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# **PORTOLA/FRANK SINATRA**

## **RESIDENTIAL**

### **TRAFFIC ANALYSIS**

#### **CITY OF PALM DESERT**

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## **LIST OF ABBREVIATED TERMS**

(1)	Reference
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CMP	Congestion Management Program
DU	Dwelling Unit
EAP	Existing Plus Ambient Growth Plus Project
EAPC	Existing Plus Ambient Growth Plus Project Plus Cumulative
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
MUTCD	Manual on Uniform Traffic Control Devices
N/A	Not Applicable
NP	Without Project
PHF	Peak Hour Factor
Project	Portola/Frank Sinatra Residential
TA	Traffic Analysis

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# 1 INTRODUCTION

This report presents the results of the traffic analysis (TA) for the proposed Portola/Frank Sinatra Residential (“Project”), which is located south Frank Sinatra Drive and west of Portola Avenue in the City of Palm Desert.

The purpose of this TA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and recommend improvements to achieve acceptable circulation system operational conditions. This TA has been prepared based in accordance with the County of Riverside’s Transportation Analysis Guidelines for Level of Service & Vehicle Miles Traveled (December 2020), as the City of Palm Desert utilizes the County LOS/VMT analysis guidelines. (1) To ensure that this TA satisfies the City of Palm Desert’s traffic study requirements, Urban Crossroads, Inc. prepared a traffic study scoping package for review by City staff prior to the preparation of this report. The Agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology. The Agreement approved by the City is included in Appendix 1.1.

## 1.1 SUMMARY OF FINDINGS

For Existing (2022) and Opening Year Cumulative (2024) traffic conditions the addition of Project traffic and cumulative traffic to study area intersections did not result in deficient intersection operations.

## 1.2 PROJECT OVERVIEW

The Project is proposed to consist of 394 residential dwelling units but the number of units on the site plan is slightly less than was evaluated in the traffic analysis (which includes 402 dwelling units). The traffic analysis volumes are conservatively high and the analysis fully accounts for the Project. It is anticipated that the Project would be fully developed by year 2024. A preliminary site plan of the proposed Project is shown in Exhibit 1-1. Project will have one right-out access (exit only) along Frank Sinatra Drive, one right-out access (exit only) along Portola Avenue, and one right-in/right-out/left-in access along Portola Avenue. Regional access to the project site is provided via the I-10 Freeway at Cook Street, Monterey Avenue, and Country Club Drive.

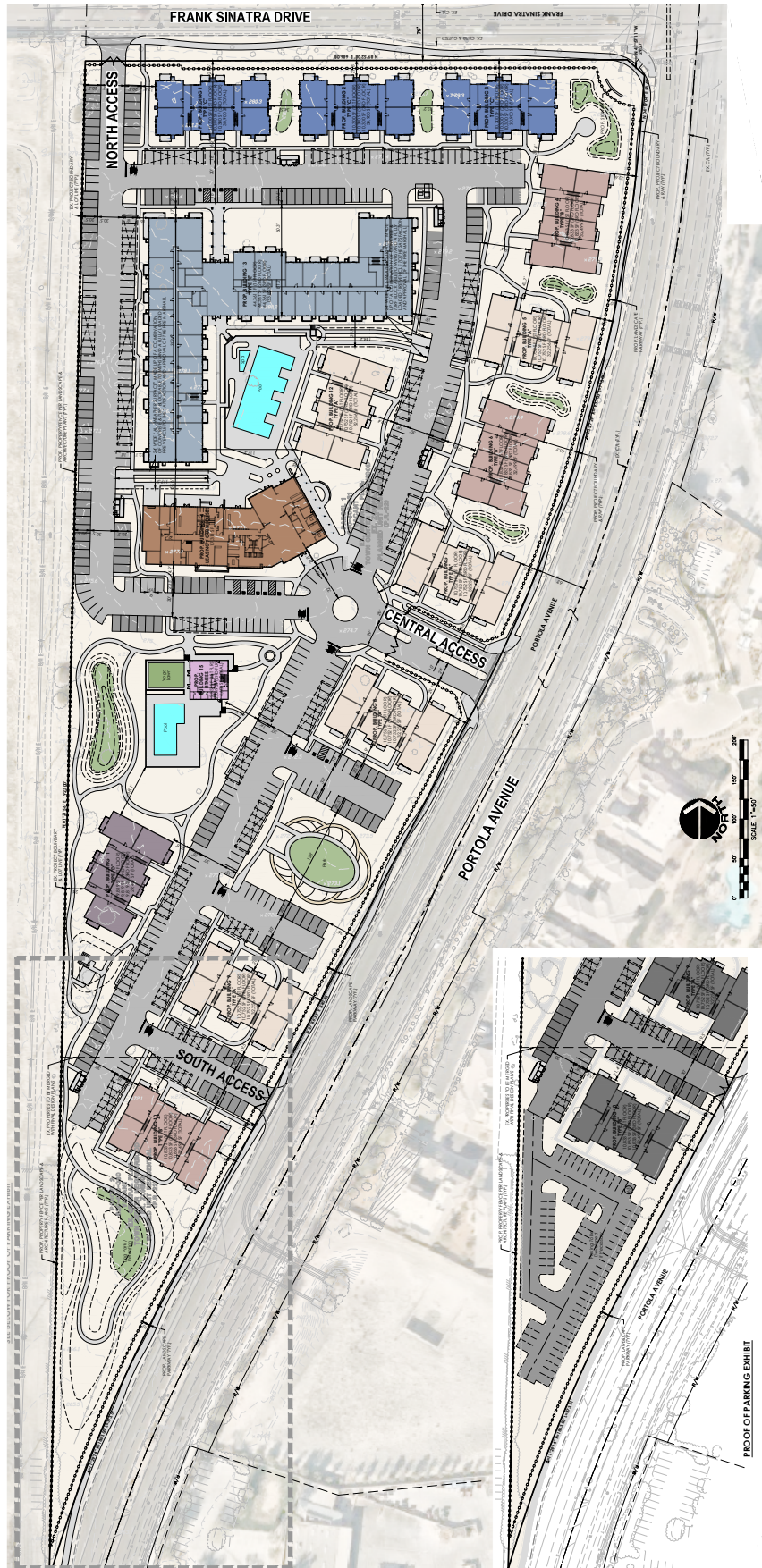
Trips generated by the Project’s proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11<sup>th</sup> Edition, 2021. (2) The Project is anticipated to generate a net total of 2,709 trip-ends per day with 161 AM peak hour trips and 205 PM peak hour trips.

The assumptions and methods used to estimate the Project’s trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

## 1.3 ANALYSIS SCENARIOS

For the purposes of this traffic study, potential impacts to traffic and circulation have been evaluated for each of the following conditions:

## EXHIBIT 1-1: PRELIMINARY SITE PLAN



- Existing (2022) Conditions
- Existing plus Ambient Growth plus Project (EAP) (2024) Conditions
- Existing plus Ambient Growth plus Project Plus Cumulative (EAPC) (2024) Conditions

All study area intersections are evaluated using the Highway Capacity Manual (HCM) 6<sup>th</sup> Edition analysis methodology.

#### **1.3.1 EXISTING CONDITIONS**

Existing physical conditions have been disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

#### **1.3.2 EAP CONDITIONS**

The EAP (2024) traffic conditions analyses determine potential traffic impacts based on a comparison of the EAP traffic conditions to Existing conditions. To account for background traffic growth, an ambient growth factor from Existing conditions of 4.04% (2 percent per year over 2 years, compounded annually) for 2024 conditions is included for EAP traffic conditions. Consistent with County of Riverside traffic study guidelines, the EAP analysis is intended to identify “Opening Year” deficiencies associated with the development of the proposed Project based on the expected background growth within the study area.

#### **1.3.3 EAPC CONDITIONS**

The EAPC (2024) traffic conditions analyses determine the potential near-term cumulative circulation system deficiencies. Background traffic for these analysis scenarios follow the same ambient growth methodology described above for EAP traffic conditions. However, EAPC traffic conditions also include the addition of cumulative development traffic. The comprehensive list of cumulative development projects was compiled from information provided by the City of Palm Desert.

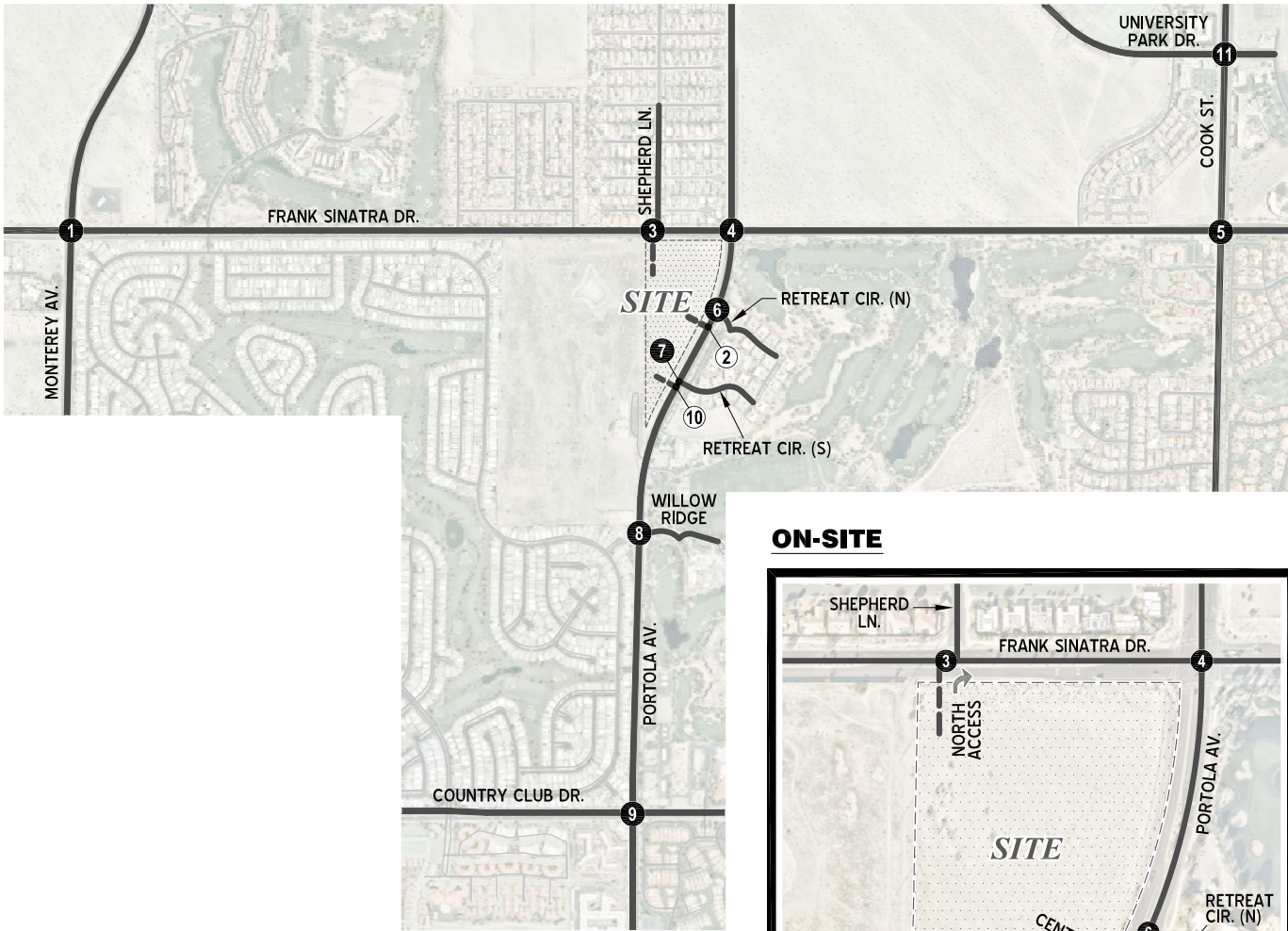
### **1.4 STUDY AREA**

The Project study area was defined in coordination with the City of Palm Desert. Consistent with County of Riverside traffic study guidelines, the study area includes any intersection of “Collector” or higher classification street, with “Collector” or higher classification streets, at which the proposed project will add 50 or more peak hour trips. Exhibit 1-2 presents the study area and intersection analysis locations.

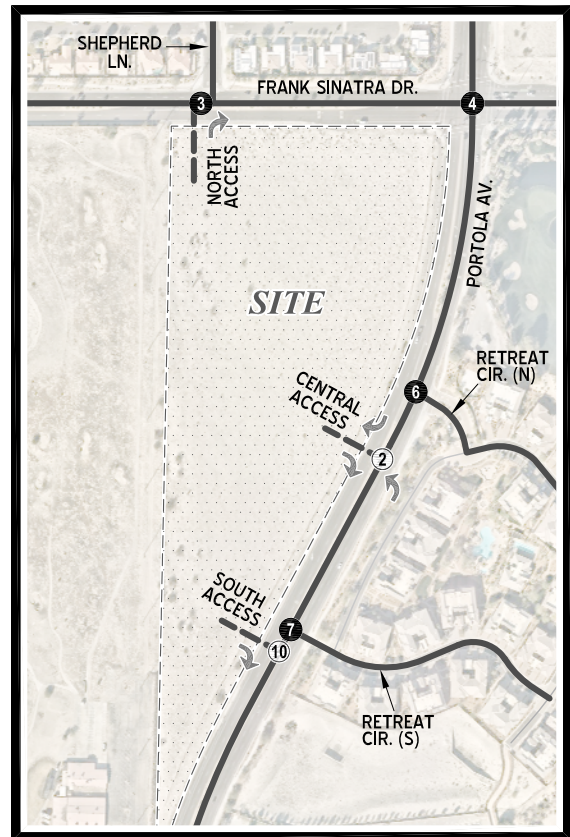
The “50 peak hour trip” criteria generally represents a minimum number of trips at which a typical intersection would have the potential to be substantively impacted by a given development proposal. Although each intersection may have unique operating characteristics, this traffic engineering rule of thumb is a widely utilized tool for estimating a potential area of impact (i.e., study area).



## EXHIBIT 1-2: TRAFFIC ANALYSIS STUDY AREA



### ON-SITE



### LEGEND:

- ⑨ = EXISTING ANALYSIS LOCATION
- ② = FUTURE ANALYSIS LOCATION
- = FUTURE PROJECT DRIVEWAY
- ↘ = RIGHT-OUT ONLY (EXIT ONLY)
- ↔ = RIGHT-IN/RIGHT-OUT/LEFT-IN ONLY



To ensure that this TA satisfies the needs of the City of Palm Desert, Urban Crossroads, Inc. prepared a Project specific traffic study scoping agreement for review by City staff prior to the preparation of this TA. The agreement provides an outline of the study area, trip generation, trip distribution, and analysis methodology. The agreement approved by the City of Palm Desert is included in Appendix 1.1.

#### 1.4.1 INTERSECTIONS

The following 11 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for this TA based on consultation with City of Palm Desert staff.

**TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS**

ID	Intersection Location	ID	Intersection Location
1	Monterey Avenue / Frank Sinatra Drive	7	Portola Avenue / Retreat Circle (S)
2	Portola Avenue / Central Access	8	Portola Avenue / Willow Ridge
3	Shepherd Lane - North Access / Frank Sinatra Drive	9	Portola Avenue / Country Club Drive
4	Portola Avenue / Frank Sinatra Drive	10	Portola Avenue / South Access
5	Cook Street / Frank Sinatra Drive	11	Cook Street / University Park Drive
6	Portola Avenue / Retreat Circle (N)		

### 1.5 ANALYSIS FINDINGS

This section provides a summary of the analysis results for Existing (2022), EAP (2024), and EAPC (2024) conditions. The LOS results are summarized in Exhibit 1-3.

#### Existing (2022) Conditions

For Existing (2022) traffic conditions, the study area intersections are currently operating at acceptable LOS (i.e., LOS “D” or better) during AM and PM peak hours.
































#### Opening Year (2024) Conditions

For EAP (2024) and EAPC (2024) traffic conditions, the study area intersections continue to operate at an acceptable LOS (i.e., LOS “D” or better) during AM and PM peak hours.






### 1.6 SITE ACCESS IMPROVEMENTS

The Project is proposed to have one right-out access (exit only) along Frank Sinatra Drive, one right-out access (exit only) along Portola Avenue, and one right-in/right-out/left-in access along Portola Avenue, as indicated on Exhibit 1-4. Roadway improvements necessary to provide site access are assumed to be constructed in conjunction with site development.

**EXHIBIT 1-3: SUMMARY OF INTERSECTION LOS BY ANALYSIS SCENARIO**

#	Intersection	Existing (2022)	EAP (2024)	EAPC (2024)
1	Monterey Av. / Frank Sinatra Dr.			
2	Portola Av. / Central Access	NA		
3	Shepherd Ln. - N. Access / Frank Sinatra Dr.			
4	Portola Av. / Frank Sinatra Dr.			
5	Cook St. / Frank Sinatra Dr.			
6	Portola Av. / Retreat Cir. (N)			
7	Portola Av. / Retreat Cir. (S)			
8	Portola Av. / Willow Ridge			
9	Portola Av. / Country Club Dr.			
10	Portola Av. / South Access	NA		
11	Cook St. / University Park Dr.			

**LEGEND:**

-  = AM PEAK HOUR
-  = PM PEAK HOUR
-  = LOS A-D
-  = LOS E
-  = LOS F

Shared sidewalks should be constructed along the Project frontage, consistent with General Plan Roadway Cross-sections. At each Project access, a crosswalk should be provided perpendicular to the driveway (along the major street). The sidewalk and crosswalk features provided in conjunction with development of this site will connect residents to the Portola Avenue/Frank Sinatra Drive intersection where safe street crossings are accommodating with the existing traffic signal and crosswalks. The transit services which are closest to the site are currently provided along Cook Street, and residents may choose to utilize the existing sidewalk along Frank Sinatra Drive east of Portola Avenue to access these services.

These improvements should be in place prior to occupancy:

**Portola Avenue & Central Access (#2)** – Install a stop control on the eastbound approach, provide crosswalk for north/south pedestrians on the Project side of Portola Avenue, and construct the intersection with the following geometrics:

- Provide a median opening along Portola Avenue at this location to accommodate a 200 ft. northbound left turn lane for the Project access.
- Provide one southbound right turn lane (200 ft.).
- Provide one eastbound right lane.

The recommended 200 ft. northbound left turn pocket and 200 ft. southbound right turn pocket adequately accommodates peak hour volumes for the Project.

**North Access & Frank Sinatra Drive (#3)** – Construct the Project access as a right-out only access with crosswalk for east/west pedestrians on the Project side of Frank Sinatra Drive. Cross-street stop control on the northbound approach provides acceptable peak hour service levels.

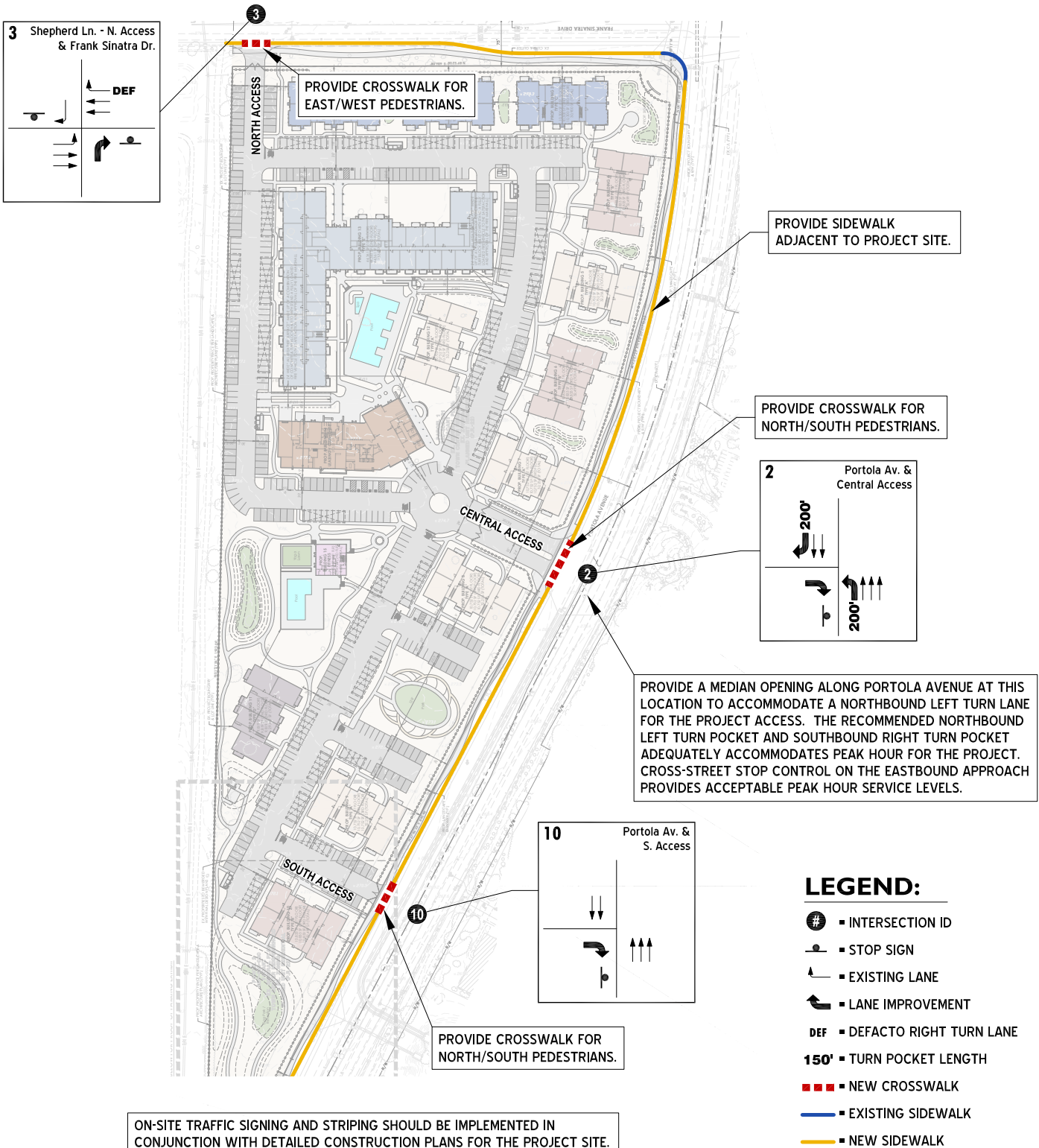
Exhibit 1-4 shows the intersection configuration of #3 Shepherd Ln – N. Access & Frank Sinatra Drive. The existing Shepherd Lane is accessed at Frank Sinatra Drive via southbound right turn lane, eastbound left turn lane, or westbound defacto right turn lane. The proposed Project North Access is located slightly offset from Shepherd Lane, but the Project traffic does not interact with Shepherd Lane. Project traffic has the option to turn right out to Frank Sinatra, but no left turns or inbound traffic is allowed.

**Portola Avenue & South Access (#10)** – Construct the Project access as a right-out only access with crosswalk for north/south pedestrians on the Project side of Portola Avenue. Cross-street stop control on the eastbound approach provides acceptable peak hour service levels.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site.

Sight distance at the project access points should be reviewed with respect to standard American Association of State Highway and Transportation Officials (AASHTO) sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

## EXHIBIT 1-4: SITE ACCESS RECOMMENDATIONS





## 2 METHODOLOGIES

This section documents the methodologies and assumptions used to perform this traffic assessment.

### 2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

### 2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The *Highway Capacity Manual* (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (3) The HCM uses different procedures depending on the type of intersection control.

#### 2.2.1 SIGNALIZED INTERSECTIONS

The City of Palm Desert require signalized intersection operations analysis based on the methodology described in the HCM 6<sup>th</sup> Edition (3). Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1. Study area intersections have been evaluated using the Synchro (Version 11) analysis software package.

Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness in addressing such parameters as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

**TABLE 2-1: SIGNALIZED INTERSECTION DESCRIPTION OF LOS**

Description	Average Control Delay (Seconds), $V/C \leq 1.0$	Level of Service, $V/C \leq 1.0$	Level of Service, $V/C > 1.0$
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A	F
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B	F
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C	F
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D	F
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths	80.01 and up	F	F

Source: HCM 6<sup>th</sup> Edition (3)**2.2.2 UNSIGNALIZED INTERSECTIONS**

The City of Palm Desert require the operations of unsignalized intersections be evaluated using the methodology described in the HCM 6<sup>th</sup> Edition. (3) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

**TABLE 2-2: UNSIGNALIZED INTERSECTION DESCRIPTION OF LOS**

Description	Average Control Delay Per Vehicle (Seconds)	Level of Service, $V/C \leq 1.0$	Level of Service, $V/C > 1.0$
Little or no delays.	0 to 10.00	A	F
Short traffic delays.	10.01 to 15.00	B	F
Average traffic delays.	15.01 to 25.00	C	F
Long traffic delays.	25.01 to 35.00	D	F
Very long traffic delays.	35.01 to 50.00	E	F
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F	F

Source: HCM 6<sup>th</sup> Edition

At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. For all-way stop controlled intersections, LOS is computed for the intersection as a whole.

## 2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TA uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD), for all study area intersections. (4)

The signal warrant criteria for Existing conditions are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The CAMUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (4) Specifically, this TA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing study area intersections for all analysis scenarios. Warrant 3 is appropriate to use for this TA because it provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

Future intersections that do not currently exist have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets.

Traffic signal warrant analyses were performed for the unsignalized study area intersection of Portola Avenue / Willow Ridge (#8). The remaining unsignalized existing and future intersections are not evaluated since Portola Avenue / Central Access (#2), Shepherd Lane – North Access / Frank Sinatra Drive (#3), Portola Avenue / Retreat Circle N. (#6), Portola Avenue / Retreat Circle S. (#7), and Portola Avenue / South Access (#10) are not full access intersections.

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Existing Conditions* of this report. The traffic signal warrant analysis for future conditions is presented Section 5 *EAP (2024) Traffic Analysis* and Section 6 *EAPC (2024)* of this report.

It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

## 2.4 MINIMUM LEVEL OF SERVICE (LOS)

Per Goal 2, Policy 1, Program 1.A of the City of Palm Desert General Plan, the following LOS will be utilized for study area intersections located within the City: The City shall make good-faith efforts to achieve LOS C along roadway segments and for peak hour intersection operations. LOS D shall be acceptable in instances when physical constraints, land use compatibility or other urban design considerations make achieving LOS C impractical.

## 2.5 DEFICIENCY CRITERIA

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies.

To determine whether the addition of project traffic at a study intersection would result in a deficiency, the following will be utilized:

- A deficiency occurs at study area intersections if the pre-Project condition is at or better than LOS D (i.e., acceptable LOS), and the addition of project trips causes the peak hour LOS of the study area intersection to operate at unacceptable LOS (i.e., LOS E or F). Per the County of Riverside traffic study guidelines, for intersections currently operating at unacceptable LOS (LOS E or F), a deficiency would occur if the Project contributes 50 or more peak hour trips to pre-project traffic conditions.

## 2.6 PROJECT FAIR SHARE CALCULATION METHODOLOGY

In cases where this TA identifies that the Project would contribute additional traffic volumes to cumulative traffic deficiencies, Project fair share costs of improvements necessary to address deficiencies have been identified. The Project's fair share cost of improvements is determined based on the following equation, which is the ratio of Project traffic to total future traffic:

$$\text{Project Fair Share \%} = \text{Project Traffic} / (\text{EAPC Total Traffic} - \text{Existing Traffic})$$

### 3 EXISTING CONDITIONS

This section provides a summary of the existing circulation network, the City of Palm Desert General Plan Circulation Network, and a review of existing peak hour intersection operations, freeway mainline operations, and traffic signal warrant analyses.

#### 3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Palm Desert staff (Appendix 1.1), the study area includes a total of 11 existing and future intersections as shown on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

#### 3.2 CITY OF PALM DESERT GENERAL PLAN CIRCULATION ELEMENT

Exhibit 3-2 shows the adopted City of Palm Desert General Plan Circulation Element, and Exhibit 3-3 illustrates the adopted City of Palm Desert General Plan roadway cross-sections.

#### 3.3 TRANSIT SERVICE

The study area is currently served by the Sunline with bus services along Cook Street via route 5 and route 10. Transit service is reviewed and updated by Sunline periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate.

#### 3.4 PEDESTRIAN AND BICYCLE FACILITIES

The existing pedestrian facilities within the study area are shown on Exhibit 3-4.

As shown on Exhibit 3-4, existing on-street bike lanes are generally located throughout the study area, with exception of the following roadways: Monterey Avenue - south of Frank Sinatra Drive, Cook Street north of Frank Sinatra Drive, University Park Drive, and Shepherd Lane.

Sidewalks also exist throughout the study area roadways, with the exception of some portions of Monterey Avenue, Frank Sinatra Drive (including adjacent to the Project site), Portola Avenue (including adjacent to the Project site), and east leg of University Park Drive.

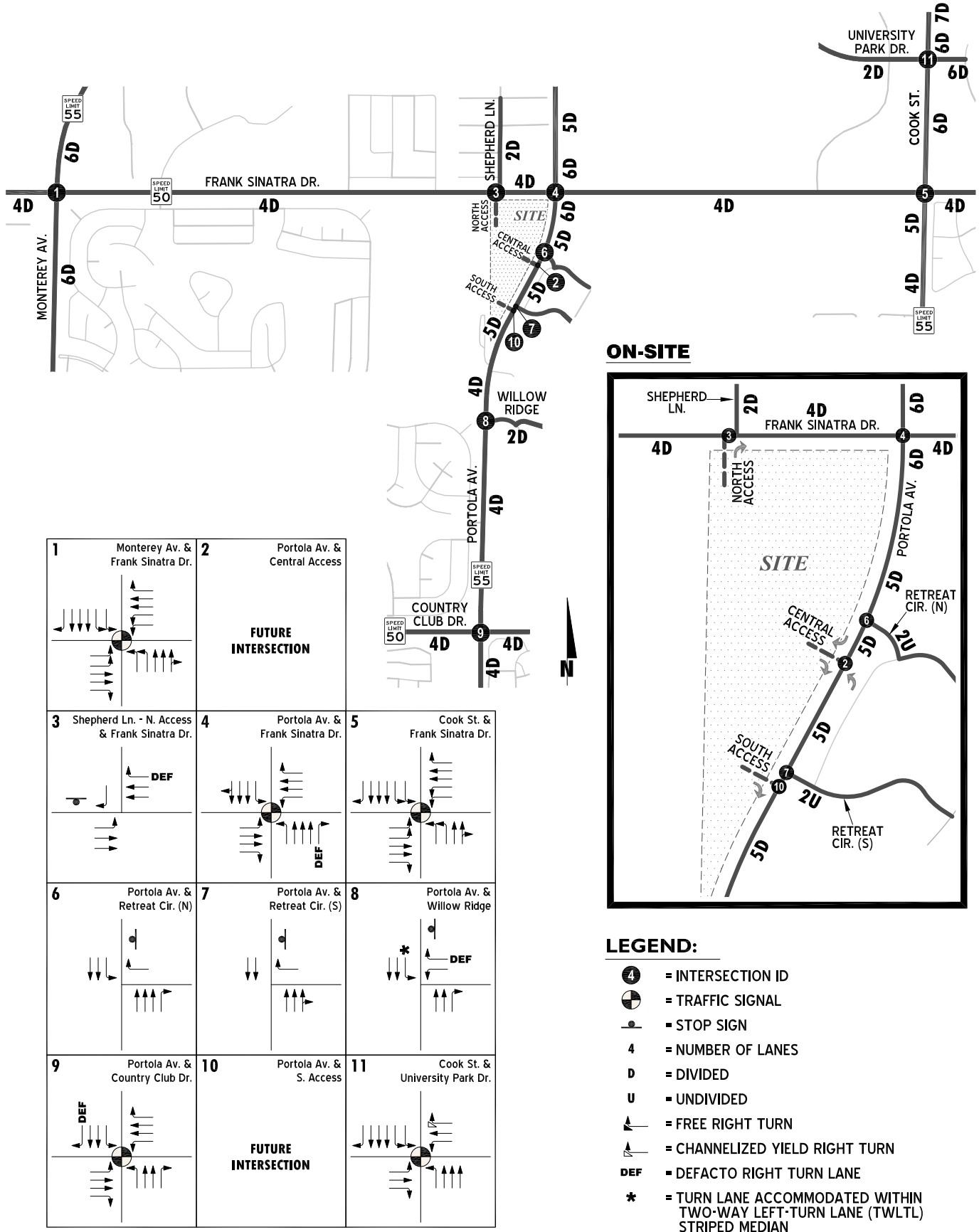
#### 3.5 EXISTING TRAFFIC VOLUMES

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in March 2022. The following peak hours were selected for analysis:

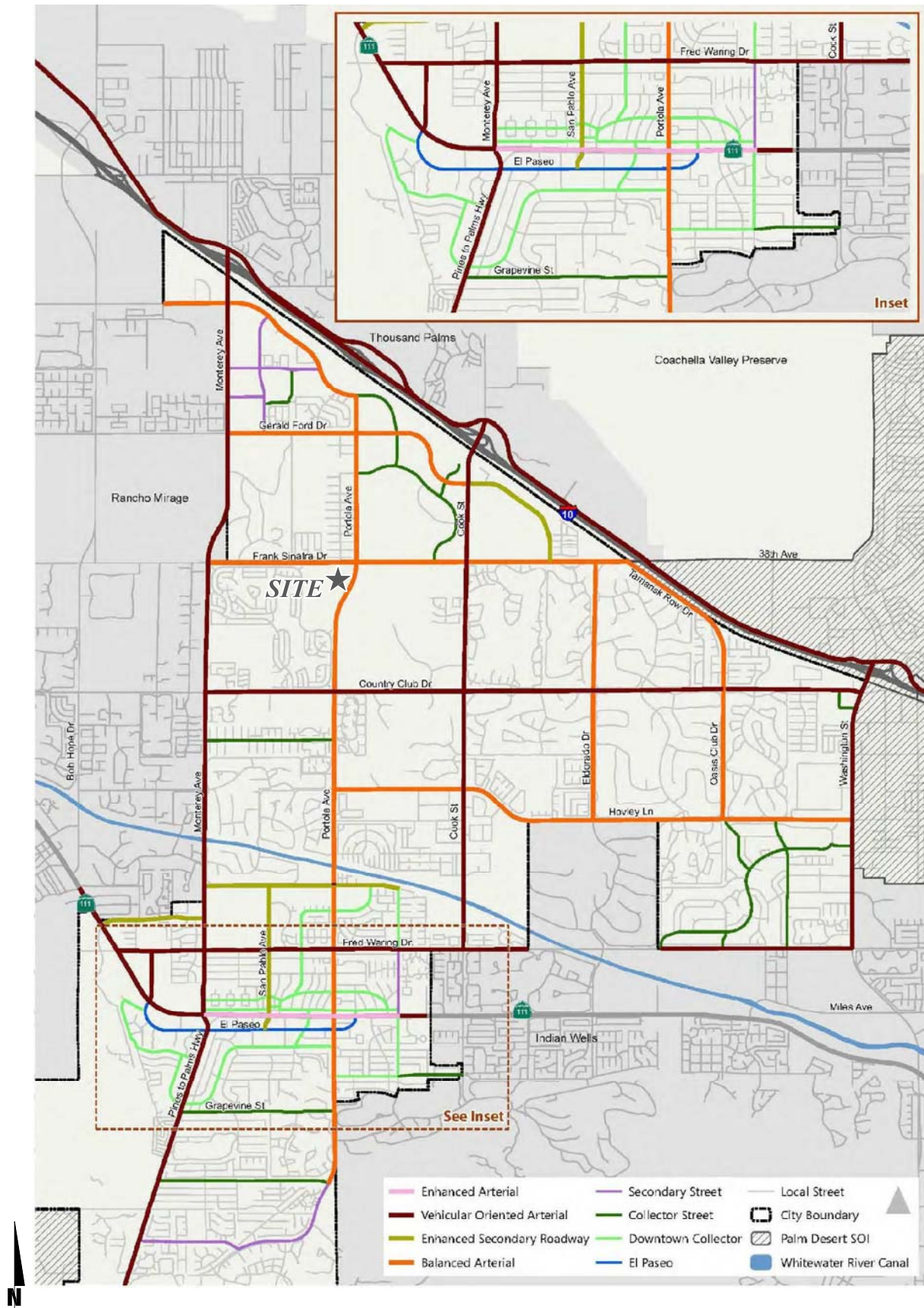
- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1.

# EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

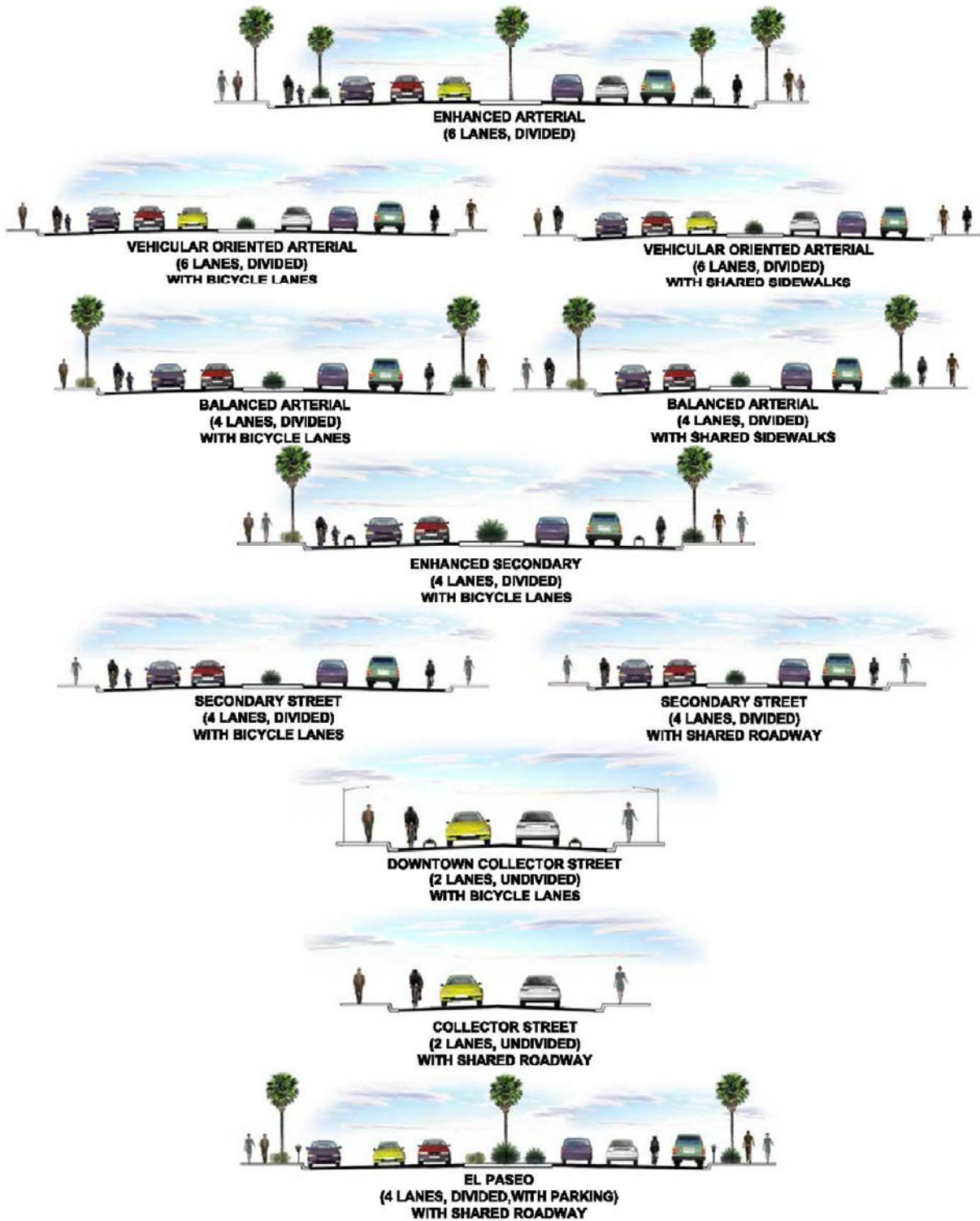


## EXHIBIT 3-2: CITY OF PALM DESERT GENERAL PLAN CIRCULATION ELEMENT





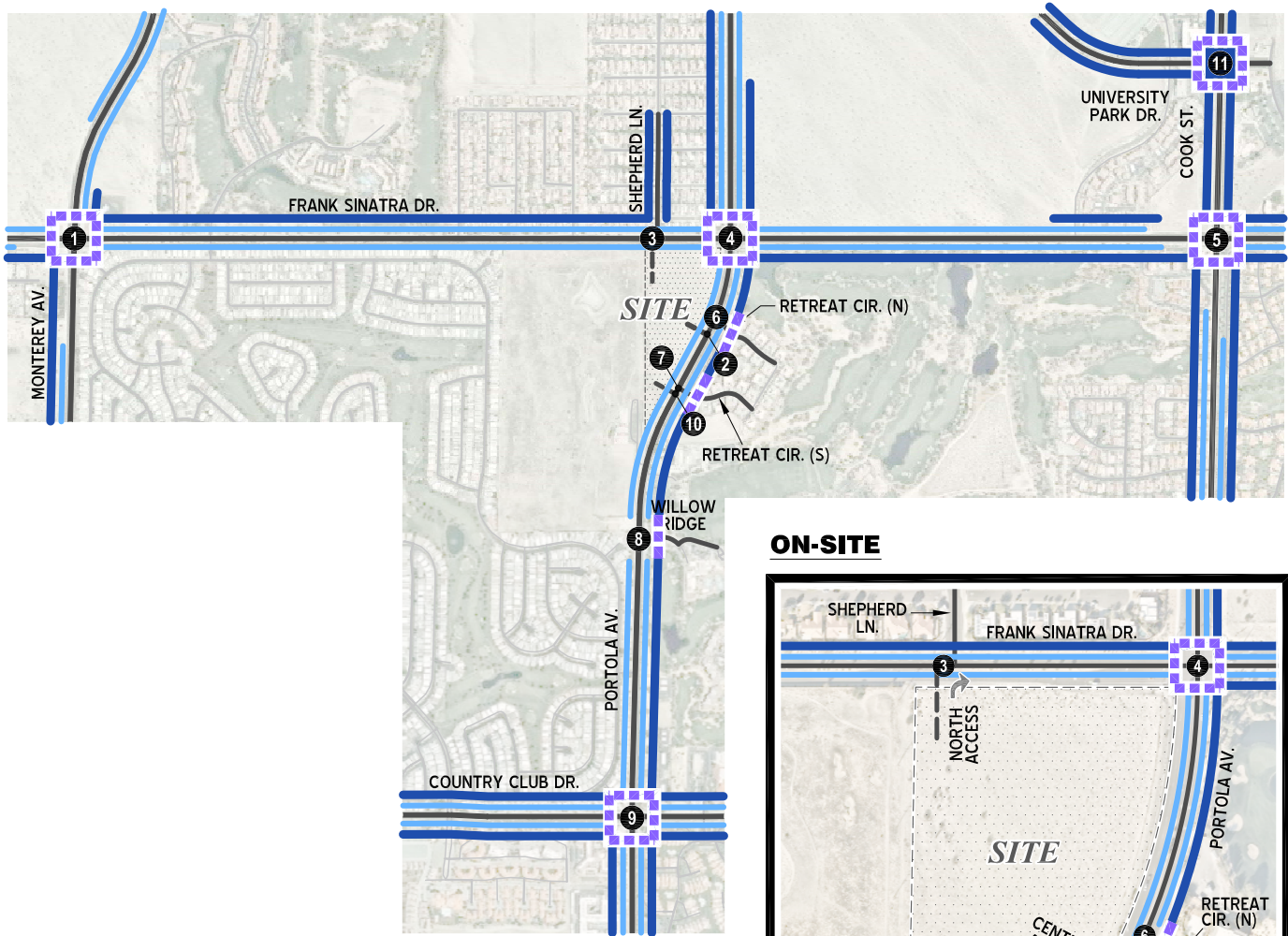
### EXHIBIT 3-3: CITY OF PALM DESERT GENERAL PLAN ROADWAY CROSS-SECTIONS



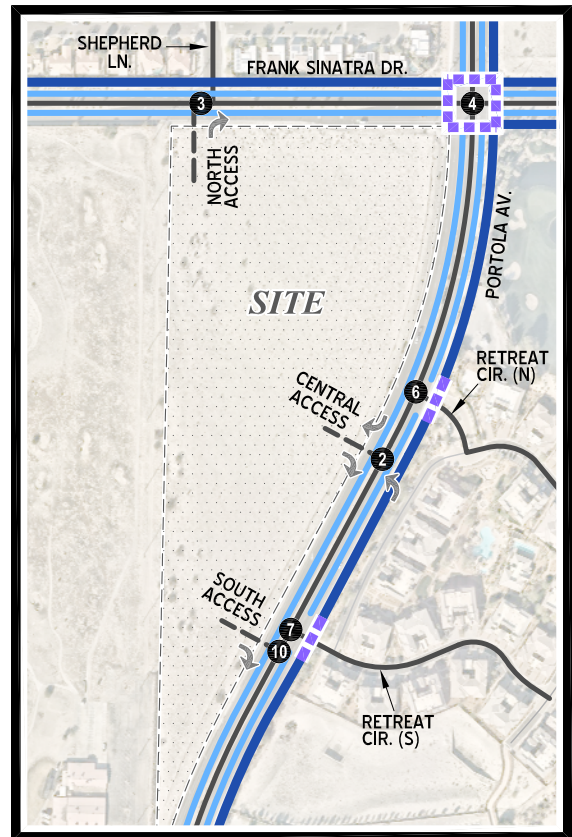
SOURCE: CITY OF PALM DESERT



### EXHIBIT 3-4: EXISTING PEDESTRIAN AND BIKE FACILITIES



#### ON-SITE



#### LEGEND:

- ⑪ = INTERSECTION ID
- = SIDEWALK/PATH
- - - = CROSSWALK
- = ON-STREET BIKE LANES



The weekday AM and PM peak hour count data are representative of typical peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity that would prevent or limit roadway access and detour routes. These raw turning volumes have been flow conserved between intersections with limited access, no access and where there are currently no uses generating traffic.

Existing weekday average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-5. Existing ADT volumes are based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg where daily counts are unavailable:

$$\text{Weekday PM Peak Hour (Approach Volume + Exit Volume)} \times 12.658 = \text{Leg Volume}$$

For those roadway segments which have 24-hour tube count data available in close proximity to the study area, a comparison between the PM peak hour and daily traffic volumes indicated that the peak-to-daily relationship of approximately 7.90 percent would sufficiently estimate ADT volumes for planning-level analyses. As such, the above equation utilizing a factor of 12.658 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.90 percent (i.e.,  $1/0.0790 = 12.658$ ). Existing weekday AM and PM peak hour intersection volumes are also shown on Exhibit 3-5.

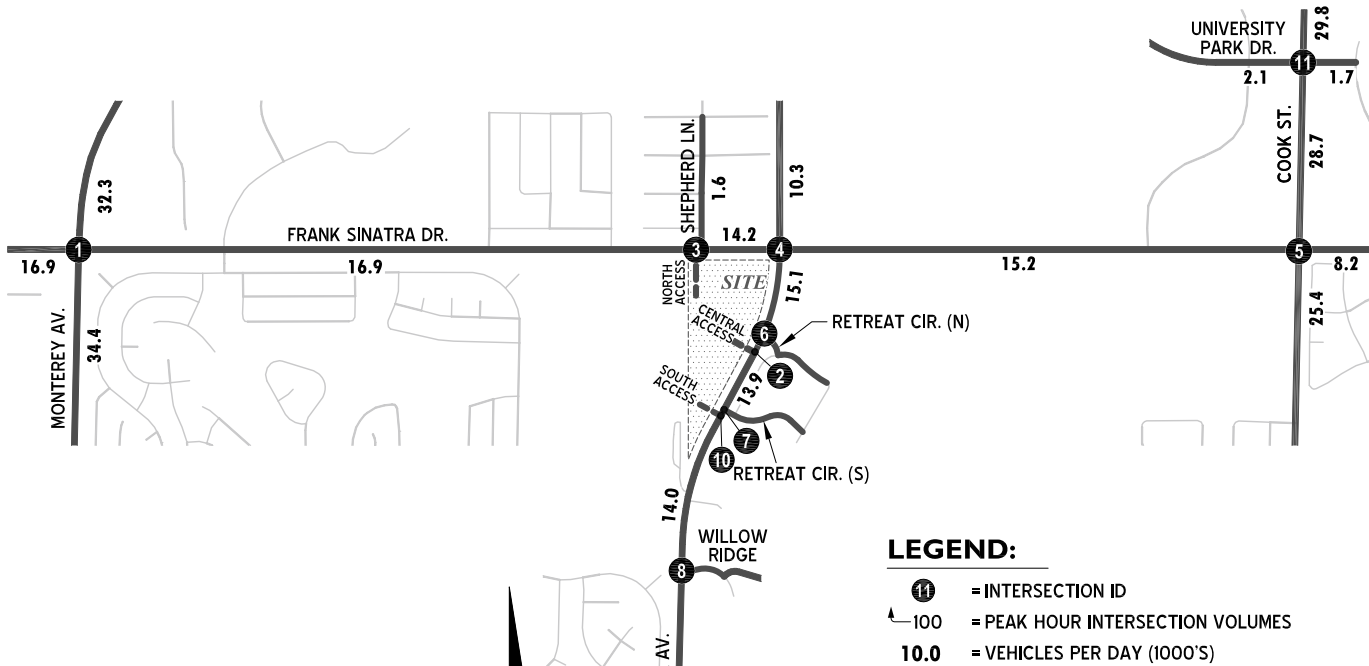
### **3.6 EXISTING CONDITIONS INTERSECTION OPERATIONS ANALYSIS**

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1 which indicates that the study area intersections are currently operating at acceptable LOS (LOS “D” or better) during the peak hours. The intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

### **3.7 EXISTING CONDITIONS TRAFFIC SIGNAL WARRANTS ANALYSIS**

Traffic signal warrants for Existing traffic conditions are based on 2022 peak hour intersection turning volumes (see Appendix 3.3). For Existing (2022) traffic conditions, the unsignalized intersection of Portola Avenue / Willow Ridge is not anticipated warrant a traffic signal.

# EXHIBIT 3-5: EXISTING (2022) TRAFFIC VOLUMES



## AM PEAK HOUR

<p><b>1</b> Monterey Av. &amp; Frank Sinatra Dr.</p> <p>92 181 51 63 575 182 41 272 106 73 580 34</p>	<p><b>2</b> Portola Av. &amp; Central Access</p> <p><b>FUTURE INTERSECTION</b></p>	<p>COUNTRY CLUB DR. 21.4 9 19.0 22.0</p>
<p><b>3</b> Shepherd Ln. - N. Access &amp; Frank Sinatra Dr.</p> <p>70 18 718 22 400 0</p>	<p><b>4</b> Portola Av. &amp; Frank Sinatra Dr.</p> <p>20 330 33 18 597 130 17 268 115 119 362 65</p>	<p><b>5</b> Cook St. &amp; Frank Sinatra Dr.</p> <p>572 3 9 537 4</p>
<p><b>6</b> Portola Av. &amp; Retreat Cir. (N)</p> <p>572 3 9 537 4</p>	<p><b>7</b> Portola Av. &amp; Retreat Cir. (S)</p> <p>572 1 540 1</p>	<p><b>8</b> Portola Av. &amp; Willow Ridge</p> <p>550 33 20 31 516 28</p>
<p><b>9</b> Portola Av. &amp; Country Club Dr.</p> <p>40 417 65 82 685 160 40 358 151 198 407 134</p>	<p><b>10</b> Portola Av. &amp; South Access</p> <p><b>FUTURE INTERSECTION</b></p>	<p><b>11</b> Cook St. &amp; University Park Dr.</p> <p>15 135 2 10 3 31 17 10 751 10</p>

## PM PEAK HOUR

<div>1</div> <div>Monterey Av. &amp; Frank Sinatra Dr.</div> <div><div><div>610</div><div>890</div><div>89</div><div>68</div><div>349</div><div>140</div></div><div><div>121</div><div>566</div><div>124</div><div>117</div><div>1219</div><div>126</div></div></div>	<div>2</div> <div>Portola Av. &amp; Central Access</div> <div><div>FUTURE INTERSECTION</div></div>	<div>3</div> <div>Shepherd Ln. - N. Access &amp; Frank Sinatra Dr.</div> <div><div><div>45</div><div>41</div><div>484</div></div><div><div>40</div><div>667</div><div>0</div></div></div>	<div>4</div> <div>Portola Av. &amp; Frank Sinatra Dr.</div> <div><div><div>28</div><div>280</div><div>67</div><div>13</div><div>354</div><div>90</div></div><div><div>12</div><div>573</div><div>82</div><div>143</div><div>415</div><div>100</div></div></div>	<div>5</div> <div>Cook St. &amp; Frank Sinatra Dr.</div> <div><div><div>183</div><div>75</div><div>75</div><div>39</div><div>163</div><div>42</div></div><div><div>332</div><div>257</div><div>136</div><div>119</div><div>882</div><div>74</div></div></div>	
<div>6</div> <div>Portola Av. &amp; Retreat Cir. (N)</div> <div><div><div>448</div><div>4</div><div>14</div></div><div><div>644</div><div>5</div></div></div>	<div>7</div> <div>Portola Av. &amp; Retreat Cir. (S)</div> <div><div><div>448</div><div>1</div></div><div><div>648</div><div>1</div></div></div>	<div>8</div> <div>Portola Av. &amp; Willow Ridge</div> <div><div><div>418</div><div>30</div><div>27</div><div>45</div></div><div><div>628</div><div>40</div></div></div>	<div>9</div> <div>Portola Av. &amp; Country Club Dr.</div> <div><div><div>50</div><div>377</div><div>72</div><div>121</div><div>531</div><div>177</div></div><div><div>36</div><div>741</div><div>168</div><div>163</div><div>445</div><div>170</div></div></div>	<div>10</div> <div>Portola Av. &amp; S. Access</div> <div><div>FUTURE INTERSECTION</div></div>	<div>11</div> <div>Cook St. &amp; University Park Dr.</div> <div><div><div>41</div><div>967</div><div>44</div><div>56</div><div>6</div><div>16</div></div><div><div>47</div><div>4</div><div>30</div><div>41</div><div>1203</div><div>9</div></div></div>

**TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2022) CONDITIONS**

#	Intersection	Traffic Control <sup>3</sup>	Intersection Approach Lanes <sup>1</sup>												Delay <sup>2</sup> (Secs)		Level of Service <sup>2</sup>	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
1	Monterey Av. / Frank Sinatra Dr.	TS	2	3	0	2	3	1	2	2	1	2	2	1	20.0	22.2	C	C
2	Portola Av. / Central Access		Intersection Does Not Exist												-	-		
3	Shepherd Ln. - N. Access / Frank Sinatra Dr.	CSS	0	0	0	0	0	1	1	2	0	0	2	d	12.0	10.4	B	B
4	Portola Av. / Frank Sinatra Dr.	TS	1	3	d	1	3	0	1	2	1	1	2	1	24.5	23.1	C	C
5	Cook St. / Frank Sinatra Dr.	TS	2	2	0	2	3	1	2	2	1	2	2	1	12.3	25.4	B	C
6	Portola Av. / Retreat Cir. (N)	CSS	0	3	1	1	2	0	0	0	0	0	0	1	11.5	11.8	B	B
7	Portola Av. / Retreat Cir. (S)	CSS	0	3	0	0	2	0	0	0	0	0	0	1	11.4	11.7	B	B
8	Portola Av. / Willow Ridge	CSS	0	2	1	1*	2	0	0	0	0	1	0	d	16.3	16.7	C	C
9	Portola Av. / Country Club Dr.	TS	1	2	1	1	2	d	1	2	1	1	2	1	40.7	38.2	D	D
10	Portola Av. / South Access		Intersection Does Not Exist												-	-		
11	Cook St. / University Park Dr.	TS	1	3	1>>	2	3	1	1	1	1	1	1	1	5.8	5.7	A	A

<sup>1</sup> When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; >> = Free Right Turn Lane; d = Defacto Right Turn Lane; \* = Turn lane accommodated within two-way left-turn lane (TWLTL)

<sup>2</sup> Per the Highway Capacity Manual 6th Edition (HCM6), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

Delay and level of service is calculated using Synchro 11 analysis software.

<sup>3</sup> TS = Traffic Signal; CSS = Cross-Street Stop

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## 4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The Project is proposed to consist of 394 dwelling units but the traffic analysis includes 402 dwelling units (slightly more than shown on the site plan). The traffic analysis volumes are conservatively high and the analysis fully accounts for the Project. For the purposes of this analysis, it is assumed that the Project will be constructed within a single phase of development with a projected Opening Year of 2024. Project will have one right-out access (exit only) along Frank Sinatra Drive, one right-out access (exit only) along Portola Avenue, and one right-in/right-out/left-in access along Portola Avenue. Regional access to the project site is provided via the I-10 Freeway at Cook Street, Monterey Avenue, and Country Club Drive.

### 4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development.

Trip generation rates used to estimate Project traffic and a summary of the Project's trip generation are shown in Table 4-1. The trip generation rates are based upon data collected by the Institute of Transportation Engineers (ITE) for Multifamily Housing-Low Rise (ITE Land Use Code 220) land use in their published Trip Generation Manual, 11<sup>th</sup> Edition, 2021. (2) As shown on Table 4-1, the proposed Project is anticipated to generate a net total of 2,709 trip-ends per day with 161 AM peak hour trips and 205 PM peak hour trips.

### 4.2 PROJECT TRIP DISTRIBUTION

The trip distribution pattern for the proposed Project is depicted on Exhibit 4-1. The trip distribution has been developed based on past work experience in the vicinity of the Project site and refined to reflect the roadway network and the surrounding uses in the vicinity of the proposed Project as they exist today.

### 4.3 MODAL SPLIT

Although the use of public transit, walking, and/or bicycling have the potential to reduce Project-related traffic, such reductions have not been taken into considerations in this traffic study in order to provide a conservative analysis of the Project's potential to contribute to circulation system deficiencies.

### 4.4 TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project weekday ADT, AM peak hour, and PM peak hour peak hour intersection turning movement volumes are shown on Exhibit 4-2.

**TABLE 4-1: PROJECT TRIP GENERATION SUMMARY**

Trip Generation Rates <sup>1</sup>									
Land Use	ITE LU Code	Quantity <sup>2</sup>	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Multifamily Housing (Low-Rise)	220	402 DU	0.10	0.30	0.40	0.32	0.19	0.51	6.74

Trip Generation Results									
Land Use	ITE LU Code	Quantity <sup>2</sup>	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Multifamily Housing (Low-Rise)	220	402 DU	40	121	161	129	76	205	2,709

<sup>1</sup> Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition (2021).

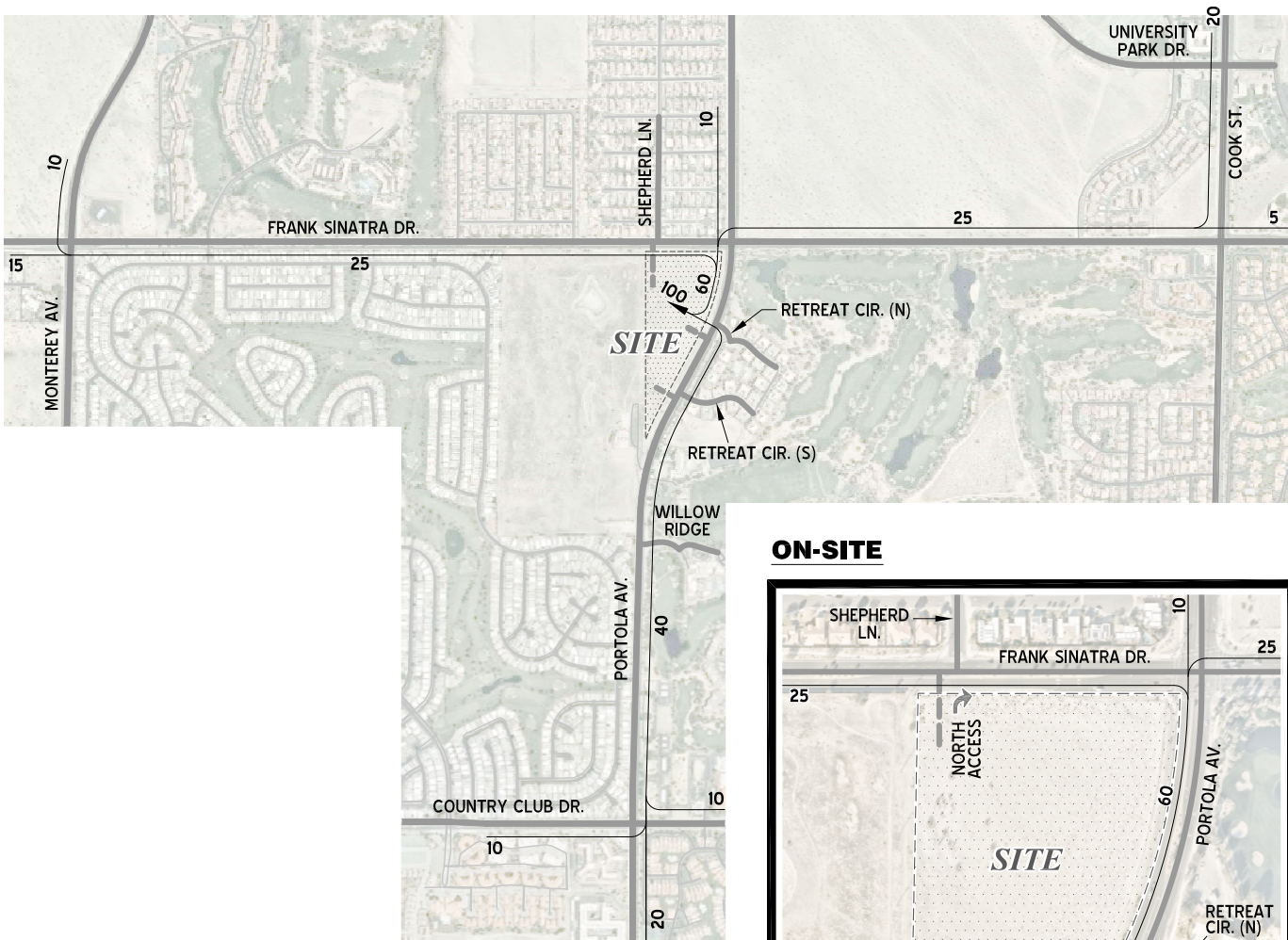
<sup>2</sup> DU = Dwelling Unit

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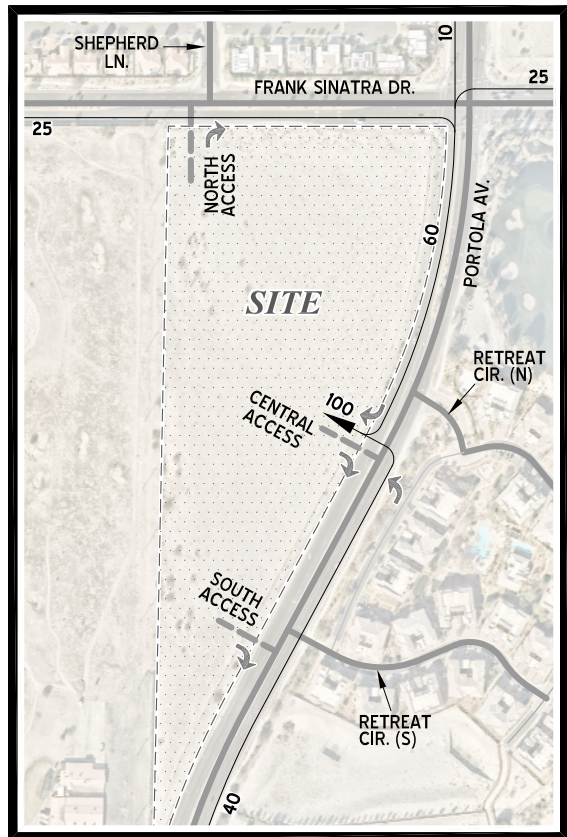




## EXHIBIT 4-1 (2 OF 2): PROJECT TRIP DISTRIBUTION (INBOUND)



### ON-SITE



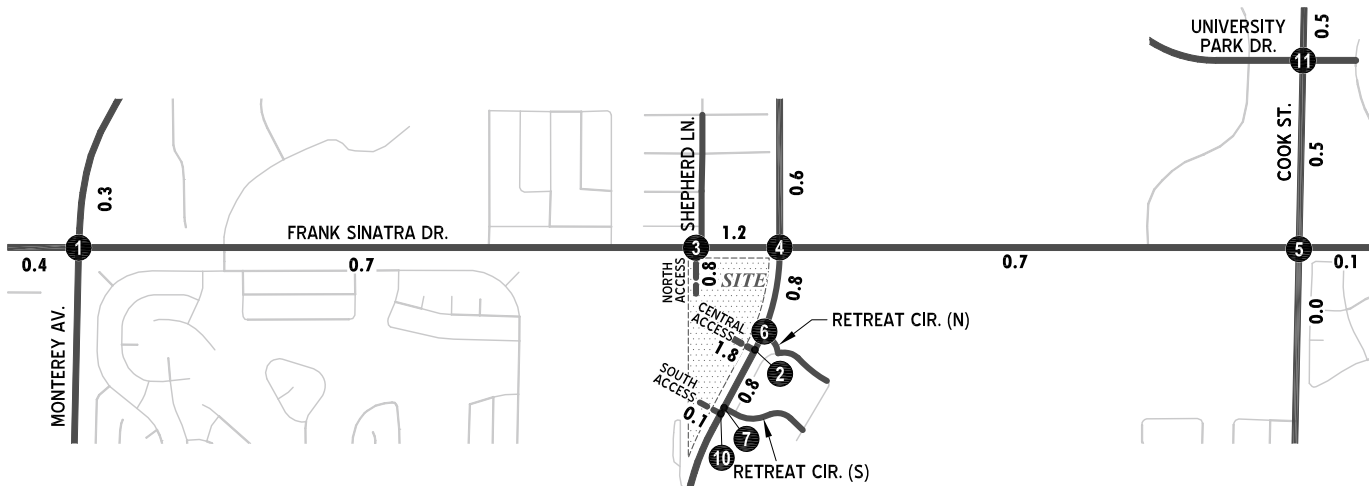
### LEGEND:

- 10 ■ PERCENT TO PROJECT
- FUTURE ROADWAY
- ↘ RIGHT-OUT ONLY (EXIT ONLY)
- ↘↘ RIGHT-IN/RIGHT-OUT/LEFT-IN ONLY

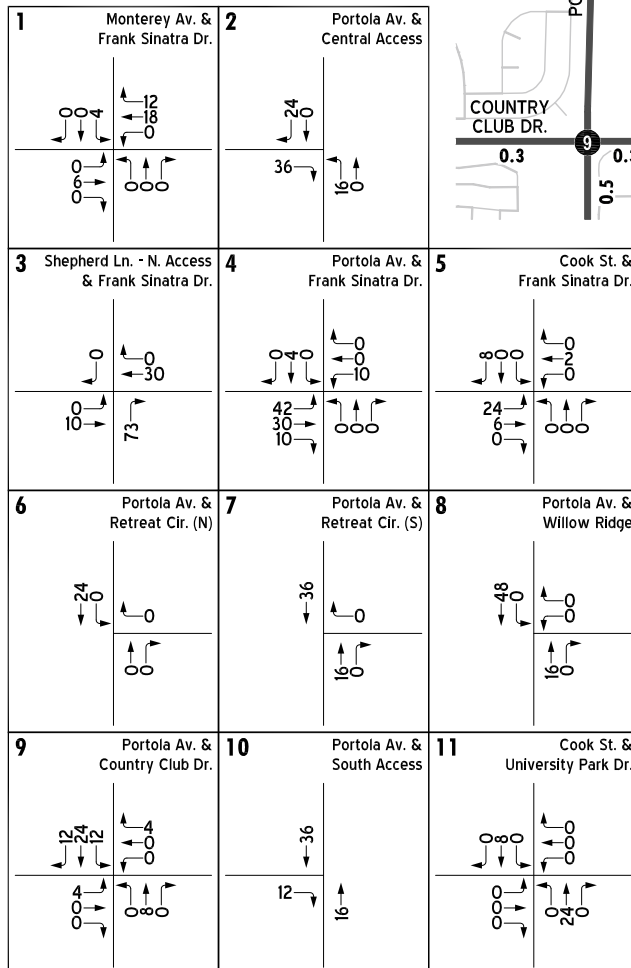




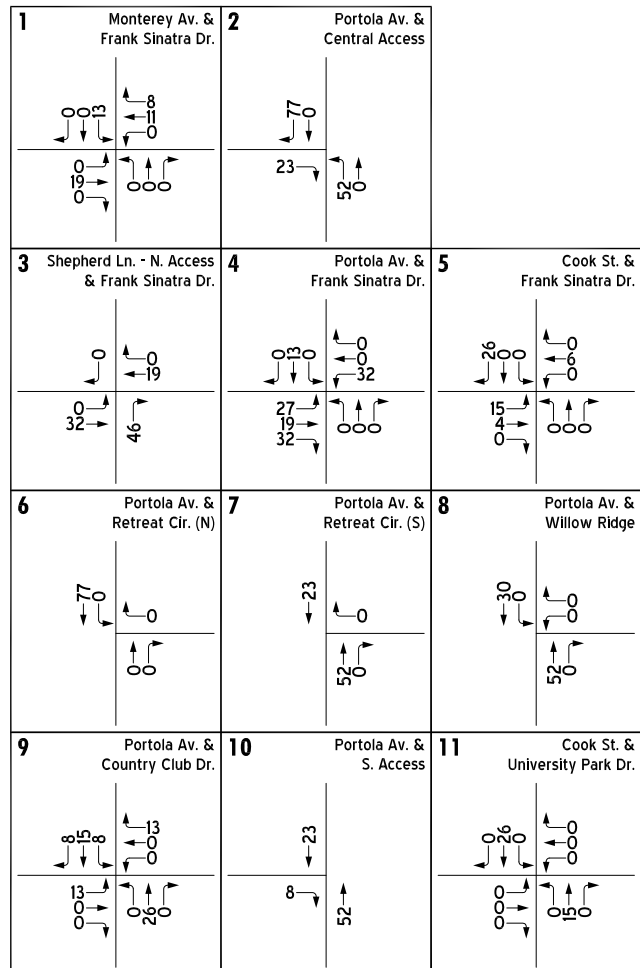
# EXHIBIT 4-2: PROJECT ONLY TRAFFIC VOLUMES



## AM PEAK HOUR



## PM PEAK HOUR



## 4.5 CUMULATIVE GROWTH TRAFFIC

### 4.5.1 AMBIENT GROWTH RATE

Future year traffic forecasts have been based upon background (ambient) growth at 4.04 percent (2 percent per year over 2 years) for EAP and EAPC traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies, for EAPC traffic conditions.

### 4.5.2 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Palm Desert.

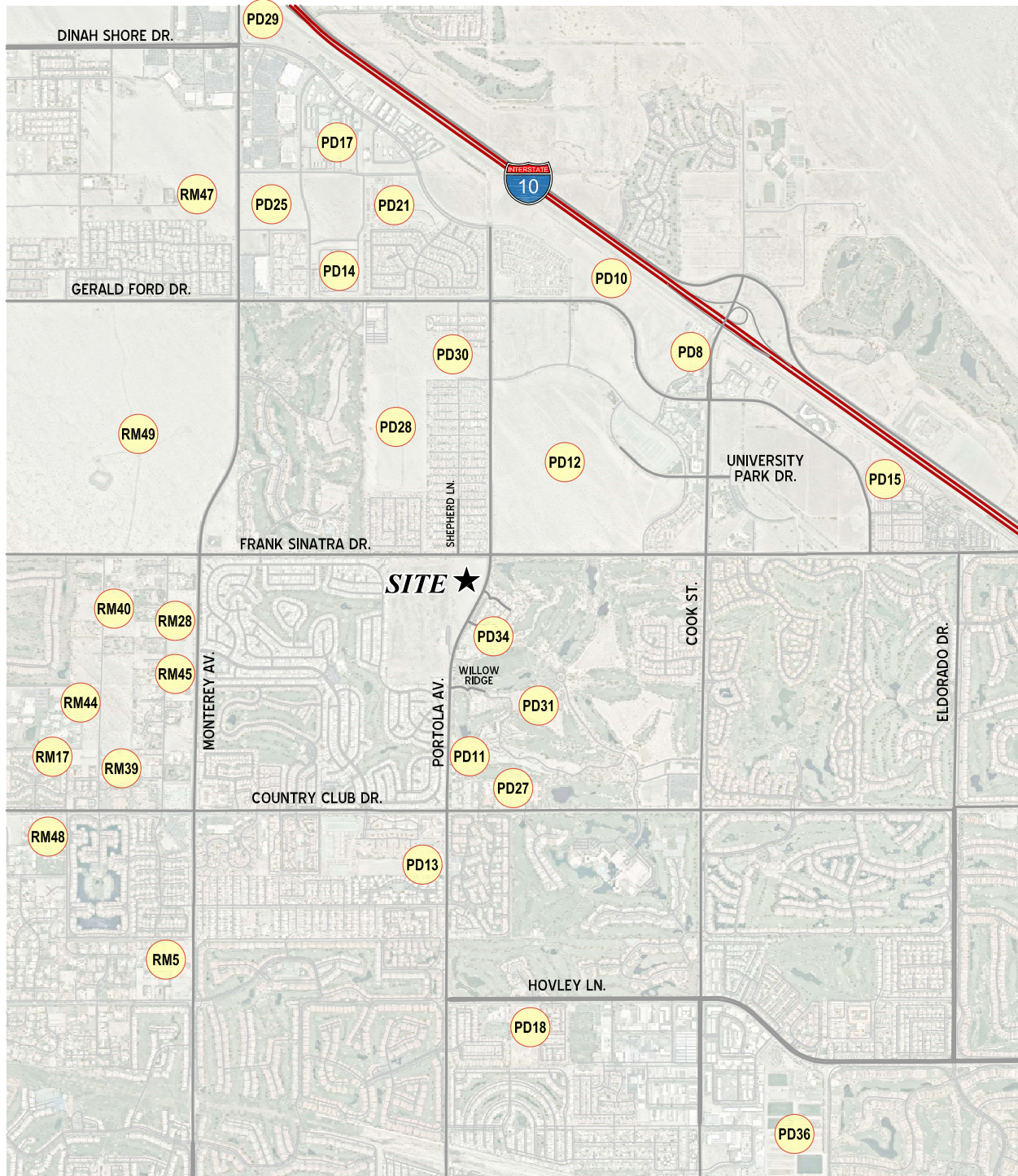
Exhibit 4-3 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown on Table 4-2. If applicable, the traffic generated by individual cumulative projects was manually added to the Opening Year Cumulative forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-2 are reflected as part of the background traffic.

### 4.5.3 NEAR-TERM TRAFFIC FORECASTS

The “buildup” approach combines existing traffic counts with a background ambient growth factor to forecast EAP (2024) and EAPC (2024) traffic conditions. An ambient growth factor of 2% per year accounts for background (area-wide) traffic increases that occur over time up to the year 2024 from the year 2022 (compounded 2% per year growth over a 2-year period). Project traffic is added to assess both forecast EAP (2024) and EAPC (2024) traffic conditions. Traffic volumes generated by cumulative development projects are not included in the EAP (2024) traffic conditions. The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- EAP (2024)
  - Existing 2022 volumes
  - Ambient growth traffic (4.04%)
  - Project Traffic
- EAPC (2024)
  - Existing 2022 volumes
  - Ambient growth traffic (4.04%)
  - Cumulative Development traffic
  - Project Traffic

## EXHIBIT 4-3: CUMULATIVE DEVELOPMENT LOCATION MAP



### LEGEND:

# = CUMULATIVE DEVELOPMENT ID



TABLE 4-2: CUMULATIVE DEVELOPMENT LAND USE SUMMARY

ID	Project Name	Land Use <sup>1</sup>	Quantity	Units <sup>2</sup>
<b>CITY OF PALM DESERT</b>				
PD8	Fairfield Inn & Suites Marriott Hotel	Hotel	108	RM
PD10	Millennium Palm Desert	SFDR	166	DU
		Multi-Family	612	DU
		Commercial	551.0	TSF
		Hotel	250	RM
PD11	Scotelle Office Building	Office	10.732	TSF
PD12	University Park	SFDR	773	DU
		Multi-Family	336	DU
PD13	Villa Portofino	Congregate Care	161	DU
		Assisted Living	150	Beds
		SFDR	288	DU
		Multi-Family	182	DU
PD14	Dolce	SFDR	159	DU
PD15	Spanish Walk	Multi-Family	150	DU
PD17	Falling Waters	SFDR	159	DU
PD18	The Sands Apartments	Apartments	142	DU
PD21	Ponderosa II	SFDR	111	DU
		Multi-Family	114	DU
PD25	Monterey Specific Plan	Multi-Family	384	DU
		Commercial	120.0	TSF
PD27	Wolff Cottages	Senior Adult Living	167.0	DU
PD28	Vitalia/Refuge Palm Desert Residential	SFDR	211	DU
		Rental Homes	165	DU
		Paired Housing	128	DU
		Apartments	270	DU
PD29	Monterey Crossings	Commercial	120.0	TSF
PD30	Santa Barbara Apartment	Multi-Family	48	DU
PD31	Desert Surf	Resort Hotel	350	RM
		Surf Lagoon	1350	Guests
		Shopping Center	4.0	TSF
		High-Turnover (Sit-Down) Restaurant	11.250	TSF
PD34	The Retreat at Desert Willow	Condominiums	112	DU
PD36	Laboratory/Office Space Building	Laboratory/Office Space	20.5	TSF
<b>CITY OF RANCHO MIRAGE</b>				
RM5	PDP 13003/FDP 13004	SFDR	32	DU
RM17	TTM 36623/PDP 14003	SFDR	17	DU
RM28	TTM 32308 (Los Ranchos)	SFDR	7	DU
RM39	TPM 34233	SFDR	4	DU
RM40	TPM 34741	SFDR	4	DU
RM44	TPM 36683	SFDR	1	DU
RM45	TPM 36849	SFDR	3	DU
RM47	Monterey Medical Center	Medical Office	75.164	TSF
RM48	Pulte Homes / Del Webb	Assisted Living	84	Beds
RM49	Section 31 Specific Plan	Hotel	400	RM
		Retail	175.0	TSF
		Multi-Family (Mid Rise)	832	DU
		Single Family	1100	DU

<sup>1</sup> SFDR = Single Family Detached Residential<sup>2</sup> DU = Dwelling Units; TSF = Thousand Square Feet; RM = Rooms

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## 5 EAP (2024) TRAFFIC CONDITIONS

This section discusses the methods used to develop Existing plus Ambient Growth plus Project (EAP) (2024) traffic conditions and the resulting peak hour intersection operations and traffic signal warrant analyses.

### 5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAP conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAP conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).

### 5.2 EAP (2024) TRAFFIC VOLUME FORECASTS

To account for background traffic growth, an ambient growth from Existing conditions of 4.04% (2 percent per year over 2 years, compounded annually) is included for EAP traffic conditions. Cumulative development projects are not included as part of the EAP analysis. EAP weekday ADT, weekday PM, and weekend peak hour intersection turning movement volumes are shown on Exhibit 5-1.

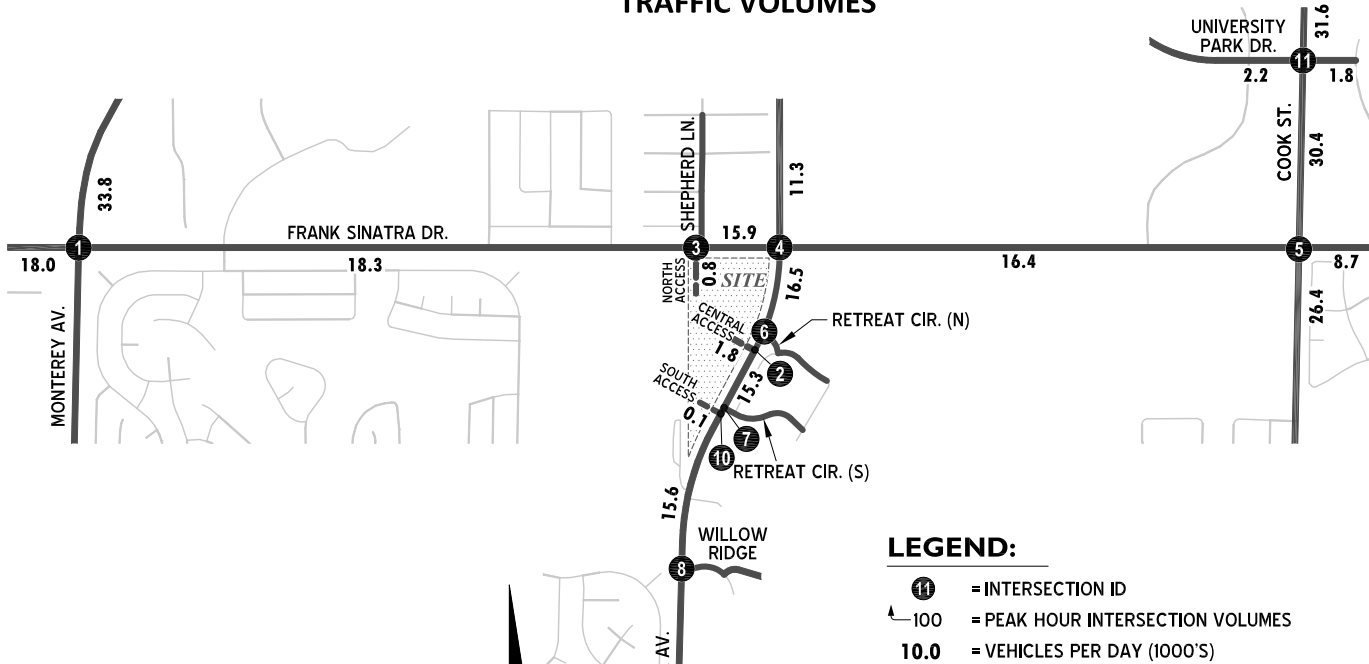
### 5.3 EAP (2024) INTERSECTION OPERATIONS ANALYSIS

EAP peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TA. The intersection analysis results are summarized in Table 5-1, which indicate that the study intersections are anticipated to continue to operate at an acceptable LOS (LOS "D" or better) with the addition of Project traffic. The intersection operations analysis worksheets for EAP traffic conditions is included in Appendix 5.1 of this TA.

### 5.4 EAP (2024) TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for EAP (2024) traffic conditions are based on estimated peak hour intersection turning volumes (see Appendix 3.3). For EAP (2024) traffic conditions, the unsignalized intersection of Portola Avenue / Willow Ridge is not anticipated warrant a traffic signal.

# EXHIBIT 5-1: EXISTING PLUS AMBIENT PLUS PROJECT (2024) TRAFFIC VOLUMES



## AM PEAK HOUR

<p><b>1</b> Monterey Av. &amp; Frank Sinatra Dr.</p> <p>96 1229 57 43 289 110 76 603 35 78 616 189</p>	<p><b>2</b> Portola Av. &amp; Central Access</p> <p>24 595 36 16 563</p>	<p>COUNTRY CLUB DR. 22.5 9 20.3</p>
<p><b>3</b> Shepherd Ln. - N. Access &amp; Frank Sinatra Dr.</p> <p>73 423 26 73 19 777</p>	<p><b>4</b> Portola Av. &amp; Frank Sinatra Dr.</p> <p>21 347 34 19 621 145 60 309 130 124 377 68</p>	<p><b>5</b> Cook St. &amp; Frank Sinatra Dr.</p> <p>409 1088 43 49 244 59 184 126 123 104 593 51</p>
<p><b>6</b> Portola Av. &amp; Retreat Cir. (N)</p> <p>619 3 9 559 4</p>	<p><b>7</b> Portola Av. &amp; Retreat Cir. (S)</p> <p>631 578 1</p>	<p><b>8</b> Portola Av. &amp; Willow Ridge</p> <p>620 34 21 32 553 29</p>
<p><b>9</b> Portola Av. &amp; Country Club Dr.</p> <p>54 458 80 89 713 166 46 372 157 206 431 139</p>	<p><b>10</b> Portola Av. &amp; South Access</p> <p>631 12 579</p>	<p><b>11</b> Cook St. &amp; University Park Dr.</p> <p>16 19 49 10 3 32 180 10 805</p>

## PM PEAK HOUR

<p><b>1</b> Monterey Av. &amp; Frank Sinatra Dr.</p> <p>63 1030 106 79 374 146 126 608 129 122 126 131</p>	<p><b>2</b> Portola Av. &amp; Central Access</p> <p>77 466 23 52 675</p>	<p><b>3</b> Shepherd Ln. - N. Access &amp; Frank Sinatra Dr.</p> <p>47 43 523 42 726 46</p>	<p><b>4</b> Portola Av. &amp; Frank Sinatra Dr.</p> <p>20 504 70 14 368 126 39 615 117 149 432 104</p>	<p><b>5</b> Cook St. &amp; Frank Sinatra Dr.</p> <p>216 786 41 176 44 360 271 141 124 918 77</p>	<p><b>6</b> Portola Av. &amp; Retreat Cir. (N)</p> <p>543 4 15 670 5</p>	<p><b>7</b> Portola Av. &amp; Retreat Cir. (S)</p> <p>489 726</p>	<p><b>8</b> Portola Av. &amp; Willow Ridge</p> <p>465 31 27 46 705 42</p>	<p><b>9</b> Portola Av. &amp; Country Club Dr.</p> <p>60 407 83 139 552 184 50 771 175 170 489 177</p>	<p><b>10</b> Portola Av. &amp; S. Access</p> <p>489 8 727</p>	<p><b>11</b> Cook St. &amp; University Park Dr.</p> <p>43 1032 46 58 17 49 4 31 43 1267 9</p>
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TABLE 5-1: INTERSECTION ANALYSIS FOR EAP (2024) CONDITIONS

#	Intersection	Traffic Control <sup>3</sup>	Intersection Approach Lanes <sup>1</sup>												Delay <sup>2</sup> (Secs)		Level of Service <sup>2</sup>	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
1	Monterey Av. / Frank Sinatra Dr.	TS	2	3	0	2	3	1	2	2	1	2	2	1	20.9	24.0	C	C
2	Portola Av. / Central Access	CSS	<u>1</u>	3	0	0	2	<u>1</u>	0	0	<u>1</u>	0	0	0	10.7	10.0	B	B
3	Shepherd Ln. - N. Access / Frank Sinatra Dr.	CSS	0	0	<u>1</u>	0	0	1	1	2	0	0	2	d	12.5	11.5	B	B
4	Portola Av. / Frank Sinatra Dr.	TS	1	3	d	1	3	0	1	2	1	1	2	1	28.8	25.8	C	C
5	Cook St. / Frank Sinatra Dr.	TS	2	2	0	2	3	1	2	2	1	2	2	1	16.4	30.0	B	C
6	Portola Av. / Retreat Cir. (N)	CSS	0	3	1	1	2	0	0	0	0	0	0	1	11.7	12.0	B	B
7	Portola Av. / Retreat Cir. (S)	CSS	0	3	0	0	2	0	0	0	0	0	0	1	11.6	12.2	B	B
8	Portola Av. / Willow Ridge	CSS	0	2	1	1*	2	0	0	0	0	1	0	d	17.3	18.4	C	C
9	Portola Av. / Country Club Dr.	TS	1	2	1	1	2	d	1	2	1	1	2	1	41.3	39.2	D	D
10	Portola Av. / South Access	CSS	0	3	0	0	2	0	0	0	<u>1</u>	0	0	0	10.6	10.0	B	B
11	Cook St. / University Park Dr.	TS	1	3	1>>	2	3	1	1	1	1	1	1	1	5.9	5.8	A	A

<sup>1</sup> When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; >> = Free Right Turn Lane; d = Defacto Right Turn Lane; \* = Turn lane accommodated within two-way left-turn lane (TWLTL)

1 = Improvement

<sup>2</sup> Per the Highway Capacity Manual 6th Edition (HCM6), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control.

For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

Delay and level of service is calculated using Synchro 11 analysis software.

<sup>3</sup> TS = Traffic Signal; CSS = Cross-Street Stop

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## 6 EAPC (2024) TRAFFIC CONDITIONS

This section discusses the methods used to develop Existing plus Ambient Growth plus Project plus Cumulative (EAPC) (2024) traffic conditions and the resulting peak hour intersection operations and traffic signal warrant analyses.

### 6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAPC conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAPC conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for EAPC conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

### 6.2 EAPC (2024) TRAFFIC VOLUME FORECASTS

To account for background traffic, other known cumulative development projects in the study area were included in addition to 4.04% of ambient growth for EAPC traffic conditions in conjunction with traffic associated with the proposed Project. EAPC weekday ADT, weekday PM, and weekend peak hour intersection turning movement volumes are shown on Exhibit 6-1.

### 6.3 EAPC (2024) INTERSECTION OPERATIONS ANALYSIS

EAPC peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TA. The intersection analysis results are summarized in Table 6-1, which indicate that the study area intersections are anticipated to continue to operate at acceptable LOS (LOS "D" or better) under EAPC conditions. The intersection operations analysis worksheets for EAPC traffic conditions is included in Appendix 6.1 of this TA.

### 6.4 EAPC (2024) TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for EAPC (2024) traffic conditions are based on estimated peak hour intersection turning volumes (see Appendix 3.3). For EAPC (2024) traffic conditions, the unsignalized intersection of Portola Avenue / Willow Ridge is not anticipated warrant a traffic signal.

### 6.5 PROJECT ACCESS INTERSECTION QUEUES

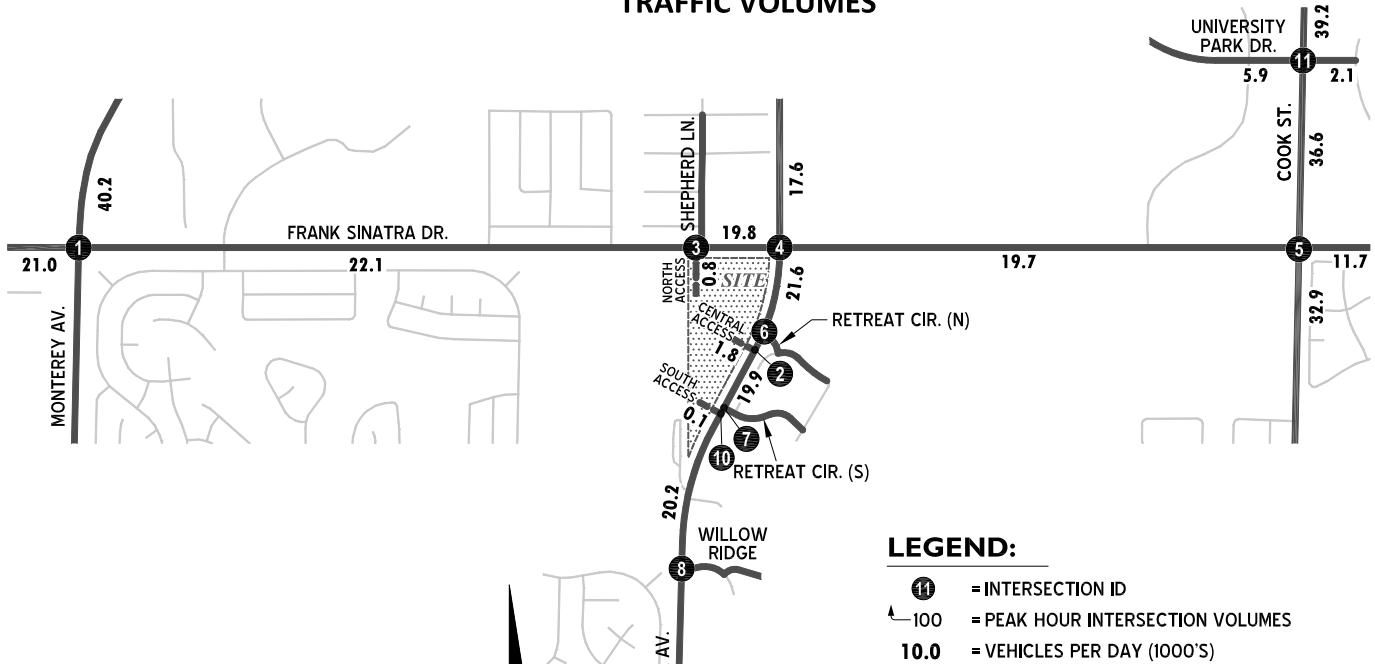
A queuing analysis was performed for EAPC (2024) conditions to assess the adequacy of turn bay lengths to accommodate vehicle queues at the Central Access Project entry. Queuing analysis findings are presented in Table 6-2 for EAPC (2024). Queueing analysis worksheets are provided in Appendix 6.1.

As shown in Table 6-2, the proposed Project turn bay lengths provide adequate storage to accommodate the anticipated 95<sup>th</sup> percentile queues.

For Portola at Central Access, the northbound left turn pocket is 200', whereas the maximum queue length is 38', so adequate storage is provided. For Portola at Retreat Circle North, the southbound left turn pocket is 100', whereas the maximum queue length is 37', so adequate storage is provided.

For eastbound left turns from Frank Sinatra Drive to Portola Avenue, the turn lane length is 120' and the maximum peak hour queue length is 121'. The maximum peak hour queue length is approximately equal to the storage provided.

# EXHIBIT 6-1: EXISTING PLUS AMBIENT PLUS PROJECT PLUS CUMULATIVE (2024) TRAFFIC VOLUMES



## AM PEAK HOUR

<p><b>1</b> Monterey Av. &amp; Frank Sinatra Dr.</p> <p>116, 1340, 86, 110, 708, 210, 53, 331, 129, 87, 705, 43</p>	<p><b>2</b> Portola Av. &amp; Central Access</p> <p>24, 750, 36, 16, 669</p>	
<p><b>3</b> Shepherd Ln. - N. Access &amp; Frank Sinatra Dr.</p> <p>73, 19, 921, 505, 73</p>	<p><b>4</b> Portola Av. &amp; Frank Sinatra Dr.</p> <p>76, 495, 62, 29, 701, 148, 79, 366, 132, 137, 483, 77</p>	<p><b>5</b> Cook St. &amp; Frank Sinatra Dr.</p> <p>412, 1255, 43, 49, 304, 67, 191, 217, 127, 106, 12, 56</p>
<p><b>6</b> Portola Av. &amp; Retreat Cir. (N)</p> <p>774, 5, 31, 665, 5</p>	<p><b>7</b> Portola Av. &amp; Retreat Cir. (S)</p> <p>786, 3, 682, 1</p>	<p><b>8</b> Portola Av. &amp; Willow Ridge</p> <p>775, 34, 32, 21, 657, 29</p>
<p><b>9</b> Portola Av. &amp; Country Club Dr.</p> <p>55, 604, 91, 101, 732, 209, 48, 401, 182, 256, 53, 227</p>	<p><b>10</b> Portola Av. &amp; South Access</p> <p>786, 12, 683</p>	<p><b>11</b> Cook St. &amp; University Park Dr.</p> <p>58, 1836, 49, 10, 3, 155, 718, 28, 913, 10</p>

## PM PEAK HOUR

<p><b>1</b> Monterey Av. &amp; Frank Sinatra Dr.</p> <p>78, 1220, 165, 137, 445, 160, 148, 715, 149, 148, 148, 153</p>	<p><b>2</b> Portola Av. &amp; Central Access</p> <p>77, 653, 23, 52, 902</p>	
<p><b>3</b> Shepherd Ln. - N. Access &amp; Frank Sinatra Dr.</p> <p>47, 43, 665, 42, 914, 46</p>	<p><b>4</b> Portola Av. &amp; Frank Sinatra Dr.</p> <p>65, 81, 88, 44, 471, 136, 100, 733, 126, 153, 651, 108</p>	<p><b>5</b> Cook St. &amp; Frank Sinatra Dr.</p> <p>224, 1016, 41, 307, 52, 364, 379, 144, 128, 174, 86</p>
<p><b>6</b> Portola Av. &amp; Retreat Cir. (N)</p> <p>730, 25, 20, 892, 10</p>	<p><b>7</b> Portola Av. &amp; Retreat Cir. (S)</p> <p>676, 2, 952, 1</p>	<p><b>8</b> Portola Av. &amp; Willow Ridge</p> <p>652, 31, 27, 46, 931, 42</p>
<p><b>9</b> Portola Av. &amp; Country Club Dr.</p> <p>62, 592, 98, 152, 584, 286, 52, 800, 233, 212, 709, 249</p>	<p><b>10</b> Portola Av. &amp; S. Access</p> <p>676, 8, 953</p>	<p><b>11</b> Cook St. &amp; University Park Dr.</p> <p>181, 1236, 46, 58, 26, 129, 65, 102, 1468, 9</p>

TABLE 6-1: INTERSECTION ANALYSIS FOR EAPC (2024) CONDITIONS

#	Intersection	Traffic Control <sup>3</sup>	Intersection Approach Lanes <sup>1</sup>												Delay <sup>2</sup> (Secs)		Level of Service <sup>2</sup>	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
1	Monterey Av. / Frank Sinatra Dr.	TS	2	3	0	2	3	1	2	2	1	2	2	1	24.1	40.4	C	D
2	Portola Av. / Central Access	<b>CSS</b>	<u>1</u>	3	0	0	2	<u>1</u>	0	0	<u>1</u>	0	0	0	11.5	10.8	B	B
3	Shepherd Ln. - N. Access / Frank Sinatra Dr.	CSS	0	0	<u>1</u>	0	0	1	1	2	0	0	2	d	13.6	12.7	B	B
4	Portola Av. / Frank Sinatra Dr.	TS	1	3	d	1	3	0	1	2	1	1	2	1	30.8	29.4	C	C
5	Cook St. / Frank Sinatra Dr.	TS	2	2	0	2	3	1	2	2	1	2	2	1	19.5	41.0	B	D
6	Portola Av. / Retreat Cir. (N)	CSS	0	3	1	1	2	0	0	0	0	0	0	1	12.7	14.6	B	B
7	Portola Av. / Retreat Cir. (S)	CSS	0	3	0	0	2	0	0	0	0	0	0	1	12.2	13.6	B	B
8	Portola Av. / Willow Ridge	CSS	0	2	1	1*	2	0	0	0	0	1	0	d	20.1	24.6	C	C
9	Portola Av. / Country Club Dr.	TS	1	2	1	1	2	d	1	2	1	1	2	1	45.4	44.4	D	D
10	Portola Av. / South Access	<b>CSS</b>	0	3	0	0	2	0	0	0	<u>1</u>	0	0	0	11.4	10.8	B	B
11	Cook St. / University Park Dr.	TS	1	3	1>>	2	3	1	1	1	1	1	1	1	16.4	11.0	B	B

<sup>1</sup> When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; >> = Free Right Turn Lane; d = Defacto Right Turn Lane; \* = Turn lane accommodated within two-way left-turn lane (TWLTL)

1 = Improvement

<sup>2</sup> Per the Highway Capacity Manual 6th Edition (HCM6), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control.

For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

Delay and level of service is calculated using Synchro 11 analysis software.

**BOLD** = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

<sup>3</sup> TS = Traffic Signal; CSS = Cross-Street Stop

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TABLE 6-2: EAPC (2024) PROJECT TURN LANE STORAGE LENGTHS

ID	Intersection	Turning Movement Lane	EAPC (2024)				Storage Length <sup>2</sup> (feet)	95th Percentile Queue Length Per Lane (feet) <sup>1</sup>	
			AM	PM	Peak Hour	Volume		AM	PM
2	Portola Av. / Central Access	NBL	16	52	PM	52	200	30	38
		SBR	24	77	PM	77	200	NOM <sup>3</sup>	NOM <sup>3</sup>
		EBR	36	23	AM	36	>50	34	31
3	Shepherd Ln. - N. Access / Frank Sinatra Dr.	NBR	73	46	AM	73	>75	53	70
4	Portola Av. / Frank Sinatra Dr.	EBL	79	100	PM	100	120	102	121
		EBR	132	126	AM	132	230	49	62
6	Portola Av. / Retreat Cir. (N)	SBL	5	25	PM	25	100	23	37
10	Portola Av. / South Access	EBR	12	8	AM	12	>75	33	27

<sup>1</sup> Queue length calculated using SimTraffic.<sup>2</sup> Proposed length of storage.<sup>3</sup> NOM = Nominal, average length less than 10 feet.

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## 7 SITE ACCESS AND SAFETY IMPROVEMENTS

The Portola/Frank Sinatra Residential Project is proposed to have one right-out access (exit only) along Frank Sinatra Drive, one right-out access (exit only) along Portola Avenue, and one right-in/right-out/left-in access along Portola Avenue, as indicated on previously presented Exhibit 1-4. Exhibit 1-4 shows Project access and site-adjacent improvements to be constructed in conjunction with development. Roadway improvements necessary to provide site access and on-site circulation are assumed to be constructed in conjunction with site development.

Shared sidewalks should be constructed along the Project frontage, consistent with General Plan Roadway Cross-sections. At each Project access, a crosswalk should be provided perpendicular to the driveway (along the major street). The sidewalk and crosswalk features provided in conjunction with development of this site will connect residents to the Portola Avenue/Frank Sinatra Drive intersection where safe street crossings are accommodating with the existing traffic signal and crosswalks. The transit services which are closest to the site are currently provided along Cook Street, and residents may choose to utilize the existing sidewalk along Frank Sinatra Drive east of Portola Avenue to access these services.

These improvements should be in place prior to occupancy:

**Portola Avenue & Central Access (#2)** – Install a stop control on the eastbound approach, provide crosswalk for north/south pedestrians on the Project side of Portola Avenue, and construct the intersection with the following geometrics:

- Provide a median opening along Portola Avenue at this location to accommodate a 200 ft. northbound left turn lane for the Project access.
- Provide one southbound right turn lane (200 ft.).
- Provide one eastbound right lane.

The recommended 200 ft. northbound left turn pocket and 200 ft. southbound right turn pocket adequately accommodates peak hour volumes for the Project. Exhibit 7-1 shows the proposed Project turn lanes and other conceptual striping features.

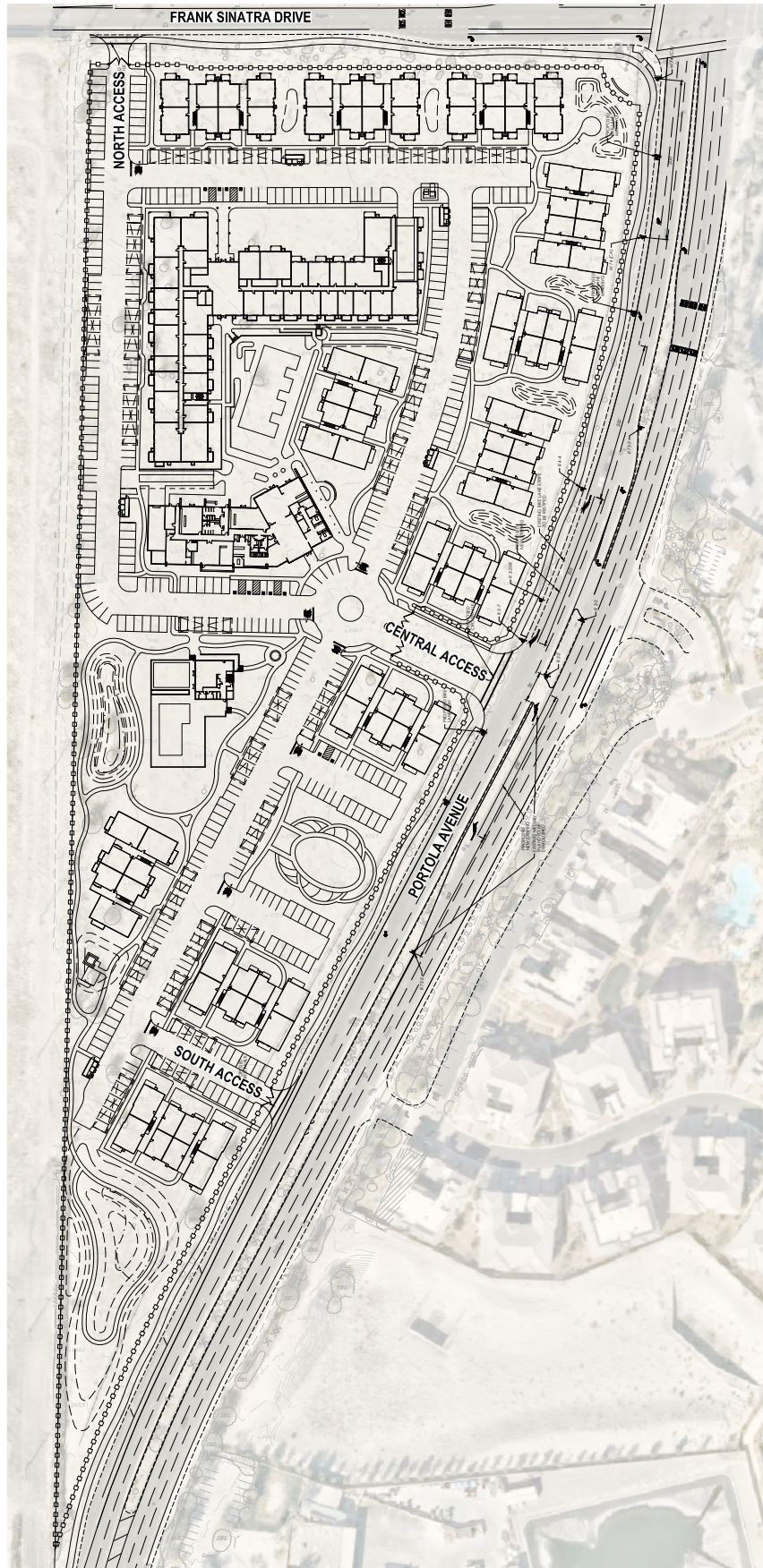
**North Access & Frank Sinatra Drive (#3)** – Construct the Project access as a right-out only access with crosswalk for east/west pedestrians on the Project side of Frank Sinatra Drive. Cross-street stop control on the northbound approach provides acceptable peak hour service levels.

**Portola Avenue & South Access (#10)** – Construct the Project access as a right-out only access with crosswalk for north/south pedestrians on the Project side of Portola Avenue. Cross-street stop control on the eastbound approach provides acceptable peak hour service levels.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site.

Sight distance at the project access points should be reviewed with respect to standard AASHTO sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

## EXHIBIT 7-1: CONCEPTUAL STRIPING PLAN





## 8 REFERENCES

1. **Riverside County Transportation Department.** *Transportation Analysis Guidelines for Level of Service & Vehicle Miles Traveled.* County of Riverside : s.n., December 2020.
2. **Institute of Transportation Engineers.** Trip Generation Manual. 11th Edition, 2021.
3. **Transportation Research Board.** *Highway Capacity Manual (HCM), 6th Edition.* s.l. : National Academy of Sciences, 2016.
4. **California Department of Transportation.** California Manual on Uniform Traffic Control Devices (MUTCD). [book auth.] California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CAMUTCD).* 2014.

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