Los Angeles County
Metropolitan Transportation Authority

Appendix E Alternatives Considered and Project Description

EASTSIDE TRANSIT CORRIDOR PHASE 2



May 2026

Metro

Appendix E
Alternatives Considered and Project Description

May 2026

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Acronyms

AA Report	Alternatives Analysis Report
ADA	Americans with Disabilities Act
am	Ante meridiem
BRT	Bus Rapid Transit
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FLM	First/Last Mile
FTA	Federal Transit Administration
I	Interstate
IOS	Initial Operating Segment
LACMTA	Los Angeles County Metropolitan Transportation Authority
LPA	Locally preferred alternative
LRT	light rail transit
LRV	Light rail vehicles
Metro	Los Angeles County Metropolitan Transportation Authority
Metro Board	Metro Board of Directors
MRDC	Metro Rail Design Criteria
MSF	Maintenance and Storage Facility
NEPA	National Environmental Policy Act
NextGen	Next-Generation
NSDV	North Side Design Variation
NOI	Notice of Intent

NOP	Notice of Preparation
OII	Operating Industries Inc.
OCS	overhead catenary system
pm	Post meridiem
Project	Eastside Transit Corridor Phase 2 Project
ROW	right-of-way
SCE	Southern California Edison
SR	State Route
TBM	tunnel boring machine
TOC	Transit Oriented Communities
TPSS	traction power substation
TSM	Transportation Systems Management
UPRR	Union Pacific Railroad
U.S.	United States
USEPA	United States Environmental Protection Agency
$	dollars

1.0 HISTORY OF ALTERNATIVES CONSIDERED

This appendix provides an overview of the history of alternatives considered, including a summary of previous studies and decisions made that have led to the development of the Build Alternative being analyzed in this Environmental Assessment (EA) under NEPA. The appendix provides the Project history with a summary and timeline of events and activities, followed by a summary table of alternatives screened and descriptions of alternatives considered, concluding with a discussion of the Build Alternative being considered in this EA.

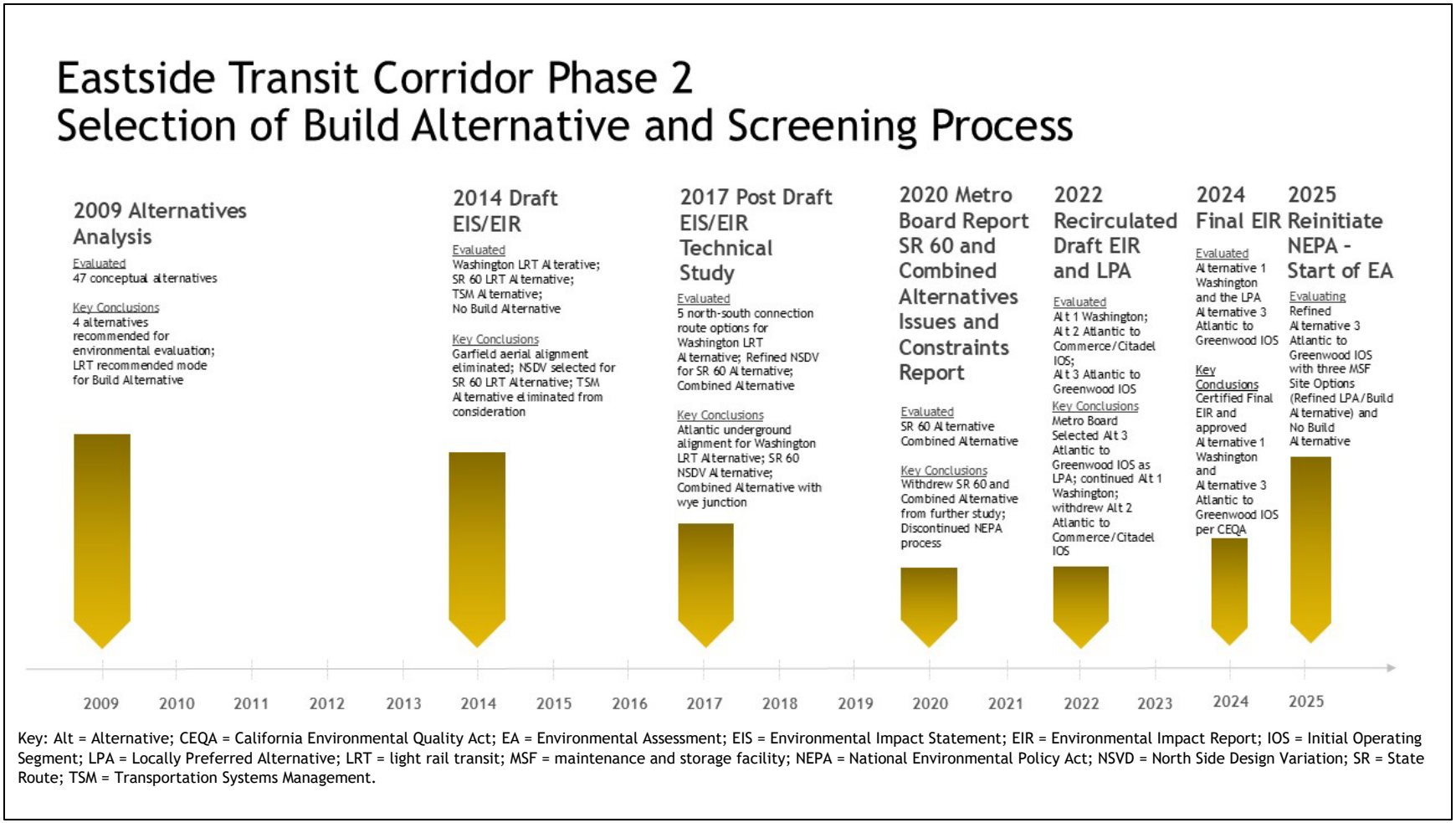
The extension of Los Angeles County Metropolitan Transportation Authority (LACMTA/Metro) light rail transit (LRT) in east Los Angeles County is being constructed in phases. This first phase extension was completed November 2009. The second phase extension, known as the Eastside Transit Corridor Phase 2 Project (Project), is the subject of this EA. In January 2002, the Federal Transit Administration (FTA) and Metro published a Final Supplemental Environmental Impact Statement (EIS) and Final Subsequent Environmental Impact Report (EIR) under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), respectively, for the first phase extension of the Pasadena Blue Line into East Los Angeles to Atlantic Station. This extension was later named the Metro E Line Eastside Extension.

For the development of this second phase extension, there is a long history of evaluation and screening of concepts, engineering and environmental refinements, and alternatives considered. As described in **Section 2.0**, the Build Alternative would consist of approximately 4.7 miles of reconfigured and new LRT guideway[1] to extend the Metro E Line east from the current terminus at Atlantic Boulevard to an at-grade terminal station at the Greenwood station in the City of Montebello.

1.1 Project History

The Project has undergone a long history of planning and environmental review since 2007, beginning with an alternatives analysis of 47 concepts in 2007 that was narrowed through various environmental review documents and technical studies to a locally preferred alternative (LPA) in 2022, a Final EIR with Project approvals under CEQA in May 2024, and the initiation of an EA under NEPA in 2025. This EA evaluates the Build Alternative, which is the LPA identified in the Final CEQA EIR with minor refinements, and a No Build Alternative in accordance with NEPA environmental requirements per Title 23 Code of Federal Regulations 771.119. The Project history is highlighted in **Figure 1.1** and described in more detail in the following sections.

[1] According to the FTA, a guideway refers to a public transportation facility using and occupying a separate right-of-way (ROW) or rail line for the exclusive use of public transportation (FTA 2025). The Build Alternative guideway is the proposed rail line, including the underground, aerial, and at-grade configurations. The centerline refers to the center line between the guideway LRT tracks or structures that supports, contains, and physically guides the LRT vehicles.



Key: Alt = Alternative; CEQA = California Environmental Quality Act; EA = Environmental Assessment; EIS = Environmental Impact Statement; EIR = Environmental Impact Report; IOS = Initial Operating Segment; LPA = Locally Preferred Alternative; LRT = light rail transit; MSF = maintenance and storage facility; NEPA = National Environmental Policy Act; NSVD = North Side Design Variation; SR = State Route; TSM = Transportation Systems Management.

Source: Metro; CDM Smith/AECOM JV 2026.

Figure 1.1. Development of the Alternatives and Screening Process

In 2007, Metro initiated plans for a high-capacity transit connection to the Eastside Extension Phase 1 project by developing an Eastside Transit Corridor Phase 2 Alternatives Analysis Report (AA Report) that provided preliminary, initial, final, and conceptual engineering screening of concepts for the second phase. During the alternatives analysis study process, 47 initial alternatives were evaluated and screened down to four feasible build alternatives. To further refine the build alternatives for environmental analysis, Metro conducted the Eastside Transit Corridor Phase 2 Alternatives Analysis Addendum (2009) with applied additional evaluation criteria and conceptual level engineering. In October 2009, the Metro Board of Directors (Metro Board) authorized staff to study four alternatives identified in the AA Report for the second phase; these alternatives included two build alternatives, a No Build Alternative and a transportation systems management (TSM) alternative. The two build alternatives were the State Route (SR)-60 LRT Alternative and the Washington Boulevard LRT Alternative (Metro 2009).

In August 2014, a joint NEPA/CEQA document (Draft EIS/EIR) for Phase 2 was released for public review by FTA and Metro that addressed the two build, TSM, and No Build alternatives identified by the Metro Board in 2009. Based on agency and public comments provided on the 2014 Draft EIS/EIR, the Metro Board directed staff to carry forward two build alternatives for further study and to conduct additional technical studies, including identifying a new north-south connection to Washington Boulevard, addressing agency comments regarding the SR-60 Alternative, and exploring a Combined Alternative consisting of full build-out of the SR-60 and Washington Alternatives. Subsequently, the Eastside Transit Corridor Phase 2 Post Draft EIS/EIR Technical Study Report was prepared to address the Metro Board's directive. The Metro Board approved the technical study report in November 2017 and directed further environmental review and analysis to proceed on the No Build Alternative, SR-60 Alternative, Washington Alternative, and a Combined Alternative (Metro 2017).

Preparation of a Supplemental/Recirculated Draft EIS/EIR for Phase 2 was initiated in 2019 to address the No Build Alternative and the three Build Alternatives identified by the Metro Board in 2017. FTA published a Notice of Intent (NOI) in the Federal Register on May 29, 2019, pursuant to NEPA (FTA 2019) and Metro issued a Notice of Preparation (NOP) on May 31, 2019, pursuant to CEQA. The NOI/NOP informed the public of the alternatives, provided notice of a 45-day scoping period, and provided notice of intent to release a Supplemental/Recirculated Draft EIS/EIR. The NOI/NOP also described the consideration of adopting an LPA by the Metro Board based on the findings of the Supplemental/Recirculated Draft EIS/EIR.

As further technical environmental analysis, additional engineering design, and Metro policy and program updates were completed while preparing the Supplemental/Recirculated Draft EIS/EIR, issues and constraints within and along the SR-60 Alternative became evident. This included conflicts with future planned improvements along the SR-60 Freeway and challenges associated with running parallel to or in an aerial configuration along the SR-60 freeway right-of-way (ROW). The SR-60 Alternative was also determined to be inconsistent with Metro's policies and parking, which were not in place when the Project was first introduced. The Combined Alternative, which included the SR-60 Alternative, was found to compound these technical challenges as it would have required the addition of an underground wye junction at the current terminus of the Metro E Line.

In February 2020, the Metro Board approved the withdrawal of the SR-60 and Combined Alternatives and also approved the discontinuation of the NEPA analysis to streamline the environmental clearance process. Metro subsequently notified the FTA and cooperating agencies of the decision to discontinue

the NEPA environmental study (Supplemental Draft EIS) and to advance a Recirculated Draft EIR pursuant to CEQA for the Washington Boulevard LRT Alternative (Metro 2022a).

Following the additional technical studies and public outreach activities conducted between 2020 and 2022, Metro published a Recirculated Draft EIR for public review in June 2022 pursuant to CEQA. The Recirculated Draft EIR studied three build alternatives with two design options, two MSF site options, and a No Project Alternative. The three build alternatives consisted of Alternative 1: Washington (Atlantic Boulevard to Lambert station); Alternative 2: Atlantic to Commerce/Citadel Initial Operating Segment (IOS); and Alternative 3: Atlantic to Greenwood IOS. The three build alternatives studied had the same guideway alignment east of the existing terminus at Atlantic Station but varied in length and location of the eastern terminus. The two MSF site options included a 24-acre site in the City of Commerce that required the acquisition of approximately 21 parcels and a 30-acre site in the City of Montebello that required the full acquisition of 5 parcels. Based on public input and the findings of the Recirculated Draft EIR, the Metro Board selected the Atlantic to Greenwood IOS with the Montebello MSF as the LPA on December 1, 2022 (Metro 2022b). At the same time, the Metro Board advanced the LPA and the full alignment with the Montebello MSF for further analysis in the Final EIR. The Metro Board also reinitiated the NEPA environmental process in 2022 for the LPA (Atlantic to Greenwood Alternative IOS, otherwise known as the Build Alternative for this EA).

The Final EIR included refinements to the alternatives identified in the Recirculated Draft EIR, including a minor change in the location of the transition from the aerial to at-grade configurations, additional crossovers[2] near the Atlantic/Whittier station, Greenwood station, and Lambert station, and a design option for a new crossover within the existing track between Maravilla Station and East Los Angeles Civic Center Station to improve Metro's operational needs. The Metro Board certified the Final EIR in May 2024.

In 2025, Metro began coordination with FTA to discuss federal environmental clearance for federal funding opportunities to carry out the engineering and construction for the Build Alternative. On May 7, 2025, Metro requested an environmental Class of Action determination from FTA to advance into the NEPA process with an EA. On May 22, 2025, the FTA informed Metro that based on the information that had been submitted, the NEPA Class of Action for the Project is an EA, which initiated the EA process.[3] The Locally Preferred Alternative identified during the CEQA process, with refinements, is the Build Alternative for this EA.

1.1.1 Screening of Concepts and Alternatives

This section provides a summary of the screening and refinement of concepts and alternatives for the Project that have been considered through the process, beginning with initial concepts identified in 2007 and leading to the selection of the LPA in 2022. As shown in **Table 1.1**, this process has included the preparation of screening reports and technical studies completed as part of the development of the Project. This is illustrated in **Table 1.1**. The referenced reports are available on the Project website: https://www.metro.net/projects/eastside_phase2/.

[2] Crossovers are mechanical track installations along a double-track alignment that allow trains traveling in either direction on either track to move to the other track and continue traveling in the same direction without stopping.
[3] FTA requires an EA in two situations: Further investigation is needed to determine if the project would significantly affect the quality of the human and natural environment and require an EIS (23 CFR 771.119(a)); or for other purposes in compliance with NEPA (40 CFR 1508.9).

Table 1.1. Concepts and Alternatives Considered

Alternative and Concepts Considered	Screening and Refinement of Alternatives	Referenced Report	Alternative(s)/ Concept(s) Carried Forward
Initial Concepts			
Initial Concepts	▪ 47 conceptual alternatives were identified. Based on stakeholder input and technical analysis on constructability and operational feasibility, the list of conceptual alternatives was narrowed to 17 initial alternatives. ▪ 17 initial alternatives, along with the required No Build and TSM options, underwent initial level technical and environmental analysis. ▪ Based on a comparative analysis and public feedback, 4 build alternatives were identified for further study: SR-60 LRT, Washington Boulevard LRT, Beverly Boulevard LRT, and Beverly/Whittier Boulevard LRT. ▪ Beverly Boulevard LRT and Beverly/Whittier Boulevard LRT alternatives were not recommended due to issues related to potential conflicts with Southern California Edison (SCE), Union Pacific Railroad (UPRR), and Whittier Greenway Sections 6(f) and 4(f) concerns.	AA Report October 2009	▪ SR-60 LRT Alternative ▪ Washington Boulevard LRT Alternative ▪ TSM Alternative ▪ No Build Alternative
SR-60 Alternative			
SR-60 Bus Rapid Transit (BRT)	▪ BRT option generated the lowest ridership of the alternatives and did not provide any cost savings when compared to the LRT alternatives. ▪ In the AA Report, LRT technology was determined the most appropriate transit mode given higher ridership projections and resulting capacity needs.	AA Report October 2009	▪ LRT chosen mode for the Eastside Transit Corridor Phase 2 Project
SR-60 LRT Baseline Alternative (alignment south of the SR-60 Freeway)	▪ The SR-60 LRT Baseline Alternative alignment would transition to an independent aerial structure within the south side of the SR-60 Freeway to Garfield Avenue. As such, the southern alignment traverses environmentally sensitive land uses and resources including the Operating Industries, Inc. (OII) Superfund site, Whittier Narrows Flood Control Basin, Whittier Narrows Recreation Area, environmental justice communities, residential and educational land uses, and major utility corridors. ▪ Conflicts with SCE utilities. ▪ MSF site limitations ▪ Metro's Transit Oriented Communities (TOC) and First/Last Mile (FLM) policies. ▪ Public Scoping comments (stakeholder concerns related to safety, access, construction, permitting, traffic, etc.)	Metro Board Report November 2014	▪ SR-60 LRT North Side Design Variation ▪ Washington LRT Alternative ▪ No Build Alternative

Alternative and Concepts Considered	Screening and Refinement of Alternatives	Referenced Report	Alternative(s)/ Concept(s) Carried Forward
SR-60 LRT – Mission Junction Maintenance Yard	▪ The Mission Junction Maintenance Yard Site was approximately 11 acres located in the City of Los Angeles (between Interstate (I)-5, I-10, and the Los Angeles River). This site was not large enough to accommodate the MSF option without closing portions of Mission Road. ▪ Technical studies found that a complicated 0.5 mile long yard lead track would be required to access this site.	Metro Board Report February 2020	▪ Commerce MSF site option ▪ Montebello MSF site option
SR-60 LRT – North Side Design Variation (alignment north of the SR-60 Freeway)	▪ Non-standard bridge design over SR-60 Freeway. ▪ Impacts on California Department of Transportation's (Caltrans') future expansion plan of the SR-60 Freeway: to accommodate potential future freeway expansion, the alignment would need to be relocated which would require more property acquisitions and result in additional environmental impacts and increased costs. ▪ Potential conflicts with the Paramount Boulevard Bridge Restoration Project. ▪ Withdrawn as part of the SR-60 LRT Alternative (see detailed in **Section 1.1.2**)	Metro Board Report February 2020	▪ Washington LRT Alternative ▪ No Build Alternative
Washington Alternative			
Washington LRT – Garfield Avenue (aerial)	▪ Based on stakeholder comments received on the Draft EIS/EIR, the Metro Board directed a study to identify other north-south connections to Washington Boulevard. ▪ Concerns related to construction impacts on traffic/circulation, business disruption and/or relocation.	Metro Board Report November 2014	▪ Washington LRT – Atlantic Boulevard (underground)
Washington LRT – Garfield Avenue (underground)	▪ Impacts on existing businesses, residents, and relocation of underground utilities. ▪ Would not serve highest ridership catchment area near Commerce/Citadel. ▪ Result in significant impacts during construction (property acquisition, business displacement, and traffic/circulation).	Post Draft EIS/EIR Technical Study Report May 2017	▪ Washington LRT – Atlantic Boulevard (underground)
Washington LRT – Atlantic Boulevard (at-grade)	▪ Atlantic Boulevard is a major arterial that would be impacted by an at-grade LRT configuration, especially given the presence of numerous sensitive uses (e.g., schools and churches). ▪ An at-grade crossing analysis concluded that an at-grade LRT could result in non-mitigatable significant traffic/circulation and access impacts.	Post Draft EIS/EIR Technical Study Report May 2017	▪ Washington LRT – Atlantic Boulevard (underground)
Washington LRT – Arizona Avenue (at-grade)	▪ An at-grade LRT alignment would require removal of on-street parking and reduction of existing travel lanes, creating a significant hardship to residents along Arizona Avenue. ▪ A junction at 3rd Street and Mednik Avenue would require additional property acquisitions and reconfiguration of the intersection which would affect adjacent sensitive land uses.	Post Draft EIS/EIR Technical Study Report May 2017	▪ Washington LRT – Atlantic Boulevard (underground)

Alternative and Concepts Considered	Screening and Refinement of Alternatives	Referenced Report	Alternative(s)/ Concept(s) Carried Forward
Washington LRT – Arizona Avenue (underground)	▪ The LRT portal to underground and a rail junction on Arizona Avenue would remove the existing at-grade East Los Angeles Civic Center and Atlantic stations, essentially discontinuing service to these stations. ▪ To accommodate the underground configuration on Arizona Avenue, it would require acquisition of numerous residences in the vicinity of 3rd Street and Mednik Avenue, where a large construction site would be needed to launch or extract a tunnel boring machine (TBM).	Post Draft EIS/EIR Technical Study Report May 2017	▪ Washington LRT – Atlantic Boulevard (underground)
Washington LRT – Santa Fe Springs MSF Option	▪ This MSF option was approximately 9 acres in size and located in the City of Santa Fe Springs (south of Washington Boulevard and east of Allport Avenue). ▪ This MSF option was withdrawn due to property acquisition. The parcel is under construction for private industrial development.	No Longer Considered 2019	▪ Commerce MSF site option ▪ Montebello MSF site option
Washington LRT – Rosemead Boulevard Crossing Option	▪ Aerial configuration was withdrawn based on the findings of the Metro Grade Crossing Analysis.	No Longer Considered 2020	▪ Washington LRT Alternative, Rosemead Boulevard at-grade
Washington LRT – San Gabriel River/ Interstate-605 Crossing Option	▪ Upon closer coordination with Caltrans and further development in engineering design, it was determined that the guideway could be placed under the I-605 and no longer require an aerial configuration.	No Longer Considered 2021	▪ Washington LRT Alternative, Interstate 605 at-grade
Washington LRT – Alternative 1 Washington	▪ Alternative 1 is a 9 mile alignment from Atlantic Station to Lambert station in the City of Whittier; this alternative includes seven stations, two design options, and a Commerce MSF site option and Montebello MSF site option. ▪ Additional design refinements were analyzed in the Final EIR, including a guideway refinement and four crossover refinements. ▪ Compared to Alternative 3, Alternative 1 has a greater number of properties and public ROW needs. Alternative 1 would also require more regulatory agency coordination as it would cross the Rio Hondo and San Gabriel River and a longer construction duration. Therefore Alternative 1 was not selected as the LPA. ▪ Alternative 1 with the Atlantic/Pomona Station Option, the Montebello At-Grade Option, and the Montebello MSF was approved in the certification of the Final EIR.	Metro Board Report November 2022a; Final EIR (Metro 2024a)	▪ Alternative 1 Washington ▪ Alternative 3 Atlantic to Greenwood IOS

Alternative and Concepts Considered	Screening and Refinement of Alternatives	Referenced Report	Alternative(s)/ Concept(s) Carried Forward
Washington LRT – Alternative 2 Atlantic to Commerce / Citadel IOS	▪ Alternative 2 Atlantic to Commerce/Citadel IOS was a 3.2 mile alignment from Atlantic Station to Commerce/Citadel station in the City of Commerce; this alternative included three stations, one design option, and a Commerce MSF site option. ▪ The Commerce MSF site option was determined to have significant and unavoidable impacts to cultural resources. Therefore Alternative 2 was not advanced in the Final EIR.	Recirculated Draft EIR (Metro 2022a)	▪ Alternative 1 Washington ▪ Alternative 3 Atlantic to Greenwood IOS
Washington LRT – Alternative 3 Atlantic to Greenwood IOS	▪ Alternative 3 is a 4.6 mile alignment from Atlantic Station to Greenwood station in the City of Montebello; this alternative includes four stations, two design options, and a Commerce MSF site option and Montebello MSF site option. ▪ Additional design refinements were analyzed in the Final EIR, including a guideway refinement and four crossover refinements. ▪ Alternative 3 with the Atlantic/Pomona Station Option, the Montebello At-Grade Option, and the Montebello MSF was approved as the LPA with the certification of the Final EIR. ▪ Certification of the Final EIR approved the refinement of the LPA with design options for Atlantic/Pomona (open underground station) and Greenwood station (at-grade) and an MSF (including both at-grade and aerial yard lead design options) located in the City of Montebello.	Metro Board Report May 2024a; Final EIR (Metro 2024a)	▪ Alternative 1 Washington ▪ Alternative 3 Atlantic to Greenwood IOS
The Build Alternative	▪ The Build Alternative includes approximately 4.7 miles of reconfigured and new LRT alignment to extend the Metro E Line from the current terminus at Atlantic Boulevard to an at-grade terminal station at the Greenwood station in the City of Montebello. The Build Alternative would include a relocated underground Atlantic/Pomona station, two new underground stations, and one new at-grade station. ▪ The Build Alternative would also include an MSF; three sites are being considered for the MSF: (1) aerial yard lead tracks located mid-block (City of Montebello); (2) aerial yard lead tracks located along Yates Avenue (City of Montebello); and (3) a smaller satellite yard at Gayhart Street (City of Commerce).	2026 EA	▪ The Build Alternative (LPA)

Alternative and Concepts Considered	Screening and Refinement of Alternatives	Referenced Report	Alternative(s)/ Concept(s) Carried Forward
Other Alternatives and Concepts			
Beverly Boulevard LRT	▪ The eastern half of the Beverly Boulevard LRT alignment would require an SCE easement. However, SCE indicated potential long-term plans for use of that property. ▪ The UPRR tracks currently accommodate Metrolink and freight operations. UPRR indicated potential plans for their property that would preclude any other structure. ▪ The Whittier Greenway is lined on both sides by residences, and on the north side by four schools. LRT operations would require the acquisition of half of this recreational area which would raise Section 4(f) issues.	Alternatives Analysis Addendum October 2009	▪ SR-60 LRT Alternative ▪ Washington LRT Alternative ▪ TSM Alternative ▪ No Build Alternative
Whittier Boulevard LRT	▪ Technical and environmental analysis identified significant community impacts, including a high potential for noise and vibration, community cohesion, and street system capacity impacts.	Alternatives Analysis Addendum October 2009	▪ SR-60 LRT Alternative ▪ Washington LRT Alternative ▪ TSM Alternative ▪ No Build Alternative
TSM Alternative	▪ FTA no longer required a TSM Alternative for federal New Starts funding. ▪ Next-Generation (NextGen) bus improvements throughout the Los Angeles County region are part of the No Build Alternative (baseline).	Draft EIS/EIR November 2014	▪ SR-60 LRT Alternative ▪ Washington LRT Alternative ▪ No Build Alternative
Combined Concept	▪ In addition to the environmental constraints and engineering challenges described for the SR-60 Alternative, the Combined Alternative would require additional property acquisitions and result in more construction impacts in the Via Campo neighborhood. ▪ The Combined Alternative could not support 5 minute headways without interlining the Metro E Line in the area.	Metro Board Report February 2020	▪ Washington LRT – Atlantic Boulevard (underground)

Source: Metro; CDM Smith/AECOM JV 2025.
Key: AA Report = Alternatives Analysis Report, Caltrans = California Department of Transportation, EIR = environmental impact report, EIS = environmental impact statement, F/LM = first/last mile, FTA = Federal Transportation Administration, I = interstate, IOS = Initial Operating Segment; LPA = Locally Preferred Alternative, LRT = light rail transit, MSF = maintenance and storage facility, NextGen = Next-Generation, OII = Operating Industries, Inc., SCE = Southern California Edison, SR = State Route, TBM = tunnel boring machine, TOC = transit oriented communities, TSM = Transportation Systems Management, UPRR = Union Pacific Railroad.

1.1.2 Description of Alternatives Considered

The following are detailed descriptions of the alternatives that were considered during the development of the Project.

1.1.2.1 2014 Draft EIS/EIR

Transportation Systems Management Alternative

As described in the 2014 Draft EIS/EIR (Metro 2014a), the TSM Alternative addressed mobility needs within the corridor, but did not include construction of a fixed guideway facility. The TSM Alternative included all provisions of the No Build Alternative plus enhancement of east-west bus service in the same corridor with additional north-south bus services. In comparison between the TSM and the build alternatives which are discussed below, the build alternatives were more successful in leveraging transit investments as they provided shorter travel times, connectivity without forced transfers, and offered opportunities for future land use benefits. Additionally, the build alternatives resulted in a higher reduction in vehicle miles traveled compared to the TSM Alternative.

After the 2014 Draft EIS/EIR (Metro 2014a), the FTA no longer required a TSM alternative to be evaluated as part of the New Starts program, noting that certain incremental system improvements will occur whether the New Starts project is constructed or not. As such, the final rule eliminated the need to evaluate a project against both a separate no-build and TSM alternative, and instead directed the use of a baseline alternative that is agreed upon by project sponsors and FTA. The baseline alternative involves transit improvements that are lower in cost than the proposed New Starts project (United Sates [U.S.] General Accounting Office 2002). In 2020, Metro initiated the NextGen Bus Plan with bus service improvements that would serve the corridor similar to the TSM Alternative. As such, the NextGen bus improvements are assumed under baseline conditions (the No Build Alternative evaluated in this EA) and the TSM Alternative was eliminated from further consideration.

Washington Alternative, North-South Connection to Washington Boulevard

Described in the 2014 Draft EIS/EIR (Metro 2014a), the Washington Boulevard Alternative included an aerial track and station on Garfield Avenue to avoid extensive major utilities within the center of the street and impacts to sensitive uses. Following the release of the 2014 Draft EIS/EIR (Metro 2014a), substantial public comments were received regarding the aerial configuration on Garfield Avenue. A majority of these comments addressed construction impacts, with a focus on traffic and business disruption and/or relocations.

Per the May 2017 Post Draft EIS/EIR Technical Report (Metro 2017), a planning process was initiated to consider north-south options for the Washington Alternative. A total of 27 potential connections to Washington Boulevard were considered and screened based on physical constraints, ridership, cost, travel time, access, TOC potential, and economic opportunities. Metro also undertook extensive outreach efforts with project stakeholders (over 110 outreach meetings including community meetings, briefings with coalitions, and stakeholder briefings) to provide project updates and gain input on the refinement of the north-south connection for the Washington Boulevard Alternative. As a result of the outreach and screening process, five route concepts were determined to be most promising: Garfield Avenue (underground), Atlantic Boulevard (at-grade and underground), and Arizona Avenue (at-grade and underground). These routing options were screened and evaluated to determine a north-south connection for the Washington Alternative. The key reasons for elimination of the Garfield Avenue, Atlantic Boulevard at-grade, and Arizona Avenue at-grade and underground routing options are as follows:

- **Garfield Avenue (underground)** – This routing option required a tight horizontal curve west of Via Campo and Wilcox Avenue which could impact existing businesses and residents and require relocation of storm drains and sewer lines. This route would also not serve the Commerce Citadel area which showed the highest ridership catchment area. Given the location of the tunnel and station portal on Garfield Avenue, this route would result in significant impacts during construction including property acquisition, business disruption, and traffic/circulation impacts. For these reasons, the Garfield Avenue underground routing concept was not recommended for further consideration.
- **Atlantic Boulevard (at-grade)** – This routing option would serve higher density and activity levels including commercial/retail corridors compared to the other routing options. However, because the catchment area around Atlantic Boulevard is a major arterial, it is not a viable corridor for an at-grade LRT configuration, especially given the presence of numerous sensitive uses nearby (e.g., schools and churches). Based on a grade crossing analysis, the at-grade route option on Atlantic Boulevard would result in significant traffic/circulation and access impacts that could not be mitigated. For these reasons, the Atlantic Boulevard at-grade routing concept was not recommended for further consideration.
- **Arizona Avenue (at-grade)** – The at-grade Arizona Avenue routing option was considered due to the wideness of the street (108-foot-curb-to curb) and its ability to accommodate two sets of tracks just west of the intersection of 3rd Street and Mednik Avenue. However, the at-grade routing concept would have significant engineering challenges and community impacts as it required reduction of existing travel lanes and elimination of a substantial amount of on-street parking along Arizona Avenue. Additionally, an at-grade junction near 3rd Street and Mednik Avenue would require additional property acquisitions and reconfiguration of the intersection, which would result in impacts to traffic and adjacent sensitive uses (schools and churches). For these reasons, the Arizona Avenue at-grade routing concept was not recommended for further consideration.
- **Arizona Avenue (underground)** – The underground Arizona Avenue routing option would begin just west of the intersection of Arizona Avenue and 3rd Street with a portal in the center of the street. The distance required for a transition to connect to the existing at-grade Metro E Line would necessitate the removal of the existing at-grade East Los Angeles Civic Center Station and Atlantic Station, effectively cutting-off service to the east along the existing at-grade alignment. If a below grade-junction at Arizona Avenue was designed to maintain service to the east, it would require 3 to 5 acres for construction which would result in significant number of residential property acquisitions and disruptions to surrounding sensitive uses (schools). For these reasons, the Arizona Avenue underground routing concept was not recommended for further consideration.

The Garfield Avenue aerial alignment and station were eliminated from consideration and a technical study was initiated by Metro to develop a new north-south connection to Washington Boulevard.

SR-60 Alternative (with and without North Side Design Variation)

As one of the original initial concepts from the 2009 AA Report and Alternatives Analysis Addendum and further studied in the 2014 Draft EIS/EIR (Metro 2014a), the SR-60 Alternative proposed a 6.9-mile LRT service from the existing Atlantic Boulevard Station to Peck Road in the City of South El Monte. There were four stations proposed with the SR-60 Alternative (Garfield Avenue, The Shops at Montebello,

Santa Anita Avenue, and Peck Road) located within the cities of Montebello, Monterey Park, and South El Monte.

The majority of this alignment (94 percent) was designed to operate within an aerial configuration on the southern portion of the SR-60 Freeway ROW. To avoid concerns raised by the United States Environmental Protection Agency (USEPA) regarding potential impacts to the former OII landfill site, the 1.5 mile North Side Design Variation (NSDV) was also studied. West of Greenwood Avenue, the NSDV alignment crossed over the SR-60 Freeway, then ran approximately 3,500 feet (at-grade and aerial) before returning to the south side of the freeway, just west of Paramount Boulevard in the City of Monterey Park.

The SR-60 Alternative underwent several refinements to address issues related to running parallel to the SR-60 Freeway and potential impacts to sensitive land uses and environmental resources. The evaluation, redesign, and refinement of the SR-60 was documented through several studies, including the Draft EIS/EIR Report (Metro 2014a), the 2017 Post Draft EIS/EIR Technical Study (Metro 2017), the additional analyses performed in 2019 (Metro 2019a), and the SR-60 and Combined Alternatives Issues and Constraints Report in 2020 (Metro 2020b). The major issues and concerns related to the SR-60 Alternative included the following:

- Ability to accommodate future improvements to the SR-60 Freeway – To accommodate Caltrans' future expansion plan of the SR-60 Freeway, the alignment would need to be relocated approximately 93 feet which would further increase constraints and impacts, including additional property acquisitions, construction impacts, and costs. In addition, given potential improvements at the SR-60/I-605 Interchange, the Peck Road station and track would need to be redesigned which would result in additional environmental impacts to surrounding sensitive uses.
- Non-standard bridge design over the SR-60 Freeway – Engineering challenges would require unconventional permitting processes and extensive agency coordination, which could take a considerable amount of time and potentially adding several years of delay to the Project schedule.
- Conflicts with sensitive land uses and permitting requirements from regulatory agencies – The SR-60 alignment traverses environmentally sensitive land uses and resources including the OII Superfund site, Whittier Narrows Flood Control Basin, Whittier Narrows Recreation Area, environmental justice communities, residential and educational land uses, and major utility corridors. As a result, extensive mitigations and design options would need to be developed to address potential impacts to communities and sensitive uses.
- Conflicts with SCE utilities – In the 2017 Post Draft EIS/EIR study, several refinements to the alignment were designed to address SCE utility conflicts with transmission lines. However, given the complexity of requirements from both SCE and Metro Rail Design Criteria (MRDC) (Metro 2024d), two of the three transmission line conflicts could not be avoided. Therefore, the alignment would require raising transmission lines or modifying utility corridors which would require a considerable amount of time, budget, and coordination between agencies.

- MSF site limitations – Per Metro operation's Fleet Management Plan, the MSF site would need to accommodate 100 to 120 light rail vehicles requiring a site approximately 20 acres in size. Given the land constraints along the built-out corridor along the freeway, the MSF site proposed for the SR-60 Alternative would be 15.5 acres in size and would not accommodate a full Operations and Maintenance Facility program. Additionally, longer lead tracks and conflicts with transmission lines would require additional ROW and an easement from SCE.
- Inconsistencies with recent Metro Policies – The SR-60 Alternative was inconsistent with Metro's recent policies and programs. An assessment report reviewed as part of the Metro Board Report in February 2020 (Metro 2020a) used criteria to assess the SR-60 Alternative relative to physical barriers in the surrounding station areas. Given the lack of proximity to residential communities and lack of direct connections within the 0.5 mile station area, the SR-60 Alternative was found to be less supportive of areas with the highest population densities. The communities along the SR-60 Alternative, when compared to the county average, have lower densities, fewer communities with non-English speaking population, and fewer communities living below the federal poverty level. Metro's 2018 TOC Policy (Metro 2018c) was adopted to promote places that, by design, allow people to drive less and access transit more. As such, the TOC criteria used in the assessment report (Metro 2020a) included consideration of adjacent land uses, population and employment densities. Initial findings from the TOC assessment indicated that the SR-60 Alternative was challenged and constrained since the guideway runs parallel to the freeway. Land uses surrounding the station were also less transit supportive than those along the Washington Alternative. As described in Metro's 2014 FLM Strategic Plan (Metro 2014b) and the February 2020 Metro Board Report (Metro 2020a), FLM criteria analyzed bicycle facilities, block sizes, and active transportation elements. Due to the spatial nature of the SR-60 Alternative's proposed station areas, connections to existing residential neighborhoods were hindered by the quality of the public realm, a discontinuous and suburban street network, large block sizes, numerous freeway on/off-ramps, and freeway underpasses.
- Public Scoping Comments – During the 2019 Scoping period, the SR-60 Alternative was presented as one of the three Build LRT alternatives. Approximately one-third of the comments referred to the SR-60 Alternative, which received the lowest amount of support from the public. Concerns from stakeholders included negative health and quality of life impacts related to the at-grade/aerial build for the SR-60 Alternative, community/neighborhood impacts, noise and vibration impacts, air quality impacts and visual impacts. A total of 21 agencies also submitted comments during the 2019 scoping period. Additional concerns were raised from several Cooperating Agencies about the SR-60 Alternative following review of the 2014 Draft EIS/EIR. In particular, comments were received from the Caltrans, USEPA, and U.S. Army Corps of Engineers on the SR-60 Alternative related to constructability and safety challenges, access and construction within the Whittier Narrows Dam Basin, and extensive review processes for encroachment permits, traffic, visual impacts, ROW concerns, and non-standard existing facilities (Metro 2020a).
- Complications to refine the SR-60 Alternative's alignment and stations to address constraints and challenges would impede Project implementation efforts.

In February 2020, the Metro Board approved the withdrawal of the SR-60 Alternative from further consideration (Metro 2020a).

1.1.2.2 2020 Metro Board Report – Attachment A, SR-60 and Combined Alternatives Issues and Constraints Report

Combined Alternative

The Combined Alternative included the potential build-out and operation of both the SR-60 and Washington Alternatives by allowing service from South El Monte and Whittier to downtown Los Angeles and the regional transit network. The Combined Alternative required additional infrastructure and operational elements when compared to the other alternatives (if they operated as a "stand-alone" line). The alternative would allow for connection between South El Monte, Whittier, and downtown Los Angeles in a "C" configuration via a wye junction (e.g., three-way junction) located near Via Campo. The wye junction would allow trains to alternate train movements between both ends (South El Monte and Whittier) which would create three service lines. The Combined Alternative stations would be the same as both the SR-60 and Washington Alternatives.

In addition to the environmental constraints and engineering challenges described for the SR-60 Alternative, the Combined Alternative would require additional property acquisitions from La Verne Avenue to Sadler Avenue in the Via Campo neighborhood to accommodate the wye junction. As such, the Combined Alternative would add approximately $1.3-$1.7 billion (dollars) to the Project's capital cost. In addition, given the junction design, the Combined Alternative could not support five-minute headways, which are required for LRT projects under the MRDC, without interlining tracks, adding more cost for this alternative.

Similar to the SR-60 Alternative, the Combined Alternative faced significant environmental and engineering challenges as well as the additive operational challenges related to the underground wye junction within the East Los Angeles community near the Via Campo neighborhood. Complications to redesign and refine the Combined Alternative's alignment, stations and wye junction would impede Project implementation efforts and create risk in the ability to meet 2028 acceleration goals. As such, in February 2020, the Metro Board approved the withdrawal of the Combined Alternative from further consideration (Metro 2020a).

1.1.2.3 2022 Recirculated Draft EIR and 2024 Final EIR

Alternative 1 Washington

This alternative was analyzed in the Recirculated Draft EIR (Metro 2022a) and further evaluated with design refinements in the Final EIR (Metro 2024a). Alternative 1 would extend the at-grade Project alignment approximately 9 miles east from the current at-grade terminus at Atlantic Boulevard to a terminus at Lambert station in the City of Whittier. The alignment would include approximately 3 miles of underground, 1.5 miles of aerial, and 4.5 miles of at-grade alignment. The Alternative 1 alignment would cross the Rio Hondo and San Gabriel River and the Rio Hondo Spreading Grounds, and the existing San Gabriel River and Rio Hondo bridges on Washington Boulevard would be replaced with new bridges designed to carry both the LRT facility and the four-lane roadway. Alternative 1 would also cross below the I-605 overpass on Washington Boulevard. Alternative 1 would relocate/reconfigure the existing at-

grade Atlantic Station to a new underground station and provide six new stations (two underground, one aerial, and three at-grade). One design option, the Atlantic/Pomona station option, was considered for the relocated/reconfigured Atlantic Station and one design option, the Montebello At-Grade option was considered for the alignment. It is anticipated that property acquisitions would be required to accommodate the stations and related facilities. The proposed station location for Alternative 1 would include:

- Atlantic (Relocated/Reconfigured) – existing Atlantic Station would be relocated and reconfigured to an underground center platform station located beneath Atlantic Boulevard south of Beverly Boulevard in East Los Angeles.
    - Alternatively, the **Atlantic/Pomona Station Option** would relocate the existing Atlantic Station to a shallow underground open-air station with two side platforms and a canopy. This station would be located beneath the existing triangular parcel bounded by Atlantic Boulevard, Pomona Boulevard, and Beverly Boulevard.
- **Atlantic/Whittier** – would be underground with a center platform located beneath the intersection of Atlantic and Whittier Boulevards in East Los Angeles.
- **Commerce/Citadel** – would be underground with a center platform located beneath Smithway Street near the Citadel Outlets in the City of Commerce.
- **Greenwood** – would be aerial with a side platform located in the median of Washington Boulevard east of Greenwood Avenue in the City of Montebello.
- **Rosemead** – would be at-grade with a center platform located in the center of Washington Boulevard west of Rosemead Boulevard in the City of Pico Rivera.
- **Norwalk** – would be at-grade with a center platform located in the median of Washington Boulevard east of Norwalk Boulevard in the City of Santa Fe Springs.
- **Lambert** – would be at-grade with a center platform located south of Washington Boulevard just west of Lambert Road in the City of Whittier.

Following the action of the Metro Board and receipt and review of public comments on the Recirculated Draft EIR, the conceptual engineering of the Project continued to progress. This resulted in the consideration of refinements to the overall project design and performance that are applicable to Alternative 1. These refinements were identified and analyzed in the 2024 Final EIR.

The design refinements consisted of (1) an optional Guideway Refinement for the transition from the aerial configuration to the at-grade configuration; and (2) Crossover Refinements consisting of four new or revised crossover locations (Maravilla, Atlantic/Whittier station, Greenwood, and Lambert) that were not described in the Recirculated Draft EIR. The Metro Board approved the selection of the full 9 mile (Alternative 1) Eastside Transit Corridor Phase 2 with Lambert Station in the City of Whittier as the terminus for the Project (Metro 2024b, 2024c).

Alternative 2 Atlantic to Commerce / Citadel IOS

This alternative was analyzed in the Recirculated Draft EIR (Metro 2022a). Alternative 2 would extend the at-grade Project alignment for approximately 3.2 miles from the current at-grade terminus at Atlantic Boulevard to an underground terminal station at the Commerce/Citadel station in the City of Commerce with lead tracks connecting to the Commerce MSF site option. This alternative would include

the relocated/reconfigured Atlantic station and two new stations in an underground configuration. The Alternative 2 alignment would consist of approximately 3 miles of underground, 0.1 mile of aerial, and 0.1 mile of at-grade alignment. One design option, the Atlantic/Pomona station option, was considered for the relocated/reconfigured Atlantic Station.

The Commerce MSF site option and other ancillary facilities would be part of Alternative 2. Located in the City of Commerce, the 24 acres site would be bounded by Davie Avenue to the east, Fleet Street to the north, Saybrook Avenue to the west, and an unnamed street to the south. The proposed site would require the acquisition of additional parcels identified as low-rise commercial and industrial buildings to accommodate the lead track and construction staging. The Commerce MSF would connect to the Project through an underground to aerial configuration west of the intersection of Gayhart Street and Washington Boulevard and would run parallel to Washington Boulevard from Gayhart Street to Yates Avenue. To construct and operate the Commerce MSF site option, Corvette Street, an undivided two-lane road, would need to be permanently closed between Saybrook Avenue and Davie Avenue.

The Metro Board did not advance Alternative 2 for further environmental evaluation in the Final EIR as it required the Commerce MSF, which would have a significant unavoidable impact on cultural resources caused by the demolition of the historic Pacific Metals Company building and removal of properties within the potential Vail Field Industrial Addition historic district (Metro 2022a). As such, Alternative 2 was not advanced for further analysis in the 2024 Final EIR.

Alternative 3 Atlantic to Greenwood IOS / Locally Preferred Alternative

Alternative 3 was analyzed in the Recirculated Draft EIR (Metro 2022a) and further evaluated with design refinements in the Final EIR (Metro 2024a). Alternative 3, as evaluated in the Recirculated Draft EIR, is a 4.6 mile alignment from Atlantic Station to Greenwood station in the City of Montebello, including approximately 3 miles of underground, 1.5 miles of aerial, and 0.1 mile of at-grade alignment. Alternative 3 includes four stations (one relocated/reconfigured Atlantic Station, three underground, and one aerial), two design options (Atlantic/Pomona station option and Montebello At-Grade option), and a Commerce MSF site option and Montebello MSF site option.

In 2022, the Metro Board identified Alternative 3 with design options for Atlantic/Pomona (open underground station) and Greenwood Station (at-grade) and an at-grade Montebello MSF as the LPA (Metro 2022b). The proposed stations for Alternative 3/LPA would include Atlantic/Pomona, Atlantic/Whittier, Commerce/Citadel, and Greenwood, as described under Alternative 1.

Alternative 3/LPA would include an MSF in the City of Montebello, north of Washington Boulevard and south of Flotilla Street. With the MSF, the alignment would transition from an aerial to an at-grade configuration east of the MSF, between Vail Avenue and Maple Avenue.

Following the action of the Metro Board to select the LPA and receipt and review of public comments on the Recirculated Draft EIR, the conceptual engineering of the Project continued to progress. This resulted in the consideration of refinements to the overall project design and performance. These refinements identified and analyzed in the Final EIR as design refinements, included changes incorporated into Alternative 3/LPA that consisted of (1) an optional Guideway Refinement for the transition from the aerial configuration to the at-grade configuration to be between Vail Avenue and Maple Avenue; and (2) Crossover Refinements consisting of three new or revised crossover locations

(Maravilla, Atlantic/Whittier station, and Greenwood) that were not described in the Recirculated Draft EIR.

1.1.2.4 NEPA Environmental Assessment

The NEPA process was initiated in 2025 and carries forward Alternative 3/LPA for environmental analysis as the Build Alternative in this environmental assessment (EA). As described in **Section 1.1.2.3**, following the Metro Board's adoption of Alternative 3 as the LPA in 2022, there were additional design refinements to Alternative 3/LPA that were described and evaluated in the Final EIR. The Metro Board certified the Final EIR with the refined Alternative 3/LPA in May 2024.

Following certification of the Final EIR, the conceptual engineering of the Build Alternative has continued to progress, which has resulted in further modifications to the project design and operation from the refined Alternative 3/LPA evaluated in the Final EIR.[4] The design changes generally consist of (1) a smaller MSF with three optional locations, including two sites that encompass a portion of the site evaluated in the Final EIR and one in a new location; (2) minor adjustments to the guideway length and configuration, stations, and access; (3) adjustments to property acquisitions; and (4) other modifications such as frequency of operations. A summary of the changes between the Build Alternative evaluated in this EA and the refined Alternative 3/LPA evaluated in the 2024 Final EIR is presented below.

- MSF refinements
  - The refined Alternative 3/LPA includes one 39-acre site (including a 30-acre site for MSF operations and 9 acres for the yard lead tracks), in the City of Montebello north of Washington Boulevard and south of Flotilla Street between Yates Avenue and Vail Avenue. Based on input received from corridor cities and further environmental design and operational considerations, the MSF size and location have been modified. The Build Alternative includes three MSF site options, only one of which would be selected and built. The three options are summarized below. See **Section 2.1.4** for additional description and **Figure 2.9** for the location.
    - MSF Site 1 occupies 25 acres of the 39-acre MSF and yard lead tracks footprint under the refined Alternative 3/LPA. The yard lead tracks would be at the same location and configuration (aerial), as the refined Alternative 3/LPA. The transition of aerial guideway alignment from the underground alignment would be in the center of Washington Boulevard under the Build Alternative, as with the refined Alternative 3/LPA.
    - MSF Site 2 is a 28-acre site that occupies one parcel that was evaluated as part of the MSF site under the refined Alternative 3/LPA and an additional parcel to the north. The yard lead tracks, which would be aerial, are on Yates Avenue instead of mid-block under the refined Alternative 3/LPA. If MSF Site 2 is selected, the transition of aerial guideway alignment from the underground alignment would be on the northern side of Washington Boulevard and would merge into the center median of Washington Boulevard east of Garfield Avenue.

[4] Subsequent CEQA review of the project modifications will take place prior to project implementation pursuant to CEQA requirements.

  - MSF Site 3 is a 9-acre site that occupies three parcels in the City of Commerce, two of which were evaluated under the refined Alternative 3/LPA for use for construction staging and the tunnel boring machine (TBM) launch site. The refined Alternative 3/LPA did not consider a future MSF at this location. The transition of aerial guideway alignment from the underground alignment would be in the center of Washington Boulevard under the Build Alternative, as with the refined Alternative 3/LPA.

- Guideway, station, and access refinements
  - The refined Alternative 3/LPA is 4.6 miles with an approximately 3.0-mile underground guideway, 0.9-mile aerial guideway, and 0.7-mile at-grade guideway. As a result of minor design updates, the Build Alternative alignment is 4.7 miles, with an approximately 3.1-mile underground guideway, 0.9-mile aerial guideway, and 0.7-mile at-grade guideway. This 0.1-mile alignment increase is primarily due to the transition from existing at-grade alignment to the underground extension beginning further west under the Build Alternative than under the refined Alternative 3/LPA. Under the Build Alternative, the guideway would transition to the underground guideway within a trench that extends from east of Civic Center Way to east of La Verne Avenue. The trench would eliminate vehicle left turns and pedestrian crossings at 3rd Street and La Verne Avenue under the Build Alternative.
  - In addition to the removal of left turns at La Verne Avenue, under the Build Alternative, left turns at 3rd Street and Civic Center Way would also be eliminated. To facilitate traffic movement to and from La Verne Avenue and Civic Center Way, Woods Avenue would be modified to allow eastbound traffic on 3rd Street to make a U-turn to reverse direction. Westbound traffic would continue to be allowed to make a U-turn at Mednick Avenue to reverse direction. A new pedestrian crossing would be installed crossing 3rd Street between Civic Center Way and Woods Avenue.
  - Existing access to the East Los Angeles County Sherriff's Department from 3rd Street is limited to right turns from westbound 3rd Street, and egress is limited to right turns onto westbound 3rd Street. Under the Build Alternative, a new controlled access guideway crossing would be established to enable Sherriff's Department vehicles to make left turns from eastbound 3rd Street to the Sherriff's Department and left turns from the Sherriff's Department to eastbound 3rd Street.
  - The refined Alternative 3/LPA includes the Atlantic Pomona Open-Air Station, which would relocate the existing Atlantic Station to a shallow underground open-air station with two side platforms and a canopy. The Build Alternative would include a fully underground Atlantic/Pomona Station at the same location evaluated for an open air station under the refined Alternative 3/LPA. Under the Build Alternative, the existing Atlantic station would be relocated/reconfigured to an underground platform station located beneath the triangular parcel bounded by Atlantic Boulevard, Pomona Boulevard, and Beverly Boulevard.

- As described previously, as a result of design refinements, under the Build Alternative, left turns would be eliminated at 3rd Street and La Verne Avenue and 3rd Street and Civic Center Drive. Additionally, the Build Alternative would eliminate left turns at the intersection of Washington Boulevard and Maple Avenue. The Build Alternative also includes two options for vehicle movements at the intersection of Washington Boulevard and Montebello Boulevard. Option 1 would prohibit left turns between Washington Boulevard and Montebello Boulevard, and Option 2 would maintain left turns between Washington Boulevard and Montebello Boulevard but would require additional commercial property acquisition on the south side of Washington Boulevard near the intersection.
- Minor changes in track design under the Build Alternative include the shifting of the at-grade alignment near Greenwood Avenue and the location of crossovers to avoid partial property acquisition of the frontage of two historic properties east of Greenwood Avenue. This change was also made to shift the location of the parking facilities for Greenwood station from the northeast corner of the Greenwood Avenue and Washington Boulevard intersection, adjacent to Greenwood Elementary School, to the southeast corner of the intersection at the site of an existing commercial use.
- Additional minor design refinements under the Build Alternative include updates to station design, track design, and roadway modifications. See Appendix C of the Final EIR for drawings of the refined Alternative 3/LPA and **Appendix P**, Engineering Drawings of the EA for drawings of the Build Alternative.

- Property acquisition and use refinements
  - Adjustments to permanent and temporary construction property acquisition areas, sizes, and staging areas for the Build Alternative as compared to the refined Alternative 3/LPA, including locations identified under the discussion of guideway, station, and access refinements.
- Additional modifications to the Build Alternative
  - The Build Alternative includes the temporary installation of electrical conduit within the Yates Avenue ROW from the existing Vail Substation north of Flotilla Street to the TBM launch site on Washington Boulevard to provide electrical power to the TBM during the construction period.
  - Minor changes to the frequency of LRT operations under the Build Alternative as compared to the LRT operations under the refined Alternative 3/LPA.

The Build Alternative includes an adjusted ridership assumption as compared to the refined Alternative 3/LPA that accounts for a 30 percent ridership reduction as result of COVID-19 pandemic, lower population growth projections in the 2024 RTP as compared to the 2020 RTP growth projections used in the Final EIR, and an updated horizon year of 2050 as compared to a horizon year of 2042 used in the Final EIR.

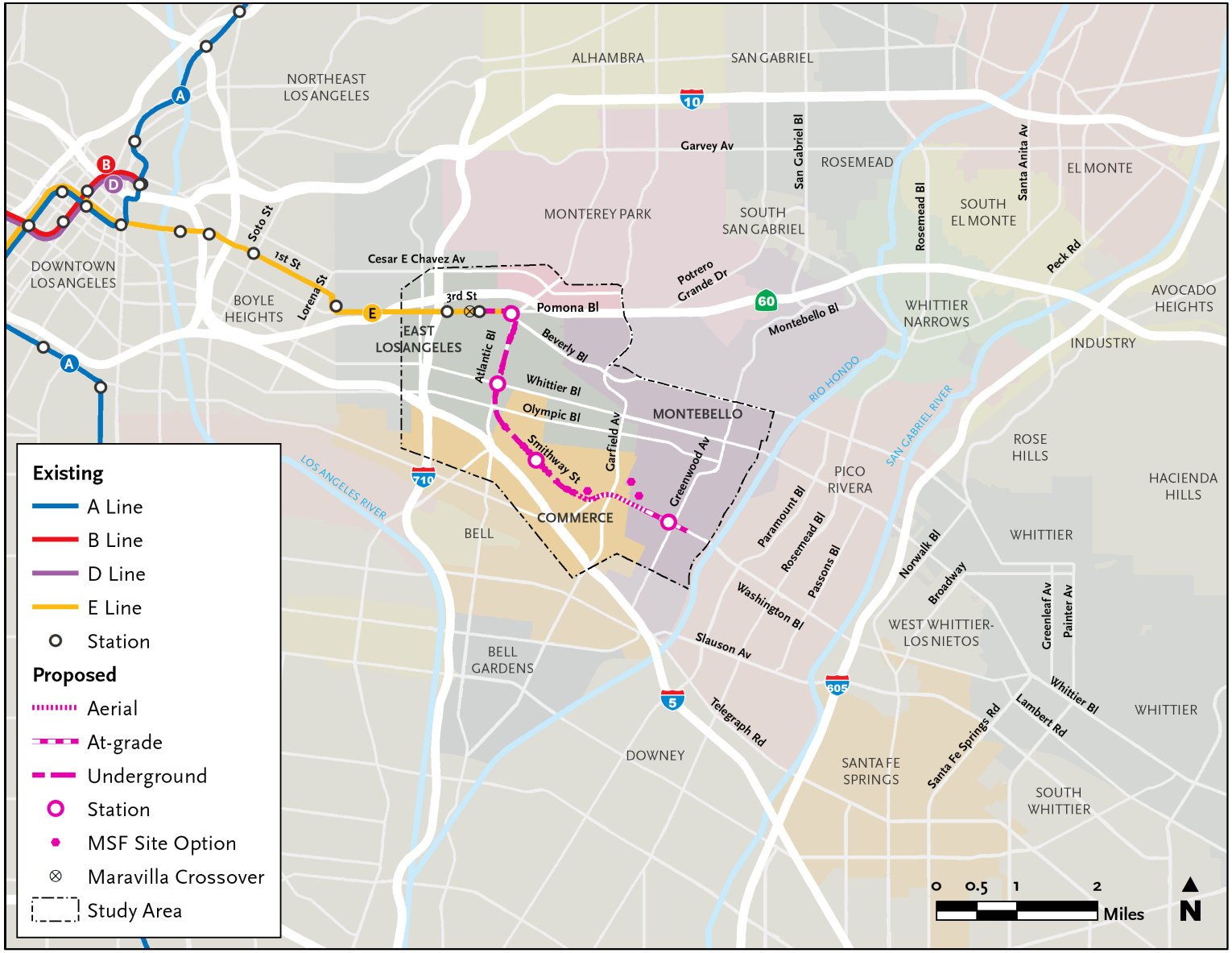
The Build Alternative components are described **Section 2.1** below, along with a summary of operations and construction. The NEPA analysis also analyzes a No Build Alternative which is described in **Section 2.2**.

2.0 PROJECT DESCRIPTION

2.1 Build Alternative

The Build Alternative is an electric-powered light rail service extension in eastern Los Angeles County. The Build Alternative would consist of approximately 4.7 miles of reconfigured and new LRT guideway to extend the Metro E Line east from the current terminus at Atlantic Boulevard to an at-grade terminal station at the Greenwood station in the City of Montebello. The 4.7 miles would include reconfiguration of 0.4 mile of existing track for a transition to a new 4.3-mile extension. The configuration includes an approximately 3.1-mile underground guideway, 0.9-mile aerial guideway, and 0.7-mile at-grade guideway. It also includes a relocated underground Atlantic/Pomona station and three new stations, as shown in **Figure 2.1**. As discussed in greater detail below, the Build Alternative also includes guideway and system facilities to support vehicle operations, such as overhead catenary system (OCS), radio communications, and train control houses, that would be constructed along the alignment, a modification to existing tracks west of the proposed alignment extension (Maravilla Crossover); and an MSF. Three site options for the MSF are being evaluated based on project requirements, constructability, environmental impacts, operational efficiency, and compatibility with surrounding land uses, but only one would be selected. Of the evaluated MSF site options, two are in the City of Montebello (MSF Sites 1 and 2) and one is in the City of Commerce (MSF Site 3 **Figure 2.2** shows a close-up of the Study Area and the alignment with the proposed stations and MSF site options.

The Build Alternative satisfies the purpose and need of the Project because it would expand transit opportunities in eastern Los Angeles County, provide a transportation alternative to local and arterial roadways during periods of congestion, improve quality of life by enhancing mobility and access options, and serve a population with high transit demand.



Source: Metro; CDM Smith/AECOM JV 2026.

Figure 2.1. Study Area



Source: Metro; CDM Smith/AECOM JV 2026.

Figure 2.2. Study Area Close-Up

2.1.1 Guideway Alignment

The Build Alternative includes modifications to the existing Metro E Line tracks west of the existing East Los Angeles Civic Center Station and a new guideway extension that begins east of the station in East Los Angeles (unincorporated Los Angeles County).

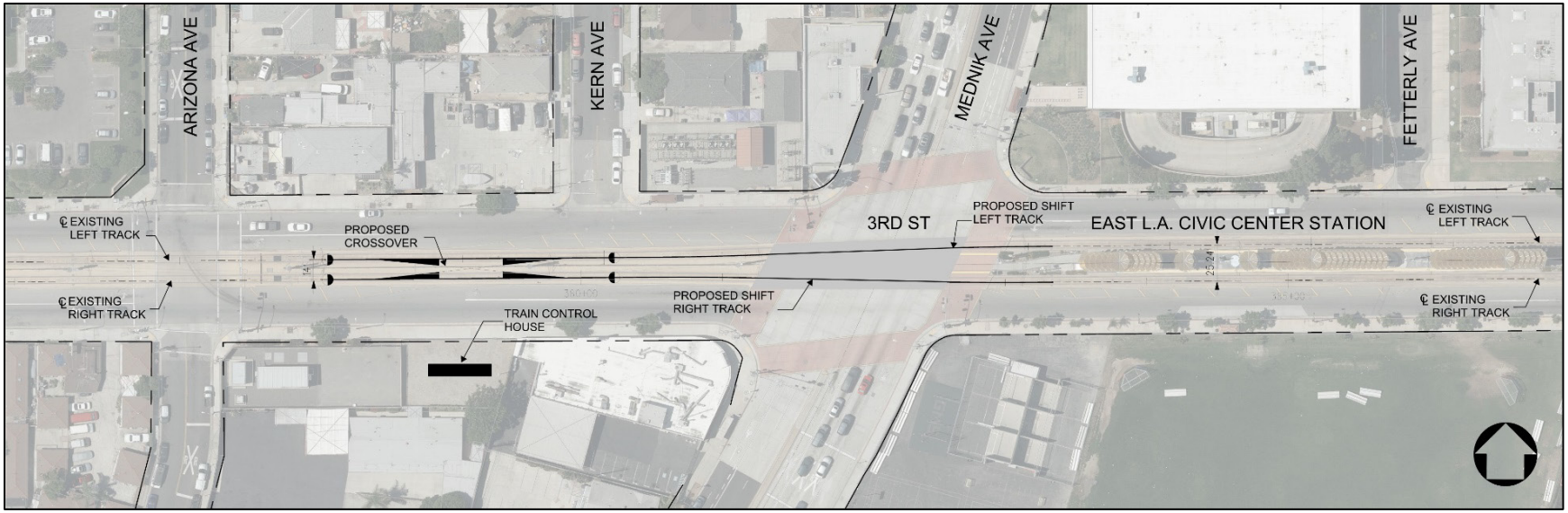
The existing tracks would be reconfigured to install a new at-grade double crossover[5] on 3rd Street between Arizona Avenue and Kern Avenue as shown in **Figure 2.3.** The new crossover, referred to as the Maravilla Crossover, is required to meet operational requirements of the guideway extension. Construction of the Maravilla Crossover would involve a minor shift of the existing track to the east and roadway resurfacing within the existing right-of-way (ROW). A train control house with electric power switches and auxiliary power room would be constructed at the vacant lot owned by Metro on the south side of 3rd Street between South Arizona Avenue and South Mednik Avenue (see **Figure 2.3**). This site is adjacent to an existing traction power substation (TPSS) that is surrounded by a block wall. The block wall would be extended to include the train control house site.

The new guideway would begin with a transition from the existing at-grade guideway to an underground guideway within an open trench that extends from east of Civic Center Way to east of La Verne Avenue as shown in **Figure 2.4**. The trench would eliminate vehicle and pedestrian crossings of 3rd Street at La Verne Avenue and therefore, left turns to and from La Verne Avenue would be prohibited during construction and operation of the Build Alternative. Left turns would also be eliminated at Civic Center Way; however, the pedestrian crosswalk at this location would remain. To facilitate traffic movement to and from La Verne Avenue and Civic Center Way, eastbound traffic on 3rd Street would be allowed to make a U-turn on Wood Avenue to reverse direction. Westbound traffic would continue to be allowed to make a U-turn at Mednick Avenue to reverse direction. Additionally, a new access road would be constructed to allow Sheriff's Department vehicles to turn left from the Sheriff's Department driveway onto 3rd Street. A new high-visibility crosswalk would provide pedestrian access across 3rd Street between the existing pedestrian access at Civic Center Way and Woods Avenue.

Once underground, the guideway would follow 3rd Street to the proposed relocated underground Atlantic/Pomona station located east of Beverly Boulevard. The underground guideway would then turn south, running east of Atlantic Boulevard until south of 4th Street and then underneath Atlantic Boulevard to approximately Verona Street and Olympic Boulevard. Then, the underground guideway would curve southeast, running under Smithway Street near the Citadel Outlets in the City of Commerce.

After crossing Saybrook Avenue, the guideway would transition from underground to an aerial configuration. If MSF Site 1 or 3 is selected, the aerial guideway would continue east and merge into the center of Washington Boulevard at Gayhart Street. However, if MSF Site 2 is selected, the aerial guideway would continue east immediately to the north of Washington Boulevard and merge into the center of Washington Boulevard east of Garfield Avenue.

[5] Track crossovers allow a train to reverse direction and use adjacent track to continue operation. The Build Alternative includes the Maravilla Crossover and crossovers along the alignment extension as addressed in **Section 2.3.3**.



Source: HNTB/Cordoba 2026.

Figure 2.3. Maravilla Crossover Exhibit



Source: HNTB/Cordoba 2026.

Figure 2.4. Conceptual 3rd Street Modifications

Under all three MSF site options, the aerial tracks would transition to an at-grade configuration between Vail Avenue and Maple Avenue. The alignment would remain at-grade in the center of Washington Boulevard until the intersection of Washington Boulevard and Greenwood Avenue in the City of Montebello, where it would shift slightly south of the center of Washington Boulevard. Revenue service would terminate at Greenwood station to the west of Greenwood Avenue and tail tracks would continue further east to Montebello Boulevard to allow for the LRT to reverse direction. The guideway and trackwork design would comply with the MRDC.

2.1.1.1 Traffic Circulation Changes

Left turns would be eliminated at the intersection of Washington Boulevard and Maple Avenue where the at-grade alignment begins just west of the intersection. At the intersection of Washington Boulevard and Montebello Boulevard, two options for the guideway are being considered:

- Montebello Boulevard Option 1 (no left turn) – This option would remove left-turn pockets on Washington Boulevard and eliminate left turns onto Montebello Boulevard from both directions. Only through traffic movement and right turns would be allowed from Washington Boulevard at this intersection.
- Montebello Boulevard Option 2 (left-turn pocket) – This option would retain left-turn pockets on Washington Boulevard for traffic in both directions. This option would require widening Washington Boulevard and involves additional property acquisitions.

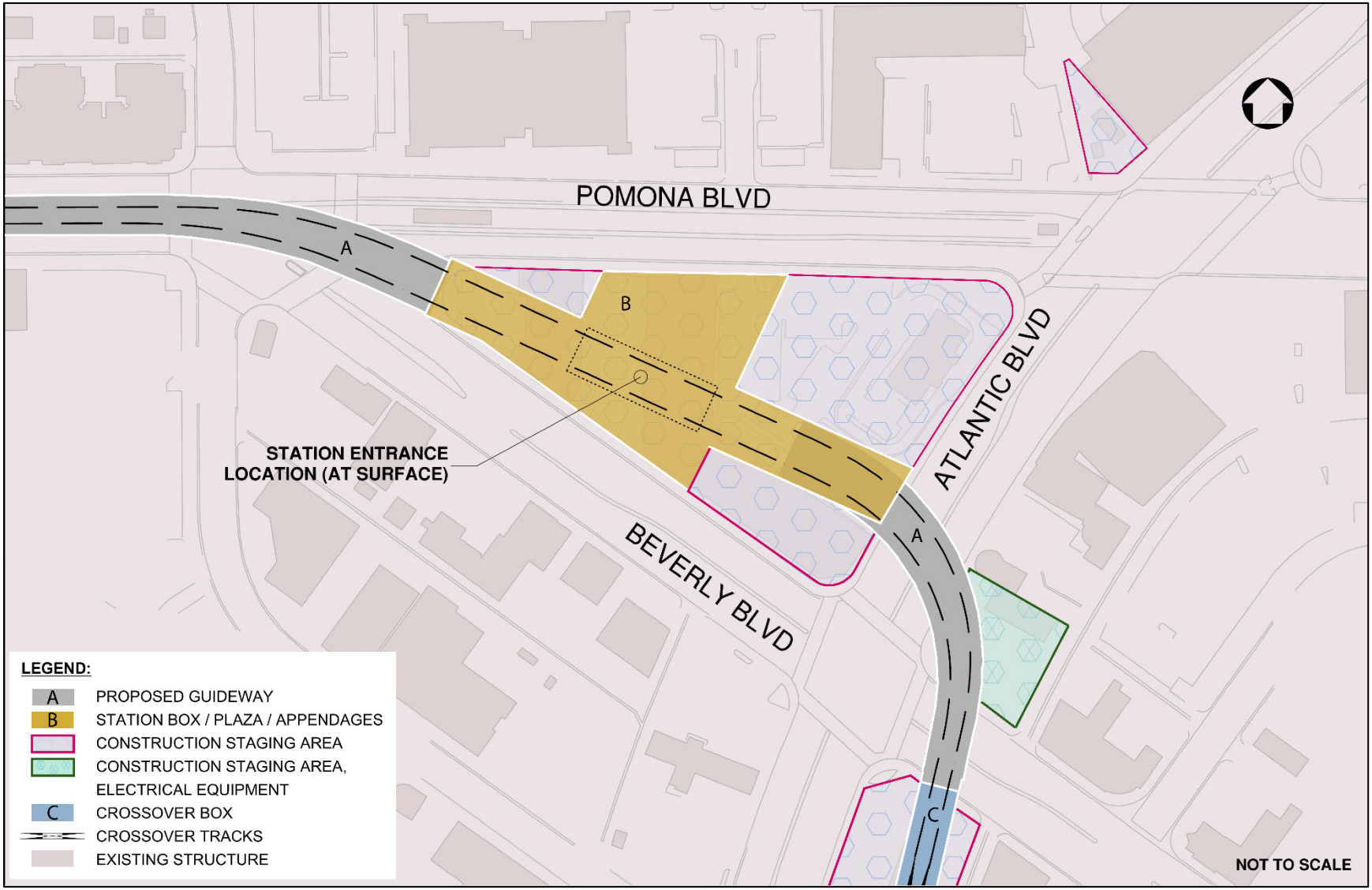
Additional changes to traffic circulation include a reduction in the number of traffic lanes on 3rd Street from two lanes to one between Civic Center Way and the new Sheriff's Department access road to accommodate the open trench and on Washington Boulevard between Saybrook Avenue and the eastern terminus from three lanes to two lanes to allow for the placement of columns to support the aerial guideway and for the right-of-way needs of the at-grade guideway. Unsignalized left turns along the at-grade guideway would be prohibited. Minor changes to lane configurations at intersections may be required to accommodate new or modified traffic circulation patterns, such as along Washington Boulevard and near the intersection of 3rd Street and Atlantic Boulevard to accommodate the trench for the transition. There may also be new traffic signals or modifications to existing traffic signals to accommodate light rail movements and traffic circulation patterns at intersections and grade crossings and to facilitate pedestrian access to and from stations. Additional changes may include access changes at selected cross streets due to at-grade or aerial crossings and driveway widening at some industrial properties along Washington Boulevard.

2.1.2 Proposed Stations

The following stations would be constructed under the Build Alternative:

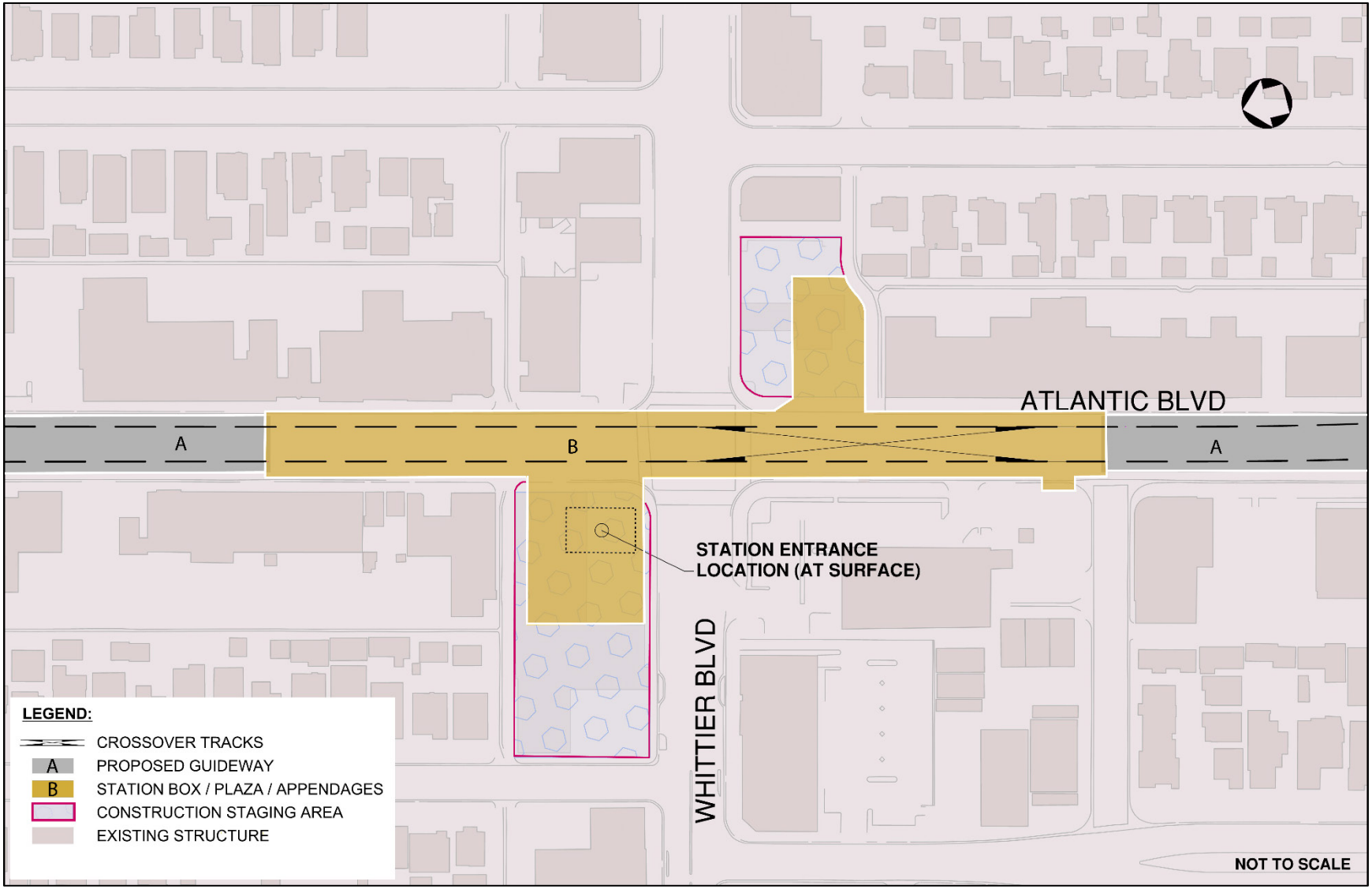
- Atlantic/Pomona – The Atlantic/Pomona station would relocate the existing at-grade Atlantic Station to an underground station with a center platform layout. This station would be located beneath the triangular parcel bounded by Atlantic Boulevard, Pomona Boulevard, and Beverly Boulevard. The existing parking structure with 280 parking spaces located north of the 3rd Street and Atlantic Boulevard intersection would continue to serve this station. In coordination with Metro Art, efforts would be made, as feasible, to relocate the artwork from the existing Atlantic Station to the new Atlantic/Pomona station.
- Atlantic/Whittier – This station would be underground with a center platform located beneath the intersection of Atlantic and Whittier Boulevards in East Los Angeles. Parking would not be provided at this station. Access to the station would be provided via an entrance located on the northwest corner of the Whittier Boulevard and Atlantic Boulevard intersection.
- Commerce/Citadel – This station would be underground with a center platform located beneath Smithway Street near the Citadel Outlets in the City of Commerce. Parking would not be provided at this station. Access to the station would be provided via an entrance located south of Smithway Street west of Gaspar Avenue.
- Greenwood – This station would be at-grade with a center platform on Washington Boulevard located just west of Greenwood Avenue in the City of Montebello. This station would provide a surface parking facility with 270 to 370 proposed new surface parking spaces near the intersection of Greenwood Avenue and Washington Boulevard.

Conceptual station site plans are shown in **Figure 2.5** through **Figure 2.8**. Station public area designs and amenities would comply with the Systemwide Station Design Standards, Metro Art Program Policy, MRDC, and Architectural Standard and Directive Drawings. Design elements would include, but would not be limited to, station signs, entrance portal canopies at the underground stations, platform canopies at the at-grade station, plaza paving and landscaping, interior architectural finishes and furnishings, lighting, passenger telephones, sound attenuation features, customer information panels, real-time information digital screens, fare gates, fare vending machines, integrated public art, security cameras, and bike racks and lockers. Station entry portals with escalators and elevators would provide access to underground stations. Access to all stations would be compliant with the Americans with Disabilities Act (ADA) and would also have bicycle and pedestrian connections. Bicycle and pedestrian connections to the stations would comply with the Metro FLM Guidelines and the MRDC. Details, including station area planning and urban design, would be determined during the Build Alternative's final design phase in compliance with Metro design standards and policies for Metro rail stations.



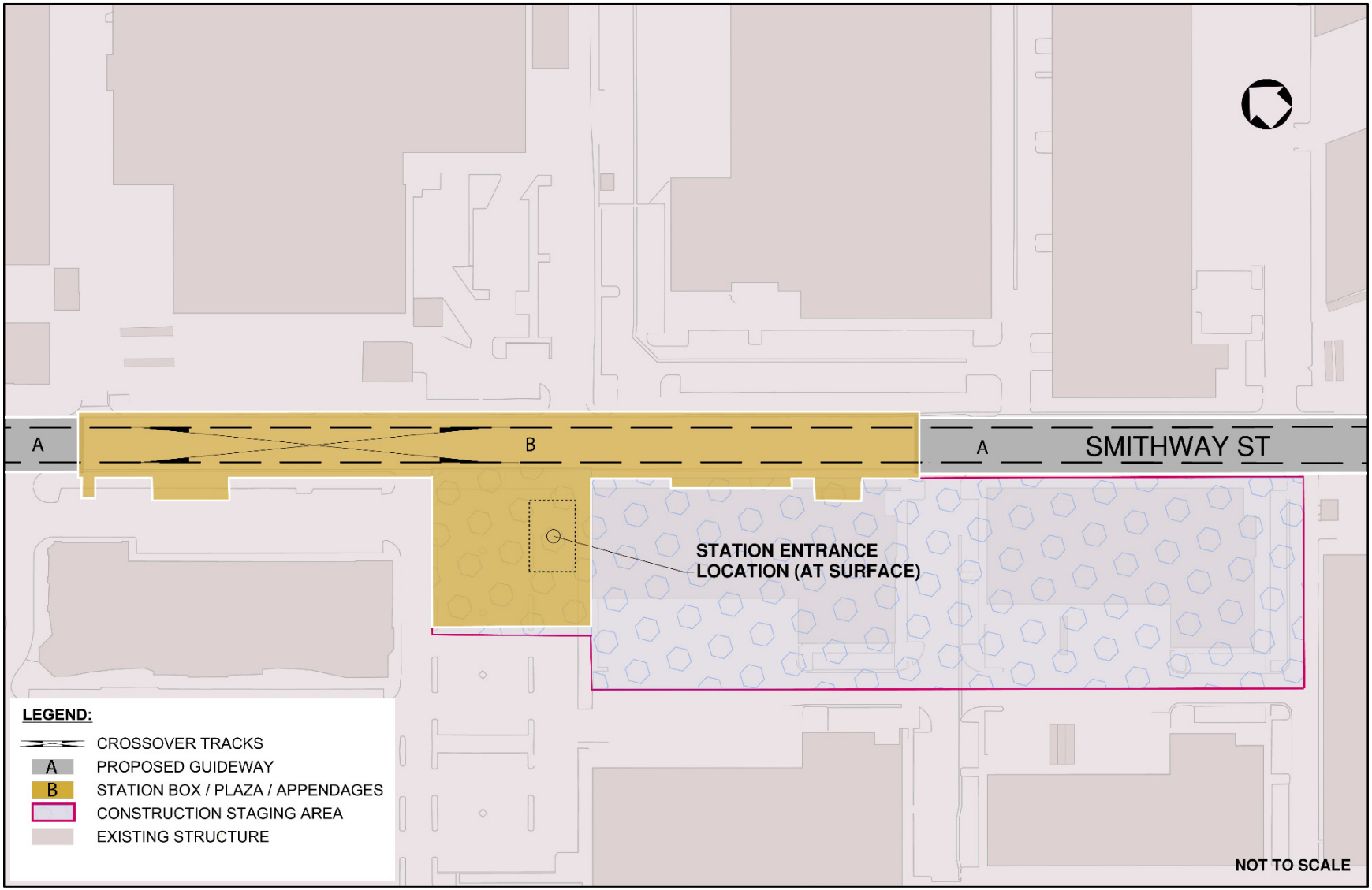
Source: Metro; HNTB/Cordoba 2026.

Figure 2.5. Atlantic/Pomona Station Conceptual Site Plan



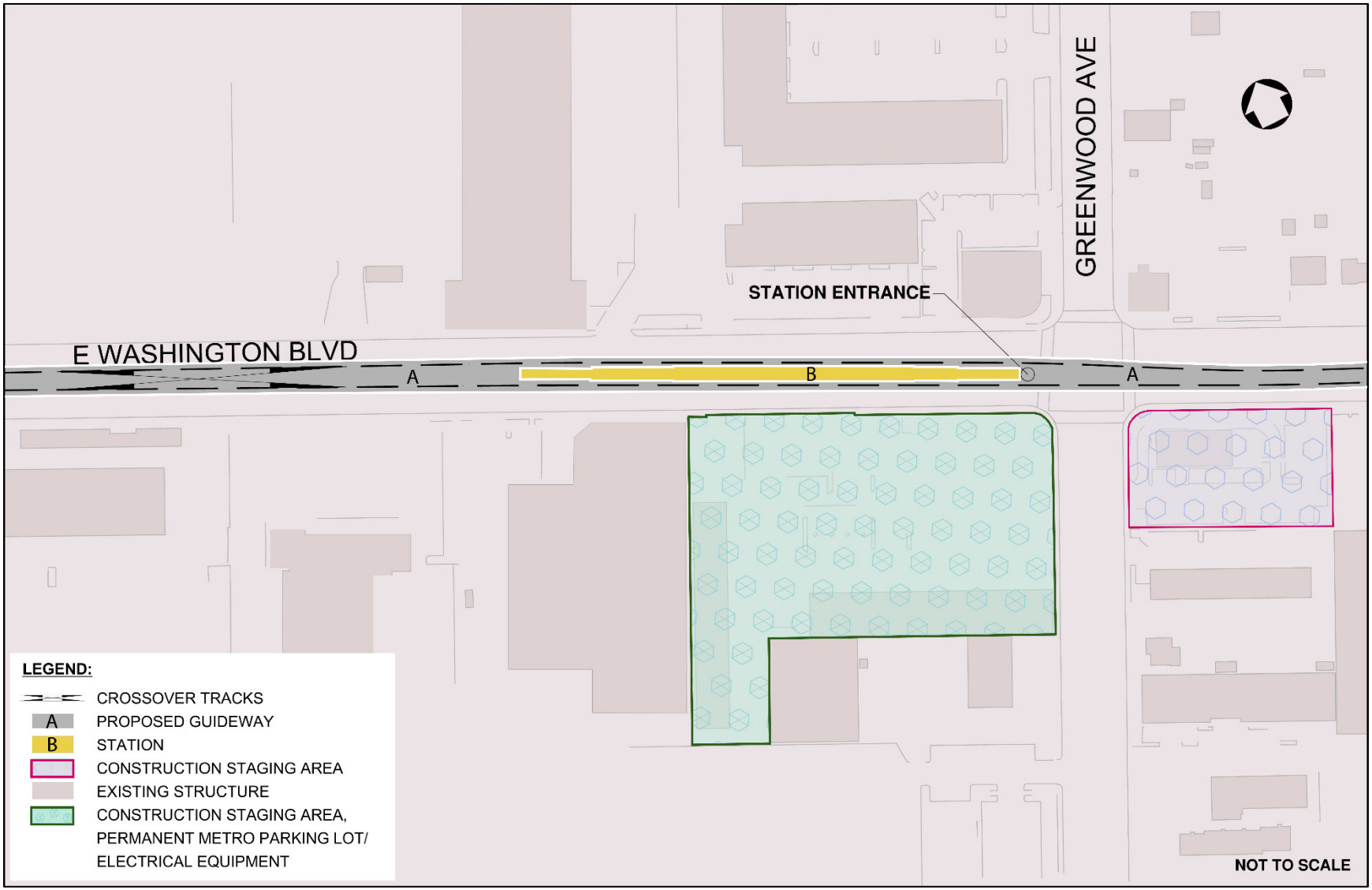
Source: Metro; HNTB/Cordoba 2026.

Figure 2.6. Atlantic/Whittier Station Conceptual Site Plan



Source: Metro; HNTB/Cordoba 2026.

Figure 2.7. Commerce/Citadel Station Conceptual Site Plan



Source: Metro; HNTB/Cordoba 2026.

Figure 2.8. Greenwood Station Conceptual Site Plan

2.1.3 Guideway and System Facilities

The Build Alternative would include additional elements to support vehicle operations, including but not limited to the OCS, tracks, crossovers, cross passages, ventilation structures, emergency fire exits, TPSS, train control houses with electric power switches and auxiliary power rooms, radio communications, an emergency generator, and the MSF. The Build Alternative would have an underground alignment of approximately 3.1 miles in length between La Verne and Saybrook Avenue. Ventilation shafts and emergency fire exits would be installed along the underground portion of the alignment as required by the current version of Metro's Fire Life Safety Criteria. These would be located at the underground stations and adjacent to the crossover following the Atlantic/Pomona station. The precise location of railroad system facilities would be determined in a subsequent design phase.

2.1.4 Maintenance and Storage

2.1.4.1 Maintenance and Storage Facility

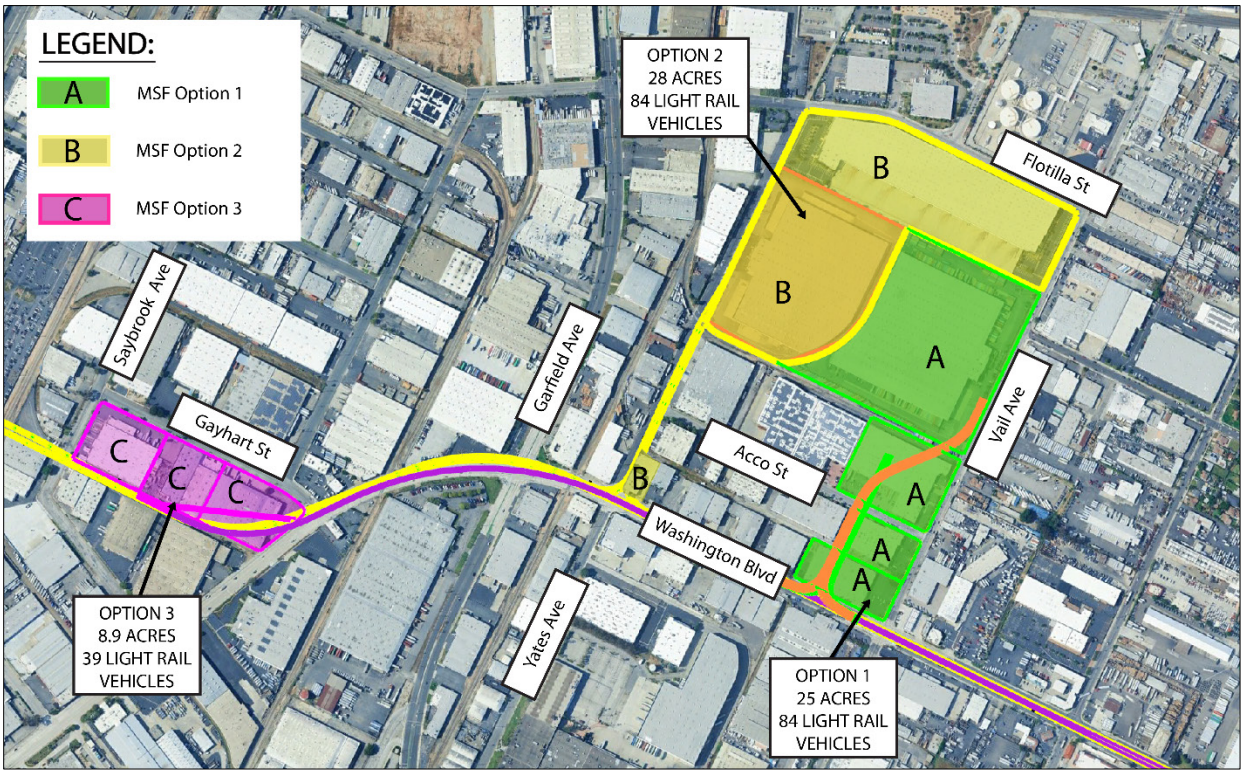
The Build Alternative would include equipment and facilities for cleaning and maintenance of rail cars and to store vehicles that are not in service. This would be supported by a new MSF that would be constructed in an industrial zone in the City of Montebello or in the City of Commerce.

Three site options for the MSF are evaluated in this EA: MSF Sites 1 and 2 (25 acres and 28 acres in size, respectively) are in the City of Montebello and MSF Site 3 (9 acres in size) is in the City of Commerce. Only one of the three sites would be selected and constructed. The MSF would include equipment and facilities to clean and maintain rail cars, tracks, and other system components. The MSF would enable storage of light rail vehicles that are not in service and Metro's hi-rail service vehicles, and it would also provide office space for operation and administrative staff. MSF Sites 1 and 2 would have repair facilities and larger storage capacity as compared to MSF Site 3.

As shown on **Figure 2.9**, MSF Sites 1 and 2 would be north of Washington Boulevard and south of Flotilla Street. Specifically, MSF Site 1 would be west of Vail Avenue with mid-block yard lead tracks and MSF Site 2 would be west of MSF Site 1 with yard lead tracks on Yates Avenue. MSF Sites 1 and 2 would require yard lead tracks that connect to the mainline alignment at a wye junction (i.e., three-way junction). The yard lead tracks for MSF Sites 1 and 2 would connect to the main alignment in an aerial configuration and transition to at-grade as the track approaches the MSF.

MSF Site 3 would be located west of MSF Sites 1 and 2, at the TBM launch site at Gayhart Street, east of Saybrook Avenue (**Figure 2.9**). The tracks to the MSF would come off the mainline alignment in the LRT ROW north of Washington Boulevard on the parcel east of Saybrook Avenue and south of Gayhart Street as the alignment transitions from an underground to an aerial configuration.

The three MSF sites are described in greater detail in the following sections. The evaluation of the MSF in this EA refers to MSF Sites 1, 2, and 3. MSF Sites 1, 2, and 3 are discussed separately only when there is a difference in the analysis between the three sites.

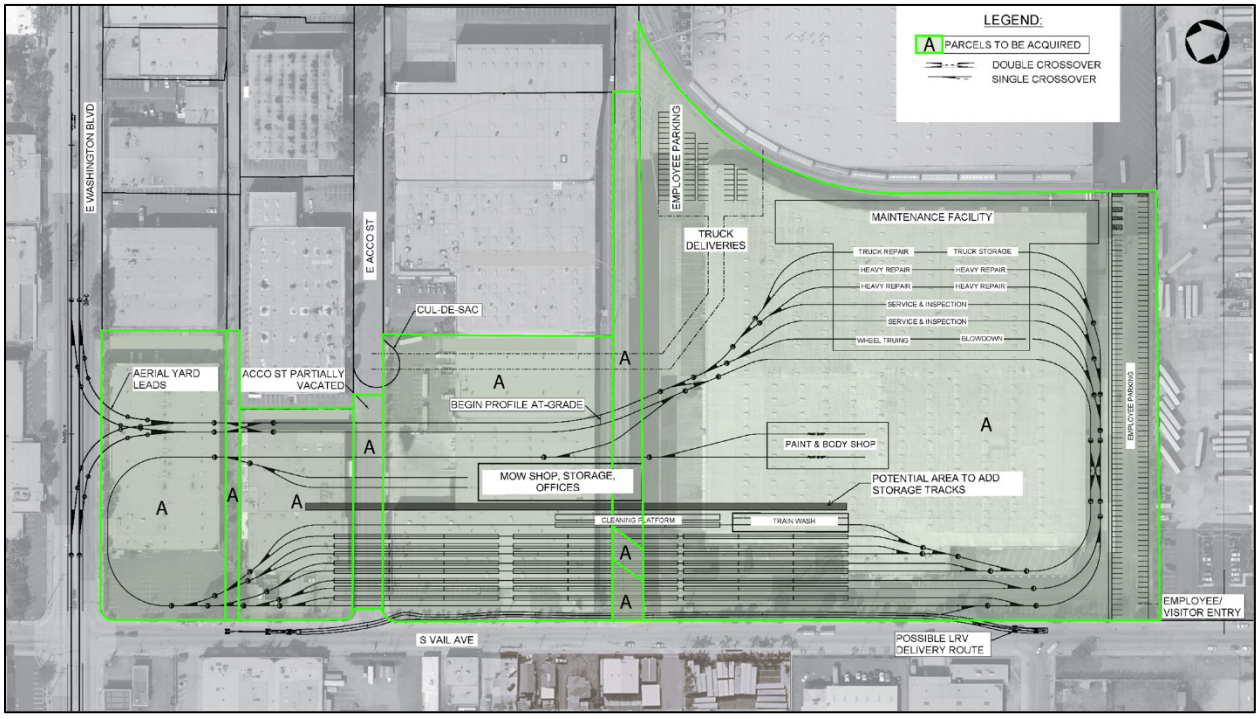


Source: HNTB/Cordoba 2026.

Figure 2.9. MSF Site Options

2.1.4.1.1 MSF Site 1: Aerial Yard Lead Tracks Located along Mid-Block

MSF Site 1, shown in **Figure 2.10**, would be approximately 25 acres in size and would encompass four parcels on the west side of Vail Avenue between Flotilla Street and Washington Boulevard. The yard lead tracks to MSF Site 1 would be in an aerial configuration from Washington Boulevard, paralleling Vail Avenue, and would transition to grade as the track approaches the MSF. The yard lead tracks would require elimination of through-access to vehicles on Acco Street from Yates Avenue to Vail Avenue. A cul-de-sac would be provided on the westerly side of the lead tracks to ensure that access to businesses in this area is maintained from Yates Avenue. MSF Site 1 would require the full acquisition of five properties and partial acquisition of two properties with commercial and industrial uses to accommodate the MSF and the lead tracks. A partial vacation of Acco Street would also be required. MSF Site 1 would accommodate storage of up to 84 light rail vehicles (LRV) cars and would have approximately 204 employee parking stalls (including 6 ADA parking stalls).

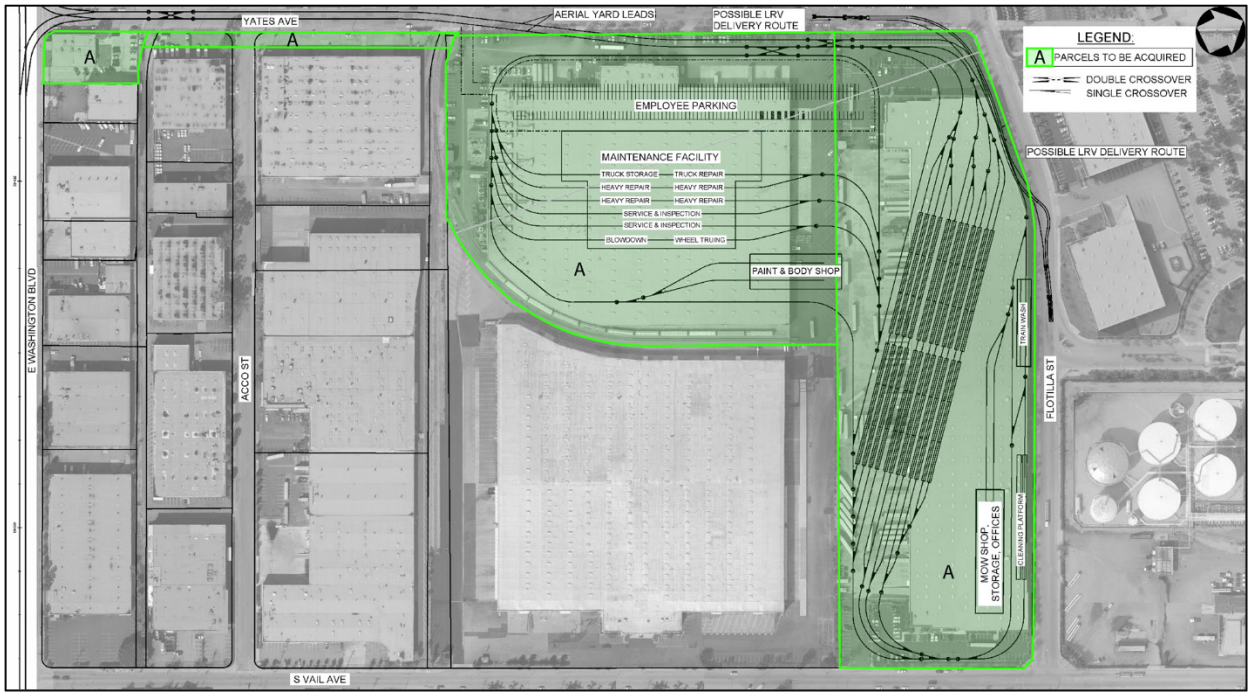


Source: Metro; HNTB/Cordoba 2026.
Key: LRV = Light Rail Vehicle; MOW = Maintenance of Way

Figure 2.10. MSF Site 1

2.1.4.1.2 MSF Site 2: Aerial Yard Lead Tracks Located along Yates Avenue

MSF Site 2, shown in **Figure 2.11**, would be approximately 28 acres in size and would encompass one parcel along the south frontage of Flotilla Street between Yates Avenue and Vail Avenue, and one adjacent parcel immediately to the south, east of Yates Avenue. Additional acreage would be needed to accommodate the yard lead tracks and associated construction staging. If MSF Site 2 is selected, the aerial guideway east of Gayhart Street would be located immediately to the north of Washington Boulevard and merge into the center median of Washington Boulevard east of Garfield Avenue. The yard lead tracks to the MSF would partially be in the City of Commerce, starting in an aerial configuration from Washington Boulevard along the easterly edge of Yates Avenue, and transitioning to at-grade as the tracks approach the MSF. Yates Avenue would retain one vehicle lane in both directions. Two lanes of traffic would be maintained in each direction along Washington Boulevard. MSF Site 2 would require full acquisition of seven parcels for the MSF and the yard lead tracks. MSF Site 2 would also require 10 partial acquisitions of properties including properties along Yates Avenue between Washington Boulevard and MSF Site 2 to accommodate the yard lead tracks and along Washington Boulevard between Gayhart Street and Yates Avenue for the mainline alignment and lead tracks. The MSF would accommodate storage of up to 84 LRV cars and would have approximately 255 employee parking stalls (7 ADA parking stalls).

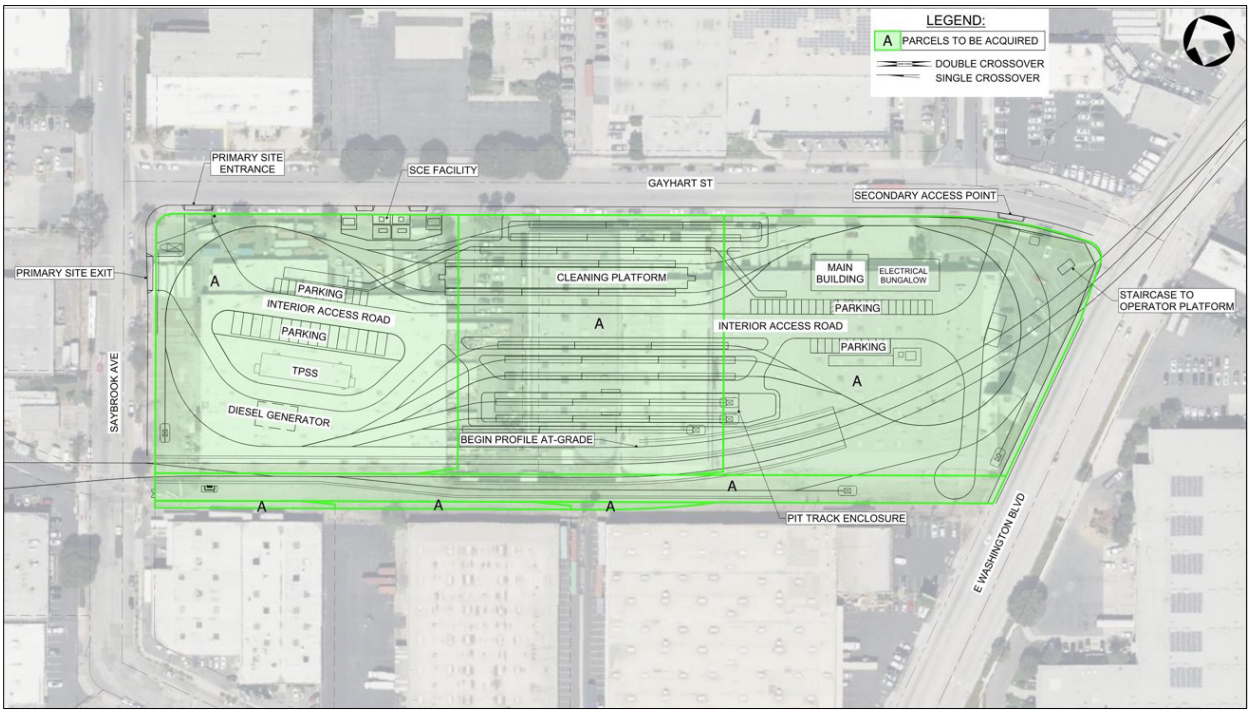


Source: Metro; 2026.
Key: LRV = Light Rail Vehicle; MOW = Maintenance of Way

Figure 2.11. MSF Site 2

2.1.4.1.3 MSF Site 3: Satellite Yard at Gayhart Street

MSF Site 3, shown in **Figure 2.12**, would be approximately 8.9 acres in size and would encompass three parcels south of Gayhart Street between Saybrook Avenue and Washington Boulevard in the City of Commerce. MSF Site 3 would require full acquisition of five parcels for the MSF, which would also be used for the transition from the tunnel to aerial tracks, construction staging, and the launching of the TBM. The tracks into the MSF would connect to the mainline alignment in an at-grade configuration between Saybrook Avenue and Washington Boulevard as the mainline alignment transitions from underground to aerial. MSF Site 3 would accommodate storage for a minimum of 39 LRV cars and would have approximately 62 employee parking stalls (3 ADA parking stalls). MSF Site 3 would not have repair facilities.



Source: Metro; HNTB/Cordoba 2026.
Key: LRV = Light Rail Vehicle; SCE = Southern California Edison; TPSS = traction power substation

Figure 2.12. MSF Site 3

2.1.5 Construction

The Build Alternative would include the construction of an underground, aerial, and at-grade guideway for light rail transit. Key construction activities associated with the guideway (at-grade, aerial, underground) would include temporary roadway decking for the cut and cover sections of the underground guideway and the underground stations, tunnel boring for the remaining portions of the underground guideway, and the construction of an aerial viaduct for the aerial guideway. Additional activities would include underground and at-grade station construction, demolition, utility relocations, street improvements (such as sidewalk reconstruction and traffic signal installation), retaining walls, and light rail transit operating systems installation, including TPSS and OCS. The Build Alternative would also include construction of a parking facility, other railroad system facilities, the Maravilla Crossover and other crossovers along the alignment, potential street widening, and the MSF. Utility relocation work would generally occur within the affected ROW and on adjacent and nearby streets.

In addition to adhering to regulatory requirements, the development of the Build Alternative would employ conventional construction methods, techniques, and equipment. All work for development of the light rail transit system would conform to accepted industry specifications and standards, including Best Management Practices. Project engineering and construction would, at minimum, be completed in conformance with applicable regulations, guidelines, and criteria, including, but not limited to, Architectural Standard and Directive Drawings, California Public Utilities Commission regulations, California Building Code, MRDC, Metro Operating Rules, and Metro standard and directive drawings from other engineering disciplines as needed. Cooperation with the corridor cities and Los Angeles County would occur throughout the construction process.

Build Alternative construction is anticipated to last approximately 60 to 84 months. Construction activities for the at-grade alignment, aerial alignment, and underground alignment would occur simultaneously. The construction of the underground stations is anticipated to take 36 to 48 months, while the construction of the at-grade station is expected to last approximately 12 to 18 months. Most construction activities would occur during daytime hours. For specialized construction tasks, it may be necessary to work during nighttime hours to minimize traffic disruptions and disruptions to businesses and other land uses along the alignment. Traffic control and pedestrian control during construction would follow local jurisdiction guidelines and the Manual of Uniform Traffic Control Devices standards. Standard traffic control methods and devices would be used, including the use of signage, roadway markings, flagging, and barricades to regulate, warn, or guide road users. Laydown and storage areas (staging areas) for construction equipment and materials would be in the vicinity of the Build Alternative within parking facilities, and/or on parcels that would be acquired for the proposed stations and the MSF. Staging areas would be used to store building materials and construction equipment, assemble the TBM, temporarily store excavated materials, and house temporary field offices for the contractor.

2.1.5.1 Construction Scenarios

This section provides an overview of the typical construction activities and sequencing that would occur to build the Build alternative based on the engineering drawings (**Appendix P** of this EA). These methods are consistent with previously constructed Metro projects and Metro policies. However, the final design, as well as the actual construction methods, sequencing, and equipment, may vary depending on the contractors' approach to implementing the work in the most cost-efficient manner, while adhering to the parameters outlined in the bid.

2.1.5.1.1 Guideway Construction

At-Grade Guideway

The at-grade guideway would be at or slightly above the existing ground elevation. The Build Alternative would include a modification to the existing at-grade track (Maravilla Crossover) and have a new at-grade guideway from between Vail Avenue and Maple Avenue to the terminus at Greenwood station.[6] The location for constructing the at-grade guideway is illustrated in **Figure 2.1** and **Figure 2.2**. The construction of the at-grade guideway would involve the use of embedded track[7] (**Figure 2.13**).

The construction method for embedded track would begin with demolition of the existing median island or street. In areas where embedded track is planned to be installed within the street, construction would involve excavation of the existing median paving and down to the subgrade material (the native material underneath the pavement or railway track), compaction or replacement with imported soils, and preparation of the rail subgrade. The center median would be sectioned off from the rest of the street with k-rail (temporary concrete traffic barriers), and construction staging would occur in the center median. Equipment would generally consist of rubber-tired excavators, loaders, rubber-tired compactors, graders and small bulldozers, and water trucks for dust control. Construction vehicles may temporarily delay traffic mobility in the areas of construction. Traffic detour and designated truck routes

[6] Tail tracks would extend from the terminus at Greenwood station to just east of Montebello Boulevard.
[7] A type of track construction where the rails are set directly into a paved surface—such as concrete, asphalt, or special track panels—so that the top of the rail is flush with the surrounding roadway.

would be required during construction. To minimize any disruptions to traffic, traffic management and traffic control measures would be implemented with coordination and involvement from various jurisdictions before construction would occur. Refer to **Appendix O**, Transportation Impacts Report for further details.



Source: Metro; CDM Smith/AECOM JV 2019.

Figure 2.13. Example of At-Grade Guideway with Embedded Trackwork through Intersection on Existing Eastside Line

Construction of embedded track would then proceed with placement of rebar (reinforcing metal bars) and the first layer of concrete. The rails would then be positioned over the first layer of the track slab supported on steel ties. Equipment requirements would include transit mix concrete trucks and concrete pumps, and flatbed trucks to deliver the rails and reinforcing steel. The rails and ties would be placed with specialized rubber-tired equipment.

For locations where ballasted track (track under gravel or coarse stone) is installed, such as the MSF, construction would involve excavation of the existing pavement and subgrade material, compaction or replacement with imported soils, and preparation of the rail subgrade. The construction method for ballasted track would consist of one layer of compacted subbase material (a layer of material placed beneath the base course) plus ballast. Ballast would be imported by truck and tamped in place with special equipment. Rails and ties would be imported by truck and then placed with specialized rubber-tired equipment. Local rail storage areas would be necessary for short-term storage and to facilitate placement and welding of rail.

Aerial Guideway

Aerial structures would typically be constructed with reinforced cast-in-place concrete, but precast concrete girders or other specialized construction methods might be used. The rail would be fastened directly to a concrete bridge deck. The location of the aerial guideway is illustrated in **Figure 2.1** and **Figure 2.2**.

Aerial structures (**Figure 2.14**) are constructed in several stages. The first stage involves sectioning off the work zone with a temporary concrete traffic barrier and then installing foundation piles (a long vertical structural element) that would support the weight of the structure and the live trains that it would carry. Typically, the piles would be cast-in-drilled-hole piles. Cast-in-drilled-hole pile construction involves the drilling of shafts up to 10 feet in diameter, inserting a rebar cage inside the shaft with casing dependent on soil conditions, and filling it with concrete.

The second stage of construction may involve the construction of the pile cap (a thick concrete mat) that joins all the piles. The pile cap is constructed of reinforced concrete and is approximately 4 to 5 feet thick. Cast-in-drilled-hole piles may or may not require a pile cap depending upon the structural loads to be supported.

The third stage involves the construction of columns. Columns are constructed using reinforced concrete, which is typically poured inside a reusable steel form. The shape of the column can vary to meet architectural requirements.

The fourth stage of construction involves the placement of the top of the aerial structure, with large reinforced concrete beams (pre-cast concrete girders or cast-in-place concrete spans). Pre-cast girders are lifted into place by large cranes and secured to the columns. Erection of these girders over active roadways is typically done at night to minimize traffic disruptions. Heavy cranes, generally rubber-tired, would be used for the erection of the girders. Due to their size, special staging areas close to the site would be needed to set up the cranes and to temporarily store the girders. Once the girders have been placed, a concrete slab would be placed and the rails would be fastened to it.

Cast-in-place concrete spans would require the erection of falsework (framing) to support the forms into which concrete is poured. Depending on the length of the spans, falsework can be several feet deep. If the bridge is spanning an active roadway, then the bridge must be designed with sufficient clearance under the falsework to allow traffic to pass. Alternatively, clearance might be temporarily reduced during construction and trucks and other large vehicles may need to be detoured. Falsework needs to remain in place long enough for the concrete to reach sufficient strength.

Equipment required for aerial guideway construction would include drilling rigs, trucks to remove excavated soil, transit mix concrete trucks and concrete pumps, specialized truck trailers to deliver pre-cast concrete beams, cranes, trucks to deliver forms, reinforcing steel, pavement saws, and water trucks for dust control. Construction vehicles may temporarily impede traffic mobility in the areas of construction.



Source: Curbed Los Angeles 2018.

Figure 2.14. Example of an Aerial Structure

Underground Guideway Construction

There are three types of underground construction methods that are typically utilized for Metro rail projects: open cut construction, cut and cover construction, and bored tunnel construction. These methods are described in detail in the following sections.

Open Cut and Cut and Cover Construction

Open cut excavation and cut and cover activities are techniques by which massive amounts of soil are excavated to build an underground space for the Build Alternative elements. Open cut excavation is a method of excavation where the ground is dug directly from the surface, typically with open access, until the structure is built. The cut and cover construction methodology would build a temporary roadway surface (decking) on top of the excavation to maintain traffic during the construction period, while the underground construction continues beneath. Such methods are used for construction of underground stations, tunnel boring launch sites and excavation pits, and for short tunnel segments typically less than one mile. The following are the main construction elements and activities for open cut and cut and cover guideway construction:

- Utility relocation or protection-in-place and hanging where cut and cover method would be used. Relocating utilities are necessary where underground or above ground utilities conflict with the Build Alternative elements.
- Temporary traffic reconfiguration and demolition of existing street along cut and cover segments.
- Soldier pile (column foundations) installation involving shoring (temporary support system during the construction phase) on both sides of the roadway to support the roadways and adjacent building foundations during construction.
- Deck installation involving 12 feet of excavation below surface level and construction of reinforced concrete suspended slab (temporary concrete where traffic would drive on) supported by beams and girders (large beams).
- Initial excavation from surface using large excavators, installation of struts (a structural member that would uphold the excavation from its sides) and lagging (boards or panels that retain soil from its sides).
- Stockpiling (storing large quantities of earth) of excavated soil that is deemed suitable for reuse as backfill material.
- Excavation to lower levels.
- Building of the tunnel and/or underground station facilities.
- Backfilling and restoring the surface street once the facilities are completed.

Cut and cover construction includes impacts along the entire alignment during the early stages of construction, including reduced lanes and detours. After the deck has been constructed, traffic would be able to resume on top of the cut and cover excavation.

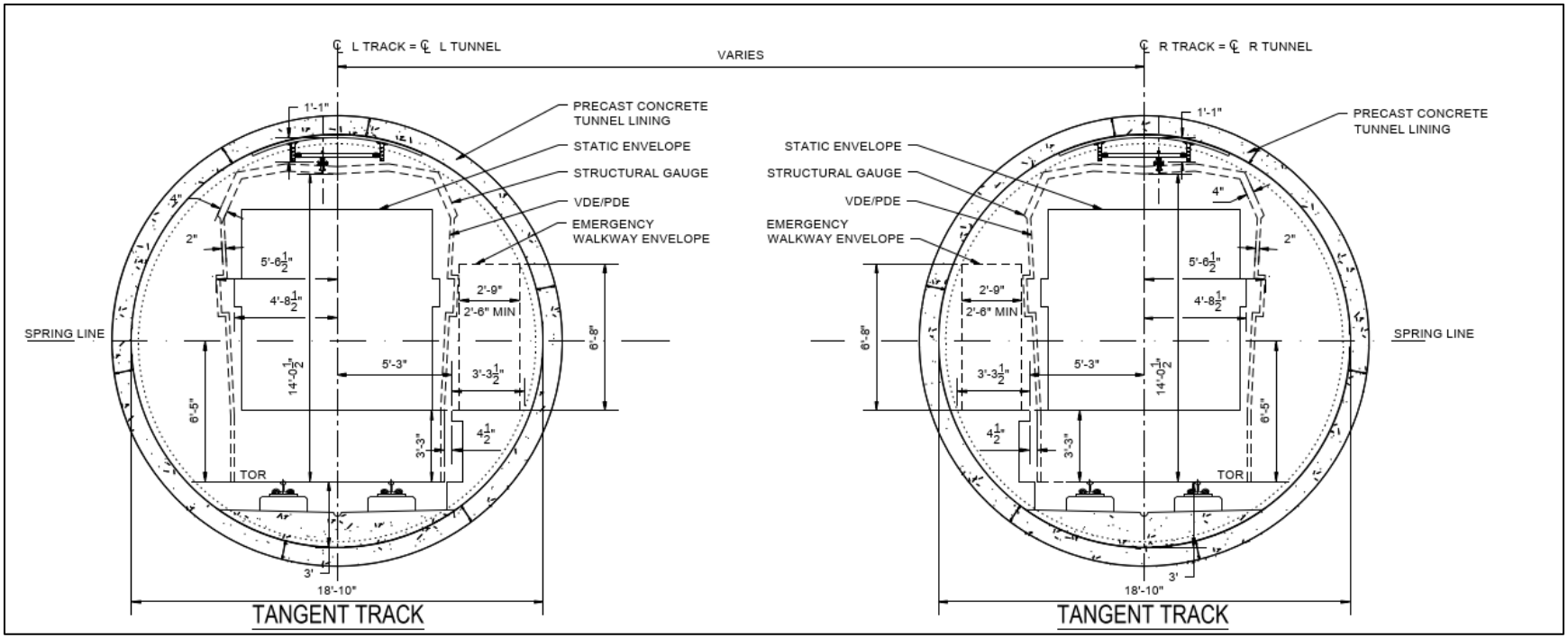
Bored Tunnel Construction with Tunnel Boring Machine

The underground guideway would typically contain two twin bored tunnels (**Figure 2.15**). These bored tunnels would be constructed using an earth pressure balance TBM. TBMs are horizontal drills that continuously excavate circular tunnel sections (**Figure 2.16**). Bored tunnel construction activities at the surface would typically be limited to the TBM launch sites, extraction sites, and at stations (**Figure 2.17**). The following are the main construction elements and activities for bored tunnel construction:

- Utility relocation at TBM launch and extraction sites.
- Temporary traffic reconfiguration and demolition of existing street at TBM launch and extraction sites.
- Temporary power supply to power the TBMs.
- Assembly of the TBMs at the site.
- Excavation of tunnel boring launch site, 4 to 6 acres or greater, which can be located at the site of an underground station.
- For each tunnel lining installed, advancement of the TBM by a small distance (4 to 5 feet).
- Repetition of the TBM advancement process until the entire length of the tunnel has been excavated.
- Extraction of the TBM at the end of the tunnel segment at an underground station or at an extraction site.
- Mining of cross passages between tunnels to provide passengers with an exit in case of an emergency during operations.
- Construction of retaining walls where the guideway transitions from the tunnel alignment to an aerial configuration.
- Transition from at-grade to underground in trench from a temporary retaining wall or support of excavation to reinforced concrete structure.

Construction activities would occur at tunnel portals, stations, and crossover locations. Nearby structures close to station locations, tunnels and other underground structures may require protection, such as special excavation support systems, underpinning or grouting or other activities to avoid soil settlement. The condition and type of the surrounding structures and foundations would determine the type of building protection and support systems used during construction.

A temporary electrical conduit would be extended from the existing Vail Substation north of Flotilla Street to the TBM launch site to power the TBM. This would involve installing the temporary conduit in a trench within the ROW of Yates Avenue and Washington Boulevard. Building the service feed would include the following construction activities: excavating the trench line, installing shoring to support the trench, laying conduit, installing vaults, encasing the conduit with concrete, backfilling the trench with slurry and/or compacted soil, and placing steel plates over the trench line. Wires would be pulled into the conduit between vaults and then energized during a tie-in to the existing power grid. The trench excavation would be approximately 3-feet wide and about 20-feet deep.



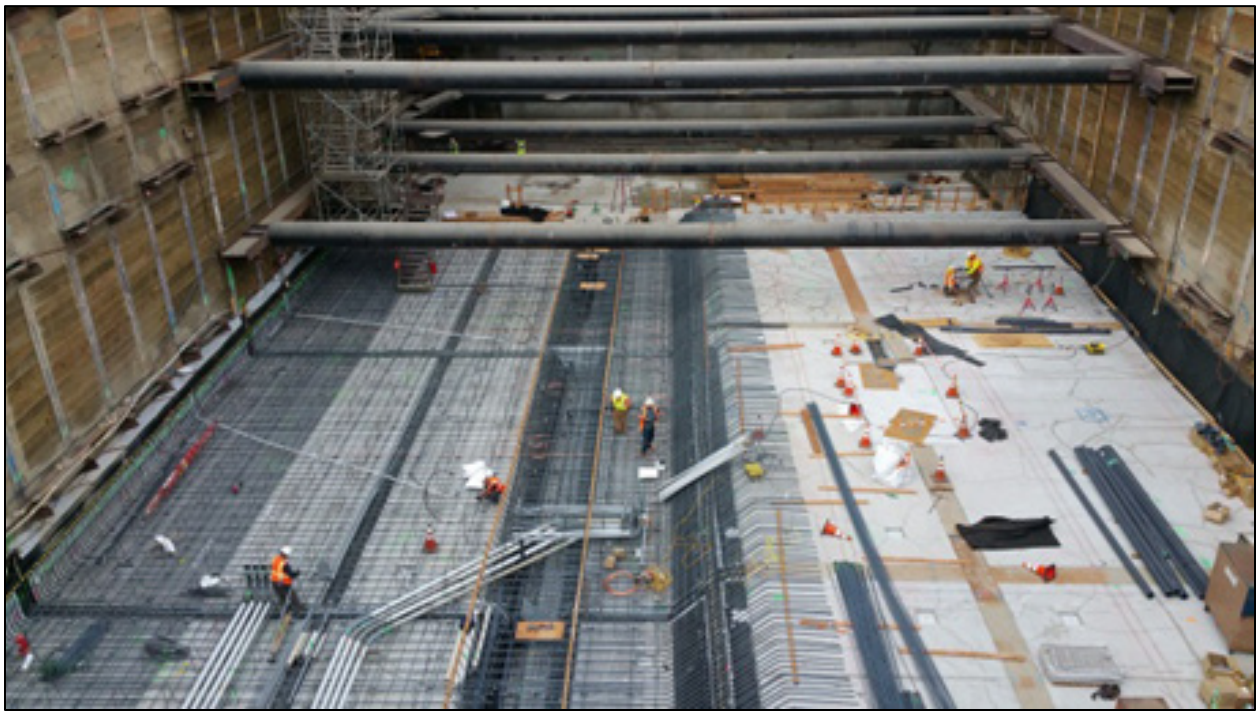
Source: HNTB/Cordoba JV 2025.

Figure 2.15. Typical Twin Bored Tunnel Guideway Cross Section



Source: CDM Smith/AECOM JV 2019.

Figure 2.16. TBM



Source: CDM Smith/AECOM JV 2019.

Figure 2.17. Example of Metro TBM Launch Site

2.1.5.1.2 Station Construction

At-Grade Station

The Build Alternative would have one at-grade station west of Greenwood Avenue in the center of Washington Boulevard. **Figure 2.1** and **Figure 2.2** illustrate the location of the station. The Greenwood station would be slightly above the existing ground elevation and would have a center platform configuration, where one platform is located between the two tracks and serves both tracks. A split platform station is a variation of a side platform station with two platforms staggered instead of mirrored.

Construction of the at-grade station would involve cast-in-place concrete or pre-cast panels to construct an approximately 40-inch-high platform along with ramps and stairs. Station furnishings, including canopy, railings, lighting, seating, signage, and fare vending equipment, would then be installed. The stations would be constructed of standard building materials such as concrete, steel, and other materials, per MRDC. Construction of the stations would also require trucks for the removal of excavated soil; transit mix concrete trucks and concrete pumps; trucks to deliver forms, reinforcing steel, and other materials; and water trucks for dust control. An example of a typical completed at-grade station is shown in **Figure 2.18**.



Source: CDM Smith/AECOM JV 2019.

Figure 2.18. Example of Metro Center Platform At-Grade Station

Underground Stations

The Build Alternative would have three fully underground stations: relocated Atlantic/Pomona station, Atlantic/Whittier station, and Commerce/Citadel station. The locations of the underground stations are illustrated in **Figure 2.1** and **Figure 2.2**. Construction of underground stations and crossovers would occur using cut and cover and open cut excavation construction methods as described in **Section 2.1.5.1.1**. Refer to **Figure 2.19** for a typical Metro project site for an underground station. The station elements are similar to an at-grade station but underground. Emergency ventilation fans and similar equipment to move air in and out of the underground station would also be built. Such ventilation would be built flush as a standalone ventilation facility at surface level, east of the proposed Atlantic/Pomona station.



Source: CDM Smith/AECOM JV 2025.

Figure 2.19. Example of an Underground Station Under Construction via Cut and Cover

2.1.5.1.3 Construction Staging Areas

The laydown and storage areas for construction equipment and materials would be established in the vicinity of the Build Alternative within parking facilities, and/or on parcels that would be acquired for the proposed stations, cut and cover guideway on private ROW, TPSS sites, and the MSF and lead tracks. There would be potential future Joint Development opportunities within these areas after Metro is finished with construction. Construction staging areas would be used to store building materials and construction equipment, assemble the TBM, provide temporary storage of excavated materials, and serve as temporary field offices for the contractor. Heavy duty steel track out grates (i.e., rumble plates) would be staged at the entrance of the construction staging areas to capture dirt and soil debris from the wheels of trucks and construction equipment to minimize soil and mud tracks on the public roadway. For security purposes, construction staging areas would be equipped with a combination of fences, lighting, security cameras, and/or guards to prevent vandalism and theft.

Staging areas would be required at underground and at-grade station locations, TPSS sites, grade separations, intermittently along the guideway, and at the MSF. Potential construction staging sites are identified in **Chapter 2.0**, Description of Alternatives, of this EA. Temporary easements would be required to allow construction staging on public sidewalks, streets, and if necessary, private property. Site clearance and demolition of existing structures at the construction staging areas would occur before major construction activities begin. The MRDC considers the following for siting staging areas: proximity and access to support construction, issues related to property acquisition, jurisdiction planning goals, and potential future Joint Development opportunities after Metro is finished with construction. The size of the construction staging areas range from approximately 0.7 acres (29,865 square feet) to 5 acres (217,800 square feet) although the MSF site (9 to 28 acres depending on which MSF Site is selected) could also be used as a staging area. Staging areas supporting the underground segment would require additional space compared to the at-grade segment to accommodate activities including, but not limited to, tunneling, handling of TBM spoils (leftover soil, rock, and debris removed while tunneling underground), assembling the TBM, launching and extracting the TBM, and decking operations. Large stationary cranes would be located at staging areas that require cut and cover and TBM excavation.

At the TBM launching site, the staging area would also be used for storage and preparation of pre-cast concrete segments (this concrete would line and support the tunnel), temporary spoil storage and handling, ventilation lines, shaft support (air, water/wastewater, electricity, spoil hoisting), workshops, mixing and processing slurry for excavation support or tunnel excavation, and post-excavation slurry treatment (separation), which would include filters, centrifuges, and vibrator equipment. Temporary easements, typically a portion of the sidewalk, traffic lanes, and parking areas, may be required at various locations for staging. It is estimated that the contractor would employ up to 630 construction workers at the peak of construction activities.

Temporary parking would be included at the staging areas to support the contractor's field offices. However, crew members, inspectors, construction management, and other third parties related to construction may park along the alignment in temporary street closures and sometimes public parking spaces to build and oversee construction activities, which would be negotiated with the Cities of Commerce and Montebello and Los Angeles County.

2.1.5.1.4 Haul Routes

The contractor would determine the method of removing material and hauling it away from the job site. Excavated material is anticipated to be loaded into trucks and transported along the Eastside Transit Corridor Phase 2 ROW and/or major streets to construction staging areas or to or from the nearest freeway (e.g. I-5, SR-60, and I-605). Some fill material may also have to be trucked to the site if sufficient material is not available or suitable for use. Coordination with corridor cities and Los Angeles County would occur throughout the construction process for planned haul routes. Restrictions on haul routes can be incorporated into the construction specifications. Estimates of the total number of haul trucks during the construction period are based on the estimated quantities of soil that would require excavation. The total estimated number of haul trucks are provided in **Table 2.1**. This would translate to approximately 15 additional trucks on the roadway during each morning peak (6 am – 9 am) and afternoon/evening hours (3 pm – 7 pm).

Table 2.1. Total Number of Anticipated Haul Trucks

Configuration	Total Number of Trucks
Aerial	1,828
At-Grade	1,540
Underground	70,233
Total	73,601

Source: Metro; CDM Smith/AECOM JV 2025.

When transporting material to or from the Build Alternative the contractor would follow required regulations and employ best management practices, such as drying out the soil prior to loading the trucks and covering the soil with tarps in loaded trucks. Some of the soil would be stockpiled within the Study Area limits so that it is available to use in retained fill. Excess soil would be hauled to an off-site location where it may be available for other projects requiring fill material. Potential haul routes would be identified based on the location of the construction activities with respect to major streets leading to freeways.

Excavated material from major Los Angeles construction sites is typically disposed of at sites on the I-10 corridor or accessed from SR 14. The northern haul routes are shown in **Figure 2.20**. The southern haul routes, which would be where the TBM is launched, are shown in **Figure 2.21**.

Excavated material may be transported to local landfill site(s) if it is not suitable for fill or contains contaminated soils, hazardous building materials, including asbestos, lead, and polychlorinated biphenyls and other hazardous wastes. As discussed in **Appendix J,** Hazardous Materials Impacts Report, transportation of hazardous materials would comply with federal and state regulations governing hazardous materials transport. Cooperation with the Cities of Commerce and Montebello and Los Angeles County would occur throughout the construction process. Restrictions on haul routes can be incorporated into the construction specifications according to local permitting requirements.



Source: CDM Smith/AECOM JV 2023.
Note: Haul route is a potential scenario. The contractor would determine the method of removing material and hauling it away from the job site.

Figure 2.20. Northern Haul Routes



Source: CDM Smith/AECOM JV 2023.
Note: Haul route is a potential scenario. The contractor would determine the method of removing material and hauling it away from the job site.

Figure 2.21. Southern Haul Routes

2.1.5.1.5 Other Facilities and Construction Activities

Other facilities and construction activities would be required for construction of the Build Alternative as described in **Table 2.2**.

Table 2.2. Other Facilities and Construction Activities

Facility	Description
Maintenance and Storage Facility (MSF Site 1, 2, or 3)	Standard methods associated with construction of trackwork and buildings, including demolition of existing facilities, leveling of land, installation/relocation of utilities, and construction of new sheds and maintenance buildings, fencing, pavement and landscaping, as well as track work, traction power, and OCS for storage of LRV.
Traction Power Substations (TPSS)	Electrical substations that would typically be placed every 1 to 1.5 miles along the alignment and at the MSF to provide electrical power for LRT vehicles. Location would be at points along the alignment where maximum power draw is expected (such as stations and inclines). Would require clearing and grading the TPSS site, installing a concrete slab with connections to utilities, mounting the prefabricated TPSS structure on the slab and connecting it to utilities, and installing fencing around the site and landscaping as feasible.
Overhead Catenary System (OCS)	Network of overhead wires that distribute electricity to the LRT. Includes steel poles to support an electrical power line that would be suspended above the LRT tracks. A pantograph or "arm" on the roof of LRT vehicles would slide along the underside of the contact wire and deliver electric power to the vehicles. OCS poles would be approximately 30 feet tall and typically located every 90 to 170 feet between two LRT tracks.
Street Widening and Reconstruction	Would be required for streets along the at-grade and aerial alignment to accommodate the guideway. Reconstruction would be required for some streets along the underground alignment. In these locations, Metro would require full and/or partial acquisition of properties and removal of structures and vegetation. Additional street reconstruction work would be required at all at-grade crossing locations to allow for placement of the track slab and rails and modification of existing curbs, gutters, and sidewalks to accommodate the rail crossing.
Utility Relocation, Modification, and Protection-in-Place	Would be required throughout the Build Alternative alignment. Impacted utilities could include, but would not be limited to, storm drains, sanitary sewers, waterlines, gas and oil pipelines, overhead power lines, and telephone and communication lines. To the extent possible, the Build Alternative has been located to avoid conflicts with the space occupied by major utilities. Nevertheless, in certain instances, utilities would need to be relocated, modified, or protected-in-place. Metro would coordinate relocations, modifications, and protection-in-place, with all impacted utilities under the terms of each provider's franchise or other agreements defining the provisions for such matters. Construction effects on utilities are discussed in **Section 3.17** of the EA.
Temporary Street and Lane Closures	Street and lane closures may be necessary and could include potential closures during nights or on weekends. The extent and duration of the closures would be coordinated with the Cities of Commerce and Montebello, Los Angeles County (unincorporated), and Caltrans. As discussed in **Appendix O**, Metro would provide traffic control plans, designated haul routes, and a Transportation Management Plan to minimize disruption during construction. Metro would also coordinate with local transit agencies in advance to communicate closures and information on any changes to bus service that would result from construction activities.

Source: CDM Smith/AECOM JV 2025.

2.1.6 Operations

Operation of the Build Alternative would be managed by Metro staff and personnel. The Build Alternative would operate a train line using light rail technology. Operational activities of the Build Alternative would include train car operations, train car maintenance (including cleaning and storage), track maintenance, and general administration. In addition, the Build Alternative would include emergency lighting, communications and wayfinding systems, a command-and-control system, a public information system, and security systems to monitor activity at station platforms along the alignment and at the MSF. Operation of an MSF would include maintenance and cleaning, inspection, and storage of light rail vehicles. MSF Sites 1 and 2 would also include repair facilities.

The operating hours and schedules for the Build Alternative would be comparable to the weekday, Saturday and Sunday, and holiday schedules for the Metro E Line. It is anticipated that trains would operate every day from 4 am to 1 am the following day. On weekdays, trains would operate approximately every 6 minutes during peak hours, every 10 minutes mid-day, and every 12 to 20 minutes in the early morning and after 7 pm. On weekends, trains would operate every 10 minutes from 9 am to 9 pm, and every 20 minutes before 9 am and after 9 pm. The operational headways (the time between vehicles past a given point) are consistent with Metro design requirements for future rail services.

Forecasted ridership for the Build Alternative is anticipated to be approximately 7,550 total weekday station boardings by 2050 compared to 3,010 boardings at the existing Atlantic/Pomona Station under the No Build Alternative. Based on the operating headway requirements and ridership forecasts, Metro anticipates the need for an additional three trains for the Metro E Line to operate the Build Alternative. Each train would have three cars and there would be one spare train consisting of three train cars for a total of 12 new train cars. Further information on ridership projections is available in **Section 3.15** and **Appendix O**.

2.2 No Build Alternative

The No Build Alternative evaluates the reasonably foreseeable effects within the Study Area if the Build Alternative were not approved. The No Build Alternative would maintain existing transit service through the year 2050. No new transportation infrastructure would be built within Los Angeles County aside from projects currently under construction or funded for construction and operation by 2050 via the 2008 Measure R or 2016 Measure M sales taxes. The No Build Alternative would include existing roadway and transit projects identified for funding in Metro's 2020 Long Range Transportation Plan (LRTP) and Southern California Association of Governments (SCAG) Connect SoCal 2024-2050 Regional Transportation Plan (2024 RTP). The No Build Alternative would include existing projects from the base year (2025) and planned regional projects in operation in the horizon year (2050).

The No Build Alternative is used for comparison purposes to assess the relative benefits and adverse effects of constructing a new transit project in the Study Area versus implementing only currently planned and funded projects. The No Build Alternative is required as a baseline for comparison under NEPA.

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