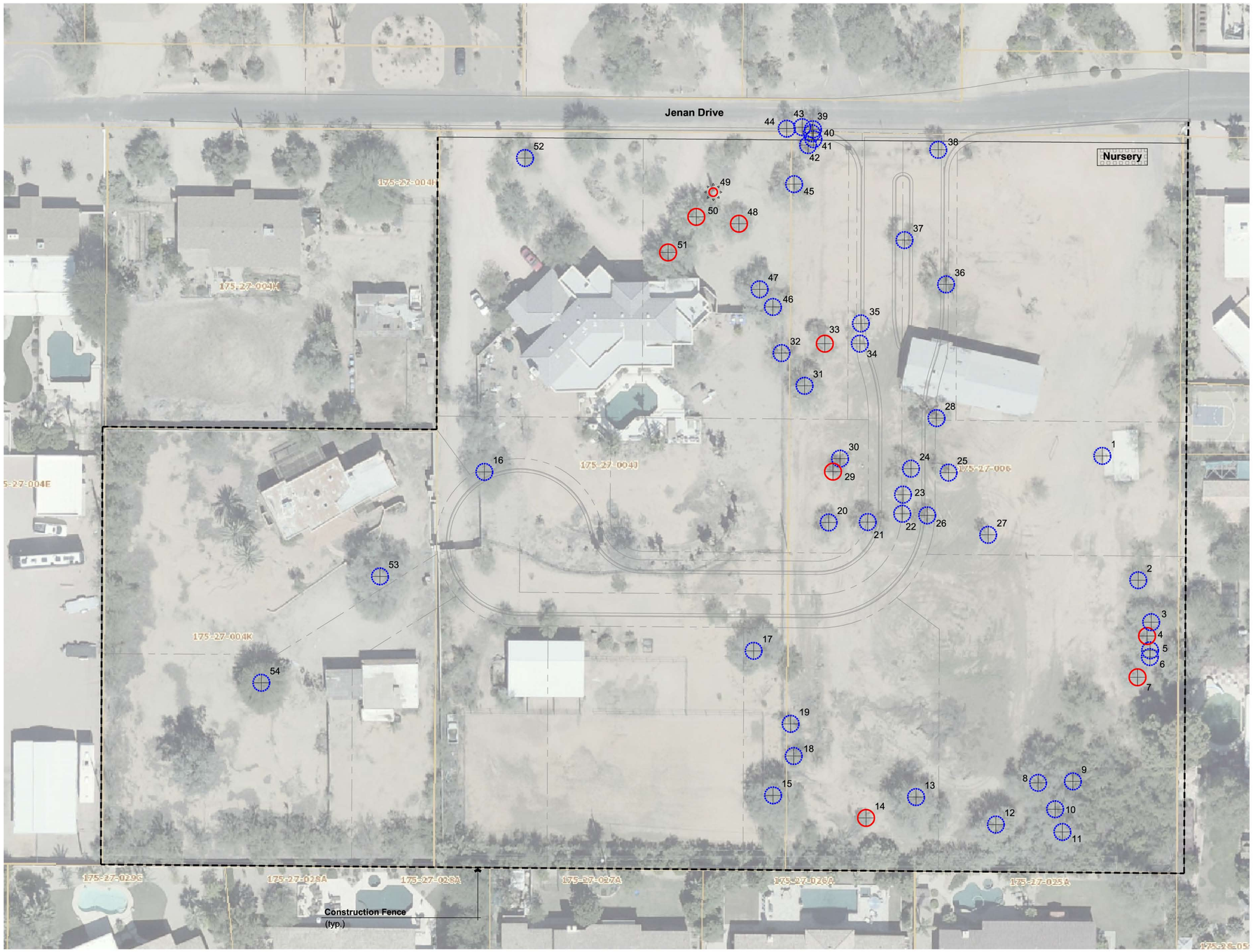
Archaeological Resources

Airport Vicinity Development Checklist

Parking Study

Trip Generation Comparison

Parking Master Plan




| Plant # | Common Name | Caliper (in)/ Height (ft) | Status | Comments |
|---|---|---|---|---|
| 1 | Mesquite | 4 | NS | Proximity to Concrete |
| 2 | Mesquite | 7 | NS | Cambium Damage |
| 3 | Mesquite | 9 | NS | Cambium Damage |
| 4 | Mesquite | 8 | S | |
| 5 | Mesquite | 4 | NS | Form / Leaning |
| 6 | Mesquite | 7 | NS | Cambium Damage / Leaning |
| 7 | Mesquite | 7 | S | |
| 8 | Mesquite | 24 | NS | Cambium Damage / Poor Structure |
| 9 | Mesquite | 14 | NS | Cambium Damage / Poor Structure |
| 10 | Mesquite | 4 | NS | Cambium Damage / Poor Structure |
| 11 | Mesquite | 20 | NS | Cambium Damage / Poor Structure |
| 12 | Mesquite | 22 | NS | Exposed Roots / Cambium Damage |
| 13 | Mesquite | 24 | NS | Cambium Damage |
| 14 | Mesquite | 4 | S | |
| 15 | Mesquite | 20 | NS | Proximity to Power Line |
| 16 | Mesquite | 12 | NS | Proximity to Wall |
| 17 | Mesquite | 16 | NS | Cambium Damage / Poor Structure |
| 18 | Mesquite | 6 | NS | Form / Poor Structure |
| 19 | Mesquite | 16 | NS | Cambium Damage / Poor Structure |
| 20 | Mesquite | 18 | NS | Cambium Damage / Poor Structure |
| 21 | Mesquite | 12 | NS | Cambium Damage / Poor Structure |
| 22 | Mesquite | 6 | NS | Cambium Damage / Poor Structure |
| 23 | Mesquite | 7 | NS | Cambium Damage |
| 24 | Mesquite | 22 | NS | Cambium Damage |
| 25 | Mesquite | 14 | NS | Cambium Damage / Leaning |
| 26 | Mesquite | 7 | NS | Form / Leaning |
| 27 | Mesquite | 7 | NS | Cambium Damage |
| 28 | Mesquite | 36 | NS | Cambium Damage |
| 29 | Mesquite | 7 | S | |
| 30 | Mesquite | 7 | NS | Cambium Damage |
| 31 | Mesquite | 14 | NS | Form / Leaning |
| 32 | Mesquite | 8 | NS | Form / Leaning |
| 33 | Mesquite | 10 | S | |
| 34 | Mesquite | 8 | NS | Cambium Damage |
| 35 | Mesquite | 8 | NS | Cambium Damage |
| 36 | Mesquite | 24 | NS | Cambium Damage |
| 37 | Mesquite | 12 | NS | Cambium Damage |
| 38 | Mesquite | 8 | NS | Cambium Damage / Leaning |
| 39 | Mesquite | 4 | NS | Form / Leaning |
| 40 | Mesquite | 7 | NS | Form / Leaning |
| 41 | Mesquite | 6 | NS | Cambium Damage / Poor Structure |
| 42 | Mesquite | 8 | NS | Form / Poor Structure |
| 43 | Mesquite | 4 | NS | Cambium Damage / Leaning |
| 44 | Mesquite | 8 | NS | Cambium Damage / Poor Structure |
| 45 | Mesquite | 12 | NS | Poor Structure / Cambium Damage |
| 46 | Mesquite | 16 | NS | Cambium Damage / Leaning |
| 47 | Mesquite | 12 | NS | Cambium Damage / Leaning |
| 48 | Mesquite | 10 | S | |
| 49 | Saguaro | 18 | S | |
| 50 | Blue Palo Verde | 15 | S | |
| 51 | Blue Palo Verde | 16 | S | |
| 52 | Mesquite | 10 | NS | Branch Dieback / Declining |
| 53 | Mesquite | 24 | NS | Cambium Damage |
| 54 | Mesquite | 18 | NS | Trunk Form / Poor Structure |

| Summary | Trees | Cacti | Legend |
|---|---|---|---|
| Salvageable | 8 | 1 | S = Salvageable |
| Non-Salvageable | 45 | 0 | NS = Non-Salvageable |
| Remain-In-Place | 0 | 0 | RIP = Remain-In-Place |
| Total | 53 | 1 | |

## Plant Legend

- Tree - Salvageable
- Tree - Non-Salvageable
- Tree - Remain In Place
- Cacti - Salvageable
- Cacti - Non-Salvageable
- Cacti - Remain In Place

## Project Consultants

Salvage Contractor

**Native Resources International**
1540 West Happy Valley Road
Phoenix, Arizona 85085
623-869-6757 (p) • 623-869-6769 (f)
Contact: Kevin Brenda - kevin@nativeresources.com

N

Scale: 1" = 30'

0 30 60

Native Resources Intl.
1540 W Happy Valley Rd.
Phoenix, AZ. 85027
Phone (623) 869-6757
Fax (623) 869-6769

# Jenan & 74th

7315 E. Jenan Drive
Scottsdale, Arizona

Native Plant Inventory Plan

DATE: 1/17/2020
REVISION:
SCALE: 1" = 20'
CHECKED:
DRAWN: KB
SHEET 1 OF 1

2-ZN-2020
1/28/2020

TRANSPORTATION IMPACT AND MITIGATION ANALYSIS

# Scottsdale Road and Jenan Drive

## Scottsdale, Arizona

Prepared for:

**Camelot Homes, Inc.**

Kimley»Horn

2-ZN-2020
1/28/2020

# TRANSPORTATION IMPACT AND MITIGATION ANALYSIS

# Scottsdale Road and Jenan Drive
## Scottsdale, Arizona

Prepared for:

Camelot Homes, Inc.
6607 N. Scottsdale Road, Suite H-100
Scottsdale, Arizona 85250

Prepared By:

Kimley-Horn and Associates, Inc.
7740 North 16th Street, Suite 300
Phoenix, Arizona 85020


291104071
November 2019


Kimley»Horn

2-ZN-2020
1/28/2020

## Contents

## Figures



## Tables

# 1.0 EXECUTIVE SUMMARY

## 1.1 INTRODUCTION

This report documents a traffic impact analysis performed for a proposed residential development on the south side of Jenan Drive between Scottsdale Road and 74th Place in Scottsdale, Arizona. The site will consist of 10 single-family detached housing units and is anticipated to be built out by 2020.

## 1.2 REPORT PURPOSE AND OBJECTIVES

Kimley-Horn and Associates, Inc., has been retained by Camelot Homes, Inc to perform the traffic impact analysis for the proposed development.

The purpose of this study is to address traffic and transportation impacts of the proposed development on surrounding streets and intersections. This traffic impact study was prepared based on criteria set forth by the City of Scottsdale Category 2 Traffic Impact and Mitigation Analysis (TIMA). The specific objectives of this study are:

- To evaluate lane requirements on all existing roadway links and at all existing intersections within the study area;
- To determine future level of service (LOS) for all existing intersections within the study area and recommend any capacity-related improvements;
- To determine necessary lane configurations at all new driveways within the proposed development in order to provide acceptable future levels of service;
- To evaluate the need for auxiliary lanes at all study area intersections; and
- To evaluate the need for future traffic signals.

## 1.3 PRINCIPAL FINDINGS AND RECOMMENDATIONS

The proposed development is expected to generate 96 daily trips, with 7 trips occurring in the AM peak hour and 10 trips occurring in the PM peak hour.

- The unsignalized intersections are expected to operate at a satisfactory LOS in 2020, with the exception of minor movements at the intersection of Scottsdale Road and Jenan Drive. Drivers are anticipated to use alternate routes which utilize adjacent signalized intersections to access the roadway network during these peak periods. It is anticipated that during non-peak periods the LOS of minor movements will improve.
- The site driveway operates at an acceptable level of service in 2020 total traffic conditions.
- The on-site storage at the site driveway is expected to be sufficient to accommodate projected site traffic volumes and satisfies the gated private street and driveway entrance requirements.

- It is recommended that site triangles be provided at all site access points to give drivers exiting the site a clear view of oncoming traffic. The landscaping within site triangles must not obstruct drivers' views of the adjacent travel lanes.

# 2.0 PROPOSED DEVELOPMENT

## 2.1 SITE LOCATION

The proposed development, a single-family detached housing development, is located on the south side of Jenan Drive between Scottsdale Road and 74th Place in Scottsdale, Arizona. The project location is shown in **Figure 1**.

## 2.2 LAND USE AND SITE PLAN

The overall development consists of 10 single-family dwelling units. The total site area is on approximately 5.7 acres. The layout of the site is illustrated in **Figure 2**.

## 2.3 SITE ACCESSIBILITY

The site is accessed locally via Scottsdale Road, Jenan Drive and 74th Place. Regional access is expected to be provided by Loop 101 and by other arterial streets in the vicinity such as Cactus Road and Shea Boulevard. The Loop 101 runs north-south and is located approximately two miles east of the site.

## 2.4 SITE CIRCULATION

The site plan is shown in previously referenced **Figure 2**. The site consists of one driveway. Driveway D1 is proposed as a full access driveway onto Jenan Drive approximately 1,150 feet east of Scottsdale Road. The proposed site is a cul-de-sac serving less than 25 single-family dwelling units, therefore, the City of Scottsdale Design Standards and Policies Section 5-3.800 criteria permits a single access development.

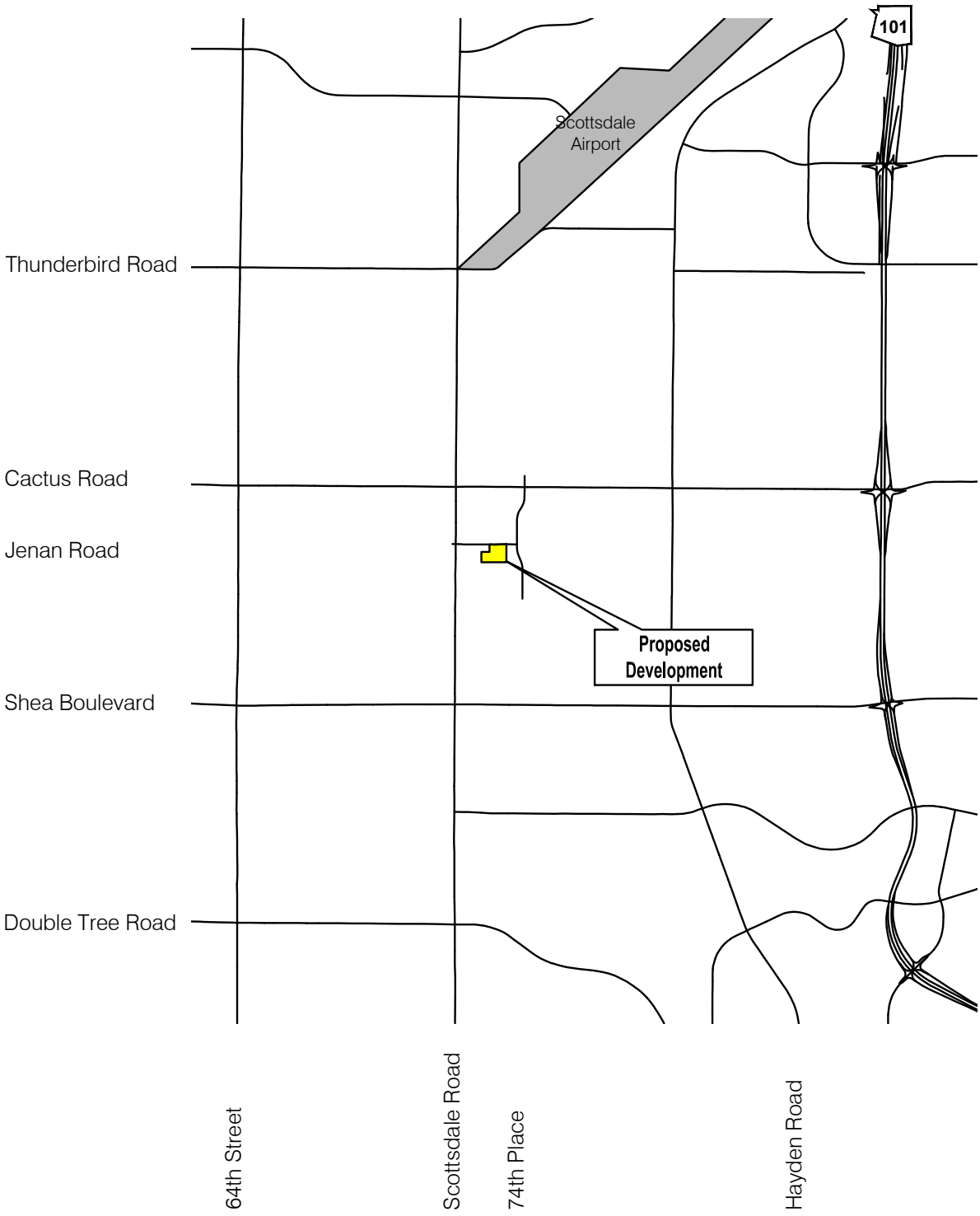



Figure 1
Vicinity Map

2-ZN-2020
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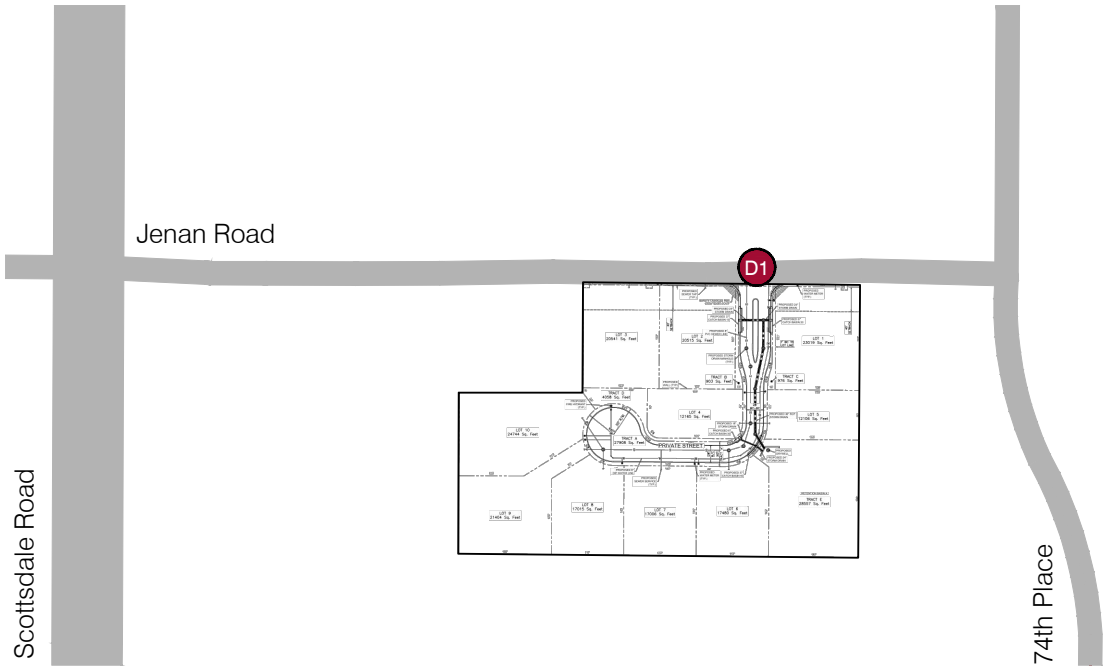



Figure 2
Site Plan

2-ZN-2020
1/28/2020

# 3.0 STUDY AREA

## 3.1 STUDY AREA

The study area includes the intersections of Scottsdale Road/Jenan Drive and 74th Place/Jenan Drive as well as the site driveway along Jenan Drive.

## 3.2 ADJACENT LAND USE

The area in the vicinity of the site contains a mix of land uses that is comprised primarily of residential, retail, and recreational land use types. The North Scottsdale United Methodist Church is located on the southeast corner of the intersection of Scottsdale Road and Jenan Drive. The WhizKidz Preschool occupies the northeast corner of the intersection of Scottsdale Road and Jenan Drive. The majority of the surrounding land uses are primarily single-family residential. The Loop 101 exists approximately two miles to the east of Scottsdale Road. The Scottsdale Airport exists approximately one and a half miles north of the site.

# 4.0 EXISTING CONDITIONS

## 4.1 PHYSICAL CHARACTERISTICS

The existing roadway network within the study area includes Scottsdale Road, Jenan Drive and 74th Place. The existing intersection lane use and traffic control is shown in **Figure 3**.

***Scottsdale Road*** currently extends north-south with three lanes in each direction with a raised center median. Curb, gutter and sidewalks exist on both sides of the roadway in the vicinity of the site. The posted speed limit is 45mph in both directions. The City of Scottsdale classifies Scottsdale Road as a major arterial suburban road in the vicinity of the site.

***Jenan Drive*** currently extends east-west in the vicinity of the site with one lane in each direction and a posted speed limit of 25mph.

***74th Place*** currently extends north-south in the vicinity of the site with one lane in each direction and a posted speed limit of 25 mph. Curb and gutter exists on both sides of the roadway in the vicinity of the site.

The existing intersections analyzed in this report are Scottsdale Road/Jenan Drive (stop-controlled in the east-west direction) and 74th Place/Jenan Drive (stop-controlled for the eastbound approach).

## 4.2 TRAFFIC VOLUMES

Turning movement counts were collected at the intersections of Scottsdale Road/Jenan Drive and 74th Place/Jenan Drive on Thursday, July 26, 2018. The counts were performed between 7:00 AM and 9:00 AM and between 4:00 PM and 6:00 PM. The results of these counts are shown in **Figure 3**. A copy of the counts is attached in the **Appendix.**

In addition to peak hour turning movement counts, 24-hour bidirectional volume counts were performed along Jenan Drive between Scottsdale Road and 74th Place on Thursday, July 26, 2018. A copy of the counts is attached in the **Appendix**.

## 4.3 LEVEL OF SERVICE

The LOS at the intersections of Jenan Drive with Scottsdale Road and 74th Place was evaluated using the traffic counts collected on Thursday, July 26, 2018. The LOS for the intersections was evaluated using the *Highway Capacity Manual 6th Edition* methodology for unsignalized intersections. The existing intersection geometry and control, shown in **Figure 3**, was used to obtain the LOS. The results of this analysis are shown in **Table 1**.

**Table 1. Existing Level of Service: Unsignalized Intersections**

| Intersection | NB | | | SB | | | EB | | | WB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R | L | T | R |
| *Scottsdale Road and Jenan Drive* | | | | | | | | | | | | |
| AM Peak | C | A | | C | A | | F | | | F | | B |
| PM Peak | A | A | | D | A | | F | | | F | | C |
| *74th Place and Jenan Drive* | | | | | | | | | | | | |
| AM Peak | A | | | A | | | A | | | - | | |
| PM Peak | A | | | A | | | A | | | - | | |

The existing unsignalized intersections operate at an acceptable level of service with the exception of the westbound left/through movement and the eastbound left-turn movement at the intersection of Scottsdale Road and Jenan Drive during the peak hours. Drivers are anticipated to use alternate routes which utilize adjacent signalized intersections to access the roadway network during these peak periods. It is anticipated that during non-peak periods the LOS of the minor movements will improve.

## 4.4 CRASH DATA

Crash data at the intersection of Scottsdale Road and Jenan Drive was obtained from the City of Scottsdale for September 2015 through January 2018. The crash data is included in the **Appendix**.

Based on the crash data obtained from the City of Scottsdale, there were eight crashes reported at the intersection of Scottsdale Road and Jenan Drive over the three year period. There was one non-incapacitating injury. One crash was a front to side angle crash, five were rear end crashes, one was a same direction sideswipe, and one was a rear-to-side crash.

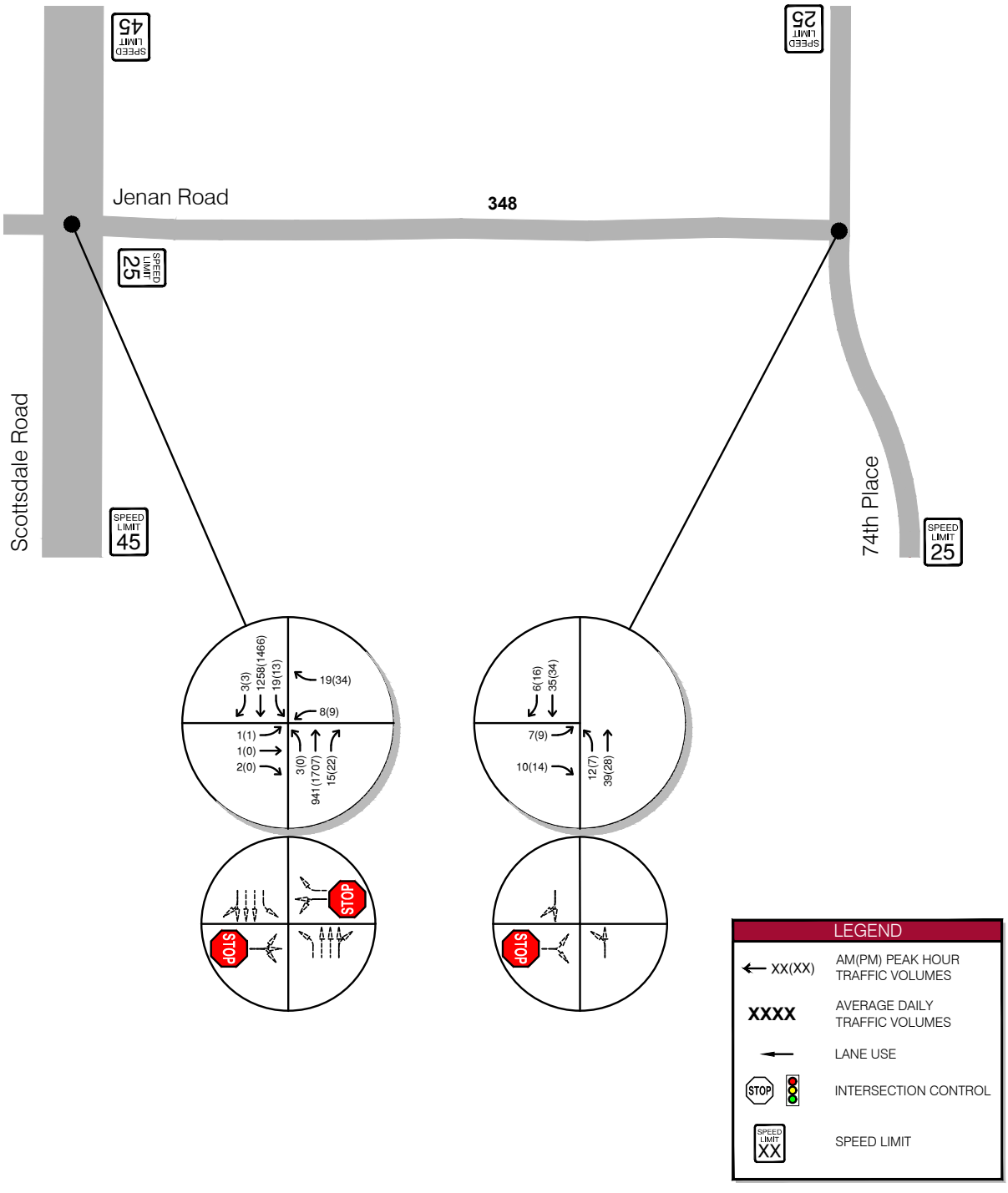



Figure 3
Existing Conditions

2-ZN-2020
1/28/2020

# 5.0 PROJECTED TRAFFIC

## 5.1 SITE TRAFFIC FORECASTS

### 5.1.1 TRIP GENERATION COMPARISON

The Institute of Transportation Engineers' (ITE) *Trip Generation, 10th Edition,* was used to obtain daily and peak-hour trip generation rates and inbound-outbound percentages, which were then used to estimate the number of daily and peak hour trips that can be attributed to the proposed development. The trip generation characteristics of the site are summarized in **Table 2**.

**Table 2. Trip Generation**

| Land Use | ITE Code | Quantity | Units | Daily Total | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | In | Out | Total | In | Out | Total |
| Single-family detached housing | 210 | 10 | DUs | 96 | 2 | 5 | 7 | 6 | 4 | 10 |

The proposed development is expected to generate 96 daily trips, with 7 trips occurring in the AM peak hour and 10 trips occurring in the PM peak hour.

### 5.1.2 TRIP DISTRIBUTION

Distribution percentages for the site-generated traffic were developed based on the surrounding roadway system, population density, existing average daily traffic (ADT) volumes, and land uses in the vicinity of the project site. The trip distribution is shown in **Figure 4**.

### 5.1.3 TRAFFIC ASSIGNMENT

Trips generated by the proposed development were assigned to the roadway network on the basis of the trip distribution and the likely travel patterns to and from the site. **Figure 5** shows the results of the traffic assignment.

## 5.2 FUTURE TRAFFIC FORECASTING

The background traffic volumes for the buildout year 2020 were calculated based on 2016 traffic counts and the calculated annual traffic growth rate. **Table 3** shows the closest available average daily traffic (ADT) volumes in the vicinity of the site and the corresponding growth rate. The 2016 counts were taken from the City of Scottsdale ADT count map, and the projected 2030 volumes were taken from the City of Scottsdale Transportation Master Plan (TMP).

**Table 3. Traffic Growth**

| Roadway | 2016 ADT (vehicles per day, both directions) | 2030 ADT (vehicles per day, both directions) | Average Annual Growth |
|---|---|---|---|
| Scottsdale Road | 38,800 | 45,000 | 1.1% |

On the basis of the above growth rates, a conservative annual growth rate of 2.0 percent per year was applied to the existing turning movements to obtain background traffic volumes for the year 2020. The resulting 2020 background traffic volumes are shown in **Figure 6**.

## 5.3 TOTAL TRAFFIC

The results of the traffic assignment were added to the year 2020 background traffic volumes shown in **Figure 6** to produce total traffic volumes for the study area. These total traffic volumes are shown in **Figure 7**.

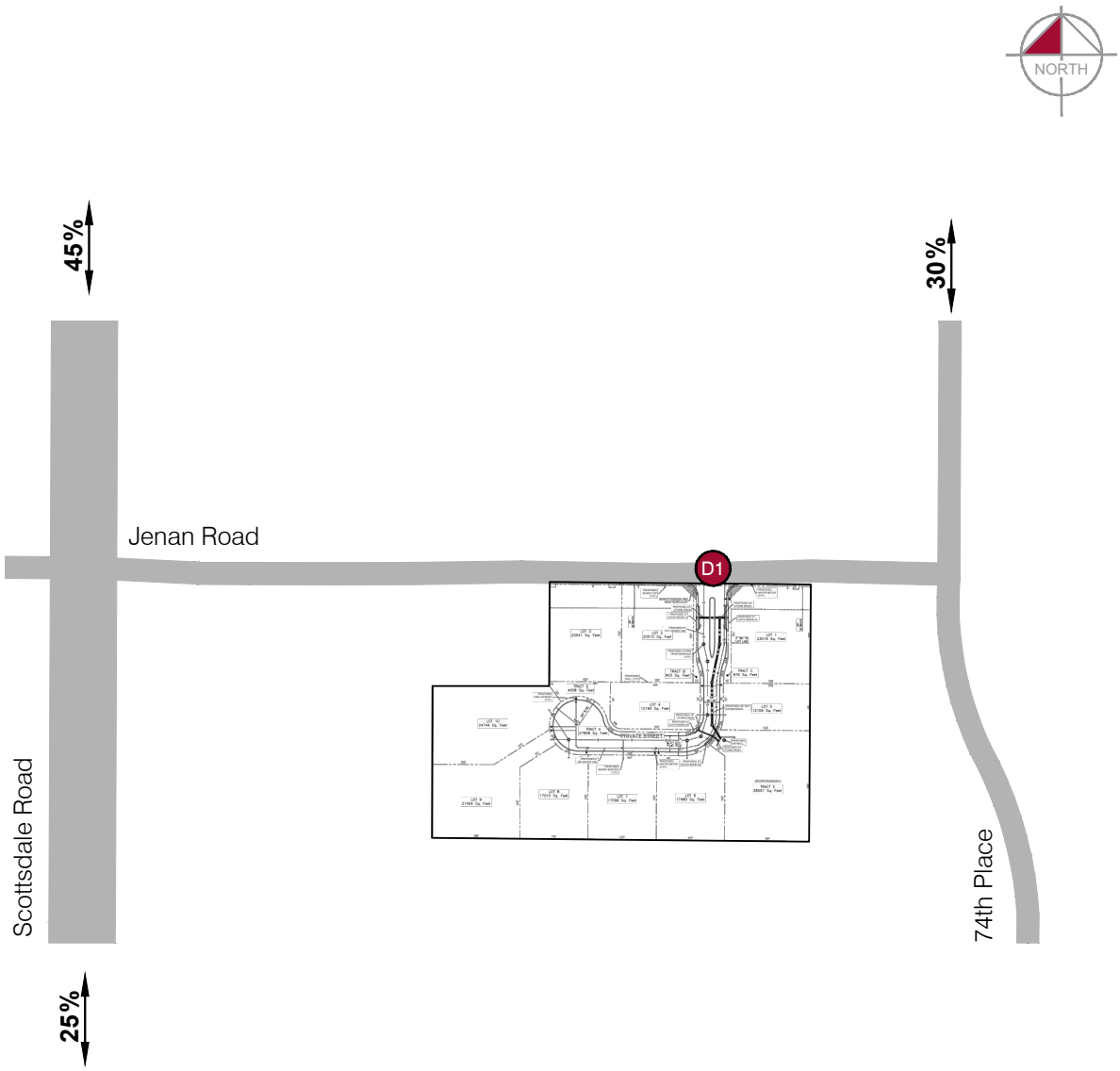



Figure 4
Trip Distribution

2-ZN-2020
1/28/2020

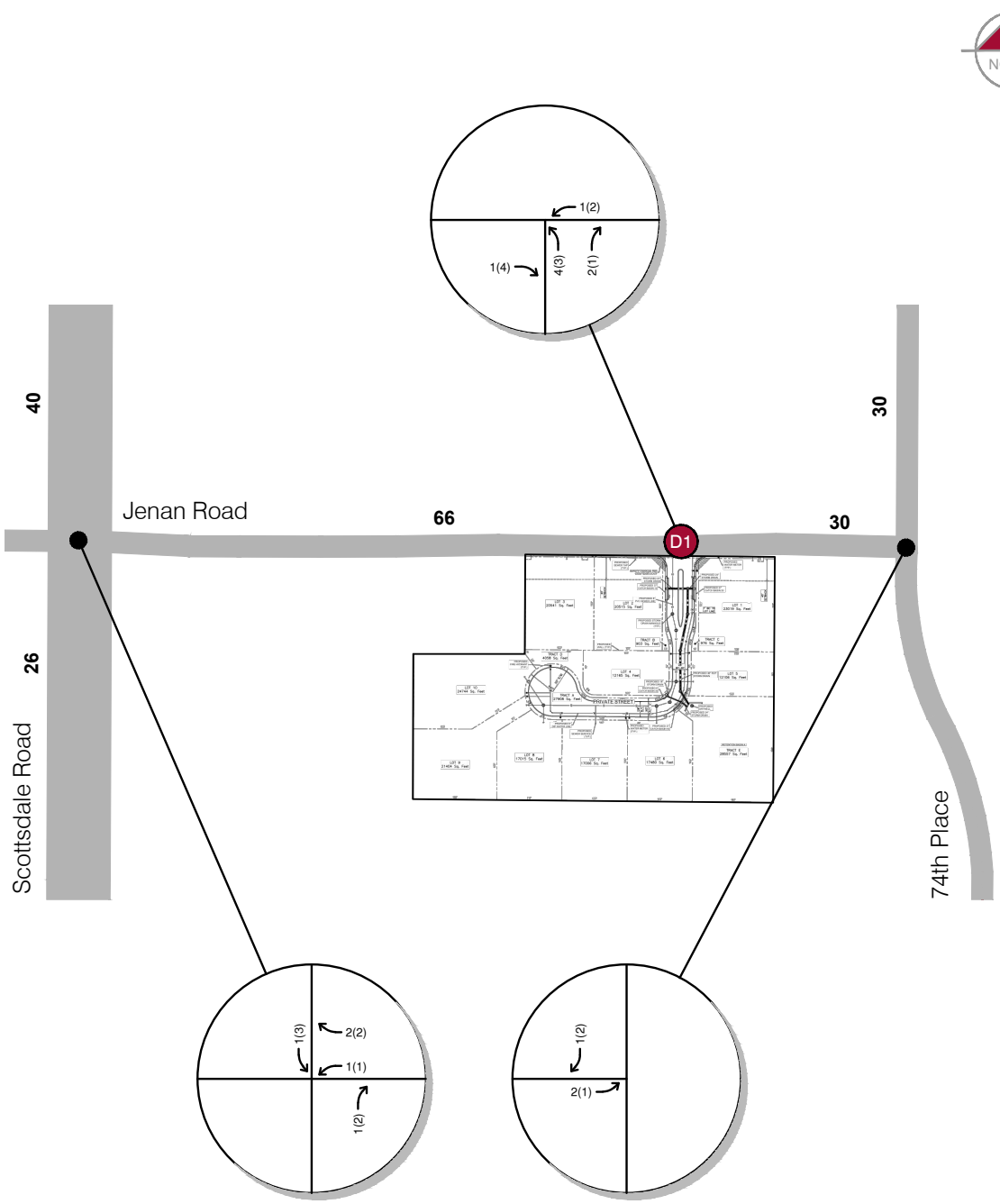



Figure 5
Site Traffic Assignment

2-ZN-2020
1/28/2020

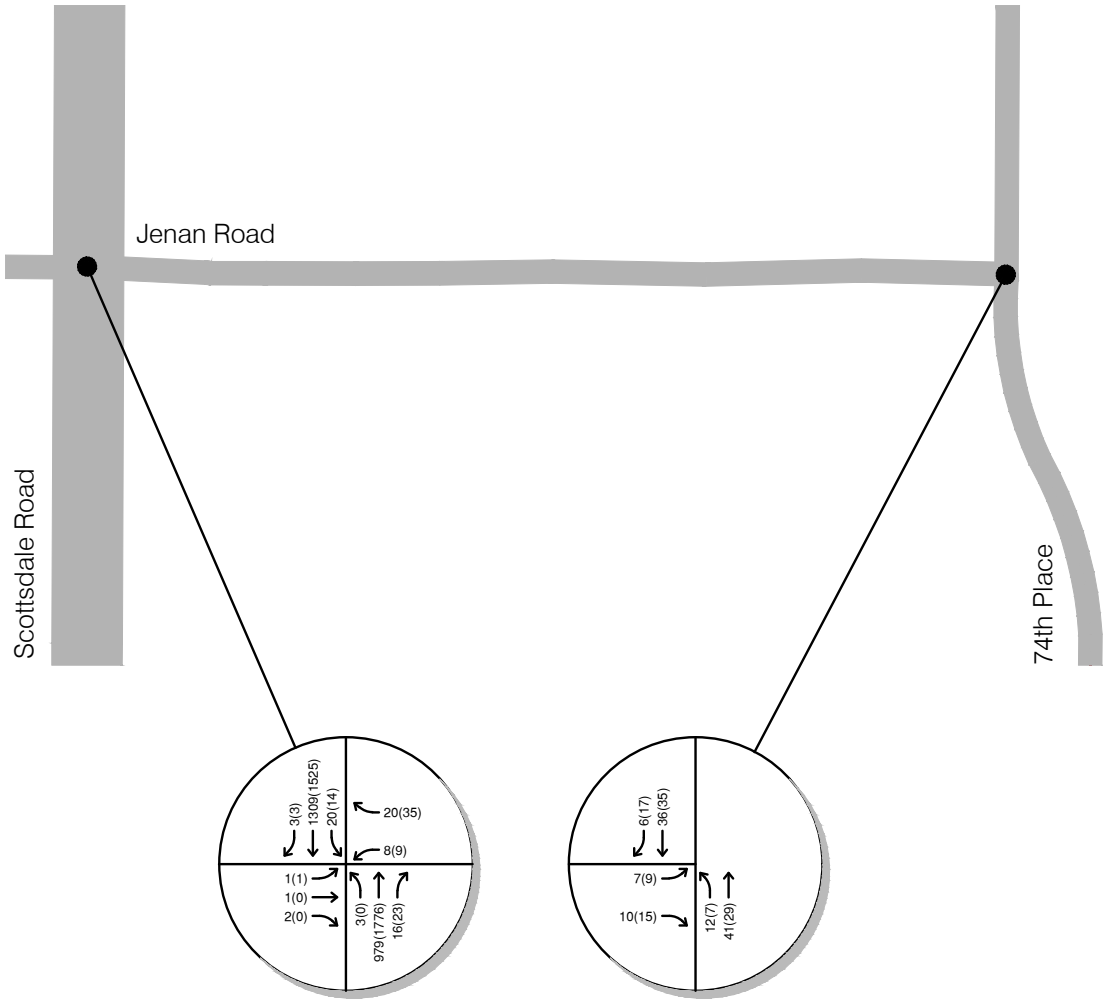



Figure 6
2020 Background Traffic

2-ZN-2020
1/28/2020

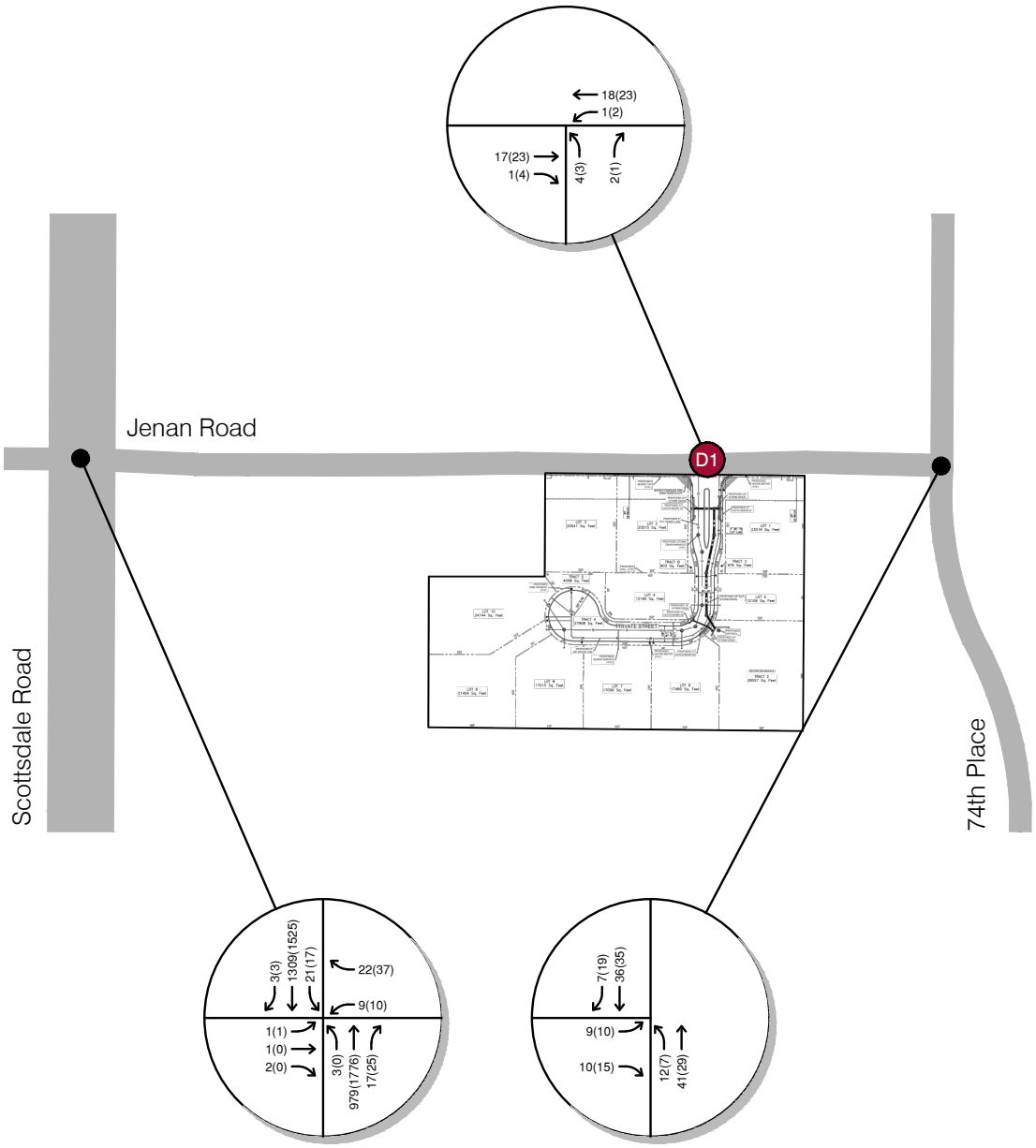



Figure 7
2020 Total Traffic

2-ZN-2020
1/28/2020

# 6.0 TRAFFIC AND IMPROVEMENT ANALYSIS

## 6.1 LEVEL OF SERVICE ANALYSIS

The LOS for the study area intersections for 2020 was evaluated using the *Highway Capacity Manual 6th Edition* methodology for unsignalized intersections using *Synchro 10* analysis software. LOS analysis worksheets are included in the **Appendix**.

### 6.1.1 2020 BACKGROUND TRAFFIC LEVEL OF SERVICE ANALYSIS

The unsignalized intersections in the study area were evaluated on the basis of the 2020 background traffic shown in **Figure 6**, and the existing geometry shown in **Figure 3**. The results of the analysis for the unsignalized intersections is shown in Error! Reference source not found..

**Table 4. 2020 Background Level of Services: Unsignalized Intersections**

| Intersection | NB | | | SB | | | EB | | | WB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R | L | T | R |
| *Scottsdale Road and Jenan Drive* | | | | | | | | | | | | |
| AM Peak | C | A | | C | A | | F | | | F | | B |
| PM Peak | A | A | | D | A | | F | | | F | | C |
| *74th Place and Jenan Drive* | | | | | | | | | | | | |
| AM Peak | A | | | A | | | A | | | - | - | - |
| PM Peak | A | | | A | | | A | | | - | - | - |

The unsignalized intersections are expected to operate at a satisfactory LOS in 2020, with the exception of the westbound left/through movement and the eastbound left-turn movement at the intersection of Scottsdale Road/Jenan Drive during the peak hours. Drivers are anticipated to use alternate routes which utilize adjacent signalized intersections to access the roadway network during these peak periods. It is anticipated that during non-peak periods the LOS of the minor movements will improve.

### 6.1.1 2020 TOTAL TRAFFIC LEVEL OF SERVICE ANALYSIS

The unsignalized intersections in the study area were evaluated on the basis of the 2020 total traffic shown in **Figure 7**, and the recommended geometry shown in **Figure 8**. The results of the analysis for the unsignalized intersections and site driveway are shown in **Table 5.** 2020 Total Traffic Level of Service: Unsignalized Intersections

.

**Table 5. 2020 Total Traffic Level of Service: Unsignalized Intersections**

| Intersection | NB | | | SB | | | EB | | | WB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R | L | T | R |
| *Scottsdale Road and Jenan Drive* | | | | | | | | | | | | |
| AM Peak | C | A | | C | A | | F | | | F | | B |
| PM Peak | A | A | | D | A | | F | | | F | | D |
| *74th Place and Jenan Drive* | | | | | | | | | | | | |
| AM Peak | A | | | A | | | A | | | - | - | - |
| PM Peak | A | | | A | | | A | | | - | - | - |
| *Driveway D1 and Jenan Drive* | | | | | | | | | | | | |
| AM Peak | A | | | - | - | - | - | A | | A | | - |
| PM Peak | A | | | - | - | - | - | A | | A | | - |

The unsignalized intersections' level of service results are essentially the same as in the 2020 background traffic condition.

The site driveway is expected to operate at an acceptable LOS in 2020 total traffic conditions.

## 6.2 LEFT-TURN STORAGE ANALYSIS

The Institute of Transportation Engineers, *Manual of Transportation Studies 2nd Edition* recommends a left turn lane when Figure 5-21 Suggested Warrants for Isolated Left-Turn Bays criteria is met. The criteria states that a left turn is to be provided when the left turn peak hour volume and the directional single lane volume is equal to or greater to the volume in the Figure 5.21 Suggested Warrants for Isolated Left-Turn Bays. Review of the 2020 total traffic volumes reveals that left turn lane warrants are met at Scottsdale Road and Jenan Drive.

The unsignalized intersection of Scottsdale Road and Jenan Drive was analyzed to determine the left-turn storage needed to accommodate the expected traffic volumes in the year 2020. The calculations associated with these conclusions are included in the **Appendix**. The recommended storage lengths shown in **Table 6** are based on total traffic volumes shown in **Figure 7**.

**Table 6. Left Turn Storage**

| Intersection and Approach | *Existing* | Recommended |
|---|---|---|
| *Scottsdale Road and Jenan Drive* | | |
| - Northbound Approach | 145 feet | 100 feet* |
| - Southbound Approach | 125 feet | 100 feet* |

*Calculated value less than existing.

The existing left turn lane storage is expected to accommodate the 2020 total traffic volumes.

## 6.4 RIGHT-TURN LANES

Right-turn lanes are often recommended on roadways where right-turning vehicles create delays or safety problems for other traffic movements. The need for a right-turn lane depends on the speed of traffic on the road, the volume of traffic turning right, and the through traffic volume in the same lane as the right-turning traffic.

### 6.4.1 INTERSECTIONS

The City of Scottsdale Design Standards and Policies Manual Section 5-3.123 recommends a right-turn lane is required at all street intersections (public or private) on major arterials. Although warranted, the site generated right turns utilizing the existing right turn access from Scottsdale Road onto Jenan Drive is not expected to contribute significant volumes requiring the implementation of a right-turn lane.

The northbound right-turn movement at the intersection of Scottsdale Road and Jenan Drive is expected to operate at an acceptable LOS in 2020 and the increase in northbound right-turns due to the proposed development is expected to be nominal; therefore, a northbound right-turn lane at Scottsdale Road/Jenan Drive is not recommended.

### 6.4.2 DRIVEWAY

The City of Scottsdale recommends a right-turn deceleration lane at site driveways when the following criteria is met:

- At least 5,000 vehicles per day are expected to use the street;
- The 85$^{th}$ percentile traffic speed on the street is at least 35 miles per hour;
- At least 30 vehicles will make right turns into the driveway during a one hour period.

Review of the 2020 total traffic volumes reveals that a right turn deceleration lane is not warranted at the site driveway.

## 6.5 SITE CIRCULATION

In order to provide smooth ingress and egress to the proposed development, all site driveways should be constructed with appropriate throat lengths. Provision of sufficient throat lengths at all site driveways will prevent entering vehicles from obstructing traffic flow on the adjacent public street system and provide adequate on-site storage for exiting vehicles. Based on queuing analysis for unsignalized intersections, the recommended on-site storage lengths are summarized in **Table 7.**

**Table 7. On-Site Storage**

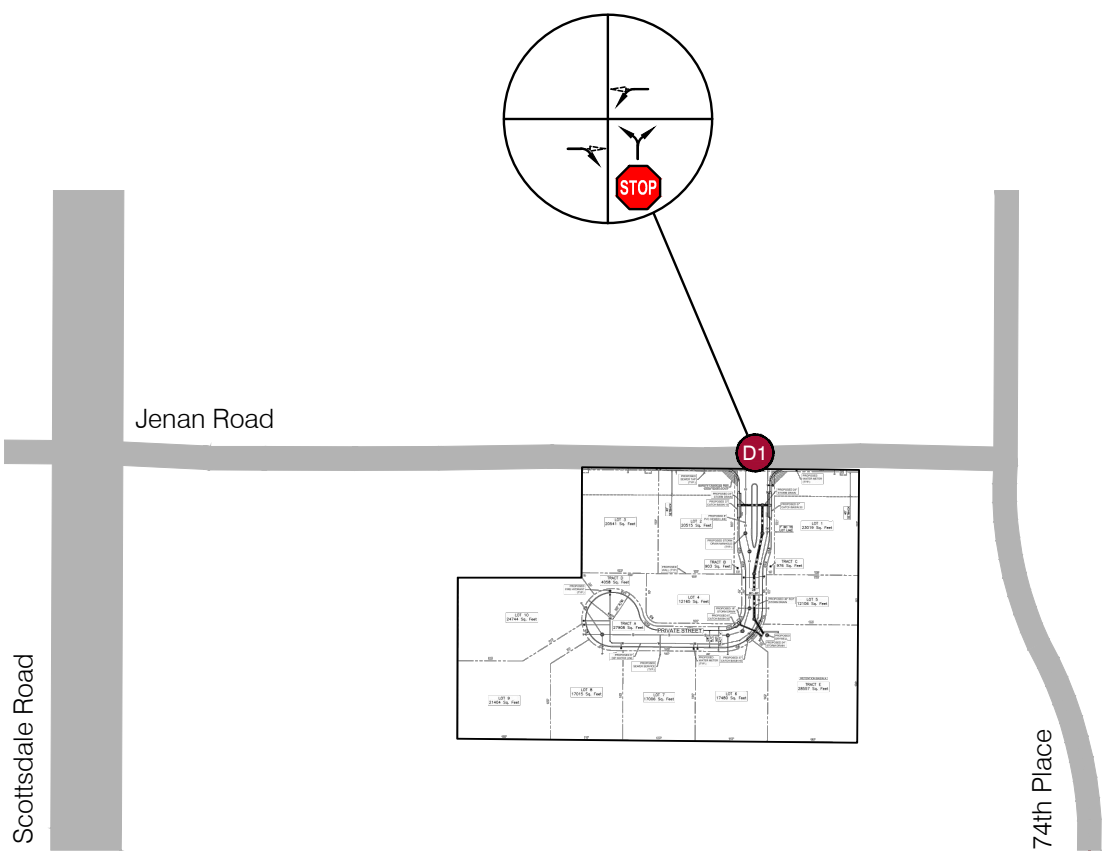
| Intersection and Approach | *Proposed* | Recommended |
|---|---|---|
| *Driveway D1 and Jenan Drive* | | |
| - Northbound Approach | 65 feet | 50 feet* |

*Calculated value less than proposed.

It is required that Gated Private Street and Driveway Entrances Section 2-1.302 provided by the City of Scottsdale Design Standards and Policies Manual meets entrance distance requirements. The site circulation is expected to accommodate two-way traffic.

## 6.6 SIGHT TRIANGLES

It is recommended that sight triangles be provided at all site access points to give drivers exiting the site a clear view of oncoming traffic. The landscaping within sight triangles must not obstruct drivers' views of the adjacent travel lanes.




LEGEND

LANE USE

STOP INTERSECTION CONTROL

Figure 8
Recommended Geometry

2-ZN-2020
1/28/2020

# 7.0 CONCLUSIONS AND RECOMMENDATIONS

The proposed development is expected to generate 96 daily trips, with 7 trips occurring in the AM peak hour and 10 trips occurring in the PM peak hour..

The unsignalized intersections are expected to operate at a satisfactory LOS in 2020, with the exception of minor movements at the intersection of Scottsdale Road and Jenan Drive. Drivers are anticipated to use alternate routes which utilize adjacent signalized intersections to access the roadway network during these peak periods. It is anticipated that during non-peak periods the LOS of minor movements will improve.

The site driveway operates at an acceptable level of service in 2020 total traffic conditions.

The on-site storage at the site driveway is expected to be sufficient to accommodate projected site traffic volumes and satisfies the gated private street and driveway entrance requirements.

It is recommended that site triangles be provided at all site access points to give drivers exiting the site a clear view of oncoming traffic. The landscaping within site triangles must not obstruct drivers' views of the adjacent travel lanes.

# APPENDIX

- Traffic Counts
- Crash Data
- Existing AM Traffic Capacity Analysis
- Existing PM Traffic Capacity Analysis
- 2020 Background AM Traffic Capacity Analysis
- 2020 Background PM Traffic Capacity Analysis
- 2020 Total AM Traffic Capacity Analysis
- 2020 Total PM Traffic Capacity Analysis
- Left Turn Storage Calculations
- On-Site Storage Calculations

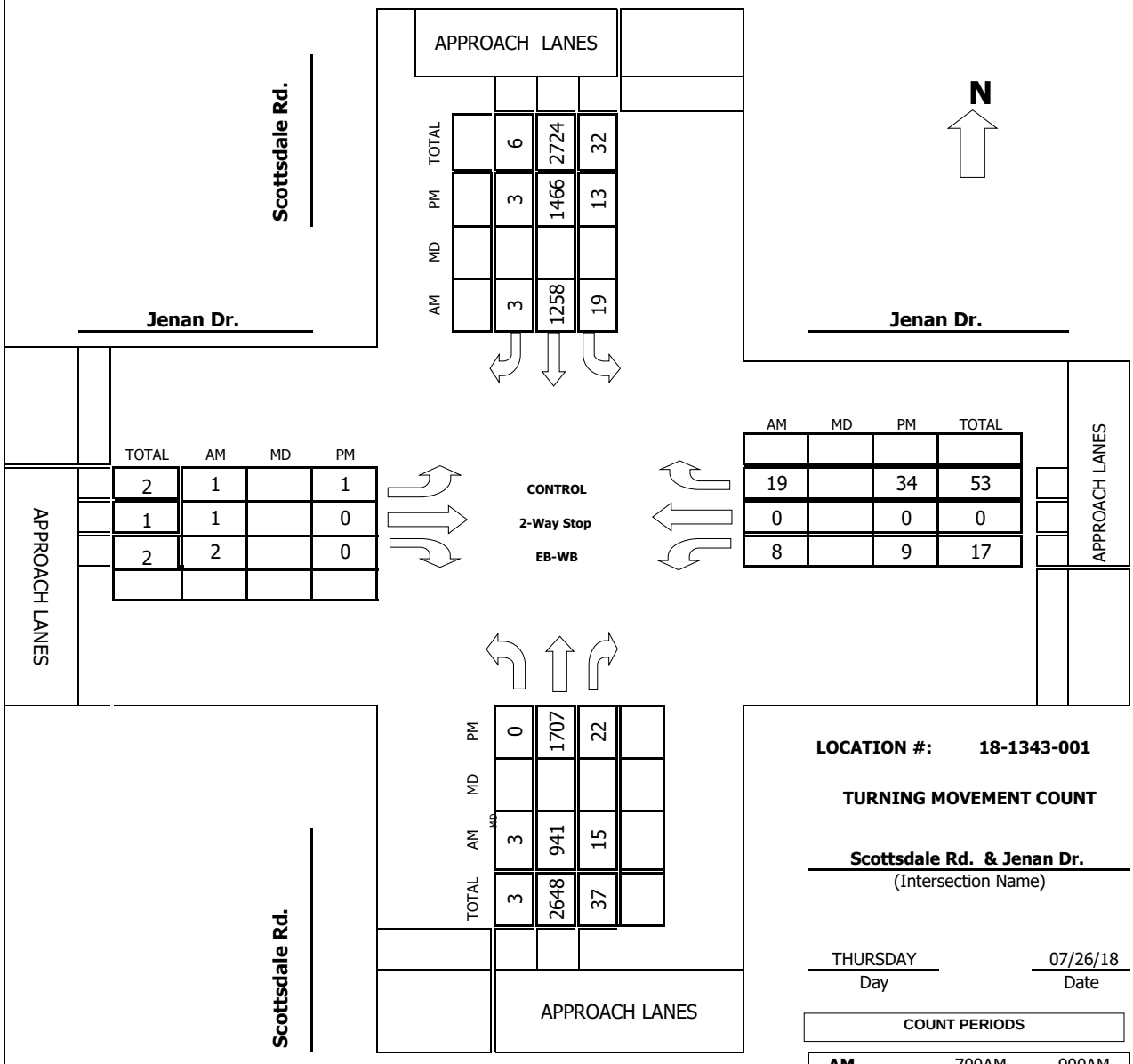
# Traffic Counts

**Intersection Turning Movement**
**Prepared by:**

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

**Project #: 18-1343-001**

***TMC SUMMARY OF Scottsdale Rd. & Jenan Dr.***




**LOCATION #: 18-1343-001**

**TURNING MOVEMENT COUNT**

**Scottsdale Rd. & Jenan Dr.**
(Intersection Name)

THURSDAY (Day) 07/26/18 (Date)

| COUNT PERIODS | | | |
|---|---|---|---|
| **AM** | 700AM | - | 900AM |
| **NOON** | | - | |
| **PM** | 400PM | - | 600PM |

AM PEAK HOUR 730 AM

NOON PEAK HOUR

PM PEAK HOUR 445 PM

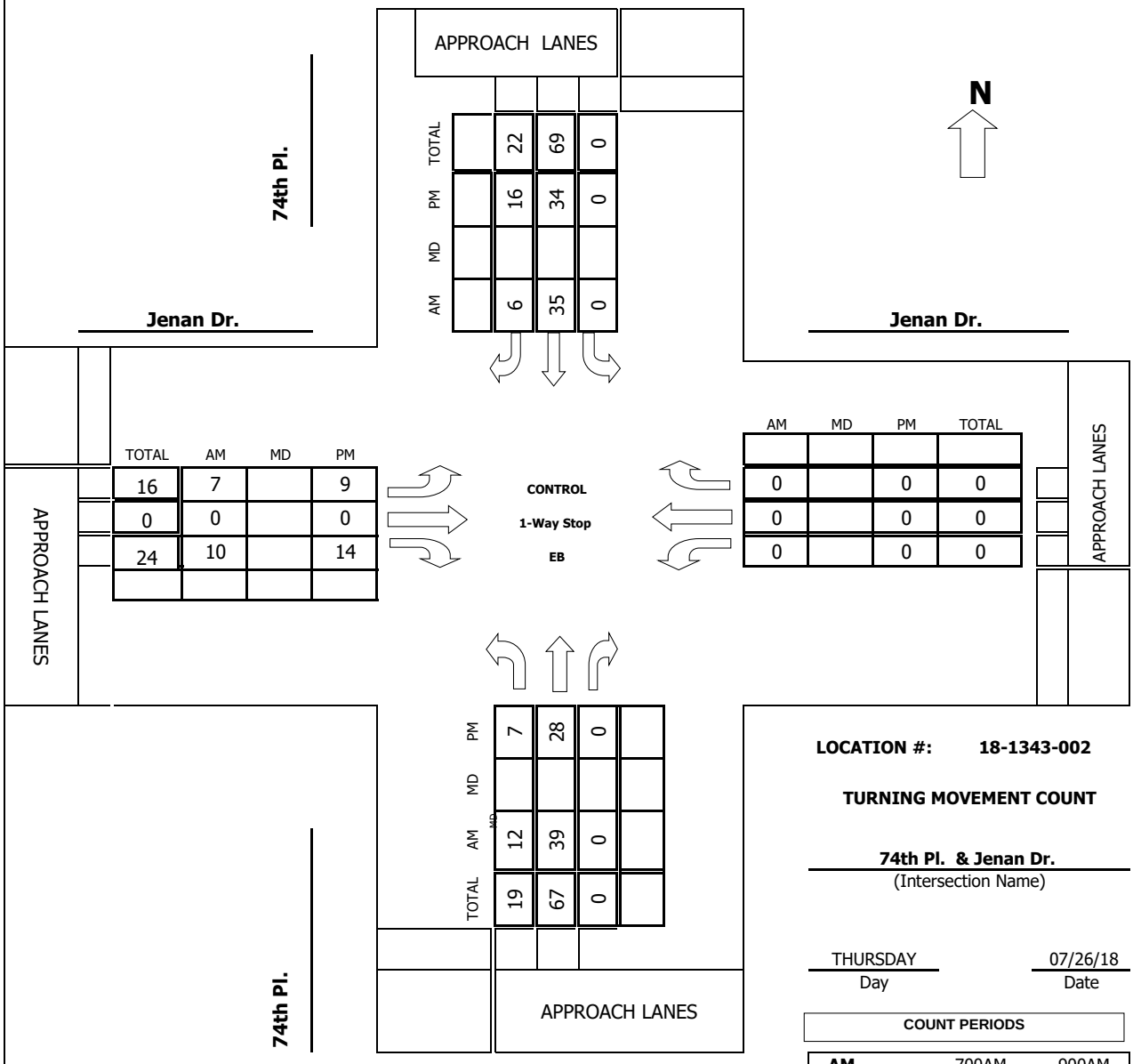
2-ZN-2020
1/28/2020

**Intersection Turning Movement**
**Prepared by:**

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

**Project #: 18-1343-002**

## *TMC SUMMARY OF 74th Pl. & Jenan Dr.*




**LOCATION #: 18-1343-002**

**TURNING MOVEMENT COUNT**

**74th Pl. & Jenan Dr.**
(Intersection Name)

THURSDAY
Day

07/26/18
Date

| COUNT PERIODS | | | |
|---|---|---|---|
| **AM** | 700AM | - | 900AM |
| **NOON** | | - | |
| **PM** | 400PM | - | 600PM |

AM PEAK HOUR 730 AM

NOON PEAK HOUR

PM PEAK HOUR 500 PM

2-ZN-2020
1/28/2020

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Thursday, July 26, 2018 City: Scottsdale Project #: 18-1343-003

Location: Jenan Dr. 1000' east of Scottsdale Rd.

| AM Period | NB | SB | EB | | WB | | | PM Period | NB | SB | EB | | WB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 1 | | 3 | | | 12:00 | | | 0 | | 2 | | |
| 00:15 | | | 2 | | 0 | | | 12:15 | | | 1 | | 2 | | |
| 00:30 | | | 0 | | 1 | | | 12:30 | | | 0 | | 0 | | |
| 00:45 | | | 0 | 3 | 0 | 4 | 7 | 12:45 | | | 0 | 1 | 1 | 5 | 6 |
| 01:00 | | | 0 | | 2 | | | 13:00 | | | 1 | | 2 | | |
| 01:15 | | | 1 | | 1 | | | 13:15 | | | 0 | | 0 | | |
| 01:30 | | | 0 | | 1 | | | 13:30 | | | 1 | | 1 | | |
| 01:45 | | | 2 | 3 | 1 | 5 | 8 | 13:45 | | | 3 | 5 | 0 | 3 | 8 |
| 02:00 | | | 1 | | 3 | | | 14:00 | | | 2 | | 3 | | |
| 02:15 | | | 1 | | 1 | | | 14:15 | | | 0 | | 1 | | |
| 02:30 | | | 1 | | 0 | | | 14:30 | | | 1 | | 2 | | |
| 02:45 | | | 0 | 3 | 1 | 5 | 8 | 14:45 | | | 0 | 3 | 1 | 7 | 10 |
| 03:00 | | | 1 | | 1 | | | 15:00 | | | 0 | | 0 | | |
| 03:15 | | | 1 | | 1 | | | 15:15 | | | 1 | | 1 | | |
| 03:30 | | | 0 | | 3 | | | 15:30 | | | 2 | | 2 | | |
| 03:45 | | | 2 | 4 | 3 | 8 | 12 | 15:45 | | | 1 | 4 | 1 | 4 | 8 |
| 04:00 | | | 0 | | 3 | | | 16:00 | | | 2 | | 4 | | |
| 04:15 | | | 2 | | 4 | | | 16:15 | | | 3 | | 3 | | |
| 04:30 | | | 2 | | 4 | | | 16:30 | | | 4 | | 5 | | |
| 04:45 | | | 5 | 9 | 3 | 14 | 23 | 16:45 | | | 2 | 11 | 5 | 17 | 28 |
| 05:00 | | | 1 | | 4 | | | 17:00 | | | 5 | | 4 | | |
| 05:15 | | | 4 | | 3 | | | 17:15 | | | 4 | | 6 | | |
| 05:30 | | | 5 | | 4 | | | 17:30 | | | 5 | | 5 | | |
| 05:45 | | | 6 | 16 | 3 | 14 | 30 | 17:45 | | | 3 | 17 | 3 | 18 | 35 |
| 06:00 | | | 3 | | 1 | | | 18:00 | | | 1 | | 3 | | |
| 06:15 | | | 2 | | 3 | | | 18:15 | | | 1 | | 1 | | |
| 06:30 | | | 1 | | 1 | | | 18:30 | | | 3 | | 1 | | |
| 06:45 | | | 2 | 8 | 2 | 7 | 15 | 18:45 | | | 3 | 8 | 0 | 5 | 13 |
| 07:00 | | | 2 | | 4 | | | 19:00 | | | 2 | | 0 | | |
| 07:15 | | | 4 | | 3 | | | 19:15 | | | 2 | | 2 | | |
| 07:30 | | | 5 | | 4 | | | 19:30 | | | 2 | | 3 | | |
| 07:45 | | | 2 | 13 | 3 | 14 | 27 | 19:45 | | | 4 | 10 | 1 | 6 | 16 |
| 08:00 | | | 3 | | 2 | | | 20:00 | | | 2 | | 1 | | |
| 08:15 | | | 4 | | 5 | | | 20:15 | | | 4 | | 2 | | |
| 08:30 | | | 2 | | 4 | | | 20:30 | | | 1 | | 0 | | |
| 08:45 | | | 1 | 10 | 3 | 14 | 24 | 20:45 | | | 2 | 9 | 6 | 9 | 18 |
| 09:00 | | | 2 | | 2 | | | 21:00 | | | 6 | | 3 | | |
| 09:15 | | | 3 | | 1 | | | 21:15 | | | 2 | | 3 | | |
| 09:30 | | | 2 | | 0 | | | 21:30 | | | 4 | | 3 | | |
| 09:45 | | | 1 | 8 | 1 | 4 | 12 | 21:45 | | | 0 | 12 | 2 | 11 | 23 |
| 10:00 | | | 1 | | 1 | | | 22:00 | | | 0 | | 1 | | |
| 10:15 | | | 1 | | 0 | | | 22:15 | | | 0 | | 1 | | |
| 10:30 | | | 1 | | 1 | | | 22:30 | | | 0 | | 0 | | |
| 10:45 | | | 0 | 3 | 0 | 2 | 5 | 22:45 | | | 0 | 0 | 0 | 2 | 2 |
| 11:00 | | | 1 | | 1 | | | 23:00 | | | 0 | | 0 | | |
| 11:15 | | | 1 | | 3 | | | 23:15 | | | 0 | | 0 | | |
| 11:30 | | | 0 | | 2 | | | 23:30 | | | 0 | | 0 | | |
| 11:45 | | | 1 | 3 | 1 | 7 | 10 | 23:45 | | | 0 | 0 | 0 | 0 | |
| **Total Vol.** | | | | 83 | | 98 | **181** | | | | | 80 | | 87 | **167** |

**GPS Coordinates:** 33.593054, -111.922538

**Daily Totals**

| NB | SB | EB | WB | Combined |
|---|---|---|---|---|
| | | 163 | 185 | **348** |

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| **Split %** | 45.9% | 54.1% | **52.0%** | 47.9% | 52.1% | **48.0%** |
| **Peak Hour** | 05:15 | 04:15 | **05:00** | 17:00 | 16:30 | **16:45** |
| **Volume** | 18 | 15 | **30** | 17 | 20 | **36** |
| **P.H.F.** | 0.75 | 0.94 | **0.83** | 0.85 | 0.83 | **0.90** |

2-ZN-2020
1/28/2020

# Crash Data

2-ZN-2020
1/28/2020

# CITY OF SCOTTSDALE '17 -'18 COLLISION SUMMARY

| REPORT # | DATE YYMMDD | TIME HHMM | NORTH / SOUTH ST. | TYPE | EAST WEST ST. | TYPE | DIR FROM | DIST FROM | INJ. SEV. #1 | #2 | PHYS. COND. #1 | #2 | VIOLATION #1 | #2 | ACTION #1 | #2 | TRAV. DIR. #1 | #2 | MANNER OF COLLISION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1727469 | 171212 | 1504 | SCOTTSDALE | RD | JENAN | DR | AT | | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 3 | NB | NB | 4 | MULTI VEH 3 |
| 1718767 | 170824 | 1757 | SCOTTSDALE | RD | JENAN | DR | AT | | 1 | 1 | 99 | 0 | 2 | 1 | 1 | 1 | NB | NB | 4 | |
| 1700385 | 170106 | 0723 | SCOTTSDALE | RD | JENAN | DR | AT | | 1 | 1 | 0 | 0 | 12 | 1 | 8 | 1 | SB | SB | 6 | |
| 1800865 | 180112 | 1454 | SCOTTSDALE | RD | JENAN | DR | S | 100 | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 3 | NB | NB | 4 | |

## KEY

**INJURY SEVERITY:**
1=NO INJURY, 2=POSSIBLE INJURY, 3=NON-INCAPACITATING INJURY, 4=INCAPACITATING INJURY, 5=FATAL INJURY, 99=NOT REPORTED / UNKNOWN

**PHYSICAL CONDITION:**
0=NO APPARENT INFLUENCE, 1=ILLNESS, 2=PHYSICAL IMPAIRMENT, 3=FELL ASLEEP / FATIGUED 4=ALCOHOL, 5=DRUGS, 6=MEDICATIONS, A=NO TEST GIVEN, B=TEST GIVEN, C=TEST REFUSED, D=TESTING UNKNOWN, 97=OTHER, 99=UNKNOWN

**VIOLATION:**
1=NO IMPROPER ACTION, 2=SPEED TOO FAST FOR CONDITIONS, 3=EXCEEDED LAWFUL SPEED 4=FOLLOWED TOO CLOSELY. 5=RAN STOP SIGN, 6=DISREGAREDED TRAFFIC SIGNAL7=MADE IMPROPER TURN, 8=DROVE/RODE IN OPPOSING TRAFFIC LANE, 9=KNOWINGLY OPERATED WITH FAULTY / MISSING EQUIPMENT, 10=REQUIRED MOTORCYCLE SAFETY EQUIPMENT NOT USED, 11=PASSED IN NO PASSING ZONE, 12=UNSAFE LANE CHANGE, 13=FAILED TO KEEP IN PROPER LANE, 14=DISREGARDED PAVEMENT MARKINGS, 15=OTHER UNSAFE PASSING, 16=INATTENTION/DISTRACTION, 17=DID NOT USE CROSSWALK, 18=WALKED ON WRONG SIDE OF ROAD, 19=ELECTRONIC COMMUNICATIONS DEVICE, 20=FAILED TO YIELD RIGHT OF WAY (added August 2014), 97=OTHER, 99 UNKNOWN

**ACTION:**
1=GOING STRAIGHT AHEAD, 2=SLOWING IN TRAFFICWAY, 3=STOPPED IN TRAFFICWAY, 4=MAKING LEFT TURN, 5=MAKING RIGHT TURN, 6=MAKING U-TURN, 7=OVERTAKING/PASSING, 8=CHANGING LANES, 9=NEGOTIATING A CURVE, 10=BACKING, 11=AVOIDING VEH/OBJ/PED/CYCLIST/ANIMAL, 12=ENTERING PARKING POSITION, 13=LEAVING PARKING POSITION, 14=PROPERLY PARKED, 15=IMPROPERLY PARKED, 16=DRIVERLESS MOVING VEHICLE, 17=CROSING ROAD, 18=WALKING WITH TRAFFIC, 19=WALKING AGAINST TRAFFIC, 20=STANDING, 21=LYING, 22=GETTING ON OR OFF VEHICLE, 23=WORKING ON/PUSHING VEHICLE, 24=WORKING ON ROAD, 97=OTHER, 99=UKNOWN

**MANNER OF COLLISION:**
1=SINGLE VEHICLE, 2=ANGLE (front to side, other than left turn), 3=LEFT TURN, 4=REAR END (front to rear), 5=HEAD-ON (front to front, other than left turn), 6=SIDESWIPE (same direction), 7=SIDESWIPE (opposite direction), 8=REAR-TO-SIDE, 9=REAR TO REAR, 97=OTHER, 99=UNKNOWN

***TOTAL*** **4**

# CITY OF SCOTTSDALE '15 -'16 COLLISION SUMMARY

| REPORT # | DATE YYMMDD | TIME HHMM | NORTH / SOUTH ST. | TYPE | EAST WEST ST. | TYPE | DIR FROM | DIST FROM | INJ. SEV. #1 | INJ. SEV. #2 | PHYS. COND. #1 | PHYS. COND. #2 | VIOLATION #1 | VIOLATION #2 | ACTION #1 | ACTION #2 | TRAV. DIR. #1 | TRAV. DIR. #2 | MANNER OF COLLISION | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-27463 | 151215 | 1632 | SCOTTSDALE | RD | JENAN | DR | AT | | 1 | 2 | 0 | 0 | 2 | 1 | 1 | 3 | NB | NB | 4 | |
| 15-25176 | 151117 | 1730 | SCOTTSDALE | RD | JENAN | DR | AT | | 3 | 1 | 0 | 0 | 12 | 1 | 8 | 1 | NB | NB | 8 | |
| 16-06863 | 160322 | 1723 | SCOTTSDALE | RD | JENAN | DR | S | 189 | 1 | 3 | 0 | 0 | 4 | 1 | 1 | 1 | NB | NB | 4 | MULTI VEH 3 |
| 15-19373 | 150904 | 1551 | SCOTTSDALE | RD | JENAN | DR | E | 1000 | 1 | 1 | 0 | 0 | | 1 | 97 | 1 | SB | EB | 2 | |

## KEY

**INJURY SEVERITY: 1=NO INJURY, 2=POSSIBLE INJURY, 3=NON-INCAPACITATING INJURY, 4=INCAPACITATING INJURY, 5=FATAL INJURY, 99=NOT REPORTED / UNKNOWN**

**PHYSICAL CONDITION: 0=NO APPARENT INFLUENCE, 1=ILLNESS, 2=PHYSICAL IMPAIRMENT, 3=FELL ASLEEP / FATIGUED 4=ALCOHOL, 5=DRUGS, 6=MEDICATIONS, A=NO TEST GIVEN, B=TEST GIVEN, C=TEST REFUSED, D=TESTING UNKNOWN, 97=OTHER, 99=UNKNOWN**

**VIOLATION: 1=NO IMPROPER ACTION, 2=SPEED TOO FAST FOR CONDITIONS, 3=EXCEEDED LAWFUL SPEED 4=FOLLOWED TOO CLOSELY. 5=RAN STOP SIGN, 6=DISREGAREDED TRAFFIC SIGNAL7=MADE IMPROPER TURN, 8=DROVE/RODE IN OPPOSING TRAFFIC LANE, 9=KNOWINGLY OPERATED WITH FAULTY / MISSING EQUIPMENT, 10=REQUIRED MOTORCYCLE SAFETY EQUIPMENT NOT USED, 11=PASSED IN NO PASSING ZONE, 12=UNSAFE LANE CHANGE, 13=FAILED TO KEEP IN PROPER LANE, 14=DISREGARDED PAVEMENT MARKINGS, 15=OTHER UNSAFE PASSING, 16=INATTENTION/DISTRACTION, 17=DID NOT USE CROSSWALK, 18=WALKED ON WRONG SIDE OF ROAD, 19=ELECTRONIC COMMUNICATIONS DEVICE, 20=FAILED TO YIELD RIGHT OF WAY (added August 2014), 97=OTHER, 99 UNKNOWN**

**ACTION: 1=GOING STRAIGHT AHEAD, 2=SLOWING IN TRAFFICWAY, 3=STOPPED IN TRAFFICWAY, 4=MAKING LEFT TURN, 5=MAKING RIGHT TURN, 6=MAKING U-TURN, 7=OVERTAKING/PASSING, 8=CHANGING LANES, 9=NEGOTIATING A CURVE, 10=BACKING, 11=AVOIDING VEH/OBJ/PED/CYCLIST/ANIMAL, 12=ENTERING PARKING POSITION, 13=LEAVING PARKING POSITION, 14=PROPERLY PARKED, 15=IMPROPERLY PARKED, 16=DRIVERLESS MOVING VEHICLE, 17=CROSING ROAD, 18=WALKING WITH TRAFFIC, 19=WALKING AGAINST TRAFFIC, 20=STANDING, 21=LYING, 22=GETTING ON OR OFF VEHICLE, 23=WORKING ON/PUSHING VEHICLE, 24=WORKING ON ROAD, 97=OTHER, 99=UKNOWN**

**MANNER OF COLLISION: 1=SINGLE VEHICLE, 2=ANGLE (front to side, other than left turn), 3=LEFT TURN, 4=REAR END (front to rear), 5=HEAD-ON (front to front, other than left turn), 6=SIDESWIPE (same direction), 7=SIDESWIPE (opposite direction), 8=REAR-TO-SIDE, 9=REAR TO REAR, 97=OTHER, 99=UNKNOWN**

***TOTAL*** **4**

2-ZN-2020
1/29/2020

# Existing AM
# Traffic Capacity Analysis

2-ZN-2020
1/28/2020

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 1 | 1 | 2 | 8 | 0 | 19 | 3 | 941 | 15 | 19 | 1258 | 3 |
| Future Vol, veh/h | 1 | 1 | 2 | 8 | 0 | 19 | 3 | 941 | 15 | 19 | 1258 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | 50 | 145 | - | - | 125 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 50 | 50 | 50 | 56 | 56 | 56 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 2 | 2 | 4 | 14 | 0 | 34 | 3 | 1046 | 17 | 21 | 1398 | 3 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1866 | 2511 | 701 | 1663 | 2504 | 532 | 1401 | 0 | 0 | 1063 | 0 | 0 |
| Stage 1 | 1442 | 1442 | - | 1061 | 1061 | - | - | - | - | - | - | - |
| Stage 2 | 424 | 1069 | - | 602 | 1443 | - | - | - | - | - | - | - |
| Critical Hdwy | 6.44 | 6.54 | 7.14 | 6.44 | 6.54 | 7.14 | 5.34 | - | - | 5.34 | - | - |
| Critical Hdwy Stg 1 | 7.34 | 5.54 | - | 7.34 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.74 | 5.54 | - | 6.74 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.82 | 4.02 | 3.92 | 3.82 | 4.02 | 3.92 | 3.12 | - | - | 3.12 | - | - |
| Pot Cap-1 Maneuver | 77 | 28 | 327 | 102 | 28 | 421 | 249 | - | - | 365 | - | - |
| Stage 1 | 97 | 196 | - | 181 | 299 | - | - | - | - | - | - | - |
| Stage 2 | 529 | 296 | - | 413 | 196 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 67 | 26 | 327 | 90 | 26 | 421 | 249 | - | - | 365 | - | - |
| Mov Cap-2 Maneuver | 67 | 26 | - | 90 | 26 | - | - | - | - | - | - | - |
| Stage 1 | 96 | 185 | - | 179 | 295 | - | - | - | - | - | - | - |
| Stage 2 | 481 | 292 | - | 380 | 185 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 65.9 | 25.6 | 0.1 | 0.2 |
| HCM LOS | F | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 249 | - | - | 67 | 90 | 421 | 365 | - | - |
| HCM Lane V/C Ratio | 0.013 | - | - | 0.119 | 0.159 | 0.081 | 0.058 | - | - |
| HCM Control Delay (s) | 19.7 | - | - | 65.9 | 52.4 | 14.3 | 15.5 | - | - |
| HCM Lane LOS | C | - | - | F | F | B | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0.4 | 0.5 | 0.3 | 0.2 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.2 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 7 | 10 | 12 | 39 | 35 | 6 |
| Future Vol, veh/h | 7 | 10 | 12 | 39 | 35 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 71 | 71 | 75 | 75 | 73 | 73 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 14 | 16 | 52 | 48 | 8 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 136 | 52 | 56 | 0 | - | 0 |
| Stage 1 | 52 | - | - | - | - | - |
| Stage 2 | 84 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 857 | 1016 | 1549 | - | - | - |
| Stage 1 | 970 | - | - | - | - | - |
| Stage 2 | 939 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 848 | 1016 | 1549 | - | - | - |
| Mov Cap-2 Maneuver | 848 | - | - | - | - | - |
| Stage 1 | 959 | - | - | - | - | - |
| Stage 2 | 939 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.9 | 1.7 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1549 | - | 939 | - | - |
| HCM Lane V/C Ratio | 0.01 | - | 0.025 | - | - |
| HCM Control Delay (s) | 7.3 | 0 | 8.9 | - | - |
| HCM Lane LOS | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

# Existing PM
# Traffic Capacity Analysis

2-ZN-2020
1/28/2020

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 1 | 0 | 0 | 9 | 0 | 34 | 0 | 1707 | 22 | 13 | 1466 | 3 |
| Future Vol, veh/h | 1 | 0 | 0 | 9 | 0 | 34 | 0 | 1707 | 22 | 13 | 1466 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | 50 | 145 | - | - | 125 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 25 | 25 | 25 | 77 | 77 | 77 | 96 | 96 | 96 | 89 | 89 | 89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 4 | 0 | 0 | 12 | 0 | 44 | 0 | 1778 | 23 | 15 | 1647 | 3 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 2390 | 3480 | 825 | 2479 | 3470 | 901 | 1650 | 0 | 0 | 1801 | 0 | 0 |
| Stage 1 | 1679 | 1679 | - | 1790 | 1790 | - | - | - | - | - | - | - |
| Stage 2 | 711 | 1801 | - | 689 | 1680 | - | - | - | - | - | - | - |
| Critical Hdwy | 6.44 | 6.54 | 7.14 | 6.44 | 6.54 | 7.14 | 5.34 | - | - | 5.34 | - | - |
| Critical Hdwy Stg 1 | 7.34 | 5.54 | - | 7.34 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.74 | 5.54 | - | 6.74 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.82 | 4.02 | 3.92 | 3.82 | 4.02 | 3.92 | 3.12 | - | - | 3.12 | - | - |
| Pot Cap-1 Maneuver | 36 | 6 | 271 | 32 | 6 | 241 | 188 | - | - | 158 | - | - |
| Stage 1 | 66 | 150 | - | 55 | 132 | - | - | - | - | - | - | - |
| Stage 2 | 355 | 130 | - | 366 | 150 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 27 | 5 | 271 | 30 | 5 | 241 | 188 | - | - | 158 | - | - |
| Mov Cap-2 Maneuver | 27 | 5 | - | 30 | 5 | - | - | - | - | - | - | - |
| Stage 1 | 66 | 136 | - | 55 | 132 | - | - | - | - | - | - | - |
| Stage 2 | 290 | 130 | - | 331 | 136 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 160.3 | 57.6 | 0 | 0.3 |
| HCM LOS | F | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 188 | - | - | 27 | 30 | 241 | 158 | - | - |
| HCM Lane V/C Ratio | - | - | - | 0.148 | 0.39 | 0.183 | 0.092 | - | - |
| HCM Control Delay (s) | 0 | - | - | 160.3 | 187.4 | 23.3 | 30.1 | - | - |
| HCM Lane LOS | A | - | - | F | F | C | D | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0.5 | 1.2 | 0.7 | 0.3 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.7 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 9 | 14 | 7 | 28 | 34 | 16 |
| Future Vol, veh/h | 9 | 14 | 7 | 28 | 34 | 16 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 72 | 72 | 88 | 88 | 89 | 89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 13 | 19 | 8 | 32 | 38 | 18 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 95 | 47 | 56 | 0 | - | 0 |
| Stage 1 | 47 | - | - | - | - | - |
| Stage 2 | 48 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 905 | 1022 | 1549 | - | - | - |
| Stage 1 | 975 | - | - | - | - | - |
| Stage 2 | 974 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 900 | 1022 | 1549 | - | - | - |
| Mov Cap-2 Maneuver | 900 | - | - | - | - | - |
| Stage 1 | 970 | - | - | - | - | - |
| Stage 2 | 974 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.8 | 1.5 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1549 | - | 971 | - | - |
| HCM Lane V/C Ratio | 0.005 | - | 0.033 | - | - |
| HCM Control Delay (s) | 7.3 | 0 | 8.8 | - | - |
| HCM Lane LOS | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

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| Intersection | |
|---|---|
| Int Delay, s/veh | 1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 1 | 1 | 2 | 8 | 0 | 20 | 3 | 979 | 16 | 20 | 1309 | 3 |
| Future Vol, veh/h | 1 | 1 | 2 | 8 | 0 | 20 | 3 | 979 | 16 | 20 | 1309 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | 50 | 145 | - | - | 125 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 25 | 25 | 25 | 77 | 77 | 77 | 96 | 96 | 96 | 89 | 89 | 89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 4 | 4 | 8 | 10 | 0 | 26 | 3 | 1020 | 17 | 22 | 1471 | 3 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1931 | 2560 | 737 | 1669 | 2553 | 519 | 1474 | 0 | 0 | 1037 | 0 | 0 |
| Stage 1 | 1517 | 1517 | - | 1035 | 1035 | - | - | - | - | - | - | - |
| Stage 2 | 414 | 1043 | - | 634 | 1518 | - | - | - | - | - | - | - |
| Critical Hdwy | 6.44 | 6.54 | 7.14 | 6.44 | 6.54 | 7.14 | 5.34 | - | - | 5.34 | - | - |
| Critical Hdwy Stg 1 | 7.34 | 5.54 | - | 7.34 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.74 | 5.54 | - | 6.74 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.82 | 4.02 | 3.92 | 3.82 | 4.02 | 3.92 | 3.12 | - | - | 3.12 | - | - |
| Pot Cap-1 Maneuver | 70 | 26 | 310 | 102 | 26 | 429 | 230 | - | - | 376 | - | - |
| Stage 1 | 86 | 180 | - | 188 | 307 | - | - | - | - | - | - | - |
| Stage 2 | 536 | 305 | - | 395 | 180 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 62 | 24 | 310 | 82 | 24 | 429 | 230 | - | - | 376 | - | - |
| Mov Cap-2 Maneuver | 62 | 24 | - | 82 | 24 | - | - | - | - | - | - | - |
| Stage 1 | 85 | 169 | - | 186 | 303 | - | - | - | - | - | - | - |
| Stage 2 | 497 | 301 | - | 354 | 169 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 82.2 | 25.7 | 0.1 | 0.2 |
| HCM LOS | F | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 230 | - | - | 62 | 82 | 429 | 376 | - | - |
| HCM Lane V/C Ratio | 0.014 | - | - | 0.258 | 0.127 | 0.061 | 0.06 | - | - |
| HCM Control Delay (s) | 20.9 | - | - | 82.2 | 55.2 | 13.9 | 15.2 | - | - |
| HCM Lane LOS | C | - | - | F | F | B | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0.9 | 0.4 | 0.2 | 0.2 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.4 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 7 | 10 | 12 | 41 | 36 | 6 |
| Future Vol, veh/h | 7 | 10 | 12 | 41 | 36 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 72 | 72 | 88 | 88 | 89 | 89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 14 | 14 | 47 | 40 | 7 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 119 | 44 | 47 | 0 | - | 0 |
| Stage 1 | 44 | - | - | - | - | - |
| Stage 2 | 75 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 877 | 1026 | 1560 | - | - | - |
| Stage 1 | 978 | - | - | - | - | - |
| Stage 2 | 948 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 869 | 1026 | 1560 | - | - | - |
| Mov Cap-2 Maneuver | 869 | - | - | - | - | - |
| Stage 1 | 969 | - | - | - | - | - |
| Stage 2 | 948 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.9 | 1.7 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1560 | - | 955 | - | - |
| HCM Lane V/C Ratio | 0.009 | - | 0.025 | - | - |
| HCM Control Delay (s) | 7.3 | 0 | 8.9 | - | - |
| HCM Lane LOS | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

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| Intersection | |
|---|---|
| Int Delay, s/veh | 1.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 1 | 0 | 0 | 9 | 0 | 35 | 0 | 1776 | 23 | 14 | 1525 | 3 |
| Future Vol, veh/h | 1 | 0 | 0 | 9 | 0 | 35 | 0 | 1776 | 23 | 14 | 1525 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | 50 | 145 | - | - | 125 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 25 | 25 | 25 | 77 | 77 | 77 | 96 | 96 | 96 | 89 | 89 | 89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 4 | 0 | 0 | 12 | 0 | 45 | 0 | 1850 | 24 | 16 | 1713 | 3 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 2487 | 3621 | 858 | 2579 | 3610 | 937 | 1716 | 0 | 0 | 1874 | 0 | 0 |
| Stage 1 | 1747 | 1747 | - | 1862 | 1862 | - | - | - | - | - | - | - |
| Stage 2 | 740 | 1874 | - | 717 | 1748 | - | - | - | - | - | - | - |
| Critical Hdwy | 6.44 | 6.54 | 7.14 | 6.44 | 6.54 | 7.14 | 5.34 | - | - | 5.34 | - | - |
| Critical Hdwy Stg 1 | 7.34 | 5.54 | - | 7.34 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.74 | 5.54 | - | 6.74 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.82 | 4.02 | 3.92 | 3.82 | 4.02 | 3.92 | 3.12 | - | - | 3.12 | - | - |
| Pot Cap-1 Maneuver | 31 | 5 | 258 | 27 | 5 | 228 | 174 | - | - | 145 | - | - |
| Stage 1 | 59 | 138 | - | 49 | 121 | - | - | - | - | - | - | - |
| Stage 2 | 340 | 120 | - | 352 | 138 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 23 | 4 | 258 | 25 | 4 | 228 | 174 | - | - | 145 | - | - |
| Mov Cap-2 Maneuver | 23 | 4 | - | 25 | 4 | - | - | - | - | - | - | - |
| Stage 1 | 59 | 123 | - | 49 | 121 | - | - | - | - | - | - | - |
| Stage 2 | 272 | 120 | - | 313 | 123 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 192 | 68.8 | 0 | 0.3 |
| HCM LOS | F | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 174 | - | - | 23 | 25 | 228 | 145 | - | - |
| HCM Lane V/C Ratio | - | - | - | 0.174 | 0.468 | 0.199 | 0.108 | - | - |
| HCM Control Delay (s) | 0 | - | - | 192 | 240.5 | 24.7 | 32.8 | - | - |
| HCM Lane LOS | A | - | - | F | F | C | D | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0.5 | 1.4 | 0.7 | 0.4 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.6 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 9 | 15 | 7 | 29 | 35 | 17 |
| Future Vol, veh/h | 9 | 15 | 7 | 29 | 35 | 17 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 72 | 72 | 88 | 88 | 89 | 89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 13 | 21 | 8 | 33 | 39 | 19 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 98 | 49 | 58 | 0 | - | 0 |
| Stage 1 | 49 | - | - | - | - | - |
| Stage 2 | 49 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 901 | 1020 | 1546 | - | - | - |
| Stage 1 | 973 | - | - | - | - | - |
| Stage 2 | 973 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 896 | 1020 | 1546 | - | - | - |
| Mov Cap-2 Maneuver | 896 | - | - | - | - | - |
| Stage 1 | 968 | - | - | - | - | - |
| Stage 2 | 973 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.8 | 1.4 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1546 | - | 970 | - | - |
| HCM Lane V/C Ratio | 0.005 | - | 0.034 | - | - |
| HCM Control Delay (s) | 7.3 | 0 | 8.8 | - | - |
| HCM Lane LOS | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

# 2020 Total AM
# Traffic Capacity Analysis

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| Intersection | |
|---|---|
| Int Delay, s/veh | 1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 1 | 1 | 2 | 9 | 0 | 22 | 3 | 979 | 17 | 21 | 1309 | 3 |
| Future Vol, veh/h | 1 | 1 | 2 | 9 | 0 | 22 | 3 | 979 | 17 | 21 | 1309 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | 50 | 145 | - | - | 125 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 50 | 50 | 50 | 56 | 56 | 56 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 2 | 2 | 4 | 16 | 0 | 39 | 3 | 1088 | 19 | 23 | 1454 | 3 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1943 | 2615 | 729 | 1733 | 2607 | 554 | 1457 | 0 | 0 | 1107 | 0 | 0 |
| Stage 1 | 1502 | 1502 | - | 1104 | 1104 | - | - | - | - | - | - | - |
| Stage 2 | 441 | 1113 | - | 629 | 1503 | - | - | - | - | - | - | - |
| Critical Hdwy | 6.44 | 6.54 | 7.14 | 6.44 | 6.54 | 7.14 | 5.34 | - | - | 5.34 | - | - |
| Critical Hdwy Stg 1 | 7.34 | 5.54 | - | 7.34 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.74 | 5.54 | - | 6.74 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.82 | 4.02 | 3.92 | 3.82 | 4.02 | 3.92 | 3.12 | - | - | 3.12 | - | - |
| Pot Cap-1 Maneuver | 69 | 24 | 313 | 93 | 24 | 408 | 234 | - | - | 347 | - | - |
| Stage 1 | 88 | 183 | - | 168 | 285 | - | - | - | - | - | - | - |
| Stage 2 | 517 | 282 | - | 398 | 183 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 59 | 22 | 313 | 80 | 22 | 408 | 234 | - | - | 347 | - | - |
| Mov Cap-2 Maneuver | 59 | 22 | - | 80 | 22 | - | - | - | - | - | - | - |
| Stage 1 | 87 | 171 | - | 166 | 281 | - | - | - | - | - | - | - |
| Stage 2 | 461 | 278 | - | 363 | 171 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 76.8 | 28.2 | 0.1 | 0.3 |
| HCM LOS | F | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 234 | - | - | 58 | 80 | 408 | 347 | - | - |
| HCM Lane V/C Ratio | 0.014 | - | - | 0.138 | 0.201 | 0.096 | 0.067 | - | - |
| HCM Control Delay (s) | 20.6 | - | - | 76.8 | 61 | 14.8 | 16.1 | - | - |
| HCM Lane LOS | C | - | - | F | F | B | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0.4 | 0.7 | 0.3 | 0.2 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.3 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 9 | 10 | 12 | 41 | 36 | 7 |
| Future Vol, veh/h | 9 | 10 | 12 | 41 | 36 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 71 | 71 | 75 | 75 | 73 | 73 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 13 | 14 | 16 | 55 | 49 | 10 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 141 | 54 | 59 | 0 | - | 0 |
| Stage 1 | 54 | - | - | - | - | - |
| Stage 2 | 87 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 852 | 1013 | 1545 | - | - | - |
| Stage 1 | 969 | - | - | - | - | - |
| Stage 2 | 936 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 843 | 1013 | 1545 | - | - | - |
| Mov Cap-2 Maneuver | 843 | - | - | - | - | - |
| Stage 1 | 958 | - | - | - | - | - |
| Stage 2 | 936 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 9 | 1.7 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1545 | - | 925 | - | - |
| HCM Lane V/C Ratio | 0.01 | - | 0.029 | - | - |
| HCM Control Delay (s) | 7.4 | 0 | 9 | - | - |
| HCM Lane LOS | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.4 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 17 | 1 | 1 | 18 | 4 | 2 |
| Future Vol, veh/h | 17 | 1 | 1 | 18 | 4 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 18 | 1 | 1 | 20 | 4 | 2 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 19 | 0 | 41 | 19 |
| Stage 1 | - | - | - | - | 19 | - |
| Stage 2 | - | - | - | - | 22 | - |
| Critical Hdwy | - | - | 4.12 | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | - | - | 1597 | - | 970 | 1059 |
| Stage 1 | - | - | - | - | 1004 | - |
| Stage 2 | - | - | - | - | 1001 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1597 | - | 969 | 1059 |
| Mov Cap-2 Maneuver | - | - | - | - | 969 | - |
| Stage 1 | - | - | - | - | 1003 | - |
| Stage 2 | - | - | - | - | 1001 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.4 | 8.6 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 997 | - | - | 1597 | - |
| HCM Lane V/C Ratio | 0.007 | - | - | 0.001 | - |
| HCM Control Delay (s) | 8.6 | - | - | 7.3 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - |

# 2020 Total PM
# Traffic Capacity Analysis

2-ZN-2020
1/28/2020

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 1 | 0 | 0 | 10 | 0 | 37 | 0 | 1776 | 25 | 17 | 1525 | 3 |
| Future Vol, veh/h | 1 | 0 | 0 | 10 | 0 | 37 | 0 | 1776 | 25 | 17 | 1525 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | 50 | 145 | - | - | 125 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 25 | 25 | 25 | 77 | 77 | 77 | 96 | 96 | 96 | 89 | 89 | 89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 4 | 0 | 0 | 13 | 0 | 48 | 0 | 1850 | 26 | 19 | 1713 | 3 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 2493 | 3629 | 858 | 2586 | 3617 | 938 | 1716 | 0 | 0 | 1876 | 0 | 0 |
| Stage 1 | 1753 | 1753 | - | 1863 | 1863 | - | - | - | - | - | - | - |
| Stage 2 | 740 | 1876 | - | 723 | 1754 | - | - | - | - | - | - | - |
| Critical Hdwy | 6.44 | 6.54 | 7.14 | 6.44 | 6.54 | 7.14 | 5.34 | - | - | 5.34 | - | - |
| Critical Hdwy Stg 1 | 7.34 | 5.54 | - | 7.34 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.74 | 5.54 | - | 6.74 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.82 | 4.02 | 3.92 | 3.82 | 4.02 | 3.92 | 3.12 | - | - | 3.12 | - | - |
| Pot Cap-1 Maneuver | 31 | 5 | 258 | 27 | 5 | 228 | 174 | - | - | 144 | - | - |
| Stage 1 | 58 | 138 | - | 48 | 121 | - | - | - | - | - | - | - |
| Stage 2 | 340 | 119 | - | 349 | 137 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 22 | 4 | 258 | 24 | 4 | 228 | 174 | - | - | 144 | - | - |
| Mov Cap-2 Maneuver | 22 | 4 | - | 24 | 4 | - | - | - | - | - | - | - |
| Stage 1 | 58 | 120 | - | 48 | 121 | - | - | - | - | - | - | - |
| Stage 2 | 268 | 119 | - | 303 | 119 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 202 | 76.9 | 0 | 0.4 |
| HCM LOS | F | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 174 | - | - | 22 | 24 | 228 | 144 | - | - |
| HCM Lane V/C Ratio | - | - | - | 0.182 | 0.541 | 0.211 | 0.133 | - | - |
| HCM Control Delay (s) | 0 | - | - | 202 | 269 | 25 | 33.8 | - | - |
| HCM Lane LOS | A | - | - | F | F | D | D | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0.5 | 1.6 | 0.8 | 0.4 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.7 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 10 | 15 | 7 | 29 | 35 | 19 |
| Future Vol, veh/h | 10 | 15 | 7 | 29 | 35 | 19 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 72 | 72 | 88 | 88 | 89 | 89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 14 | 21 | 8 | 33 | 39 | 21 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 99 | 50 | 60 | 0 | - | 0 |
| Stage 1 | 50 | - | - | - | - | - |
| Stage 2 | 49 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 900 | 1018 | 1544 | - | - | - |
| Stage 1 | 972 | - | - | - | - | - |
| Stage 2 | 973 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 896 | 1018 | 1544 | - | - | - |
| Mov Cap-2 Maneuver | 896 | - | - | - | - | - |
| Stage 1 | 967 | - | - | - | - | - |
| Stage 2 | 973 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.9 | 1.4 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1544 | - | 965 | - | - |
| HCM Lane V/C Ratio | 0.005 | - | 0.036 | - | - |
| HCM Control Delay (s) | 7.3 | 0 | 8.9 | - | - |
| HCM Lane LOS | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 23 | 4 | 2 | 23 | 3 | 1 |
| Future Vol, veh/h | 23 | 4 | 2 | 23 | 3 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 25 | 4 | 2 | 25 | 3 | 1 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 29 | 0 | 56 | 27 |
| Stage 1 | - | - | - | - | 27 | - |
| Stage 2 | - | - | - | - | 29 | - |
| Critical Hdwy | - | - | 4.12 | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | - | - | 1584 | - | 952 | 1048 |
| Stage 1 | - | - | - | - | 996 | - |
| Stage 2 | - | - | - | - | 994 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1584 | - | 951 | 1048 |
| Mov Cap-2 Maneuver | - | - | - | - | 951 | - |
| Stage 1 | - | - | - | - | 995 | - |
| Stage 2 | - | - | - | - | 994 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.6 | 8.7 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 974 | - | - | 1584 | - |
| HCM Lane V/C Ratio | 0.004 | - | - | 0.001 | - |
| HCM Control Delay (s) | 8.7 | - | - | 7.3 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - |

# Left-Turn Storage Calculations

2-ZN-2020
1/28/2020

# Left-turn Storage Analysis

| Intersection | Direction (N,S,E,W) | Peak volume (vph) | Signalized??? (Place an "X") Yes | Signalized??? (Place an "X") No | If signalized: Cycle Length (seconds) | If signalized: # of Left-turn Lanes (#) | Required Storage per Lane (ft.) (100' min. default) |
|---|---|---|---|---|---|---|---|
| | | | | | | | 0 |
| Scottsdale Road and Jenan Road | NB | 3 | | X | | | 100 |
| | SB | 21 | | X | | | 100 |
| | EB | 1 | | X | | | 25 |
| | WB | 10 | | X | | | 25 |
| | | | | | | | 0 |
| | | | | | | | 0 |
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| | | | | | | | 0 |

2-ZN-2020
1/28/2020

# On-Site Storage Calculations

2-ZN-2020
1/28/2020

# On-site Storage Analysis

| Intersection | Direction (N,S,E,W) | Peak volume (vph) | Signalized??? (Place an "X") | | If signalized | | Required Storage per Lane (ft.) |
|---|---|---|---|---|---|---|---|
| | | | Yes | No | Cycle Length (seconds) | # of Left-turn Lanes (#) | (75' min. default) |
| | | | | | | | 0 |
| Driveway D1 and Jenan Road | NB | 6 | | X | | | 25 |
| | | | | | | | 0 |
| | | | | | | | 0 |
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