

Appendix G

Traffic Technical Memorandum

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To: Nick Minicilli, Senior Traffic Engineer, City of Temecula
From: Jano Baghdanian, P.E., T.E., JB & Associates
Date: July 24, 2023
Subject: Winchester Road Senior Apartments (80134 Winchester Road, Temecula, CA)

JB & Associates is pleased to present this technical memorandum for the proposed senior apartments “the Project”, in the City of Temecula. The purpose of this memorandum is to address the proposed Project trip generation, and distribution, as well as issues associated with Project access. The recommended improvements are also presented in this memorandum.

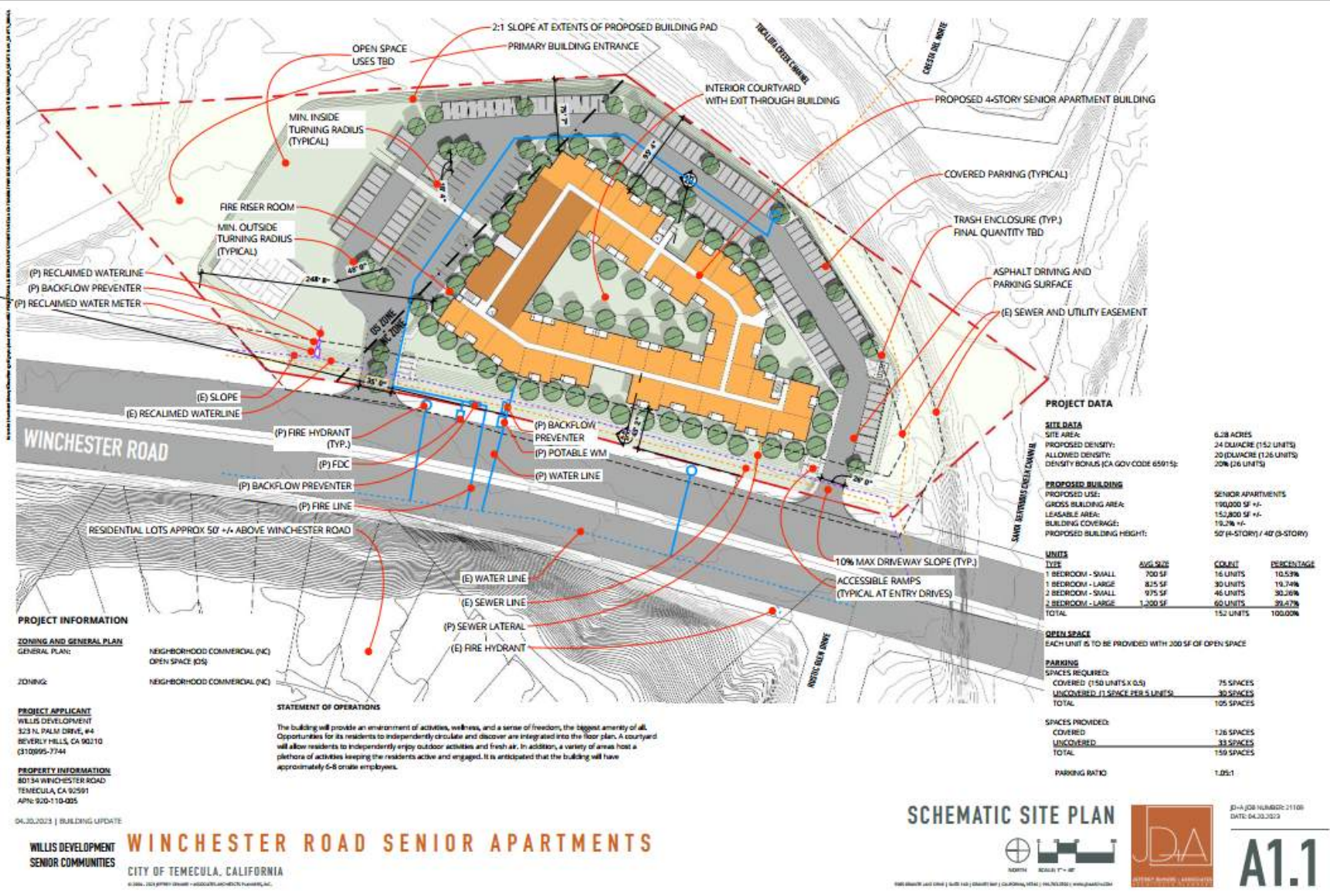
Project Overview

The Project is located at 80134 Winchester Road, in the City of Temecula, California. The Project consists of the construction of a 4-story senior apartment building with a total of 152 dwelling units. The Project will have a total of 159 outdoor parking spaces, of which, 126 are covered spaces and 33 are uncovered spaces.

Access to the Project will be provided from the following two driveways:

1. A 35-foot-wide main driveway located on Winchester Road at the northern portion of the Project site
2. A 26-foot-wide secondary driveway located on Winchester Road at the southern portion of the Project site, to be used mainly for fire access.

Please refer to **Figure 1 – Project Site Plan**.



SCHEMATIC SITE PLAN

DATE: 04.30.2023

JDA

A1.1

Figure 1
Project Site Plan

Project Trip Generation Methodology

The Project site is current undeveloped. To estimate the morning, afternoon peak hours and daily trips to be generated by the Project, trip rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual 11th Edition* were used in this analysis.

The calculations of the estimated Project trips are shown in **Table 1 – Project Trip Generation**.

Table 1
Project Trip Generation¹
Winchester Road Senior Apartments

| Land Use (ITE Code) | Size | Units | AM Peak Hour Trips | | | | PM Peak Hour Trips | | | | Daily Trips | | |
|--|------|-------|--------------------|--------------|-----------|-----------|--------------------|-------|-----------|-----------|-------------|------------|--|
| | | | Rate | Total | In | Out | Rate | Total | In | Out | Rate | Total | |
| New Project Land Use Added | | | | | | | | | | | | | |
| Senior Adult Housing-Multifamily (252) | 152 | du | 0.2 | 30 | 34% | 66% | 0.25 | 38 | 56% | 44% | 3.24 | 492 | |
| | | | | | 10 | 20 | | | 21 | 17 | | | |
| | | | | Total | 30 | 10 | 20 | | 38 | 21 | 17 | 492 | |

¹ ITE "Trip Generation" Manual, 11th Edition, 2021

As shown in **Table 1**, the Project is estimated to generate 30 trips (10 inbound and 20 outbound) in the morning peak hour, 38 trips (21 inbound and 17 outbound) in the afternoon peak hour, and 492 trips on a typical weekday.

Project Trip Distribution

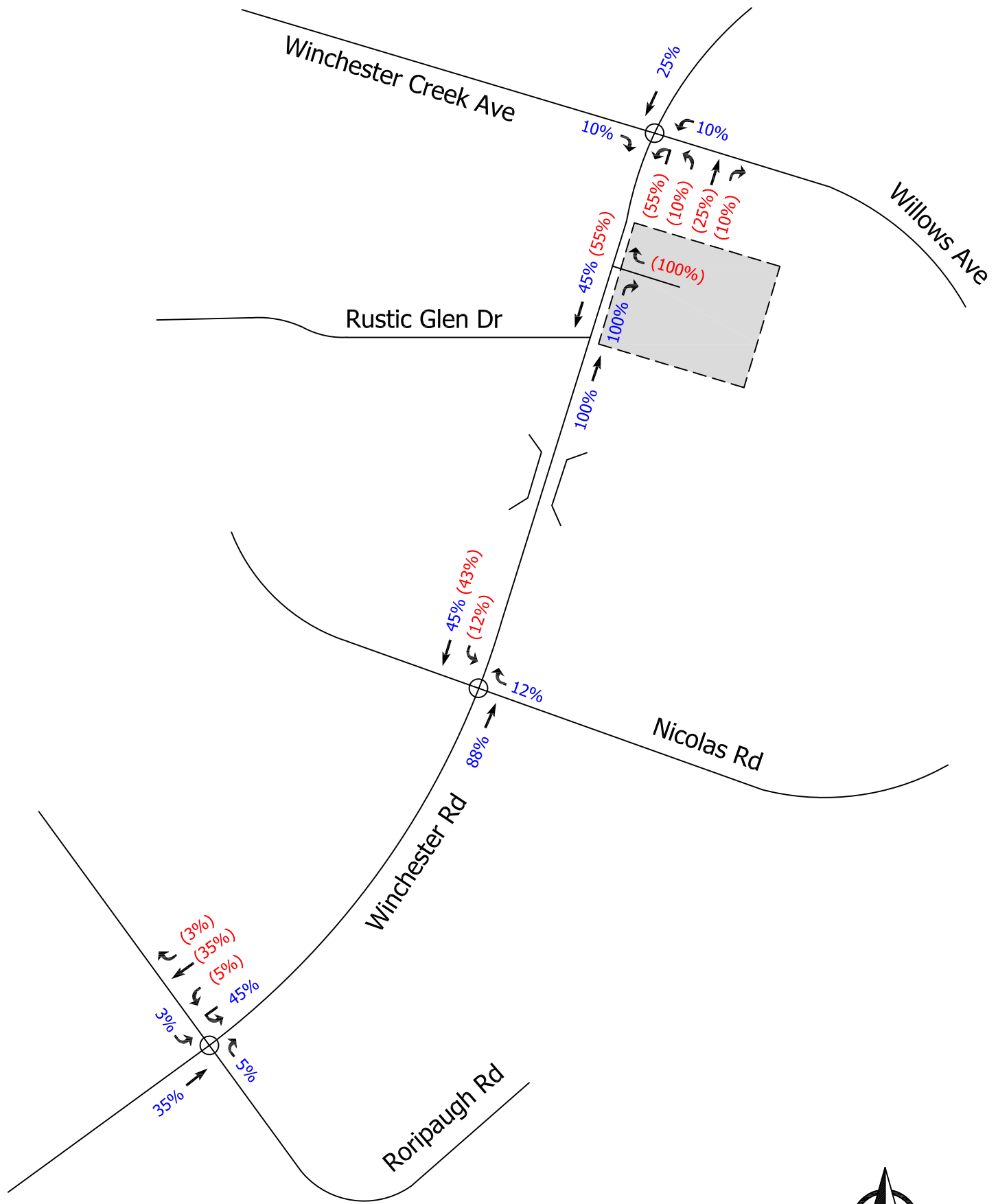
Trip distribution assumptions are used to determine the origin and destination of new vehicle trips associated with the Project. The geographic distribution of Project trips is based on the functional classifications of streets in the vicinity, the magnitude of traffic volumes, the estimated origins and destinations of Project trips, and local knowledge of the roadway network. The estimated Project trip distribution are shown in **Figure 2 – Project Trip Distribution**.

Project Access Analysis

Inbound and Outbound Project Traffic Movements

Due to the presence of a raised median divider on Winchester Road in front of the Project site, left-turn inbound and outbound movements will be restricted at the Project driveways with the current roadway configuration. With the inability of making left-turns at the Project driveways, a significant portion of the drivers will have to make U-turns at nearby intersections to enter and exit the Project. As shown in Figure 1, all outbound Project traffic traveling to the south (approximately 55%) would have to make U-turns on northbound Winchester Road at Willows Avenue, which is the adjacent intersection to the north.

For the same reason, all inbound Project traffic arriving from the north (approximately 45%) would have to make U-turns at an intersection to the south to enter the Project site. The challenge for this maneuver is that U-turns are prohibited on southbound Winchester Road at Nicolas Road, which is the intersection immediately to the south of the Project. As a result, U-turns would have to be made at the



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 XX% = INBOUND
 (XX%) = OUTBOUND

▭ = Project Site

next intersection, Roripaugh Road, which is about 4,360 feet south of the main Project driveway. In other words, with the existing raised median divider in front of the Project site, for an inbound driver from the north, he or she would have to pass the Project site and travel an additional 8,720 feet (or 1.65 miles) to enter the main Project driveway. This would be extremely inconvenient, and would generate a number of unnecessary trips on Winchester Road.

Recommended improvement: provide an opening in the raised median on Winchester Road in front of the main Project driveway.

Traffic Control on Winchester Road and the Main Project Driveway

To improve Project site access, the raised median on Winchester Road should have an opening in front of the main Project driveway. In addition, due to the high prevailing speed on Winchester Road (55 miles per hour), and very heavy traffic volumes during the commuter peak periods (3,500 to 5,000 vehicle per hour), there should also be some sort of traffic control on Winchester Road at the main Project driveway.

JB & Associates conducted a Traffic Signal Warrant study in accordance with guidelines published in the *California Manual on Uniform Traffic Control Devices (CA MUTCD) 2014 Edition*. Because the subject intersection is in the future, some of the required traffic data, such as eight-hour vehicle volumes, four-hour vehicle volumes, pedestrian volumes, collision records, intersection delays etc. are not currently available. Therefore, only “Traffic Signal Warrant 3, Peak Hour” was used in the study. According to CA MUTCD, “The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street (main Project driveway) traffic suffers undue delay when entering or crossing the major street (Winchester Road)”.

In **Appendix A** is the Peak-Hour Signal Warrant for the Winchester Road and the main Project driveway intersection. As shown in Appendix A, the peak hour volumes at the Project driveway are below the threshold volume for the minor-street approach of 150 vehicles per hour. Therefore, according to this particular warrant, a traffic signal is not justified at the subject location, and traffic at the main Project driveway is not expected to suffer undue delay during the peak hours. However, in addition to the high prevailing speed and heavy peak-period traffic volumes previously mentioned, future residents at this Project are seniors that potentially have relatively longer perception and reaction time to changing traffic conditions.

To address the safety aspect of this analysis, a traffic gap survey was conducted on June 8, 2023 during the afternoon commuter peak period of 4:30 to 6:30 pm. In **Appendix B** is the traffic gap data for northbound Winchester Road in front of the Project site. The purpose of the gap study is to determine if there are adequate critical gaps on Winchester Road that would allow Project traffic to enter the Winchester Road traffic stream from the main driveway. According to the *Highway Capacity Manual*, published by Transportation Research Board, “the critical gap is defined as the minimum time interval in the major-street traffic stream that allows intersection entry for one minor-street vehicle”. Based on the Highway Capacity Manual, the critical gap for making a right-turn from a minor street (i.e. the main Project driveway) is 6.9 seconds. As shown in Appendix B, of all the traffic gaps recorded, about 58% are

less than or equal 7 seconds. In other words, without any traffic control on Winchester Road, more than 50% of the time a driver waiting at the main Project driveway will not have adequate time to make a right turn onto Winchester Road. It is important to note that the critical gap in the Highway Capacity Manual is applicable to typical drivers. Some senior drivers may require even longer gap time for the right-turn maneuver.

Recommended Improvement: Install a traffic signal with a protected southbound left-turn phase at the Winchester Road and main Project driveway intersection.

Intersection Geometric Layout on Winchester Road at the Main Project Driveway

Under existing condition, Winchester Road in front of the Project has 3 travel lanes in each direction with a raised median. To facilitate inbound and outbound movements to and from the Project site, the following improvements are recommended:

- ***Provide a 34-foot-wide main Project driveway with a 10-foot-wide right-turn lane, a 10-foot-wide left-turn lane and a 14-foot-wide inbound lane.***
- ***Provide an exclusive 120-foot-long southbound left-turn lane with a 2-foot-wide raised median, and a 120-foot-long transition in the Winchester Road median.***

In addition, due to the higher than normal travel speed on northbound Winchester Road, special attention was given to the design of the northbound approach to the main Project driveway. The provision of a northbound deceleration lane was originally considered at the request of the City. However, the existing power poles on the east side of Winchester Road prohibit adequate widening of Winchester Road for a deceleration lane, especially when the City decides to extend the existing buffered bicycle lane northerly in the future. In reviewing other intersections on Winchester Road in close proximity to the Project, such as Rustic Glenn Drive and Willows Avenue that carry heavier traffic volumes than the main Project driveway, deceleration lanes are not provided at those intersections.

Therefore, it is recommended that in lieu of a deceleration lane, a 95-foot-long transition taper at the northbound Winchester Road approach to the main Project driveway be provided with a 35-foot curb return radius at the main Project driveway. This design will provide a transition zone for inbound traffic to diverge from the through movement, and to reduce speed before entering the Project site.

Shown in ***Figure 3 – Schematic Project Driveway Design*** is a diagram showing the schematic signing and striping design, as well as traffic signal equipment layout for the intersection on Winchester Road at the main Project driveway.



LEGEND

- Striping Modification
- Curb Line Modification
- ➔ Proposed Traffic Signal Equipment
- + Proposed Signing on Signal Equipment

Figure 3
Schematic Project Driveway Design

Conclusion

The Project is estimated to generate 30 trips (10 inbound and 20 outbound) in the morning peak hour, 38 trips (21 inbound and 17 outbound) in the afternoon peak hour, and 492 trips on a typical weekday.

The existing raised median divider on Winchester Road restricts left-turn movement to and from the Project site, and would create excessive U-turns at nearby intersections.

Due to heavy traffic volumes on Winchester Road, it would be difficult for the Project traffic to enter the traffic stream on Winchester Road without any traffic control.

It is recommended to provide an opening in the raised median on Winchester Road in front of the main Project driveway to improve Project accessibility and a traffic signal with a southbound protected left turn phase be installed to enhance traffic safety.

Appendix A

Traffic Signal Warrant

Winchester Road and Project Driveway, Temecula, CA

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume SATISFIED* YES NO

Record hourly vehicular volumes for any four hours of an average day.

| APPROACH LANES | 2 or More | | Hour |
|--------------------------------|-----------|------|------|
| | One | More | |
| Both Approaches - Major Street | | | |
| Higher Approach - Minor Street | | | |

| | | |
|--|------------------------------|-----------------------------|
| *All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS) | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS) | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

WARRANT 3 - Peak Hour SATISFIED YES NO
 (Part A or Part B must be satisfied)

PART A SATISFIED YES NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

| | | |
|---|---|--|
| 1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |

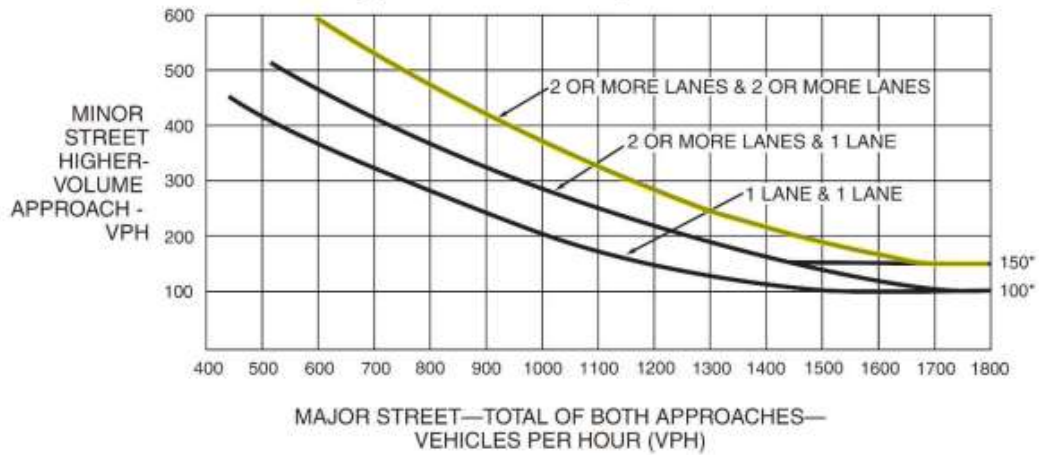
PART B SATISFIED YES NO

| APPROACH LANES | 2 or More | | Hour |
|--------------------------------|-----------|-------|------|
| | One | More | |
| Both Approaches - Major Street | | 3,334 | |
| Higher Approach - Minor Street | | 20 | |

| | | |
|--|------------------------------|--|
| The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS) | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS) | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |

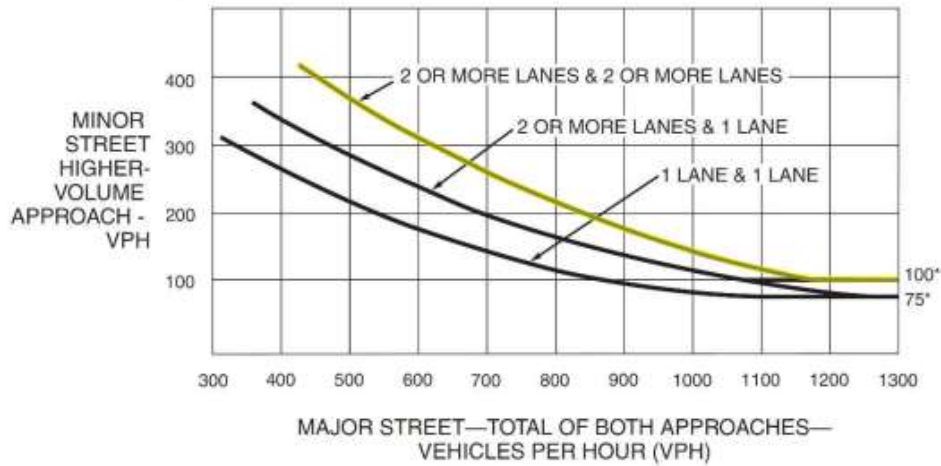
The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)
 (COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Appendix B

Traffic Gap Survey Data

CITY TRAFFIC COUNTERS
WWW.CTCOUNTERS.COM

File Name : 80134WinchesterRd_NB_GapStudy
 Site Code : 00000000
 Start Date : 6/8/2023
 Page No : 1

Directions Printed: North

| Start Time | Volume | 2 - 3 | 4 - 5 | 6 - 7 | 8 - 9 | 10 - 11 | 12 - 13 | 14 - 15 | 16 - 17 | 18 - 19 | 20 - 21 | 22 - 23 | 24 - 25 | 26 - 27 | 28 - 29 | >29 | Int. Total | Average |
|--------------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 04:30 PM | 324 | 18 | 5 | 6 | 6 | 2 | 4 | 2 | 4 | 2 | 4 | 0 | 0 | 1 | 0 | 2 | 56 | 6-7 |
| 04:45 PM | 334 | 8 | 16 | 6 | 4 | 3 | 1 | 4 | 4 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 53 | 6-7 |
| Total | 658 | 26 | 21 | 12 | 10 | 5 | 5 | 6 | 8 | 3 | 4 | 1 | 1 | 2 | 1 | 4 | 109 | 6-7 |
| 05:00 PM | 313 | 18 | 10 | 8 | 3 | 3 | 3 | 3 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 3 | 56 | 6-7 |
| 05:15 PM | 338 | 21 | 10 | 0 | 4 | 6 | 5 | 3 | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 2 | 57 | 4-5 |
| 05:30 PM | 293 | 17 | 9 | 7 | 7 | 4 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 4 | 56 | 6-7 |
| 05:45 PM | 325 | 13 | 11 | 5 | 8 | 3 | 4 | 1 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 3 | 53 | 6-7 |
| Total | 1269 | 69 | 40 | 20 | 22 | 16 | 13 | 9 | 2 | 3 | 6 | 2 | 4 | 1 | 3 | 12 | 222 | 6-7 |
| 06:00 PM | 314 | 23 | 10 | 12 | 6 | 5 | 3 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 66 | 6-7 |
| 06:15 PM | 267 | 12 | 10 | 6 | 5 | 4 | 3 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 5 | 51 | 6-7 |
| Grand Total | 2508 | 130 | 81 | 50 | 43 | 30 | 24 | 16 | 14 | 6 | 12 | 3 | 7 | 4 | 5 | 23 | 448 | 6-7 |
| Total % | | 29.0 | 18.1 | 11.2 | 9.6 | 6.7 | 5.4 | 3.6 | 3.1 | 1.3 | 2.7 | 0.7 | 1.6 | 0.9 | 1.1 | 5.1 | | |

Peak Hour Analysis From 04:30 PM to 06:15 PM - Peak 1 of 1
 Peak Occurred: 04:30 PM
 Volume 1309
 High Int. 05:15 PM
 Volume 338
 PHF 0.968