NORTH HOLLYWOOD TO PASADENA

BRT Corridor Planning and Environmental Study

ALTERNATIVES ANALYSIS REPORT

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Background

The North Hollywood to Pasadena Bus Rapid Transit (BRT) Corridor was identified by Metro's 2013 Countywide Bus Rapid Transit (BRT) and Street Design Improvement Study as one of the region's most heavily traveled corridors without a premium bus service. This project would provide a new high-quality BRT service between the San Fernando and San Gabriel Valleys, connecting the Metro Red and Orange Lines in North Hollywood to Pasadena City College in Pasadena. The North Hollywood to Pasadena BRT Corridor Project is funded with $267 million in Measure M funds and is expected to open mid-2024.

Initiated in June 2018, the North Hollywood to Pasadena BRT Corridor Planning and Environmental Study builds upon Metro's North Hollywood to Pasadena BRT Corridor Technical Study. The BRT Corridor Technical Study, completed in March 2017, explored the feasibility and performance of implementing BRT, including dedicated bus lanes, enhanced stations, all-door boarding, and transit signal priority. The BRT Corridor Technical Study identified two initial BRT concepts (Primary Street and Primary Freeway), including multiple route options, as the most promising alternatives to address the transportation challenges within this corridor. The purpose of the North Hollywood to Pasadena BRT Corridor Planning and Environmental Study is to further evaluate project alternatives and to develop recommendations regarding which alternatives should be advanced into environmental review.

Study Area

The North Hollywood to Pasadena BRT Corridor (**ES Figure 1**) is approximately 18 miles in length, extending from the North Hollywood Metro Red/Orange Line Station to Pasadena City College. The study corridor generally parallels the Ventura Freeway (State Route 134) between the San Fernando and San Gabriel Valleys. Existing high-capacity transit services in the study corridor include the Metro Red and Orange Lines in North Hollywood, the Metrolink Antelope Valley and Ventura Lines in Burbank, and the Metro Gold Line in Pasadena. The corridor traverses the communities of North Hollywood and Eagle Rock in the City of Los Angeles as well as the Cities of Burbank, Glendale, and Pasadena. The study area also includes many densely populated residential areas with cultural, entertainment, shopping, and employment areas distributed throughout, including:

- North Hollywood Metro Red/Orange Line Station
- North Hollywood Arts District
- Burbank Media District
- Downtown Burbank
- Burbank Metrolink Station
- Downtown Glendale
- Eagle Rock Community
- Old Pasadena
- Metro Gold Line
- Pasadena City College

ES Figure 1 – North Hollywood to Pasadena BRT Corridor

Purpose and Need

Of the 700,000 daily trips entering the study area, the majority are destined to locations within the corridor; only one-third of the trips extend from one end of the study area to the other. By far, the largest existing mode share is single occupant auto trips. Transit currently accounts for just 2 percent of trips along the corridor, despite the presence of Metro Rail connections at both ends. The key challenge for the North Hollywood to Pasadena corridor will be to design a premium transit service that captures more of the travel market within the corridor by offering competitive travel times, better transit access, improved regional connectivity, and enhanced passenger comfort and convenience.

A premium bus transit service along the corridor would fill a significant gap in the transit network between the San Fernando and San Gabriel Valleys and provide a viable alternative to the use of single-occupancy automobiles along congested roadways, while further encouraging development of Transit Oriented Communities (TOC). Accessibility would be improved to both the Metro Red and Orange Lines to the west and to the Metro Gold Line to the east. A new high-quality bus option would also connect Metro's regional transit network to densely populated residential areas in Los Angeles, Burbank, Glendale, and Pasadena as well as to many key employment and activity centers throughout the corridor.

The North Hollywood to Pasadena BRT Corridor Project objectives can be summarized as follows:

- Advance a premium transit service that is more competitive with auto travel to attract discretionary riders;
- Improve accessibility for disadvantaged communities;
- Improve transit access to major local and regional activity and employment centers;
- Enhance connectivity to Metro and other regional transit services;
- Provide improved passenger comfort and convenience; and
- Support community plans and transit-oriented community goals.

Initial BRT Concepts

Development of project alternatives began with the North Hollywood to Pasadena BRT Corridor Technical Study completed in March 2017, which identified both a "Primary Street" and a "Primary Freeway" BRT concept along with various route options (**ES Figure 2** and **ES Figure 3**, respectively).

Beginning in August 2018, the project team launched an extensive public outreach effort to update the public on the Project and to solicit feedback on the initial BRT concepts identified in the BRT Corridor Technical Study. This outreach effort included five community meetings in addition to approximately 40 individual project briefings given to the affected cities' elected officials and other community, business, and neighborhood groups. To broaden the outreach efforts to reach historically underserved communities, the project team also attended several neighborhood events such as street fairs, farmers markets, and music festivals, and shared project information at the North Hollywood Metro Red/Orange Line Station.

The public could also access project updates and/or provide comments through the project website or the special email address and telephone number established for the Project.

ES Figure 2 – Primary Street Concept with Route Options from 2017 BRT Corridor Technical Study

ES Figure 3 – Primary Freeway Concept with Route Option from 2017 BRT Corridor Technical Study

Screening of Initial BRT Concepts

Field reviews were conducted to evaluate all the potential routings as well as land use opportunities and constraints. Concurrently, a comprehensive database of street cross sections, existing transit service characteristics, and other data to inform the screening and evaluation of alternatives was assembled.

An initial screening of the concepts was then performed using the criteria shown below in **ES Table 1**. Combined with the feedback received from the various communities, several of the initial routing options were eliminated from further consideration—three from the Primary Street Concept and two from the Primary Freeway Concept.

ES Table 1 – Initial Screening Evaluation

	Physical Constraints	Land Use Compatibility	Misses Several Key Destinations
Primary Street Route Options			
Chandler Boulevard (North Hollywood to Downtown Burbank)	X	X	
Magnolia Boulevard (North Hollywood to Downtown Burbank)	X	X	
Brand Boulevard (Glendale)	X		
Primary Freeway Route Options			
Burbank Boulevard – Hollywood Way – Hollywood Burbank Airport – Interstate 5 (North Hollywood & Burbank)	X	X	X
Fair Oaks Avenue/Raymond Avenue Couplet (Pasadena)			X

Eliminated Primary Street Route Options

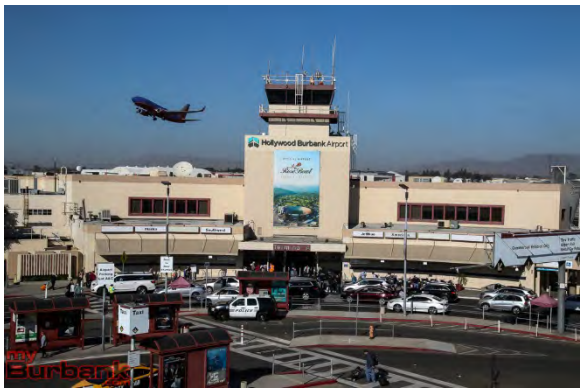
- **Chandler Boulevard (North Hollywood/Burbank):** Although Metro owns right-of-way along Chandler Boulevard, the median area is presently occupied by a Class 1 bikeway. The road is narrow and shifts from a single two-lane roadway in Los Angeles to a two-way couplet in Burbank. Within Burbank, the median is heavily landscaped, and the land use is relatively low-density residential. Metro received community input that a dedicated BRT lane along Chandler Boulevard in the City of Burbank would be incompatible with the residential neighborhood. Burbank residents also expressed strong concern over the potential loss of the bikeway. Moreover, this route option was anticipated to have low ridership potential based on its low-density characteristics.

- **Magnolia Boulevard (North Hollywood/Burbank):** Although Magnolia Boulevard would provide the shortest route between North Hollywood and Downtown Burbank, the roadway narrows to a single eastbound travel lane west of North Clybourn Avenue. The narrow roadway, and presence of numerous small businesses that are dependent upon a limited on-street parking supply, would make this route challenging to support BRT lanes. This option also was not supported by the Burbank community and City elected officials.

- **Brand Boulevard (Glendale):** This alignment was removed due to physical constraints; routing via Central Avenue in Downtown Glendale was preferred. Bulb-outs and diagonal parking on Brand Boulevard would need to be removed to accommodate dedicated BRT lanes. Without dedicated lanes, service reliability would suffer, particularly during peak times. BRT stations located along Central Avenue (900 feet to the west) at similar cross streets could provide access to the commercial uses along Brand Boulevard.

Eliminated Primary Freeway Route Options

- **Burbank Boulevard – Hollywood Way – Hollywood Burbank Airport – Interstate 5:** This alignment has several deficiencies. Although this route would serve the Hollywood Burbank Airport, Burbank Boulevard in Los Angeles is too narrow to support dedicated BRT lanes. In addition, the Los Angeles segment has industrial and commercial land uses such as auto body shops that are not anticipated to attract significant ridership. Furthermore, this route is indirect with out-of-direction travel to the north, would miss the Burbank Media District, and passes through Downtown Burbank along Interstate 5, which does not provide good service to the downtown area. Access to the Hollywood Burbank Airport could be provided by enhancing other existing transit routes.



- **Fair Oaks Avenue/Raymond Avenue Couplet (Pasadena):** This couplet, which would utilize the Fair Oaks interchange along the Ventura Freeway, was included in the Primary Freeway Concept in the BRT Corridor Technical Study. Although a northbound station could be provided immediately adjacent to the Del Mar Metro Gold Line Station, this option would not serve the heart of Pasadena, the South Lake Avenue District, or Pasadena City College. Input from stakeholders and City staff confirmed a preference for routing along Colorado Boulevard or a Green Street/Union Street couplet to Pasadena City College at Hill Street.

Refined Alternatives Studied

The results of the initial screening analysis were synthesized into three distinctive refined alternatives to further study as part of the Alternatives Analysis—a Street-Running, a Freeway-Running, and a Hybrid Street/Freeway-Running alternative. Each of these three alternatives would extend from the Metro Red/Orange Line terminus on Lankershim Boulevard at Chandler Boulevard in North Hollywood and would serve the North Hollywood Arts District. Similarly, each alternative would terminate at Pasadena City College on Colorado Boulevard at Hill Avenue in Pasadena, serving Old Pasadena and connecting to the Metro Gold Line. Key route characteristics of each alternative are noted in this section.

This section contains maps of each of the refined alternatives that indicate "candidate" station locations; the siting of each station is subject to refinement during the environmental phase. Additionally, because there are sections where stations are located closer to each other than the typically-desirable 1-mile average station spacing for BRT, stations may be consolidated or eliminated based upon further evaluation of ridership potential and operational factors.

Street-Running Alternative

This alternative (**ES Figure 4**), which closely resembles the Primary Street Concept originally identified in the 2017 BRT Corridor Technical Study, incorporates the most promising segments. This alternative has the greatest number of stations, maximizing ridership potential, connectivity to other local bus and regional rail services, and access to land uses along the corridor. Except for a short stretch of freeway between Eagle Rock and Pasadena, it operates entirely on-street, and therefore would have a longer end-to-end running time than the other alternatives.

Key route characteristics of the Street-Running alternative include:

- Serves the Burbank Media District and provides access to Downtown Burbank
- Provides connection to Burbank-Downtown Metrolink station
- Serves the heart of Downtown Glendale with multiple stations
- Operates along Colorado Boulevard serving the Eagle Rock community
- Operates along Colorado Boulevard in Pasadena

ES Figure 4 – Street-Running Alternative

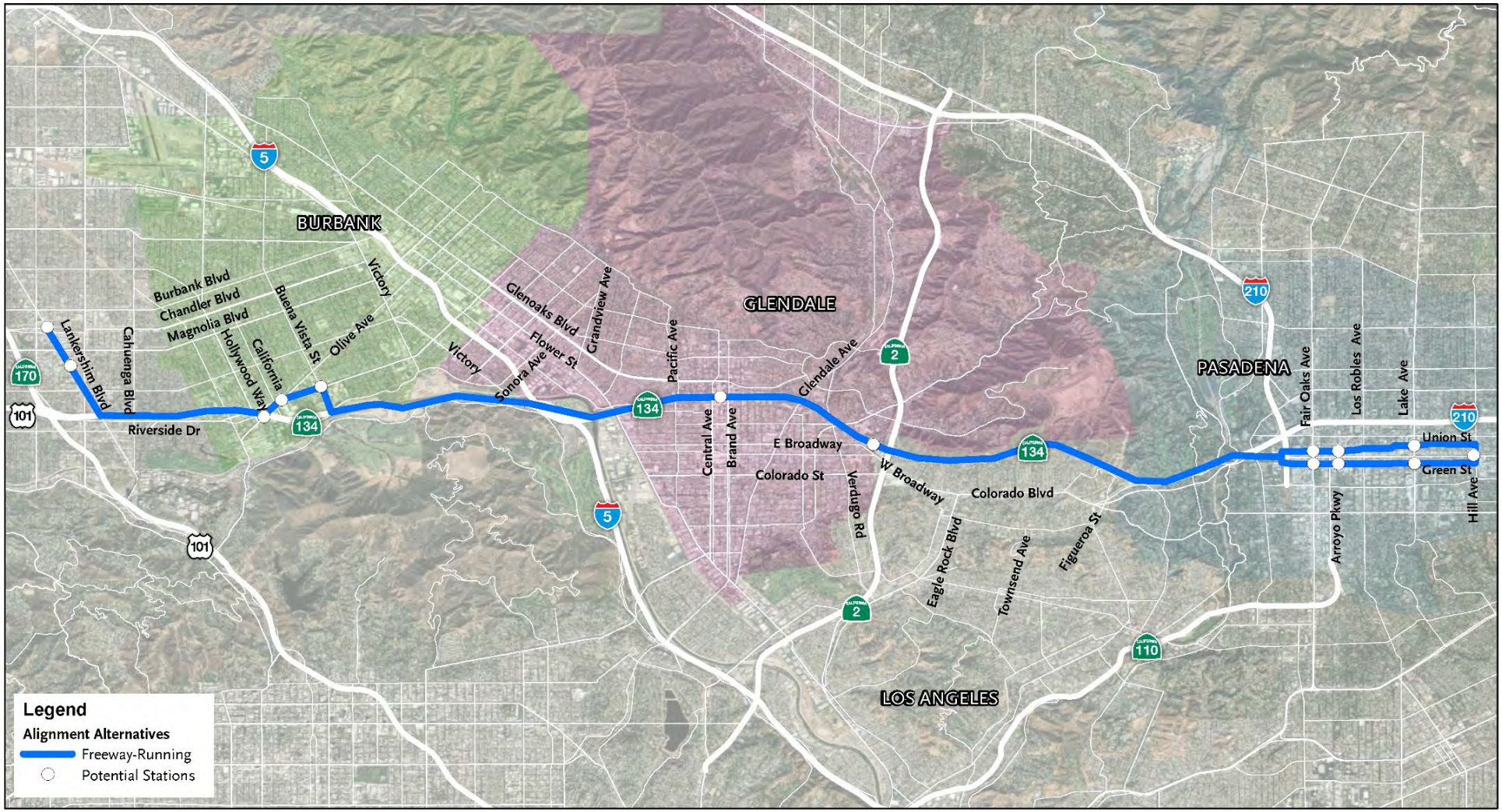
Freeway-Running Alternative

This alternative (**ES Figure 5**) was largely based upon the Primary Freeway Concept identified in the 2017 North Hollywood to Pasadena BRT Corridor Technical Study. It operates along the Ventura Freeway (State Route 134) between Burbank and Pasadena with a short on-street section through the Burbank Media District. With the least amount of on-street operation and with fewer stations, it would have the fastest end-to-end travel time; however, this alternative would also be expected to attract fewer riders because it would serve fewer destinations.

Key route characteristics of the Freeway-Running alternative include:

- Serves the Burbank Media District but does not provide access to Downtown Burbank
- Serves Downtown Glendale but with only one station
- Does not serve the Eagle Rock community
- Operates along the Green Street/Union Street one-way couplet in Pasadena

ES Figure 5 – Freeway-Running Alternative



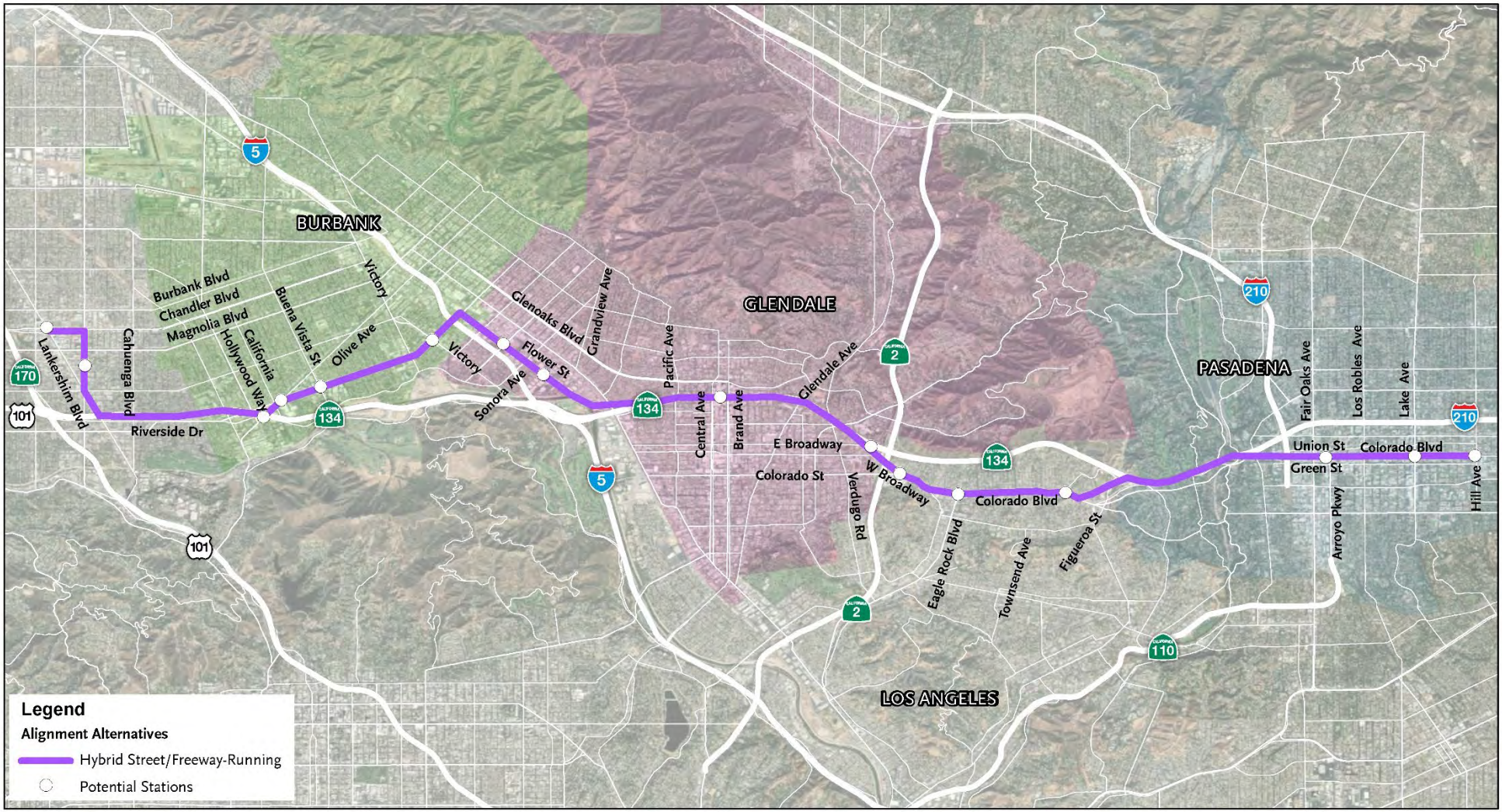
Hybrid Street/Freeway-Running Alternative

A third alternative (**ES Figure 6**) was developed for evaluating alternate route options, station locations, and testing a blend of on-street and freeway operations. This alternative, termed the Hybrid Street/Freeway-Running alternative, incorporates various route options including routing from the North Hollywood Metro Red/Orange Line Station via Chandler Boulevard to Vineland Avenue where there is adequate width to provide center-running bus lanes. The Hybrid Street/Freeway-Running alternative connects Burbank and Glendale along Alameda Avenue and Flower Street, then runs along the Ventura Freeway through the northern edge of Downtown Glendale to the Glendale city limits, just outside the community of Eagle Rock in Los Angeles. It has fewer stations than the Street-Running alternative but more than the Freeway-Running alternative. The end-to-end travel time would be faster than the Street-Running alternative but slower than the Freeway-Running alternative.

Key route characteristics of the Hybrid Street/Freeway-Running alternative include:

- Serves the Burbank Media District but does not provide access to Downtown Burbank
- Serves media production centers located along Flower Street
- Serves Downtown Glendale but with only one station
- Operates along Colorado Boulevard serving the Eagle Rock community
- Operates along Colorado Boulevard in Pasadena with a station at Arroyo Parkway, providing a closer connection to the Memorial Park Metro Gold Line Station

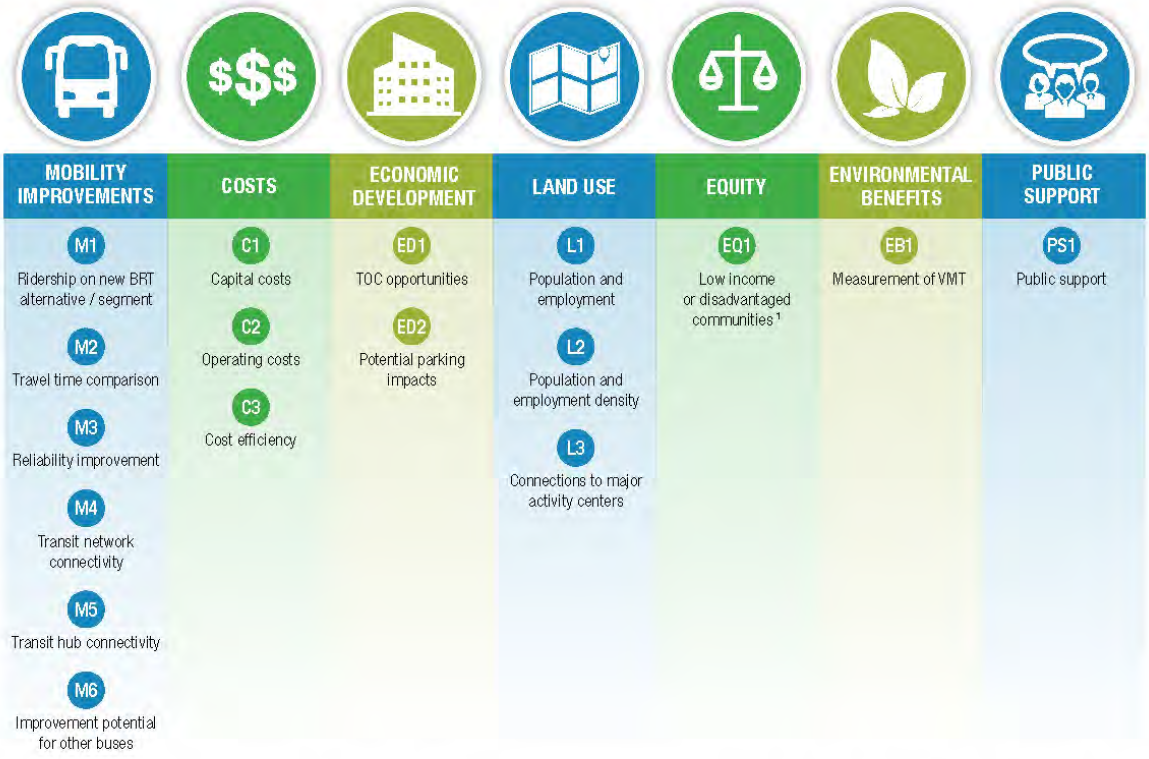
ES Figure 6 – Hybrid Street/Freeway-Running Alternative



Evaluation Criteria

Next, the three refined study alternatives were evaluated for mobility improvements, costs, economic development, land use, and environmental benefits in accordance with Metro policies, industry Best Practices, and Federal Transit Authority (FTA) guidelines as presented in the Fixing America's Surface Transportation (FAST) Act. Equity and public support categories have also been included as important considerations. Specific measures, calculations, sources, and ranking breakpoints have been selected to provide a meaningful comparison of alternatives, as well as of individual segments within each alternative. **ES Table 2** shows the criteria and related measures.

ES Table 2 – Evaluation Criteria and Measures



Notes:

1. *"Disadvantaged" as identified by the California Environmental Protection Agency as the top 25% most impacted census tracts using CalEnviroScreen 3.0; "Low-income Communities" – census tracts that are either at or below 80 percent of the statewide median income, or at or below the threshold designated as low-income by the California Department of Housing and Community Development's (HCD) 2016 State Income Limits.*

Evaluation Summary

For each evaluation criterion, the three refined study alternatives were assigned a comparative ranking ranging from very high to very low, with a corresponding score as follows.

- Very High = 5 points
- High = 4 points
- Moderate = 3 points
- Low = 2 points
- Very Low = 1 point

The scores were totaled for each evaluation criteria to determine an overall score for the three refined study alternatives. **ES Table 3** presents the evaluation results.

The Street-Running alternative has the highest overall score; although the travel time is the slowest and the capital and operating costs are the highest, this alternative has the highest ridership potential and provides the best access to regional activity centers, aligning with the purpose and need for the Project. It also delivers the highest vehicle miles traveled (VMT) reduction, which supports Metro's priorities of sustainability, and provides the most service to disadvantaged communities.

Both the Freeway-Running and Hybrid Street/Freeway-Running alternatives leverage the Ventura Freeway, where no mainline improvements were considered (i.e., buses would operate in mixed-flow or in the existing High Occupancy Vehicle [HOV] lane), to achieve time and cost savings relative to the Street-Running alternative. These time and cost savings, however, are achieved by sacrificing some accessibility to the system and connectivity to activity centers.

Although the Hybrid Street/Freeway-Running alternative would cost less to implement than the Street-Running alternative, this alternative did not attract many more riders than the Freeway-Running alternative and it scored significantly lower on the mobility criteria when compared to the Street-Running alternative. This analysis indicated that shifting portions of the alignment to the freeway would not improve the Project.

High-level observations in the various evaluation categories are as follows:

- **Mobility Improvements**: The Street-Running alternative attracts nearly 28 percent more net new transit riders than the Freeway-Running alternative and 14 percent more than the Hybrid Street/Freeway-Running alternative. It also outperforms the other two alternatives on all mobility criteria except travel time. (It should be noted, however, that the ridership patterns indicate fewer riders would be traveling the entire length from one end of the study area to the other.)

- **Costs**: Both the Hybrid Street/Freeway-Running and the Freeway-Running alternatives have higher cost efficiency (calculated as the annualized capital costs over 20 years divided by the annual new riders). Although the Street-Running alternative attracts the greatest ridership, it is not as cost efficient because the capital costs are higher.

- **Economic Development**: The Street-Running alternative is most supportive of Metro's TOC policies. But, this alternative also has the highest potential for impacting traffic and on-street parking, so developing mitigation measures should be a focus during the design refinement and environmental phase of project development.

- **Land Use**: The Street-Running alternative scored the highest on two of the three metrics. It has a lower "density" score; however, this is somewhat misleading as the score is an average of the densities at all stations. The three alternatives serve many of the same high-density centers, but the Street-Running alternative also serves additional stations in less dense areas.

- **Equity**: The Street-Running alternative provides a higher level of access to low income and disadvantaged communities, as defined by the California Environmental Protection Agency (CalEPA). Low income and disadvantaged populations within 1/4-mile buffers of each alternative alignment (except the portion of the route alignments on freeways) and within 1/2-mile buffers of potential station locations were considered.

- **Environmental Benefits**: The Street-Running alternative would result in the greatest reduction in VMT, substantially better than the Freeway-Running alternative and slightly better than the Hybrid Street/Freeway-Running alternative.

- **Public Support**: Although this criterion is somewhat subjective, the Street-Running alternative was judged to be the highest scoring. Based on input from the public and from multiple stakeholders during community outreach efforts, there was a strong consensus that the Freeway-Running alternative was the least desirable.

Source: Trammell Crow Company's NoHo District Transit Oriented Development Project

ES Table 3 – Evaluation Results

	Alternative 1: Street-Running	Alternative 2: Freeway-Running	Alternative 3: Hybrid Street/ Freeway-Running
Mobility Improvements			
Daily Ridership	29,570	23,136	25,963
End-to-End Travel Time	65 mins	43 mins	56 mins
Travel Time Reliability			
Transit Network Connectivity			
Transit Hub Connectivity			
Other Bus Line Benefit			
Costs			
Capital Cost (Year of Expenditure)	$271-429M	$137-201M	$156-230M
Annual Operating Cost	$19.6M	$12.9M	$16.9M
Cost Efficiency (1)			
Economic Development			
TOC Opportunities			
Potential Parking Impacts			
Land Use			
Population and Employment (2)	364,072	199,774	267,355
Population and Employement Density (3)	40	47	40
Connections to Major Activity Centers			
Equity			
Disadvantaged Communities (4)			
Environmental Benefits			
VMT Reduction (5)			
Public Support			
Public Support	Moderate	Very Low	Low
SUMMARY – Very High (5 points)	9	6	2
SUMMARY – High (4 points)	1	1	3
SUMMARY – Moderate (3 points)	1	0	6
SUMMARY – Low (2 points)	0	1	5
SUMMARY – Very Low (1 points)	6	9	1
Total Score	58	45	51

Notes:

1. ***Cost efficiency is measured as the annualized capital costs over 20 years divided by the annual new riders***
2. ***Total existing population and employment within a 1/2-mile radius of potential stations***
3. ***Total existing population and employment density per acre within a 1/2-mile radius of potential stations***
4. ***Low income or disadvantaged population, as defined by CalEPA, within 1/4-mile buffers of each alternative alignment and within 1/2-mile buffers of potential station locations***
5. ***Daily decrease in vehicle miles traveled***

Refined Project Alternative

Based on the evaluation conducted of the three alternatives, it was determined that the Street-Running alternative best meets the purpose and need for the Project and achieves the highest number of overall benefits, including ridership potential, connectivity, TOC opportunities, equity, and environmental benefits. However, high-performing segments from the other two alternatives are recommended to be carried forward resulting in a Refined Street-Running Alternative with Route Options as described below.

Refined Street-Running Alternative with Route Options

The Recommended Project Alternative to be advanced for environmental review is shown in **ES Figure 7**. This alternative is a refinement of the Street-Running alternative with several route options. Specific refinements include:

- Addition of a route option from the North Hollywood Metro Red/Orange Line Station via Chandler Boulevard to Vineland Avenue to Lankershim Boulevard
- Routing via the Ventura Freeway between Lankershim Boulevard and the Burbank Media District to provide a faster operating speed compared to Riverside Drive
- Addition of two route options in Glendale – an alternative street-running segment using Colorado Street in lieu of Broadway as well as an alternative freeway-running segment using the Ventura Freeway between Brand Boulevard and Harvey Drive
- Addition of a route option in Pasadena via the Green Street/Union Street couplet, as an alternative to operating along Colorado Boulevard
- Consolidation of stations in Pasadena with a single station at Arroyo Parkway in lieu of separate stations at Fair Oaks Avenue and Marengo Avenue, to provide a more convenient connection to the Metro Gold Line in Pasadena

The Refined Street-Running Alternative with Route Options, which is the Recommended Project Alternative, connects to the Metro Red and Orange Lines and the future North San Fernando Valley BRT at the North Hollywood Metro Red/Orange Line Station and extends to Pasadena City College in Pasadena. Key route characteristics of the Recommended Project Alternative include:

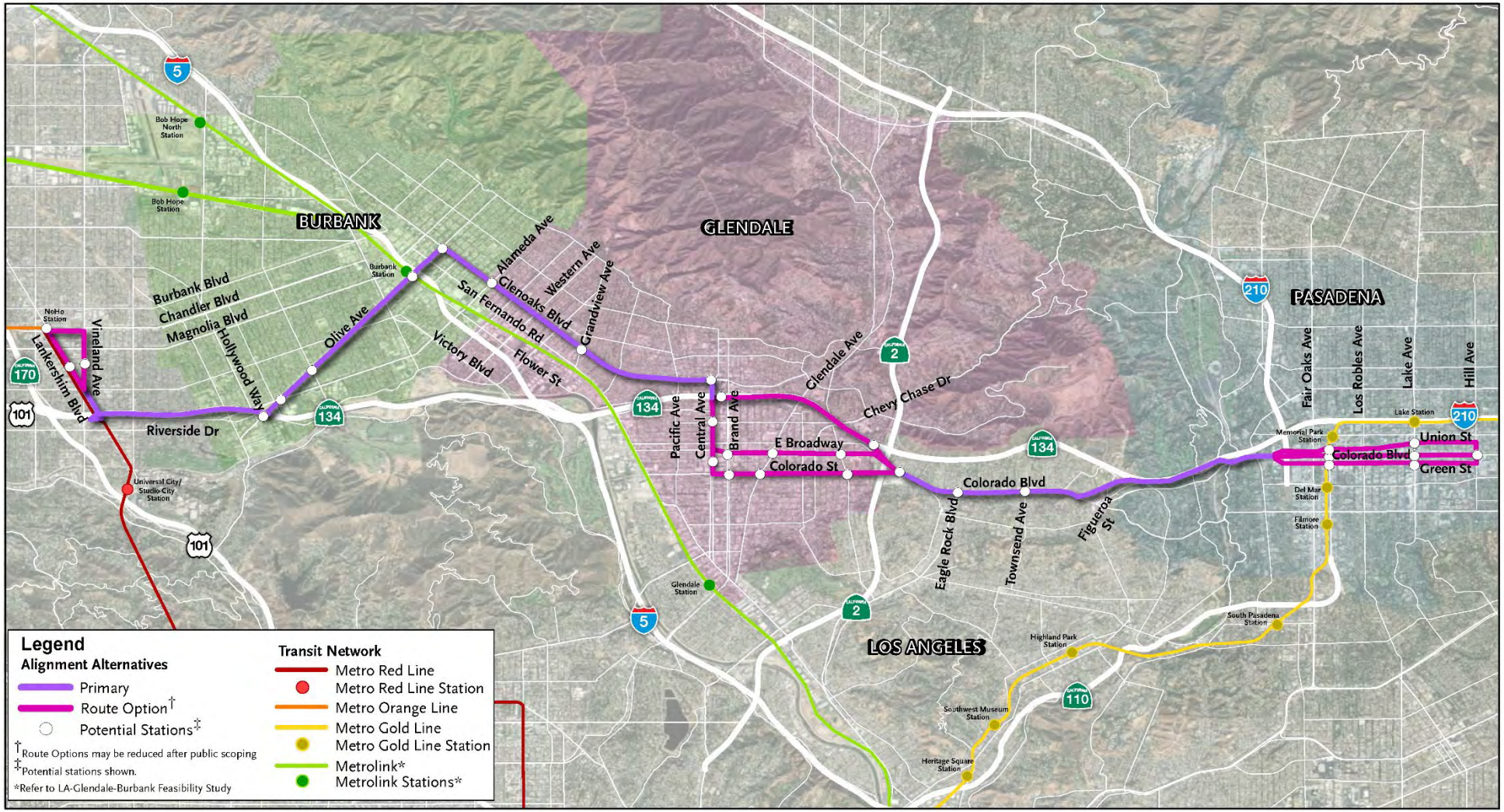
- Serves the North Hollywood Arts District
- Serves the Burbank Media District and Downtown Burbank, including the Burbank-Downtown Metrolink Station
- Connects to Downtown Glendale with options serving the heart of Downtown Glendale with multiple stations, or alternatively with one station adjacent to the Ventura Freeway
- Operates along Colorado Boulevard through the community of Eagle Rock
- Provides access to Old Pasadena, the Metro Gold Line, South Lake Avenue District, and Pasadena City College in Pasadena

The primary segments (shown in purple on **ES Figure 7**) and route options (shown in pink on **ES Figure 7**) from west to east are described below.

- From North Hollywood, utilizes either Lankershim Boulevard directly to the Ventura Freeway or utilizes a Chandler Boulevard-Vineland Avenue-Lankershim Boulevard routing with dedicated lanes along Vineland Avenue and along Lankershim Boulevard south of Vineland Avenue
- Operates in mixed traffic along the Ventura Freeway between Lankershim Boulevard and Pass Avenue, with stations both south and north of the freeway in the Burbank Media District
- Extends northeast in dedicated lanes along Olive Avenue to Glenoaks Boulevard in Downtown Burbank
- Continues southeast in dedicated lanes along Glenoaks Boulevard between Burbank and Downtown Glendale
- Operates on-street through Downtown Glendale via Central Avenue to Broadway or Colorado Street, or utilizes the Ventura Freeway between Brand Boulevard and Harvey Drive east of downtown
- Operates along Colorado Boulevard in dedicated lanes through the community of Eagle Rock in the City of Los Angeles
- Uses the freeway ramps located east of Linda Rosa Avenue in Eagle Rock to access the Ventura Freeway, continuing along the freeway to Colorado Boulevard in Pasadena
- Continues along Colorado Boulevard in dedicated lanes to Pasadena City College at Colorado Boulevard and Hill Avenue, or operates along the Green Street/Union Street couplet; an Arroyo Parkway station would provide convenient transfer to the Metro Gold Line

The alternative includes 18 to 21 potential stations (depending upon whether the freeway is used to bypass the heart of Glendale); however, all station locations are preliminary at this point in the planning process. More specific determinations regarding station locations are dependent upon further design development and evaluation.

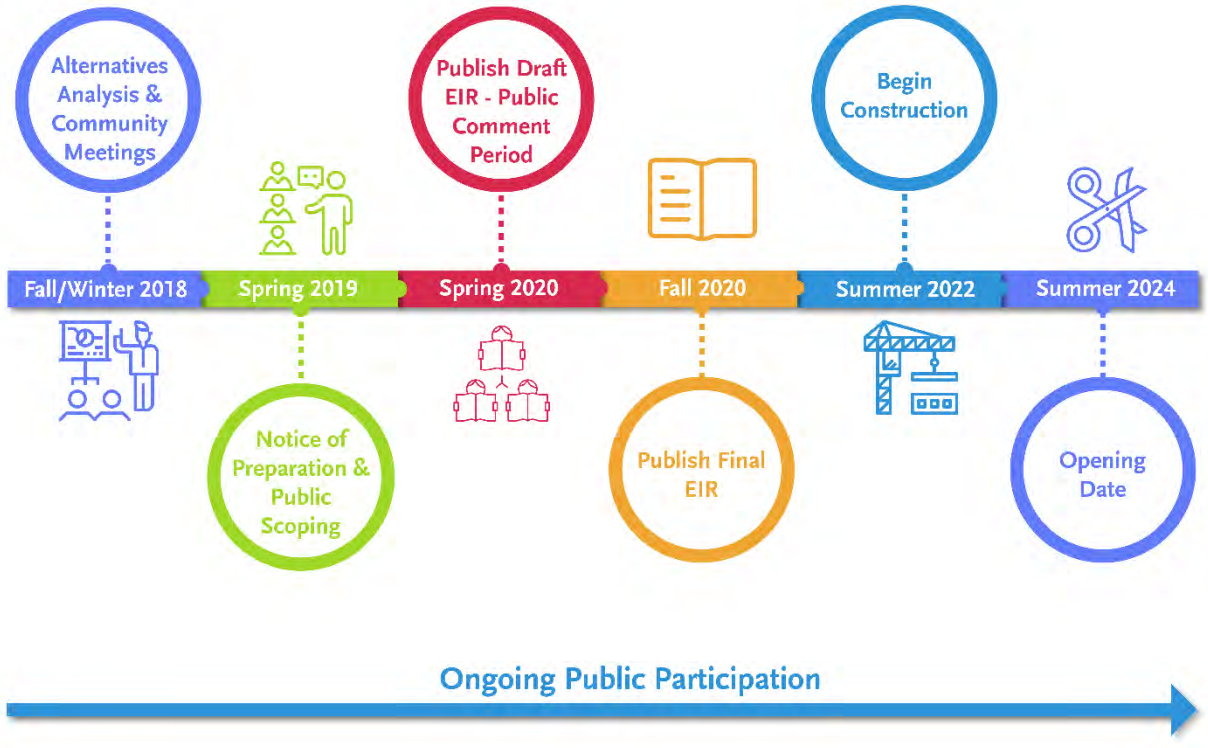
ES Figure 7 – Refined Street-Running Alternative with Route Options



Project Timeline/Next Steps

The North Hollywood to Pasadena BRT Corridor Planning and Environmental Study is currently in the Alternatives Analysis phase. Approval of the Alternatives Analysis will trigger initiation of the formal Environmental Analysis with issuance of a Notice of Preparation (NOP) in Spring 2019 followed by Public Scoping meetings. The Draft Environmental Impact Report (DEIR) will be available in early 2020 and it is expected that the Final EIR will be certified in late 2020. The overall project schedule anticipates construction commencing by mid-2022 with an opening date by mid-2024.

The Refined Street-Running Alternative with Route Options as described in this Alternatives Analysis is recommended for further evaluation in the DEIR. The DEIR will identify a Proposed Project and assess route options as part of the Proposed Project or as alternatives to lessen potentially significant impacts. The content of the DEIR will be informed by additional input from Public Scoping Meetings and the ongoing community engagement process.



1.0 INTRODUCTION

1.0 Introduction

1.1 Background

Initiated in June 2018, the Los Angeles County Metropolitan Transportation Authority (Metro) is conducting a Planning and Environmental Study to advance the implementation of the North Hollywood to Pasadena Bus Rapid Transit (BRT) Corridor Project (the Project) through technical evaluation, including conceptual design, environmental review, and preliminary engineering. The Project would provide a new high-quality BRT service between the San Fernando and San Gabriel Valleys, connecting the Metro Red and Orange Lines in North Hollywood to Pasadena City College in Pasadena. The Project is expected to open by mid-2024.

The North Hollywood to Pasadena Bus Rapid Transit (BRT) Corridor was identified by Metro's 2013 Countywide Bus Rapid Transit (BRT) and Street Design Improvement Study as one of the region's most heavily traveled corridors without a premium bus service. In March 2017, Metro completed the North Hollywood to Pasadena BRT Corridor Technical Study that explored the feasibility of implementing BRT along the corridor and its expected performance, including using dedicated bus lanes, enhanced stations, all-door boarding, transit signal priority, and other key BRT features. The Technical Study identified two initial BRT concepts, Primary Street and Primary Freeway, with multiple route options, as the corridor's most promising alternatives to address the corridor's transportation challenges. In March 2017, both BRT concepts and their route options were approved by the Metro Board of Directors to be advanced to the environmental phase of project development. The Project is funded by Measure M, which has budgeted $267 million for the implementation of the North Hollywood to Pasadena BRT Corridor.

In June 2018, the North Hollywood to Pasadena BRT Corridor Planning and Environmental Study (the Study) commenced. The Study is currently in the Alternatives Analysis (AA) phase which is further evaluating project alternatives and providing recommendations regarding the Proposed Project to be advanced into environmental review. This AA Report describes and evaluates potential BRT alternatives and options for the corridor. The Proposed Project, which incorporates the most promising route options and a No-Project Alternative, will advance to the environmental phase of the Project, pursuant to California Environmental Quality Act (CEQA) guidelines, with the concurrence of the Metro Board of Directors.

1.2 Study Area

The North Hollywood to Pasadena BRT Corridor (**Figure 1**) is approximately 18 miles in length, extending from the North Hollywood Metro Red/Orange Line Station to Pasadena City College. The study corridor generally parallels the Ventura Freeway (State Route 134) between the San Fernando and San Gabriel Valleys. Existing high-capacity transit services in the study corridor include the Metro Red and Orange Lines in North Hollywood, the Metrolink Antelope Valley and Ventura Lines in Burbank, and the Metro

Gold Line in Pasadena. The corridor traverses the communities of North Hollywood and Eagle Rock in the City of Los Angeles as well as the Cities of Burbank, Glendale, and Pasadena. The study area also includes many densely populated residential areas with several cultural, entertainment, shopping, and employment districts distributed throughout, including:

- North Hollywood Metro Red/Orange Line Station
- North Hollywood Arts District
- Burbank Media District
- Downtown Burbank
- Burbank Metrolink Station
- Downtown Glendale
- Eagle Rock
- Old Pasadena
- Metro Gold Line
- Pasadena City College

Figure 1 – North Hollywood to Pasadena BRT Corridor

1.3 Purpose and Need

Of the 700,000 daily trips entering the study area, the majority are destined to locations within the corridor; only one-third of the trips extend from one end of the study area to the other. By far, the largest existing mode share is single occupant auto trips. Transit currently accounts for just 2 percent of trips along the corridor, despite the presence of Metro Rail connections at both ends. The key challenge for the North Hollywood to Pasadena BRT Corridor will be to design a premium transit service that captures more of the travel market within the corridor by offering competitive travel times, better transit access, improved regional connectivity, and enhanced passenger comfort and convenience.

A premium bus transit service along the corridor would fill a significant gap in the transit network between the San Fernando and San Gabriel Valleys and provide a viable alternative to the use of single-occupancy automobiles along congested roadways, while further encouraging development of Transit Oriented Communities (TOC). Accessibility would be improved to both the Metro Red and Orange Lines to the west and to the Metro Gold Line to the east. A new high-quality bus option would also connect Metro's regional transit network to densely populated residential areas in Los Angeles, Burbank, Glendale, and Pasadena as well as to many key employment and activity centers throughout the corridor.

The North Hollywood to Pasadena BRT Corridor Project objectives can be summarized as follows:

- Advance a premium transit service that is more competitive with auto travel to attract discretionary riders;
- Improve accessibility for disadvantaged communities;
- Improve transit access to major local and regional activity and employment centers;
- Enhance connectivity to Metro and other regional transit services;
- Provide improved passenger comfort and convenience; and
- Support community plans and transit-oriented community goals.

The corridor currently experiences mobility challenges due in large part to the lack of premium public transportation choices. A substantial segment of the study area is not currently served by effective transit service. For those with access to transit, service hours are limited and the proximity of stops to key employment, shopping, and other activity centers is restricted within the corridor. Consequently, existing transit ridership represents a small fraction of the total corridor travel demand. Opportunities exist to attract new transit users by implementing convenient, attractive, and enhanced services along priority corridors and serving key local and regional destinations.

1.3.1 Mobility Problem

The North Hollywood to Pasadena BRT Corridor transportation network provides vital connections between the residential communities, major employment centers, and regional destinations and attractions located in the San Fernando and San Gabriel Valleys. However, many streets and highways are heavily congested, resulting in travel delays and unpredictable travel times for auto and transit users alike. The lack of direct connections and service variability has been a major factor inhibiting transit use. Transit service operating along congested roadways in mixed traffic with automobiles does not adequately provide the level of transit quality (i.e., reliability, speed, travel time, comfort, and convenience) to attract discretionary riders and change their travel habits. Despite the high degree of travel time variability associated with automobile travel (which is the case particularly during congested peak travel periods), the existing level of transit service does not adequately provide a convenient, reliable, time-competitive alternative to the automobile for travelers in the corridor, including discretionary riders who are primarily driving.

The current bus transit network serving the corridor is comprised of Metro, BurbankBus, Glendale Beeline, Pasadena Transit, Foothill Transit, and Los Angeles Department of Transportation (LADOT) bus routes that provide first/last mile circulator and line haul corridor services. The bus network often requires transfers between express and various local routes to connect the major destinations located along the length of the corridor and primarily operate in congested, mixed traffic conditions. As a result, the bus network serves only a very small percentage of the corridor's overall daily trips.

The North Hollywood to Pasadena BRT Corridor Project will identify a viable transit option that can provide an effective alternative to automobile use along the corridor, as further described in the following Project Objectives section.

1.3.2 Project Objectives

The Project objectives reflect Metro's mission to satisfy public transportation and mobility needs for transit infrastructure, while encouraging the development of Transit Oriented Communities or TOCs along the corridor. Listed below are the Project objectives, with bulleted descriptions or actions reflective of each Project objective for the North Hollywood to Pasadena BRT Corridor Project.

1. ***Advance a premium transit service that is more competitive with auto travel to retain existing riders and attract discretionary riders***

   - Implement new service and/or infrastructure that creates connections to centers of employment, education, residence, shopping, culture, and entertainment within the corridor;
   - Increase transit service efficiency (i.e., speed and passenger throughput) in the Project study area;
   - Decrease transit travel times in the study area;
   - Improve travel time reliability, particularly during peak-hour traffic, and on-time performance with dedicated transit lanes;
   - Implement Intelligent Transportation Systems (ITS) that benefit transit operations, including transit signal priority;
   - Provide enhanced BRT amenities (e.g., branded vehicles, near level boarding, stations, electronic/off-board fare collection, passenger information technology, etc.) to improve rider experience and convenience;
   - Develop cost-effective transit solutions; and
   - Make transit service more environmentally beneficial via reductions in greenhouse gas emissions in the Project study area.

2. **Improve accessibility for disadvantaged communities**
   - Enhance access to jobs from disadvantaged communities within the corridor and systemwide; and
   - Support Metro's Equity Framework by providing a premium BRT service for the region's transit-dependent/low income communities.

3. ***Improve transit access to major local and regional activity centers and employment sites***

   - Implement a premium, one-seat ride transit service that connects local and regional activity centers along the corridor;
   - Increase transit mode split, particularly for home-to-work trips, along the corridor;
   - Provide safe and convenient access to transit for bicycles and pedestrians; and
   - Increase transportation system productivity (passengers per hour) within the corridor.

4. ***Enhance connectivity to Metro and regional rail services***

   - Increase regional transit network trips to/from the study area, including transfers to Metro Rail, Metro Orange Line BRT, the future North San Fernando Valley BRT, and Metrolink;
   - Capitalize on existing local and regional transit facilities and operations;
   - Provide safe, convenient, and attractive transfer facilities; and
   - Create opportunities for future upgrades or additional premium transit services.

5. Provide improved passenger comfort and convenience

- Provide efficient connections with local transit services and first mile/last mile infrastructure;
- Develop infrastructure to facilitate seamless transfers where major transit corridors intersect;
- Encourage transit usage for different trip types and purposes;
- Promote improved pedestrian and bicycle connectivity between transit services and adjoining land uses;
- Provide safe, convenient, and attractive transit stations; and
- Integrate premium transit service with local bus, bicycle, pedestrian, private automobile, and intercity travel modes.

6. Support community plans and transit-oriented development goals

- Improve transit access to existing and future developments;
- Use transportation infrastructure to help create attractive communities;
- Provide high-capacity transit facilities at locations where existing and future land uses make them mutually supportive;
- Encourage adoption of County and local ordinances that support TOC development and pedestrian/bicycle enhancements;
- Identify and pursue opportunities for joint development of transit stations and facilities with the private sector;
- Maximize funding opportunities from state, local, and federal sources; and
- Identify opportunities for value capture in conjunction with Metro's investment in transit.

1.4 Alternatives Analysis Report Purpose and Structure

This AA Report presents the background, advantages, disadvantages, and potential impacts of each alternative identified for the Study. The remainder of this Report is organized into the following sections:

- **Section 2:** Initial Screening Process
- **Section 3:** Public Outreach Summary
- **Section 4:** Refined Alternatives Studied
- **Section 5:** Key Characteristics of Refined Alternatives
- **Section 6:** Evaluation of Refined Alternatives
- **Section 7:** Refined Project Alternatives
- **Section 8:** Project Timeline/Next Steps

2.0 INITIAL SCREENING PROCESS

2.0 Initial Screening Process

This section describes the initial screening process that was completed to evaluate the BRT concepts identified in the prior Technical Study and screen the concepts to identify the most promising options to carry forward for further refinement and analysis. The initial BRT concepts were evaluated for their physical constraints, land use compatibility with a BRT system, connectivity with destinations, and the public perception of the Project.

2.1 Initial BRT Concepts

Development of project alternatives began with the North Hollywood to Pasadena BRT Corridor Technical Study completed in March 2017, which identified both a "Primary Street" and a "Primary Freeway" BRT concept along with various route options in Burbank, Glendale, and Pasadena (**Figure 2** and **Figure 3**, respectively).

Beginning in August 2018, the North Hollywood to Pasadena BRT Corridor Project team launched an extensive public outreach effort to update the public on the Project and to solicit feedback on the initial BRT concepts identified in the 2017 BRT Corridor Technical Study. This outreach effort included five community meetings in addition to approximately 40 individual project briefings given to the affected cities' elected officials and other community, business, and neighborhood groups. To broaden the outreach efforts to reach historically underserved communities, the project team also attended several neighborhood events such as street fairs, farmers markets, and music festivals, and shared project information at the North Hollywood Metro Red/Orange Line Station.

The public could also access project updates and/or provide comments through the project website or the special email address and telephone number established for the Project.

Outcomes from the stakeholder outreach effort are further described in Section 3.

Figure 2 – Primary Street Concept with Route Options from 2017 BRT Corridor Technical Study

Figure 3 – Primary Freeway Concept with Route Option from 2017 BRT Corridor Technical Study

2.2 Screening of Initial BRT Concepts

Field reviews were also conducted to evaluate all the potential routings as well as land use opportunities and constraints. Concurrently, a comprehensive database of street cross sections, existing transit service characteristics, and other data to inform the screening and evaluation of alternatives was assembled.

An initial screening of the BRT concepts and other route options was then performed using the criteria shown below in **Table 1**. The screening reviewed several street options in the western portion of the study area and a potential alternative routing to the Hollywood Burbank Airport via Interstate-5. Several factors were considered including physical constraints such as narrow roadways, land use incompatibility, and deficiencies in connectivity such as missing serving key hubs and downtown areas.

Table 1 – Initial Screening Evaluation

	Physical Constraints	Land Use Compatibility	Misses Several Key Destinations
Primary Street Route Options			
Chandler Boulevard (North Hollywood to Downtown Burbank)	X	X	
Magnolia Boulevard (North Hollywood to Downtown Burbank)	X	X	
Brand Boulevard (Glendale)	X		
Primary Freeway Route Options			
Burbank Boulevard – Hollywood Way – Hollywood Burbank Airport – Interstate 5 (North Hollywood & Burbank)	X	X	X
Fair Oaks Avenue/Raymond Avenue Couplet (Pasadena)			X

2.2.1 Screening Results

Combined with the feedback received from the various communities during the public outreach, several of the initial routing options were eliminated from further consideration—three from the Primary Street Concept and two from the Primary Freeway Concept, as further described below.

2.2.2 Eliminated Primary Street Route Options

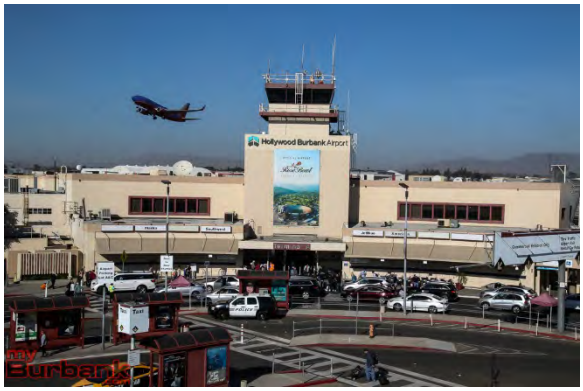
- **Chandler Boulevard (North Hollywood/Burbank):** Although Metro owns right-of-way along Chandler Boulevard, the median area is presently occupied by a Class 1 bikeway. The road is narrow and shifts from a single two-lane roadway in Los Angeles to a two-way couplet in Burbank. Within Burbank, the median is heavily landscaped, and the land use is relatively low-density residential. Metro received community input that a dedicated BRT lane along Chandler Boulevard in the City of Burbank would be incompatible with the residential neighborhood. Burbank residents also expressed strong concern over the potential loss of the bikeway. Moreover, this route option was anticipated to have low ridership potential based on its low-density characteristics.

- **Magnolia Boulevard (North Hollywood/Burbank):** Although Magnolia Boulevard would provide the shortest route between North Hollywood and Downtown Burbank, the roadway narrows to a single eastbound travel lane west of North Clybourn Avenue. The narrow roadway, and presence of numerous small businesses that are dependent upon a limited on-street parking supply, would make this route challenging to support dedicated BRT lanes. This option also was not supported by the Burbank community and City elected officials.

- **Brand Boulevard (Glendale):** This alignment was removed due to physical constraints; routing via Central Avenue in Downtown Glendale was preferred. Bulb-outs and diagonal parking on Brand Boulevard would need to be removed to accommodate dedicated BRT lanes. Without dedicated BRT lanes, service reliability would suffer, particularly during peak times. BRT stations located along Central Avenue (900 feet to the west) at similar cross streets could provide access to the commercial uses along Brand Boulevard.

2.2.3 Eliminated Primary Freeway Route Options

- **Burbank Boulevard – Hollywood Way – Hollywood Burbank Airport – Interstate 5:** This alignment has several deficiencies. Although this route would serve the Hollywood Burbank Airport, Burbank Boulevard in Los Angeles is too narrow to support dedicated BRT lanes. In addition, the Los Angeles segment has industrial and commercial land uses such as auto body shops that are not anticipated to attract significant ridership. Furthermore, this route is indirect with out-of-direction travel to the north, would miss the Burbank Media District, and bypasses Downtown Burbank along Interstate 5, which does not provide good service to the downtown area. The Burbank Media District and Downtown Burbank are expected to attract more ridership than the Airport. Access to the Hollywood Burbank Airport could be provided by enhancing other existing transit routes.



- **Fair Oaks Avenue/Raymond Avenue Couplet (Pasadena):** This couplet, which would utilize the Fair Oaks interchange along the Ventura Freeway, was included in the Freeway Concept in the 2017 BRT Corridor Technical Study. Although a northbound station could be provided immediately adjacent to the Del Mar Metro Gold Line Station, this option would not serve the heart of Pasadena, the South Lake Avenue District, or Pasadena City College. Input from stakeholders and City staff confirmed a preference for routing along Colorado Boulevard or a Green Street/Union Street couplet extending to Pasadena City College at Hill Street.

3.0 PUBLIC OUTREACH SUMMARY

3.0 Public Outreach Summary

At the initiation of the current Study, Metro began a "pre-scoping" public outreach program to gather input and feedback from community members and stakeholders prior to initiation of the formal environmental process. The public outreach program was intended to solicit broad-based public input from potential transit riders and other stakeholders interested in the route alignment, station locations, and quality of service offered. This section summarizes the outreach efforts during this early phase of the Study, from August 2018 through December 2018. Outreach will continue through 2019 and be documented in the subsequent environmental phase of the Project.

3.1 Public Engagement Activities

Metro initiated an outreach strategy to engage and inform stakeholders of the Study's background, purpose and need, and objectives through traditional and non-traditional outreach approaches. Beginning in August 2018, the project team has met regularly with the local cities, key stakeholders, and the public within the study area. This process included a wide range of opportunities for feedback designed to be transparent, inclusive, and in accordance with Metro's Board-adopted Public Participation Plan. The outreach effort has also been guided by Metro's Equity Platform Framework adopted by the Metro Board in February 2018, ensuring outreach includes meaningful engagement with historically underserved communities. In addition to conducting five formal community meetings, Metro has held a total of approximately 40 stakeholder meetings, pop-up events, city council and agency presentations, and other events. These activities have provided a forum for informing the public about the proposed project, gathering input, and hearing community issues, concerns and suggestions.

Metro developed a stakeholder database of almost 5,500 contacts throughout the project study area to initiate and coordinate communication with the surrounding communities. The database consists of community leaders and key stakeholders, including agencies, neighborhood and community groups, civic clubs/organizations, businesses and business groups, faith based and religious institutions, media, elected officials, schools, and key opinion leaders and other individuals within North Hollywood, Burbank, Glendale, Eagle Rock and Pasadena. Outreach efforts were supplemented with a project website, email address and telephone line, all of which accepted comments from the public. **Table 2** summarizes the breadth and scope of the various meetings held in Fall 2018.

Table 2 – Outreach Summary

August	
August 11	North Hollywood Block Party
August 25	Altadena Town Council Ice Cream Social
September	
September 6	Elected Official Briefing
September 11	Burbank City Council
September 14	Glendale City Staff Briefing
September 18	City of Los Angeles Council District 14 Briefing
September 20	San Fernando Valley Council of Governments
September 24	Eagle Rock Neighborhood Council Executive Committee
September 25	North Hollywood Station Pop-Up
September 25	Pasadena Municipal Services Committee
September 26	Glendale Transportation and Parking Commission
September 27	Pasadena Transportation Advisory Commission
September 29	NoHo-Pasadena and North San Fernando Valley Joint Community Meeting
October	
October 1	Glendale Community Meeting
October 2	Eagle Rock Neighborhood Council
October 3	Pasadena Community Meeting
October 3	San Fernando Valley Service Council Meeting

October (Continued)	
October 4	Burbank Community Meeting
October 6	Eagle Rock Music Festival
October 8	San Gabriel Valley Service Council Meeting
October 10	North Hollywood Business Improvement District
October 10	Kiwanis Club of La Cañada
October 13	Eagle Rock Community Meeting
October 17	South Lake Business Association
October 20	City of Glendale Fall Festival
October 24	Universal City / North Hollywood Chamber of Commerce
October 24	34th Congressional District Staff Briefing
October 27	Burbank Farmers Market
October 30	Burbank Transit Management Organization
November	
November 1	Arroyo Verdugo Communities Joint Powers Authority
November 6	Valley Industry and Commerce Association
November 14	The Eagle Rock Association
November 16	Burbank Holiday in the Park
November 19	North Hollywood Neighborhood Council

Throughout this pre-scoping outreach effort, the project team gathered feedback regarding the technical aspects of the proposed alternatives and station options along with general comments regarding project funding, ridership, and alignments.

3.2 Project Communication

A project information telephone line (213-418-3228) and email address (nohopasbrt@metro.net) were established for the public to comment and ask questions. Both platforms are monitored regularly by Metro.

The Metro team prepared a fact sheet in English and Spanish that was provided to attendees at all outreach events. The fact sheet was developed as the Project began and will be updated at key milestones during the Project to provide the most current information on the project background, goals, history and next steps. The fact sheet also provides the project web page and contact information.

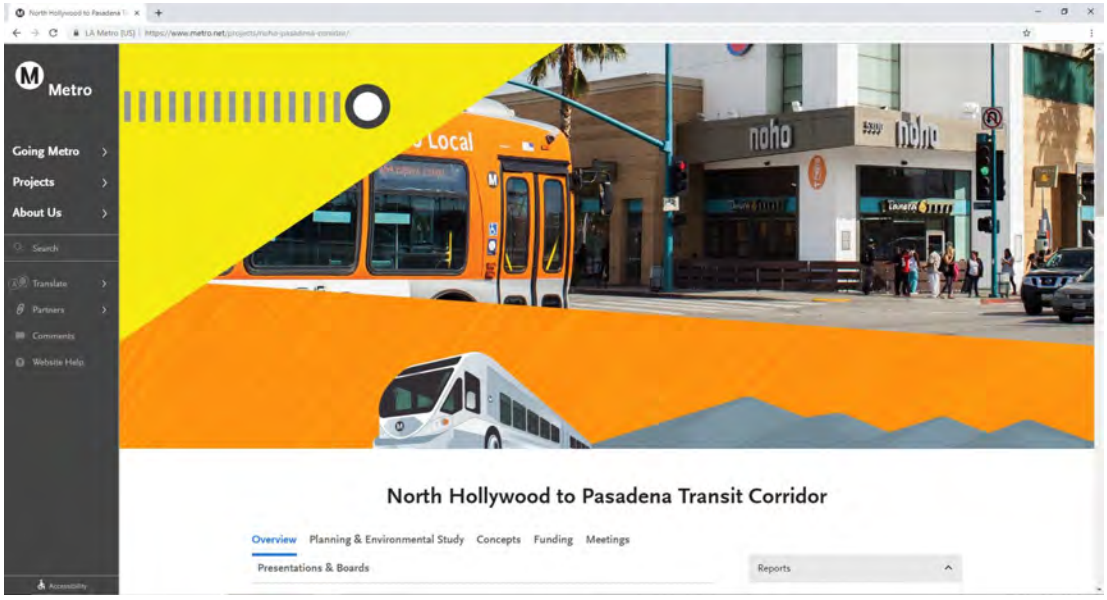
Metro also created a video for the Project to promote awareness of the Project and its purpose and need. The video was shared at community and stakeholder meetings, and it was promoted by Metro through advertising on Facebook to zip codes along the project study area, as well as to the following key activity centers:

- JPL (Jet Propulsion Lab)
- Huntington Hospital
- Glendale Adventist Church
- Providence St. Joseph Hospital
- Glendale City College
- Pasadena City College
- Caltech University
- The Rose Bowl
- Universal Studios
- Hollywood Burbank Airport
- Woodbury University
- Eagle Rock Plaza
- Occidental College
- Colorado Boulevard
- Eagle Rock Boulevard

The Facebook ad reached approximately 100,000 individual users and the full video was viewed 37,825 times. The core age group that showed the most engagement in the video was between the ages of 25-44. This demographic accounted for 43% of the total video views and 59% of the video views were by males.

Additionally, a project web page, http://www.metro.net/projects/noho-pasbrt, continues to be used as a means for notifying stakeholders about the community meetings, providing a resource for project information including the video, and creating a platform to receive comments and contact information. A screenshot of the web page is shown in **Figure 4**.

Figure 4 – Project Web Page



Source: Metro, 2018

3.3 Community Events & Pop-Ups

The project team conducted several outreach efforts at events in the study area. These "pop up" outreach events included attendance at street fairs, farmers markets, music festivals, and other types of events. The events attended were selected in part to broaden the project team's engagement efforts to reach historically underserved communities in the corridor. On each such occasion, Spanish-speaking team members had a booth with bilingual project information (e.g., fact sheets, comment cards) to hand out as well as boards and/or maps showing the Project. The events were conducted starting in August 2018 and continued through Winter 2018/2019. **Table 3** provides a list of these events.

Table 3 – Community Events & Pop-Ups

Date	Event	Approximate Attendees
August 11, 2018	NoHo Block Party	83
August 25, 2018	Altadena Town Council Ice Cream Social	50
September 25, 2018	North Hollywood Station Pop-Up	20
October 6, 2018	Eagle Rock Music Festival	61
October 20, 2018	Glendale Fall Festival	20
October 27, 2018	Burbank Farmer's Market	15
November 16, 2018	Burbank Holiday in the Park	25


The following key takeaways were received from the event participants:

- **General Support of the Proposed Project:** Attendees were generally supportive of implementing a BRT within this corridor to connect key destinations.
- **Alternative Preferences:** Street-Running alternatives were the most favored. At the Eagle Rock Music Festival, several attendees favored a median-running configuration.
- **Station Locations:** Many attendees provided comments about preferred station locations or questioned the need for specific stations. Several attendees noted station preferences near colleges and activity centers.

3.4 Community Meetings

3.4.1 Community Meeting Dates and Locations

Five community meetings were held during Fall 2018 to provide project information to the community and to solicit feedback on the proposed alternatives. The first community meeting in North Hollywood was held in conjunction with the Metro North San Fernando Valley BRT project. **Table 4** shows the date, location, and approximate attendance at the five community meetings.

Table 4 – Community Meetings Summary

Meeting Date / Time	Location	Attendees
September 29, 2018 10AM-12PM	East Valley High School North Hollywood, CA	32
October 1, 2018 6PM-8PM	Pacific Community Center Glendale, CA	22
October 3, 2018 6PM-8PM	Pasadena Senior Center Pasadena, CA	52
October 4, 2018 6PM-8PM	Buena Vista Library Burbank, CA	18
October 13, 2018 1PM-3PM	Eagle Rock Plaza Los Angeles, CA	38

3.4.2 Community Meeting Format and Materials

The format of the community meetings consisted of an open house that allowed participants an opportunity to provide feedback about proposed alignments and station locations using corridor maps. A PowerPoint presentation was given by Metro staff, and a question and answer period followed in which attendees could participate.

Upon signing in at the meetings, each attendee received a project fact sheet, comment card, information about Senate Bill 1 (because this Project has received funding from this source), general information about Metro, flyers for upcoming meetings, and a Metro contact information card. Translation services for Spanish speakers were provided to attendees at all meetings; translation for Armenian speakers was provided at the Glendale and Burbank meetings.

3.4.3 Community Meeting Notices

Targeted outreach was conducted to stakeholders via street and station banners, email (e-blasts), multi-lingual flyers, and social media posts in advance of the community meetings. A total of nine e-blasts, which included translations to Spanish, Armenian, and Tagalog, were sent to 4,873 individual stakeholder email addresses before and after the community meetings. Metro issued a press release on September 25, 2018, announcing the meetings and posted a story on its blogs *The Source* and *El Pasajero*. Meeting notices and information about the Project were shared by Old Pasadena Management District, Los Angeles City Councilmember Jose Huizar's office, CurbedLA, Streetsblog Los Angeles, Pasadena Star News, Urbanize Los Angeles, the San Gabriel Valley Tribune, and Walk Eagle Rock. Banners with the project information were hung at the North Hollywood Red/Orange Line Station and the Gold Line Memorial Park and Del Mar Stations.

Social media was used to promote the community meetings. Metro Marketing published event ads on Facebook targeted along the from between September 15, 2018, to October 12, 2018. Approximately 64,704 people viewed the ad, and 919 people responded that they were interested in the community meetings. The areas that showed the most engagement were Pasadena and Glendale, which accounted for 48% of the total event responses. In addition, 59% of the event responses were received from females.

3.4.4 Community Meeting Comments

At all five meetings, the majority of community members did not express direct opposition to the Project, but rather voiced concerns or provided feedback on specific route alternative(s), station preferences, improvements to the current and/or future alignments, and project elements (e.g., runningways, first-last mile concepts, transit-oriented development opportunities, etc.). **Table 5** summarizes the number of comments received at each community meeting. Attendees were provided the opportunity to voice their questions, encouragement, or concerns via comment cards, ask questions verbally during the Q&A portion of the presentation, or provide comments on post-it notes that were then placed on roll-out aerials of the study corridor (i.e. Number of Roll Plot Comments) presented in **Table 5**.

Table 5 – Summary of Community Meeting Comments

Meeting Date	Location	Number of Comment Cards Received	Number of Public Speaker Comments	Number of Roll Plot Comments
September 29, 2018	North Hollywood	9	7	54
October 1, 2018	Glendale	7	7	49
October 3, 2018	Pasadena	13	29	79
October 4, 2018	Burbank	3	15	31
October 13, 2018	Eagle Rock	11	24	70

3.4.5 Summary of Comments Received

A total of 630 comments were collected, including responses received via email, the project website, public comments, open house feedback activities, social media, comment cards, pop-up events, blogs, and online news articles.

Of the comments that pertained to the various BRT route alternatives, most favored a street-running alternative as indicated in **Table 6**. A freeway-running alternative was favored by a considerably fewer number of respondents. It should be noted that a similar number of respondents disapproved of the freeway-running alternative as those who favored it.

Table 6 – Summary of Community Meeting Preferences for Alternatives

Alternative	Comments in Favor
Street-Running Alternative	72
Freeway-Running Alternative	13
Street-Running (No Route Specified)	10
No Street-Running	1
No Freeway-Running	14

The following key takeaways were received from the public outreach process:

- **General Support of the Proposed Project**: Stakeholders and agencies generally agreed the Project is necessary to improve mobility options along the corridor and to enhance the regional transit network.
- **Environmental Impact Concerns**: Stakeholders expressed that the environmental impact study should address issues related to how the Project would fit into the existing built environment, including aesthetics, traffic, and parking. Specifically:

- **Aesthetics**: Residents were concerned about potential visual impacts to green space or landscaping due to median removal or reconfiguration (e.g., Glenoaks Boulevard or Colorado Boulevard in Eagle Rock). Additionally, several residents expressed concern that the implementation of BRT could disrupt or otherwise negatively impact street improvements that are planned or already in place.
- **Traffic**: Stakeholders were concerned about circulation impacts occurring on street-running corridors that are already highly congested, such as increased congestion if lanes were removed, also potentially resulting in diversion of traffic into adjoining neighborhoods.
- **Parking**: Residents believe that replacement parking should be provided if parking is removed, and that parking should be considered at the BRT stations.

- **Safety & Security**: Residents believe the project design should prioritize pedestrian/bicyclist safety and patron security, especially at stations.
- **Station Locations:** Some attendees commented on preferred station locations or questioned the need for specific stations. Several identified preferences for stations proximate to schools and colleges, job centers, shopping centers, restaurants, and the Hollywood Burbank Airport. Attendees voiced questions regarding station amenities, such as whether there will be all-door boarding, off-board fare collection, bike lockers, and general facilities providing for overall passenger comfort.
- **Connectivity**: Many attendees strongly supported improving the convenience of connections to existing lines including the Metro Red Line, Orange Line, and Gold Line. Additionally, questions were raised about the need to provide better connections north and south to connect into Downtown Los Angeles (especially from Burbank and Glendale).
- **First/Last Mile:** Stakeholders would like for first/last mile connections to be considered for this Project, including bicycle amenities at stations, bicycle lanes and bicycle accessible buses.
- **Alternative Preferences**: Street-running alternatives were the most favored of the alternatives. Some attendees favoring a street-running alternative acknowledged that it would be slower but would serve more destinations that would yield a higher ridership potential.
- **Freeway-Running:** Attendees favoring a freeway-running alternative noted it would be faster and more cost effective.
- **Additional Preferences**: Several attendees expressed skepticism about whether the Project would be better than simply improving the current Metro Line 501 NoHo to Pasadena Express Route. Some expressed hope for future conversion of the proposed BRT into rail.
- **Frequency and Speed**: Several attendees stressed the need to ensure that the alternatives chosen include elements to increase the frequency and speed of the buses. Several attendees supported dedicated bus lanes to reduce travel times.
- **Dedicated Lanes:** Many stakeholders voiced concerns regarding the loss of parking or traffic lanes to accommodate dedicated bus lanes. Input from the North Hollywood Neighborhood Council, Universal City/North Hollywood Chamber of Commerce and the North Hollywood

Business Improvement District indicated that they would oppose the removal of on-street parking or travel lanes to provide a dedicated bus-only lane. Additionally, North Hollywood community meeting attendees raised concerns about traffic, access and lack of need for expanding existing transit service along Lankershim Boulevard. In Pasadena, several residents voiced concerns about dedicated bus lanes along Colorado Boulevard. In Glendale, some voiced concerns about dedicated bus lanes along Brand Boulevard and Central Avenue.

- **Funding**: Attendees inquired about funding for the Project and wanted to know where additional funding would be obtained should the Project's costs exceed currently identified sources.

3.5 Agency Consultation Stakeholder Meetings

3.5.1 City/Agency Coordination Meetings

A project-specific Technical Working Group (TWG) was established at the onset of the Project. This project-specific TWG consists of staff from several Metro departments, as well as staff from Caltrans and the Cities of Los Angeles, Burbank, Glendale, and Pasadena. The purpose of this group is to provide their technical expertise and local knowledge to the project team to help shape and guide the Project. The project team has also met individually with each of the cities and/or agencies. These coordination meetings were conducted between July and December 2018 and will continue to be on-going throughout the entire environmental study process.

As shown in **Table 7**, the city and agency meetings included staff from the cities and other public agencies in the project area, including representatives from Caltrans as well as the Cities of Los Angeles, Burbank, Glendale, and Pasadena. The project-specific TWG also includes multiple Metro departments providing various types of expertise.

Table 7 – Agency Consultation Meetings

Meeting Date	Agencies
July 18, 2018	Project Technical Working Group
August 14, 2018	Pasadena City Staff
August 16, 2018	Burbank City Staff
September 14, 2018	Glendale City Staff
September 25, 2018	Caltrans – District 7
October 14, 2018	Los Angeles City Staff
November 14, 2018	Los Angeles City Staff
December 5, 2018	Technical Working Group

Agencies were asked to provide input about the following topics:

- Alternatives that are street-running and freeway-running within their jurisdictions, as well as potential station options and preferences;
- Recent and future land use and transportation developments that may influence the Project;
- Identification of additional key stakeholders to include in the outreach process; and
- Recommendations for successful public outreach activities.

The following key takeaways were received from the agencies:

- **Environmental impact concerns** – The Project should address concerns about environmental effects along the proposed alignments, particularly lane reductions or median takes, bicycle lane removal, and parking and traffic impacts. Glendale is studying a potential streetcar route and City/Metro staff will need to coordinate effectively to understand specific impacts.
- **Desired design options** – The Project should examine a variety of different design configurations specific to the street or jurisdiction, including center-running and curb-running dedicated bus lanes. In addition, the Project should consider key activity centers and points of interest when examining the alternatives, including the Hollywood Burbank Airport, colleges, shopping and retail centers, major employment centers, and TOCs. Consideration of mixed-flow BRT with no loss of traffic lanes was mentioned by some attendees.
- **Interest in multi-modal connections** – The addition of bicycle paths and bicycle parking at stations should be included and would be viewed favorably by local bicycle advocates.
- **Connectivity** – Connections to key destinations should be considered, while also being cognizant of servicing the people in the surrounding areas and communities.

3.5.2 Key Stakeholder Meetings and Presentations

Metro also conducted several key stakeholder meetings starting in September 2018 and continuing through the winter of 2018-19. These key stakeholders included elected officials, community-based organizations, neighborhood councils, business groups, and chambers of commerce. At these key stakeholder meetings, Metro staff provided a presentation that included a project overview, a description of the alternatives under consideration, information about the project timeline, and a list of next steps. **Table 8** provides a list of these meetings.

Table 8 – Stakeholder Meetings

Meeting Date	Stakeholders
September 6, 2018	Federal, State and Local Elected Officials Briefing
September 11, 2018	Burbank City Council
September 18, 2018	City of Los Angeles Council District 14 Staff
September 24, 2018	Eagle Rock Neighborhood Council Executive Committee
September 25, 2018	Pasadena Municipal Services Committee
September 26, 2018	Glendale Transportation and Parking Commission
September 27, 2018	Pasadena Transportation Advisory Commission
October 2, 2018	Eagle Rock Neighborhood Council Board Meeting
October 3, 2018	San Fernando Valley Service Council
October 8, 2018	San Gabriel Valley Service Council
October 10, 2018	North Hollywood Business Improvement District
October 10, 2018	Kiwanis Club of La Cañada
October 17, 2018	South Lake Business Association
October 24, 2018	Universal City/North Hollywood Chamber of Commerce
October 30, 2018	Burbank Transportation Management Organization
November 1, 2018	Arroyo Verdugo Communities Joint Powers Authority
November 6, 2018	Valley Industry and Commerce Association
November 14, 2018	The Eagle Rock Association
November 19, 2018	North Hollywood Neighborhood Council

The following key takeaways were received from the Cities/agencies and/or key stakeholders:

- **Environmental impact concerns –** The Project should address concerns about environmental effects along the proposed alignments.
- **Desired design options –** The Project should examine a variety of different design configurations and should consider connectivity with key activity centers and points of interest. Mixed-flow BRT with no loss of traffic lanes was desired by some attendees.
- **Potential BRT route alignments –** The general preference was for the 2017 BRT Corridor Technical Study's Primary Street Concepts; and
- **Stations should be well served by first/last-mile connections –** including safe and convenient bicycle and pedestrian access.

3.6 Ongoing Stakeholder Outreach

Stakeholders continue to be actively engaged in the Study process. As the proposed project continues to be refined, stakeholders will continue to provide valuable input based on their local knowledge of the communities.

4.0 REFINED ALTERNATIVES STUDIED

4.0 Refined Alternatives Studied

Taking into consideration the preliminary technical analysis and the input and feedback from community members and stakeholders described in Sections 2 and 3, respectively, the most promising segments of the initial BRT concepts were synthesized into three distinctive refined alternatives for further study as part of the Alternatives Analysis—a Street-Running, a Freeway-Running, and a Hybrid Street/Freeway-Running Alternative. Each of these alternatives would extend from the Metro Red/Orange Line terminus on Lankershim Boulevard at Chandler Boulevard in North Hollywood and would serve the North Hollywood Arts District. Similarly, each alternative would terminate at Pasadena City College on Colorado Boulevard at Hill Avenue in Pasadena, serving Old Pasadena and connecting to the Metro Gold Line. Key route characteristics of each alternative are noted in this section.

This section contains maps of each of the refined alternatives that indicate "candidate" station locations; the siting of each station is subject to refinement during the environmental phase. Additionally, because there are sections where stations are located closer to each other than the typically-desirable 1-mile average station spacing for BRT, stations may be consolidated or eliminated based upon further evaluation of ridership potential and operational factors.

Conceptual engineering studies were performed for each alternative to determine where dedicated bus lanes could potentially be provided within the existing street right-of-way applying various configurations (refer to Section 7) to reduce impacts. Subsequently, each alternative was evaluated using criteria described in Section 6 and the results of this analysis were used to define the most promising alternative(s) to be carried forward into the environmental review process.

4.1 Street-Running Alternative

This alternative (**Figure 5**), which closely resembles the Primary Street Concept originally identified in the 2017 BRT Corridor Technical Study, incorporates the most promising segments. This alternative has the greatest number of stations, maximizing ridership potential, connectivity to other local bus and regional rail services, and access to land uses along the corridor. Except for a short stretch of freeway between Eagle Rock and Pasadena, it operates entirely on-street, and therefore would have a longer end-to-end running time than the other alternatives.

Key route characteristics of the Street-Running Alternative include:

- Serves the Burbank Media District and Downtown Burbank
- Provides connection to Burbank-Downtown Metrolink station
- Serves the heart of Downtown Glendale with multiple stations
- Operates along Colorado Boulevard serving the Eagle Rock community
- Operates along Colorado Boulevard in Pasadena

The route as shown on **Figure 5** includes the roadway segments from west to east as follows:

- **Begin at the North Hollywood "NoHo" Station (Los Angeles)**
- Lankershim Boulevard (North Hollywood, Los Angeles)
- Riverside Drive (Toluca Lake, Los Angeles)
- Olive Avenue (Burbank)
- Glenoaks Boulevard (Burbank-Glendale)
- Central Avenue (Glendale)
- Broadway (Glendale)
- Colorado Boulevard (Eagle Rock, Los Angeles)
- Ventura Freeway between Colorado Boulevard (Eagle Rock, Los Angeles) and Colorado Boulevard (Pasadena)
- Colorado Boulevard (Pasadena)
- **End at Terminus near Pasadena City College "PCC" east of Hill Avenue (Pasadena)**

Figure 5 – Street-Running Alternative

Table 9 identifies candidate station locations for the Street-Running Alternative along with connectivity and accessibility to Metro and other city and regional transit carrier stations and services available within an estimated five-minute walk. With 25 stations, this alternative provides extensive connectivity to Metro and the other transit service providers.

Table 9 – Transit Transfers Near Proposed Station Locations – Street-Running Alternative

STATION LOCATION	Metro Red Line (rail)	Metro Gold Line (rail)	Metrolink (rail)	Metro Orange Line (BRT)	North San Fernando (BRT[1])	Metro Route (bus)	LADOT Route (bus)	BurbankBus (bus)	Glendale Beeline (bus)	Pasadena Transit (bus)	Foothill Transit (bus)
North Hollywood	X			X	X	X	X	X			
NoHo Arts District						X					
Riverside at Cahuenga						X					
Riverside at Olive[2]						X	X				
Olive at Alameda[2]						X	X	X			
Olive at Buena Vista[2]						X		X			
Olive at Victory						X		X			
Olive at Metrolink[3]			X			X		X	X		
Olive at Glenoaks[3]						X					
Glenoaks at Alameda						X			X		
Glenoaks at Western						X			X		
Glenoaks at Grandview						X			X		
Glenoaks at Central[4]						X			X		
Central at Lexington[4]									X		
Broadway at Brand[4]						X			X		
Broadway at Glendale									X		
Broadway at Verdugo						X			X		
Colorado at Sierra Villa[5]						X	X				
Colorado at Eagle Rock[5]						X	X				
Colorado at Townsend[5]						X	X				
Colorado at Eagle Vista[5]						X					
Colorado at Fair Oaks[6]						X				X	X
Colorado at Marengo[6]		X				X				X	X
Colorado at Lake[6]						X	X			X	X
Colorado at Hill/PCC						X					X

Notes:
1. Proposed
2. Burbank Media District
3. Downtown Burbank
4. Downtown Glendale
5. Eagle Rock
6. Old Pasadena

4.2 Freeway-Running Alternative

This alternative (**Figure 6**) was largely based upon the Primary Freeway Concept identified in the 2017 North Hollywood to Pasadena BRT Corridor Technical Study. This alternative is similar to the existing Metro Line 501 Route; however, the alternative would extend further east in Pasadena serving more destinations and have a more robust service plan. It operates along the Ventura Freeway (State Route 134) between Burbank and Pasadena with a short on-street section through the Burbank Media District. With the least amount of on-street operation and with fewer stations, it would have the fastest end-to-end travel time; however, this alternative would also be expected to attract fewer riders because it would serve fewer destinations.

Key route characteristics of the Freeway-Running Alternative include:

- Serves the Burbank Media District but does not provide access to Downtown Burbank
- Serves Downtown Glendale but with only one station on the northern edge of the commercial district
- Does not serve the Eagle Rock community
- Operates along the Green Street/Union Street one-way couplet in Pasadena

The route as shown on **Figure 6** includes the roadway segments from west to east as follows:

- **Begin at the North Hollywood, "NoHo" Station (Los Angeles)**
- Lankershim Boulevard (North Hollywood, Los Angeles)
- Ventura Freeway between Lankershim Boulevard and Hollywood Way (Los Angeles – Burbank)
- Pass Avenue Off-Ramp – Riverside Drive – Olive Avenue, eastbound; Olive Avenue – Hollywood Way – Alameda Avenue On-Ramp, westbound (Burbank)
- Olive Avenue (Burbank)
- Alameda Avenue (Burbank)
- Buena Vista Street (Burbank)
- Ventura Freeway between Hollywood Way and Central Avenue (Burbank-Glendale)
- Sanchez Drive, eastbound; Goode Avenue, westbound (Glendale)

- Ventura Freeway between Brand Boulevard and Colorado Boulevard with station at Harvey Drive (Glendale-Pasadena)
- St. John Street (Pasadena)
- Green Street, eastbound; Union Street, westbound (Pasadena)
- **End at Terminus near Pasadena City College, "PCC" (Pasadena)**

Figure 6 – Freeway-Running Alternative

Table 10 identifies candidate station locations for the Freeway-Running Alternative along with connectivity and accessibility to Metro and other city and regional transit carrier stations and services available within an estimated five-minute walk. With 11 stations, this alternative provides less connectivity to Metro and the other transit service providers.

Table 10 – Transit Transfers Near Proposed Station Locations – Freeway-Running Alternative

STATION LOCATION	Metro Red Line (rail)	Metro Gold Line (rail)	Metrolink (rail)	Metro Orange Line (BRT)	North San Fernando (BRT[1])	Metro Route (bus)	LADOT Route (bus)	BurbankBus (bus)	Glendale Beeline (bus)	Pasadena Transit (bus)	Foothill Transit (bus)
North Hollywood	X			X	X	X	X	X			
NoHo Arts District						X					
Riverside at Olive[2]						X	X	X			
Olive at Alameda[2]						X	X				
Olive at Buena Vista[2]						X		X			
Central – Brand[3]						X	X		X		
Harvey Drive[4]						X	X		X		
Green/Union at Fair Oaks[5,6]						X				X	X
Green/Union at Marengo[5,6]		X				X				X	
Green/Union at Lake[5,6]						X	X			X	
Colorado at Hill/PCC						X					X

Notes:
1. Proposed
2. Burbank Media District
3. Downtown Glendale (EB on Sanchez, WB on Goode)
4. At Ventura Freeway Ramp
5. EB on Green, WB on Union
6. Old Pasadena

4.3 Hybrid Street/Freeway-Running Alternative

A third alternative (**Figure 7**) was developed for evaluating alternate route options, station locations, and testing a blend of on-street and freeway operations. This alternative, termed the Hybrid Street/Freeway-Running Alternative, incorporates various route options including routing from the North Hollywood Metro Red/Orange Line Station via Chandler Boulevard to Vineland Avenue where there is adequate width to provide dedicated bus lanes. The Hybrid Street/Freeway-Running Alternative connects Burbank and Glendale along Alameda Avenue and Flower Street, then runs along the Ventura Freeway through the northern edge of Downtown Glendale to the Glendale city limits, just outside the community of Eagle Rock in Los Angeles. This alternative has fewer stations than the Street-Running Alternative but more than the Freeway-Running Alternative. The end-to-end travel time would be faster than the Street-Running Alternative but slower than the Freeway-Running Alternative.

Key route characteristics of the Hybrid Street/Freeway-Running Alternative include:

- Serves the Burbank Media District but does not provide access to Downtown Burbank
- Serves media production centers located along Flower Street
- Serves Downtown Glendale but with only one station on the northern edge of the commercial district
- Operates along Colorado Boulevard serving the Eagle Rock community
- Operates along Colorado Boulevard in Pasadena with a station at Arroyo Parkway, providing a closer connection to the Memorial Park Metro Gold Line Station

The route as shown on **Figure 7** includes the roadway segments from west to east as follows:

- **Begin at the North Hollywood, "NoHo" Station (Los Angeles)**
- Chandler Boulevard (North Hollywood, Los Angeles)
- Vineland Avenue (North Hollywood, Los Angeles)
- Lankershim Boulevard (North Hollywood, Los Angeles)
- Ventura Freeway between Lankershim Boulevard and Hollywood Way (Los Angeles – Burbank)
- Pass Avenue Off-Ramp – Riverside Drive – Olive Avenue, eastbound; Olive Avenue – Hollywood Way – Alameda Avenue On-Ramp, westbound (Burbank)
- Olive Avenue (Burbank)
- Alameda Avenue (Burbank)
- Flower Street – Fairmont Avenue (Burbank-Glendale)
- Ventura Freeway between San Fernando Road and Central Avenue (Glendale)
- Sanchez Drive, eastbound; Goode Avenue, westbound (Glendale)
- Ventura Freeway between Brand Boulevard and Harvey Drive (Glendale)
- Harvey Drive – Broadway – Colorado Boulevard (Glendale)
- Colorado Boulevard (Eagle Rock, Los Angeles)
- Ventura Freeway between Colorado Boulevard (Eagle Rock, Los Angeles) and Colorado Boulevard (Pasadena)
- Colorado Boulevard (Pasadena)
- **End at Terminus near Pasadena City College "PCC" east of Hill Avenue (Pasadena)**

Figure 7 – Hybrid Street/Freeway-Running Alternative

Table 11 identifies candidate station locations for the Hybrid Street/Freeway-Running Alternative along with connectivity and accessibility to Metro and other city and regional transit carrier stations and services available within an estimated five-minute walk. The Hybrid Street/Freeway-Running Alternative's blend of street-running and freeway-running alignments with 16 stations provides a mid-range of connectivity and accessibility opportunities to Metro and the other transit service providers.

Table 11 – Transit Transfers Near Proposed Station Locations – Hybrid Street/Freeway-Running Alternative

STATION LOCATION	Metro Red Line (rail)	Metro Gold Line (rail)	Metrolink (rail)	Metro Orange Line (BRT)	North San Fernando (BRT*[1])	Metro Route (bus)	LADOT Route (bus)	BurbankBus (bus)	Glendale Beeline (bus)	Pasadena Transit (bus)	Foothill Transit (bus)
North Hollywood	X			X	X	X	X	X			
NoHo Arts District						X					
Riverside at Olive[2]						X	X	X			
Olive at Alameda[2]						X	X				
Alameda at Buena Vista[2]						X	X	X			
Alameda at Victory						X					
Flower at Western									X		
Flower at Paula						X			X		
Central – Brand[3]						X	X		X		
Harvey Drive[4]						X	X		X		
Colorado at Sierra Villa[5]						X	X				
Colorado at Eagle Rock[5]						X	X				
Colorado at Eagle Vista[5]						X					
Colorado at Arroyo Parkway[6]		X				X				X	X
Colorado at Lake[6]						X	X			X	X
Colorado at Hill/PCC						X					X

Notes:
1. Proposed
2. Burbank Media District
3. Downtown Glendale (EB on Sanchez, WB on Goode)
4. At Ventura Freeway Ramp
5. Eagle Rock
6. Old Pasadena

5.0 KEY CHARACTERISTICS OF REFINED ALTERNATIVES

5.0 Key Characteristics of Refined Alternatives

This section summarizes the key characteristics, including service plans, preliminary ridership potential, and cost estimates, of the refined alternatives (Street-Running, Freeway-Running, and Hybrid Street/Freeway-Running). Beyond the route alignment and potential station locations identified for each alternative in Section 4, additional service parameters and assumptions were defined to estimate ridership, and capital and operations and maintenance (O&M) costs, for the three alternatives. This data provides the basis for the alternatives evaluation presented in Section 6.

5.1 Service Plans and Operating Characteristics

Proposed service spans and frequencies were initially developed for the Street-Running Alternative, which includes the greatest extent of operation on local roadways. Initial assumptions regarding the service span (hours of operation) and service frequencies are presented in **Table 12** and **Table 13**. The service spans are consistent with the Metro Red Line, with service 21 hours per day Sunday through Thursday and longer hours on Friday and Saturday. As presented in **Table 13**, service frequencies will be between 10-20 minutes during weekdays, and between 15-30 minutes on weekends. These operating characteristics are preliminary and subject to refinement based on results of further analysis and definition of the proposed project during subsequent phases of project development.

Table 12 – Proposed Street-Running Alternative BRT Service Span

	Early	AM Peak	Midday	PM Peak	Early Evening	Evening	Night
Monday-Thursday	4-6 AM	6-9 AM	9 AM-3 PM	3-7 PM	7-9 PM	9 PM-12AM	12-1 AM
Friday	4-6 AM	6-9 AM	9 AM-3 PM	3-7 PM	7-9 PM	9 PM-12AM	12-3 AM
Saturday	4-6 AM	6-9 AM	9 AM-3 PM	3-7 PM	7-9 PM	9 PM-12AM	12-3 AM
Sunday/Holiday	4-6 AM	6-9 AM	9 AM-3 PM	3-7 PM	7-9 PM	9 PM-12AM	12-1 AM

Table 13 – Proposed Street-Running Alternative BRT Service Frequencies

	Early	AM Peak	Midday	PM Peak	Early Evening	Evening	Night
Monday-Thursday	20 min	10 min	10 min	10 min	15 min	20 min	20 min
Friday	20 min	10 min	10 min	10 min	15 min	20 min	20 min
Saturday	30 min	15 min	15 min	15 min	15 min	30 min	30 min
Sunday/Holiday	30 min	15 min	15 min	15 min	15 min	30 min	30 min

Using the service characteristics as a starting point, estimates were made for PM peak and midday travel times along the various street-running and freeway sections of all three alternatives. BRT travel time estimates were completed for each of the alternatives by using a travel time model. Travel times consist of three components: the time the vehicle is in motion, time spent at intersections, and time spent at stations. **Table 14** shows the end-to-end travel time summary during peak and midday time periods for all three alternatives.

Table 14 – BRT End-to-End Travel Time Summary (in Minutes)

	PM Peak	Midday
Street-Running Alternative	65	65
Hybrid Street/Freeway-Running Alternative	56	54
Freeway-Running Alternative	43	41

5.1.1 Summary of BRT Operating Statistics

Operating statistics—including revenue hours, revenue miles, peak vehicles, and maintenance facility needs—were generated for each alternative based on the service plans. This is a necessary step in determining O&M costs because operating statistics are multiplied by unit costs to determine the total annual O&M cost for each alternative. The directional miles and station platforms were based on the infrastructure definition for each alternative. **Table 15** summarizes the operating statistics for all three BRT alternatives.

Table 15 – BRT Operating Statistics Summary

	BRT Mainline Service					
	Annual Revenue Hours	Annual Revenue Miles	Peak Vehicles	Directional Lane Miles[1]	Station Platforms	Maintenance Facilities[2]
Street-Running Alternative	97,100	1,277,400	17	30.6	48	0.13
Hybrid Street/Freeway-Running Alternative	81,500	1,264,100	15	20.6	30	0.11
Freeway-Running Alternative	58,700	1,176,000	11	5.1	20	0.08

Notes:

1. Directional lane miles are the number of curbside or center-running dedicated bus lane miles. This number does not include miles in mixed traffic or freeway miles.

2. Percentage of maintenance facility for each alternative is based on the required peak vehicles divided by 135.4 peak bus vehicles per maintenance facility (1761 total peak Metro vehicles divided by 13 Metro maintenance facilities). This number is calculated using information from both directly operated motor bus service and the Metro Orange Line.

5.2 Ridership Forecasts

The Metro Corridors Based Model 18 (CBM18) was used to develop preliminary ridership forecasts for the three alternatives. This model reflects all transit services that are expected to be operating in Year 2042 along with the expected future year land use (population and employment). **Table 16** presents transit trips and boardings forecasted for each of the three alternatives in the year 2042. Each transit trip represents one entire trip from origin to destination including transfers. Boardings are tallied for each entry or exit from a transit vehicle – boardings are greater than transit trips due to transfers. Total new transit trips are forecast to increase by 14,566 for the Street-Running Alternative, the highest number for any of the three alternatives, and this alternative also has the highest level of estimated boardings.

Table 16 – 2042 Transit Trips and Boardings Summary

	Alternative			
	No-Project	Street-Running	Hybrid Street/ Freeway-Running	Freeway-Running
Total Systemwide Transit Trips	1,712,155	1,726,711	1,724,300	1,722,637
New Systemwide Transit Trips		14,556	12,145	10,482
Metro Bus Boardings	1,157,695	1,182,505	1,178,450	1,179,861
North Hollywood to Pasadena BRT Boardings		29,570	25,963	23,136

5.3 Conceptual Capital Costs

Capital cost estimates were developed for each of the three alternatives. The cost estimates were developed using the Federal Transit Administration's (FTA's) Standard Cost Category (SCC) format. Unit cost data was drawn from construction bid data from several sources, including from Caltrans, Los Angeles County Department of Public Works, and similar Metro projects. The base year for the capital cost estimates is 2019 and it is assumed construction will occur between 2022-2024. Contingencies are included in the capital cost estimates to compensate for unforeseen items of work, quantity fluctuations, variances in unit costs, and variances in project scope that develop as the Project progresses through the various stages of study and design development.

5.3.1 Cost Estimate Summary

Table 17 summarizes the conceptual capital cost estimates for the alternatives. Costs are presented in year of expenditure (YOE) dollars reflecting the anticipated costs at the time of construction (2022-2024), accounting for inflation. Based on the lack of definition and engineering for the alternatives at this phase of project development, a margin of error of Low -15% and High +25% is appropriate per American Association of Cost Engineers (AACE) guidelines. The low and high ranges provided in **Table 17** reflect this margin of error. There are two separate costs for the Street-Running Alternative; the "Center" configuration option reflects the need for more extensive reconstruction of the roadways, which is necessary when the bus lanes are in the median.

Table 17 – Cost Estimate Summary

Alternative	Length (mi)	YOE[1] Low ($M)	YOE[1] High ($M)	Cost per Mile (low, $M)	Cost per Mile (high, $M)
Street–Running (Center Configuration)	18.4	$292	$429	$15.8	$23.3
Street-Running (Side Configuration)	18.4	$271	$398	$14.7	$21.7
Hybrid Street/ Freeway-Running	17.0	$156	$230	$9.2	$13.5
Freeway-Running	16.6	$137	$201	$8.3	$12.1

Note:
1. Year of Expenditure (YOE) dollars in millions assuming construction will occur in 2022-2024

The conceptual cost estimates for each alternative have wide ranges, which is indicative of each alternative's length, number of stations, and permanency (as reflected by the amount of dedicated bus lanes). For example, the Street-Running Alternative has dedicated bus lanes over the majority of the 16 miles the route operates on surface streets. The Hybrid Street/Freeway-Running Alternative and the

Freeway-Running Alternative have significantly fewer miles of dedicated bus lanes because these alternatives operate on the freeway in mixed traffic over much of the route.

5.4 O&M Cost Estimates

An O&M cost model was developed to estimate the annual cost to operate, maintain, and administer each alternative. The O&M cost model is calibrated to Metro operating costs obtained from the 2017 National Transit Database (NTD) data and expressed in 2017 dollars. Operating costs were escalated to 2018 dollars by applying a 3.81 percent growth rate based on the Consumer Price Index (CPI-U) for the Los Angeles-Long Beach-Anaheim area. The annual revenue hours and annual revenue miles presented for the alternatives in Section 5.1 were multiplied by operating costs per revenue hour and operating costs per revenue mile to estimate O&M costs for the three alternatives.

The estimated annual cost of BRT service ranges from about $12.9 million for the Freeway-Running Alternative to $19.6 million for the Street-Running Alternative. The difference is primarily due to the Freeway-Running Alternative having a faster travel time (thus requiring fewer buses to operate the service) as well as fewer stations and miles of dedicated bus lanes to maintain. The O&M cost estimates reflect total costs for operating each of the alternatives and do not consider potential cost reductions expected to be achieved by restructuring overlapping or redundant services provided by an existing transit line, so actual "net" operating costs may be lower. **Table 18** summarizes the estimated annual O&M costs associated with each alternative.

Table 18 – Metro Annual O&M Cost Estimates (2018 Dollars)

Alternative	Annual O&M Costs
Street-Running Alternative	$19,581,000
Hybrid Street/Freeway-Running Alternative	$16,918,000
Freeway-Running Alternative	$12,916,000

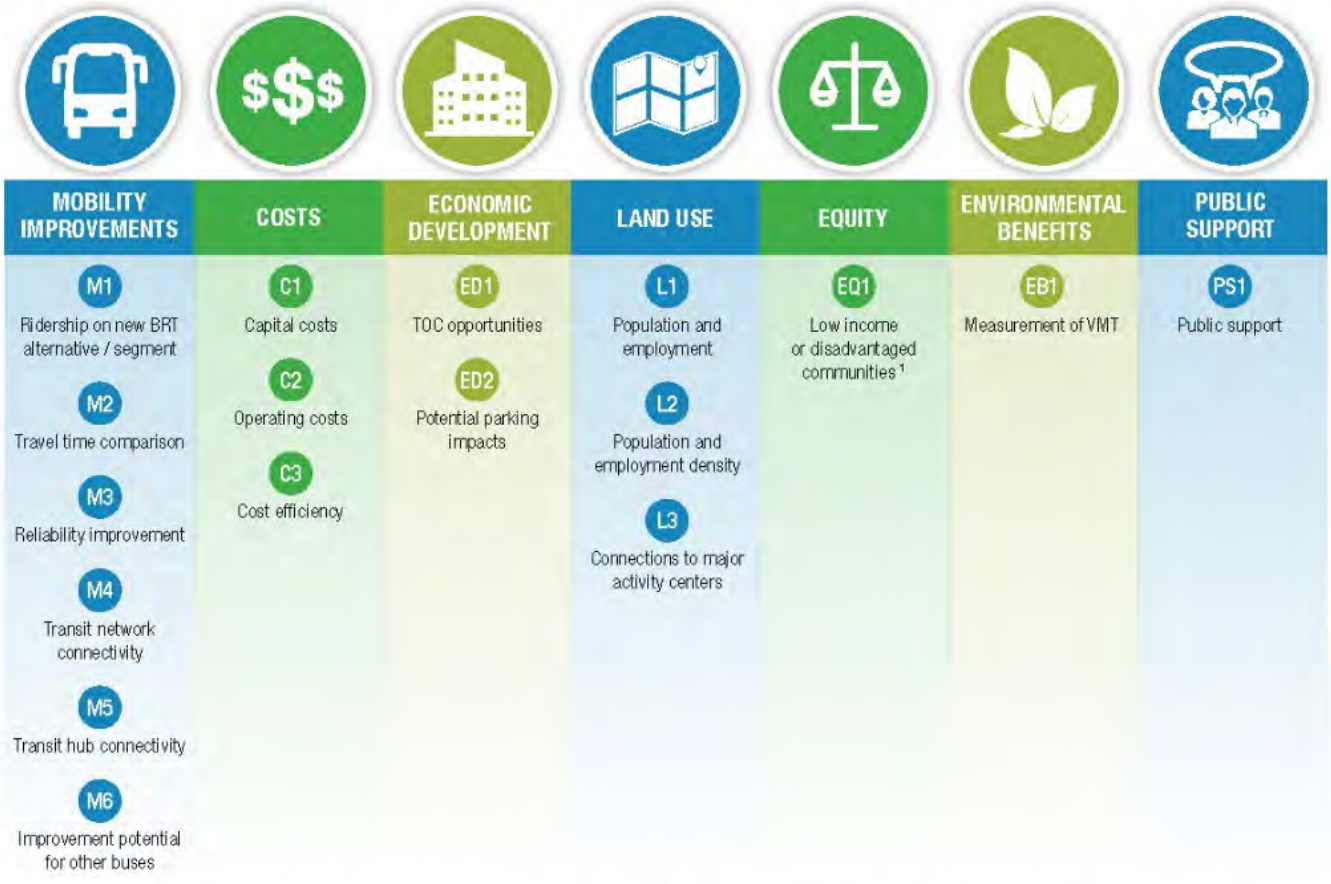
6.0 EVALUATION OF REFINED ALTERNATIVES

6.0 Evaluation of Refined Alternatives

6.1 Evaluation Criteria

The three refined alternatives were then evaluated for mobility improvements, costs, economic development, land use, and environmental benefits in accordance with Metro policies, industry Best Practices, and Federal Transit Authority (FTA) guidelines as presented in the Fixing America's Surface Transportation (FAST) Act. Equity and public support categories have also been included as important considerations. Specific measures, calculations, sources, and ranking breakpoints have been selected to provide a meaningful comparison of alternatives, as well as of individual segments within each alternative. **Figure 8** shows the criteria and related measures.

Figure 8 – Evaluation Criteria and Measures



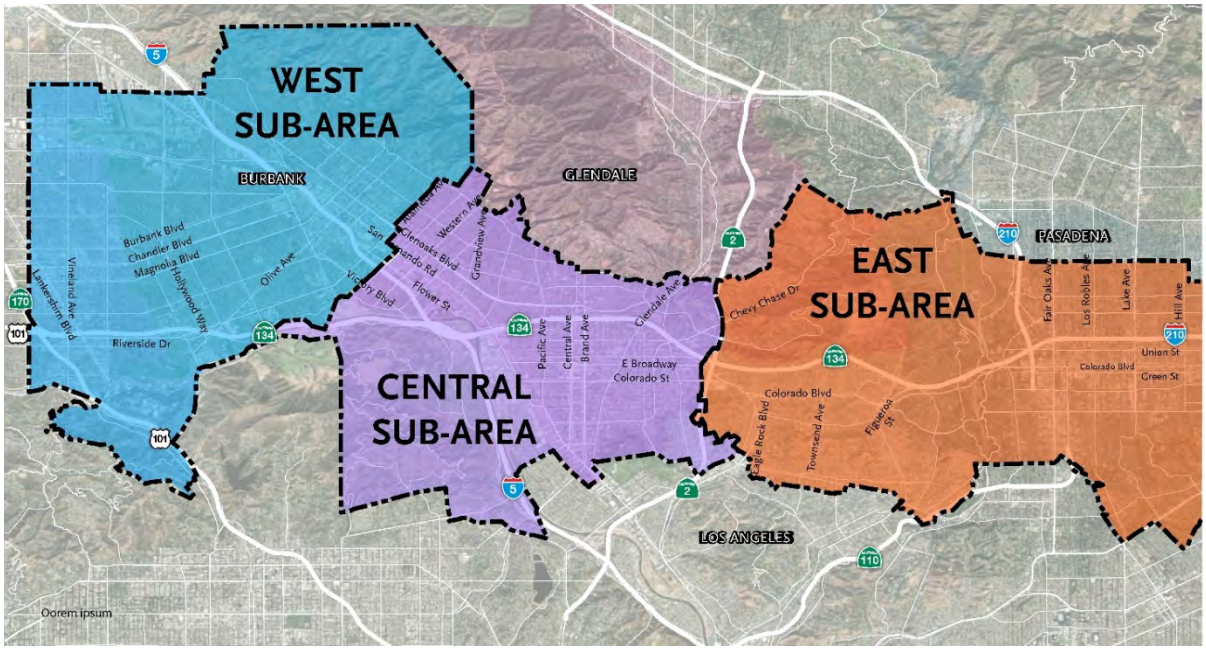
Notes:
1. *"Disadvantaged" as identified by the California Environmental Protection Agency as the top 25% most impacted census tracts using CalEnviroScreen 3.0; "Low-income Communities" – census tracts that are either at or below 80 percent of the statewide median income, or at or below the threshold designated as low-income by the California Department of Housing and Community Development's (HCD) 2016 State Income Limits.*

6.2 Decision Making Matrix

Data for the evaluation criteria were analyzed end-to-end and by segment for select criteria to facilitate refinement of the most promising alternatives. The corridor was grouped into three sub-areas (**Figure 9**):

1. West, comprised of the North Hollywood and Toluca Lake communities in the City of Los Angeles and the City of Burbank;
2. Central, comprised of the City of Glendale; and
3. East, comprised of the Eagle Rock community in the City of Los Angeles and the City of Pasadena.

Figure 9 – North Hollywood to Pasadena BRT Corridor Sub-Areas



For each evaluation criterion, the three refined study alternatives were assigned a comparative ranking ranging from very high to very low based on the highs and lows of each data set, with a corresponding score as follows.

- Very High = 5 points
- High = 4 point
- Moderate = 3 points
- Low = 2 points
- Very Low = 1 point

Alternatives could receive the same score if they fell within the same range.

For example, the M1 Ridership criterion has a high of 29,570 daily boardings for the Street-Running Alternative and a low of 23,136 daily boardings for the Freeway-Running Alternative. The value range for M1 Ridership was determined based on this range:

- Very High = greater than 28,000 boardings
- High = 26,751 – 28,000 boardings
- Moderate = 25,501 – 26,750 boardings
- Low = 24,250 – 25,500 boardings
- Very Low = fewer than 24,250 boardings

Using this criterion, and the total boardings for all sub-areas, the Street-Running Alternative was given a score of "5" whereas the Freeway-Running Alternative received a "1" and the Hybrid Street/Freeway-Running Alternative was assigned a score of "3." The sub-area breakdown indicates how each alternative performs in different geographic zones.

6.3 Mobility Improvements

Ridership on new BRT alternative/segment: The preliminary ridership estimates for each alternative, broken down by sub-area, are shown in **Table 19**. Segments for each alternative are compared based on the boardings forecast by the travel model and are scored from lowest to highest ridership. For each end-to-end alternative, total forecasted boardings for the stations are tabulated to produce an overall score.

Table 19 – Daily Project Boardings by Sub-Area

Sub-Area	*Alternative*	*Boardings*	*Score*	*Assessment*
West Sub-Area	Freeway-Running	10,539	2	Low
	Hybrid Street/ Freeway-Running	10,476	2	Low
	Street-Running	13,256	5	Very High
Central Sub-Area	Freeway-Running	3,757	1	Very Low
	Hybrid Street/ Freeway-Running	4,780	3	Moderate
	Street-Running	6,297	5	Very High
East Sub-Area	Freeway-Running	8,840	2	Low
	Hybrid Street/ Freeway-Running	10,708	5	Very High
	Street-Running	10,017	4	High
Total	Freeway-Running	23,136	1	Very Low
	Hybrid Street/ Freeway-Running	25,963	3	Moderate
	Street-Running	29,570	5	Very High

Travel time comparison: This criterion is a measurement of peak period end-to-end travel times for each alternative, as shown in **Table 20**. Peak period end-to-end travel time estimates were developed for each of the alternatives via a travel time model. Travel times consist of three components: the time the vehicle is in motion, time spent at intersections, and time spent at stations. The time in operation includes the time it takes for the bus to accelerate, the time the bus spends cruising at the designated top speed, and the time for the bus to decelerate. Intersection delay is the amount of time the vehicle spends waiting at intersections. The methodology assumes transit signal priority will be implemented and the intersection delay is the average delay that occurs at the intersections along the proposed alignment. Dwell time is the amount of time the vehicle spends waiting at stations for passengers to board or alight the vehicle; efficient boarding (through all-door boarding and other techniques) is assumed to reduce dwell times at stations.

Table 20 – End-to End Travel Time

Alternative	Peak Travel Time in Minutes	Score	Assessment
Freeway-Running	43	5	Very High
Hybrid Street/Freeway-Running	56	3	Moderate
Street-Running	65	1	Very Low

Directly correlated to travel time is the average operating speed for the alternatives along the routes. The Street-Running Alternative has an estimated operating speed of 16.9 miles per hour (mph) during peak travel times. The estimated operating speed is 19.2 mph for the Hybrid Street/Freeway-Running Alternative and 23.4 mph for the Freeway-Running Alternative.

Reliability Improvement: The scoring of travel time reliability improvement is based upon the degree of congestion – measured by the estimated current year Level of Service (LOS) and the number of locations where a bus lane could bypass this congestion. Alternatives with more intersections, especially more highly congested intersections, scored higher. Although route segments along the freeway could potentially operate faster than surface street segments, freeway running times are subject to greater fluctuation, resulting in lower travel time reliability. The highest score of 5 is assigned for the most improvement for the alternative, indicating that reliability has been improved for more locations and/or more highly congested locations.

Whereas surface street bus lanes will continue to offer relief from congestion and improved travel time reliability even if overall traffic levels on local roadways increase over time, speeds along freeway segments where the bus generally operates in mixed flow are anticipated to drop with overall traffic growth. Thus, development of dedicated bus lanes on surface streets adds “permanency” to the service which cannot be provided along the freeway without major upgrades.

Scoring is based on Existing Level of Service (LOS) estimates during peak hour conditions. (LOS scoring translates from alphanumeric to numeric as: LOS A-B = 1; LOS C = 2; LOS D = 3; LOS E = 4; LOS F = 5.) These results are shown in **Table 21**. For example, the Street-Running Alternative passes through 40 intersections in the central sub-area (16 with LOS B, 14 with LOS C, 7 with LOS D, and 3 with LOS E) and totals 77 points ((16 X 1) + (14 X 2) + (7 X 3) + (3 X 4)). Within the central sub-area, the Freeway-Running Alternative totals 13 points for passing through five improved intersections (1 with LOS A, 2 with LOS C, and 2 with LOS E). Within the central sub-area, the Hybrid Street/Freeway-Running Alternative totals 35 points for passing through 20 improved intersections (3 with LOS A, 8 with LOS B, 5 with LOS C, 2 with LOS D, and 2 with LOS E). The Street-Running Alternative, which totals 77 points in the central sub-area, earns a score of "5."

Table 21 – Travel Time Reliability by Sub-Area

Sub-Area	Alternative	Intersection Points	Score	Assessment
West Sub-Area	Freeway-Running	45	1	Very Low
	Hybrid Street/ Freeway-Running	60	4	High
	Street-Running	65	5	Very High
Central Sub-Area	Freeway-Running	13	1	Very Low
	Hybrid Street/ Freeway-Running	35	2	Low
	Street-Running	77	5	Very High
East Sub-Area	Freeway-Running	53	4	High
	Hybrid Street/ Freeway-Running	51	3	Moderate
	Street-Running	51	3	Moderate
Total	Freeway-Running	111	1	Very Low
	Hybrid Street/ Freeway-Running	146	3	Moderate
	Street-Running	193	5	Very High

Transit Network Connectivity: This is a measurement of the number of connecting transit routes, as shown in **Table 22**. The measurement identifies the number of existing intersecting major transit lines and bus routes within 1/4-mile of a potential station for each alternative, including Metro, LADOT, BurbankBus, Glendale Beeline, Pasadena Transit, and Foothill Transit. The Street-Running Alternative has considerably more connectivity in each sub-area and end-to-end due to more stations.

Table 22 – Transit Network Connectivity

Sub-Area	Alternative	Local Routes	Score	Assessment
West Sub-Area	Freeway-Running	13	1	Very Low
	Hybrid Street/Freeway-Running	13	*1*	Very Low
	Street-Running	21	5	Very High
Central Sub-Area	Freeway-Running	3	1	Very Low
	Hybrid Street/Freeway-Running	6	2	Low
	Street-Running	16	5	Very High
East Sub-Area	Freeway-Running	16	1	Very Low
	Hybrid Street/Freeway-Running	19	4	High
	Street-Running	20	5	Very High
Total	Freeway-Running	32	1	Very Low
	Hybrid Street/Freeway-Running	38	2	Low
	Street-Running	57	5	Very High

Transit Hub Connectivity: Measures the number of major hubs connected within 1/4-mile of a potential station for each alternative, as shown in **Table 23**. The major transportation hubs in the corridor include:

- North Hollywood Metro Red/Orange Line Station
- Hollywood Burbank Airport
- Burbank Downtown Metrolink
- Metro Gold Line in Pasadena

The only distinction between the three alternatives is in the central sub-area for the Street-Running Alternative, which provides a connection with Burbank-Downtown Metrolink.

Table 23 – Transit Hub Connectivity

Sub-Area	Alternative	Transit Hubs	Score	Assessment
West Sub-Area	Freeway-Running	1	3	Moderate
	Hybrid Street/ Freeway-Running	1	3	Moderate
	Street-Running	1	3	Moderate

Sub-Area	Alternative	Transit Hubs	Score	Assessment
Central Sub-Area	Freeway-Running	0	1	Very Low
	Hybrid Street/ Freeway-Running	0	1	Very Low
	Street-Running	1	5	Very High
East Sub-Area	Freeway-Running	1	3	Moderate
	Hybrid Street/ Freeway-Running	1	3	Moderate
	Street-Running	1	3	Moderate
Total	Freeway-Running	2	2	Low
	Hybrid Street/ Freeway-Running	2	2	Low
	Street-Running	3	4	High

Improvement Potential for Other Buses: This criterion measures the number of existing bus routes along the route alignment for each alternative that benefit from the opportunity to use exclusive bus lanes or intersection improvements, as shown in **Table 24**.

Table 24 – Potential Improvements to Other Bus Routes

Sub-Area	Alternative	Bus Routes	Score	Assessment
West Sub-Area	Freeway-Running	7	1	Very Low
	Hybrid Street/Freeway-Running	8	2	Low
	Street-Running	10	5	Very High
Central Sub-Area	Freeway-Running	2	1	Very Low
	Hybrid Street/Freeway-Running	5	2	Low
	Street-Running	13	5	Very High
East Sub-Area	Freeway-Running	1	1	Very Low
	Hybrid Street/Freeway-Running	9	5	Very High
	Street-Running	9	5	Very High
Total	Freeway-Running	10	1	Very Low
	Hybrid Street/Freeway-Running	22	3	Moderate
	Street-Running	32	5	Very High

6.4 Costs

Three different cost metrics were evaluated: Capital Costs, Operating Costs, and Cost Efficiency, which was calculated as the annualized capital cost over 20 years divided by the annual number of estimated new riders. Results for each of these categories are described below.

Capital Costs: Capital cost estimates developed for the evaluation are based on preliminary conceptual plans for the three alternatives and, as such, are preliminary and subject to refinement as the project scope is refined. Accordingly, substantial contingencies are included in these capital cost estimates to compensate for unforeseen items of work, quantity fluctuations, variances in unit costs, and variances in project scope that develop as the Project progresses through stages of study and design development. A more refined explanation of capital costs is provided in **Section 5.3**. The range in the capital cost estimates corresponds with the current level of definition and conceptual engineering that has been completed for the alternatives. The capital cost estimates shown in **Table 25** were used in the subsequent assessment of cost efficiency.

Table 25 – Capital Costs

Sub-Area	Alternative	Millions	Score	Assessment
Total	Freeway-Running	$137 - $201	5	Very High
	Hybrid Street/Freeway-Running	$156 - $230	4	High
	Street-Running	$271 - $429	1	Very Low

Operating Costs: O&M cost models were used to estimate the annual cost to operate, maintain, and administer an alternative for the defined set of service indicators, as shown in **Table 26.** O&M costs are expressed as the annual total of employee wages and salaries, fringe benefits, contract services, materials and supplies, utilities, and other day-to-day expenses incurred in the operation and maintenance of a transit system. O&M costs include costs directly related to the provision of transit service (e.g., bus operators, mechanics, etc.) and an allocation of administrative functions related to the provision of transit service (e.g., customer service, finance and accounting, etc.). A more detailed explanation of operating costs is discussed in **Section 5.4**.

Table 26 – Operating Costs

Sub-Area	Alternative	Millions	Score	Assessment
Total	Freeway-Running	$12.9	5	Very High
	Hybrid Street/Freeway-Running	$16.9	3	Moderate
	Street-Running	$19.6	1	Very Low

Cost Efficiency: The cost efficiency of the three alternatives is measured as the annualized capital costs divided by the annual new riders on the transit system. For this evaluation, the annualized capital costs were determined as the mean capital cost estimate for each of the alternatives spread over a 20-year average lifespan for the various project elements. The new daily transit trips for each alternative were obtained from the travel forecasting model and were multiplied by an annualization factor of 300 to adjust for lower ridership expectations for weekends and holidays. The cost efficiencies for the three alternatives are shown in **Table 27**.

Table 27 – Cost Efficiency

Sub-Area	Alternative	Capital Cost per New Rider	Score	Assessment
Total	Freeway-Running	$2.69	5	Very High
	Hybrid Street/Freeway-Running	$2.65	5	Very High
	Street-Running	$4.01	1	Very Low

6.5 Economic Development

TOC Opportunities: To determine the potential for creation of and enhancement of Transit Oriented Communities (TOCs) in the project corridor, this criterion was developed based on the major TOC elements and guidelines from Metro's TOC Policy (2018). As part of the TOC opportunities assessment, first/last mile (FLM) was considered an important component for TOC development. The major FLM characteristics including points of interests, street grid, pedestrian shed, key transit access corridors, land use maps and bicycle connections are imbedded in the TOC elements. For this evaluation process, the potential station areas were evaluated based on how well each aligned with the following TOC elements:

- Mobility Options (up to 10 points per station): Increase transit ridership and provide transportation choices
- Transportation Connectivity (up to 15 points per station): Provide transit benefits by connecting to local and regional transportation systems near major activity centers such as colleges, shopping and job centers
- Economic Development (up to 20 points per station): Capture development value created by high-quality transit
- Active Lifestyles (up to 10 points per station): Engage local organizations, jurisdictions, and the public in active transportation alternatives and support safe and convenient bicycle and pedestrian facilities to improve health and activity levels

The methodology to determine the best performing station areas for the three alternatives is based on a scoring system for individual criteria under each of the TOC elements described above.

The cumulative TOC assessment is summarized and scored for potential stations in each sub-area for each alternative (shown in **Table 28)**.

Table 28 – TOC Opportunities

Sub-Area	*Alternative*	*TOC Metric*	*Score*	*Assessment*
West Sub-Area	Freeway-Running	172	1	Very Low
	Hybrid Street/ Freeway-Running	195	1	Very Low
	Street-Running	328	5	Very High
Central Sub-Area	Freeway-Running	65	1	Very Low
	Hybrid Street/ Freeway-Running	103	1	Very Low
	Street-Running	259	5	Very High
East Sub-Area	Freeway-Running	145	1	Very Low
	Hybrid Street/ Freeway-Running	211	3	Moderate
	Street-Running	278	5	Very High
Total	Freeway-Running	382	1	Very Low
	Hybrid Street/ Freeway-Running	509	2	Low
	Street-Running	866	5	Very High

Potential Parking Impacts: This criterion considers potential impacts to on-street parking, taking into consideration existing conditions and potential modifications to the roadway configuration necessary to accommodate dedicated bus lanes. The assessment considers the relative potential on-street parking loss associated with each alternative. A low score indicates a greater potential to impact on-street parking, whereas a high score indicates a lower potential to impact on-street parking. Because the ultimate project would seek to provide replacement parking to compensate for the removal of on-going street parking, specific parking counts are not provided. The potential impacts are shown for each alternative within each sub-area in **Table 29**.

Table 29 – Potential Parking Impacts

Sub-Area	Alternative	Score	Assessment
West Sub-Area	Freeway-Running	5	Very High
	Hybrid Street/ Freeway-Running	5	Very High
	Street-Running	1	Very Low
Central Sub-Area	Freeway-Running	4	High
	Hybrid Street/ Freeway-Running	5	Very High
	Street-Running	1	Very Low
East Sub-Area	Freeway-Running	5	Very High
	Hybrid Street/ Freeway-Running	1	Very Low
	Street-Running	1	Very Low
Total	Freeway-Running	5	Very High
	Hybrid Street/ Freeway-Running	5	Very High
	Street-Running	1	Very Low

6.6 Land Use

Population and Employment Density – Existing: The total density within a 1/2-mile radius of potential station locations for each alternative, grouped by sub-areas, is measured in this criterion. Total population and employment are divided by acres to provide an even measurement of density (people/acre) across all alternatives. Data obtained at the traffic analysis zone (TAZ) level from the travel forecasting model is the source of the population and employment.

Buffers of 1/2-mile radii were drawn around each potential station location and superimposed on the TAZs. Where 1/2-mile station buffers overlap, the buffers are merged to prevent double counting. **Figure 10 – Figure 15** show, for each alternative, the level of population and the level of employment density, respectively, by TAZ proximate to station locations. A visual review of aerial photography was performed to estimate the proportion of population and employment attributed to areas outside the 1/2-mile station buffers, for TAZs that are not fully 100 percent contained within the 1/2-mile station buffer.

Figure 10 – Street-Running Alternative Population Density

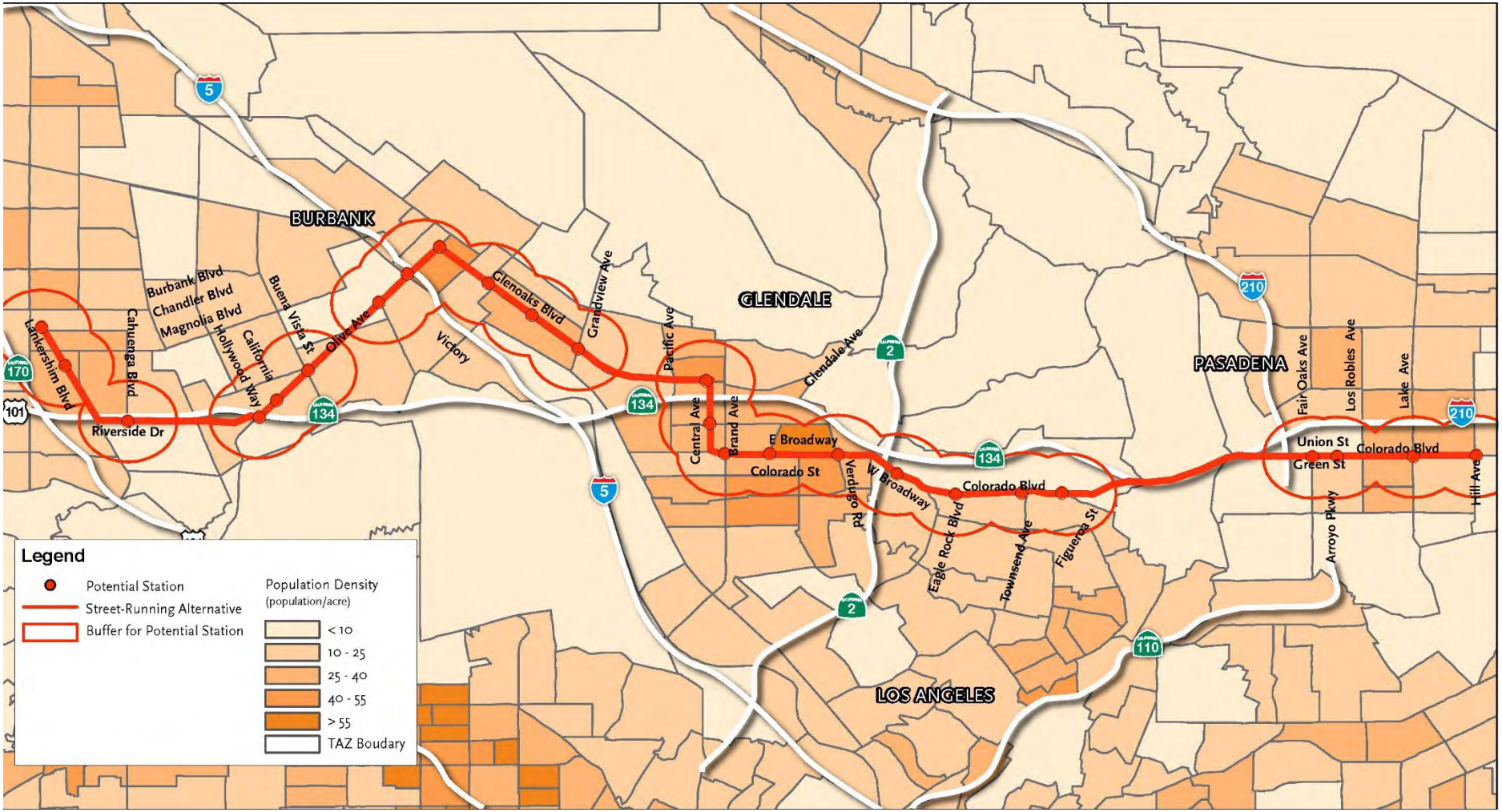


Figure 11 – Freeway-Running Alternative Population Density

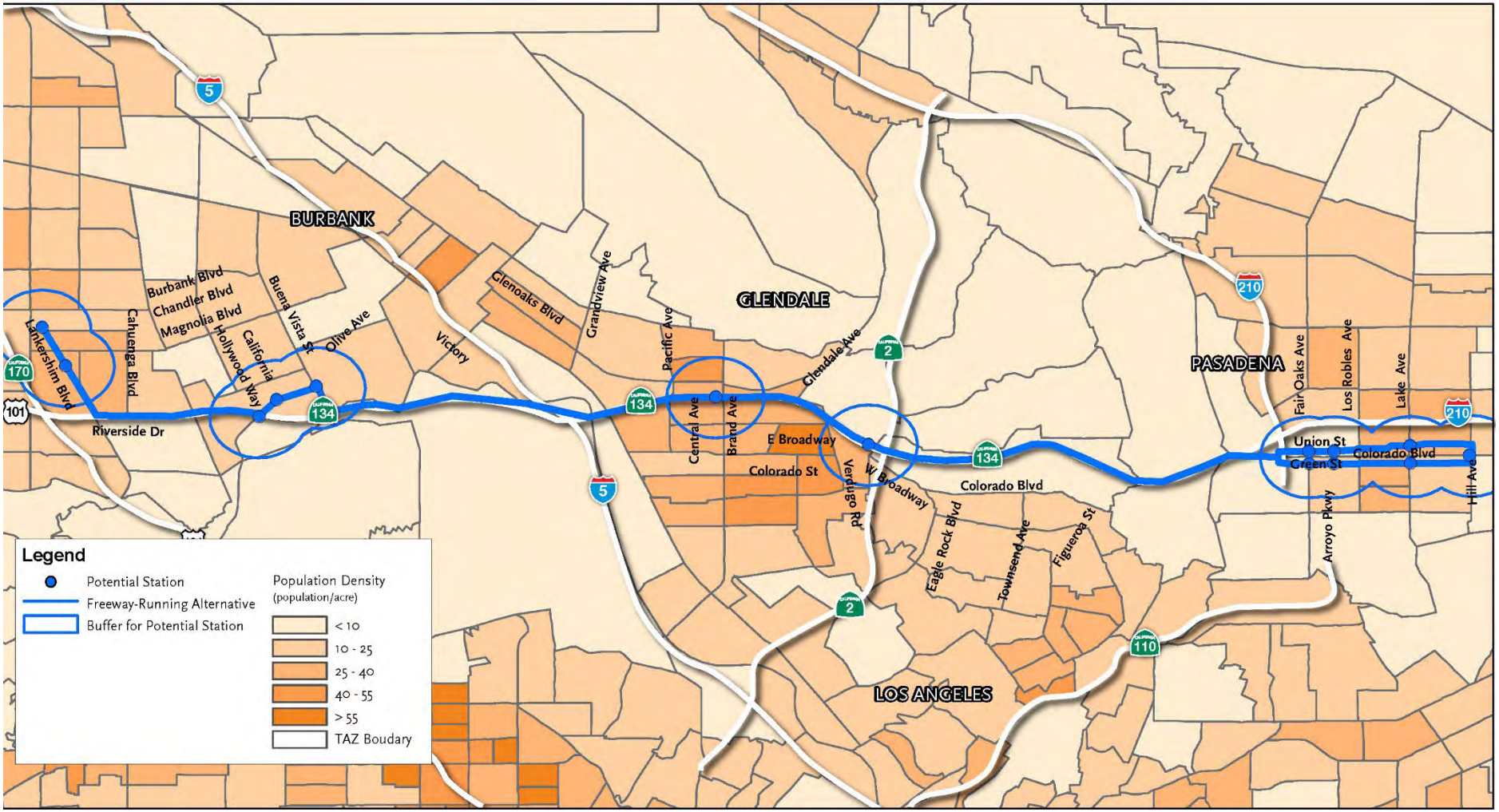


Figure 12 – Hybrid Street/Freeway-Running Alternative Population Density

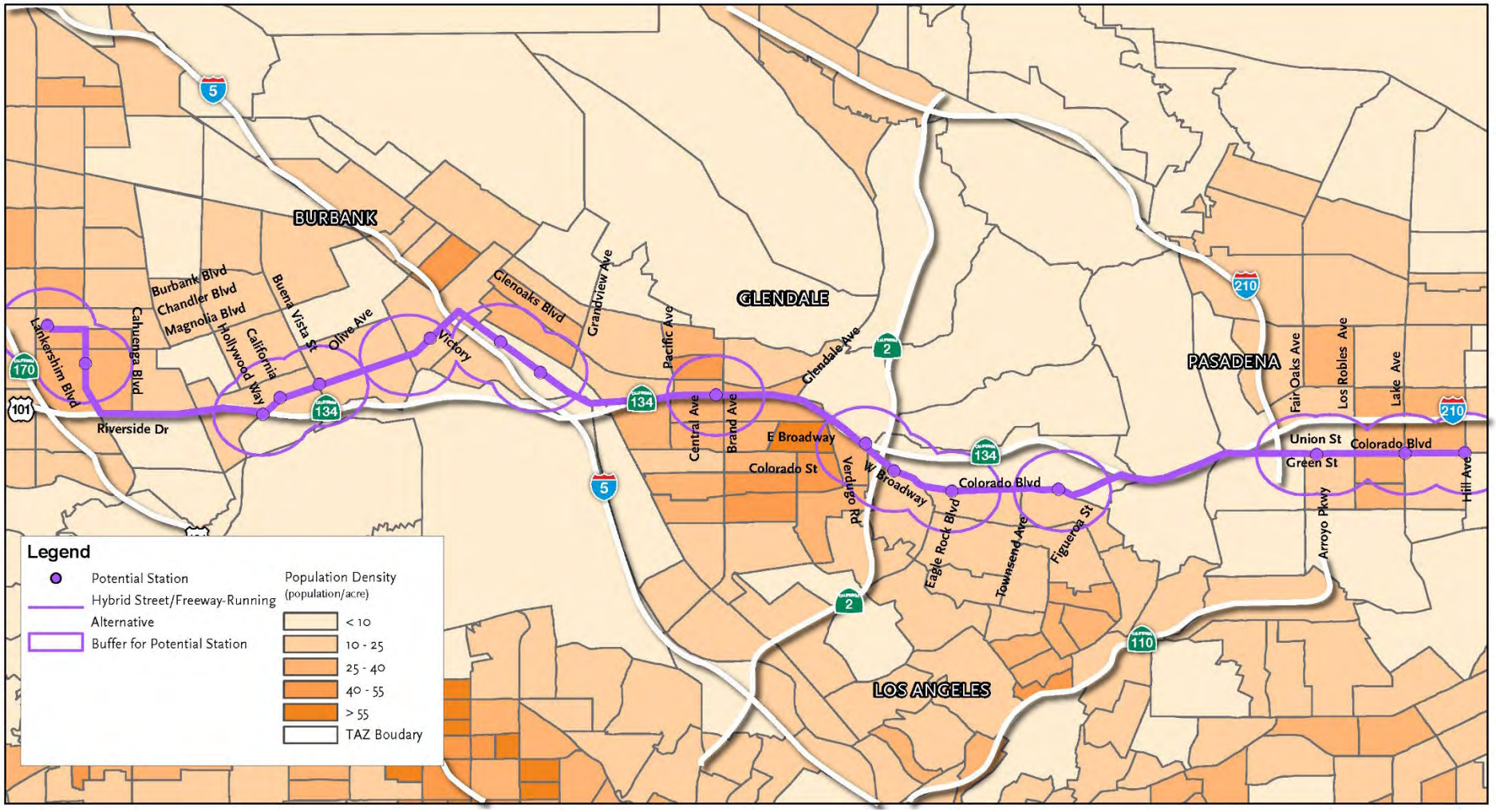


Figure 13 – Street-Running Alternative Employment Density

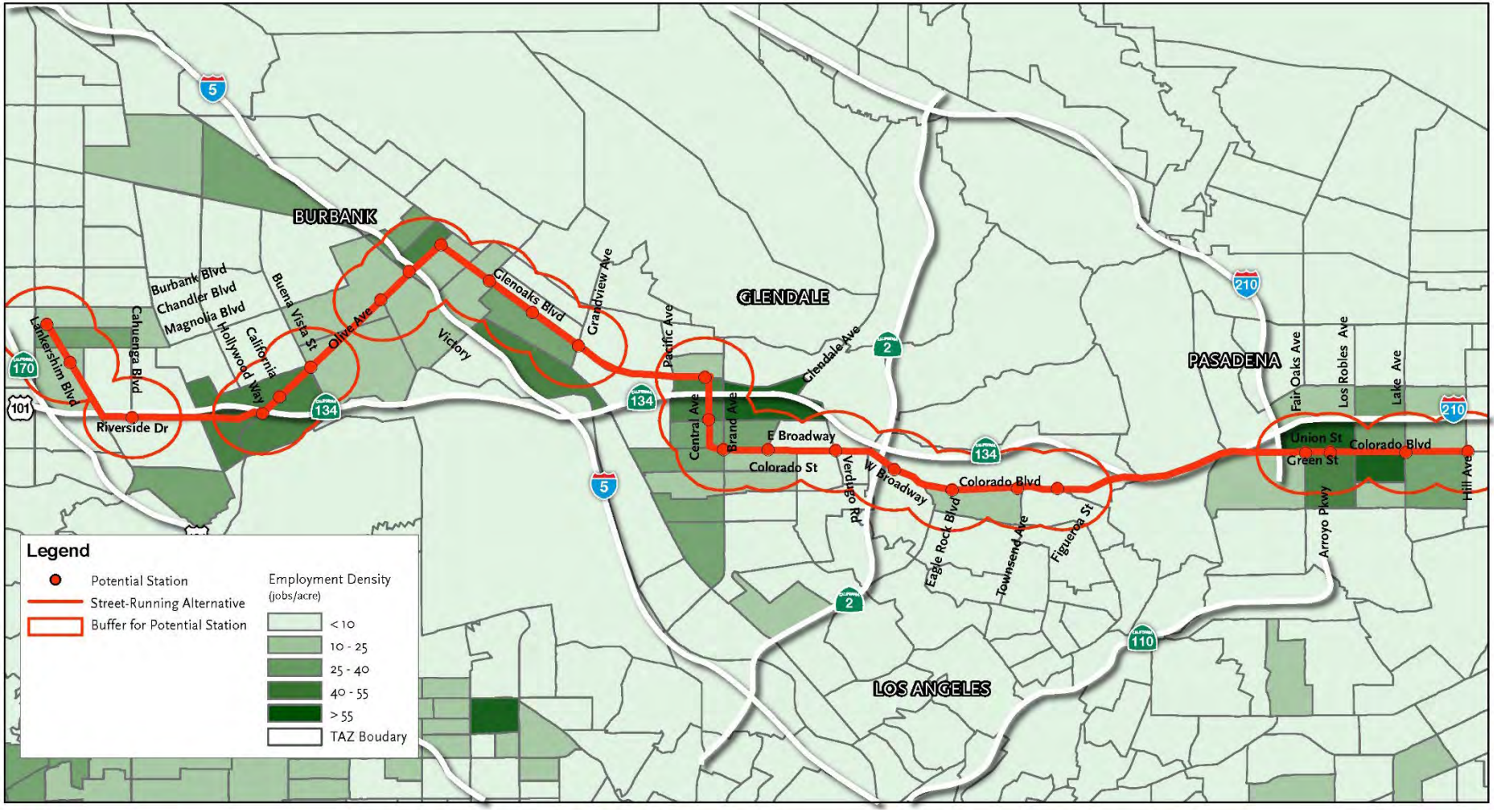


Figure 14 – Freeway-Running Alternative Employment Density

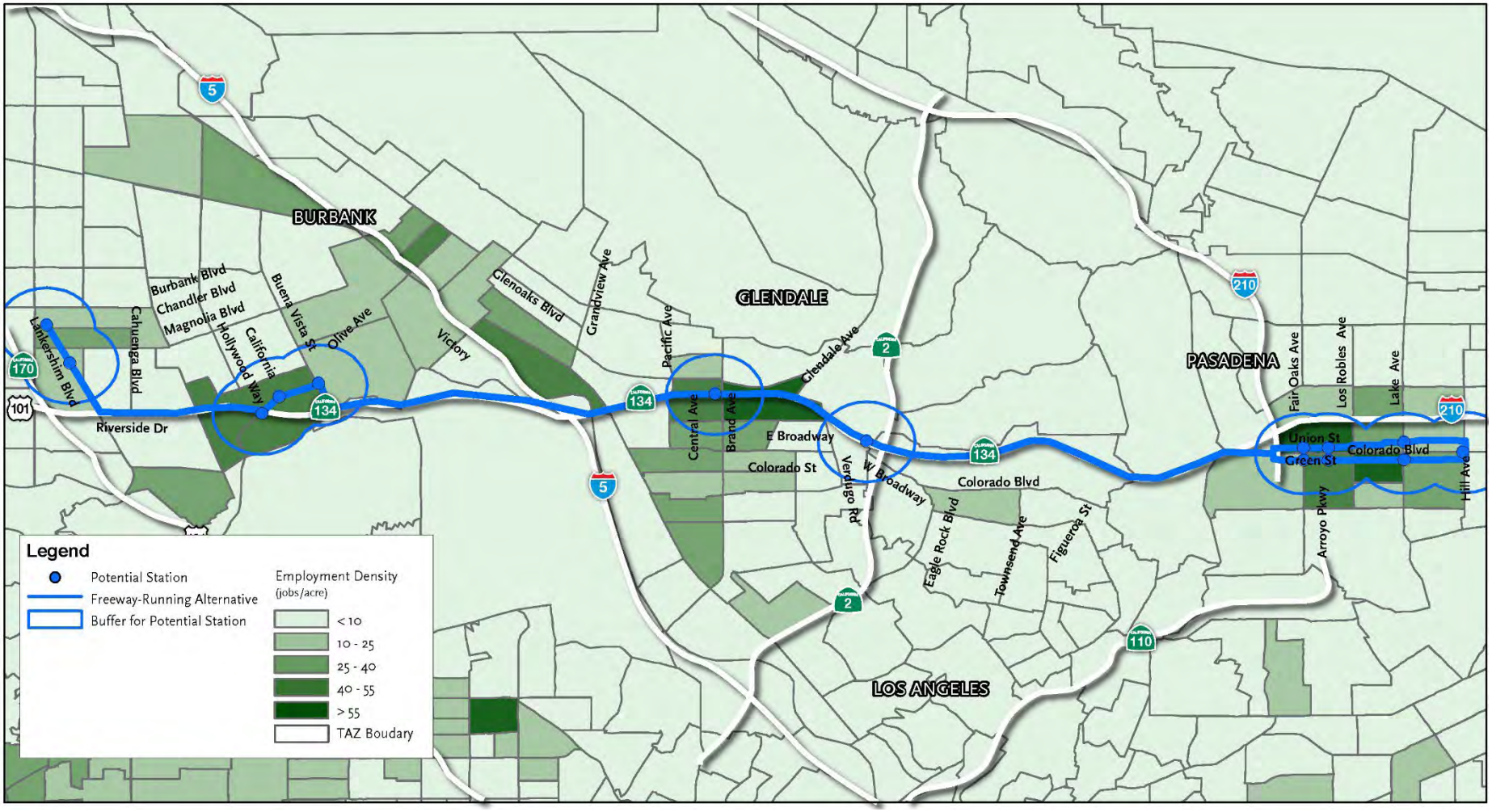
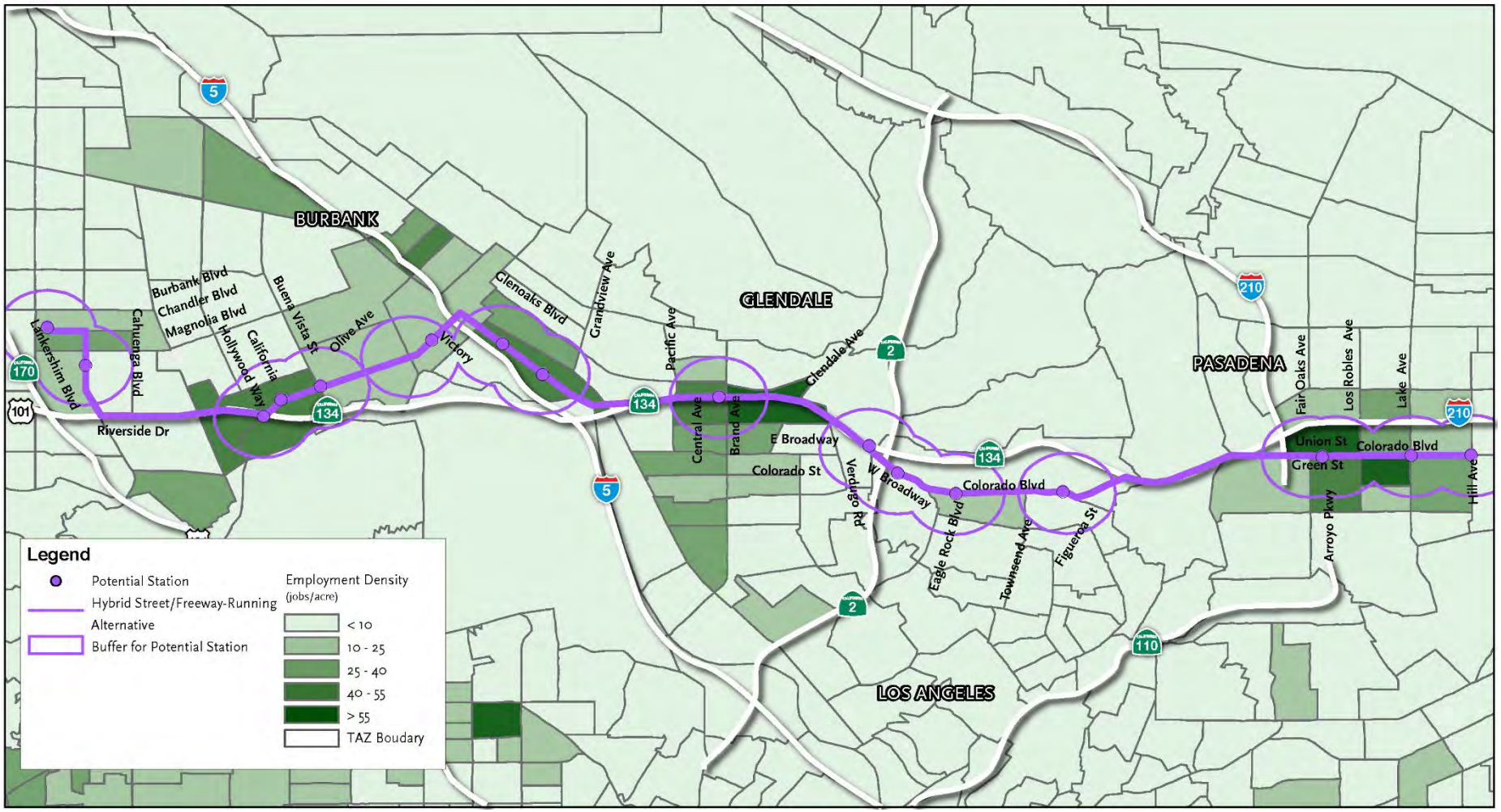


Figure 15 – Hybrid Street/Freeway-Running Alternative Employment Density



The station area population and employment densities for the three alternatives are shown in **Table 30**.

Table 30 – Station Area Population and Employment Density

Sub-Area	Alternative	People per acre	Score	Assessment
West Sub-Area	Freeway-Running	44	5	Very High
	Hybrid Street/Freeway-Running	42	3	Moderate
	Street-Running	39	1	Very Low
Central Sub-Area	Freeway-Running	49	5	Very High
	Hybrid Street/Freeway-Running	44	1	Very Low
	Street-Running	48	5	Very High
East Sub-Area	Freeway-Running	49	5	Very High
	Hybrid Street/Freeway-Running	36	1	Very Low
	Street-Running	35	1	Very Low
Total	Freeway-Running	47	5	Very High
	Hybrid Street/Freeway-Running	40	1	Very Low
	Street-Running	40	1	Very Low

Population and Employment Total: This criterion measures the total existing population and employment within a 1/2-mile radius of potential station locations for each alternative, grouped by sub-area. Data obtained at the traffic analysis zone (TAZ) level from the travel forecasting model is the source of the population and employment.

Buffers of 1/2-mile radii were identified around each potential station location and superimposed on the TAZs. Where 1/2-mile station buffers overlap, the buffers are merged to prevent double counting. A visual review of aerial photography was performed to estimate the proportion of population and employment attributed to areas outside the 1/2-mile station buffers, for TAZs that are not fully 100 percent contained within the 1/2-mile station buffer.

The total population and employment served, as shown in **Table 31**, is a good measure to differentiate the potential market served by each alternative. The Street-Running Alternative scores highest with total population of more than 360,000, followed by the Hybrid Street/Freeway-Running Alternative with more than 265,000, while the Freeway-Running Alternative scores lowest with a total population of about 200,000.

Table 31 – Station Area Population and Employment

Sub-Area	Alternative	People	Score	Assessment
West Sub-Area	Freeway-Running	74,940	1	Very Low
	Hybrid Street/ Freeway-Running	92,396	2	Low
	Street-Running	132,513	5	Very High
Central Sub-Area	Freeway-Running	44,736	1	Very Low
	Hybrid Street/ Freeway-Running	77,969	2	Low
	Street-Running	131,350	5	Very High
East Sub-Area	Freeway-Running	80,098	1	Very Low
	Hybrid Street/ Freeway-Running	96,990	5	Very High
	Street-Running	100,209	5	Very High
Total	Freeway-Running	199,774	1	Very Low
	Hybrid Street/ Freeway-Running	267,355	3	Moderate
	Street-Running	364,072	5	Very High

Connections to Major Activity Centers: Total number of activity centers served by each alternative, by sub-area, are measured by this criterion. The results are shown in **Table 32**. The activity centers located within 1/2-mile of potential station locations for at least one of the alternatives include:

- North Hollywood Station
- Media District in Burbank
- Downtown Burbank
- Downtown Glendale
- Eagle Rock Plaza
- Eagle Rock Boulevard at Colorado Boulevard
- Old Pasadena
- High Schools (7 within 1/2-mile of potential station locations)
- Colleges (5 within 1/2-mile of potential station locations)

Table 32 – Connections to Major Activity Centers

Sub-Area	Alternative	Major Activity Centers	Score	Assessment
West Sub-Area	Freeway-Running	5	2	Low
	Hybrid Street/ Freeway-Running	5	2	Low
	Street-Running	7	3	Moderate
Central Sub-Area	Freeway-Running	2	1	Very Low
	Hybrid Street/ Freeway-Running	2	1	Very Low
	Street-Running	2	1	Very Low
East Sub-Area	Freeway-Running	7	3	Moderate
	Hybrid Street/ Freeway-Running	7	3	Moderate
	Street-Running	8	3	Moderate
Total	Freeway-Running	14	4	High
	Hybrid Street/ Freeway-Running	14	4	High
	Street-Running	17	5	Very High

6.7 Equity

Low Income or Disadvantaged Communities: Low income or disadvantaged population served is measured by this criterion. Disadvantaged and low income areas are defined by the California Environmental Protection Agency (CalEPA) as:

- Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation
- Areas with concentrations of people that are of low income, high unemployment, low levels of home ownership, high rent burden, sensitive populations, or low levels of educational attainment

Low income and disadvantaged communities typically exhibit propensity for transit dependency.

To measure potential benefits to the priority populations, populations within 1/4-mile buffers of each alternative alignment (except the portion of the route alignments on freeways) and within 1/2-mile buffers of potential station locations were determined. Priority population GIS data from the California Air Resources Board web page were gathered. These data are produced in census tracts, which are nearly identical to the TAZs in the ridership model. **Figure 16 – Figure 18** show the census tracts of various categories of low income and disadvantaged populations both within the buffers as well as within the general catchment area of the Project for each alternative.

Figure 16 – Street-Running Alternative Low Income and Disadvantaged Communities

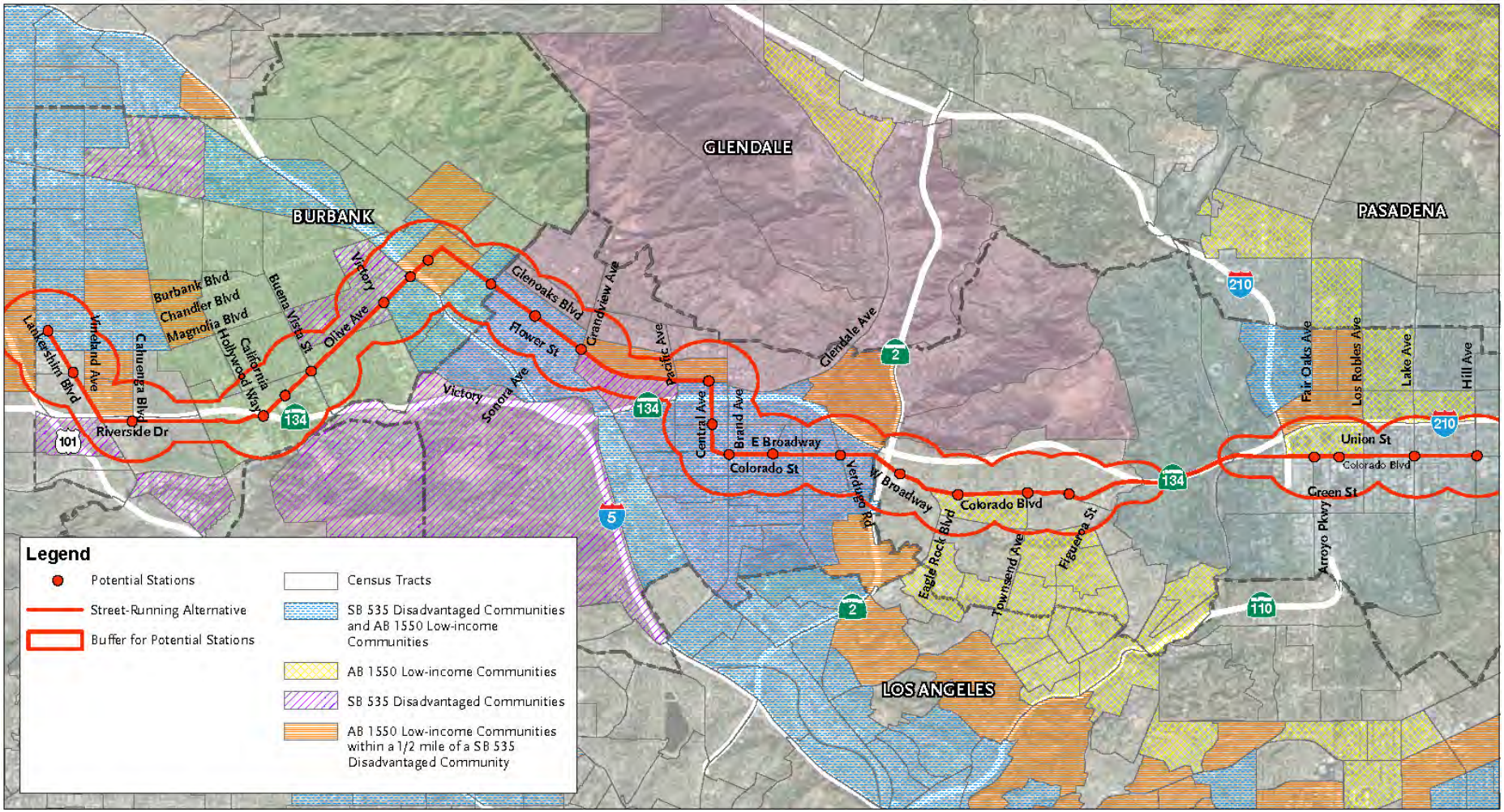


Figure 17 – Freeway-Running Alternative Low Income and Disadvantaged Communities

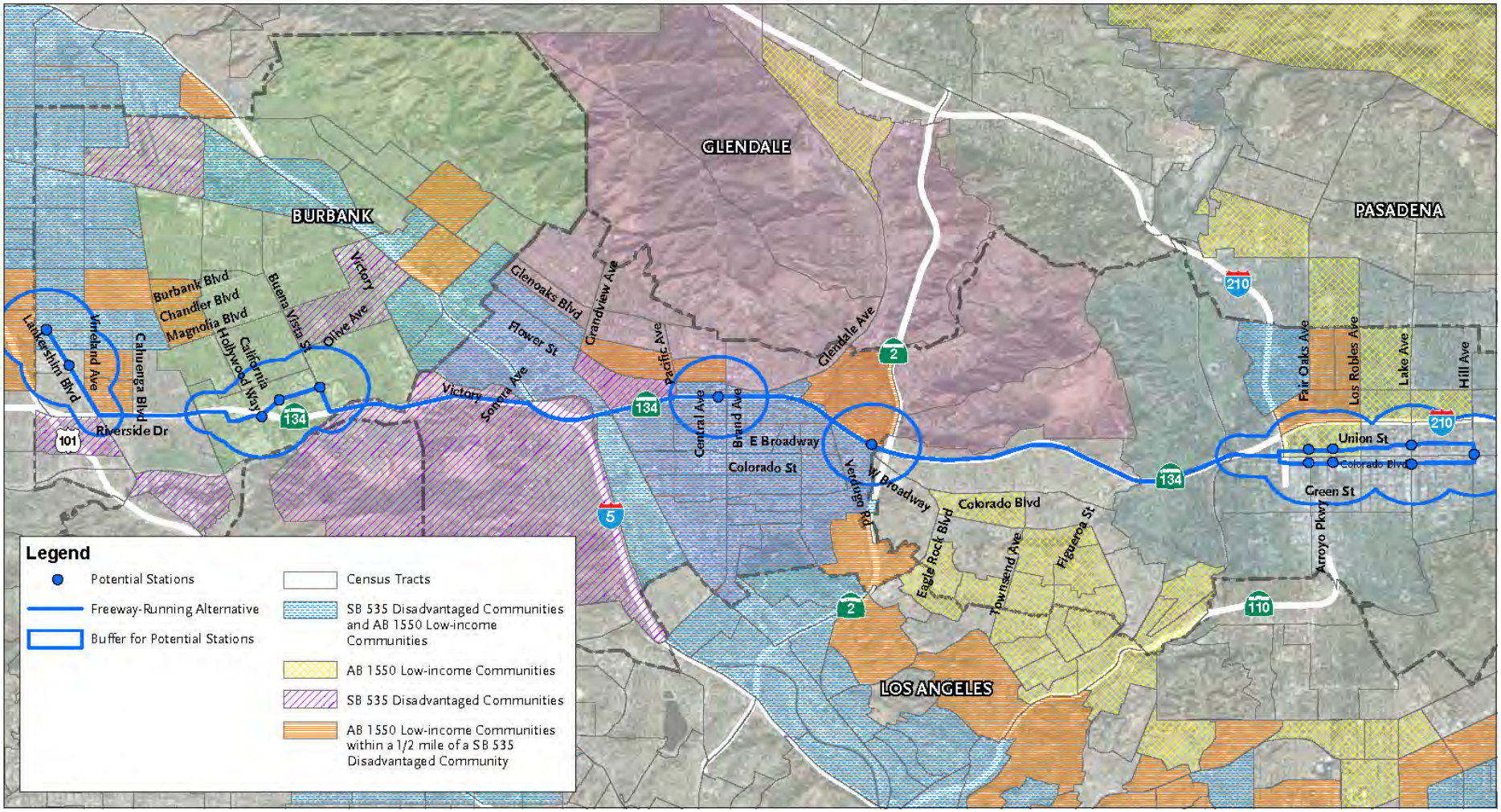
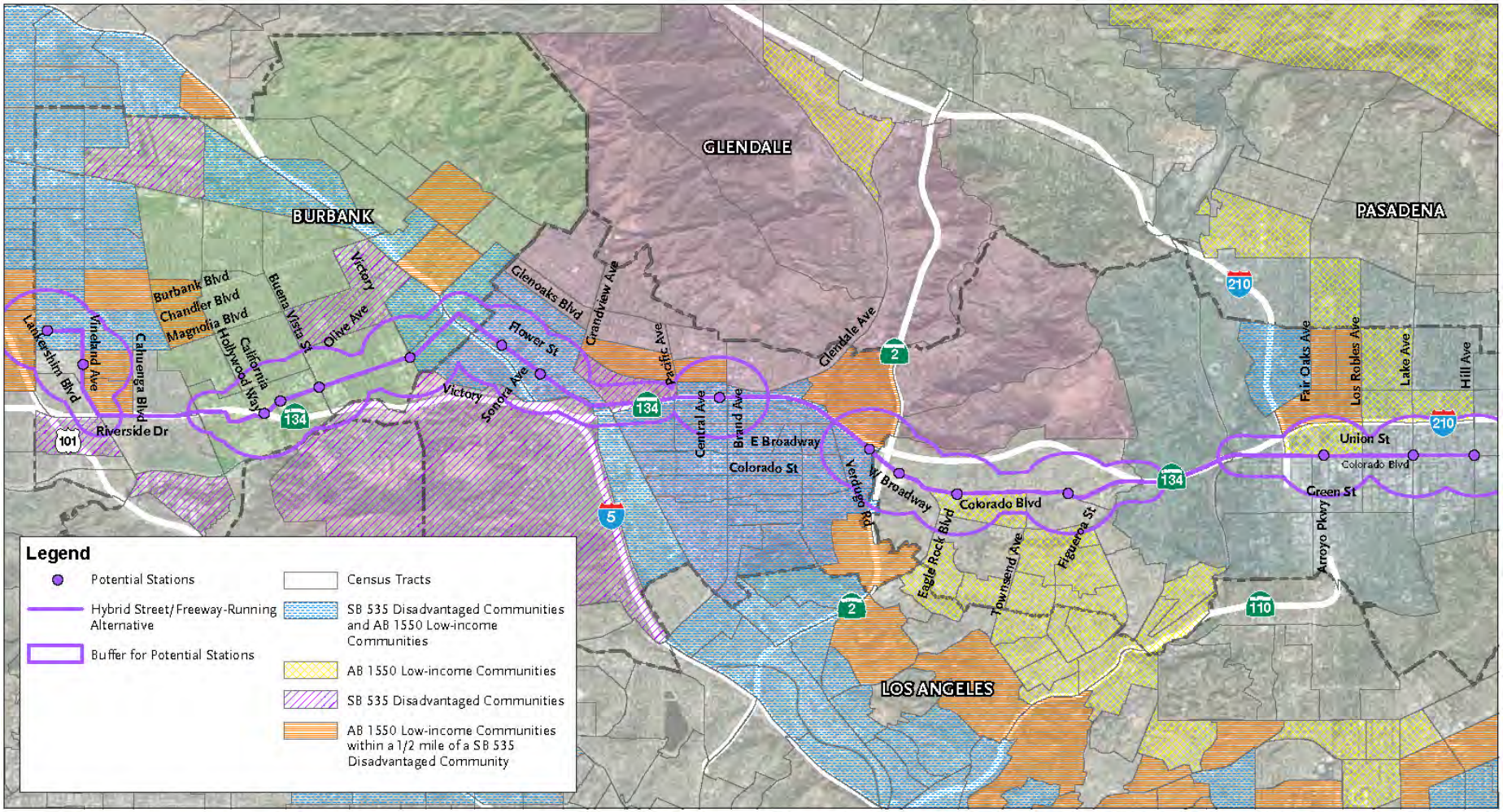


Figure 18 – Hybrid Street/Freeway-Running Alternative Low Income and Disadvantaged Communities



The low income and disadvantaged populations served by the three alternatives are shown in **Table 33**.

Table 33 – Benefits to Low Income and Disadvantaged Communities

Sub-Area	Alternative	People	Score	Assessment
West Sub-Area	Freeway-Running	15,934	1	Very Low
	Hybrid Street/Freeway-Running	24,836	2	Low
	Street-Running	42,020	5	Very High
Central Sub-Area	Freeway-Running	21,233	1	Very Low
	Hybrid Street/Freeway-Running	36,314	2	Low
	Street-Running	71,054	5	Very High
East Sub-Area	Freeway-Running	3,606	1	Very Low
	Hybrid Street/Freeway-Running	7,656	5	Very High
	Street-Running	8,303	5	Very High
Total	Freeway-Running	40,773	1	Very Low
	Hybrid Street/Freeway-Running	68,806	2	Low
	Street-Running	121,377	5	Very High

6.8 Environmental Benefits

Measurement of VMT: This criterion is a measurement of the potential environmental benefits associated with each alternative resulting from a decrease in vehicle miles traveled, such as reduction in greenhouse gas emissions. Vehicle Miles Traveled (VMT) output from the travel forecasting model is used to score the VMT criterion. Alternatives with the most VMT (or provide the lowest VMT reduction) achieve the lowest score. VMT reduction could not be determined at the sub-area level for the alternatives; therefore, only the end-to-end alternatives are scored (**Table 34**).

Table 34 – VMT Reduction

Alternative	VMT Reduction	Score	Assessment
Freeway-Running	70,951	1	Very Low
Hybrid Street/ Freeway-Running	78,368	4	High
Street-Running	80,247	5	Very High

6.9 Public Support

Public Support: The public outreach input documented in Section 3 was used to form the scoring for this criterion. The Public Support criterion is a qualitative assessment of how the public viewed the potential risks and benefits associated with the alternatives (based on feedback obtained during outreach activities).

The assessment of public support for each alternative, as summarized in **Table 35,** helps decision-makers gauge factors and potential challenges that are not necessarily quantifiable (unlike capital costs, for example), but may impact implementation. The "moderate" score for the Street-Running Alternative reflects general support for the Project as well as concerns for potential impacts associated with implementation. The "very low" score for the Freeway-Running Alternative reflects concerns that this Alternative is not well integrated into the communities and provides less coverage and accessibility.

Table 35 – Public Support

Alternative	Score	Assessment
Freeway-Running	1	Very Low
Hybrid Street/ Freeway-Running	2	Low
Street-Running	3	Moderate

6.10 Evaluation Summary

This section summarizes the evaluation for all scoring criteria. For each evaluation criterion, the three refined alternatives were assigned a comparative ranking ranging from very high to very low, using a five-point scale:

- Very High = 5 points
- High = 4 points
- Moderate = 3 points
- Low = 2 points
- Very Low = 1 point

The scores were totaled for each evaluation criterion to determine an overall score for the three refined alternatives. **Table 36** presents the evaluation results.

The Street-Running Alternative has the highest overall score; although the travel time is the slowest and the capital and operating costs are the highest, this alternative has the highest ridership potential and provides the best access to regional activity centers, aligning with the purpose and need for the Project. It also delivers the highest vehicle miles of travel (VMT) reduction, which supports Metro's priorities of sustainability, and provides the most service to disadvantaged communities.

Both the Freeway-Running and Hybrid Street/Freeway-Running Alternatives leverage the Ventura Freeway, where no mainline improvements were considered (i.e., buses would operate in mixed-flow or in the existing High Occupancy Vehicle [HOV] lane), to achieve time and cost savings relative to the Street-Running Alternative. These time and cost savings, however, are achieved by sacrificing some accessibility to the system and connectivity to activity centers.

Although the Hybrid Street/Freeway-Running Alternative would cost less to implement than the Street-Running Alternative, this Alternative did not attract many more riders than the Freeway-Running Alternative and it scored significantly lower on the mobility criteria when compared to the Street-Running Alternative. This analysis indicated that shifting major portions of the alignment to the freeway would not improve the Project.

High-level observations in the various evaluation categories are as follows:

- **Mobility Improvements**: The Street-Running Alternative attracts nearly 28 percent more net new transit riders than the Freeway-Running Alternative and 14 percent more than the Hybrid Street/Freeway-Running Alternative. It also outperforms the other two alternatives on all mobility criteria except travel time. (It should be noted, however, that the ridership patterns indicate fewer riders would be traveling the entire length from one end of the study area to the other.)

- **Costs**: The Street-Running Alternative has the highest capital and annual operating costs. The Freeway-Running Alternative has the lowest capital and annual operating costs, and the capital and annual operating costs for the Hybrid Street/Freeway-Running Alternative are in between. Although the Street-Running Alternative attracts the greatest ridership, from a capital cost perspective it is not as cost efficient (calculated as the annualized capital costs over 20 years divided by the annual new riders) because the capital costs are higher.
- **Economic Development**: The Street-Running Alternative is most supportive of Metro's TOC policies. But, this Alternative also has the highest potential for impacting traffic and on-street parking, so developing mitigation measures should be a focus during the design refinement in the environmental phase of project development.
- **Land Use**: The Street-Running Alternative scored the highest on two of the three metrics. It has a lower "density" score; however, this is somewhat misleading as the score is an average of the densities at all stations. The three alternatives serve many of the same high-density centers, but the Street-Running Alternative also serves additional stations in less dense areas.
- **Equity**: The Street-Running Alternative provides a higher level of access to low income and disadvantaged communities, as defined by the California Environmental Protection Agency (CalEPA). Low income and disadvantaged populations within 1/4-mile buffers of each alternative alignment (except the portion of the route alignments on freeways) and within 1/2-mile buffers of potential station locations were considered.
- **Environmental Benefits**: The Street-Running Alternative would result in the greatest reduction in VMT, substantially better than the Freeway-Running Alternative and slightly better than the Hybrid Street/Freeway-Running Alternative.
- **Public Support**: Although this criterion is somewhat subjective, the Street-Running Alternative was judged to be the highest scoring. Based on input from the public and from multiple stakeholders during community outreach efforts, there was a strong consensus that the Freeway-Running Alternative was the least desirable.

Source: Trammell Crow Company's NoHo District Transit Oriented Development Project

Table 36 – Evaluation Results

	Alternative 1: Street-Running	Alternative 2: Freeway-Running	Alternative 3: Hybrid Street/ Freeway-Running
Mobility Improvements			
Daily Ridership	29,570	23,136	25,963
End-to-End Travel Time	65 mins	43 mins	56 mins
Travel Time Reliability			
Transit Network Connectivity			
Transit Hub Connectivity			
Other Bus Line Benefit			
Costs			
Capital Cost (Year of Expenditure)	$271-429M	$137-201M	$156-230M
Annual Operating Cost	$19.6M	$12.9M	$16.9M
Cost Efficiency (1)			
Economic Development			
TOC Opportunities			
Potential Parking Impacts			
Land Use			
Population and Employment (2)	364,072	199,774	267,355
Population and Employement Density (3)	40	47	40
Connections to Major Activity Centers			
Equity			
Disadvantaged Communities (4)			
Environmental Benefits			
VMT Reduction (5)			
Public Support			
Public Support	Moderate	Very Low	Low
SUMMARY – Very High (5 points)	9	6	2
SUMMARY – High (4 points)	1	1	3
SUMMARY – Moderate (3 points)	1	0	6
SUMMARY – Low (2 points)	0	1	5
SUMMARY – Very Low (1 points)	6	9	1
Total Score	58	45	51

Notes:

6. *Cost efficiency is measured as the annualized capital costs over 20 years divided by the annual new riders*
7. *Total existing population and employment within a 1/2-mile radius of potential stations*
8. *Total existing population and employment density per acre within a 1/2-mile radius of potential stations*
9. *Low income or disadvantaged population, as defined by CalEPA, within 1/4-mile buffers of each alternative alignment and within 1/2-mile buffers of potential station locations*

7.0 REFINED PROJECT ALTERNATIVE

7.0 Refined Project Alternative

Based on the evaluation conducted on the three alternatives, it was determined that the Street-Running Alternative best meets the purpose and need for the Project and achieves the highest number of overall benefits, including ridership potential, connectivity, TOC opportunities, equity, and environmental benefits. However, high-performing route segments from the other two alternatives are recommended to be carried forward resulting in a Refined Street-Running Alternative with Route Options as described below.

7.1 Project Description

The project alternative proposed to be advanced for environmental review is shown in **Figure 19.** This alternative is a refinement of the Street-Running Alternative with several route options. Specific refinements include:

- Addition of a route option from the North Hollywood Metro Red/Orange Line Station via Chandler Boulevard to Vineland Avenue to Lankershim Boulevard
- Routing via the Ventura Freeway between Lankershim Boulevard and the Burbank Media District to provide a faster operating speed compared to Riverside Drive
- Addition of two route options in Glendale – an alternative street-running segment using Colorado Street in lieu of Broadway as well as an alternative freeway-running segment using the Ventura Freeway between Brand Boulevard and Harvey Drive
- Addition of a route option in Pasadena via the Green Street/Union Street couplet, as an alternative to operating along Colorado Boulevard
- Consolidation of stations in Pasadena with a single station at Arroyo Parkway in lieu of separate stations at Fair Oaks Avenue and Marengo Avenue, to provide a more convenient connection to the Metro Gold Line in Pasadena

The Refined Street-Running Alternative with Route Options connects to the Metro Red and Orange Lines and the future North San Fernando Valley BRT at the North Hollywood Metro Red/Orange Line Station and extends to Pasadena City College in Pasadena. Key route characteristics of the Recommended Project Alternative include:

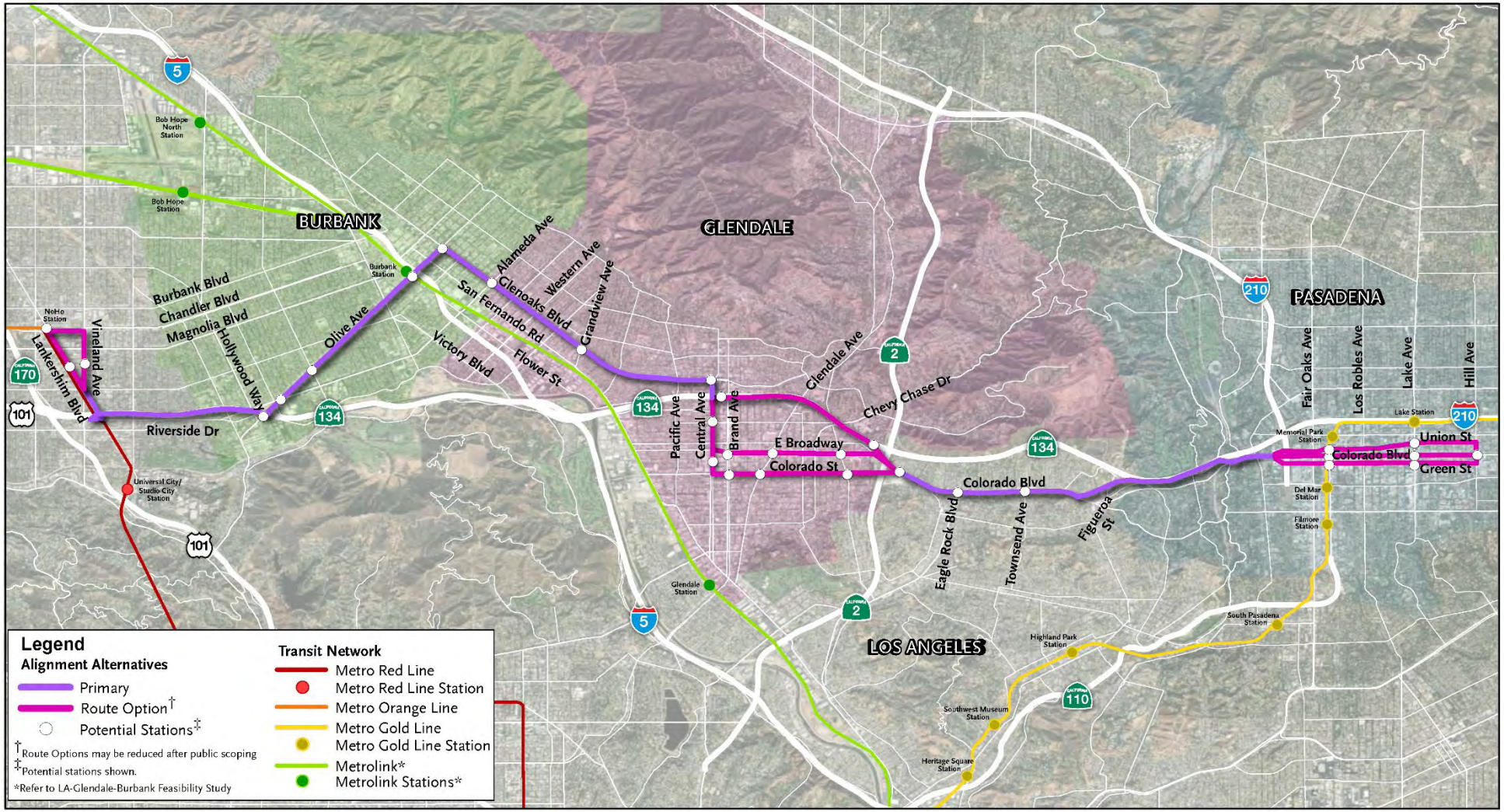
- Serves the North Hollywood Arts District
- Serves the Burbank Media District and Downtown Burbank, including the Burbank-Downtown Metrolink Station
- Connects to Downtown Glendale with options serving the heart of Downtown Glendale with multiple stations, or alternatively with one station adjacent to the Ventura Freeway
- Operates along Colorado Boulevard through the community of Eagle Rock
- Provides access to Old Pasadena, the Metro Gold Line, South Lake Avenue District, and Pasadena City College in Pasadena

The primary segments (shown in purple on **Figure 19**) and route options (shown in pink on **Figure 19**) from west to east are described below.

- From North Hollywood, utilizes either Lankershim Boulevard directly to the Ventura Freeway or utilizes a Chandler Boulevard-Vineland Avenue-Lankershim Boulevard routing with dedicated lanes along Vineland Avenue and along Lankershim Boulevard south of Vineland Avenue
- Operates in mixed traffic along the Ventura Freeway between Lankershim Boulevard and Pass Avenue, with stations both south and north of the freeway in the Burbank Media District
- Extends northeast in dedicated lanes along Olive Avenue to Glenoaks Boulevard in Downtown Burbank
- Continues southeast in dedicated lanes along Glenoaks Boulevard between Burbank and Downtown Glendale
- Operates on-street though Downtown Glendale via Central Avenue to Broadway or Colorado Street, or utilizes the Ventura Freeway between Brand Boulevard and Harvey Drive east of downtown
- Operates along Colorado Boulevard in dedicated lanes through the community of Eagle Rock in the City of Los Angeles
- Uses the freeway ramps located east of Linda Rosa Avenue in Eagle Rock to access the Ventura Freeway, continuing along the freeway to Colorado Boulevard in Pasadena
- Continues along Colorado Boulevard in dedicated lanes to Pasadena City College at Colorado Boulevard and Hill Avenue, or operates along the Green Street/Union Street couplet; an Arroyo Parkway station would provide convenient transfer to the Metro Gold Line

The alternative includes 18 to 21 potential stations (depending upon whether the freeway is used in Glendale); however, all station locations are preliminary at this point in the planning process. More specific determinations regarding station locations are dependent upon further design development and evaluation.

Figure 19 – Refined Street-Running Alternative with Route Options



7.2 Busway Design Options and Treatments

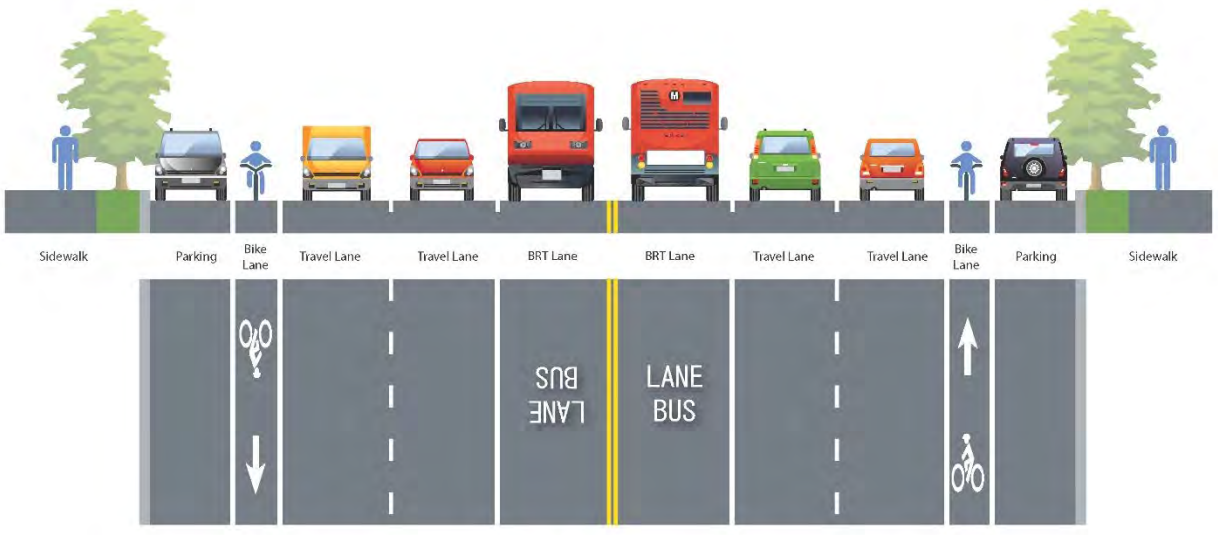
For assessing impacts in the environmental or Draft Environmental Impact Report (DEIR) phase, further refinement of the project description will be necessary to support environmental analyses. This will include developing conceptual engineering of roadway configurations that provide dedicated bus lanes to support BRT operations. Typical BRT runningways, or dedicated bus lanes, and their features are further described below.

7.2.1 Typical BRT Runningways

Transit runningways are a key feature of a BRT service; they provide an exclusive, dedicated operating environment for buses resulting in faster travel for customers. While dedicated bus lanes may not be possible for the entire corridor, maximizing their use allows the BRT service to be more reliable and attractive by promoting permanency as well as resiliency to changes in traffic congestion and flow patterns. Following are various runningway configurations which could potentially be developed along the North Hollywood to Pasadena BRT Corridor.

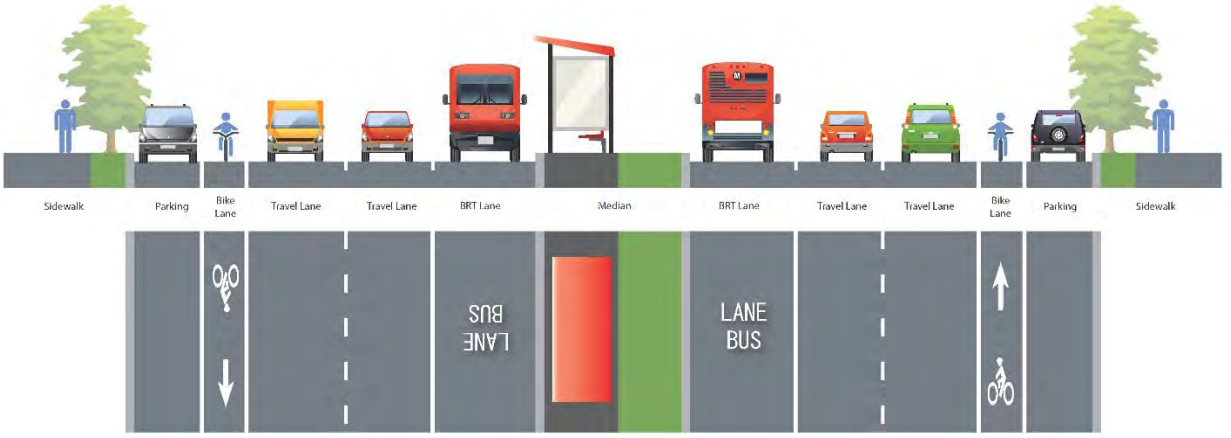
Center-Running Bus Lanes – Center-running bus lanes typically provide two lanes (one for each direction of travel) in the center of the roadway. Center-running bus lanes may be physically separated from adjacent traffic and provide an exclusive "guideway" for BRT vehicles or can simply be delineated with pavement markings, as shown on **Figure 20**. This type of runningway can be generally applied in streets with 100-foot or greater curb-to-curb width. Light rail transit often operates in a center-running configuration; therefore, this type of runningway has the greatest potential for future rail conversion, although additional right-of-way may be required.

Figure 20 – Typical Center-Running Bus Lanes Cross Section



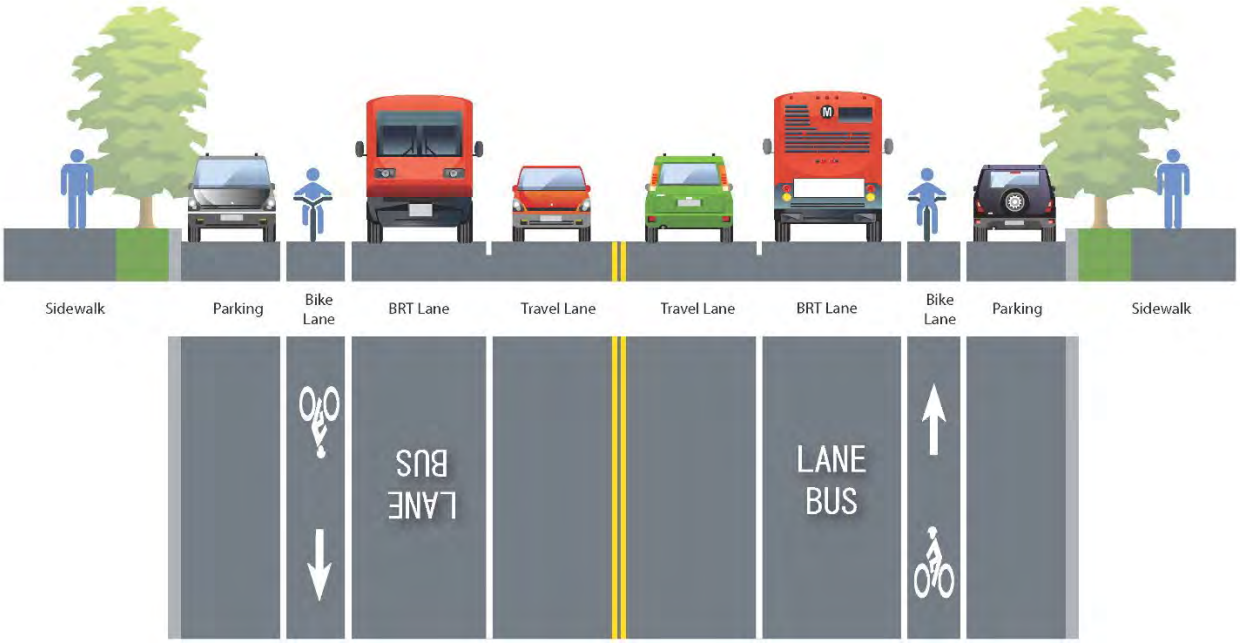
Center-Running with Median Bus Lanes – The BRT service operates within dedicated lanes adjacent to a median (i.e., the left-most lane in the direction of travel) as shown in **Figure 21**. Where present, a median can potentially accommodate a BRT station. A median-running bus lane may also be physically separated from parallel roadway traffic in a defined guideway. Typical applications allow for transitions of the lane for median BRT stations and left-turn lanes at intersections. Like center-running bus lanes, median-running bus lanes have the potential for future rail conversion without major reorganization of the roadway configuration, although additional right-of-way may be required.

Figure 21 – Typical Center-Running with Median Bus Lanes Cross Section



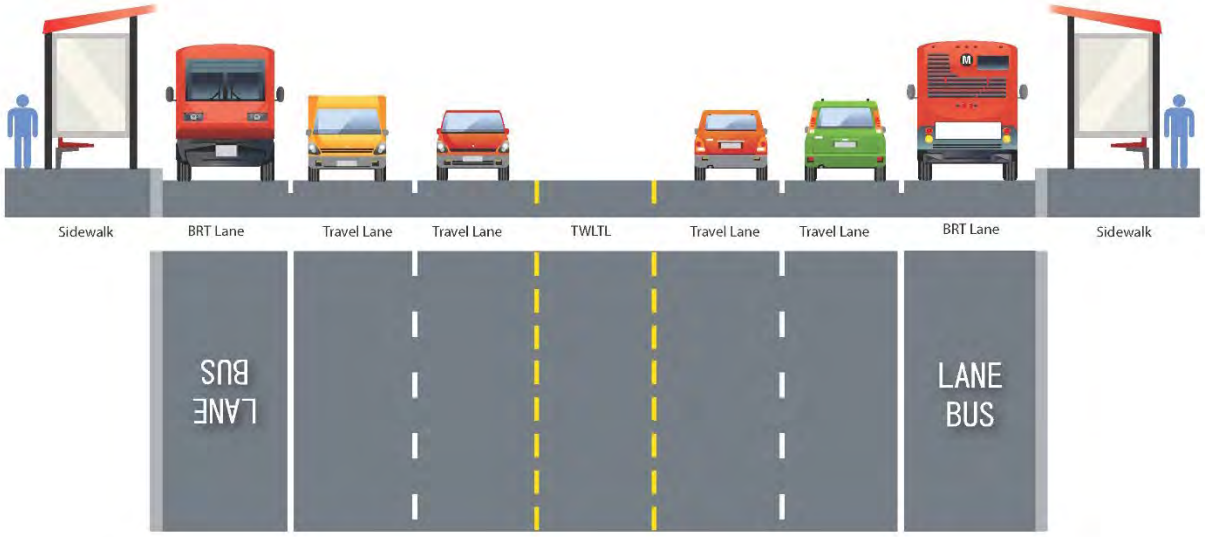
Side-Running Bus Lanes – Side-running bus lanes dedicate the right-most travel lane to BRT vehicles, as shown in **Figure 22**. Side-running bus lanes are separated from the curb by bicycle lanes, parking lanes, or both, which may allow for right-turns to be made from the curb lane at intersections reducing conflicts with buses. Because station placement is adjacent to the sidewalk, stations are typically developed with "bulb outs" or "curb extensions" enhancing walkability and the pedestrian environment. Station siting and design treatment should minimize conflicts with cyclists, parked vehicles, commercial loading zones/vehicles, and right-turning traffic. Conversion to light rail is feasible but usually requires reconfiguring the entire roadway to provide typical light rail guideway types and may require additional right-of-way.

Figure 22 – Typical Side-Running Bus Lanes Cross Section



Curb-Running Bus Lanes – Curb-running bus lanes place the dedicated bus lane immediately adjacent to the curb, as shown in **Figure 23,** which eliminates parking or restricts parking to time periods when the bus lane is not operational. Like the side-running bus lanes configuration, a "curb extension" may be provided; however, operation along the curb may preclude development of a "bulb out." This type of runningway can experience friction or interaction with cyclists, parked vehicles, commercial loading zones/vehicles, and right-turning traffic, which typically merges into the bus lane prior to turning. Conversion to light rail is feasible, but usually requires reconfiguring the entire roadway to provide typical light rail guideway types and may require additional right-of-way.

Figure 23 – Typical Curb-Running Bus Lanes Cross Section



7.2.2 Potential Runningway Configurations for Street-Running Sections

Figure 24 and **Table 37** identify the running way options or configurations that could potentially be used to provide dedicated bus lanes in various route segments along the North Hollywood to Pasadena BRT Corridor. These configurations will be evaluated for physical and operational impacts in the environmental or Draft EIR phase. A mixed-flow configuration may be considered on segments where there are right-of-way constraints or potential impacts to the corridor and adjacent land uses are significant.

Figure 24 – Potential Runningway Configurations Key Map

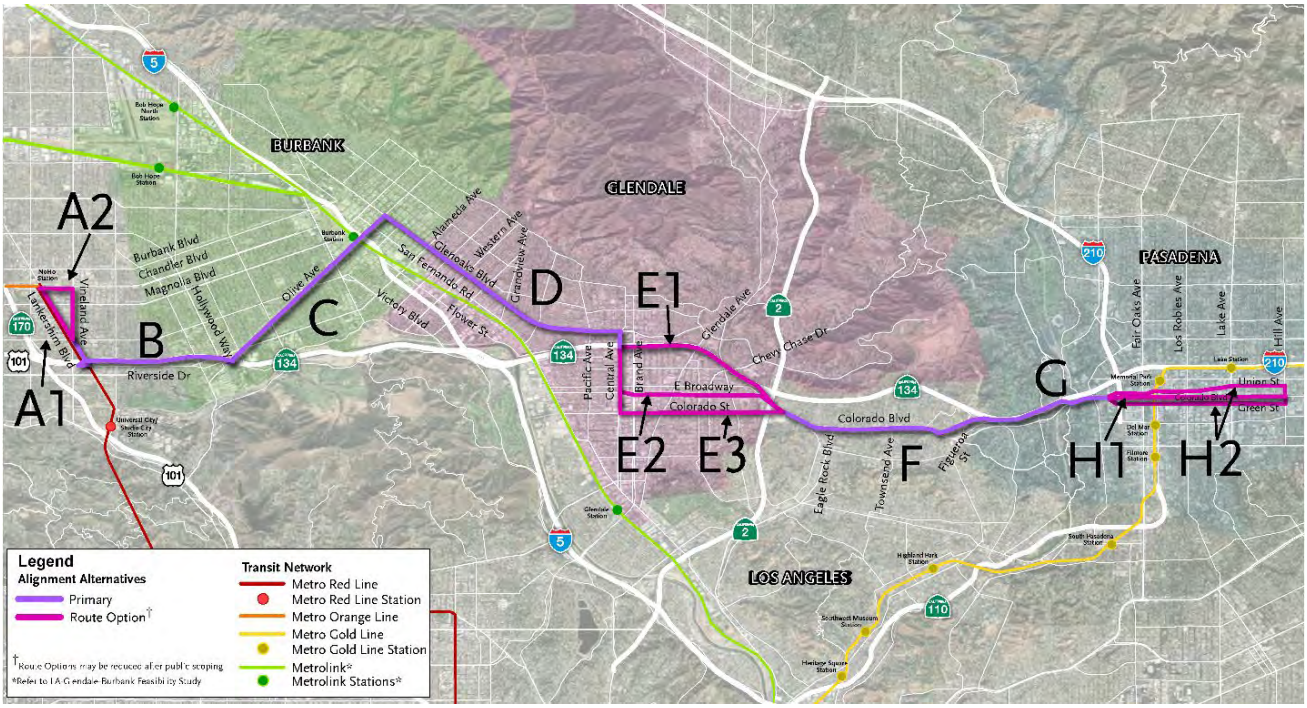


Table 37 – Potential Runningway Configurations

Key	Segment	From	To	Potential Runningway Configurations
A-1	Lankershim Boulevard	Lankershim Boulevard / Chandler Boulevard	Ventura Freeway at Lankershim Boulevard	Side-Running
A-2	Chandler Boulevard-Vineland Boulevard-Lankershim Boulevard			Center-Running

Key	Segment	From	To	Potential Runningway Configurations
B	Ventura Freeway	Lankershim Boulevard	Hollywood Way[1]	Mixed Flow (freeway)
C	Olive Avenue	Riverside	Glenoaks Boulevard	Side-Running Curb-Running
D	Glenoaks Boulevard	Olive Avenue	Central Avenue / Ventura Freeway	Median-Running Side-Running
E-1	Ventura Freeway	Central / Ventura Freeway	W. Broadway / Colorado Boulevard	Mixed Flow (freeway) Center-Running (street) Side-Running (street)
E-2	Central Avenue - Broadway			Center-Running Side-Running
E-3	Central Avenue – Colorado Street			Center-Running Side-Running Curb-Running
F	Colorado Boulevard	W Broadway	Colorado Boulevard / Ventura Freeway (Linda Rosa Avenue)	Center-Running Side-Running Curb-Running
G	Ventura Freeway (SR-134)	Colorado Boulevard / Ventura Freeway (Linda Rosa Avenue)	Ventura Freeway / Orange Grove Boulevard	Mixed Flow (Freeway)
H-1	Colorado Boulevard	Ventura Freeway / Orange Grove Boulevard	Colorado Boulevard / Hill Avenue	Side-Running
H-2	St. John Street - Green Street / Union Street (Couplet) – Hill Avenue			Side-Running

[1] EB SR-134 off-ramp at Pass Avenue to Riverside Drive; WB SR-134 on-ramp from Alameda via Hollywood Way.

7.2.3 Other BRT Treatments under Consideration

In addition to the various runningway options previously described, additional treatments to facilitate bus movements may be incorporated into the Project as it is further developed and evaluated in the environmental process. These are identified below.

Transit Signal Priority (TSP) – TSP will be considered along all route roadway segments. TSP can provide "Early Green," "Green Extension," and other transit priority functions to expedite buses through signalized intersections, resulting in up to 10-11 percent reduction in travel time relative to operations at intersections without transit signal priority.

Queue Jump – A "queue jump" can be provided at an intersection where there is a dedicated bus lane on the approach to allow a bus to proceed ahead of other traffic. At such a location, a "bus green" signal indication can be displayed to expedite a bus from a dedicated lane into a downstream mixed-flow section ahead of other vehicles. Candidate queue jump locations include transition lanes and freeway off- and on-ramps, where a spot widening could be provided to develop a bus-only lane from which buses can bypass other traffic.

8.0 PROJECT TIMELINE/ NEXT STEPS

8.0 Project Timeline/Next Steps

The North Hollywood to Pasadena BRT Corridor Planning and Environmental Study is currently in the Alternatives Analysis phase. Approval of the Alternatives Analysis will trigger initiation of the formal Environmental Analysis with issuance of a Notice of Preparation (NOP) in Spring 2019 followed by Public Scoping meetings. The Draft Environmental Impact Report (DEIR) will be available in early 2020 and it is expected that the Final EIR will be certified in late 2020. The overall project schedule anticipates design and construction commencing by mid-2022 with an opening date by mid-2024.

The Refined Street-Running Alternative with Route Options as described in this Alternatives Analysis is recommended for further evaluation in the DEIR. The DEIR will identify a Proposed Project and assess route options as part of the Proposed Project or as alternatives to lessen potentially significant impacts. The content of the DEIR will be informed by additional input from Public Scoping Meetings and the ongoing community engagement process.