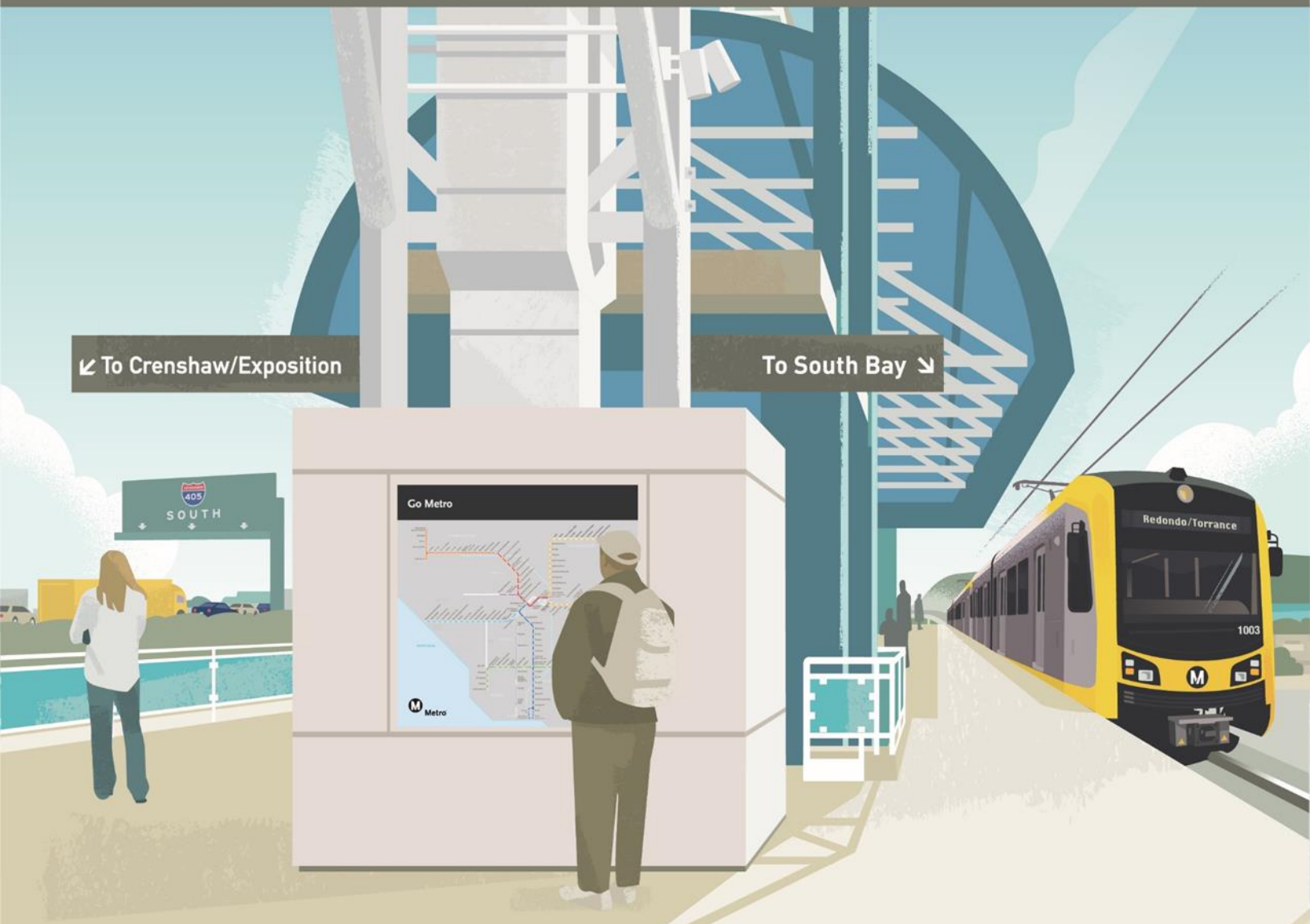
Los Angeles County
Metropolitan Transportation Authority

Alternatives Considered and Eliminated Report

C LINE (GREEN) EXTENSION TO TORRANCE



Metro

Alternatives Considered and Eliminated Report

January 2023

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Abbreviations/Acronyms

AA.....Alternatives Analysis

APM.....Automated People Mover

BRT .....Bus rapid transit

CEQA .....California Environmental Quality Act

CRT .....Commuter rail transit

DMU .....Diesel multiple unit

EIR .....Environmental Impact Report

EIS.....Environmental Impact Statement

EMU.....electric multiple unit

HFB .....High-Frequency Bus Alternative

LAWA.....Los Angeles World Airports

LAUS .....Los Angeles Union Station

LAX .....Los Angeles International Airport

LOSSAN.....Los Angeles to San Diego rail corridor

Metro .....Los Angeles County Metropolitan Transportation Authority

NOP .....Notice of Preparation

OCS.....Overhead catenary system

SAA .....Supplemental Alternatives Analysis

SCAG.....Southern California Association of Governments

SCE.....Southern California Edison

SPR .....Self-propelled railcar

ROW .....Right-of-Way

SAA .....Supplemental Alternatives Analysis

TC .....Transit Center

TSM .....Transportation System Management

VMT.....Vehicle Miles Traveled

1 INTRODUCTION

1.1 BACKGROUND

The Los Angeles County Metropolitan Transportation Authority (Metro) has initiated a Draft Environmental Impact Report (EIR) for the C Line (Green) Extension to Torrance Project (Project) pursuant to the California Environmental Quality Act (CEQA). Metro is the lead agency for the Project. The Project is a proposed light rail transit line that would extend approximately 4.5 miles from the end of the existing Metro C Line (Green) in Redondo Beach southeast to Torrance traveling along portions of the Metro-owned Harbor Subdivision freight railroad right-of-way (Metro ROW). The proposed light rail line would connect the Metro system further into the South Bay with connections to the Metro K (Crenshaw), J (Silver) and A (Blue) Lines. The Project Area is primarily urbanized, and includes portions of the Cities of Lawndale, Redondo Beach, and Torrance (Figure 1-1).

The Draft EIR evaluates three alignments, defined as:

- **Metro ROW Alignment (Elevated/Street-Level)**: Follows the existing Metro ROW for the length of the Project from the existing Redondo Beach (Marine) Station to the Torrance Transit Center (TC), with an elevated segment, followed by an at-grade segment. Two rail stations are proposed adjacent to the Redondo Beach Transit Center and Torrance Transit Center. This alignment is referred to as the Proposed Project in the Draft EIR as it is alignment that has been studied and advanced over the years.
- **Metro ROW Alignment (Trench/Below-Grade)**: Follows the existing Metro ROW for the length of the project, with a below-grade trench segment between Inglewood Avenue and 170th Street, followed by at-grade segments with a short trench to cross under 182nd Street. Includes the same station locations as the Metro ROW Alignment (Elevated/Street-Level). This alignment is referred to as the Trench Option in the Draft EIR.
- **Hawthorne Option (Elevated)**: Starts within the existing Metro ROW, then leaves Metro's ROW to run along Interstate 405 (I-405) and turns onto Hawthorne Boulevard near 162nd Street to travel in the center median of the street before rejoining the Metro ROW south of 190th Street. The entire alignment between the Redondo Beach (Marine Station) and 190th Street is elevated. A station would be located in the median of Hawthorne Boulevard, south of Artesia Boulevard, adjacent to the South Bay Galleria. This alignment is referred to as the Hawthorne Option in the Draft EIR.

As previously noted, the Metro ROW Alignment (Elevated/Street-Level) is referred to as the Proposed Project in the Draft EIR because it is the alignment that has been historically studied and advanced for the extension of the C Line (Green) to the South Bay region. This term does not, however, convey any preference or recommendation as to the alignment or options. Metro staff will prepare a recommendation on its preferred alignment in Spring 2023 based on findings from the Draft EIR, public comments made during the comment period, technical analysis, stakeholder input, and other factors such as cost, ridership, and project objectives.

Pursuant to CEQA, the Draft EIR also evaluates three Alternatives to the Proposed Project, to substantially reduce or eliminate significant impacts associated with project development. These are:

- **No Project Alternative**: Considers future conditions in the corridor without the light rail Project.
- **High-Frequency Bus (HFB) Alternative**: Would implement a rapid bus service alternative instead of a light rail extension.

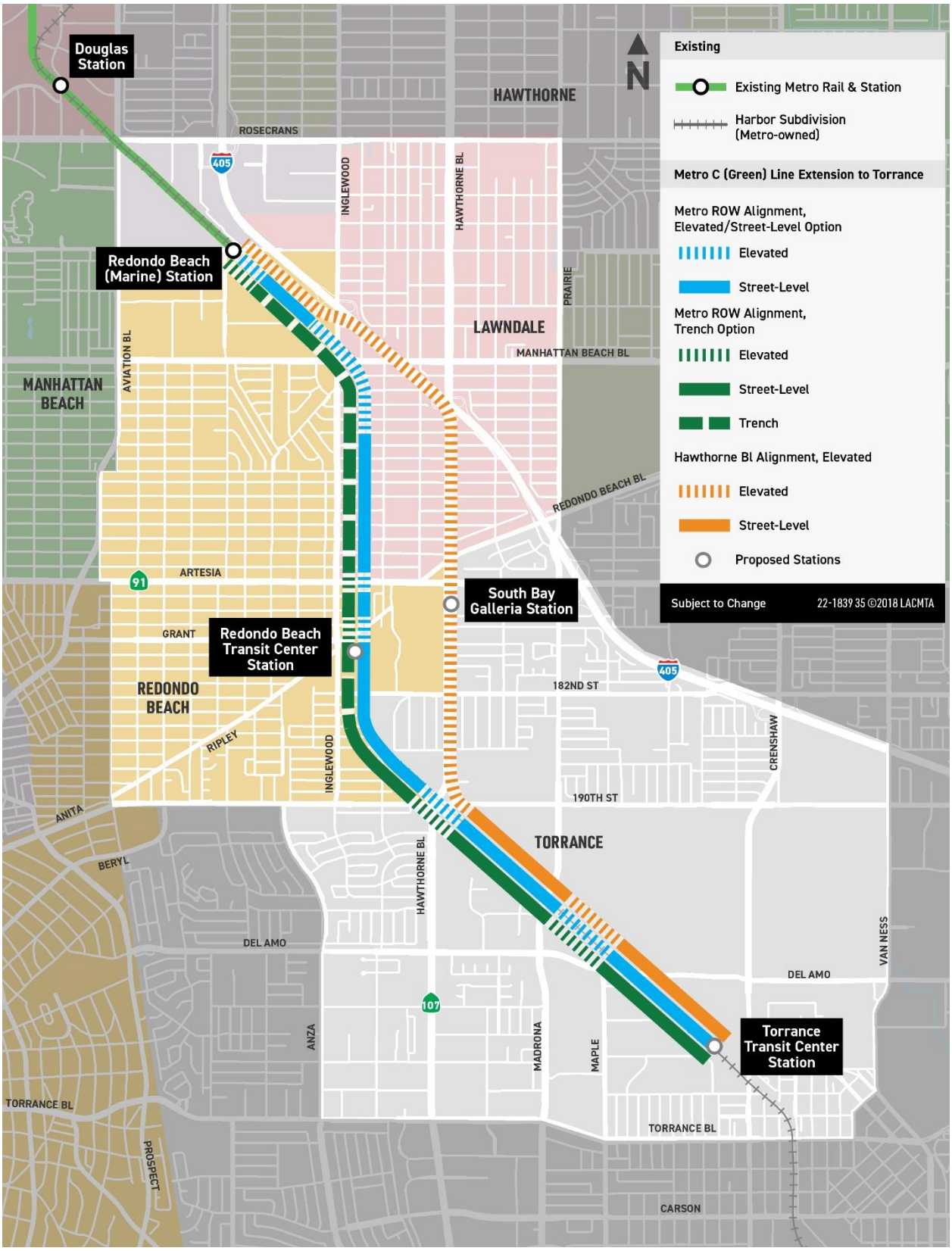
- **170th/182nd Grade-Separated Light Rail Transit Alternative:** Would be identical to the Metro ROW Alignment (Elevated/Street Level), except the light rail would be grade separated from the roadways at 170th Street and 182nd Street in a below-grade trench configuration.

Figure 1-1 shows the three alignments within the Project Area. The boundaries of the Project Area form roughly a one-mile buffer around the Metro ROW, with the borders generally following city limits and/or major roadways.

1.2 Report Overview

The Project has been evaluated in previous studies that have contributed to the current alignments being studied in the Draft EIR. This report summarizes the previous phases of the Project, the alignments that have been previously considered, and the reasons why they were eliminated from further study.

Figure 1-1. C Line (Green) Extension to Torrance – Project Overview



Source: STV, 2022

2 2009 HARBOR SUBDIVISION ALTERNATIVES ANALYSIS

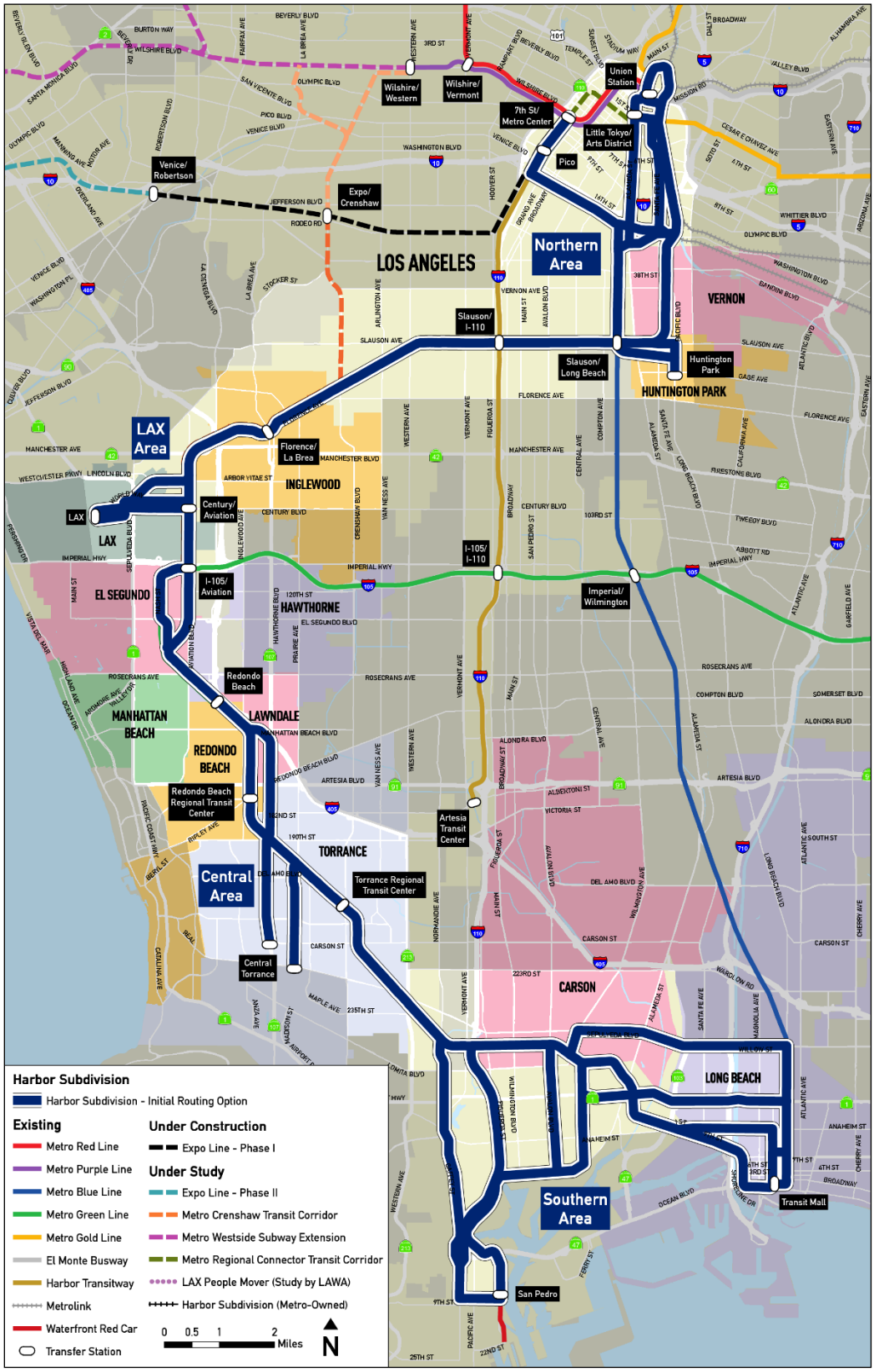
2.1 ALTERNATIVES ANALYSIS STUDY ACTIVITIES

Approved by Metro in 2009, the Harbor Subdivision Alternatives Analysis (AA) Study analyzed both existing and forecasted transportation conditions within the AA Study Area and detailed a range of project objectives designed to address specific mobility problems. A number of transit alternatives were identified to utilize the Metro ROW and connect to activity centers such as Los Angeles Union Station (LAUS), the downtown Los Angeles area, Los Angeles International Airport (LAX), central City of Torrance, the South Bay, and the harbor areas of San Pedro and the City of Long Beach.

The alternatives evaluation process for the AA Study was divided into two stages: a Stage I Initial Screening and a Stage II Comparative Evaluation. The Stage I Initial Screening process included the evaluation of 25 route and terminus options, six modes, and five potential travel markets. The six modal options investigated were: bus rapid transit (BRT), light rail transit, self-propelled railcar (SPR) including diesel multiple unit (DMU), electric multiple unit (EMU), and commuter rail transit (CRT). Many of the initial routing and terminus options, as shown in Figure 2-1, were eliminated during the initial Stage I analysis due to factors including: limited ridership potential, operational constraints, physical or ROW constraints, and/or potential community impacts. As an example, the BRT mode was eliminated after the Stage I analysis due to safety and operational issues associated with sharing the corridor with freight trains, grade crossing concerns, narrow ROW in some sections, and the lack of substantial travel time benefits over existing transit service.

Following the Stage I Initial Screening, four alternatives incorporating various routing and terminus options, transit technologies, and travel markets were advanced into a more detailed Stage II Comparative Evaluation. That evaluation applied a wide range of criteria to compare the performance of the four alternatives against each other, as well as against the No Build and lower-cost bus alternatives. The key criteria included transportation system performance, cost effectiveness, environmental benefits or impacts, and community acceptability.

Figure 2-1. 2009 Harbor Subdivision Stage I Initial Screening



Source: STV, AE LLC, 2009

The AA Study recommended four rail Build Alternatives, as well as a bus alternative called the Transportation System Management (TSM) Baseline Alternative, which are, described below:

- **TSM Baseline** – The TSM Alternative was examined as a baseline used for comparison to the four AA rail Build Alternatives with higher capital investment requirements. Unlike the No Build Alternative, the TSM baseline consisted of low-cost operational improvements to current bus transit facilities and services that extracted the greatest benefits from existing infrastructure. These included options such as Metro Rapid, Metro Rapid Express, and Los Angeles World Airports (LAWA) FlyAway Bus that followed on-street routes and included bus stops at similar intervals to rail service in the other AA Build Alternatives.
- **Local North Alternative** – The Local North Alternative proposed rail service between LAX and downtown Los Angeles using light rail or freight compatible DMU modes. Its alignment remained within the existing Metro ROW from the existing Aviation/LAX Station, on the Metro C Line (Green), to the existing Slauson Station on the Metro A Line (Blue). From there, the alignment departed the Metro ROW and traveled north on Long Beach Avenue on new light rail tracks parallel to the Metro A Line (Blue), before shifting to Alameda Street just south of East 24th Street. The alignment continued north along Alameda Street, joining with existing light rail tracks on the Metro L Line (Gold), and terminated underground beneath the Little Tokyo/Arts District Station on the Metro L Line (Gold). This alternative provided local service with stations spaced approximately every mile.
- **Local South Alternative** – The Local South Alternative proposed phased light rail service between the LAX area and the southern end of the Metro ROW corridor, with eventual terminus options in San Pedro, Wilmington, and the City of Long Beach. The northern terminus was the existing Redondo Beach (Marine) Station. This alternative was anticipated to facilitate single seat rides (i.e. no transfers required) between the South Bay and points north of LAX via the Crenshaw/LAX Transit Corridor, depending on operation plans. The alignment of the Local South Alternative was to remain within the Metro ROW, traveling adjacent to existing freight tracks. At approximately the intersection of the Metro ROW and Normandie Avenue in the unincorporated community of West Carson, the proposed alignment split into multiple terminus options, each of which eventually departed the Metro ROW corridor and traveled along public roadways. These segments of the proposed alignments required extensive elevated structures and on-street operation due to constrained ROW and busy intersections. In all terminus options of the Local South Alternative, stations were to be spaced approximately every mile.
- **Regional Alternative** – The Regional Alternative was proposed to travel the entire length of the Metro ROW from LAUS to the San Pedro Cruise Terminal. This alternative was designed to serve commuters over a longer distance, travel at higher speeds, and stop to serve stations less frequently. Both light rail and freight-compatible modes were examined. Freight-compatible mode trains traveled south along the existing Los Angeles to San Diego (LOSSAN) rail corridor which runs through Los Angeles County, connecting to the Metro ROW at Redondo Beach via a new elevated structure. With light rail-compatible modes, new separate tracks were required in the LOSSAN corridor segment of the alternative. The alignment traveled west and south toward LAX, then south and east toward San Pedro, at-grade within the Metro ROW. Where the Metro ROW intersects Interstate 110 (I-110), the alignment turned south to travel along the freeway for the remainder of the route, terminating near the San Pedro Cruise Terminal, as mentioned above. Stations in this alternative were located approximately every four miles.
- **Express Alternative** – The Express Alternative proposed non-stop light rail-compatible or freight-compatible trains between LAUS and LAX. The alignment and track configurations were the same as the Regional Alternative between those two points. However, the Express Alternative terminated in

the central terminal area of LAX. The Express Alternative focused on service to and from LAX, and required long sections of trench and/or elevated structures through South Los Angeles and the City of Inglewood to allow for high-speed operations. New structures to grade separate the train from traffic were required along Century Boulevard between the Metro ROW and the LAX central terminal area for direct access to the airport. This alternative was contingent upon the completion of the LAX Specific Plan Amendment Study, which in 2009 was in the process of assessing LAX Master Plan projects that would have impacted the Express Alternative terminus at LAX. Stations were only to be located at LAUS and LAX.

2.2 RESULTS OF THE AA

The AA's final recommendation recognized that a program of alternatives would best address the needs of the AA Study Area, and therefore identified a phased implementation strategy that would allow for specific projects (and minimum operable segments) to be implemented over time. Each of the four AA Build Alternatives described above and their segments were assigned implementation timeframes based on the scores assigned to them as part of the Stage II Comparative Evaluation. Overall, the Local South Alternative had the highest scores, with the C Line (Green) to Redondo Beach TC and Redondo Beach TC to Torrance TC segments performing the best out of all the segments. Therefore, the Local South Alternative from the C Line (Green) to the Torrance TC was assigned the highest priority for implementation.

As a result, the Metro Board selected the Priority I Local South Alternative (Metro C Line (Green) to Torrance TC) as the Locally Preferred Alternative and advanced it for further environmental review, as well as the Priority II Regional Alternative (between the LAX area and the Torrance TC), in November 2009. None of the alternatives from the Priority III list was selected for further review. The phased implementation strategy identified by the AA is below.

2.3 PHASED IMPLEMENTATION STRATEGY

Based on the results of the Stage II Comparative Evaluation, alternatives and segments were prioritized into the phased implementation strategy listed below and shown in Figure 2-2.

Priority I:

- **Local South Alternative**: Metro C Line (Green) to Torrance TC

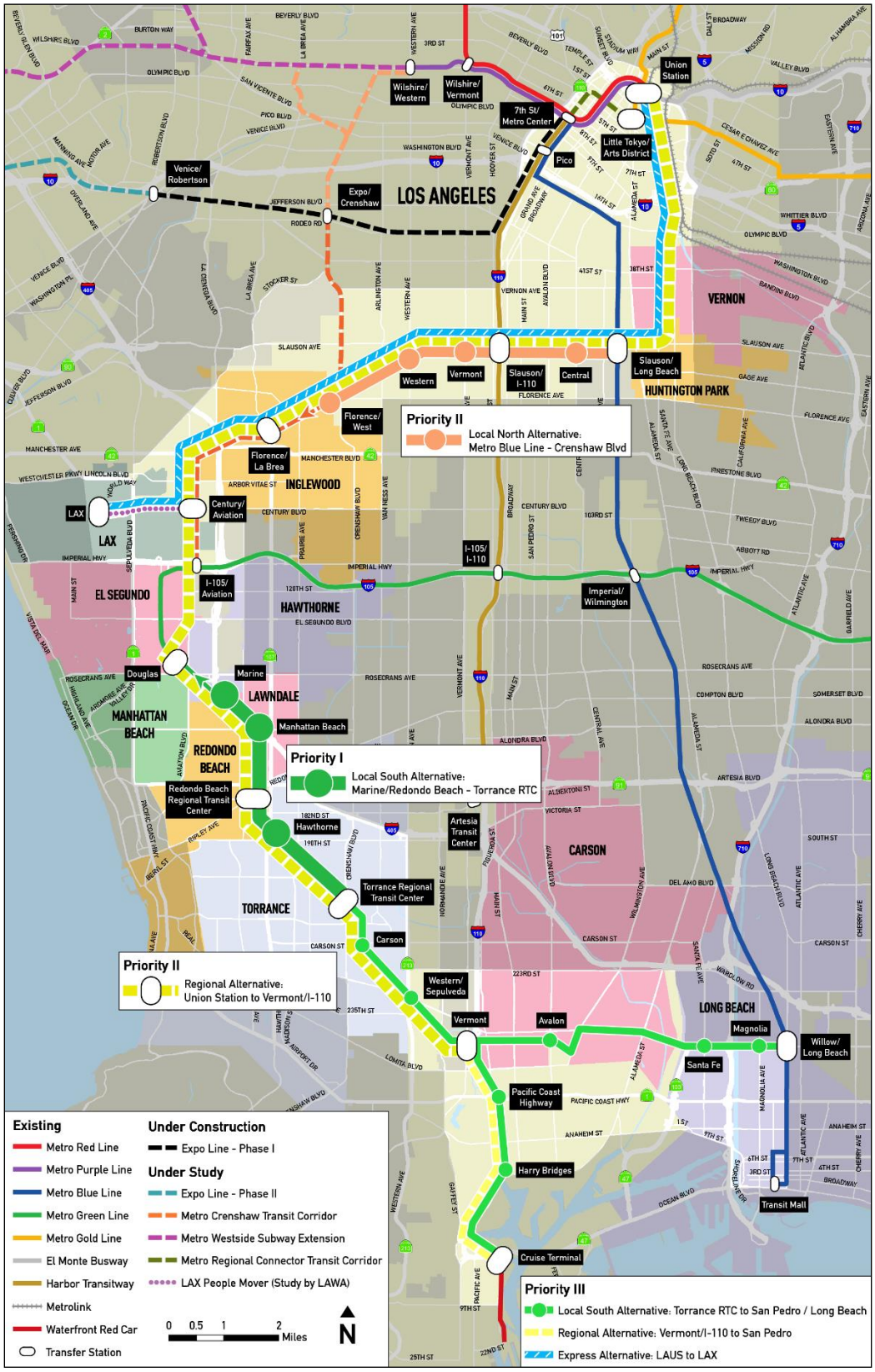
Priority II (in no order of preference):

- **Regional Alternative**: LAUS to Vermont/I-110
- **Local North Alternative**: Metro A Line (Blue) to Crenshaw Boulevard

Priority III (in no order of preference):

- **Local South Alternative**: Torrance TC to San Pedro via I-110
- **Local South Alternative**: Torrance TC to City of Long Beach via Sepulveda/Willow
- **Regional Alternative**: Vermont/I-110 to San Pedro
- **Express Alternative**: LAUS to LA

Figure 2-2. 2009 Metro Harbor Subdivision Transit Corridor – Phased Implementation Strategy



Source: STV, AE LLC, 2009

3 2010 SCOPING TO PREPARE DRAFT EIS/EIR

In 2010, Metro initiated scoping with a Notice of Intent and Notice of Preparation (NOP) for an environmental impact statement (EIS)/EIR to move forward to the next stages of project development. The analysis included the Priority I Local South Alternative and Priority II Regional Alternative identified in the AA Phased Implementation Strategy. For the purposes of the EIS/EIR, the Local South Alternative was renamed the Light Rail Alternative, and the Regional Alternative was renamed the Freight Track Alternative. The EIS/EIR also evaluated a TSM Alternative (enhanced bus service) as a basis of comparison in addition to a No Build Alternative.

Several alternatives and alignment options were considered during this time period, but were rejected from further study for a number of reasons.

The viability of alternatives considered in the environmental analysis was determined using:

- State guidelines (CEQA Guidelines)
- Federal guidelines (Section 4(f)[1], Federal Transit Administration New Starts programs)
- Local guidelines and input (Metro Grade Crossing Policy for Light Rail Transit, community acceptability, etc.)
- Draft EIS/EIR alternatives evaluation criteria, which included:
    - Failure to meet most of the basic project objectives
    - Infeasibility (physically constrained or constrained by regulation)
    - Inability to avoid significant environmental impacts
    - Inability to avoid Section 4(f) impacts (impacts to publicly owned park and recreation areas that are open to the general public, publicly owned wildlife and waterfowl refuges, and public or privately-owned historic sites)
    - Cost effectiveness concerns
    - Safety issues per Metro Grade Crossing Policy
    - Lack of public support

Based on these factors, the alternatives and options rejected from further study included the Freight Track Alternative (previously referred to as the Regional Alternative in the AA), several Light Rail Alternative alignment options, and several maintenance facility options. The reasons for their elimination are described in the following sections by comparing them to the Light Rail Alternative (previously referred to as the Local South Alternative in the AA), which is referred to as the Baseline

[1] Department of Transportation Act "Section 4(f)" (now codified at 49 U.S.C. § 303(c)) applies to U.S. Department of Transportation actions involving the "use" of a publicly-owned park, recreation area, wildlife or waterfowl refuge, or land from a public or private historic site. It requires federal transportation agencies to avoid such uses where there are feasible and prudent alternatives to the use, and to use all possible planning to minimize harm to such resources.

Light Rail Alternative throughout the rest of this report to distinguish it from the other potential Light Rail Alternative options.

3.1 FREIGHT TRACK ALTERNATIVE

The Freight Track Alternative was one of the alternatives advanced from the AA for further consideration. The Freight Track Alternative would have provided new transit service along the existing Metro ROW, with track upgrades to the existing freight rail, and new stations and sidings to allow for passenger train operations. Key features of the Freight Track Alternative are described in the following sections, with an overview of the alternative shown in Figure 3-1.

Vehicles

The Freight Track Alternative would have operated SPR or CRT rail vehicles. SPR and CRT vehicles are powered by fuel sources such as diesel, natural gas, fuel cells, hybrid technology or other non-electric sources. SPR vehicles are approximately 85 feet in length, and one powered vehicle would be coupled with two unpowered trailers to form a three-car train. Both types of vehicles can operate at speeds of up to 79 miles per hour, depending on distances between stations and the presence of constraints such as grade crossings, and could accommodate between to 425 and 675 passengers per train depending on the type of vehicle selected.

SPR or CRT vehicles could not have used existing or planned light rail infrastructure (such as maintenance facilities) in the 2010 Draft EIS/EIR Project Area. Passengers of the Freight Track Alternative would have had to transfer to connect to the Metro C Line (Green) or K Line (Crenshaw) at an existing or planned station to proceed north to destinations beyond the 2010 Draft EIS/EIR Project Area.

Alignment

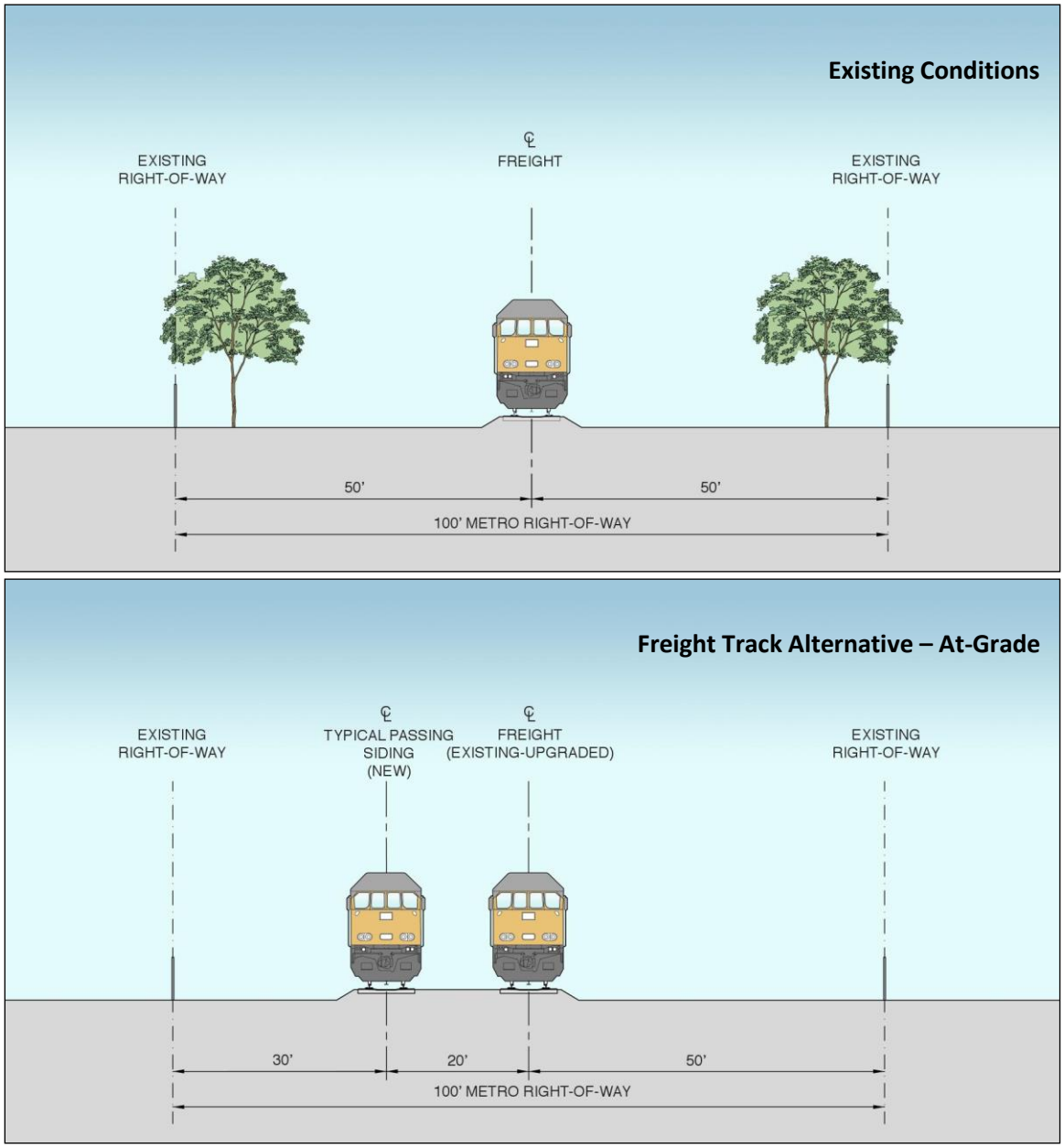
The Freight Track Alternative would have traveled mostly at-grade for 8.7 miles along the rebuilt and upgraded freight tracks of the Metro ROW from the LAX area to the Torrance TC. The existing freight tracks would have been rebuilt and upgraded to allow for passenger rail operations, and new equipment would have been added along the length of the alignment. A typical cross-section for this alternative is shown in Figure 3-2. New equipment would have included a wayside signal system, communications infrastructure, upgraded grade crossings, and stations.

In addition, passing sidings would have been added along several stretches of the alignment to allow for two-way operations. A new elevated structure would have been needed for passenger trains to cross over Inglewood Avenue and Manhattan Beach Boulevard, and would have been located adjacent to the existing freight track, which would have remained at-grade through the crossings.

Figure 3-1. 2010 Freight Track Alternative – Overview

Source: STV, AE LLC, 2011

Figure 3-2. 2010 Freight Track Alternative – Typical Cross-Section



Source: Cityworks Design, 2011

Stations

Up to four stations were proposed for the Freight Track Alternative: at the intersection of Aviation Boulevard and Century Boulevard, adjacent to the existing Redondo Beach (Marine) Station, at the Redondo Beach TC, and at the Torrance TC.

Supporting Facilities

Unlike the Baseline Light Rail Alternative, the Freight Track Alternative did not require an overhead catenary system (OCS) or traction power substations because the rail vehicles would not have been electrically powered. However, the Freight Track Alternative would have required communications and signaling buildings to house related equipment, as well as a vehicle maintenance facility.

The vehicle maintenance facility proposed for the Freight Track Alternative was proposed to be located on a parcel just north of the Torrance TC, and would have supported SPR or CRT vehicles instead of light rail vehicles, which have different size requirements from light rail.

Justification for Eliminating Freight Track Alternative

The Freight Track Alternative was intended to make the best use of existing infrastructure to result in cost and operational benefits. However, during the 2010 Scoping process, preliminary environmental and conceptual engineering results indicated that the Freight Track Alternative would not perform as well as the light rail and TSM alternatives in meeting the primary project objectives as stated in the 2010 Draft EIS/EIR Purpose and Need. The following sections summarize the reasons for eliminating the Freight Track Alternative based on the preliminary findings and performance for each of the five objectives of the Purpose and Need statement.

Objective 1 – Improve public transit service and mobility in southwestern Los Angeles County by providing reliable, high-frequency transit service.

The existing width and configuration of the freight track within the Metro ROW upon which the Freight Track Alternative would have operated could not be configured to allow for rail service frequencies of less than 15 minutes in the corridor without a significant capital investment. The cost to reconfigure the Harbor Subdivision railroad infrastructure would likely have been greater than the cost of the Baseline Light Rail Alternative. Such frequencies would not have provided the level of service of the existing Metro C Line (Green) (every 7.5 minutes during the peak) and would have resulted in lower ridership and less time saved by riders than the Baseline Light Rail Alternative.

The Baseline Light Rail and TSM Alternatives were estimated to provide better service frequencies than the Freight Track Alternative. Both the Baseline Light Rail and TSM Alternatives were estimated to carry more daily riders and save riders more time per day than the Freight Track Alternative at a much lower estimated capital cost.

Objective 2 – Enhance the regional transit network by providing more direct connections to regional destinations.

The Freight Track Alternative would have served fewer destinations and required more transfers, resulting in an inability to effectively serve as many trips between LAX and the City of Torrance as the Baseline Light Rail Alternative. It would have had only four stations between LAX and the City of Torrance versus nine for the Baseline Light Rail Alternative. Based on initial operations and ridership analyses, the proposed Freight Track Alternative would generate fewer transit trips within the South Bay than the Baseline Light Rail and TSM Alternatives. Additionally, the Freight Track Alternative would have less daily ridership than the Baseline Light Rail and TSM Alternatives because it would require riders to transfer to other lines to reach destinations outside the 2010 Draft EIS/EIR Project Area.

In addition, the vehicles required for the Freight Track Alternative were not compatible with other Metro bus or rail vehicles and would have required the purchase of a new type of vehicle and the construction of a new facility to maintain the vehicles. Both the TSM and Baseline Light Rail Alternative would have directly served destinations outside the 2010 Draft EIS/EIR Project Area due to their compatibility with the rest of the Metro system. The Freight Track Alternative would have introduced an additional vehicle type which, while adding new connections to the regional transit network, would not have provided convenience for trips to many destinations. Therefore, the Freight Track Alternative was not estimated to be effective as a standalone project within the 2010 Draft EIS/EIR Project Area.

Objective 3 – Provide an alternative mode of transportation for commuters who currently use the congested 2010 Draft EIS/EIR Project Area arterials and I-405 Corridor.

Due to the relatively infrequent service and fewer stations, the Freight Track Alternative would not have attracted as many new riders as the TSM or Baseline Light Rail Alternatives. Public comments received during the 2010 Draft EIS/EIR scoping period and at community meetings suggested that the Freight Track Alternative was less able to serve the type of trips desired by travelers in the corridor. Only a small number of public comments received during project scoping expressed support for the Freight Track Alternative. Furthermore, no comments were received in support of the Freight Track Alternative in response to requests for input regarding elimination during the 2010 Draft EIS/EIR community update meetings.

Concerns expressed in the public comments about the Freight Track Alternative included: lack of service to destinations in the El Segundo area without a transfer, potential impacts to the existing BNSF freight service to the El Segundo Chevron refinery, traffic/access impacts to businesses on Aviation Boulevard such as Northrop Grumman and air freight facilities, and impacts on air quality, noise, and vibration. Additional concerns were raised about increased operations costs due to adding a new vehicle type to the Metro system.

Objective 4 – Improve transit accessibility for residents of communities along the corridor.

Areas with large populations of low-income and/or transit-dependent riders, such as the City of Lawndale, would not have been directly served by the Freight Track Alternative. Intermediate stations at Manhattan Beach Boulevard/Inglewood Avenue in the City of Lawndale and Hawthorne Boulevard/190th Street in the City of Torrance were not included as part of this alternative due to the inability of the SPR and CRT vehicles to accelerate rapidly to running speed and then stop within the short distance between these stations.

The shortest distance between stations for the Baseline Light Rail Alternative was 0.7 miles, with an average distance of approximately one mile. It would have been possible to add these intermediate stations to the Freight Track Alternative, however the operating speed would have been decreased and, therefore, would not have adequately satisfied the objective of reducing transit travel time. The Freight Track Alternative would have required additional transfers by residents of transit-dependent communities in the corridor to access the system. The long distance between stations was more suitable for longer trip distances, such as for routes that are part of the existing Metrolink system, and would not have met local riders' needs for trips within the South Bay.

Objective 5 – Encourage a mode shift to transit, reducing air pollution and greenhouse gas emissions.

The Freight Track Alternative was not as effective at attracting new riders as the TSM and Baseline Light Rail Alternatives. In addition, its vehicles would likely have been clean diesel-powered compared to natural gas-powered buses and electrically-powered light rail vehicles for the TSM and Baseline Light Rail Alternatives, respectively. The Freight Track Alternative would have introduced noise and air pollutant emissions at higher levels compared to the other alternatives.

Other Elimination Justifications

Other considerations justified the elimination of the Freight Track Alternative after the 2010 Scoping period, including:

- **Inability to avoid Section 4(f) impacts** – if the Federal Transit Administration were to identify any impacts to publicly owned park and recreation areas that are open to the general public, publicly owned wildlife and waterfowl refuges, and public or privately-owned historic sites (i.e., Section 4(f)

resources) from the light rail or TSM Alternatives, the Freight Track Alternative would not have provided a feasible and prudent avoidance alternative to the light rail or TSM Alternatives.

- **Greater environmental impacts** - The Freight Track Alternative would have introduced noise and air pollutant emissions at higher levels compared to the other alternatives.
- **Use of existing infrastructure** – The Freight Track Alternative was assumed to operate at-grade its entire distance, therefore taking advantage of existing track infrastructure and resulting in implementation and cost efficiency benefits. However, preliminary engineering results determined grade separations would be required for at least one mile, raising the cost of the alternative significantly and reducing its competitiveness with other alternatives.
- **Lack of community support** – The Freight Track Alternative did not receive strong support during the 2010 Scoping public outreach process.

Summary

Detailed analysis indicated that the Freight Track Alternative would not yield the quick-to-implement cost effective performance originally anticipated in the 2009 AA Stage II Comparative Evaluation process that elevated the Freight Track Alternative for further review. It did not meet the project objectives as well as the TSM and Baseline Light Rail Alternatives, had poor cost effectiveness (high costs and low ridership), and was not well supported by the community. After initial analysis, Metro and the FTA concluded that further study of the Freight Track Alternative was not warranted. The Metro Board approved removing this alternative from further analysis in January 2011.

3.2 Light Rail Alternative – Other Alignment Options Considered and Eliminated

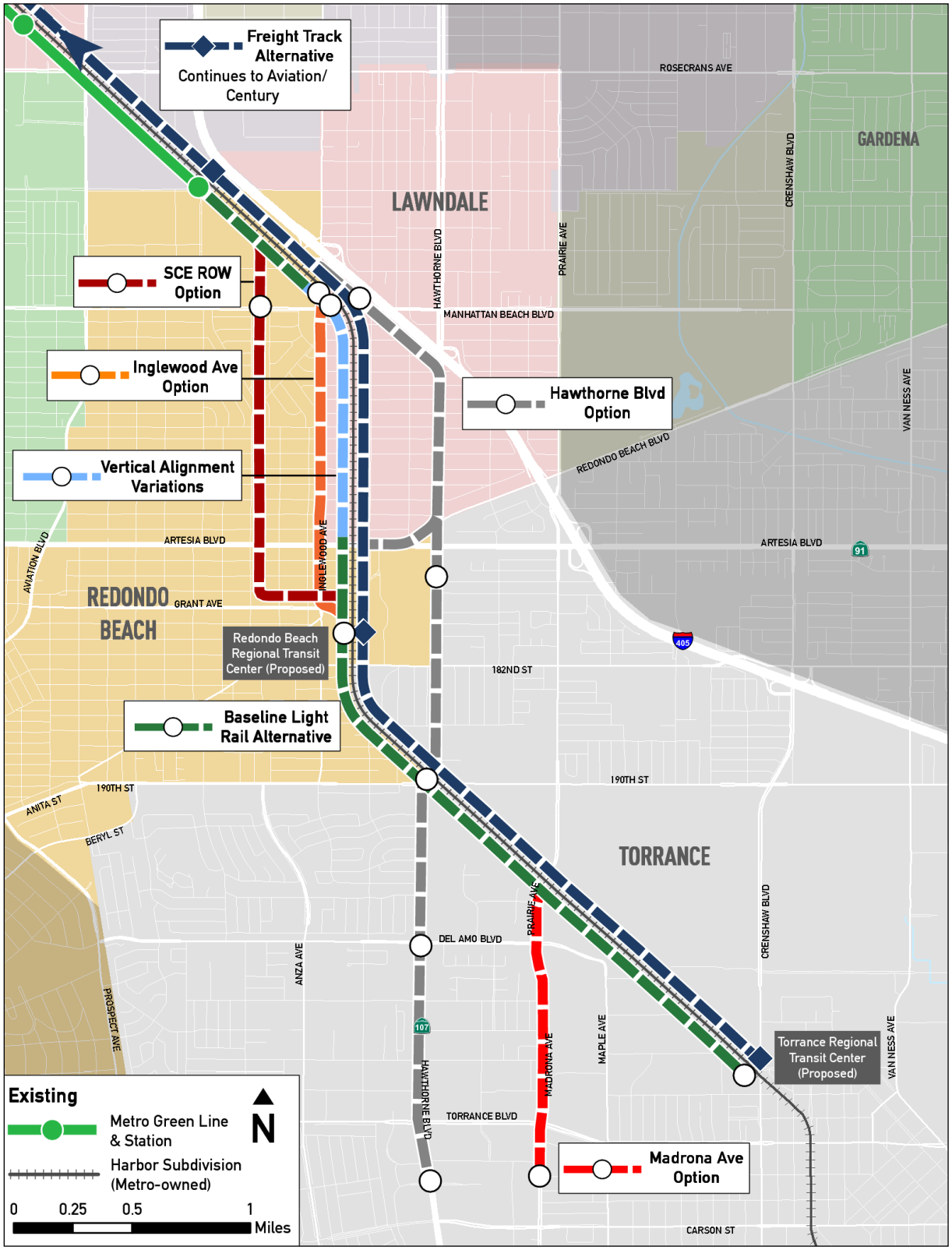
A number of alignment options for the Light Rail Alternative were proposed by the public during the 2010 Scoping period, but were eliminated from further review. These other Light Rail Alternative alignment options are listed below, along with a summary of the reasons they were removed from additional consideration. Figure 3-3 displays the location of these alignment options.

- **Hawthorne Boulevard**: Options utilizing the Hawthorne Boulevard alignment, which spanned from Manhattan Beach Boulevard to just south of Torrance Boulevard, were proposed during the 2010 Scoping period, and were estimated to result in environmental impacts greater than the Baseline Light Rail Alternative in areas including traffic, property acquisitions, aesthetics, economic and fiscal issues, and construction. The option considered an elevated structure for the light rail tracks, which would cost substantially more to implement than the Baseline Light Rail Alternative, generated similar or lesser ridership, and would not have connected to the two transit centers being planned or constructed by the Cities of Redondo Beach and Torrance. The Hawthorne Boulevard alignment option was supported by residents living near the Metro ROW, but opposed by businesses along Hawthorne Boulevard who expected construction and long term economic and fiscal impacts from its implementation. As a result, the Hawthorne Boulevard alignment option spanning from Manhattan Beach Boulevard to just south of Torrance Boulevard, was eliminated from further consideration in 2011. However, in 2016-2017, the scoping process of the Supplemental Alternatives Analysis (SAA) (discussed in Section 4, below) revealed renewed interest from stakeholders and the public in alignment options utilizing Hawthorne Boulevard. The SAA evaluated alignments that utilized Hawthorne Boulevard for shorter lengths than the alignment considered in the 2010 Draft EIS/EIR. The SAA alternatives also connected to one or both of the planned transit centers in the study area, whereas the alignments considered in the Draft EIS/EIS did not. See Section 4 for a description of the SAA alignments.

- **Inglewood Avenue**: The Inglewood Avenue option was proposed during the 2010 Scoping period, and estimated to result in environmental impacts greater than the Baseline Light Rail Alternative in areas including traffic, acquisitions, removal of parking, visual character, utilities, safety, and construction. The option would have cost substantially more to implement than the Baseline Light Rail Alternative, but generate similar or lesser ridership. It did not receive strong support from the community. For these reasons, the Inglewood Avenue option was eliminated from further consideration in 2011.
- **Madrona Avenue**: The Madrona Avenue option was proposed during the 2010 Scoping period, and estimated to result in environmental impacts greater than the Baseline Light Rail Alternative in areas including traffic, acquisitions, communities and neighborhoods, visual character, safety, and construction. The at-grade crossings of this option would have introduced traffic and safety concerns for commingling of transit, vehicles, pedestrians at intersections and likely required an elevated structure. The option could also have impacted Delthorne Park, a Section 4(f) resource, that the Baseline Light Rail Alternative would not have impacted. The Madrona Avenue option would have cost substantially more to implement than the Baseline Light Rail Alternative, but not generated an appreciable increase in ridership. The option would also not have connected to the transit center currently under construction by the City of Torrance, and did not receive strong support from the public. For these reasons, the Madrona Avenue option was eliminated from further consideration in 2011.
- **Southern California Edison (SCE) ROW:** The SCE ROW option was proposed during the 2010 Scoping period, and estimated to require numerous property acquisitions, and the light rail tracks and OCS system would have interfered with the SCE electrical infrastructure. SCE does not generally allow construction on its ROW, and the environmental impacts along this alignment would have been greater than the Baseline Light Rail Alternative in areas including traffic, property acquisitions, community impacts, noise and vibration, utilities, and safety. The SCE ROW option would have required property acquisition from Dale Page Park and the North Redondo Beach Bikeway, Section 4(f) resources that the Baseline Light Rail Alternative would not have impacted. This option would have cost substantially more to implement than the Baseline Light Rail Alternative, but would not have generated additional ridership. This option did not receive significant support from the community. For these reasons, the SCE ROW option was eliminated from further consideration in 2011.
- **Vertical alignment variations:** Comments received during the 2010 Scoping period suggested that an alternate vertical configuration, such as a below-ground or elevated structure, be examined for the Light Rail Alternative between Manhattan Beach Boulevard and Artesia Boulevard in the City of Lawndale. The decision to construct the Project above or below-grade was based on the results of an analysis which considered the Metro Grade Crossing Policy for Light Rail Transit, environmental impacts, physical constraints, and factors such as existing infrastructure or regulatory requirements. All sections of the Light Rail Alternative were evaluated using this analysis framework. At two locations (where the Light Rail Alternative crosses Inglewood Avenue and crosses Manhattan Beach Boulevard), one or more of the factors described above led to the determination that grade separation was needed, and an elevated structure was incorporated into the project design at those locations. In the remaining at-grade sections of the alignment, including the segment south of Manhattan Beach Boulevard to Artesia Boulevard, the analysis confirmed that the criteria for grade separation were not met and that there were no significant physical constraints or environmental conditions (displacements, historic structures, etc.) that could not be adequately mitigated. For these reasons, vertical alignment options in the City of Lawndale (below-grade or elevated) south of Manhattan Beach Blvd were eliminated from further consideration in 2011. However, in 2016-2017,

the scoping process of the SAA revealed renewed interest from stakeholders and the public in different vertical alignment options in this area. See Section 4 for a description of the SAA alignments.

Figure 3-3. Alternatives and Options Considered and Eliminated from Further Review after 2010 Scoping to Prepare Draft EIS/EIR



Source: STV, AE LLC, 2011

3.3 OTHER ALTERNATIVES AND OPTIONS

Several other alternatives and options were suggested by stakeholders during the 2010 Scoping period, and at subsequent community meetings. Each of these alternatives and reasons for not considering them further are discussed below:

- **City of Redondo Beach Maintenance Facility Options** – Several maintenance facility options in the City of Redondo Beach were initially evaluated but were eliminated from further consideration. One site was located south of the existing Redondo Beach (Marine) Station between the Metro ROW and I-405. A second option consisted of the site set aside for the Redondo Beach TC, in addition to another parcel located immediately to the south. Both sites were eliminated from consideration due to limited size and access, development, and expansion constraints.
- **Use Light Rail Technology for the Freight Track Alternative** – Light rail already exists between Aviation/LAX and the Redondo Beach (Marine) Stations on the Metro C Line (Green), and north of Aviation/LAX as part of the Metro K Line (Crenshaw). Providing light rail along the Metro ROW north of the Redondo Beach (Marine) Station would have duplicated existing and planned light rail service and would not meet federal railroad safety regulations. As a result, this option was eliminated.
- **Provide Direct Connection to LAX** – LAWA is currently constructing an Automated People Mover (APM) to connect the central terminal area to other airport facilities and the transit system. The APM will connect to the Metro network at an additional station planned for the Metro K Line (Crenshaw). The additional station, known as the LAX/Metro Transit Center Station will be located at Aviation Boulevard and 96th Street. Riders will be able to connect to the APM at this station via the K Line (Crenshaw) or Metro C Line (Green) service, depending on operational configurations. The connection to LAX will be resolved by the K Line and APM, not the Project.
- **Provide a Transit Connection to Westchester/Playa Vista** – Connections to Westchester and Playa Vista were not within the scope of the 2010 analysis. A separate transit investment was explored as part of the Los Angeles Department of Transportation's Westside Mobility Plan study.
- **Provide a Transit Connection to the City of Long Beach** – The AA recommended future transit service to the City of Long Beach and San Pedro. These alternatives and segments were considered as Priority III projects. The implementation of these projects is largely dependent upon the availability of funding and the prior or potential implementation of other transportation-related investments.
- **Extend to San Fernando Valley** – The San Fernando Valley is far from the Project Area and is served by several existing fixed-guideway transit services, including the Metro B Line (Red) and G Line (Orange), and the Metrolink Antelope Valley and Ventura County Lines.
- **Use Alameda Corridor** – The Alameda Corridor is a grade-separated, consolidated freight rail corridor paralleling Alameda Street from downtown Los Angeles to the Ports of Los Angeles and Long Beach. This corridor is outside the Project Area, and does not serve the South Bay. In addition, the dedicated-freight nature of the corridor precludes the addition of any passenger service.
- **Eliminate Hawthorne/190th Station** – One of the Baseline Light Rail Alternative options included elimination of a proposed station at Hawthorne/190th. Prior to the pause of the Project in 2012, outreach to corridor cities established a preference for this option due to land constraints, poor access, and lack of utility and operating efficiency due to the station's proximity to the planned Redondo Beach TC. As a result, SAA alternatives in the Metro ROW that were considered after the pause of the Project do not include a station at this location.

4 2018 SUPPLEMENTAL ALTERNATIVES ANALYSIS

Following the passing of Measure M in 2016, Metro initiated a SAA for the Project in 2017 to build upon the previous 2009 AA and 2010 Scoping process. The SAA focused on soliciting feedback from corridor cities and stakeholders to refine and update the alternatives analyzed in the previous studies. This resulted in Metro expanding the range of alternatives from the single Baseline Light Rail Alternative from the previous studies to four Build Alternatives (SAA Build Alternatives). Each alternative would begin at the current terminus of the Metro C Line (Green) at the existing Redondo Beach (Marine) Station and connect to the Torrance TC. Between 2016 and 2017, the initial outreach process of the SAA revealed renewed interest from stakeholders and the public in alignment options utilizing Hawthorne Boulevard, but for a shorter length than the alternative eliminated from further review in 2010. This resulted in the consideration of two alternatives along Hawthorne Boulevard that also connected to the city transit centers in the project area.

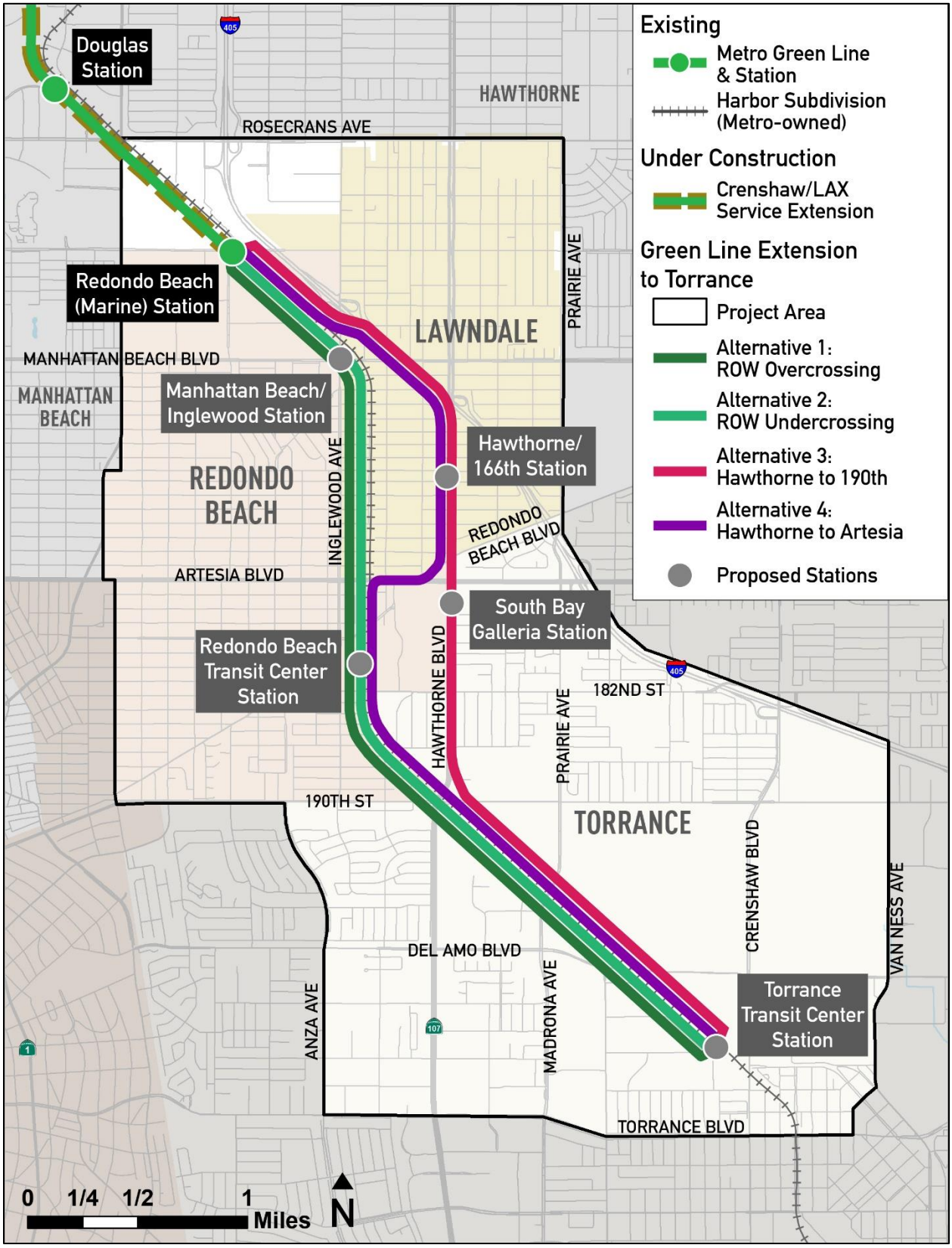
An overview of the SAA Build Alternative alignments is shown in Figure 4-1. The SAA Build Alternatives included two alternatives that would operate within the existing Metro ROW (Alternatives 1 and 2) for the entire length of the extension, and two alternatives that would travel down the median of Hawthorne Boulevard for various lengths (Alternatives 3 and 4) before rejoining the Metro ROW just south of 190th Street. These alternatives were referred to as:

- Alternative 1: ROW Overcrossing (elevated between Inglewood Ave and 162nd Street)
- Alternative 2: ROW Undercrossing (below grade between Inglewood Ave and 162nd Street)
- Alternative 3: Hawthorne to 190th Street
- Alternative 4: Hawthorne to Artesia

On September 27, 2018, the Metro Board voted to carry forward two of the SAA Build Alternatives (SAA Alternative 1 and Alternative 3) and a No Project Alternative for consideration in the 2020 Draft EIR. While the SAA Report found Alternative 2 (ROW Undercrossing) did not perform as well compared to Alternative 1 (ROW Overcrossing), the Metro Board requested that a below-grade option continue to be studied in future phases.

The reasons for eliminating Alternative 2 (ROW Undercrossing) and Alternative 4 (Hawthorne to Artesia) are described in the following sections. Additionally, the reasons for the elimination of a station in Lawndale are summarized below.

Figure 4-1. 2018 SAA Project Area and Build Alternatives



Source: STV, 2018

The four SAA Build Alternatives were compared against one another using evaluation criteria based on the project goals defined in the SAA. These goals and related evaluation criteria are as follows:

Goal 1: Improve Mobility

- Travel Time/Reliability: introduce high-frequency transit service options
- System Connectivity: provide high quality connections to transportation hubs and existing or planned transit lines
- Ridership: change in ridership as a result of the Project
- Change in vehicle miles traveled (VMT): encourage a mode shift to transit, reducing VMT
- Accessibility: improve accessibility to transit and provide more direct connections to regional destinations

Goal 2: Minimize Environmental Impacts

There would be potential environmental benefits and effects associated with implementing a new transit service. Environmental topics included in the SAA to serve as the evaluation criteria for Goal 2:

Air Quality	Hazardous Materials and Waste
Climate Change	Historical, Archeological, and Paleontological Resources
Communities and Neighborhoods	Noise and Vibration
Construction Effects	Parklands and Community Facilities
Cumulative Effects	Safety and Security
Displacement and Relocations	Section 4(f) and 6(f)[2]
Ecosystems and Biological Resources	Transportation
Energy	Visual Resources and Aesthetics
Geology, Soils and Seismicity	Water Resources
Growth-Inducing Effects	

Goal 3: Ensure Cost Effectiveness and Financial Feasibility

- Capital Costs: costs related to design and construction of the Project, including elements such as guideways, vehicles, and support system facilities
- Operations & Maintenance Costs: costs associated with the day-to-day operations of the transit system including labor, vehicle maintenance, fuel, and parts/supplies

[2] Section 6(f) of the Land and Water Conservation Fund Act (16 USC § 460l - 8(f) (PL 88-578) applies to projects which impact recreational lands purchased or improved with land and water conservation funds.

- Cost Per Rider: annualized costs divided by annual ridership
- Financial Feasibility: availability of funding sources to carry out all construction phases

Goal 4: Support Local and Regional Land Use Plans and Policies

- Accessibility: improve accessibility to transit and provide more direct connections to regional destinations (also evaluated under Goal 1: Improve Mobility)
- Land Use Consistency: consistency with existing land use plans and the potential to add a new physical barrier to existing communities
- Economic and Fiscal Effects: short-term economic effects of construction and long-term economic development potential as a result of adding light rail service

Goal 5: Ensure Equity

Goal 5 identified the location of socioeconomically disadvantaged populations near the Project. This goal was designed to prepare a basis for analyzing potential disproportionately high and adverse effects from the Project on potential environmental justice communities, defined as communities in which the population is at least 50 percent minority, low-income, or of limited English proficiency (LEP). However, all Project alternatives performed similarly under this goal.

4.1 Alternative 2: ROW Undercrossing

Alternative 2 (ROW Undercrossing) followed the existing Metro ROW for the length of the Project. A grade separation analysis conducted in 2010 determined that Inglewood Avenue and Manhattan Beach Boulevard required grade separation for light rail service. As a result, when crossing Inglewood Avenue and Manhattan Beach Boulevard, Alternative 2 would have been in a below-grade configuration, serving a below-grade station at that intersection.

Table 4-1. Alternative 2: ROW Undercrossing Performance under Project Goals

Goal	Performance
1. Improve Mobility	Good: would provide short travel times and a potential pathway for active transportation connectivity to the Project.
2. Minimize Environmental Impacts	Mixed: would create greater air quality and climate change impacts, and would make access for emergency vehicles difficult, but would reduce roadway congestion and would utilize the Metro ROW instead of requiring acquisition of new land.
3. Ensure Cost Effectiveness and Financial Feasibility	Poor: would be less cost effective than Alternative 1 (ROW Overcrossing) due to the high capital costs required for excavation activities to construct a proposed trench
4. Support Local and Regional Land Use Plans and Policies	Good: would use Metro ROW that was already zoned for transportation use and is consistent with local land use plans
5. Ensure Equity	Neutral: Performed similarly to all alternatives

Source: STV, 2018

4.2 Alternative 4: Hawthorne to Artesia

Alternative 4 (Hawthorne to Artesia) started within the existing Metro ROW, and left the Metro ROW to parallel I-405. The alignment traveled on an elevated structure along Hawthorne Boulevard between 162nd Street and Redondo Beach Boulevard in the City of Lawndale, serving an elevated station on

Hawthorne Boulevard. The elevated alignment turned west along Redondo Beach Boulevard and Artesia Boulevard before turning south to rejoin the Metro ROW at Artesia Boulevard.

Table 4-2. Alternative 4: Hawthorne to Artesia Performance under Project Goals

Goal	Performance
1. Improve Mobility	Poor: would be entirely grade separated, but would have the longest alignment, as well as speed constraints resulting from track curvature where the alignment would rejoin the Metro ROW at Artesia Boulevard
2. Minimize Environmental Impacts	Poor: would have traffic impacts, would create physical barriers within the community, and would require additional ROW
3. Ensure Cost Effectiveness and Financial Feasibility	Poor: would be less cost effective than Alternative 1 (ROW Overcrossing) and Alternative 2 (ROW Undercrossing) due to additional ROW acquisitions and elevated structures, as well as larger fleet requirements for maintaining similar headways to the other alternatives with a longer alignment
4. Support Local and Regional Land Use Plans and Policies	Poor: would require additional ROW not zoned for transportation uses
5. Ensure Equity	Neutral: Performed similarly to all alternatives

Source: STV, 2018

4.3 LAWNDALE STATION

During the 2018 SAA outreach process, attendees voiced concerns over a station in the City of Lawndale. The community showed limited support for the Lawndale Station at Manhattan Beach Boulevard/Inglewood Avenue in Alternative 1 due to its close proximity to the existing Redondo Beach (Marine) Station (0.6 miles away), impact to businesses, lack of parking, and traffic concerns. The community expressed similar concerns for a station at Hawthorne Boulevard/166th Street in Alternative 3, including its proximity to the South Bay Galleria Station. Other concerns expressed included aesthetics, noise, property impacts, safety, and traffic. During the preparation of the SAA, the City of Lawndale sent a letter to Metro formally requesting that the proposed stations in Lawndale be removed from the study.

At the conclusion of the SAA in Fall 2018, the Metro Board accepted the recommendations to further study Alternatives 1 and 3 and not include stations at Manhattan Beach Boulevard/Inglewood Avenue (Alternative 1) and Hawthorne Boulevard/166th Street (Alternative 3). These recommendations have been carried through to the 2023 Draft EIR.

5 2021 SCOPING FOR DRAFT EIR

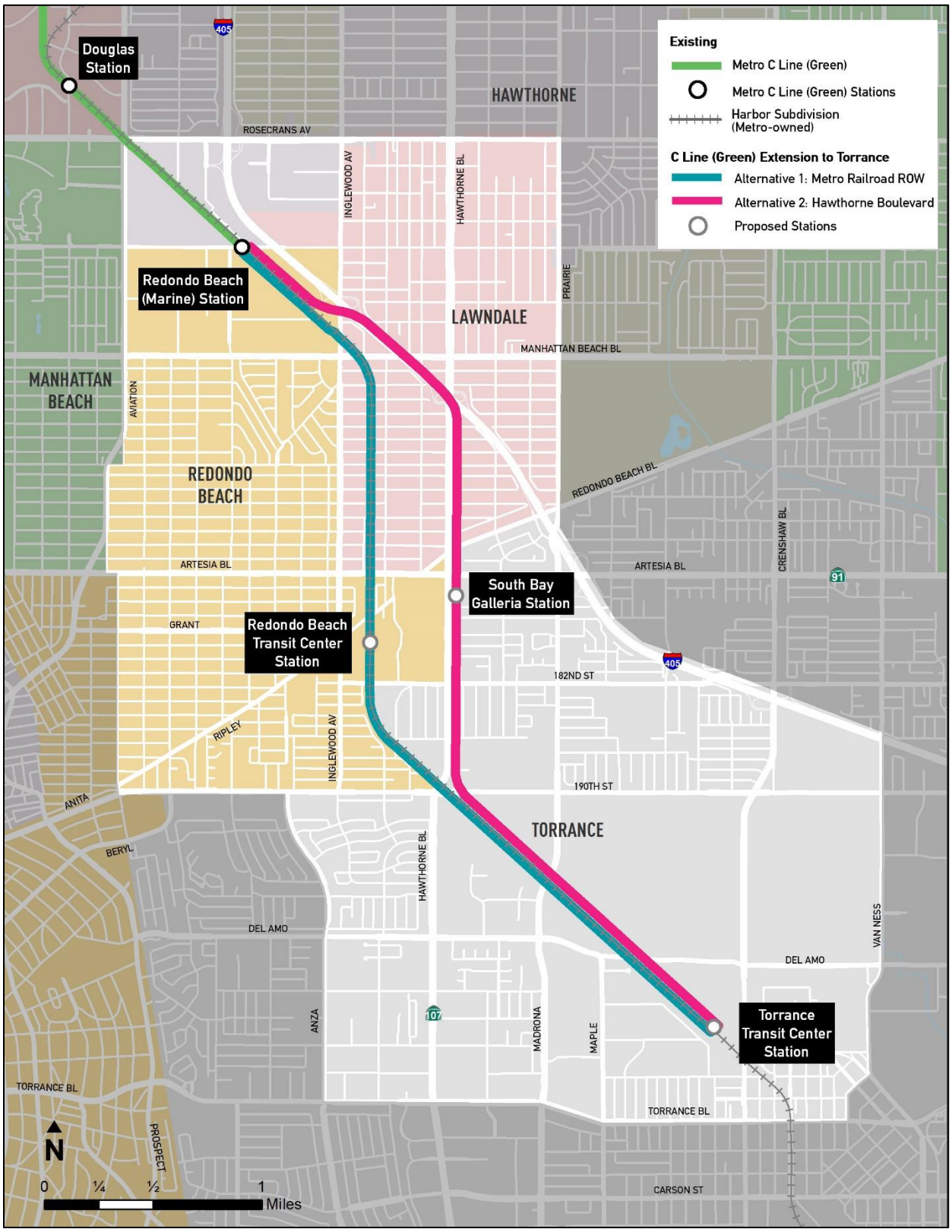
In January 2021, Metro issued a NOP initiating the CEQA scoping process for the Draft EIR. The NOP included two build light rail alternatives: Alternative 1: Metro ROW and Alternative 2: Hawthorne Boulevard, which are consistent with the 2018 SAA Alternatives 1 and 3, respectively. These two alternatives are described below and shown in Figure 5-1.

- **Alternative 1: Metro ROW.** This alignment is based on the 2018 SAA Alternative 1, and would follow the existing Metro ROW from the existing Redondo Beach (Marine) Station to the Torrance terminus. When crossing streets between Inglewood Avenue and 162nd Street, this alignment would be in an elevated grade-separated configuration. Alternative 1 is most similar to the Local South Alternative (Metro C Line (Green) to Torrance TC) evaluated in the 2009 AA. Two stations are proposed along the Metro ROW at the Redondo Beach TC and Torrance TC.

- **Alternative 2: Hawthorne Boulevard.** This alignment is based on the 2018 SAA Alternative 3. It would start within the existing Metro ROW and would leave the Metro ROW to parallel I-405 (San Diego Freeway) between Inglewood Avenue and Hawthorne Boulevard. The alignment would then travel along Hawthorne Boulevard between 162nd Street in Lawndale and 190th Street in Torrance before rejoining the Metro ROW south of 190th Street to continue to the terminus at the Torrance TC north of Crenshaw Blvd. Two stations are proposed: South Bay Galleria along Hawthorne Blvd and Torrance TC along the Metro ROW.

The Public Scoping period commenced on January 29, 2021 and ended on March 29, 2021. During the scoping period, over 700 comment letters, emails, and phone calls were received. Approximately 130 comments recommended various alternatives to those presented during scoping.

Figure 5-1. 2021 Scoping Alternatives



Source: STV, 2021

During the 2021 public scoping period, several comments requested that additional alternatives and options be studied. Below is a summary discussing why proposed additional alternatives and options were considered but eliminated from further review as part of the 2023 Draft EIR.

- **Provide direct connection to LAX** – As described in Section A.3.1.3, Metro will provide a connection to LAX through the APM, which can be accessed at the LAX/Metro Transit Center Station via the Metro K Line (Crenshaw).
- **Add stations to the alignment** – El Camino College and Del Amo Mall are fairly accessible via proposed bicycle routes and existing transit options from the Redondo Beach TC.
- **Provide a bus route or BRT option** – Torrance Transit provides bus connections to Long Beach, LAX, and Old Town Torrance. In the 2009 Alternatives Analysis BRT was considered as a potential mode for the Project. The BRT mode was eliminated after the Stage I analysis due to safety and operational issues associated with sharing the corridor with freight trains, grade crossing concerns, narrow ROW in some sections, and the lack of substantial travel time benefits over existing transit service.
- **Extend the Project to Old Town Torrance or Long Beach** – As discussed in Section A.3.1.3, the AA recommended future transit service to the City of Long Beach and San Pedro, the implementation of which would largely depend upon the availability of funding and the prior or potential implementation of other transportation-related investments. This recommended alternative was eliminated from further review in the Draft EIR as it does not meet the project objective to connect to the Torrance TC.
- **Change technology to magnetic levitation** – The Project is an extension of an existing light rail line, and therefore light rail would be the preferred mode, as discussed in the 2018 SAA.
- **Relocation of alignment to be along other corridors** – As described in Section A.3.1.2, previous studies have looked at parallel corridors for the alignment, such as along Prairie Avenue/Madrona Avenue and Inglewood Avenue. These other corridors were eliminated because they would have greater environmental impacts or would not allow for riders to connect to other transit service provided at the Torrance TC.
- **No Project option through Lawndale –** Previous studies evaluated alignments that would avoid the City of Lawndale entirely, including the SCE ROW and Inglewood Avenue, but they were eliminated from further study as described in Section 3.2. However, as required by CEQA, a No Project Alternative is analyzed in Chapter 4, Evaluation of Alternatives, of the Draft EIR.
- **Enclose train station with filtered air** – Stations will be designed in accordance with Metro standards, which typically define open-air platforms for ground level or elevated stations.
- **Make the ROW a green belt** – Turning the Metro ROW into a green belt would not meet the project objectives. In addition, the Metro ROW currently hosts active freight railroad service operated by BNSF and is expected to continue to do so in the future.
- **Put the Metro ROW alternative in a tunnel** – Putting the alignment in a tunnel would require a tunnel boring machine or cut and cover construction, both of which would result in many environmental impacts during construction. Additionally, tunnels require expensive ongoing maintenance for ventilation and fire life safety equipment that is not present in non-enclosed rail systems. Tunnels are planned in areas where Metro cannot locate rail due to grade separations and/or limited space—two conditions which are not present along the Project alignment. Finally, this option would far exceed the funding approved in Measure M to construct the Project. For these reasons, this alternative was eliminated from further consideration.

6 2023 DRAFT EIR

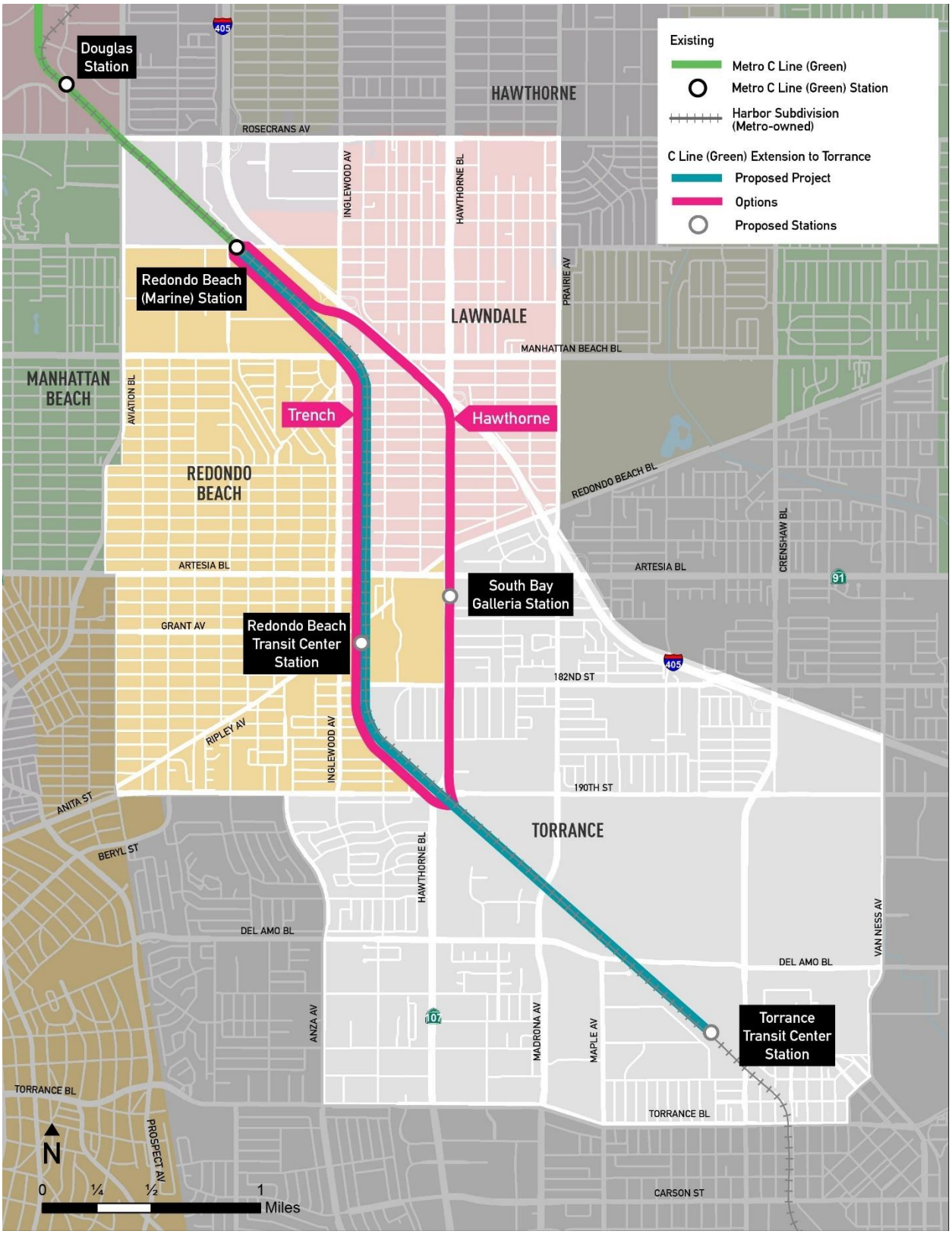
After the conclusion of scoping in March 2021, Metro commenced the design for the alignments. For the Hawthorne Boulevard alignment, Metro initially analyzed the feasibility of an at-grade alignment along the length of Hawthorne Boulevard. After an evaluation based on the Metro Grade Crossing Safety Policy, Metro concluded that an at-grade design at the Redondo Beach and Artesia Boulevard intersections with Hawthorne Boulevard would not provide sufficient pedestrian safety. Due to the width of the street, it would not be possible for pedestrians cross Hawthorne Boulevard in one traffic signal. Currently, pedestrians can wait in the median between traffic signals. The median area would be occupied by the at-grade light rail with limited space for pedestrian queuing. Additionally, the signal timing assumptions for the at-grade alignment would have resulted in significant vehicle queuing that would have exceeded the capacity of the left-turn storage lanes. As the Redondo Beach and Artesia Boulevard intersections are roughly in the center of the one-mile Hawthorne Boulevard segment, leaving the other intersections at-grade would require multiple transition areas between at-grade and elevated alignments, which could only be accomplished by having long stretches of retaining walls in the center of the street to support the rail structures. These walls would block access for cars, pedestrians, and bicyclists to cross Hawthorne Boulevard. Therefore, Metro ultimately decided to eliminate the Hawthorne Boulevard at-grade alignment from further study, and proceed with an all-elevated configuration called the Hawthorne Option in the 2023 Draft EIR.

Based on comments during scoping and community input, Metro included a second alignment along the Metro ROW that includes a below-grade open air trench to cross under eight streets between Inglewood Avenue and 182nd Street. This alignment is called the Trench Option in the 2023 Draft EIR.

In summary, the 2023 Draft EIR evaluates the following, shown in Figure 6-1.

- **Proposed Project:** Follows the existing Metro ROW for the length of the Project from the existing Redondo Beach (Marine) Station to the Torrance Transit Center (TC), with an elevated segment, followed by an at-grade segment.
- **Trench Option**: Follows the existing Metro ROW for the length of the project, with the light rail tracks primarily below grade. South of 190th Street, the alignment is the same as the Proposed Project.
- **Hawthorne Option**: Starts within the existing Metro ROW, then leaves Metro's ROW to run along I-405 within the median of Hawthorne Boulevard. The entire alignment between the Redondo Beach (Marine Station) and 190th Street is elevated. South of 190th Street, the alignment is the same as the Proposed Project.

Figure 6-1. Proposed Project and Options Evaluated in the Draft EIR

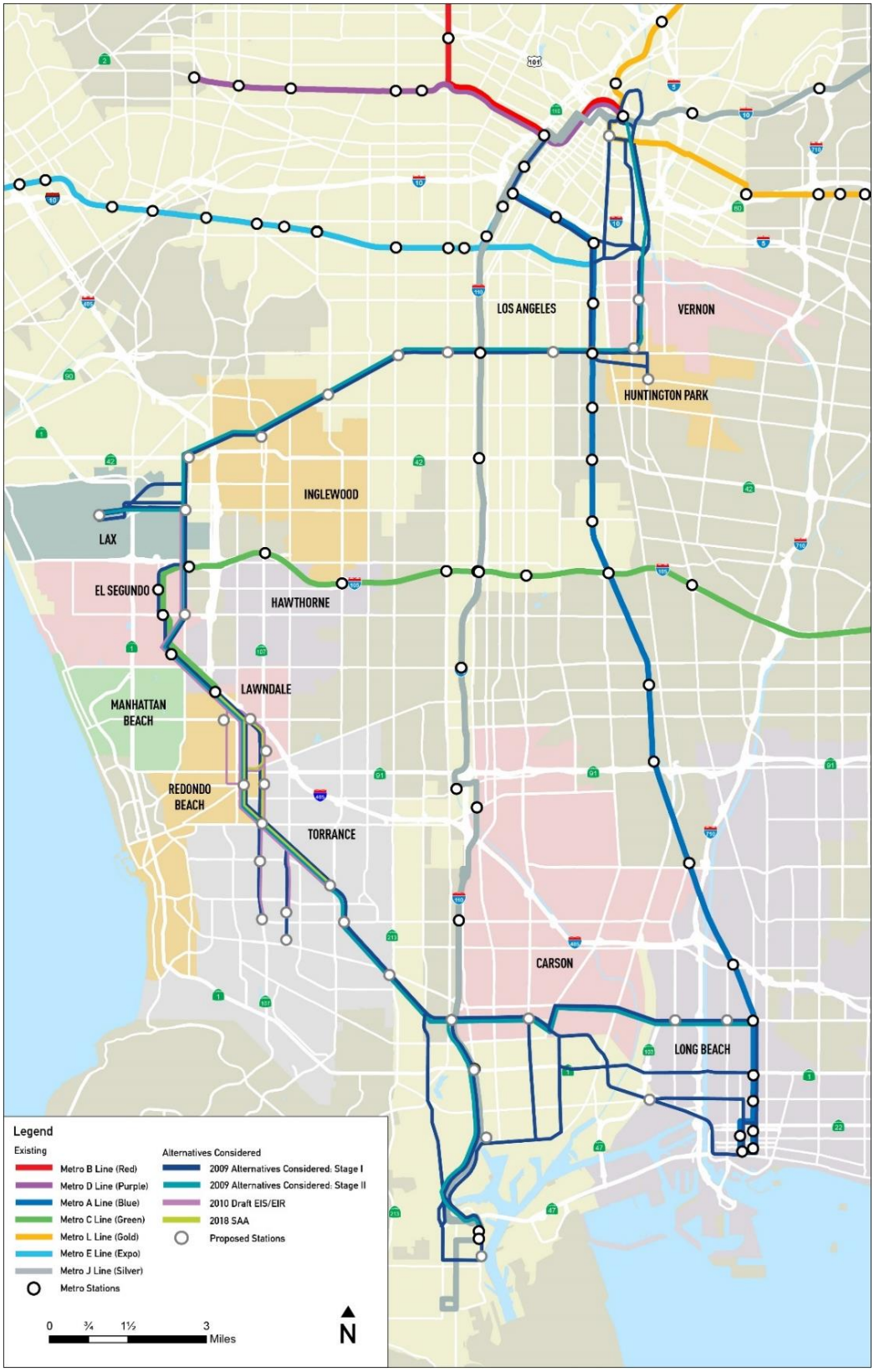


Source: STV, 2022

7 SUMMARY OF ALTERNATIVES CONSIDERED BUT ELIMINATED

Figure 7-1 and Table 7-1 show the alternatives considered leading up to the 2023 Draft EIR. Throughout the project development, many alternatives and options were considered and eliminated, including different vehicle types, station options, and alignment routes. Reasons for elimination including inability to meet project objectives, high costs, low ridership, low public support, environmental impacts, and concerns regarding safety.

Figure 7-1. Alternatives Considered but Eliminated from 2009 to Present



Source: STV, 2020

Table 7-1. Summary of Alternatives Considered from 2009 to 2023

Projects and Phases	Alternatives/Options	Carried Forward for Further Analysis	Withdrawn
2009 Harbor Subdivision Alternatives Analysis – Stage I Initial Screening	BRT Alternatives	–	X
	Light Rail Alternatives	X	–
	SPR Alternatives (rail)	–	X
	DMU Alternatives (rail)	X	–
	EMU Alternatives (rail)	–	X
	CRT Alternatives (rail)	–	X
2009 Harbor Subdivision Alternatives Analysis – Stage II Comparative Evaluation	TSM Alternative (bus)	X	–
	Local North Alternative (rail)	–	X
	Local South Alternative (rail)	X	–
	Regional Alternative (rail)	X	–
	Express Alternative (rail)	–	X
2010 Draft EIS/EIR	No Build Alternative	X	–
	TSM Alternative (bus)	–	X
	Freight Track Alternative (previously named Regional Alternative in 2009 AA)	–	X
	Light Rail Alternative (previously named Local South Alternative in 2009 AA)	X	–
2018 SAA	Alternative 1: ROW Overcrossing (previously named Light Rail Alternative in 2010 EIS/EIR)	X	–
	Alternative 2: ROW Undercrossing	–	X
	Alternative 3: Hawthorne to 190th	X	–
	Alternative 4: Hawthorne to Artesia	–	X
	Station Options: Lawndale Stations	–	X
2023 Draft EIR	Proposed Project (previously named Alternative 1 in 2018 SAA)	X	–
	Trench Option	X	–
	Hawthorne Boulevard at-grade alignment (previously named Alternative 3 in 2018 SAA)	–	X
	Hawthorne Option (elevated)	X	–
	No Project Alternative	X	
	High-Frequency Bus Alternative	X	
	170th/182nd Grade-Separated Light Rail Transit Alternative	X	