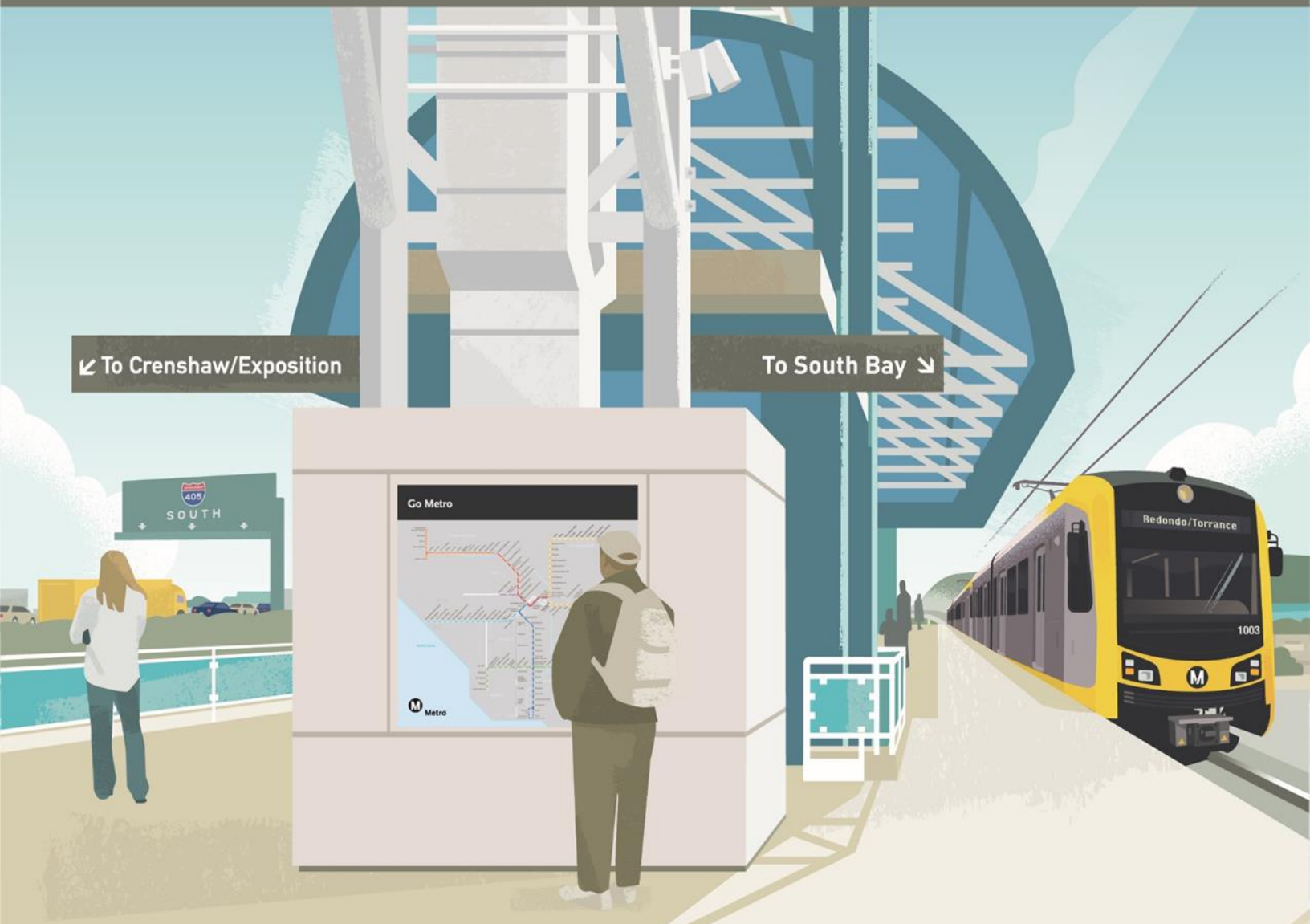
Los Angeles County
Metropolitan Transportation Authority

Transportation Detail Report

C LINE (GREEN) EXTENSION TO TORRANCE



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January 2023

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Abbreviations/Acronyms

ADA .....Americans with Disabilities Act

CEQA .....California Environmental Quality Act

EIR .....Environmental Impact Report

HFB .....High-Frequency Bus Alternative

LAX .....Los Angeles International Airport

LOS .....Level of Service

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

SCAG.....Southern California Association of Governments

ROW .....Right-of-Way

RTP/SCS.....Regional Transportation Plan/Sustainable Communities Strategy

SCAG.....Southern California Association of Governments

TC .....Transit Center

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 Project has evolved over the years, based on several planning studies, which are discussed in greater detail in the Alternatives Considered and Eliminated Report (Metro, 2023).

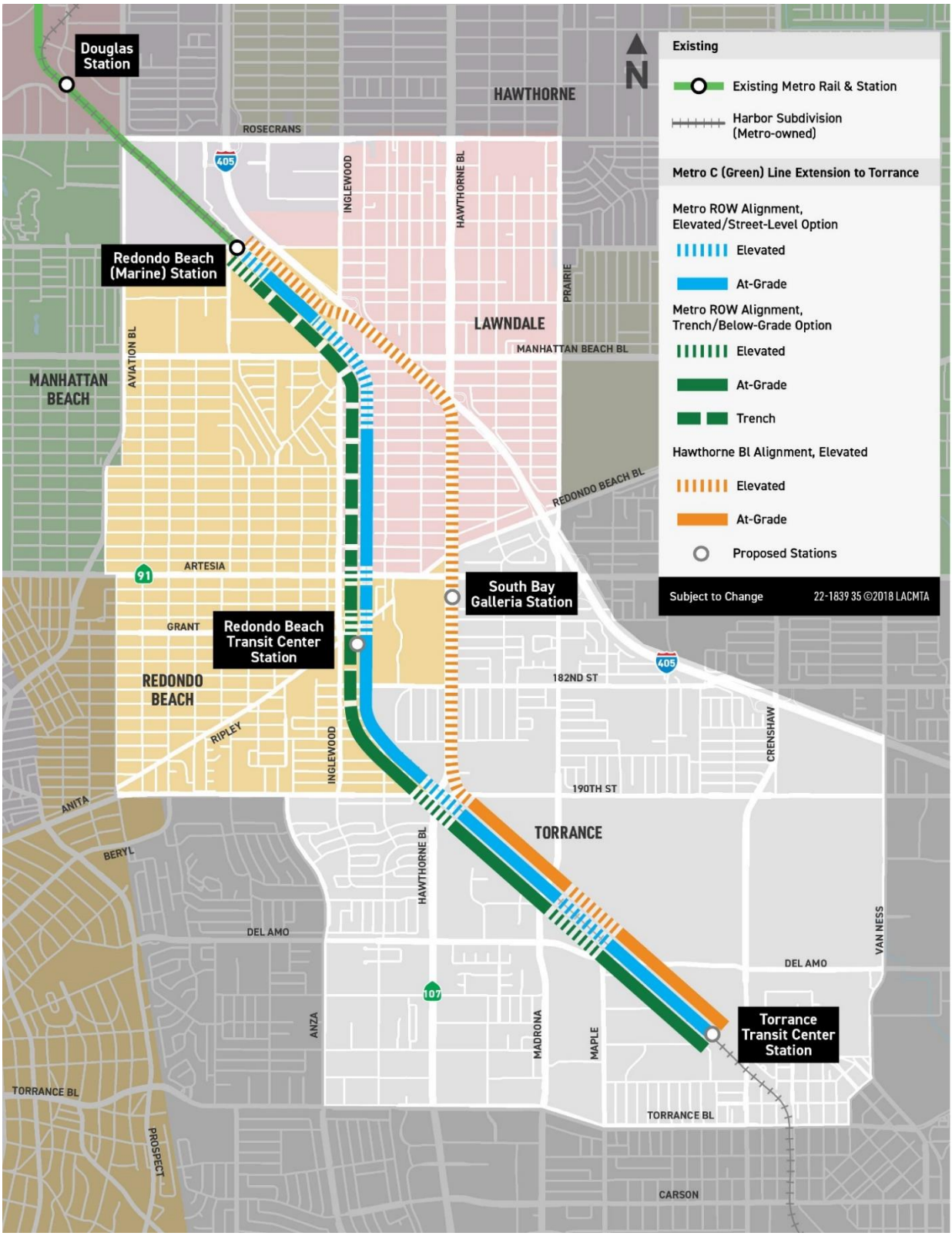
The Draft EIR evaluates three alignments, defined as:

- **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 TC and Torrance TC. 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 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.

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.

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



Source: STV, 2022

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.

1.2 Report Overview

This report provides information about the transportation-related changes that would result from the Project which are relevant to project development and the effects on the community, but are not considered environmental effects under the CEQA.

In the past, CEQA practitioners commonly used level of service (LOS) as a metric for evaluating the performance of the transportation network, and its use in practice for decades has been to minimize traffic delay, which has resulted in continuous widening of roads and intersections. The effect of this practice has resulted in streets that are less safe for people walking, biking, and using transit, while failing to actually reduce or "solve" traffic congestion overall. Recognizing this and the negative effects on the environment and livable communities, the State of California has enacted a series of laws in recent years that have led to the removal of LOS as a criterion for measuring a project's environmental impact under CEQA (see, e.g., Pub. Resources Code, § 21099(b), CEQA Guidelines, § 15064.3).

CEQA now considers the number and length of trips induced by a project, measured as vehicle miles traveled (VMT) as the preferred method for analyzing transportation impacts. Under the new CEQA guidelines, transportation projects that reduce VMT, such as transit projects, can be presumed to have a less than significant impact on VMT (CEQA Guidelines, § 15064.3(b)(2)).

Although CEQA no longer requires LOS analysis, Metro conducted a traffic study to support the advanced conceptual design effort, helping identify potential issues and improving the design of the project to minimize negative effects on traffic operations. The results are summarized in this report for informational purposes, along with supplemental information for parking and transit rerouting.

2 PROJECT SUMMARY

2.1 Metro ROW (Elevated/Street-Level) Alignment:

The Metro ROW (Elevated/Street Level) Alignment would begin at the existing Redondo Beach (Marine) Station in the City of Redondo Beach and follow the existing Metro ROW parallel to the existing freight rail track. It would continue within the Metro ROW south through the Cities of Lawndale, Redondo Beach, and Torrance to the proposed terminus at the Torrance TC, immediately west of Crenshaw Boulevard in the City of Torrance. Two new stations are proposed: 1) at the Redondo Beach TC in Redondo Beach and 2) the terminus at the Torrance TC. The Project would be elevated from near Inglewood Avenue to approximately 162nd Street, where it would begin to transition to at-grade (street level) as it continues south. The Metro ROW Alignment would cross over Hawthorne Boulevard and 190th Street on new bridges adjacent parallel to the existing freight bridge and continue south to terminate at the Torrance TC Station.

The Metro ROW Alignment includes two multi-use recreational paths in areas where the Metro ROW is sufficiently wide: 1) between 159th Street and 170th Street, and 2) between Grant Avenue and 182nd Street. The path would be approximately 20 feet wide. Where the multi-use path would be parallel to the freight track, a fence would provide safe separation.

The following is a summary of changes that would be made to the existing freight crossings. There are two crossings where the both light rail and freight tracks would be at-grade (170th Street and 182nd Street); these intersections were included in the traffic analysis, described in further detail in Section 5 of this report.

- Inglewood Avenue between 156th Street and Manhattan Beach Boulevard: The Metro ROW Alignment would cross Inglewood Avenue above-grade. Gates and warning devices would be upgraded and installed on both sides of the crossing for pedestrians crossing the at-grade freight track along Inglewood Boulevard. The existing freight track would relocate slightly eastward within the existing Metro-owned ROW.
- Manhattan Beach Boulevard and Condon Avenue: The Metro ROW Alignment would cross Manhattan Beach Boulevard above-grade. The Metro ROW Alignment would add a pedestrian crossing barrier and sign prohibiting crossing of Manhattan Beach Boulevard to maintain pedestrian safety. The nearest crosswalks are 450 feet and 550 feet to the west and east, respectively. The sidewalk along Manhattan Beach Boulevard would be improved with new freight railroad crossing gates to prevent pedestrians from crossing the tracks when a freight train is approaching, which are not present today.
- 159th, 160th, 161st and 162nd Streets between Inglewood Avenue and Firmona Avenue: The Metro ROW Alignment would cross these streets above-grade while the existing freight rail track would remain at-grade and be relocated slightly to the west. The Metro ROW Alignment would relocate the at-grade freight crossings slightly to the west. Additionally, the multi-use recreational path would be located west of the freight track, with a fence as a separation barrier. The Metro ROW Alignment would enhance the at-grade freight crossings to provide pedestrian gates and signals on both sides of the track, on both sides of each street. The multi-use path would cross each street with a signed and continental (“zebra”) striped crosswalk. On the southeastern side of the 159th Street crossing, the sidewalk will be shifted southward, where it would then cross the freight track and rejoin the sidewalk on 159th Street.
- 170th Street between Condon Avenue and Firmona Avenue: The Metro ROW Alignment would cross 170th Street at-grade, and the existing freight rail track would be relocated to the west. The Metro ROW Alignment would add pedestrian upgrades on the sidewalks on both sides of the track and both sides of 170th Street. The multi-use path would cross the street with a signed and continental (“zebra”) striped crosswalk.
- Grant Avenue between Inglewood Avenue and Condon Avenue: The Metro ROW Alignment would cross Grant Avenue on a new light rail bridge alongside the existing freight bridge. A multi-use path providing pedestrian access to the Redondo Beach TC Station would begin from the south side of Grant Avenue and run along the east edge of the Metro ROW south to the station. A new pedestrian crossing would be provided where the station access path meets Grant Avenue across to Condon Avenue. This new crossing would include advance pedestrian signals to warn approaching drivers, and would include sidewalk improvements for ADA-compliance. For eastbound drivers on Grant Avenue, advance warning signs would be placed prior to the rail bridges to alert drivers of the

pedestrian crossing, as the rail bridge over Grant Avenue reduces visibility for eastbound drivers of the intersection with Condon Avenue.

- 182nd Street between Firmona Avenue and Kingsdale Avenue: The Metro ROW Alignment would cross 182nd Street at-grade alongside the existing freight track, which would be shifted slightly to the west. The Metro ROW Alignment would add pedestrian upgrades on the sidewalks on both sides of the track and both sides of 182nd Street. The multi-use path ends on the north side of 182nd Street, and a marked pedestrian crossing would be provided on the east side of the crossing.

The Metro ROW Alignment (Proposed Project) would not modify any street parking.

2.2 TRENCH OPTION

Along the Metro ROW, there is an option being considered between Marine Avenue and 190th Street called the Trench Option. Like the Metro ROW Alignment, the Trench Option would follow the existing Metro ROW, but it would be entirely grade-separated with the light rail in a trench crossing under eight streets between Inglewood Ave and 182nd Street. One station is proposed in this segment: Redondo Beach TC Station. The multi-use paths would also be provided for the Trench Option.

South of 190th Street, the alignment would be the same as the Metro ROW Alignment.

All light rail crossings for the Trench Option would be grade-separated, with the light rail in a trench and the roadways crossing over on a bridge. The freight crossings would remain at-grade as they are today. Each freight crossing location would be upgraded with railroad crossing gates and warning devices consistent with the Metro ROW Alignment and following the same standards. As there would be no at-grade light rail crossings with the Trench Option, traffic conditions would not be changed by the project and no parking loss would occur. Therefore a traffic operations analysis for the project was not conducted.

2.3 HAWTHORNE OPTION

Between the Redondo Beach (Marine) Station and 190th Street, the Hawthorne Option is being considered, which would leave the Metro ROW and run within the median of Hawthorne Boulevard. The Hawthorne Option is entirely elevated. It would start within the existing Metro ROW, leave the Metro ROW to parallel I-405 between Inglewood Avenue and Hawthorne Boulevard, and follow Hawthorne Boulevard south between 162nd Street and 190th Street. One station is proposed in this segment: South Bay Galleria Station south of Artesia Boulevard. South of 190th Street, the alignment would be the same as the Metro ROW Alignment.

The Hawthorne Option was initially studied as an at-grade configuration between 164th Street and 182nd Street. After analyzing train, pedestrian, and traffic operations and safety in the at-grade configuration, Metro determined that there was not a feasible solution for safe and efficient at-grade operation on Hawthorne Boulevard. Therefore, the Hawthorne Option was revised to be fully elevated between the Redondo Beach (Marine) Station and 190th Street.

The following intersections would be modified under the Hawthorne Option. The traffic operations analysis evaluated these changes, discussed in more detail in Section 5 of this report.

- Existing signalized intersections at 166th, 169th, and 182nd: There would be no changes to the existing signals or pedestrian crossings, but the left turn lanes on Hawthorne would be realigned to accommodate the elevated structure columns.

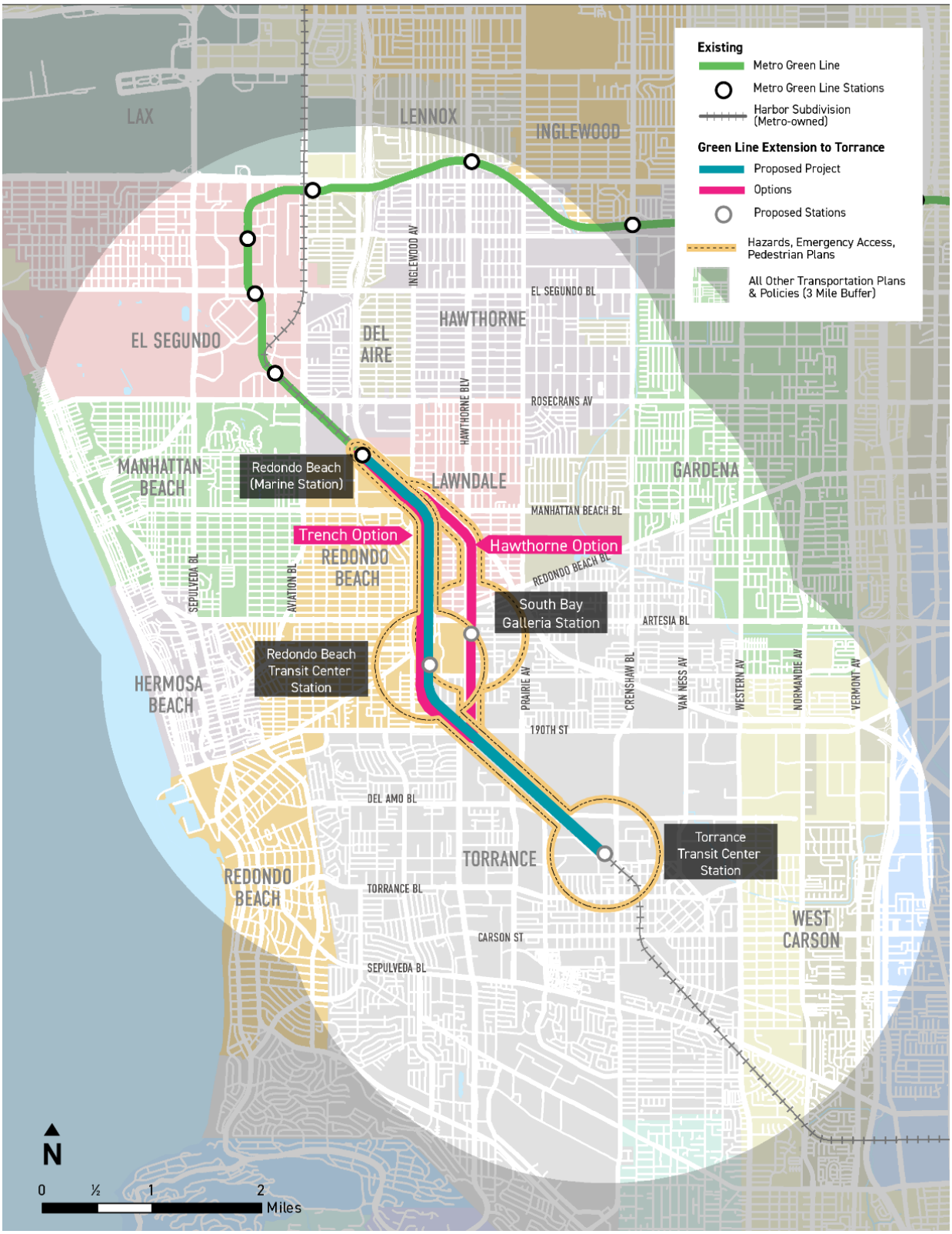
- 164th Street: The Hawthorne Option would upgrade this unsignalized intersection to a fully-signalized one which would improve the safety for pedestrians and minimize potential geometric hazards with vehicles. The left turn lanes on Hawthorne Boulevard would be shifted to accommodate the elevated structure columns.
- 166th Street: The left turn lanes on Hawthorne would be realigned to accommodate the elevated structure columns.
- 169th Street: The left turn lanes on Hawthorne would be realigned to accommodate the elevated structure columns.
- 171st Street: The southbound left turn lane on Hawthorne Boulevard approaching 171st Street would be shifted eastward to accommodate the elevated structure column.
- Redondo Beach Boulevard: The northbound and southbound left turn lanes on Hawthorne Boulevard approaching Redondo Beach Boulevard would be realigned parallel to the through lanes to accommodate the light rail columns. The existing islands would also be reduced in size to accommodate the left turn lane modification.
- Artesia Boulevard: The southbound left turn lane on Hawthorne Boulevard approaching Artesia Boulevard would be realigned to accommodate the light rail columns.
- South Bay Galleria Station Mid-Block Crossing: The Hawthorne Option would construct a new signalized mid-block crossing approximately 360 feet south of Artesia Boulevard, at the south end of the station. The signalized crossing would cross the southbound lanes of Hawthorne Boulevard north of the South Bay Galleria mall driveway and would cross the northbound lanes south of the mall driveway. The southbound right turn pocket into the South Bay Galleria, which is also currently shared with a major bus stop serving multiple routes, would be replaced with a bus-only turnout, and a curb extension would be added at the crosswalk to improve safety, visibility, and reduce the pedestrian crossing distance.
- 177th Street: The northbound left turn pocket on Hawthorne Boulevard approaching 177th Street would be reduced from two lanes to one. The existing median would be expanded to accommodate the elevated structure columns.
- 179th Street: The Hawthorne Option would upgrade this intersection from unsignalized to signalized and add a pedestrian crossing of Hawthorne Boulevard. This improvement also would accommodate traffic currently permitted to make a left turn at the unsignalized intersection of Hawthorne Boulevard and 180th Street, where the median would be permanently closed. The northbound left turn lane on Hawthorne Boulevard approaching 179th Street would be extended up to 230 feet as the median is closed at 180th Street.
- 180th Street: The Hawthorne Option would permanently close the median at this location and require left turning traffic to either continue north to the newly signalized intersection at 179th Street, or south to the existing signalized intersection at 182nd Street. Both locations permit drivers to make a U-turn to access 180th Street or the shopping plaza. This closure is required because the column placement through this segment would otherwise create visual obstructions that would prevent drivers from seeing oncoming traffic in an unsignalized left.
- 186th Street: The northbound left turn lane on Hawthorne Boulevard approaching 186th Street would be realigned to the west to accommodate the light rail column.

- South of 186th Street median access: Immediately south of 186th Street an unsignalized southbound left turn is provided to access businesses on the east side of Hawthorne Boulevard. Under the Hawthorne Option, the column design at this location would utilize straddle-bents to maximize visibility for the southbound left turn and of those vehicles by northbound traffic.

2.4 STUDY AREA

The Study Area for transportation encompasses the areas in which there may be foreseeable effects of the Project on the transportation network. Considerations include pedestrian and bicycle facility safety, transit route connectivity, intersection operations, and on-street parking inventory. The geographic scope of the Study Area generally includes a half-mile radius from each station as well as the roadways that intersect or are adjacent to the Metro ROW Alignment, Trench or Hawthorne Options. Figure 2-1 shows the Study Area in relation to the Project.

Figure 2-1. Project Study Area



Source: Fehr & Peers, 2021

3 ON-STREET PARKING INVENTORY AND CHANGES

3.1 HAWTHORNE BOULEVARD ON-STREET PARKING

Currently, street parking is present on both sides of Hawthorne Boulevard between 162nd Street and 171st Street during off-peak hours. No street parking is provided along Hawthorne Boulevard south of 171st Street to 190th Street. The curb lane is designated for on-street parking on the west side of Hawthorne Boulevard during off-peak hours and is utilized as a fourth southbound travel lane between 4 PM and 6 PM on weekdays. The curb lane on the east side of Hawthorne Boulevard north of 167th Street is utilized as a fourth northbound through lane between 6 AM and 9 AM on weekdays. Parking on the east side of Hawthorne Boulevard between 167th Street and 171st Street is currently prohibited during those same hours in the AM peak period, but it is not striped for a fourth peak period northbound through lane. Three northbound through lanes are provided along Hawthorne Boulevard at all times between Artesia Boulevard and 167th Street. Approximately 49 unmarked curb parking spaces are provided on the west side of Hawthorne Boulevard, and 60 unmarked curb parking spaces are provided on the east side of Hawthorne Boulevard during available times, assuming about 20 feet of length per car. All parking spaces are unmetered but are limited to two hours in duration.

In addition to on-street curb parking, additional parking spaces are provided within the median of Hawthorne Boulevard. The center parking areas feature angled spaces with a physically separated drive aisle to the left of each direction. Egress from these parking areas is provided by slip lanes that provide access only to left-turn pockets at various intersections along Hawthorne Boulevard. Parking within the median is limited to two hours except with a permit and is prohibited between 2 AM and 4 AM. Four of these parking areas are provided on Hawthorne Boulevard between 162nd Street and 171st Street, which provide a total of 83 parking spaces.

In total, there are approximately 192 on-street spaces on Hawthorne Boulevard between 162nd Street and 171st Street.

The Hawthorne Option would modify the median angled parking zones in the City of Lawndale between 162nd Street and 171st Street, and remove approximately 20 median parking spaces to accommodate the elevated structure support columns. Columns would remain a minimum of 18 inches set back from the face of curb in all directions and would not introduce a geometric hazard for vehicles. Existing access to the median parking would remain with curb separation; in select locations the separation may be narrowed to use flexible vertical delineators.

3.2 SIDE STREET PARKING

3.2-1 City of Lawndale

In addition to on-street parking provided along Hawthorne Boulevard between 162nd Street and 171st Street described above, unmarked curb parking is provided along side streets intersecting Hawthorne Boulevard. On many side streets, parking spaces within approximately 150 feet of Hawthorne Boulevard are limited to two hours in duration, and all parking spaces along these streets on both sides of Hawthorne Boulevard are subject to once weekly street sweeping parking restrictions. On the intersecting side streets, there are approximately 118 unmarked curb parking spaces fronting commercial parcels. No estimate was made for parking supply in front of homes. Of these 118 parking spaces, approximately 69 (58%) are subject to 2-hour time limit restrictions. Two parking spaces are subject to 20-minute time limit restrictions, and the remainder are unrestricted other than for weekly street sweeping.

3.2-2 City of Torrance

On the intersecting side streets south of Artesia Boulevard, there are approximately 186 unmarked curb parking spaces. Of these 186 parking spaces, approximately three spaces (2%) are subject to 1-hour time limit restrictions, and the remainder are unrestricted other than for weekly street sweeping.

Along the Hawthorne Boulevard frontage road along the east side of Hawthorne Boulevard between 176th Street and 179th Street, there are approximately 12 spaces which are available for nighttime parking but are restricted between 7 AM and 7 PM.

In total, there are approximately 186 spaces fronting commercial parcels on streets intersecting with Hawthorne Boulevard between 171st and 190th Street, and 12 spaces on frontage roads that allow parking between 7 PM and 7 AM. Additionally, all commercial uses fronting Hawthorne Boulevard south of 171st Street provide dedicated off-street parking facilities, including the South Bay Galleria, which contains surface parking lots for the shopping mall.

The Hawthorne Option would not modify the parking on intersecting side streets. Due to the minor widening of Hawthorne Boulevard in the segment between approximately 175th Street and 179th Street, the short segments of frontage road that allow overnight parking may be narrowed as a result of the Hawthorne Option. At the current level of design, it is undetermined if this would require permanent restriction of parking in this segment. If so, it would represent the loss of up to 12 overnight-only parking spaces.

4 POTENTIAL TRANSIT ROUTE CHANGES

As part of the transportation analysis and ridership forecasting for the project alignments, the existing Metro and municipal bus routes operating in the study area were reviewed for potential changes to directly serve the proposed Metro light rail stations. This high-level analysis considers routes that operate within the study area and the most direct re-routing required to serve the station. This is conceptual for planning purposes and is not a formal transit route analysis and does not take into account the many factors bus service planners consider when adjusting routes. Bus route planning for connections to transit stations typically occurs once construction of a project is actually underway, and would be undertaken by the responsible agency and staff. The purpose of considering these bus re-routes is to support the ridership forecasting and traffic modeling efforts for the Project development. More information on the ridership forecasts can be found in the Ridership Report.

The routes included in this preliminary evaluation included the Metro, Torrance Transit, Beach Cities Transit, and GTrans routes in operation around late 2021, as described in Table 4-1.

Table 4-1. Existing (2021) Transit Routes Near the Metro ROW

Transit Agency	Route	Existing Origin	Existing Destination	Route Description	Existing C Line Connection
Metro	40	SB Galleria	DTLA	Downtown LA-South Bay Galleria via King Bl-Hawthorne Bl	Hawthorne Station
Metro	210	SB Galleria	Hollywood	Cahuenga/Yucca (Hollywood) – South Bay Galleria via Crenshaw Bl	Crenshaw Station
Metro	211 & 215	Inglewood (Loop)	Lawndale (Loop)	South Bay Galleria - Redondo Beach Station via Prairie Ave and Inglewood Ave	Redondo Beach Station
Metro	212	Hawthorne/ Lennox Station	Hollywood/ Vine Station	Hollywood/Vine Sta - Hawthorne/Lennox via La Brea & Prairie	Hawthorne/Lennox Station
Metro	344	Harbor Gateway	Palos Verdes	Harbor Gateway TC - Palos Verdes via Hawthorne Bl	No
Torrance Transit	1	Torrance	Harbor Freeway	Torrance - Harbor Freeway via Torrance Blvd & Vermont Ave	Harbor Freeway
Torrance Transit	2	Del Amo Fashion	Harbor Freeway	Torrance - Harbor Freeway via Artesia Blvd & Crenshaw Blvd	Harbor Freeway
Torrance Transit	3	Redondo Beach	Long Beach	Redondo Beach - Long Beach via Torrance Blvd & Carson St	No
Torrance Transit	4X	Torrance	DTLA	Torrance - DTLA via Torrance Blvd & I-110	Harbor Freeway
Torrance Transit	5	Torrance	Crenshaw Station	Torrance Airport - Crenshaw Station via Van Ness Ave	Crenshaw Station
Torrance Transit	6	Del Amo Fashion	Artesia A Line Station	Torrance - Artesia via 190th Street	No
Torrance Transit	8	Torrance	LAX	Torrance Airport - LAX via Hawthorne Blvd & Artesia Blvd	Mariposa Station
Torrance Transit	10	Torrance	Inglewood	Torrance Airport - Hawthorne Airport via Crenshaw Blvd	Crenshaw Station
Torrance Transit	13	Redondo Beach	Artesia Station	Redondo Beach - Artesia Station via Artesia Bl	No
Beach Cities Transit	102	Redondo Beach	Redondo Beach Station	Redondo Beach - Redondo Beach Station via SB Galleria	Redondo Beach Station
Gtrans (Gardena)	3	Redondo	Compton A Line Station	Redondo - Compton via Hawthorne Blvd & Redondo Beach Blvd	None

4.1 METRO ROW ALIGNMENT

For Metro ROW Alignments (Elevated/Street Level and Trench Option), many bus routes currently serve the South Bay Galleria and therefore any detour into the new Redondo Beach TC on Kingsdale Avenue would have a relatively minor effect on the route. This analysis assumes that all bus routes currently serving the South Bay Galleria would add a stop at the Redondo Beach TC by making the most direct path to Kingsdale Avenue (either turning off Artesia Boulevard or turning from Hawthorne Boulevard

onto 179th Street or 182nd Street to Kingsdale Avenue). For the purpose of the C Line Extension analysis, the following routes are assumed to detour into the Redondo Beach TC Station:

- Metro Line 40
- Metro Line 210
- Metro Line 211/215
- Metro Line 344
- Torrance Line 2
- Torrance Line 8
- Beach Cities Line 102
- Gtrans Line 3

The Torrance TC on Crenshaw Boulevard is currently only passed by Torrance Transit Line 10, which is assumed to serve the station directly. For the purpose of the C Line Extension analysis, the following routes are also assumed to detour into the Torrance TC Station:

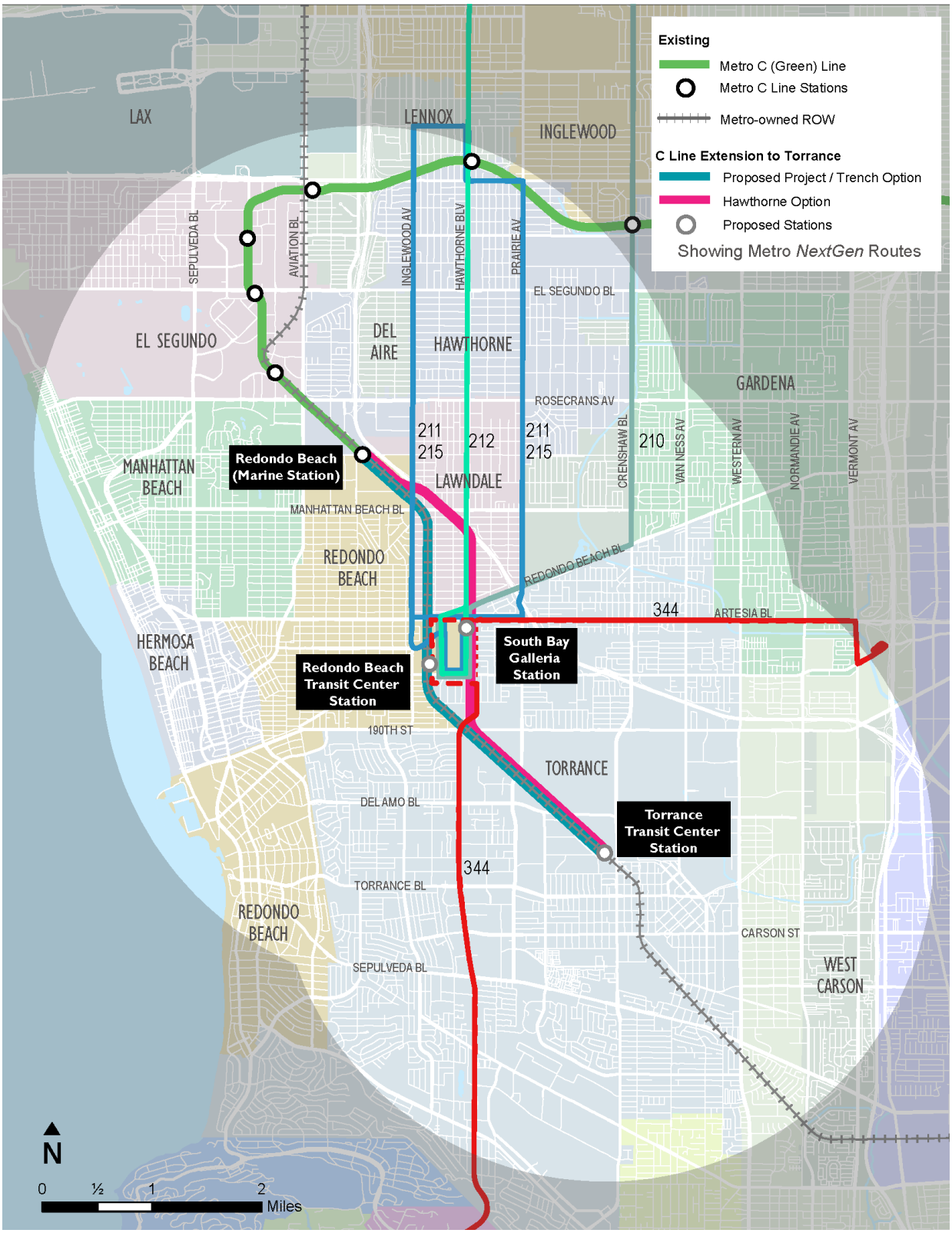
- Torrance Line 4X
- Torrance Line 5
- Torrance Line 6

4.2 HAWTHORNE OPTION

Under the Hawthorne Option, the bus re-routing assumptions are the same for the Torrance TC, and generally similar and simpler for the proposed South Bay Galleria Station. Because most bus routes currently serve the South Bay Galleria itself with a stop at or near the intersection of Artesia Boulevard, no detours are required. It is assumed most routes would also serve the Redondo Beach TC itself as a key turn-around and layover for the many routes that terminate in the area.

Maps illustrating the key Metro and Torrance Transit routes, and the conceptual detours, are shown below in Figure 4-1 and Figure 4-2.

Figure 4-1. Metro Routes (2021) Near Proposed Stations



Source: Fehr & Peers, 2022

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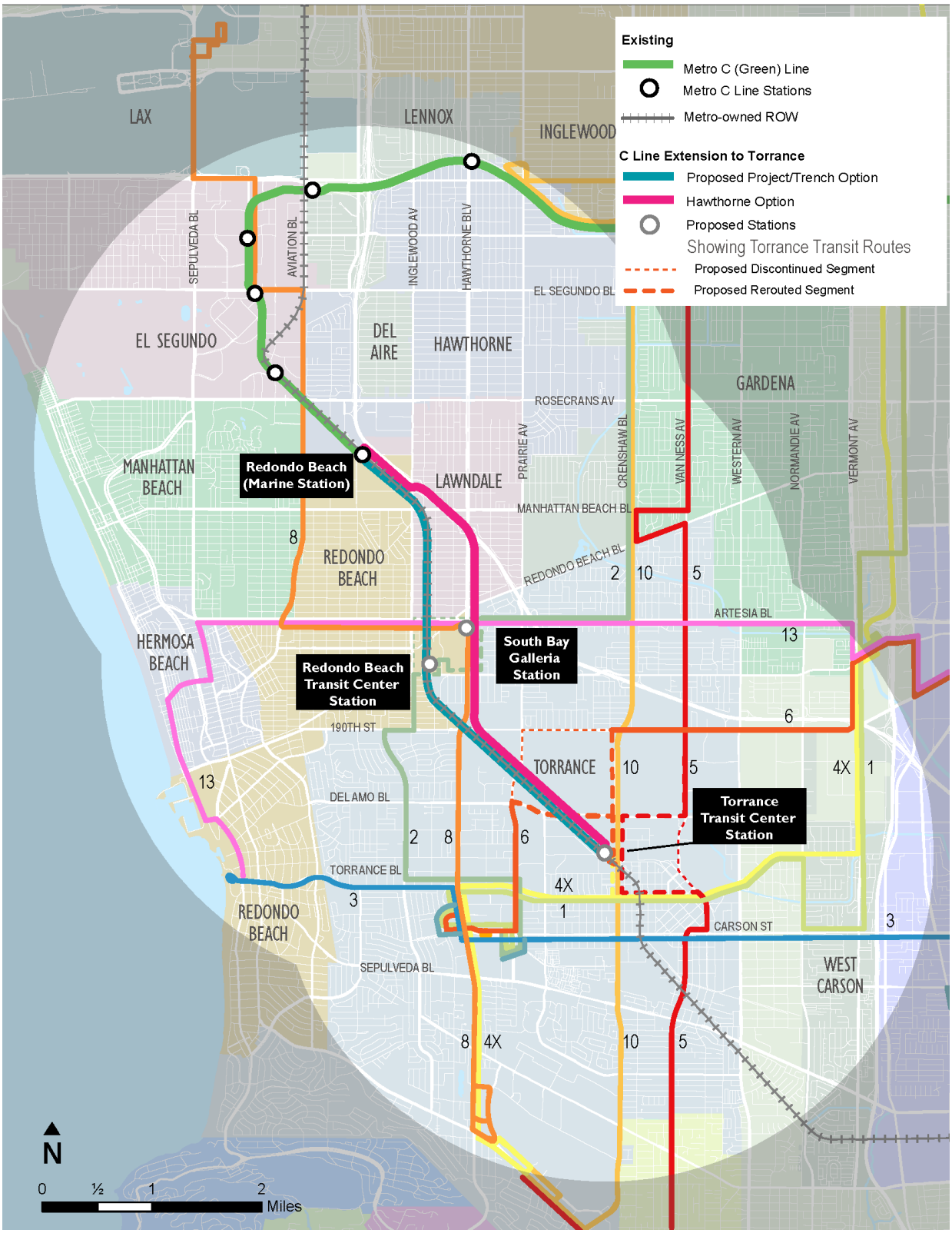
Figure 4-2. Torrance Transit Routes (2021) Near Proposed Stations



Source: Fehr & Peers, 2022

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5 TRAFFIC OPERATIONS ANALYSIS

In addition to evaluating and refining the project design to address the safety and pedestrian and bicycle accessibility, traffic operations analysis remains a key aspect informing the design and feasibility of the Metro ROW Alignment, Trench Option, and Hawthorne Option. Although traffic delay is no longer a valid criterion for CEQA impacts, this report describes the estimated future conditions without the Project and analyzes the Project's effects on intersection delay and intersection queues.

5.1 METHODOLOGY

The traffic operations study commenced in 2020 during the advance conceptual engineering phase, with a 2042 Design Year analysis. This section summarizes the traffic data methodology, which used a blend of actual count data from prior to 2020 and estimates where count data were not available, and the analysis methodology. The analysis scenarios include:

- Baseline (2019), which estimates traffic, transit, and pedestrian conditions as they were prior to the COVID-19 pandemic.
- Design Year (2042) No-Project, which estimates future traffic conditions without the Project.
- Design Year (2042) with Project, including modeling of the light rail operations assuming the maximum (i.e., peak) design frequency of 5-minute headways between trains in each direction, as well as vehicular traffic accessing the proposed stations.
- Design Year (2042) with Hawthorne Option, including vehicular traffic accessing the proposed stations. This Option does not include any light rail modeling as the entire alignment would be grade-separated through the study area.

As noted in Section 2.2, a traffic operations analysis for the Trench Option is not provided, as the full length of the alignment would be entirely grade-separated and therefore traffic conditions would be similar to the Design Year (2042) No-Build.

5.1-1 Transportation Data

Vehicle Volumes (Turning Movement Counts)

Existing turning movement counts were estimated using cellular device data (StreetLight Data) from fall of 2019 and calibrated using historical count data where available. The use of historic data for the preliminary analysis was necessary due to the ongoing COVID-19 pandemic which made gathering new counts impractical, as they would substantially under-represent pre-pandemic traffic volumes. The application of similar data collection methods has been proposed on a variety of freeway projects in California including the I-15 Express Lanes Project in San Bernardino County and the SR-239 Project in Contra Costa, Alameda, and San Joaquin Counties. Historical count data was available at all of the signalized intersections along SR-107 (Hawthorne Boulevard).

Extensive testing of this data collection methodology is documented in a white paper titled *A Transformative Data Collection Solution (Fehr & Peers, 2020)*. Nearly 90 percent of the intersections in the sample had counts that fell within the reasonableness range based on the StreetLight estimates. The reasonableness range included locations where the count was within two standard deviations of the StreetLight estimate (almost 70 percent) or over-estimated the count in a consistent and repeatable manner across the sample, such that it could be corrected with calibration adjustments.

In order to develop a local calibration factor for the StreetLight data, historical average daily traffic and turning movement counts collected were collected. The study intersections are shown in Figure 5-1. Historical turning movement counts were available at seventeen of the thirty-four study intersections, including all of the signalized intersections except the intersection of Kingsdale Avenue & Target Driveway/South Bay Galleria Driveway (intersection 22). Historical turning movement counts are provided in Appendix B. Turning movement counts were developed using the methodology described:

1. StreetLight Data was first used to estimate the relative turning movement volumes at study intersections where historical counts were not available for the morning (AM) and evening (PM) peak hour. Streetlight Data turning movement counts were locally calibrated using average daily traffic collected for the South Bay Galleria redevelopment project along major corridors within the study area.
2. Streetlight Data is provided by hour increments beginning on the hour (i.e., 7:00 – 8:00 AM or 8:00 – 9:00 AM as opposed to 7:15 – 8:15 AM). An adjustment factor was applied to the Streetlight Data turning movement counts to scale the Streetlight Data to the peak hour derived from the historical counts.
3. All of the turning movement counts, both historical and estimated, were rounded to the nearest 10 and balanced along the corridor for use in the microsimulation model.

Existing Year (2019) peak hour traffic counts are provided in Appendix B. Roadway geometries at the proposed grade crossings were collected from field observation in fall of 2020.

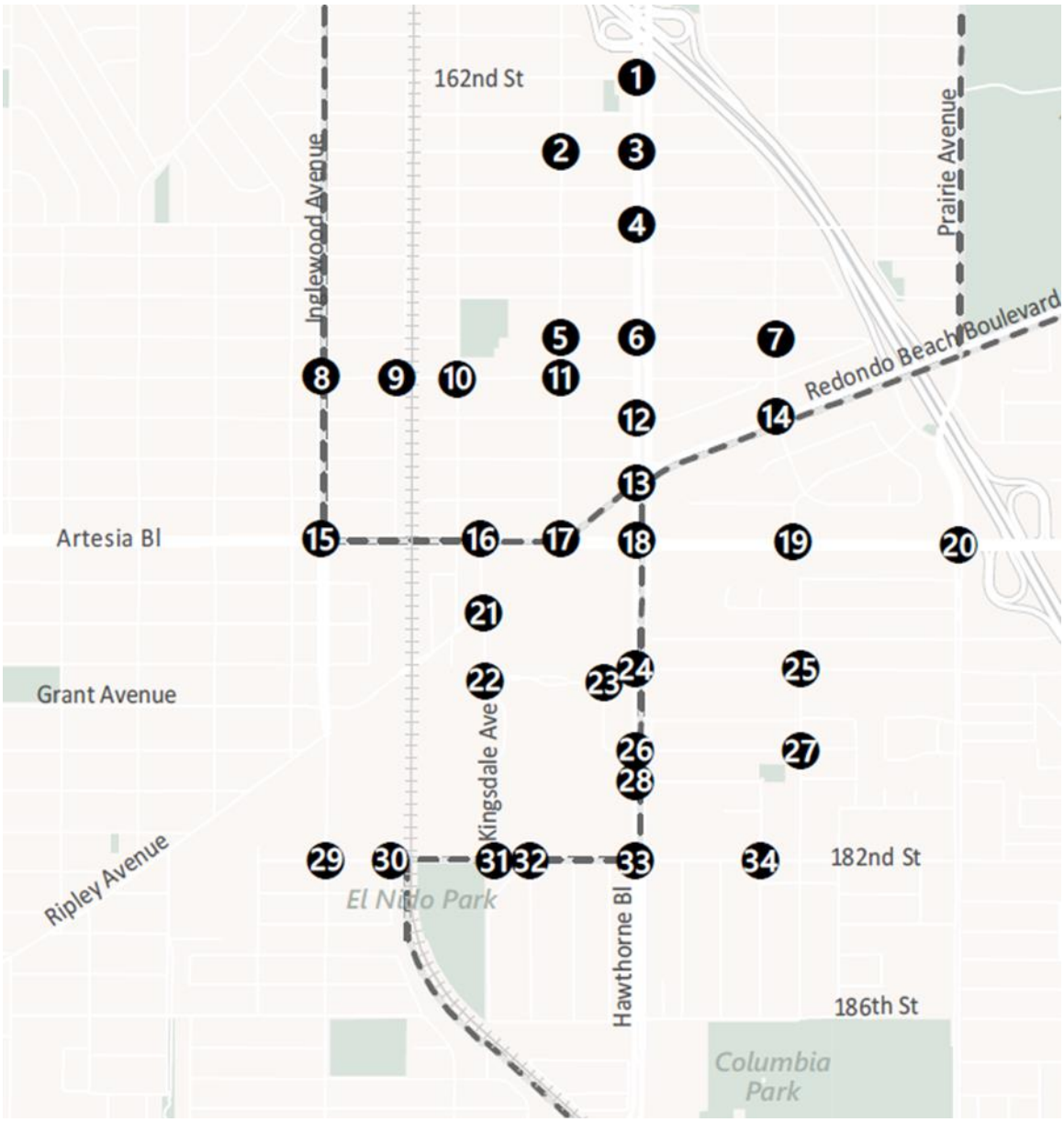
Traffic Signal Timings

Traffic signal timings were provided by local agencies including Caltrans, Los Angeles County, City of Lawndale, and City of Torrance. The City of Redondo Beach did not provide signal timings, so those intersection timings were estimated based on observations in the field (Intersections 21, 22, and 29).

Multimodal Count Data

Bus routes, departure times, and stops were incorporated into the model using pre-COVID-19 schedules. Pedestrian activity was estimated based on the count data available and field observation.

Figure 5-1. Study Intersections in the Microsimulation Model



Source: Fehr & Peers, 2022

5.1-2 Analytical Methods

Traffic Forecasting

The Design Year (2042) scenarios assumed an average background traffic growth rate of 0.30% per year based on data from the Metro transit model forecast. In addition, traffic from planned or recently constructed developments including the Torrance TC, Redondo Beach TC, and South Bay Galleria redevelopment projects were added on top of the background traffic growth. Those project-related trips were assigned separately based on model data (and in the case of the South Bay Galleria, from the transportation operational effect analysis prepared for that project's EIR).

As a part of the Redondo Beach TC and South Bay Galleria redevelopment projects, the northbound approach of Kingsdale Avenue at Artesia Boulevard will be widened to provide two dedicated left-turn lanes and two dedicated right-turn lanes. Peak hour Design Year (2042) No-Build turning movement volumes and intersection geometries are provided in Appendix A[1].

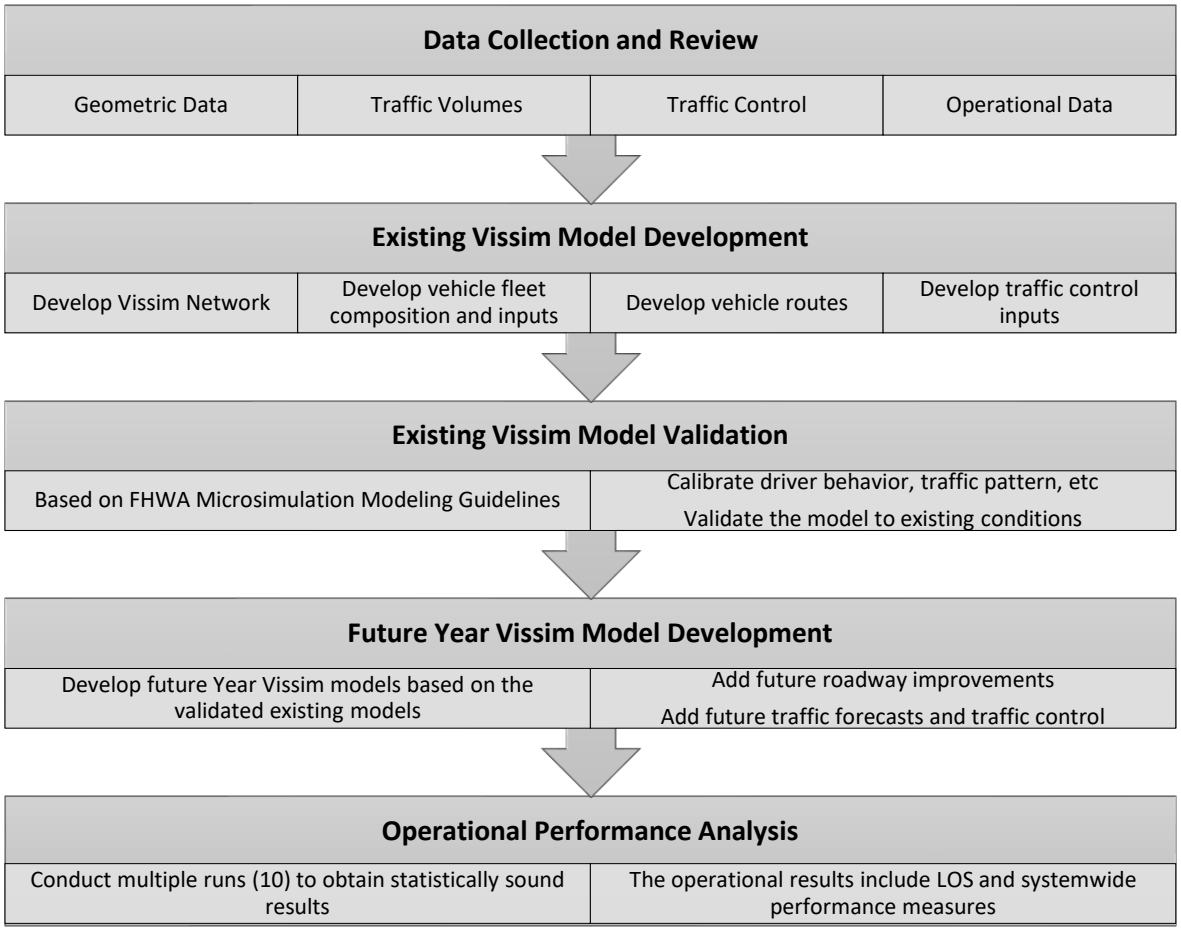
Vehicle trips to the proposed light rail stations picking up and dropping off passengers, based on outputs from the Metro transit model, were distributed within the simulation network and assigned to study intersections. Peak hour Design Year (2042) turning movement counts and intersection geometries are provided in Appendix A.

Simulation Model Development

A traffic simulation model using PTV Vissim was developed for the AM and PM peak hours and includes all of the study intersections shown in Figure 5-1. The simulation models were developed to be consistent with the Highway Capacity Manual, 6th Edition and the FHWA Guidelines for Applying Traffic Microsimulation Modeling Software (2019) using the flow chart shown below in Figure 5-2. Existing Vissim models were calibrated to match conditions observed in the field to the extent feasible, which was limited by the travel pattern effects of COVID-19 “safer at home” orders at the time of the initial analysis in 2020.

[1] Appendices are available upon request.

Figure 5-2. Vissim Model Development Flow Chart



Source: Fehr & Peers, 2021

Level of Service

LOS is a qualitative measure used to describe the condition of traffic flow on the road network, ranging from free-flowing conditions at LOS A to heavily congested conditions at LOS F. The Federal Highway Capacity Manual methodology is used to calculate the intersection delay (in seconds) and corresponding LOS letter grade for study intersections. Table 5-1 below summarizes LOS definitions for signalized and unsignalized intersections.

Table 5-1. LOS Definitions

Level of Service	Signalized Intersection Average Control Delay (seconds/vehicle)	Unsignalized Intersection Average Control Delay	General Description
A	≤ 10.0	< 10.0	Free Flow
B	> 10.0 and ≤ 20.0	> 10.0 and ≤ 15.0	Stable Flow (slight delays)
C	> 20.0 and ≤ 35.0	> 15.0 and ≤ 25.0	Stable Flow (acceptable delays)
D	> 35.0 and ≤ 55.0	> 25.0 and ≤ 35.0	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	> 55.0 and ≤ 80.0	> 35.0 and ≤ 50.0	Unstable flow (intolerable delay)
F	> 80.0	> 50.0	Forced flow (congested and queues fail to clear)

Study intersections were evaluated under the Existing (2019), Design Year (2042) No-Build, and Design Year (2042) With Project scenarios. LOS qualitatively describes the efficiency of an intersection, while queue length results measure how far back a line of vehicles may be while waiting to proceed through an intersection. Queue lengths are helpful in evaluating whether one intersection is affecting another (queue length extends all the way back to the prior, or upstream, intersection), or for understanding when a left or right turn lane may experience queues longer than there is space for.

Each scenario presents a table of maximum queue length results from the microsimulation model for each controlled (stop sign or signal) approach affected by the Project. Appendix C presents Vissim output worksheets, which include maximum queues for all movements, including both those included in Table 2, as well as the movements that are not included in the Table. The maximum queues were calculated by averaging the maximum queue reported by Vissim for each of the 10 selected simulation model runs and rounded up to the nearest 25 feet[2]. **The maximum queue represents the worst condition over the peak hour but is not necessarily observed during every signal cycle.** During the development of the simulation, adjustments to signal timing are made to reduce the potential that a queue exceeds storage length for most or all of the hour.

[2] The Vissim software does not report 85th percentile queues (an imputed estimate typically reported by Synchro/Simtraffic software), and average queues reported in Vissim would consider the queue length for each movement for every time-step, even when there are no queues (such as when a movement has the green phase).

5.2 SIMULATION MODEL RESULTS

5.2-1 Metro ROW Alignment Project Traffic Operations Results

The intersection operations analysis examines LOS and queuing at the study intersections adjacent to the proposed at-grade crossing locations (170th Street and 182nd Street):

- #8: Inglewood Avenue & 170th Street
- #9: Condon Avenue & 170th Street
- #10: Firmona Avenue & 170th Street
- #29: Inglewood Avenue & 182nd Street (signal)
- #30: Firmona Avenue & 182nd Street
- #31: Kingsdale Avenue & 182nd Street

Table 5-2 shows the queue lengths from the simulation results. Table 5-3 presents intersection operations results including the average intersection delay and the LOS letter grade. As shown in the tables, the maximum queues would not exceed the storage length at any of the intersections under both Design Year No-Build and Design Year with Project.

Table 5-2. Vehicle Queue Lengths – Metro ROW Alignment

Intersection		Approach	Movement	Storage Length (feet)	Peak Hour	Maximum Queue (ft.)		
						2019 Existing	2042 No-Build	2042 w/ Project
*	Existing At-Grade Crossing Midblock on 170th Street east of Condon Avenue	EB	TH	675	AM	-	-	150
					PM	-	-	225
		WB	TH	325	AM	-	-	125
					PM	-	-	125
8	Inglewood Avenue & 170th Street	WB	LT/TH/RT	675	AM	150	150	200
					PM	150	200	225
9	Condon Avenue & 170th Street	NB	LT/TH/RT	300	AM	75	75	75
					PM	100	100	75
		SB	LT/TH/RT	300	AM	75	75	75
					PM	75	75	100
10	Firmona Avenue & 170th Street	EB	LT/TH/RT	325	AM	175	200	200
					PM	225	250	250
*	Existing At-Grade Crossing Midblock on 182nd Street east of Firmona Avenue	EB	TH	625	AM	-	-	125
					PM	-	-	150
		WB	TH	600	AM	-	-	125
					PM	-	-	125
29	Inglewood Avenue & 182nd Street	WB	LT/TH	625	AM	375	575	625
					PM	300	350	375
			RT	275	AM	150	175	150
					PM	125	125	125
31	Kingsdale Avenue & 182nd Street	EB	LT/TH	600	AM	225	300	350
					PM	275	400	400

Source: Fehr & Peers, 2021

* Existing freight at-grade crossings of the Metro ROW with east-west streets, which have no queue results without the Project because the freight service is limited and sporadic (approximately one to two trains per day); no freight train crossings were assumed during the peak hours.

Intersection 30 is uncontrolled.

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

LT = Left-turn movement, TH = Through movement, RT = Right-turn movement

Table 5-3. Intersection Operations – Metro ROW Alignment

ID	Intersection	Control	Peak Hour	2019 Existing		2042 No-Build		2042 w/ Project	
				Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
8	Inglewood Avenue & 170th Street	SSSC[1]	AM	2 (29)	A (D)	2 (32)	A (D)	2 (34)	A (D)
			PM	2 (41)	A (E)	**47 (83)**	**E (F)**	**41 (71)**	**E (F)**
9	Condon Avenue & 170th Street	SSSC	AM	2 (9)	A (A)	2 (10)	A (B)	6 (17)	A (C)
			PM	2 (14)	A (B)	2 (11)	A (B)	7 (18)	A (C)
10	Firmona Avenue & 170th Street	AWSC	AM	12	B	12	B	12	B
			PM	12	B	13	B	12	B
29	Inglewood Avenue & 182nd Street	Signal	AM	21	C	26	C	28	C
			PM	25	C	51	D	49	D
30	Firmona Avenue & 182nd Street	None[2]	AM	0 (1)	A (A)	2 (3)	A (A)	5 (8)	A (A)
			PM	0 (1)	A (A)	0 (1)	A (A)	3 (5)	A (A)
31	Kingsdale Avenue & 182nd Street	AWSC	AM	12	B	16	C	18	C
			PM	14	B	19	C	27	D

Source: Fehr & Peers, 2021
Bold text indicates level of service E or F.
SSSC = Side-Street Stop Control; AWSC = All-Way Stop Control.
[1]SSSC delay results are presented as: Average Delay (Worst Observed Delay)
[2]The intersection of Firmona Avenue & 182nd Street is 180 feet west of the at-grade railroad crossing. Firmona Avenue (a north-south street) only allows right turns into the street from 182nd Street and no turns from Firmona Avenue onto 182nd Street. Therefore, delay at this intersection only occurs when the railroad crossing is occupied, and will otherwise be near-zero.

5.2-2 Hawthorne Option Traffic Operations Results

Under the Hawthorne Option with the light rail on an elevated structure, the operation of the train itself does not affect traffic operations. However, the modifications to intersections (described in detail in Section 2.3) affect turn lane alignments, storage lengths (for cars queuing), and signal operations. There are also new traffic signals and one intersection closure. A summary of the major changes to the network include:

- Signalization of the intersection of Hawthorne Boulevard and 164th Street.
- Modification to left turn lanes on Hawthorne Boulevard from 164th Street through 182nd Street.
- Reduction of the northbound left turn pocket on Hawthorne Boulevard at 177th Street from two to one.
- Signalization of the intersection of Hawthorne Boulevard and 179th Street and extension of the northbound left turn pocket to accommodate additional vehicles.
- Closure of the median at Hawthorne Boulevard and 180th Street to prevent unsafe left tuns, which would permanently detour to 179th Street (northbound) or 182nd Street (southbound) to reverse direction.

Table 5-4 presents the queueing results from the simulation analysis. Table 5-5 presents the intersection level of service analysis. As the tables show, the maximum queues would exceed the storage length at

several intersections under both Design Year (2042) No-Build and Design Year (2042) With Hawthorne Option conditions. This is primarily due to the growth in No-Build traffic volumes.

There are some locations, notably at Hawthorne Boulevard and 179th Street, where queues increase significantly as a result of the Hawthorne Option. In this case, the closure of the median at 180th Street causes some northbound left turn volumes to divert to 179th Street, which becomes a signalized intersection. This preliminary analysis finds that the proposed configuration is capable of handling the diverted traffic, although additional work would be required to fine-tune the traffic signal timing within the signal timing progression on Hawthorne Boulevard. The final design and timing could be adjusted to further reduce queues and improve the LOS. Likewise, the detoured traffic that would normally make a southbound left from Hawthorne Boulevard onto 180th Street would continue to 182nd Street and turn left or make a U-turn. This increase in turning traffic during the PM peak hour worsens the LOS at 182nd Street, although further adjustments to signal timing could alleviate the effect.

Table 5-4. Vehicle Queue Lengths – Hawthorne Option

Intersection		Approach	Movement	Storage Length (ft.)	Peak Hour	Maximum Queue (ft.)		
						2019 Existing	2042 No-Build	2042 Hawthorne Option
4	Hawthorne Boulevard & 166th Street	NB	LT	325	AM	200	250	225
					PM	75	75	100
		SB	LT	375	AM	75	75	100
					PM	150	150	175
5	Grevillea Avenue & 169th Street	WB	LT/RT	550	AM	100	75	75
					PM	175	175	175
6	Hawthorne Boulevard & 169th Street	NB	LT	225	AM	175	200	175
					PM	225	225	**250**
		SB	LT	225	AM	150	175	175
					PM	200	200	200
7	Freeman Avenue & 169th Street	EB	LT/TH/RT	1000	AM	150	175	175
					PM	200	200	225
13	Hawthorne Boulevard & Redondo Beach Boulevard	NB	LT	225	AM	100	125	125
					PM	175	150	**250**
		SB	LT	275/310[1]	AM	125	125	125
					PM	150	150	175
14	Freeman Avenue/Amie Avenue & Redondo Beach Boulevard	EB	LT	100	AM	100	100	125
					PM	150	150	125
			TH/RT	1100	AM	125	125	125
					PM	175	150	175
17	Grevillea Ave/ Redondo Beach Blvd & Artesia Blvd	WB	TH/RT	450	AM	50	50	50
					PM	75	75	75
		SWB	TH/RT	625	AM	200	275	250
					PM	350	300	325

Intersection		Approach	Movement	Storage Length (ft.)	Peak Hour	Maximum Queue (ft.)		
						2019 Existing	2042 No-Build	2042 Hawthorne Option
18	Hawthorne Blvd & Artesia Blvd	NB	LT	200/400[1]	AM	150	325	**425**
					PM	400	**525**	**750**
		SB	LT	200/300[1]	AM	150	125	150
					PM	150	175	175
20	Prairie Ave & Artesia Blvd	EB	LT	225	AM	125	150	150
					PM	**300**	**425**	**400**
24	Hawthorne Blvd & 177th St	NB	LT	300/200[1]	AM	75	100	125
					PM	150	175	**475**
		SB	LT	200	AM	75	150	125
					PM	200	**250**	175
25	Amie Ave & 177th St	EB	LT/TH/RT	1250	AM	75	75	75
					PM	150	175	150
26	Hawthorne Blvd & 179th St	NB	LT	125/200[1]	AM	75	75	**350**
					PM	175	175	**900**
31	Kingsdale Ave & 182nd St	WB	TH	1100	AM	450	525	500
					PM	375	400	375
			RT	250	AM	25	50	50
					PM	50	50	50
33	Hawthorne Blvd & 182nd St	NB	LT	175/200[1]	AM	**300**	**300**	**275**
					PM	**625**	**675**	**575**
		SB	LT	200/225[1]	AM	**225**	**250**	**675**
					PM	**1025**	**1050**	**975**
40	Hawthorne Boulevard & 186th Street	NB	LT	160	AM	100	150	125
					PM	150	**200**	**225**
		SB	LT	190	AM	150	150	150
					PM	150	175	150

Source: Fehr & Peers, 2022

Bold text indicates that the maximum queue exceeds the available storage.

[1]Storage Length under Existing Conditions and 2042 No-Build/Storage Length under 2042 With Project.

Southbound queue is measured to the upstream adjacent signalized intersection. A signal is constructed under 2042 With Project at the intersection of Hawthorne Boulevard and 179th Street, hence why the southbound queue length decreases between No-Build and Build conditions.

Table 5-5. Intersection Level of Service – Hawthorne Option

				Baseline (2019)		2042 No Build		2042 with Hawthorne Option	
#	Intersection	Control	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Avg Delay	LOS
1	Hawthorne Blvd/162nd St	Signal	AM	15.8	B	15.6	B	14.0	B
			PM	13.4	B	13.8	B	18.8	B
2	Grevillea Ave/164th St	AWSC	AM	16.0	C	28.9	D	33.3	D
			PM	2.5	A	3.0	A	2.7	A
3	Hawthorne Blvd/164th St	SSSC/ Signal (w/ Project)	AM	58.4	**F**	**>100**	**F**	16.0	B
			PM	**50.4**	**F**	**58.9**	**F**	27.7	C
4	Hawthorne Blvd/166th St	Signal	AM	15.6	B	18.4	B	16.8	B
			PM	13.8	B	13.5	B	38.3	D
5	Grevillea Ave/169th St	SSSC	AM	15.0	B	13.5	B	14.2	B
			PM	17.8	C	20.8	C	17.1	C
6	Hawthorne Blvd/169th St	Signal	AM	19.7	B	19.2	B	17.1	B
			PM	16.1	B	15.4	B	47.9	D
7	Freeman Ave/169th St	SSSC	AM	10.9	B	10.4	B	12.0	B
			PM	14.9	B	13.9	B	17.5	C
8	Inglewood Ave/170th St	SSSC	AM	33.8	D	34.9	D	34.2	D
			PM	**38.9**	**E**	**70.6**	**F**	**97.0**	**F**
9	Condon Ave/170th St	SSSC	AM	10.4	B	10.4	B	10.4	B
			PM	10.6	B	10.9	B	11.2	B
10	Firmona Ave/170th St	AWSC	AM	10.2	B	12.3	B	12.7	B
			PM	12.0	B	11.6	B	12.4	B
11	Grevillea St/170th St	AWSC	AM	7.6	A	7.7	A	7.7	A
			PM	8.0	A	8.5	A	11.5	B
12	Hawthorne Blvd/171st St	SSSC	AM	22.9	C	28.9	D	29.5	D
			PM	23.7	C	27.1	D	**79.8**	**F**
13	Hawthorne Blvd/Redondo Beach Blvd	Signal	AM	29.8	C	36.5	D	31.0	C
			PM	33.4	C	47.1	D	**65.3**	**E**
14	Freeman Avenue/Redondo Beach Blvd	Signal	AM	9.8	A	10.8	B	10.7	B
			PM	11.0	B	12.1	B	12.5	B
15	Inglewood Avenue/Artesia Blvd	Signal	AM	44.0	D	**57.8**	**E**	**61.5**	**E**
			PM	**70.7**	**E**	**>100**	**F**	**>100**	**F**
16	Kingsdale Avenue/Artesia Blvd	Signal	AM	13.7	B	14.6	B	14.8	B
			PM	20.3	C	19.4	B	20.2	C
17	Grevillea Ave/Artesia Blvd-Redondo Beach Blvd	Signal	AM	26.1	C	28.4	C	27.6	C
			PM	27.9	C	32.8	C	40.8	D

				Baseline (2019)		2042 No Build		2042 with Hawthorne Option	
#	Intersection	Control	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Avg Delay	LOS
18	Hawthorne Blvd/Artesia Blvd	Signal	AM	34.2	C	42.7	D	46.0	D
			PM	39.2	D	48.1	D	**85.3**	**F**
19	Amie Avenue/Artesia Blvd	SSSC	AM	24.1	C	**40.2**	**E**	**68.8**	**F**
			PM	30.5	D	28.1	D	**>100**	**F**
20	Prairie Blvd/Artesia Blvd	Signal	AM	46.8	D	**72.5**	**E**	**79.5**	**E**
			PM	53.0	D	**94.4**	**F**	**98.1**	**F**
21	Kingsdale Ave/Grant Ave	Signal	AM	16.3	B	17.2	B	17.2	B
			PM	25.7	C	48.2	D	41.0	D
22	Kingsdale Ave/177th St	Signal	AM	10.0	A	16.1	B	15.8	B
			PM	20.1	C	32.7	C	29.7	C
23	Mall Driveway/177th St	SSSC	AM	9.5	A	10.4	B	10.8	B
			PM	19.6	C	20.6	C	**37.1**	**E**
24	Hawthorne Blvd/177th St	Signal	AM	20.4	C	22.0	C	27.9	C
			PM	21.3	C	18.0	B	**71.3**	**E**
25	Amie Avenue/177th St	AWSC	AM	7.8	A	7.5	A	7.4	A
			PM	10.2	B	10.6	B	9.0	A
26	Hawthorne Blvd/179th St	SSSC/ Signal (w Project)	AM	**52.2**	**F**	**50.1**	**F**	27.2	C
			PM	**48.5**	**E**	**87.5**	**F**	39.6	D
27	Amie Avenue/179th St	AWSC	AM	7.7	A	7.7	A	8.0	A
			PM	8.1	A	8.1	A	7.7	A
28	Hawthorne Blvd/180th St	SSSC	AM	**42.7**	**E**	**41.8**	**E**	**46.5**	**E**
			PM	**62.1**	**F**	**96.6**	**F**	**>100**	**F**
29	Inglewood Ave/182nd St	Signal	AM	20.2	C	25.3	C	29.2	C
			PM	25.8	C	**65.8**	**E**	**56.8**	**E**
30	Firmona Ave/182nd St	SSSC	AM	0.6	A	3.1	A	3.9	A
			PM	0.6	A	0.5	A	0.6	A
31	Kingsdale Ave/182nd St	AWSC	AM	13.2	B	14.2	B	14.3	B
			PM	15.3	C	17.6	C	17.3	C
32	Mansel Ave/182nd St	SSSC	AM	16.3	C	16.8	C	15.2	C
			PM	14.2	B	18.0	C	18.3	C
33	Hawthorne Blvd/182nd St	Signal	AM	28.2	C	30.3	C	36.7	D
			PM	52.7	D	**64.9**	**E**	**>100**	**F**
34	Regina Avenue/182nd St	SSSC	AM	12.9	B	12.2	B	13.8	B
			PM	16.0	C	15.3	C	18.7	C
35	Crenshaw Blvd/Del Amo Blvd	Signal	AM	39.1	D	53.9	D	77.9	E
			PM	40.3	D	44.3	D	44.7	D

				Baseline (2019)		2042 No Build		2042 with Hawthorne Option	
#	Intersection	Control	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Avg Delay	LOS
36	Crenshaw Blvd/208th St	Signal	AM	8.0	A	16.8	B	29.7	C
			PM	8.3	A	10.5	B	20.1	C
37	Crenshaw Blvd/Torrance TC	SSSC	AM	N/A		13.3	B	29.2	C
			PM	N/A		4.5	A	9.2	A
38	Crenshaw Blvd/Maricopa St	Signal	AM	23.3	C	19.2	B	13.5	B
			PM	28.3	C	16.2	B	17.8	B
39	Crenshaw Blvd/Torrance Blvd	Signal	AM	41.6	D	41.2	D	41.4	D
			PM	48.5	D	48.2	D	49.3	D
40	Hawthorne Blvd/186th St	Signal	AM	11.0	B	12.1	B	12.1	B
			PM	18.4	B	21.5	C	38.7	D

Source: Fehr & Peers, 2022
Bold text indicates level of service E or F.
SSSC = Side-Street Stop Control; AWSC = All-Way Stop Control.
SSSC results represent the worst controlled movement.