Transportation Impact Analysis

Marriott Residence Inn Project

City of Alameda

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November 14, 2018

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1) INTRODUCTION

The proposed project involves construction of ta Marriott Residence Inn in the Harbor Bay Business Park in the City of Alameda. The hotel and would include a total of 172 rooms and would also include a 5,000 square foot restaurant and a 2,000 square foot coffee shop. The project would also include typical business hotel amenities such a fitness room and a pool. The location of the proposed project is shown in **Figure 1.** The project would be access via two new driveways on the Harbor Bay Parkway located just west of its intersection with Bay Edge Road. The project is proposing to provide 275 parking spaces and the site plan for the proposed project is presented in **Figure 2.**

Study Intersections and Impact Analysis Methodology

The traffic analysis evaluated the project potential impacts at 5 existing intersections and also the three proposed driveways that would serve as the entrances to the project. The intersection locations are shown on **Figure 1**. Intersections #1, #2, #3, and #4 are controlled with stop signs and Intersection #5 is controlled with a traffic signal. The study intersections are:

1. Adelphian Way and Mecartney Road
2. Harbor Bay Parkway and Bay Edge Road
3. Harbor Bay Parkway and North Loop Road/South Loop Road
4. Harbor Bay Parkway and Penumbra Place/South Loop Road
5. Harbor Bay Parkway and the Ron Cowan Parkway

The traffic study evaluated the project during AM and PM peak hours, using the 2010 Highway Capacity Manual (HCM 2010) Operations Method contained in the standard traffic analysis software Synchro 8. This methodology determines intersection level of service (LOS) based on average control delay per vehicle for the overall intersection during peak-hour operating conditions. Evaluation of the non–signalized intersections was based on the HCM 2010 Unsignalized Methodology, also contained in Synchro.

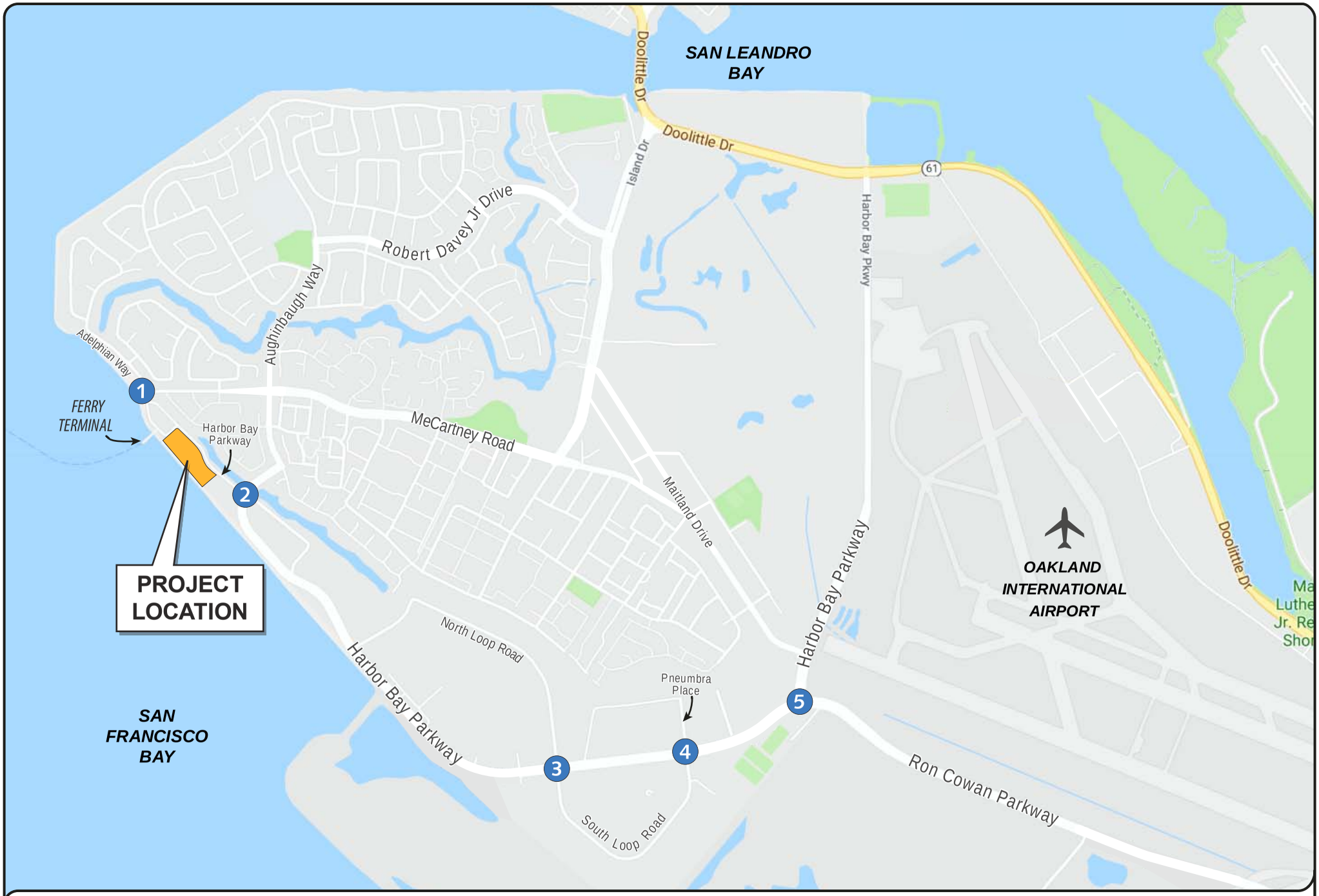

FIGURE 1 | PROJECT LOCATION & STUDY INTERSECTIONS
TRANSPORTATION IMPACT ANALYSIS
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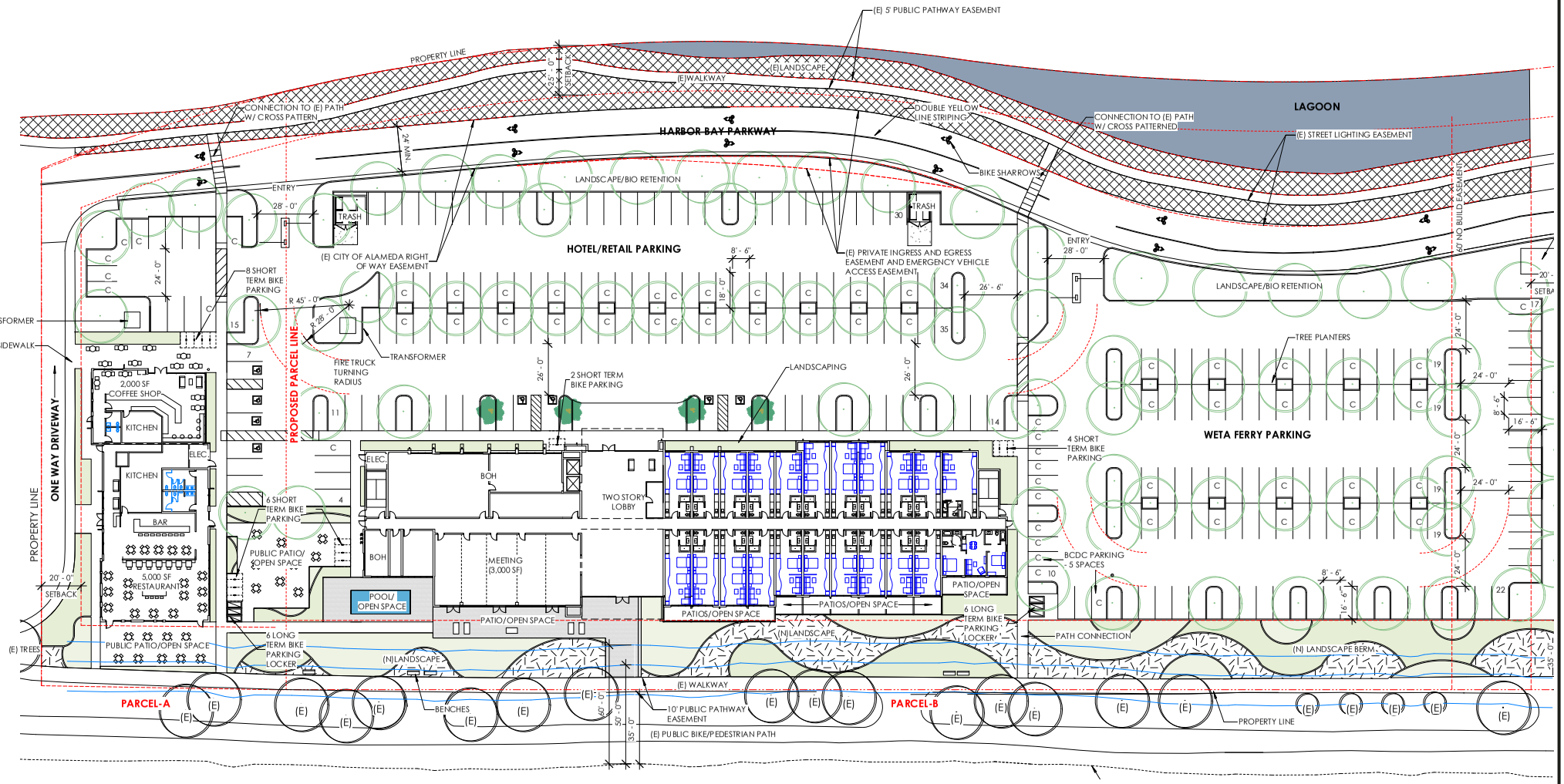

FIGURE 2 | SITE PLAN
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Traffic Analysis Scenarios

Six study scenarios or sets of traffic conditions have been addressed in the analysis of these intersections. As required by City standards, each of the five study intersections have been analyzed for the weekday AM peak hour (7:30 – 8:30 AM) and the weekday PM commute peak hour (5:00 to 6:00 PM). The six scenarios are as follows:

- Existing Conditions - This scenario evaluates the level-of-service for the intersections during the peak hour using traffic counts conducted in January, 2018.

- Existing Plus Project Conditions - This scenario includes the existing traffic volumes with the addition of the trips generated by the project.

- Baseline Conditions - This scenario includes existing traffic plus traffic from reasonably foreseeable future projects that could affect the volumes at the study intersections.

- Baseline Plus Project Conditions - This scenario includes the baseline traffic described above with the addition of the trips generated by the project.

- Cumulative Conditions (2040) – For this scenario data from the Alameda County Traffic Model for the year 2040 was used to develop the future traffic volume forecasts.

- Cumulative (2040) plus project conditions – This scenario includes the estimates of cumulative (2040) traffic with the addition of the trips generated by the proposed project.

2) SETTING

The setting for the transportation and circulation issues and the scope of the analysis are described below. This section also presents the analysis methodologies and a discussion of the existing conditions.

Traffic and transportation studies are generally required for all projects that generate over 50 peak hour trips or that add traffic to an existing substandard intersection. The proposed project is consistent with what has been assumed for the site in the future volume forecasts but in the near term the project would generate an increase of more than 50 peak hour trips. The primary basis of the analysis is the peak hour level of service calculations for the key intersections. The hours identified as the “peak” hours are between 7:45 AM and 8:45 AM and 5:00 PM and 6:00 PM for all of the transportation facilities described. Throughout this report, these peak hours will be identified as the AM and PM peak hours, respectively.

Existing Roadway Network

The City of Alameda is an island separated from the City of Oakland by the Oakland Estuary. Access to the City of Alameda is provided by a one-way couplet of under-Estuary tubes at Webster and Posey Streets (State Route 260), and draw bridges at Park Street/29th Avenue, Tilden Way/Fruitvale Avenue, and High Street. Doolittle Drive/Otis Drive (State Route 61) crosses San Leandro Channel, providing access from Bay Farm Island.

The proposed project site is located on the southern side of Alameda on Bay Farm Island within the Harbor Bay Business Park. The primary regional access to the site is from Interstate 880 via the Hegenberger Road and 98th Avenue interchanges to the Ron Cowan Parkway. The site can also be accessed via the High Street and the Bay Farm Island Bridge. The street network

serving the project site is shown in **Figure 1**. Locally, the project could be reached via Mecartney Road but the primary access would be via the Harbor Bay Parkway.

Interstate 880 (I-880) is a north/south eight-lane freeway (though oriented east/west in the study area) between I-80 near the Bay Bridge and San Jose. Traffic generated in Alameda uses I-880 to travel to/from eastern Alameda and Contra Costa County, San Francisco (via the Bay Bridge), the Tri-Valley (via State Route 238 and I-580), and also the South Bay. The closest access to/from the project site is provided via circuitous routes to/from the Broadway, Jackson Street, 23rd Avenue, and 29th Avenue/Fruitvale Avenue interchanges.

Harbor Bay Parkway is a north-south four-lane road that is located east of the project location. At the intersection with Ron Cowan Parkway, Harbor Bay Parkway curves to become an east-west roadway. It has a speed limit of 45 mph, and provides the principal access to the Harbor Bay Business Park.

Ron Cowan Parkway is a north-south four-lane road that serves as the principal access to the area from the south side at Oakland International Airport. It has a posted speed limit of 45 mph.

South Loop Road is a two-lane road that provides access to the adjacent commercial land uses and has a speed limit of 25 mph.

Adelphian Way, Mecartney Road and Bay Edge Road are all two-lane roads that provide access to residential areas and have a speed limit of 25 mph. Please note that to the east of Fontana Drive and Baywood Road Mecartney Road becomes a four lane roadway.

Transit Service

The Bus service in Alameda is provided by the Alameda-Contra Costa Transit District (AC Transit), which serves 13 cities and adjacent areas in Alameda and Contra Costa counties. **Figure 3** presents the transit service available in the vicinity of the proposed project. At the current time the bus transit service in the area is provided by AC Transit and ferry service is provided by the Alameda Harbor Bay Ferry. AC Transit Routes 21 and OX serve Bay Farm Island.

Route OX is a Transbay line that runs from the Bay Farm Island Park-and-Ride to the Temporary Transbay Terminal in San Francisco. It runs westbound from 5:30 AM to 8:47 AM with about 20 minute headways and eastbound from 4:15 PM to 8:38 PM with about 20 minute headways.

Route 21 is a line that is very convenient for commuters because it provides service to the Oakland International Airport, the Ferry terminal, and the Fruitvale BART station. Route 21 runs approximately every 30 minutes between 6:20 AM and 9:53 PM.

The Alameda Harbor Bay Ferry is a ferry that mainly transports commuters on weekdays to the Ferry Plaza in San Francisco. It departs the Harbor Bay Terminal four times in the morning from 6:30 AM to 8:30 AM. In the evening there are three ferries that depart from 5:05 PM to 7:05 PM. At the San Francisco Ferry Plaza, the ferry for the Harbor Bay Terminal leaves four times from 6:55 AM to 8:55 AM in the morning and in the evening there are three ferries that leave from 5:05 PM to 7:05 PM.

The Harbor Bay Business Park also operates a private shuttle service providing employees direct service to BART. The service operates on approximately ½ hour headways from about 6:00 AM to 9:00 AM and from about 3:23 to 6:30 PM.

FIGURE 3 | TRANSIT SERVICE IN THE PROJECT STUDY AREA
TRANSPORTATION IMPACT ANALYSIS
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Pedestrian Facilities

Alameda, and especially Bay Farm Island, are very pedestrian-friendly areas. According to the Alameda Pedestrian Plan, there are approximately 260 miles of sidewalks in Alameda. Within the study area, all the streets are lined with sidewalks. The adjacent intersections of the Harbor Bay Parkway with the Ron Cowan Parkway and also with South Loop Road include crosswalks. Along with the previously mentioned pedestrian facilities, there is also a major trail, the Bay Trail, which lines the perimeter of Bay Farm Island and provides easy access to the Bay Farm Island Bicycle Bridge adjacent to the Bay Farm Island Bridge.

Bicycle Facilities

There are several major bicycle routes designated in the Project Area vicinity, consisting of both Class I and Class II route types. Class I routes are separate bicycle path that are also multi-use trails. One of these trails runs along Island Drive and Mecartney Road. Class II bicycle routes are separate bicycle lanes adjacent to the curb lane. In the Project Area there is a Class I bicycle path around Bay Farm Island, the Bay Trail, that runs adjacent to the Harbor Bay Parkway for much of its length.

Intersection Level of Service Analysis Methodology

Study Intersections. Intersections, rather than midblock roadway segments, are typically the critical capacity-controlling locations for vehicular travel on urban roadway networks and are the primary basis for determining traffic impacts. For this study traffic operating conditions have been analyzed at 5 key local intersections in the Project area. **Figure 4** illustrates the lane configurations of the study intersections as well as the existing (and planned) traffic control devices for each.

Intersection Analysis Methodology. Existing operational conditions at the 5 study intersections have been evaluated with Synchro 8.0 software using the 2000 *Highway Capacity Manual* (*HCM*) level of service methodology. Intersection Level of Service (LOS) is a qualitative description of the performance of an intersection based on the average delay per vehicle. The LOS rating ranges from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

For signalized intersections, the *HCM* methodology determines the capacity of each lane group approaching the intersection. The LOS is then based on average delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average delay and LOS are presented for the intersection. **Table 1** summarizes the relationship between LOS and average delay at signalized intersections.

For unsignalized (all-way stop controlled and two-way stop controlled) intersections, the average delay and LOS operating conditions are calculated by approach (e.g., northbound) and movement (e.g., northbound left-turn) for those movements that are subject to delay. In general, the operating conditions for unsignalized intersections are presented for the worst approach. **Table 2** summarizes the relationship between LOS and average vehicle delay at unsignalized intersections.

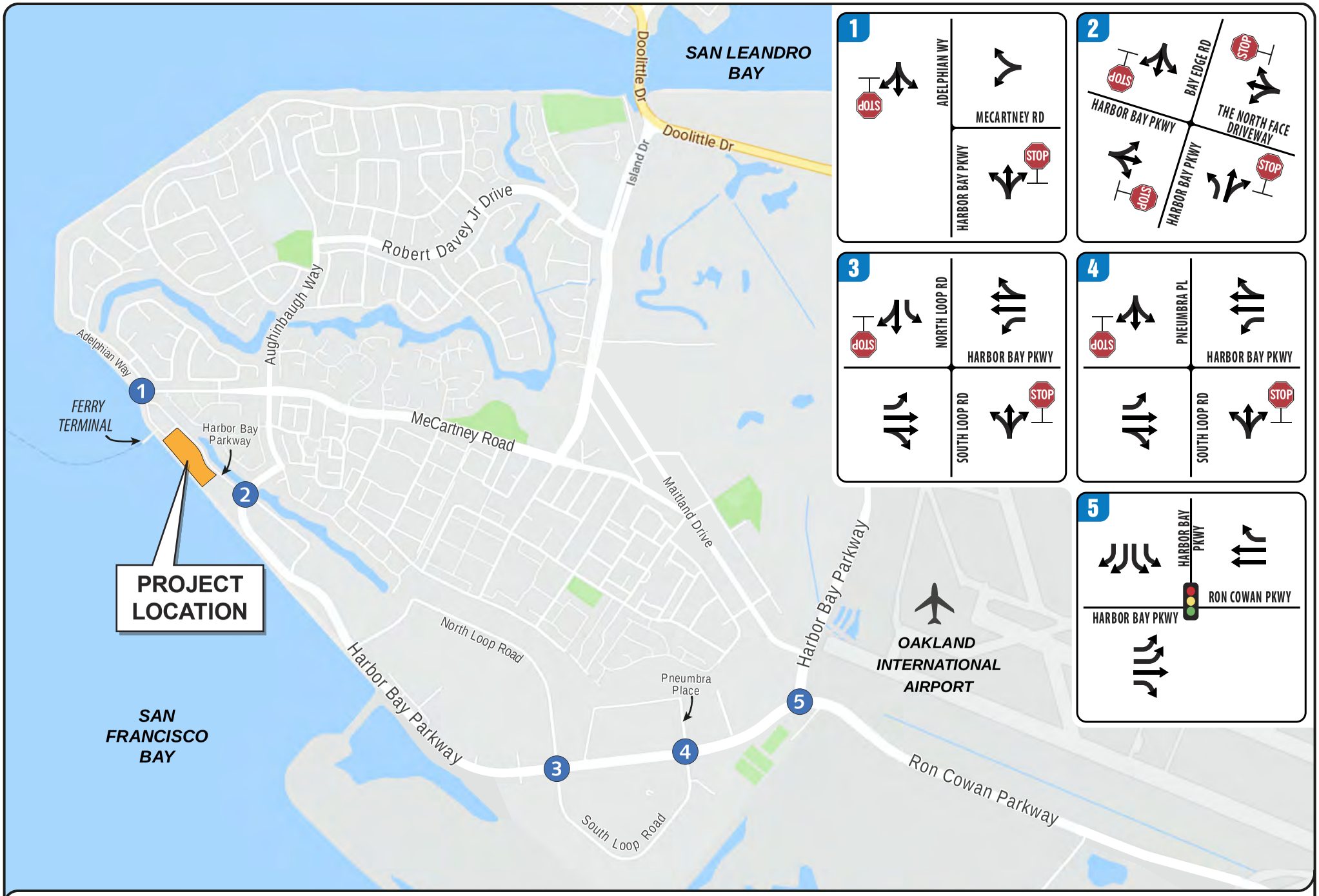

FIGURE 4 | EXISTING LANE CONFIGURATIONS
TRANSPORTATION IMPACT ANALYSIS
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TABLE 1
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Delay (sec/veh)
A	Insignificant Delays: No approach phase is fully used and no vehicle waits longer than one red indication.	≤ 10
B	Minimal Delays: An occasional approach phase is fully used. Drivers begin to feel restricted.	> 10 to 20
C	Acceptable Delays: Major approach phase may become fully used. Most drivers feel somewhat restricted.	> 20 to 35
D	Tolerable Delays: Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly without excessive delays.	> 35 to 55
E	Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues from upstream.	> 55 to 80
F	Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.	> 80

As part of the *HCM methodology*, adjustments are typically made for various factors that reduce the ability of the streets to accommodate vehicles (such as the downtown nature of the area, number of pedestrians, vehicle types, lane widths, grades, on-street parking and queues). These adjustments are performed to ensure that the LOS analysis results reflect the operating conditions that are observed in the field. The capacity calculation methodology and the LOS definitions are different than signalized intersections.

SOURCE: *Highway Capacity Manual*, Transportation Research Board, 2011.

TABLE 2
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Delay (seconds/vehicle)
A	No delay for stop-controlled approaches.	0 to 10
B	Operations with minor delays.	> 10 to 15
C	Operations with moderate delays.	> 15 to 25
D	Operations with some delays.	> 25 to 35
E	Operations with high delays and long queues.	> 35 to 50
F	Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50

SOURCE: *Highway Capacity Manual*, Transportation Research Board, 2011.

Existing Intersection Capacity Conditions

Traffic counts for this study were conducted in January, 2018 when schools were in session and the existing volumes at the project study intersection are shown in **Figure 5**. **Table 3** summarizes the associated LOS computation results for the existing weekday AM and PM peak hour conditions at these intersections. As shown in **Table 3**, all of the study intersections currently have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours with the exception of Intersections #3 and #4. These two unsignalized intersections currently exceed the City's LOS standards during both the AM and PM peak hours.

TABLE 3
EXISTING INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	EXISTING	
				Delay	LOS
1	ADELPHIAN WAY & MECARTNEY ROAD	Side Street Stop	AM	7.9	A
			PM	7.3	A
2	BAY EDGE ROAD & HARBOR BAY PARKWAY	Side Street Stop	AM	8.9	A
			PM	8.7	A
3	NORTH LOOP ROAD / SOUTH LOOP ROAD & HARBOR BAY PARKWAY	Side Street Stop	AM	**>50**	**F**
			PM	**>50**	**F**
4	PENUMBRA PLACE / SOUTH LOOP ROAD & HARBOR BAY PARKWAY	Side Street Stop	AM	**>50**	**F**
			PM	**>50**	**F**
5	RON COWAN PARKWAY & HARBOR BAY PARKWAY	Signalized	AM	14.1	B
			PM	9.3	A

SOURCE: Abrams Associates, 2018
NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

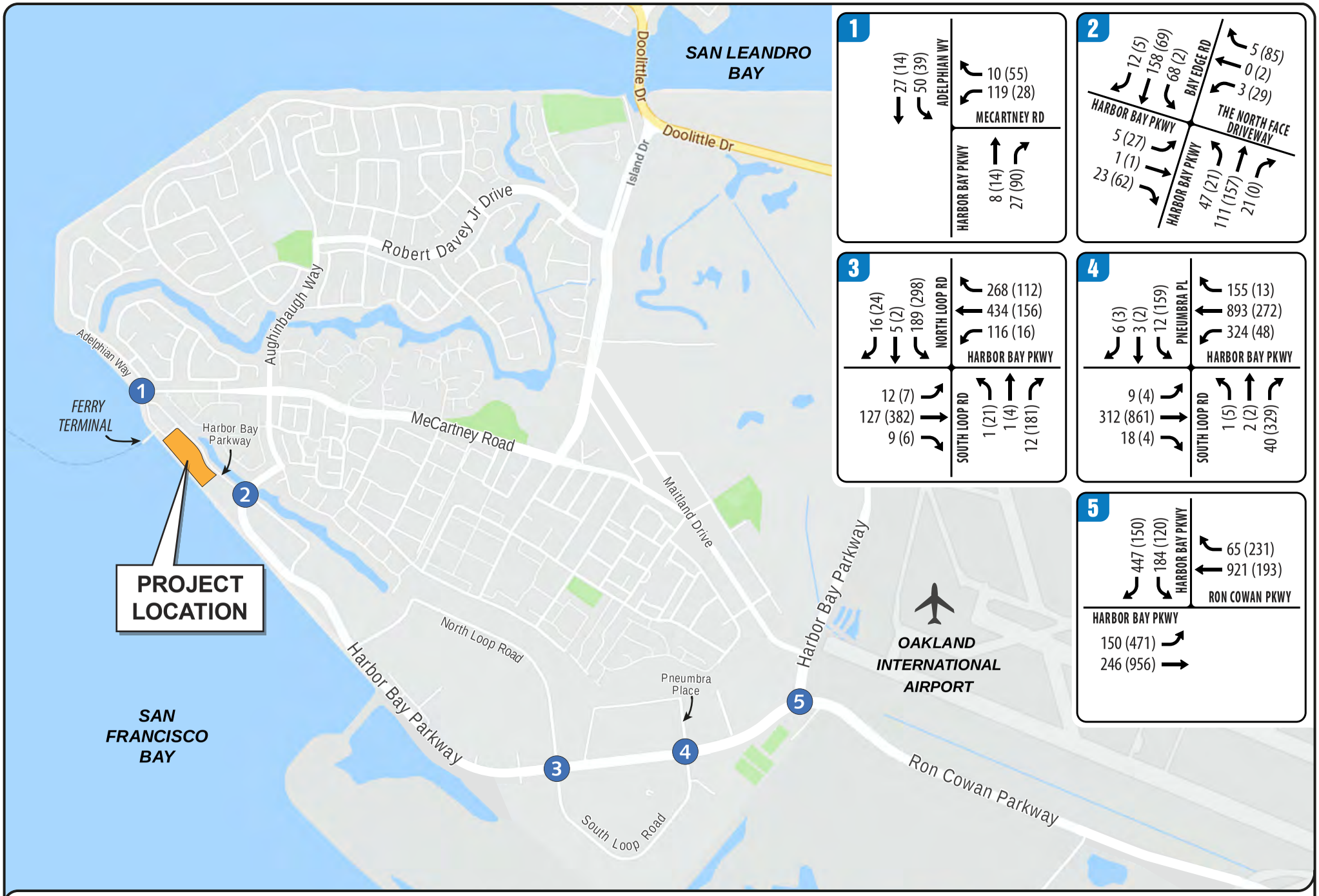

FIGURE 5 | EXISTING AM(PM) PEAK HOUR TRAFFIC VOLUMES
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3) REGULATORY FRAMEWORK

Responsible Agencies

The management of transportation systems in the study area is the responsibility of several different agencies. The California Department of Transportation (Caltrans) is responsible for freeways and State Routes in the area including SR 61. The Alameda County Congestion Management Agency is responsible for verifying compliance with the County's growth management policies and maintains the County's traffic model. The City of Alameda is responsible for ensuring there are no significant traffic impacts from the proposed project, particularly on roadways within the City limits. These agencies have statutory authority and are Responsible Agencies under CEQA. Further, since the City of Alameda would have direct entitlement authority for the proposed project, it also serves as the Lead Agency for the project.

Significance Criteria

According to CEQA guidelines, a project would have a significant impact if it would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.
- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

According to the City of Alameda[1], a project would have a significant impact if it would:

(a) Signalized Intersections: Project-related operational impacts on signalized intersections would be considered significant if project-related traffic would cause the LOS rating to deteriorate from LOS D or better to LOS E or F, or from LOS E to LOS F. In addition, a project would result in significant adverse impacts at intersections that operate at LOS E or F under existing conditions, depending upon the magnitude of the project's contribution to the worsening of delay. In Alameda it is considered a significant impact if a project would increase traffic volumes by more than 3 percent at a signalized intersection operating at LOS E or F. In addition, a project would have a significant adverse effect if it would cause major traffic hazards, or would contribute considerably to the cumulative traffic increases that would cause the deterioration in levels of service to unacceptable levels. For signalized intersections a

[1] Guide for Preparation of Traffic Studies and Reports, City of Alameda Public Works Department, Alameda, CA, November, 28, 2005.

significant impact would occur if project-generated traffic would cause intersection operations to deteriorate from an acceptable level, which is defined as LOS D or better.

(b) Unsignalized Intersections: Project-related operational impacts on unsignalized intersections are considered significant if project-generated traffic would cause the worst-case movement (or average of all movements for all-way stop-controlled intersections and roundabouts) to deteriorate from an acceptable level of service. In addition, a project would be considered to have a significant impact if it would increase traffic volumes by more than 3 percent at an unsignalized intersection operating at LOS E or F.

(d) Parking: Project-related parking impacts on parking would be considered significant if a project would have inadequate parking capacity under City parking standards.

(e) Transit: A project would have a significant effect on the environment if it would cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity.

(f) Pedestrian System: A project would have a significant effect on the environment if it would result in substantial overcrowding on sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

(g) Bicycle System: A project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

The City of Alameda Transportation Commission recommends additional criteria in a document entitled *Thresholds of Significance and Procedures for Ranking Modes Where Multiple Priorities are Identified*[2]. According to this document, a project would cause a significant transportation impact if the project has one or more of the following effects:

- Transit – If travel speed degrades by 10 percent or more along a street segment. A segment would be defined as the impacted bus stop location, plus the two previous stops and the two subsequent stops. A segment that crosses a City boundary shall also include five bus stops, but the last stop shall be the first bus stop outside of the City of Alameda (Transit LOS for an arterial segment would be calculated using the Highway Capacity Manual's methodology for Urban Street (arterial) LOS).

- Automobile (intersections) – Causes an intersection to degrade below LOS D. If an intersection were already at LOS E or worse, an impact would be considered significant if there is a 3 percent or greater increase in the traffic volume. (Automobile LOS at intersections is calculated using the Highway Capacity Manual's methodology for determining the average vehicle delay at an intersection.)

- Automobile (arterial segments) – Causes an arterial segment to degrade below LOS D. If an arterial were already at LOS E or worse, an impact would be considered significant if the Average Travel Speed of a segment decreases by 10 percent or more. (Automobile LOS for an arterial segment would be calculated using the Highway Capacity Manual's methodology for Urban Street (arterial) LOS).

[2] *Threshold of Significance and Procedures for Ranking Modes Where Multiple Priorities are Identified*, Attachment I, Item 9-C, Planning Board Meeting, 10/11/10.

- Bicycle – Causes the Bicycle segment LOS to degrade below LOS B. If a street segment were already below LOS B, an impact would be considered significant if the LOS score increases by 10 percent or more in value. If a segment has an existing adjacent Class I facility, and has not been recommended for a future bicycle lane, the degradation of the Bicycle LOS to E would not be considered a significant impact. (Florida Department of Transportation methodology for street segments will be used for the LOS analysis).

- Pedestrian – Causes the Pedestrian LOS to degrade below LOS B at a signalized intersection. If the intersection were already below LOS B, an impact would be considered significant if the delay for a crosswalk increases by 1- percent. (Pedestrian LOS would be determined using the Highway Capacity Manual methodology for determining the average delay for pedestrians at a signalized intersection.)

4) VEHICULAR TRAFFIC IMPACT ANALYSIS

Project Trip Generation

A "trip" is defined in ITE's *Trip Generation* publication as a single or one-directional vehicular movement with either the origin or destination at the project site. As a result, a trip can be either "to" or "from" the site. Consequently, a single visit to a site is counted as two trips (i.e., one to and one from the site). For purposes of determining the reasonable worst-case impacts of traffic on the surrounding street network from a proposed project in this area, the trips generated by a proposed development are typically estimated between the hours of 7:45 to 8:45 a.m. and 5:00 to 6:00 p.m. While the project itself may generate more traffic during some other times of the day, such as around noon, the peak of "*adjacent street traffic*" represents the time period when the uses generally contribute to the greatest amount of congestion due to commute traffic.

As noted previously, the project involves a hotel with a total of 172 rooms and would also include a 5,000 square foot restaurant and a 2,000 square foot coffee shop. In additional there would be some typical business hotel amenities such as a breakfast area, a fitness room, and a pool. Trip generation for development projects, such as the proposed project, are typically calculated based on rates contained in the ITE publication, *Trip Generation 10th Edition*. *Trip Generation* is a standard reference used by jurisdictions throughout the country for the estimation of potential vehicular trips from proposed new developments. For this project the ITE trip generation categories of Business Hotel (ITE Land Use Code 312), High-Turnover Sit-Down Restaurant (ITE Land Use Code 932), and Coffee Shop (ITE Land Use Code 936) were used. A summary of the project's trip generation rates and the resulting trips are presented in **Table 4**. Based on the trip generation forecasts the project would generate about 117 new vehicle trips during the AM peak hour and 90 trips during the PM peak hour. The trips generated by this proposed development are estimated for the peak commute hours which represent the peak of adjacent street traffic.

TABLE 4
PROJECT TRIP GENERATION

Land Use	ITE Code	Size	ADT	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
ITE Hotel Trip Rates - Trips per Room	312		4.02	0.16	0.23	0.39	0.18	0.14	0.32
Hotel Trip Generation		*172 rooms*	*691*	*28*	*39*	*67*	*30*	*25*	*55*
ITE Restaurant Trip Rates - Trips per ksf	932		112.08	5.47	4.47	9.94	5.85	3.59	9.44
Restaurant Trip Generation		*5,000 sq. ft.*	*561*	*28*	*22*	*50*	*29*	*18*	*47*
Reduction for Pass-By/Non-Auto Trips (43%)			241	12	10	22	12	8	20
Subtotals for the Restaurant			*320*	*16*	*12*	*28*	*17*	*10*	*27*
ITE Coffee Shop Trip Rates - Trips per ksf	936		112.18	51.58	49.59	101.14	18.16	18.16	36.31
Coffee Shop Trip Generation		*3,000 sq. ft.*	*224*	*103*	*99*	*202*	*36*	*36*	*73*
Reduction for Pass-By/Non-Auto Trips (89%)			200	92	88	180	32	32	65
Subtotals for the Coffee Shop			*25*	*11*	*11*	*22*	*4*	*4*	*8*
Net New Project Trip Generation			**1,036**	**55**	**62**	**117**	**51**	**39**	**90**

SOURCE: Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington D.C., 2018.

Ferry Parking Trip Generation

The project is currently proposing to set aside up to 100 parking spaces for ferry passengers, with the exact amount depending on the parking demand of the project itself. The City has indicated the amount of ferry parking to be provided would be managed to assure there would be no parking overflow from the project. This is possible because of the reservation systems used by hotels which allow them to determine the expected hotel occupancy levels at least 24 hours in advance. As a result, the hotel would know in advance how many parking spaces will be needed for their customers and how many can be made available for ferry parking.

As a worst case scenario the addition trip generation from 100 ferry parking spaces would be forecast to equate to approximately 43 trips during the AM and PM peak hours. There are no specific ITE rates for ferry parking so these forecasts were based on the trip rates for the most comparable ITE category which is a park and ride lot with bus or light rail service (ITE Land Use Code 90). Once this traffic is distributed in various directions based on the travel characteristics of the existing ferry parking users the net increase in traffic to any one roadway would be less than 20 peak hour trips. This increase in traffic is low enough that further analysis of additional roadway facilities would not be expected to yield any additional useful information about the project's potential for transportation impacts. In addition, it is expected that some of these trips may replace existing trips from commuters who are currently being dropped off and picked up because of the limited amount of parking available for ferry patrons.

Trip Distribution

Trip distribution is a process that determines in what proportion of vehicles would be expected to travel between a project site and various destinations outside the project study area. Trip distribution assumptions for the proposed project were developed based on previous traffic impact studies conducted in the study area vicinity and consultation with City transportation staff. For this project approximately 47 percent of project traffic would be expected to travel to and from the east towards the I-80 freeway and the Oakland Airport via the Ron Cowan Parkway. **Figure 6** shows the resulting project trips added at each of the study intersections.

Existing Plus Project Intersection Operations

Figure 7 shows the existing plus project AM and PM peak hour traffic volumes. Using this data, the intersection capacity was calculated for each intersection. **Table 5** summarizes the Level of Service (LOS) computation results for the existing plus project weekday AM and PM peak hour conditions (the corresponding LOS analysis calculation sheets are presented in the *Traffic Analysis Appendix*).

TABLE 5
EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

	INTERSECTION	CONTROL	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	ADELPHIAN WAY & MECARTNEY ROAD	Side Street Stop	AM	7.9	A	8.0	A
			PM	7.3	A	7.4	A
2	BAY EDGE ROAD & HARBOR BAY PARKWAY	Side Street Stop	AM	8.9	A	9.3	A
			PM	8.7	A	8.9	A
3	NORTH LOOP ROAD / SOUTH LOOP ROAD & HARBOR BAY PARKWAY	Side Street Stop	AM	**>50**	**F**	**>50**	**F**
			PM	**>50**	**F**	**>50**	**F**
4	PENUMBRA PLACE / SOUTH LOOP ROAD & HARBOR BAY PARKWAY	Side Street Stop	AM	**>50**	**F**	**>50**	**F**
			PM	**>50**	**F**	**>50**	**F**
5	RON COWAN PARKWAY & HARBOR BAY PARKWAY	Signalized	AM	14.1	B	14.8	B
			PM	9.3	A	9.6	A

SOURCE: Abrams Associates, 2018
NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

As shown in **Table 5**, all study intersections would continue to operate at acceptable conditions (LOS D or better) during the weekday AM and PM peak hours with the exception of Intersections #3 and #4. These two unsignalized intersections currently would continue to exceed the City's LOS standards during both the AM and PM peak hours. Based on an analysis of Caltrans signal warrants traffic signals will eventually be warranted (and are planned and funded) at these two intersections but the exact timing of their installation is yet to be determined by the City. Please note that the project would increase the peak hour volumes at these two intersections by less than 3 percent and, as noted above, traffic signals to address the future congestion at these intersections are already planned. Therefore, no off-site traffic mitigations would be required under this scenario. The detailed LOS calculations and the signal warrant analysis worksheets for each study intersection are presented in the *Traffic Analysis Technical Appendix*.

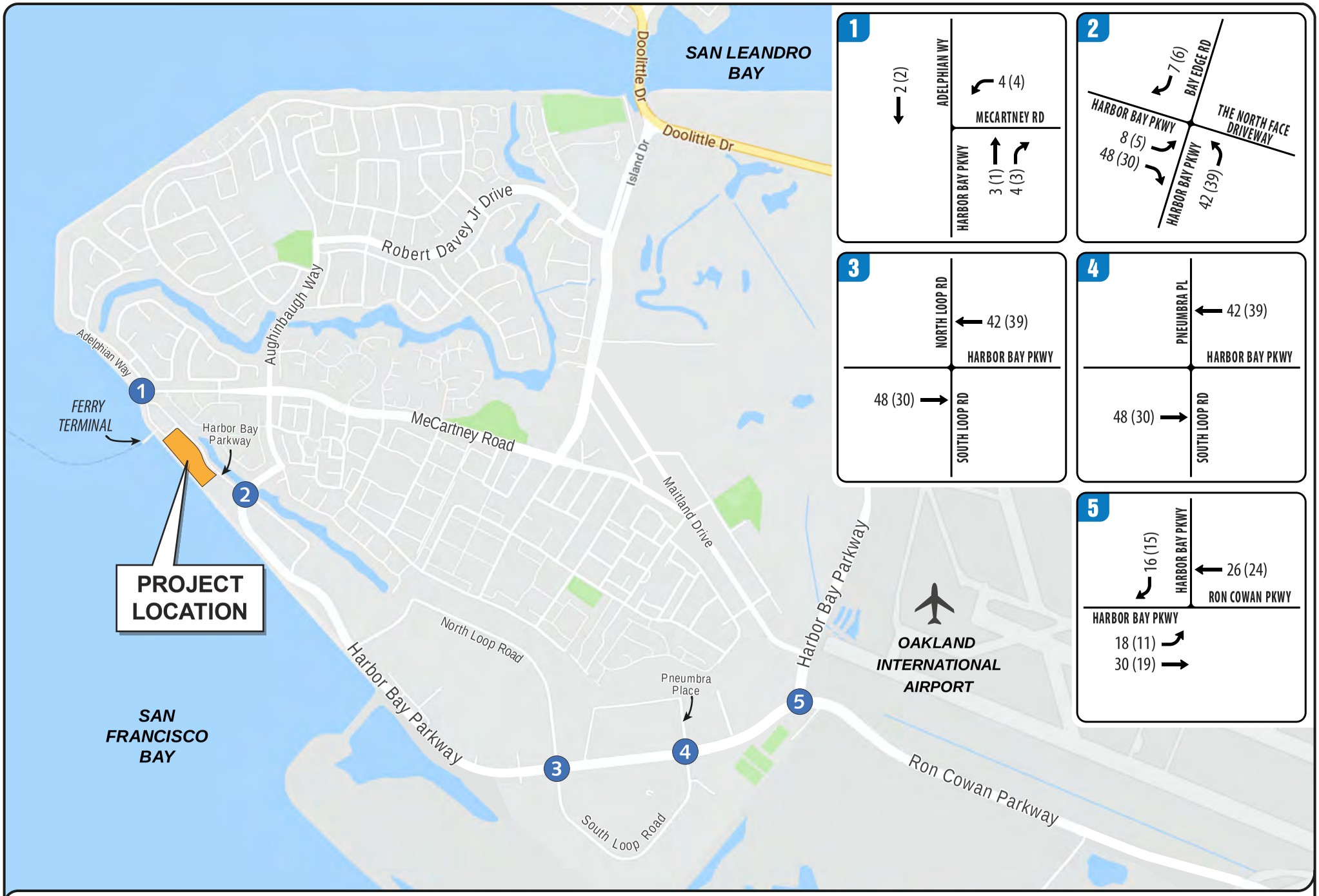

FIGURE 6 | PROJECT AM(PM) PEAK HOUR TRIPS
TRANSPORTATION IMPACT ANALYSIS
Marriott Residence Inn Project
City of Alameda

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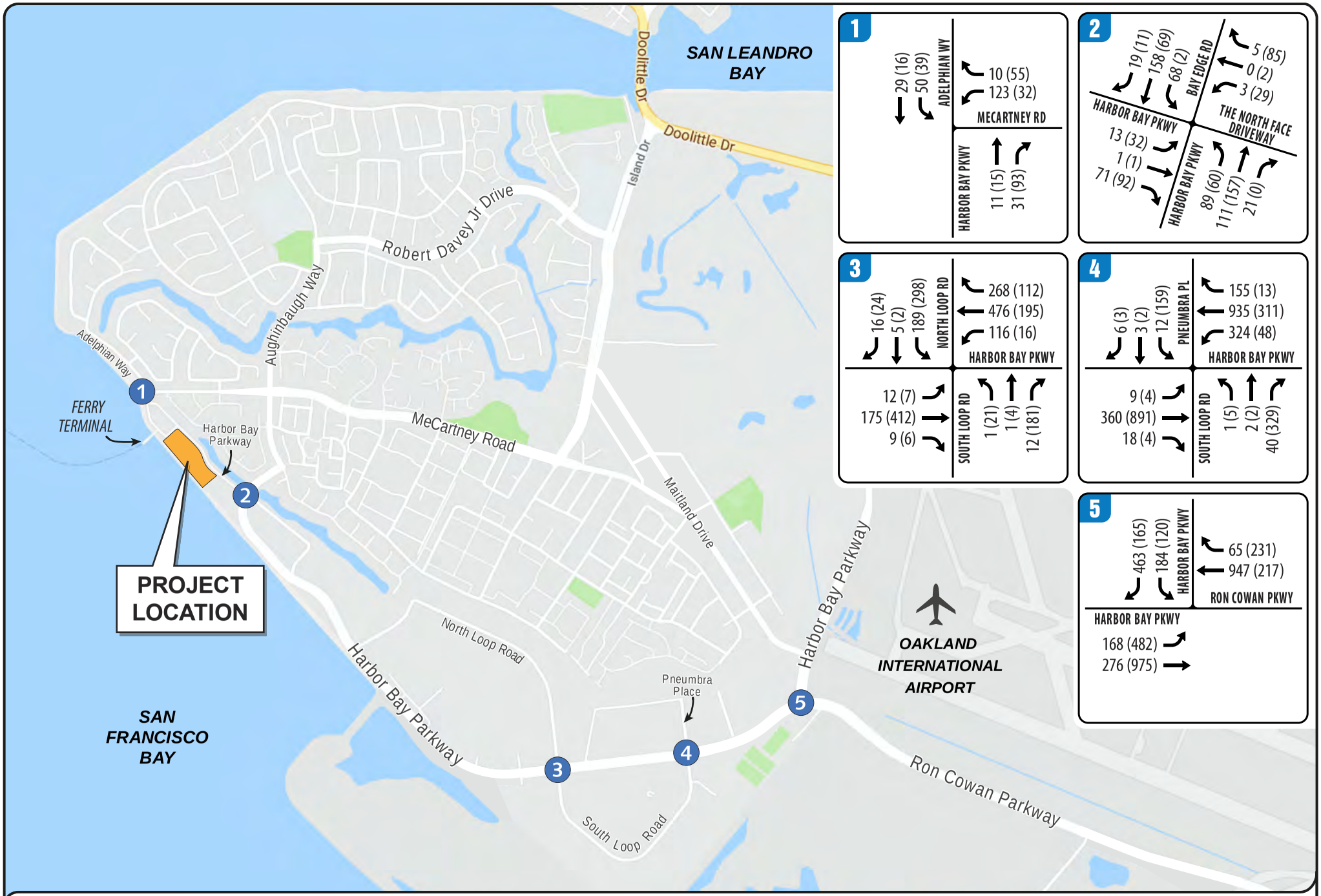

FIGURE 7 | EXISTING PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES
TRANSPORTATION IMPACT ANALYSIS
Marriott Residence Inn Project
City of Alameda

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Baseline Traffic Volumes

The Baseline scenario evaluates the background level-of-service at the studied intersections for the existing conditions with the addition of traffic from reasonably foreseeable projects in the area. This scenario includes traffic from the development of the approved North Loop Center 3 project and the planned Harbor Bay Hotels Project at the east end of the business park. The North Loop Center 3 project includes a total of 187,000 square feet of office space which has not yet been constructed and occupied. The planned Harbor Bay Hotels Project is proposed to include a total of 211 new hotel rooms. This scenario also includes background traffic growth of 1 percent per year to the year 2020. Because no other funded transportation network improvements are expected to be completed at the study intersections by 2020, it has been assumed that the roadway network, traffic controls, and lane geometries for Baseline Conditions would be the same as under Existing Conditions. **Figure 8** shows the baseline AM and PM peak hour traffic volumes.

Baseline Intersection Operations

The projected intersection level of service computations for Baseline conditions at the project study intersections (during the weekday AM and PM peak hours) without the proposed project are shown in **Table 6**. All study intersections are forecast to meet the City's standards except for Intersections #3 and #4. These two unsignalized intersections would continue to exceed the City's LOS standards during both the AM and PM peak hours. Based on an analysis of Caltrans signal warrants traffic signals will eventually be warranted (and are planned and funded) at these two intersections but the exact timing of their installation is yet to be determined by the City. The detailed LOS calculations and the signal warrant analysis worksheets for each study intersection are presented in the *Traffic Analysis Technical Appendix*.

Baseline Plus Project Intersection Operations

The addition of project traffic to the baseline conditions was analyzed in this scenario. The results of the intersection LOS computations for Baseline Plus Project conditions are as presented in **Table 6**. This scenario consists of Baseline (2020) Conditions, with the addition of traffic expected to be generated by the proposed hotel project. The projected intersection turning movement volumes for Baseline Plus Project conditions at the project study intersections are shown in **Figure 9**. As shown in **Table 6**, all study intersections would continue to operate at acceptable conditions (LOS D or better) during the weekday AM and PM peak hours with the exception of Intersections #3 and #4. These two unsignalized intersections currently would continue to exceed the City's LOS standards during both the AM and PM peak hours. Based on an analysis of Caltrans signal warrants traffic signals will eventually be warranted. Please note these traffic signals would be warranted regardless of whether or not the proposed project is implemented and the project would increase the peak hour volumes at these two intersections by less than 3 percent. In addition, traffic signals to address the future congestion at intersections #3 and #4 are already planned. Therefore, no off-site traffic mitigations would be required under this scenario. The detailed LOS calculations and the signal warrant analysis worksheets for each study intersection are presented in the *Traffic Analysis Technical Appendix*.

Cumulative (2040) Traffic Volumes

The 2040 cumulative traffic volumes were based on the latest travel demand model from the Alameda County Transportation Commission. The only planned transportation network improvements assumed for the area was the installation of traffic signals at the intersections of the Harbor Bay Parkway with North Loop Road and with South Loop Road/Penumbra Place. **Figure 10** shows the cumulative AM and PM peak hour traffic volumes.

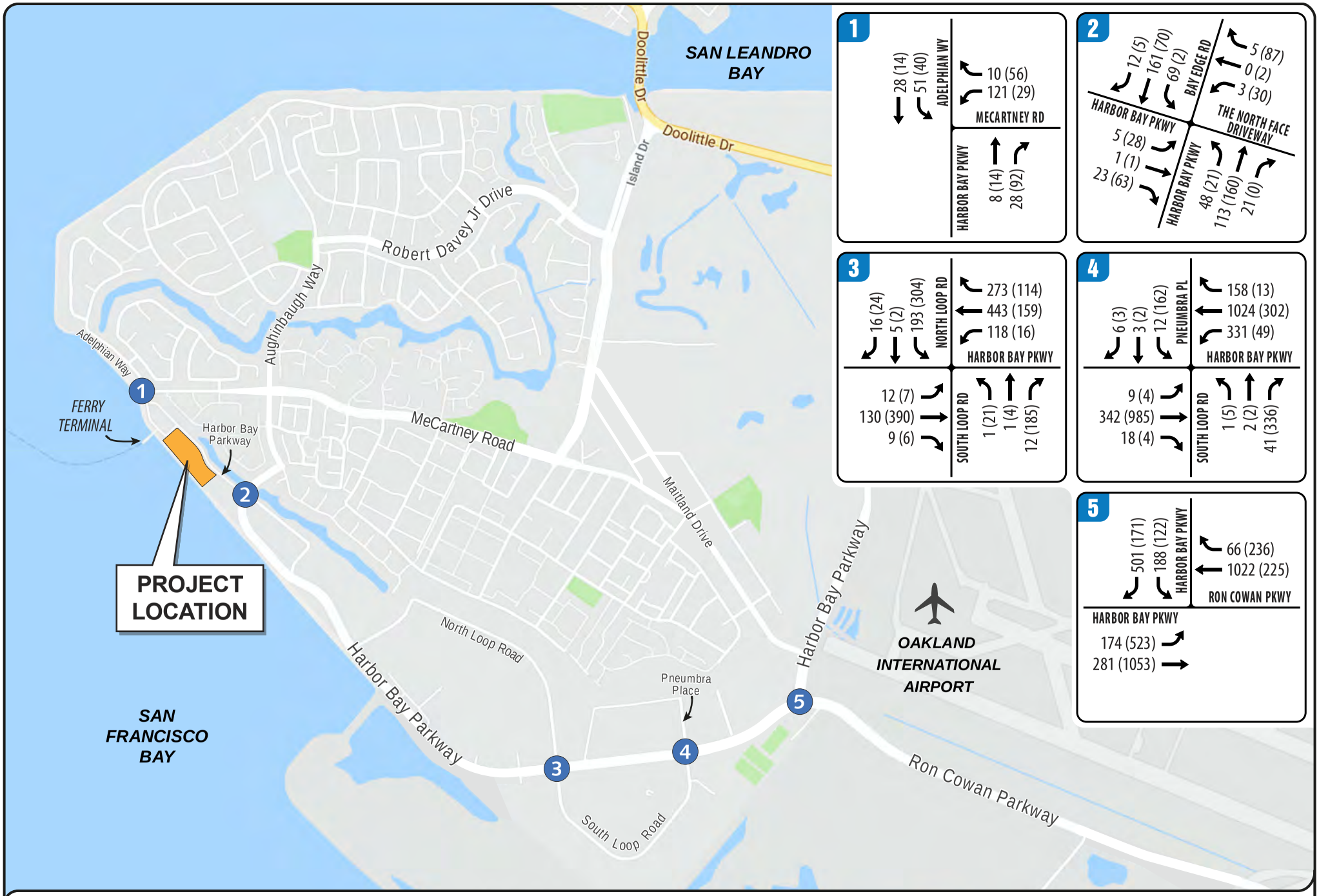

FIGURE 8 | BASELINE AM(PM) PEAK HOUR TRAFFIC VOLUMES
TRANSPORTATION IMPACT ANALYSIS
Marriott Residence Inn Project
City of Alameda

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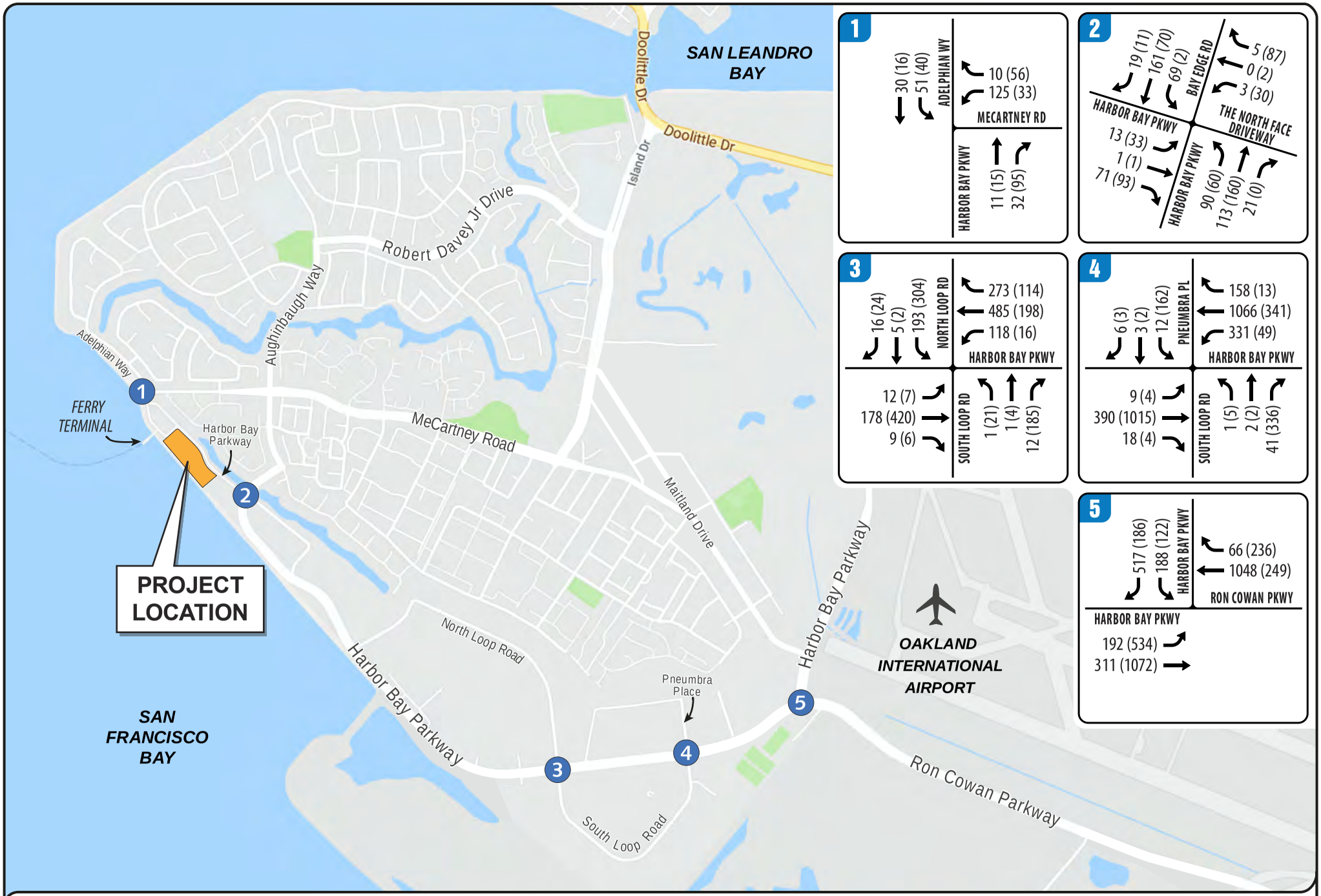

FIGURE 9 | BASELINE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES
TRANSPORTATION IMPACT ANALYSIS
Marriott Residence Inn Project
City of Alameda

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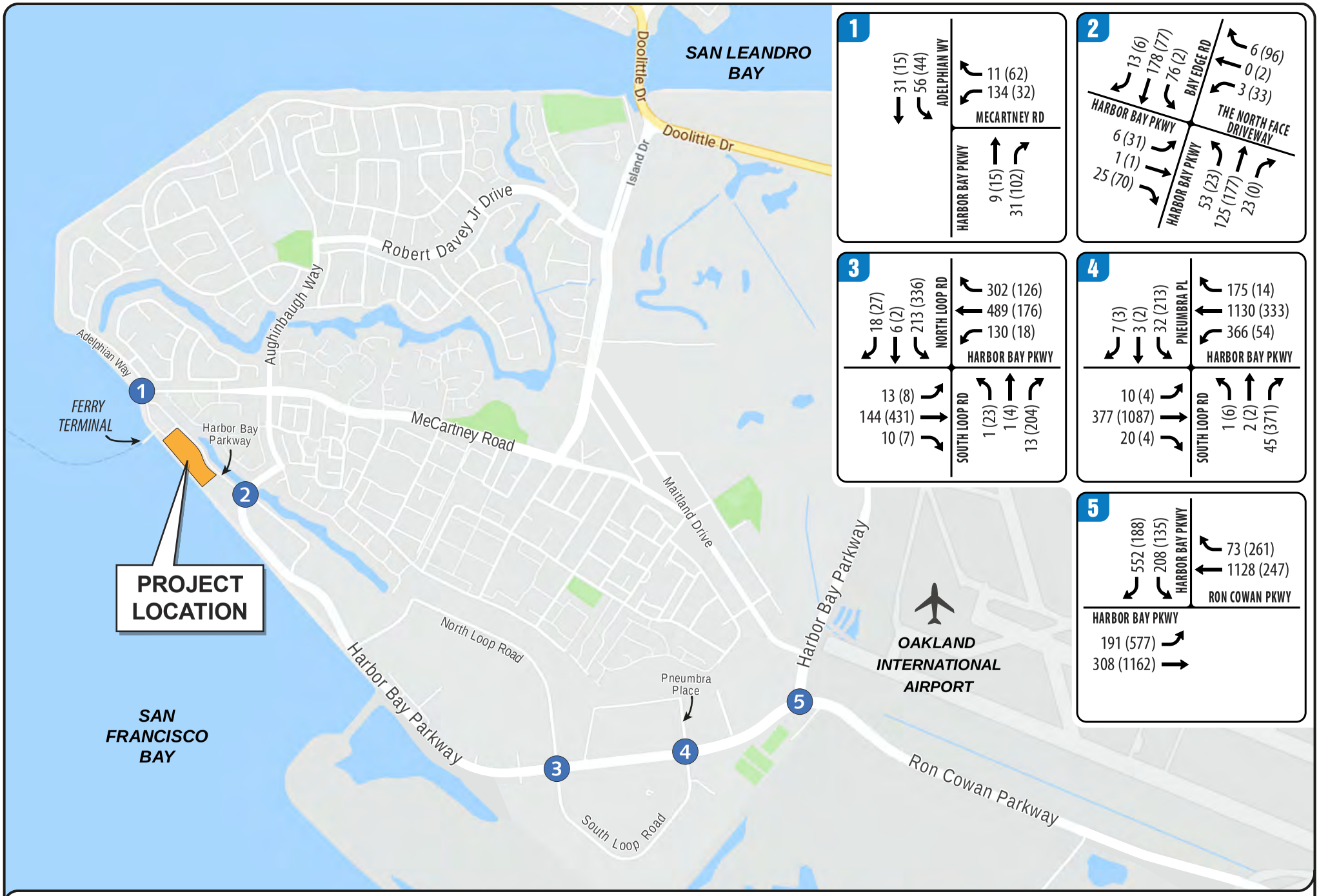

FIGURE 10 | CUMULATIVE AM(PM) PEAK HOUR TRAFFIC VOLUMES
TRANSPORTATION IMPACT ANALYSIS
Marriott Residence Inn Project
City of Alameda

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TABLE 6
BASELINE INTERSECTION LEVEL OF SERVICE CONDITIONS

	INTERSECTION	CONTROL	PEAK HOUR	BASELINE		BASELINE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	ADELPHIAN WAY & MECARTNEY ROAD	Side Street Stop	AM	8.0	A	8.0	A
			PM	7.4	A	7.4	A
2	BAY EDGE ROAD & HARBOR BAY PARKWAY	Side Street Stop	AM	8.9	A	9.3	A
			PM	8.7	A	8.9	A
3	NORTH LOOP ROAD / SOUTH LOOP ROAD & HARBOR BAY PARKWAY	Side Street Stop	AM	**>50**	**F**	**>50**	**F**
			PM	**>50**	**F**	**>50**	**F**
4	PENUMBRA PLACE / SOUTH LOOP ROAD & HARBOR BAY PARKWAY	Side Street Stop	AM	**>50**	**F**	**>50**	**F**
			PM	**>50**	**F**	**>50**	**F**
5	RON COWAN PARKWAY & HARBOR BAY PARKWAY	Signalized	AM	16.4	B	17.4	B
			PM	10.0	A	10.3	B

SOURCE: Abrams Associates, 2018
NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

Cumulative (2040) Intersection Operations

The projected intersection level of service computations for Cumulative (Year 2040) conditions at the project study intersections (during the weekday AM and PM peak hours) without the proposed project are shown in **Table 7**. With the installation of the planned traffic signals at Intersections #3 and #4 to address the potential congestion identified at those locations, all intersections are forecast to meet the established standards. The detailed LOS calculations and the signal warrant analysis worksheets for each study intersection are presented in the *Traffic Analysis Technical Appendix*.

Cumulative Plus Project Intersection Operations

The projected intersection turning movement volumes for Cumulative 2040 plus project conditions at the five study intersections (during the weekday AM and PM peak hours) are shown in **Figure 11**. The results of the associated intersection LOS computations for Cumulative intersection operations, as well as Cumulative operations with the addition of project traffic are shown in **Table 7**. The detailed LOS calculation sheets for each study intersection are presented in the *Traffic Analysis Appendix*. As shown in **Table 6**, all study intersections would continue to operate at acceptable conditions (LOS D or better) during the weekday AM and PM peak hours with the implementation of the two planned traffic signals at Intersections #3 and #4. As noted above, the detailed LOS calculations and the signal warrant analysis worksheets for each study intersection are presented in the *Traffic Analysis Technical Appendix*.

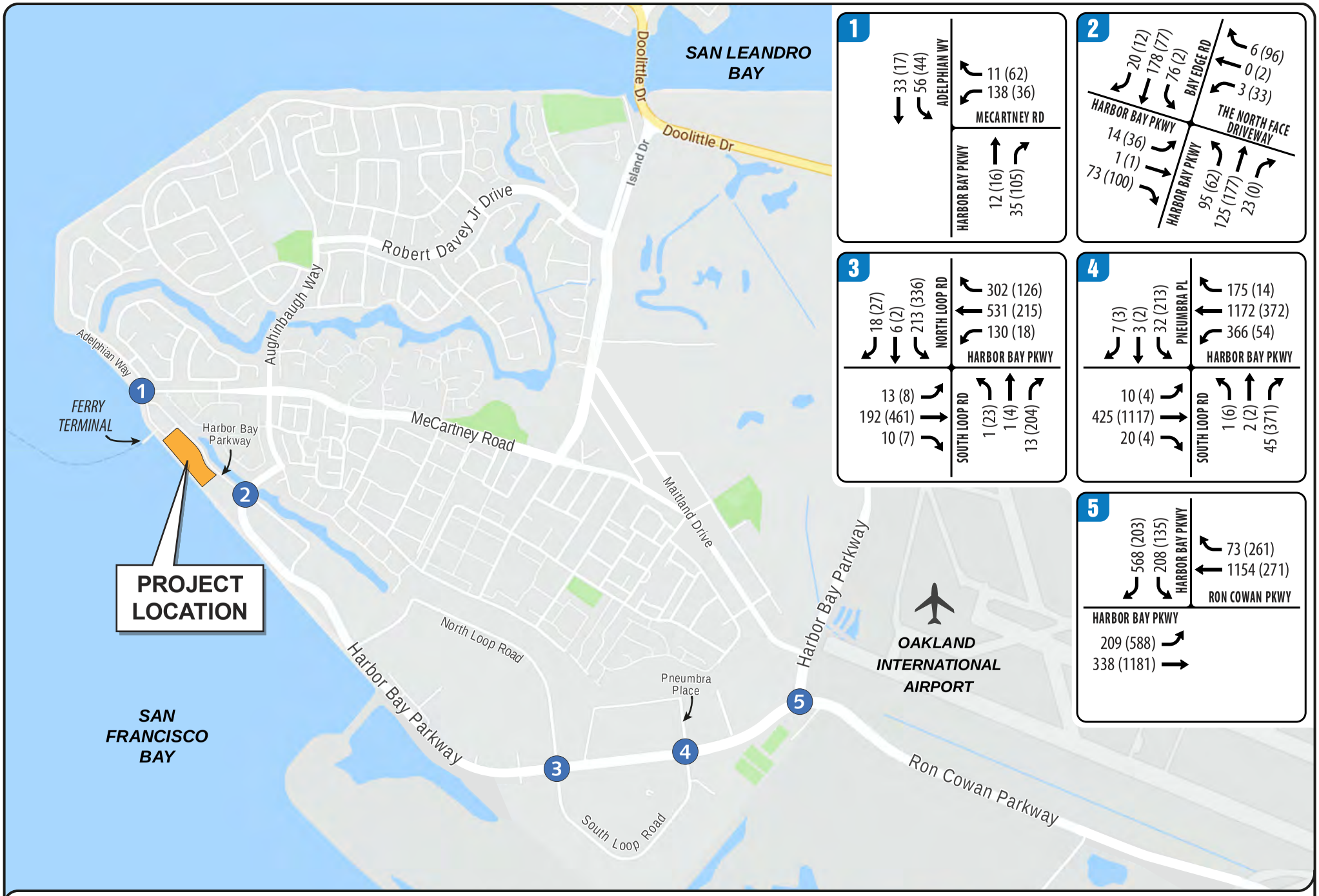

FIGURE 11 | CUMULATIVE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES
TRANSPORTATION IMPACT ANALYSIS
Marriott Residence Inn Project
City of Alameda

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TABLE 7
CUMULATIVE INTERSECTION LEVEL OF SERVICE CONDITIONS

	INTERSECTION	CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	ADELPHIAN WAY & MECARTNEY ROAD	Side Street Stop	AM	8.1	A	8.2	A
			PM	7.4	A	7.5	A
2	BAY EDGE ROAD & HARBOR BAY PARKWAY	Side Street Stop	AM	9.2	A	9.6	A
			PM	9.0	A	9.3	A
3	NORTH LOOP ROAD / SOUTH LOOP ROAD & HARBOR BAY PARKWAY	Signalized	AM	11.0	B	11.0	B
			PM	11.0	B	11.4	B
4	PENUMBRA PLACE / SOUTH LOOP ROAD & HARBOR BAY PARKWAY	Signalized	AM	9.0	A	9.1	A
			PM	24.5	C	25.4	C
5	RON COWAN PARKWAY & HARBOR BAY PARKWAY	Signalized	AM	19.2	B	20.4	C
			PM	10.7	B	11.0	B

SOURCE: Abrams Associates, 2018
NOTE: Intersection LOS is based on delay which is presented in terms of seconds per vehicle.

Arterial Analysis of the Ron Cowan Parkway

The projected volumes for Cumulative 2040 cumulative and cumulative plus project conditions were used to evaluate the arterial LOS on the Ron Cowan Parkway adjacent to the proposed project. The results of the arterial LOS computations for Cumulative conditions with and without the addition of project trips are presented in the technical appendix to this report. The analysis indicated that under cumulative plus project conditions the Ron Cowan Parkway would operate at LOS B during the AM peak hour and LOS C during the PM peak hour, with no change in LOS resulting from the addition of project traffic. In general, the analysis confirmed the results of previous studies which indicate the parkway would continue to operate with acceptable conditions (LOS D or better) under all scenarios during the weekday AM and PM peak hours.

Analysis of Accident History

Based on a review of the past five years of accident data on record with the California Highway Patrol there are no unusual accident trends or problems in the project study area. In addition, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in the Collision Data Summary for California State Highways from the California Department of Transportation. All of the study intersections experienced collisions at a rate that is lower than the statewide average for similar facilities. As noted above, the California Highway Patrol accident records summary is included in the technical appendix to this report.

Internal Circulation and Access

The project's preliminary plan for the internal roadway network has been reviewed by licensed traffic engineers and potential concerns with traffic operations have been identified with the proposed entry gates, particularly during the AM peak period. It is recommended that an alternative plan to manage the parking lot without requiring gates be considered for this project. Adjustments to the landscaping may be necessary as it cannot restrict sight distance at the project driveways. It should also be noted that the City of Alameda Pedestrian Design Guidelines state that "*All trees should be at least 15 to 20 feet from intersections and 10 feet from driveways*." In addition, the guidelines specify that street tree canopies must be limbed up

to a height of 14 feet at intersections and driveways. For this reason, the guidelines recommend use of trees that can be adequately pruned to maintain sight distances, such as taller tree species. Beyond the concerns described above, no other issues have been identified that would potentially cause internal safety problems or any unusual traffic congestion or delay.

Parking

This section discusses the City of Alameda's zoning requirements and the estimated parking demand for the project. The City's Municipal Code specifies that the off-street parking for hotels not located within a community commercial district is 1.25 spaces per hotel room. For this proposed 172 room hotel project, this equates to a minimum requirement of 215 off-street parking spaces. With the addition of the parking requirements for the restaurant and coffee shop the total requirement is for 275 spaces, which is the amount of off-street parking the project is proposing to provided.

Parking Demand Based on ITE Parking Generation Rates - To provide additional justification for the parking demand analysis, **Table 8** provides a summary of the parking demand results using the average ITE peak parking demand rates for a Business Hotel (ITE Land Use Code 312), a High-Turnover Sit-Down Restaurant (ITE Land Use Code 932), and a Coffee Shop (ITE Land Use Code 936) were used from the 4th Edition of the *ITE Parking Generation Manual*. As shown in **Table 8**, the parking demand generated by the project would be forecast to be approximately 158 parking spaces based on the ITE data. However, please note that the majority of these ITE estimates are based on surveys of parking demand at suburban locations so the rates may not fully account for the project's urban location with good transit access and private shuttle service to the airport.

Table 8
Off-Street Parking Calculations Using Parking Data from the Institute of Transportation Engineers

Land Use	Size		Parking Ratio	Estimated Demand
Hotel	172	rooms	0.6	103
Restaurant	5,000	sq. ft.	5.55	28
Coffee Shop	2,000	sq. ft.	13.56	27
Total Unadjusted Peak Parking Demand				*158*

Hotel Parking Demand Based on Surveys of Similar Hotels - To provide additional information on the potential parking demand for hotels in the project area, available parking studies for the area were reviewed and additional parking surveys were conducted at the two other hotels located in the Harbor Bay Business Park. Afternoon and evening surveys of hotel parking occupancy were conducted at the Extended Stay America on South Loop Road and the Hampton Inn and Suites on the Harbor Bay Parkway. The surveys were conducted between 1:00 and 3:00 pm and also between 6:00 and 8:00 PM on Tuesday April 10, 2018 and Friday April 13, 2018.

The Extended Stay America at 1260 South Loop Road has 88 rooms and 112 parking spaces. The peak demand was recorded on Friday night when 68 vehicles were recorded in the hotel parking lot, which equates to a peak parking demand of 0.77 vehicles per room. However, as noted above, based on data on average hotel occupancy per month it is estimated the peak

parking demand during the summer months is about 11% higher than the average occupancy during the month of April when the surveys were conducted.[3] Therefore, it is estimated that the peak parking demand during summer months is about 0.85 vehicles per room.

The Hampton Inn and Suites at 1700 Harbor Bay Parkway has 105 rooms and 135 parking spaces. The peak demand there was also recorded on a Friday night when there were 76 vehicles recorded in the hotel parking lot, which equates to a peak parking demand of 0.72 vehicles per room. However, based on data on average hotel occupancy per month in the U.S. it is estimated the peak parking demand during the peak month for most hotels (in July) is about 11% higher than the average occupancy during the month of April when the surveys were conducted. Therefore, it is estimated that the peak parking demand during summer months would be approximately 0.80 vehicles per room. If the rate from the surveys is utilized while the other uses are estimated with the ITE rates shown in Table 8, the resulting average peak parking demand would be forecast to be approximately 207 parking spaces.

Summary of Findings on Parking - Based on these studies, the parking provided would be sufficient to meet the estimated demand of the project based on ITE data and surveys of nearby hotels. The project is currently proposing to provide 275 parking spaces on-site in a surface parking lot, which should be sufficient to meet the estimated demand of the project based on ITE data and surveys of nearby hotels. Please note the availability of transit has been shown to result in a reduction in the demand for parking and this has not been incorporated into any of the parking calculations.

Bus transit service in the area is provided by AC Transit and ferry service is provided by the Alameda Harbor Bay Ferry. Local bus routes provide connections to the Oakland International Airport, the Ferry terminal, and the Fruitvale BART station. The Alameda Harbor Bay Ferry is a ferry that mainly transports commuters on weekdays to the Ferry Plaza in San Francisco. However, with this hotel's location directly adjacent to the ferry terminal it is expected that some guests will plan to utilize the ferry. In addition, the Harbor Bay Business Park operates a private shuttle service providing direct service to BART.

With the rising popularity of ride-sharing services it is also expected that some hotel patrons would arrive via Uber and Lyft. Lastly, the hotel is proposing to provide private shuttle service for hotel guests to the Oakland Airport. Therefore, for this project it is anticipated that a higher portion of travel will occur through the use of public transit, ferry service, ride sharing services, and the hotel shuttle service. In general, it is expected that through self-selection some of the hotel guests would choose other travel modes and would not arrive in private autos or rental vehicles.

Based on the analysis of parking demand and that fact that the peak parking periods for hotel are different from office uses, any impacts related to adequate parking should be less-than-significant and no impacts would be expected to adjacent properties. This is based, in part, on the fact that the final parking plan would be completed as part of the final project plans and would be subject to City approval.

[3] *Redefining Weekday Hotel Business*, STR Analytics, Hendersonville, TN, April 27, 2015.

5) PEDESTRIAN IMPACT ANALYSIS

Pedestrian Impact Analysis Methodology

The pedestrian patterns in the study area were analyzed during the peak commute hours of 7-9 AM and 4-6 PM, where the number of pedestrians crossing the intersection was noted, as well as which crosswalks they utilized. This data was incorporated into the assumptions used in the Synchro LOS calculations for each intersection under each study scenario.

Potential impacts on pedestrian LOS were evaluated based on the HCM 2000 methodology for determining average delay for pedestrians at signalized study intersections. Pedestrian delay is based on the effective green signal time for pedestrians to cross each intersection leg, and the actuated cycle length of the signal. **Table 9** shows the LOS criteria for pedestrians at signalized intersections. Based on City of Alameda pedestrian LOS standards for signalized intersections, a project impact would be considered significant if the delay for a crosswalk increases by 10 percent or more.

TABLE 9
LEVEL OF SERVICE CRITERIA FOR PEDESTRIANS AT SIGNALIZED INTERSECTIONS

Level of Service	Average Delay (seconds/vehicle)
A	< 10
B	≥ 10 and ≤ 20
C	> 20 and ≤ 30
D	> 30 and ≤ 40
E	> 40 and ≤ 60
F	> 60

SOURCE: *Highway Capacity Manual*, Transportation Research Board, 2000.

Pedestrian LOS Analysis

The results of the pedestrian LOS calculations are presented in **Table 10** for each of the roadway segments that were analyzed. The pedestrian analysis results for no project conditions are compared to the plus project conditions in **Table 10**. As seen in this table all intersections are expected to continue operating at acceptable service levels of LOS B or better under all study scenarios except for the intersections of Harbor Bay Parkway at South Loop Road/Penumbra Place and at the Ron Cowan Parkway. Under Cumulative conditions the pedestrian LOS across the northern leg (a.k.a. southbound approach) of these intersections is forecast to operate at LOS C during the AM peak commute hour, regardless of whether or not the proposed project is implemented. However, the addition of project trips to the peak-hour volumes at these two intersections would cause the average pedestrian delay to increase by less than 10%. Therefore, this would not be considered a significant impact as per the Transportation Element of the City's General Plan.

Although the proposed project would increase vehicle and pedestrian traffic in the project vicinity it is not expected to significantly impact or change the design of any existing pedestrian

TABLE 10
PEDESTRIAN LEVEL OF SERVICE CONDITIONS

Intersection	Peak Hour	Scenario	Eastbound		Westbound		Northbound		Southbound	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
3. North Loop Rd & Harbor Bay Parkway	AM	Cumulative	11.9	B	7.4	A	11.6	B	11.6	B
		Plus Project	11.9	B	7.3	A	12.1	B	12.1	B
	PM	Cumulative	12.8	B	12.7	B	7.0	A	7.0	A
		Plus Project	12.8	B	12.8	B	7.1	A	7.1	A
4. Penumbra Pl & Harbor Bay Parkway	AM	Cumulative	10.7	B	2.6	A	21.7	C	21.7	C
		Plus Project	10.8	B	2.6	A	22.6	C	22.6	C
	PM	Cumulative	13.4	B	11.8	B	15.3	B	15.3	B
		Plus Project	13.3	B	11.7	B	15.6	B	15.6	B
5. Harbor Bay Parkway & Ron Cowan Parkway	AM	Cumulative	3.0	A	8.4	A	N/A	N/A	22.3	C
		Plus Project	3.1	A	8.6	A	N/A	N/A	22.9	C
	PM	Cumulative	2.8	A	12.9	B	N/A	N/A	15.0	B
		Plus Project	2.8	A	12.9	B	N/A	N/A	15.3	B

SOURCE: Abrams Associates, 2018

facilities or create any new safety problems in the area. Additionally, the project would not remove any marked or unmarked crosswalks.

There are some adjustments recommended with respect to the plan for adding new crosswalks on the Harbor Bay Parkway along the northeastern frontage of the project. Rather than creating new marked mid-block crosswalks it is recommended that crosswalks only be marked at stop controlled intersections in this area. It is recommended that the project instead provide a pedestrian connection to the northeast corner of the site where there is an existing stop controlled intersection. This intersection, in the back corner of the ferry terminal parking lot, currently has stop signs on only two of the three approaches. The northbound approach from the Harbor Bay Parkway currently does not have a stop sign. It is our recommendation that a stop sign and a marked crosswalk be placed on the remaining approach that doesn't currently have a stop sign (the northbound Harbor Bay Parkway approach). This would create an all-way stop controlled intersection that would reduce speeds in the area and allow for a new crosswalk that would help facilitate safe pedestrian crossings to the trail on the northeast side of the roadway in this area. Based on the City's significance criteria the project's impacts on pedestrian travel would be considered less than significant.

6) BICYCLE IMPACT ANALYSIS

Bicycle Impact Analysis Methodology

Potential impacts on bicycle LOS were evaluated based on the Florida Department of Transportation methodology for assessing bicyclists' perceived level of comfort along study roadway segments. Bicycle LOS scores are based on five variables: 1) average effective width of the outside through lane (and presence of bike lane); 2) motor vehicle volumes; 3) motor vehicle speeds; 4) truck volumes; and, 5) pavement conditions. **Table 11** shows the LOS criteria for bicycles on roadway segments. Based on City of Alameda bicycle LOS standards for roadway segments, a project impact would be considered significant if the bicycle LOS score for a study roadway segment increases by 10 percent or more. Based on this analysis the bicycle LOS score would not increase by 10 percent as a result of the project, and the project's impact on bicycle travel would therefore be less than significant. **Figure 12** shows the currently existing City of Alameda bikeways within the project study area.

TABLE 11
LEVEL OF SERVICE CRITERIA FOR BICYCLES ON ROADWAY SEGMENTS

Level of Service	Bicycle LOS Score
A	≤ 1.5
B	> 1.5 and ≤ 2.5
C	> 2.5 and ≤ 3.5
D	> 3.5 and ≤ 4.5
E	> 4.5 and ≤ 5.5
F	≥ 5.5

SOURCE: *Florida Department of Transportation, 2009 Level of Service Handbook.*

Bicycle LOS Analysis

The results of the pedestrian LOS calculations are presented in **Table 12** for each of the roadway segments where bicycle conditions were analyzed. This table compares the bicycle analysis results for no project conditions with plus project conditions. As seen in Table 12, the bicycle lanes in the area are expected to continue operating at an acceptable service level of LOS B or better. It should also be noted the addition of project trips to the peak-hour volumes on this roadway would not cause the bicycle LOS score to increase by more than 10% which is the threshold considered to result in significant impacts as per the Transportation Element of the City's General Plan.

Although the proposed project would increase vehicle and pedestrian traffic in the project vicinity it is not expected to significantly impact or change the design of any existing bicycle facilities or create any new safety problems for bicyclists in the area. Based on the City's significance criteria the project's impacts on bicycle travel would be considered less than significant.

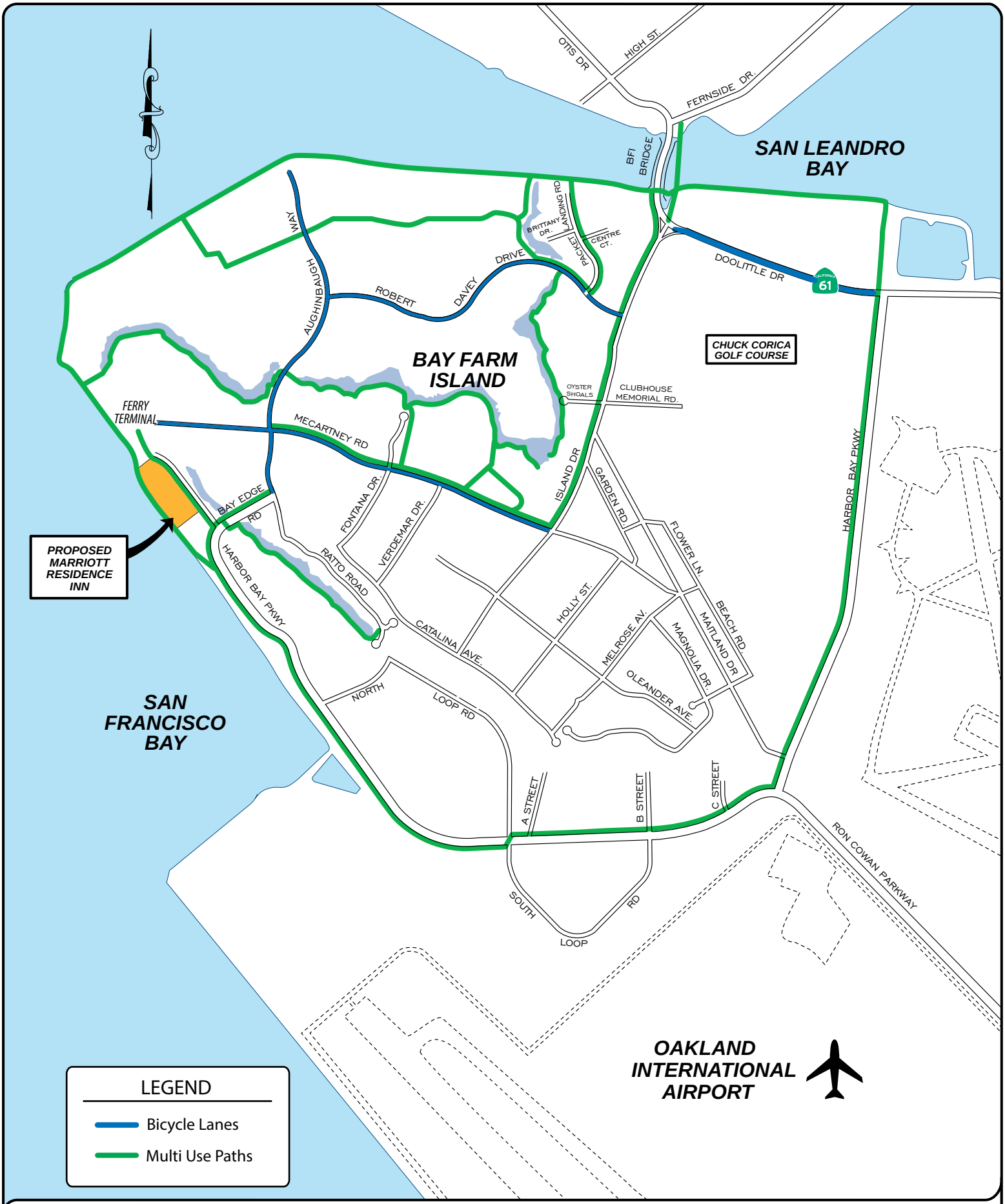

FIGURE 12| EXISTING BIKE LANES IN THE PROJECT STUDY AREA
TRANSPORTATION IMPACT ANALYSIS
Marriott Residence Inn Project
City of Alameda

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TABLE 12
BICYCLE LEVEL OF SERVICE CONDITIONS

Segment	Peak Hour	Scenario	NB / WB Bike Score	NB / WB LOS	NB / WB % Change	SB / EB Bike Score	SB / EB LOS	SB / EB % Change
MeCartney Road (Aughinbaugh Wy to Adelphian Wy)	AM	Cumulative	0.5	A	<1%	0.5	A	<1%
		Plus Project	0.5	A		0.5	A	
	PM	Cumulative	0.5	A	<1%	0.5	A	<1%
		Plus Project	0.5	A		0.5	A	
Aughinbaugh Wy (Bay Edge Road to MeCartney Rd)	AM	Cumulative	2.2	B	<1%	1.96	A	1%
		Plus Project	2.2	B		1.98	A	
	PM	Cumulative	2.1	B	<1%	0.50	A	<1%
		Plus Project	2.1	B		0.50	A	

SOURCE: Abrams Associates, 2018

7) TRANSIT IMPACT ANALYSIS

Transit Impact Analysis Methodology

The 2000 Highway Capacity Manual arterial level-of-service analysis methodology was used for the analysis of transit operations. This methodology is based on the average arterial speeds for the segments under consideration, computed from the control delay of through movements at signalized intersections. This is information is used to determine the level of service along the transit corridors that were studied. **Table 13** presents the LOS criteria for transit operations on roadway segments.

TABLE 13
LEVEL OF SERVICE CRITERIA FOR TRANSIT ON HCM TYPE IV ROADWAY SEGMENTS

Level of Service	Average Speed (miles/hour)
A	> 25
B	> 19 and ≤ 25
C	> 13 and ≤ 19
D	> 9 and ≤ 13
E	> 7 and ≤ 9
F	≤ 7

SOURCE: *Highway Capacity Manual*, Transportation Research Board, 2000.

Transit LOS Analysis

The results of the transit LOS calculations are presented in **Table 14** for each of the roadway segments where transit service could potentially be impacted by the project. This table compares the transit analysis results with and without the proposed project. As seen in **Table 13** the project contribution to the key roadway segments that were studied would not result in any significant changes to travel speeds (i.e. a change of 10% or more). As a result, the project would not be expected to result in any significant impacts to transit service in the area.
The proposed project has the potential to increase patronage on bus lines in the area but should not result in degradation of the level of service (or a significant increase in delay) on any roadway segments currently being utilized by bus transit in the area and, as such, no significant impacts to transit are expected.

TABLE 14
TRANSIT LEVEL OF SERVICE CONDITIONS

			NB / WB			SB / EB		
Segment	**Peak Hour**	**Scenario**	**Travel Speed (MPH)**	**LOS**	**% Change in Travel Speed**	**Travel Speed (MPH)**	**LOS**	**% Change in Travel Speed**
Harbor Bay Pkwy (North Loop Rd to Penumbra Place)	AM	Cumulative	24.2	B	1%	20.5	C	0%
		Plus Project	23.9	C		20.5	C	
	PM	Cumulative	23.4	C	2%	16.9	D	1%
		Plus Project	22.9	C		16.7	D	
Harbor Bay Pkwy (Penumbra Place to Ron Cowan Pkwy)	AM	Cumulative	26.5	B	0%	27.1	B	0%
		Plus Project	26.6	B		27.0	B	
	PM	Cumulative	21.7	C	0%	26.0	B	0%
		Plus Project	21.7	C		26.0	B	

SOURCE: Abrams Associates, 2018

8) RECOMMENDED MITIGATIONS MEASURES AND IMPROVEMENT MEASURES

An analysis of Caltrans traffic signal warrants indicates no new traffic signals would be warranted as a result of the project, either now or under cumulative plus project conditions. Please note that on the section of the Harbor Bay Parkway directly adjacent to the project the volumes are low enough with sufficient gaps in traffic to allow safe operations at the three project entrance intersections with the planned side street stop control. There would be no significant delays or queuing expected on the Harbor Bay Parkway. Since through traffic on the Harbor Bay Parkway would not need to stop at the entrance intersections, all queuing and delay would be contained on private property on the stop-controlled side street approaches from the parking lot. It should also again be noted that the addition of project traffic would not be considered a significant impact at any of the other project study intersections according to the City's established significance criteria for transportation impacts.

Project-Specific Impacts and Mitigation Measures

The following is a list of proposed mitigation measures to address the transportation impacts of the project. With the implementation of the mitigation measures described in this section, all project transportation impacts would be reduced to a less than significant level.

TR-1 Impacts related to pedestrian facilities.

Some adjustments to the plan for adding new crosswalks on the Harbor Bay Parkway are recommended. Rather than creating new marked mid-block crosswalks along the northern frontage of the project it is recommended that crosswalks only be marked at stop controlled intersections in this area. It is recommended that the project instead provide a pedestrian connection to the northeast corner of the site where there is an existing stop controlled intersection. This intersection, in the back corner of the ferry terminal parking lot, currently has stop signs on only two of the three approaches. The northbound approach from the Harbor Bay Parkway currently does not have a stop sign. It is our recommendation that a stop sign and a marked crosswalk be placed on this remaining approach that doesn't currently have a stop sign (the northbound Harbor Bay Parkway approach). This would create an all-way stop controlled intersection that would reduce speeds in the area and allow for a new crosswalk that would help facilitate safe pedestrian crossings to the trail on the northeast side of the roadway in this area. The proposed project would generate additional pedestrian and bicycle traffic in the area, thereby potentially increasing conflicts between vehicles, bicycles, and pedestrians. However, based on the City's significance criteria the project's impacts on pedestrian travel would be considered less than significant and no off-site mitigations would be required.

Mitigation Measure(s)
None required.

TR-2 Impacts related to bicycle facilities.

Although the proposed project would increase vehicle and pedestrian traffic in the project vicinity it is not expected to significantly impact or change the design of any existing bicycle facilities or create any new safety problems for bicyclists in the area. The addition of project trips to the peak-hour volumes on the roadways in the study area would not cause the bicycle LOS score to increase by more than 10% which is the threshold considered to result in significant impacts as per the Transportation Element of the City's General Plan.

Although the proposed project would increase vehicle and pedestrian traffic in the project vicinity it is not expected to significantly impact or change the design of any existing bicycle facilities or create any new safety problems for bicyclists in the area.

Mitigation Measure(s)
None required.

TR-3 Impacts related to transit facilities.

The proposed project has the potential to increase patronage on bus lines in the area. However, based on this analysis the project would not result in degradation of the level of service (or a significant increase in delay) on any roadway segments currently being

utilized by bus transit in the area and, as such, no significant impacts to transit are expected. The project contribution to key roadway segments in the area would not result in any significant changes to travel speeds according to City standards (i.e. a change of 10% or more). As a result, the project would not be expected to result in any significant impacts to transit service in the area.

Mitigation Measure(s)
None required.

TR-4 Demolition and construction activities associated with the proposed project would result in an increase in traffic to and from the site and could lead to unsafe conditions near the project site.

The increase in traffic as a result of demolition and construction activities associated with the proposed project has been quantified assuming a worst-case single phase construction period of 24 months.

Heavy Equipment

Approximately four pieces of heavy equipment are estimated to be transported on and off the site each month throughout the demolition and construction of the proposed project. Heavy equipment transport to and from the site could cause traffic impacts in the vicinity of the project site during construction. However, each load would be required to obtain all necessary permits, which would include conditions. Prior to issuance of grading and building permits, the project applicant would be required to submit a Traffic Control Plan.

The requirements within the Traffic Control Plan include, but are not limited to, the following: truck drivers would be notified of and required to use the most direct route between the site and the freeway, as determined by the City Engineering Department; all site ingress and egress would occur only at the main driveways to the project site and via the Harbor Bay Parkway, use of residential streets by construction traffic will be prohibited. Construction activities may require installation of temporary (or ultimate) traffic signals as determined by the City Engineer; specifically designated travel routes for large vehicles would be monitored and controlled by flaggers for large construction vehicle ingress and egress; warning signs indicating frequent truck entry and exit would be posted on adjacent roads; and any debris and mud on nearby streets caused by trucks would be monitored daily and may require instituting a street cleaning program. In addition, eight loads of heavy equipment being hauled to and from the site each month would be short-term and temporary.

Employees

The weekday work is expected to begin around 7:00 AM and end around 4:00 PM. The construction worker arrival peak would occur between 6:30 AM and 7:30 AM, and the departure peak would occur between 4:00 PM and 5:00 PM. These peak hours are slightly before the citywide commute peaks. It should be noted that the number of trips generated during construction would not only be temporary, but would also be substantially less than the proposed project at buildout. Based on past construction of similar projects, construction workers could require parking for up to 50 vehicles during the peak construction period. Additionally, deliveries, visits, and other activities may generate peak non-worker parking demand of 10 to 20 trucks and automobiles per day. Therefore, up to 75 vehicle parking spaces may be required during the peak construction period just for the construction employees. Furthermore, the Traffic Control Plan will

require construction employee parking be provided on the project site to eliminate conflicts with nearby residential areas. Because the construction of the project can be staggered so that employee parking demand is met by using on-site parking, the impacts of construction-related employee traffic and parking are considered less-than-significant.

Construction Material Import

The project would also require the importation of construction material, including raw materials for the building pads, the buildings, the parking areas, and landscaping. Under the provisions of the Traffic Control Plan, if importation and exportation of material becomes a traffic nuisance, then the City Engineer may limit the hours the activities can take place.

Traffic Control Plan

The Traffic Control Plan would indicate how parking for construction workers would be provided during construction and ensure a safe flow of traffic in the project area during construction. This analysis assumed construction of the entire project in one phase to identify the potential worst-case traffic effects. If the project is built in phases over time, the effects of each phase will be the same or less. Each phase will be subject to a Traffic Control Plan and oversight by the City Engineer. The last phase may require added worker parking measures, depending on the circumstances, as there will not be any remaining vacant land for parking. Therefore, the demolition and construction activities associated with the proposed project or its individual phases would not lead to noticeable congestion in the vicinity of the site or the perception of decreased traffic safety resulting in a ***less-than-significant*** impact.

Mitigation Measure(s)
None required.

TR-5 Impacts to freeway operations.

The development of the proposed project would increase the total traffic during both AM and PM peak hours. However, the project site has already been planned to be developed with traffic generating uses (i.e. offices) in the General Plans of the City of Alameda and Alameda County and has already been assumed in all cumulative build-out traffic forecasts that have been used in the design of freeway facilities in the area. Therefore, the proposed project would have a ***less-than-significant*** impact to freeway operations.

Mitigation Measure(s)
None required.

TR-6 Impacts related to site access and circulation.

The proposed project would have one main unsignalized driveway on the Harbor Bay Parkway. Based on a review of the proposed site plan it was determined that the site circulation should function well and would not cause any safety or operational problems. The project site design has been required to conform to City design standards and the plan is not expected to create any significant impacts to pedestrians, bicyclists or traffic operations. However, Intersections #3 and #4 are forecast to continue to exceed City standards (regardless of whether or not the proposed project is implemented) until such

a time when the City determines the installation of the planned traffic signals at these two intersections should move forward.

It should again be noted that there would be no significant impacts to operations on the Harbor Bay Parkway, all queuing and delay would be contained on private property on the side street approaches to the Harbor Bay Parkway. Therefore, the development of the proposed project is expected to have ***less-than-significant*** impacts regarding site access and circulation.

Mitigation Measure(s)
None required.

TR-7 Impacts regarding emergency vehicle access on and surrounding the proposed project site.

Sufficient emergency access is determined by factors such as number of access points, roadway width, and proximity to fire stations. The land use plan for the proposed project would have both primary and secondary entrances onto the Harbor Bay Parkway. All lane widths within the project would meet the minimum width that can accommodate an emergency vehicle; therefore, the width of the internal roadways would be adequate. Therefore, the development of the proposed project is expected to have ***less-than-significant*** impacts regarding emergency vehicle access.

Mitigation Measure(s)
None required.

TR-8 Impacts relating to the presence and availability of adequate parking.

The project is proposing to meet or exceed the City's parking requirements, subject to City approval of the proposed parking plan, and is not expected to result in any significant parking impacts on the surrounding areas. Therefore, the proposed project is not expected to create parking impacts on the surrounding areas, and impacts related to adequate parking would be ***less-than-significant***.

Mitigation Measure(s)
None required.

Recommended Improvement Measures

Pedestrian Improvements – As noted previously, there are some adjustments recommended with respect to the plan for adding new marked crosswalks to the segment of the Harbor Bay Parkway along the northeastern frontage of the project. Rather than creating several new marked mid-block crosswalks it is recommended that crosswalks only be marked at stop controlled intersections in this area. Instead of the mid-block crosswalks it is recommended the project instead provide a pedestrian connection to the northeast corner of the site where there is an existing stop controlled intersection. This existing intersection, in the back corner of the ferry terminal parking lot, currently has stop signs on only two of its three approaches. The northbound approach from the Harbor Bay Parkway currently doesn't have a stop sign. It is recommended that a stop sign and a marked crosswalk be placed on this remaining approach, which is the northbound Harbor Bay Parkway approach (the approach that doesn't currently have a stop sign). This would create an all-way stop controlled intersection that should reduce speeds in the area while also allowing for a new crosswalk at a stop controlled location that would help facilitate safe pedestrian crossings to the existing trail on the northeast side of the roadway in this area.

Parking Management – Based on a review of similar shared parking arrangements it is recommended that the City include a condition of approval that would allow for enforcement of short and long term parking restrictions that will be required for this site. It is recommended that the parking be managed with a combination of short term time restrictions, meters, pay stations, and a phone app that would allow ferry and hotel patrons to obtain authorized access to the parking lot by entering their license plate number. The parking could then be enforced by vehicles outfitted with cameras that would automatically identify authorized and unauthorized cars for enforcement. It should also be noted that some parking apps also have the ability to give directions to the parking lot using Google Maps and then they also provide walking directions to the appropriate building (or ferry terminal). This type of feature could potentially be used to direct ferry and hotel patrons (who are parking in the project parking lots) to arrive via the Harbor Bay Parkway rather than the other main route to the site which is Island Drive to Mecartney Drive. This route typically experiences more congestion than the Harbor Bay Parkway route so it is recommended that motorists be directed to take the Harbor Bay Parkway to access the site.