Los Angeles County
Metropolitan Transportation Authority

Project Need and Purpose Report

Metro

Project Need and Purpose Report

January 2023

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Abbreviations/Acronyms

APM.....Automated People Mover

CEQA .....California Environmental Quality Act

EFC.....Equity focus community

EIR .....Environmental Impact Report

GTrans .....Gardena Transit

HFB .....High-Frequency Bus Alternative

LADOT .....Los Angeles Department of Transportation

LAWA.....Los Angeles World Airports

LAX .....Los Angeles International Airport

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

ROW .....Right-of-Way

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

SCAG.....Southern California Association of Governments

TC .....Transit Center

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 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. 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).

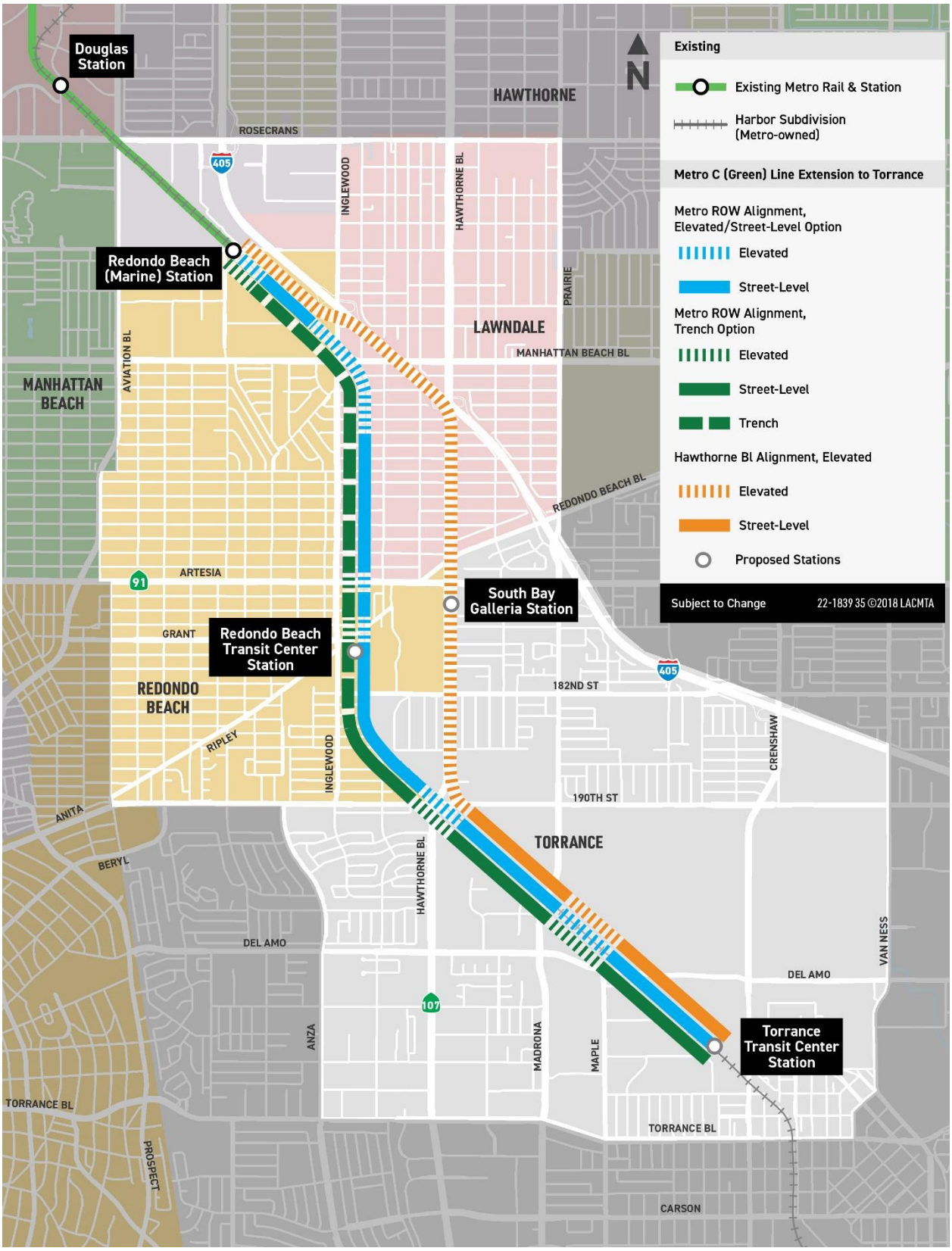
The Draft EIR evaluates three alignments, defined as:

- **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 Transit Center and Torrance Transit Center. This alignment is referred to as the Proposed Project in the Draft EIR as it is the 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.

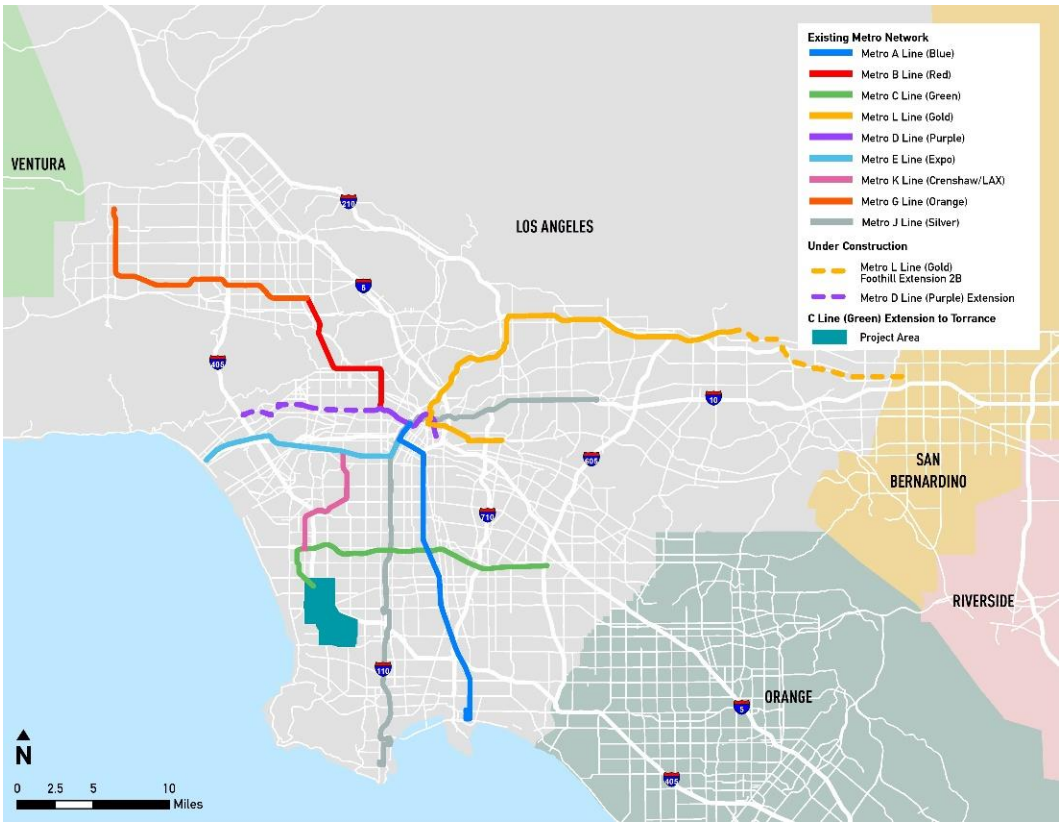
Figure 1-1 shows the three alignments within the Project Area. The boundaries of the Project Area form roughly a one-mile buffer around the Metro ROW, with the borders generally following city limits and/or major roadways. For regional context, Figure 1-2 shows the Project Area within the greater Los Angeles region.

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



Source: Metro, STV, 2022

Figure 1-2. Regional Context



Source: STV, 2022

1.2 REPORT OVERVIEW

This report characterizes the transportation and mobility problems within the Project Area, shown in Figure 1-1, describes the project need, and identifies project objectives to improve these problems.

2 PROJECT AREA OVERVIEW

The Project Area currently faces several interrelated land use and transportation issues. Major arterial roadways are congested throughout much of the day, and congestion is anticipated to worsen under current conditions. Similarly, congestion on Interstate 405 (I-405) will worsen, limiting convenient travel between the South Bay and other regions. As a consequence of roadway congestion, bus routes in the South Bay experience slow travel speeds and a high variation in travel times, making transit a less reliable option for riders. There are numerous transit operators in the Project Area, but poor connections between local and regional systems. Many trips require transfers between operators, whose service schedules may not be synced for convenient transfers (see Table 2-6). Additionally, there is a lack of high-quality, frequent transit service that connects to key destinations and employment centers locally and outside the Project Area. A more convenient and reliable connection between the Metro rail system and South Bay communities would reduce transit travel times and provide a viable and reliable alternative to driving.

The main purpose of the Project is to provide a reliable, high-frequency transit service and improve mobility in southwestern Los Angeles County by enhancing the regional transit network in the South Bay. Metro aims to provide more direct connections to regional destinations and between key transit hubs/routes; provide an alternative mode of transportation to congested arterial roadways and

freeways; provide a one-seat ride to key destinations and employment centers such as West Los Angeles, Downtown Los Angeles, and Los Angeles International Airport (LAX); reduce the total travel time to these destinations; improve transit accessibility and connectivity for Project Area residents; enhance transit accessibility through first/last mile improvements and active transportation connections in the Project Area; present opportunities for more integrated transit planning efforts across the South Bay; and encourage a mode shift to transit, reducing air pollution and greenhouse gas emissions.

The following sections describes the existing conditions of the Project Area with particular focus on the corridors to be considered for the alignments described in Section 1.1.

2.1 METRO ROW CHARACTERISTICS

The Metro ROW is between 70 and 100 feet wide throughout most of the Project Area, which would accommodate the addition of two new light rail tracks alongside the existing freight tracks, which would be relocated in some areas. In the south end of the Project Area in the City of Torrance, from approximately 190th Street to Crenshaw Boulevard, the Metro ROW is only approximately 15 feet wide. Within the Project Area, the Metro ROW crosses multiple streets, with eight existing at-grade freight crossings (shown in Figure 2-1), located at Inglewood Avenue, Manhattan Beach Boulevard, 159th Street, 160th Street, 161st Street, 162nd Street, 170th Street, and 182nd Street. The remaining street crossings are grade-separated from the existing freight tracks in the Metro ROW.

2.2 HAWTHORNE BOULEVARD/STATE ROUTE 107

Hawthorne Boulevard, classified as State Route (SR) 107 between the I-405 junction to the north and extending past the Project Area boundary to the south, is a bidirectional arterial that runs north-south through the Cities of Lawndale and Torrance in the Project Area. The width in the Project Area ranges from approximately 112 feet to approximately 150 feet. The segment of Hawthorne Boulevard that lies within the City of Lawndale between Rosecrans Avenue and Redondo Beach Boulevard features three through lanes in each direction (four during peak hours) separated by a center median that includes a mix of left-turn lanes, parking, and landscaping. Within the City of Torrance (south of Redondo Beach Boulevard), Hawthorne Boulevard features four through lanes in each direction with additional left-turn lanes at major intersections, all separated by a landscaped central median.

2.3 PROJECT AREA FREEWAYS / ARTERIALS

The Project Area is served by extensive freeway and arterial roadway systems, as shown in Figure 2-1. I-405 runs north-south through the entire Project Area east of the Metro ROW, SR-91 bisects the Project Area in an east-west direction along Artesia Boulevard, and Hawthorne Boulevard runs north-south through the Project Area in the Cities of Lawndale and Torrance, and parallel to the eastern border of the City of Redondo Beach. Major arterial roadways in the Project Area are generally located one mile apart and include the following:

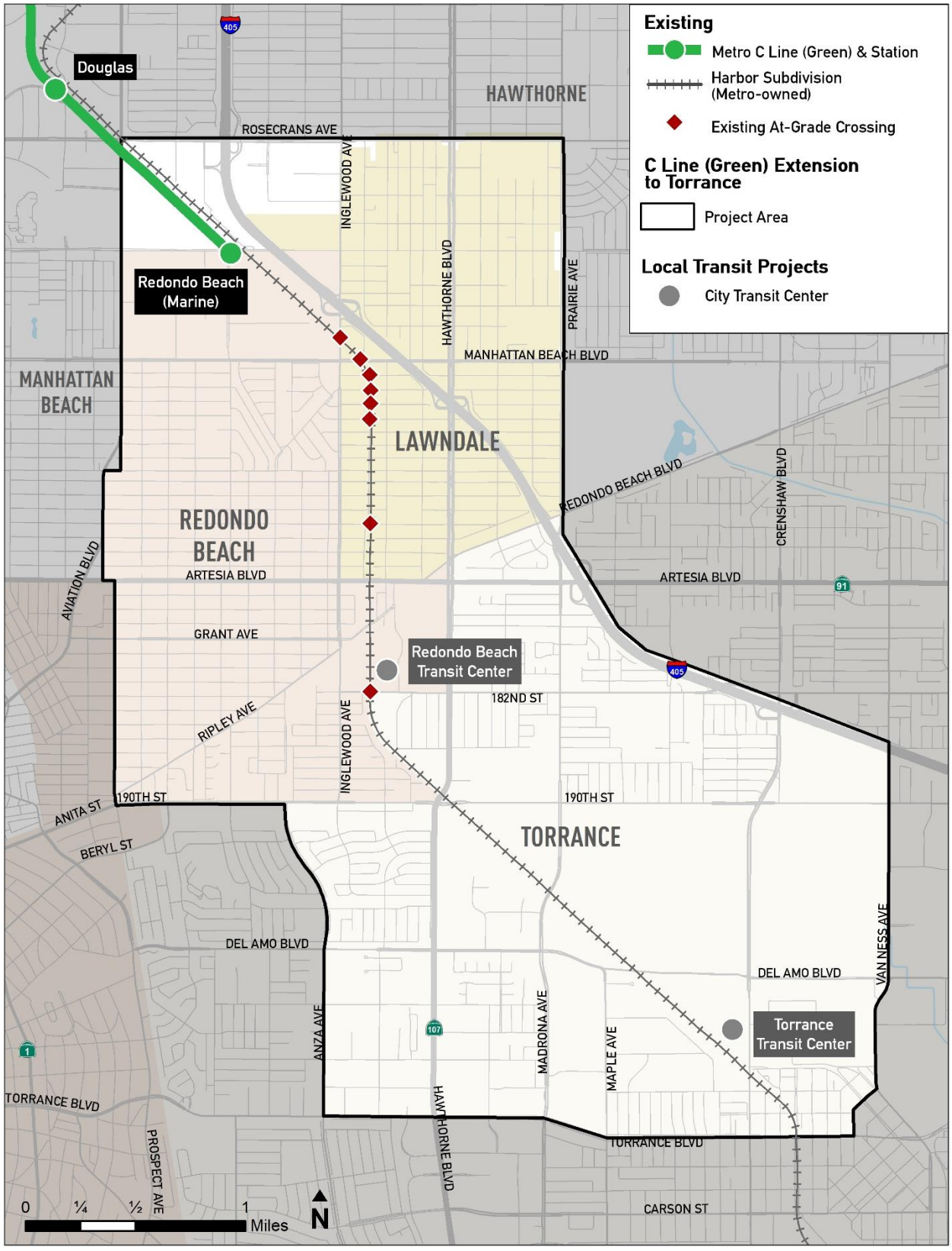
East-West

- Rosecrans Avenue
- Manhattan Beach Boulevard
- Artesia Boulevard
- 190th Street
- Del Amo Boulevard
- Torrance Boulevard

North-South

- Aviation Boulevard
- Inglewood Avenue
- Anza Avenue
- Hawthorne Boulevard
- Prairie Avenue
- Madrona Avenue
- Crenshaw Boulevard
- Van Ness Avenue

Figure 2-1. Existing At-Grade Freight Crossings in Project Area

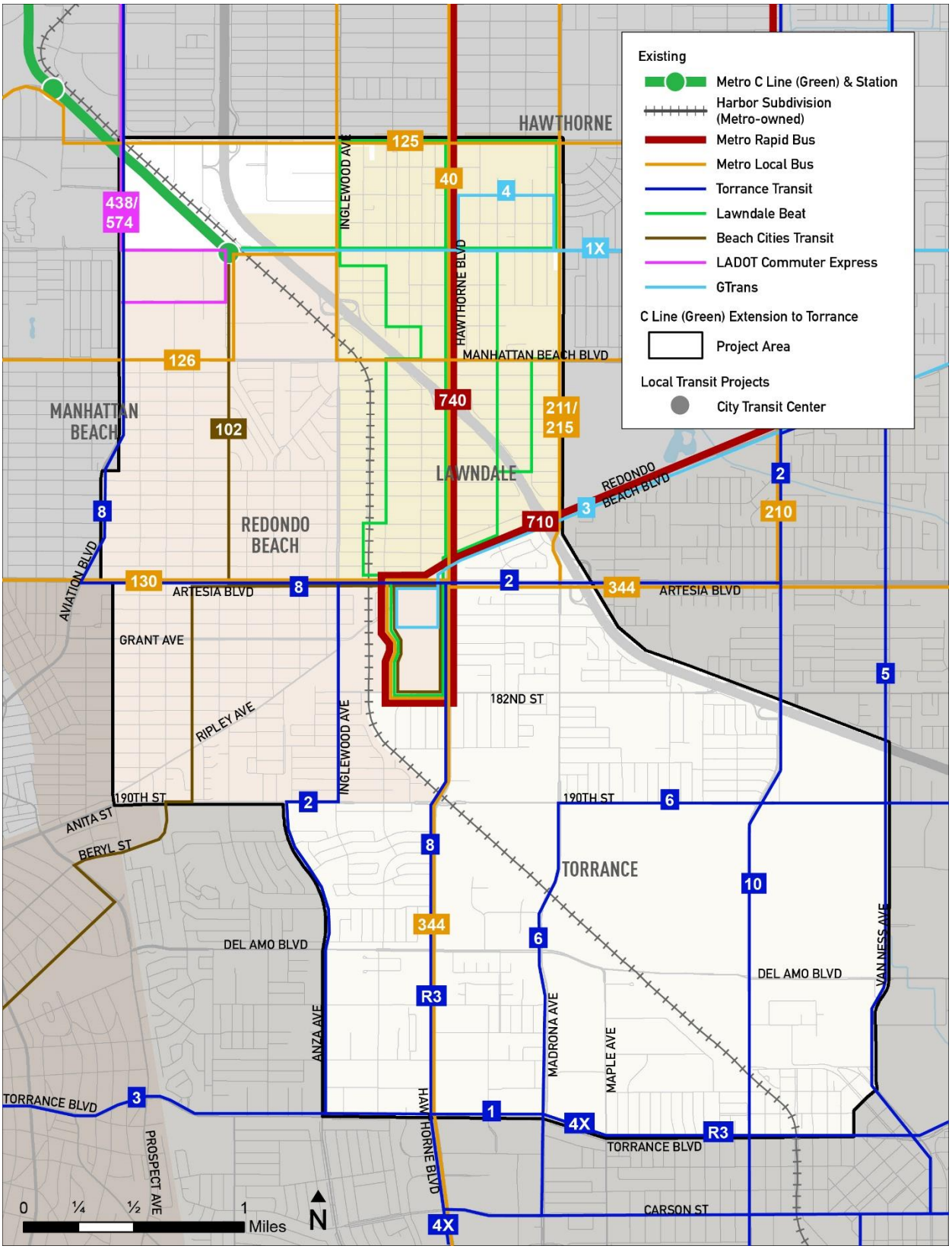


Source: Metro, STV, 2022

2.4 PROJECT AREA TRANSIT NETWORK

Local bus service is the predominant form of transit in the Project Area, with some express and rapid buses offering limited service. Transit service providers within the Project Area include Metro and municipal bus operators, including Beach Cities Transit, Torrance Transit, the Los Angeles Department of Transportation (LADOT), and Gardena Transit (GTrans). Service types provided include rapid, express, limited, and local lines. Community-based shuttle service was previously provided by Lawndale Beat, but it was suspended during the COVID-19 pandemic. Figure 2-2 shows the existing transit service network in the Project Area, and Table 2-1 describes the routes.

Figure 2-2. Project Area – Existing Transit Network



Source: Metro, Municipal Bus Operators, STV, 2022

Table 2-1. Project Study Area Transit Lines and Operators

Transit Agency	Route Number	Service Type	Average Peak Period Headways	Proposed Metro NextGen Peak Period Headways
Metro	40	Late Night	15	10
Metro	120	Local	41	30
Metro	125	Local	27	20
Metro	126	Local	57	*Discontinued*
Metro	130	Local	35	30
Metro	204	Local	13	5
Metro	205	Local	37	30
Metro	206	Local	14	10
Metro	210	Local	21	10
Metro	211	Local	38	40
Metro	212	Local	13	7.5
Metro	215	Local	38	40
Metro	232	Local	22	15
Metro	344	Local	33	30
Metro	460	Express	25	30
Metro	550	Express	36	30
Metro	625	Shuttle	26	*Discontinued*
Metro Rapid	740	Rapid	23	*Discontinued*
Metro Rapid	710	Rapid	17	*Discontinued*
Metro Rapid	754	Rapid	9	10
Metro Micro Pilot LAX/Inglewood Service Area north of El Segundo Bl	N/A	On-Demand Van	N/A	*Not Applicable*
Beach Cities Transit	102	Local	30	*Not Applicable*
Beach Cities Transit	109	Local	45	*Not Applicable*
LADOT Commuter Express	438	Express	13	*Not Applicable*
LADOT Commuter Express	574	Express	32	*Not Applicable*
GTrans (Gardena)	1X	Express	30	*Not Applicable*
Gtrans (Gardena)	2	Local	15	*Not Applicable*
Gtrans (Gardena)	3	Local	15	*Not Applicable*
Gtrans (Gardena)	4	Local	50	*Not Applicable*
Gtrans (Gardena)	5	Local	30	*Not Applicable*
Lawndale Beat[1]	EX	Shuttle	40	*Not Applicable*
Lawndale Beat[1]	RES	Shuttle	50	*Not Applicable*
Torrance Transit	1	Local	40	*Not Applicable*
Torrance Transit	2	Local	64	*Not Applicable*
Torrance Transit	3/Rapid 3	Local	25	*Not Applicable*
Torrance Transit	4X	Express	30	*Not Applicable*
Torrance Transit	5	Local	60	*Not Applicable*
Torrance Transit	6	Local	40	*Not Applicable*
Torrance Transit	7	Local	60	*Not Applicable*
Torrance Transit	8	Local	30	*Not Applicable*
Torrance Transit	9	Local	60	*Not Applicable*
Torrance Transit	10	Local	28	*Not Applicable*

Source: Fehr & Peers, 2022; Transit Service Providers

[1] Lawndale Beat was suspended during the COVID-19 pandemic.

Related transit projects within and near the Project Area include:

- **NextGen Bus Plan:** a reimagining of Metro's current bus system to improve access and service for the region. The NextGen Bus Plan seeks to consolidate rapid and local lines, reconfigure the frequency and stop locations of local lines, and remove underutilized stops and lines.
- **Crenshaw/LAX Transit Project (K Line):** a new light rail line which links the South Bay to LAX, destinations in Inglewood, and Santa Monica and Downtown Los Angeles via the Metro E Line (Expo). Phase 1 of the K Line (Crenshaw) opened this year.
- **LAWA Automated People Mover (APM):** Los Angeles World Airports (LAWA) is constructing an APM, scheduled to open in 2023, which would connect Metro Rail to terminals and other airport facilities.
- **LAX/Metro Transit Center Station:** a planned station on the K Line (Crenshaw), scheduled to open in 2023, which would allow for transfers between Metro Rail and the APM.
- **Redondo Beach TC:** the City of Redondo Beach's new transit center, which would serve as a regional bus hub and potentially connect to the Project.
- **Torrance TC:** the City of Torrance's new transit center, which would link Metro Rail to points beyond its proposed terminus via bus lines.

These projects as well as other related projects within the region are shown in Figure 2-3.

Figure 2-3. Related Projects

Source: Metro, STV, 2020

2.5 COMMUNITY PROFILE

2.5-1 Population and Employment

Table 2-2 and Table 2-3 show the population and employment for 2017 (Metro model data, based on 2016 Southern California Association of Governments (SCAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)) and 2042 (projected) for the Project Area and urban Los Angeles County (excluding the County's sparsely developed mountainous western and northern areas).[1] Figure 2-4 and Figure 2-6 show the population and employment density, respectively, in 2017. As shown in the tables, the Project Area has high population and employment density, with over 104,000 residents and over 54,000 jobs in 2017. Within the Project Area, the Cities of Lawndale and Redondo Beach have 50% more residents than jobs, with jobs mostly clustered around the Redondo Beach (Marine) Station and South Bay Galleria areas. The City of Torrance has about the same number of residents as jobs throughout the Project Area, with employment concentrated around the Del Amo Fashion Center and Old Town Torrance areas.

According to the 2016 SCAG RTP/SCS, population and employment within the Project Area are projected to grow by 7% and 19%, respectively, by 2042 (SCAG, 2016). Figure 2-5 and Figure 2-7 illustrate the projected 2042 population and employment, respectively. Figure 2-8 shows the distribution of population growth projected in the Project Area. The greatest concentrations of growth are located by the Redondo Beach (Marine) Station and South Bay Galleria, as well as directly south of the under-construction Torrance TC. Figure 2-9 shows the distribution of employment growth. Employment growth is concentrated primarily around the South Bay Galleria. The residential and employment densities are currently higher than those of urban Los Angeles County. This, combined with projected rates of growth in the Project Area, suggest an increasing need for mobility options to meet future transportation demand.

Table 2-2. Project Area Population – 2017 and 2042

Area	Area (mi^2)	Year 2017		Year 2042		% Change
		Population	Density (People/ mi^2)	Population	Density (People/mi^2)	
Project Area	10.7	104,233	9,741	111,075	10,381	7%
Urban LA County	1,283	9,381,114	7,312	10,513,126	8,194	12%

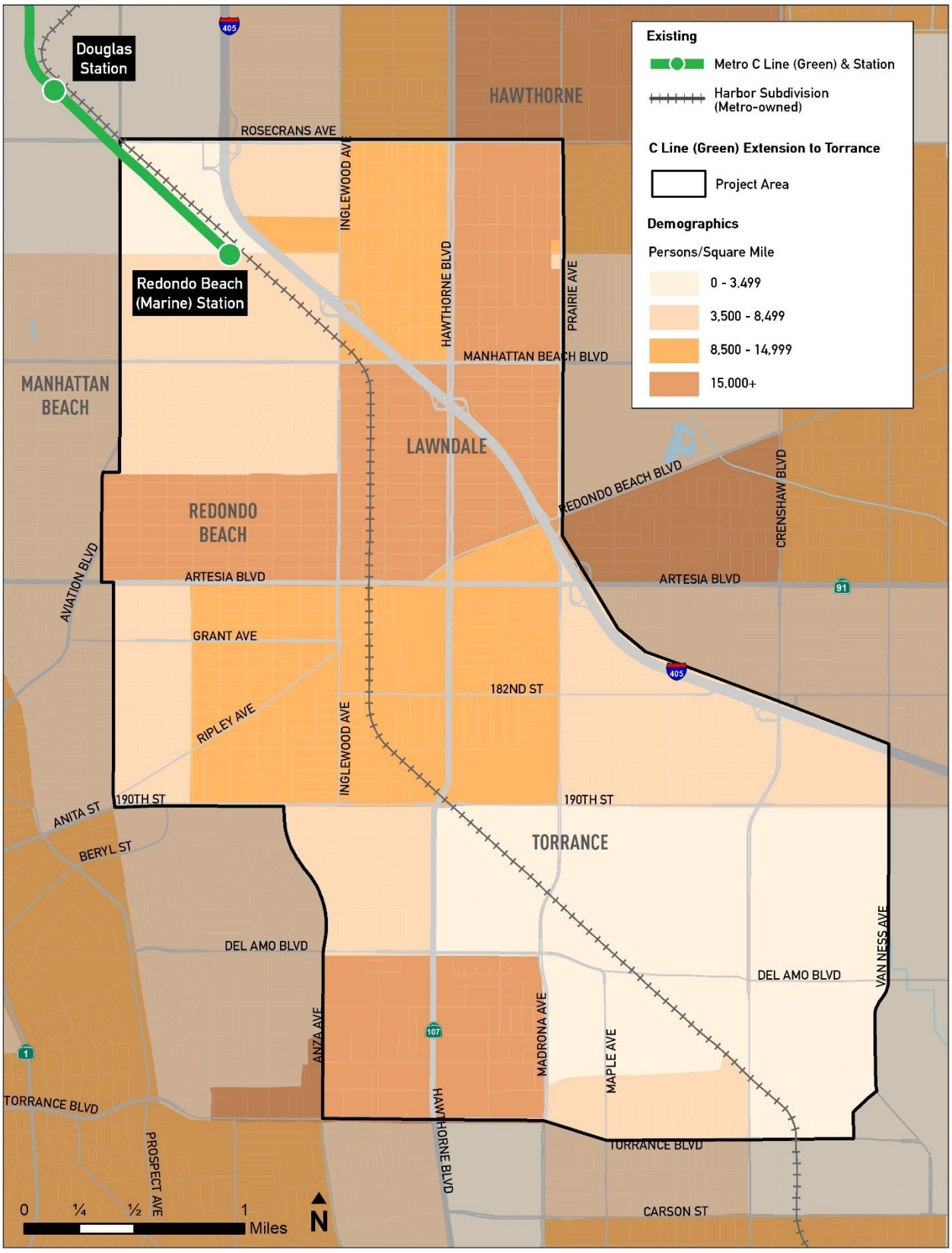
Table 2-3. Project Area Employment – 2017 and 2042

Area	Area (mi^2)	Year 2017		Year 2042		% Change
		Employment	Density (Jobs/mi^2)	Employment	Density (Jobs/mi^2)	
Project Area	10.7	54,590	5,102	64,954	6,070	19%
Urban LA County	1,283	4,101,776	3,197	4,868,757	3,794	19%

Source: Metro, SCAG, AECOM, STV, 2020

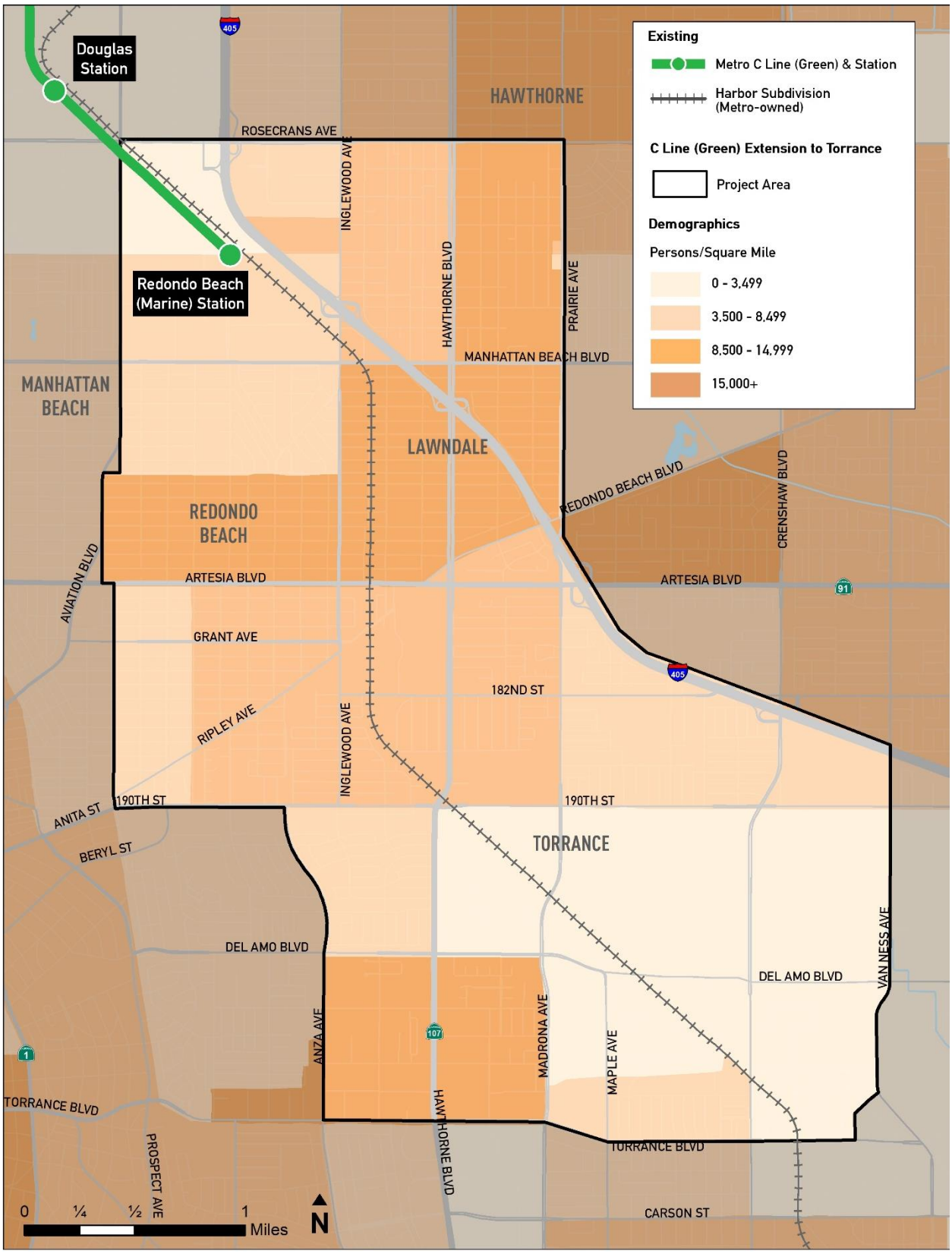
[1] The 2020 SCAG RTP/SCS was not available at the time of preparation of this report; therefore, the Metro ridership model, which is based on the 2016 RTP/SCS, was used. However, the population and employment trends for the cities in the Project Area are similar between the 2016 RTP/SCS and 2020 RTP/SCS.

Figure 2-4. Population Density – 2017



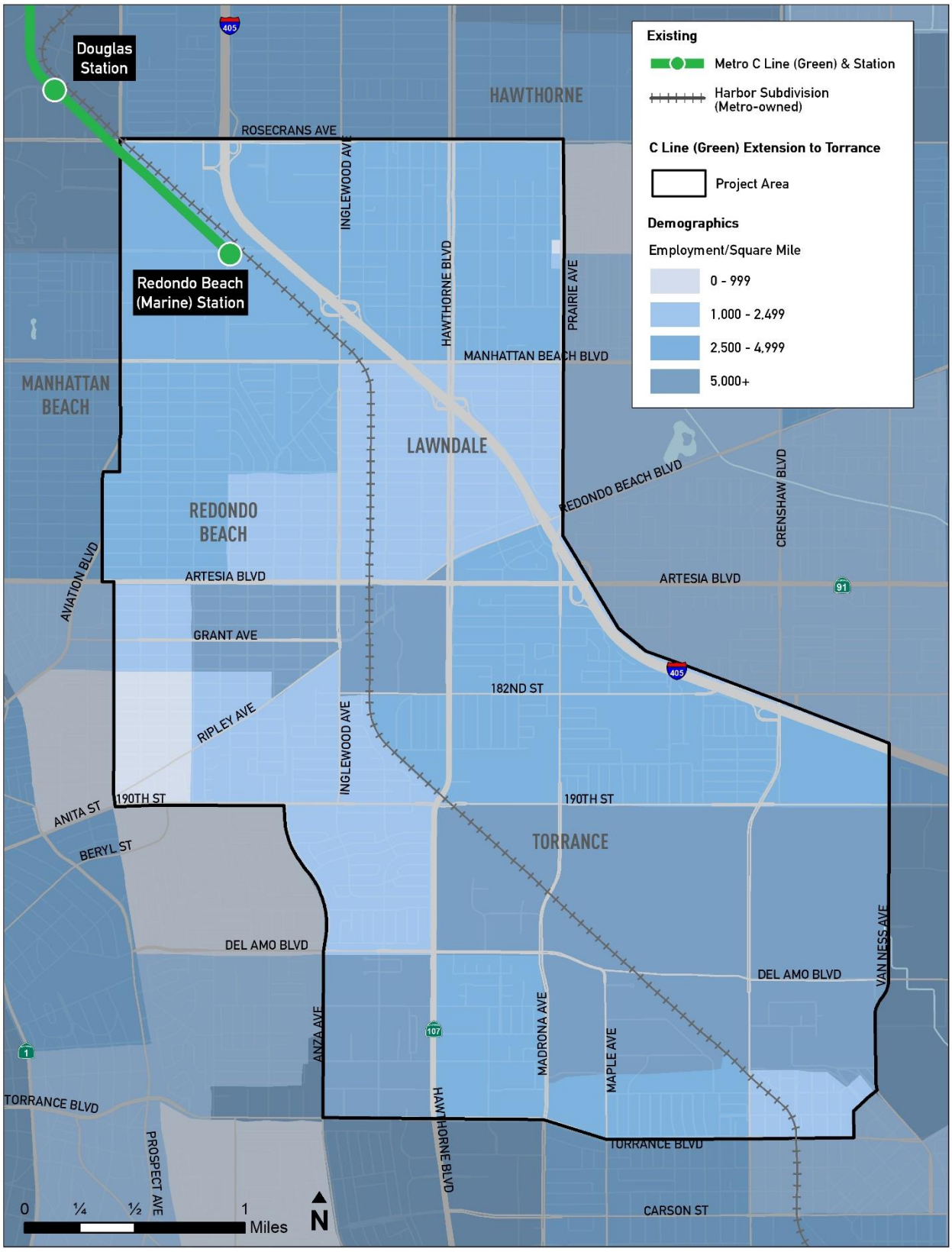
Source: Metro, AECOM, STV, 2020

Figure 2-5. Population Density – 2042



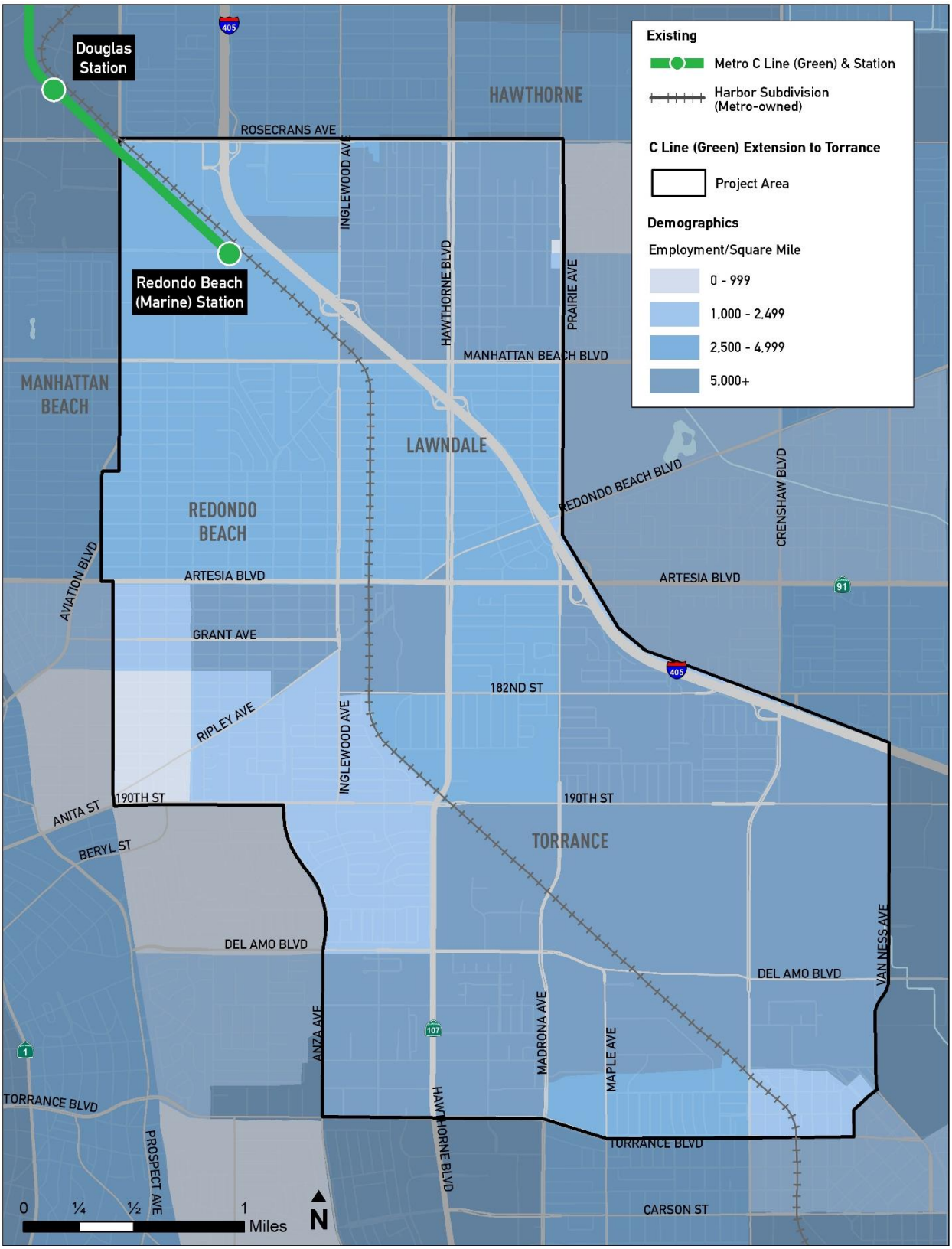
Source: Metro, AECOM, STV, 2020

Figure 2-6. Employment Density – 2017



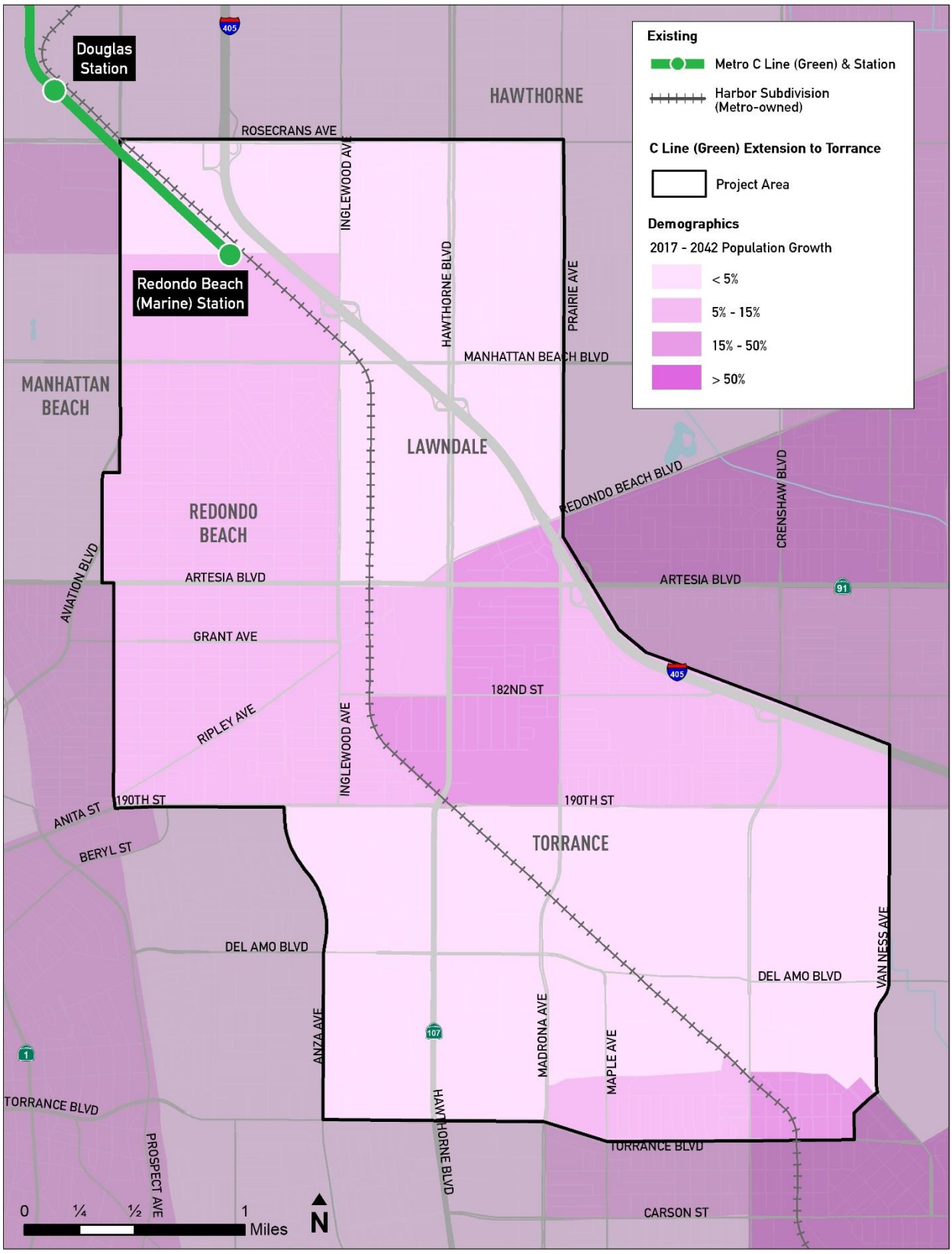
Source: Metro, AECOM, STV, 2020

Figure 2-7. Employment Density – 2042



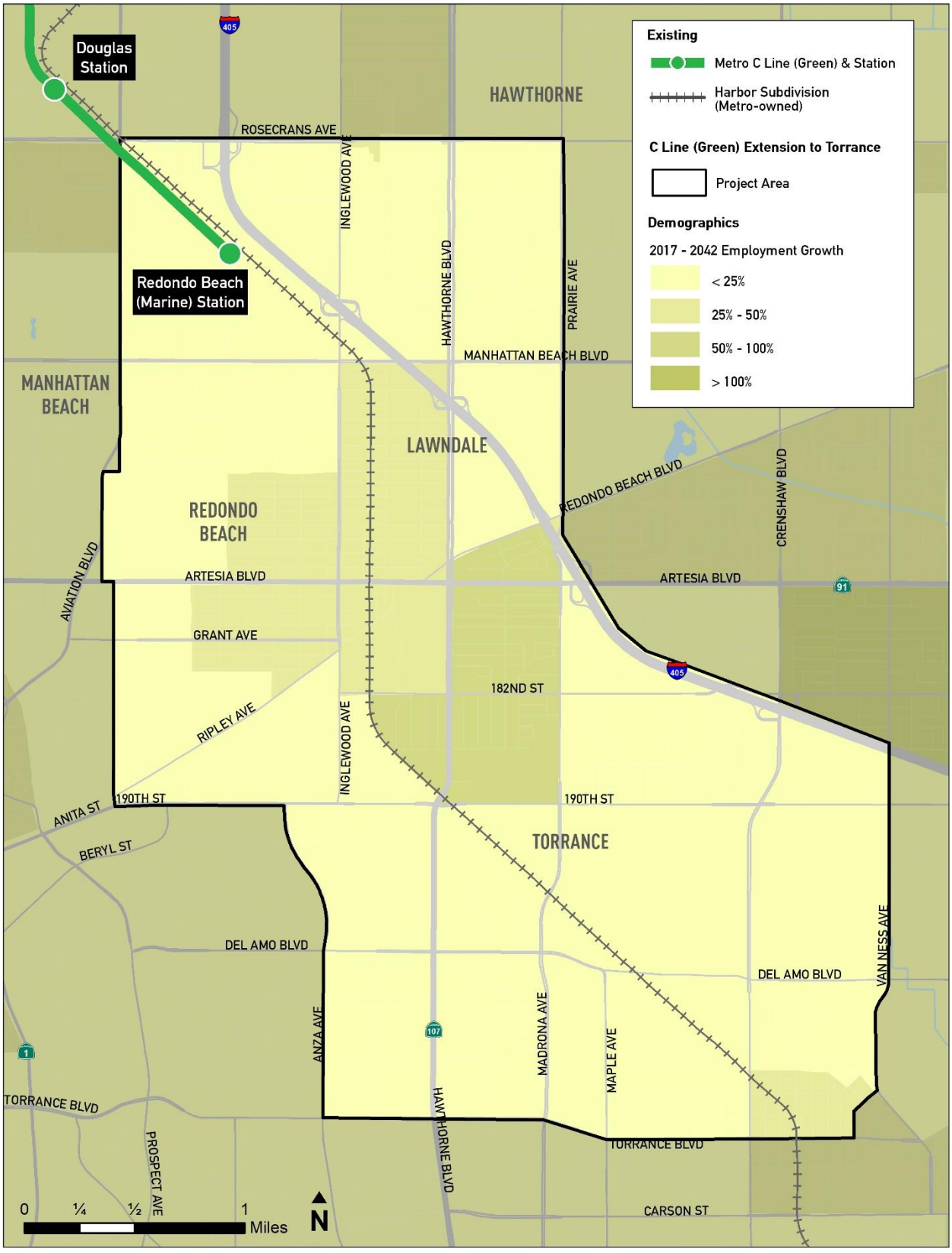
Source: Metro, AECOM, STV, 2020

Figure 2-8. Population Growth – 2017-2042



Source: Metro, AECOM, STV, 2020

Figure 2-9. Employment Growth – 2017-2042

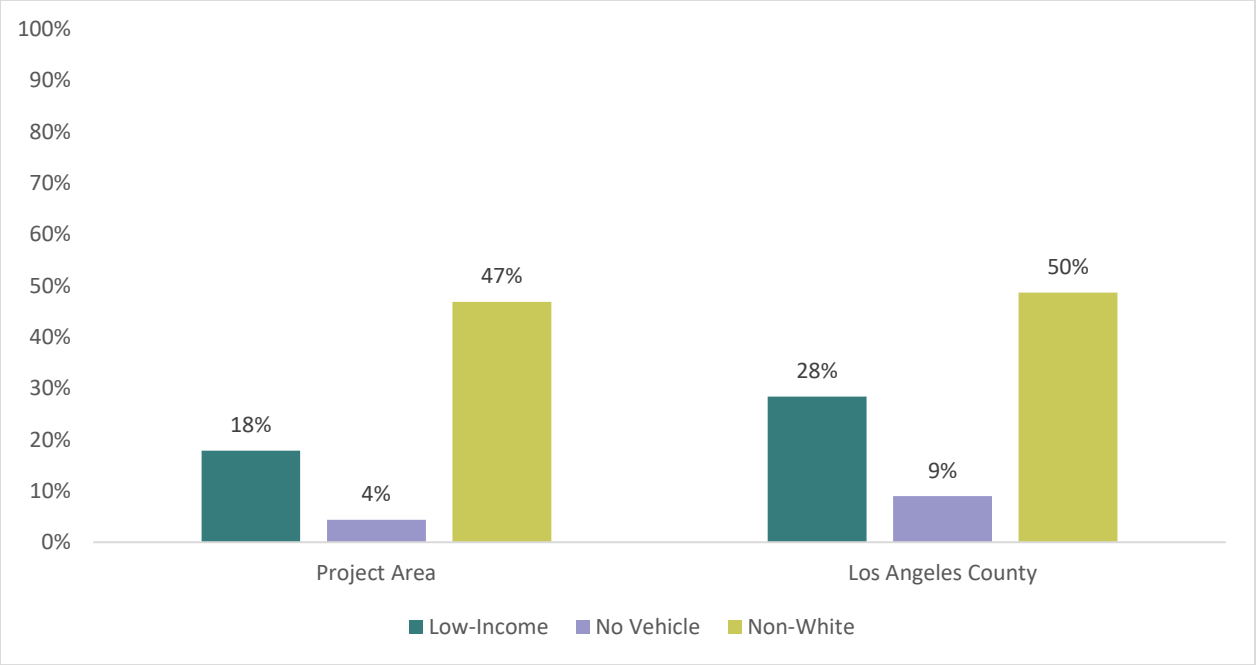


Source: Metro, AECOM, STV, 2020

2.5-2 Equity Focus Communities

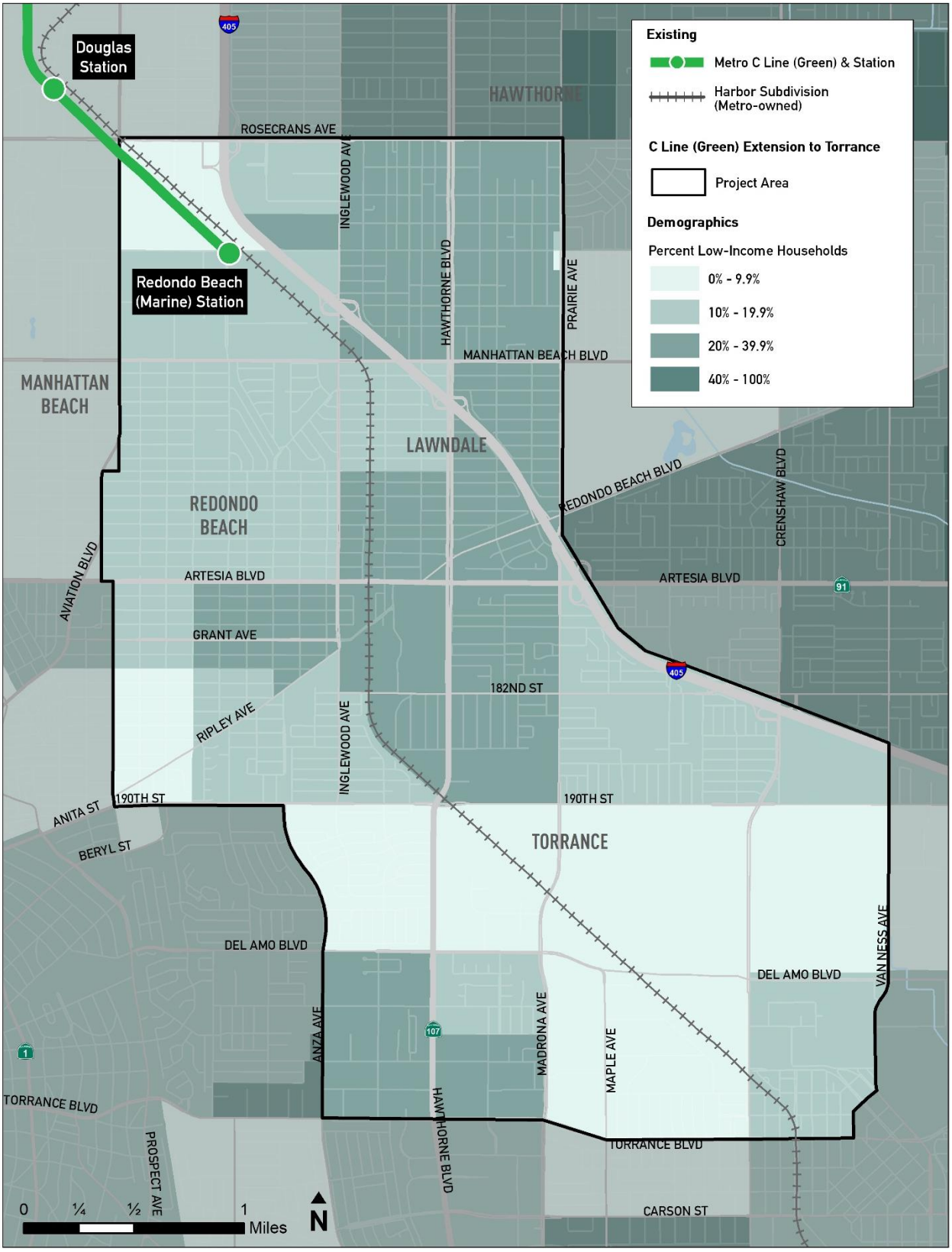
Metro has identified equity focus communities (EFC) that experience opportunity gaps, and defined equity-specific performance measures to measure and track the equity impacts of transportation projects in Los Angeles County. Metro defines EFCs as census tracts where: 40% of the population is low-income, and either 10% of households have no vehicle, or 80% of the population is non-white (Metro 2019). Figure 2-10 shows the percentages of each criterion within the Project Area and for the whole of Los Angeles County. Low-income households are defined as households with an annual income below $35,000. Figure 2-11 shows the percentage of low-income households in the Project Area. The greatest number of low-income households lies within Lawndale, east of the Redondo Beach (Marine) Station. The distribution of households in the Project Area with no vehicle are shown in Figure 2-12. Households without vehicles make up 4% of all households for the majority of the Project Area. Finally, Figure 2-13 shows the percentage of the population that is non-white. For all three of these criteria, the greatest percentages of equity-related criteria within the Project Area are located in Lawndale, east of the Redondo Beach (Marine) Station; centrally, surrounding the South Bay Galleria; and in Torrance, to the west of the Torrance TC.

Figure 2-10. Equity Focus Communities Demographics – Project Area and Urban Los Angeles County



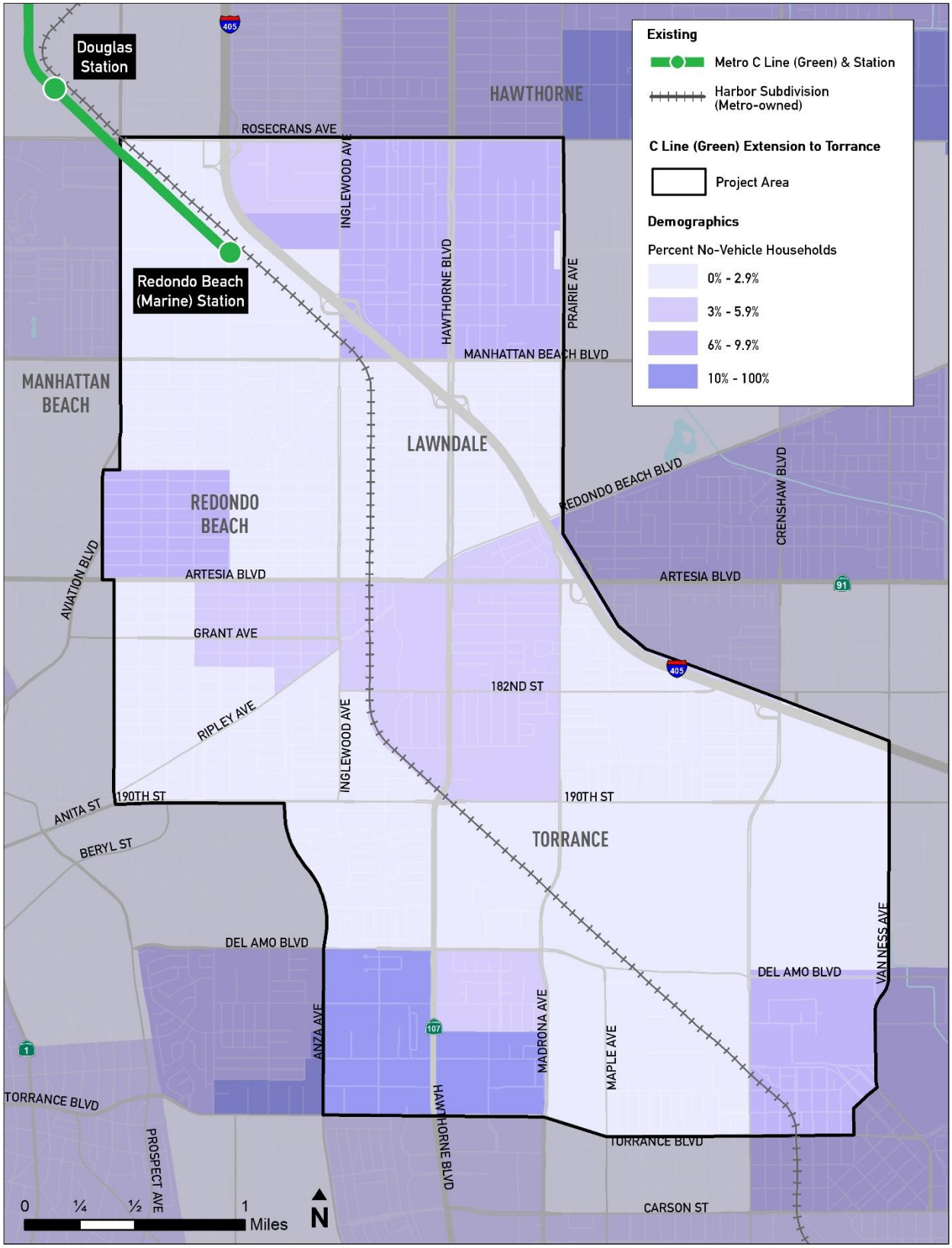
Source: Metro, STV, data from the 2018 American Community Survey (ACS) 5-year Estimate

Figure 2-11. Percent of Low-Income Households – 2018



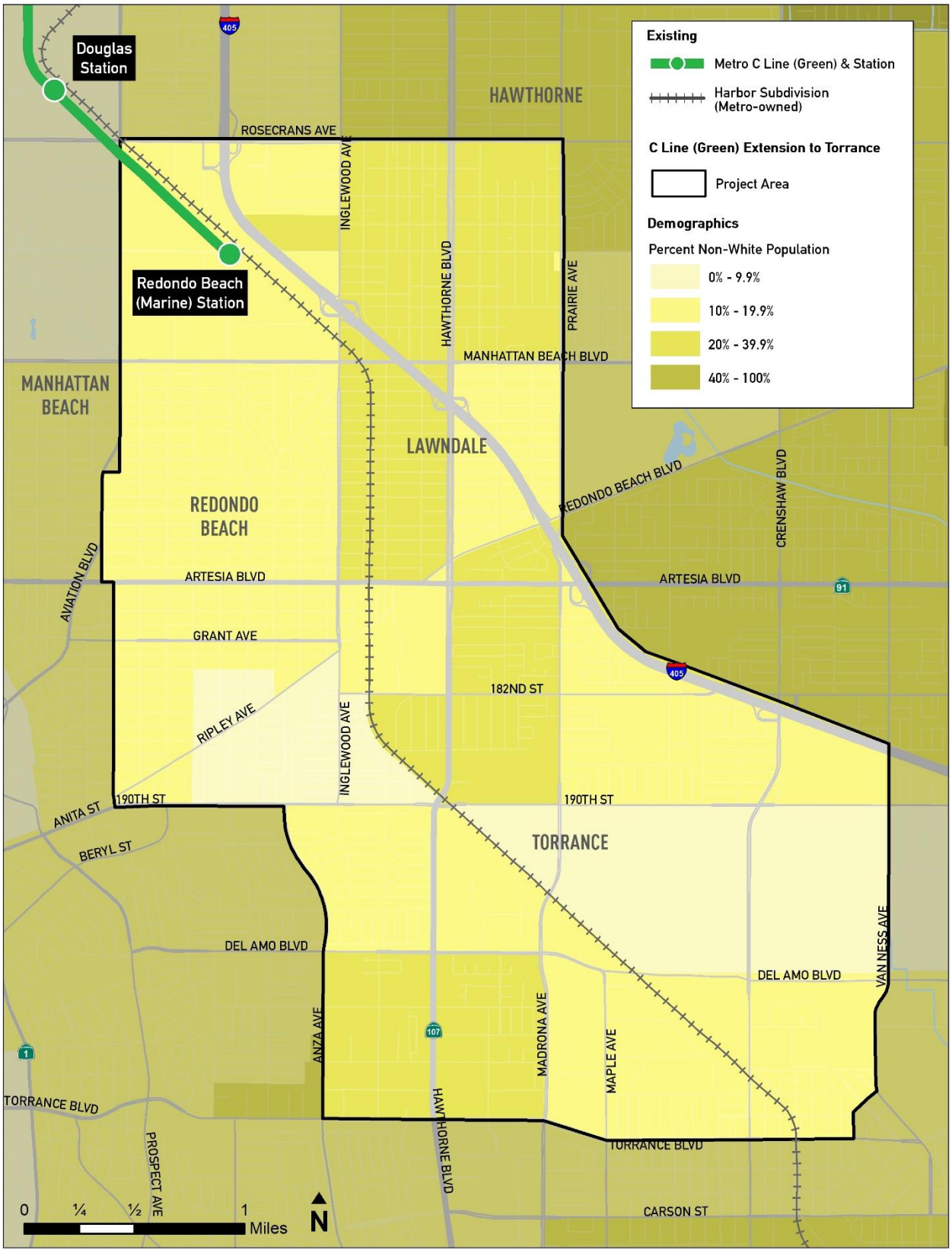
Source: Metro, STV, United States Census Bureau, 2020

Figure 2-12. Percent of Households with No Vehicle – 2018



Source: Metro, STV, United States Census Bureau, 2020

Figure 2-13. Percent of Non-White Population – 2018



Source: Metro, STV, United States Census Bureau, 2020

2.6 LAND USES AND ACTIVITY CENTERS

Existing land uses for the Project Area are described in Table 2-4 and shown in Figure 2-14. As shown in Table 2-4, residential uses comprise nearly one-half of the Project Area, with 24% of the Project Area containing single-family residences. These are mostly concentrated within the Cities of Lawndale and Redondo Beach, with residential neighborhoods directly abutting the existing Metro ROW. At 22%, there is a similar concentration of medium- to high-density residences, mostly located in the City of Redondo Beach. Commercial uses comprise approximately 11% of the Project Area and are concentrated at the north end of the Project Area near the Redondo Beach (Marine) Station, around the South Bay Galleria in the City of Redondo Beach, and parallel to Hawthorne Boulevard. Just over a quarter of the Project Area is industrial, most of which is located within the City of Torrance, with the largest use being the Torrance Refinery located directly adjacent to the existing Metro ROW.

Table 2-4. Existing Land Uses within Project Area

Land Use	Low-Density Residential	Medium/High-Density Residential	Commercial / Mixed-Use	Industrial	Public Facilities / Institutions	Open Space / Recreation	Other
Percent of Project Area	24%	22%	11%	27%	7%	3%	6%

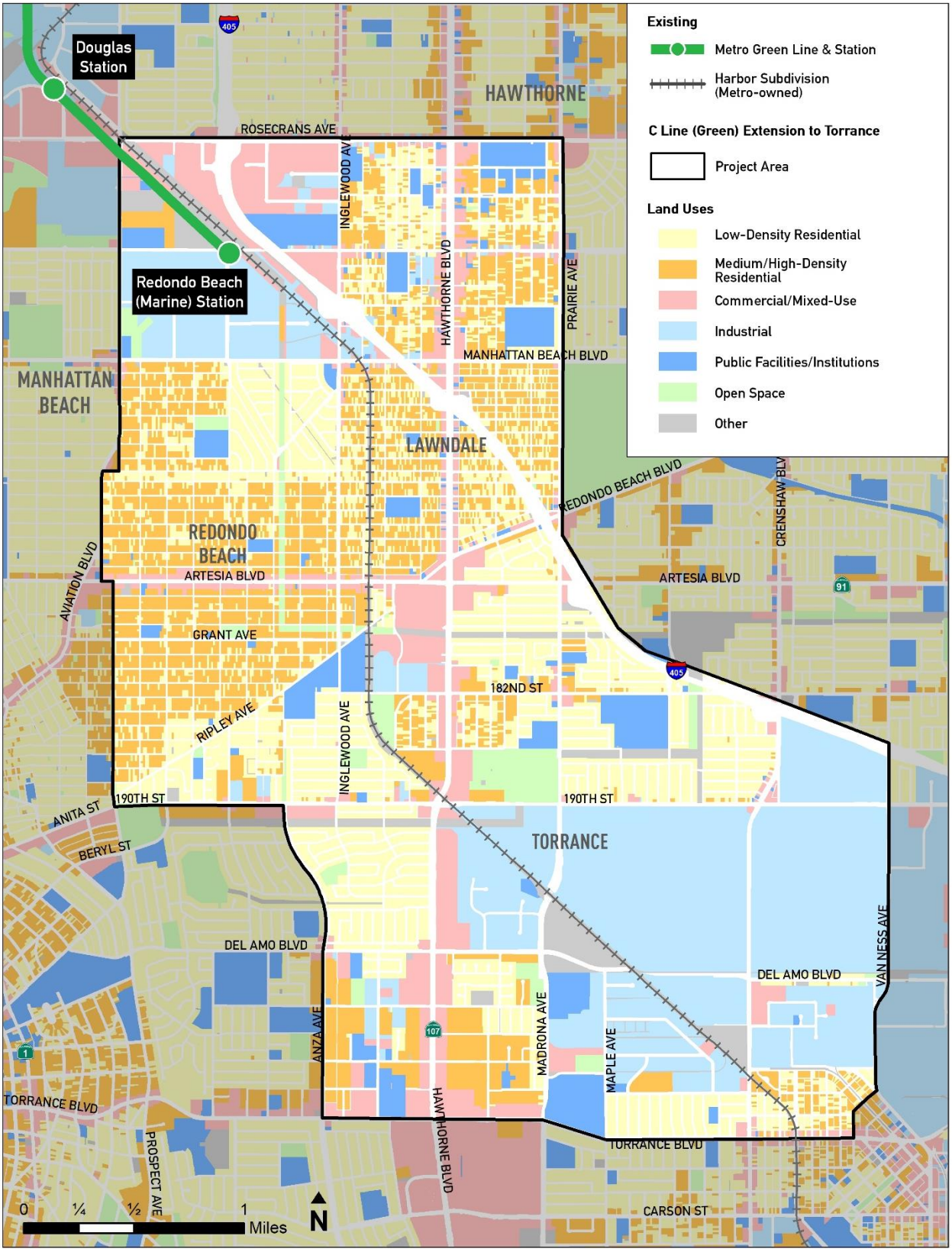
Source: STV, SCAG, 2020

There are multiple major activity centers within and adjacent to the Project Area, shown in Figure 2-15 alongside transit lines. They include, from north to south: LAX; employment centers in El Segundo and Inglewood; the South Bay Galleria and Redondo Beach Performing Arts Center in the City of Redondo Beach; and the Del Amo Fashion Center, Old Town Torrance, and other commercial and industrial centers in the City of Torrance.

Overall, the presence of major regional commercial and industrial centers along with projected population growth indicate opportunities for providing high-capacity and more reliable transit service within the Project Area.

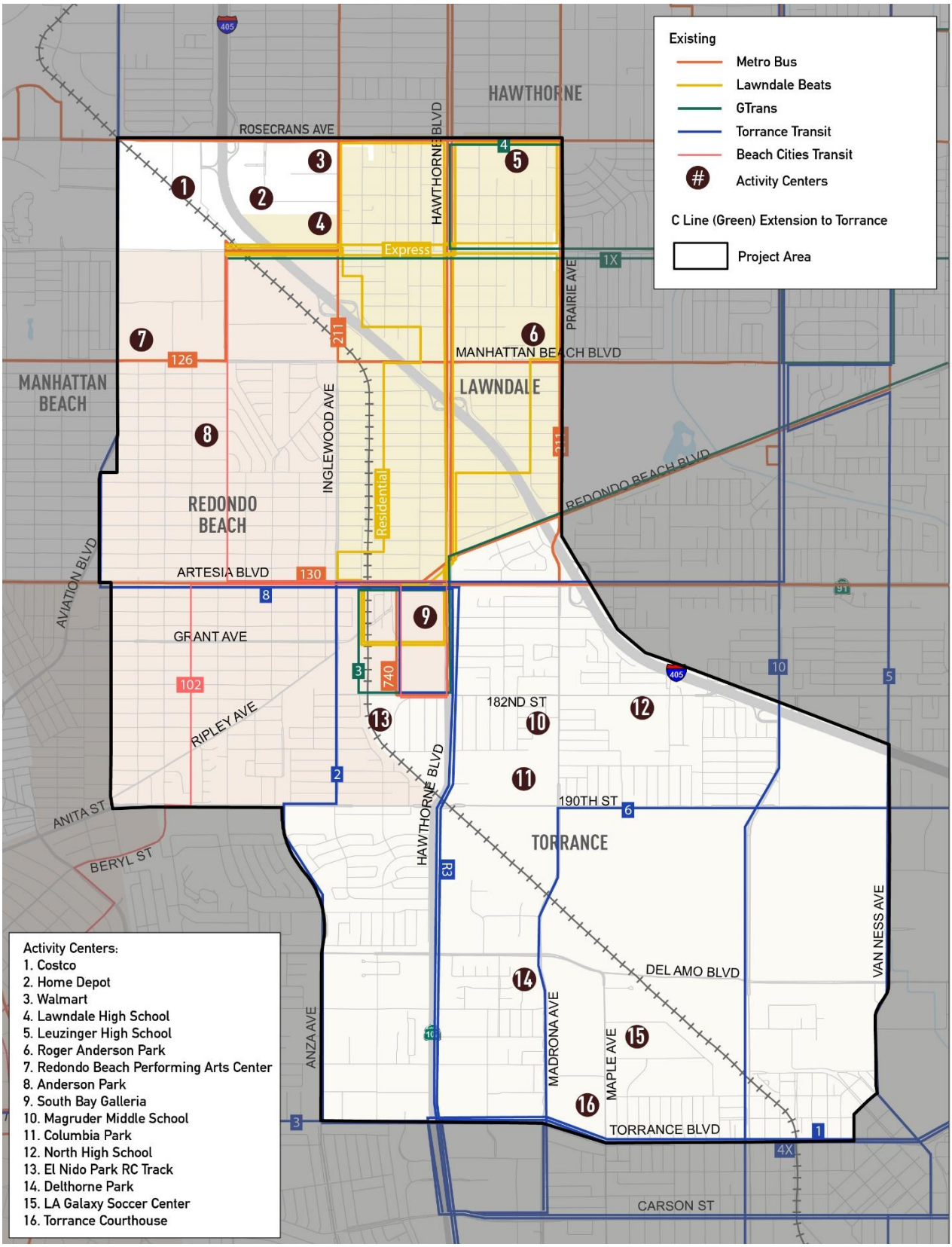
Figure 2-16 illustrates the proposed land uses for the Project Area according to each City's General Plan, as compiled and generalized by SCAG. The General Plans establish land use designations and policies that guide future development in each City. Hawthorne Boulevard and Artesia Boulevard are planned to serve as commercial/mixed use corridors, while substantial portions of the City of Torrance in the south and southeast portion of the Project Area and portions of the City of Redondo Beach in the northwest portion of the Project Area are planned for commercial/mixed use or industrial land uses, which would be potential trip attractors. Substantial portions of the City of Lawndale and the City of Redondo Beach are planned for medium- to high-density residential land uses, which would be potential trip generators.

Figure 2-14. Existing Land Uses



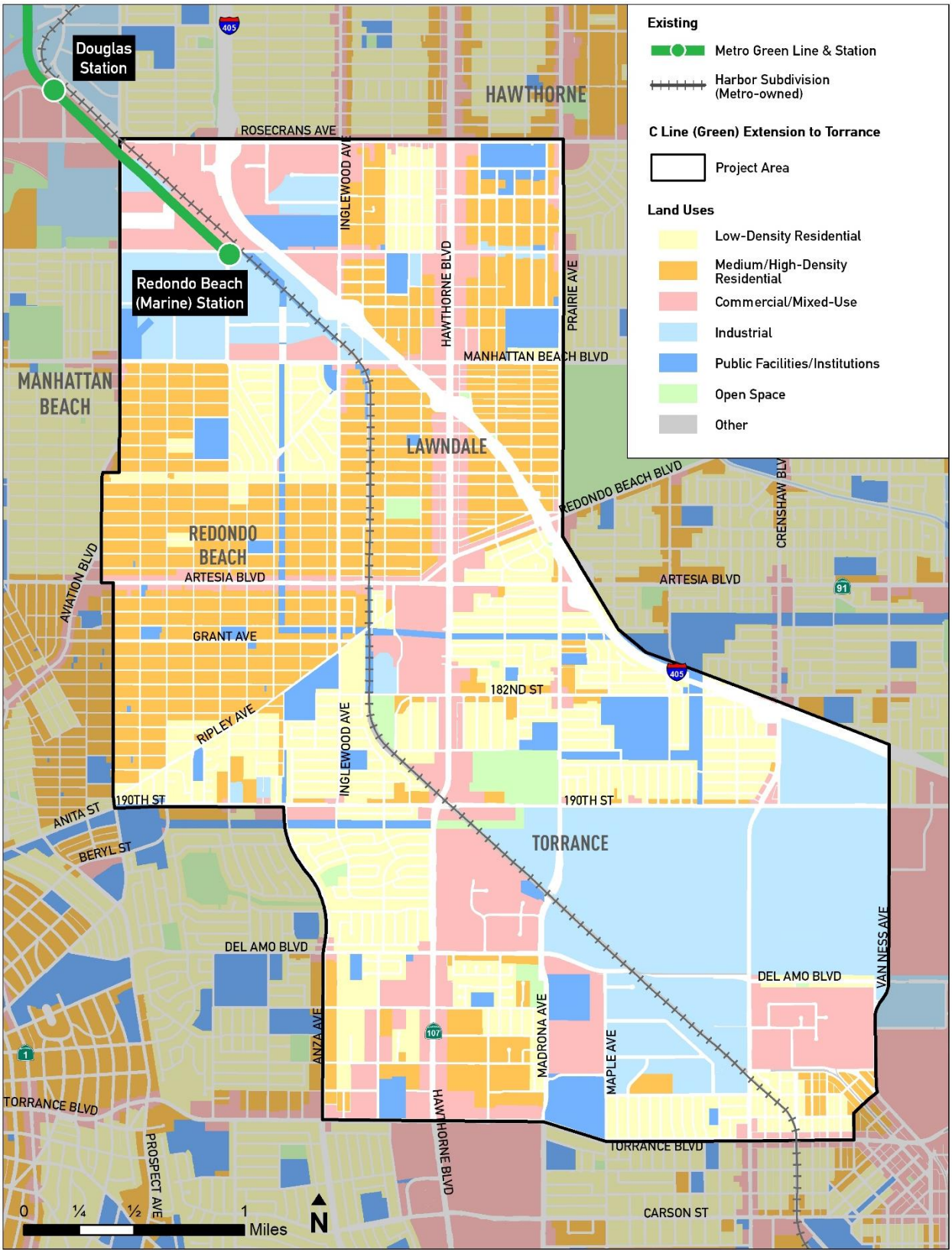
Source: Metro, STV, SCAG, 2020

Figure 2-15. Activity Centers and Transit Lines



Source: Metro, STV, SCAG, 2020

Figure 2-16. Proposed Land Uses



Source: Metro, STV, SCAG, 2020

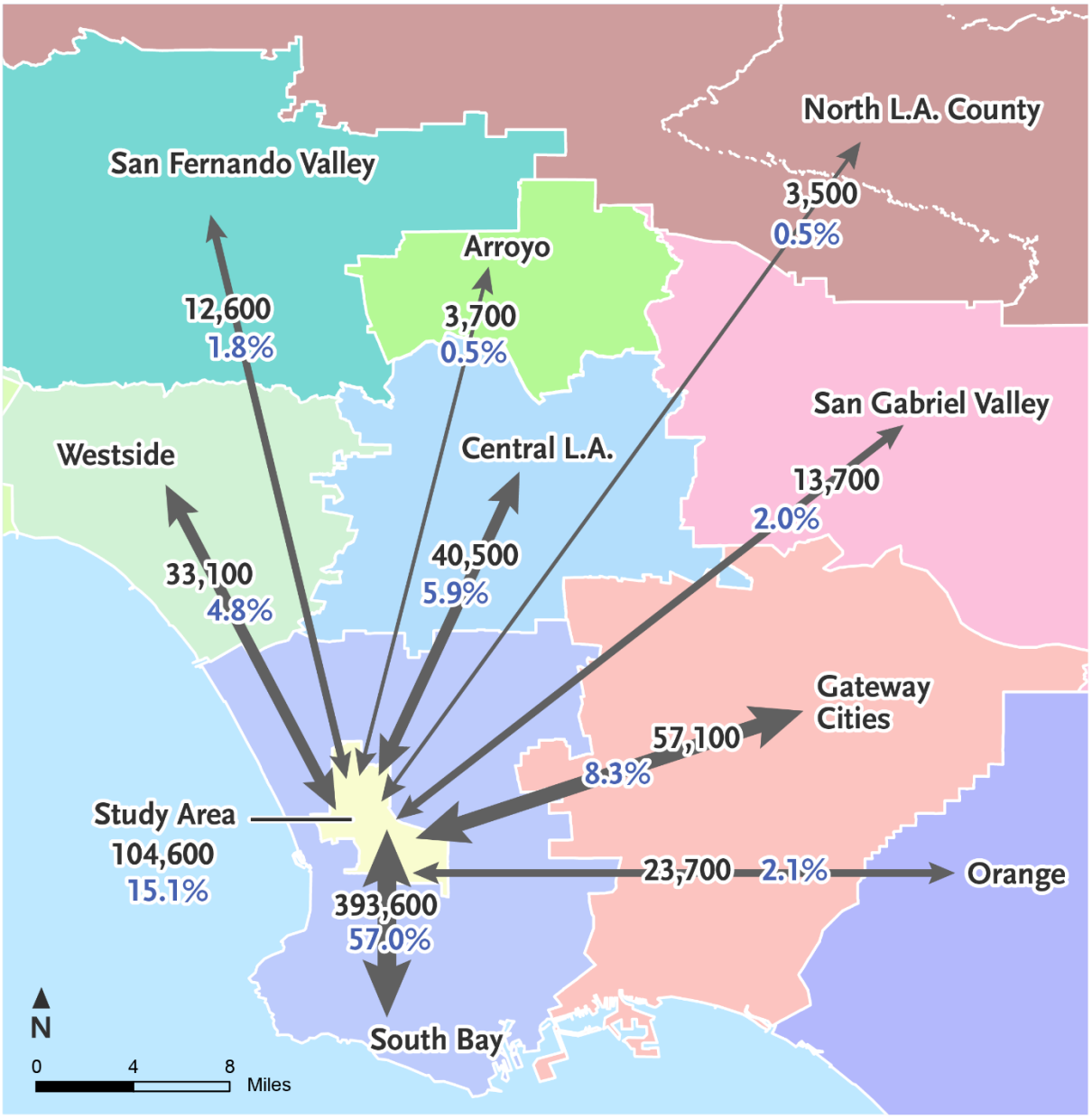
2.7 TRAVEL MARKETS

There are four major travel markets in and around the Project Area based on an analysis of travel patterns:

- **I-405 Corridor Travel Market** – This regional travel market includes medium to long distance commute trips within the South Bay, to other regions in Los Angeles County, and to Orange County. Between LAX and Long Beach, the Metro ROW generally parallels the I-405 freeway, where there is currently no regional transit service between the south end of the Project Area and LAX.
- **South Bay North-South Local Travel Market** – This local north-south travel market generally serves trips between the City of Torrance and LAX. This travel market overlaps with the I-405 Corridor, but it is treated separately because the trips use major north-south arterial roadways instead of the freeway. These local trip distances are shorter compared to trips using I-405.
- **South Bay Regional Travel Market** – This regional travel market includes trips between the South Bay, downtown Los Angeles, and points further to the north and east.
- **LAX Travel Market** – This travel market includes trips to and from LAX throughout the Los Angeles Basin. According to LAWA, LAX served over 84 million passengers in 2017, and is home to tens of thousands of jobs (SCAG, 2020). The number of passengers is expected to increase to 151 million annual passengers by 2045, according to SCAG. Most passengers access the airport via automobile, as there are currently gaps in local and regional transit connections to LAX. Metro is in the process of extending rail service to serve LAX with the K Line (Crenshaw).

A preliminary travel market analysis was conducted, showing that existing travel patterns suggest a strong demand for transit service in the Project Area. The model results of the existing and projected travel pattern are presented in average weekday person trips, reflecting trips between origin and destination districts. There were over 316,600 trips entering and 269,500 trips leaving the Project Area in 2017.The numbers are expected to increase to about 344,600 (+9%) and 286,500 (+6%) by 2042. In 2017, about 15% of all trips (approximately 104,600 trips) start and end in the Project Area, which is projected to grow to approximately 111,700 trips in 2042, as shown in Figure 2-17 and Figure 2-18. The South Bay is the top origin/destination for the Project Area, producing and attracting over 393,600 trips to the Project Area, making up approximately 57% of all the trips travelling to/from the Project Area in 2017. In 2042, the number of trips to/from the Project Area is projected to decrease by 0.5% to approximately 419,400 for the South Bay. This is followed by the Gateway Cities, Central L.A. and the Westside, which also generate a considerable number of trips to the Project Area at 57,100, 40,500 and 33,100 in 2017, respectively. This is expected to increase by 5% for Gateway Cities (60,000), 15% for Central LA (46,500) and 8% for the Westside (35,700) by 2042.

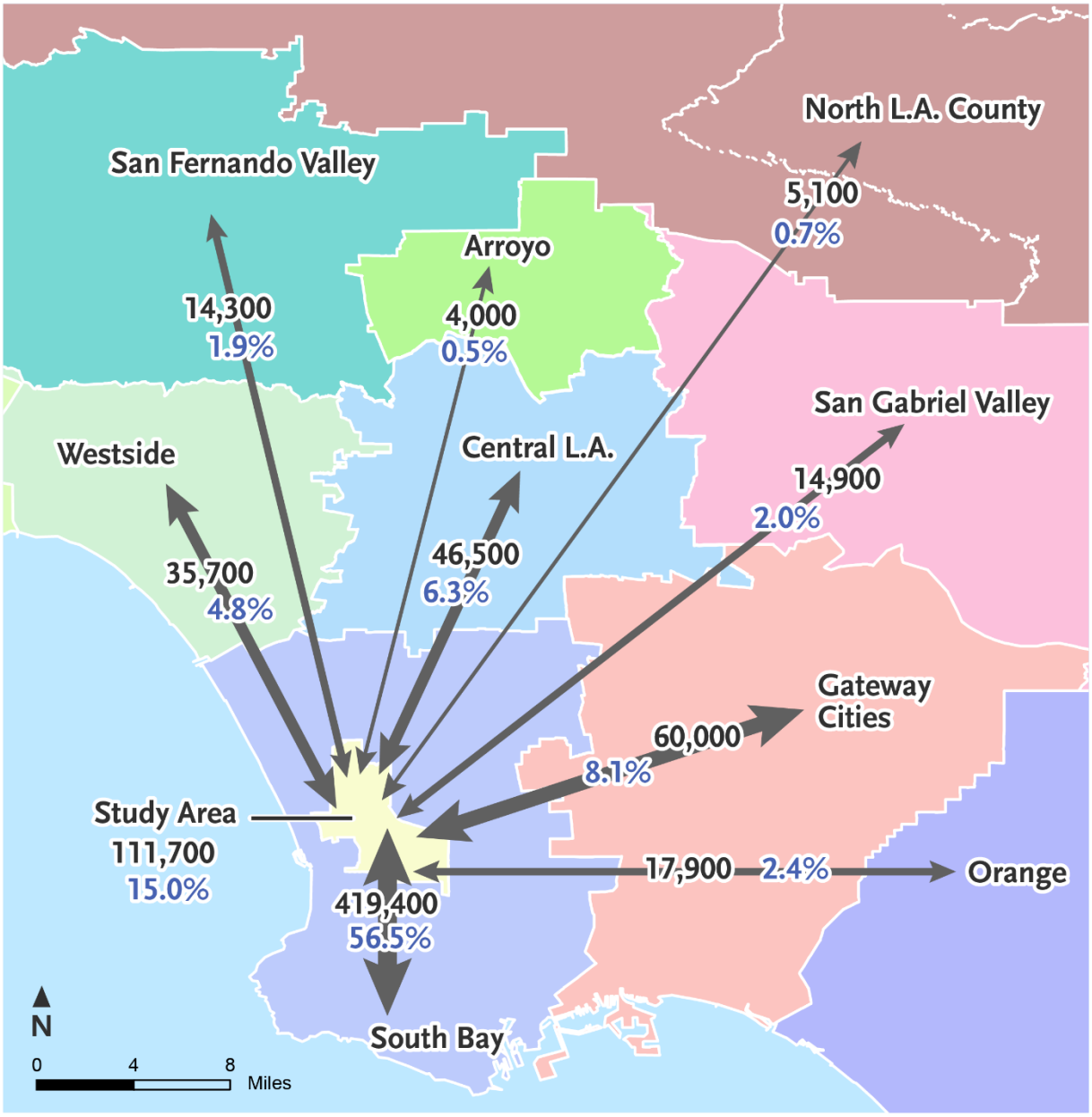
Figure 2-17. 2017 Bi-Directional Daily Person Trips To/From Project Area



Note:
1. The travel market analysis is based on trips by Traffic Analysis Zone (TAZ). TAZ boundaries do not exactly match those of the Project Area however for purposes of this analysis TAZs were selected that most closely align with the Project Area.
2. Riverside, San Fernando Valley West, San Bernardino, Ventura, and Imperial districts contribute about 1.7% of all trips to/from the study area and are not shown on the map.

Source: Metro, AECOM, STV, 2020

Figure 2-18. 2042 Bi-Directional Daily Person Trips To/From Project Area

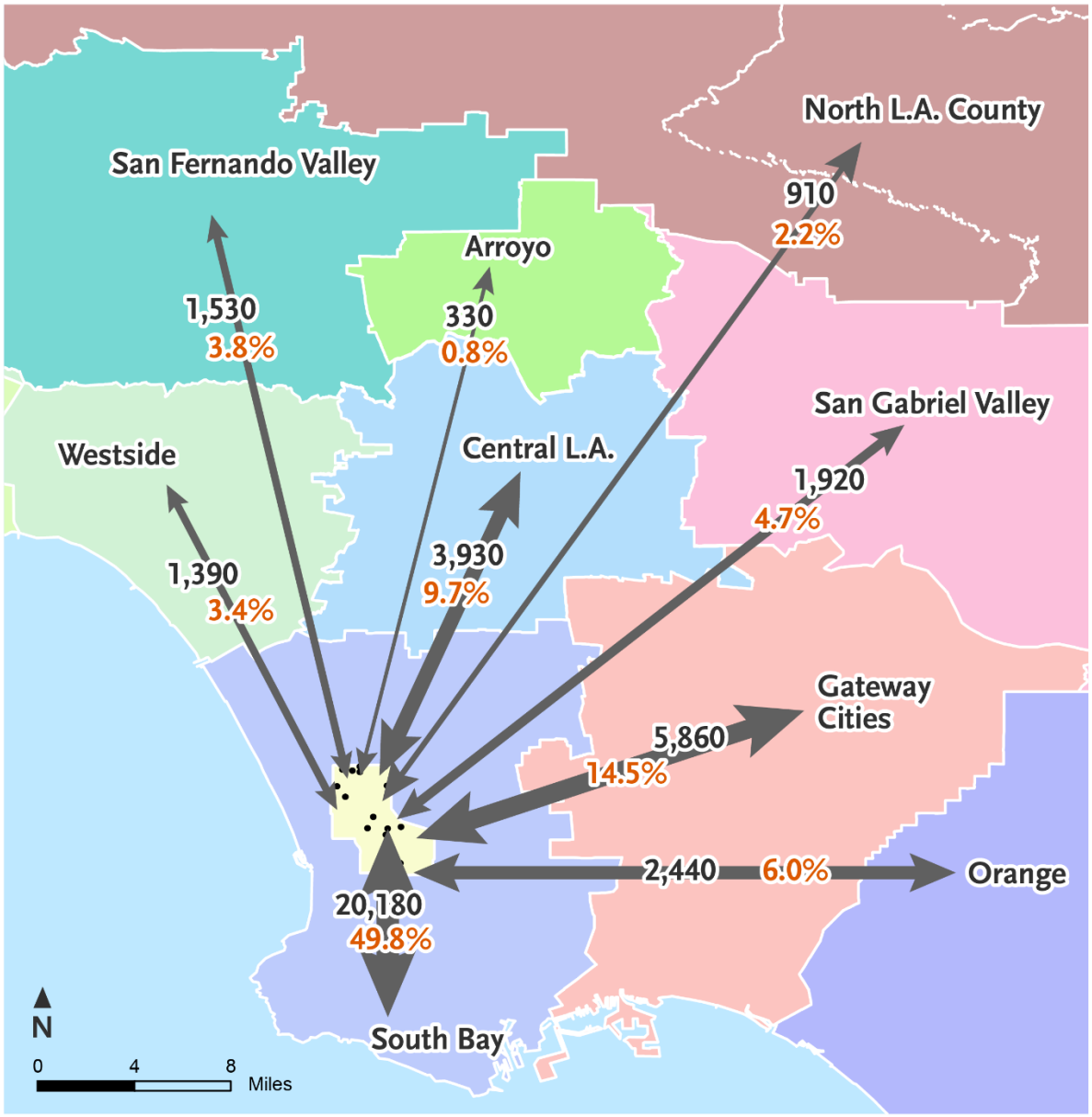


Note:
1. The travel market analysis is based on trips by Traffic Analysis Zone (TAZ). TAZ boundaries do not exactly match those of the Project Area however for purposes of this analysis TAZs were selected that most closely align with the Project Area.
2. Riverside, San Fernando Valley West, San Bernardino, Ventura, and Imperial districts contribute about 1.8% of all trips to/from the study area and are not shown on the map.

Source: Metro, AECOM, STV, 2020

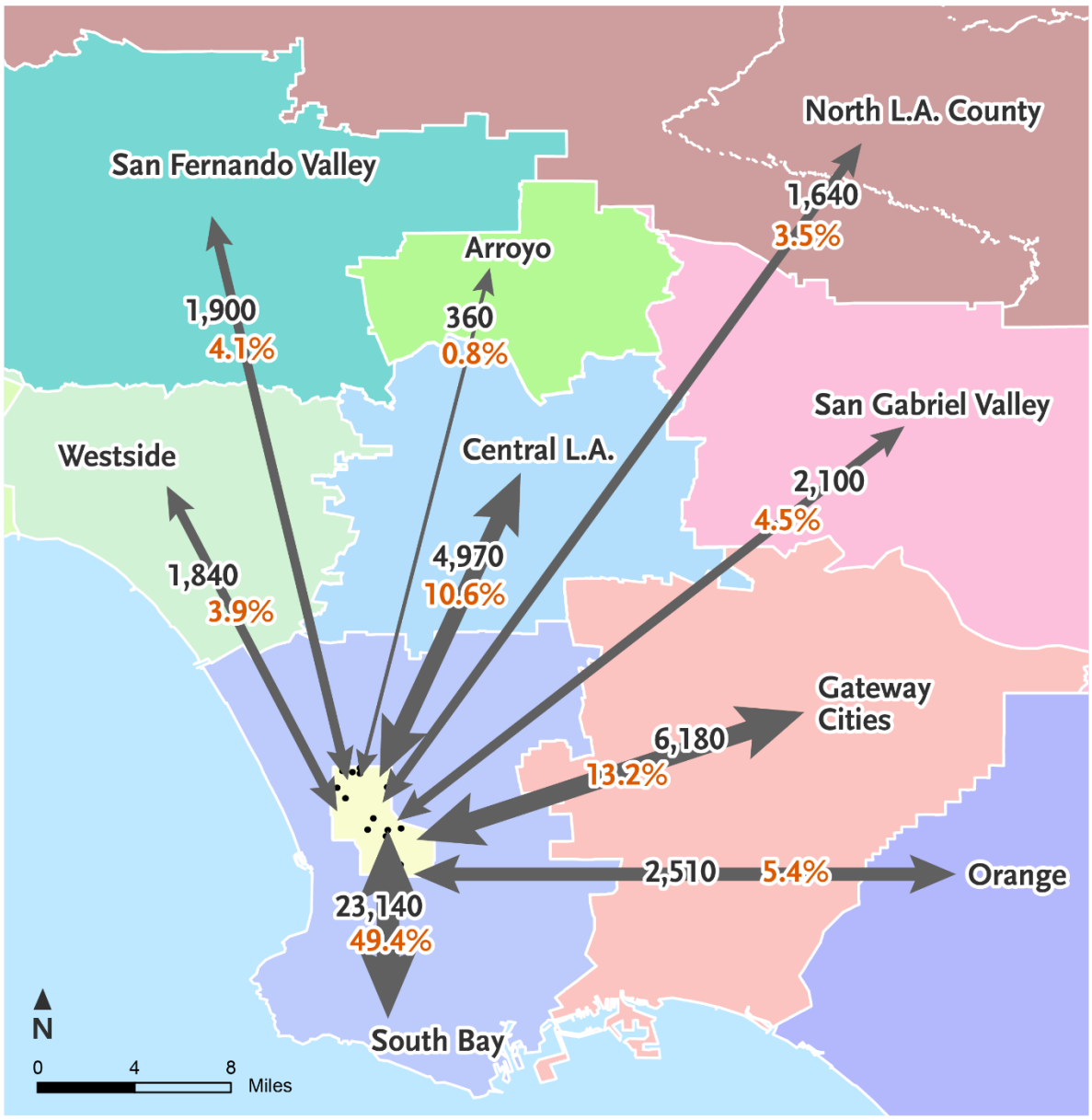
As depicted in Figure 2-15, the Project Area has a number of activity and job centers that could attract work trips into the Project Area from other parts of the region. Figure 2-19 and Figure 2-20 show the home-based work trips (which represent trips originating from home to destinations with the purpose of commuting to work locations) to these destinations from other regional districts in 2017 and 2042. Overall, there are about 40,540 work trips to the study area activity and job centers in 2017, which will increase by 15.5% to 46,860 trips in 2042. Nearly half of the commuters are from the rest of the South Bay area, followed by Gateway Cities (around 14.5% in 2017 and 13.2% in 2042) and Central Los Angeles (approximately 9.7% in 2017 and 10.6% in 2042). North Los Angeles County will experience the greatest increase in work trips to these destinations by 1.3% from 2017 to 2042 among all the regional districts, followed by Central Los Angeles (with 0.9% increase in work trips). Comparatively, decreases of 1.3% and 0.6% from 2017 to 2042 are projected for the Gateway Cities and Orange districts, respectively.

Figure 2-19. 2017 Home-Based Work Trips Into Project Area



Source: Metro, AECOM, STV, 2020

Figure 2-20. 2042 Home-Based Work Trips Into Project Area



Source: Metro, AECOM, STV, 2020

2.8 TRANSPORTATION SYSTEM PERFORMANCE

2.8-1.1.1 Highway and Arterial System Performance

For years, the Los Angeles metropolitan area has been ranked among the most traffic congested areas in the country. According to the 2019 Texas Transportation Institute Urban Mobility Report, the Los Angeles area was ranked the worst in the country for congestion-induced delay. As shown in Figure 2-21, the freeways and arterial roadways within the Project Area are no exception to the region's congested conditions. The I-405 freeway experiences high traffic volumes not only during peak commute periods (as shown in Figure 2-21), but also throughout the day, as it provides access to LAX and other regional destinations with large amounts of activity during non-traditional peak travel hours. Major arterial roadways in the Project Area also experience heavy peak period traffic and congestion.

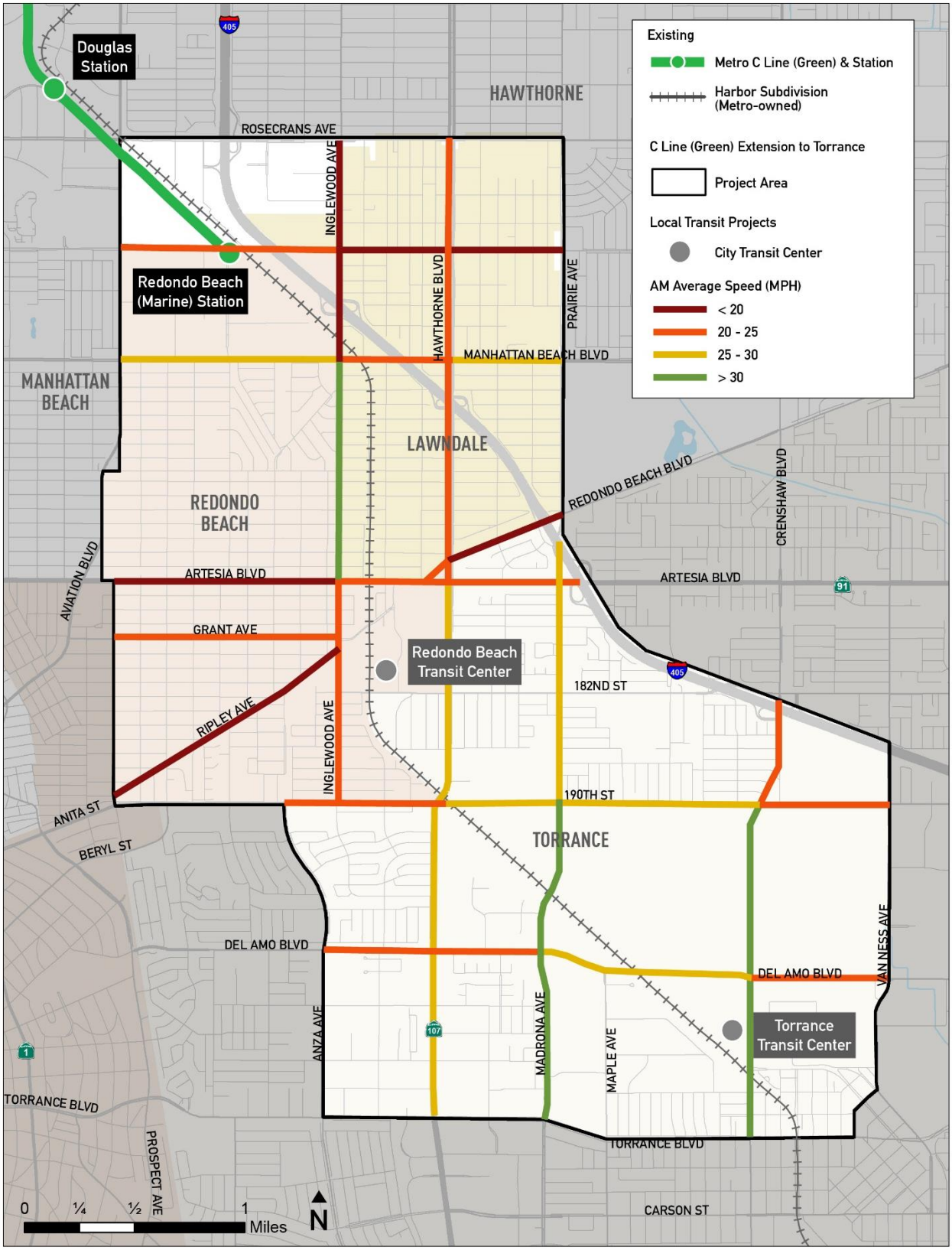
To demonstrate this, traffic data from three typical weekdays in January 2020 is used to analyze the traffic conditions in the Project Area (ClearGuide 2020). Figure 2-22 and Figure 2-23 depict the average speed (miles per hour) over roadway segments in the Project Area during the AM and PM peak periods. Figure 2-24 and Figure 2-25 show the amount of extra time spent (in minutes) by a vehicle over and above the time it takes to traverse a roadway segment at free flow speed. The travel delay index, shown in Figure 2-26 and Figure 2-27, is the ratio of the average travel time to the free-flow travel time. Road segments with lower scores (e.g. 1-1.25) indicate that the average travel time during peak hours along that road segment is the same as or similar to the travel time during the times of least congestion. Higher index scores indicate that travel times during peak hours are longer than at times of least congestion. Therefore, the travel delay index ranks road segments by how different travel times are between peak hours and the least congested hours. The AM peak hour period is from 6 AM to 9 AM, and the PM peak hour period is from 3 PM to 7 PM. The data from the three weekdays is averaged to represent the typical traffic conditions in the Project Area.

As population and employment grow, the resulting increased congestion and reduced speeds will increase the vehicle delay throughout the Project Area. In general, traffic during the PM peak is worse than during the AM peak hours, especially in the vicinity of freeway exits. During the AM peak, the average travel speeds on roadway segments range from 12.9 to 31.5 mph with delays from 0.2 to 1 minute on a single roadway segment. Vehicular traffic experiences a 16.5% to 77% delay depending on the route and trip length. In comparison, the average travel speed has a slight decrease during PM peak, averaging 10.9 to 30.1 mph with 0.2 to 2 minutes delay by roadway segments; vehicles can experience from 10% up to over 100% delay compared to usual free flow traffic. In general, the north and west parts of the Project Area experience slower vehicle movements and longer and higher chance of delays during rush hours. Given the already congested conditions, Metro ran a travel analysis to determine how road conditions may change in the future. Table 2-5 gives a side-by-side comparison of travel along major arterials during the PM peak in 2017 and 2042 to demonstrate that traffic flow will further slow if mobility conditions remain the same.

Figure 2-21. Peak Period Congestion in Project Area

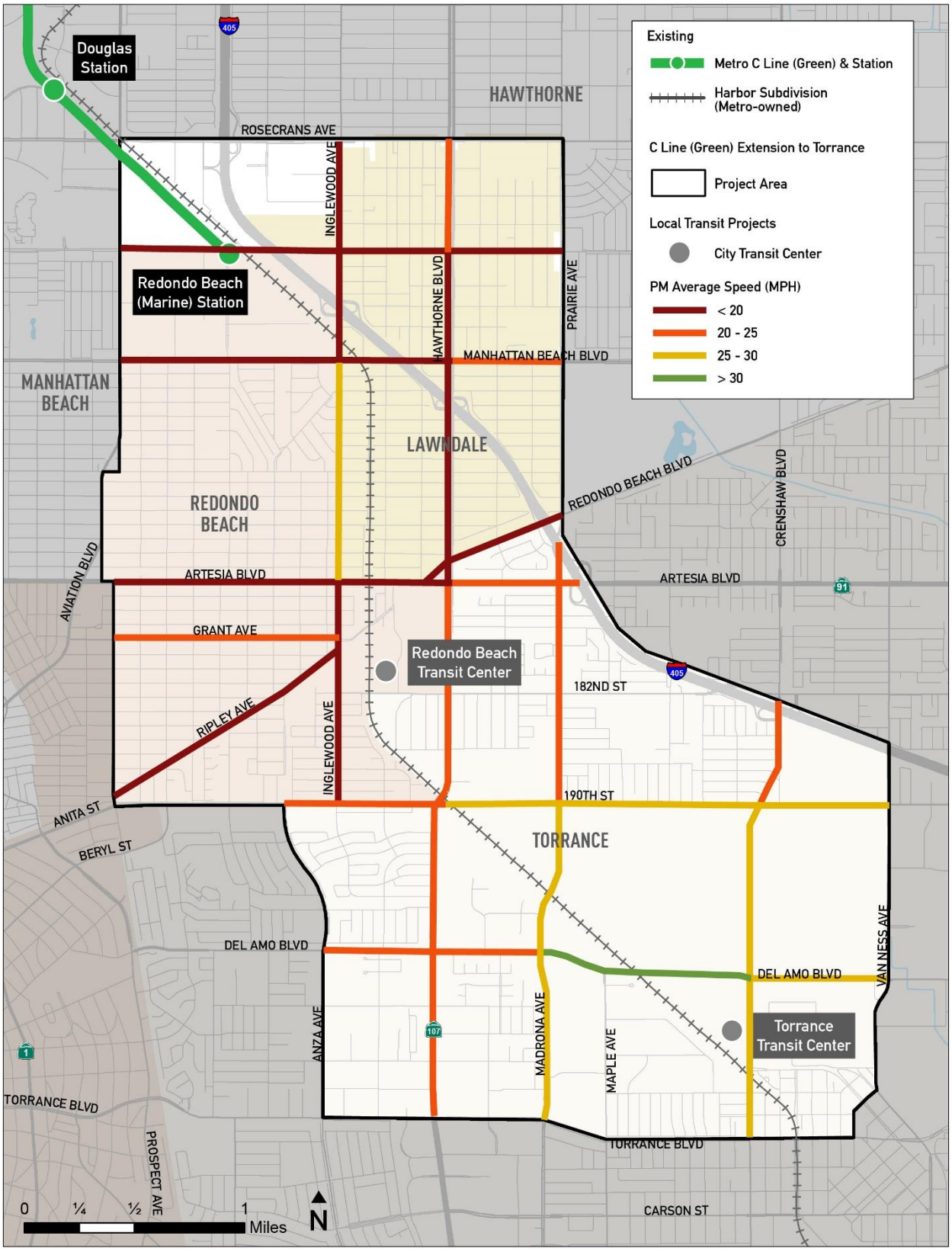
Left: I-405 looking north (City of Lawndale)
Right: Manhattan Beach Boulevard looking west towards Inglewood Avenue (City of Lawndale)
Source: STV, 2018

Figure 2-22. Project Area AM Peak Period Average Speed – 2017



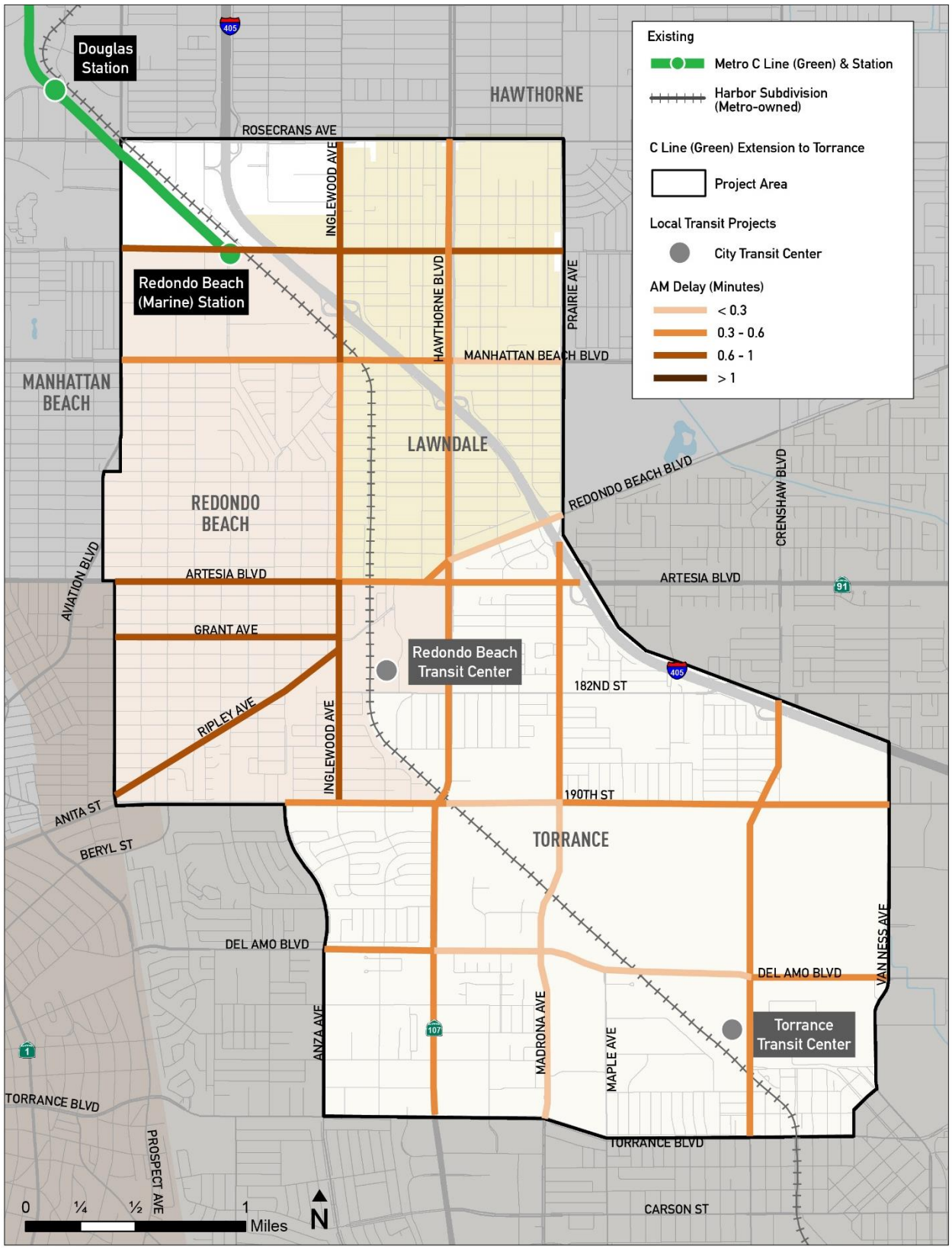
Source: Metro, AECOM, STV, 2020

Figure 2-23. Project Area PM Peak Period Average Speed – 2017



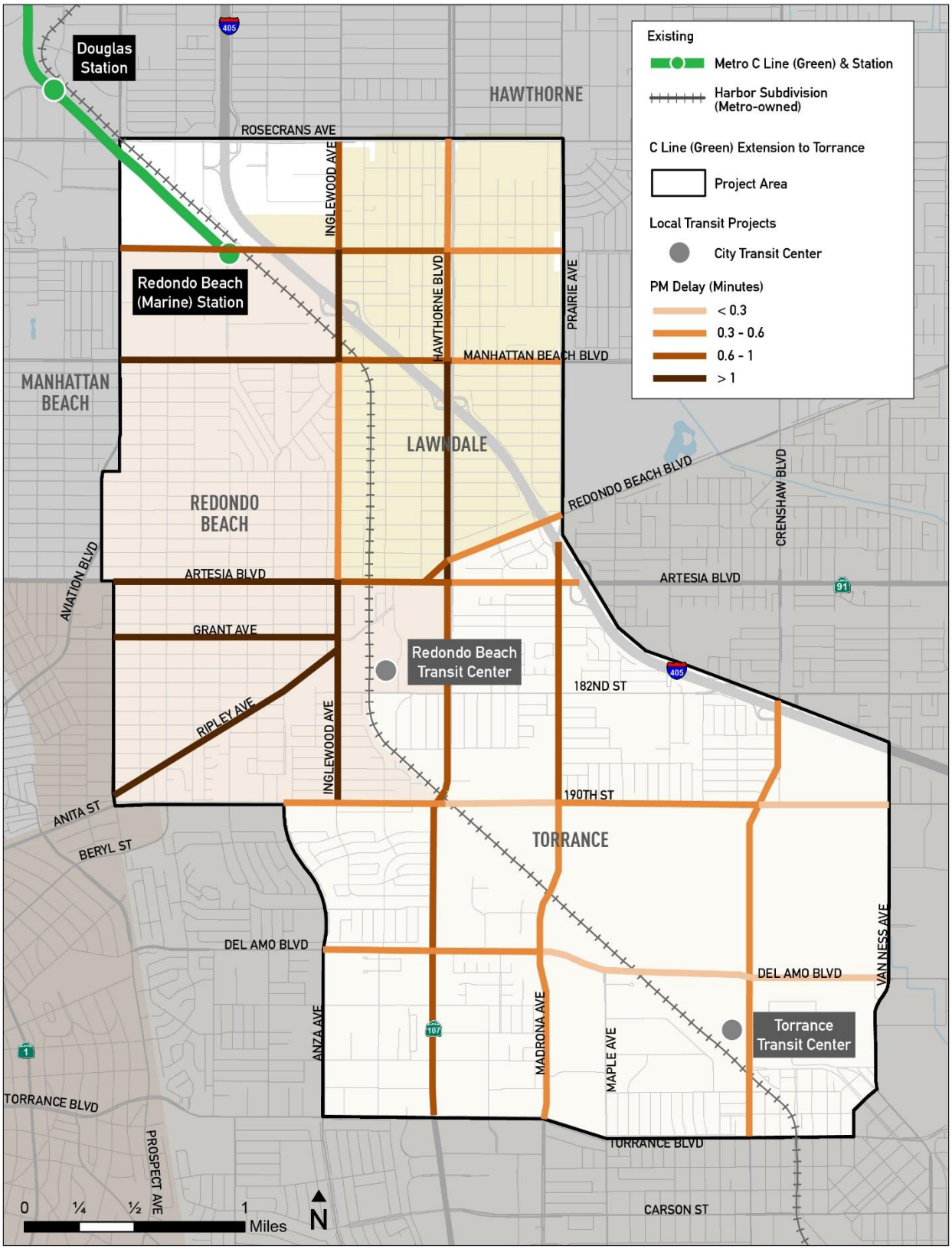
Source: Metro, AECOM, STV, 2020

Figure 2-24. Project Area AM Peak Period Delay – 2017



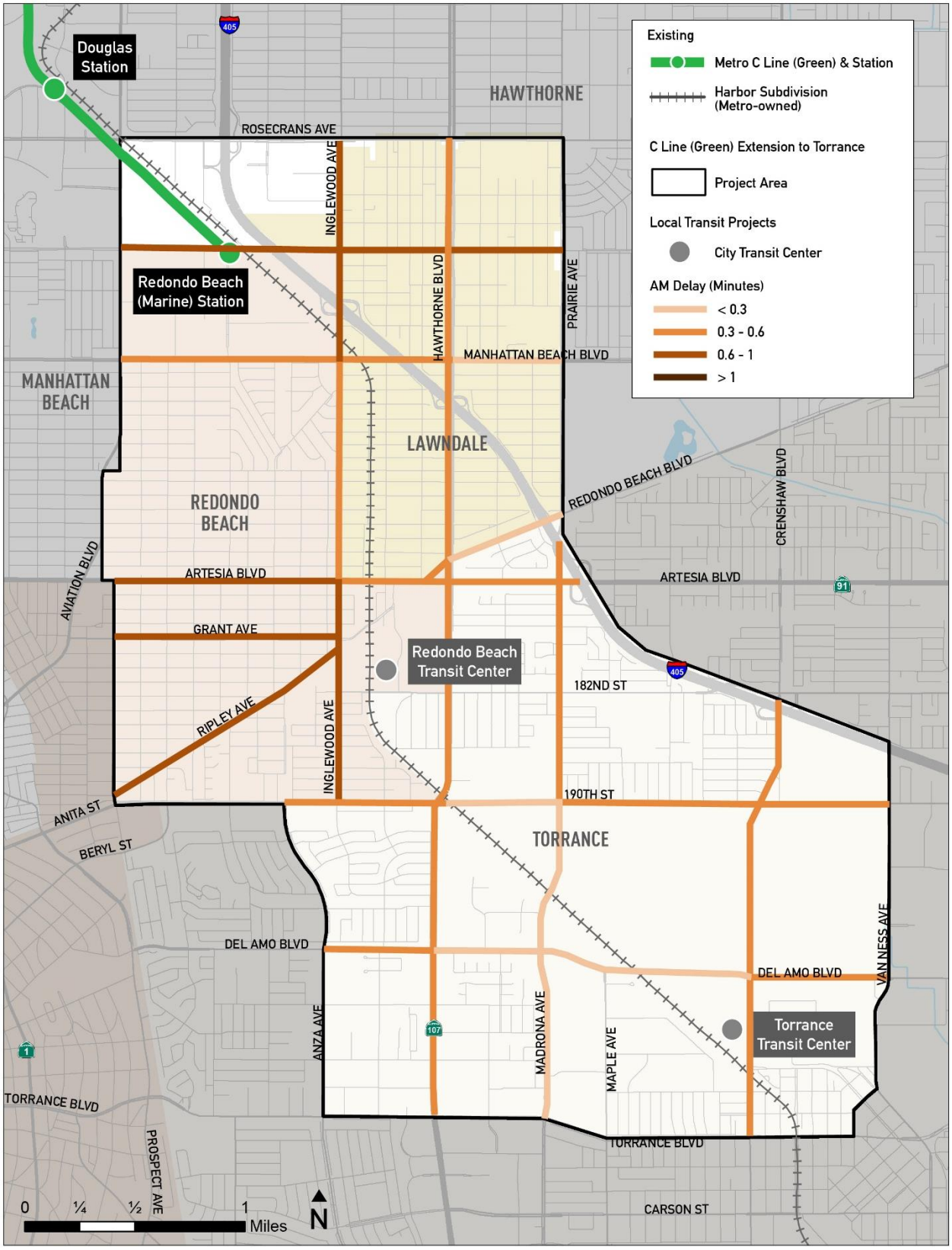
Source: Metro, AECOM, STV, 2020

Figure 2-25. Project Area PM Peak Period Delay – 2017



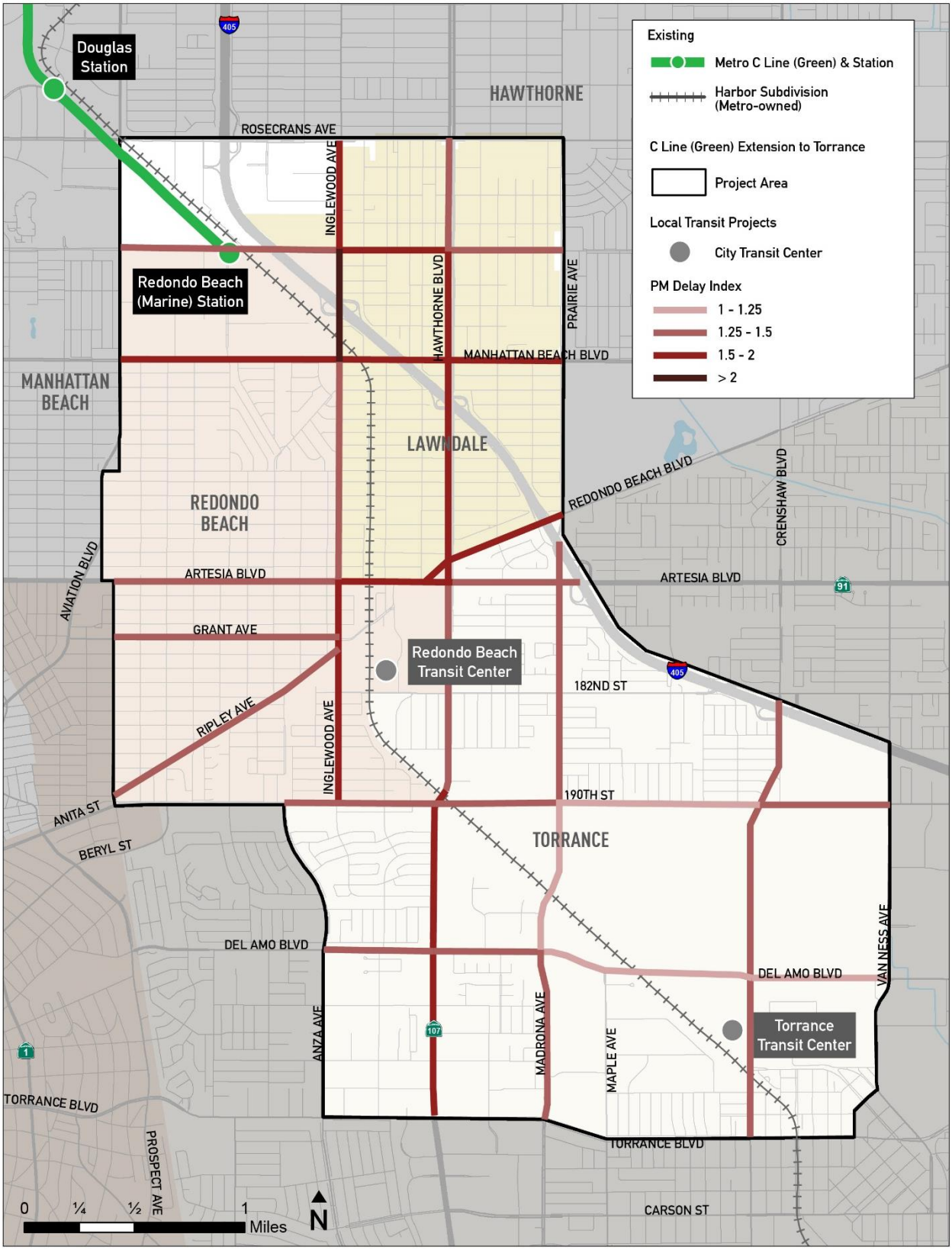
Source: Metro, AECOM, STV, 2020

Figure 2-26. Project Area AM Peak Period Delay Index – 2017



Source: Metro, AECOM, STV, 2020

Figure 2-27. Project Area PM Peak Period Delay Index – 2017



Source: Metro, AECOM, STV, 2020

Table 2-5. PM Peak Period Performance of Key Project Area Roadways – 2017 and 2042

Roadway	Segment	Direction	2017		2042		% Change	
			Travel Time (Min:Sec)	Speed (mph)	Travel Time (Min:Sec)	Speed (mph)	Travel Time	Speed
I-405	Century Blvd to Western Ave	EB	14	32	16	29	9.7%	-8.9%
		WB	18	25	19	25	0.6%	-0.6%
Sepulveda Blvd	Lincoln Blvd to Artesia Blvd	NB	14	23	15	22	2.9%	-2.9%
		SB	16	20	17	20	1.8%	-1.7%
Aviation Blvd	Rosecrans Ave to Pacific Coast Hwy	NB	8	22	8	22	0.2%	-0.2%
		SB	8	22	8	22	0.6%	-0.6%
Inglewood Ave	Century Blvd to 190th St	NB	16	21	16	21	1.8%	-1.7%
		SB	16	21	16	21	0.8%	-0.8%
Hawthorne Blvd	Century Blvd to Sepulveda Blvd	NB	21	23	22	22	3.8%	-3.6%
		SB	22	24	22	24	1.6%	-1.5%
Crenshaw Blvd	I-405 to Sepulveda Blvd	NB	8	23	8	22	0.7%	-0.7%
		SB	8	22	8	22	1.3%	-1.3%
Rosecrans Ave	Sepulveda Ave to I-405	EB	5	19	5	19	1.0%	-1.0%
		WB	4	21	4	21	0.1%	-0.1%
Artesia Blvd	Sepulveda Blvd to I-405	EB	7	24	8	24	1.2%	-1.2%
		WB	7	25	7	25	2.8%	-2.7%
190th St	Prospect Ave to Western Ave	EB	11	25	11	24	3.1%	-3.0%
		WB	10	25	10	25	1.1%	-1.1%

Source: Metro, AECOM, STV, 2020

2.8-1.1.2 Transit System Performance

The Redondo Beach (Marine) Station, the Metro C Line (Green) existing southern terminus, has nearly 2,000 daily combined boardings and alightings. There are several Metro bus routes with high ridership in the Project Area, such as Metro Line 40 on Hawthorne Boulevard, which carried an average of almost 14,000 riders during weekdays in 2019. The Project Area is also served by several municipal transit systems, many of which offer connections to the Redondo Beach (Marine) Station, but have smaller service areas. Table 2-1 shows the existing peak hour headways and travel times of major bus routes throughout the Project Area.

The municipal bus systems within the Project Area typically operate only within and/or just outside city limits, although some Torrance Transit lines provide limited express service to destinations such as downtown Los Angeles. Additionally, the municipal systems in the Project Area tend to have long headways of 30 to 60 minutes (e.g., GTrans) or run limited peak hour service during weekdays. Because of the limited coverage and operating hours of municipal transit systems within the Project Area, transfers between lines are necessary, as well as difficult, for riders who are traversing multiple South Bay communities. Table 2-6 compares travel times by transit and by driving between six sample origin and destination points within or near the Project Area. Table 2-7 compares travel times by transit and by driving between the Project Area and to other regional destinations.

Table 2-6. Existing Transit Travel Times for Select Trips within or near the Project Area

Origin	Destination	Distance (miles)	Required Transfers	Transit Travel Time (min)	Driving Travel Time (min)	Difference Between Transit and Driving (min)	Difference Between Transit and Driving (%)
Bartlett Senior Citizens Center (Torrance)	LAX City Bus Center	10	1	67	19	48	253%
Torrance City Hall	Space Park/Aviation	6	0	46	17	29	171%
Del Amo Fashion Center	Redondo Beach City Hall	3	0	21	9	12	133%
South Bay Galleria	Old Town Torrance	5	1	46	13	33	254%
Lawndale City Hall	Del Amo Fashion Center	5	0	27	14	13	93%
LAX City Bus Center	Lawndale City Hall	5	1	35	11	24	218%

Source: Google Maps, 2020

Table 2-7. Existing Transit Travel Times for Select Trips between the Project Area and Regional Destinations

Origin	Destination	Distance (miles)	Required Transfers	Transit Travel Time (min)	Driving Travel Time (min)	Difference Between Transit and Driving (min)	Difference Between Transit and Driving (%)
Project Area	Downtown Los Angeles	20	2	60	25	35	140%
Project Area	LAX	7	2	52	11	41	373%
Project Area	Disneyland	28	2	148	30	118	393%
Project Area	UCLA	18	2	119	21	98	467%
Project Area	Downtown Long Beach	14	1	83	19	64	337%

Source: AECOM, Metro, SCAG, 2020

Note: Distances are based on the shortest driving route between the centroid of the origins and destinations; Driving travel time and transit travel time are based on weekday mid-day traffic conditions.

Both transfers and long travel times make transit a less favorable mode of travel, and the projected increase in congestion will further exacerbate this mobility issue.

Metro Rail operates in only a portion of the Project Area, but attracts a large number of riders due to speed and travel time advantages afforded by operating on exclusive right-of-way. The Metro C Line (Green) carries approximately 30,000 riders on a typical weekday. The route, operating hours, on-time performance, and average daily riders of each existing transit route in the Project Area are described in Table 2-8.

Many of the bus routes in the southern portion of the Project Area are operated by local municipalities such as the Cities of Lawndale and Torrance. Municipal transit service typically operates on segments of high or medium-capacity arterial roadways, often remaining within city limits (although some operators like Torrance Transit offer limited express service to destinations such as downtown Los Angeles). This means that riders who want to move through multiple cities in the South Bay face multiple transfers, slow travel speeds and infrequent service. In these cases, the lack of connectivity along each arterial roadway corridor limits the potential for higher ridership, due to the lost time and inconvenience caused by required transfers. A regional transit solution that minimizes or eliminates inconvenient transfers in the Project Area would help to alleviate these issues.

Table 2-8. Project Area Transit Ridership Details

Operator	Route #	Route Details	Operating Hours	Avg. Daily Riders	On-Time Performance
Beach Cities Transit	102	Redondo Beach Pier to Metro C Line (Green) Aviation/LAX Station via Diamond St and Redondo Beach Ave	6AM-8PM Mon-Sun	492	On-Time: 97%
Gardena Municipal Transit	1X	Lawndale to Downtown Los Angeles via Marine Ave, Vermont Ave and Harbor Transitway	5AM-10PM Mon-Fri 7AM-7PM Sat-Sun	156	On-Time: 65%
	3	Compton Metro C Line (Green) Station to South Bay Galleria via Alondra Blvd and Redondo Beach Blvd	5AM-10PM Mon-Fri 5AM-7PM Sat-Sun	63	On-Time: 77%
Lawndale Beat[1]	Residential	Operates within Lawndale serving the Metro C Line (Green) and South Bay Galleria	7AM-6PM Mon-Sun	52	N/A
	Express	Operates within Lawndale serving the Metro C Line (Green) and South Bay Galleria	7AM-6PM Mon-Sun	47	N/A
LADOT Commuter Express	438	Downtown Los Angeles to Redondo Beach via Harbor Transitway, I-105 and Catalina Ave	6AM-9AM 4PM-8PM Mon-Fri	297	On-Time: 68% Early: 2% Late: 30%
	574	Sylmar to El Segundo via Sepulveda Blvd, I-405, and Balboa Blvd	5AM-9AM 3PM-8PM Mon-Fri	274	On-Time: 84% Early: 1% Late: 15%
Metro Local Bus	40	Downtown Los Angeles to South Bay Galleria via Broadway, Martin Luther King Blvd, Crenshaw Blvd and Hawthorne Blvd	24 Hours Mon-Sun	14,561	On-Time: 68.5% Early: 2.3% Late: 29.1%
	120	Metro C Line (Green) Aviation/LAX Station to Metro C Line (Green) Rosa Parks Station via Imperial Hwy	5AM-1AM Mon-Sun	4,066	On-Time: 75.8% Early: 1.4% Late: 22.8%
	125	El Segundo to Norwalk via Rosecrans Ave	5AM-9PM Mon-Sun	5,102	On-Time: 63.1% Early: 2.9% Late: 34%

Operator	Route #	Route Details	Operating Hours	Avg. Daily Riders	On-Time Performance
	126	Manhattan Beach to Metro C Line (Green) Hawthorne Station via Manhattan Beach Blvd and Redondo Beach Blvd	6AM-10AM 3PM-7PM Mon-Fri	217	On-Time: 71.5% Early: 2.2% Late: 26.3%
	130	Redondo Beach to Cerritos via Artesia Blvd	5AM-10PM Mon-Sun	2,736	On-Time: 66.6% Early: 3% Late: 30.3%
Metro Local Bus	210	Hollywood to South Bay Galleria via Vine St, Rossmore Ave and Crenshaw Blvd	5AM-2AM Mon-Sun	10,785	On-Time: 68.8% Early: 2.1% Late: 29.1%
	211/215	Metro C Line (Green) Redondo Beach Station to Inglewood to South Bay Galleria via Inglewood Ave and Prairie Ave	6AM-9AM 3PM-7PM Mon-Fri	653	On-Time: 62.8% Early: 2.8% Late: 34.3%
Metro Limited Stop Bus	344	Rancho Palos Verdes to Artesia Transit Center via Palos Verdes Blvd, Hawthorne Blvd and Artesia Blvd	5AM-9PM Mon-Sun	1,453	On-Time: 78.8% Early: 1.4% Late: 19.9%
Metro Rapid Bus	710	South Bay Galleria to Mid-Wilshire area via Redondo Beach Blvd and Crenshaw Blvd	6AM-9PM Mon-Sat	6,804	On-Time: 57.5% Early: 1.1% Late: 41.4%
	740	South Bay Galleria to downtown Los Angeles via Hawthorne Blvd, Crenshaw Blvd, Martin Luther King Blvd and Broadway	5AM-9PM Mon-Sat	2,294	On-Time: 65.4% Early: 3% Late: 31.5%
Metro Rail	Metro C Line (Green)	LRT between Norwalk and Redondo Beach along I-105, Nash Street and the Harbor Subdivision ROW	4AM-1AM Mon-Sun	30,236	On-Time: 98.6%
Torrance Transit	1	Del Amo Fashion Center to Downtown Los Angeles via Torrance Blvd, Vermont Ave and Harbor Transitway	5AM-11PM Mon-Sun	2,004	N/A
	2	Del Amo Fashion Center to Downtown Los Angeles via Crenshaw Blvd and Harbor Transitway	6AM-8PM Mon-Sat	899	N/A
	3	Redondo Beach Pier to downtown Long Beach via Torrance Blvd, Carson St, Main St and Pacific Coast Hwy	5AM-10PM Mon-Sun	7,905	N/A
	5	Downtown Torrance to El Camino Community College via Van Ness Ave and Crenshaw Blvd	6AM-10PM Mon-Sat	1,076	N/A

Operator	Route #	Route Details	Operating Hours	Avg. Daily Riders	On-Time Performance
	6	Del Amo Fashion Center to Metro A Line (Blue) Artesia Station via Prairie Ave and 190th St	5AM-8PM Mon-Fri	614	N/A
	8	Torrance Airport to LAX City Bus Center via Hawthorne Blvd and Aviation Blvd	5AM-11PM Mon-Sun	2,227	N/A

Source: City of Gardena, November 2019. City of Lawndale, November 2019. City of Los Angeles, 2020. City of Redondo Beach, 2019. City of Torrance, 2014. Metro, 2019.
Ridership data available for Torrance Transit are from 2014 and on-time performance data are not available (N/A).
Note that this data represents pre-COVID-19 service levels
[1] Lawndale Beat was suspended during the COVID-19 pandemic.

3 PROJECT NEED

The Project Area currently faces several interrelated land use and transportation issues, as demonstrated in Section 2. Due to highly congested traffic conditions on many of the arterial roadways during peak hours, bus routes in the South Bay experience slow travel speeds and variable travel times. There are several different transit operators in the Project Area with varying schedules and poor collaboration, contributing to a lack of connectivity between local bus routes and the regional transit system. As a result, transit connectivity is limited or inconvenient for those wanting to access major activity centers. Multiple transfers are often necessary between local and regional bus routes, which creates a poor rider experience and increases overall trip time. For most riders traveling from within the Project Area to regional destinations such as LAX or downtown Los Angeles, transit is simply not an efficient or reliable mode. The transportation problem in the Project Area is summarized below.

- **Heavy Traffic Congestion** – In the Project Area and much of the rest of Los Angeles County, growth in traffic volumes has outpaced available roadway capacity. While High Occupancy Vehicle lanes on I-405 provide reduced travel times for carpools, mainline freeway lanes are subject to congestion throughout the day. Project Area arterial roadways also perform poorly during the morning and evening commute peak hours, due in part to traffic spillage onto arterials from I-405. According to the 2020 SCAG RTP/SCS, the regional average daily person-hours of delay on arterials, freeways, expressways and high occupancy vehicle lanes in the SCAG Counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura, is expected to increase by approximately 30% from 3.2 to 4.2 million hours between 2016 and 2045.
- **Poor Transit Travel Times and Schedule Reliability** – Limited coverage of bus routes and infrequent service increase travel times and often necessitate transfers between lines, adding additional challenges for riders. While this issue could be addressed by improving frequency of service, bus travel speeds are ultimately constrained by prevailing roadway traffic conditions in the Project Area. With local arterial roadway and freeway performance expected to deteriorate in the future, transit travel times are expected to increase through 2042 and transit on-time performance is anticipated to be less reliable through 2042. The 2009 Harbor Subdivision Alternatives Analysis evaluated an enhanced bus service alternative called the Transportation System Management Baseline, which included options for low-cost operational improvements to current transit facilities and services to extract the greatest benefits from existing infrastructure; however these types of improvements were not selected as best able to address the needs of the Project Area.
- **Poor Regional Transit Connections** –There are six transit operators serving the Project Area, but many of the municipal routes operate with limited frequency or are community circulators, and they do not serve the demand for regional transit service. Transferring between the multiple municipal services can also be challenging and confusing for riders because of poor schedule coordination and differences in fares.
- **Poor Transit Connections to Major Activity Centers** – Several major activity centers are within the Project Area, including regional commercial destinations such as the South Bay Galleria in the City of Redondo Beach. These activity centers attract trips from communities within the Project Area as well as the broader region, but transit accessibility to these centers is poor.

4 PROJECT OBJECTIVES

As discussed above, the underlying purpose of the Project is to provide high-capacity transit service in the South Bay. Metro has identified the following objectives for this Project:

- Improve mobility within the South Bay and encourage mode shift by:
    - Introducing high-frequency transit service options from the current C Line terminus south to Torrance.
    - Creating direct connections between the regional transit network and local transit hubs for convenient transfers.
    - Providing an alternative mode of transportation for commuters traveling along congested arterials and I-405.
    - Providing First-Last Mile facilities to connect to neighborhoods to station areas.
- Reduce air pollution and greenhouse gas emissions by making transit a more viable transportation choice.
- Avoid and minimize environmental impacts on environmental resources to the maximum extent feasible.
- Provide a cost-effective project.
- Provide more equitable access to regional destinations by improving connections to the Metro regional rail system.

Metro staff will prepare a recommendation on the 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 adherence to the above project objectives.