# 608 Harbor Boulevard Residential Development

Transportation Impact Analysis

Prepared for:

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# Table of Contents



## Appendices



## List of Tables



## List of Figures

# Executive Summary

This report presents the results of the transportation impact analysis conducted for the proposed residential development located at 608 Harbor Boulevard in Belmont, California. The project would construct a five-story 103-unit multi-family residential building with 69 parking spaces. The site is currently occupied by a gas station and a car wash. The site currently has driveways on Elmer Street, Harbor Boulevard, and Old County Road. These would be replaced by a main driveway on Elmer Street. The Elmer Street driveway would provide access to 69 resident parking spaces. Also, there would be a driveway on Old County Road that would serve only a loading area.

## Project Trip Generation

The proposed project would result in a net increase of 18 trips in the AM peak hour and 22 trips in the PM peak hour.

## Intersection Levels of Service

The results of the intersection level of service analysis show that all study intersections would continue to operate at an acceptable level of service under both existing plus project, background plus project and cumulative plus project conditions during the AM and PM peak hours. Accordingly, none of the study intersections would have an adverse effect by the project. The intersection level of service results for all scenarios are summarized in Table ES-1.

## Signal Warrant Analysis

A peak hour signal warrant analysis (*MUTCD 2010 Edition,* Part 4, Warrant 3) was performed for all the unsignalized study intersections to determine whether the project would produce an adverse effect according to the City of Belmont impact criteria. The peak-hour signal warrant was checked for existing, background, and project conditions. The signal warrant analysis results show that the intersections at Ralston Avenue/Elmer Street and Old County Road/Masonic Way are warranted for a traffic signal under existing conditions during the PM peak hour. According to the City of Belmont criteria, the project would have an adverse effect at the intersection of Ralston Avenue/Elmer Street.

**Proposed Improvement**

The *Final Ralston Avenue Corridor Study and Improvements Plan*, dated August 26, 2014, recommends the signalization of the intersection at Ralston Avenue and Elmer Street. Per the City of Belmont traffic study guidelines, contribution of a fair share toward the cost of a traffic signal would address the deficiency caused by the project. Under cumulative conditions, this project is expected to add 5 trips during the AM peak hour and 7 trips during the PM peak hour, which represents an average of 1% of the cumulative traffic growth at this intersection.

This report also provides the following recommendations for the project:

- Red curb should be painted for 15 feet on both sides of the Elmer Street driveway and the loading driveway on Old County Road to provide adequate sight distance.

- Signs prohibiting parking during garbage pickup hours should be placed adjacent to the project site along Elmer Street. The trash bins also should be removed from the public right-of-way immediately after garbage pickup so as to not impact AM or PM peak hour traffic conditions.

- The project should prepare a Transportation Demand Management (TDM) plan to reduce the parking demand.

## Table ES-1
## Intersections Level of Service Summary

| | | | | | Existing | | | Existing Plus Project | | | | | Background | | | Background Plus Project | | | | | Cumulative | | | Cumulative Plus Project | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Int. # | Study Intersection | Peak Hour | Control[3] | Count Date | Avg. Delay (sec)[1] | Crit. V/C | LOS | Avg. Delay (sec)[1] | Crit. V/C | LOS | Incr. In Avg. Delay (sec) | Incr. In Crit. V/C (sec) | Avg. Delay (sec)[1] | Crit. V/C | LOS | Avg. Delay (sec)[1] | Crit. V/C | LOS | Incr. In Avg. Delay (sec) | Incr. In Crit. V/C (sec) | Avg. Delay (sec)[1] | Crit. V/C | LOS | Avg. Delay (sec)[1] | Crit. V/C | LOS | Incr. In Avg. Delay (sec) | Incr. In Crit. V/C (sec) | Project Trips |
| 1 | Elmer Street and Harbor Boulevard | AM | OWSC | 01/14/20 | 12.7 | - | B | 12.7 | - | B | - | - | 13.7 | - | B | 13.7 | - | B | - | - | 19.8 | - | C | 20.3 | - | C | - | - | 11 |
| | | PM | | 01/14/20 | 25.1 | - | D | 26.2 | - | D | - | - | 26.9 | - | D | 28.2 | - | D | - | - | **>120** | - | **F** | **>120** | - | **F** | - | - | 11 |
| 2 | Old County Road and Harbor Boulevard | AM | Signal | 01/14/20 | 20.3 | 0.562 | C | 20.4 | 0.562 | C | 0.1 | 0.000 | 20.3 | 0.566 | C | 20.4 | 0.566 | C | 0.1 | 0.000 | 40.5 | 0.582 | D | 40.5 | 0.582 | D | 0.000 | 0.000 | 7 |
| | | PM | | 01/14/20 | 21.9 | 0.601 | C | 22.0 | 0.601 | C | 0.1 | 0.000 | 22.2 | 0.636 | C | 22.2 | 0.637 | C | 0.0 | 0.001 | 58.4 | 0.861 | E | 58.8 | 0.861 | E | 0.400 | 0.000 | 8 |
| 3 | El Camino Real and Harbor Boulevard | AM | Signal | 01/14/20 | 30.4 | 0.600 | C | 30.6 | 0.601 | C | 0.2 | 0.001 | 30.2 | 0.637 | C | 30.3 | 0.638 | C | 0.1 | 0.001 | 33.0 | 0.855 | C | 32.9 | 0.857 | C | -0.100 | 0.002 | 7 |
| | | PM | | 01/14/20 | 25.4 | 0.671 | C | 25.5 | 0.673 | C | 0.1 | 0.002 | 25.3 | 0.717 | C | 25.4 | 0.719 | C | 0.1 | 0.002 | 58.1 | 1.153 | E | 58.5 | 1.154 | E | 0.400 | 0.001 | 8 |
| 4 | Industrial Road and Harbor Boulevard | AM | Signal | 01/14/20 | 28.1 | 0.488 | C | 28.3 | 0.490 | C | 0.2 | 0.002 | 28.8 | 0.498 | C | 28.9 | 0.500 | C | 0.1 | 0.002 | 43.9 | 0.613 | D | 44.4 | 0.614 | D | 0.500 | 0.001 | 4 |
| | | PM | | 01/14/20 | 25.5 | 0.469 | C | 25.4 | 0.470 | C | -0.1 | 0.001 | 25.8 | 0.477 | C | 25.8 | 0.477 | C | 0.0 | 0.000 | 64.1 | 0.911 | E | 64.2 | 0.911 | E | 0.100 | 0.000 | 3 |
| 5 | Old County Road and Karen Road | AM | OWSC | 01/17/18 | 10.2 | - | B | 10.2 | - | B | - | - | 10.2 | - | B | 10.2 | - | B | - | - | 12.4 | - | B | 12.4 | - | B | - | - | 0 |
| | | PM | | 01/17/18 | 12.8 | - | B | 12.8 | - | B | - | - | 13.3 | - | B | 13.3 | - | B | - | - | 16.7 | - | C | 16.7 | - | C | - | - | 0 |
| 6 | Elmer Street and Oneill Avenue | AM | AWSC | 01/23/18 | 7.5 | - | A | 7.5 | - | A | - | - | 7.6 | - | A | 7.6 | - | A | - | - | 8.7 | - | A | 8.8 | - | A | - | - | 7 |
| | | PM | | 01/23/18 | 14.2 | - | B | 14.4 | - | B | - | - | 14.7 | - | B | 14.9 | - | B | - | - | 47.6 | - | E | 49.0 | - | E | - | - | 11 |
| 7 | Old County Road and Oneill Avenue | AM | TWSC | 03/23/17 | 10.6 | - | B | 10.6 | - | B | - | - | 11.2 | - | B | 11.2 | - | B | - | - | 18.1 | - | C | 18.0 | - | C | - | - | 2 |
| | | PM | | 03/23/17 | 14.3 | - | B | 14.3 | - | B | - | - | 15.2 | - | C | 15.3 | - | C | - | - | 28.6 | - | D | 29.1 | - | D | - | - | 4 |
| 8 | El Camino Real and Oneill Avenue | AM | Signal | 02/06/18 | 16.3 | 0.806 | B | 16.3 | 0.808 | B | 0.0 | 0.002 | 16.6 | 0.846 | B | 16.6 | 0.847 | B | 0.0 | 0.001 | 22.4 | 0.883 | C | 22.3 | 0.885 | C | -0.100 | 0.002 | 4 |
| | | PM | | 02/06/18 | 18.6 | 0.798 | B | 18.6 | 0.800 | B | 0.0 | 0.002 | 19.1 | 0.853 | B | 19.1 | 0.854 | B | 0.0 | 0.001 | 31.0 | 1.134 | C | 31.0 | 1.135 | C | 0.000 | 0.001 | 4 |
| 9 | 6th Avenue and Ralston Avenue | AM | Signal | 02/05/19 | 27.8 | 0.448 | C | 27.8 | 0.448 | C | 0.0 | 0.000 | 27.8 | 0.453 | C | 27.8 | 0.454 | C | 0.0 | 0.001 | 32.8 | 0.710 | C | 32.8 | 0.710 | C | 0.000 | 0.000 | 3 |
| | | PM | | 02/05/19 | 44.6 | 0.509 | D | 44.6 | 0.509 | D | 0.0 | 0.000 | 44.8 | 0.513 | D | 44.9 | 0.513 | D | 0.1 | 0.000 | 46.3 | 0.765 | D | 46.4 | 0.766 | D | 0.100 | 0.001 | 4 |
| 10 | El Camino Real & Ralston Avenue* | AM | Signal | 01/14/20 | 54.6 | 0.789 | D | 54.7 | 0.790 | D | 0.1 | 0.001 | 56.5 | 0.818 | E | 56.6 | 0.819 | E | 0.1 | 0.001 | **104.1** | **1.164** | **F** | **104.4** | **1.165** | **F** | **0.300** | **0.001** | 6 |
| | | PM | | 01/14/20 | 50.9 | 0.840 | D | 51.1 | 0.842 | D | 0.2 | 0.002 | 54.4 | 0.885 | D | 54.6 | 0.886 | D | 0.2 | 0.001 | **>120** | **1.452** | **F** | **>120** | **1.453** | **F** | **0.300** | **0.001** | 8 |
| 11 | Old County Road and Ralston Avenue | AM | Signal | 01/14/20 | 40.8 | 0.563 | D | 40.8 | 0.563 | D | 0.0 | 0.000 | 41.3 | 0.568 | D | 41.3 | 0.568 | D | 0.0 | 0.000 | 51.1 | 0.838 | D | 51.3 | 0.838 | D | 0.200 | 0.000 | 2 |
| | | PM | | 01/14/20 | 37.7 | 0.587 | D | 37.7 | 0.587 | D | 0.0 | 0.000 | 38.4 | 0.612 | D | 38.5 | 0.612 | D | 0.1 | 0.000 | 59.4 | 1.015 | E | 59.9 | 1.015 | E | 0.500 | 0.000 | 4 |
| 12 | Elmer Street and Ralston Avenue | AM | OWSC | 01/14/20 | 10.3 | - | B | 10.3 | - | B | - | - | 10.5 | - | B | 10.5 | - | B | - | - | 51.6 | 0.562 | D | 51.6 | 0.562 | D | 0.000 | 0.000 | 5 |
| | | PM | | 01/14/20 | 14.7 | - | B | 14.8 | - | B | - | - | 15.4 | - | C | 15.5 | - | C | - | - | 41.8 | 0.624 | D | 41.7 | 0.712 | D | -0.100 | 0.088 | 7 |
| 13 | Hiller Street and Ralston Avenue | AM | Signal | 10/26/17 | 34.2 | 0.751 | C | 34.2 | 0.753 | C | 0.0 | 0.002 | 34.5 | 0.767 | C | 34.5 | 0.769 | C | 0.0 | 0.002 | 23.2 | 0.783 | C | 23.2 | 0.785 | C | 0.000 | 0.002 | 5 |
| | | PM | | 10/26/17 | 34.5 | 0.729 | C | 34.5 | 0.731 | C | 0.0 | 0.002 | 34.5 | 0.744 | C | 34.5 | 0.746 | C | 0.0 | 0.002 | 19.1 | 0.768 | B | 19.2 | 0.768 | B | 0.100 | 0.000 | 7 |
| 14 | US 101 SB off ramp and Ralston Avenue | AM | Signal | 10/26/17 | 14.6 | 0.606 | B | 14.6 | 0.608 | B | 0.0 | 0.002 | 14.7 | 0.615 | B | 14.8 | 0.617 | B | 0.1 | 0.002 | 14.1 | 0.599 | B | 14.1 | 0.599 | B | 0.000 | 0.000 | 5 |
| | | PM | | 10/26/17 | 17.3 | 0.688 | B | 17.3 | 0.689 | B | 0.0 | 0.001 | 17.2 | 0.691 | B | 17.2 | 0.691 | B | 0.0 | 0.000 | 17.9 | 0.794 | B | 17.8 | 0.794 | B | -0.100 | 0.000 | 7 |
| 15 | Island Parkway/US 101 NB Off Ramp and | AM | Signal | 10/26/17 | 31.3 | 0.670 | C | 31.3 | 0.670 | C | 0.0 | 0.000 | 31.3 | 0.670 | C | 31.3 | 0.671 | C | 0.0 | 0.001 | 35.7 | 0.680 | D | 35.7 | 0.681 | D | 0.000 | 0.001 | 5 |
| | Ralston Avenue | PM | | 10/26/17 | 33.5 | 0.768 | C | 33.7 | 0.770 | C | 0.2 | 0.002 | 34.1 | 0.777 | C | 34.3 | 0.779 | C | 0.2 | 0.002 | 38.2 | 0.838 | D | 38.4 | 0.840 | D | 0.200 | 0.002 | 6 |
| 16 | Old County Road and Masonic Way | AM | AWSC | 02/14/20 | 13.3 | - | B | 13.3 | - | B | - | - | 13.4 | - | B | 13.4 | - | B | - | - | 19.3 | 0.637 | B | 19.3 | 0.637 | B | 0.000 | 0.000 | 0 |
| | | PM | | 02/14/20 | 19.9 | - | C | 19.9 | - | C | - | - | 21.2 | - | C | 21.2 | - | C | - | - | 13.5 | 0.802 | B | 13.5 | 0.802 | B | 0.000 | 0.000 | 0 |

Notes:
* denotes CMP intersection
[1] For TWSC and OWSC, the average Delay and LOS is reported for the worst movement.
[2] Elmer Street/Ralston Avenue and Old County Road/Masonic Way intersections are signalized under Cumulative conditions.
[3] Intersection control type definitions: TWSC = Two-way-stop-control; OWSC = One-way-stop-control; AWSC = All-way-stop-control
**Bold** indicates substandard level of service

# 1. Introduction

This report presents the results of the transportation impact analysis conducted for the proposed residential development located at 608 Harbor Boulevard in Belmont, California (see Figure 1). The project would construct a five-story 103-unit multi-family residential building with 69 parking spaces (see Figure 2 and 3). The site is currently occupied by a gas station and a car wash. The site currently has driveways on Elmer Street, Harbor Boulevard, and Old County Road. These would be replaced by a main driveway on Elmer Street for residents and a secondary driveway on Old County Road serving a loading area.

## CEQA Transportation Analysis Scope and Methodology

The CEQA transportation analysis for the project consists a project-level vehicle miles traveled (VMT) impact analysis. SB 743 established VMT as the appropriate measure for transportation impacts under CEQA. The Governor's Office of Planning & Research (OPR) published guidelines for the evaluation of VMT, which became mandatory as of July 1, 2020. Belmont has not yet established its own VMT guidelines, so this study uses the suggested OPR guidelines.

## Local Transportation Analysis Scope

The local transportation analysis supplements the VMT analysis by identifying potential adverse operational effects that may arise due to a new development, as well as evaluating the effects of a new development on site access, circulation, and other safety-related elements in the proximate area of the project.

The potential adverse effects of the project were evaluated in accordance with the standards set forth by the City of Belmont, and the San Mateo County Congestion Management Program (CMP). The traffic analysis was based on level of service for 10 signalized intersections and 6 unsignalized intersections, for a total of 16 study intersections. One study intersection in the City of Belmont is a CMP intersection. The study intersections are identified below.

The proposed project would not generate more than 100 peak hour trips. Therefore, an analysis based on the requirements of the City/County Association of Governments of San Mateo County (C/CAG), the administering agency for the CMP, is not necessary.

## City of Belmont Intersections

1. Elmer Street and Harbor Boulevard (unsignalized)
2. Old County Road and Harbor Boulevard
3. El Camino Real and Harbor Boulevard
4. Industrial Road and Harbor Boulevard
5. Old County Road and Karen Road (unsignalized)
6. Elmer Street and O'Neill Avenue (unsignalized)
7. Old County Road and O'Neill Avenue (unsignalized)
8. El Camino Real and O'Neill Avenue
9. Sixth Avenue and Ralston Avenue
10. El Camino Real and Ralston Avenue*
11. Old County Road and Ralston Avenue
12. Elmer Street and Ralston Avenue (unsignalized)
13. Hiller Street and Ralston Avenue
14. US 101 Southbound off ramp and Ralston Avenue
15. Island Parkway/US 101 Northbound off Ramp and Ralston Avenue
16. Old County Road and Masonic Way (unsignalized)

* Denotes CMP Intersection

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 weekday AM (7:00 – 9:00 AM) and PM (4:00 – 6:00 PM) peak-hour traffic volumes were obtained from recent traffic studies in the City of Belmont, the General Plan EIR, and the Ralston Avenue Program for Arterial System Synchronization (PASS). New manual peak-hour turning movement counts were conducted in January and February 2020 for eight intersections.

**Scenario 2:** *Background Conditions.* Background traffic volumes were estimated by adding to existing volumes the projected volumes from approved but not yet completed developments in the project area. A list of such projects was provided by the City of Belmont, the City of San Mateo, and the City of San Carlos.

**Scenario 3:** *Existing Plus Project Conditions.* Existing Plus Project peak hour traffic volumes 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 to determine the effects the project would have on the existing roadway network.

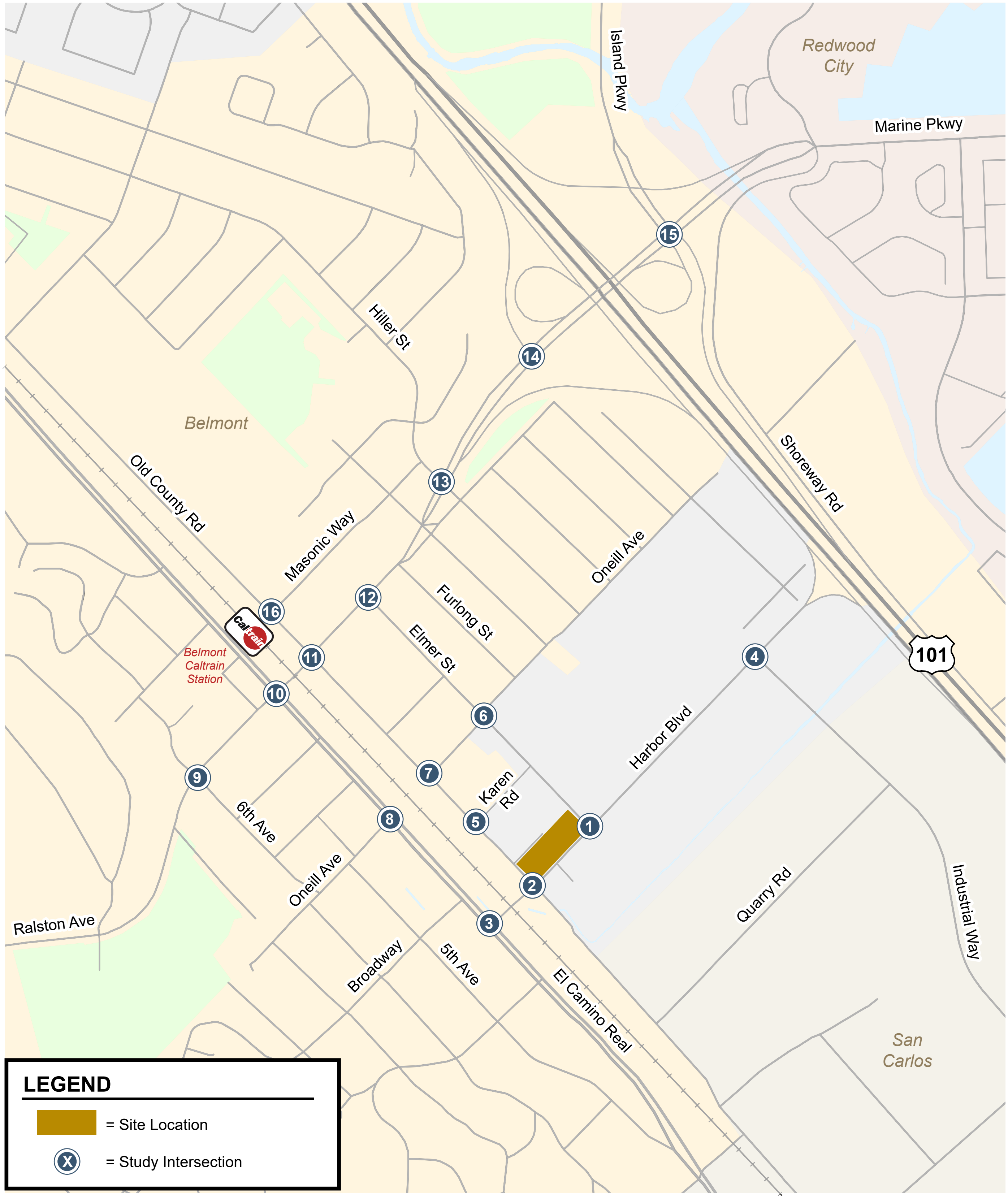



**Figure 1**
**Site Location and Study Intersections**


## DEPARTMENT LEGEND

- AMENITY
- CIRCULATION
- MAINTENANCE/UTILITIES
- PARKING
- STORAGE
- UNITS

**Figure 2**
**Project Site Plan - Floor 1 Plan**


## DEPARTMENT LEGEND

- AMENITY
- CIRCULATION
- MAINTENANCE/UTILITIES
- UNITS

**Figure 3**
**Project Site Plan - Floor 2 Plan**

HEXAGON

NORTH
Not to Scale

**Scenario 4:** *Background Plus Project Conditions.* Background plus Project traffic volumes were estimated by adding to background traffic volumes the additional traffic generated by the project. Project conditions were evaluated relative to background conditions to determine potential adverse effect by the project.

**Scenario 5:** Cumulative Conditions. Cumulative traffic volumes represent traffic growth through the year 2035. Cumulative traffic volumes were obtained from 2035 General Plan forecasts. Intersections not included in the General Plan traffic analysis were estimated based on the closest nearby intersection.

# Methodology

This section presents the methods used to determine the traffic conditions for each scenario described above. 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 the City of Belmont, the City of San Mateo, the City of San Carlos, field observations, and new traffic counts. The following data were obtained from these sources:

- existing peak-hour intersection turning-movement volumes,
- existing lane configurations,
- signal timing and phasing,
- existing bicycle and pedestrian volumes, and
- list of approved projects.

### Analysis Methodologies and Level of Service 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. The correlation between average control delay and level of service is shown in Table 1. The various analysis methods are described below.

**City of Belmont Signalized Intersections**

The City of Belmont level of service methodology for signalized intersections is the 2000 *Highway Capacity Manual* (HCM) method. The *2000 Highway Capacity Manual* methodology estimates the average control delay per vehicle in seconds. *Control delay* is the amount of delay that is attributed to the particular traffic control device at the intersection, and includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average delay can then be correlated to a level of service. This method was applied using the SYNCHRO software. The City of Belmont level of service standard for signalized intersections varies according to the existing intersection level of service (see Table 3).

**Table 1**
**Signalized Intersection Level of Service Definition**

| Level of Service | Description | Average Control Delay Per Vehicle (sec.) |
|---|---|---|
| A | Signal progression is extremely favorable. Most vehicles arrive during the green phase and do not stop at all. Short cycle lengths may also contribute to the very low vehicle delay. | 10.0 or less |
| B | Operations characterized by good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average vehicle delay. | 10.1 to 20.0 |
| C | Higher delays may result from fair signal progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though may still pass through the intersection without stopping. | 20.1 to 35.0 |
| D | The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable signal progression, long cycle lenghts, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable. | 35.1 to 55.0 |
| E | This is considered to be the limit of acceptable delay. These high delay values generally indicate poor signal progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Individual cycle failures occur frequently. | 55.1 to 80.0 |
| F | This level of delay is considered unacceptable by most drivers. This condition often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes of such delay levels. | greater than 80.0 |

Source: Transportation Research Board, *2000 Highway Capacity Manual* (Washington, D.C., 2000) p10-16.

## City of Belmont Unsignalized Intersections

For the unsignalized study intersections, the level of service that is reported in this traffic study corresponds to the average control delay for all stop-controlled approaches. This method is applicable for both side street stop-controlled and all-way stop-controlled intersections. The City of Belmont level of service standard for unsignalized intersections varies according to the existing intersection level of service (see Table 4). The delay and corresponding level of service at the unsignalized and stop-controlled intersections are presented in Table 2.

**Table 2**
**Unsignalized Intersection Level of Service Definition**

| Level of Service | Description | Average Control 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, *2000 Highway Capacity Manual* (Washington, D.C., 2000) p17-2.

**<u>CMP Study Intersection</u>**

The study intersection of El Camino Real (SR 82) and Ralston Avenue is a CMP intersection. The CMP level of service standard for CMP intersections within the City of Belmont is LOS E or better. However, since the City of Belmont has a more conservative level of service standard that is based on the existing intersection LOS, this intersection was analyzed based on the more stringent City of Belmont standards.

Adverse Intersection Operation Effects Criteria are used to establish what constitutes an adverse effect. For this analysis, the criteria used to determine potential adverse effects are based on the City of Belmont criteria as detailed in the *City of Belmont Guidelines for Traffic Impact Studies*, August 2014.

## Intersection LOS Adverse Effect Criteria

For the purpose of this study, the project is said to create an adverse effect on traffic conditions at a signalized, all-way stop-controlled, or side-street stop-controlled intersection in the City of Belmont if for either peak hour the project meets the corresponding criteria shown in Table 3, or 4. For criteria pertinent to side-street stop-controlled intersections, the City guidelines state that the criteria do not apply to low volume roadways, but do not define what constitutes a “low volume roadway”.

**Table 3**
**Signalized Intersection Potential Adverse Effect Criteria**

| If the base case (without project) LOS is: | Then the corresponding average control delay is: | The adverse effect caused by the project is considered potential if the increase in delay due to the project is: | And the Volume-to-Capacity ratio increases by more than: |
|---|---|---|---|
| A | 10.0 or less | 10.0 seconds | 0.02 |
| B | 10.1 to 20.0 | 10.0 seconds | 0.02 |
| C | 20.1 to 35.0 | 7.5 seconds | 0.02 |
| D | 35.1 to 55.0 | 4.0 seconds | 0.01 |
| E | 55.1 to 80.0 | 4.0 seconds [1] | 0.01 |
| F | greater than 80.0 | 4.0 seconds [1] | 0.01 |

Notes:

1. If the addition of project traffic results in a reduction in intersection control delay, then the adverse effect caused by the project is considered potential if 35 or more project vehicle trips are added to an intersection operating at LOS E, or 20 or more project vehicle trips are added to an intersection operating at LOS F.

**Table 4**
**Unsignalized Intersection Potential Adverse Effect Criteria**

| If the base case (without project) LOS is: | Then the existing average control delay experienced by all drivers entering the intersection is: | The adverse effect caused by the project is potential if the increase in average control delay due to the project is: |
|---|---|---|
| A | 10.0 or less | 10.0 seconds |
| B | 10.1 to 15.0 | 5.0 seconds |
| C | 15.1 to 25.0 | 5.0 seconds |
| D | 25.1 to 35.0 | 4.0 seconds |
| E | 35.1 to 50.0 | 4.0 seconds [1] |
| F | greater than 50.0 | 4.0 seconds [1] |

Notes:

1. If the addition of project traffic results in a reduction in intersection control delay, then the adverse effect caused by the project is considered potential if 25 or more project vehicle trips are added to an intersection operating at LOS E, or 15 or more project vehicle trips are added to an intersection operating at LOS F.

## Other Intersection-Level Adverse Effect Criteria

In addition to the intersection-LOS adverse effect, the *Guidelines for Traffic Impact Studies* also identifies the following intersection-level non-LOS adverse effect criteria:

- Signal Warrants: The project traffic causes an intersection to meet or exceed Caltrans signal warrant criteria. For locations where base case volumes already exceed signal warrant criteria levels, traffic increases the demand to capacity ratio (V/C) by 0.01.
- Turn Lanes: The project traffic increases volumes to a level meeting or exceeding criteria for provision of a right or left turn lane on an intersection approach. For locations where base case volumes already exceed turn lane warrant criteria levels, project traffic increases peak hour volume by more than 1%.

- Sight Lines: The project creates an unsignalized intersection or the project adds to an existing unsignalized intersection approach that does not have adequate sight lines based upon Caltrans criteria for state highway intersections and/or criteria for City roadway intersections.
- Vehicle Queues: The project traffic creates vehicle queues exceeding turn lane capacity or causing problematic back-ups of traffic on driveways or roadways on or off the project site. For intersections where base case volumes already create vehicle queues exceeding turn lane capacity, project traffic increases vehicle queues by 1%.

### Other Transportation Adverse Effect Criteria

The project would have an adverse effect if it results in any of the following conditions:

- On-site Roads and Frontage Improvements: The proposed on-site circulation would not meet the City's minimum standards for roadway or driveway design, or, in the opinion of the registered traffic engineer conducting the study, result in safety hazards to pedestrians, bicyclists or vehicles.
- Parking: The proposed on-site vehicle or bicycle parking supply would not be adequate to accommodate parking demand based upon City code criteria.
- Emergency Access: The project site would have inadequate emergency access.
- Policies and Plans: The project would conflict with adopted policies, plans, or programs.
- Road Hazards: The project would substantially increase hazards to pedestrians, bicyclists or vehicles due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses.

### Mitigation of Potential Adverse Effects

In the event any adverse effects are identified in the Transportation Impact Analysis, alternative mitigation measures shall be evaluated to determine whether they adequately mitigate the adverse effects. The proposed mitigation measures may be suggested by the applicant or the City and shall be evaluated by the Director of Community Development and the Director of Public Works. Mitigation measures may include, but are not limited to, measures such as the following:

1. Installation of physical improvements at the affected intersection or roadway segment;
2. Installation of physical improvements at another intersection or roadway segment that will improve traffic flow within the transportation corridor (such as the Ralston Avenue Corridor);
3. Contribution of a fair share toward transportation improvements planned by the City and included in its capital improvement program or otherwise planned for construction;
4. Contribution of a fair share toward transit improvements or operations to relieve traffic congestion;
5. Modifications of the proposed land use or site design or operational measures to reduce trip generation.

## Report Organization

This report has a total of seven chapters. Chapter 2 describes existing conditions including the existing roadway network, transit service, bicycle and pedestrian facilities. Chapter 3 presents the Vehicle

Miles Traveled (VMT) analysis. Chapter 4 presents the traffic conditions in the study area under background conditions. Chapter 5 presents project conditions including descriptions of the method used to estimate project traffic, its adverse effect on the transportation system, and any recommended mitigation measures. Chapter 6 presents the intersection operations under cumulative conditions. Chapter 7 provides an evaluation of other transportation-related issues, such as site access, on-site circulation, vehicle queuing, parking, as well as potential adverse effect by project on bicycle, pedestrian, and transit facilities. Chapter 8 presents the study conclusions including a summary of recommended improvements.

# 2.
# Existing Conditions

This chapter describes the existing conditions for all of the major transportation facilities near the site, including the roadway network, transit service, and bicycle and pedestrian facilities.

## Existing Roadway Network

Regional access to the project is provided via US 101, and I-280, which are described below.

*US 101* is a north/south freeway that extends from north of San Francisco to south of San Jose. In the project vicinity, US 101 has eight mixed-flow lanes. US 101 provides access to the project site via the interchange at Ralston Avenue. A bicycle/pedestrian bridge crosses US-101 just north of the Ralston Avenue interchanges, providing access to the Bay Trail multiuse path.

*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. I-280 provides access to the project site via Ralston Avenue by way of SR-92. Bicycle/pedestrian facilities are available at the Ralston Avenue/SR-92 interchange, providing access to the Ralston Avenue Bike Trail.

Local access to the project site is provided by El Camino Real, Ralston Avenue, Harbor Boulevard, Old County Road and Elmer Street These roadways are described below.

*El Camino Real* is a north-south four-lane arterial roadway that runs parallel to US-101 between San Francisco and San Jose and provides alternative regional access to the proposed project site. The posted speed limit on El Camino Real is 35 mph. On-street parking is provided on both sides of the street in most locations within the study area. There are sidewalks on both sides of the road in the project vicinity. El Camino Real provides access to the project site via Ralston Avenue/Harbor Boulevard and Old County Road/Elmer Street.

*Ralston Avenue* is an east-west divided arterial that extends from SR 92 in the west to US 101 in the east. Ralston Avenue is two- to four-lanes wide and has a posted speed limit of 30 mph in the project vicinity. There are sidewalks on both sides of the road in the project vicinity. Ralston Avenue provides access to the project site via Old County Road and Elmer Street.

*Harbor Boulevard* is an east-west two- to four- lane roadway that extends from El Camino Real in the west to US 101 in the east and has a posted speed limit of 35 mph in the project vicinity. On-street parking and sidewalks are available on both the sides of the street. Harbor Boulevard provides access to the project site via Old County Road and Elmer Street.

*Old County Road* is a north-south two-lane collector road that runs parallel to US-101 and El Camino Real through the study area. On-street parking and sidewalks are available on both the sides of the street. The posted speed limit on Old County Road is 30 mph. Old County Road provides direct access to the project site.

*Elmer Street* is a two-lane north-south roadway that extends from Harbor Boulevard in the south to Ralston Avenue in the north. On-street parking is available on both the sides of the street. Sidewalks are available on both sides of Elmer Street except for 90 feet, just opposite to the project site. The speed limit on Elmer Street is 25 mph. Elmer Street provides direct access to the project site.

## Existing Bicycle Facilities

Bicycle facilities include bike paths, bike lanes, and bike routes. Bike paths (Class I facilities) are pathways, separate from roadways that are designated for use by bicycles. Often, these pathways also allow pedestrian access. Bike lanes (Class II facilities) are lanes on roadways designated for use by bicycles with special lane markings, pavement legends, and signage. Bike routes (Class III) are existing rights-of-way that accommodate bicycles but are not separate from the existing travel lanes. Routes are typically designated only with signs.

There exists a Class I bike/pedestrian overpass over US 101 (see Figure 4). The overpass begins at the northeast corner of the intersection at Hiller Street and Ralston Avenue, runs along the northern side of Ralston Avenue and US 101 SB off-ramp, and connects to Marine Parkway in the Redwood Shores district. At the Hiller Street terminus of the overpass, the bicycle network is connected to a short segment of shared pedestrian/bike sidewalk on the west side of Hiller Street extending to Masonic Way. At Masonic Way, there exist Class II bike lanes on both sides of the street extending west to Old County Road. Masonic Way ends at Old County Road, but the Belmont Station underpass furthers the bicycle network to El Camino Real (SR 82). Between El Camino Real (SR 82) and South Road, Ralston Avenue provides a Class III bike route on both sides of the street. There exists a Class III bike route on Old Country Road, south of the intersection of Old County Road and Ralston Avenue. Local roads such as O'Neill Avenue, Elmer Street, Furlong Street, Granada Street, and Hiller Street carry low traffic volumes and are conducive for bicyclists.

## Existing Pedestrian Facilities

Sidewalks are provided on most commercial and residential streets in the vicinity of the project site. However, sidewalk is not provided on portions of the east side of Elmer Street and Karen Road. Crosswalks with pedestrian signal heads and push buttons are located at most of the signalized intersections. However, crosswalks with pedestrian signal heads and push buttons are present only on the north and east leg of the intersection of El Camino Real and Harbor Boulevard. Crosswalks are not present at the unsignalized intersections of O'Neill Avenue/Elmer Street, Elmer Street/Karen Road and Old County Road/Karen Road.

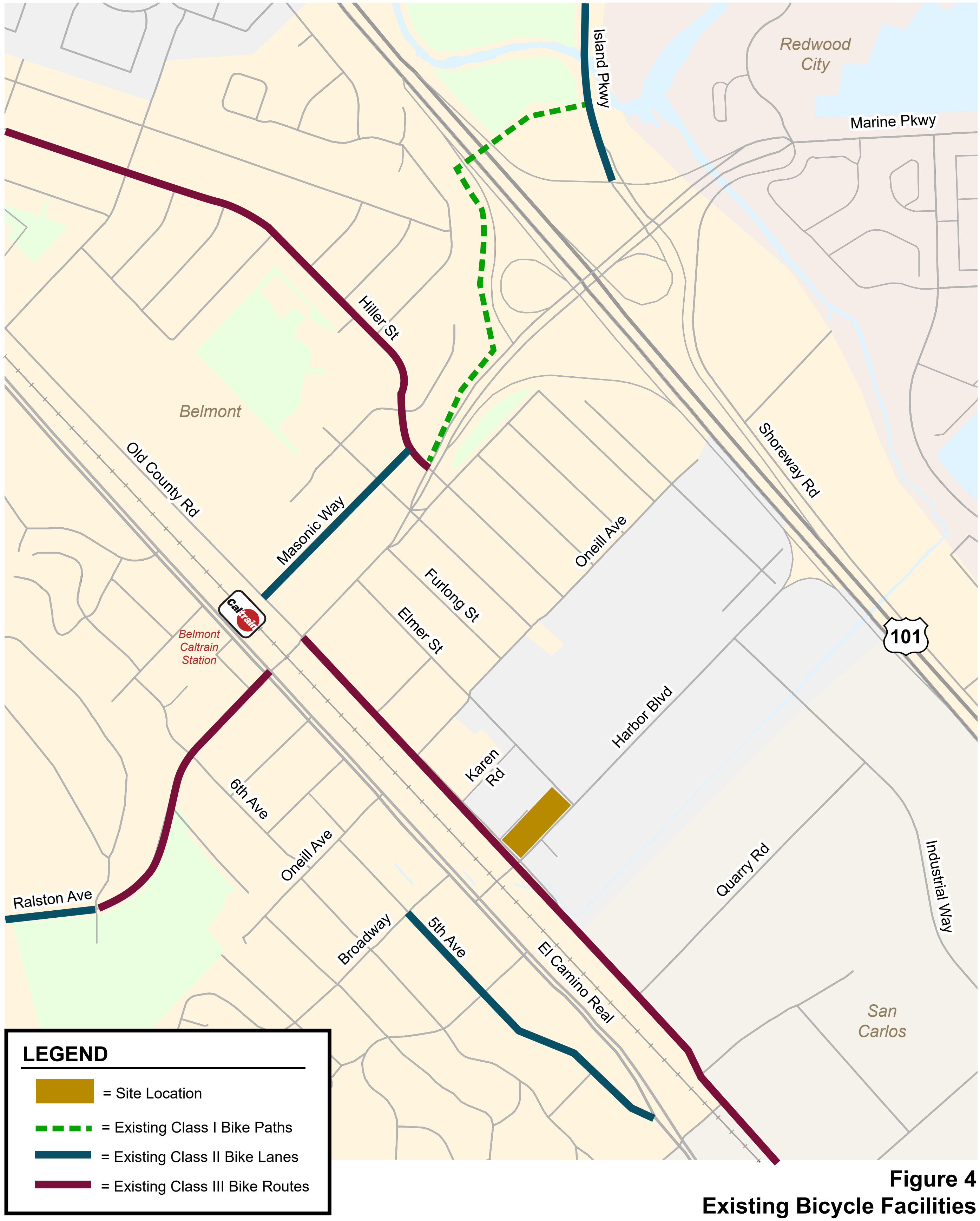



**Figure 4**
**Existing Bicycle Facilities**

## Existing Transit Service

Existing bus service to the study area is provided by SamTrans. Rail service is provided by Caltrain. The El Camino Real and Harbor Boulevard bus stop is the closest bus stop, which is located 525 feet from the project site. The Belmont Caltrain Station is located approximately 2,000 feet from the project site. Existing transit services are described below and shown on Figure 5.

**Table 5**
**Transit Services**

| Route[1] | Route Description | Weekday Hours of Operation[2] | Headways[2] (minutes) |
|---|---|---|---|
| School-day Only Route 60 | Rlaston School - Bridge/Bowsprit | 7:00 AM - 9:30 AM<br>12:45 PM - 4:00 PM | |
| School-day Only Route 62 | Carlmont High - Dale View/Old County | 8:00 AM - 9:30 AM<br>3:30 PM - 4:00 PM | |
| School-day Only Route 67 | Rlaston School - Bridge/Bowsprit | 7:00 AM - 8:00 AM<br>12:45 PM - 4:00 PM | |
| Route 260 | San Carlos Caltrain Station - College of San Mateo | 6:00 AM - 7:15 PM | 25-35 |
| Express and Multi-City Route 397 | San Francisco – Palo Alto Transit Center (Limited Overnight Service) - Serves SF Airport | 12:45 AM - 6:30 AM | 60 |
| Express and Multi-City RouteRoute 398 | San Francisco – Redwood City Transit Center - Serves SF Airport | 5:00 AM - 11:30 PM | 55-75 |
| Express and Multi-City Route Route ECR | Daly City BART – Palo Alto Transit Center | 4:45 AM - 1:15 PM | 14-17 |

Notes:
Source: SamTrans Service Schedule and Map, January 2020
1. Closest bus stop to bus routes 397, 398 and ECR is located at El Camino Real and Harbor Boulevard (525 feet from the project location) and all others are at Ralston Avenue and Old County Road (1,725 feet from the project location).

2. Approximate weekday operation hours and headways during peak periods in the project area, as of January 2020.


**Figure 5**
**Existing Transit Services**

### Caltrain Services

Commuter rail service between San Francisco and Gilroy is provided by Caltrain. The project site is located approximately 2,000 feet south of the Belmont Caltrain Station. The Belmont Caltrain Station generally is served by one train each hour in the northbound and southbound directions.

There is a public Caltrain shuttle providing service between the Belmont Caltrain Station and the Hillsdale Caltrain Station in San Mateo. The Hillsdale Caltrain Station is served by Baby Bullet Trains. Therefore, residents could ride the shuttle from the Belmont Station or SamTrans buses 397,398 and ECR to take the baby bullet train at the Hillsdale Station.

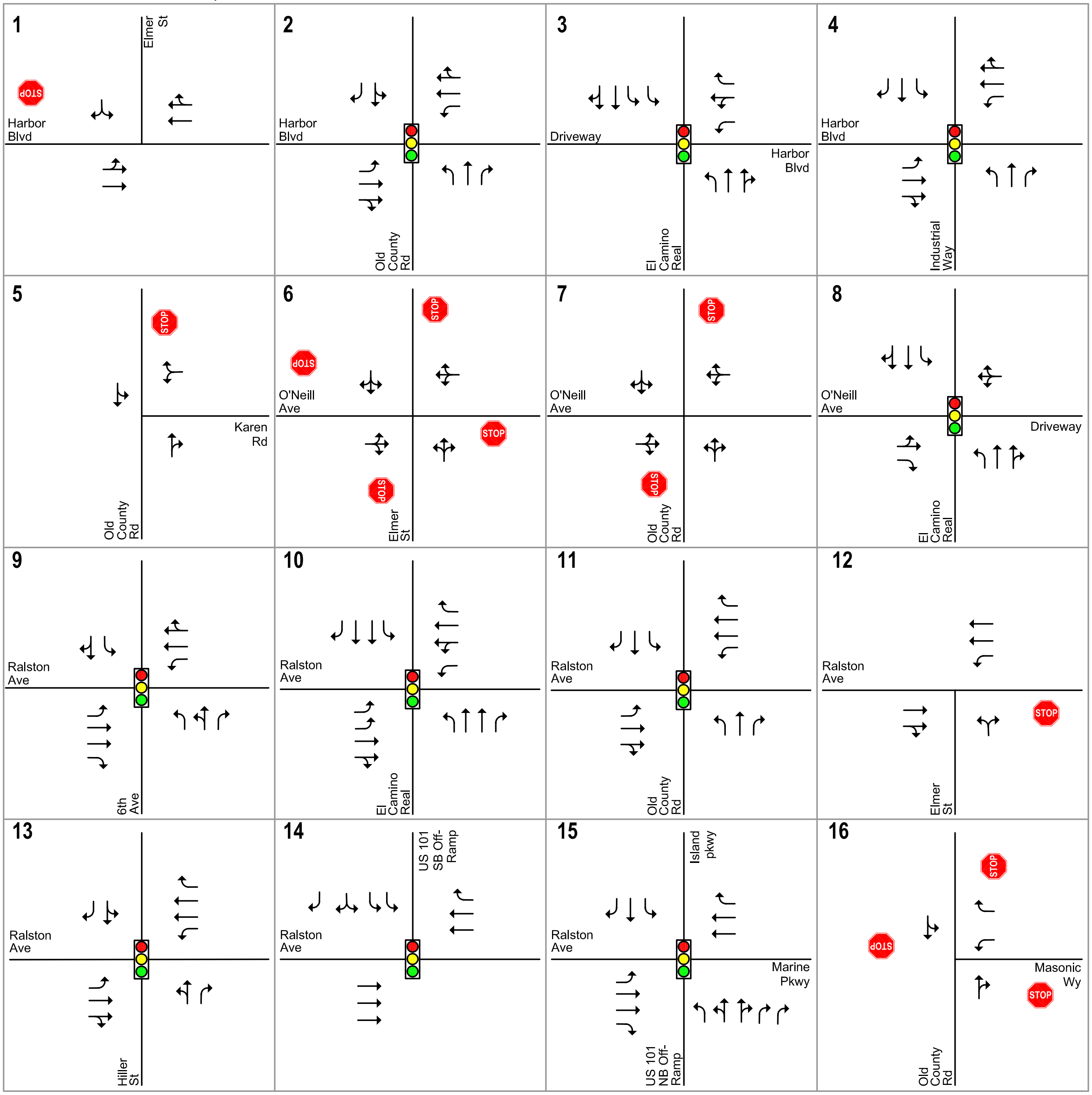
## Existing Lane Configurations and Traffic Volumes

The existing lane configurations at the study intersections were obtained from field observations and are shown on Figure 6. Existing AM and PM peak-hour traffic volumes were obtained from recent traffic studies in the City of Belmont, the General Plan EIR, and the Ralston Avenue Program for Arterial System Synchronization (PASS). New manual peak-hour turning movement counts were conducted in January and February 2020 for eight intersections. As per the guidance from the City of Belmont, 2.5 percent growth was added to the counts from 2017 and 2 percent for counts from 2018 to adjust the counts to 2020. The existing peak-hour intersection volumes are shown on Figure 7. Intersection turning-movement counts conducted for this analysis are presented in Appendix A.

## Existing Intersection Levels of Service

The results of the level of service analysis under existing conditions show that all the study intersections are operating at acceptable levels during both the AM and PM peak hours (see Table 6).

The level of service calculation sheets are included in Appendix B.



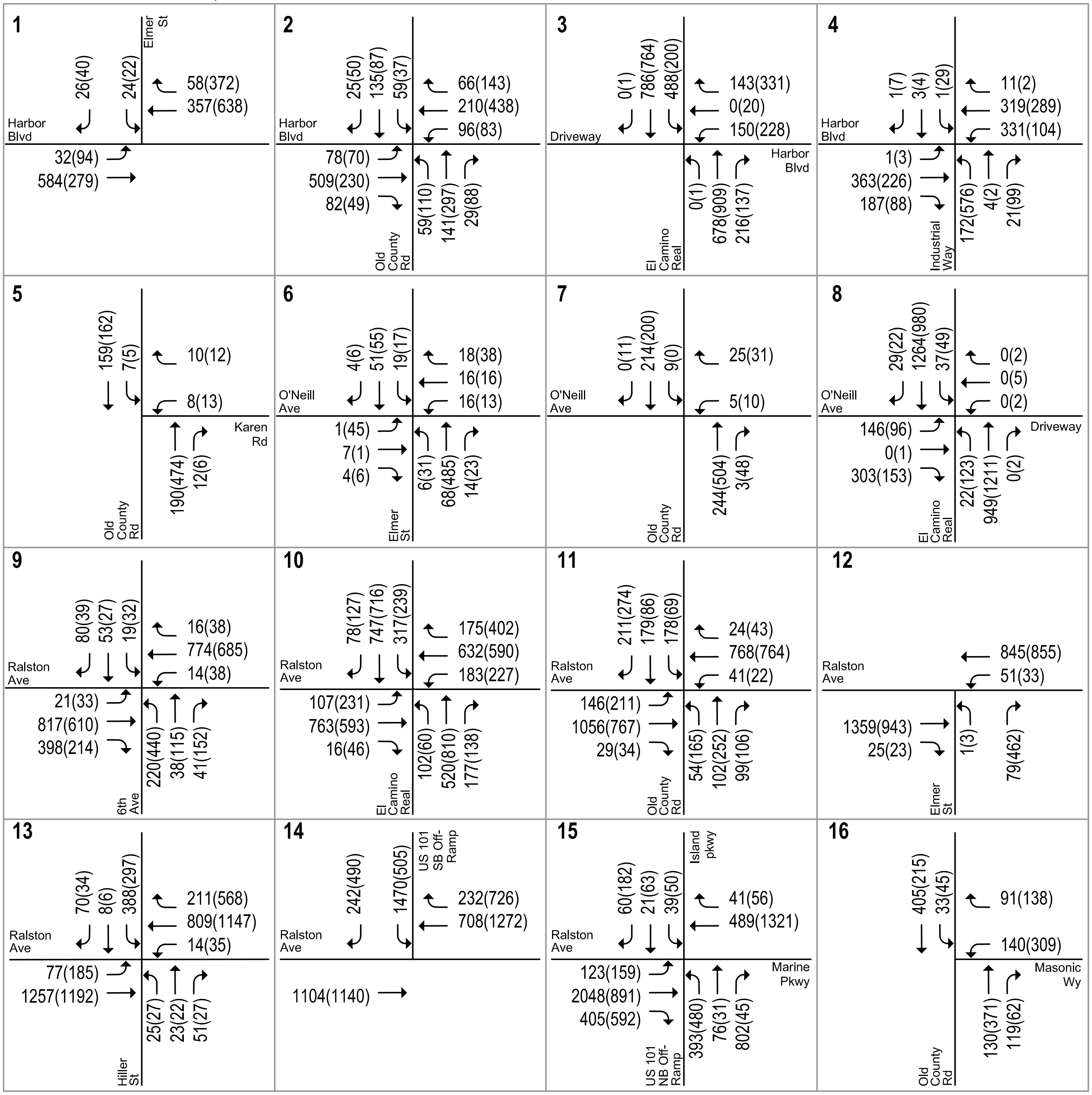

LEGEND

STOP = Sign

= Signalized Intersection

**Figure 6**
**Existing Lane Configurations**

NORTH
Not to Scale




LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

**Figure 7**
**Existing Traffic Volumes**

HEXAGON

NORTH
Not to Scale

**Table 6**
**Existing Intersection Levels of Service Summary**

| Number | Study Intersection | Peak Hour | Control Type[1] | Count Date | Avg. Delay (sec) | LOS |
|---|---|---|---|---|---|---|
| 1 | Elmer Street and Harbor Boulevard | AM | OWSC | 01/14/20 | 12.7 | B |
| | | PM | | 01/14/20 | 25.1 | D |
| 2 | Old County Road and Harbor Boulevard | AM | Signal | 01/14/20 | 20.3 | C |
| | | PM | | 01/14/20 | 21.9 | C |
| 3 | El Camino Real and Harbor Boulevard | AM | Signal | 01/14/20 | 30.4 | C |
| | | PM | | 01/14/20 | 25.4 | C |
| 4 | Industrial Road and Harbor Boulevard | AM | Signal | 01/14/20 | 28.1 | C |
| | | PM | | 01/14/20 | 25.5 | C |
| 5 | Old County Road and Karen Road | AM | OWSC | 01/17/18 | 10.2 | B |
| | | PM | | 01/17/18 | 12.8 | B |
| 6 | Elmer Street and Oneill Avenue | AM | AWSC | 01/23/18 | 7.5 | A |
| | | PM | | 01/23/18 | 14.2 | B |
| 7 | Old County Road and Oneill Avenue | AM | TWSC | 03/23/17 | 10.6 | B |
| | | PM | | 03/23/17 | 14.3 | B |
| 8 | El Camino Real and Oneill Avenue | AM | Signal | 02/06/18 | 16.3 | B |
| | | PM | | 02/06/18 | 18.6 | B |
| 9 | 6th Avenue and Ralston Avenue | AM | Signal | 02/05/19 | 27.8 | C |
| | | PM | | 02/05/19 | 44.6 | D |
| 10 | El Camino Real & Ralston Avenue* | AM | Signal | 01/14/20 | 54.6 | D |
| | | PM | | 01/14/20 | 50.9 | D |
| 11 | Old County Road and Ralston Avenue | AM | Signal | 01/14/20 | 40.8 | D |
| | | PM | | 01/14/20 | 37.7 | D |
| 12 | Elmer Street and Ralston Avenue | AM | OWSC | 01/14/20 | 10.3 | B |
| | | PM | | 01/14/20 | 14.7 | B |
| 13 | Hiller Street and Ralston Avenue | AM | Signal | 10/26/17 | 34.2 | C |
| | | PM | | 10/26/17 | 34.5 | C |
| 14 | US 101 SB off ramp and Ralston Avenue | AM | Signal | 10/26/17 | 14.6 | B |
| | | PM | | 10/26/17 | 17.3 | B |
| 15 | Island Parkway/US 101 NB Off Ramp and Ralston Avenue | AM | Signal | 10/26/17 | 31.3 | C |
| | | PM | | 10/26/17 | 33.5 | C |
| 16 | Old County Road and Masonic Way | AM | AWSC | 02/14/20 | 13.3 | B |
| | | PM | | 02/14/20 | 19.9 | C |

Notes:
* denotes CMP intersection
[1] Intersection control type definitions: OWSC = One-way-stop-control; AWSC = All-way-stop-control
[2] For TWSC and OWSC, the average Delay and LOS is reported for the worst movement.

## Observed Existing Traffic Conditions

Traffic conditions were observed in the field in order to identify existing operational deficiencies and to confirm the accuracy of calculated intersection levels of service. Existing Conditions field observations were conducted in February 2018 and January 2020. The purpose of this effort was (1) to identify any existing traffic problems that may not be directly related to level of service, and (2) to identify any locations where the level of service analysis does not accurately reflect existing traffic conditions. Although all the study intersections operate at acceptable LOS standards, some movements were observed to require two signal cycles to clear the intersection. Below is a description of the existing field conditions that were observed at the study intersections.

### *Old County Road and Harbor Boulevard*

During the PM peak hour, westbound vehicles from the El Camino Real/Harbor Boulevard intersection backed up to the Old County Road/Harbor Boulevard intersection, blocking the westbound movements. Westbound movements occasionally required two signal cycles to clear the intersection.

### *El Camino Real and Harbor Boulevard*

During the AM peak hour, some southbound left turning vehicles required two signal cycles to clear the intersection. This briefly happened whenever eastbound vehicles at the Old County Road/Harbor Boulevard intersection extended back to the El Camino Real/Harbor Boulevard intersection.

### *El Camino Real and Ralston Avenue*

The Old County Road/Ralston Avenue intersection and El Camino Real/Ralston Avenue intersection are spaced less than 200 feet apart. During the AM and PM peak hours, some southbound left turning vehicles spilled out of the turn pocket and required two signal cycles to clear the intersection. This occasionally happened whenever eastbound vehicles at the Old County Road/Ralston Avenue intersection extended back to the El Camino Real/Ralston Avenue intersection. Also, eastbound through movements on Ralston Avenue occasionally needed two signal cycles to clear the intersection during the AM and PM peak hours.

### *Old County Road and Ralston Avenue*

During the AM peak hour, southbound left turning vehicles required two cycles to clear the intersection. The southbound queues extended up to Masonic Way. During the PM peak hour, northbound traffic was heavy. Occasionally, northbound through vehicles required two signal cycles to clear the intersection. The westbound queue extended past Elmer Street and occasionally required two signals to clear the intersection.

### *Elmer Street and Ralston Avenue*

During the PM peak hour, northbound traffic was heavy. Occasionally, northbound vehicles required 50 to 70 seconds to clear the stop-controlled intersection.

### *Old County Road and Masonic Way*

During the AM peak hour, southbound traffic was heavy. During the peak 15 minutes, southbound vehicles required 75 seconds to clear the stop-controlled intersection. During the PM peak hour, northbound traffic was heavy, and queues extended to Ralston Avenue.

### *Hiller Street and Ralston Avenue*

During the AM peak hour, southbound left turning vehicles occasionally required two signal cycles to clear the intersection. The southbound queues extended past Masonic Way.

### *US 101 Northbound Ramps/Island Parkway and Ralston Avenue*

During the AM peak hour, eastbound traffic was heavy, and vehicles from the Oracle Parkway/Ralston Avenue intersection backed up to the US 101 northbound ramps. Occasionally eastbound through vehicles required two signal cycles to clear the intersection.

# 3. Vehicle Miles Traveled (VMT) Analysis

Pursuant to SB 743, the Governor's Office of Planning and Research (OPR) published the finalized updates to the CEQA Guidelines in November 2017. The Technical Advisory on Evaluating Transportation Impacts in CEQA published by OPR in December 2018 provided recommendations regarding VMT evaluation methodology, significance thresholds and screening thresholds for land use projects. The guidelines stated that Level of Service will no longer be considered to be an environmental impact under CEQA and considers vehicle-miles-travelled (VMT) the most appropriate measure of transportation impact. The OPR guidelines state that transit-oriented development projects located within ½ mile of an existing major transit stop would have a less-than-significant impact on VMT. The proposed project is located within 2,000 feet of the Belmont Caltrain station, which qualifies as a major transit stop. Thus, the project would be presumed to have a less-than-significant impact on VMT per OPR guidelines.

# 4.
# Background Conditions

This chapter presents background traffic conditions without the project. Traffic volumes for background conditions comprise volumes from existing traffic counts plus traffic generated by other approved developments in the vicinity of the site. This chapter describes the procedure used to determine background traffic volumes and the resulting traffic conditions.

## Transportation Network under Background Conditions

It is assumed in this analysis that the transportation network under background conditions, including roadways and intersection lane configurations, would be the same as that described under existing conditions at all study intersections.

## Background Traffic Volumes

Background conditions traffic volumes were estimated by adding to the existing traffic volumes the traffic estimated to be generated by the approved but not yet constructed projects in the Cities of Belmont, San Mateo and San Carlos. A list of approved projects was provided on their respective websites for all three Cities. Based on a review of traffic studies prepared for these projects, the types and sizes of these developments, and their distance from the project site, the following approved developments are expected to add traffic to at least one of the study intersections during at least one of the peak hour periods:

1. 2 Davis Drive, Belmont – demolish existing warehouse building and construct new 71,000 sq. ft. Office / R&D Building
2. Barrett Community Centre, Belmont – demolish the existing (28,000 s.f.) building and construct 42,000 s.f. multi-use community center
3. Firehouse Square, 1300 El Camino Real, Belmont – 66 affordable residential apartments, 15 market rate townhouses and 3,750 s.f. commercial space
4. Hill Street, 900 El Camino Real, Belmont – 37 unit residential project
5. Windy Hill Project, 1325 Old County Road, Belmont – 250 residential units and 1,350 community flex space
6. Transit Village (333 El Camino Real, San Carlos) – 202 new multi-family dwelling units and 25,800 s.f. of commercial space

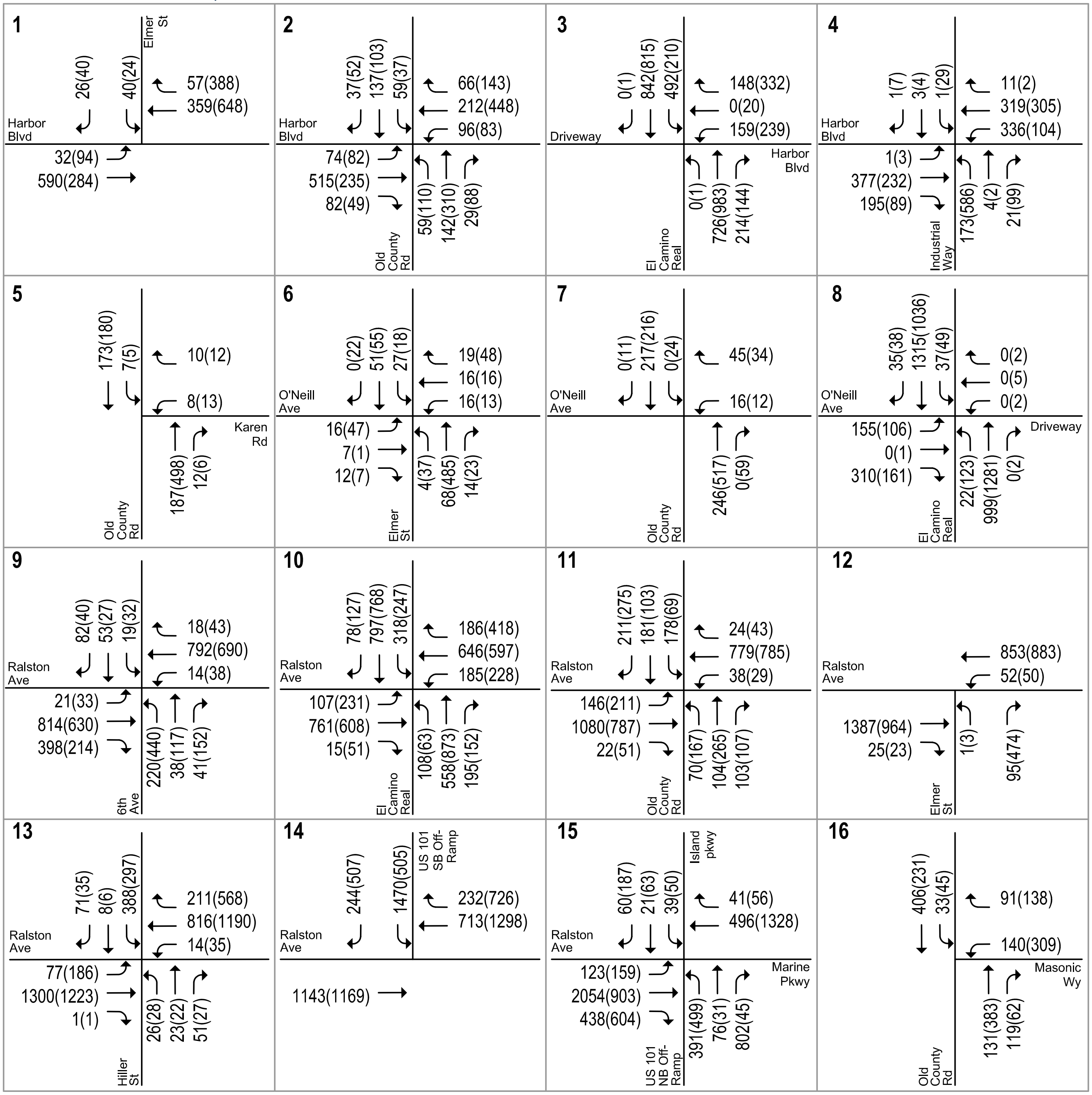
7. Wheeler Plaza (57 El Camino Real, San Carlos) – demolish existing commercial buildings and construct 9,855 s.f. of retail space, 4,000 s.f. of office space, 4,500 s.f. of restaurant and 139 multi-family residential units
8. Meridian 25 (887 Industrial Road, San Carlos) – demolish existing industrial buildings and construct 528,520 s.f. of office space
9. 644-678 Laurel Street, San Carlos – addition of 6,996 s.f. of retail space
10. 520 El Camino Real, San Carlos – 9 condominium units and 1,730 s.f. of retail space
11. 26 El Camino Real, San Carlos – demolish existing 29-room hotel and construct 104 room-hotel
12. 1257 Magnolia, San Carlos – 9 residential units
13. 560 El Camino Real, San Carlos – 24 residential units and 2,756 s.f. commercial space
14. 817 Walnut Street, San Carlos – 24 residential units
15. Franklin Templeton, San Mateo – 245,260 s.f of office space on vacant site (Phase I expansion)
16. Hillsdale Shopping Center, San Mateo – renovation and reconfiguration of north block at Hillsdale Shopping Center
17. Hillsdale Terraces, San Mateo – 74 condominium units and 15,678 s.f. commercial space

Trip generation estimates for the approved projects were based on traffic impact studies conducted for each of the projects, if available. For projects that did not require a traffic study (due to their small size), trips were estimated based on ITE trip rates. The estimated trips from the approved projects were distributed and assigned to the project study area roadways based on the trip distribution assumptions present in the traffic studies, if available, or knowledge of the study area.

Trips generated by the approved projects were added to existing traffic volumes to estimate background traffic volumes. The AM and PM peak-hour intersection traffic volumes under background conditions are shown on Figure 8. The trips assigned to the study intersections are tabulated in Appendix C.

## Background Intersection Levels of Service

The results of the level of service analysis under background conditions show that all the study intersections would operate at acceptable levels during both the AM and PM peak hours (see Table 7). The LOS at the El Camino Real and Ralston Avenue CMP intersection would change from D to E under background conditions. The acceptable level of service standard for CMP intersections within the City of Belmont is LOS E or better. At the intersections of El Camino Real/Harbor Boulevard and Ralston Avenue / US 101 SB Off Ramp, the delay under background conditions is shown to be lower than that of existing conditions during the AM and/or PM peak hour. This occurs because the intersection delay is a weighted average of all intersection movements. The addition of project traffic to movements with delays lower than the average intersection delay (such as right turns) can pull the average delay for the entire intersection lower. The level of service calculation sheets are included in Appendix B.




LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

**Figure 8**
**Background Traffic Volumes**

NORTH
Not to Scale

**Table 7**
**Background Signalized Intersection Levels of Service**

| | | | Existing | | Background | |
|---|---|---|---|---|---|---|
| Number | Study Intersection | Peak Hour | Avg. Delay (sec)[1] | LOS | Avg. Delay (sec)[1] | LOS |
| 1 | Elmer Street and Harbor Boulevard | AM | 12.7 | B | 13.7 | B |
| | | PM | 25.1 | D | 26.9 | D |
| 2 | Old County Road and Harbor Boulevard | AM | 20.3 | C | 20.3 | C |
| | | PM | 21.9 | C | 22.2 | C |
| 3 | El Camino Real and Harbor Boulevard | AM | 30.4 | C | 30.2 | C |
| | | PM | 25.4 | C | 25.3 | C |
| 4 | Industrial Road and Harbor Boulevard | AM | 28.1 | C | 28.8 | C |
| | | PM | 25.5 | C | 25.8 | C |
| 5 | Old County Road and Karen Road | AM | 10.2 | B | 10.2 | B |
| | | PM | 12.8 | B | 13.3 | B |
| 6 | Elmer Street and Oneill Avenue | AM | 7.5 | A | 7.6 | A |
| | | PM | 14.2 | B | 14.7 | B |
| 7 | Old County Road and Oneill Avenue | AM | 10.6 | B | 11.2 | B |
| | | PM | 14.3 | B | 15.2 | C |
| 8 | El Camino Real and Oneill Avenue | AM | 16.3 | B | 16.6 | B |
| | | PM | 18.6 | B | 19.1 | B |
| 9 | 6th Avenue and Ralston Avenue | AM | 27.8 | C | 27.8 | C |
| | | PM | 44.6 | D | 44.8 | D |
| 10 | El Camino Real & Ralston Avenue* | AM | 54.6 | D | 56.5 | E |
| | | PM | 50.9 | D | 54.4 | D |
| 11 | Old County Road and Ralston Avenue | AM | 40.8 | D | 41.3 | D |
| | | PM | 37.7 | D | 38.4 | D |
| 12 | Elmer Street and Ralston Avenue | AM | 10.3 | B | 10.5 | B |
| | | PM | 14.7 | B | 15.4 | C |
| 13 | Hiller Street and Ralston Avenue | AM | 34.2 | C | 34.5 | C |
| | | PM | 34.5 | C | 34.5 | C |
| 14 | US 101 SB off ramp and Ralston Avenue | AM | 14.6 | B | 14.7 | B |
| | | PM | 17.3 | B | 17.2 | B |
| 15 | Island Parkway/US 101 NB Off Ramp and Ralston Avenue | AM | 31.3 | C | 31.3 | C |
| | | PM | 33.5 | C | 34.1 | C |
| 16 | Old County Road and Masonic Way | AM | 13.3 | B | 13.4 | B |
| | | PM | 19.9 | C | 21.2 | C |

Notes:
* denotes CMP intersection
[1] For TWSC and OWSC, the average Delay and LOS is reported for the worst movement.

# 5.
# Project Conditions

This chapter describes project traffic conditions. First is a description of the transportation system under project conditions. Project traffic estimates are then described. Included in this chapter is a summary of project traffic conditions, as well as any adverse effects caused by the project.

## Transportation Network under Project Conditions

It is assumed in this analysis that the transportation network under project conditions, including roadways and intersection lane configurations, would be the same as that described under existing and background conditions at all study intersections. The proposed project would remove the existing site driveways along Harbor Boulevard and Old County Road. However, there would be no changes to the nearby intersections.

## Project Description

The project would construct a five-story 103-unit multi-family residential building with 69 parking spaces. The project site is currently occupied by a gas station and a car wash. Access to the project would be provided via a full access driveway on Elmer Road.

## 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 traveling to and from the proposed residential development was estimated for the AM and PM peak hours. As part of the project trip distribution, the directions to and from which the project trips would travel were estimated. In the project trip assignment, the project trips were assigned to specific streets and intersections. These procedures are described below.

### Trip Generation

Through empirical research, data have been collected that quantify the amount of traffic expected to be produced by many types of land uses. The research is published by the Institute of Transportation Engineers (ITE) in *Trip Generation, 10th Edition* (2017). Project trip generation was estimated by applying to the size and uses of the development the appropriate trip generation rates obtained from the ITE Trip Generation Manual, 10th Edition. The average trip generation rates for Multi-Family Housing Mid-Rise (Land Use 221) were applied to the project. Mid-rise multifamily housing is defined as apartments located within the same building with at least three other dwelling units and that have between three and 10 levels (floors). To be conservative, 105 residential units were used in transportation impact analysis. Based on the size of the project, the proposed development would generate a total of 571 daily vehicle trips, with 38 trips occurring during the AM peak hour and 46 trips occurring during the PM peak hour (see Table 8).

**Existing Land Use**

The project site is currently developed with a car wash and gas station. Also, one parcel is currently vacant. Trips associated with the existing uses on the project site can be subtracted from the project trip estimates. The trips generated by the existing buildings on the site were estimated based on driveway counts conducted in January 2020. Based on the driveway counts, existing uses at the project site generated 45 trips during the AM peak hour and 35 trips during PM peak hour. Trips generated by gas stations are typically adjusted to account for pass-by-trips. Pass-by-trips are trips that are already on the adjacent roadways (and are therefore already counted in the existing traffic) but turn into the site while passing by. Pass-by-trips were therefore subtracted from the driveway counts. Pass-by trip reductions were based on the average pass-by trip reduction rates published in the ITE *Trip Generation Handbook, 3rd Edition.* Pass-by trip reductions of 58% and 42% were applied to the gas station during the AM and PM peak hours, respectively. After applying the appropriate pass-by trip reductions, the existing land uses generated 20 vehicle trips (10 inbound and 10 outbound trips) during the AM peak hour and 24 vehicle trips (11 inbound and 13 outbound trips) during the PM peak hour.

During the driveway counts conducted in January 2020, it was observed that 43 vehicles cut through the gas station during the PM peak hour to by-pass the signalized intersection at Harbor Boulevard and Old County Road. Those 43 vehicles were added to the westbound right turning vehicles at the Harbor Boulevard and Old County Road intersection.

**Net Project Trip Generation**

Based on the ITE trip generation rates, and credit for former use on the project site, it is estimated that the proposed project would generate an additional 356 daily trips, with 18 trips (18 outbound) occurring during the AM peak hour and 22 trips (17 inbound and 5 outbound) occurring during the PM peak hour.

## Trip Distribution

The trip distribution pattern for the proposed project was estimated based on existing travel patterns of the surrounding roadway system and the locations of complementary land uses (See Figure 9).

The project trips were assigned to the roadway network and study intersections based on the directions of approach and departure, the roadway network connections, and the location of project driveway (Figure 10).

## Table 8
## Trip Generation Summary

| Land Use | Size | | Daily Rate | Daily Trips | AM Peak Hour Pk-Hr Rate | AM In | AM Out | AM Total | PM Peak Hour Pk-Hr Rate | PM In | PM Out | PM Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Proposed Uses** | | | | | | | | | | | | |
| Multifamily Housing (Mid-Rise)[1] | 105 | d.u. | 5.44 | 571 | 0.36 | 10 | 28 | 38 | 0.44 | 28 | 18 | 46 |
| **Total Trips** | | | | **571** | | **10** | **28** | **38** | | **28** | **18** | **46** |
| **Existing Land Use** | | | | | | | | | | | | |
| Vacant Land[2] | 5.710 | ksf | - | - | | - | - | - | | - | - | - |
| Self Service Car Wash[3] | 5 | wash stalls | 16.00 | 80 | | 1 | 1 | 2 | | 3 | 5 | 8 |
| Gas Station[3] | 9 | vehicle fueling positions | 30.00 | 270 | | 22 | 21 | 43 | | 14 | 13 | 27 |
| Gas-Station Pass-By Reduction[4] *(Daily, AM, PM) (50%, 58%, 42%)* | | | | (135) | | (13) | (12) | (25) | | (6) | (5) | (11) |
| **Total Trips** | | | | **215** | | **10** | **10** | **20** | | **11** | **13** | **24** |
| **Net New Trips:** | | | | 356 | | **(0)** | **18** | **18** | | **17** | **5** | **22** |

Notes: d.u. - dwelling units ksf - 1,000 square feet gross leasable area

1 Mid-Rise Multifamily Housing (Land Use 221), *ITE Trip Generation Manual, 10th Edition (2017)* , average rates for General Urban/Suburban settings are used.

2 No trip credits for the vacant land.

3 Daily trips were estimated assuming PM peak hour trips comprise 10% of daily trips; Peak-hour trips based on driveway counts on Tuesday, January 14th, 2020.

4 Passer-by trips based on ITE Trip Generation Handbook (Third Edition).

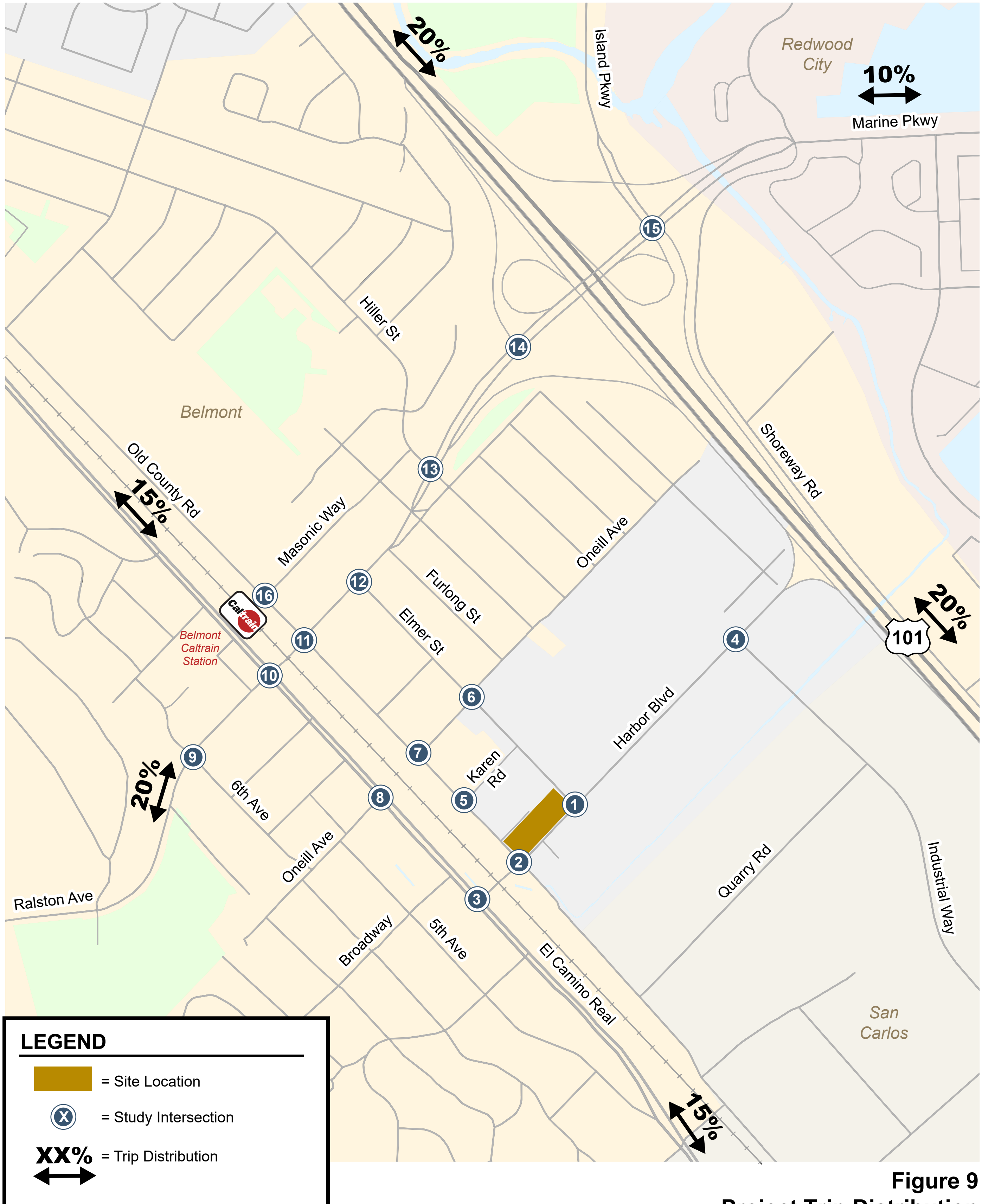



**Figure 9**
**Project Trip Distribution**

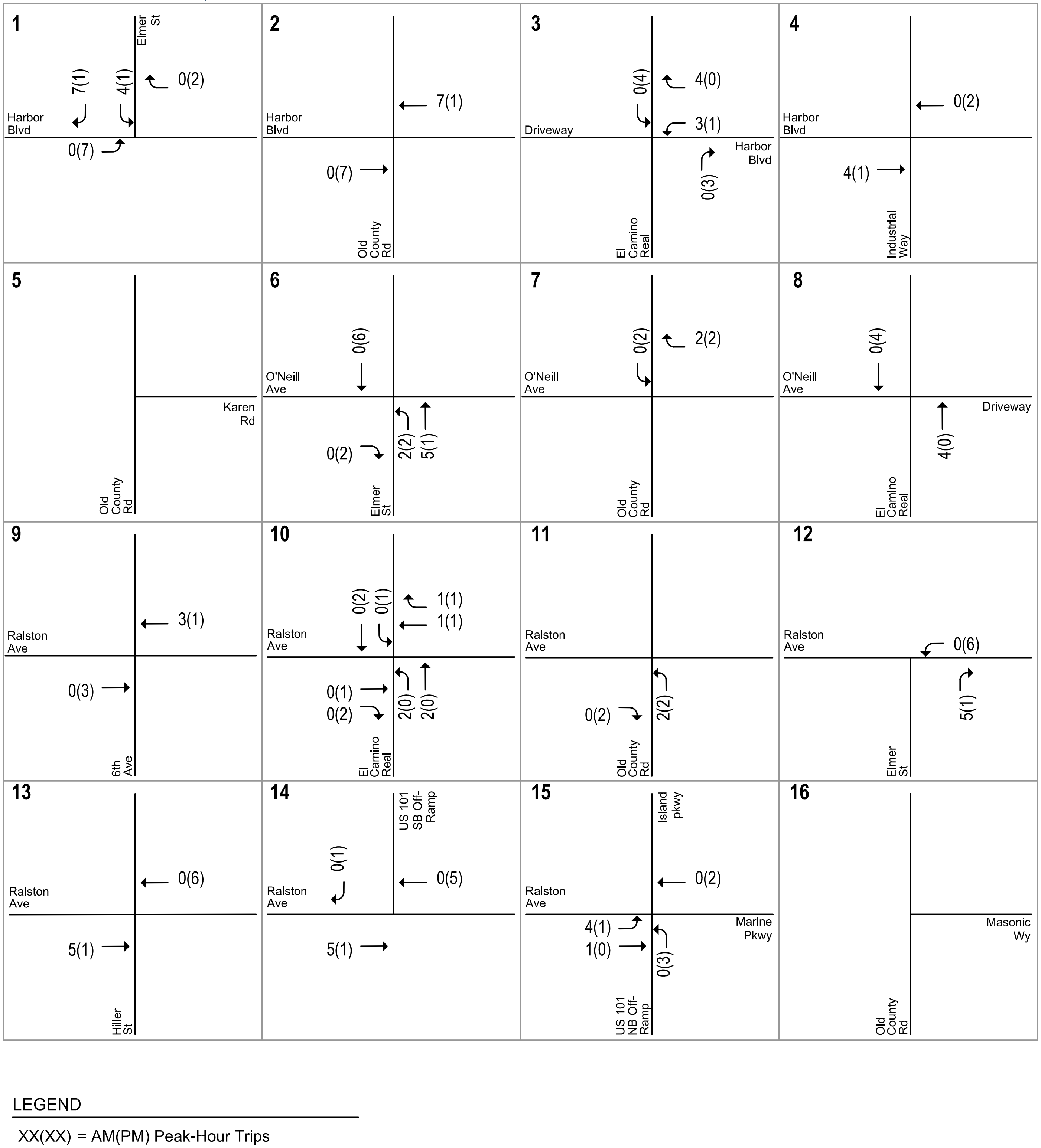



**Figure 10**
**Project Trip Assignment**

HEXAGON

NORTH
Not to Scale

## CMP Compliance

As the Congestion Management Agency for San Mateo County, the City/County Association of Governments (C/CAG) is responsible for maintaining the performance and standards of the Congestion Management Program (CMP) roadway network. The CMP requires new development projected to add 100 or more peak hour trips to the CMP roadway network to implement Travel Demand Management (TDM) measures that would reduce the adverse effect by the project. In the vicinity of the project site, facilities that are part of the CMP network include El Camino Real (SR 82), I-280, SR 92, and US 101.

The proposed project would not generate more than 100 peak hour trips. Therefore, an analysis based on the requirements of C/CAG, the administering agency for the CMP, is not necessary.

## Project Conditions Intersection Levels of Service

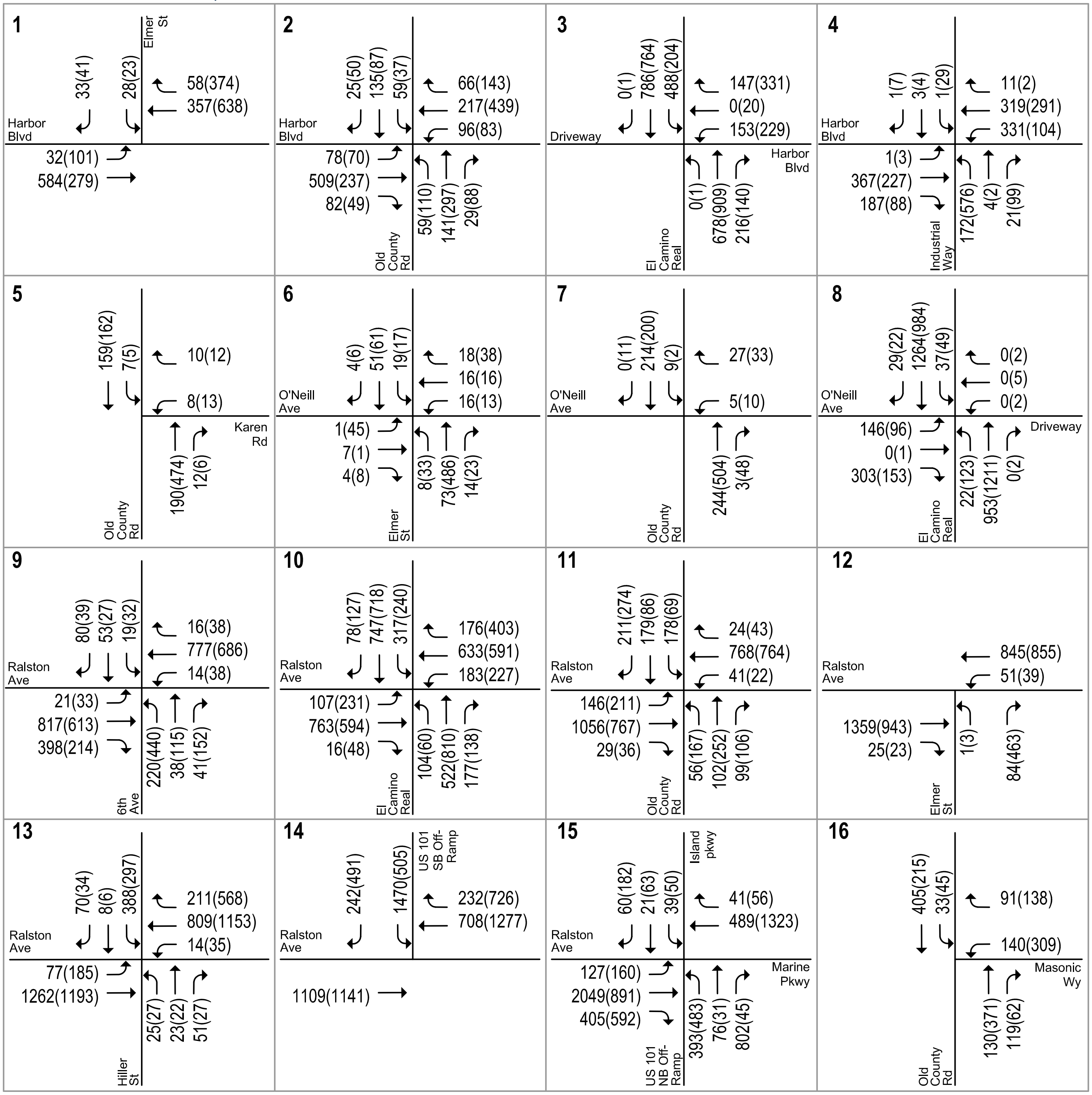
The results of the intersection LOS analysis under existing plus project and background plus project conditions show that all the study intersections would operate at an acceptable level during both the AM and PM peak hours of traffic when measured against the applicable municipal and CMP level of service standards (see Table 9). Intersection LOS standards for signalized and unsignalized intersections are shown in Tables 3 and 4.

Figures 11 and 12 shows the intersection turning-movement volumes under existing plus project and background plus project conditions, respectively. The volume summary table is included in Appendix C. LOS calculation sheets of each study intersection are included in Appendix B.

## Table 9
## Project Levels of Service

| | | | Existing | | Existing Plus Project | | | | Background | | Background Plus Project | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Study Intersection | Peak Hour | Avg. Delay (sec)[1] | LOS | Avg. Delay (sec)[1] | LOS | Incr. In Avg. Delay (sec) | Incr. In Crit. V/C (sec) | Avg. Delay (sec)[1] | LOS | Avg. Delay (sec)[1] | LOS | Incr. In Avg. Delay (sec) | Incr. In Crit. V/C (sec) | Project Trips | Adverse effect |
| 1 | Elmer Street and Harbor Boulevard | AM | 12.7 | B | 12.7 | B | - | - | 13.7 | B | 13.7 | B | - | - | 11 | No |
| | | PM | 25.1 | D | 26.2 | D | - | - | 26.9 | D | 28.2 | D | - | - | 11 | No |
| 2 | Old County Road and Harbor Boulevard | AM | 20.3 | C | 20.4 | C | 0.1 | 0.000 | 20.3 | C | 20.4 | C | 0.1 | 0.000 | 7 | No |
| | | PM | 21.9 | C | 22 | C | 0.1 | 0.000 | 22.2 | C | 22.2 | C | 0.0 | 0.001 | 8 | No |
| 3 | El Camino Real and Harbor Boulevard | AM | 30.4 | C | 30.6 | C | 0.2 | 0.001 | 30.2 | C | 30.3 | C | 0.1 | 0.001 | 7 | No |
| | | PM | 25.4 | C | 25.5 | C | 0.1 | 0.002 | 25.3 | C | 25.4 | C | 0.1 | 0.002 | 8 | No |
| 4 | Industrial Road and Harbor Boulevard | AM | 28.1 | C | 28.3 | C | 0.2 | 0.002 | 28.8 | C | 28.9 | C | 0.1 | 0.002 | 4 | No |
| | | PM | 25.5 | C | 25.4 | C | -0.1 | 0.001 | 25.8 | C | 25.8 | C | 0.0 | 0.000 | 3 | No |
| 5 | Old County Road and Karen Road | AM | 10.2 | B | 10.2 | B | - | - | 10.2 | B | 10.2 | B | - | - | 0 | No |
| | | PM | 12.8 | B | 12.8 | B | - | - | 13.3 | B | 13.3 | B | - | - | 0 | No |
| 6 | Elmer Street and Oneill Avenue | AM | 7.5 | A | 7.5 | A | - | - | 7.6 | A | 7.6 | A | - | - | 7 | No |
| | | PM | 14.2 | B | 14.4 | B | - | - | 14.7 | B | 14.9 | B | - | - | 11 | No |
| 7 | Old County Road and Oneill Avenue | AM | 10.6 | B | 10.6 | B | - | - | 11.2 | B | 11.2 | B | - | - | 2 | No |
| | | PM | 14.3 | B | 14.3 | B | - | - | 15.2 | C | 15.3 | C | - | - | 4 | No |
| 8 | El Camino Real and Oneill Avenue | AM | 16.3 | B | 16.3 | B | 0.0 | 0.002 | 16.6 | B | 16.6 | B | 0.0 | 0.001 | 4 | No |
| | | PM | 18.6 | B | 18.6 | B | 0.0 | 0.002 | 19.1 | B | 19.1 | B | 0.0 | 0.001 | 4 | No |
| 9 | 6th Avenue and Ralston Avenue | AM | 27.8 | C | 27.8 | C | 0.0 | 0.000 | 27.8 | C | 27.8 | C | 0.0 | 0.001 | 3 | No |
| | | PM | 44.6 | D | 44.6 | D | 0.0 | 0.000 | 44.8 | D | 44.9 | D | 0.1 | 0.000 | 4 | No |
| 10 | El Camino Real & Ralston Avenue* | AM | 54.6 | D | 54.7 | D | 0.1 | 0.001 | 56.5 | E | 56.6 | E | 0.1 | 0.001 | 6 | No |
| | | PM | 50.9 | D | 51.1 | D | 0.2 | 0.002 | 54.4 | D | 54.6 | D | 0.2 | 0.001 | 8 | No |
| 11 | Old County Road and Ralston Avenue | AM | 40.8 | D | 40.8 | D | 0.0 | 0.000 | 41.3 | D | 41.3 | D | 0.0 | 0.000 | 2 | No |
| | | PM | 37.7 | D | 37.7 | D | 0.0 | 0.000 | 38.4 | D | 38.5 | D | 0.1 | 0.000 | 4 | No |
| 12 | Elmer Street and Ralston Avenue | AM | 10.3 | B | 10.3 | B | - | - | 10.5 | B | 10.5 | B | - | - | 5 | No |
| | | PM | 14.7 | B | 14.8 | B | - | - | 15.4 | C | 15.5 | C | - | - | 7 | No |
| 13 | Hiller Street and Ralston Avenue | AM | 34.2 | C | 34.2 | C | 0.0 | 0.002 | 34.5 | C | 34.5 | C | 0.0 | 0.002 | 5 | No |
| | | PM | 34.5 | C | 34.5 | C | 0.0 | 0.002 | 34.5 | C | 34.5 | C | 0.0 | 0.002 | 7 | No |
| 14 | US 101 SB off ramp and Ralston Avenue | AM | 14.6 | B | 14.6 | B | 0.0 | 0.002 | 14.7 | B | 14.8 | B | 0.1 | 0.002 | 5 | No |
| | | PM | 17.3 | B | 17.3 | B | 0.0 | 0.001 | 17.2 | B | 17.2 | B | 0.0 | 0.000 | 7 | No |
| 15 | Island Parkway/US 101 NB Off Ramp and | AM | 31.3 | C | 31.3 | C | 0.0 | 0.000 | 31.3 | C | 31.3 | C | 0.0 | 0.001 | 5 | No |
| | Ralston Avenue | PM | 33.5 | C | 33.7 | C | 0.2 | 0.002 | 34.1 | C | 34.3 | C | 0.2 | 0.002 | 6 | No |
| 16 | Old County Road and Masonic Way | AM | 13.3 | B | 13.3 | B | - | - | 13.4 | B | 13.4 | B | - | - | 0 | No |
| | | PM | 19.9 | C | 19.9 | C | - | - | 21.2 | C | 21.2 | C | - | - | 0 | No |

Notes:
* denotes CMP intersection
[1] For TWSC and OWSC, the average Delay and LOS is reported for the worst movement.



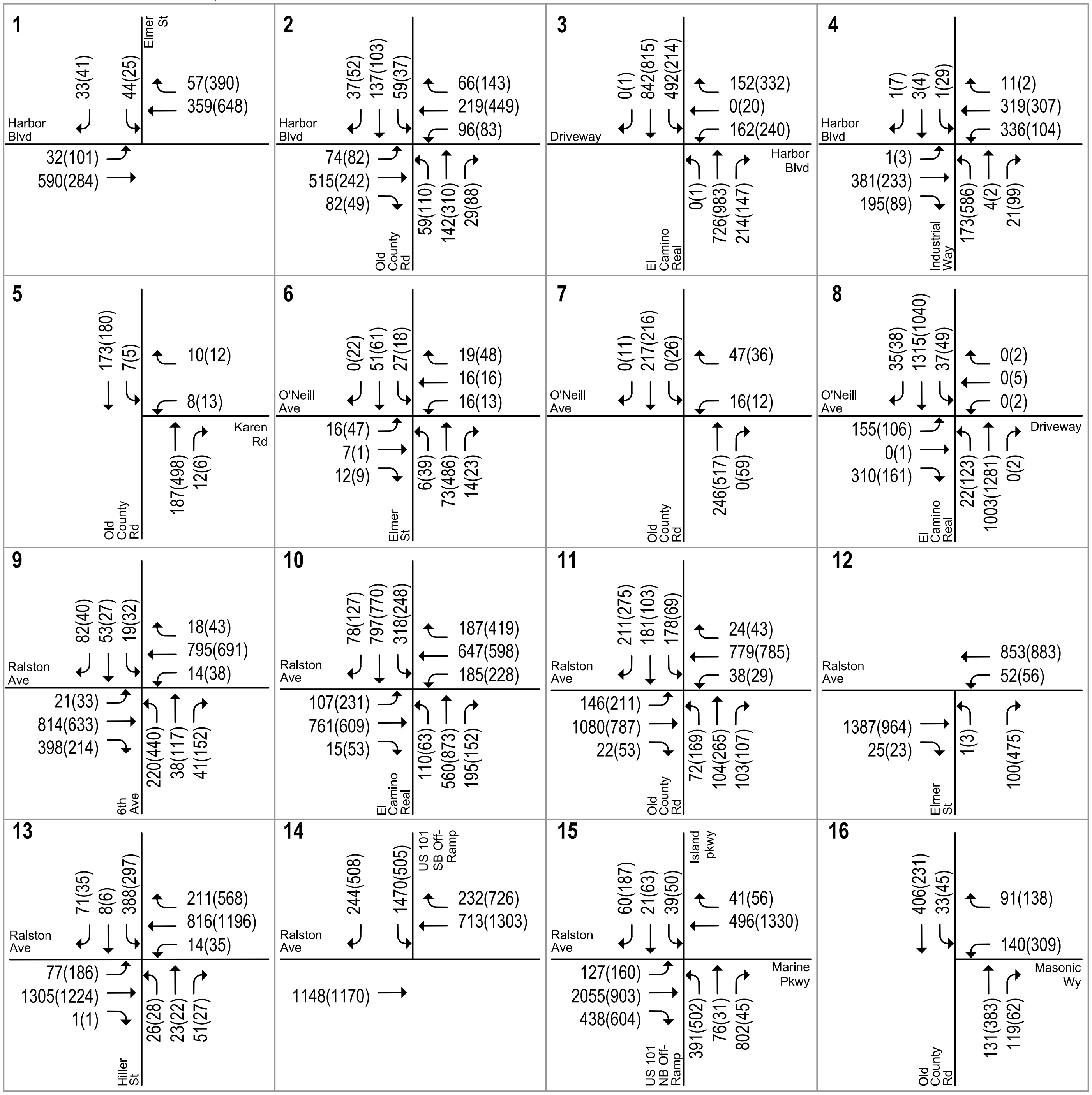

LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

**Figure 11**
**Existing Plus Project Traffic Volumes**



NORTH
Not to Scale




LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

**Figure 12**
**Background Plus Project Traffic Volumes**

HEXAGON

NORTH
Not to Scale

# 6. Cumulative Conditions

This chapter presents a summary of the traffic conditions that would occur under cumulative conditions with the proposed project. Cumulative conditions represent future traffic conditions with expected growth in the area. The expected future growth under cumulative conditions was obtained from the City of Belmont General Plan 2035 model (Traffic Environmental Impact Report (EIR) report). Thus, cumulative conditions reflect a horizon year of 2035.

## Roadway Network and Traffic Volumes

It is assumed that the transportation network under cumulative conditions would include the following improvements identified in the City of Belmont General Plan mitigation measures to be completed in the study area.

El Camino Real and Ralston Avenue – Conversion of two exclusive left turn lanes on eastbound Ralston Avenue into one left turn lane and one shared through and left turn lane. Conversion of the shared through and right turn lane into a through lane and addition of an exclusive right turn lane.

Elmer Street and Ralston Avenue – Installation of a traffic signal with separate left turn and right turn lanes in the northbound direction on Elmer Street.

Old County Road and Masonic Way – Installation of a traffic signal with the addition of a left turn lane in the southbound direction and a right turn lane in the northbound direction on Old County Road.

Cumulative 2035 no project traffic conditions were evaluated for the AM and PM peak hours. The 2035 AM and PM peak hour traffic volumes were based on the City of Belmont General Plan 2035 plus project model (from the EIR report). The proposed project trips were then added to the cumulative no project volumes to create the cumulative plus project conditions volumes (see Figure 13).

## Intersection Levels of Service Analysis

The results of the level of service analysis under cumulative and cumulative plus project conditions show that the intersections of El Camino Real & Ralston Avenue and Elmer Street & Harbor Boulevard would operate at LOS F (see Table 10). However, the adverse effect of the project would be less than significant. It should be noted that the intersection of El Camino Real and Ralston Avenue was identified as operating at LOS F in the General Plan EIR. Further improvements are not feasible due to right-of-way constraints. The adverse effect in the General Plan EIR was considered significant and unavoidable.

At the intersection of Elmer Street & Harbor Boulevard, the average delay is reported for the worst movements, which are the southbound left and right turns. Based on the City of Belmont guidelines for traffic impact studies, if the existing or base case (without project) operation of the stop sign controlled approach or movement is already worse than LOS D (35 seconds control delay), project-related traffic would produce a potential adverse effect if the delay increases by four seconds or 15 vehicle trips. The project would add only 11 trips to the intersection. Therefore, the project would not have an adverse effect. It should be noted that traffic using southbound Elmer Street and facing delays at Harbor Boulevard would have the option of using Old County Road instead. They could cross over on O'Neill Avenue or Karen Road. Southbound traffic could then take advantage of the signal at the Old County Road & Harbor Boulevard intersection.

The Elmer Street/O'Neill Avenue and Old County Road/Ralston Avenue intersections would operate at LOS E under cumulative conditions. The increase in average delay under project conditions would be less than 4 seconds for both the intersections. Therefore, the project would not have an adverse effect.

At the intersections El Camino Real/Harbor Boulevard and Ralston Avenue/US 101 SB off ramp, the delay under cumulative plus project conditions is shown to be lower than that of cumulative conditions. This occurs because the intersection delay is a weighted average of all intersection movements. The addition of project traffic to movements with delays lower than the average intersection delay (such as right turns) can pull the average delay for the entire intersection lower.

The level of service calculation sheets are included in Appendix B.

**Table 10**
**Cumulative Intersection Levels of Service**

| | | | Cumulative | | Cumulative Plus Project | | | |
|---|---|---|---|---|---|---|---|---|
| Number | Study Intersection | Peak Hour | Avg. Delay (sec)[1] | LOS | Avg. Delay (sec)[1] | LOS | Incr. In Avg. Delay (sec) | Incr. In Crit. V/C (sec) |
| 1 | Elmer Street and Harbor Boulevard | AM | 19.8 | C | 20.3 | C | - | - |
| | | PM | **>120** | **F** | **>120** | **F** | - | - |
| 2 | Old County Road and Harbor Boulevard | AM | 40.5 | D | 40.5 | D | 0.0 | 0.000 |
| | | PM | 58.4 | E | 58.8 | E | 0.4 | 0.000 |
| 3 | El Camino Real and Harbor Boulevard | AM | 33.0 | C | 32.9 | C | -0.1 | 0.002 |
| | | PM | 58.1 | E | 58.5 | E | 0.4 | 0.001 |
| 4 | Industrial Road and Harbor Boulevard | AM | 43.9 | D | 44.4 | D | 0.5 | 0.001 |
| | | PM | 64.1 | E | 64.2 | E | 0.1 | 0.000 |
| 5 | Old County Road and Karen Road | AM | 12.4 | B | 12.4 | B | - | - |
| | | PM | 16.7 | C | 16.7 | C | - | - |
| 6 | Elmer Street and Oneill Avenue | AM | 8.7 | A | 8.8 | A | - | - |
| | | PM | 47.6 | E | 49.0 | E | - | - |
| 7 | Old County Road and Oneill Avenue | AM | 18.1 | C | 18.0 | C | - | - |
| | | PM | 28.6 | D | 29.1 | D | - | - |
| 8 | El Camino Real and Oneill Avenue | AM | 22.4 | C | 22.3 | C | -0.1 | 0.002 |
| | | PM | 31.0 | C | 31.0 | C | 0.0 | 0.001 |
| 9 | 6th Avenue and Ralston Avenue | AM | 32.8 | C | 32.8 | C | 0.0 | 0.000 |
| | | PM | 46.3 | D | 46.4 | D | 0.1 | 0.001 |
| 10 | El Camino Real & Ralston Avenue* | AM | **104.1** | **F** | **104.4** | **F** | **0.3** | **0.001** |
| | | PM | **>120** | **F** | **>120** | **F** | **0.3** | **0.001** |
| 11 | Old County Road and Ralston Avenue | AM | 51.1 | D | 51.3 | D | 0.2 | 0.000 |
| | | PM | 59.4 | E | 59.9 | E | 0.5 | 0.000 |
| 12 | Elmer Street and Ralston Avenue | AM | 51.6 | D | 51.6 | D | 0.0 | 0.000 |
| | | PM | 41.8 | D | 41.7 | D | -0.1 | 0.088 |
| 13 | Hiller Street and Ralston Avenue | AM | 23.2 | C | 23.2 | C | 0.0 | 0.002 |
| | | PM | 19.1 | B | 19.2 | B | 0.1 | 0.000 |
| 14 | US 101 SB off ramp and Ralston Avenue | AM | 14.1 | B | 14.1 | B | 0.0 | 0.000 |
| | | PM | 17.9 | B | 17.8 | B | -0.1 | 0.000 |
| 15 | Island Parkway/US 101 NB Off Ramp and Ralston Avenue | AM | 35.7 | D | 35.7 | D | 0.0 | 0.001 |
| | | PM | 38.2 | D | 38.4 | D | 0.2 | 0.002 |
| 16 | Old County Road and Masonic Way | AM | 19.3 | B | 19.3 | B | 0.0 | 0.000 |
| | | PM | 13.5 | B | 13.5 | B | 0.0 | 0.000 |

Notes:
* denotes CMP intersection
[1] For TWSC and OWSC, the average Delay and LOS is reported for the worst movement.
[2] Elmer Street/Ralston Avenue and Old County Road/Masonic Way intersections are signalized under Cumulative conditions.
**Bold** indicates substandard Level of Service

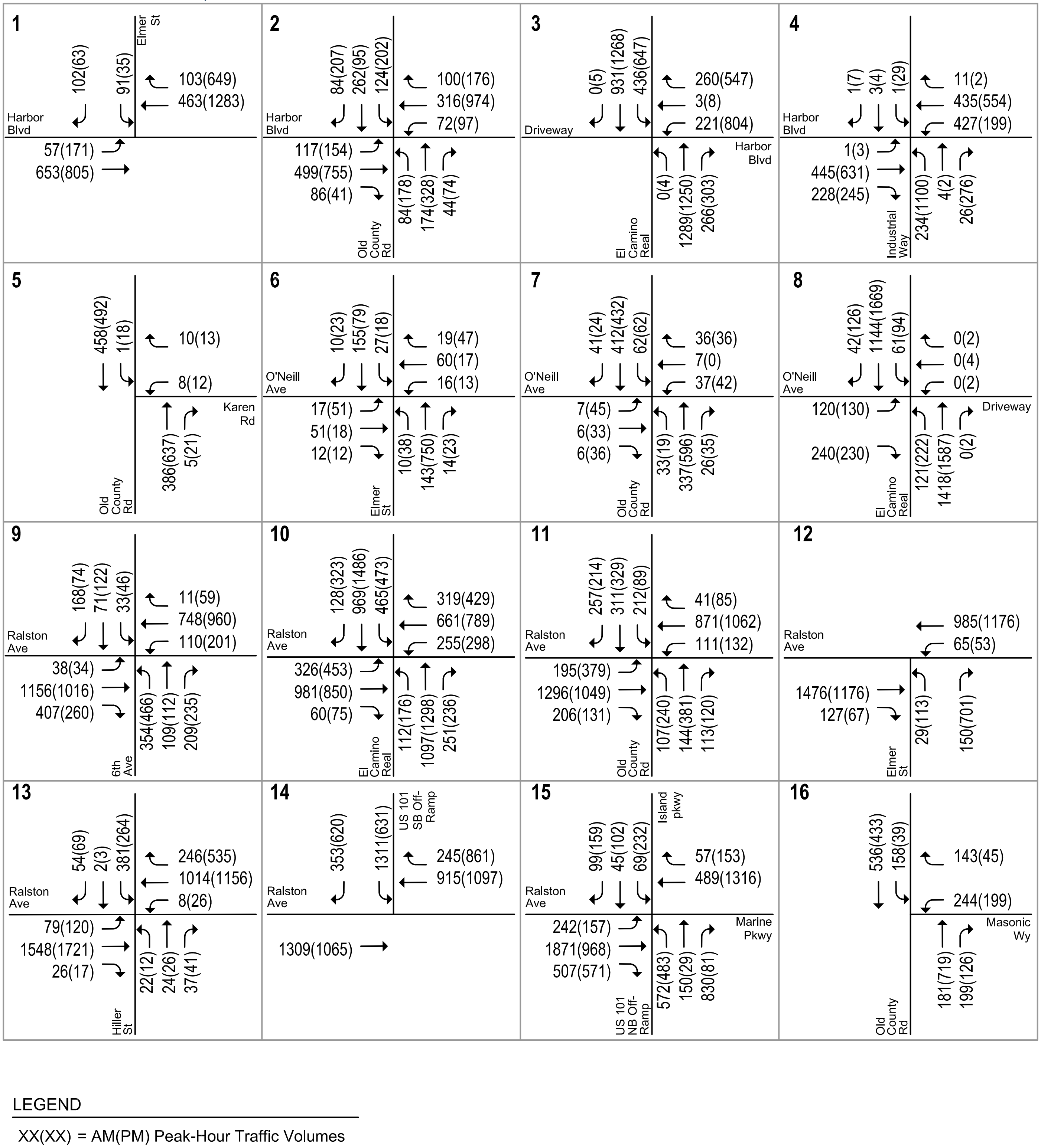



**Figure 13**
**Cumulative Plus Project Traffic Volumes**

HEXAGON

# 7.
# Other Transportation Issues

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

- Vehicular site access and on-site circulation
- Parking demand
- Sight distance
- Potential impacts to transit, bicycle and pedestrian facilities
- Vehicle miles traveled
- Signal warrant analysis

## Project Impact on Bicycle, Pedestrian, and Transit Facilities

The project site is fairly-well served by existing bicycle facilities. There is an existing Class II bike lane on Masonic Way. There exists a Class I bike/pedestrian overpass over US 101. Old County Road along the project frontage is a designated Class III bike route. According to the Belmont Village Specific Plan (BVSP), additional portions of Old County Road, El Camino Real, and O'Neill Avenue are identified as future Class III bicycle routes, which will improve bicycle connectivity. The Bicycle Plan shows Class II Bike Lanes along Old County Road where there is sufficient width.

Pedestrian activity could occur between the site and retail centers located along El Camino Real, as well as the closest bus stops and Caltrain Station. There are existing sidewalks on Old County Road, Harbor Boulevard and Ralston Avenue that connect the site to the bus stops and to the shopping areas. Crosswalks with pedestrian signal heads and push buttons are located at most of the signalized intersections in the study area.

As discussed in Chapter 2, the project site is served by bus routes 60, 62, 67, 260, 397, 398, ECR, Belmont Caltrain Shuttle, and all buses stop within walking distance of the project site. In addition, the Belmont Caltrain station is located approximately 2,000 feet north of the project site and is also within walking distance. The Hillsdale Caltrain Station provides baby-bullet service and is located about 2.1 miles from the project site, which is approximately an 11-minute biking distance. There are continuous pedestrian facilities connecting the project site to the various bus stops and the Belmont Caltrain station. The project is anticipated to generate additional transit ridership on the buses, the Caltrain shuttles, and Caltrain. The Caltrain electrification project would enable Caltrain to provide more frequent train service. Caltrain predicts an initial capacity increase of over 30%. It is expected that the Caltrain electrification project would accommodate the potential increase in transit ridership generated by the project. It is assumed that should the free shuttle service become full, additional shuttles would be provided to meet the demand. Therefore, the project would not significantly impact transit facilities and transit travel times.

## Signal Warrant Analysis

A peak hour signal warrant analysis (*MUTCD 2010 Edition,* Part 4, Warrant 3) was performed for all the unsignalized study intersections to determine whether the project would produce an intersection non-level of service adverse effect according to the City of Belmont potential adverse effect criteria. The peak-hour signal warrant was checked for existing, background, and project conditions. The signal warrant analysis results show that the intersections at Ralston Avenue/Elmer Street and Old County Road/Masonic Way are warranted for a traffic signal under existing conditions during the PM peak hour. According to the City of Belmont adverse effect criteria, for intersections that are warranted for a traffic signal under the base case (background conditions), the project is considered to produce a potential adverse effect if the project would increase the demand to capacity ratio (V/C) by 0.01.

**Table 11**
**Signal Warrant Analysis Results**

| | | | Existing Conditions | | Existing + Project Conditions | | | Background Conditions | | Background + Project Conditions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Intersection | Peak Period | Warrant Met | V/C | Warrant Met | V/C | Inc. in V/C | Warrant Met | V/C | Warrant Met | V/C | Inc. in V/C |
| 1 | Elmer Street and Harbor Boulevard | AM | No | - | No | - | - | No | - | No | - | - |
| | | PM | No | - | No | - | - | No | - | No | - | - |
| 5 | Old County Road and Karen Road | AM | No | - | No | - | - | No | - | No | - | - |
| | | PM | No | - | No | - | - | No | - | No | - | - |
| 6 | Elmer Street and Oneill Avenue | AM | No | - | No | - | - | No | - | No | - | - |
| | | PM | No | - | No | - | - | No | - | No | - | - |
| 7 | Old County Road and Oneill Avenue | AM | No | - | No | - | - | No | - | No | - | - |
| | | PM | No | - | No | - | - | No | - | No | - | - |
| 12 | Elmer Street and Ralston Avenue | AM | No | - | No | - | - | No | - | No | - | - |
| | | PM | **Yes** | **0.04** | **Yes** | **0.05** | **0.01** | **Yes** | **0.06** | **Yes** | **0.07** | **0.01** |
| 16 | Old County Road and Masonic Way[1] | AM | No | - | No | - | - | No | - | No | - | - |
| | | PM | Yes | - | Yes | - | - | **Yes** | - | **Yes** | - | - |

Notes:
[1] The project does not add any trips to this intersection.
**BOLD** is potential adverse effect.

### Elmer Street and Ralston Avenue

Analysis results show that during the AM and PM peak periods when signalization is warranted, the project would increase the V/C ratio by 0.01 in comparison to the existing and background conditions. The project thus would produce a potential adverse effect at the intersection of Elmer Street and Ralston Avenue (see Table 11).

The *Final Ralston Avenue Corridor Study and Improvements Plan*, dated August 26, 2014, recommends the signalization of the intersection at Ralston Avenue and Elmer Street. The signal warrant impact occurs with the addition of approximately 5 trips during AM peak hour and 7 trips during PM peak hour. Per the City of Belmont traffic impact guidelines, contribution of a fair share toward the cost of the traffic signal would mitigate the potential adverse effect caused by the project. Under cumulative conditions, this project is expected to add 5 trips during the AM peak hour and 7 trips during the PM peak hour (see Figure 10), which represents an average of 1% of the cumulative traffic growth at this intersection (see Table 12). The fair share towards the cost of the improvement is estimated based on the Caltrans formula.

**Table 12**
**Fair Share Calculation**

| Number | Study Intersection | Peak Hour | Existing Volume +Approved Project | Cum 2035 EIR Volume | Difference (A) | 608 Harbor Blvd Project Trips (B) | Fair Share % (B / A) |
|---|---|---|---|---|---|---|---|
| 12 | Elmer Street and Ralston Avenue | AM | 2413 | 2827 | 414 | 5 | 1.2% |
| | | PM | 2397 | 3279 | 882 | 7 | 0.8% |
| | | | | | | **Average** | **1.0%** |

## Old County Road and Masonic Way

Analysis results show that the Old County Road and Masonic Way intersection is warranted for signalization during the PM peak period. The project would not add trips to this intersection. Thus, the project would not cause a potential adverse effect at the intersection of Old County Road and Masonic Way.

# Site Access and On-Site Circulation

This section describes the site access and circulation for the proposed project. This review is based on the project site plans prepared by BDE Architecture dated June 2021 (see Figure 2 and 3).

### *Site Access*

Site access was evaluated to determine the adequacy of site driveways with regard to corner sight distance and traffic volume. The project proposes to have a full access driveway along: Elmer Street that would provide access to 69 parking spaces. Per City of Belmont standards, driveways that serve a residential parking garage shall have a minimum width of ten feet to a maximum of 25 feet. The proposed driveway along Elmer Street is shown to be 22.5 feet wide, and the loading driveway along Old County Road is shown to be 12 feet wide, which meets the City's standard.

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 corner sight distance (sight distance triangles) should be provided at all site access points in accordance with the City's standards. Sight distance triangles should be measured approximately 15 feet back from the traveled way. Sight distance requirements vary depending on the roadway speeds. The speed limit on Elmer Street is 25 mph, and Old County Road is 30 mph. The Caltrans recommended stopping sight distance is 200 feet for Elmer Street and 250 feet for Old County Road. Red curb should be painted for 15 feet on both sides of the Elmer Street driveway to provide adequate sight distance. There is a driveway to the loading area and a driveway to the adjacent property just north of the site on Old County Road. Red curb should be painted between the loading driveway and the driveway to the north to provide adequate sight distance to the north. The proposed loading driveway will remove one existing on-street parking space on Old County Road. On street parking is prohibited south of the proposed loading driveway along the Old County Road project frontage. Though the project would remove one on-street space along Old County Road and two on-street spaces along Elmer Street to provide red curb and a trash staging area, the project would add seven on-street parking spaces along Harbor Boulevard. Therefore, there would be a net increase of four spaces due to the project. In order to provide better visibility for pedestrian and vehicles entering and exiting the project site, the street trees species are expected to be a high canopy tree and would not be expected to have low foliage that would block vehicular traffic views. Pedestrian scale pole lights are also set back at the back of sidewalk with the pole height of 14 feet tapered from 6" at base to 4" at top.

The Elmer Street driveway is projected to serve 10 inbound and 28 outbound vehicles during the AM peak hour and 28 inbound vehicles and 18 outbound vehicles during the PM peak hour. The project driveway would provide full access, allowing right and left inbound and outbound turns to and from Elmer Street. Outbound left turns from the project driveway would require vehicles to wait for gaps in traffic in both the northbound and southbound directions, while inbound left turns would require vehicles to wait for a gap in the southbound traffic flow only. Given that Elmer Street consists of only one lane in each direction with no left-turn pockets, inbound left turns at the project driveway would be made from the through lane. Due to the low volume on southbound Elmer Street during the AM and PM peak hours (maximum of 77 vehicles), the vehicles entering the project site are not expected to block through traffic. Although the northbound traffic volume on Elmer Street is high during PM peak hours (maximum of 491 vehicles), there would be 30 feet of queuing space between the project driveway and the first parking stall to accommodate any exiting vehicle queues. The project would add one outbound left-turn vehicle every ten minutes during the PM peak hour. Therefore, there would not be any queuing issues on the site.

### *On-Site Circulation*

Per the City Standards, the parking aisle within the garage should be 26 feet wide for 90-degree parking. Drive-aisle width is shown to be at least 26 feet wide, which complies with the standard. Per the City standards, standard parking stalls shall be a minimum of 18 feet in length and 8 feet 6 inches in width for 90-degree parking. All the standard parking stalls within the parking garage are shown to be 18 feet in length and 8 feet and 6 inches in width, which meets the City's requirement. The project proposes to provide parking lifts in the parking garage for 30 vehicles. The parking lifts accommodate cars up to 6 feet 10 inches in width and 17 feet in length. The lifts accommodate a maximum height of 6 feet 3 inches on the top level and 7 feet on the bottom level. These dimensions can accommodate almost all passenger vehicles including SUVs and trucks.

A back-up space has been provided at the end of the mechanical lifts to allow vehicles to turn around to exit the garage. There are building entrances and stairwells shown along the project frontage on Elmer Street, Old County Road and Harbor Boulevard. These would provide easy access for pedestrians.

The project site plan shows the driveway ramp designed with a 10 percent slope. Though there are no Belmont city standards for ramp slope, the proposed ramp slope would be adequate.

### *Loading Space and Garbage Collection*

As per the Belmont City zoning ordinance, multi-family developments with 50 to 149 units are required to provide one small loading space. Small loading spaces must have a width of no less than 10 feet and length of 25 feet. The project site plan shows a 10 foot by 25-foot loading area with a driveway on the Old County Road, which meets the City's requirement.

The site plan shows a trash room located inside the parking garage. Garbage collection activities for the project are not expected to occur on-site because vehicle access would not be provided to the trash room. Therefore, the trash bins should be moved to the curb along Elmer Street through the trash staging area on designated garbage collection days. Given that on-street parking is permitted along Elmer Street, signs prohibiting parking during garbage pickup hours should be placed adjacent to the project site. The trash bins also should be removed from the public right-of-way immediately after garbage pickup so as to not impact AM or PM peak hour traffic conditions.

## Parking

For residential use in Belmont, the Zoning Ordinance requires two spaces per unit, one of which must be covered. Thus, the project is required to provide 206 parking spaces. The project site plan shows 69 parking spaces for residents, which does not meet the minimum City code requirement. Since the proposed project is planning to allocate 15% of the residential units to affordable housing, the project will qualify for a density bonus under Gov. Code section 65915(f)(1). Instead of the density bonus, the proposed project is planning to exercise the incentive allowed under the statute to reduce the required vehicular parking ratio for the project to 69 onsite parking spaces. The project is also planning to implement various transportation demand management (TDM) measures as per the TDM report prepared by Nelson Nygaard.

As per the City of Belmont Zoning Ordinance requirements, the project is required to provide four accessible parking spaces. As shown on the site plan, the project is planning to provide four accessible parking spaces (including one van accessible and one electric vehicle van accessible), which meets the City's requirements. As per the Zoning Ordinance, parking facilities containing 20 or more spaces serving Multi-Unit Residential uses should provide at least five percent of parking spaces for electric vehicle (EV) charging stations. Thus, the proposed project needs to provide at least 4 electric vehicle charging stations. As per the proposed site plan, the project is planning to provide 5 EV charging stations (including one electric vehicle van accessible), which meets the City's requirement. The project is planning to provide 30 parking spaces in puzzle parking lifts. Puzzle parking lifts allow each vehicle to be independently accessed.

Based on the Zoning Ordinance bicycle parking requirements, the project should provide two short term bicycle parking spaces and one long-term space per 20 units. Therefore, the project is required to provide two short term bicycle parking spaces and five long term bicycle parking spaces. According to the site plan, the project is proposing 67 long-term parking spaces in a secured bike room and 14 short-term bicycle parking spaces at the sidewalk along the project frontage in Harbor Boulevard. Therefore, the bicycle parking proposed by the project would exceed the City's requirement.

# 8. Conclusions

This report presents the results of the transportation impact analysis conducted for the proposed residential development located at 608 Harbor Boulevard in Belmont, California. The project would construct a five-story 103-unit multi-family residential building with 69 parking spaces. The site is currently occupied by a gas station and a car wash. The site currently has driveways on Elmer Street, Harbor Boulevard, and Old County Road. These would be replaced by full access driveway on Elmer Street and along Old County Road for loading. The Elmer Street driveway would provide access to 69 parking spaces to the residents.

## Project Trip Generation

The proposed project would result in a net increase of 18 trips in the AM peak hour and 22 trips in the PM peak hour.

## Intersection Levels of Service

The results of the intersection level of service analysis show that all study intersections would continue to operate at an acceptable level of service (see Tables 3 and 4 for LOS definitions) under both existing plus project, background plus project and cumulative plus project conditions during the AM and PM peak hours. Accordingly, none of the study intersections would have an adverse effect by the project.

## Signal Warrant Analysis

A peak hour signal warrant analysis (*MUTCD 2010 Edition,* Part 4, Warrant 3) was performed for all the unsignalized study intersections to determine whether the project would produce an adverse effect according to the City of Belmont criteria. The peak-hour signal warrant was checked for existing, background, and project conditions. The signal warrant analysis results show that the intersections at Ralston Avenue/Elmer Street and Old County Road/Masonic Way are warranted for a traffic signal under existing conditions during the PM peak hour. According to the City of Belmont criteria, the project would have an adverse effect at the intersection of Ralston Avenue/Elmer Street met the significant threshold criteria.

**Proposed Improvement**

The *Final Ralston Avenue Corridor Study and Improvements Plan*, dated August 26, 2014, recommends the signalization of the intersection at Ralston Avenue and Elmer Street. Per the City of Belmont traffic guidelines, contribution of a fair share toward the cost of a traffic signal would address the adverse effect caused by the project. Under cumulative conditions, this project is expected to add 5 trips during the AM peak hour and 7 trips during the PM peak hour, which represents an average of 1% of the cumulative traffic growth at this intersection.
This report also provides the following recommendations for the project:

- Red curb should be painted for 15 feet on both sides of the Elmer Street driveway and the loading driveway on Old County Road to provide adequate sight distance.

- Signs prohibiting parking during garbage pickup hours should be placed adjacent to the project site along Elmer Street. The trash bins also should be removed from the public right-of-way immediately after garbage pickup so as to not impact AM or PM peak hour traffic conditions.

- The project should prepare a Transportation Demand Management (TDM) plan to reduce the parking demand.

# 608 Harbor Boulevard Residential Development

# TIA

# Technical Appendices

# Appendix A

## Traffic Counts

# Appendix B

## Intersection Level of Service Calculations

# Appendix C

## Volume Summary Tables

# Appendix D

## Signal Warrant Worksheets