

MEMORANDUM

To: Kelley Matthews – Bike Ranch, LLC
From: Alejandro Angel, PhD, PE - Psomas
Date: February 25, 2019
Subject: Bike Ranch – Traffic Memorandum



Introduction

This memorandum includes an evaluation of traffic conditions associated with the proposed Bike Ranch Resort, a development that will be focused on bicycle tourism and sustainability. The project will be located near Saguaro National Park East in Pima County, Arizona, west of Old Spanish Trail and north of Escalante Road. The project location is shown in Figure 1.

Figure 1. Site Location



Project Description

Bike Ranch Resort will be a small boutique resort with 49 rooms (casitas). Access to the site will be provided on Old Spanish Trail approximately 600 feet south of Cactus Forest Drive (entrance to Saguaro National Park) and 750 feet north of Escalante Road using an existing driveway that serves eight existing residential casitas, which are currently rented. Further, the project will include an emergency access road across Cactus Forest Drive. Figure 2 (on page 3) shows the proposed site plan for the Bike Ranch Resort.

Existing Conditions

In the vicinity of the project, Old Spanish Trail is a two-lane undivided roadway with paved shoulders for bikes on both sides of the roadway and a 40 MPH posted speed limit. The study segment does not have turn lanes, except for a recently completed southbound left turn lane at the intersection with Cactus Forest Drive (Saguaro National Park's entrance).

Near the project site, Old Spanish Trail is classified as scenic major route, low volume arterial in the Pima County *Major Streets and Scenic Routes*¹. Further, the study segment of Old Spanish Trail is a designated bike route in the *Pima County Regional Bike Map*².

Traffic Safety

Per Pima Association of Governments (PAG) crash data, there have been no reported crashes in the study segment of Old Spanish Trail in the most recent five years (2013 to 2017).

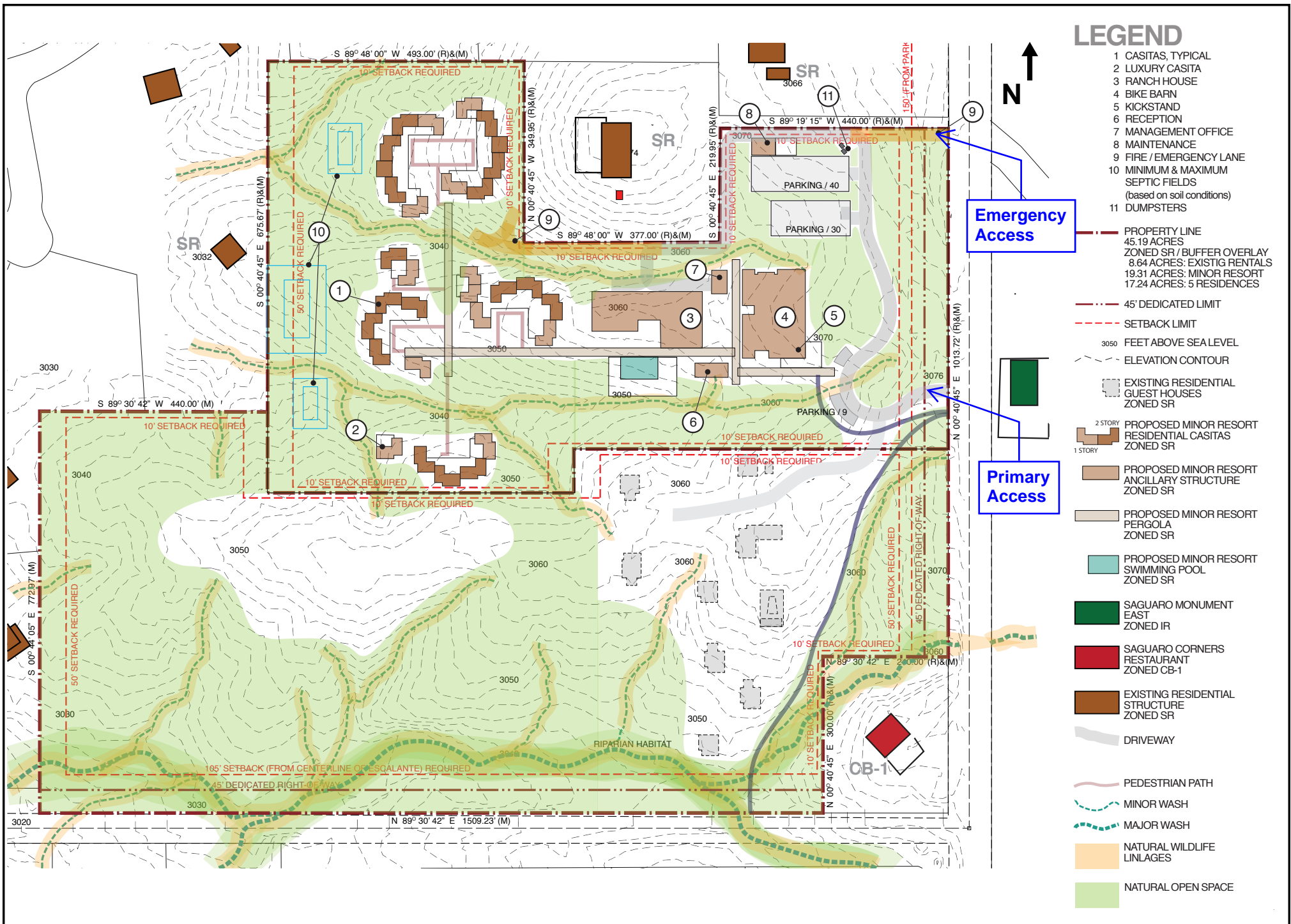
Traffic Volumes

Pima County conducted traffic counts on Old Spanish Trail between Escalante Road and Cactus Forest Drive (entrance to Saguaro National Park) in August, 2017³. The average daily traffic along the project frontage is 4,489 vehicles per day. It is estimated that 10% of the daily traffic (approximately 450 vehicles) occurs during the peak hour, with 60% of traffic (270 vehicles) moving in the peak travel direction. The capacity (at Level of Service D) for a two-lane undivided road like Old Spanish Trail ranges from 13,300 to 15,900 vehicles per day. Therefore, approximately 30% of the road's capacity is currently utilized.

¹ Pima County *Major Streets and Scenic Routes*. Available at <http://webcms.pima.gov/cms/one.aspx?portalId=169&pageId=54602>

² Pima County Regional Bike Map. Available at http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Transportation/Bicycle%20and%20Pedestrian%20Program/Maps%20and%20Resources/3390%20update%20to%20regional%20bike%20map%20for%20web%20interior.pdf

³ Pima County ADT Counts. Available at <http://dot.pima.gov/trafeng/trafcnt/adt.htm>



Project Trips

Trip generation for the project is based on the 10th Edition of the ITE *Trip Generation* for Land Use Code 311 – All Suites Hotel. Land Use 311 includes all suites hotels that provide sleeping accommodations, a small restaurant and lounge, and small amounts of meeting space. Further, each suite includes a sitting room and separate bedroom, and limited kitchen facilities are provided within the suite, similar to the proposed casitas at the Bike Ranch Resort. Table 1 shows the estimated trip generation for the project. As shown on the table, the project would add 18 trips in the PM peak period, but since 50% of the trips will proceed north and the other 50% to/from the south, only 9 trips will be added to any segment of Old Spanish Trail. This would increase the total estimated peak hour volume from 450 vehicles (under current conditions) to 459 vehicles (with the project).

Table 1. Project Trip Generation

ITE LU 311 (10th Edition) - All Suites Hotel						
Rooms			49			
Period	Trips/Unit	Trips	% In	% Out	Trips In	Trips Out
AM Peak	0.34	17	53%	47%	9	8
PM Peak	0.36	18	48%	52%	8	9
Daily	4.46	219	50%	50%	109	109

Currently, there are eight houses in the project site. The access to these houses will be the same as the access to Bike Ranch Resort on Old Spanish Trail. The estimated trip generation for the existing houses is shown in Table 2.

Table 2. Existing Conditions Trip Generation

ITE LU 210 (10th Edition) - Single-Family Detached Housing						
Rooms			8			
Period	Trips/Unit	Trips	% In	% Out	Trips In	Trips Out
AM Peak	0.74	6	25%	75%	1	4
PM Peak	0.99	8	63%	37%	5	3
Daily	9.44	76	50%	50%	38	38

The total traffic for the site access, including Bike Ranch Resort and the existing houses, is expected to be 23 trips in the morning peak hour and 26 trips in the afternoon peak hour. It is estimated that existing and project trips at the study site are evenly distributed in Old Spanish Trail north and south directions. Figure 3 shows the anticipated trip distribution.

Figure 3. Trip Distribution

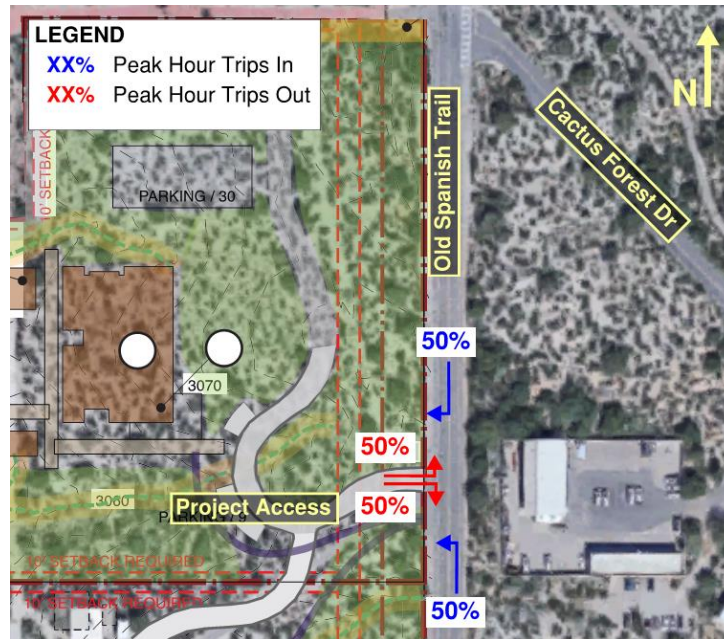


Figure 4 shows the turning movements at the study site access during the PM peak hour, the busiest period in the day.

Figure 4. Project Access Turning Movements (PM Peak Hour)



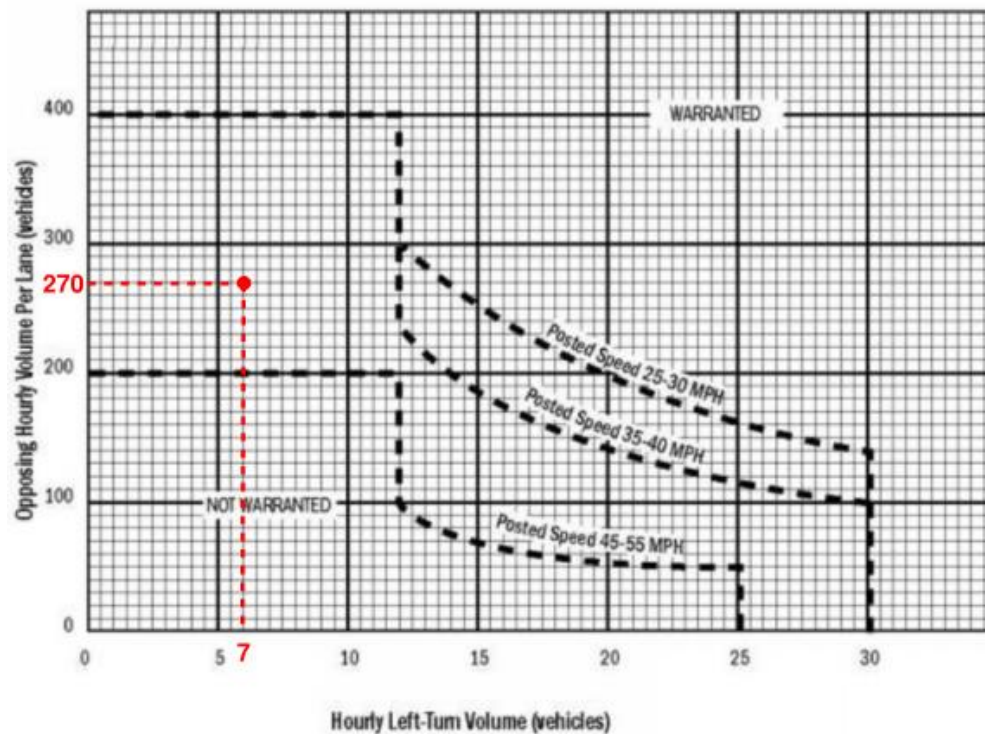
Improvements Analysis

This memorandum evaluated the needs for turn lanes on Old Spanish Trail to provide access to the project site. This study followed the turn lane warrants as outlined in the *2016 Pima County Subdivision and Development Street Standards*⁴.

Because existing peak hour through volumes are not available, they were estimated based on the average daily traffic in the Old Spanish Trail study segment. It is assumed that 10% of the daily traffic occurs during the peak hour, with 60% of traffic moving in the peak travel direction. Therefore, the directional hourly volume in the study segment is approximately 270 vehicles per hour in the peak direction. To be conservative, the peak direction hourly volume will be used to evaluate both turn lane warrants.

The warrant analysis for a northbound left turn lane on Old Spanish Trail is shown in Figure 5. As seen in the figure, 7 hourly left turns with an opposing hourly volume of 270 vehicles per hour do not warrant a left turn lane on a 40 MPH roadway.

Figure 5. Left Turn Lane Warrant

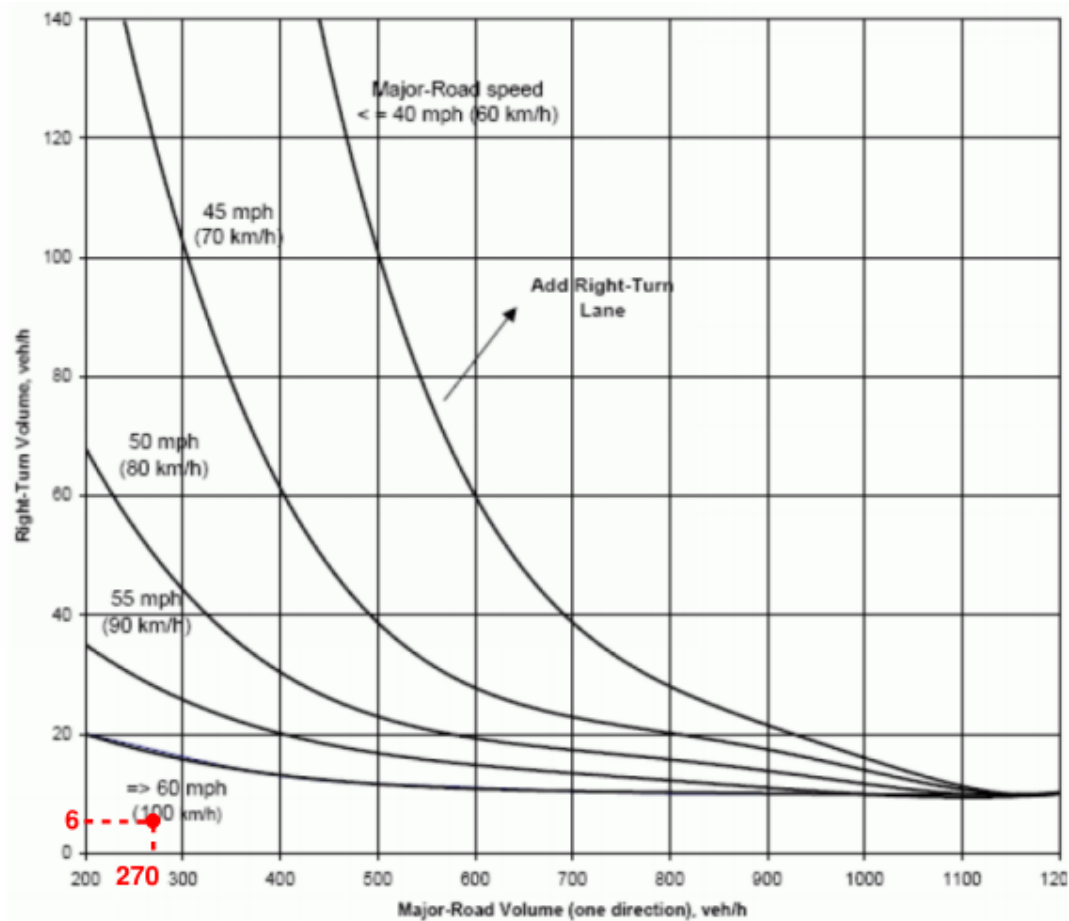


⁴ 2016 Pima County Subdivision and Development Street Standards. Available at

https://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Development%20Services/Building/2016%20SDSS.pdf

The warrant analysis for a southbound right turn lane on Old Spanish Trail is shown in Figure 6. As seen in the figure, 6 hourly right turns with a directional hourly volume of 270 vehicles per hour do not warrant a right turn lane on a 40 MPH roadway.

Figure 6. Right Turn Lane Warrant



Summary of Findings

This memorandum presented a summary of the potential traffic impacts associated with the proposed Bike Ranch Resort on Old Spanish Trail south of Cactus Forest Drive (entrance to Saguaro National Park East) and north of Escalante Road. The project is expected to generate 17 new trips during the morning peak hour, and 18 trips in the evening peak hour. Those volumes would represent less than 5% of the peak hour volumes on Old Spanish Trail, and are well below the minimum thresholds used by Pima County for requiring a traffic study (100 peak hour trips), or even a traffic memorandum (25 peak hour trips).

Kelley Matthews
February 25, 2019

There are eight existing single-family homes in the project site, which generate approximately 6 trips in the morning peak hour and 8 trips in the afternoon peak hour. The total trips generated at the site access driveway (Bike Ranch Resort and existing homes) were evaluated to assess the need for a northbound left turn lane and a southbound right turn lane on Old Spanish Trail to provide access to the project site. Based on the turn lane warrants in the *Pima County Subdivision and Development Street Standards*, no turn lanes are warranted. Sight distance at the access driveway meets design requirements. No other improvements are needed, but it is recommended that stop signs be installed for vehicles exiting the site, to assist visitors to the resort who may be unfamiliar with the intersection.