North Hollywood to Pasadena Bus Rapid Transit (BRT) Corridor Planning and Environmental Study

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT

Prepared For:

Metro

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ACRONYMS AND ABBREVIATIONS

af	Artificial Fill
BRT	Bus Rapid Transit
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CIT	California Institute of Technology
EIR	Environmental Impact Report
gpd	Massive to Gneissoid Quartz Diorite
gr	Massive Granitic Rock
LACM	Los Angeles County Museum
Metro	Los Angeles County Metropolitan Transportation Authority
PBDB	Paleobiology Database
PRC	Public Resources Code
Qa	Alluvium
Qf	Alluvium Derived from Verdugo Mountains
Qg	Stream Channel Deposits
Qoa	Older Alluvial Deposits
Qof	Older Alluvial Fan Gravel and Sand
ROW	Right-of-Way
SVP	Society of Vertebrate Paleontology
Tb	Dikes
TSP	Transit Signal Priority
Ttqdb	Topanga Formation Breccia Unit
Ttsc	Topanga Formation Sandstone Unit
UCMP	University of California Museum of Paleontology

1. Introduction

The Los Angeles County Metropolitan Transportation Authority (Metro) is proposing the North Hollywood to Pasadena Bus Rapid Transit (BRT) Corridor Project (Proposed Project or Project) which would provide a BRT service connecting several cities and communities between the San Fernando and San Gabriel Valleys. Specifically, the Proposed Project would consist of a BRT service that runs from the North Hollywood Metro B/G Line (Red/Orange) station in the City of Los Angeles through the Cities of Burbank, Glendale, the community of Eagle Rock in the City of Los Angeles, and Pasadena, ending at Pasadena City College. The Proposed Project with route options would operate along a combination of local roadways and freeway sections with various configurations of mixed-flow and dedicated bus lanes depending on location. A Draft Environmental Impact Report (EIR) is being prepared for the following purposes:

- To satisfy the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code (PRC) Section 21000, et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, Section 15000, et seq.).
- To inform public agency decision-makers and the public of the significant environmental effects of the Proposed Project, as well as possible ways to minimize those significant effects, and reasonable alternatives to the Proposed Project that would avoid or minimize those significant effects.
- To enable Metro to consider environmental consequences when deciding whether to approve the Proposed Project.

The term “cultural resources” encompasses historic, archaeological, built environment, and paleontological resources, and burial sites. These terms are defined as:

- Paleontological resources are comprised of the remains, imprints, or traces of once-living organisms preserved in rocks, sediments, tar, amber, and other settings. Fossils are considered non-renewable resources because the organisms they represent no longer exist.
- Archaeological resources represent the material remains of past human activities. These resources are generally separated into two categories:
    - Prehistoric resources are associated with occupation of the land by Native Americans prior to contact with Euro-Americans. In California, these resources are typically less than 10,000 years old.
    - Historic-age resources are associated with activities and settlement of the land by Euro-Americans and are at least 50 years old.
- Built environment resources are those built above ground whereas prehistoric and historic resources are located on, or within, the ground.
- Burial sites are formal or informal locations where human remains, usually associated with indigenous cultures, are interred.

The current document is limited to paleontological resources. Built environment resources are discussed in the *Historical Resources Technical Report* (Galvin Preservation Associates, 2020). Archaeological resources and burial sites are discussed in the *Archaeological and Tribal Cultural Resources Technical Report* (Paleo Solutions, 2020).

This Paleontological Resources Technical Report provides the methods and results of the records search and literature review related to identifying the potential for the Proposed Project to impact paleontological resources and proposed treatment of those resources, if necessary. The study was completed in compliance with CEQA and pertinent City regulations.

This Paleontological Resources Technical Report is comprised of the following sections:

1. Introduction
2. Project Description
3. Regulatory Framework
4. Existing Setting
5. Significance Thresholds and Methodology
6. Impact Analysis
7. Cumulative Analysis
8. References
9. List of Preparers

2. Project Description

This section is an abbreviated version of the Project Description contained in the Draft EIR. This abbreviated version provides information pertinent to the Technical Reports. Please reference the Project Description chapter in the Draft EIR for additional details about the Proposed Project location and surrounding uses, project history, project components, and construction methods. The Draft EIR also includes a more comprehensive narrative description providing additional detail on the project routing, station locations, and proposed roadway configurations. Unless otherwise noted, the project description is valid for the Proposed Project and all route variations, treatments, and configurations.

2.1 PROJECT ROUTE DESCRIPTION

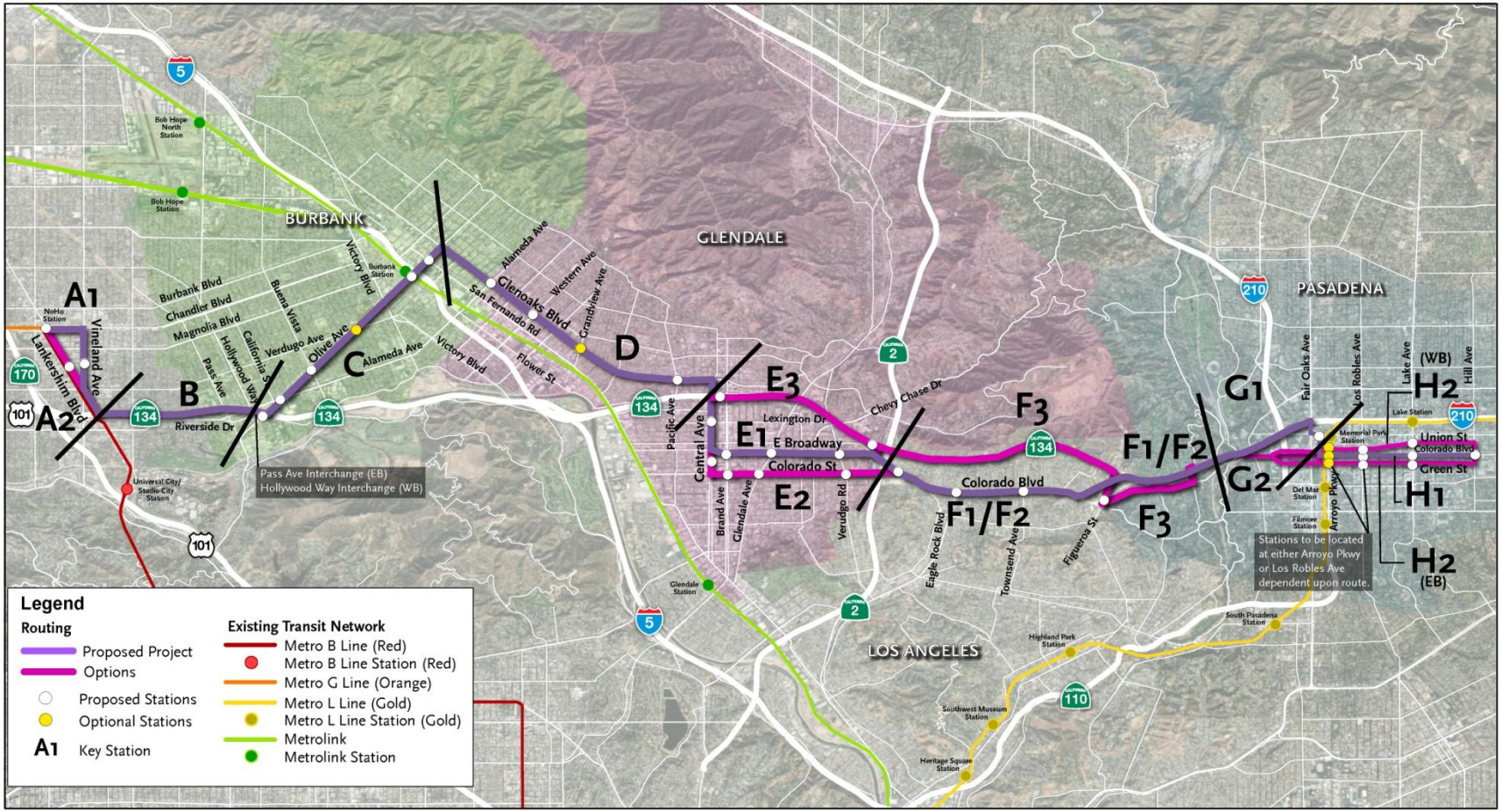
Metro is proposing the BRT service to connect several cities and communities between the San Fernando and San Gabriel Valleys. The Proposed Project extends approximately 18 miles from the North Hollywood Metro B/G Line (Red/Orange) Station on the west to Pasadena City College on the east. The BRT corridor generally parallels the Ventura Freeway (State Route 134) between the San Fernando and San Gabriel Valleys and 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. Potential connections with existing high-capacity transit services include the Metro B Line (Red) and G Line (Orange) in North Hollywood, the Metrolink Antelope Valley and Ventura Lines in Burbank, and the Metro L Line (Gold) in Pasadena. The Study Area includes several dense residential areas as well as many cultural, entertainment, shopping and employment centers, including the North Hollywood Arts District, Burbank Media District, Downtown Burbank, Downtown Glendale, Eagle Rock, Old Pasadena and Pasadena City College (see **Figure 1**).

2.2 BRT ELEMENTS

BRT is intended to move large numbers of people quickly and efficiently to their destinations. BRT may be used to implement rapid transit service in heavily traveled corridors while also offering many of the same amenities as light rail but on rubber tires and at a lower cost. The Project would provide enhanced transit service and improve regional connectivity and mobility by implementing several key BRT elements. Primary components of the BRT are further addressed below and include:

- Dedicated bus lanes on city streets
- Transit signal priority (TSP)
- Enhanced stations with all-door boarding

Figure 1 – Proposed Project with Route Options



2.3 DEDICATED BUS LANES

The Proposed Project would generally include dedicated bus lanes where there is adequate existing street width, while operating in mixed traffic within the City of Pasadena. BRT service would operate in various configurations depending upon the characteristics of the roadways as shown below:

- **Center-Running Bus Lanes**: Typically includes two lanes (one for each direction of travel) located in the center of the roadway. Stations are usually provided on islands at intersections and are accessible from the crosswalk.
- **Median-Running Bus Lanes**: Typically includes two lanes (one for each direction of travel) located in the inside lane adjacent to a raised median in the center of the roadway. Stations are usually provided on islands at intersections and are accessible from the crosswalk.
- **Side-Running Bus Lanes**: Buses operate in the right-most travel lane separated from the curb by bicycle lanes, parking lanes, or both. Stations are typically provided along curb extensions where the sidewalk is widened to meet the bus lane. At intersections, right-turn bays may be provided to allow buses to operate without interference from turning vehicles and pedestrians.
- **Curb-Running Operations**: Buses operate in the right-most travel lane immediately adjacent to the curb. Stations are located along the sidewalk which may be widened to accommodate pedestrian movement along the block. Right-turning traffic merges with the bus lane approaching intersections and buses may be delayed due to interaction with right-turning vehicles and pedestrians.
- **Mixed-Flow Operations**: Where provision of dedicated bus lanes is impractical, the BRT service operates in lanes shared with other roadway vehicles, although potentially with transit signal priority. For example, where the service transitions from a center-running to side-running configuration, buses would operate in mixed-flow. Buses would also operate in mixed-flow along freeway facilities.

Table 1 provides the bus lane configurations for each route segment of the Proposed Project.

Table 1 – Route Segments

Key	Segment	From	To	Bus Lane Configuration
A1 (Proposed Project)	**Lankershim Blvd.**	**N. Chandler Blvd.**	**Chandler Blvd.**	**Mixed-Flow**
	Chandler Blvd.	**Lankershim Blvd.**	**Vineland Ave.**	**Side-Running**
	Vineland Ave.	**Chandler Blvd.**	**Lankershim Blvd.**	**Center-Running**
	Lankershim Blvd.	**Vineland Ave.**	**SR-134 Interchange**	**Center-Running** **Mixed-Flow**[1]
A2 (Route Option)	Lankershim Blvd.	N. Chandler Blvd.	SR-134 Interchange	Side-Running Curb-Running[2]
B (Proposed Project)	**SR-134 Freeway**	**Lankershim Blvd.**	**Pass Ave. (EB)** **Hollywood Wy. (WB)**	**Mixed-Flow**
C (Proposed Project)	**Pass Ave. – Riverside Dr. (EB)** **Hollywood Wy. –** **Alameda Ave. (WB)**	**SR-134 Freeway**	**Olive Ave.**	**Mixed-Flow**[3]
	Olive Ave.	**Hollywood Wy. (EB)** **Riverside Dr. (WB)**	**Glenoaks Blvd.**	**Curb-Running**
D (Proposed Project)	**Glenoaks Blvd.**	**Olive Ave.**	**Central Ave.**	**Curb-Running** **Median-Running**[4]
E1 (Proposed Project)	**Central Ave.**	**Glenoaks Blvd.**	**Broadway**	**Mixed Flow** **Side-Running**[5]
	Broadway	**Central Ave.**	**Colorado Blvd.**	**Side-Running**
E2 (Route Option)	Central Ave.	Glenoaks Blvd.	Colorado St.	Side-Running
	Colorado St. – Colorado Blvd.	Central Ave.	Broadway	Side-Running
E3 (Route Option)	Central Ave.	Glenoaks Blvd.	Goode Ave. (WB) Sanchez Dr. (EB)	Mixed-Flow
	Goode Ave. (WB) Sanchez Dr. (EB)	Central Ave.	Brand Blvd.	Mixed-Flow
	SR-134[6]	Brand Blvd.	Harvey Dr.	Mixed-Flow
F1 (Route Option)	Colorado Blvd.	Broadway	Linda Rosa Ave. (SR-134 Interchange)	**Side-Running**
				Side-Running Center Running[7]

Key	Segment	From	To	Bus Lane Configuration
F2 (Proposed Project)	**Colorado Blvd.**	**Broadway**	**Linda Rosa Ave. (SR-134 Interchange)**	**Side-Running**
F3 (Route Option)	SR-134	Harvey Dr.	Figueroa St.	Mixed-Flow
	Figueroa St.	SR-134	Colorado Blvd.	**Mixed-Flow**
	Colorado Blvd.	Figueroa St.	SR-134 via N. San Rafael Ave. Interchange	**Mixed-Flow**
G1 (Proposed Project)	**SR-134**	**Colorado Blvd.**	**Fair Oaks Ave. Interchange**	**Mixed-Flow**
	Fair Oaks Ave.	**SR-134**	**Walnut St.**	**Mixed-Flow**
	Walnut St.	**Fair Oaks Ave.**	**Raymond Ave.**	**Mixed-Flow**
	Raymond Ave.	**Walnut St.**	**Colorado Blvd. or Union St./Green St.**	**Mixed-Flow**
G2 (Route Option)	SR-134	Colorado Blvd.	Colorado Blvd. Interchange	Mixed-Flow
	Colorado Blvd. or Union St./Green St.	Colorado Blvd. Interchange	Raymond Ave.	Mixed-Flow
H1 (Proposed Project)	**Colorado Blvd.**	**Raymond Ave.**	**Hill Ave.**	**Mixed-Flow**
H2 (Route Option)	Union St. (WB) Green St. (EB)	Raymond Ave.	Hill Ave.	Mixed-Flow

Notes:
[1]South of Kling St.
[2]South of Huston St.
[3]Eastbound curb-running bus lane on Riverside Dr. east of Kenwood Ave.
[4]East of Providencia Ave.
[5]South of Sanchez Dr.
[6]Route continues via Broadway to Colorado/Broadway intersection (Proposed Project F2 or Route Option F1) or via SR-134 (Route Option F3)
[7]Transition between Ellenwood Dr. and El Rio Ave.

2.4 TRANSIT SIGNAL PRIORITY

TSP expedites buses through signalized intersections and improves transit travel times. Transit priority is available areawide within the City of Los Angeles and is expected to be available in all jurisdictions served by the time the Proposed Project is in service. Basic functions are described below:

- **Early Green:** When a bus is approaching a red signal, conflicting phases may be terminated early to obtain the green indication for the bus.
- **Extended Green:** When a bus is approaching the end of a green signal cycle, the green may be extended to allow bus passage before the green phase terminates.
- **Transit Phase:** A dedicated bus-only phase is activated before or after the green for parallel traffic to allow the bus to proceed through the intersection. For example, a queue jump may be implemented in which the bus departs from a dedicated bus lane or a station ahead of other traffic, so the bus can weave across lanes or make a turn.

2.5 ENHANCED STATIONS

It is anticipated that the stations servicing the Proposed Project may include the following elements:

- Canopy and wind screen
- Seating (benches)
- Illumination, security video and/or emergency call button
- Real-time bus arrival information
- Bike racks
- Monument sign and map displays

Metro is considering near-level boarding which may be achieved by a combination of a raised curb along the boarding zone and/or ramps to facilitate loading and unloading. It is anticipated that BRT buses would support all door boarding with on-board fare collection transponders in lieu of deployment of ticket vending machines at stations.

The Proposed Project includes 21 proposed stations and two “optional” stations, and additional optional stations have been identified along the Route Options, as indicated in **Table 2**. Of the 21 proposed stations, four would be in the center of the street or adjacent to the median, and the remaining 17 stations would be situated on curbs on the outside of the street.

Table 2 – Proposed/Optional Stations

Jurisdiction	Proposed Project	Route Option
North Hollywood (City of Los Angeles)	North Hollywood Transit Center (Metro B/G Lines (Red/Orange) Station)	
	Vineland Ave./Hesby St.	Lankershim Blvd./Hesby St.
City of Burbank	Olive Ave./Riverside Dr.	
	Olive Ave./Alameda Ave.	
	Olive Ave./Buena Vista St.	
	Olive Ave./Verdugo Ave. (optional station)	
	Olive Ave./Front St. (on bridge at Burbank-Downtown Metrolink Station)	
	Olive Ave./San Fernando Blvd.	
City of Glendale	Glenoaks Blvd./Alameda Ave.	
	Glenoaks Blvd./Western Ave.	
	Glenoaks Blvd./Grandview Ave. (optional station)	
	Central Ave./Lexington Dr.	Goode Ave. (WB) & Sanchez Dr. (EB) west of Brand Blvd.
		Central Ave./Americana Way
	Broadway/Brand Blvd.	Colorado St./Brand Blvd.
	Broadway/Glendale Ave.	Colorado St./Glendale Ave.
	Broadway/Verdugo Rd.	Colorado St./Verdugo Rd.
		SR 134 EB off-ramp/WB on-ramp west of Harvey Dr.
Eagle Rock (City of Los Angeles)	Colorado Blvd./Eagle Rock Plaza	
	Colorado Blvd./Eagle Rock Blvd.	
	Colorado Blvd./Townsend Ave.	Colorado Blvd./Figueroa St.
City of Pasadena	Raymond Ave./Holly St. [1] (near Metro L Line (Gold) Station)	
	Colorado Blvd./Arroyo Pkwy. [2]	Union St./Arroyo Pkwy. (WB)[2] Green St./Arroyo Pkwy. (EB)[2]
	Colorado Blvd./Los Robles Ave. [1]	Union St./Los Robles Ave. (WB)[1] Green St./Los Robles Ave. (EB)[1]
	Colorado Blvd./Lake Ave.	Union St./Lake Ave. (WB) Green St./Lake Ave. (EB)
	Pasadena City College (Colorado Blvd./Hill Ave.)	Pasadena City College (Hill Ave./Colorado Blvd.)

[1]With Fair Oaks Ave. interchange routing
[2]With Colorado Blvd. interchange routing

2.6 DESCRIPTION OF CONSTRUCTION

Construction of the Proposed Project would likely include a combination of the following elements dependent upon the chosen BRT configuration for the segment: restriping, curb-and-gutter/sidewalk reconstruction, right-of-way (ROW) clearing, pavement improvements, station/loading platform construction, landscaping, and lighting and traffic signal modifications. Generally, construction of dedicated bus lanes consists of pavement improvements including restriping, whereas ground-disturbing activities occur with station construction and other support structures. Existing utilities would be protected or relocated. Due to the shallow profile of construction, substantial utility conflicts are not anticipated, and relocation efforts should be brief. Construction equipment anticipated to be used for the Proposed Project consists of asphalt milling machines, asphalt paving machines, large and small excavators/backhoes, loaders, bulldozers, dump trucks, compactors/rollers, and concrete trucks. Additional smaller equipment may also be used such as walk-behind compactors, compact excavators and tractors, and small hydraulic equipment.

The construction of the Proposed Project is expected to last approximately 24 to 30 months. Construction activities would shift along the corridor so that overall construction activities should be of relatively short duration within each segment. Most construction activities would occur during daytime hours. For specialized construction tasks, it may be necessary to work during nighttime hours to minimize traffic disruptions. Traffic control and pedestrian control during construction would follow local jurisdiction guidelines and the Work Area Traffic Control Handbook. Typical roadway construction traffic control methods would be followed including the use of signage and barricades.

It is anticipated that publicly owned ROW or land in proximity to the Proposed Project's alignment would be available for staging areas. Because the Proposed Project is anticipated to be constructed in a linear segment-by-segment method, there would not be a need for large construction staging areas in proximity to the alignment.

2.7 DESCRIPTION OF OPERATIONS

The Proposed Project would provide BRT service from 4:00 a.m. to 1:00 a.m. or 21 hours per day Sunday through Thursday, and longer service hours (4:00 a.m. to 3:00 a.m.) would be provided on Fridays and Saturdays. The proposed service span is consistent with the Metro B Line (Red). The BRT would operate with 10-minute frequency throughout the day on weekdays tapering to 15 to 20 minutes frequency during the evenings, and with 15-minute frequency during the day on weekends tapering to 30 minutes in the evenings. The BRT service would be provided on 40-foot zero-emission electric buses with the capacity to serve up to 75 passengers, including 35-50 seated passengers and 30-40 standees, and a maximum of 16 buses are anticipated to be in service along the route during peak operations. The buses would be stored at an existing Metro facility.

3. Regulatory Framework

3.1 FEDERAL REGULATIONS

There are no federal regulations regarding paleontological resources that apply to this project.

3.2 STATE REGULATIONS

3.2.1 California Environmental Quality Act

The procedures, types of activities, persons, and public agencies required to comply with CEQA are defined in the Guidelines for Implementation of CEQA (State CEQA Guidelines), as amended on March 18, 2010 (Title 14, Section 15000 et seq. of the California Code of Regulations and further amended January 4, 2013, and December 28, 2018). One of the questions listed in the CEQA Environmental Checklist is: “Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?” (State CEQA Guidelines Appendix G, Section VII, Part F).

3.2.2 California Public Resources Code

The California PRC (Chapter 1.7), Sections 5097 and 30244, includes additional state level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts to paleontological resources resulting from development on state lands, and define the excavation, destruction, or removal of paleontological “sites” or “features” from public lands without the express permission of the jurisdictional agency as a misdemeanor. As used in Section 5097, “state lands” refers to lands owned by, or under the jurisdiction of, the state or any state agency. “Public lands” is defined as lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

3.3 LOCAL REGULATIONS

3.3.1 City of Los Angeles

The City of Los Angeles’ General Plan is a comprehensive, long-range declaration of purposes, policies and programs. The Conservation Element of the General Plan identifies paleontological resources in the City of Los Angeles and contains resource management objectives and policies. Relevant Conservation Element objectives and policies related to paleontological resource are shown in **Table 3**.

Table 3 – City of Los Angeles Conservation Element of the General Plan

Objectives/Policy	Description
Objective	Protect the city's archaeological and paleontological resources for historical, cultural, research and/or educational purposes.
Policy 1	Continue to identify and protect significant archaeological and paleontological sites and/or resources known to exist or that are identified during land development, demolition or property modification activities.

SOURCE: City of Los Angeles, *Conservation Element of the Los Angeles General Plan*, 2001.

3.3.2 City of Burbank

The Open Space and Conservation Element of the City of Burbank's General Plan contains resource management goals and policies. Relevant Open Space and Conservation Element goals and policies related to paleontological resources are shown in **Table 4**.

Table 4 – City of Burbank Open Space and Conservation Element of the General Plan

Goal/Policy	Description
Goal 6	Burbank's open space areas and mountain ranges are protected spaces supporting important habitat, recreation, and resource conservation.
Policy 6.1	Recognize and maintain cultural, historical, archaeological, and paleontological structures and sites essential for community life and identity.

SOURCE: City of Burbank, *Burbank 2035 General Plan, Open Space and Conservation Element*, 2013.

3.3.3 City of Glendale

The City of Glendale General Plan (1997) does not contain any goals, objectives, or policies pertaining to paleontological resources.

3.3.4 City of Pasadena

The City of Pasadena General Plan (2015) does not contain any goals, objectives, or policies pertaining to paleontological resources.

4. Existing Setting

The Project Area is located within the Transverse Ranges Geomorphic Province at its southern boundary with the Peninsular Ranges Geomorphic Province (California Geological Survey, 2002). A geomorphic province is a geographical area of distinct landscape character with related geophysical features, including relief, landforms, orientations of valleys and mountains, type of vegetation, and other geomorphic attributes (Harden, 2004). In contrast to the other mountain ranges in California, which are aligned north to south, the Transverse Ranges are aligned to the northwesterly trending San Andreas Fault and span east to west approximately 520 kilometers, beginning at the boundary of Joshua Tree National Park with the Mojave Desert and Colorado Desert on the North American Plate, crossing the San Andreas Fault at the Cajon Pass, and terminating at San Miguel Island on the Pacific Plate (Prothero, 2017). Separated by the San Andreas Fault, the Transverse Ranges are divisible into two distinct provinces each with a distinct geological history: the Western Transverse Ranges, which lie west of the San Andreas Fault on the Pacific Plate; and the Eastern Transverse Ranges, which lie east of the San Andreas Fault on the North American Plate (Harden, 2004; Norris and Webb, 1990; Prothero, 2017). The Project Area is specifically within the Western Transverse Ranges.

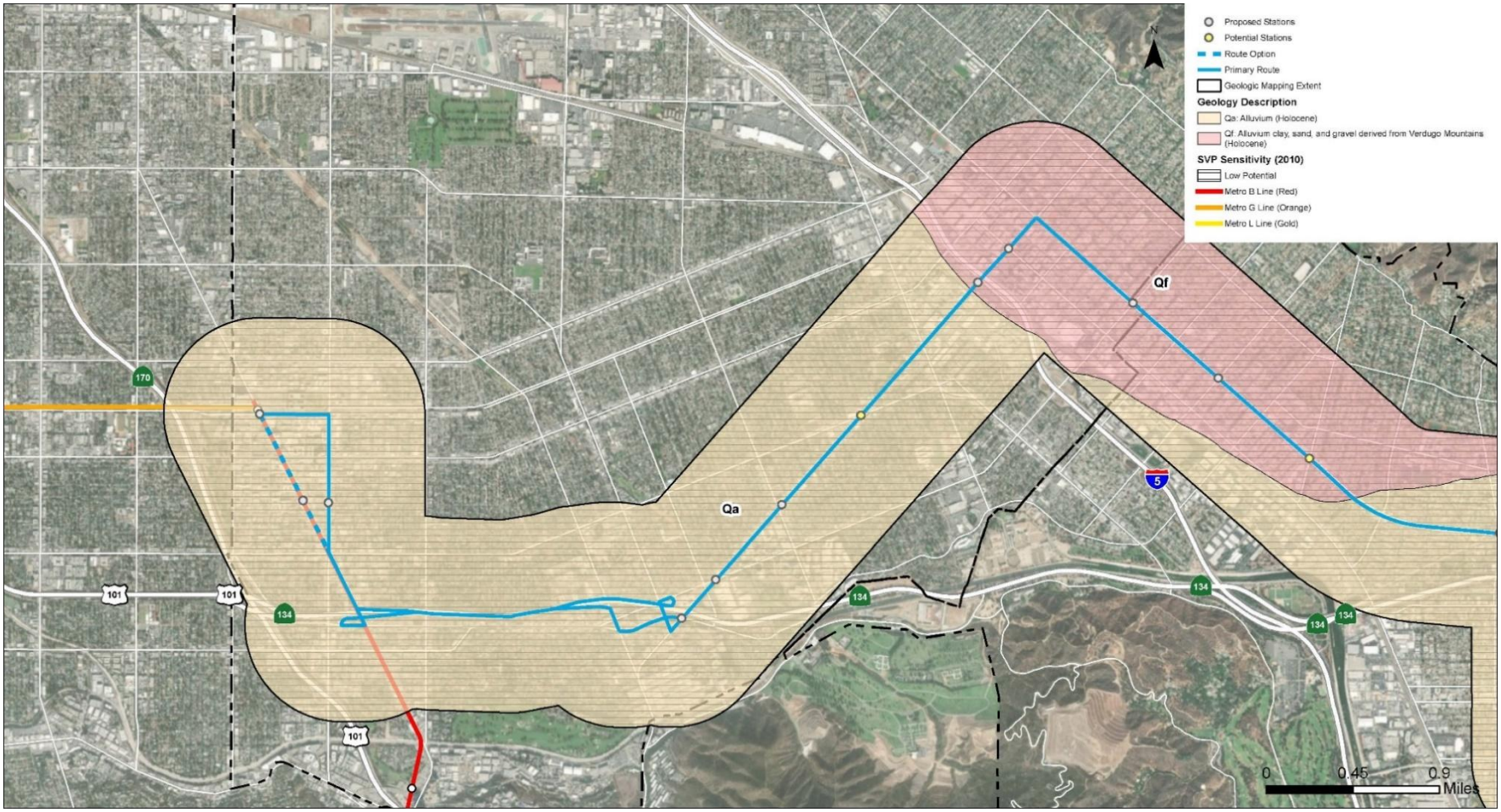
4.1 GEOLOGICAL AND PALEONTOLOGICAL CONTEXT

Geologic mapping by Dibblee and Ehrenspeck (1989, 1991, 1998) indicates that the Project area is underlain by Holocene-age younger sedimentary deposits (Qa, Qf, Qg), Pleistocene-age older sedimentary deposits (Qoa, Qof), Miocene-age Topanga Formation (Ttsc, Ttqdb), and Cretaceous-age igneous rocks (gr, qpd). Additionally, mapped within the half mile buffer of the Project Area are recent artificial fill (af) and Tertiary-age dikes (Tb) (see **Figure 2** through **Figure 4**).

4.1.1 Artificial Fill (Recent)

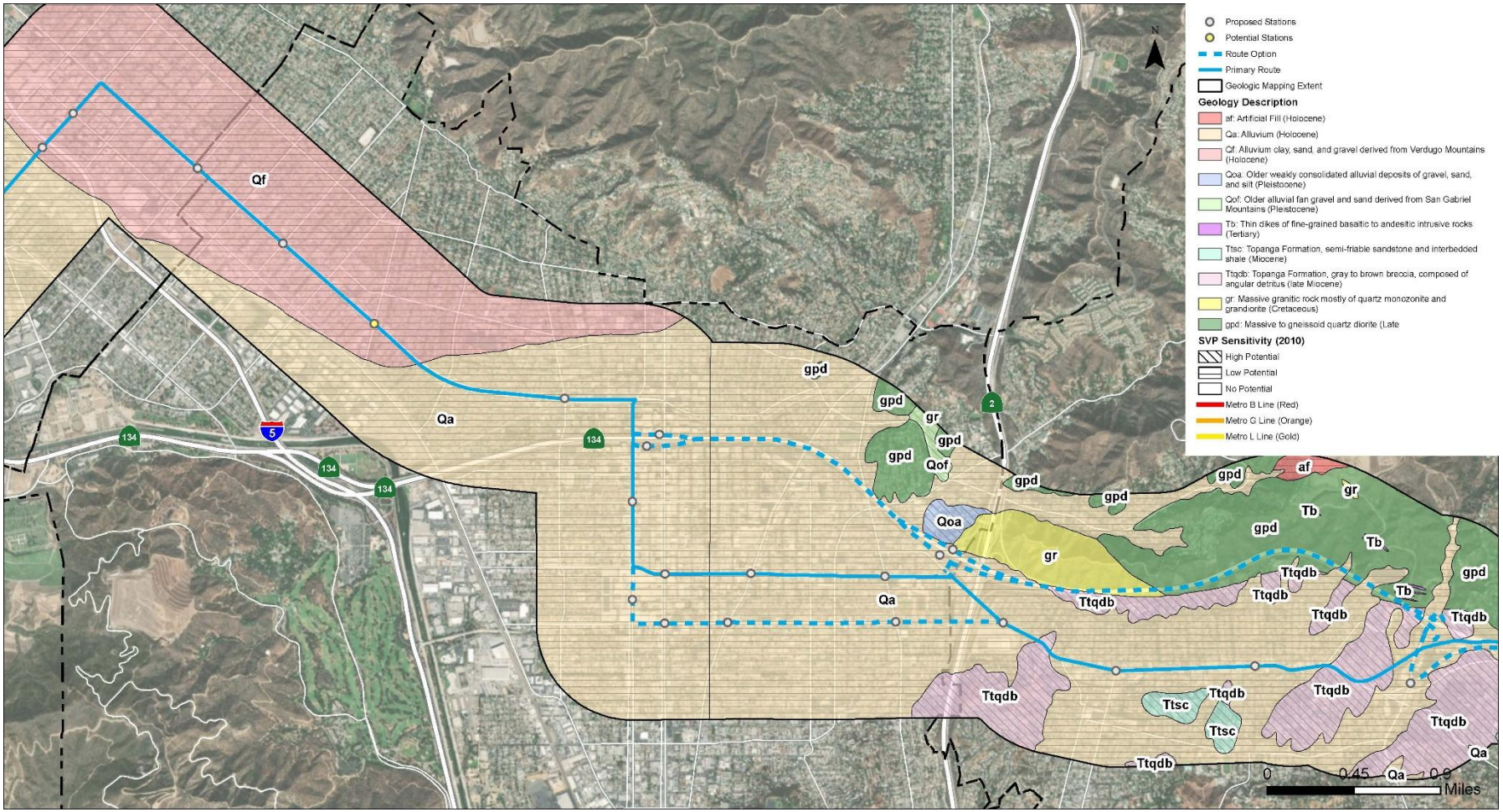
Artificial fill (af) comprises recent deposits of previously disturbed sediments emplaced by construction operations and are found in areas where recent construction has taken place. Color is highly variable, and sediments are mottled in appearance. These sediments are not mapped within the boundaries of the Project Area but are likely to be encountered within previously disturbed portions of the Project. Scientifically significant fossils are generally not known from artificial fill (af), since any discovered resource would lack stratigraphic context. These deposits have a low paleontological potential using Society of Vertebrate Paleontology (SVP) (2010) guidelines.

Figure 2 – Project Area Geology and Paleontological Sensitivity, Map 1 of 3



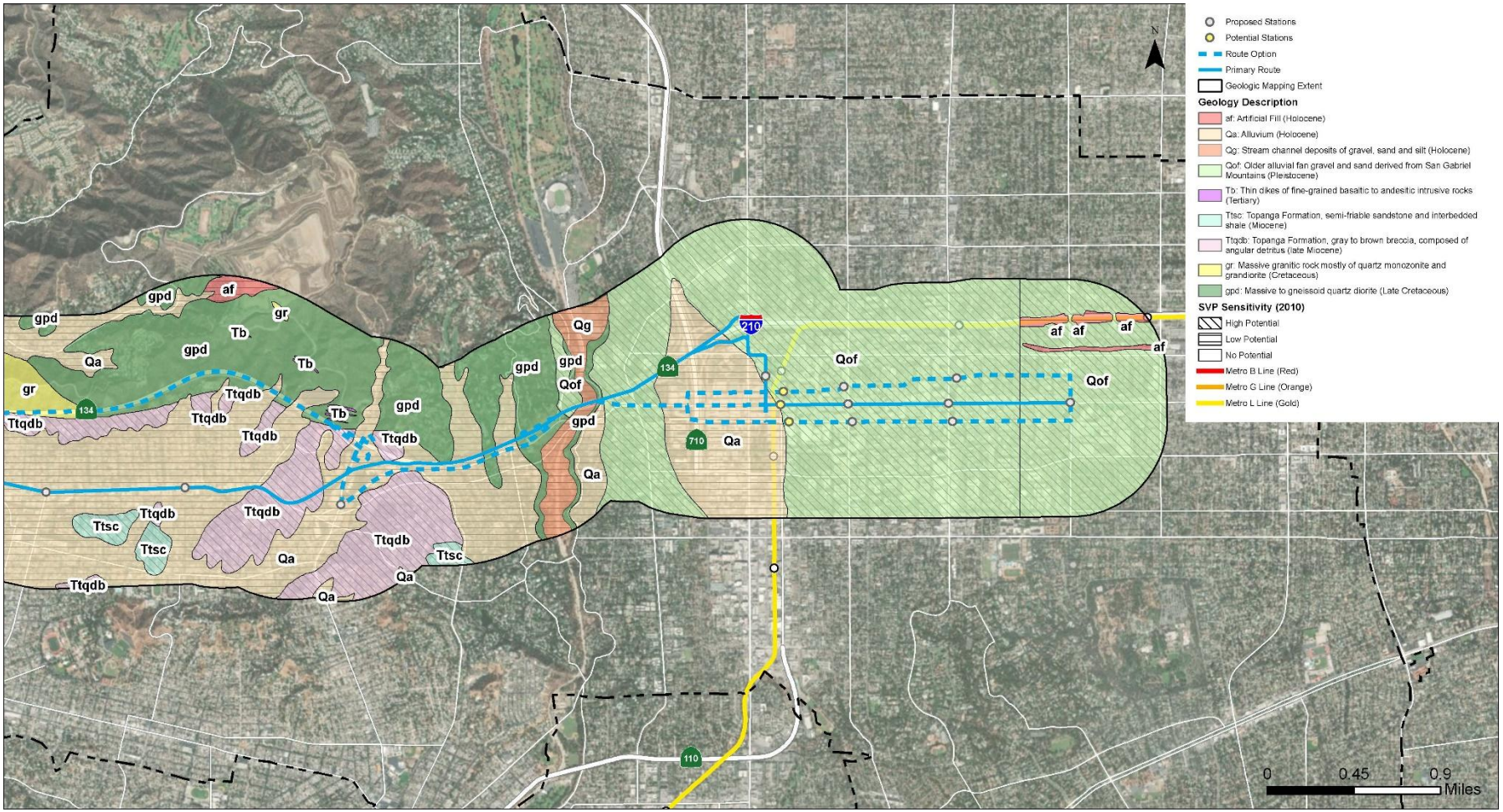
SOURCE: Dibblee and Ehrenspeck, *Geologic map of the Hollywood and Burbank (south ½) quadrangles*, 1991.

Figure 3 – Project Area Geology and Paleontological Sensitivity, Map 2 of 3



SOURCE: Dibblee and Ehrenspeck, *Geologic map of the Hollywood and Burbank (south ½) quadrangles*, 1991; Dibblee and Ehrenspeck, *Geologic map of the Pasadena quadrangle*, 1989.

Figure 4 – Project Area Geology and Paleontological Sensitivity, Map 3 of 3



SOURCE: Dibblee and Ehrenspeck, *Geologic map of the Pasadena quadrangle*, 1989; Dibblee and Ehrenspeck, *Geologic map of the Mount Wilson and Azusa quadrangles*, 1998. .

4.1.2 Younger Sedimentary Deposits (Holocene)

Younger surficial sedimentary deposits are Holocene-age (less than 11,000 years old) and include alluvium (Qa, Qf) and stream channel deposits (Qg) within the Project Area. Alluvium within the Project Area consists of unconsolidated deposits of clay, silt, sand, and gravel (Qa), and clay, sand, and gravel derived from the Verdugo Mountains (Qf). Stream channel deposits (Qg) are composed of gravel, sand, and silt (Dibblee and Ehrenspeck, 1989, 1991, 1998). Holocene-age sediments are typically too young to contain fossilized material (SVP, 2010), but they may overlie sensitive older (e.g., Pleistocene- or Miocene-age) deposits at variable depth. Holocene-age younger sedimentary deposits (Qa, Qf, Qg) are therefore considered to have a low potential for producing significant paleontological resources using SVP (2010) guidelines.

4.1.3 Older Sedimentary Deposits (Pleistocene)

Pleistocene-age older sedimentary deposits were deposited between approximately 2.51 million years ago to 11,000 years ago and comprise variable amounts of silt, sand, and gravel that were deposited in ancient terrestrial environments. Pleistocene-age units mapped within the Project Area include weakly consolidated older alluvium composed of gravel, sand, and silt (Qoa) and older alluvial fan deposits composed of gravel and sand derived from the San Gabriel Mountains (Qof) (Dibblee and Ehrenpeck, 1989, 1998).

Numerous Ice Age taxa have been recovered from Pleistocene-age deposits in Los Angeles County, and specimens include frog (cf. *Rana* sp.), tortoise (*Emys marmorata*), scaled reptile (Squamata), snake (Serpentes), pheasant (*Parapavo californicus*), quail (*Callipepla*), shearwater (*Ardenna grisea*), western grebe (*Aechmophorus occidentalis*), loon (*Gavia* sp.), duck (Anatidae), diving goose (*Chendytes lawi*), ray-finned fish (Teleostei), eagle ray (*Myliobatis*), shark (Chondrichthyes), white shark (*Carcharodon* sp.), perch (*Rhacochilus vacca*), speckled sanddab (*Citharichthys* sp.), white croaker (*Genyonemus lineatus*, *Merluccius productus*, *Merluccius productus*), rodent (*Neotoma*, *Thomomys*, *Dipodomys* cf. *agilis, Microtus californicus*, *Peromyscus* sp., *Notiosorex crawfordi*), rabbit (*Lepus californicus*, *Sylvilagus*), horse (*Equus* sp., *Equus simplicidens*), tapir (*Tapirus haysii, Tapirus* cf. *californicus*), cat (Felinae), black bear (*Ursus americanus*), bison (*Bison*), mammoth (*Mammuthus primigenius*, *Mammuthus* cf. *columbi*), mastodon (*Mammut pacificus*), ground sloth (Megalonychidae, *Megalonyx* sp., *Paramylodon harlani*), camel (*Camelops* sp., *Camelops* cf. *hesternus, Hemiauchenia* sp.), deer (*Odocoileus* cf. *hemionus*), dire wolf (*Canis* cf. *dirus*), coyote (*Canis* cf. *latrans*), lynx (*lynx rufus*), saber-toothed cat (*Smilodon* sp.), whale (Cetacea), sea otter (*Enhydra* sp.), seal (Otariidae, Phocidae), sea lion (*Phoca* cf. *vitulina*, *Zalophus* sp.), and dolphin (*Lissodelphis*) (Paleobiology Database [PBDB], 2020; University of California Museum of Paleontology [UCMP], 2020). The Pleistocene-age older sedimentary deposits (Qoa, Qof) have a high paleontological potential using SVP (2010) guidelines.

4.1.4 Topanga Formation (Miocene)

The Topanga Formation is early to middle Miocene age (approximately 18 to 12 million years old) and comprises moderate to deep marine deposits consisting dominantly of sandstone, siltstone, and shale. The Topanga Formation was originally named by Kew (1923) for exposures in the Santa Monica Mountains, and it extends through the southern, eastern, northern, and northwestern areas of the Los Angeles Basin, as well as the southern part of the eastern Ventura Basin (Campbell et al., 2007). Within the Project Area and immediate vicinity, the Topanga Formation includes two distinct lithologies including a breccia unit (Ttqdb) and a sandstone unit (Ttsc). The breccia unit (Ttqdb) consists of gray to brown, massive to vaguely bedded breccia composed of angular detritus with sparse rounded cobbles and boulders of biotite hornblende quartz diorite. The sandstone unit (Ttsc) consists of light gray to brown, semi-friable sandstone and interbedded sandy to silty shale and pebble-cobble conglomerate (Dibblee and Ehrenspeck, 1989).

The Topanga Formation has produced numerous significant fossil resources, including vertebrates, invertebrates, plants, and microfossils. Recorded vertebrate specimens from Los Angeles and Orange counties include ray (*Myliobatis*), dogfish shark (*Squalus sericulus*), angel shark (*Squatina lerichei*), mackerel shark (*Isurus tumulus*), requiem shark (*Negaprion*, *Galeocerdo aduncus*), weasel shark (*Hemipristis serra*), hooked tooth mako shark (*Isurus planus*), white shark (*Carcharodon tembloris*), megalodon (*Carcharocles megalodon*), shorebird (*Alcodes* aff. *ulnulus*), duck (Anatidae), albatross (*Diomedea*), shearwater (*Puffinus priscus*), booby (Sulidae), mouse (*Leidymys*), rabbit (*Archaeolagus*), horse (Equidae, *Parapliohippus carrizoensis*), sea cow (*Dusisiren reinharti*, *Hydrodamalis cuestae*, *Metaxytherium arctodites*, *Dioplotherium allisoni*), hippopotamus-like creature (*Desmostylus hesperus*, *Paleoparadoxia*), walrus (*Neotherium*, *Pelagiarctos*), pinniped (*Eotaria, Allodesmus*), camel (*Aepycamelus*), and whale (Cetotheriidae, *Zarhinocetus errabundus*, *Kentriodon obscurus*) (PBDB, 2020; UCMP, 2020). The Topanga Formation (Ttsc, Ttqdb) has a high paleontological potential using SVP (2010) guidelines.

4.1.5 Igneous Rocks (Tertiary and Cretaceous)

The Project area is underlain by one Tertiary-age and two Cretaceous-age igneous rock units, which have no potential to produce paleontological resources.

Igneous rocks are crystalline or non-crystalline rocks that form through the cooling and subsequent solidification of lava or magma. Intrusive (plutonic) igneous rocks form below the earth's surface, and extrusive (volcanic) rocks form on the earth's surface. Lava and magma are formed by the melting of pre-existing plutonic rocks in the earth's crust or mantle due to increases in temperature, changes in pressure, or changes in geochemical composition. Extreme temperatures in the environments in which intrusive igneous rocks form prevent the preservation of fossils. The formation of extrusive igneous rocks as a result of volcanic processes is associated with extremely high temperatures that also generally prevents the preservation of fossils.

The following igneous rocks are present within the Project Area (Dibblee and Ehrenspeck, 1989):

- Tertiary-age thin dikes of fine-grained basaltic to andesitic intrusive rocks (Tb);
- Cretaceous-age massive granitic rock mostly of quartz monzonite and granodiorite (gr); and
- Late Cretaceous-age, massive to gneissoid quartz diorite (gpd).

4.2 PALEONTOLOGICAL RECORD SEARCH RESULTS

A paleontological search of records maintained by the Natural History Museum of Los Angeles County was completed on March 5, 2020. The museum reported that there is one fossil locality recorded from within the Project Area, and that additional localities have been recorded from within the Project vicinity from sediments similar to those underlying the Project Area (McLeod, 2020; Appendix A).

Locality LACM 6970 is partially located within the western portion of the Project Area and produced specimens of camel (*Camelops hesternus*), bison (*Bison antiquus*), and ground sloth (*Glossotherium harlani*) from depths of 60 to 80 feet within Pleistocene-age deposits. Further south of the western portion of the Project Area, localities 6306 and 6385-6386 produced specimens of stickleback fish (Gasterosteidae), frogs (*Rana*, Hylidae), lizards (*Gerrhonotus*, *Uta*), snakes (*Thamnophis*, *Tantilla*), bird (Aves), shrew (*Sorex*), rabbit (*Sylvilagus*), and rodents (*Perognathus*, *Thomomys*, *Dipodomys*, and *Peromyscus*) from depths of 40 to 60 feet within Pleistocene-age deposits. Locality LACM (CIT) 342 is located to the south of the central portion of the Project Area in Eagle Rock and produced specimens of mammoth (*Mammuthus*) and turkey (*Parapavo californicus*) from a depth of 14 feet within Pleistocene-age deposits. Locality LACM 2027 is located to the northeast of the Project Area and produced mastodon (*Mammut*) fossil from an unreported depth within Pleistocene-age deposits (McLeod, 2020; Appendix A).

Locality LACM (CIT) 424 is located to the south of the Project Area in Eagle Rock and produced specimens of fossil fish, including herrings (*Ganolytes* and *Etringus*) and snake mackerel (*Thyrsocles*) from the Topanga Formation. The depth of recovery was not reported (McLeod, 2020; Appendix A).

5. Significance Thresholds and Methodology

5.1 SIGNIFICANCE THRESHOLDS

Appendix G of the State CEQA Guidelines provides screening questions to address impacts with regard to built environment, archaeological, paleontological, cultural, and tribal cultural resources. The current report addresses paleontological resources only. Analysis pertaining to historical and archaeological resources are addressed separately in the *Historic Resources Technical Report (*Galvin Preservation Associates, 2020) and the A*rchaeological and Tribal Cultural Resources Technical Report* (Paleo Solutions, 2020).

In accordance with Appendix G of the State CEQA Guidelines, the Project would have a significant impact related to paleontological resources if it would:

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

5.2 METHODOLOGY

The paleontological scope of work included an analysis of existing data consisting of a geologic map review, a review of literature and online databases, and a record search conducted at the Natural History Museum of Los Angeles County. Paleo Solutions reviewed geologic mapping of the Project Area and half-mile buffer by T.W. Dibblee and H.E. Ehrenspeck (1989, 1991, 1998). The literature review included published and unpublished scientific papers. Samuel McLeod, Ph.D., conducted the Natural History Museum of Los Angeles County record search, dated March 5, 2020. Additional record searches of online databases, including the UCMP database and the PBDB, were completed by Paleo Solutions staff.

5.2.1 Criteria for Evaluating Paleontological Sensitivity

Based on the results of the analysis of existing data, paleontological sensitivity of the geologic units within the Project Area were ranked using SVP (2010) guidelines. In its “Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources,” SVP (2010) recognizes four categories of paleontological potential for rock units: high, undetermined, low, and no potential:

High Potential: Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rock units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ashes or tephras), some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent,

and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstones, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones, etc.). Paleontological potential consists of both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.

Undetermined Potential: Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.

Low Potential: Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units would be poorly represented by fossil specimens in institutional collections or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule (e.g., basalt flows or recent colluvium). Rock units with low potential typically would not require impact mitigation measures to protect fossils.

No Potential: Some rock units have no potential to contain significant paleontological resources, for instance high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Rock units with no potential require no protection nor impact mitigation measures relative to paleontological resources.

6. Impact Analysis

The following section includes the impact analysis, mitigation measures (if necessary), and significance after mitigation measures (if applicable). The potential for the Proposed Project to result in an impact to paleontological resources is independent of the specific alignment and Project components. The following impact conclusions are valid for the Proposed Project and all route variations, treatments, and configurations.

Impact a) Would the Proposed Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Construction

Less-Than-Significant Impact. The Proposed Project would include dedicated bus lanes along existing surface streets where feasible, using a variety of configuration options in combination with mixed-flow operation along freeway segments and local roadways where dedicated bus lanes are not practical. Dedicated bus lanes would be provided by repurposing and/or revising existing roadway travel lane and parking delineations with limited roadway reconstruction or widening. Excavation activities would be limited to two to three feet below ground surface, within soils previously impacted during initial road and sidewalk construction.

Within the station platform footprints various vertical elements such as shelters, seating, monument signs, electronic displays and bicycle racks would be located. Excavation associated with these vertical elements would be limited to the first two to three feet below ground surface, within soils previously impacted during initial road and sidewalk construction.

Design integration of the station features into the sidewalk area would consider retaining or relocating existing vertical elements such as trees, signs, parking meters and streetlights to minimize conflicts. Excavation of these elements may extend to a depth of 12 feet below ground surface.

One paleontological locality was recorded from Pleistocene-age deposits within the western portion of the Project Area from a depth of 60 to 80 feet and additional localities were recorded from the Pleistocene-age deposits and Miocene-age Topanga Formation in the vicinity of the Project. Furthermore, it is possible that buried paleontological resources or unique geological features are present within native, undisturbed sediments of the high paleontological potential Pleistocene-age older sedimentary deposits (Qoa, Qof) or Miocene-age Topanga Formation (Ttsc, Ttqdb) in the subsurface of the Project Area. However, based on the excavation plans, the majority of the excavations would be within previously disturbed sediments in the upper three feet of the site. These shallow excavations would not result in impacts to significant paleontological resources. Excavations for tree removal are generally minimal and shallow, only extending to the depth necessary to remove the stump and root system. Therefore, there is a low likelihood of uncovering significant paleontological or unique geologic resources during tree removal.

In the unanticipated event that fossil resources are discovered, they should be protected from further excavation, destruction, or removal as required by the California PRC (see Section 3).

Operations

No Impact. The surface-running BRT would have no potential to disturb paleontological resources. Therefore, the Proposed Project would not result in a significant impact related to operational activities.

Mitigation Measures

No mitigation measures are required.

Significance of Impacts after Mitigation

Less-than-significant impact.

7. Cumulative Analysis

CEQA Guidelines Section 15355 defines cumulative impacts as two or more individual actions that, when considered together, are considerable or would compound other environmental impacts. CEQA Guidelines Section 15130(a) requires that an Environmental Impact Report (EIR) discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable." As set forth in CEQA Guidelines Section 15065(a)(3), "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. Thus, the cumulative impact analysis allows the EIR to provide a reasonable forecast of future environmental conditions to more accurately gauge the effects of multiple projects.

In accordance with CEQA Guidelines Section 15130(a)(3), a project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. In addition, the lead agency is required to identify facts and analysis supporting its conclusion that the contribution would be rendered less than cumulatively considerable.

CEQA Guidelines Section 15130(b) further provides that the discussion of cumulative impacts reflects "the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone." Rather, the discussion is to "be guided by the standards of practicality and reasonableness and should focus on the cumulative impact to which the identified other projects contribute." CEQA Guidelines Sections 15130(b)(1)(A) and (B) include two methodologies for assessing cumulative impacts. One method is a list of past, present, and probable future projects producing related or cumulative impacts. The other method is a summary of projections contained in an adopted local, regional, or statewide plan, or related planning document that describes or evaluates conditions contributing to the cumulative effect. Such plans may include a general plan, regional transportation plan, or plans for reducing greenhouse gas emissions. The cumulative effect on paleontological resources in the Project Area is best addressed through consideration of Related Projects.

Related Projects that are considered in the cumulative impact analysis are those projects that may occur in the Project Site's vicinity within the same timeframe as the Proposed Project. In this context, "Related Projects" includes past, present, and reasonably probable future projects. Related Projects associated with this growth and located within half a mile of the Project Site are depicted graphically in **Figures 5a** through **5c** and listed in **Table 5**. The figures do not show Eagle Rock as no related projects have been identified in the Project Area. Related projects of particular relevance to the Proposed Project are discussed below.

Figure 5a – Cumulative Impact Study Area

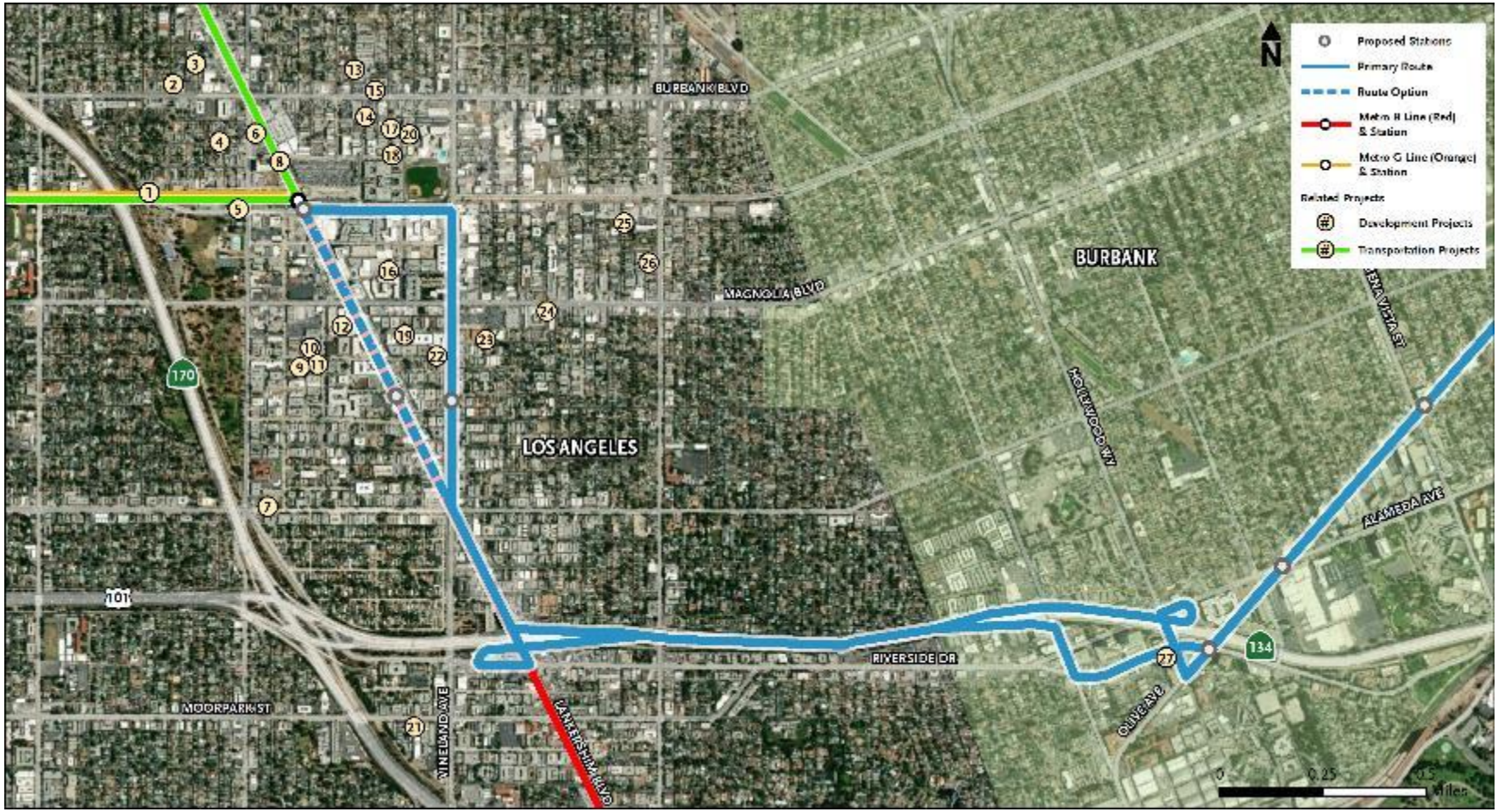


Figure 5b – Cumulative Impact Study Area

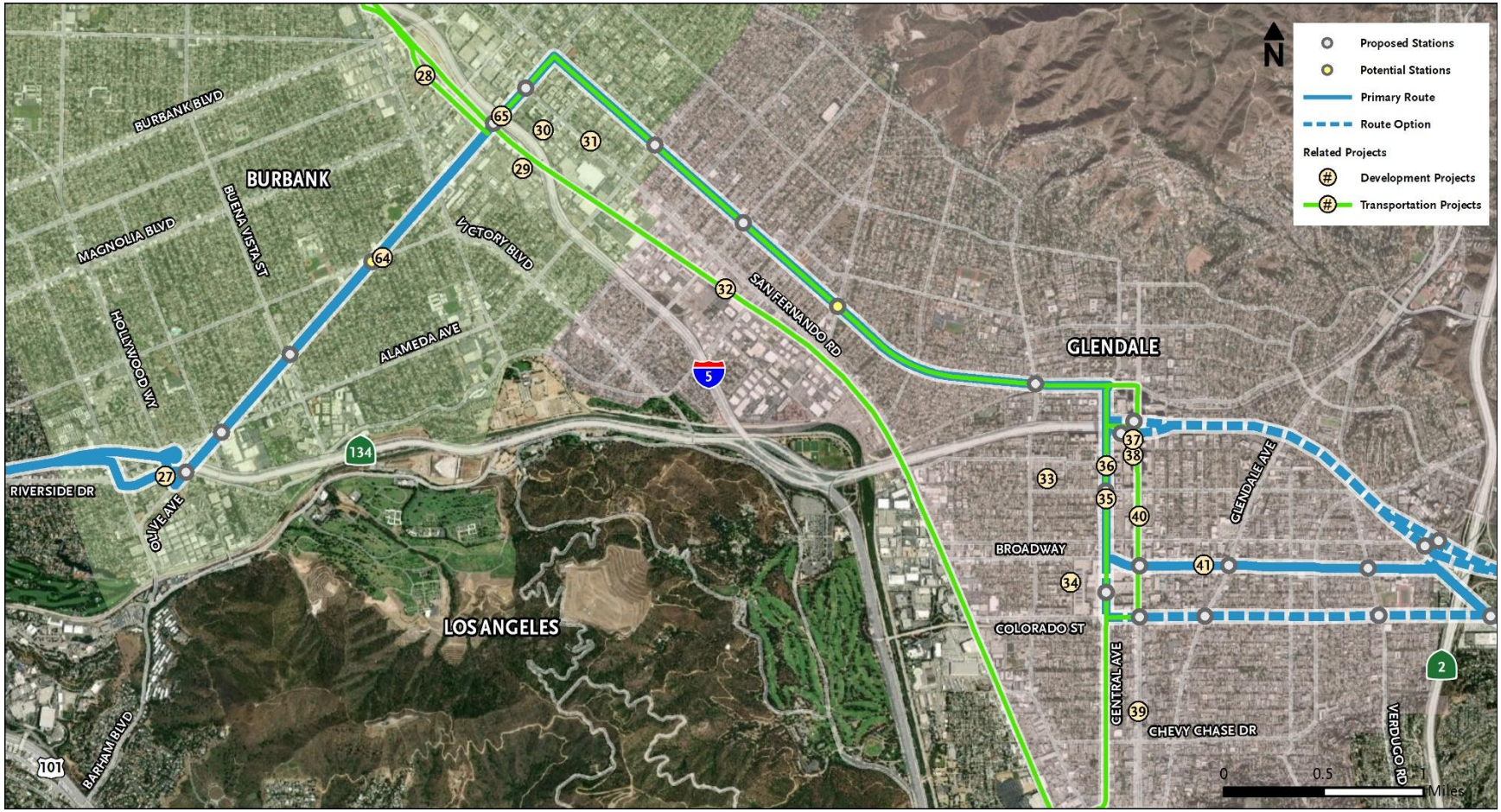


Figure 5c – Cumulative Impact Study Area

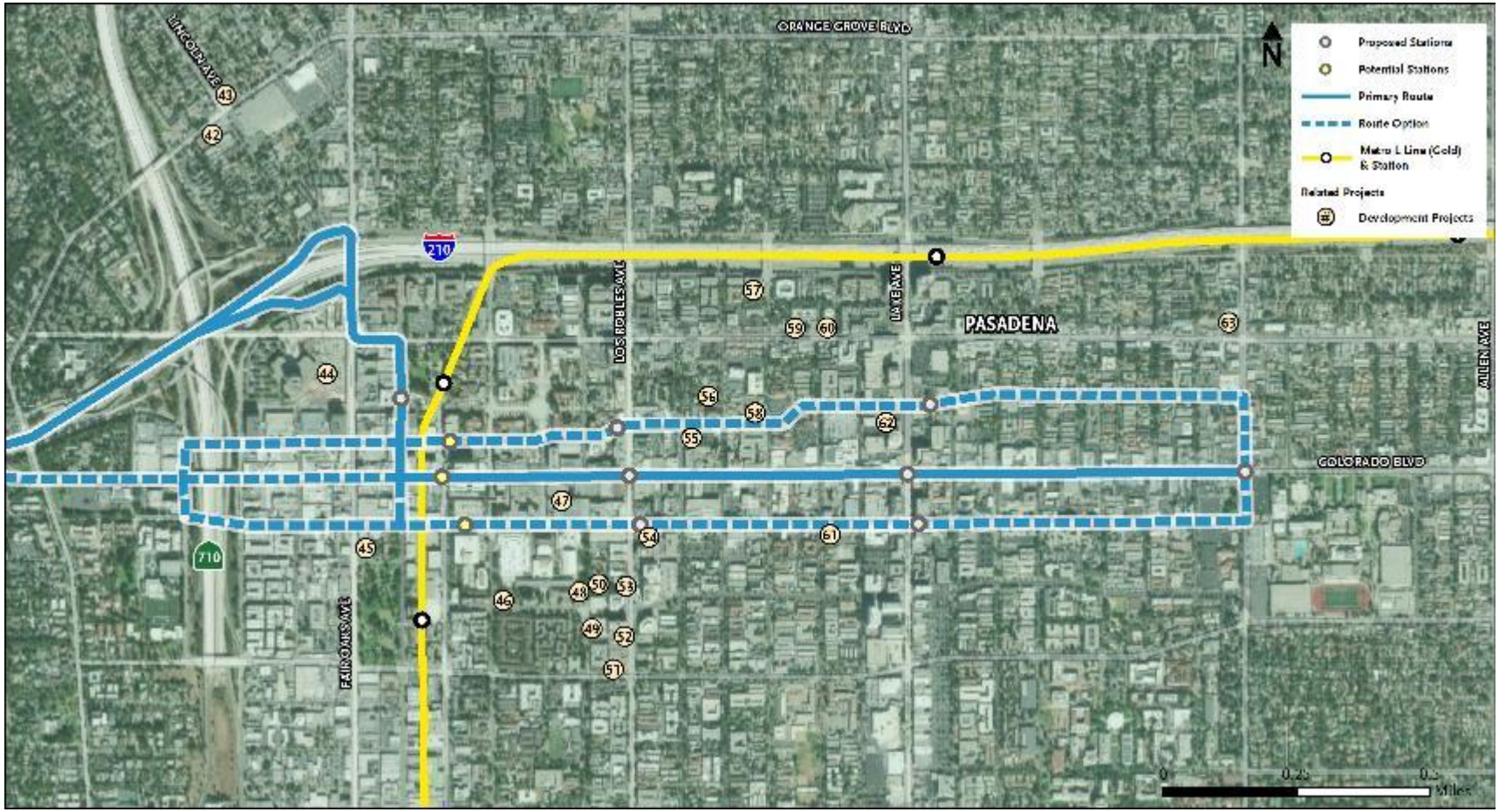


Table 5 – Related Projects

Map ID	Project Name	Location	Description	Status
REGIONAL				
N/A	NextGen Bus Plan	Los Angeles County	The NextGen Bus Plan will revise the existing Metro bus network to improve ridership and make bus use more attractive to current and future riders. The Plan will adjust bus routes and schedules based upon existing origin/destination ridership data with a phased approach to future infrastructure investments in transit convenience, safety, and rider experience.	Implementation early 2021
N/A	East San Fernando Valley LRT Project	San Fernando Valley	New 9-mile LRT line that will extend north from the Van Nuys Metro G Line (Orange) station to the Sylmar/San Fernando Metrolink Station.	Planning
8	North San Fernando Valley BRT Project	San Fernando Valley	New 18-mile BRT line from North Hollywood B/G Line (Red/Orange) Station to Chatsworth.	Planning
32	Los Angeles – Glendale-Burbank Feasibility Study	Amtrak corridor from Los Angeles Union Station to Bob-Hope Airport	Metro is studying a 13-mile transit corridor between Los Angeles Union Station and the Hollywood Burbank Airport. A range of options are under study including both light rail and enhanced commuter rail.	Planning and feasibility
BURBANK				
27	Mixed-Use Development	3700 Riverside Dr.	49-unit residential condominium and 2,000 sq. ft. of retail	Active Project Submission

Map ID	Project Name	Location	Description	Status
28	San Fernando Bikeway	San Fernando Blvd. Corridor	Three-mile Class I bike path along San Fernando Blvd. near the Downtown Metrolink Station in the City of Burbank. This project will complete a 12-mile long regional bike path extending from Sylmar to the Downtown Burbank Metrolink Station along the San Fernando Blvd. rail corridor	Planning
29	Commercial Development	411 Flower St.	Commercial building (size unknown)	Active Project Submission
30	Mixed-Use Development	103 Verdugo Ave.	Two mixed-use buildings (size unknown)	Active Project Submission
31	Mixed-Use Development	624 San Fernando Blvd.	42-unit, 4-story mixed-use building with 14,800 sq. ft. of ground-floor commercial	Active Project Submission
64	Olive Ave./Sparks St./Verdugo Ave. Intersection Improvements	Olive Ave./Sparks St./Verdugo Ave.	Various intersection improvements.	Planning
65	Olive Ave. Overpass Rehabilitation	Olive Ave. over Interstate 5	Improvements to operational efficiency, pedestrian safety, and bicycle connections.	Planning
GLENDALE				
33	Multi-Family Development	452 Milford St.	15-unit building	Active Project Submission
34	Multi-Family Development	401 Hawthorne St.	23-unit building	Active Project Submission
35	Commercial Development	340 Central Ave.	14,229 sq. ft. office	Active Project Submission
36	Multi-Family Development	520 Central Ave.	98-unit building	Active Project Submission
37	Commercial Development	611 Brand Blvd.	Hotel (857 hotel rooms and 7,500 sq. ft. of restaurant/retail)	Active Project Submission
38	Multi-Family Development	601 Brand Blvd.	604 units in 3 buildings	Active Project Submission

Map ID	Project Name	Location	Description	Status
39	Commercial Development	901 Brand Blvd.	34,228 sq. ft. parking structure for car dealership	Active Project Submission
40	Glendale Streetcar	Downtown Glendale	Streetcar connecting the Larry Zarian Transportation Center with Downtown Glendale	Planning and feasibility
41	Commercial Development	517 Broadway	Medical/office/retail building (size unknown)	Active Project Submission
LOS ANGELES				
N/A	Orange Line Transit Neighborhood Plan	North Hollywood, Van Nuys, and Sepulveda BRT Stations	Develop regulatory tools and strategies for the areas around these three Orange Line stations to encourage transit ridership, enhance the urban built environment, and focus new growth and housing in proximity to transit and along corridors	Undergoing Environmental Review
N/A	Take Back The Boulevard Initiative	Colorado Blvd.	The mission of the Take Back the Boulevard initiative is to serve as a catalyst for the community-drive revitalization of Colorado Boulevard in Eagle Rock. The Take Back the Boulevard initiative seeks to utilize broad community feedback and involvement to make this central corridor through Eagle Rock a safe, sustainable, and vibrant street in order to stimulate economic growth, increase public safety, and enhance community pride and wellness.	Active Initiative
1	Multi-Family Development	11525 Chandler Blvd.	60-unit building	Active Building Permit
2	Multi-Family Development	5610 Camellia Ave.	62-unit building	Active Building Permit

Map ID	Project Name	Location	Description	Status
3	Multi-Family Development	5645 Farmdale Ave.	44-unit building	Active Building Permit
4	Multi-Family Development	11433 Albers St.	59-unit building	Active Building Permit
5	Mixed-Use Development	11405 Chandler Blvd.	Mixed-use building with residential and commercial components (size unknown).	Active Building Permit
6	Mixed-Use Development	5530 Lankershim Blvd.	15-acre joint development at the North Hollywood Metro Station. Includes 1,275-1,625 residential units (275-425 affordable units), 125,000-150,000 sq. ft. of retail, and 300,000-400,000 sq. ft. of office space	Active Project Submission
7	Mixed-Use Development	11311 Camarillo St.	Mixed-use building (size unknown)	Active Building Permit
9	Multi-Family Development	11262 Otsego St.	49-unit building	Active Building Permit
10	Multi-Family Development	11241 Otsego St.	42-unit building	Active Building Permit
11	Multi-Family Development	11246 Otsego St.	70-unit building	Active Building Permit
12	Mixed-Use Development	5101 Lankershim Blvd.	297 units in a mixed-use housing complex	Active Building Permit
13	Multi-Family Development	5630 Fair Ave.	15-unit building	Active Building Permit
14	Multi-Family Development	5550 Bonner Ave.	48-unit building	Active Building Permit
15	Commercial Development	11135 Burbank Blvd.	4-story hotel with 70 guestrooms	Active Building Permit
16	Commercial Development	11115 McCormick St.	Apartment/Office building (size unknown)	Active Building Permit
17	Multi-Family Development	5536 Fulcher Ave.	36-unit building	Active Building Permit
18	Multi-Family Development	11111 Cumpston St.	41-unit building	Active Building Permit
19	Multi-Family Development	11050 Hartsook St.	48-unit building	Active Building Permit
20	Multi-Family Development	5525 Case Ave.	98-unit building	Active Building Permit

Map ID	Project Name	Location	Description	Status
21	Multi-Family Development	11036 Moorpark St.	96-unit building	Active Building Permit
22	Multi-Family Development	11011 Otsego St.	144-unit building	Active Building Permit
23	Multi-Family Development	10925 Hartsook St.	42-unit building	Active Building Permit
24	Multi-Family Development	10812 Magnolia Blvd.	31-unit building	Active Building Permit
25	Multi-Family Development	5338 Cartwright Ave.	21-unit building	Active Building Permit
26	Multi-Family Development	5252 Willow Crest Ave.	25-unit building	Active Building Permit
PASADENA				
42	Mixed-Use Development	690 Orange Grove Blvd.	48-unit building with commercial space	Active Project Submission
43	Multi-Family Development	745 Orange Grove Blvd.	35-unit building	Active Project Submission
44	Mixed-Use Development	100 Walnut St.	Mixed-use planned development: office building, 93-unit apartment building, and a 139-unit building	Active Building Permit
45	Multi-Family Development	86 Fair Oaks Ave.	87-unit building with commercial space	Active Project Submission
46	Commercial Development	190 Marengo Ave.	7-story hotel with 200 guestrooms	Active Project Submission
47	Multi-Family Development	39 Los Robles Ave.	Residential units above commercial space (size unknown)	Active Building Permit
48	Mixed-Use Development	178 Euclid Ave.	42-unit building with 940 sq. ft. of office space	Active Building Permit
49	Multi-Family Development	380 Cordova St.	48-unit building	Active Building Permit
50	Mixed-Use Development	170 Euclid Ave.	42-unit building with 10,000 sq. ft. of commercial space	Active Project Submission
51	Multi-Family Development	399 Del Mar Blvd.	55-unit building	Active Building Permit

Map ID	Project Name	Location	Description	Status
52	Multi-Family Development	253 Los Robles Ave.	92-unit building	Active Project Submission
53	Mixed-Use Development	171 Los Robles Ave.	8-unit building	Active Project Submission
54	Commercial Development	98 Los Robles Ave.	school of medicine building	Active Building Permit
55	Multi-Family Development	530 Union St.	55-unit building with retail space	Active Building Permit
56	Multi-Family Development	119 Madison Ave.	81-unit building	Active Building Permit
57	Multi-Family Development	289 El Molino Ave.	105-unit building	Active Building Permit
58	Multi-Family Development	99 El Molino Ave.	40-unit building	Active Building Permit
59	Commercial Development	711 Walnut St.	Mixed-use building with condominiums, commercial space, food facility, parking structure (size unknown)	Active Building Permit
60	Commercial Development	737 Walnut St.	42-unit building with commercial space	Active Project Submission
61	Mixed-Use Development	740 Green St.	273-unit building	Active Project Submission
62	Mixed-Use Development	83 Lake Ave.	54-unit building with office space	Active Project Submission
63	Multi-Family Development	231 Hill Ave.	59-unit building	Active Project Submission

SOURCE: Terry A. Hayes Associates Inc., 2020.

North San Fernando Valley (SFV) Bus Rapid Transit (BRT) Project. The North SFV BRT Project is a proposed new 18-mile BRT line that is intended to serve the portions of the San Fernando Valley that are north of the Metro G Line (Orange) service area. The project would provide a new, high-quality bus service between the communities of Chatsworth to the west and North Hollywood to the east. The project would enhance existing bus service and increase transit system connectivity.

Joint Development - North Hollywood Station Project. The Joint Development - North Hollywood Station project would construct facilities at the North Hollywood B/G Line (Red/Orange) Station that would be shared by the Proposed Project. The project has been identified in the Measure M Expenditure Plan, with a projected opening date between Fiscal Year 2023-25 and $180 million of funding.

NextGen Bus Plan. In January 2018, Metro began the NextGen Bus Plan aimed at reimagining the bus network to be more relevant, reflective of, and attractive to the diverse customer needs within Los Angeles County. The NextGen Bus Plan will realign Metro's bus network based upon data of existing ridership and adjust bus service routes and schedules to improve the overall network. The Proposed Project would be included in the Plan and replace some select bus services in the region. The NextGen Bus Plan is anticipated to begin implementation in the beginning of 2021.

East SFV Light Rail Transit (LRT) Project. The East SFV LRT Project will be a 9-mile LRT line that will extend north from the Van Nuys Metro G Line (Orange) station to the Sylmar/San Fernando Metrolink Station. Light rail trains will operate in the median of Van Nuys Boulevard for 6.7 miles to San Fernando Road. From San Fernando Road, the trains will transition onto the existing railroad right-of-way that's adjacent to San Fernando Road, which it will share with Metrolink for 2.5 miles to the Sylmar/San Fernando Metrolink Station. The project includes 14 at-grade stations. The Draft EIR/Environmental Impact Statement (EIR/EIS) was published in August 2017 and the Final EIR/EIS is currently being prepared by Metro.

There is an existing cumulative impact in the Project Area related to paleontological resources. The cumulative setting is the areas of potential disturbance. Most of the Related Projects are development or transportation projects, whose construction could include excavation that could disturb buried paleontological resources, if extant. Although much of the Project Area is developed and paved, there is a potential for buried paleontological deposits to exist. The potential for an individual project to impact significant paleontological resources is unknown but it is possible that cumulative growth and development in the Project Area could have impacts on significant paleontological resources. The Proposed Project combined with past, present, and reasonably probable future projects could contribute to the existing cumulative impact. The cumulative effect is best addressed through consideration of Related Projects.

Regarding construction activities, earthwork activities could result in the finding of buried paleontological resources. Paleontological resources have been recorded from the subsurface of the Project Area and Project Vicinity. However, due to the minimal amount of deep excavation with the potential to encounter native sediments with high paleontological potential

(i.e., Pleistocene-age older sedimentary deposits [Qoa, Qof] and Miocene-age Topanga Formation [Ttsc, Ttqdb]), the Proposed Project would not significantly impact paleontological resources. Effects to paleontological resources (e.g., plant and wildlife species) would not be significant. Therefore, Proposed Project construction activities would not contribute to the existing cumulative impact.

Regarding operational activities, the potential to disturb paleontological resources is only possible during construction activities. There is no potential for the surface-running BRT to encounter paleontological resources. Therefore, Proposed Project operational activities would not contribute to the existing cumulative impact.

8. References

California Geological Survey, *California Geomorphic Provinces, Note 36,* 2002. Available: https://www.contracosta.ca.gov/DocumentCenter/View/34134/CGS-2002-California-Geomorphic-ProvincesNote-36-PDF

Campbell, R.H., T.H. McCulloh, and J.G. Vedder, *The Miocene Topanga Group of southern California: a 100 year history of changes in stratigraphic nomenclature, Open-File Report 2007-1385*, U.S. Geological Survey, Reston, VA, 2007.

Dibblee, T.W., and H.E. Ehrenspeck, *Geologic map of the Hollywood and Burbank (south ½) quadrangles, Los Angeles County, California,* Dibblee Geological Foundation Map DF-30, Scale (1:24,000), 1991.

Dibblee, T.W., and H.E. Ehrenspeck, *Geologic map of the Mount Wilson and Azusa quadrangles, Los Angeles County, California*, Dibblee Geological Foundation Map DF-67, Scale (1:24,000), 1998.

Dibblee, T.W., and H.E. Ehrenspeck, *Geologic map of the Pasadena quadrangle, Los Angeles County, California, Dibblee Geological Foundation Map DF-23, Scale (1:24,000*), 1989.

Galvin Preservation Associates, *Historic Resources Technical Report*, 2020.

Harden, D.R. *California Geology*, second edition: Pearson, Prentice Hall, Upper Saddle River, New Jersey, 2004.

Kew, W.S., *Geologic formations of a part of southern California and their correlation, American Association of Petroleum Geologists Bulletin*, v. 7, 411-420 pp., 1923.

McLeod, S.A., *Paleontological Resources for the proposed North Hollywood to Pasadena BRT Project, in the Cities of Los Angeles, Burbank, Glendale, and Pasadena, Los Angeles County, project area*, prepared by the Natural History Museum of Los Angeles County, Prepared for Paleo Solutions, 2020.

Norris, R.M., and R.W. Webb, *Geology of California*, second edition, John Wiley & Sons, N.Y., 1990.

Paleo Solutions, Inc., *Archaeological and Tribal Cultural Resources Technical Report*, 2020.

PaleoBiology Database (PBDB), *PaleoBiology Database*. Available: https://paleobiodb.org/classic, accessed in March 2020.

Prothero, D.R., *California's Amazing Geology*, CRC Press, Taylor & Francis Group, Boca Raton, New York, New York, 2017.

Society of Vertebrate Paleontologists (SVP), *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources,* 2010.

University of California Museum of Paleontology (UCMP), *UCMP database*. Available: https://ucmpdb.berkeley.edu/loc.html, accessed in March 2020.

9. List of Preparers

PALEO SOLUTIONS

Courtney Richards, M.S., Principal Paleontologist
Elisa Barrios, B.S., GIS Specialist

Appendices to the Paleontological Resources Technical Report

APPENDIX A
RECORDS SEARCH RESULTS

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of Los Angeles County
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Los Angeles, CA 90007

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NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY

Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

5 March 2020

Paleo Solutions, Inc.
911 South Primrose Avenue, Unit N
Monrovia, CA 91016

Attn: Barbara Webster, GIS Specialist & Archaeologist

re: Paleontological resources for the proposed North Hollywood to Pasadena BRT Project, in the Cities of Los Angeles, Burbank, Glendale, and Pasadena, Los Angeles County, project area

Dear Barbara:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed North Hollywood to Pasadena BRT Project, in the Cities of Los Angeles, Burbank, Glendale, and Pasadena, Los Angeles County, project area as outlined on the portions of the Van Nuys, Burbank, Pasadena and Mount Wilson USGS topographic quadrangle maps that you sent to me via e-mail on 28 February 2020. We have one vertebrate fossil locality that partly occurs in a portion of the proposed project area, and we have other fossil localities nearby from the same sedimentary deposits that occur in the proposed project area, either at the surface or at depth

In the eastern portion of the proposed project area, in the elevated terrain of the San Rafael Hills around and north of Ventura Freeway (Highway 134) and also on the slopes on both sides of Arroyo Seco, there are exposures of intrusive igneous rocks that will not contain recognizable fossils.

Also in the eastern portion of the proposed project area, in the elevated terrain in Eagle Rock south of the Ventura Freeway (Highway 134) and around some eastern portions of the Ventura Freeway (Highway 134), geologic mapping shows exposures of the middle Miocene Topanga Formation, but indicates these sediments are a relatively coarse fraction of the Topanga

Formation. Our closest vertebrate fossil locality from the Topanga Formation is LACM (CIT) 424, just south of this portion proposed project area southeast of Poppy Peak near the intersection of Avenue 64 and Burleigh Drive, that produced specimens of fossil fish including herrings, *Ganolytes* and *Etringus*, as well as snake mackerel, *Thyrsocles*.

In the eastern portion of the proposed project area in the active drainage of Arroyo Seco, and also in the western portion of the proposed project area near the intersection of Olive Avenue and Frederic Street as well as around the intersection of Olive Avenue and Alameda Avenue westward along the northern side of the Ventura Freeway (Highway 134) to about Clybourn Avenue, there are surficial deposits of relatively coarse younger Quaternary gravels. These surficial deposits are unlikely to contain significant vertebrate fossils.

In the western portion of the proposed project area, between the Hollywood Freeway (Highway 170) in the west, the Ventura Freeway (Highway 134) in the south, and the Golden State Freeway (I-5) in the east, the surficial deposits consist of younger Quaternary Alluvium, derived as alluvial fan deposits from the San Gabriel Mountains to the north via the Central Branch of the Tujunga Wash and from the Santa Monica Mountains to the west via the Los Angeles River. These younger Quaternary deposits typically do not contain significant vertebrate fossils in the uppermost layers, but at varying depths there are older Quaternary deposits that do contain significant fossil vertebrate remains. We have one older Quaternary locality, LACM 6970, that encompasses the very southwestern-most portion of the proposed project area along Lankershim Boulevard between Hortense Street and the Ventura Freeway (Highway 134). Locality LACM 6970 produced fossil specimens of camel, *Camelops hesternus*, bison, *Bison antiquus*, and ground sloth, *Glossotherium harlani*, at approximately 60 feet to 80 feet below grade during excavation for the Metrorail Redline Universal City Tunnel. Further south along Lankershim Boulevard and south of the Los Angeles River we have additional vertebrate fossil localities, LACM 6306 and 6385-6386, also collected during salvage mitigation for construction of the Metrorail station and tunnels at depths approximately 40' to 60' below the surface. These localities produced fossil specimens of stickleback fish, Gasterosteidae, frogs, *Rana* and Hylidae, lizards, *Gerrhonotus* and *Uta*, snakes, *Thamnophis* and *Tantilla*, bird, Aves, shrew, *Sorex*, rabbit, *Sylvilagus*, and rodents, *Perognathus*, *Thomomys*, *Dipodomys*, *Microtus*, and *Peromyscus*.

For most of the western portion of the proposed project area east of the Golden State Freeway (I-5), along Olive Avenue and Glenoaks Boulevard, the surficial deposits consist of relatively coarse younger Quaternary alluvial fan deposits from the Verdugo Mountains just to the east. These relatively coarse Quaternary deposits also usually do not contain significant vertebrate fossils in the uppermost layers, but there may be older Quaternary deposits at depth that do contain significant fossil vertebrate remains.

In the central portion of the proposed project area in Glendale, along Glenoaks Avnue then southward along Central Avenue and eastward along Colorado Street as well as eastward along the Ventura Freeway (Highway 134) to the San Rafael Hills, the surface deposits consist of younger Quaternary Alluvium, derived primarily from the Verdugo Mountains and the San Rafael Hills to the northeast via Verdugo Wash and the Sycamore Canyon drainage. These younger Quaternary deposits also occur at the surface further east in the less elevated terrain

along Colorado Boulevard in Eagle Rock. Our closest vertebrate fossil locality in older Quaternary deposits beneath the younger Quaternary Alluvium is LACM (CIT) 342, south of this central portion of the proposed project area east of the Pasadena Freeway (I-110) and Eagle Rock Boulevard just south of York Boulevard, that produced fossil specimens of turkey, *Parapavo californicus*, and mammoth, *Mammuthus*, at a depth of 14 feet below the surface. The fossil turkey specimen from locality LACM (CIT) 342 was published in the scientific literature by L.H. Miller in 1942 (A New Fossil Bird Locality. Condor, 44(6):283-284) and the mammoth specimen was a rare, nearly complete skeleton and was published in the scientific literature by V.L. Roth in 1984 (How Elephants Grow: Heterochrony and the Calibration of Developmental Stages in Some Living and Fossil Species. Journal of Vertebrate Paleontology, 4(1):126-145).

Around the intersection of the Ventura Freeway (Highway 134) and the Foothill Freeway (I-210), geologic mapping shows surficial deposits of younger Quaternary Alluvium. Otherwise the eastern portion of the proposed project area in Pasadena east of Arroyo Seco have surface deposits that consist of older Quaternary Alluvium, derived as alluvial fan deposits from the San Gabriel Mountains to the north. Our closest vertebrate fossil locality in these older Quaternary deposits is LACM 2027, northeast of the this portion of the proposed project area, in Pasadena south of Washington Boulevard and west of Allen Avenue near the western end of Brigden Road, that produced a fossil specimen of mastodon, *Mammut*, at unstated depth.

Excavations in the igneous bedrock in the San Rafael Hill and the slopes around Arroyo Seco in the eastern portion of the proposed project area will not encounter any recognizable fossils. Shallow excavations in the younger Quaternary deposits exposed in most of the proposed project area are unlikely to uncover significant fossil vertebrate remains. Deeper excavations there that extend down into older sedimentary deposits, as well as any excavations in the exposures of the Topanga Formation or surface deposits of older Quaternary Alluvium, however, may well encounter significant vertebrate fossils. Any substantial excavations in the sedimentary deposits in proposed project area, therefore, should be closely monitored to quickly and professionally collect any specimens without impeding development. Also, sediment samples should be collected and processed to determine the small fossil potential in the proposed project area. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice