



**APPENDIX 2-A ALTERNATIVES CONSIDERED BUT WITHDRAWN
FROM FURTHER EVALUATION**

ALTERNATIVES CONSIDERED BUT WITHDRAWN FROM FURTHER EVALUATION

K LINE NORTHERN EXTENSION



Metro

K LINE NORTHERN EXTENSION TRANSIT CORRIDOR PROJECT

ALTERNATIVES CONSIDERED BUT WITHDRAWN FROM FURTHER EVALUATION

Prepared for:



Los Angeles County
Metropolitan Transportation Authority

Prepared by:



515 S. Figueroa Street, Suite 1400
Los Angeles, California 90071

JULY 2024

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ABBREVIATIONS/ACRONYMS

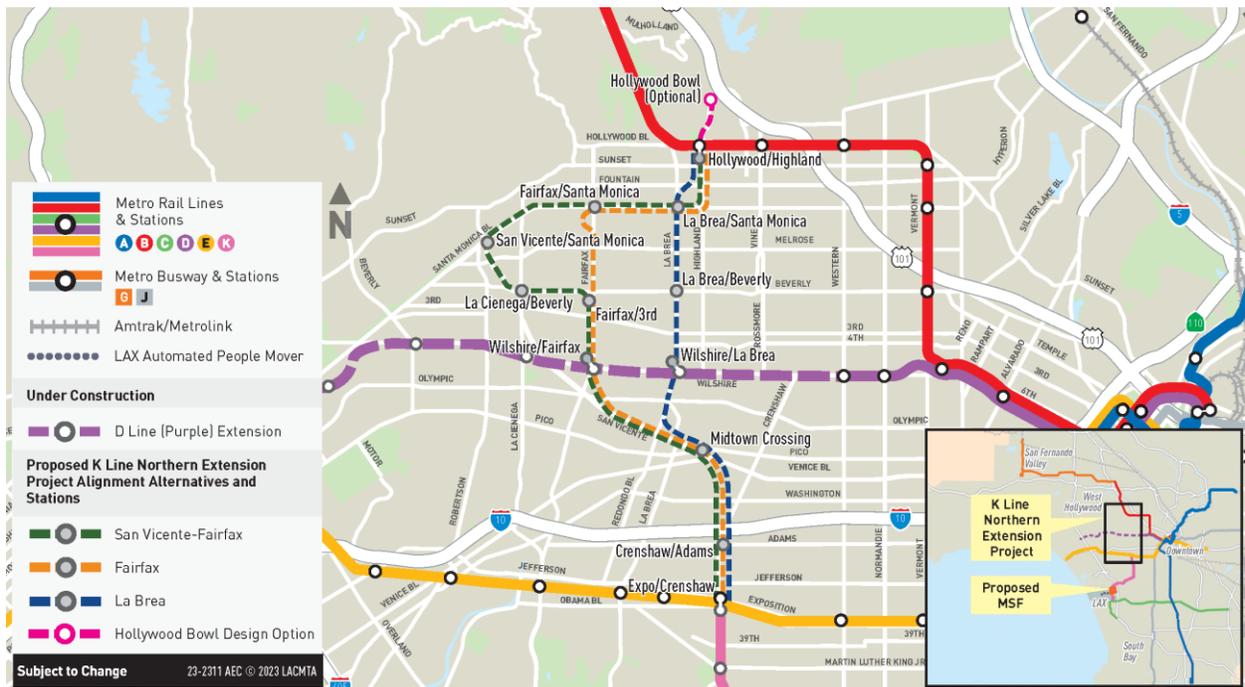
ACRONYM	DEFINITION
AA	Alternatives Analysis
Advanced AA	Advanced Alternatives Analysis
KNE	K Line Northern Extension
EIR	environmental impact report
LAX	Los Angeles International Airport
LRT	light rail transit
Metro	Los Angeles County Metropolitan Transportation Authority
MOW	maintenance-of-way
MSF	maintenance and storage facility
Project	K Line Northern Extension Project
ROW	right-of-way
TOC	transit-oriented community
VMT	vehicle miles traveled

SECTION 1: INTRODUCTION

The Los Angeles County Metropolitan Transportation Authority (Metro) is preparing a Draft Environmental Impact Report (EIR) for the K Line Northern Extension (KNE) Transit Corridor Project (the project) (Figure 1-1). The project would provide a northern extension of the Metro light rail transit (LRT) K Line from the Metro E Line (Expo) to the Metro D Line (Purple) and B Line (Red) heavy rail transit lines. The project would serve as a critical regional connection, linking the South Bay, the Los Angeles International Airport (LAX) area, South Los Angeles, Inglewood, and Crenshaw corridor to Mid-City, Central Los Angeles, West Hollywood, and Hollywood, allowing for further connections to points north in the San Fernando Valley via the Metro B Line. The project would also connect major activity centers and areas of high population and employment density within the project area itself.

This memorandum describes the development of alternatives considered in the Draft EIR through a comprehensive planning process. Section 2 provides an overview of the project history, and Section 3 outlines the project goals, which informed the evaluation criteria used in the screening of alternatives. Section 4 describes the development process for the alignment alternatives and stations, and Section 5 describes the identification of the maintenance and storage facility (MSF) site location.

FIGURE 1-1. K LINE NORTHERN EXTENSION ALIGNMENTS



Source: Connect Los Angeles Partners 2024

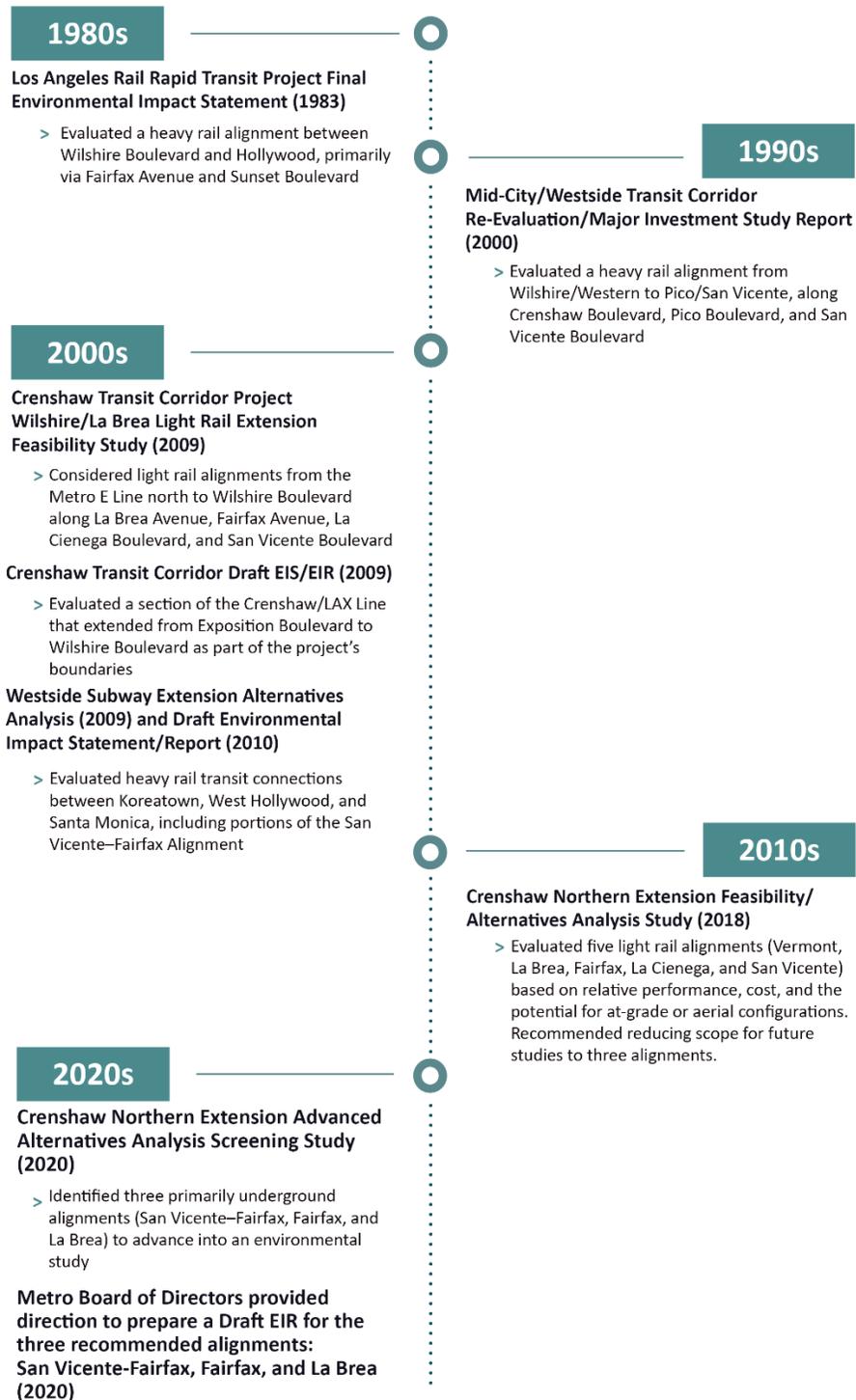
SECTION 2: PROJECT HISTORY

Over the past decade, Metro has documented the clear need for a north-south rail line in the Central Los Angeles vicinity to address high travel demand and alleviate congestion with the goal of improving access to some of the busiest destinations and employment centers in Southern California. In 2009, Metro prepared the Crenshaw Transit Corridor Project Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR), which considered a segment of the underground Crenshaw/LAX Line, now the Metro K Line, from Exposition Boulevard to Wilshire Boulevard (Metro 2009a). The K Line south of Exposition Boulevard was constructed and opened in 2022, but the portion north of Exposition Boulevard was not advanced due to funding constraints at the time.

The 2009 Crenshaw Transit Corridor Project Wilshire/La Brea Light Rail Transit Extension Feasibility Study considered light rail extensions of the Crenshaw/LAX Line from the Metro E Line north to Wilshire Boulevard along La Brea Avenue, Fairfax Avenue, La Cienega Boulevard, and San Vicente Boulevard (Metro 2009b). The Feasibility Study also suggested potential extensions farther north to Hollywood and West Hollywood. A portion of the San Vicente and La Cienega alignments, between Hollywood and Wilshire Boulevards, was studied further in the Westside Subway Extension Alternatives Analysis (Metro 2009c) and the Westside Subway Extension Draft EIS/EIR (Metro 2010) as a potential heavy rail branch of the Purple Line Extension, now the Metro D Line Extension, but was ultimately dropped from further consideration due to funding constraints at the time.

In 2016, Metro initiated a feasibility study to further consider the possibility of extending the K Line to the north. In 2018, Metro published the Crenshaw Northern Extension Feasibility/Alternatives Analysis Study (Feasibility/AA Study) (Metro 2018), which presented the relative performance and cost of five alignment alternatives—Vermont, La Brea, Fairfax, La Cienega, and San Vicente. To further refine the alignments, Metro prepared the Crenshaw Northern Extension Advanced Alternatives Analysis Screening Study (Metro 2020) (Advanced AA), resulting in the identification of three recommended alignment alternatives: the San Vicente–Fairfax Alignment Alternative, the Fairfax Alignment Alternative, and the La Brea Alignment Alternative. In 2020, the Metro Board provided direction to prepare the Draft EIR for the project for the three recommended alignment alternatives. Scoping for the Draft EIR was held in 2021, and in 2022 the Crenshaw Northern Extension Post-Scoping Alignment Refinement Evaluation was prepared to further refine the three alignment alternatives to be studied in the Draft EIR (Metro 2022).

A timeline of these prior studies and reports is shown in Figure 2-1. This memorandum focuses on the development of alternatives starting with the Feasibility/AA Study (Metro 2018) through the identification of alternatives to be evaluated in the Draft EIR.

FIGURE 2-1. TIMELINE OF PRIOR STUDIES AND REPORTS


Source: Connect Los Angeles Partners 2024

SECTION 3: PROJECT GOALS

The 2018 Feasibility/AA Study established a set of goals for the project, which were expanded during the Advanced AA in 2020. These goals were developed to reflect the Metro Performance Metrics Framework. The goals were used to inform the creation of objectives and criteria that were used in the alternative development and screening. The goals, objectives, and criteria for the project as evaluated in the Feasibility/AA Study and Advanced AA are presented in Table 3-1. In the Draft EIR, these goals were refined, but they are presented here as they were at the time of the Advanced AA (2020).

- **Goal 1 – Improve Mobility and Systems Connectivity:** The project should improve public transit service and mobility for trips to, from, and within the Study Area, particularly for transit-dependent populations, while enhancing connections to the existing and future transit network, including the Metro B and D Lines.
- **Goal 2 – Cost Effectiveness:** The project should maximize benefits relative to costs due to the scarcity of funding and resources, and to enhance project competitiveness for potential federal and/or state transit funds.
- **Goal 3 – Maximize Project Feasibility and Constructability:** The project should be financially feasible based on Metro’s Long Range Transportation Plan and funding commitments, and minimize risks associated with the project’s construction. The project should minimize impacts to existing structure and utilities.
- **Goal 4 – Minimize Environmental Impacts/Maximize Environmental Benefits:** The project should minimize displacement of residents and businesses and impacts to existing communities. The project should reduce tailpipe/greenhouse gas emissions, vehicle miles traveled (VMT), and burdens on the existing transportation network.

As with the alternatives, the goals evolved between phases. The Advanced AA Study included all the prior goals and two more. These goals were primarily addressed through a transit-oriented community (TOC)/first-last mile analysis of existing conditions.

- **Goal 5 – Increase Accessibility and Equity:** The project should efficiently serve job centers and people, especially job centers that are near stations and people who rely on transit as their primary means of transportation. The project should leverage opportunities to connect to high-quality pedestrian and bicycle infrastructure to allow for safe station access for those walking, biking, or rolling.
- **Goal 6 – Support Transit-Supportive Land Use Policies and TOC Policies:** The project should contribute toward the development of TOCs, consistent with existing transit-supportive land use patterns, adopted transit-supportive plans and policies, and where there is strong potential for higher intensity, infill development and first-last mile connections.

TABLE 3-1. PROJECT GOALS, OBJECTIVES, AND PERFORMANCE MEASURES FROM THE FEASIBILITY/AA STUDY (2018) AND ADVANCED AA STUDY (2020)

GOAL	OBJECTIVES	PERFORMANCE MEASURES
Improve Mobility and System Connectivity	<ul style="list-style-type: none"> • Maximize potential transit ridership and person throughput, with an emphasis on transit-dependent populations • Reduce travel times • Improve reliability • Improve service frequency • Enhance linkages to the transit system and active transportation facilities 	<ul style="list-style-type: none"> • Daily and annual trips on project by alternative • Daily trip types – within Study Area, into/from Study Area, through Study Area • New transit trips compared to No Project Alternative • Average end-to-end operating speeds • Travel times by alternative • Estimated daily hours of transit travel time savings • Ridership on Section 1 to the D Line • Number of new transit-dependent riders • Estimated change in transit mode share • Number of direct connections to transit (rail and bus)
Maximize Cost Effectiveness	<ul style="list-style-type: none"> • Maximize project benefits relative to costs 	<ul style="list-style-type: none"> • Total capital costs (2017 value) • Annual O&M costs • Annualized capital and O&M costs • Cost effectiveness – average cost per daily trip on the project • Cost effectiveness – average cost per hour saved due to project
Project Feasibility and Constructability	<ul style="list-style-type: none"> • Be financially feasible based on funding commitments and potential for federal and/or state matching funds • Minimize risks associated with project construction • Be constructible based on Study Area features • Be constructible in phases 	<ul style="list-style-type: none"> • Engineering issues analysis <ul style="list-style-type: none"> – Underground segment and geotechnical issues analysis – Aerial structures issues analysis – At-grade guideway and traffic analysis – Utility conflict analysis – Constructability analysis • Operations issues • Project phasing analysis <ul style="list-style-type: none"> – Ridership of Section 1 to the D Line – Cost estimates of Section 1 to the D Line – Constructability of Section 1 to the D Line

GOAL	OBJECTIVES	PERFORMANCE MEASURES
Minimize Environmental Impacts/Maximize Environmental Benefits	<ul style="list-style-type: none"> Minimize impacts to surrounding communities, including the displacement of homes and businesses Reduce VMT and greenhouse gas emissions 	<ul style="list-style-type: none"> Summary assessment of potentially significant adverse environmental effects by category Estimate of annual VMT and greenhouse gas reduction Qualitative assessment of environmental areas of concern based on public outreach and feedback
Increase Accessibility and Equity*	<ul style="list-style-type: none"> Maximize number of people and job centers served by transit Maximize access to people who rely on transit Maximize opportunities to connect to walking and cycling paths for first/last mile 	<ul style="list-style-type: none"> Number of residents/population density, including transit-dependent populations, within 0.5 mile of proposed alignment and stations Number of transit-dependent residents/households served by transit Number of jobs/employment density within 0.5 mile of proposed alignment and stations Within 0.5 mile of proposed stations: <ul style="list-style-type: none"> Intersection density, block size/length Safe crossings, accessible sidewalks, bicycle facilities, and transit friendliness Quality of the public realm within 0.5 mile of proposed stations Plans and policies that support active transportation connections to proposed stations Safety and security considerations within 0.5 mile of proposed stations: <ul style="list-style-type: none"> High collision corridor for walking and bicycling Potential for safety improvements as needed near station areas based on lighting, security, appearances, and visibility
Support Transit-Supportive Land Use Policies and TOC Policies*	<ul style="list-style-type: none"> Promote TOC Be consistent with adopted plans and policies that encourage transit-supportive development 	<ul style="list-style-type: none"> Number of existing high-density/mixed-use activity centers within 0.5-mile walk distance of proposed station locations Plans and policies that support TOC for proposed station areas, including: <ul style="list-style-type: none"> Adopted transit-supportive policies, development policies Parking management policies (e.g., shared parking districts, pricing strategies, and unbundled parking requirements around transit) Evaluation of large vacant and underutilized parcels within 0.5 mile of proposed station locations that have characteristics that are likely to be redeveloped

Source: Metro 2018, 2020

*Added during the Advanced AA Study

AA = Alternatives Analysis; O&M = operations and maintenance; TOC = transit-oriented communities; VMT = vehicle miles traveled

SECTION 4: ALIGNMENT ALTERNATIVES

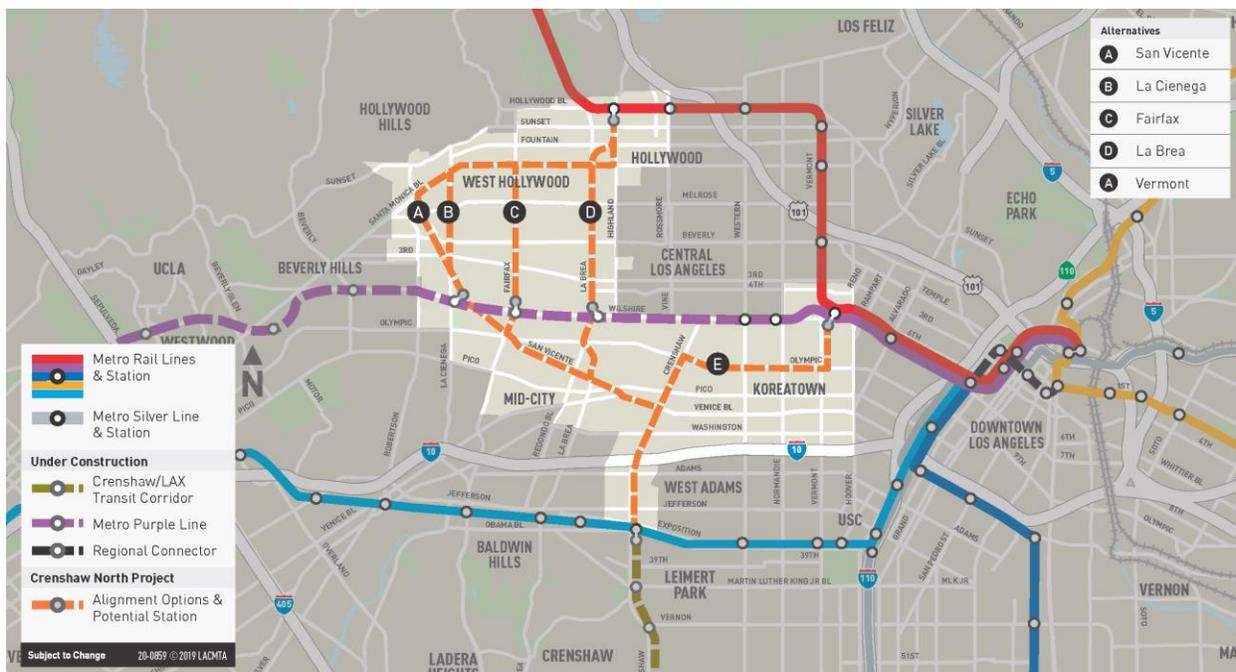
4.1 FEASIBILITY/ALTERNATIVES ANALYSIS STUDY (2018)

The Feasibility/AA Study (2018) prepared a screening process to define and narrow alignment alternatives for consideration and to determine where light rail may be feasible to travel above ground (either at-grade or aerial). To define the initial set of alternatives, factors such as existing street width, referred to as public right-of-way (ROW), traffic conditions and congestion, rail track geometry, potential environmental impacts, urban design issues, and stakeholder feedback were considered. This was a technical study and did not include public outreach.

Based on this process, five alternatives were developed and evaluated in the Feasibility/AA Study (Figure 4-1):

- San Vicente
- La Cienega
- Fairfax
- La Brea
- Vermont

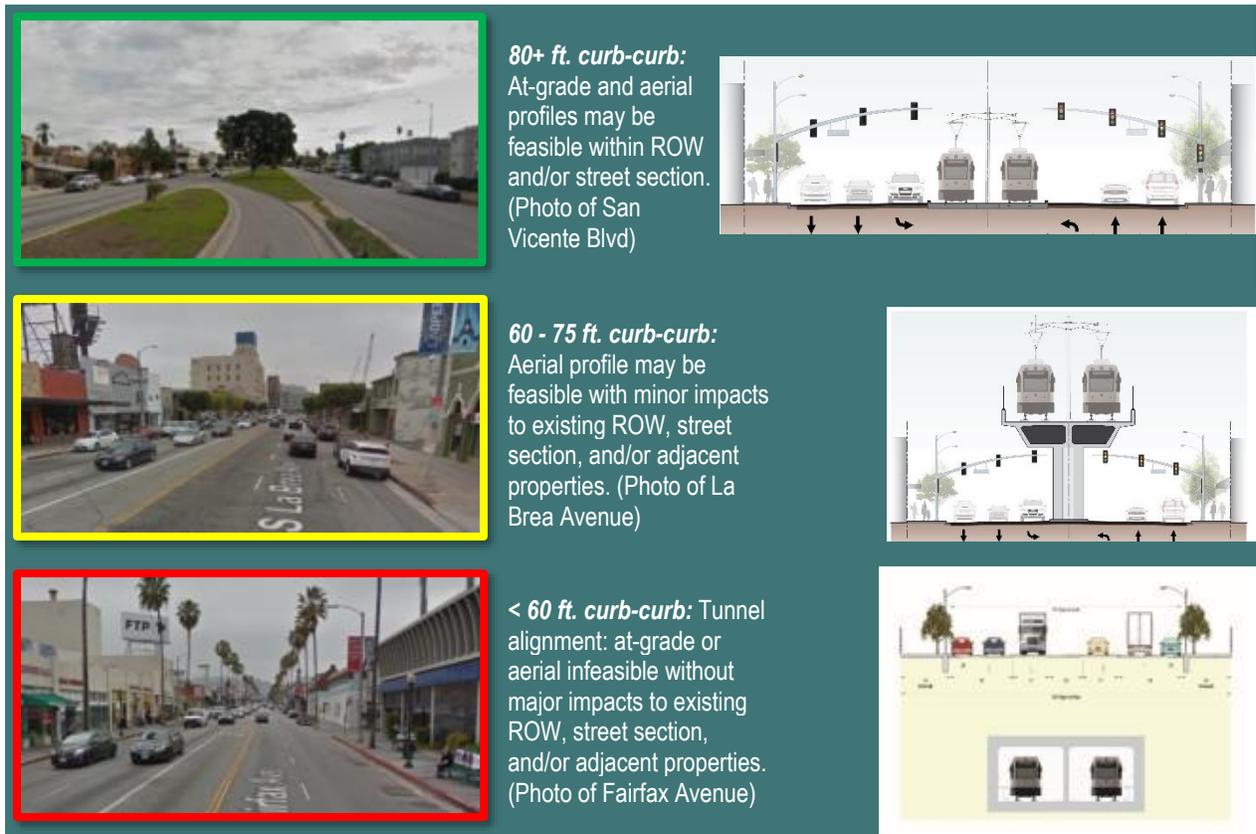
FIGURE 4-1. FEASIBILITY/ALTERNATIVES ANALYSIS STUDY ALTERNATIVES (2018)



Source: Metro 2018

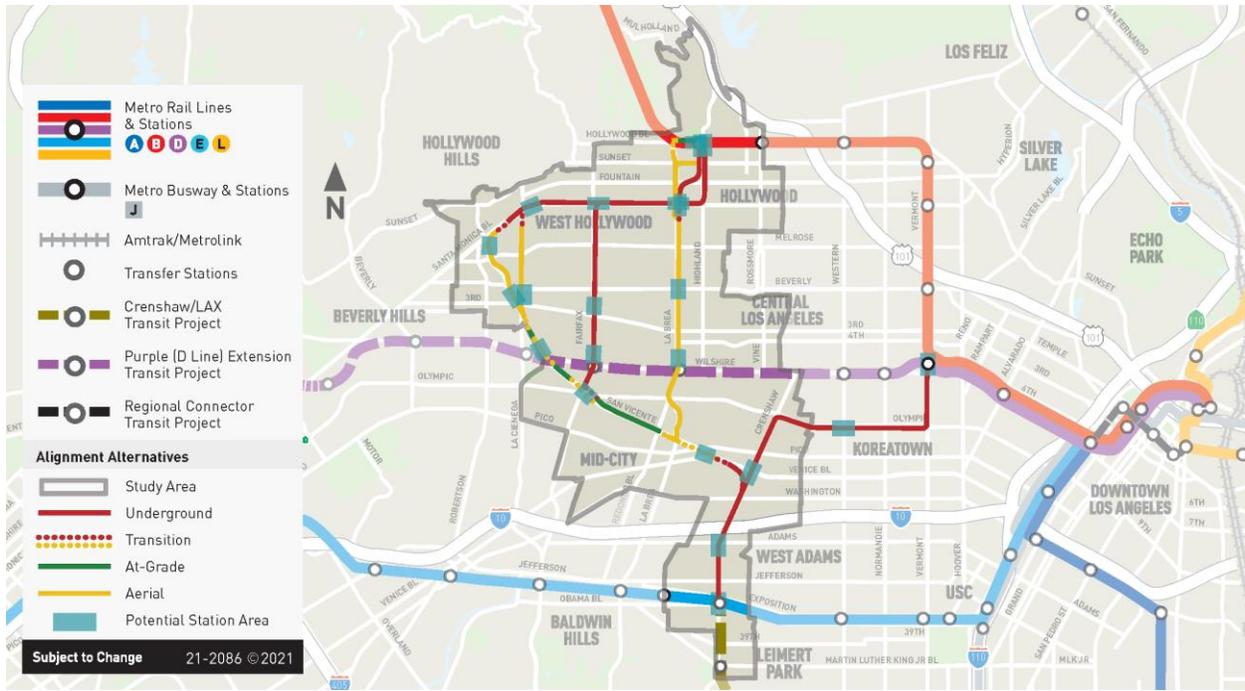
The Feasibility/AA Study analyzed the potential vertical profile for at-grade and elevated light rail configurations to maximize cost effectiveness as underground tunneling is significantly more expensive to construct. The Study analyzed the width of the public ROW along the five alternatives to determine where travel lanes, medians, street parking, and sidewalks might be affected to accommodate light rail. The Study also analyzed traffic congestion at intersections that may necessitate grade separation as guided by Metro’s Grade Separation Policy (Figure 4-2). Where aerial or at-grade configurations were deemed infeasible due to public ROW constraints (a curb-to-curb width of less than 60 feet), an underground tunnel configuration was proposed. As a result of this analysis, the Feasibility/AA Study concluded by recommending underground segments along Crenshaw Boulevard, Fairfax Avenue, Santa Monica Boulevard, and Highland Avenue, as well as the entire Vermont Alternative (Figure 4-3) with the remaining segments identified where aerial or at-grade configurations could be possible.

FIGURE 4-2. RIGHT-OF-WAY AND VERTICAL PROFILE CONFIGURATIONS



Source: Metro 2018

Based on the ROW widths and grade separation needs, the team prepared track geometry concepts to allow for transitions between underground and aboveground segments to complete the overall profile for each alternative. The green lines show where there is potential for at-grade; the yellow lines indicate where the alignment is proposed as aerial; and the red lines indicates where the alignment is proposed as underground (Figure 4-3).

FIGURE 4-3. ALTERNATIVE ALIGNMENT RECOMMENDATIONS AND CONFIGURATIONS FROM FEASIBILITY/ALTERNATIVES ANALYSIS STUDY (2018)


Source: Metro 2018

As a result of this analysis, the Feasibility/AA Study refined the vertical profile and identified remaining segments where aerial or at-grade configurations could be possible. However, additional study was still needed to further define the feasibility of at-grade operation based on Metro’s Grade Crossing Policy. Table 4-1 identifies the length of the potential vertical configurations for each alternative studied.

TABLE 4-1. ALTERNATIVES STUDIED AND VERTICAL PROFILE CONFIGURATIONS

2018 ALTERNATIVES	SAN VICENTE	SAN VICENTE– LA CIENEGA	FAIRFAX	LA BREA	VERMONT
Bored Tunnel Length (miles)	6.4	6.2	6.7	3.2	4.8
Aerial Guideway Length (miles)	2.1	2.0	0.5	3.1	0
At-Grade Guideway Length (miles)	1.0	1.0	0.9	0.0	0
Total Route Length	9.6	9.2	8.0	6.3	4.8
New Underground Stations (#)	4	5	6	3	3
New Aerial Stations (#)	5	4	1	3	0
Total Stations (#)	9	9	7	6	3

As part of a parallel effort to the AA Feasibility Study, Metro prepared an urban design analysis, evaluating design best practices to integrate at-grade and aerial light rail into the urban fabric, including existing and future development. Metro prepared concept site plans and renderings as part of this effort. Based on this analysis, Metro prepared the Elevated Rail Design Guide to inform the design of aerial light rail for future corridor studies.

The Feasibility/AA Study concluded that while all the alternatives were forecasted to serve high ridership comparable to Metro's highest-performing rail lines, the western alternatives demonstrated higher total ridership and user benefits. The La Brea Alternative had the lowest capital cost but would not serve many of the major regional job and activity centers. Alternatives to the west had higher access to jobs and housing in the vicinity of proposed station locations.

The Feasibility/AA Study recommended eliminating from further study the Vermont Alternative as it did not meet the purpose and need of the KNE project as effectively as the other alternatives under consideration. While the Vermont Alternative was initially added to reach the Metro D and B Lines with the shortest distance, it did not meet the other project objectives:

- Seventy percent of its ridership would be through trips, which would not serve origins and destinations within the Study Area.
- The alternative would be largely redundant with the existing rail system and all the western alignments, which connect riders to the D Line quicker than via Vermont.
- While this alternative would save one to two minutes from existing travel times to points east (including Downtown LA), it would impose a more than eight-minute penalty for trips between the Study Area, points south of the Study Area, and the Westside, as well as the San Fernando Valley.
- This alternative would not serve any new neighborhoods/areas that would not be served with any of the other alternatives or are not already served by the existing Metro rail system.

4.2 ADVANCED ALTERNATIVES ANALYSIS STUDY (2020)

In 2019, Metro initiated the Advanced AA Study to build on the 2018 Feasibility/AA Study. At the outset, the study included all five alternatives from the prior phase (San Vicente, La Cienega, Fairfax, La Brea, and Vermont), which were presented to the public during the early stages of the Advanced AA. The Advanced AA included stakeholder engagement activities. In spring 2019, the first of two rounds of public meetings presented initial alternatives and advanced screening criteria. Outcomes from the first round of public outreach meetings are shown in Table 4-2. In fall 2019, a second round of meetings presented refinements to alternatives based on community input and preliminary analysis.

TABLE 4-2. ADVANCED AA PUBLIC OUTREACH SUGGESTIONS AND OUTCOMES

COMMUNITY SUGGESTIONS	CONSIDERATIONS	OUTCOME
Continue north of Hollywood/Highland to the Hollywood Bowl	<ul style="list-style-type: none"> After public input, it was determined the extension to the Hollywood Bowl would provide access to a key regional destination. 	<ul style="list-style-type: none"> Recommended for further study as a potential extension during the environmental clearance and advanced conceptual engineering phase
Continue the alignment to Universal Studios, Burbank Media District, and Hollywood Burbank Airport	<ul style="list-style-type: none"> Goes beyond the purpose and need (a connection between existing and proposed east-west Metro transit lines). Not included in the Measure M funding allocated for the extension and would not meet the Measure M description. 	<ul style="list-style-type: none"> Recommended to not consider further as part of Advanced AA
Interline with the E Line	<ul style="list-style-type: none"> Interlining, where two routes share part of a rail line, would serve different travel patterns, purpose, and need than the project. There would be constructability issues with interlining the underground K Line and the at-grade E Line due to structural needs and additional public ROW acquisition. The E Line does not have capacity to accommodate additional rail service. Therefore, interlining would require public ROW acquisition with accompanying property and land use impacts. 	<ul style="list-style-type: none"> Recommended to not consider further as part of Advanced AA
Interline with D Line from Crenshaw Boulevard west, then continue north at San Vicente Boulevard	<ul style="list-style-type: none"> The D Line was not constructed with infrastructure to accommodate interlining. Interlining an LRT line (K Line) along HRT tracks (D Line) would not be possible due to the different technologies and vehicle sizes. 	<ul style="list-style-type: none"> Recommended to not consider further as part of Advanced AA
A new hybrid alignment that would serve Fairfax Ave and San Vicente Blvd	<ul style="list-style-type: none"> Met the project's goals, purpose, and need. Serves major destinations from San Vicente and Fairfax Alternatives without adding significant length and travel time. A viable alternative. 	<ul style="list-style-type: none"> Recommended for inclusion for analysis as part of Advanced AA

Source: Metro 2020

AA = Alternatives Analysis; HRT = heavy rail transit; LRT = light rail transit; ROW = right-of-way

The Advanced AA Study reaffirmed the conclusion that the Vermont Alternative would not meet key goals of the project to improve transit service within the Study Area (as outlined in the bullets above), and should be eliminated from further study. The four other alternatives provide greater travel time savings for trips to, from, and between the major activity centers and destinations; offer a quicker connection to the D Line; and significantly lower travel times to points farther north throughout Central Los Angeles and the San Fernando Valley and points west. Additionally, in 2017, the Metro Board directed staff to conduct further analysis of the Vermont Transit Corridor, a separate high-capacity transit study along the entire

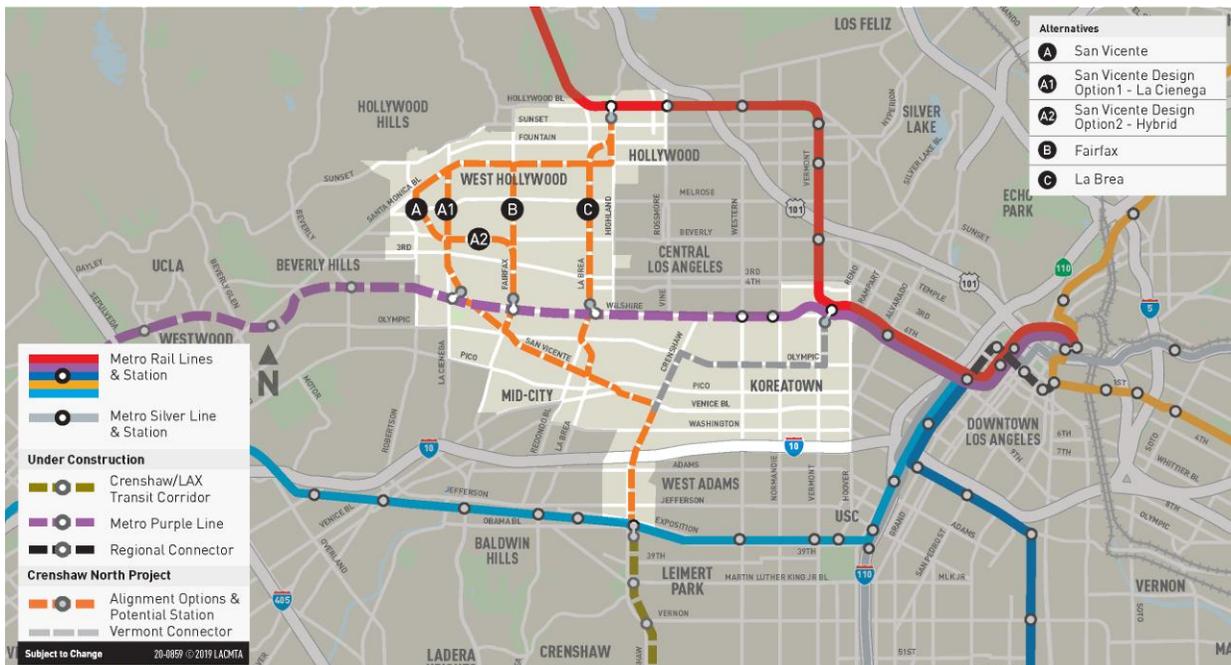
Vermont corridor from Hollywood to the Metro C Line (Green) at 120th Street. A separate 2019 feasibility study evaluated an extension farther south to the Metro J Line Pacific Coast Highway Station.

In addition to the evaluation criteria considered in the 2018 Feasibility/AA Study, the 2020 Advanced AA expanded what was studied under environmental impacts to include a more qualitative assessment, reviewing opportunities and constraints for TOC, accessibility, and equity goals (Table 3-1). The cost estimates for the alternatives were also refined based on more defined configurations combining underground, at-grade, and aerial configurations, as well as for an alignment completely underground for each alternative.

The alternatives considered as part of the 2020 Advanced AA build on initial concepts developed during the 2018 Feasibility/AA Study and were modified to reflect the initial screening performance, community and stakeholder input, and Metro Board direction. The five alternatives analyzed in the Advanced AA are depicted in Figure 4-4 and are as follows:

- San Vicente
- San Vicente Design Option 1 – La Cienega
- San Vicente Design Option 2 – Hybrid (renamed as San Vicente–Fairfax in subsequent phases)
- Fairfax
- La Brea

FIGURE 4-4. ADVANCED ALTERNATIVES ANALYSIS STUDY ALTERNATIVES (2020)



Source: Metro 2020

The alternatives were further evaluated for engineering feasibility of vertical configurations and constructability. Similarly, changes to roadways (eliminating travel lanes along congested streets), property impacts, and potential conflicts with the Historic Preservation Overlay Zone reduced the areas where aboveground rail is feasible. Additional constraints and limitations for at-grade and aerial configurations are summarized in the Advanced AA Study (2020) by alignment and include the following:

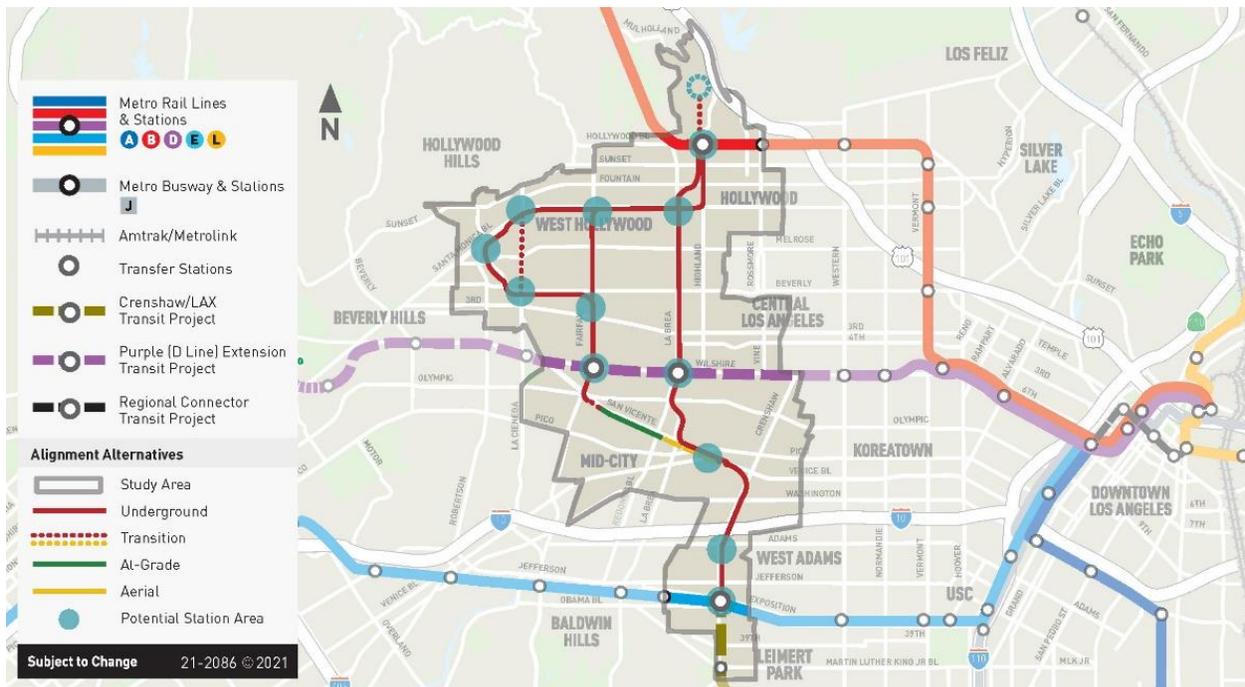
- San Vicente–Fairfax (Hybrid) Alternative: Limited width of public right-of-way along Beverly Boulevard and Fairfax Avenue to accommodate aboveground light rail.
- Fairfax Alternative: Limited width of right-of way and high daily traffic volumes that require underground configuration along Fairfax Avenue.
- La Brea Alternative: Multiple engineering constraints limit the viability for at-grade and aerial configurations, including significant property acquisitions for site stations, straddle bents, and columns based on roadway curvature, loss of travel lanes, and on-street parking that could increase congestion.

Based on this additional feasibility analysis, the recommendations in the Advanced AA Study included increasing the portions of the alignments to be constructed underground.

For the San Vicente–Fairfax (Hybrid) Alternative, the alignment would transition to an underground configuration on San Vicente Boulevard just before turning north at Fairfax Avenue and west under Beverly Boulevard. The alignment would then connect with San Vicente Boulevard and continue underground along Santa Monica Boulevard and Highland Avenue to the B Line connection at Hollywood/Highland and potentially farther north to the Hollywood Bowl.

Similarly, the Fairfax Alternative would transition to an underground configuration along San Vicente Boulevard just before turning north onto Fairfax Avenue and remain underground for the entirety of the alignment to the connection at Hollywood/Highland.

Figure 4-5 summarizes the findings from the screening of aboveground segments, which limited aboveground light rail to a single segment along San Vicente Boulevard approximately 1.3 miles in length and less than a half-mile segment of aerial light rail.

FIGURE 4-5. RECOMMENDED ALTERNATIVES RESULTING FROM THE ADVANCED AA STUDY


Source: Metro 2020

The final report, published in 2020, recommended advancing the San Vicente Design Option 2 – Hybrid (renamed San Vicente–Fairfax), Fairfax, and La Brea Alternatives. Based on public interest, a potential alternate terminus station at the Hollywood Bowl was recommended for further study. The Advanced AA recommended dropping the following alignment alternatives from consideration:

- **San Vicente Alternative:** The San Vicente Alternative was dropped in favor of the San Vicente Design Option 2 – Hybrid (now known as the San Vicente–Fairfax) Alternative developed through the community outreach process. The San Vicente Alternative would have resulted in a 1,300-foot-long (0.25-mile) transfer between the project and the D Line at Wilshire/La Cienega. A seamless connection between the two lines is critical for system connectivity as a high volume of transfers is anticipated. The Advanced AA Study determined that benefits of the San Vicente Alternative would be better captured with the San Vicente–Fairfax Alternative, which would provide a more direct connection to the D Line at Wilshire/Fairfax and also serve destinations in West Hollywood and Mid-City West.
- **San Vicente Design Option 1 – La Cienega:** The San Vicente Design Option 1 – La Cienega presents similar constraints as the San Vicente Alternative at the D Line transfer location and was recommended for dismissal in favor of the San Vicente–Fairfax Alternative. In addition to challenges at the D Line connection, due to alignment geometry constraints, this option would have made it difficult to locate a station immediately adjacent to the La Cienega/Beverly intersection as well as the Santa Monica/La Cienega intersection. Although the La Cienega

alignment was eliminated, a station between San Vicente Boulevard and La Cienega Boulevard on Santa Monica Boulevard was still under consideration, as well as a station that would serve the intersection of La Cienega Boulevard and Beverly Boulevard.

Following the publication of the Advanced AA, the Metro Board provided direction to prepare the Draft EIR for the three recommended alternatives from the Advanced AA.

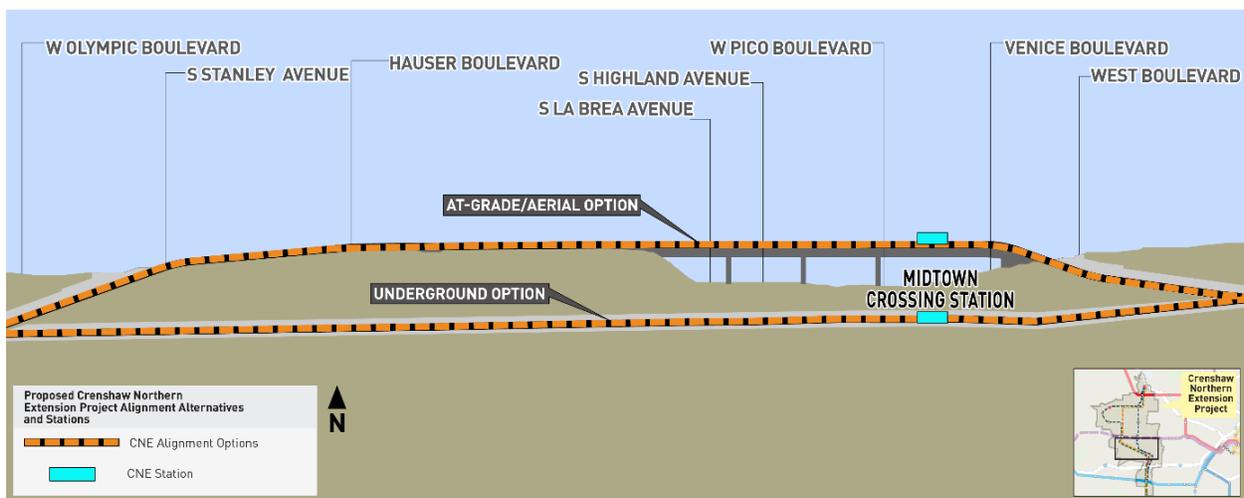
4.3 POST-SCOPING ALIGNMENT REFINEMENT EVALUATION

Scoping for the project occurred in May 2021 after the publication of the Notice of Preparation. At Scoping, the San Vicente–Fairfax, Fairfax, and La Brea Alignments were presented. Following Scoping, the project was refined to reflect public comments and optimize design.

4.3.1 SAN VICENTE BOULEVARD VERTICAL PROFILE

As recommended in the Advanced AA, the approximately 1.3-mile at-grade/aerial and at-grade alignment along San Vicente Boulevard between Venice Boulevard and Fairfax Avenue was the only portion of the alternatives that could potentially not be underground. Following Scoping, additional analysis was conducted to evaluate the feasibility, cost, and other considerations of maintaining an underground alignment through this segment. The evaluation concluded that although tunneling is more expensive than aerial/at-grade construction on a per-foot basis, there would be significant savings due to economies of scale by continuing to tunnel rather than transitioning to aerial/at-grade construction for a short segment in the middle of the route, with the corresponding costs of the grade transitions and need for multiple tunnel boring machine launch sites and efforts. Therefore, an “all underground” configuration along San Vicente Boulevard was carried forward into the Draft EIR (Figure 4-6).

FIGURE 4-6. SAN VICENTE BOULEVARD ALIGNMENT CONFIGURATION OPTIONS



Source: Connect Los Angeles Partners 2021

4.3.2 SPUR CONCEPT

During Scoping, one recurring suggestion from the public was to study a new “spur” concept. The spur concept would involve construction of the La Brea Alternative along with a spur line that would connect to the proposed Santa Monica/La Brea Station and run west along Santa Monica Boulevard to serve West Hollywood. An analysis was conducted considering funding, constructability, connectivity, operations, and the maintenance facility needs of four operating concepts for the spur. The analysis concluded that the spur concept would not provide a direct extension of the K Line in accordance with the project scope identified in Measure M, lacks support from the public and key stakeholders, would not result in significant cost savings compared to the San Vicente–Fairfax Alternative, and would not provide a direct north-south connection to West Hollywood and other key destinations in the Study Area. In addition, the spur concept would require the construction of a complex and costly wye-junction at Santa Monica/La Brea for rail vehicles to pass one another to either access the MSF or provide interlining service. A wye-junction is a triangular configuration of rail tracks where two rail tracks join with a third rail track to allow flexibility for trains to turn around and change direction. Unless major additional trackwork was provided, interlining the spur and the K Line would limit headways, resulting in less frequent service along the branches and increased overall travel times along both the West Hollywood spur and the La Brea trunk relative to the La Brea Alternative. Travel times between the connecting B and D Lines would also increase due to lower frequencies and split service, which opposes the project’s purpose and need as a critical regional connection. Therefore, the spur concept was not advanced into the Draft EIR.

4.3.3 OPTIONAL LA CIENEGA/SANTA MONICA STATION

An optional station at La Cienega/Santa Monica was presented at Scoping. However, its proximity to the proposed San Vicente/Santa Monica Station (0.5 mile) led to the decision for a single station on Santa Monica Boulevard between the two in lieu of two separate stations. As a result, the optional station at La Cienega/Santa Monica was dropped from further consideration and the San Vicente/Santa Monica Station was advanced into the Draft EIR.

4.3.4 ALIGNMENT BETWEEN CRENSHAW/ADAMS AND MIDTOWN CROSSING STATIONS

The two alignments considered between the Crenshaw/Adams and Midtown Crossing Stations are depicted in Figure 4-7. The design option between the Crenshaw/Adams and Midtown Crossing Stations (depicted in pink) was initially developed when Metro was exploring at-grade and aerial options, which necessitated that the alignment follows the public ROW. From the Crenshaw/Adams Station, the design option alignment would continue northeast beneath Crenshaw Boulevard, crossing below the I-10 Freeway and following Crenshaw Boulevard until Washington Boulevard. The Base Alignment follows a more direct route between the Crenshaw/Adams and Midtown Crossing Stations. The design option alignment would tunnel under fewer residential properties than the Base Alignment; however, it would cost approximately \$180 million more than the Base Alignment with no substantial benefit. For this reason, the design option alignment between the Crenshaw/Adams and Midtown Crossing Stations was removed from further consideration and the Base Alignment was assumed in the Draft EIR.

FIGURE 4-7. CRENSHAW/ADAMS TO MIDTOWN CROSSING ALIGNMENT DESIGN OPTIONS

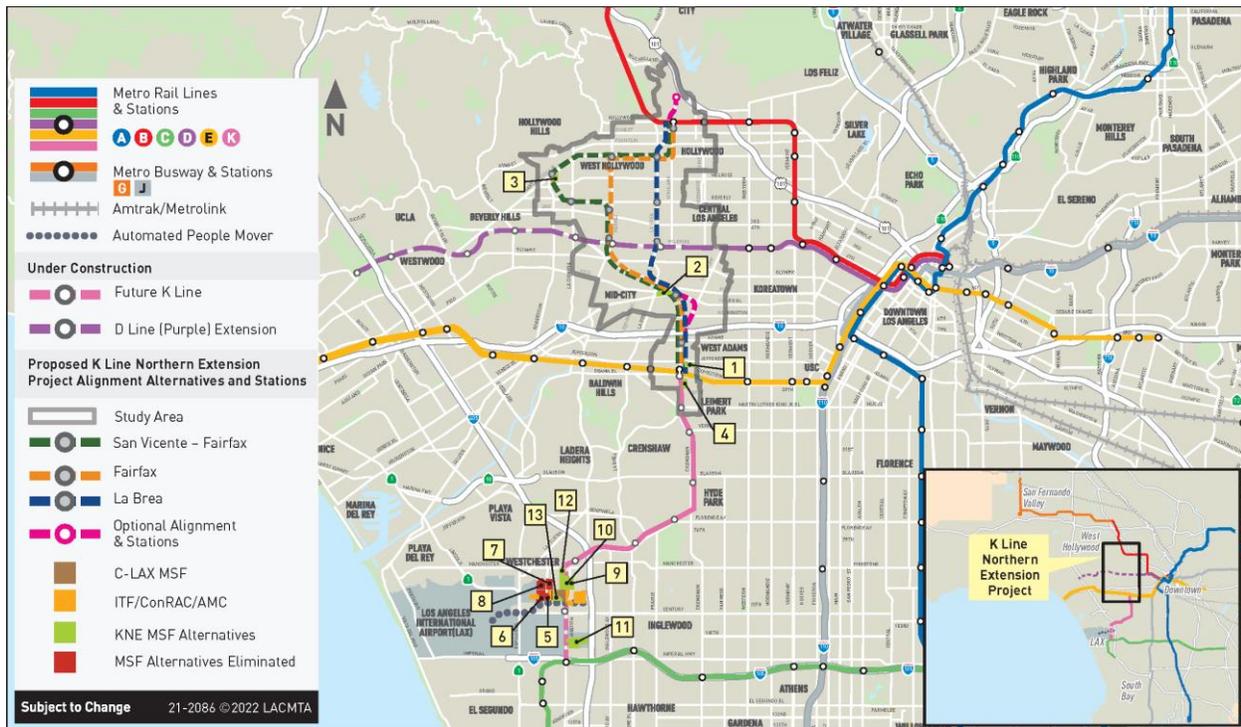


Source: Connect Los Angeles Partners 2022

SECTION 5: MAINTENANCE AND STORAGE FACILITY

An MSF is required to store and maintain the rail fleet operating on the project. The MSF for the existing Metro K Line, also known as the Division 16: Southwestern Yard Maintenance Facility (Division 16), does not have sufficient capacity to accommodate the additional vehicles required for the project, requiring the development of an additional MSF or an expansion of the existing Division 16 facilities. Due to the dense development and lack of industrial land immediately adjacent to the project (north of the E Line), options were explored along the existing K Line. Eleven MSF site options were evaluated during the Advanced AA Study, of which four were located adjacent to the project and seven were located near LAX. In the pre-scoping phase of environmental clearance, one additional option was added immediately north of Division 16 and one option was added as an expansion of the existing Division 16 for a total of 13 site options (Figure 5-1 and Table 5-1).

FIGURE 5-1. POTENTIAL MSF SITES CONSIDERED



Source: Connect Los Angeles Partners 2021

The MSF site options were evaluated to ensure the MSF site fulfilled the following criteria:

- Meets minimum size requirement, which is based on fleet size and alignment length. The longest alignment alternative evaluated during the Advanced AA stage required 13.3 acres.
- Compatible with adjacent land uses.
- Does not have a major existing or planned site conflict.
- Close to the K Line.

To screen out MSF options that would not meet the operational needs of the project, the initial 13 MSF options were first evaluated based on the minimum size requirement to house each alignment's fleet. The San Vicente–Fairfax Alignment, the longest alignment, would require 13.3 acres of space for its operating fleet size. Thus, a minimum size requirement of 13.3 acres was used to screen the 13 MSF options. As shown in Table 5-1, MSF Options 1, 3, and 4 were eliminated, as they were within proximity of the K Line tracks but did not meet the minimum size requirement.

Since activities at an MSF could produce noise that impacts residential communities, MSFs are typically located in industrial areas. Sites near an underground portion of the project would be difficult to access, making these locations unfeasible. Due to these constraints, MSF Option 2 (in addition to Options 1, 3, and 4) was eliminated, leaving only MSF options located in the vicinity of LAX. The area around LAX is generally zoned for light industrial, heavy commercial, mixed-use, and multifamily residential uses. Due to their adjacent proximities to residential land uses, MSF Options 7 and 8, located northeast and northwest of Airport Boulevard and Arbor Vitae Street, respectively, were eliminated from consideration. These considerations are shown in Table 5-1.

Additional existing and planned land uses in the vicinity of LAX, such as the construction of an Automated People Mover and Intermodal Transportation Facilities, led to the elimination of Options 5 and 6, as they would have interfered with full access to their yard spaces. The planned Inglewood Transit Connector also could have conflicted with the proposed MSF Options 9 and 10, depending on the alignment selected for construction. South of Arbor Vitae Street, a new MSF would conflict with land use due to the interlining of the C and K Lines and proximity to flight paths at LAX, which led to the elimination of Option 11. At this site, a new rail junction connected to the trenched mainline would have also needed to be constructed. Although Option 13 is also located south of Arbor Vitae Street, it would be an expansion of the existing Division 16 facility, rather than a new facility, and would use the same rail junction as Division 16. Therefore, Option 13 was not eliminated for this reason.

An additional consideration was the MSF's distance to the mainline tracks of the K Line, as the MSF would have ideally been located adjacent to the mainline to minimize the need for construction of additional trackwork to access the MSF. Options 5, 6, and 9 were located 1,500, 2,250, and 500 feet, respectively, from the mainline and were eliminated due to this long distance from the mainline.

Following Scoping, a more detailed analysis was conducted for the three most promising sites—Options 10, 12, and 13. Option 13 would expand the existing Division 16 yard to the west, resulting in operational efficiencies by allowing the expanded yard to integrate operations with the existing yard and reducing unnecessary duplication of facilities that would be necessary with a standalone facility. The operational

efficiencies would translate to both lower operations and maintenance costs as well as capital costs. Furthermore, MSF Alternative 13 could best accommodate future expansion to support future Metro projects. As a result, MSF Option 13, an expansion of the existing Metro Division 16, was recommended for inclusion in the Draft EIR (Figure 5-2). Table 5-1 presents a summary of the primary reasons for disqualification for each MSF option.

TABLE 5-1. MSF SCREENING RESULTS

OPTION	MSF OPTION LOCATION	JURISDICTION	PRIMARY REASON FOR DISQUALIFICATION
1	36 th St	Los Angeles	<ul style="list-style-type: none"> • Minimum size requirement • Adjacent land use compatibility
2	Midtown Crossing	Los Angeles	<ul style="list-style-type: none"> • Adjacent land use compatibility
3	San Vicente/Santa Monica	West Hollywood	<ul style="list-style-type: none"> • Minimum size requirement • Adjacent land use compatibility
4	Expo/Crenshaw	Los Angeles	<ul style="list-style-type: none"> • Minimum size requirement • Adjacent land use compatibility
5	SE Airport/Arbor Vitae	Los Angeles	<ul style="list-style-type: none"> • Major existing/planned site conflicts • Distance to the K Line
6	SW Airport/Arbor Vitae	Los Angeles	<ul style="list-style-type: none"> • Major existing/planned site conflicts • Distance to the K Line
7	NE Airport/Arbor Vitae	Los Angeles	<ul style="list-style-type: none"> • Major existing/planned site conflicts • Adjacent land use compatibility • Distance to the K Line
8	NW Airport/Arbor Vitae	Los Angeles	<ul style="list-style-type: none"> • Major existing/planned site conflicts • Adjacent land use compatibility • Distance to the K Line
9	NE Aviation/Arbor Vitae	Inglewood	<ul style="list-style-type: none"> • Distance to the K Line
10	NW Aviation/Arbor Vitae	Inglewood	<ul style="list-style-type: none"> • Adjacent land use compatibility • Operations and maintenance costs
11	111 th St	Los Angeles	<ul style="list-style-type: none"> • New facility and junction south of Arbor Vitae St
12	NW C-LAX/Arbor Vitae	Los Angeles	<ul style="list-style-type: none"> • Adjacent land use compatibility • Operations and maintenance costs
13 (selected as the proposed MSF)	West of C-LAX MSF	Los Angeles	<ul style="list-style-type: none"> • Advanced to Draft EIR

Source: Connect Los Angeles Partners 2024

EIR = environmental impact report; LAX = Los Angeles International Airport; MSF = maintenance and storage facility

FIGURE 5-2. RECOMMENDED MSF FOR THE DRAFT EIR



Source: Connect Los Angeles Partners 2024

SECTION 6: REFERENCES

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