Chapter 2 ALTERNATIVES CONSIDERED

This chapter discusses how the alternatives studied in this EIS/EIR were developed. All of the proposed build alternatives meet the purpose and need outlined in Chapter 1.

This chapter includes a detailed discussion of the alternatives identified for additional study and alternatives that were analyzed and subsequently eliminated from consideration. These alternative analyses were performed in compliance with the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), and all applicable associated guidance.

The Regional Connector Transit Corridor Project Draft EIS/EIR was made available to identified stakeholders, agencies, and the general public for review and comment for a 45-day review period from September 3, 2010 through October 18, 2010. On October 28, 2010, the Metro Board of Directors voted to designate the Fully Underground Light Rail Transit (LRT) Alternative without the Flower/5th/4th Street station as the Locally Preferred Alternative (LPA). However, the project design would not preclude construction of a station at this location as a future, separate project. This chapter has been updated since publication of the Draft EIS/EIR based on refinements to the LPA, which were undertaken in order to reduce impacts. A Supplemental Environmental Assessment/Recirculated Sections of the Draft EIR (Supplemental EA/Recirculated Draft EIR Sections) document was circulated for 45 days, from July 22, 2011 to September 6, 2011, in order to provide additional information about the LPA refinements. A vertical line in the margin is used to show where revisions have occurred to this chapter since publication of the Draft EIS/EIR, excluding minor edits for consistency and correction of formatting and minor typographical errors.

Based on comments received on the Draft EIS/EIR and the Supplemental EA/Recirculated Draft EIR Sections and input received from community meetings held during preparation of this Final EIS/EIR, the following refinements, which are described in further detail in Section 2.3.6 below and Section 4.18, Construction Impacts, were made to the LPA to reduce or avoid previously identified impacts:

- An enhanced pedestrian walkway would be created along the east side of Flower Street from the 4th Street and Flower Street area to the existing 7th Street/Metro Center Station entrance at 7th and Flower Streets.
- At 2nd Street and the pedestrian signal to the Japanese Village Plaza (JVP), the tracks would continue underground heading northeast under the plaza and 1st and Alameda Streets.
- The proposed Little Tokyo/Arts District underground station, 1st/Central Avenue station (previously called 2nd/Central Avenue station), would be partially located within Central Avenue and the northern half of the block bounded by 1st Street, Central Avenue, 2nd Street, and Alameda Street.
- The Tunnel Boring Machine (TBM) would be inserted at the property northeast of 1st and Alameda Streets, the Mangrove property (formerly known as the Nikkei development), and transported underground to Central Avenue, where it would begin excavating westward (refer to Section 4.18, Construction Impacts, for more detail).

- Tunnel boring activities from the new insertion site would proceed farther down Flower Street to 4th Street instead of ending at the proposed 2nd/Hope Street station (refer to Section 4.18, Construction Impacts, for more detail).
- Cut and cover on 2nd Street in Little Tokyo would not be required, which would result in less cut and cover overall during construction (refer to Section 4.18, Construction Impacts, for more detail).
- Relocation of the 2nd Street storm drain would not be required in Little Tokyo (refer to Section 4.18, Construction Impacts, for more detail).
- Reductions were made to the size of proposed temporary construction easements along Flower Street.

The following refinements were made to the LPA to improve project design:

- A pocket track, which could also serve as a crossover, would be located beneath Flower Street between 4th and 6th Streets. This would allow for a possible future station beneath Flower Street between 5th and 4th Streets to be constructed as a separate project.
- Crossovers could be located north and east of the proposed rail junction: in the tunnel beneath the Mangrove property, and beneath 1st Street just east of the intersection of 1st and Alameda Streets.
- A traction power substation (TPSS) facility would be located underground along Flower Street between 5th and 4th Streets in the deleted Flower/5th/4th Street station location. This would not preclude a possible future station from being constructed at this location as a separate project.
- Antennas may be used as part of the LRT communication system. Antennas would not be visible from any historic resource and would not intrude on the visual quality of the surrounding neighborhood (refer to Section 2.3.3.7 below for more information).

In addition to modifications associated with refinements to the LPA described above, there have been modifications and corrections to this chapter in response to comments received on the Draft EIS/EIR and the Supplemental EA/Recirculated Draft EIR Sections, as indicated in the Responses to Comments, Volumes F-2 through F-4 of this Final EIS/EIR.

The LPA would involve construction and operation of a 1.9 mile LRT connector that would link the Metro Blue Line, Metro Gold Line, and future Metro Expo Line into a single consolidated system. All proposed build alternatives would begin underground at the existing Metro Blue Line (and future Metro Expo Line) platform at 7th Street/Metro Center Station and extend in a northeastern direction to a new junction with the Metro Gold Line near Alameda Street. Figure 2-1 shows the LRT routes and stations that were identified for study in the EIS/EIR, as well as the refined LPA.

2.1 Background and Planning Context

The Regional Connector Transit Corridor alternatives presented in this EIS/EIR build on prior planning studies and projects from the past two decades. In particular, the early studies from 1988 to 1993 focused on extending the Metro Blue Line (light rail line) to Pasadena. The Metro Blue Line currently extends from downtown Los Angeles to Long Beach. This project was later

constructed as the Metro Gold Line from Union Station to Pasadena, with the connection to the Metro Blue Line at 7th Street/Metro Center Station deferred to a later time. The Metro Expo Line (light rail line), which will extend from downtown West Los Angeles to Santa Monica, was not included in those studies, as it was not yet in the planning stages.

In addition, the Eastside Extension portion of the Metro Gold Line (light rail line), which extends from downtown Los Angeles to East Los Angeles, was initially approved as an extension of the Metro Red Line (a heavy rail subway system). The Metro Red Line currently extends from downtown Los Angeles to North Hollywood. The proposed extension to East Los Angeles was later re-scoped to the currently operating Metro Gold Line to East Los Angeles light rail system. These earlier studies did not account for the benefits of a cross-county east-west light rail service, and instead focused on the north-south route from Long Beach to Pasadena.

The Regional Connector Transit Corridor would provide the benefits of both north-south as well as east-west routes. Later studies, from 2004 onward, including the recent Regional Connector Alternatives Analysis (AA), focused on both the north-south and east-west routes, and called for a connection between Union Station and 7th Street/Metro Center Station.

The Metro Board of Directors authorized the Regional Connector Transit Corridor project to proceed into the Draft EIS/EIR phase in February 2009. Regional plans and funding measures that identify the Regional Connector Transit Corridor include the Southern California Association of Governments (SCAG) Regional Transportation Plan, the Metro Long Range Transportation Plan (LRTP), and Measure R.

Following the 45-day comment period for the Draft EIS/EIR, from September 3, 2010 to October 18, 2010, the Metro Board of Directors designated an LPA and authorized the Regional Connector Transit Corridor project to proceed into the Final EIS/EIR phase. Metro subsequently published a Supplemental EA/Recirculated Draft EIR Sections document to formally introduce refinements made to the LPA since publication of the Draft EIS/EIR. The 45-day comment period for the Supplemental EA/Recirculated Draft EIR Sections document ran from July 22, 2011 to September 6, 2011.

2.1.1 SCAG Regional Transportation Plan

SCAG's 2008 *Regional Transportation Plan* includes the Regional Connector Transit Corridor as a strategic transit system expansion project with implementation expected prior to 2035. As the designated Metropolitan Planning Organization (MPO) for Los Angeles, Riverside, San Bernardino, Ventura, Orange, and Imperial Counties, SCAG provides coordination between transit projects across the Southern California region.

2.1.2 Measure R

In November 2008, Los Angeles County voters approved a half-cent sales tax increase (Measure R) that will be used to fund approximately $40 billion worth of transportation projects in Los Angeles County over the next 30 years. Due to the uncertainty of the passage of Measure R during the development of the Regional Connector AA, projects identified in Measure R were not included in the AA Report, as they had not yet been identified as funded in the LRTP. With the passing of Measure R, all Measure R projects are now included in the LRTP. Those funded

projects identified to be completed and operational by 2035 are incorporated in the analysis conducted for this EIS/EIR, as further described in Section 2.3, as part of the No Build Alternative.

2.1.3 Metro Long Range Transportation Plan

Metro's 2009 LRTP includes the Regional Connector Transit Corridor among the projects planned for implementation by 2035 (with a possible opening date of 2019). The other projects outlined in the plan are also included in the baseline conditions (year 2035) assumed for the regional transportation analysis presented in this EIS/EIR.

2.2 Development of Alternatives

2.2.1 Overview

As indicated in Section 2.1, the Regional Connector Transit Corridor project alternatives presented in this EIS/EIR build on the findings of previous studies and projects beginning in the early 1990s. The development of light rail alternatives for this study included the following processes:

- Identification of alternatives
- Project scoping and refinement of alternatives
- Detailed analysis of the refined alternatives

As discussed in Chapter 1, the first step of identifying alternatives was accomplished during the AA process. The process included an investigation to identify and screen potential transportation alternatives in light of the project purpose and need, and goals and objectives. This screening process is documented in the Final AA Report approved by Metro in January 2009 (Appendix H) and is incorporated into this EIS/EIR. The AA process included initial technical analysis and community and public agency feedback gathered at meetings and public workshops. Alternatives considered in the AA represent the full spectrum of reasonable means of achieving the goals and objectives outlined in Chapter 1. The report evaluated potential alternatives based on their environmental impacts, efficiency, financial feasibility, effectiveness, and equity. From the AA effort, alternatives emerged which were analyzed further for this EIS/EIR and were confirmed and refined based on the public scoping process and community input received. These alternatives are:

- No Build Alternative (see Figure 2-2)
- TSM Alternative (see Figure 2-3)
- At-Grade Emphasis LRT Alternative (see Figure 2-8)
- Underground Emphasis LRT Alternative (see Figure 2-9)

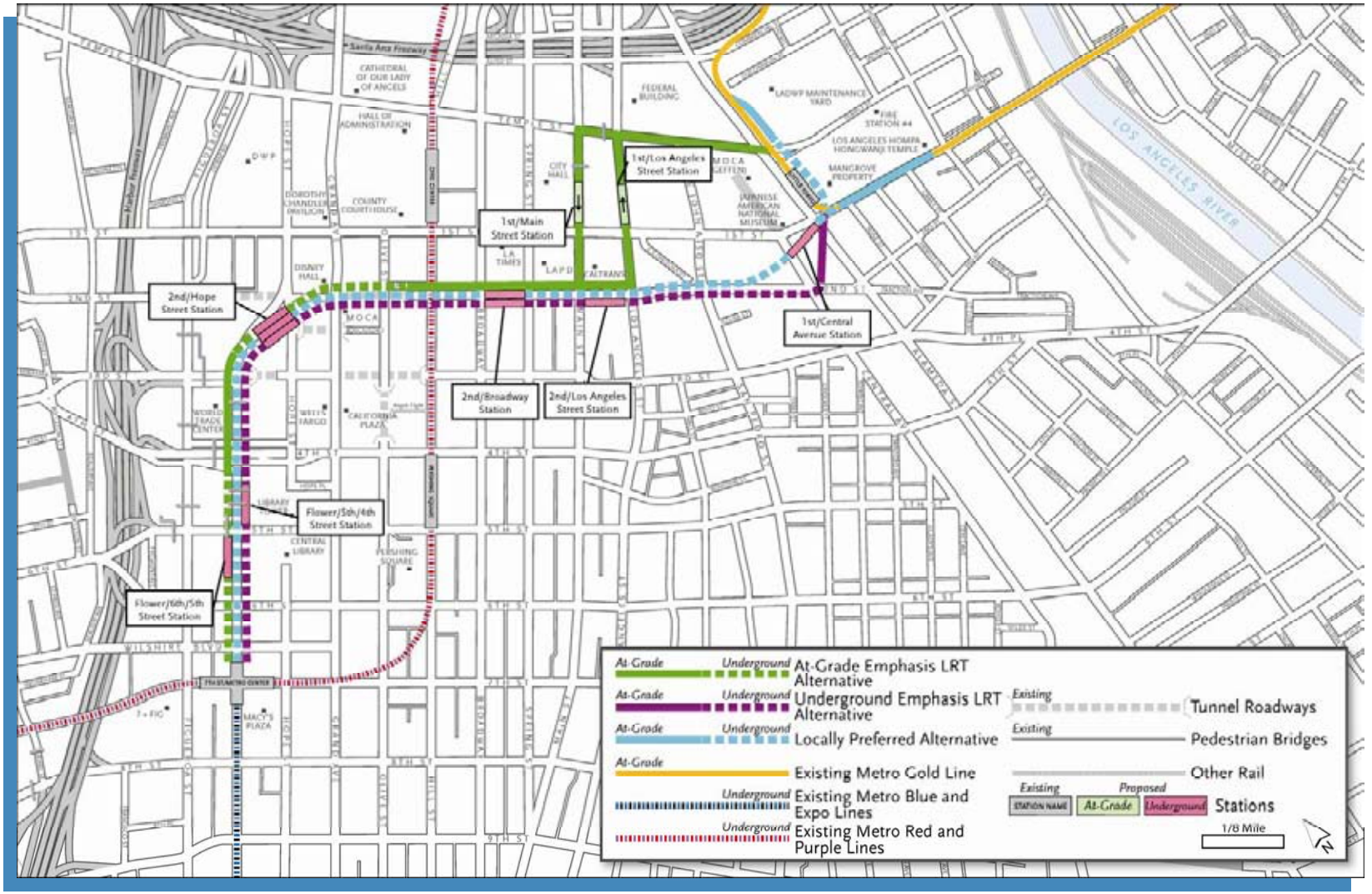


Figure 2-1. LRT Alignments and Stations Studied

In response to extensive community input and formal project scoping, the Metro Board of Directors authorized inclusion of a new alternative— the Fully Underground LRT Alternative (see Figure 2-10)—in this EIS/EIR in February 2010.

The Metro Board of Directors authorized inclusion of this alternative, which is identical to the Underground Emphasis LRT Alternative until it reaches 2nd Street and Central Avenue, in the Draft EIS/EIR. At that point it would remain underground, avoiding surface operation at 1st and Alameda Streets, which was of concern to the surrounding community. This alternative became viable when adjacent stakeholders worked collaboratively to reconfigure adjacent vacant property which at that time was planned for future development. Two variations of this alternative were proposed for study, and the technical appendices for the Draft EIS/EIR (Appendices K through GG) addressed both of them.

However, once the costs and potential impacts of Variation 2 were analyzed further, the community expressed a preference for Variation 1. Variation 2 was subsequently eliminated from further consideration based on technical, cost, and community considerations. The Fully Underground LRT Alternative is referred to as "Fully Underground LRT Alternative – Little Tokyo Variation 1" in the technical appendices; it was referred to simply as the "Fully Underground LRT Alternative" in the Draft EIS/EIR and in this Final EIS/EIR. For a description of the Fully Underground LRT Alternative – Little Tokyo Variation 2, please see Section 2.5.3.

An alternative similar to the Fully Underground LRT Alternative, named Alternative 8, was studied in the Final AA Report (Appendix H). However, the alternative was eliminated from further study in the AA due to uncertainty regarding development of the Mangrove property and potential impacts to the Los Angeles Hompa Hongwanji Buddhist Temple.

Additional coordination with Los Angeles Hompa Hongwanji Buddhist Temple staff and the Mangrove property developer during the Draft EIS/EIR process revealed that the proposed Fully Underground LRT Alternative would be feasible in light of recent changes in development plans.

2.2.2 Alternatives Screening and Selection Process

The AA Report evaluated a wide range of reasonable alternatives, including different routes, modes, configurations, and station locations. One of the primary purposes of the AA process was to screen the alternatives and identify those that would be most feasible and best meet the goals of the project, which are described in Chapter 1, Purpose and Need. NEPA and CEQA allow alternatives to be eliminated for further consideration before the Draft EIS/EIR process begins. Alternatives may also be added, removed, or refined following the NEPA/CEQA scoping process and early coordination with agencies and stakeholders. Following the release of the Draft EIS/EIR, Metro Board of Directors designated the Fully Underground LRT Alternative as the LPA to be carried forward for closer study in this Final EIS/EIR.

2.2.2.1 Alternatives Screening Methodology

At the beginning of the AA study, an initial set of conceptual alternatives was developed based on review of previous studies, initial evaluation of physical and operational constraints in the corridor, evaluation of compatibility with the existing transit system, and potential adverse environmental impacts. The alternative development and screening process proceeded as follows:

- Identification of an Initial Set of Conceptual Alternatives: An initial set of 36 light rail alternatives was developed, spanning all of the appropriate alignments that would link the Metro Blue, Gold, and Expo Lines and allow them to function as a connected regional system. Additionally, the No Build and TSM Alternatives were developed to be evaluated alongside the build alternatives. The alternatives were developed based on review of previous studies, potential environmental impacts, and feasibility.

- Early Scoping Process: Based on input from stakeholders, agencies, and interested members of the public, the initial set of conceptual alternatives was narrowed to eight. Decisions to eliminate alternatives were based on clear, objective criteria including constructability, right-of-way constraints, impacts, and operational feasibility.

- Initial Screening of Alternatives: After further input from stakeholders, agencies, and the public, the eight alternatives were compared using a multi-criteria comparison model. This resulted in two promising build alternatives. These two build alternatives underwent further engineering, environmental analysis, and urban design assessments, and were carried forward into the Draft EIS/EIR phase of the project along with the No Build and TSM Alternatives.

- Draft EIS/EIR Scoping: A 49-day scoping period was initiated following the publication of the Notice of Intent/Notice of Preparation (NOI/NOP) in the Federal Register. Public and agency comments were accepted at scoping meetings held during this time, and via an on-line form, e-mail, and regular mail. Refinements were made to alternatives carried forward from the AA process based on this input. A summary of the comments received is available in the Final Scoping Report, which is incorporated into this EIS/EIR as Appendix G.

- In response to extensive community input and formal project scoping, the Metro Board of Directors authorized inclusion of a new alternative - the Fully Underground LRT Alternative (see Figure 2-10) - in this EIS/EIR in February 2010.

- The community voiced strong concerns about the other alternatives' potential construction impacts, potential to divide the community, and potential effects on local businesses and residences (additional details on these concerns is provided in Section 4.17, Environmental Justice). The community indicated strong support for the Fully Underground LRT Alternative, and opposition to other build alternatives. Metro staff therefore recognized the status of the Fully Underground LRT Alternative as the staff recommended LPA.

- Draft EIS/EIR Public Review: The Draft EIS/EIR was made available to identified stakeholders, agencies, and the general public for review and comment for a 45-day review period from September 3, 2010 through October 18, 2010. On October 28, 2010, the Metro Board of Directors accepted staff's recommendation to designate the Fully Underground LRT Alternative without the Flower/5th/4th Street station as the LPA. However, the project design would not preclude construction of a station at this location as a future, separate project.

- Supplemental EA/Recirculated Draft EIR Sections Public Review: The Supplemental EA/Recirculated Draft EIR Sections document was prepared to formally provide additional information about refinements made to the LPA after publication of the Draft EIS/EIR.

Similar to the Draft EIS/EIR, the document was made available to identified stakeholders, agencies, and the general public for review and comment for a 45-day review period from July 22, 2011 through September 6, 2011.

2.2.2.2 Evaluation Criteria

As described in Chapter 1, the evaluation criteria that were used to screen alternatives against the purpose and need goals include the following. (This is a summarized list of the key criteria presented in Chapter 1):

- Improve Mobility and Accessibility both Locally and Regionally: Develop an efficient and sustainable level of mobility within Los Angeles County to accommodate planned growth and a livable environment.
- Provide a Cost-Effective Transportation System: Develop a project that provides sufficient regional benefits to justify the investment.
- Provide a Safe and Secure Transportation System: Develop a project that is safe for riders, pedestrians, and drivers while meeting the region's need for security.
- Achieve a Financially Feasible Project: Develop a project that maximizes opportunity for funding and financing that is financially sustainable.
- Support Public Involvement and Community Preservation: Incorporate the public in the planning process and balance the benefits and impacts while preserving communities in the area, such as Little Tokyo, the Arts District, Bunker Hill, Civic Center, and the Historic Core.
- Support Efforts to Improve Environmental Quality: Develop a project that minimizes environmental impacts.
- Support Community Planning Efforts: Support the progression of the downtown Los Angeles area as an integrated destination and a dynamic livable area accommodating projected growth in a sustainable manner.

2.2.2.3 NEPA and CEQA Scoping

The Federal Transit Administration (FTA) and Metro conducted public scoping meetings in late March and early April 2009, and stakeholder meetings continued to be held throughout the EIS/EIR process. Metro accepted comments for the duration of the 49-day scoping period, from March 24, 2009 until May 11, 2009. Metro invited local, regional, state, and federal agencies; affected Native American tribes; interest groups; businesses; local community groups; and all members of the public to submit comments during the scoping period. A summary of the comments received is available in the Final Scoping Report, which is incorporated into this EIS/EIR as Appendix G.

2.3 Alternatives Evaluated in this EIS/EIR

The following alternatives were evaluated in this EIS/EIR for potential environmental, economic, and social impacts:

- No Build Alternative
- TSM Alternative
- At-Grade Emphasis LRT Alternative
- Underground Emphasis LRT Alternative
- Fully Underground LRT Alternative – LPA

All three of the build alternatives consist of LRT tracks, stations, and associated facilities. Each of the build alternatives were designed as a double-track system (one track in each direction) to accommodate the anticipated frequency of train traffic. Alternatives range in length between 1.6 and 1.9 miles and include either three or four new stations. All alternatives are within the project area shown in Figures 1-1 and 1-2 in Chapter 1, Purpose and Need, of this Final EIS/EIR. A goal of Metro is to be the transportation industry leader in maximizing sustainability efforts and its benefits for Los Angeles County's people, economy, and the environment. The Regional Connector project would also be designed and constructed in accordance with Metro's sustainability goal. Table 2-1 provides an overview of the operating characteristics of the alternatives.

2.3.1 No Build Alternative

2.3.1.1 Overview

The No Build Alternative is the future scenario without the TSM or any of the proposed build alternatives. The No Build Alternative does not include any major service improvements or new transportation infrastructure beyond what is listed in Metro's 2009 LRTP. Figure 2-2 illustrates the transit lines that currently serve the project area.

By 2035, the Metro Expo Line to Santa Monica, Metro Purple Line to Westwood, Metro Crenshaw Line, Metro Green Line to the South Bay and Los Angeles International Airport (LAX), and the Metro Gold Line to Azusa (which will ultimately run to Montclair) and the San Gabriel Valley will have opened, and a number of bus routes will have been reorganized and expanded to provide connections with these new rail lines. The transit network within the project area would otherwise be largely the same as it is now.

The anticipated light rail, heavy rail, bus, and commuter rail transit services for the year 2035 No Build Alternative are described in the following sections. Some of these projects are proposed to be funded by Measure R and FTA and are planned to be implemented within the 2035 timeframe, but could be delayed due to unforeseen circumstances.

2.3.1.2 Metro Rail

- Metro Gold Line from Union Station to Azusa: A 25-mile LRT line along the northeastern edge of the project area. The segment from Union Station to Sierra Madre Villa is currently in service. The Foothill Extension from Sierra Madre Villa to Azusa is scheduled to open in 2014. A future extension to Montclair is expected to open after 2035.

- Metro Blue Line from downtown Long Beach to 7th Street/Metro Center Station: A 22-mile LRT line, which is currently in service, traveling south from the project area.

- Metro Gold Line Eastside Extension from Union Station to East Los Angeles and I-605: An LRT line traveling east from downtown Los Angeles to East Los Angeles and the San Gabriel Valley. The first six-mile phase to East Los Angeles opened in November 2009. The further extension to I-605 in the San Gabriel Valley is anticipated to open in 2032.

- Metro Expo Line from 7th Street/Metro Center Station to the City of Santa Monica: A 15.5 to 16.5-mile light rail route scheduled to open by 2016, directly connecting downtown Los Angeles with the Westside. It will use the existing Metro Blue Line tracks between 7th Street/Metro Center Station and the intersection of Washington Boulevard and Flower Street. An initial phase to Culver City is expected to open in 2011.

- Metro Red Line to North Hollywood and Metro Purple Line to Westwood: A 26-mile heavy rail transit (HRT) system that connects 7th Street/Metro Center Station to Union Station and other major destinations in downtown Los Angeles, West Los Angeles, Beverly Hills, Westwood, Hollywood, and the San Fernando Valley. The two lines share tracks within the project area. The Metro Red Line to North Hollywood and the Metro Purple Line to Wilshire/Western Station are currently in service. The remainder of the Metro Purple Line route to Westwood is expected to open in phases by 2035.

- Metro Crenshaw Line from the Metro Green Line at Aviation Boulevard to the Metro Expo Line at Crenshaw Boulevard: An approximately ten-mile light rail transit system anticipated to be operational by 2019.

- Metro Green Line from Norwalk to LAX and the South Bay: An extension of the existing Metro Green Line to South Bay Galleria in Redondo Beach (by 2035), and a one-mile branch from the existing line to LAX (by 2028).

2.3.1.3 Bus Lines

It is anticipated that the bus service in the project area would predominantly remain the same through the year 2035, potentially with adjusted headways where needed. Given the already saturated bus service in the downtown area and considering the projected growth in traffic congestion due to employment and population growth of the project area, it is likely that few improvements can be made to frequencies in transit service without a major transportation investment.

Table 2-1. Operating Characteristics of the Alternatives

Alternative	Transit Service	Operations	Trip Time from Union Station to Pico	Trip Time from Pico/Aliso to Pico	Signal Priority or Re-Coordination
No Build Alternative	No improvements beyond existing transit service, except those listed in Metro's 2009 LRTP. Some service adjustments may occur to accommodate these service improvements.	All bus and rail lines would operate using a fleet of vehicles similar to those currently in service or identified for purchase in the LRTP.	17 minutes via Red/Purple and Blue Lines (assumes five minutes for each transfer)	23 minutes via Gold, Red/Purple, and Blue Lines (assumes five minutes for each transfer)	No new signal priority or coordination beyond what is included in LRTP projects.
TSM Alternative	All provisions of the No Build Alternative plus two new shuttle buses: Lower Grand Route (with one optional detour) and Upper Grand Route. Each route would operate every 2 ½ minutes during peak hours, and every five minutes during off-peak hours. On the Lower Grand Route, every other bus would use the option detour on Alameda Street, and the remaining buses would use Los Angeles Street. Rail service would remain unchanged from the No Build Alternative.	The buses could range from 30-foot shuttle buses to standard 40-foot buses, depending on rider demand.	22 minutes via Red/Purple and Blue Lines (assumes five minutes for each transfer)	30 minutes via Gold, Red/Purple, and Blue Lines (assumes five minutes for each transfer)	Signal priority would be granted to oncoming shuttle buses where possible.

Table 2-1. Operating Characteristics of the Alternatives (continued)

Alternative	Transit Service	Operations	Trip Time from Union Station to Pico	Trip Time from Pico/Aliso to Pico	Signal Priority or Re-Coordination
At-Grade Emphasis LRT Alternative	Light rail trains would operate on a north-south route (Montclair to Long Beach Transit Mall) and an east-west route (I-605 to Santa Monica) using the new Regional Connector Transit Corridor tracks. Trains would run every five minutes on each route during peak hours, yielding trains every 2 ½ minutes in each direction on the new Regional Connector Transit Corridor tracks.	Light rail trains would be used that are similar to Metro's current fleet.	14 minutes via north-south route	15 minutes via east-west route	Signal priority and/or coordination would be needed at Flower and 3rd Streets, on 2nd Street between Hill Street and Los Angeles Street, on Main Street between Temple Street and 2nd Street, on Los Angeles Street between Temple Street and 2nd Street, and on Temple Street between Main Street and Alameda Street.
Underground Emphasis LRT Alternative	Light rail trains would operate on a north-south route (Montclair to Long Beach Transit Mall) and an east-west route (I-605 to Santa Monica) using the new Regional Connector Transit Corridor tracks. Trains would run every five minutes on each route during peak hours, yielding trains every 2 ½ minutes in each direction on the new Regional Connector Transit Corridor tracks.	Light rail trains would be used that are similar to Metro's current fleet.	12 minutes via north-south route	10 minutes via east-west route	Signal priority and/or coordination would be needed at 1st and Alameda Streets.
LPA (Formerly the Fully Underground LRT Alternative)	Light rail trains would operate on a north-south route (Montclair to Long Beach Transit Mall) and an east-west route (I-605 to Santa Monica) using the new Regional Connector Transit Corridor tracks. Trains would run every five minutes on each route during peak hours, yielding trains every 2 ½ minutes in each direction on the new Regional Connector Transit Corridor tracks.	Light rail trains would be used that are similar to Metro's current fleet.	10 minutes via north-south route	11 minutes via east-west route	Removal of the traffic signal at 1st and Hewitt Streets may require signal re-coordination.

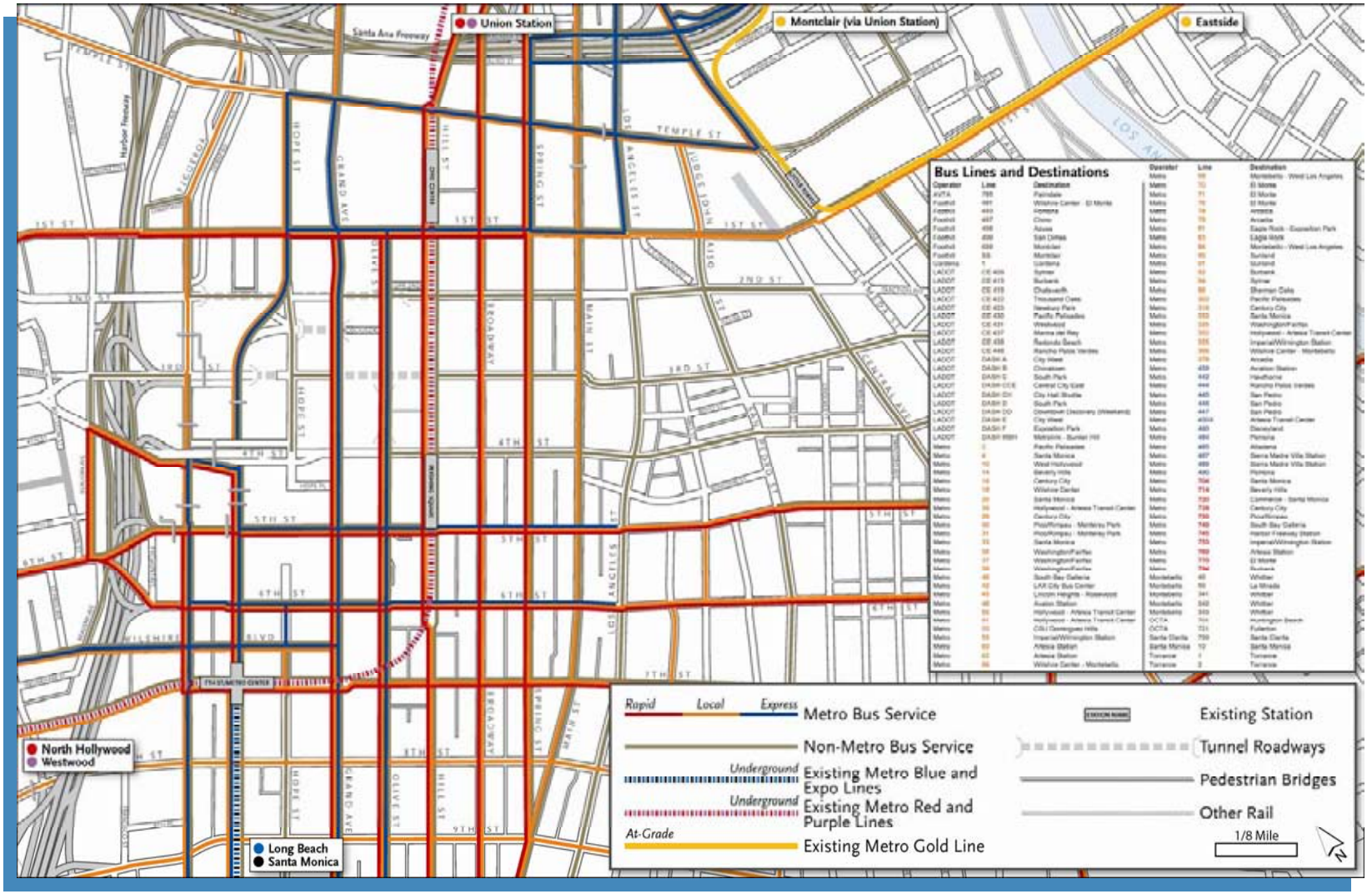


Figure 2-2. No Build Alternative

2.3.1.4 Other Passenger Rail Service

Similar to today, Amtrak and Metrolink would continue to provide commuter rail services to Union Station from other cities in the region. Arriving passengers have the choice of transferring to the Metro Red and Purple Lines, Los Angeles Department of Transportation (LADOT) DASH bus service, or other buses and shuttles that continue trips to the central business district or other parts of the Los Angeles area. The planned future California High-Speed Rail (CAHSR) project would serve Union Station and may be implemented during a similar timeframe as the Regional Connector. If this occurs, coordination between the two projects regarding construction and operation would be needed. Metro has designated a high-speed rail coordinator who would handle coordination with the CAHSR authority. Operation of the Regional Connector and the CAHSR project would be coordinated to the extent possible. The primary focus of the coordination would pertain to construction activities.

2.3.1.5 Operating Characteristics

The transit system operating characteristics under the No Build Alternative are shown in Table 2-1.

2.3.2 Transportation System Management Alternative

2.3.2.1 Overview

The TSM Alternative includes all of the provisions of the No Build Alternative, plus two new express shuttle bus lines linking the 7th Street/Metro Center and Union Stations. These buses would run frequently, just a few minutes apart, especially during peak hours. Enhanced bus stops would be located every two to three blocks, so as to maximize coverage of the area surrounding the routes. Rail service would remain the same as described for the No Build Alternative.

The two routes are described below and illustrated in Figure 2-3:

- Upper Grand Route: From the 7th Street/Metro Center Station, buses would proceed east on 7th Street, north on Olive Street, west on 5th Street, north on Grand Avenue, east on Temple Street, and then north on Los Angeles Street to Union Station. As a variation, buses could use Alameda Street between Temple Street and Union Station to allow a stop at Temple and Alameda Streets, near the Little Tokyo/Arts District Station. The alignment is assumed to follow the same route as part of the existing LADOT DASH Route B service, proceeding from the 7th Street/Metro Center Station to Union Station using Grand Avenue, Temple Street, and Los Angeles Street. Shuttle buses would provide coverage of the Bunker Hill and Civic Center areas.

- Lower Grand Route: This route would utilize the existing northbound bus-only lanes on Figueroa Street, and mixed flow lanes on 2nd and 3rd Streets, which are lightly used by other bus lines. From the 7th Street/Metro Center Station, buses would proceed north on Figueroa Street, west on 2nd Street, and north on Alameda Street to Union Station. To return to 7th Street/Metro Center Station, buses would travel south on Alameda Street, west on 3rd Street, and south on Flower Street. The alignment passes by both the Little Tokyo/Arts District Station and Union Station, and provides good coverage of Little Tokyo and the southern edge of the Civic Center.

2.3.2.2 Operating Characteristics

The shuttle routes, which could use vehicles ranging from 30-foot shuttle buses to standard 40-foot buses, would be operated by Metro. The buses would run every few minutes during peak periods, and peak hour bus-only lanes would be created where possible by restricting parking on streets that do not already have dedicated all-day bus lanes. Similar to the Metro Rapid Bus lines, a Transit Priority System (TPS) that allows longer green lights for oncoming transit vehicles could also be employed where possible to increase bus speed and efficiency.

The TSM Alternative would not require a reduction in traffic lanes. Table 2-1 provides a summary of the operating characteristics of the TSM Alternative.

2.3.3 Light Rail Transit - General Characteristics

An LRT system consists of electric trains powered by overhead wires, typically operating in an urban transit setting. LRT uses conventional steel tracks, which have the flexibility to be placed in exclusive surface right-of-way, in tunnels, on elevated viaducts, in street medians, or in mixed flow traffic lanes. This allows light rail trains to operate in a variety of environments. Metro's LRT system is designed to accommodate trains of up to three 90-foot rail cars (total train length of 270 feet) capable of speeds up to 65 miles per hour (MPH) as well as street running service adhering to posted traffic speeds for automobiles. Metro's train cars have high floors and all stations have high-platforms. Metro's LRT system does not operate in mixed flow traffic lanes, except where it crosses lanes at grade crossings. As a result, train operation is normally unaffected by parallel traffic congestion. Metro service typically operates rail service 20 hours per day, seven days per week, and train frequency on each line varies based on demand. The following subsections provide a general description of LRT infrastructure, to illustrate the mode's flexibility and the range of possibilities considered during the development of the proposed build alternatives.

2.3.3.1 Typical At-Grade Alignment

An at-grade LRT alignment consists of tracks running at ground level. Tracks can be in off-street exclusive rights-of-way or in exclusive lanes within a street with mixed flow operation at intersections. Light rail trains using street-running tracks are typically restricted to the same speed limits as automobile traffic. At locations where the tracks cross other streets, special traffic signals may be used, sometimes supplemented by automatic crossing arms. Automatic crossing arms for an LRT typically utilize visual and auditory warning devices. At some intersections, trains may be required to stop at signals while cross traffic proceeds, but the traffic signal system may be programmed to minimize such occurrences. At-grade LRT is typically less expensive to construct than other configurations, such as tunnels or elevated viaducts, but can cause traffic flow impacts at intersections where automobile traffic must wait for trains to pass. Due to these issues, at-grade LRT is not always suitable in areas with very frequent trains or heavy cross traffic. Figure 2-4 is an illustration of a typical at-grade alignment.

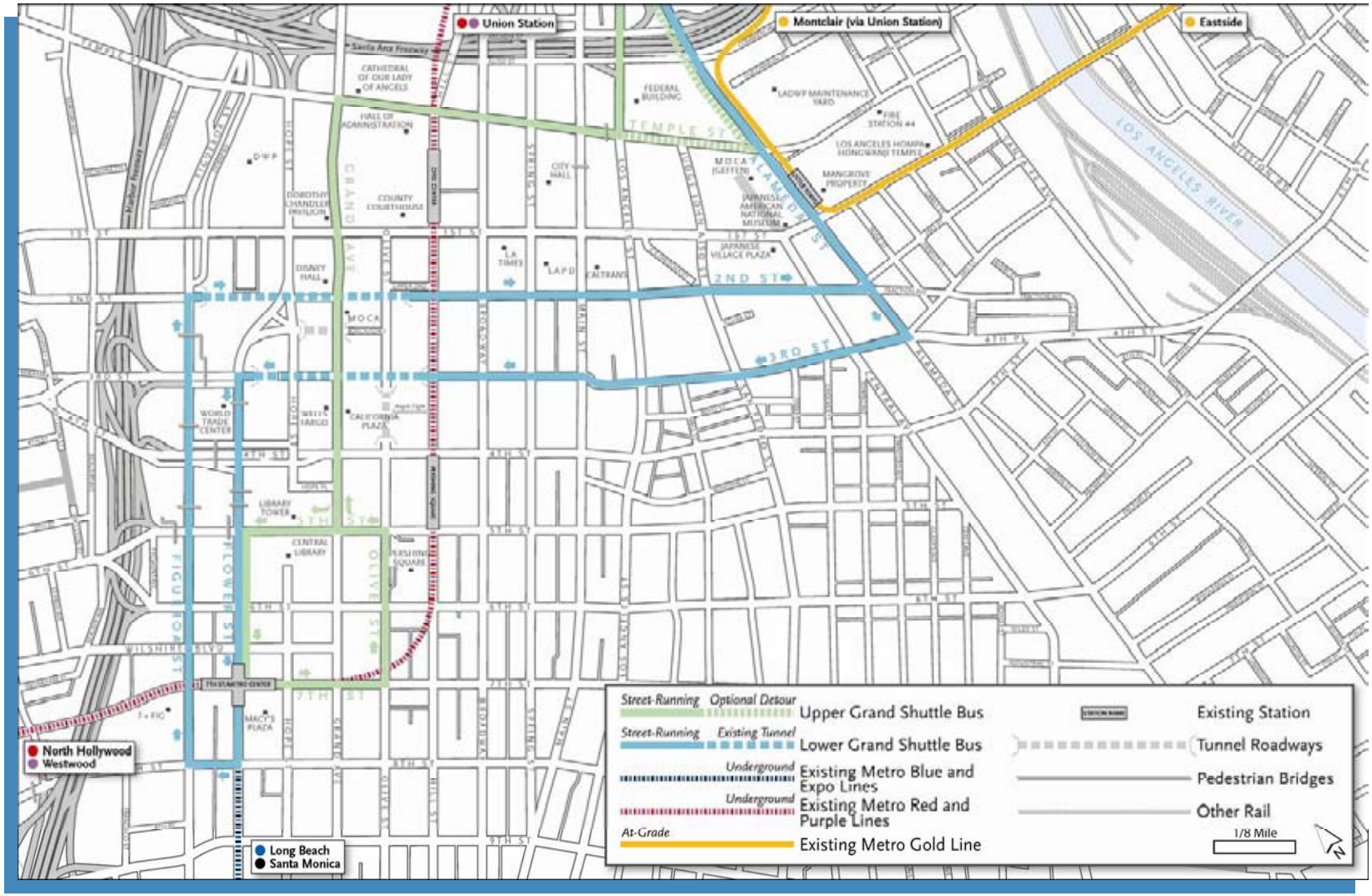


Figure 2-3. TSM Alternative

Figure 2-4. Typical At-Grade Alignment

2.3.3.2 Typical Underground Alignment

An underground LRT alignment consists of tracks in tunnels completely separated from traffic on the surface. Operation of an underground LRT system has no impact on surface traffic; however, it is typically more expensive to construct than at-grade LRT alignments. Underground LRT tracks can accommodate a higher frequency of trains, even in areas where surface traffic is heavy. Speed limits along underground LRT tracks are determined by curves in the alignment and the capabilities of the trains. LRT can transition from an underground configuration to an at-grade configuration through portals, where tracks rise from tunnels to the surface via a ramp structure. Figure 2-5 is an illustration of a typical underground alignment.

2.3.3.3 Typical Crossovers

Crossovers are mechanical track installations along a double-track alignment that allow trains traveling in either direction on either track to move to the other track and continue traveling in the same direction without stopping. Trains may also pass through a crossover without switching tracks. Crossovers allow a portion of one track to be closed without completely suspending rail service. Crossovers can be used to allow trains to bypass a stalled train or turn back in the opposite direction. Wider rights-of-way may be required in the vicinity of at-grade crossovers thus potentially increasing the amount of roadway space needed for LRT facilities.

2.3.3.4 Typical Ventilation Structures

Ventilation structures allow for climate control and emergency ventilation of tunnels and underground stations. These structures would be included at each of the proposed underground stations. In some instances, a small building on the surface above the station would be needed to house fans and electrical equipment. Ventilation structures can also be located along tunnel segments that are not adjacent to stations to provide additional air circulation in areas where there is a long stretch of tunnel between stations.

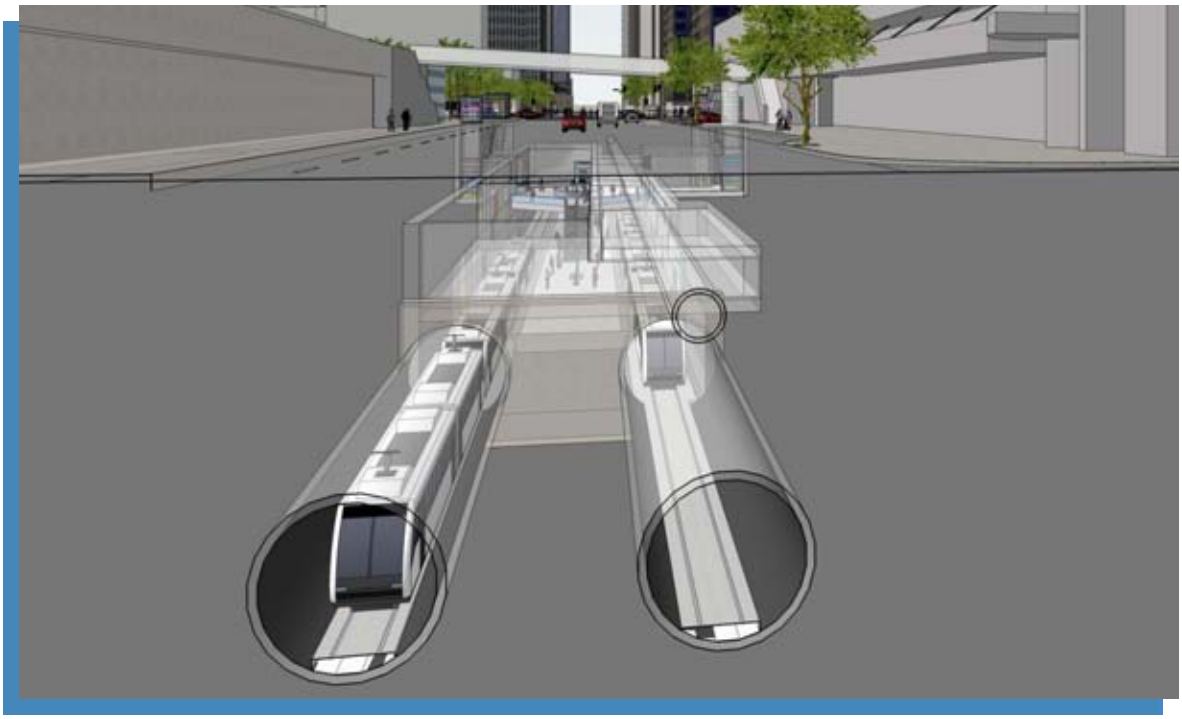


Figure 2-5. Typical Underground Alignment

2.3.3.5 Typical Overhead Catenary System

The overhead catenary system (OCS) is the network of overhead wires that delivers power to LRT trains. Trains are fitted with pantographs that maintain continuous contact with the wires as the train moves along the tracks. In tunnels, the wires are suspended from the ceiling. Along at-grade LRT tracks, the wires are supported by poles ranging from 15 to 25 feet in height, spaced 100 to 200 feet apart. Each track typically requires two wires to be suspended above it. In some instances, LRT systems can have only one wire above each track, but two-wire OCS is assumed for all of the Regional Connector build alternatives.

2.3.3.6 Typical Traction Power Substations

TPSS facilities are small buildings adjacent to the LRT alignment that supply power to the OCS. TPSS buildings can be up to approximately 5,000 square feet in size. The buildings must be located in areas with automobile access to facilitate maintenance activities. Along underground alignments, TPSS can be located in ancillary rooms in underground stations.

2.3.3.7 Communications Antennas and Other Ancillary Facilities

Antennas may be used as part of the LRT communication system. Antennas and other ancillary facilities would be located in places where they are not out of scale with the surrounding communities or neighborhoods. Antennas and ancillary facilities would not be visible from any historic resource (district or building). Ancillary facilities would include items in the Metro design criteria such as emergency exiting hatches, ventilation shafts, station markers, station entry portal configuration (canopies/pavilions), bus shelters, benches, emergency telephones, public telephones, stairs, escalators, elevators, map cases, fare collection, pedestrian and street lighting, hand railing, landscaping, trash receptacles, bike racks and lockers, emergency generator, power boxes, fire hydrants, and artwork.

Metro will be completing studies to confirm the location of antennas during final design. There would be a maximum of one antenna per station to be located on Metro or other publicly-owned property, buildings, or on existing street lights or antennas. In order to not intrude on the surrounding neighborhoods, which include dense high-rise urban environments, mid-rise residential, commercial, and industrial areas, antennas and ancillary facilities would be integrated into station design in the following ways: to be in context to visual qualities of the surrounding communities and neighborhood; and incorporated as part of the station architecture or urban design, which would include new street and pedestrian lights along adjacent streets and on the station plaza, station canopies, new street trees, and other design features. In addition, antennas would be integrated into station design in to be similar in height of existing street lights (maximum of 35 feet).

Antennas would be metallic and could be painted or designed to hide their form. Antennas may also be designed as an attachment to existing station area structures as part of the station architecture. The antennas would also be strategically located using existing or new infrastructure or foliage so they are not visible from any historic resource.

2.3.3.8 Typical Stations and Station Entrances

All of the stations proposed for the build alternatives would be at-grade or underground. All boarding platforms would be approximately 270 feet in length, approximately 39 inches in height, and could accommodate trains of up to three cars. At-grade stations can be located along sidewalks, within street right-of-ways, or off-street. Since Metro's LRT system has high-floor vehicles, at-grade stations would have short flights of steps and ramps to provide access to the boarding platforms. At-grade stations would have canopies to partially shade passengers from sunlight and rain.

Underground stations can be located beneath the street right-of-way or off-street. Underground stations usually have two levels below street level: 1) mezzanine for ticketing and fare control; and, 2) the platform level below—though the mezzanine level can be optional. The only visible features of underground stations at street level would be entrances, and possibly ventilation structures and other ancillary facilities such as ticketing vending machines. Entrances typically consist of a combination of elevators, stairs, and escalators shaded by canopies. Stations may have multiple entrances in areas where passenger loads are expected to be high. Shallow underground stations can also be built without roofs, leaving the below-grade platform visible from street level. Figure 2-6 is an illustration of a typical underground station, and Figure 2-7 is a typical underground station entrance as seen from street level.

Note: measurements shown are hypothetical estimates

Figure 2-6. Typical Underground Station

Figure 2-7. Typical Underground Station Entrance

2.3.4 At-Grade Emphasis LRT Alternative

2.3.4.1 Overview

The At-Grade Emphasis LRT Alternative would provide a direct connection from the existing underground 7th Street/Metro Center Station to the Metro Gold Line at Temple and Alameda Streets with three new station locations. This alignment includes a combination of underground and at-grade segments, with 46 percent of the route underground. New stations would serve the Civic Center, Grand Avenue, and the Financial District. Portions of 2nd Street along the alignment would be converted to a pedestrian-friendly transit mall. To implement this alternative, the number of traffic lanes and on-street parking spaces would be reduced on 2nd Street between Figueroa and Los Angeles Streets. Roadway capacity along adjacent streets such as 1st and 3rd Streets would remain unchanged, as with the No Build Alternative. Figure 2-8 provides an illustration of the At-Grade Emphasis LRT Alternative.

2.3.4.2 Route Configuration

From the existing platform at the 7th Street/Metro Center Station, the tracks would extend north underneath Flower Street to a new underground station just south of 5th Street. The tracks would then continue north, surface just south of 3rd Street, cross 3rd Street at-grade level, and veer northeast through a portal in the hillside to an underground station at 2nd and Hope Streets. At this location, a new pedestrian bridge could be constructed to connect the station to Upper Grand Avenue. The tracks would continue northeast, "punch" through the wall of the existing 2nd Street Tunnel, and then travel east in the 2nd Street Tunnel toward Hill Street.

This alternative would reduce the number of traffic lanes in the 2nd Street Tunnel from four to one. The one remaining lane would carry eastbound traffic. Trains would proceed east on 2nd Street to Main Street. 2nd Street would be transit-dedicated with its current two travel lanes and two parking lanes reduced to a single travel lane primarily for access to parking lots and loading zones. This configuration would extend from Hill Street to Los Angeles Street.

At Main Street, the alignment would split into two single track alignments. One track (for northbound trains) would continue east to Los Angeles Street and then north to Temple Street. The second track (for southbound trains) would travel north on Main Street and then east on Temple Street. Both tracks would have an at-grade station just north of 1st Street.

At Temple and Los Angeles Streets, the two tracks would rejoin and proceed east on Temple Street to Alameda Street, where the tracks would join the Metro Gold Line to East Los Angeles and I-605 in a three-way junction. Before reaching Alameda Street, the tracks would shift to the south side of Temple Street to provide an adequate turning radius for trains turning north onto the Metro Gold Line's existing ramp leading to the bridge over the US 101 Freeway to Union Station.

An at-grade crossover would be located on 2nd Street between Broadway and Spring Street. An at-grade TPSS would be located just southwest of 2nd and Spring Streets.

In summary, the At-Grade Emphasis LRT Alternative would connect the Metro Blue Line and Metro Expo Line tracks at the 7th Street/Metro Center Station to the Metro Gold Line tracks with a new junction north of the Little Tokyo/Arts District Station using new light rail rights-of-way

and new stations, enabling Metro Gold Line, Metro Blue Line, and Metro Expo Line services to be consolidated into two routes. Station site footprints and construction staging areas are shown in Appendix II, Conceptual Drawings for Build Alternatives Analyzed in the Draft EIS/EIR. These drawings are provided for illustrative and analysis purposes only and may or may not represent the stations' ultimate shape and design details. This EIS/EIR analyzes maximum potential impacts for each station. Therefore, actual impacts may be smaller in magnitude than the impacts discussed in this analysis.

Proposed LRT components that would be constructed as part of the At-Grade Emphasis LRT Alternative are:

- Underground double track beneath Flower Street from the 7th Street/Metro Center Station to a new portal between 3rd and 4th Streets
- At-grade double track on Flower Street from the portal between 3rd and 4th Streets to 3rd Street, then across the intersection of 3rd and Flower Streets to a new portal into the hillside on the northeast corner
- Underground double track from the portal on the northeast corner of 3rd and Flower Streets to a new portal through the southern wall of the 2nd Street Tunnel
- At-grade double track in the 2nd Street Tunnel and on 2nd Street, from the new portal in the 2nd Street Tunnel to Main Street
- At-grade single southbound-only track on Main Street between 2nd and Temple Streets and on Temple Street between Main and Los Angeles Streets
- At-grade single northbound-only track on 2nd Street between Main and Los Angeles Streets and on Los Angeles Street between 2nd and Temple Streets
- At-grade double track on Temple Street between Los Angeles and Alameda Streets
- Proposed stations that would be constructed as part of the At-Grade Emphasis LRT Alternative include:
  - Underground station on Flower Street just south of 5th Street (Flower/6th/5th Street station)
  - Underground station just southwest of 2nd and Hope Streets (2nd/Hope Street station)
  - At-grade southbound only station on Main Street just north of 1st Street (Main/1st Street station)
  - At-grade northbound only station on Los Angeles Street just north of 1st Street (Los Angeles/1st Street station)

On 2nd Street between Broadway and Spring Street, a proposed crossover would be constructed at-grade.

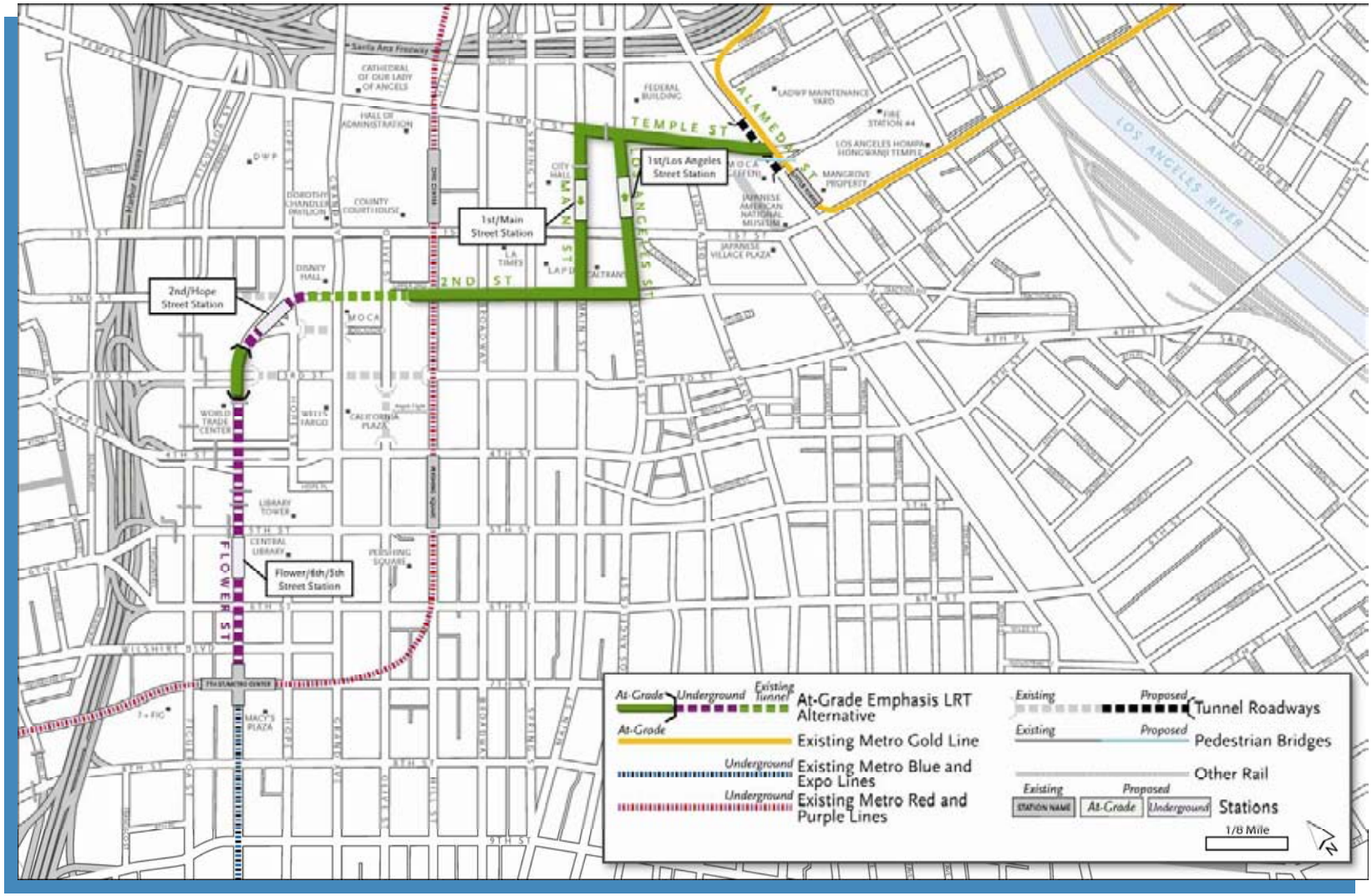


Figure 2-8. At-Grade Emphasis LRT Alternative

TPSS facilities would be placed at the following locations:

- Underground in the 2nd/Hope Street station
- At-grade on the southeast corner of 2nd and Spring Streets

2.3.4.3 Operating Characteristics

The At-Grade Emphasis LRT Alternative would allow the Metro Gold Line, Metro Blue Line, and Metro Expo Line to be consolidated into the following two routes:

- *East-West Route* (Santa Monica to I-605 via the Metro Expo Line, Regional Connector, and Metro Gold Line Eastside Extension tracks): Metro Expo Line trains from Santa Monica would travel on the existing Flower Street tracks north of the junction at Washington and Flower Streets. After stopping at the existing 7th Street/Metro Center Station, trains would continue north along the new Regional Connector tracks to the proposed three-way junction at Temple and Alameda Streets and would then continue east along the existing Metro Gold Line tracks to East Los Angeles and I-605. This route would serve the Little Tokyo/Arts District Station.

- *North-South Route* (Montclair to Long Beach via the Metro Gold Line, Regional Connector, and Metro Blue Line tracks): After stopping at 7th Street/Metro Center Station, Metro Blue Line trains from Long Beach would continue north along the new Regional Connector tracks to the proposed three-way junction at Temple and Alameda Streets and would then continue north along the existing Metro Gold Line tracks to Pasadena and the future Metro Gold Line Foothill Extension to Montclair. This route would not serve the Little Tokyo/Arts District Station.

The east-west and north-south routes would each operate with five minute headways during peak hours, combining to yield trains every 2 ½ minutes in each direction along the Regional Connector. Table 2-1 provides a summary of the operating characteristics of the At-Grade Emphasis LRT Alternative.

2.3.4.4 Vehicle and Pedestrian Circulation

For at-grade segments of the At-Grade Emphasis LRT Alternative, two LRT tracks would typically occupy a 26-foot wide surface right-of-way bordered by mountable curbs. It is expected that this width would increase to 39 feet at center platform station locations.

Vehicular and pedestrian crossings would be limited to traffic signal-controlled intersections, with the signal phasing modified to provide adequate green time for the LRT vehicles to safely cross the intersection. For safety reasons, uncontrolled mid-block vehicular crossings of tracks would not be permitted.

Access to existing parking structures, parking lots, loading docks, and commercial frontage would be affected by the at-grade LRT facilities. Left turn parking access and egress is presently allowed at many downtown sites. However, the at-grade LRT facilities would prohibit uncontrolled mid-block left turns, thus, modifying existing approach and departure traffic patterns.

Permanent roadway and lane reconfigurations would also be needed around the proposed 2nd/Hope Street station and the proposed Flower/6th/5th Street station. At the 2nd/Hope Street station, the ramps between Flower and Hope Streets would be modified. All existing traffic movements would still be possible in this location. At the proposed Flower/6th/5th Street station, one traffic lane would need to be removed from Flower Street to accommodate station entrances along the sidewalk.

The proposed At-Grade Emphasis LRT Alternative alignment would travel at-grade along 2nd Street, and it is assumed that this street would be dedicated as a transit-only roadway between the tunnel and Los Angeles Street. This segment of 2nd Street may be closed to through traffic and provide only emergency vehicle access and local access to adjacent properties. As a result of this proposed change in street circulation, through traffic currently using 2nd Street would be diverted to parallel roadways such as 1st and 3rd Streets. East of Los Angeles Street, 2nd Street would maintain its current physical features and operating characteristics. The one-way LRT couplet near City Hall along Main and Los Angeles Streets between 2nd and Temple Streets would consist of a single LRT track along each roadway. The curb-to-curb width of Temple Street, between Main and Alameda Streets, is 62 to 71 feet. With the new LRT tracks this would leave one lane of traffic in each direction, potentially with mountable curbs for use by emergency vehicles. The varying roadway width along this segment of Temple Street limits the type of additional infrastructure that can be added in the remaining space. Bike lanes, additional traffic lanes, and widened sidewalks all require continuous space along the entire roadway, and would be limited by the narrowest point (62 feet). The extra space on the wider portions of the roadway could be used for sidewalk enhancements, landscaping, or other urban design treatments.

To minimize conflicts between rail, vehicular, and pedestrian traffic, and to minimize delays at the intersection of Temple and Alameda Streets, a vehicular underpass and a pedestrian overpass are proposed along Alameda Street to route through traffic beneath the rail tracks and Temple Street traffic. Temple Street and the rail tracks would remain at-grade and the existing at-grade segment of Alameda Street would be lowered to pass under Temple Street. Through traffic traveling north and south on Alameda Street would operate unimpeded without being stopped or delayed at the intersection. Through traffic traveling east and west on Temple Street would continue to operate at-grade with a signal to control the movements between the vehicular and rail modes of transportation. In addition, a one lane, southbound, at-grade frontage road would be provided along Alameda Street to maintain access to businesses and properties on the west side of the street. Left turns to and from the frontage road may be restricted.

2.3.5 Underground Emphasis LRT Alternative

2.3.5.1 Overview

The Underground Emphasis LRT Alternative would provide a direct connection from 7th Street/Metro Center Station to the Metro Gold Line tracks at the Little Tokyo/Arts District Station with three new station locations. The alignment would extend underground from the 7th Street/Metro Center Station beneath Flower Street to 2nd Street. The tracks would then proceed east underneath the 2nd Street Tunnel and 2nd Street to a new portal on the parcel bounded by 1st Street, Alameda Street, 2nd Street, and Central Avenue. It is anticipated that some of this parcel would need to be acquired to construct the portal and stage construction of the tunnels beneath 2nd Street. The new tracks would then connect to the tracks of the Metro Gold Line at-grade. The

Underground Emphasis LRT Alternative would be entirely located underground except for a single at-grade crossing at the intersection of 1st and Alameda Streets. The tracks would cross in the same type of three-way junction as proposed for the At-Grade Emphasis LRT Alternative. Figure 2-9 provides an illustration of this alternative.

2.3.5.2 Route Configuration

The Underground Emphasis LRT Alternative alignment would extend north from the existing platform at 7th Street/Metro Center Station. Tracks would run underneath Flower Street to the next proposed station (just north of 5th Street) and would then continue north underneath Flower Street and veer northeast near the intersection of 3rd and Flower Streets. A new underground station would be located just southwest of the intersection of 2nd and Hope Streets. A new pedestrian bridge would be constructed to connect the station to Upper Grand Avenue. The bridge would begin at street level near the station entrance and cross the intersection and then parallel General Thaddeus Kosciuszko Way to reach Upper Grand Avenue. The tracks would then head east underneath 2nd Street to the next proposed station.

There would be two options for the next station to the east on 2nd Street:

- The Broadway Station Option would place an underground station on 2nd Street between Broadway and Spring Street.
- The Los Angeles Street Station Option would include an underground station between Main and Los Angeles Streets.

The tracks would then continue east underneath 2nd Street to Central Avenue, where they would veer northeast and surface via a portal in the lot bounded by 1st Street, Alameda Street, 2nd Street, and Central Avenue. The tracks would then enter an at-grade three-way junction in the intersection of 1st and Alameda Streets.

A new underpass between Temple and 2nd Streets would carry car and truck through traffic along Alameda Street beneath 1st Street and the rail junction. An optional overhead pedestrian bridge structure would eliminate most potential conflicts between pedestrians and trains. The pedestrian overpass could potentially have endpoints at each of the four corners of the intersection.

All TPSS facilities would be located underground for this alternative. Additionally, underground crossovers could be located just north of the proposed station at 5th and Flower Streets and just east of the proposed station on 2nd Street (whether it is between Broadway and Spring Street or between Main and Los Angeles Streets). Crossovers may not be needed at all of these locations, and may ultimately be placed in locations that are not adjacent to stations. TBMs cannot be used for crossovers since underground crossover locations require cut and cover construction. More information on these construction methods is provided in the Description of Construction, which is incorporated into this EIS/EIR as Appendix K.

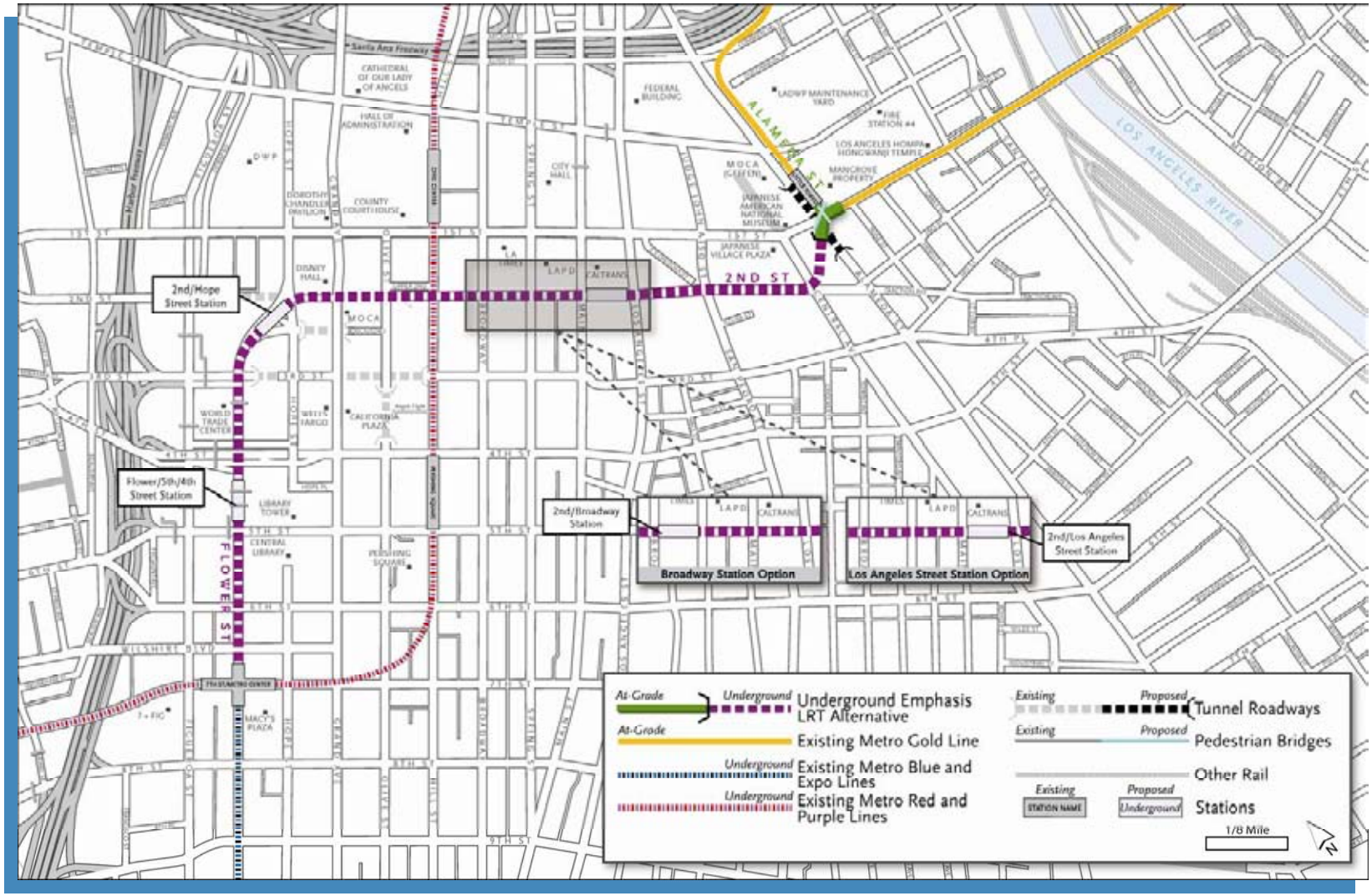


Figure 2-9. Underground Emphasis LRT Alternative

In summary, the Underground Emphasis LRT Alternative would link the Metro Blue Line and the Metro Expo Line at the 7th Street/Metro Center Station to the Metro Gold Line at a proposed junction just south of the Little Tokyo/Arts District Station at 1st and Alameda Streets. This new connection would use new proposed light rail rights-of-way and new proposed stations to enable Metro Gold Line, Metro Blue Line, and Metro Expo Line services to be consolidated into two routes. Key features of the Underground Emphasis LRT Alternative are described below. Station site footprints and construction staging areas are shown in Appendix II, Conceptual Drawings for Build Alternatives Analyzed in the Draft EIS/EIR. These drawings are provided for illustrative and analysis purposes only and may or may not represent the stations' ultimate shape and design details. This EIS/EIR analyzes maximum potential impacts for each station. Therefore, actual impacts may be smaller in magnitude than the impacts discussed in this analysis.

Proposed LRT alignments that would be constructed as part of the Underground Emphasis LRT Alternative include:

- Underground double track beneath Flower Street from the existing platform at the 7th Street/Metro Center Station to 3rd Street
- Underground double track curving northeast from the intersection of 3rd and Flower Streets toward 2nd and Hope Streets
- Underground double track beneath the 2nd Street Tunnel and 2nd Street from Hope Street to Central Avenue
- At-grade double track from a portal on the parcel bounded by 1st Street, Alameda Street, 2nd Street, and Central Avenue to a proposed three-way junction in the intersection of 1st and Alameda Streets

Proposed stations that would be constructed as part of the Underground Emphasis LRT Alternative include:

- Underground station on Flower Street just north of 5th Street (Flower/5th/4th Street station)
- Underground station just southwest of the intersection of 2nd and Hope Streets (2nd/Hope Street station)
- Underground station on 2nd Street either between Broadway and Spring Street or between Main and Los Angeles Streets (2nd Street station – Broadway Option or 2nd Street station – Los Angeles Street Option)

Proposed crossovers could potentially be located at the following preliminary locations (crossovers might not be placed at all of these locations):

- Underground just north of the station at 5th and Flower Streets
- Underground just east of the station on 2nd Street, either between Broadway and Spring Street or between Main and Los Angeles Streets

TPSS facilities would be placed at the following locations:

- Underground in the Flower/5th/4th Street station
- Underground in the 2nd Street station – Broadway Option or the 2nd Street station – Los Angeles Street Option

2.3.5.3 Operating Characteristics

The Underground Emphasis LRT Alternative would allow the Metro Gold Line, Metro Blue Line, and Metro Expo Line to be consolidated into the following two routes:

- *East-West Route* (Santa Monica to I-605 via the Metro Expo Line, Regional Connector, and Metro Gold Line Eastside Extension tracks): Metro Expo Line trains from Santa Monica would travel on the existing Flower Street tracks north of the junction at Washington and Flower Streets. After stopping at the existing 7th Street/Metro Center Station, trains would continue north along the new Regional Connector tracks to the proposed three-way junction at the intersection of 1st and Alameda Streets. Trains would then turn east on 1st Street, bypassing the Little Tokyo/Arts District Station, and continue along the Metro Gold Line Eastside Extension tracks to I-605.
- *North-South Route* (Montclair to Long Beach via the Metro Gold Line, Regional Connector, and Metro Blue Line tracks): After stopping at 7th Street/Metro Center Station, Metro Blue Line trains from Long Beach would continue north along the new Regional Connector tracks to the proposed three-way junction at 1st and Alameda Streets. The trains would then turn north on 1st Street and stop at the existing Little Tokyo/Arts District Station before continuing along the Metro Gold Line to Pasadena and the Foothill extension to Montclair.

The east-west and north-south routes would each operate with five minute headways during peak hours, combining to yield trains every 2 ½ minutes in each direction along the Regional Connector. Table 2-1 provides a summary of the operating characteristics of the Underground Emphasis LRT Alternative.

2.3.5.4 Vehicle and Pedestrian Circulation

The Underground Emphasis LRT Alternative alignment would not affect surface traffic or pedestrian circulation, except at the intersection of 1st and Alameda Streets and on Flower Street between 6th and 4th Streets. Consequently, vehicular circulation patterns along downtown streets adjacent to most of the alignment would continue to operate under current traffic flow patterns.

Permanent roadway and lane reconfigurations would also be needed around the proposed 2nd/Hope Street station and the proposed Flower/5th/4th Street station. At the 2nd/Hope Street station, the ramps between Flower and Hope Streets would be modified. All existing traffic movements would still be possible in this location. At the proposed Flower/5th/4th Street station, one traffic lane would need to be removed from Flower Street to accommodate station entrances along the sidewalk.

The future roadway levels of service for this alternative would be similar to the No Build Alternative, except on Flower Street and around the intersection of 1st and Alameda Streets,

where (to minimize delays) a vehicular underpass and pedestrian overpass are proposed to separate the heavy traffic volumes along Alameda Street from rail traffic.

The proposed underpass would result in uninterrupted flow along Alameda Street in the north and south directions between 2nd and Temple Streets, and would mitigate potential traffic delays at 1st and Alameda Streets due to the addition of train crossings. Through traffic traveling east and west on 1st Street would continue to operate at-grade with a signal to control movements between the vehicular and rail modes of transportation.

In addition, at-grade frontage roads would be provided along both sides of Alameda Street south of the intersection, and on the southbound side of the street north of the intersection to maintain access to adjacent businesses and properties. Due to the location of the tracks and the Little Tokyo/Arts District Station on the east side of Alameda Street, a full northbound frontage road is not feasible.

2.3.6 Fully Underground LRT Alternative – The Locally Preferred Alternative

2.3.6.1 Overview

On October 28, 2010, the Metro Board of Directors concurred with staff's recommendation to designate the Fully Underground LRT Alternative as the LPA. The LPA has since been refined as part of the preliminary engineering phase of the project, as reported in the July 22, 2011 Supplemental EA/Recirculated Draft EIR Sections. The LPA (formerly the Fully Underground LRT Alternative) is essentially the same configuration as the Underground Emphasis LRT Alternative, except that this alternative does not include the Flower/5th/4th Street station. The rail junction at 1st and Alameda Streets would be located underground instead of at street level. To the east and north of the junction, tracks would rise to the surface through two new portals in order to connect to the existing Gold Line. The portals would be located on the northeast corner of 1st and Temple Streets, and in the median of 1st Street between Alameda and Garey Streets.

The alignment would extend underground from the 7th Street/Metro Center Station under Flower Street to 2nd Street. Tracks would then proceed east underneath the 2nd Street Tunnel and 2nd Street to just west of Central Avenue. At 2nd Street and the pedestrian signal to the JVP, the tracks would continue underground heading northeast under the JVP and 1st and Alameda Streets.

An underground junction would be constructed beneath the intersection of 1st Street and Alameda Street. Unlike the Underground Emphasis LRT Alternative, two portals would be needed because the junction between the Regional Connector and the Pasadena/Montclair and East Los Angeles/I-605 branches of the Metro Gold Line would be located underground. The new portals would be located to the north and east of the junction, where trains would rise to the surface to connect to the Metro Gold Line heading north to Montclair and east to I-605.

One portal would be located north of Temple Street, northeast of the existing at-grade Little Tokyo/Arts District Station and Metro Gold Line tracks. This portal would rise to the north within the maintenance yard of the City of Los Angeles Department of Water and Power (LADWP) and connect to the existing LRT bridge over US 101, allowing a connection to the Metro Gold Line to Montclair. Tracks would run from the junction under 1st and Alameda Streets through a new tunnel crossing beneath Temple Street and the Mangrove property (the parcel on the northeast corner of 1st and Alameda Streets) to the new portal. This new tunnel

would run immediately east of the existing Little Tokyo/Arts District Station and Metro Gold Line tracks.

The second portal would be located within 1st Street between Alameda and Garey Streets. Tracks would rise to the east within this second portal and connect at-grade to the existing Metro Gold Line tracks toward I-605. 1st Street would be widened to the north to accommodate this second portal and maintain the existing number of through lanes.

Property northeast of 1st and Alameda Streets, the Mangrove property, would need to be acquired for insertion of the TBM, to stage construction of both portals, to connect to the Metro Gold Line LRT bridge, and to construct the tunnels beneath Temple Street and the Mangrove property. Figure 2-10 provides a map of this alternative.

2.3.6.2 Route Configuration

The LPA alignment would extend north from the existing LRT platform at 7th Street/Metro Center Station and would run underneath Flower Street. An enhanced pedestrian walkway would be provided along the widened east sidewalk of Flower Street from 4th Street to the existing 7th Street/Metro Center Station entrance, which would improve the pedestrian connection between the Financial District and the 7th Street/Metro Center Station. The tracks would then continue north underneath Flower Street and veer northeast near the intersection of 3rd and Flower Streets. A new underground station would be located just southwest of the intersection of 2nd and Hope Streets (2nd/Hope Street station).

The future Broad Art Foundation Museum, currently under construction, is projected to include a plaza above General Thaddeus Kosciuszko Way connecting to Upper Grand Avenue, which is shown in Figure 2-12. In order to provide access from the 2nd/Hope Street station to Upper Grand Avenue, an elevator from the station entrance to the plaza would be built as part of this alternative if one is not already provided. If the plaza is not built, a pedestrian connection (such as a pedestrian bridge) would be constructed as part of this alternative from the elevator to Upper Grand Avenue. The location of this potential pedestrian connection is shown in drawing A-101 in Appendix 1, Locally Preferred Alternative Drawings, of this Final EIS/EIR. From the 2nd/Hope Street station, tracks would then head east underneath 2nd Street to the next proposed underground station between Broadway and Spring Street (2nd/Broadway station).

The tracks would continue east underneath 2nd Street to just west of Central Avenue at approximately the pedestrian signal to the JVP, where the alignment would then veer northeast under privately-held property and Central Avenue to a proposed Little Tokyo/Arts District underground station (1st/Central Avenue station). Only underground easements would be needed where the alignment travels beneath the JVP. No above ground property acquisitions would be required at the JVP. The proposed underground station would be partially located within Central Avenue and the northern half of the block bounded by 1st Street, Central Avenue, 2nd Street, and Alameda Street. The Señor Fish, Weiland Brewery, the former Café Cuba (The Spice Table), and associated parking would need to be acquired for construction of this station. However, the remaining businesses on that block would remain, including the Office Depot and associated parking.

The tracks would leave the station and cross under the intersection of 1st Street and Alameda Street into a new underground rail junction. Separating from the junction, one set of tracks

would continue underground beneath the Mangrove property (located on the northeast corner of 1st and Alameda Streets), along the eastern side of the existing Little Tokyo/Arts District Station.

The tracks would then travel under Temple Street before surfacing through a portal in the southwest corner of the LADWP maintenance yard and rise to connect to the existing Metro Gold Line LRT bridge over US 101. This would allow trains to continue along the Metro Gold Line to Pasadena, which is planned to extend to Montclair. Traffic lanes on Alameda Street would be temporarily reconfigured during construction.

The other set of tracks leaving the underground junction would rise to the east within 1st Street to accommodate a new portal and the existing Metro Gold Line tracks. The portal would be located within 1st Street between Alameda and Garey Streets, with the portal opening just west of Garey Street. 1st Street would be widened on its northern side to accommodate the portal and maintain the existing number of through lanes. The widening would initiate at Alameda Street and continue east, significantly tapering down as the alignment crosses Hewitt Street, returning to the existing condition prior to the Los Angeles Hompa Hongwanji Buddhist Temple. The new Regional Connector tracks would join the existing 1st Street LRT tracks, just west of the 1st Street Bridge. This would allow trains to continue along the Metro Gold Line to East Los Angeles, which would be eventually extended to I-605 per Metro's LRTP. The signals would be removed at the intersection of 1st and Hewitt Streets. North-south traffic along Hewitt Street would no longer be able to cross 1st Street. All left turns would be prohibited at the intersection of 1st and Hewitt Streets. Right turns would continue to be permitted to and from Hewitt Street. Automobile access to the Mangrove property would continue to be available from Temple and 1st Streets. However, automobile access to the property along 1st Street would be restricted to right turns only.

A temporary easement across the property northeast of 1st and Alameda Streets, the Mangrove property, would be needed for insertion of the TBM, to stage construction of both portals, to connect to the Metro Gold Line LRT bridge, and to construct the tunnels beneath Temple Street and the Mangrove property. During construction, tracks would be installed in this area at-grade to allow service to proceed on the Metro Gold Line while construction activities occur within the project area. The existing Metro Gold Line Eastside Extension and the Little Tokyo/Arts District Station surface tracks and station would be maintained for continued service during construction.

Connecting the Regional Connector to the existing Metro Gold Line would require temporary and intermittent interruption of rail service for critical construction activities. There would be two primary closures of the tracks between the intersection of Alameda and Temple Streets, and the intersection of 1st and Vignes Streets, lasting up to six weeks. During these periods, rail service would continue to be provided to the existing Little Tokyo/Arts District Station from Union Station and Pasadena. However, a bus bridge would be needed from Little Tokyo/Arts District Station to all stations further east in the direction of Atlantic Station. Metro would evaluate the possibility of running train service from Atlantic Station to Pico/Aliso Station during this period. A likely subsequent scenario would be completion and testing of the Regional Connector, then beginning service to the new 1st/Central Avenue station to have regional rail service from the Eastside through the Regional Connector to 7th Street/Metro Center Station, continuing on to Santa Monica via the Metro Expo Line. The bus bridge would then be

shortened to run only between the new 1st/Central Avenue station and Union Station for a period of approximately one year. During this time, construction and testing of the segment of the Regional Connector from the new 1st and Alameda Streets junction to the existing embankment north of Temple Street would be completed. Metro would attempt to minimize closures and shorten the overall project construction schedule in order to reduce customer inconvenience. More information about the temporary bus bridge is provided in Section 4.18.2.6.1 of this Final EIS/EIR.

Once construction is complete, operation of the current Metro Gold Line between Pasadena and East Los Angeles would terminate. In its place, Metro would initiate operations on two routes:

- Between Montclair and Long Beach
- Between East Los Angeles and Santa Monica

The proposed underground 1st/Central Avenue station would replace the train service currently provided at the existing at-grade Little Tokyo/Arts District Station. However, there may still be some uses for the existing at-grade station, such as special event service and other contingencies.

Crossovers could be located just east of the proposed station at 2nd Street and Broadway, underground beneath 1st Street just east of the intersection of 1st and Alameda Streets, and in the tunnel located beneath the Mangrove property. In addition, a pocket track, which could also serve as a crossover, would be located beneath Flower Street between 4th and 6th Streets. The crossovers and the pocket track may not be needed at all of these locations. TBMs cannot be used for construction of crossovers since underground crossover locations require cut and cover or sequential excavation method (SEM) construction. More information on these construction methods is provided in the Description of Construction, Appendix K.

In summary, the LPA would link the Metro Blue Line and Metro Expo Line at the 7th Street/Metro Center Station to the Metro Gold Line at a new junction under 1st and Alameda Streets using new light rail rights-of-way and new stations. This would enable the Metro Gold Line, Metro Blue Line, and Metro Expo Line services to be consolidated. Key features of the LPA are described below. Figures 2-17 through 2-21 show station site footprints and construction staging areas for the LPA. Design drawings showing the alignment plans and profiles are incorporated into this Final EIS/EIR as Appendix 1, Locally Preferred Alternative Drawings. Station design may be subject to refinement during final design and therefore, ultimate impacts may be smaller in magnitude than the impacts discussed in this analysis.

Proposed LRT alignments that would be constructed as part of the LPA are:

- Underground double track beneath Flower Street from the existing platform at the 7th Street/Metro Center Station to 3rd Street
- Underground double track curving northeast from the intersection of 3rd and Flower Streets toward 2nd and Hope Streets

- Underground double track beneath the 2nd Street Tunnel and 2nd Street from Hope Street to just west of Central Avenue, at approximately the pedestrian signal to the JVP, then northeast to 1st and Alameda Streets

- Underground rail junction beneath the intersection of 1st and Alameda Streets

- Underground double track from the rail junction to the portal located within a widened 1st Street between Alameda and Garey Streets, prior to the Los Angeles Hompa Hongwanji Buddhist Temple; then at-grade double track connecting to the existing Metro Gold Line Eastside Extension tracks toward I-605

- Underground double track from the rail junction running north beneath the Mangrove property and Temple Street, just east of the existing Little Tokyo/Arts District Station, to the new portal in the LADWP maintenance yard site; then at-grade double track rising from the portal on a new ramp structure to connect to the existing Metro Gold Line bridge over the US 101

Proposed stations that would be constructed as part of the LPA are:

- Underground station just southwest of the intersection of 2nd and Hope Streets (2nd/Hope Street station)

- Underground station on 2nd Street between Broadway and Spring Street (2nd/ Broadway station)

- Underground station just southeast of the intersection at 1st Street and Central Avenue (1st/Central Avenue station). This station may include a small building at ground level on the southwest corner of 1st and Alameda Streets to house ventilation fans. This shallow station may potentially be built without a roof or mezzanine, leaving the below-grade platform level exposed.

Station entrances would be located at the following studied locations. Each station would have a minimum of one entrance, and not all entrances listed below would necessarily be constructed. Entrance locations would be confirmed during final design:

- 2nd/Hope Street station
  - Southwest corner of 2nd and Hope Streets
  - Northeast corner of 3rd and Flower Streets
  - Northeast corner of 2nd Street and General Thaddeus Kosciuszko Way
- 2nd/Broadway station
  - Southeast corner of 2nd Street and Broadway
  - Southwest corner of 2nd and Spring Streets

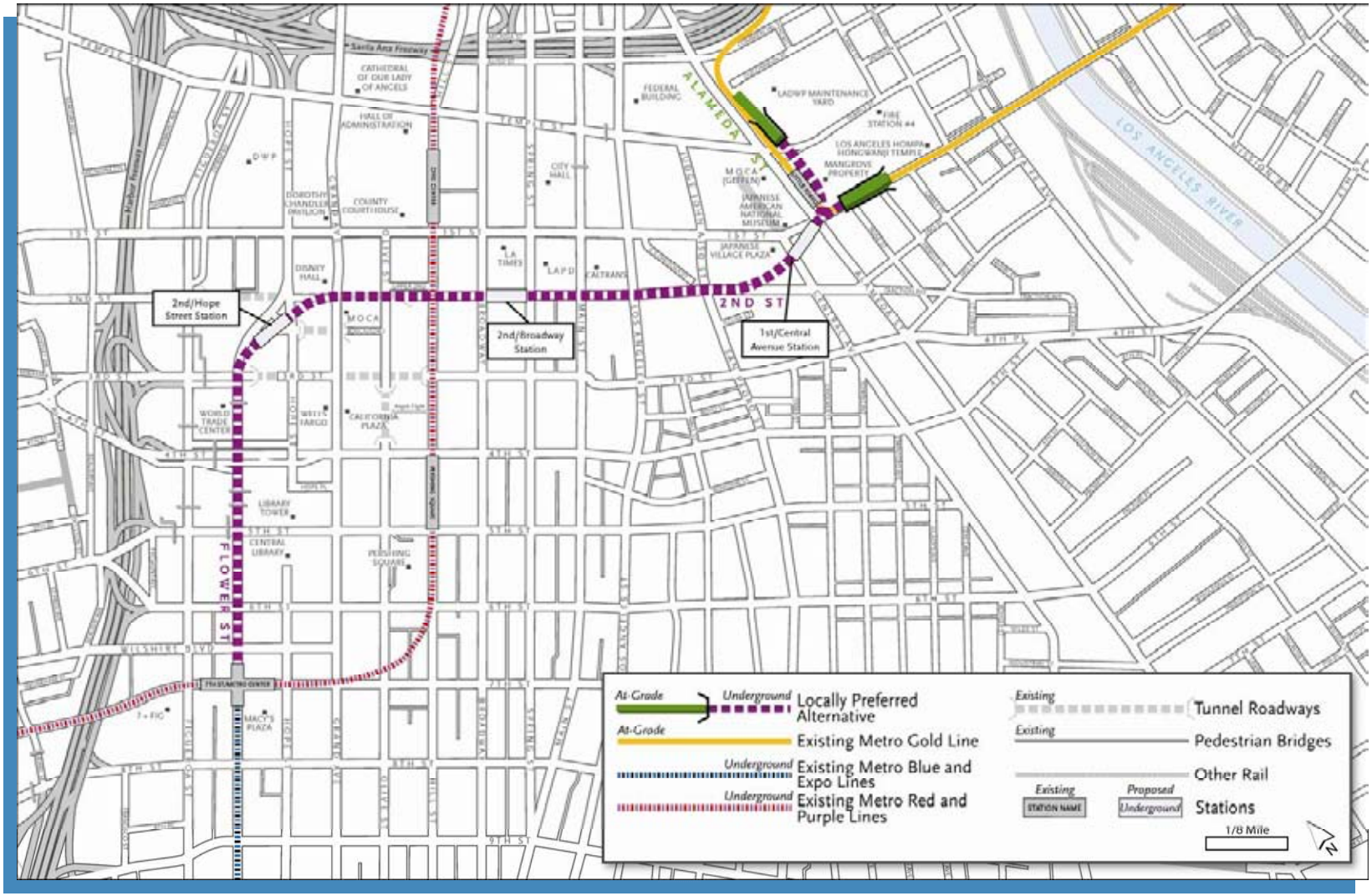


Figure 2-10. Locally Preferred Alternative

- 1st/Central Avenue station
  - Southeast corner of 1st Street and Central Avenue
  - Near the east side of Central Avenue between 1st and 2nd Streets
  - Near the west side of Alameda Street between 1st and 2nd Streets

The proposed crossovers and pocket track could be located at the following preliminary locations. The locations of pocket tracks and crossovers would be confirmed during final design:

- Pocket track, which could also serve as a crossover, underground along Flower Street between 4th and 6th Streets, which would allow for a possible future station beneath Flower Street between 5th and 4th Streets constructed as a separate project
- Crossover underground just east of 2nd/Broadway station
- Crossover underground beneath 1st Street just east of the intersection of 1st and Alameda Streets
- Crossover in the tunnel beneath the Mangrove property

Proposed TPSS facilities would be placed at the following locations:

- Underground along Flower Street between 5th and 4th Streets
- Underground in the 2nd/Broadway station

2.3.6.3 Operating Characteristics

The LPA consolidates the Metro Gold Line, Metro Expo Line, and Metro Blue Line into the following two routes:

- *East-West Route* (Santa Monica to I-605 via the Metro Expo Line, Regional Connector, and Metro Gold Line Eastside Extension tracks): Metro Expo Line trains from Santa Monica would travel on the existing Flower Street tracks north of the junction at Washington and Flower Streets. After stopping at the existing 7th Street/Metro Center Station, trains would continue north along the new Regional Connector tracks to a new junction beneath the intersection of 1st and Alameda Streets. Trains would then travel to a new portal on 1st Street, and continue along the Metro Gold Line Eastside Extension tracks to I-605.
- *North-South Route* (Montclair to Long Beach via the Metro Gold Line, Regional Connector, and Metro Blue Line tracks): After stopping at 7th Street/Metro Center Station, Metro Blue Line trains from Long Beach would continue north along the new Regional Connector tracks to a new junction beneath 1st and Alameda Streets. Trains would then travel to a new portal on the LADWP maintenance yard site, and continue along the Pasadena Metro Gold Line and the Foothill Extension to Montclair.

The east-west and north-south routes would each operate with five minute headways during peak hours, combining to yield trains every 2 ½ minutes in each direction along the Regional Connector. Table 2-1 provides a summary of the operating characteristics of the LPA. Figure 2-11 shows the proposed routes.

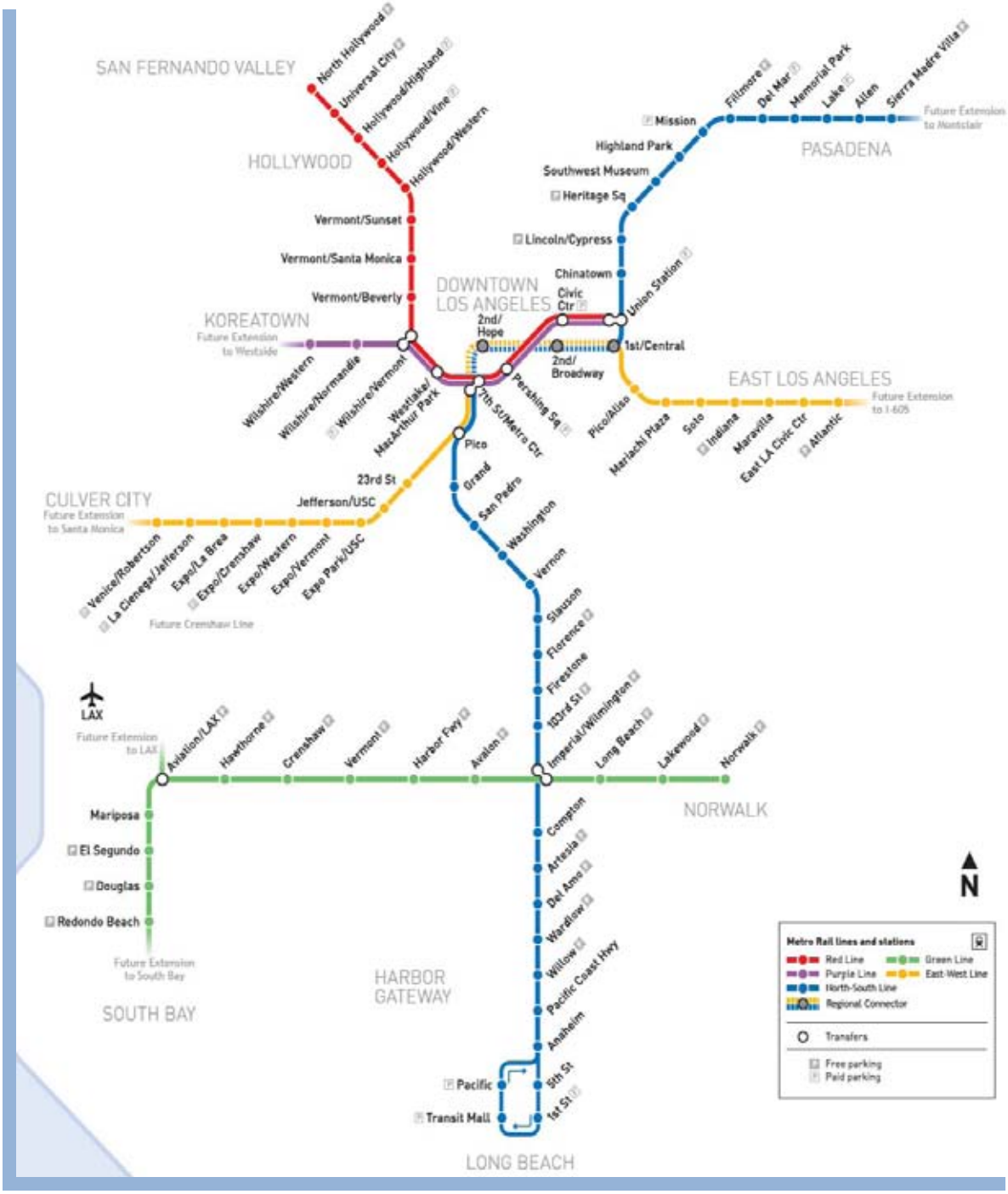


Figure 2-11. Metro Rail System with Locally Preferred Alternative

2.3.6.4 Vehicle and Pedestrian Circulation

Compared to other alternatives, the LPA alignment would require relatively small changes to surface traffic and pedestrian circulation patterns. There would be some changes on 1st Street between Alameda Street and the 1st Street Bridge where the LRT alignment would rise within a portal to an at-grade configuration. Street widening and sidewalk modifications would be required in this area. Vehicular circulation patterns along downtown streets adjacent to most of the alignment would continue to operate under current traffic flow patterns with the exception of the removal of a newly installed traffic signal at 1st and Hewitt Streets. Through traffic movements would no longer be permitted along Hewitt Street at its intersection with 1st Street, and left turns would no longer be possible from the westbound direction of 1st Street to Hewitt Street or from Hewitt Street to 1st Street, which would eliminate the existing at-grade crossing at this location (see Figure 2-13).

Other existing at-grade crossings that would be removed as a result of this alternative include at-grade crossings associated with Metro Gold Line service between Pasadena and East Los Angeles at 1st and Alameda Streets and Temple and Alameda Streets. The LPA would operate underground at these intersections.

An enhanced pedestrian walkway would be created along the east side of Flower Street from the 4th Street and Flower Street area to the existing 7th Street/Metro Center Station entrance at 7th and Flower Streets, which would improve the pedestrian connection between the Financial District and the 7th Street/Metro Center Station. Pedestrian enhancements would include an enhanced pedestrian walkway with landscaping, wayfinding signage, art features, and amenities aimed at improving pedestrian experience and safety.

Permanent roadway and lane reconfigurations would also be needed around the proposed 2nd/Hope Street station and the proposed pedestrian walkway enhancement along Flower Street. At the 2nd/Hope Street station, the ramps between Flower and Hope Streets would be modified. All existing traffic movements would still be possible in this location under the LPA. Final lane configurations will be developed in consultation with LADOT. Figure 2-12 illustrates the roadway and lane reconfigurations that would be needed around the 2nd/Hope Street station. One traffic lane would need to be removed from Flower Street between 4th and 6th Streets to accommodate the enhanced pedestrian walkway from the 4th Street and Flower Street area to the existing 7th Street/Metro Center Station entrance at 7th and Flower Streets.

2.4 Overview of Construction Activities

This section provides an overview of the types of construction that would be required to implement each proposed build alternative. Construction of the Regional Connector Transit Corridor project would use conventional techniques and equipment currently used in the Southern California region and elsewhere in the United States. The various work activities would be performed over an estimated 4- to 5-year period. Construction of linear infrastructure is often divided into segments, and construction activities along any given segment would likely last for a shorter period of time. Construction schedules would be established with community input and consideration of community activities.

A construction plan would be prepared during the final design phase of the project to detail the construction phases, durations, schedule, and sequencing of construction. Where possible, the

plan would coordinate construction activities for the Regional Connector with other improvements occurring nearby to minimize impacts.

2.4.1 Construction Staging Areas

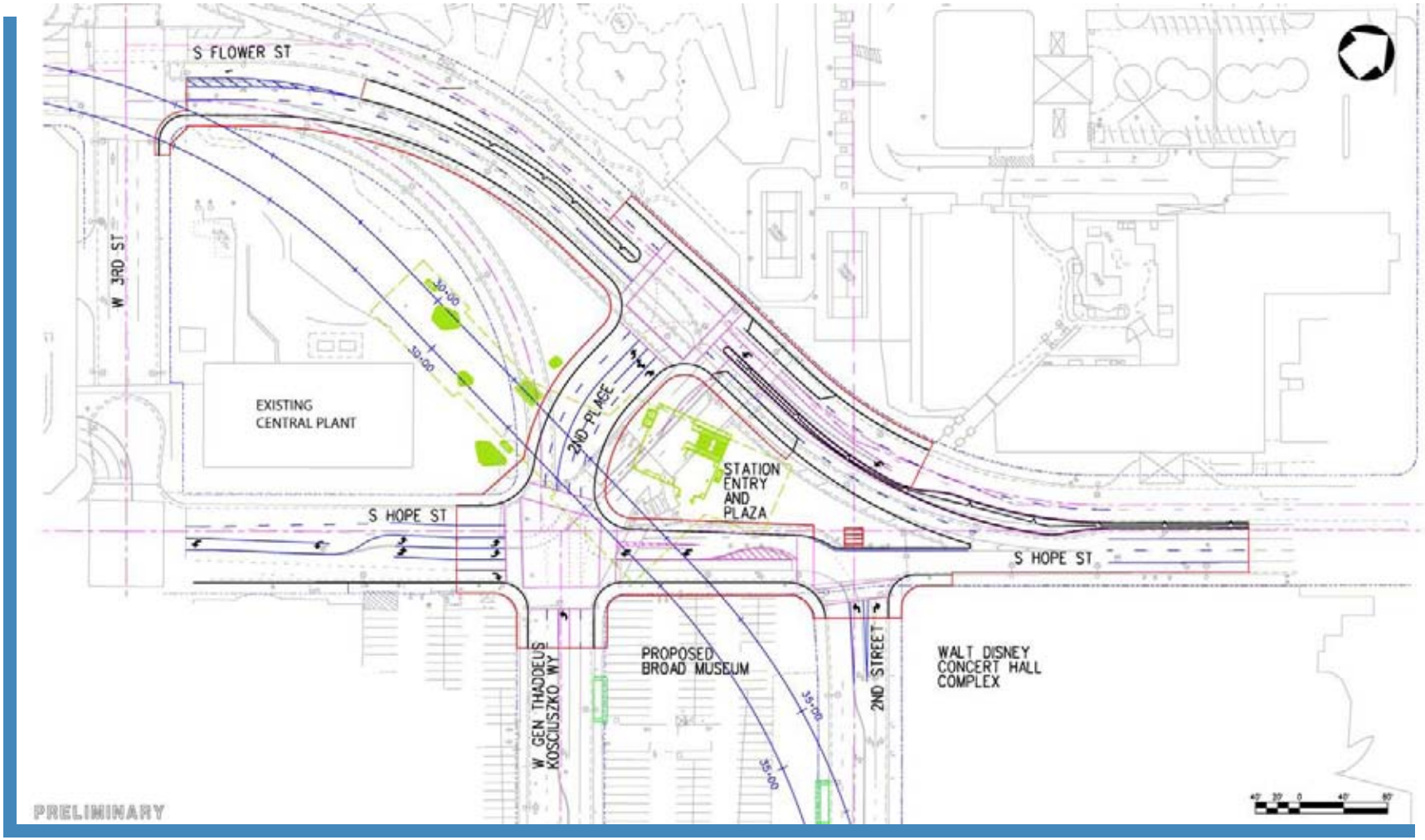
Construction staging areas are locations needed for:

- Equipment storage
- Construction materials delivery and storage
- Equipment assembly
- Materials production
- Dewatering activities
- Access roads
- Construction worker parking
- Temporary trailer offices
- Demolition staging
- Removal of excavated materials
- Other related activities during the construction period

Construction staging areas are temporary, and would be located within the street right-of-way and in off-street locations. Temporary street closures would be needed to accommodate construction staging. Detours and closures would be coordinated with LADOT.

Potential construction staging areas have been identified in multiple locations along each alternative alignment, as shown in Figures 2-14 through 2-16. More detailed drawings of the proposed construction staging areas for the LPA are provided in Figures 2-17 through 2-21, and in Appendix 1, Locally Preferred Alternative Drawings. Construction staging area drawings for build alternatives other than the LPA are provided in Appendix II, Conceptual Drawings for Build Alternatives Analyzed in the Draft EIS/EIR. In some instances, land acquired for permanent project facilities, such as station entrances, would be suitable for construction staging. In other locations, temporary construction easements may be needed to allow construction equipment to use private property during construction. Further detail on acquisitions needed for construction staging areas is provided in Section 4.2, Displacement and Relocation.

The following sections describe general scenarios for common types of LRT construction that have been analyzed for the Regional Connector.



Reconfigured curb shown in red. Reconfigured striping and crosswalks shown in blue and magenta.

Figure 2-12. 2nd/Hope Street Station Roadway and Lane Reconfiguration

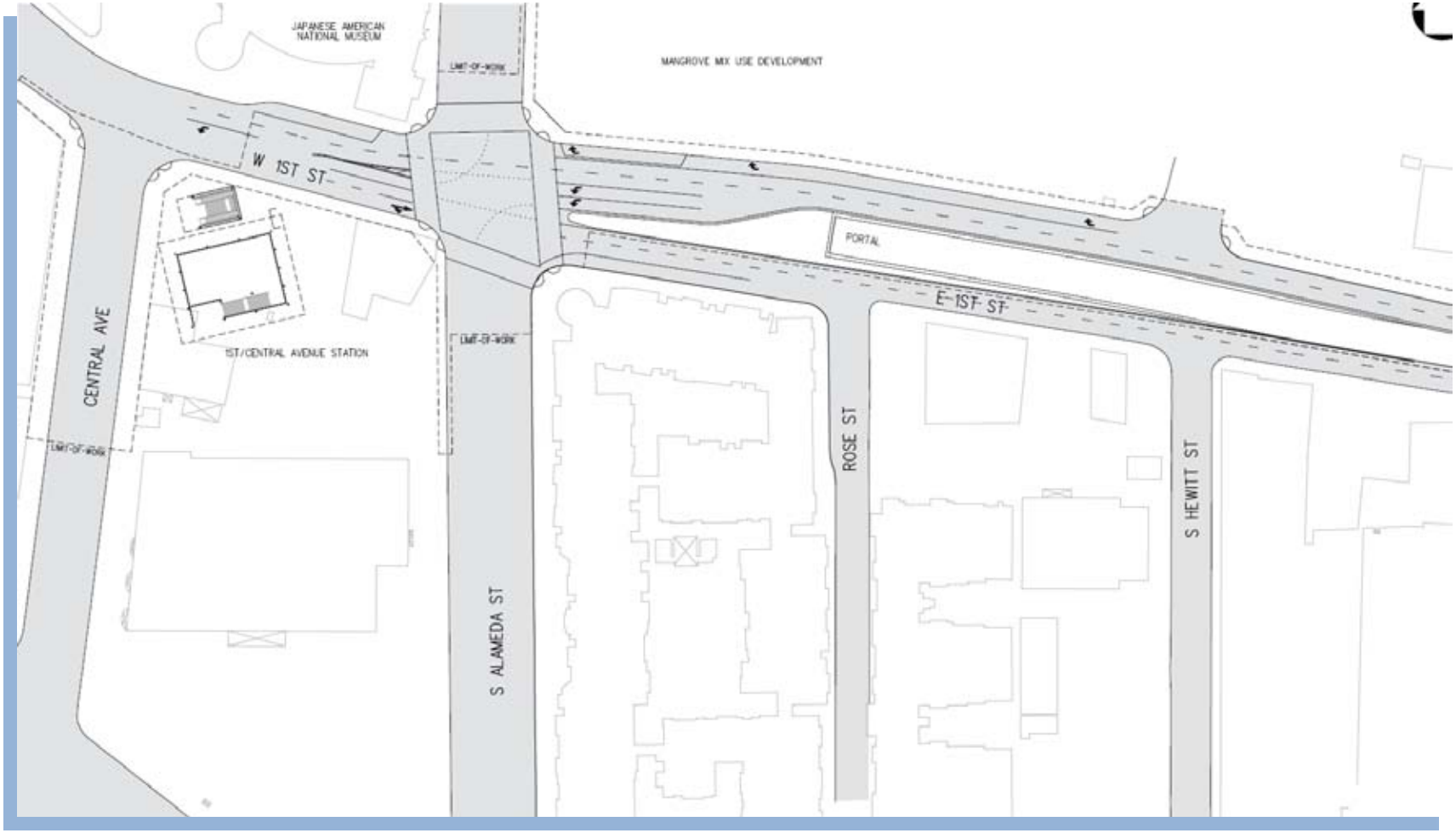


Figure 2-13. 1st Street and Hewitt Street Roadway and Lane Reconfiguration

2.4.2 Typical At-Grade LRT Construction

At-grade LRT construction within a street's right-of-way typically involves:

- Demolition of the roadway section being displaced by the LRT tracks
- Preparation of the track bed
- Construction of the supporting track slab
- Laying of rail

Foundations for OCS poles and wires may be installed at the same time as the track installation. Affected traffic lanes would be closed during construction. Rails would be brought to the site by trucks, stockpiled at designated storage areas, welded into rail strings and moved into place as work progresses. Construction of station platform slabs would likely be included in line segment contracts and would be coordinated with trackwork installation within each segment.

Given the urban context of the Regional Connector Transit Corridor, approximately two-block segments of the roadway are likely to be reserved for construction activities at one time to achieve economies of scale and reduce the overall construction time of the schedule.

Construction durations for a two-block segment are estimated to be two to four months to complete trackwork in each roadway segment. Periodic lane closures, typically on just one side of the work zone, would be required for delivery of materials and other construction activities such as concrete pours.

2.4.3 Typical Underground LRT Construction – Cut and Cover Method

Cut and cover is a traditional construction method for underground facilities that entails excavating down from the ground surface. A temporary excavation support is provided to stabilize the ground before excavation commences, and excavation is carried out inside the supported area. Temporary concrete decking can be placed over the cut immediately following the first lift of excavation (at about 12 to 15 feet below ground surface) to allow traffic to pass above. Once the deck is in place, excavation and internal bracing would continue to the required depth. Once tunnel or station construction is completed, the area is backfilled and the surface is permanently restored inside the excavated area.

Open cut construction method is similar to cut and cover, but is performed without temporary decking.

2.4.4 Typical Underground LRT Construction – Sequential Excavation Method

Application of the SEM would have less surface interruption than cut and cover, since the excavation would be performed mostly underground and accessed via a vertical shaft. Sequential excavation and support methods call for the ground to be incrementally excavated in small areas and supported with steel supports advanced beyond the opening and shotcrete (sprayed concrete).

Generally, SEM is applied when TBMs are not economical or feasible such as when constructing large non-circular tunnels or short tunnels. All operations would be conducted from an access shaft for spoils removal. The sequence of excavation for the SEM would be confirmed during the final design stage and controlled and modified as needed during construction (based on actual conditions encountered). The larger area of the station or tunnel would be completed after all the predetermined sequence areas are excavated and supported within the construction area. This construction technique is considered in special instances where the planned depth, shape, or length of the tunnel may not be cost-effective using other methods.

2.4.5 Typical Underground LRT Construction – Tunnel Boring Machine (TBM) Method

TBMs are large-diameter, horizontal drills that predominantly excavate circular tunnel sections. The excavated materials are removed through the tunnel using hopper type rail cars or by a conveyor system. As the machine advances, both the ground in front of the machine and the hole it creates are continually supported by the machine shield and pre-cast concrete tunnel liners. This method creates a tunnel with little or no disruption at the surface that is especially suitable for creating a circular opening at greater depths than would be practical for cut and cover construction. When the concrete tunnel liner has rubber gaskets between each segment, water is prevented from entering the tunnel and excavation can proceed below the ground water level.

The TBM requires an insertion shaft to start the tunneling operation. The TBM would be dismantled and retrieved through another vertical shaft at the other end of a tunnel alignment. It would then be transported back to the insertion shaft, reassembled, and repeat its journey for a second twin tunnel. Alternatively, two TBMs could be inserted relatively at the same time, and the TBMs would be removed from the retrieval shaft. TBMs are only suitable for excavating tunnels and cannot be used to construct underground stations or special trackwork areas such as crossovers.

2.4.6 Build Alternative Construction Methods

Figures 2-14 through 2-16 show the locations of the proposed construction staging areas and the construction methods under consideration for each of the proposed build alternatives. Figures 2-17 through 2-21 are more detailed drawings of the proposed construction staging areas for the LPA. These drawings are also included in Appendix 1, Locally Preferred Alternative Drawings. Construction staging area drawings for build alternatives other than the LPA are provided in Appendix II, Conceptual Drawings for Build Alternatives Analyzed in the Draft EIS/EIR. For the purposes of analyzing the greatest possible impacts, the station site footprints are currently assumed to be coterminous (have the same boundary) with the construction staging areas. Permanent station and ancillary facilities may need to be placed within these areas. Most facilities would be underground, with the exception of the Main/1st Street station and Los Angeles/1st Street station for the At-Grade Emphasis LRT Alternative. It is possible that not all of the outlined areas would be needed for construction staging or permanent facilities. Further detail regarding construction methods associated with the LPA is provided in Section 4.18, Construction Impacts.

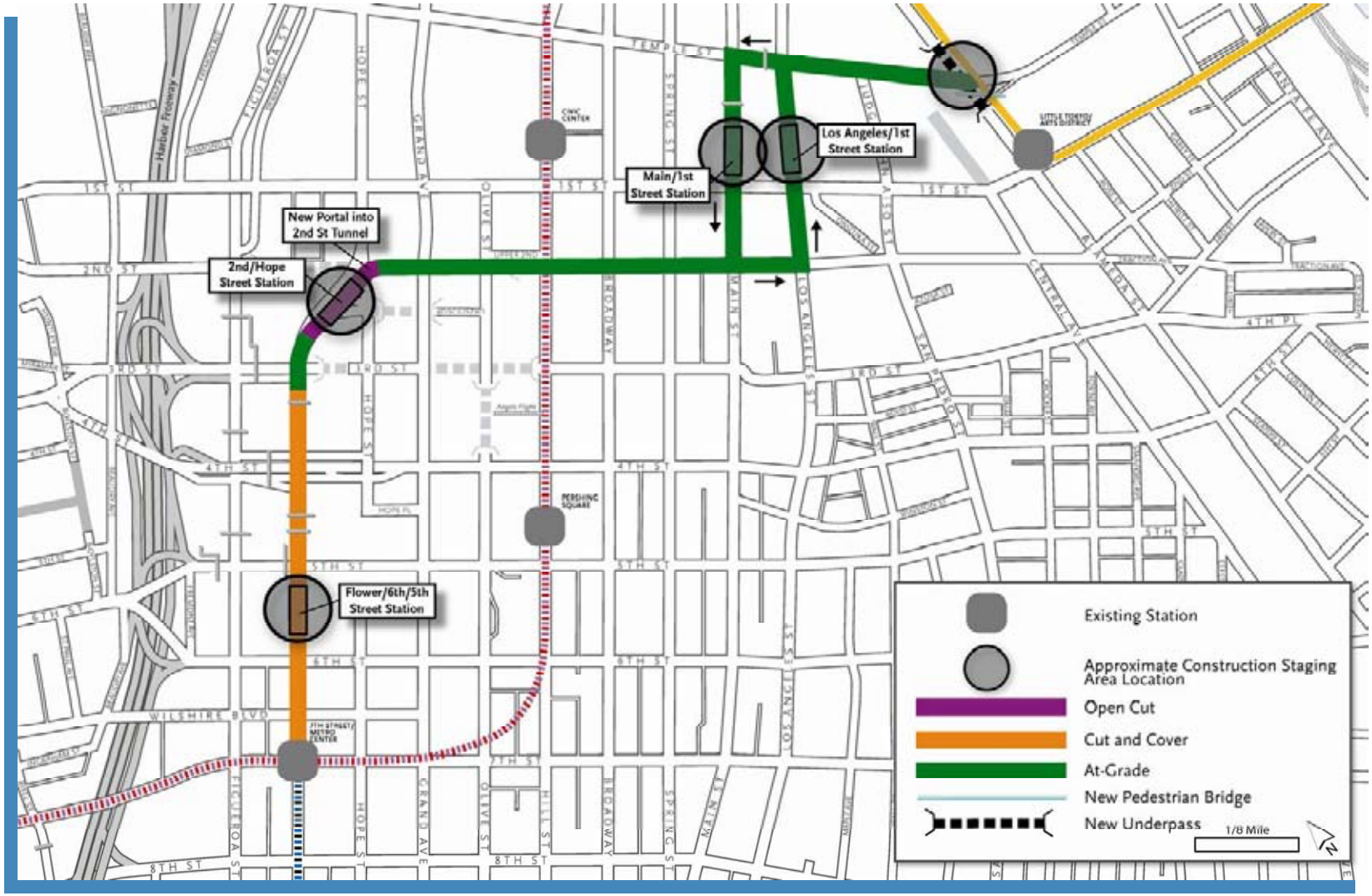


Figure 2-14. At-Grade Emphasis LRT Alternative Construction Areas and Methods

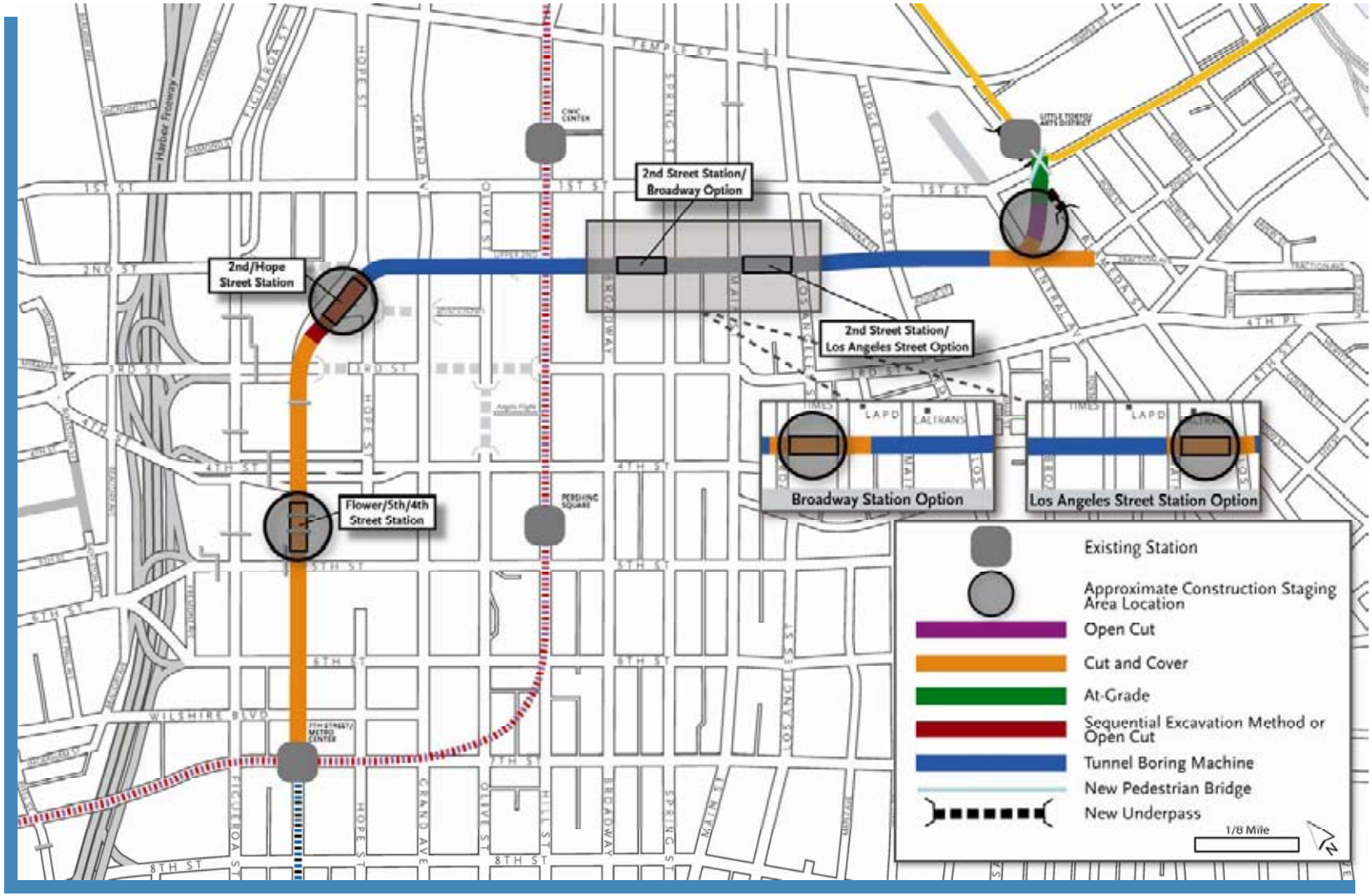


Figure 2-15. Underground Emphasis LRT Alternative Construction Areas and Methods

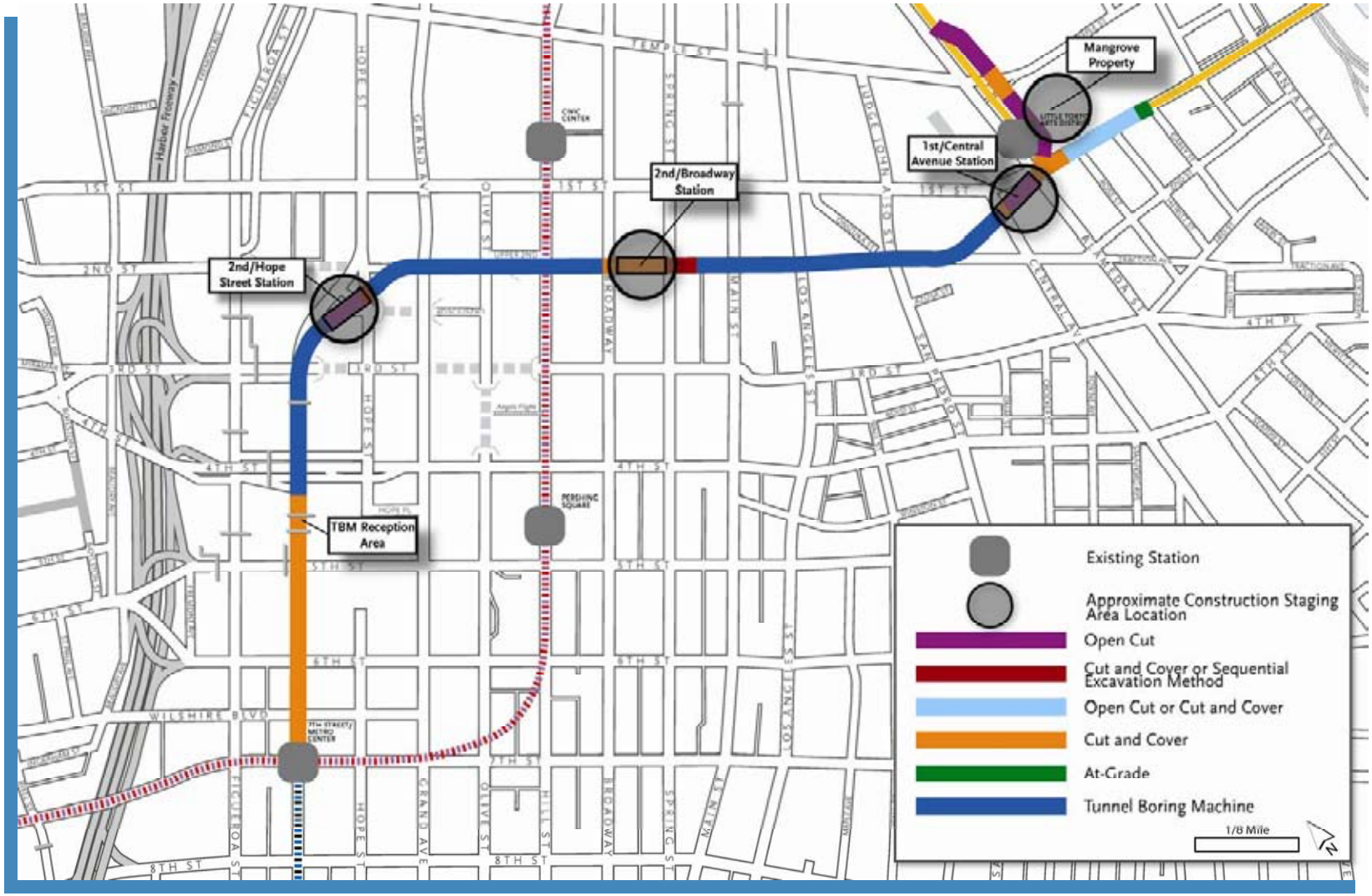


Figure 2-16. Locally Preferred Alternative Construction Areas and Methods

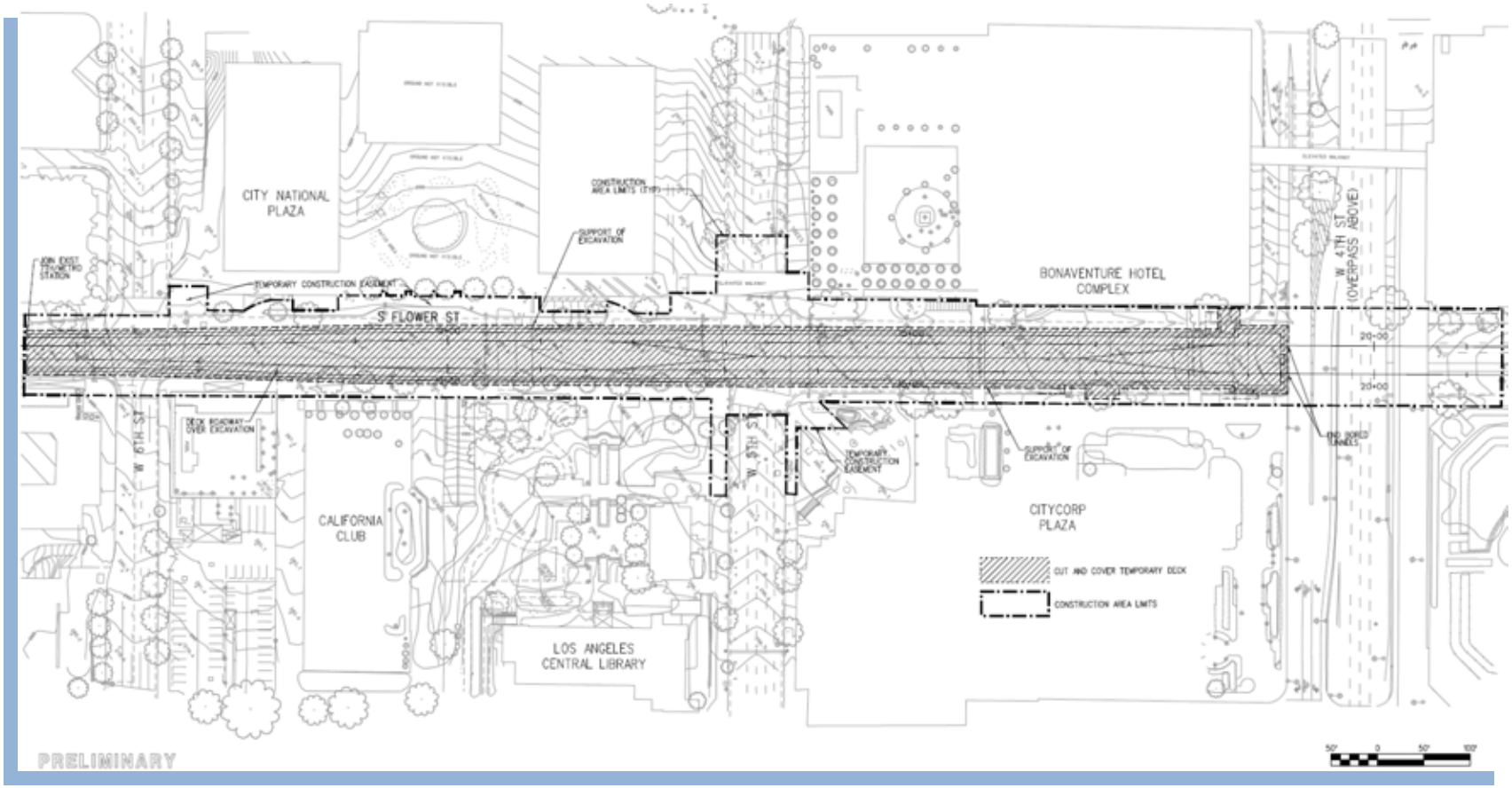


Figure 2-17. Flower Street Cut and Cover Construction Area

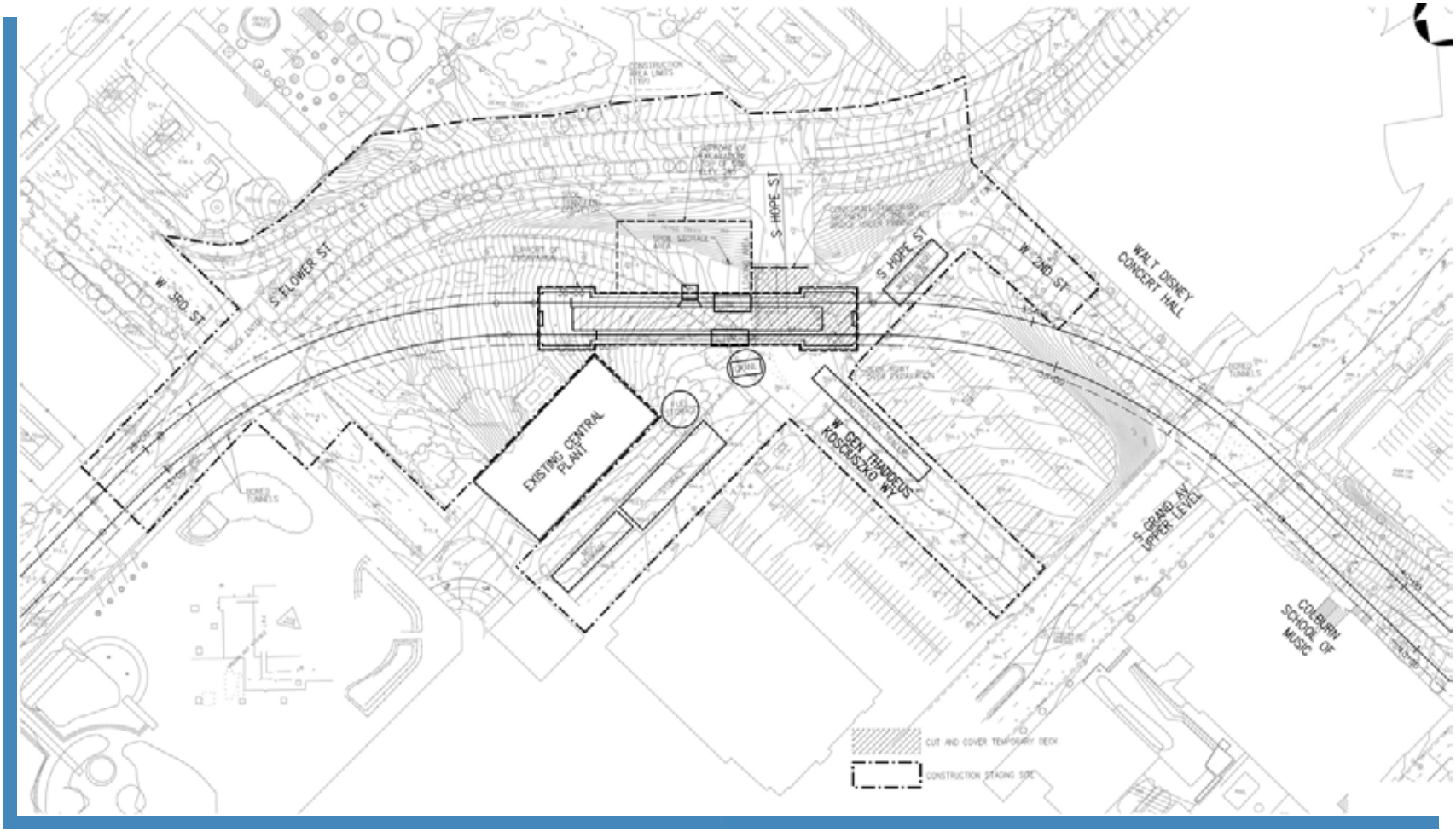


Figure 2-18. 2nd/Hope Street Station Construction Area

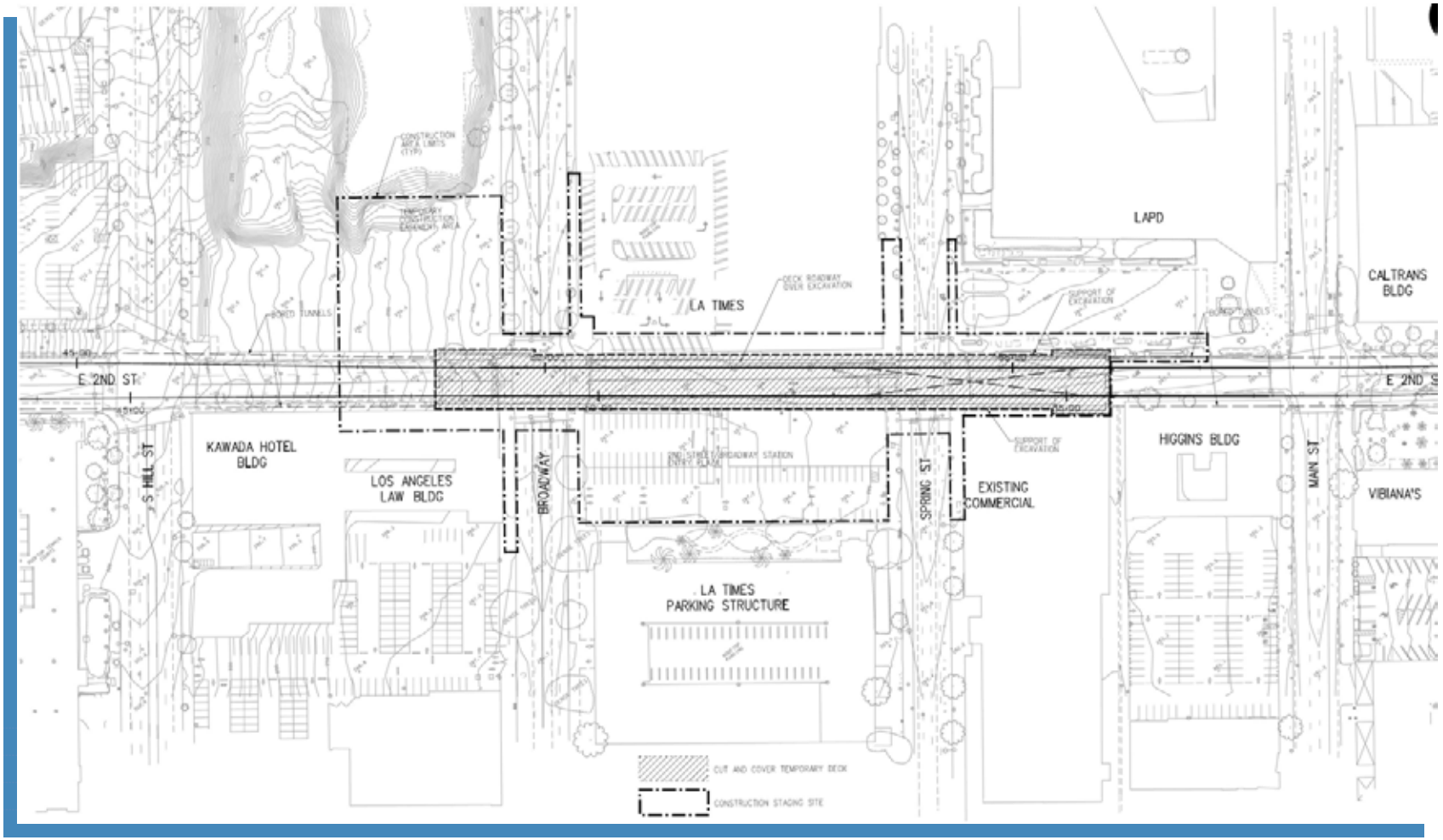


Figure 2-19. 2nd/Broadway Station Construction Area

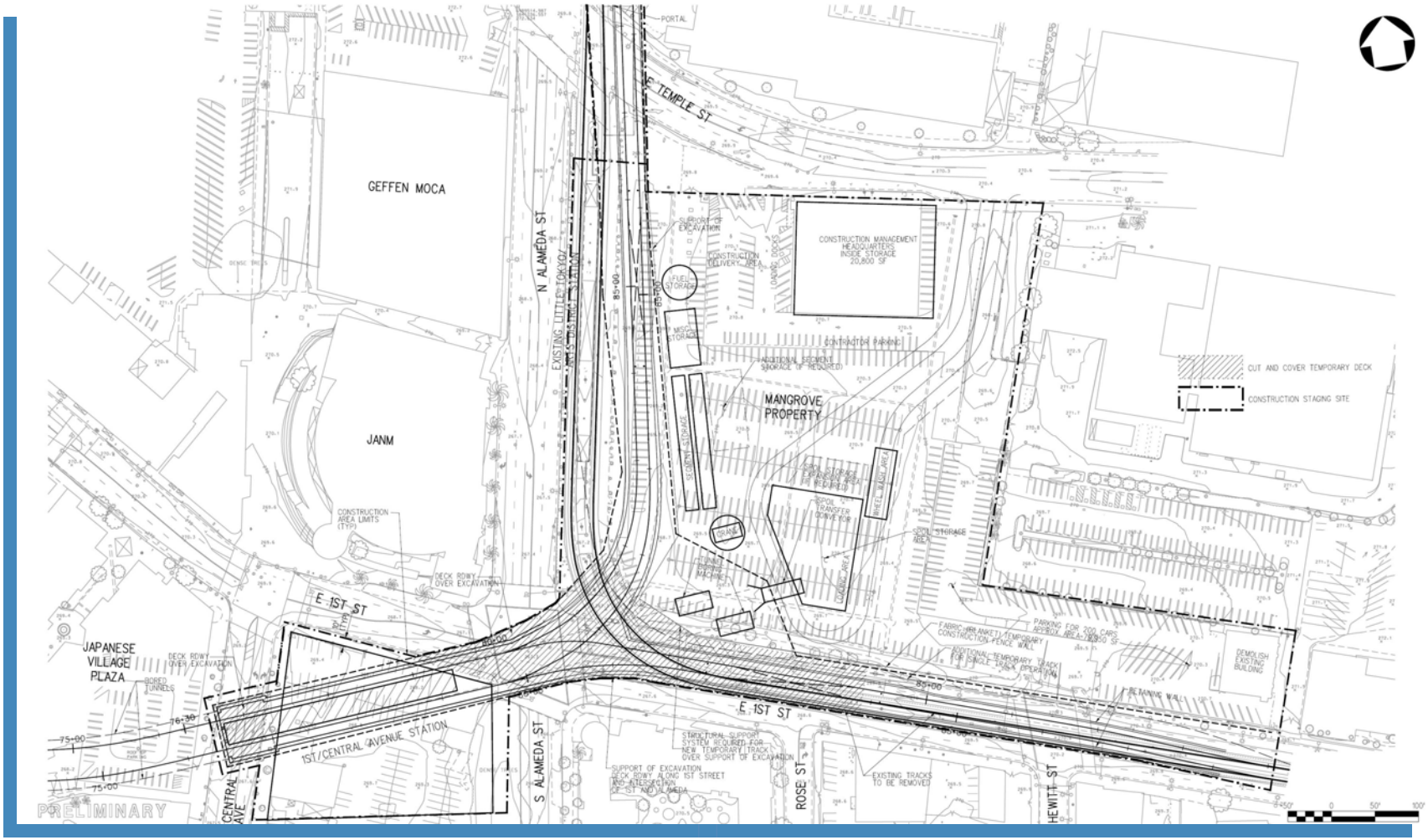


Figure 2-20. Mangrove Property Construction Area

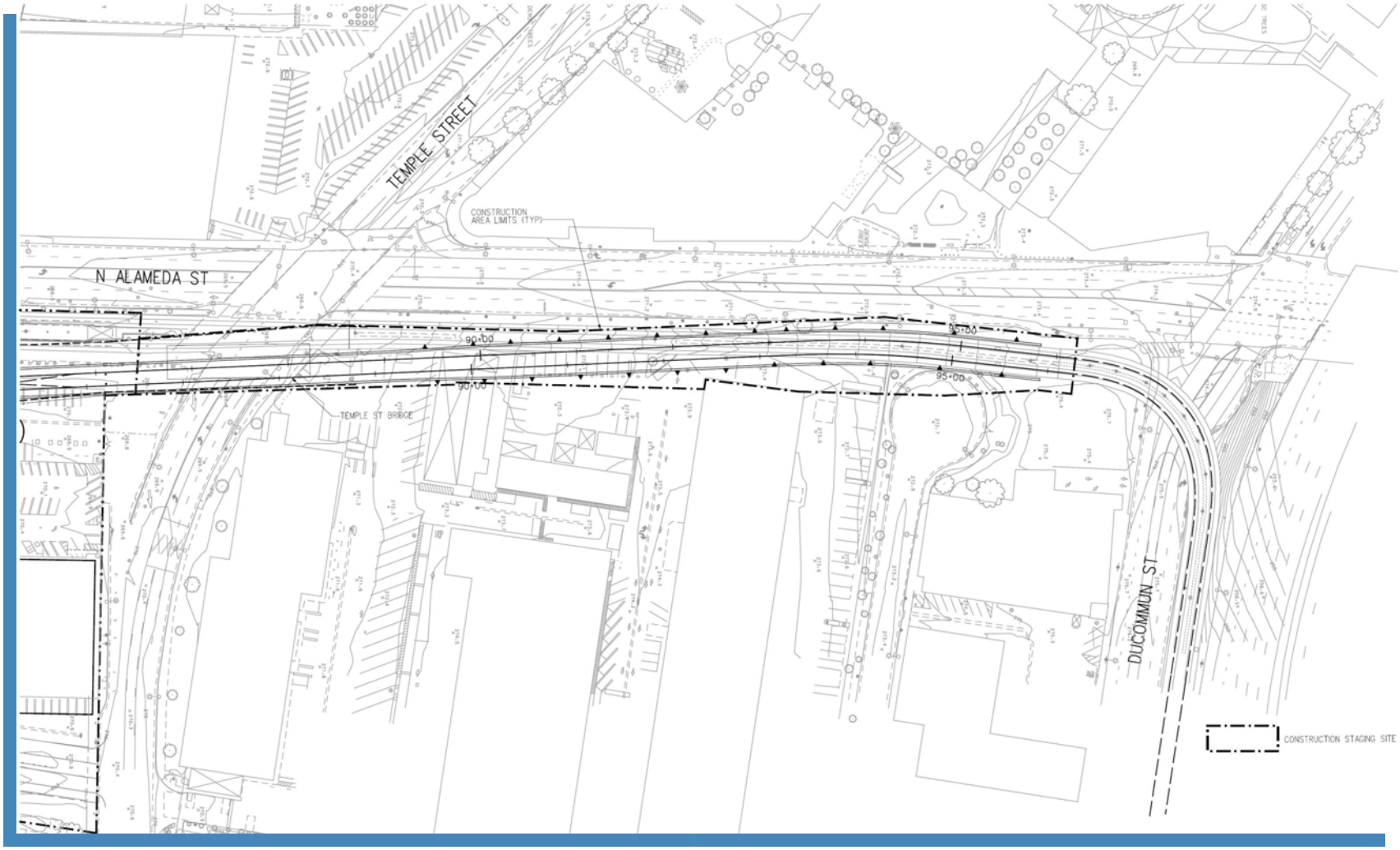


Figure 2-21. Temple/Alameda Construction Area

2.5 LRT Options Considered and Eliminated

The following LRT options were considered during the public scoping process and, based on public and technical input regarding the potential impacts and limited benefits, these alternatives were subsequently eliminated from the analysis.

2.5.1 At-Grade Station at Flower and 3rd Streets

An at-grade station in the median of Flower Street immediately south of 3rd Street was proposed as part of the At-Grade Emphasis LRT Alternative. This station was presented as an optional substitute for the proposed underground station on Flower Street between 5th and 6th Streets.

The proposed Flower/3rd Street station was eliminated due to:

- Proximity to another proposed station at 2nd and Hope Streets
- Potential traffic impacts
- Potential security issues due to the unwelcoming and bleak location compared to other sites
- Large volume of public scoping comments requesting that Metro build as much of the project underground as possible

2.5.2 At-Grade Station on 2nd Street between Broadway and Main Street

An optional split platform at-grade station on 2nd Street between Broadway and Main Street was presented during scoping as part of the At-Grade Emphasis LRT Alternative. The platform for northbound trains would have been located along the southern curb of 2nd Street between Broadway and Spring Street, and the platform for southbound trains would have been located along the northern curb between Spring and Main Streets. This station option was eliminated due to proximity to another station at 1st and Main Streets as well as physical constraints of the 2nd Street right-of-way.

2.5.3 Fully Underground LRT Alternative – Little Tokyo Variation 2

This alternative was included in the technical analyses in the technical memoranda (Appendices K through GG). It differs from the Fully Underground LRT Alternative – Little Tokyo Variation 1 in that it would extend further east on 1st Street with two staggered portals instead of one. Also, the 2nd/Central Avenue station and the junction beneath 1st and Alameda Streets would be split onto two levels, removing signal conflicts between westbound and northbound trains. The rest of the proposed alignment is otherwise identical to the Fully Underground LRT Alternative – Little Tokyo Variation 1.

Based on considerations related to high cost and community concerns, this alternative was eliminated from further discussion and inclusion in the Draft EIS/EIR. Community concerns regarding Little Tokyo Variation 2 focused primarily on the proximity of one of the proposed portals on 1st Street to the main entrance of the Los Angeles Hompa Hongwanji Buddhist Temple, a key religious institution for the Little Tokyo neighborhood. The additional intensity of construction potentially needed for Little Tokyo Variation 2 was also cited as a concern.

2.6 Environmental Process

Metro will comply with all applicable federal, state, and local environmental regulations and will responsibly and reasonably mitigate significant adverse environmental impacts resulting from the Regional Connector Transit Corridor project in accordance with Metro policies and applicable laws. The Draft EIS/EIR identified impacts that would potentially be significant and proposed mitigation measures to address those impacts. These mitigation measures have undergone further refinement as part of this Final EIS/EIR process, and a final set of commitments to mitigate impacts would be adopted by FTA upon issuance of the Record of Decision (ROD). Additionally, Metro would continue to avoid and minimize project impacts wherever possible.

Both Metro and FTA will use this Final EIS/EIR when making a project approval decision. This includes Metro's issuance of a Notice of Determination (NOD), as well as FTA's issuance of a ROD as described in Section 2.6.4 below. It is anticipated that many of the permitting agencies listed in Section 4.22 of this Final EIS/EIR will also rely on this document for decision-making purposes. Metro and FTA have consulted with Native American tribal representatives as described in Section 4.12 and Chapter 7 of this Final EIS/EIR, the California State Historic Preservation Officer (SHPO) as described in Section 4.12, the City of Los Angeles, and other agencies listed in Chapter 7.

2.6.1 Draft EIS/EIR Review and Comment Period

Metro and FTA widely distributed the Draft EIS/EIR to affected local, state, and federal agencies; tribes; community groups; interested individuals; and other interested parties. The document was also made available at Metro's offices, public libraries, and in electronic format on Metro's website. A formal public comment period was initiated following the release of the Draft EIS/EIR. Metro held public hearings during the comment period to provide information about the Draft EIS/EIR, facilitate the submission of comments, and receive oral comments. Prior to preparation of this Final EIS/EIR, Metro and FTA recirculated portions of the Draft EIS/EIR related to the LPA refinements (described above) and circulated a new chapter comparing in detail the project alternatives with the existing conditions. Although the recirculated information reported no significant change in NEPA impact findings or CEQA impact determinations, the recirculation of additional information allowed the public to review and comment. The contents of the Supplemental EA/Recirculated Draft EIR Sections document, as well as comments received and responses to those comments, are incorporated into this Final EIS/EIR.

2.6.2 The Locally Preferred Alternative

The Draft EIS/EIR identified the Fully Underground LRT Alternative as the staff recommended LPA based on the results of technical analyses of alternatives and feedback from the public. Following the Draft EIS/EIR public comment period and after examining the Draft EIS/EIR, comments received during the public comment period, and other relevant information, the Metro Board of Directors accepted staff's recommendation to designate the Fully Underground LRT Alternative as the LPA on October 28, 2010. FTA's final decision on a project alternative cannot be made until after the Final EIS/EIR is released.

2.6.3 Final EIS/EIR and Selection of a Project Alternative

Following circulation of the Draft EIS/EIR and Supplemental EA/Recirculated Draft EIR Sections, and consideration of all comments received, Metro and FTA have prepared this Final EIS/EIR. This report includes and addresses all of the comments received during the Draft EIS/EIR and Supplemental EA/Recirculated Draft EIR Sections public comment periods. It also includes refinements to the LPA and a list of proposed mitigation measures. Based on the results of the technical analysis of all the alternatives as reported in this Final EIS/EIR, the LPA, as refined, is the environmentally superior alternative. After certification of the Final EIS/EIR, Metro will officially select a project alternative for implementation.

2.6.4 Record of Decision and Notice of Determination

After Metro selects a project alternative, FTA will issue a ROD, which indicates FTA's final decision on the project. The ROD will include the alternatives that FTA considered and Metro's commitments to mitigate impacts of the Regional Connector Transit Corridor project. The ROD will include a list of mitigation measure commitments that must be implemented if the project is initiated by Metro. FTA's issuance of the ROD is needed for federal funding and approvals to proceed.

As the lead agency under CEQA, Metro will issue a NOD for the Regional Connector project that is consistent with the ROD.

2.6.5 Project Schedule

As mentioned in Section 2.1, the Regional Connector Transit Corridor project is included in Metro's 2009 LRTP and identified for funding under Measure R, a sales tax measure approved by Los Angeles County voters in November 2008. The tentative schedule for completing the environmental process, design, and construction of the Regional Connector Transit Corridor is shown in Table 2-2.

Table 2-2. Project Timeline

Activity	Timeframe
Draft EIS/EIR Published	September 3, 2010
Draft EIS/EIR Comment Period	September 3, 2010 to October 18, 2010
Metro Board Identifies Locally Preferred Alternative	October 28, 2010
Final EIS/EIR Published	Fall 2011
FTA Record of Decision	Winter 2011
Final Design	1-2 Years
Construction	4 Years
Revenue Service Begins	As early as 2019