HEXAGON TRANSPORTATION CONSULTANTS, INC.

Glenview Terrace Residential Development

Transportation Analysis

Prepared for:

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Executive Summary

This report presents the results transportation analysis (TA) conducted for the proposed Glenview Terrace residential development in San Bruno, California. The project site is located at the northeast corner of the intersection of Glenview Drive and San Bruno Avenue in the City of San Bruno, California. The project site consists of three parcels with a total of 3.28 acres. The northern parcel is currently developed with a parking lot, vacant church building, and vacant single-family home. The other two parcels are undeveloped. The project would demolish the existing vacant buildings and build 58 townhomes. All proposed homes would include two-car garages, for a total of 116 parking spaces. Seven guest parking spaces are proposed throughout the site. Vehicle access to the site would be via two full access driveways and one right-turn only driveway on Glenview Drive.

Project Trip Estimates

Trip generation estimates for the proposed project were based on trip rates published in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 11th Edition. The proposed project would generate 418 daily trips, with 28 trips (9 inbound and 19 outbound) occurring during the AM peak hour and 34 trips (19 inbound and 15 outbound) occurring during the PM peak hour.

Intersection Level of Service Analysis

The results of the intersection level of service analysis (see Table ES-1) show that both study intersections would operate at an acceptable level of service with and without the project during the AM peak hour.

During the PM peak hour, the intersection of Skyline Boulevard and San Bruno Avenue would continue operating at an unacceptable LOS F. However, since the Project would not cause the critical-movement delay at this intersection to increase by four or more seconds compared to existing conditions, the Project would not have an adverse effect on the operation of this intersection.

Based on the results of the multi-way stop analysis, installation of all-way stop control at Glenview Drive and San Bruno Avenue is warranted under both existing and existing plus project conditions. Installing an all-way stop control would improve the safety for pedestrians crossing at this intersection, which would increase with this project.

Table ES-1
Intersection Level of Service Summary

Study Number	Intersection	Peak Hour	Existing Avg. Delay (sec.)	Existing LOS	Existing Plus Project Avg. Delay (sec.)	Existing Plus Project LOS	Incr. In Crit. Delay
1	Skyline Boulevard (SR35) and San Bruno Avenue [1]	AM	20.1	C	20.4	C	0.3
		PM	**161.6**	**F**	**161.1**	**F**	0.0
2	Glenview Drive and San Bruno Avenue [2]	AM	20.0	C	21.3	C	1.3
		PM	25.0	D	26.5	D	1.5

Notes:
TWSC = Two-Way Stop Control
[1] The Highway Capacity Manual (HCM) 2010 does not support turning movements with shared and exclusive lanes or non-standard phasings. Therefore, this intersection was analyzed using the HCM 2000.
[2] Average delay for two-way stop controlled intersection is reported for the worst approach.

Stop Warrant Analysis At Glenview Drive and San Bruno Avenue

Based on the results of the multi-way stop analysis, installation of all-way stop control at Glenview Drive and San Bruno Avenue is warranted under both existing and existing plus project conditions. Installing all-way stop control would improve the safety for pedestrian crossing at the intersection.

> **Recommendations:** Currently, there is a pedestrian crossing warning sign installed about 200 feet west of Glenview Drive on the San Bruno Avenue westbound, It is recommended to install a STOP AHEAD Sign and also place a STOP AHEAD pavement marking on the roadway when an all-way stop control is installed at the intersection of Glenview Drive and San Bruno Avenue in the future to guide, warn, and regulate traffic.

Other Transportation Issues

The project would provide adequate site access and on-site circulation. The proposed number of on-site parking spaces would meet the City's parking requirements.

To maintain adequate sight distance red curbs should be installed for 25 feet south of each driveway and 5 feet north of each driveway.

1. Introduction

This report presents the results transportation analysis (TA) conducted for the proposed Glenview Terrace residential development in San Bruno, California (see Figure 1). The project site is located at the northeast corner of the intersection of Glenview Drive and San Bruno Avenue in the City of San Bruno, California. The project site consists of three parcels with a total of 3.28 acres. The northern parcel is currently developed with a parking lot, vacant church building, and vacant single-family home. The other two parcels are undeveloped. The project would demolish the existing vacant buildings and build 58 townhomes. All proposed homes would include two-car garages, for a total of 116 parking spaces. Seven guest parking spaces are proposed throughout the site. Vehicle access to the site would be via two full access driveways and one right-turn only driveway on Glenview Drive (see Figure 2).

Scope of Study

The purpose of the transportation study is to identify any impacts in accordance with the standards set forth by the City of San Bruno. The City/County Association of Governments of San Mateo County (C/CAG) *Transportation Demand Management Policy Update Approach (September 2021)* specifies that the project is exempted from the C/CAG TDM requirement because it essentially would consist of single-family homes.

This report includes an evaluation of transportation impacts according to CEQA and a Local Transportation Analysis (LTA) per the City's requirements.

CEQA Analysis

Vehicle Miles Travelled (VMT) Analysis

The effects of the project on the transportation system using the VMT metric must be completed for the purpose of evaluating transportation impacts per CEQA requirements. Since the City has not yet adopted a VMT policy or significance thresholds related to VMT, the VMT thresholds for this project will be based on Governor's Office of Planning and Research (OPR)'s recommendations. The latest C/CAG/VTA model was used to determine the VMT per resident for the project, which was compared to citywide, countywide, and regional averages.

Local Transportation Analysis

The LTA analyzed the effect of the project on traffic operations at two key intersections in the vicinity of the project site. The study intersections include those intersections that provide primary access to and from the project site and locations that may be affected by the proposed project. The study intersections are listed below and shown on Figure 1. Traffic conditions at the study locations were analyzed for the weekday AM and PM peak hours of traffic.

Study Intersections

1. Skyline Boulevard (SR 35) and San Bruno Avenue
2. Glenview Drive and San Bruno Avenue (unsignalized)

An analysis of freeway segments and freeway ramps is not required since the project is expected to generate a negligible number of trips on area freeways.

Traffic conditions at the study intersections were analyzed for the weekday AM and PM peak hours of adjacent street traffic. The AM peak hour is expected to occur between 7:00 AM and 9:00 AM, and the PM peak hour between 4:00 PM and 6:00 PM on a typical weekday. These are the hours during which most traffic congestion occurs on the roadways.

Traffic conditions were evaluated for the following scenarios:

Scenario 1: ***Existing Conditions.*** Existing AM and PM peak-hour traffic volumes were obtained from new turning-movement counts conducted in November 2023.

Scenario 2: ***Existing plus Project Conditions.*** Existing traffic volumes with the project were estimated by adding to existing traffic volumes the additional traffic generated by the project. Existing plus project conditions were evaluated relative to existing conditions in order to determine the effects the project would have on the existing roadway network.

Lists of approved but not yet constructed developments in the Cities of San Bruno, South San Francisco, and Millbrae were checked, and there are no approved projects that would add project trips to the study intersections.

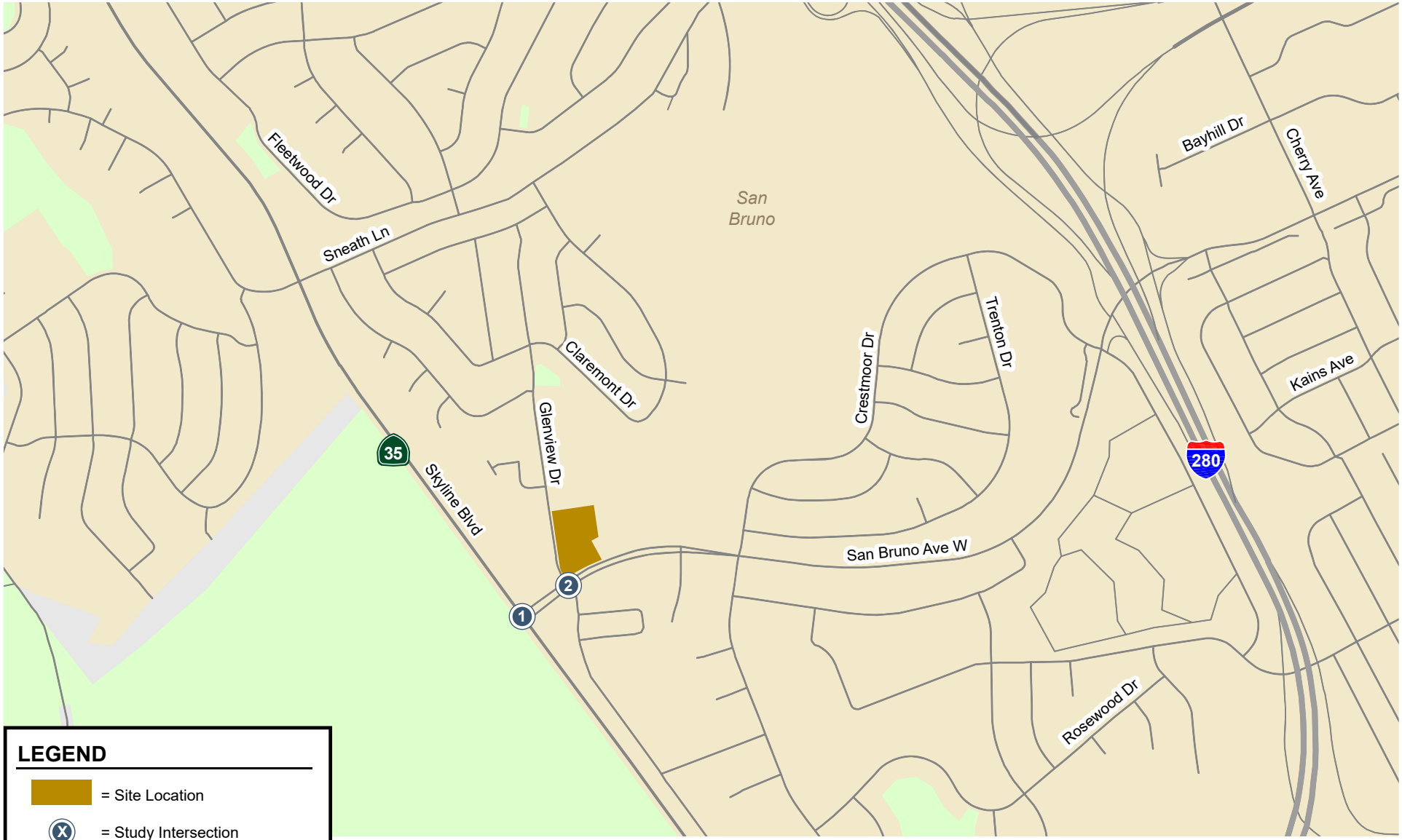


Figure 1
Site Location and Study Intersections

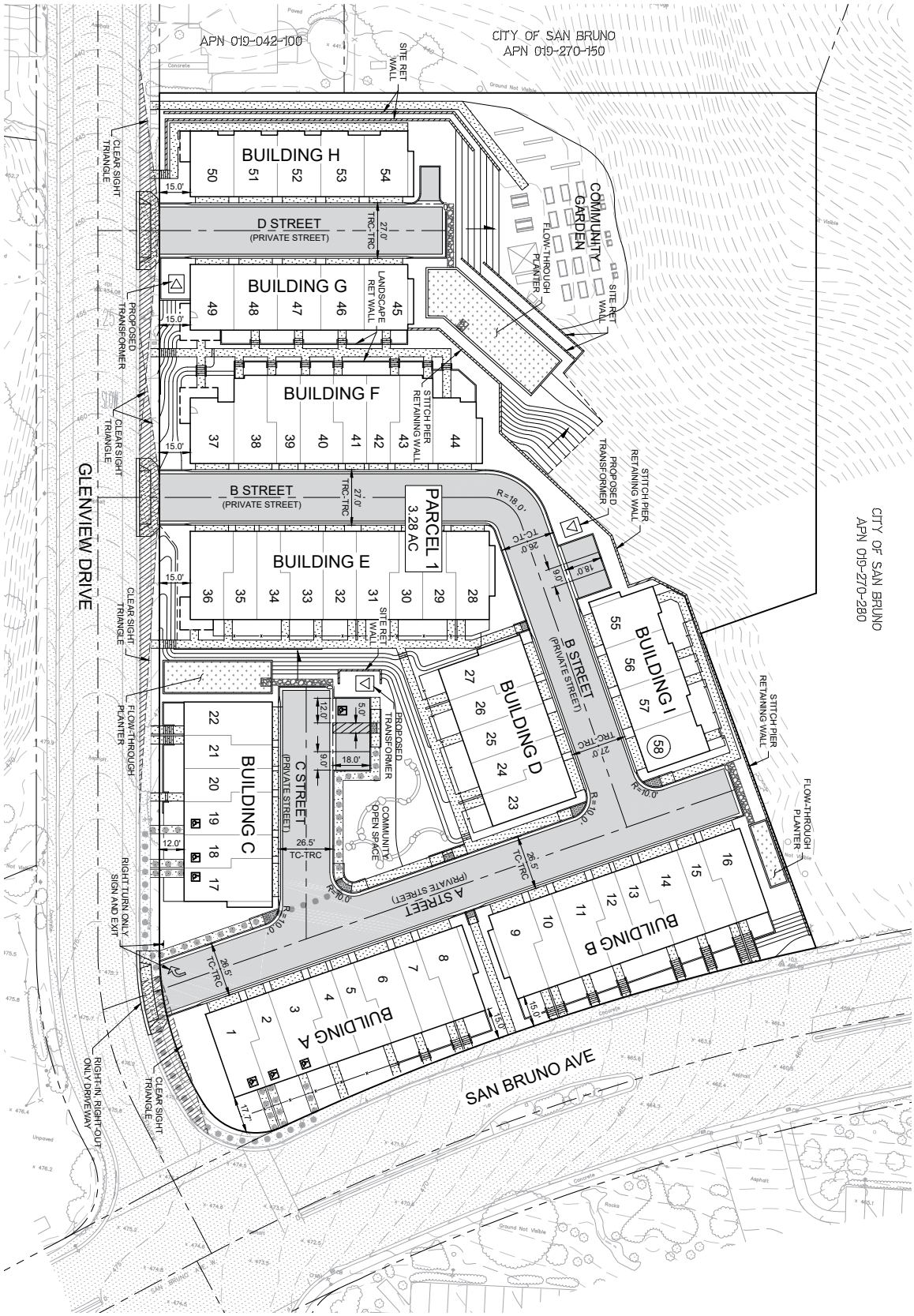


Figure 2
Site Plan

NORTH
Not to Scale

Other Transportation Issues

The study includes a review of site access, on-site circulation, and parking. In addition, vehicle queuing was evaluated at selected locations where the project would add a significant number of left-turn vehicles.

Intersection Operations Analysis Methodology

This section presents the methods used to determine traffic conditions at the study intersections. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

Data Requirements

The data required for the analysis were obtained from new traffic counts, Google Earth, field observations, and previous traffic studies. The following data were collected from these sources:

- Intersection traffic volumes,
- Lane geometries,
- Signal timing and phasing

Intersection Level of Service Analysis Methodologies and Standards

Traffic conditions at the study intersections were evaluated using level of service (LOS). Level of service is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays.

Signalized Intersections

Level of service at signalized intersections was evaluated based on the *2010 Highway Capacity Manual* (HCM) level of service methodology using Synchro software. This method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. The correlation between average control delay and level of service at signalized intersections is shown in Table 1.

City of San Bruno Intersection Level of Service Standards

The City of San Bruno General Plan specifies certain intersections at which a level of service standard (LOS D) must be maintained during AM and PM peak periods. The relevant General Plan polices are listed below:

- Policy T-B: Maintain acceptable levels of service for vehicular movement along the city's street network. Acceptable levels of service could vary based on characteristics of the area under consideration.
- Policy T-6: Maintain LOS standards for intersections for AM and PM peak periods as shown in Figure 4-2.

The City does not have a general LOS standard that applies to all intersections, but the study intersection of Skyline Boulevard (SR 35) and San Bruno Avenue is included in General Plan Figure 4-2 with a LOS standard of D. The LOS analysis is to ensure that the study intersection would remain consistent with General Plan Policy T-B with implementation of the proposed project.

California Department of Transportation (Caltrans) Intersection Level of Service Standard

The study intersection of Skyline Boulevard (SR 35) and San Bruno Avenue is within the jurisdiction of Caltrans. Therefore, this study intersection is subject to Caltrans' standards in addition to San Bruno standards. According to Caltrans' *Guide for the Preparation of Traffic Impact Studies*, Caltrans seeks to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities but acknowledges that this may not always be feasible. In instances where an existing State highway facility is operating worse than the appropriate target LOS, the existing measure of effectiveness (i.e., vehicle delay at intersections and v/c ratio at the ramps) should be maintained. Thus, LOS D is considered the appropriate target LOS for this State Route intersection.

Table 1
Signalized Intersection Level of Service Definitions Based on Average Control Delay

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	Up to 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lenghts, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	Greater than 80.0

Source: Transportation Research Board, *2010 Highway Capacity Manual* , (Washington, D.C., 2010).

Unsignalized Intersections

Level of service analysis at unsignalized intersections is generally used to determine the need for modification in the type of intersection control (i.e., all-way stop or signalization). As part of the evaluation, traffic volumes, delays and traffic signal warrants are evaluated to determine if the existing intersection control is appropriate.

The Glenview Drive and San Bruno Avenue intersection is unsignalized with two-way stop control. Level of service at the unsignalized intersection was based on the *2010 Highway Capacity Manual* (2010 HCM) method using the Synchro software. This method is applicable for both two-way and all-way stop-controlled intersections. For two-way stop control intersections, the delay and LOS for the worst approach are reported. The correlation between average control delay and LOS for unsignalized intersections is shown in Table 2.

The City of San Bruno does not have an adopted level of service standard for unsignalized intersections. However, the City strives to maintain LOS D for unsignalized intersections.

Table 2
Unsignalized Intersection Level of Service Definitions Based on Average Delay

Level of Service	Description	Average Delay Per Vehicle (Sec.)
A	Little or no traffic delay	10.0 or less
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays	greater than 50.0

Source: Transportation Research Board, *2010 Highway Capacity Manual* (Washington, D.C., 2010).

Intersection Vehicle Queuing Analysis

The analysis of intersection operations was supplemented with a vehicle queuing analysis at intersections where the project would add a substantial number of trips to the left-turn movements or stop-controlled approaches. The vehicle queuing analysis is used to determine the appropriate storage lengths for the high demand turn lanes where the project would add a substantial number of trips. Vehicle queues were estimated using Synchro software, which accounts for the effects of upstream intersections and intersection signal timing.

The basis of the analysis is as follows: (1) the Synchro software is used to estimate the 95th percentile number of queued vehicles for a particular movement; (2) the estimated 95th percentile number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated 95th percentile queue length is compared to the existing or planned available storage capacity for the left-turn movement. This analysis thus provides a basis for estimating future turn pocket storage requirements at intersections.

The 95th percentile queue length value indicates that during the peak hour, a queue of this length or less would occur on 95 percent of the signal cycles, or a queue length larger than the 95th percentile queue would only occur on 5 percent of the signal cycles (about 3 cycles during the peak hour for a signal with a 60-second cycle length). Thus, turn pocket storage designs based on the 95th percentile queue length would ensure that storage space would be exceeded only 5 percent of the time for a movement.

Definition of Adverse Intersection Operational Effects

Signalized Intersections

The project is said to create an adverse effect on traffic conditions at a signalized intersection in the City of San Bruno if the project is not consistent with General Plan Policy T-B. In order to be consistent with the General Plan Policy T-B, an adverse on intersection operations would occur if for either peak hour:

1. The level of service at the intersection degrades from an acceptable level (LOS D or better) under existing conditions to an unacceptable level under existing plus project conditions, or
2. The level of service at the intersection is an unacceptable level (LOS E or F) under existing conditions, and the addition of project trips would cause the critical-movement delay at the intersection to increase by four (4) or more seconds.

Unsignalized Intersections

Based on past practice, an unsignalized intersection would have an adverse effect on traffic conditions if the following would occur:

1. The intersection or a stop-controlled approach degrades from an acceptable LOS D to an unacceptable LOS E or F or is already operating below LOS D, and
2. The project would add ten (10) or more vehicle trips to the critical movement of the intersection or stop-controlled approach during the peak hour, and
3. The intersection meets the California Manual on Uniform Traffic Control Devices (MUTCD) peak hour volume traffic signal warrant after project completion.

Report Organization

This report has a total of four chapters. Chapter 2 presents the CEQA impact analysis. Chapter 3 presents the local transportation analysis including the description of the existing roadway network, transit service, bicycle and pedestrian facilities, traffic conditions at the study intersections under existing conditions. Chapter 3 also includes the vehicle operational analysis including the method by which project traffic is estimated, the project's traffic effects on the intersection operations, and a vehicle queuing analysis. Chapter 4 presents the analyses of other transportation-related issues, including site access, on-site circulation, and parking.

2. CEQA Transportation Analysis

Vehicle Miles Traveled (VMT) is the total miles traveled by motorized vehicles that a development is expected to generate in a day. The Governor's Office of Planning and Research (OPR) released a Technical Advisory on Evaluating Transportation Impacts in CEQA in April, 2018 that contains OPR's technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures.

The City of San Bruno has not yet adopted any thresholds or guidelines related to VMT. Thus, the VMT thresholds used for this project are based on the San Mateo County VMT guidelines, published September 23, 2020. San Mateo County VMT Implementation Guidelines specify procedures for determining project impacts on VMT based on the project description, characteristics, and location. The VMT methodology also includes screening criteria that are used to identify types, characteristics, and locations of projects that would not exceed the VMT thresholds of significance.

Screening for VMT Analysis

The San Mateo County VMT Policy establishes screening criteria for developments that are expected to cause a less-than-significant transportation impact under CEQA and are not required to prepare further VMT analysis. The San Mateo County VMT Policy provides the following screening criteria to exempt development projects from conducting a full VMT analysis:

- Small developments – Projects that generate fewer than 110 trips per day
- Projects in Low-VMT Areas – Projects located in low-VMT areas that have similar features as existing developments
- Projects in Proximity to Major Transit Stops – Projects that are located within a half mile of an existing high-quality transit stop or rail station
- Affordable Housing – 100% affordable housing in infill locations
- Local and Regional Serving Retail – Retail projects of 50,000 s.f. or less

The estimated 418 daily vehicle trips generated by the proposed project exceeds the 110 daily trip threshold used to define small projects. The project would contain market-rate residential units. Furthermore, the project site is farther than ½ mile from a rail station and there is only one bus route that stops within ½ mile of the project site (Local Route 20), and it has 30-minute headways. Therefore, the project does not qualify as a transit supportive development and must be evaluated against the CEQA thresholds of significance for VMT impacts set forth in the City's Transportation Analysis Policy.

The latest C/CAG/VTA model was used to determine the VMT per resident for the project, which was compared to citywide, countywide, and regional averages.

VMT Impact Criteria

Since the City has not yet adopted a VMT policy or significance thresholds related to VMT, the VMT thresholds used for this project are based on the San Mateo County VMT guidelines, published September 23, 2020. As stated in the County's VMT guidelines, for residential projects, OPR recommends that new developments should utilize a threshold that is 15% below baseline (existing) conditions. OPR allows a jurisdiction to choose its baseline between City Average, County Average, and Regional Average. OPR recommends that new developments should utilize a threshold that is 15% below baseline (existing) conditions. Baseline conditions may be defined as the existing regional VMT per resident/capita, Countywide average VMT per capita, or citywide average VMT per capita.

VMT Assessment Results

The latest bi-county C/CAG-Santa Clara Valley Transportation Authority (VTA) travel forecasting model was used to estimate the City Average, County Average, and project generated VMT. The results of the project generated VMT analysis are presented in Table 3. The project generated home-based VMT per capita of 9.1 is lower than the threshold (15% below the baseline average) based on City Average, County Average, and Regional Average. Therefore, the project would have a unsignificant impact based on the project generated VMT.

Table 3
Project Generated VMT Assessment

Baseline	Average VMT	Threshold[1]	Project Parcel VMT[2]
City of San Bruno	12.2	10.37	9.10
San Mateo County	13.14	11.17	9.10
Bay Area	13.96	11.87	9.10

Notes:
[1] The threshold for project generated VMT per resident is 15% below the baseline.
[2] VMT for Project Site was estimated using the latest C/CAG/VTA model.

3.
Local Transportation Analysis

This chapter describes the local transportation analysis including existing transportation facilities near the project site and the intersection operations under existing conditions. This chapter also presents the vehicle traffic operational analysis including the method by which project traffic is estimated, the results of intersection level of service analysis for background and background plus project conditions, any adverse effects to intersection level of service caused by the project, and an intersection vehicle queuing analysis.

Existing Conditions

Existing Roadway Network

Regional access to the project site is provided by I-280 and SR-35. Local access to the project site is provided via San Bruno Avenue and Glenview Drive. For the purposes of this study, SR-35/Skyline Boulevard and all parallel streets are considered to run north-south, and cross streets, such as San Bruno Avenue, are considered to run east-west.

I-280 is a north-south freeway that extends from San Francisco to downtown San Jose. In the project vicinity, I-280 has eight mixed-flow lanes. Regional access to the project site is provided via an interchange with San Bruno Avenue.

SR-35/Skyline Boulevard is a mostly two-lane state highway. It runs along the ridge of the Santa Cruz Mountains from the high point of State Route 17 near Lexington Reservoir in Santa Clara County to State Route 1 just south of Daly City in San Mateo County, where it crosses SR 1 and loops around Lake Merced to become Sloat Boulevard in San Francisco. In the study area, Skyline Boulevard is a north-south principal arterial with four lanes north of the study area, converting to two-lanes within the study area. The posted speed limit on SR35/Skyline Boulevard is 55 miles per hour (mph). Skyline Boulevard provides access to the project site via San Bruno Avenue.

San Bruno Avenue is a four-lane east-west arterial street between McDonnel Road in the east and Skyline Boulevard in the west. Sidewalks exist along both sides of the street except between west and east Crestmoor Drive. On-street parking is prohibited along both sides of the street. San Bruno Avenue has a speed limit of 45 mph. San Bruno Avenue provides access to the project site via Glenview Drive.

Glenview Drive is a two-lane north-south local street that extends south from Plymouth Way to Ridgeway Avenue where it transitions into Skyline Boulevard. The posted speed limit on Glenview

Drive is 25 mph. Sidewalks exist along both sides of the street. On-street parking is permitted along Glenview Drive. Glenview Drive provides direct access to the project site via three driveways.

Existing Transit Services

Primary transit service in Redwood City is provided by the San Mateo County Transit District (SamTrans), Caltrain, and BART. However, the project site is not well served by any existing transit routes. The San Bruno Caltrain Station is located 2.1 miles east of the project site, and the nearest BART station is the San Bruno Station, located approximately 2.5 miles from the project site. The closest bus stop is at Claremont Drive and Sneath Lane, which is about 0.5 mile from the project site. There are three bus routes that serve that stop, as described below in Table 4 and shown on Figure 4. The bus stops are beyond what is considered typical walking distance for most residents.

Table 4
Existing Transit Service

Bus Route[1]	Route Description	Weekday Hours of Operation	Headway
Local Route 141	Airport/Linden - Skyline College	6:15 AM - 10:15 PM	30 min
School Route 41	Parkside IL - San Bruno BART	7:45 AM - 8:10 AM (westbound) 3:10 PM - 3:30 PM (eastbound)	n/a [2]
School Route 42	Pacifica - Parkside IL	7:35 AM - 8:20 AM (eastbound) 3:10 PM - 4:00 PM (westbound)	n/a [3]

Notes:
Source: SamTrans Service Schedule and Map, November 2023.

[1] Closest bus stop to bus routes 142, 41 and 42 is located at Claremont Drive and Sneath Lane (0.5 mile from the project location).

[2] Route 41 only has one bus during the peak hour. On Wednesdays, the eastbound route runs from 1:25 to 1:45 PM and on the remaining weekdays, the route runs from 3:10 to 3:30 PM.

[3] Route 42 only has one bus during the peak hour. On Wednesdays, the westbound route runs from 1:09 to 2:00 PM and on the remaining weekdays, the route runs from 3:10 to 4:00 PM.

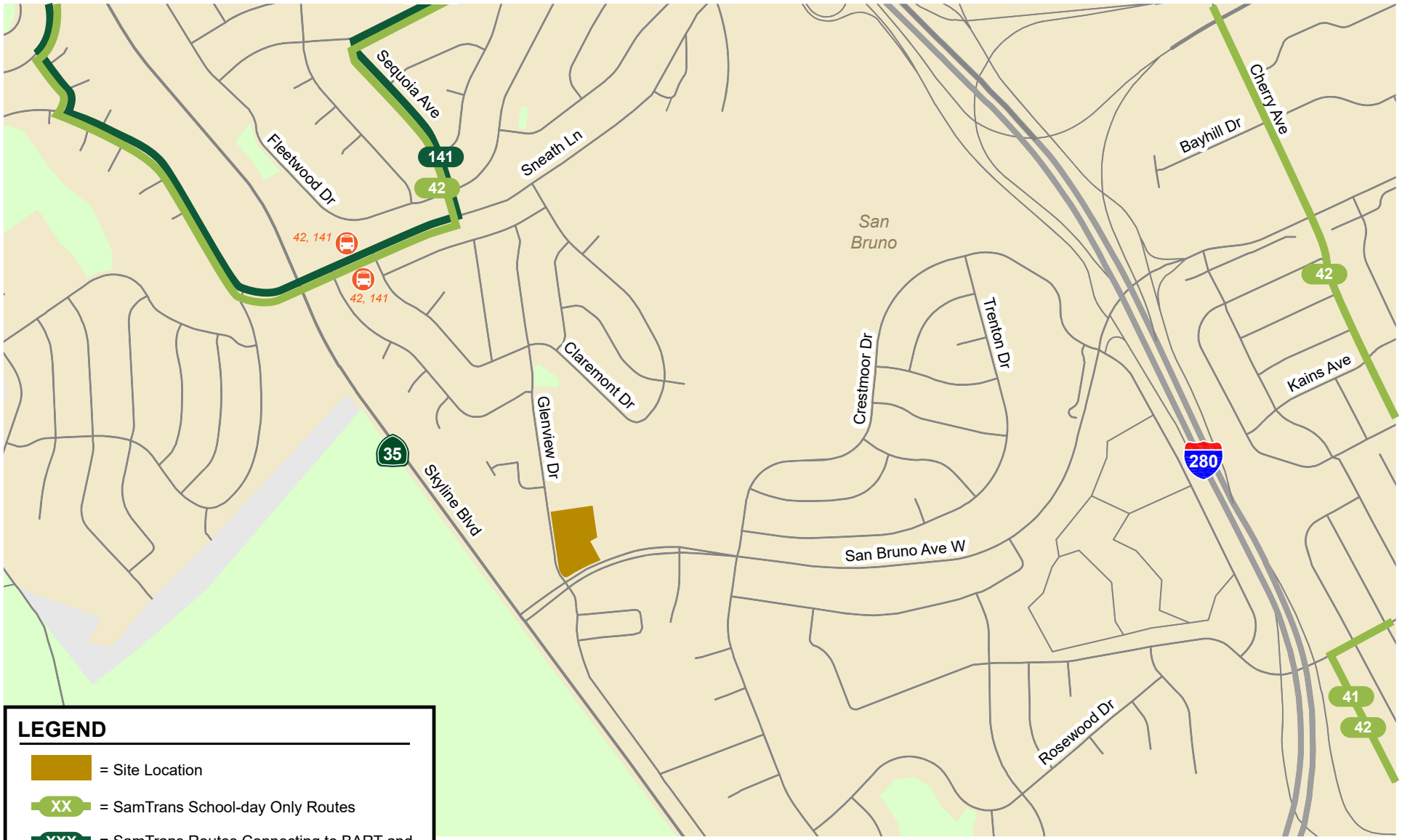


Figure 3
Existing Transit Services

NORTH
Not to Scale

Existing Pedestrian Facilities

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. In the vicinity of the project site, sidewalks exist along both sides of Glenview Drive and San Bruno Avenue. Marked crosswalks with pedestrian signal heads and push buttons are provided on the north and east approaches of the signalized intersection at Skyline Boulevard and San Bruno Avenue. Crosswalks are available on the north and east approaches at the unsignalized intersection of Glenview Drive and San Bruno Avenue.

Existing Bicycle Facilities

The existing bicycle network in San Bruno consists of three classifications of facilities:

- Class I Bikeway (bike path) – completely separated, with paved right of way (shared with pedestrians) which excludes general motor vehicle traffic.
- Class II Bikeway (bike lane) – provides a striped and stenciled lane for one-way bike travel on a street or highway
- Class III Bikeway (bike route) – a shared use roadway with motor vehicle traffic and is identified by signage or permanent markings.

Cyclists can use any non-freeway street in San Bruno but there are limited dedicated bicycle facilities. In the vicinity of the project site, Class II bicycle lanes are provided on both sides of Sneath Lane. A Class I bicycle path (the San Andreas Trail) exists south of the study area parallel to Skyline Blvd. San Bruno Avenue has wide shoulders that act as bike lanes but there is no bike lane striping or signage. The City plans to improve the on-street bicycle network. In July of 2016, the City Council adopted the Walk ‘n Bike Plan. This Plan outlines specific improvements to ensure that walking and biking are safe, comfortable, and convenient. The Plan calls for many support programs and initiatives to encourage more walking and cycling throughout the city. Existing and proposed bikeways in the study area from the 2016 Walk n’ Bike Plan are depicted in Figure 4.

Figure 4
Existing and Planned Bicycle Facilities

NORTH
Not to Scale

Observed Existing Traffic Conditions

Traffic conditions were observed in the field to identify existing operational deficiencies. Field observations conducted in November 2023 revealed the following noteworthy operational issues.

The project would generate a small number of new trips at the study intersections and would not change the operational conditions observed in the field as described below.

Skyline Boulevard (SR 35) and San Bruno Avenue

During the AM peak hour, southbound traffic is heavy. Occasionally, the southbound left-turn queue extends out of the dedicated turn pocket, however most vehicles clear in a single cycle.

During the PM peak hour, the northbound through traffic on Skyline Boulevard is extremely heavy and queues extend all the way back to I-280. Due to this congestion, it takes multiple green cycles for the northbound through and northbound right-turn movements to go through the intersection. Westbound traffic generally clears within one cycle. However, occasionally, the westbound right-turn queue extends to and beyond the intersection at Glenview Drive and San Bruno Avenue, and some vehicles must wait through two cycles to clear the intersection.

Glenview Drive and San Bruno Avenue

This intersection operates without any significant operational issues during the AM peak hour.

During the PM peak hour, occasionally, the westbound right-turn queue at the intersection of Skyline Boulevard/San Bruno Avenue spills back to Glenview Drive and impedes the flow on Glenview Drive northbound. Up to five vehicles were observed queuing. Overall, the intersection operates at acceptable levels.

Existing Lane Configurations and Traffic Volumes

The existing lane configurations at the study intersections were obtained from field observations and previous studies (see Figure 5).

Existing traffic volumes were obtained from turning movement counts collected on November 30, 2023, between 7:00 and 9:00 AM and between 4:00 and 6:00 PM. Area schools were in session. The existing peak-hour intersection volumes are shown in Figure 6. The intersection turning-movement counts conducted for this analysis are presented in Appendix A.

Existing Intersection Levels of Service

The results of the intersection level of service analysis (see Table 5) show that both study intersections currently are operating at acceptable levels of service during the AM peak hour. During the PM peak hour, the intersection at Skyline Boulevard and San Bruno Avenue is operating at LOS F.

Due to the northbound queue on Skyline Boulevard during the PM peak hour, the counted traffic volumes at the San Bruno Avenue intersection did not reflect the actual traffic demand. The existing level of service results during the PM peak hour are reported based on level of service as identified by field observations to reflect “unserved demand”. To reflect the actual traffic demand at the intersection, the counted northbound through traffic volumes were factored (2.0) up to simulate the actual time it takes for northbound traffic to go through the intersection. The intersection level of service calculation sheets for the project are included in Appendix B.

Table 5
Existing Intersection Levels of Service

Study Number	Intersection	Peak Hour	Count Date	LOS Standard	Traffic Control	Existing Avg. Delay (sec.)	Existing LOS
1	Skyline Boulevard (SR35) and San Bruno Avenue [1]	AM PM	11/30/23 11/30/23	D	Signal	20.1 **161.6**	C **F**
2	Glenview Drive and San Bruno Avenue [2]	AM PM	11/30/23 11/30/23	D	TWSC	20.0 25.0	C D

Notes:
TWSC = Two-Way Stop Control
[1] The Highway Capacity Manual (HCM) 2010 does not support turning movements with shared and exclusive lanes or non-standard phasings. Therefore, this intersection was analyzed using the HCM 2000.
[2] Average delay for two-way stop controlled intersection is reported for the worst approach.

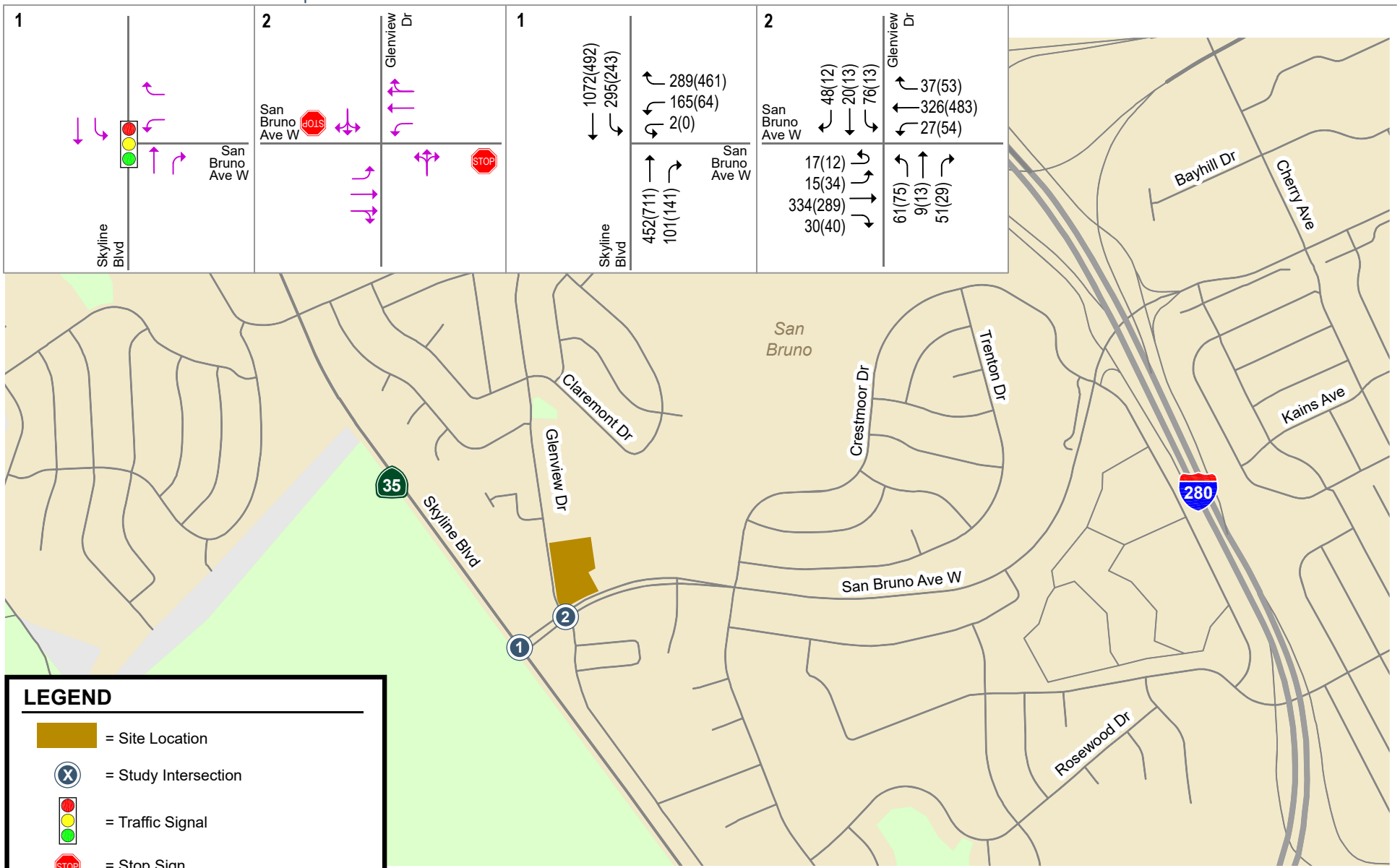


Figure 5
Existing Lane Configurations and Traffic Volumes

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear were estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM and PM peak hours. As part of the project trip distribution, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment, the project trips are assigned to specific streets and intersections. These procedures are described below.

Trip Generation

Through empirical research, data have been collected that show trip generation rates for many types of land uses. The data are published in the Institute of Transportation Engineers' (ITE) manual entitled *Trip Generation Manual,* 11th Edition. The magnitude of traffic added to the roadway system by a particular development is estimated by multiplying the applicable trip generation rates by the size of the development. Trip generation estimates for the project (see Table 6) are based on standard trip generation rates published in the ITE *Trip Generation Manual* for "Single-Family Attached Housing in a General Urban/Suburban area" (Land use 215). The "Single-Family Attached Housing" category refers to single-family housing units that share a wall with an adjoining dwelling unit, whether the walls are for living space, a vehicle garage, or storage space.

Based on the ITE trip generation rates, it is estimated that the proposed project would generate 418 daily trips, with 28 trips (9 inbound and 19 outbound) occurring during the AM peak hour and 34 trips (19 inbound and 15 outbound) occurring during the PM peak hour (see Table 6).

Table 6
Project Trip Generation Estimates

Land Use	Size	Daily Rate[1]	Daily Trips	AM Peak Hour				PM Peak Hour			
				Rate	In	Out	Total	Rate	In	Out	Total
Proposed											
Townhomes [1]	58 d.u.	7.20	418	0.48	9	19	28	0.57	19	15	34

Notes
d.u. = dwelling units
[1] Trip generation rate for the proposed townhomes are based on the ITE's *Trip Generation Manual, 11th Edition* rates for Land Use Code 215 "Single-Family Attached Housing in a General Urban/Suburban area."

Trip Distribution and Assignment

The trip distribution for the project was estimated based on existing travel patterns on the surrounding roadway network and the locations of complementary land uses (see Figure 6). The peak-hour trips generated by the proposed project were assigned to the roadway system based on the directions of approach and departure, the roadway network connections, and the location of project driveways (see Figure 6).

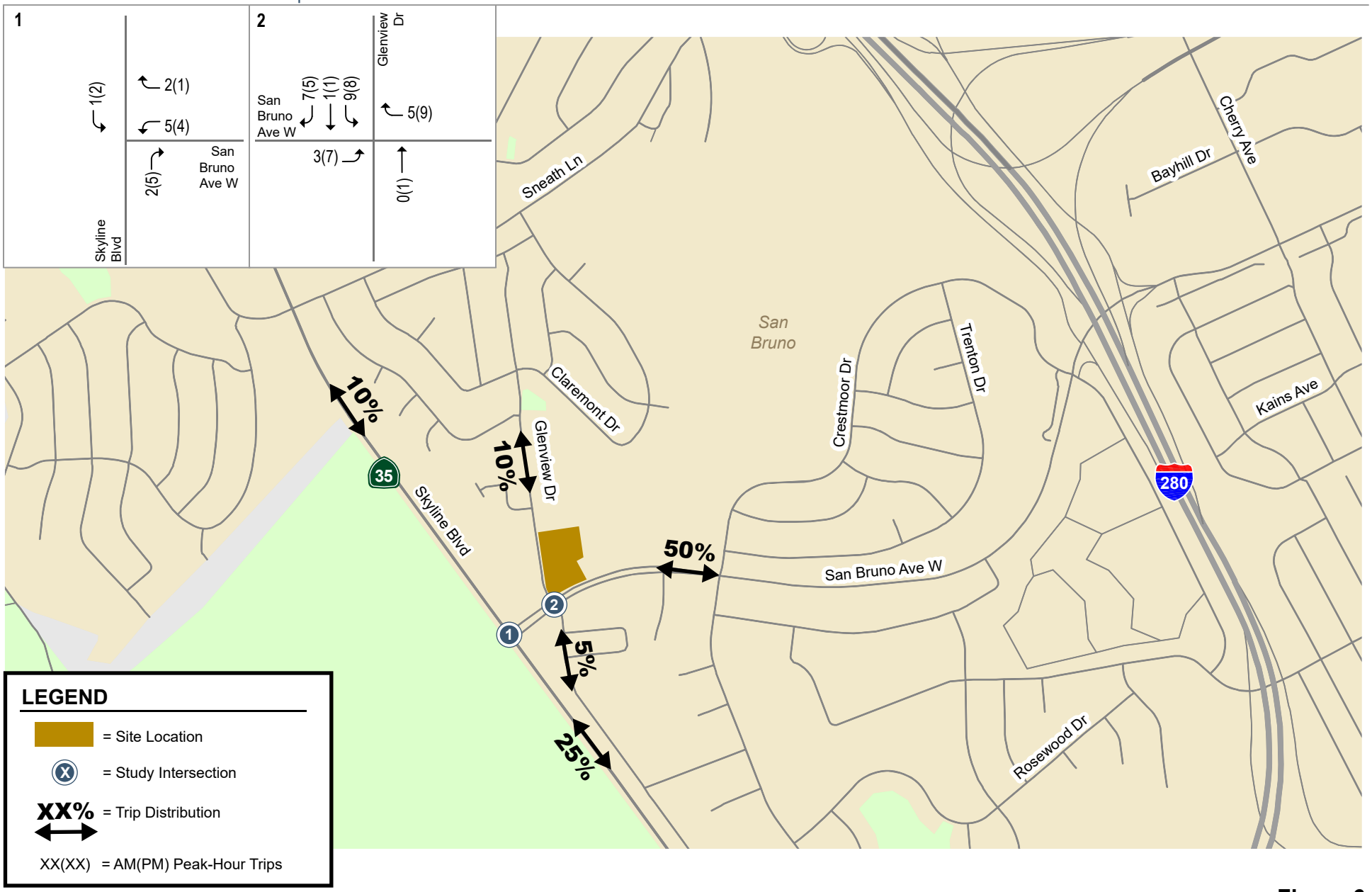


Figure 6
Project Trip Distribution and Project Trip Assignment

Existing Plus Project Conditions

The roadway network under existing plus project conditions would be the same as existing conditions because there are no planned and funded transportation improvements at the study intersections that would alter the existing intersection lane configurations, and the project would not alter the existing intersection lane configurations.

Existing Plus Project Traffic Volumes

Project trips, as represented in the above project trip assignment, were added to existing traffic volumes to obtain existing plus project traffic volumes (see Figure 7).

Existing Plus Project Intersection Levels of Service

The results of the intersection LOS analysis under existing plus project conditions are shown in Table 7. During the AM peak hour, both intersections would operate at an acceptable level when measured against the applicable municipal and CMP level of service standards.

During the PM peak hour, the intersection of Skyline Boulevard and San Bruno Avenue would continue operating at an unacceptable LOS F. However, since the Project would not cause the critical-movement delay at this intersection to increase by four or more seconds compared to existing conditions, the Project would not have an adverse effect on the operation of this intersection.

The average delay at the intersection of Skyline Boulevard/San Bruno Avenue under project conditions is shown to be less than under no project conditions during the PM peak hour. A decrease in average delay can occur because the intersection delay is a weighted average of all intersection movements. The addition of project traffic to movements with low delays can reduce the average delay for the entire intersection.

The intersection level of service calculation sheets for the project are included in Appendix B.

Table 7
Existing Plus Project Condition Intersection Levels of Service

Study Number	Intersection	Peak Hour	Existing Avg. Delay (sec.)	Existing LOS	Existing Plus Project Avg. Delay (sec.)	Existing Plus Project LOS	Incr. In Crit. Delay
1	Skyline Boulevard (SR35) and San Bruno Avenue [1]	AM	20.1	C	20.4	C	0.3
		PM	**161.6**	**F**	**161.1**	**F**	0.0
2	Glenview Drive and San Bruno Avenue [2]	AM	20.0	C	21.3	C	1.3
		PM	25.0	D	26.5	D	1.5

Notes:
TWSC = Two-Way Stop Control
[1] The Highway Capacity Manual (HCM) 2010 does not support turning movements with shared and exclusive lanes or non-standard phasings. Therefore, this intersection was analyzed using the HCM 2000.
[2] Average delay for two-way stop controlled intersection is reported for the worst approach.

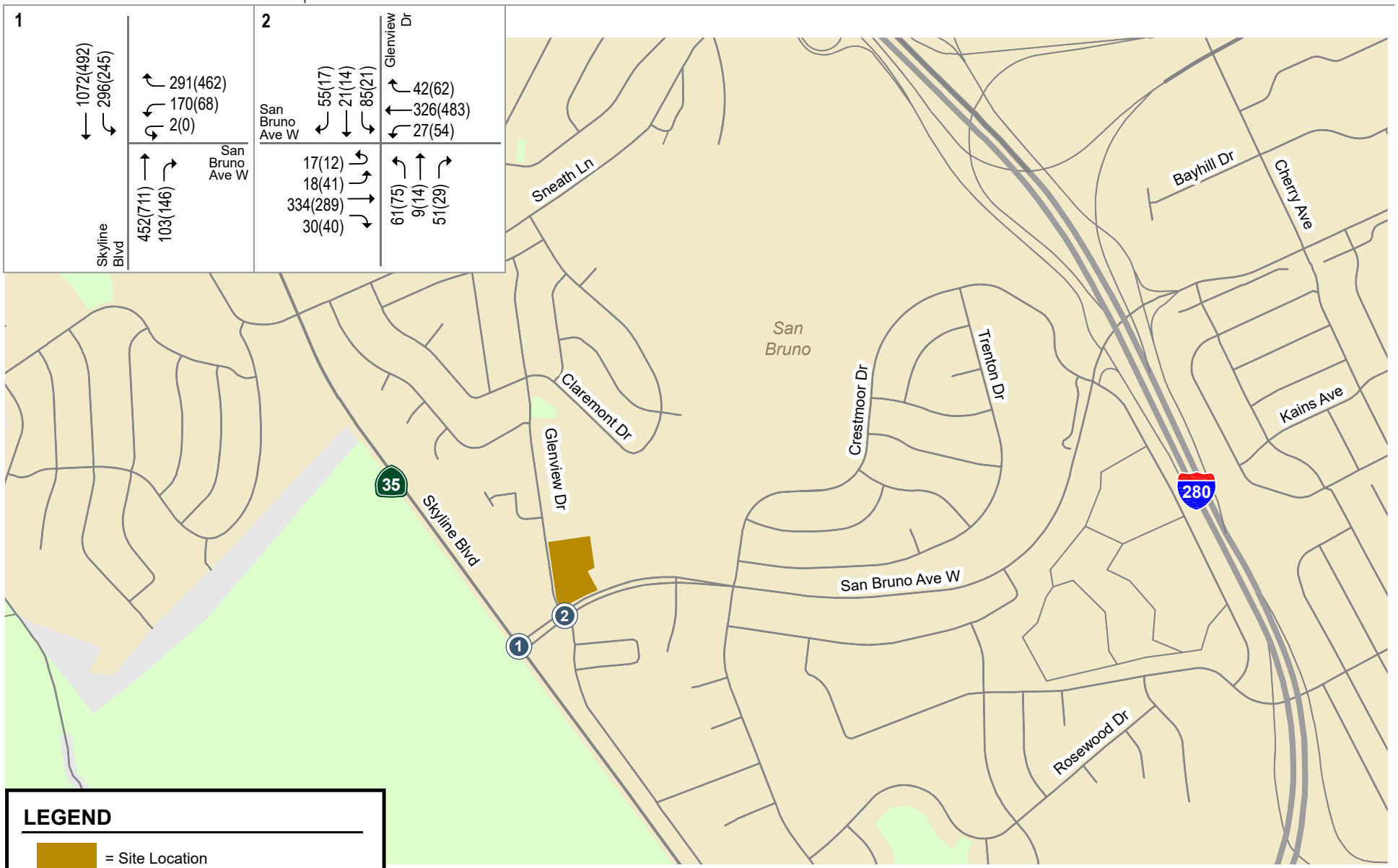


Figure 7
Existing Plus Project Traffic Volumes

Signal Warrant Analysis At Glenview Drive and San Bruno Avenue

Traffic operations at the unsignalized Glenview Drive/San Bruno Avenue intersection were also analyzed on the basis of the Peak-Hour Volume Signal Warrant, (Warrant #3) described in *the California Manual on Uniform Traffic Control Devices (CA MUTCD)*, 2014 Edition. This method makes no evaluation of intersection level of service, but simply provides an indication whether peak-hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. The results of peak-hour volume signal warrant analysis indicate that the Glenview Drive/San Bruno Avenue intersection would not meet the thresholds that warrant signalization under either existing or existing plus project conditions during both AM and PM peak hours. The peak-hour signal warrant sheet is contained in Appendix C.

Stop Warrant Analysis At Glenview Drive and San Bruno Avenue

A potential all-way stop at the Glenview Drive and San Bruno Avenue intersection was evaluated under existing and existing plus project conditions, based on the criteria described in the CA MUTCD (2014 Edition, Section 2B.07). The criteria are as follows:

A. *Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*

Based on the above conducted signal warrant check, this **criterion is not satisfied.**

B. *Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.*

Based on the collision history data (year 2022) from the Statewide Integrated Traffic Records System (SWITRS), there were no reported collisions at the intersection. Therefore, this **criterion is not satisfied**.

C. *Minimum volumes:* **criterion met**

1. *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and*
2. *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but*
3. *If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.*

D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

Other criteria that may be considered in an engineering study include:

A. The need to control left-turn conflicts;

B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;

C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and

D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.

Based on tube counts collected in December 2023, the volumes entering the intersection from the major street (San Bruno Avenue), both approaches, for the highest 8 hours average 706 vehicles per hour, which is much higher than the minimum requirement of 300 vehicles per hour. For the same 8 hours, the combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street (Glenview Drive), both approaches, is more than 160 units per hour. Since the posted speed limit of San Bruno Avenue is 40 mph the 70% factor under Criterion C.3 can be applied to the volume thresholds. As a result, the minimum volume criterion under Criterion C1 and C2 are both met at the intersection of San Bruno Avenue and Glenview Drive (see Table 8).

Table 8
All-way Stop Volume Check at Glenview Drive and San Bruno Avenue

Hour Start	Major Street (San Bruno Avenue)			Minor Street (Glenview Drive)			Meet Threshold ?
Time	Total Volume	Threshold	70% Threshold	Total Volume	Threshold	70% Threshold	
5:00 PM	895	300	210	146	200	140	
3:00 PM	798	300	210	163	200	140	
8:00 AM	756	300	210	243	200	140	
4:00 PM	753	300	210	183	200	140	
6:00 PM	700	300	210	118	200	140	
2:00 PM	696	300	210	167	200	140	
1:00 PM	542	300	210	138	200	140	
12:00 PM	509	300	210	123	200	140	
Average	**706**	**300**	**210**	**160**	**200**	**140**	**Yes**

Notes:
1. Volume for the major street is the total vehicle volume for the eastbound and westbound traffic on San Bruno Avenue.
2. Volume for the minor street is the total vehicle volume for the northbound and southbound traffic on Glenview Drive.
3. Based on tube count volume data collected in December, 2023.

With the proposed project, future residents would want to walk to the retail uses at the southeast corner of Glenview Drive and San Bruno Avenue. These pedestrians would use the crosswalk on the east approach of the intersection. Even with the pedestrian crossing warning signs installed on San Bruno Avenue, field observations show that pedestrians need to be extremely careful using the crosswalk due to the high traffic volume and high speed on San Bruno Avenue. Installing all-way stop control would improve the safety for pedestrian crossing at the intersection.

Based on the results of the multi-way stop analysis, installation of all-way stop control at Glenview Drive and San Bruno Avenue is warranted under both existing and existing plus project conditions.

Sight Distance Check on San Bruno Avenue

Currently, pedestrian crossing signs are provided on the west and east approaches of San Bruno Avenue at Glenview Drive. The speed limit along San Bruno Avenue is 45 mph. The Caltrans recommended stopping sight distance on San Bruno Avenue is 360 feet.

Northbound left-turn and southbound right-turn traffic from Skyline Boulevard to San Bruno Avenue eastbound is expected to travel at very lower speeds while making turns and the required stopping

distance is minimal. The segment of San Bruno Avenue between Skyline Boulevard and Glenview Drive is about 290 feet and there are no roadway curves or tall structures that obstruct a driver's ability to see down the road on San Bruno Avenue. Vehicles turning from Skyline Boulevard to eastbound San Bruno Avenue can see the existing pedestrian crossing sign and would be able to see the future stop sign clearly at the Skyline Boulevard/San Bruno Avenue intersection.

For vehicles travelling along San Bruno Avenue westbound approaching Glenview Drive, a stopping sight distance of 360 feet is required. Currently, there are no roadway curves or tall structures that obstruct drivers' ability to see the pedestrian crossing sign 360 feet away from Glenview Drive. Therefore, there would be adequate stopping sight distance for vehicles travelling on San Bruno Avenue.

> **Recommendations:** Currently, there is a pedestrian crossing warning sign installed about 200 feet west of Glenview Drive on the San Bruno Avenue westbound, It is recommended to install a STOP AHEAD Sign and also place a STOP AHEAD pavement marking on the roadway when an all-way stop control is installed at the intersection of Glenview Drive and San Bruno Avenue in the future to guide, warn, and regulate traffic.

Intersection Queuing Analysis

The analysis of intersection operations was supplemented with a vehicle queuing analysis for intersections where the project would add a substantial number of trips to the left-turn movements or stop-controlled movements. This analysis provides a basis for estimating future storage requirements at the intersections under existing and existing plus project conditions. Vehicle queues were estimated using Synchro, described in Chapter 1. The following movements were evaluated, and the results of the queueing analysis are summarized in Table 9:

- Westbound left-turn from San Bruno Avenue to Skyline Boulevard
- Southbound movement from Glenview Drive to San Bruno Avenue
- Eastbound left-turn from San Bruno Avenue to Glenview Drive

The queuing analysis results are presented in Table 9. The results show that both intersections studied are expected to have sufficient turn lane storage to accommodate the anticipated traffic volumes under existing plus project conditions.

Table 9
Intersection Queuing Analysis Summary

Analysis Scenario	Skyline Blvd & San Bruno Ave		Glenview Dr & San Bruno Ave			
	SB[2]		SB[2]		EBL	
	AM	PM	AM	PM	AM	PM
Existing						
95th %. Queue (ft/ln)	80	64	50	<25	<25	<25
Storage (ft/ln)	275	275	100	125	86	86
Adequate (Y/N)	Y	Y	Y	Y	Y	Y
Existing Plus Project						
95th %. Queue (ft/ln)	83	67	50	25	25	25
Storage (ft./ ln.)	275	275	100	125	86	86
Adequate (Y/N)	Y	Y	Y	Y	Y	Y

Notes:
1. Assumes 25 feet per vehicle queued.
2. Southbound storage length was measured from the southern right-turn only project driveway to the San Bruno Avenue intersection.

4. Other Transportation Issues

This chapter presents an analysis of other transportation issues associated with the project, including:

- Site access and circulation
- Parking

The analyses in this chapter are based on professional judgment in accordance with the standards and methods employed by the traffic engineering community.

Site Access and Circulation

A review of the project site plan was performed to determine if adequate vehicle site access and on-site circulation would be provided and to identify any access or circulation issues that should be improved. This review is based on the site plan prepared by Hunt Hale Jones Architects, dated September 28, 2023, presented on Figure 2 and in accordance with generally accepted traffic engineering standards.

Vehicular Site Access

Vehicle access to the project site would be provided via one right-in/right-out driveway and two full-access driveways along Glenview Drive. All the driveways would be at least 26.5 feet wide, which is sufficient for two-way traffic.

Project Driveway Operations

The project site includes two separate sections: 10 units in the northern portion and 48 units in the southern portion.

The northern full access driveway would only serve the 10 units in the northern portion of the project site. Based on the trip generation estimates, the trips that are estimated to occur at this driveway are 2 inbound and 3 outbound trips during the AM peak hour. During the PM peak hour, this driveway would serve 3 inbound and 3 outbound trips. Given the low traffic volume on Glenview Drive and small number of project trips at the driveway, the outbound traffic at this project driveway would not cause any operational issues on the project site.

The 48 units in the southern section would be served by the middle full-access driveway and the southern right-turn only driveway. It is expected that the middle full-access driveway would serve 15 outbound trips during the AM peak hour and 12 outbound trips during the PM peak hour. This calculates to about one outbound trip every 4 or 5 minutes exiting the driveway. The level of service analysis indicates that the outbound vehicles would experience LOS A conditions with an average delay of 9.8 seconds per vehicle during the AM peak hour. During the PM peak hour, the outbound

vehicles would experience moderate delays of 10.1 seconds per vehicle (LOS B). Given the small number of project trips, the delay at the project driveway would not cause any operational issues on the project site.

The right-turn only driveway would be located approximately 100 feet north of the intersection of Glenview Drive and San Bruno Avenue. It is expected that 3 and 8 inbound project trips traveling on northbound Glenview Drive would use the southern driveway during the AM and PM peak hour, respectively. Vehicles turning right into the project site from northbound Glenview Drive at the southern right-turn only driveway may block the travel lane momentarily due to vehicles slowing down to turn into the driveway, but this would not have a significant effect on traffic operations given the low traffic volume on Glenview Drive and small number of project trips entering the driveway.

Sight Distance

The proposed driveway locations were evaluated to determine if the sight distance at the driveways would be adequate. The project driveways should be free and clear of any obstructions to optimize sight distance, thereby ensuring that exiting vehicles can see pedestrians on the sidewalk and other vehicles traveling on adjacent roadways. Any landscaping and signage should be located in such a way as to ensure an unobstructed view for drivers entering and exiting the site. Adequate sight distance reduces the likelihood of a collision at driveways and provides drivers with the ability to locate sufficient gaps in traffic to exit a driveway. Sight distance of a driveway is evaluated based on the stopping sight distance recommended by Caltrans for a given design speed.

The two full-access driveways on Glenview Drive would be located along a straight segment of Glenview Drive. The speed limit along Glenview Drive is 25 mph. The Caltrans recommended stopping sight distance on Glenview Drive is 150 feet. The project driveways should be kept free of any signage or landscaping that would block sight distance, thereby ensuring that exiting vehicles can see pedestrians on the sidewalk and other vehicles traveling on Glenview Drive. Currently, there are no roadway curves or tall structures that obstruct a driver's ability to see down the road on Glenview Drive. However, street parking is currently allowed on Glenview Drive and could obstruct the vision of exiting drivers if there are cars parked next to the driveways. To maintain adequate sight distance red curbs should be installed for 25 feet south of each driveway and 5 feet north of each driveway.

The southern right-turn only driveway is located approximately 100 feet north of the intersection of Glenview Drive and San Bruno Avenue. It is expected that this driveway would have very few outbound vehicles. Nevertheless, outbound vehicles at the driveway would need be able to see vehicles approaching from the Glenview/San Bruno intersection.

Westbound right-turn traffic from San Bruno Avenue to Glenview Drive is expected to travel at lower speeds while making turns. Based on the curb radius, vehicles slow to a maximum of approximately 15 mph when turning right from westbound San Bruno Avenue. The recommended stopping sight distance would be 100 feet for a design speed of 15 mph. Therefore, south of the right-turn only driveway, the area crossing the sight line between A and C (see Figure 8) should be flat, and no planting or structures over 2 feet tall should be placed within the sight triangle to guarantee outbound drivers at this project driveway could see vehicles turning right from westbound San Bruno Avenue to Glenview Drive.

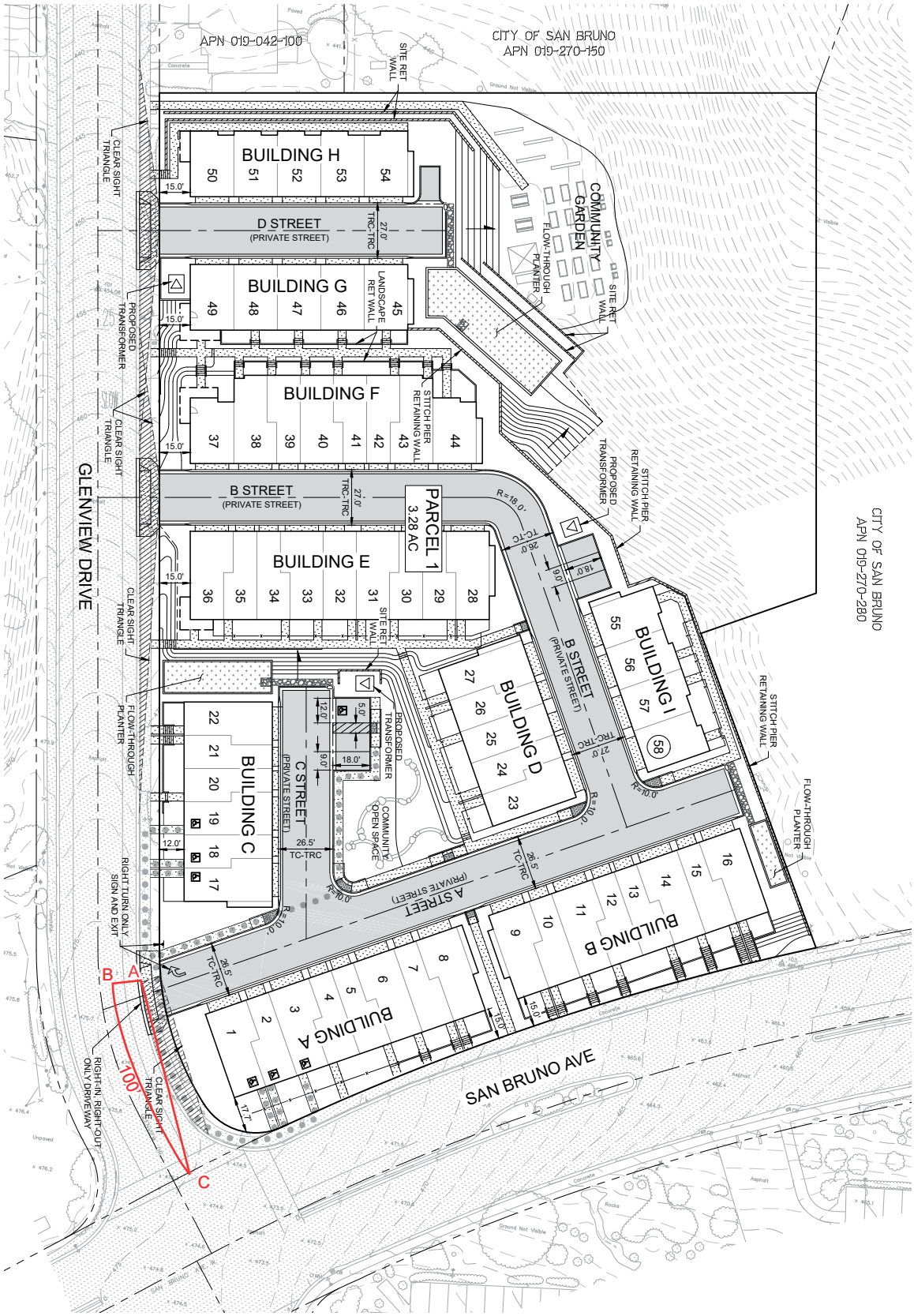


Figure 8
Illustration of the Sight Distance at the Southern Right-Turn Only Driveway

NORTH
Not to Scale

Vehicle On-Site Circulation

On-site vehicular circulation was reviewed in accordance with the City of San Bruno Zoning Code and generally accepted traffic engineering standards. The proposed site plan shows that all the internal circular roads serving the southern portion of the project site would be at least 26 feet wide. The proposed width is adequate for two-way circulation and would provide sufficient room for vehicles to back out of the garages. The site plan shows good circulation through the southern section of the project site.

The site plan shows a 140-foot dead-end road ("D Street") serving the two buildings on the northern portion of the project site. Dead-end streets generally are undesirable because upon reaching the end of an aisle, drivers must either back out or perform a three-point maneuver. However, the dead-end street would only provide access to resident garages and one visitor parking space. There would be extra space next to the visitor parking to allow a vehicle to turn around.

Parking Stall Dimensions

The guest parking stalls shown on the site plan measure 9.0 feet wide by 18 feet long, which meets the City's standard for parking stalls. The accessible ADA stalls also measure 12 feet wide by 18 feet long and include access aisles of 5 feet or more for van accessibility. These stall dimensions would meet ADA standards.

Truck Access and Circulation

The project proposes to have trash pick-up by Recology in front of each unit. Emergency response vehicles and garbage trucks would be able to access the southern section of the project site from the southern right-turn only driveway and exit at the middle full-access driveway. The minimum width of the internal roadways through the southern section of the project site would be 26 feet wide, which is adequate for emergency vehicles and garbage trucks.

No turn around space would be provided along D street for garbage trucks, large delivery trucks, or emergency vehicles to turn around. Therefore, garbage trucks would have to back out of D Street after collecting garbage. Fire trucks could service the homes on D Street from Glenview Drive because the street would be only 140 feet long. There is an existing fire hydrant on Glenview Drive.

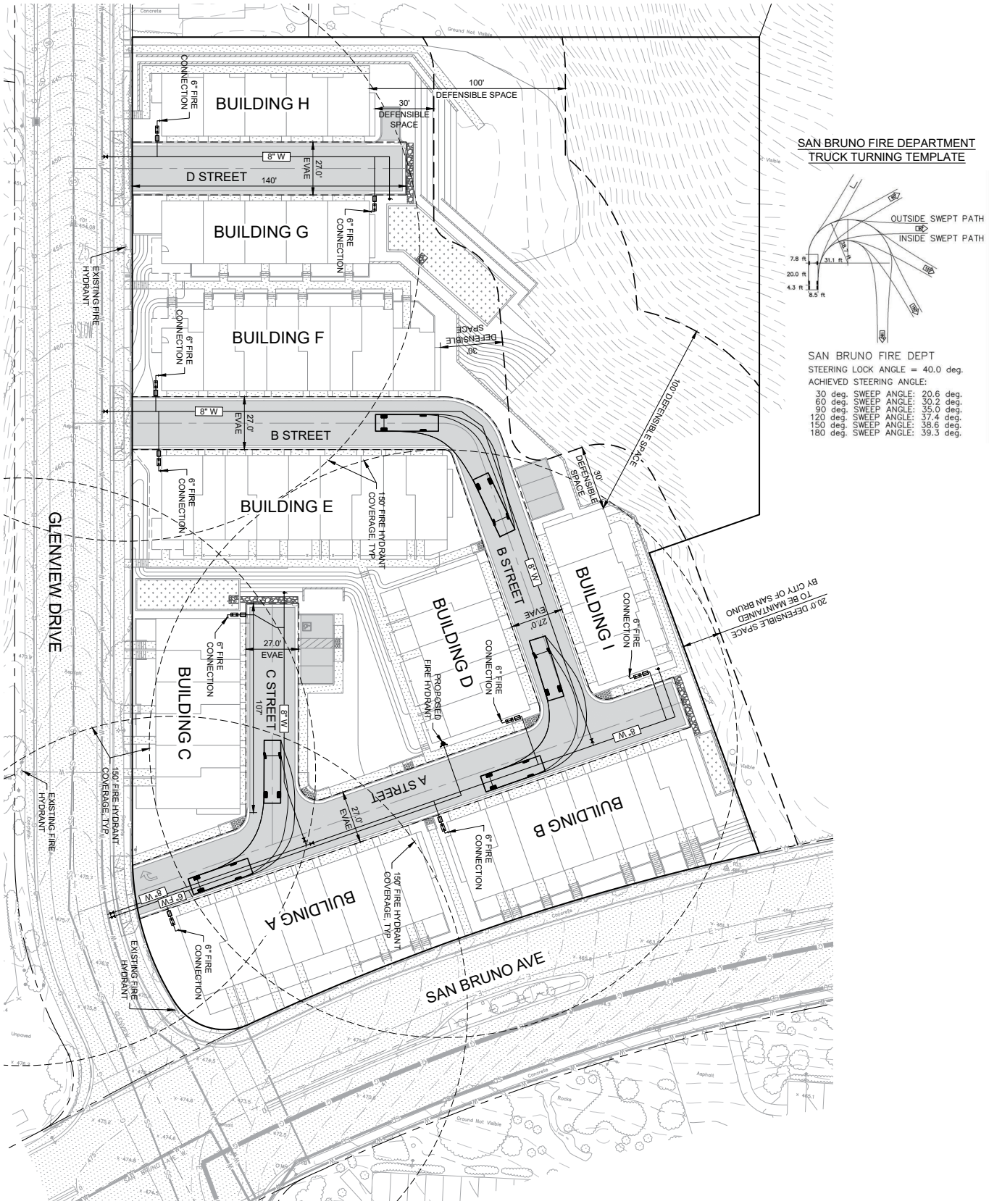


Figure 9
Truck Access and Circulation

Pedestrian, Bicycle, and Transit Access

Pedestrian Access

Pedestrian access to the project site is provided via sidewalks on San Bruno Avenue, Glenview Drive, and crosswalks at the nearby intersections. The project would build new sidewalks along its frontage on San Bruno Avenue. Pedestrian walkways would be provided through the site that provide pedestrian access from Glenview Drive and San Bruno Avenue to all the residential units.

Future residents of the project who want to walk to retail uses at the southeast corner of Glenview Drive and San Bruno Avenue would need use the crosswalk on the east approach of the intersection at Glenview Drive/San Bruno Avenue. Future residents who want to walk to/from the nearby multi-use San Andreas Trail would also need use the crosswalk on the east approach of Glenview Drive/San Bruno Avenue and the sidewalk along the south side of San Burno Avenue because there is not a continuous sidewalk on the north side. There are pedestrian crossing warning signs installed on San Bruno Avenue. However, field observations show that pedestrians need to be extremely careful using the crosswalk due to the high traffic volume and high speed on San Bruno Avenue.

Bicycle Access

In the project vicinity, neither San Bruno Avenue, Glenview Drive, nor the other nearby streets have striped bike lanes.

There is a bike lane along Sneath Lane, except between the I-280 ramps. A Class I bicycle path (the San Andreas Trail) exists south of the study area parallel to Skyline Blvd. However, there are several potential future additional bicycle facilities in the study area. The City's *Walk 'n Bike Plan* outlines the potential bicycle improvement strategies near the project site (see Figure 3) including bike lanes along San Bruno Avenue and Skyline Boulevard, although none are currently planned or funded projects.

Transit Access

The project site is not well served by any existing transit routes. The closest bus stop is at Claremont Drive and Sneath Lane, which is about 0.5 mile from the project site. There are three bus routes that serve that stop, as described below in Table 4 and shown on Figure 4. The bus stops are beyond walking distance for most residents.

The San Bruno Caltrain Station is located 2.1 mile east of the project site and the nearest BART station is the San Bruno Station, located approximately 2.5 mile from the project site.

Parking

Based on the City of San Bruno Municipal Code Section 12.100.030, two covered off-street parking spaces, defined as 2-car garage or carport spaces, per dwelling unit are required for single-family residential developments. The project would meet this requirement. The code does not address guest parking for single-family homes. However, the code has guest parking requirements for multi-family residential units based on the number of bedrooms. For units with two or more bedrooms, as proposed here, the code requires one guest space per ten units. The project would have 58 units, so 6 guest spaces would be required. The site plan shows 7 guest spaces.

Bicycle Parking

The City's zoning code does not have bicycle parking requirements for single-family developments. Residents would be able to store their bicycles inside the two-car garage that has been proposed for each unit.

Glenview Terrace Residential Development
Transportation Analysis

Technical Appendices

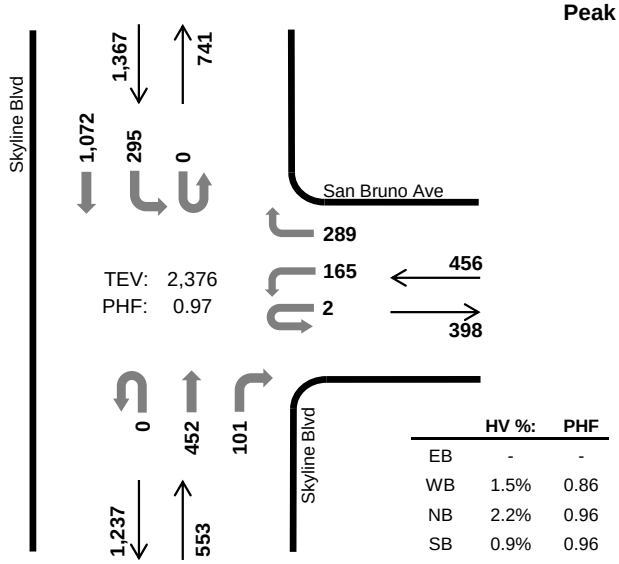
March 19, 2024

Appendix A

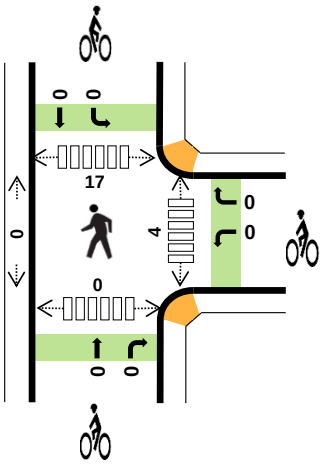
Traffic Counts

Skyline Blvd
San Bruno Ave

Peak Hour



	HV %:	PHF
EB	-	-
WB	1.5%	0.86
NB	2.2%	0.96
SB	0.9%	0.96
TOTAL	1.3%	0.97



Date: 11/30/2023
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Two-Hour Count Summaries

Interval Start		N/A Eastbound				San Bruno Ave Westbound				Skyline Blvd Northbound				Skyline Blvd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	0	0	16	0	16	0	0	33	14	0	29	169	0	277	0
7:15 AM		0	0	0	0	0	39	0	25	0	0	61	14	0	47	213	0	399	0
7:30 AM		0	0	0	0	0	41	0	36	0	0	94	16	0	51	279	0	517	0
7:45 AM		**0**	**0**	**0**	**0**	**2**	**47**	**0**	**61**	**0**	**0**	**98**	**28**	**0**	**64**	**292**	**0**	**592**	1,785
8:00 AM		**0**	**0**	**0**	**0**	**0**	**40**	**0**	**81**	**0**	**0**	**117**	**24**	**0**	**90**	**254**	**0**	**606**	2,114
8:15 AM		**0**	**0**	**0**	**0**	**0**	**49**	**0**	**83**	**0**	**0**	**117**	**27**	**0**	**83**	**256**	**0**	**615**	2,330
8:30 AM		**0**	**0**	**0**	**0**	**0**	**29**	**0**	**64**	**0**	**0**	**120**	**22**	**0**	**58**	**270**	**0**	**563**	**2,376**
8:45 AM		0	0	0	0	0	30	0	47	0	0	92	19	0	67	229	0	484	2,268
Count Total		0	0	0	0	2	291	0	413	0	0	732	164	0	489	1,962	0	4,053	0
Peak Hour	**All**	**0**	**0**	**0**	**0**	**2**	**165**	**0**	**289**	**0**	**0**	**452**	**101**	**0**	**295**	**1,072**	**0**	**2,376**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**6**	**6**	**0**	**4**	**8**	**0**	**31**	**0**
	HV%	**-**	**-**	**-**	**-**	**0%**	**0%**	**-**	**2%**	**-**	**-**	**1%**	**6%**	**-**	**1%**	**1%**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	0	2	*2*	0	0	0	0	*0*	0	3	4	0	*7*
7:15 AM	0	0	2	1	*3*	0	0	0	0	*0*	0	0	1	0	*1*
7:30 AM	0	0	9	2	*11*	0	0	0	0	*0*	0	0	4	0	*4*
7:45 AM	**0**	**3**	**5**	**3**	***11***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**3**	**0**	*5*
8:00 AM	**0**	**1**	**2**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**5**	**0**	*7*
8:15 AM	**0**	**1**	**3**	**6**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**3**	**0**	*3*
8:30 AM	**0**	**2**	**2**	**3**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**6**	**0**	***6***
8:45 AM	0	2	2	4	*8*	0	0	0	0	*0*	0	0	3	0	*3*
Count Total	0	9	25	21	*55*	0	0	0	0	*0*	4	3	29	0	*36*
Peak Hr	**0**	**7**	**12**	**12**	***31***	**0**	**0**	**0**	**0**	***0***	**4**	**0**	**17**	**0**	***21***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	N/A				San Bruno Ave				Skyline Blvd				Skyline Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	6	3	0	0	2	0	11	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**4**	**0**	**1**	**2**	**0**	**11**	27
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**3**	28
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**1**	**0**	**2**	**4**	**0**	**10**	35
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**1**	**2**	**0**	**7**	**31**
8:45 AM	0	0	0	0	0	1	0	1	0	0	2	0	0	0	4	0	8	28
Count Total	0	0	0	0	0	1	0	8	0	0	16	9	0	5	16	0	55	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**6**	**6**	**0**	**4**	**8**	**0**	**31**	**0**

Two-Hour Count Summaries - Bikes

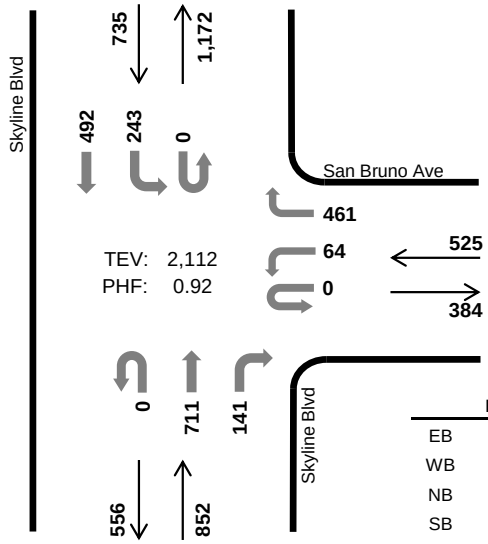
Interval Start	N/A			San Bruno Ave			Skyline Blvd			Skyline Blvd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

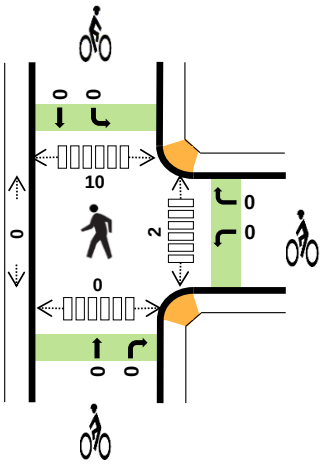
Skyline Blvd
San Bruno Ave

Date: 11/30/2023
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

Peak Hour



	HV %:	PHF
EB	-	-
WB	0.0%	0.91
NB	0.4%	0.91
SB	1.4%	0.83
TOTAL	0.6%	0.92



Two-Hour Count Summaries

Interval Start	N/A Eastbound				San Bruno Ave Westbound				Skyline Blvd Northbound				Skyline Blvd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	29	0	76	0	0	180	54	0	53	99	0	491	0
4:15 PM	0	0	0	0	0	20	0	83	0	0	193	42	0	46	125	0	509	0
4:30 PM	0	0	0	0	0	11	0	87	0	0	215	48	0	54	93	0	508	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**17**	**0**	**98**	**0**	**0**	**193**	**40**	**0**	**50**	**125**	**0**	**523**	2,031
5:00 PM	**0**	**0**	**0**	**0**	**0**	**15**	**0**	**110**	**0**	**0**	**154**	**32**	**0**	**58**	**118**	**0**	**487**	2,027
5:15 PM	**0**	**0**	**0**	**0**	**0**	**13**	**0**	**128**	**0**	**0**	**175**	**34**	**0**	**82**	**140**	**0**	**572**	2,090
5:30 PM	**0**	**0**	**0**	**0**	**0**	**19**	**0**	**125**	**0**	**0**	**189**	**35**	**0**	**53**	**109**	**0**	**530**	**2,112**
5:45 PM	0	0	0	0	1	21	0	148	0	0	160	41	0	63	85	0	519	2,108
Count Total	0	0	0	0	1	145	0	855	0	0	1,459	326	0	459	894	0	4,139	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**64**	**0**	**461**	**0**	**0**	**711**	**141**	**0**	**243**	**492**	**0**	**2,112**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**4**	**6**	**0**	**13**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**-**	**-**	**0%**	**0%**	**-**	**2%**	**1%**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	1	2	3	*6*	0	0	0	0	*0*	1	0	3	0	*4*
4:15 PM	0	0	1	1	*2*	0	0	0	0	*0*	1	0	2	0	*3*
4:30 PM	0	0	1	3	*4*	0	0	0	0	*0*	0	0	1	0	*1*
4:45 PM	**0**	**0**	**0**	**4**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**5**	**0**	*5*
5:00 PM	**0**	**0**	**2**	**2**	***4***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**4**	**0**	*6*
5:15 PM	**0**	**0**	**1**	**3**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	*1*
5:30 PM	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:45 PM	0	0	0	1	*1*	0	0	0	0	*0*	1	0	2	0	*3*
Count Total	0	1	7	18	*26*	0	0	0	0	*0*	5	0	18	0	*23*
Peak Hr	**0**	**0**	**3**	**10**	***13***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**10**	**0**	***12***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	N/A				San Bruno Ave				Skyline Blvd				Skyline Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	1	0	0	0	0	2	0	0	1	2	0	6	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	0	4	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**4**	16
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**4**	14
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**1**	**0**	**4**	16
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**13**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	10
Count Total	0	0	0	0	0	1	0	0	0	0	7	0	0	7	11	0	26	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**4**	**6**	**0**	**13**	**0**

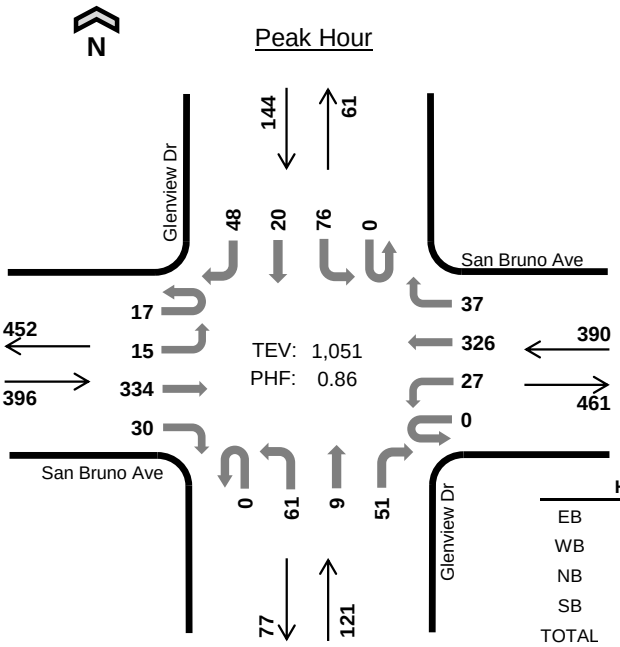
Two-Hour Count Summaries - Bikes

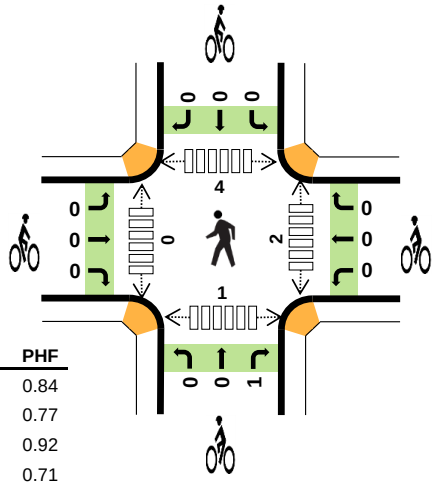
Interval Start	N/A			San Bruno Ave			Skyline Blvd			Skyline Blvd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Glenview Dr
San Bruno Ave

Date: 11/30/2023
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM





	HV %:	PHF
EB	2.5%	0.84
WB	2.3%	0.77
NB	2.5%	0.92
SB	0.7%	0.71
TOTAL	2.2%	0.86

Two-Hour Count Summaries

Interval Start	San Bruno Ave Eastbound				San Bruno Ave Westbound				Glenview Dr Northbound				Glenview Dr Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	2	2	31	5	0	1	24	1	0	7	2	8	1	1	1	2	88	0
7:15 AM	1	0	44	7	0	3	32	0	0	19	1	6	0	3	1	11	128	0
7:30 AM	4	1	49	10	0	10	42	3	0	24	0	13	0	7	3	14	180	0
7:45 AM	**4**	**4**	**71**	**7**	**0**	**6**	**62**	**5**	**0**	**19**	**3**	**11**	**0**	**14**	**9**	**16**	**231**	627
8:00 AM	**4**	**4**	**102**	**8**	**0**	**2**	**91**	**11**	**0**	**16**	**0**	**13**	**0**	**30**	**7**	**14**	**302**	841
8:15 AM	**5**	**5**	**96**	**6**	**0**	**13**	**100**	**13**	**0**	**15**	**4**	**11**	**0**	**23**	**3**	**12**	**306**	1,019
8:30 AM	**4**	**2**	**65**	**9**	**0**	**6**	**73**	**8**	**0**	**11**	**2**	**16**	**0**	**9**	**1**	**6**	**212**	**1,051**
8:45 AM	0	1	67	7	1	3	48	8	0	22	0	9	0	6	1	4	177	997
Count Total	24	19	525	59	1	44	472	49	0	133	12	87	1	93	26	79	1,624	0
Peak Hour All	**17**	**15**	**334**	**30**	**0**	**27**	**326**	**37**	**0**	**61**	**9**	**51**	**0**	**76**	**20**	**48**	**1,051**	**0**
Peak Hour HV	**0**	**1**	**9**	**0**	**0**	**2**	**5**	**2**	**0**	**2**	**0**	**1**	**0**	**1**	**0**	**0**	**23**	**0**
Peak Hour HV%	**0%**	**7%**	**3%**	**0%**	**-**	**7%**	**2%**	**5%**	**-**	**3%**	**0%**	**2%**	**-**	**1%**	**0%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	0	1	0	*2*	0	0	0	0	*0*	0	0	3	0	*3*
7:15 AM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	2	0	*2*
7:30 AM	4	0	0	0	*4*	0	0	0	0	*0*	0	0	2	0	*2*
7:45 AM	**4**	**4**	**1**	**1**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
8:00 AM	**1**	**1**	**1**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**0**	*2*
8:15 AM	**3**	**1**	**1**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:30 AM	**2**	**3**	**0**	**0**	***5***	**0**	**0**	**1**	**0**	***1***	**2**	**0**	**2**	**0**	***4***
8:45 AM	0	1	1	0	*2*	0	0	0	0	*0*	1	1	1	0	*3*
Count Total	16	10	5	1	*32*	0	0	1	0	*1*	3	1	12	1	*17*
Peak Hour	**10**	**9**	**3**	**1**	***23***	**0**	**0**	**1**	**0**	***1***	**2**	**0**	**4**	**1**	***7***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	San Bruno Ave Eastbound				San Bruno Ave Westbound				Glenview Dr Northbound				Glenview Dr Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
7:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:30 AM	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0
7:45 AM	**0**	**1**	**3**	**0**	**0**	**2**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**10**	17
8:00 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	18
8:15 AM	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**5**	22
8:30 AM	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**23**
8:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	15
Count Total	0	1	14	1	0	2	6	2	0	3	0	2	0	1	0	0	32	0
Peak Hour	**0**	**1**	**9**	**0**	**0**	**2**	**5**	**2**	**0**	**2**	**0**	**1**	**0**	**1**	**0**	**0**	**23**	**0**

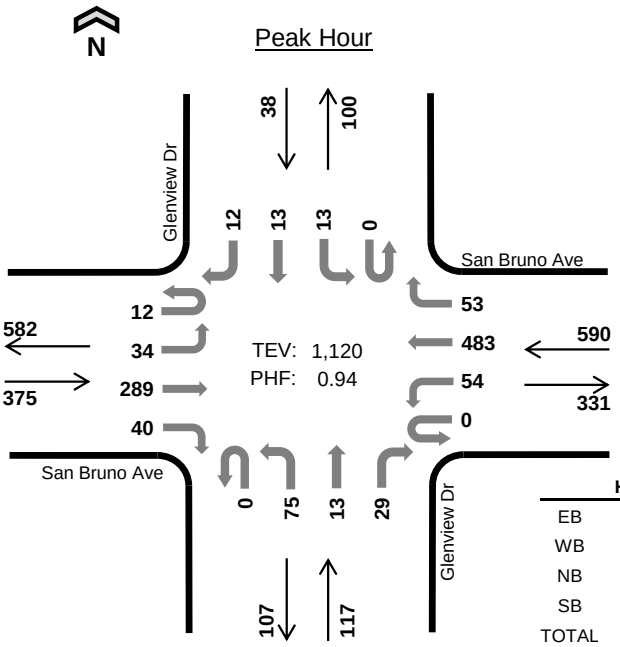
Two-Hour Count Summaries - Bikes

Interval Start	San Bruno Ave Eastbound			San Bruno Ave Westbound			Glenview Dr Northbound			Glenview Dr Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**

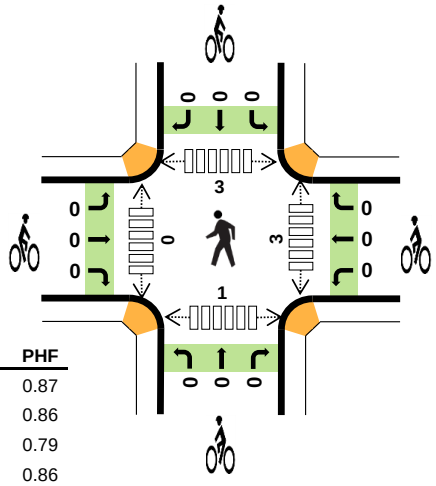
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Glenview Dr
San Bruno Ave

Date: 11/30/2023
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM



	HV %:	PHF
EB	1.1%	0.87
WB	0.2%	0.86
NB	0.0%	0.79
SB	0.0%	0.86
TOTAL	0.4%	0.94



Two-Hour Count Summaries

Interval Start	San Bruno Ave Eastbound				San Bruno Ave Westbound				Glenview Dr Northbound				Glenview Dr Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	4	15	65	16	0	15	74	7	0	25	2	15	0	3	2	5	248	0
4:15 PM	4	9	51	18	0	10	69	6	0	22	2	12	0	11	2	6	222	0
4:30 PM	7	0	65	25	0	10	66	5	0	20	4	15	0	6	2	1	226	0
4:45 PM	0	10	54	21	0	11	95	13	0	19	4	4	0	4	5	4	244	940
5:00 PM	**3**	**11**	**66**	**7**	**0**	**14**	**97**	**17**	**0**	**21**	**4**	**6**	**0**	**3**	**5**	**3**	**257**	949
5:15 PM	**2**	**6**	**87**	**13**	**0**	**13**	**118**	**11**	**0**	**17**	**4**	**7**	**0**	**4**	**1**	**3**	**286**	1,013
5:30 PM	**5**	**9**	**60**	**10**	**0**	**10**	**122**	**17**	**0**	**23**	**3**	**11**	**0**	**1**	**5**	**2**	**278**	1,065
5:45 PM	**2**	**8**	**76**	**10**	**0**	**17**	**146**	**8**	**0**	**14**	**2**	**5**	**0**	**5**	**2**	**4**	**299**	**1,120**
Count Total	27	68	524	120	0	100	787	84	0	161	25	75	0	37	24	28	2,060	0
Peak Hour All	**12**	**34**	**289**	**40**	**0**	**54**	**483**	**53**	**0**	**75**	**13**	**29**	**0**	**13**	**13**	**12**	**1,120**	**0**
Peak Hour HV	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**
Peak Hour HV%	**0%**	**0%**	**1%**	**0%**	**-**	**2%**	**0%**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**0%**	**0%**	**0%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	1	1	0	*3*	0	0	1	0	*1*	4	1	5	1	*11*
4:15 PM	1	0	1	0	*2*	0	0	0	1	*1*	2	0	1	2	*5*
4:30 PM	3	0	0	0	*3*	0	1	0	0	*1*	1	0	1	0	*2*
4:45 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	2	0	*2*
5:00 PM	**2**	**1**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**1**	*3*
5:15 PM	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
5:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**1**	**0**	*3*
5:45 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	9	2	3	0	*14*	0	1	1	1	*3*	10	1	12	4	*27*
Peak Hour	**4**	**1**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**3**	**0**	**3**	**1**	***7***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	San Bruno Ave Eastbound				San Bruno Ave Westbound				Glenview Dr Northbound				Glenview Dr Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	3	0
4:15 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
4:30 PM	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	9
5:00 PM	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	9
5:15 PM	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	9
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	6
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**
Count Total	0	0	8	1	0	2	0	0	0	1	0	2	0	0	0	0	14	0
Peak Hour	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	San Bruno Ave Eastbound			San Bruno Ave Westbound			Glenview Dr Northbound			Glenview Dr Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	1	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Count Total	0	0	0	0	0	1	0	0	1	0	1	0	3	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Appendix B

Level of Service Calculations

Movement	WBU	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations							
Traffic Volume (vph)	2	165	289	295	1072	452	101
Future Volume (vph)	2	165	289	295	1072	452	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	4.0	5.7	5.7	5.7
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)		1770	1583	1770	1863	1863	1556
Flt Permitted		0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)		1770	1583	1770	1863	1863	1556
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	165	289	295	1072	452	101
RTOR Reduction (vph)	0	0	176	0	0	0	27
Lane Group Flow (vph)	0	167	113	295	1072	452	74
Confl. Peds. (#/hr)	4	4	21	21			4
Turn Type	Prot	Prot	pt+ov	Prot	NA	NA	Perm
Protected Phases	4	4	4 5	5	2	6	
Permitted Phases							6
Actuated Green, G (s)		12.5	31.6	15.6	59.4	39.8	39.8
Effective Green, g (s)		12.5	31.6	15.6	59.4	39.8	39.8
Actuated g/C Ratio		0.15	0.39	0.19	0.73	0.49	0.49
Clearance Time (s)		3.5		4.0	5.7	5.7	5.7
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		272	616	340	1364	914	763
v/s Ratio Prot		c0.09	0.07	c0.17	c0.58	0.24	
v/s Ratio Perm							0.05
v/c Ratio		0.61	0.18	0.87	0.79	0.49	0.10
Uniform Delay, d1		32.0	16.3	31.7	6.8	13.9	11.0
Progression Factor		1.02	1.22	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.1	0.1	20.1	4.6	1.9	0.3
Delay (s)		36.7	19.9	51.9	11.5	15.8	11.3
Level of Service		D	B	D	B	B	B
Approach Delay (s/veh)		26.1			20.2	15.0	
Approach LOS		C			C	B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	81.1	Sum of lost time (s)	13.2
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

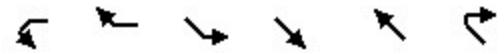
Intersection	
Int Delay, s/veh	5.2

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	17	15	334	30	27	326	37	61	9	51	76	20	48
Future Vol, veh/h	17	15	334	30	27	326	37	61	9	51	76	20	48
Conflicting Peds, #/hr	0	4	0	1	3	0	6	1	0	3	6	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	86	-	-	90	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	15	334	30	27	326	37	61	9	51	76	20	48

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	363	369	0	0	367	0	0	647	839	191	647	836	192
Stage 1	-	-	-	-	-	-	-	416	416	-	405	405	-
Stage 2	-	-	-	-	-	-	-	231	423	-	242	431	-
Critical Hdwy	6.44	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	845	1186	-	-	1188	-	-	356	300	818	356	302	817
Stage 1	-	-	-	-	-	-	-	585	590	-	593	597	-
Stage 2	-	-	-	-	-	-	-	751	586	-	740	581	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	938	938	-	-	1185	-	-	301	281	811	308	282	809
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	301	281	-	308	282	-
Stage 1	-	-	-	-	-	-	-	563	568	-	569	580	-
Stage 2	-	-	-	-	-	-	-	664	569	-	655	560	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.7	0.6	17.5	20
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	407	938	-	-	1185	-	-	382
HCM Lane V/C Ratio	0.297	0.034	-	-	0.023	-	-	0.377
HCM Control Delay (s/veh)	17.5	9	-	-	8.1	-	-	20
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.2	0.1	-	-	0.1	-	-	1.7



Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	64	461	243	492	711	141
Future Volume (vph)	64	461	243	492	711	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	4.0	5.7	5.7	5.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	1863	1863	1560
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	1863	1863	1560
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	100%	100%	100%	100%	200%	100%
Adj. Flow (vph)	64	461	243	492	1422	141
RTOR Reduction (vph)	0	7	0	0	0	12
Lane Group Flow (vph)	64	454	243	492	1422	129
Confl. Peds. (#/hr)	2	12	12			2
Turn Type	Prot	pt+ov	Prot	NA	NA	Perm
Protected Phases	4	4 5	5	2	6	
Permitted Phases						6
Actuated Green, G (s)	12.5	31.7	15.7	56.8	37.1	37.1
Effective Green, g (s)	12.5	31.7	15.7	56.8	37.1	37.1
Actuated g/C Ratio	0.16	0.40	0.20	0.72	0.47	0.47
Clearance Time (s)	3.5		4.0	5.7	5.7	5.7
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	639	354	1348	880	737
v/s Ratio Prot	0.04	c0.29	0.14	0.26	c0.76	
v/s Ratio Perm						0.08
v/c Ratio	0.23	0.71	0.69	0.36	1.62	0.17
Uniform Delay, d1	28.8	19.6	29.1	4.1	20.7	11.9
Progression Factor	1.01	1.01	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.7	5.4	0.8	282.4	0.5
Delay (s)	29.6	23.5	34.6	4.8	303.1	12.4
Level of Service	C	C	C	A	F	B
Approach Delay (s/veh)	24.3			14.7	276.9	
Approach LOS	C			B	F	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	161.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	13.2
Intersection Capacity Utilization	112.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	4.1

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	12	34	289	40	54	483	53	75	13	29	13	13	12
Future Vol, veh/h	12	34	289	40	54	483	53	75	13	29	13	13	12
Conflicting Peds, #/hr	0	3	0	1	4	0	6	1	0	4	6	0	3
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	86	-	-	90	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	34	289	40	54	483	53	75	13	29	13	13	12

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	536	542	0	0	333	0	0	764	1055	175	873	1049	277
Stage 1	-	-	-	-	-	-	-	405	405	-	624	624	-
Stage 2	-	-	-	-	-	-	-	359	650	-	249	425	-
Critical Hdwy	6.44	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	657	1023	-	-	1223	-	-	293	224	838	244	226	720
Stage 1	-	-	-	-	-	-	-	593	597	-	440	476	-
Stage 2	-	-	-	-	-	-	-	632	463	-	733	585	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	884	884	-	-	1218	-	-	253	201	830	205	203	714
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	253	201	-	205	203	-
Stage 1	-	-	-	-	-	-	-	560	564	-	415	452	-
Stage 2	-	-	-	-	-	-	-	575	440	-	651	552	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	1.1	0.7	25	21
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	295	884	-	-	1218	-	-	263
HCM Lane V/C Ratio	0.397	0.052	-	-	0.044	-	-	0.144
HCM Control Delay (s/veh)	25	9.3	-	-	8.1	-	-	21
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.8	0.2	-	-	0.1	-	-	0.5

Movement	WBU	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations							
Traffic Volume (vph)	2	170	291	296	1072	452	103
Future Volume (vph)	2	170	291	296	1072	452	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	4.0	5.7	5.7	5.7
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)		1770	1583	1770	1863	1863	1556
Flt Permitted		0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)		1770	1583	1770	1863	1863	1556
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	170	291	296	1072	452	103
RTOR Reduction (vph)	0	0	177	0	0	0	28
Lane Group Flow (vph)	0	172	114	296	1072	452	75
Confl. Peds. (#/hr)	4	4	21	21			4
Turn Type	Prot	Prot	pt+ov	Prot	NA	NA	Perm
Protected Phases	4	4	4 5	5	2	6	
Permitted Phases							6
Actuated Green, G (s)		12.7	31.8	15.6	59.4	39.8	39.8
Effective Green, g (s)		12.7	31.8	15.6	59.4	39.8	39.8
Actuated g/C Ratio		0.16	0.39	0.19	0.73	0.49	0.49
Clearance Time (s)		3.5		4.0	5.7	5.7	5.7
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		276	619	339	1361	912	761
v/s Ratio Prot		c0.10	0.07	c0.17	c0.58	0.24	
v/s Ratio Perm							0.05
v/c Ratio		0.62	0.18	0.87	0.79	0.50	0.10
Uniform Delay, d1		32.1	16.2	31.9	6.9	14.0	11.1
Progression Factor		1.02	1.22	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.3	0.1	21.1	4.7	1.9	0.3
Delay (s)		37.0	19.9	53.0	11.6	15.9	11.4
Level of Service		D	B	D	B	B	B
Approach Delay (s/veh)		26.2			20.6	15.1	
Approach LOS		C			C	B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	81.3	Sum of lost time (s)	13.2
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

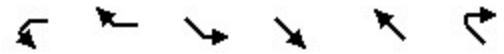
Intersection	
Int Delay, s/veh	5.7

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	17	18	334	30	27	326	42	61	9	51	85	21	55
Future Vol, veh/h	17	18	334	30	27	326	42	61	9	51	85	21	55
Conflicting Peds, #/hr	0	4	0	1	3	0	6	1	0	3	6	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	86	-	-	90	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	18	334	30	27	326	42	61	9	51	85	21	55

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	368	374	0	0	367	0	0	654	850	191	655	844	194
Stage 1	-	-	-	-	-	-	-	422	422	-	407	407	-
Stage 2	-	-	-	-	-	-	-	232	428	-	248	437	-
Critical Hdwy	6.44	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	839	1181	-	-	1188	-	-	352	296	818	351	298	815
Stage 1	-	-	-	-	-	-	-	580	587	-	592	596	-
Stage 2	-	-	-	-	-	-	-	750	583	-	734	578	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	944	944	-	-	1185	-	-	293	276	811	303	278	807
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	293	276	-	303	278	-
Stage 1	-	-	-	-	-	-	-	557	564	-	567	579	-
Stage 2	-	-	-	-	-	-	-	656	566	-	648	555	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.8	0.6	17.9	21.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	398	944	-	-	1185	-	-	380
HCM Lane V/C Ratio	0.304	0.037	-	-	0.023	-	-	0.424
HCM Control Delay (s/veh)	17.9	9	-	-	8.1	-	-	21.3
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	2.1



Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	68	462	245	492	711	146
Future Volume (vph)	68	462	245	492	711	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	4.0	5.7	5.7	5.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	1863	1863	1560
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	1863	1863	1560
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	100%	100%	100%	100%	200%	100%
Adj. Flow (vph)	68	462	245	492	1422	146
RTOR Reduction (vph)	0	7	0	0	0	13
Lane Group Flow (vph)	68	455	245	492	1422	133
Confl. Peds. (#/hr)	2	12	12			2
Turn Type	Prot	pt+ov	Prot	NA	NA	Perm
Protected Phases	4	4 5	5	2	6	
Permitted Phases						6
Actuated Green, G (s)	12.5	31.7	15.7	56.8	37.1	37.1
Effective Green, g (s)	12.5	31.7	15.7	56.8	37.1	37.1
Actuated g/C Ratio	0.16	0.40	0.20	0.72	0.47	0.47
Clearance Time (s)	3.5		4.0	5.7	5.7	5.7
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	639	354	1348	880	737
v/s Ratio Prot	0.04	c0.29	0.14	0.26	c0.76	
v/s Ratio Perm						0.09
v/c Ratio	0.24	0.71	0.69	0.36	1.62	0.18
Uniform Delay, d1	28.9	19.6	29.2	4.1	20.7	11.9
Progression Factor	1.01	1.01	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.7	5.8	0.8	282.4	0.5
Delay (s)	29.7	23.6	34.9	4.8	303.1	12.5
Level of Service	C	C	C	A	F	B
Approach Delay (s/veh)	24.4			14.8	276.1	
Approach LOS	C			B	F	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	161.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	13.2
Intersection Capacity Utilization	112.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

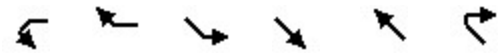
Intersection	
Int Delay, s/veh	4.5

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	12	41	289	40	54	483	62	75	14	29	21	14	17
Future Vol, veh/h	12	41	289	40	54	483	62	75	14	29	21	14	17
Conflicting Peds, #/hr	0	3	0	1	4	0	6	1	0	4	6	0	3
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	86	-	-	90	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	41	289	40	54	483	62	75	14	29	21	14	17

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	545	551	0	0	333	0	0	779	1078	175	892	1067	282
Stage 1	-	-	-	-	-	-	-	419	419	-	628	628	-
Stage 2	-	-	-	-	-	-	-	360	659	-	264	439	-
Critical Hdwy	6.44	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	648	1015	-	-	1223	-	-	286	217	838	237	221	715
Stage 1	-	-	-	-	-	-	-	582	588	-	437	474	-
Stage 2	-	-	-	-	-	-	-	631	459	-	718	576	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	889	889	-	-	1218	-	-	242	193	830	197	197	709
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	242	193	-	197	197	-
Stage 1	-	-	-	-	-	-	-	545	550	-	409	450	-
Stage 2	-	-	-	-	-	-	-	569	436	-	631	539	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	1.3	0.7	26.5	22.4
HCM LOS			D	C

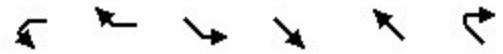
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	283	889	-	-	1218	-	-	258
HCM Lane V/C Ratio	0.417	0.06	-	-	0.044	-	-	0.202
HCM Control Delay (s/veh)	26.5	9.3	-	-	8.1	-	-	22.4
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	2	0.2	-	-	0.1	-	-	0.7



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Group Flow (vph)	167	289	295	1072	452	101
v/c Ratio	0.61	0.36	0.87	0.79	0.49	0.13
Control Delay (s/veh)	42.5	3.9	59.2	13.2	17.0	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.5	3.9	59.2	13.2	17.0	7.3
Queue Length 50th (ft)	80	2	146	282	149	12
Queue Length 95th (ft)	m141	m45	#298	562	251	41
Internal Link Dist (ft)	276			706	570	
Turn Bay Length (ft)			375			50
Base Capacity (vph)	360	801	349	1363	914	790
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.36	0.85	0.79	0.49	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



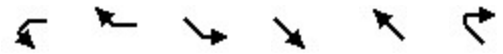
Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Group Flow (vph)	64	461	243	492	1422	141
v/c Ratio	0.23	0.70	0.69	0.37	1.62	0.19
Control Delay (s/veh)	32.2	25.2	39.4	4.9	304.1	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	32.2	25.2	39.4	4.9	304.1	11.8
Queue Length 50th (ft)	27	171	108	73	~1005	31
Queue Length 95th (ft)	m64	270	180	112	#1333	71
Internal Link Dist (ft)	276			706	570	
Turn Bay Length (ft)			375			50
Base Capacity (vph)	282	742	451	1407	880	749
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.62	0.54	0.35	1.62	0.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

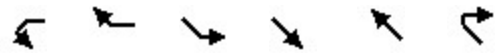
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Group Flow (vph)	172	291	296	1072	452	103
v/c Ratio	0.62	0.36	0.87	0.79	0.50	0.13
Control Delay (s/veh)	42.9	3.8	59.8	13.4	17.1	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.9	3.8	59.8	13.4	17.1	7.3
Queue Length 50th (ft)	83	2	147	287	151	13
Queue Length 95th (ft)	m143	m45	#299	562	251	41
Internal Link Dist (ft)	276			706	570	
Turn Bay Length (ft)			375			50
Base Capacity (vph)	359	803	348	1360	912	789
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.36	0.85	0.79	0.50	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Group Flow (vph)	68	462	245	492	1422	146
v/c Ratio	0.24	0.71	0.69	0.37	1.62	0.19
Control Delay (s/veh)	32.4	25.2	39.6	4.9	304.4	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	32.4	25.2	39.6	4.9	304.4	11.8
Queue Length 50th (ft)	29	171	109	73	~1006	33
Queue Length 95th (ft)	m67	272	182	112	#1333	74
Internal Link Dist (ft)	276			706	570	
Turn Bay Length (ft)			375			50
Base Capacity (vph)	282	742	451	1407	880	750
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.62	0.54	0.35	1.62	0.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Appendix C

Signal Warrant Check

Glenview Terrace Residential Development Traffic Study

TRAFFIC SIGNAL WARRANTS WORKSHEET

Analyst: LJ date: 1/28/21

Major Street: San Bruno Ave — Critical Approach Speed* (mph) 40

Minor Street: Glenview Dr — Critical Approach Speed* (mph) 25

**Posted Speed.*

Critical speed of major street traffic > 50 mph (64 km/h)……..…..…..…….. ☑ **Rural (R)**

In built up area of isolated community of < 10,000 population……..…….. ☐ **Urban (U)**

AM PEAK PERIOD

Warrant 3 - Peak Hour

PART A

(All parts 1, 2, and 3 below must be satisfied)

AM PEAK PERIOD

	Existing	Existing Plus Project							
Minor Street Approach Direction w/ Highest Delay	SB	SB							
Highest Minor Street Average Delay (sec/veh)	20.0	21.3							
Corresponding Minor Street Approach Volume (veh/hr)	144	161							
Minor Street Total Delay (veh-hrs)	0.8	1.0							
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; AND	No	No							
2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; AND	Yes	Yes							
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	Yes	Yes							
Signal Warranted based on Part A?	**No**	**No**							

*OVFL denotes delay greater than 300s

PART B

AM PEAK PERIOD

		Approach Lanes: One	Approach Lanes: 2 or More	Existing	Existing Plus Project						
Major Street - Both Approaches	San Bruno Ave		X	786	794						
Minor Street - Highest Approach	Glenview Dr	X		144	161						
Signal Warranted based on Part B?				**No**	**No**						

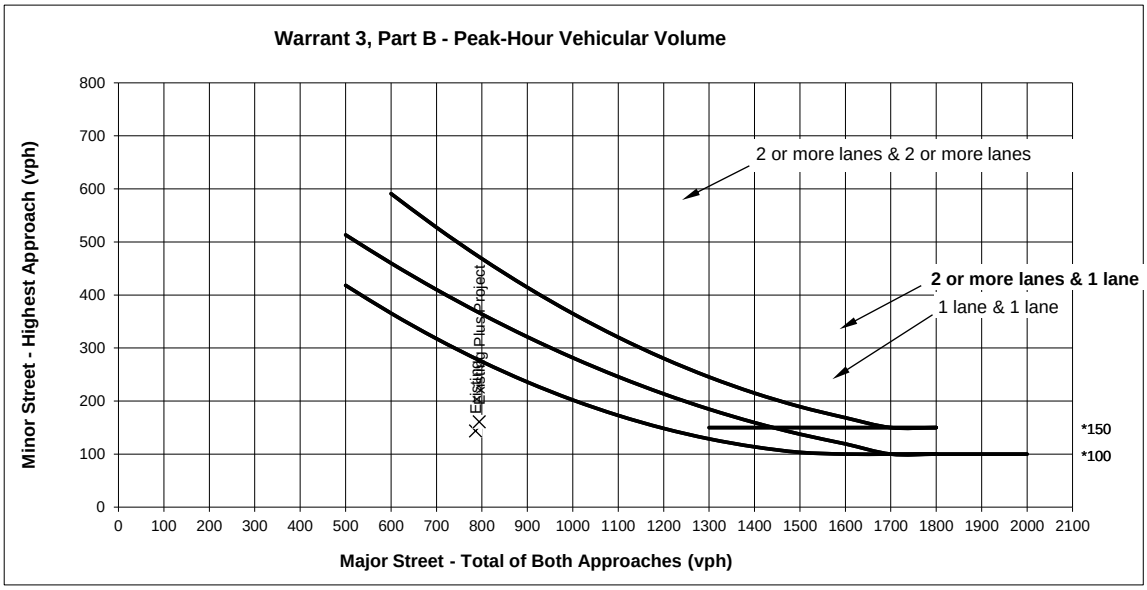
The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California).

Notes:

Glenview Terrace Residential Development Traffic Study

Glenview Dirve and San Bruno Avenue **AM PEAK PERIOD**



Source: Figure 4C-3 *California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California)* .

* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Warrant 3, Part B - Peak-Hour Vehicular Volume

		Approach Lanes		AM PEAK PERIOD								
		One	2 or More	Existing	Existing Plus Project							
Major Street - Both Approaches	San Bruno Ave		X	786	794							
Minor Street - Highest Approach	Glenview Dr	X		144	161							
Signal Warranted Based on Part B - Peak-Hour Volumes?				**No**	**No**							

*Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

Glenview Terrace Residential Development Traffic Study

TRAFFIC SIGNAL WARRANTS WORKSHEET

Analyst: LJ date: 1/28/21

Major Street: San Bruno Ave — Critical Approach Speed* (mph) 40

Minor Street: Glenview Dr — Critical Approach Speed* (mph) 25

**Posted Speed.*

Critical speed of major street traffic > 50 mph (64 km/h)……..…..…..…….. ☑ **Rural (R)**

In built up area of isolated community of < 10,000 population……..…….. ☐ **Urban (U)**

AM PEAK PERIOD

Warrant 3 - Peak Hour

PART A

(All parts 1, 2, and 3 below must be satisfied)

PM PEAK HOUR

	Existing	Existing Plus Project							
Minor Street Approach Direction w/ Highest Delay	NB	NB							
Highest Minor Street Average Delay (sec/veh)	25.0	26.5							
Corresponding Minor Street Approach Volume (veh/hr)	117	118							
Minor Street Total Delay (veh-hrs)	0.8	0.9							
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; AND	No	No							
2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; AND	Yes	Yes							
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	Yes	Yes							
Signal Warranted based on Part A?	**No**	**No**							

*OVFL denotes delay greater than 300s

PART B

PM PEAK HOUR

		Approach Lanes: One	Approach Lanes: 2 or More	Existing	Existing Plus Project						
Major Street - Both Approaches	San Bruno Ave		X	965	981						
Minor Street - Highest Approach	Glenview Dr	X		117	118						
Signal Warranted based on Part B?				**No**	**No**						

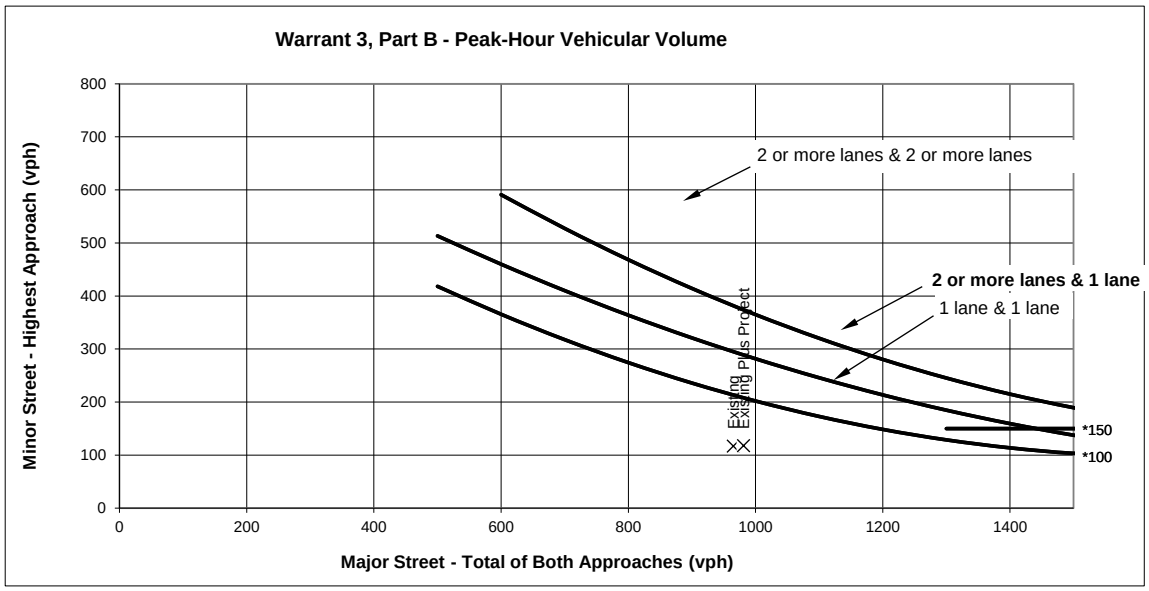
The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California).

Notes:

Glenview Terrace Residential Development Traffic Study

Glenview Dirve and San Bruno Avenue **PM PEAK HOUR**



Source: Figure 4C-3 *California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California)* .

* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Warrant 3, Part B - Peak-Hour Vehicular Volume

		Approach Lanes		PM PEAK HOUR								
		One	2 or More	Existing	Existing Plus Project							
Major Street - Both Approaches	San Bruno Ave		X	965	981							
Minor Street - Highest Approach	Glenview Dr	X		117	118							
Signal Warranted Based on Part B - Peak-Hour Volumes?				**No**	**No**							

*Warrant is satisfied if plotted points fall above the appropriate curve in graph above.