

APPENDIX E
Traffic Analysis

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MEMORANDUM

To: Dan Coughlin, Joby Aero

From: Frederik Venter and Colin Ogilvie, Kimley-Horn and Associates

Date: May 6, 2019

Re: **Preliminary Traffic Impact Evaluation for Joby Aero, Marina, CA**

Introduction

This memorandum presents a preliminary traffic impact evaluation for the proposed Joby Aviation manufacturing facility at the Marina Municipal Airport. The facility will consist of both manufacturing and office space. The company plans on having 300 employees working at the facility in the near term, the basis for this evaluation, but may scale up operations in the future.

The memorandum evaluates the following:

1. Background Documentation
2. Trip Generation, Distribution and Assignment
3. Qualitative Discussion of Potential Traffic Impacts to the Roadway Network
4. Vehicle Miles Traveled Evaluation

Background Documentation

Several previous studies were reviewed for development assumptions at the Marina Airport, the proposed project location.

- Marina Municipal Airport Master Plan
- City of Marina General Plan
- Monterey County General Plan

Marina Municipal Airport Master Plan

The Marina Municipal Airport Master Plan found that the anticipated growth at the airport over the next 20 years would result in “less than significant impact with mitigation incorporated”. The traffic analysis assumption was based on the increase of locally-based aircraft only, although the Plan states that the “implementation of the proposed Master Plan could also increase the likelihood that a private entity would establish an FBO at the Airport, which is a goal for the City.” The Master Plan anticipates an increase of 20 based aircraft resulting in an increase of 7 PM peak hour trips and 100 daily trips.

Previous studies have stated that the intersection of Reservation Road and Imjin Parkway, which is the main airport entrance, will operate at LOS E in 2035 without improvements. The Master Plan states that “potential traffic impacts of proposed Master Plan projects should be addressed as such projects are being considered and appropriate mitigation included, as necessary, at that time.”

The Master Plan also states that the future Golf Boulevard shown in the City of Marina General Plan, that would have connected the north side of the airport to Del Monte Boulevard, is no longer being pursued by the City.

Marina Municipal Airport Business and Industrial Park / UC MBEST Center Specific Plan

A draft version of the Marina Municipal Airport Business and Industrial Park / UC MBEST Center Specific Plan was completed in February 2017. The Specific Plan outlines design guidance and standards for the proposed business park on the southeast side of the Marina Municipal Airport. The south half of the business park is owned by the University of California and the north half is owned by the City of Marina. The circulation chapter describes the existing external roadway network and the planned internal roadway network. Specific Plan roadway cross sections, intersection geometries and planned multimodal networks are provided. No traffic operational analysis is provided to substantiate the internal roadway network or potential impacts to the local and regional external network.

City of Marina General Plan

The City of Marina last updated its General Plan in August 2010. The General Plan outlines several traffic related components that should be noted for the Joby Project.

1. According to Marina General Plan Policy 3.22, new major employers need to implement trip reduction measures achieving a 10% minimum reduction in peak hour vehicular traffic volumes. The General Plan states that the employee threshold for this mandate will be determined on a

case-by-case basis. The General Plan's Mitigation Measure 7.3 outlines potential travel demand management (TDM) strategies to meet the mandated reductions. Some of the outlined measures include: transit incentives, carpool parking spaces, shuttle service, shifted work schedules and telecommuting.

2. The City's level of service (LOS) significance threshold for assessing project-level impacts is LOS D except at segments or intersections that were lower than LOS D at the time of plan adoption.
3. Planned Improvements:
 - a. Golf Road – Planned 2-lane parkway that would connect Del Monte Boulevard to Blanco Road across the north side of the airport. However, according to the latest Airport Master Plan, this roadway extension is no longer being pursued and is not included in this assessment.
 - b. Reservation Road – 4-lane arterial that serves as the main point of access to the Airport and has been reserved for future widening to 6-lanes beyond 2020. However, the current Downtown Redevelopment Traffic Study assumes the roadway will remain 4 lanes in the future.
 - c. Imjin Parkway – existing 2-lane (planned 4-lane) expressway connecting SR-1 to the Airport's south entrance.
4. Marina participates in TAMC's regional transportation fee program for fair share payments (Mitigation Measure 8.1(B)).

Transportation Agency for Monterey (TAMC) Road Regional Transportation Plan

TAMC proposes to improve the Marina-Salinas corridor by widening Reservation Road to four lanes from East Garrison Drive to Davis Road and widening Davis Road from Reservation Road to West Market Street (State Route 183). Blanco Road does not have proposed improvements. TAMC also envisions a bus rapid transit corridor between Marina and Salinas through the former Fort Ord.

Trip Generation, Distribution and Assignment

Trip Generation

Trip generation for the project was calculated using the rates from the Institute of Transportation Engineer's (ITE) publication *Trip Generation*, 10th Edition (2017), which is a standard reference used by jurisdictions for the estimation of trip generation. A trip is defined in *Trip Generation* as a single or one-directional vehicle movement with either the origin or destination at the project site. In other words, a trip can be either "to" or "from" the site. Therefore, a normal work day commute would be counted as two separate trips (i.e., one to and one from the site).

Based on the project description and discussions with Joby, it was deemed that the most applicable land use is Manufacturing (ITE Land Use Code 140). The percentage split between office employees and manufacturing employees matches the ITE land use description. Also, the time-of-day distribution data presented in the Trip Generation manual for industrial land uses aligns with the planned 3-shift, 24-hour operations of the planned Project. The next factor considered was to base trip generation from the planned building area or the number of employees. A site plan was not provided by Joby but an employee

count of 300 was provided. Although common practice is to use building area when calculating trip generation, daily and peak hour trips were estimated using employees since that is the metric known at this time. Once the site plan has been determined, a comparative trip generation analysis should be completed. The Project’s trip generation is shown in **Table 1**.

Table 1: Trip Generation

Land Uses	ITE Land Use Code	Project Size		Daily Trips	AM PEAK HOUR			PM PEAK HOUR				
					Total Peak Hour	IN	OUT	Total Peak Hour	IN	OUT		
Trip Generation Rates												
Land Use												
Manufacturing ¹	140	1	KSF	3.93	0.62	77%	/	23%	0.67	31%	/	69%
Manufacturing ¹	140	1	Employee	2.47	0.37	74%	/	26%	0.33	39%	/	61%
Trips Generated												
Manufacturing ²	140	300	Employees	870	111	82	/	29	98	38	/	60

Notes:

¹ Average rate used

² Equation used

Source: Kimley-Horn and Associates, Inc., 2019

Trip Distribution

Trip distribution percentages were estimated using U.S. Census Bureau data¹ for work destination trips to employers in the City of Marina. The regional origin of the work trips is the following (shown in **Figure 1**):

- Within Marina – 19%
- From North – 33%
- From South – 18%
- From East – 30%

¹ U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2015)



Trip Assignment

Trip assignment was qualitatively assessed to determine which regional and local roadways the trips would utilize. Based on the regional distribution trips, trips from within Marina would access the project using Reservation Road and Imjin Parkway. Trips from the north would likely use State Route 1 southbound and exit at either Reservation Road or Imjin Parkway. Trips from the south would likely use State Route 1 northbound and exit at Imjin Parkway or Del Monte Boulevard or utilize surface streets, mainly the route consisting of General Jim Moore Boulevard, Lightfighter Drive, 2nd Avenue and Imjin Parkway.

Potential Traffic Impacts

The City of Marina General Plan states that the City’s level of service significance threshold for assessing project-level impacts is LOS D except at segments or intersections that were lower than LOS D at the time of plan adoption.

Although the specific quantitative traffic impacts are not being analyzed at this time, based on the assumed trip distribution and assignments the daily and peak hour trips were calculated and shown in **Table 2**.

Table 2: Distributed Volumes

Trip Distribution		Daily Trips	AM PEAK HOUR				PM PEAK HOUR			
			Total Peak Hour	IN	/	OUT	Total Peak Hour	IN	/	OUT
Marina	19.0%	165	21	16	/	6	19	7	/	11
From North	33.3%	290	37	27	/	10	33	13	/	20
From South	17.9%	156	20	15	/	5	18	7	/	11
From East	29.8%	259	33	24	/	8	28	11	/	18

From local knowledge of traffic conditions in the Project area, it is understood that the Project would affect the following study intersections currently exceeding acceptable LOS:

1. Blanco Road and Cooper Road
2. Blanco Road and Armstrong Road
3. Blanco Road and Hitchcock Road
4. Blanco Road and Davis Road
5. Imjin Parkway and SR-1 Northbound Ramps

It is anticipated that the Project may affect the following study intersections currently operating at acceptable LOS:

1. Del Monte Boulevard and Reservation Road
2. Imjin Parkway and Reservation Road
3. Imjin Parkway and 2nd Avenue
4. Imjin Parkway and SR-1 Southbound Ramps

While the Project could add enough peak hour trips to cause impacts at other locations and require mitigations, the identified locations above represent places that the Project will impact the most. However, it may be possible for the project to tier off the ongoing Marina Municipal Airport Business and Industrial Park / UC MBEST Center Specific Plan/Environmental Impact Report (EIR).

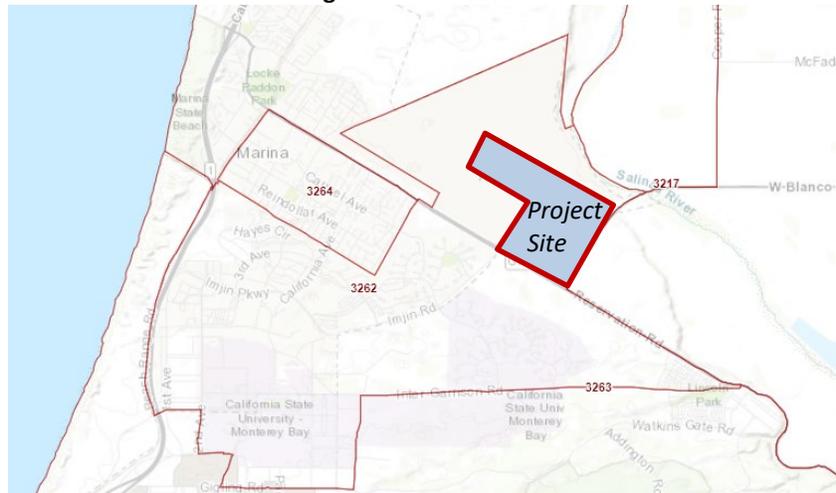
Vehicle Miles Traveled (VMT) Assessment

Vehicle miles traveled is the new method for analyzing transportation impacts under CEQA. Many agencies will continue to require LOS analysis for their purposes and policies, mainly complying with general plan obligations, but it will no longer be used for CEQA purposes. Agencies have until July 1, 2020 to institute their own policies for complying with the new CEQA requirements. It is understood that the City of Marina has not instituted its own policies. The Governor's Office of Planning and Research (OPR) has published its *Technical Advisory On Evaluation Transportation Impacts in CEQA* to provide VMT guidance. OPR recommends that "a proposed [office] project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact."

CalEEMod, an environmental analysis tool, was used to determine VMT for the Project. The output of CalEEMod is annual VMT which is then converted to Daily VMT.

The thresholds of significance were determined from the most recent available version of the Caltrans Statewide Travel Demand Model (CSTDm) which provides VMT and VMT per employee for all of California in the year 2010 and 2040. The CSTDm is divided into transportation analysis zones (TAZ) and VMT data was extracted from TAZ 3262 (shown in **Figure 2**), which encompasses south and east portions of Marina including the Marina Municipal Airport.

Figure 2: TAZ Location



To determine existing (2019) VMT, the value was interpolated between the base model year, 2010, and the cumulative year, 2040. **Table 3** shows the estimated VMT per employee for the Project from CalEEMod, the baseline existing TAZ VMT from the CSTDM, the baseline VMT with the 15% reduction and the Project’s comparison to the threshold. The Project does not exceed regional thresholds of significance and, therefore, is not expected to have a significant impact for future CEQA purposes.

Table 3: VMT per Employee

Study Group	Existing (2019) VMT per Employee	VMT per Employee Threshold (-15%)	Exceeds Threshold?	VMT CEQA Impact?
TAZ 3262 (Baseline) ¹	22.37	19.01	-	-
Joby Aviation (Project) ²	16.66		No	No

Notes:

1. VMT data from the Caltrans Statewide Travel Demand Model (CSTDM)
2. VMT data calculated using CalEEMod