

ARIZONA TEXAS NEW MEXICO OKLAHOMA

June 10, 2020

Mr. Tom Loftus CAZ PO Box 2053 Carefree, AZ 85377

### RE: TIMA Category 1 – SWC Stagecoach Pass and Windmill Road in Scottsdale, Arizona

Dear Mr. Loftus:

This letter is to serve as a Traffic Impact and Mitigation Analysis (TIMA) Category 1 report as outlined in the City of Scottsdale's *Design Standards & Policy Manual (DS&PM)*. This report is to provide a trip generation comparison reviewing the highest trip generation potential of the site under the existing and proposed zoning, review the site's proposed access locations, and provide a basic assessment of overall traffic operations within the property.

### **Proposed Site and Site Characteristics**

Figure 1 provides a vicinity map of the subject area. The property is located at the southwest corner of Stagecoach Pass and Windmill Road with a portion of site extending into the surrounding residential developments to the south and west. The 3 parcels comprising the site include Accessor Parcel Numbers 216-34-011A, 216-34-009K, and 216-34-009H, having a combined net total area of approximately 27.92 acres. A 4<sup>th</sup> ownership parcel, APN 216-34-009M, is located southwest of the planned southwest development corner, but is not being considered for improvement at this time.

The property is currently unimproved having approximately 620 feet of frontage along Stagecoach Pass (minor rural collector) and 1,610 feet of frontage along Windmill Road (rural local collector). The Maricopa County Assessors website indicates all 3 parcels are zoned R1-190. The site is proposing a zoning change to R1-70 for all parcels, planning a total of 13 single-family residential dwelling units.

The site is proposed having a single access located on Windmill Road approximately 980 feet south of Stagecoach Pass, aligned with an existing gated local roadway serving 8 residential lots, Tecolote Circle. The alignment of the two local roadways is a preferable condition to avoid opposing left-turn conflicts. Gated access is not planned for the community; however, if access to the site is to be gated, a minimum 75-foot spacing from the back of curb/traveled way to the call box is required following Figure 2.1-2 in the COS DS&PM. A right-turn deceleration lane or left-turn lane on Windmill Road at the site access point is not warranted due to low volume and low speed (25 mph posted speed limit) conditions. Per City recommendation, the site plan indicates roadway widening on northbound Windmill Road at the approach to Stagecoach Pass to include separate left- and right-turn lanes (38 feet minimum width).

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recommendation, the site plan indicates roadway widening on northbound Windmill Road at the approach to Stagecoach Pass to include separate left- and right-turn lanes (38 feet minimum width).

A copy of the conceptual site layout plan is shown as Figure 2. The site plan shows a single spine road (40foot wide ROW with an 8-foot PUE on both sides) serving the residential lots with an internal roadway offshoot terminating in an individual cul-de-sac (50-foot radii). As noted on the figure, all internal streets will follow the City's Local Residential, Rural/ESL Character cross-section design (Figure 5-3.19) with a 5-foot wide sidewalk on one side of the roadway. The notes section of Figure 2 also indicate the adjacent roadway crosssection of Stagecoach Pass and Windmill Road will be designed to the City's full Local Collector, Rural/ESL Character cross-section (including sidewalk and roll curb where applicable) and include a 50-foot desert scenic corridor open space setback. A non-paved public trail is proposed for construction on the west side of Windmill Road and a pedestrian connection of stabilized decomposed granite (DG) is indicated for the culde-sac between lots 2 and 3 and Windmill Road. Dedicated safety triangles at the site entrance and at the intersection of Windmill Road and Stagecoach Pass are also shown on the site plan. Other half-street improvements along the property frontage of Stagecoach Pass and Windmill Road will be provided in conjunction with the development, if required.

The City of Scottsdale identifies a 2018 daily traffic volume (latest City Volume Map) on Stagecoach Pass east of Pima Road of 2,500 vehicles per day (bidirectional). No volume is identified for Windmill Road, but is estimated to be lower than Stagecoach Pass. A review of the Town of Carefree and MCDOT websites did not identify any recent count data for the immediate area. Based on the above, it is estimated that the two-lane cross-section for each roadway is appropriate to accommodate the existing daily traffic demand at an acceptable level of service.

### **Existing and Proposed Zoning Characteristics**

A change to the underlying zoning for the subject parcels is being requested from an existing R1-190 zone to a proposed R1-70 zone as presented below:

- Existing Zoning: R1-190 (Single-family Residential, 27.9 acres) Intended to promote and preserve residential development with large lots to maintain low density population. The principal land use is single-family dwellings and uses incidental or accessory with required recreational, religious and educational facilities. Minimum lot area of 190,000 SF.
- Proposed Zoning: R1-70 (Single-family Residential, net 27.9 acres) Intended to promote and preserve residential development with large lots to maintain low density population. The principal land use is single-family dwellings and uses incidental or accessory with required recreational, religious and educational facilities. Minimum lot area of 70,000 SF.

Overall, the permitted and conditional land use regulations for both the R1-190 and R1-70 zones are exactly the same, the only difference being the minimum lot size. Because of the intent of the two zonings are to promote low density residential development, similar to the adjacent residential properties, a trip generation comparison of the existing and proposed zoning are based on the number of dwelling units each parcel could contain, as indicated in Table 1. It has been assumed that the net development area is equal to 83% of the gross area.

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	Parcel	Existing Condition			Proposed Condition				
Parcel Numbers	Area (SF)	Zoning	Min. Lot Size (SF)	Net Area	DU's	Zoning	Min. Lot Size (SF)	Net Area	DU's
216-34-011A	793620	R1-190	190000	0.83	3.47	R1-70	70000	0.83	9.41
216-34-009K	204601	R1-190	190000	0.83	0.89	R1-70	70000	0.83	2.43
216-34-009H	217800	R1-190	190000	0.83	0.95	R1-70	70000	0.83	2.58
Totals =	1216021				5.31				14.42

### Table 1. Existing/Proposed Development Schedule

### **Trip Generation Comparison**

*Trip Generation, Tenth Edition*, published by the Institute of Transportation Engineers (ITE) 2017, was used to calculate the trip generation potential for the site under existing and proposed zoning using the provided site layout plan. The Trip Generation Manual is the industry standard used by traffic and transportation engineers to provide trip generation characteristics for different types of land uses. The trip generation data provided by ITE is segregated into individual land uses and provides an estimate to the number of trip ends similar land uses would generate. A trip end is defined as one entering or one exiting trip during a designated time period. For the purposes of this analysis, all trip ends are assumed to be made via automobile. Some land uses generate a portion of their activity from traffic already on the adjacent roadways, identified as pass-by traffic, and therefore only a percentage of the site's total trips may be new vehicles that were not previously on that roadway. For the purposes of this analysis and based on the site's land use, all site-generated trips are assumed to be new vehicular trips.

Table 2 presents the results of the ITE Trip Generation comparison. Under the existing zoning (shaded column), the subject site could accommodate a total of 5 dwelling units while under the planned conceptual site layout with revised zoning (right column, no shade), the site is proposed for 13 dwelling units. Utilizing the ITE fitted curve equations to estimate the trip generation potential of each scenario, the 24-hour, AM peak hour, and PM peak hour for the two zoning conditions are presented.

The results of Table 2 indicate that the residential land use assuming either the existing or proposed zoning category would generate a very low number of trip ends during all time periods. Overall, the proposed site is estimated to generate 159 daily trips (inbound plus outbound vehicles), 14 AM (4 in, 10 out) and 14 PM (9 in, 5 out) peak-hour trip ends.

	Zoning Condition	Existing Zoning (R1-190 ESL)	Proposed Zoning (R1-70 ESL)	
	Land Use	Residential	Residential	
c	ITE Land Use Code	210	210	
Descriptio	ITE Land Use Title	Single-Family Detached Housing	Single-Family Detached Housing	
-	Land Use Variable	Dwelling Units	Dwelling Units	
	Variable Amount (X)	5	13	
tes	Weekday	Ln(T) = 0.92 Ln(X) + 2.71	Ln(T) = 0.92 Ln(X) + 2.71	
p Rat	AM Peak Hour	T = 0.71 (X) + 4.80	T = 0.71 (X) + 4.80	
Ţ	PM Peak Hour	<b>Peak Hour</b> Ln(T) = 0.96 Ln(X) + 0.20 L		
%	Weekday	50%	50%	
ounc	AM Peak Hour	25%	25%	
qul	PM Peak Hour	63%	63%	
	Weekday	66	159	
ips	AM Peak Hour Inbound	2	4	
al Tr	AM Peak Hour Outbound	Peak Hour Outbound 6		
Tot	PM Peak Hour Inbound	4	9	
	PM Peak Hour Outbound	2	5	

#### Table 2. Trip Generation Estimate Comparison

Source: 1 Trip Generation Manual, 10th Ed, ITE, 2017

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### Traffic Distribution and Assignment, Turn Lane Need, Traffic Control

For the purposes of this analysis, it is assumed that all site-generated vehicles entering and exiting the site will be via Windmill Road, distributed in a 50/50 manner to and from the north and south. Northbound travel would provide access to Carefree, Cave Creek and Carefree Highway via the Stagecoach Pass intersection, while southbound travel would provide a more direct travel path to and from the Scottsdale/Westland or Pima/Hawknest intersections.

Calculating the additional number of peak-hour turn vehicles the site is anticipated to contribute at the Stagecoach Pass/Windmill Road intersection, a total of 7 AM and 7 PM peak-hour vehicles (inbound plus outbound) are anticipated. When considering the ingress/egress percentages, the site is expected to add a maximum hourly turn volume of 3 vehicles to any one movement (1 additional vehicle every 20 minutes).

Based on low projected traffic volume conditions at the Stagecoach Pass Road and Windmill Road intersection, with or without the site-related traffic, and low speed conditions on Stagecoach Pass (35 mph posted speed limit) the need to add an exclusive left or right-turn lane at this intersection is not warranted. The site plan does indicate widening of the northbound Windmill Road approach to accommodate separate left and right-turn lanes to Stagecoach Pass Road as requested by the City of Scottsdale. At the site access point, low volume and low speed conditions do not warrant a left or right-turn deceleration lanes to be installed on Windmill Road.

No change to the existing traffic control at the intersection of Stagecoach Pass/Windmill is recommended. At the site's access point to Windmill Road, the roadway approach should be STOP controlled.

### **Sight Visibility Review**

A cursory review of sight visibility was conducted along Windmill Road indicating no visibility restrictions in the general area as Windmill Road has a relatively straight roadway alignment without significant vertical grade changes, as indicated in the images below (taken 160 feet north of the Tecolate Circle/Site Access alignment). Assuming a 30 mph roadway design speed on Windmill Road (25 mph posted speed limit), AASHTO/COS indicates 335 feet of intersection sight visibility is needed for drivers to safety enter the roadway, which can be provided following the City required 25-foot by 25-foot traffic safety triangle (maximum 2.5-foot height limitation area). Safety triangles are indicated on the conceptual site plan.



Image 1 (left). Estimated driver's eye position 15 feet from edge of Windmill Road looking north. Image 2 (right). Estimated driver's eye location 15 feet from edge of Windmill Road looking south.



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### Conclusion

In comparing the trip generation characteristics of the site under the existing and proposed zoning for the property, the subject site will generate about twice as many trip ends, but will still generate a relatively low number of AM, PM and daily trip ends. Additionally, no sight visibility concerns are identified at the site's Windmill Road access and no left or right-turn deceleration lanes warranted at the site driveway. Overall, little to no vehicular impacts are anticipated in the immediate area as a result of the site zoning change.

If you have any questions or comments, please feel free to contact me at (602) 955-7206.

Respectfully submitted,

Paul Guzek, PE, PTOE Lee Engineering, LLC attachments



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**Site Location** 





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Vicinity Map

Ex. R1-190 Zoned Parcels (3), Proposed R1-70 (27.9 acres total)

Figure 1 12-ZN-2019 6/16/2020

PLAN	DATA	NOTES:
GROSS SITE AREA NET SITE AREA	30.0 AC (+/-) 27.9 AC (+/-)	<ol> <li>CONSTRUCTION OF WINDMILL ROAD TO FULL LOCAL COLLECTOR CROSS SECTION, RURAL/ESL CHARACTER WITH TRAIL, DSPM FIGURE 5.3.15 IS REQUIRED. THE PAVEMENT SECTION APPROACHING STAGECOACH PASS SHALL BE WIDENED TO INCLUDE A SEPARATE NORTHBOUND RIGHT-TURN LANE AND LEFT-TURN LANE (38 FEET MIN. WIDTH).</li> </ol>
EXISTING ZONING PROPOSED ZONING	R1-190 ESL R1-70 ESL	<ol> <li>CONSTRUCTION OF STAGECOACH PASS TO FULL LOCAL COLLECTOR, RURAL/ESL CHARACTER – 24 FEET OF PAVEMENT WITH ROLL CURB ON THE SOUTH SIDE AND A 6 FOOT WIDE SIDEWALK SEPARATED FROM THE BACK OF CURB IS REQUIRED.</li> </ol>
PROP. SINGLE FAMILY LOTS PROPOSED DENSITY	13 0.43 DU/ GROSS AC	<ol> <li>INTERNAL STREETS SHALL BE LOCAL RESIDENTIAL, RURAL/ESL CHARACTER, DSPM FIGURE 5-3.19, A 5FOOT WIDE SIDEWALK SHALL BE CONSTRUCTED ON AT LEAST ONE SDE OF THE STREET AND A 6FOOT WIDE SHOULDER SHALL BE CONSTRUCTED ON THE OTHER SIDE OF THE STREET IF NO SIDEWALK IS PROVIDED (DSPM SEC. 5-3.100; SCOTTSDALE REVISED CODE SEC. 47-21 AND 47-22; DSPM 5-3.110.)</li> </ol>
ILDING HEIGHT	24' FROM NATURAL GRADE	<ol> <li>DEDICATION OF A SAFETY TRIANGLE AT THE SITE ENTRANCE INTERSECTION ON WINDMILL ROAD AND AT THE INTERSECTION OF WINDMILL ROAD AND STAGECOACH PASS IS REQUIRED (DSPM 5.3123: EG. 5.3.27).</li> </ol>





# **STAGECOACH & WINDMILL CONCEPTUAL SITE PLAN**

**FIGURE 2** 



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DATE: 6/3/20 JOB NO.: 1544

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