APPENDIX D

Village Specific Plan

Traffic Analysis

December 14, 2021

Prepared for

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VILLAGE SPECIFIC PLAN

Traffic Analysis

DRAFT

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Town of Apple Valley

December 14, 2021

Contents

List of Tables

List of Figures

I. Introduction to the Specific Plan Traffic Analysis

This report summarizes the traffic analysis conducted for the Village Specific Plan (the "Plan"). The traffic analysis evaluates and supports the Plan's proposed Circulation Plan to identify where improvements are required to achieve and maintain the Town's Level of Service (LOS) policies. Further, the traffic analysis evaluates two control and configuration alternatives for Highway 18 from Navajo Road to Central Road.

This traffic analysis is not an environmental clearance review of the Specific Plan as required under the California Environmental Quality Act (CEQA). In July 2020, Senate Bill (SB) 743 took effect and changed the way transportation impacts are analyzed under CEQA. Specifically, SB 743 amends CEQA to provide an alternative to automobile LOS for evaluating and identifying significant transportation impacts. Measurements of transportation impacts now emphasize "vehicle miles traveled (VMT) or vehicle miles traveled per service population". The analysis of the VMT impacts of the Plan are summarized in this report and the full VMT report is included in the appendix. This summary document presents the following information:

- A qualitative and quantitative description of the Specific Plan "project" comprised of the proposed land use changes and the proposed transportation system improvements.
- Estimated traffic generation of the Plan at buildout and a discussion of the assumptions used in the estimation.
- Traffic forecasts of buildout of the Plan including the methodologies used to develop the forecasts.
- Operations analysis of vehicular delay and level of service under existing conditions (for comparison) and long-term scenarios and identification of roadway and intersection improvements to incorporate into the Plan's circulation system to achieve the goals of the Plan and the Town's policies related to traffic performance.

II. Analysis Scenarios

The purpose of the analyses in this report is to demonstrate that the Plan's proposed circulation plan can accommodate the traffic demands generated by the Plan's proposed land uses while maintaining the Town's LOS policies and to identify modifications to the circulation plan to achieve these goals.

Additionally, this report contains a comparative analysis of the Highway 18 corridor alternatives from a traffic operations perspective. It is not the intent of this report to recommend one Highway 18 corridor alternative over another, but to provide information to the Town which will select an alternative based on a range of criteria of which traffic operations is but one factor.

The following scenarios are analyzed in this report:

1. Existing Conditions
2. Future 2040 Background Conditions
3. Future 2040 Plus Project Buildout Conditions

III. Project Description

A. Specific Plan Land Use Summary

The capacity for future development in the Specific Plan area is based on the following:

1. Currently vacant land within the Specific Plan boundaries.
2. Redevelopment of under-utilized developed land within the Specific Plan boundaries.

Table 1 shows the development capacity of currently vacant and under-utilized land and adds the potential commercial and residential development to existing land uses in the Specific Plan area. **Figure 1** illustrates the Specific Plan area divided into Districts which are further divided into traffic analysis zones. The land use projections are organized by these Districts and zones.

Table 1: Village Specific Plan Existing and Proposed Land Uses

Districts/Current Land Use Designation	Acres of Land					Dwelling Units				Commercial/Services/Retail SF			
	Developed Acres	Under-Utilized Acres	Total Developed Acres	Vacant Acres	Total Acreage	Existing Units	Under-Utilized Potential New Units [1]	Vacant Potential Units [2]	Total Units w/ Under-Utilized Redeveloped Land [4]	Existing SF	Under-Utilized Potential New SF [1]	Vacant Potential SF [3]	Total SF w/ Under-Utilized Redeveloped Land [4]
District-1 Village Core													
Commercial /Industrial /Office /Retail	51.85	12.23	64.07	106.57	170.64	0	[1]	[1]	---	543,437	[1]	[1]	---
Residential	7.80	2.63	10.42	1.01	11.43	46	[1]	[1]	---	0	[1]	[1]	---
Mobile Home Park **5**	0	1.47	1.47	0	1.47	17	[1]	[1]	---	0	[1]	[1]	---
District-1 Subtotal:	**51.85**	**16.33**	**75.97**	**107.58**	**183.55**	**63**	**42**	**180**	**259**	**543,437**	**310,038**	**2,147,072**	**2,907,393**
District-2 Village Services South													
Commercial /Industrial /Office /Retail	81.90	11.76	93.66	91.42	185.08	0	0	0	0	927,800	256,195	1,991,144	3,092,170
Residential	0.83	4.65	5.48	0	5.48	13	0	0	1	0	101,311	0	101,311
Public	13.05	0	13.05	0	13.05	0	0	0	0	101,733	0	0	101,733
Mobile Home Park **5**	0	7.37	7.37	0	7.37	76	0	0	0	0	160,455	0	160,455
District-2 Subtotal:	**95.78**	**23.78**	**119.56**	**91.42**	**210.98**	**89**	**0**	**0**	**1**	**1,029,533**	**517,961**	**1,991,144**	**3,455,669**
District-3 Village Services North													
Commercial /Industrial /Office /Retail	20.76	7.06	27.82	48.31	76.13	0	0	0	0	140,786	153,713	1,052,200	1,331,108
Public	8.11	0	8.11	0	8.11	0	0	0	0	40,302	0	0	40,302
Mobile Home Park **5**	0	4.00	4.00	0	4.00	41	0	0	0	0	87,109	0	87,109
District-3 Subtotal:	**28.87**	**11.06**	**39.93**	**48.31**	**88.24**	**41**	**0**	**0**	**0**	**181,088**	**240,822**	**1,052,200**	**1,458,519**
District-4 Residential and Recreation													
Commercial /Industrial /Office /Retail	5.58	0.00	5.58	0	5.58	0	0	0	0	25,651	0	0	25,651
Residential	7.76	2.51	10.28	2.98	13.25	57	50	60	152	0	0	0	0
Public, Park, etc	26.76	0	26.76	0	26.76	0	0	0	0	43,671	0	0	43,671
Mobile Home Park **5**	0	4.69	4.69	0	4.69	39	94	0	94	0	0	0	0
District-4 Subtotal:	**40.10**	**7.20**	**47.30**	**2.98**	**50.28**	**96**	**144**	**60**	**246**	**69,322**	**0**	**0**	**69,322**

Districts/Current Land Use Designation	Acres of Land					Dwelling Units				Commercial/Services/Retail SF			
	Developed Acres	Under-Utilized Acres	Total Developed Acres	Vacant Acres	Total Acreage	Existing Units	Under-Utilized Potential New Units [1]	Vacant Potential Units [2]	Total Units w/ Under-Utilized Redeveloped Land [4]	Existing SF	Under-Utilized Potential New SF [1]	Vacant Potential SF [3]	Total SF w/ Under-Utilized Redeveloped Land [4]
District-5 Residential													
Residential	0	0	0	23.28	23.28	0	0	466		0	0	0	0
District-5 Subtotal:	**0**	**0**	**0**	**23.28**	**23.28**	**0**	**0**	**466**	**466**	**0**	**0**	**0**	**0**
Land Use Total Acreage:	**216.60**	**58.36**	**282.76**	**273.57**	**556.33**	---	---	---	---	---	---	---	---
Street ROW Total Acres:	**94.82**	**0**	**94.82**	**0**	**94.82**	---	---	---	---	---	---	---	---
Grand Total	**311.42**	**58.36**	**377.58**	**273.57**	**651.16**	**289**	**186**	**706**	**971**	**1,823,380**	**1,068,821**	**5,190,416**	**8,082,618**

Note: Potential uses for vacant and/or underutilized acres assumes District 1 is mixed use residential and commercial/services (see footnote 1), Districts 2 and 3 are all commercial/services uses, and Districts 4 and 5 are all residential uses.

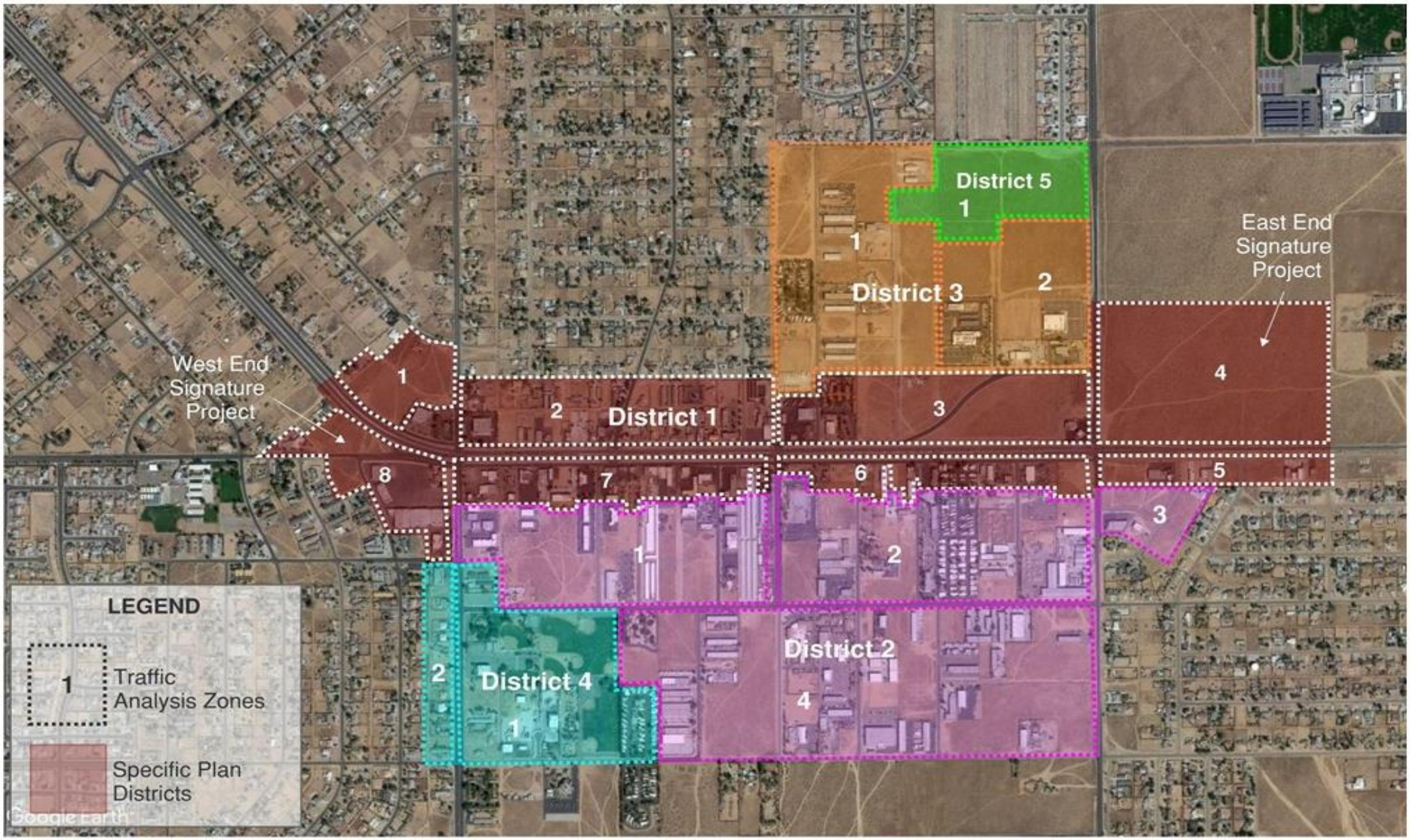
[1]. For District 1, assumes the west end signature project (Franklin, 5 parcels, approx. 8.38 acres categorized as "underutilized") will develop 25% residential (2.095 acres) and 75% commercial (6.285 acres), the east end signature project (30 acres, all vacant lands) will develop 30% residential (9 acres) and 70% commercial (21 acres), and remaining underutilized acreage will develop as commercial. Combined, the west and east end signature projects are 11.09 acres residential and 27.29 acres commercial. It was assumed that 2.095 acres was subtracted from the total underutilized acreage and applied to residential units, and the remaining underutilized acreage (16.33 - 2.095 = 14.235 acres) would be applied to commercial. For the 30-acre east end project, 9 acres was subtracted from the total vacant acreage of 107.58 and applied to residential, and the remaining acreage of 98.58 (107.58 - 9 = 98.58) is assumed commercial.

[2] Future residential development potential assumes maximum density of 20 DU/AC.

[3] Commercial development potential: estimate assumes existing development has occurred at maximum allowed Floor Area Ratio (FAR) of 0.5. (acres x 43,560 sf x 50%.)

[4] Underutilized acres currently have either commercial/retail/service SF or residential units on site. Redevelopment of underutilized sites assumes all existing SF/units would be removed from that site. For the scenarios where underutilized acres are redeveloped, the total SF or residential units is the sum of existing + underutilized. + vacant - existing underutilized. SF/units.

[5] Existing mobile home parks are planned to be redeveloped as commercial space or multi-family units. No new MHPs are proposed.



Apple Valley Village Specific Plan

Figure 1
Districts and Traffic Analysis Zones

The nearly 54 acres of under-utilized land within the Specific Plan area, assumed developed at the maximum allowable floor area ratio of 0.5, would yield over one million square feet of commercial building space (1,068,800 square feet) and about 186 new multi-family dwelling units (at a density of 20 units per acre).

The currently vacant land, also assumed developed at the maximum allowable floor area ratio of 0.5, would yield over five million square feet of commercial building space (5,190,400 square feet) and about 706 new multi-family dwelling units.

Compared to the existing level of development in the Specific Plan area, about 1,823,400 square feet of commercial uses and 289 dwelling units (both single and multi-family) the Specific Plan could potentially more than triple the existing commercial building space (342%) and residential units (308%) within all five districts.

Table 1, however, only presents the non-residential land use as an aggregate mixed-use development of commercial /industrial /office /retail land uses as well as residential. To estimate and model traffic the non-residential land use needs to be better defined by type.

B. Summary of Specific Plan Land Use by Type and Traffic Analysis Zone

Table 2 summarizes the breakdown of the aggregated land use into discrete land use types typically found in mixed-use districts. The breakdown is presented by traffic analysis zone. The fraction of the total land use representing each type of land use was assumed based on observed land use splits in typical mixed-use districts. These assumptions include about half of the land use in the Plan area would be retail and services (45%) including restaurants and drinking establishments (5%) while the other half would develop as office (30%), research and development, and hi-tech light manufacturing uses (20%). These assumptions were shared with the team's land use planers who agreed they were reasonable assumptions. Appendix A provides detailed worksheets presenting the assumptions used in converting the aggregated land uses in **Table 1** into discrete land use types that can be used to forecast and model traffic generated by buildout of the Specific Plan.

The floor areas and housing units totals in **Tables 1 and 2** may not match because they are presented differently. **Table 1** presents the Specific Plan area's land use as an accumulation of land use building from existing development and adding redevelopment of under-utilized land and development of vacant land. **Table 2** is intended to support the estimation of the Specific Plan's traffic generation, so it is typical to separate the "growth" in land use from existing land use. We estimate future traffic based on the growth in land use and add the estimated growth in traffic to existing conditions which is in the form of empirical traffic counts.

The land use totals in **Table 2** represent the maximum potential buildout of the Specific Plan area over and above the existing level of development that isn't assumed to be redeveloped. This "maximum potential" is theoretically possible and the Specific Plan's proposed changes to the Town's zoning code would permit this scenario. However, based on experience it is unlikely that the Specific Plan area would buildout with every development building to the maximum floor area ratio (FAR) so the likely buildout may be lower, but not higher, than portrayed in the tables.

C. Commercial Land Use Converted to Employees as Input to the Demand Forecasting Model (SBTAM)

Table 2 shows the conversion of the commercial land uses from building floor area to employees as the primary input for the San Bernardino Transportation Analysis Model (SBTAM)—the regional travel demand forecasting model developed and maintained by the San Bernardino County Transportation Authority (SBCTA). In addition to employment and housing units, the SBTAM requires socioeconomic data comprising numerous variables used in the process of estimating travel by different purposes and by modes. The model includes population and household variables, school enrollment variables, employment variables, and household income variables.

Table 2: Summary of Village Specific Plan Land Use at Buildout (Districts 1 -3)

Specific Plan Land Use Category		District 1 (See Figure 1)							
		Traffic Analysis Zones							
		1	2	3	4 [1]	5	6	7	8 [2]
		Building Floor Area (GSF) or Dwelling Units (DUs)							
Retail / Services		114,500	270,636	301,863	205,821	104,091	135,318	114,500	61,599
Restaurant / Drinking Establishments		12,722	30,071	33,540	22,869	11,566	15,035	12,722	6,844
Office		76,333	180,424	201,242	137,214	69,394	90,212	76,333	76,333
Industrial / R&D / High Tech Manuf		50,889	120,283	134,161	91,476	46,263	60,141	50,889	50,889
Multi Family Residential		0	0	0	180	0	0	0	42
SBCTA Travel Demand Model Land Use Categories	**Square Feet Per Employee Conversion [4]**	**Conversion of Building Floor Area to Employees**							
Retail / Service Employees [3]	1,168	109	257	287	196	99	129	109	59
Office Employees	956	80	189	211	144	73	94	80	80
Industrial Employees	2,274	22	53	59	40	20	26	22	22
	Total Employees	**211**	**499**	**557**	**380**	**192**	**250**	**211**	**161**
Multi Family Residential		0	0	0	180	0	0	0	42

Specific Plan Land Use Category		District 2 (See Figure 1)			
		Traffic Analysis Zones			
		1	2	3	4
		Building Floor Area (GSF) or Dwelling Units (DUs)			
Retail / Services		96,059	136,505	20,223	252,787
Restaurant / Drinking Establishments		24,015	34,126	5,056	63,197
Office		144,089	204,757	30,334	379,180
Industrial / R&D / High Tech Manuf		216,133	307,136	45,502	568,770
Multi Family Residential		0	0	0	0
SBCTA Travel Demand Model Land Use Categories	**Square Feet Per Employee Conversion [4]**	**Conversion of Building Floor Area to Employees**			
Retail / Service Employees [3]	1,168	103	146	22	271
Office Employees	956	151	214	32	397
Industrial Employees	2,274	95	135	20	250
	Total Employees	**349**	**495**	**73**	**917**
Multi Family Residential		0	180	0	42

Specific Plan Land Use Category		District 3 (See Figure 1)		
			Traffic Analysis Zones	
			1	2
			Building Floor Area (GSF) or Dwelling Units (DUs)	
Retail / Services			166,066	89,420
Restaurant / Drinking Establishments			41,517	22,355
Office			249,099	134,130
Industrial / R&D / High Tech Manuf			373,649	201,195
Multi Family Residential			0	0
SBCTA Travel Demand Model Land Use Categories	**Square Feet Per Employee Conversion [4]**	**Conversion of Building Floor Area to Employees**		
Retail / Service Employees [3]	1,168		178	96
Office Employees	956		261	140
Industrial Employees	2,274		164	88
	Total Employees		**603**	**324**
Multi Family Residential			0	42

Notes:
[1] East End Signature Project
[2] West End Signature Project
[3] Includes Restaurants and Drinking Establishments
[4] Source of SF to Employee Conversion Factors: Employment Density Study Summary Report. Prepared for: Southern California Association of Governments (SCAG). Prepared by The Natelson Company, Inc., October 31, 2001. Table 7B - Derivation of square feet per employee in San Bernardino County based on median employee per acre and median floor area ratio.
GSF = Gross Square Feet

Table 2 (Cont.): Summary of Village Specific Plan Land Use at Buildout (Districts 4 -5)

Specific Plan Land Use Category		District 4 (See Figure 1)		
			Traffic Analysis Zones	
			1	2
			Building Floor Area (GSF) or Dwelling Units (DUs)	
Retail / Services			0	0
Restaurant / Drinking Establishments			0	0
Office			0	0
Industrial / R&D / High Tech Manuf			0	0
Multi Family Residential			21	129
SBCTA Travel Demand Model Land Use Categories	**Square Feet Per Employee Conversion [4]**	**Conversion of Building Floor Area to Employees**		
Retail / Service Employees [3]	1,168		0	0
Office Employees	956		0	0
Industrial Employees	2,274		0	0
	Total Employees		**0**	**0**
Multi Family Residential			21	129

Specific Plan Land Use Category		District 5 (See Figure 1)	
			Traffic Analysis Zone
			1
			Building Floor Area (GSF) or Dwelling Units (DUs)
Retail / Services			0
Restaurant / Drinking Establishments			0
Office			0
Industrial / R&D / High Tech Manuf			0
Multi Family Residential			466
SBCTA Travel Demand Model Land Use Categories	**Square Feet Per Employee Conversion [4]**	**Conversion of Building Floor Area to Employees**	
Retail / Service Employees [3]	1,168		0
Office Employees	956		0
Industrial Employees	2,274		0
	Total Employees		**0**
Multi Family Residential			466

Notes:
[1] East End Signature Project
[2] West End Signature Project
[3] Includes Restaurants and Drinking Establishments
[4] Source of SF to Employee Conversion Factors: Employment Density Study Summary Report. Prepared for: Southern California Association of Governments (SCAG). Prepared by The Natelson Company, Inc., October 31, 2001. Table 7B - Derivation of square feet per employee in San Bernardino County based on median employee per acre and median floor area ratio.
GSF = Gross Square Feet

In summary, the total amount of new development at buildout of the Specific Plan area by district is equal to:

- District 1: 2,966,171 SF of commercial floor area (2,460 employees) and 222 MF dwelling units
- District 2: 2,527,869 SF of commercial floor area (1,835 employees)
- District 3: 1,277,431 SF of commercial floor area (927 employees)
- District 4: 150 MF dwelling units
- District 5: 466 MF dwelling units
- **All Districts: 6,771,471 SF of commercial floor area (5,222 employees)**
- **All Districts: 838 MF dwelling Units**

D. Proposed Circulation Plan and Alternatives

The basis of the Plan's Circulation Plan is the existing street network comprising a grid of major and minor streets. State Route (SR) 18 bisects the Specific Plan area. State Route 18 is a critical element in the Specific Plan because it is presently a significant impediment to walking (due to its 200-foot right of way and nearly ½-mile distance between protected crossings) and could present a major challenge for connecting walkable mixed-use neighborhoods on either side of Highway 18 unless the corridor is transformed into a safe and attractive multi-modal complete street.

Except for Navajo Road and Central Road as designated major streets with existing or future vehicular capacity, the remaining streets in the Specific Plan area form a somewhat uniform grid of mostly narrow two-lane streets. The two alternative concepts for the Specific Plan circulation system mostly differ in the Highway 18 corridor as described below.

1. Circulation Plan Overview

There are two alternative concepts for the Specific Plan circulation system. Alternative 1 advances the "all roundabouts on Highway 18" option developed as part of the State Route 18 Corridor Enhancement Plan and Alternative 2 assumes the "all traffic signals on Highway 18" option.

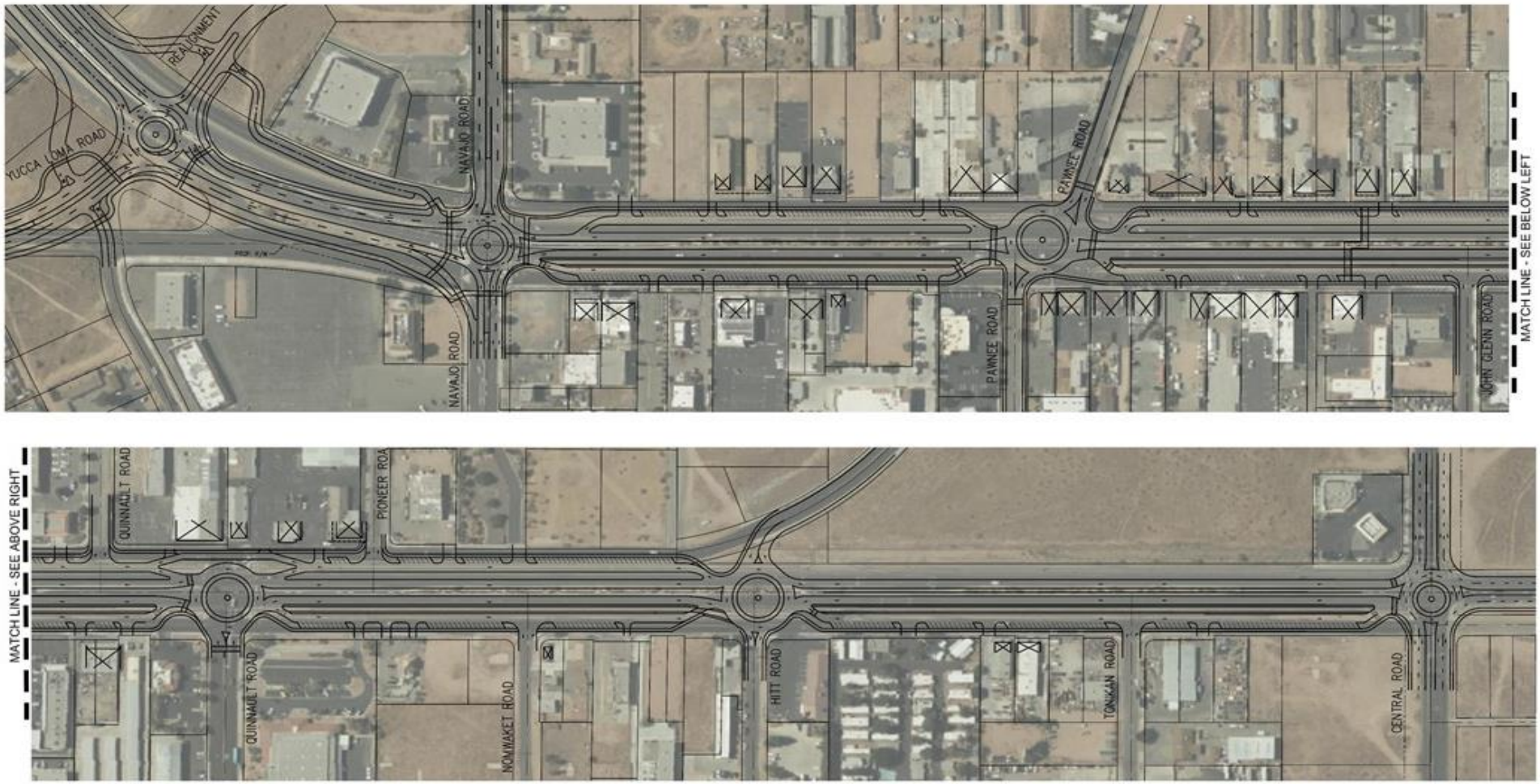
Circulation Plan Alternative 1 (All Roundabouts on Highway 18)

Circulation Plan Alternative 1 is depicted in **Figure 2** and key features of the plan are described below.

- Roundabouts comprise the intersections on Highway 18 from the realignment of Yucca Road in the west to Central Road in the east. Multi-lane roundabouts are used at intersections with major thoroughfares (Yucca Loma Road, Navajo Road, and Central Road) and single lane roundabouts are used at intersections with local streets (Pawnee Road, Quinault Road, Hitt Road / Realigned Headquarters Drive).
- Alternative 1 incorporates two roadway realignment projects including realigning Yucca Loma Road to Highway 18 and extending Yucca Loma Road to intersect Navajo Road at Arapahoe Avenue. Additionally, Headquarters Drive is realigned to intersect Highway 18 at Hitt Road. The realignment projects are described in detail in a later section.
- The Outer Highway 18 frontage roads remain in this alternative but are widened and reconfigured as one-way streets with diagonal parking lining one side of each street. Access to and from the frontage roads employs ramps near the roundabout entries and exits.
- Powhatan Road may potentially be widened to four lanes and designated as a major thoroughfare should it be required to relieve traffic demand on Highway 18 due the constriction of Highway 18 to a single lane in each direction between Navajo Road and Central Road. Should this occur the intersection of Powhatan Road and Central Road would be signalized.
- New traffic signals are identified on Ottawa Road at Navajo Road and Central Road and at Central Road / Headquarters Drive. All way stop control is proposed on Quinault Road at Powhatan Road and Ottawa Road.
- Pedestrian crossing enhancements are proposed at roundabouts and at new and existing signalized intersections. Pedestrian features of the Circulation Plan are described in the Specific Plan's Active Transportation Plan pedestrian network section.
- The narrowing of Highway 18 to a single lane in each direction (and burying the existing drainage channels on both sides on the highway) provides space to improve the frontage roads as described above and to integrate a multi-use path and urban design features within the right of way on the south side of Highway 18. **Figure 3** presents the geometric details of Alternative 1 between the realignment of Yucca Loma Road and Central Avenue.

Apple Valley Village Specific Plan

Figure 2
Circulation Plan Alternative 1
(Highway 18 All Roundabouts Alternative)



Apple Valley Village Specific Plan

Figure 3
Alternative 1 Highway 18 Geometric Detail
(Highway 18 All Roundabouts Alternative)

Circulation Plan Alternative 2 (All Signals on Highway 18)

Circulation Plan Alternative 2 is depicted in **Figure 4** and key features of the plan are described below.

- Alternative 2 shares many of the same features as Alternative 1 with the primary difference being the configuration and intersection control on Highway 18.
- Traffic signals provide intersection control along Highway 18. New signalized intersections (with protected pedestrian crossings) are located at the Yucca Road realignment to Highway 18 and at Navajo Road, the intersection of Highway 18 with Pawnee Road, and at the intersection resulting from the realignment of Headquarters Drive to Highway 18 at Hitt Road. Additional new traffic signals are identified at Central Road and Powhatan Road, Central Road and Headquarters Drive, and on Ottawa Road at Navajo Road and Central Road. All way stop control is proposed on Quinault Road at Powhatan Road and Ottawa Road.
- As in Alternative 1, the Outer Highway 18 frontage roads remain in Alternative 2 but are widened and reconfigured as one-way streets with diagonal parking lining one side of each street. Access to and from the frontage roads employs ramps before and after each signalized intersection.
- In Alternative 2, Powhatan Road remains a local street since it is not proposed to relieve traffic demand from Highway 18.
- Pedestrian crossing enhancements are proposed at new and existing signalized intersections. Pedestrian features of the Circulation Plan are described in the Active Transportation Plan pedestrian network section.
- In this alternative, Highway 18 remains a four-lane thoroughfare with left turn bays, so the street does not gain the additional space that Alternative 1 does by reducing the number of through lanes. However, Alternative 2 provides bicycle facilities in the form of Class II bike lanes in each direction of Highway 18 and/or through a multi-use path within space gained by burying the existing drainage channels on both sides on the highway. Bicycle features of the Circulation Plan are described in the Specific Plan's Active Transportation Plan bicycle network section. **Figure 5** presents the geometric details of Alternative 2 between the realignment of Yucca Loma Road and Central Road.

IV. Estimated Project Trip Generation at Buildout

A. Trip Generation Methodology

The traffic forecasting of buildout of the Specific Plan in the year 2040 occurs within the San Bernardino County Transportation Analysis Model's (SBTAM) processes. In the SBTAM, trip generation is the process of estimating daily person trips for an average weekday generated by households within each Traffic Analysis Zone (TAZ). The SBTAM contains a series of internal models that calculate trip productions (trip ends generated by households) and trip attractions (trip ends generated by employment) for different trip purpose using socioeconomic data unique to each TAZ across the County such as household size, income, age, automobile ownership, etc.

SBTAM's trip generation module is a complex process using multiple variables to estimate person trips produced by each TAZ for nine trip purposes, each purpose is further striated by household income range. After estimating person trips, another SBTAM module determines what mode of travel is used to complete the trip including drive alone in an automobile, carpool with others, public transportation by bus or train, bicycling, or walking. Trip purposes include:

- **Home-based Work** - trips between home and work, without any intermediate stops and trips between home and work that include one or more intermediate stops, such as to drop-off or pick-up a passenger, or to drop-off or pick-up a child at school.

- **Home-based School** - student trips with an at-home activity at one end of the trip and a K-12 (kindergarten through 12th grade) school activity at the other end.
- **Home-based College and University** - trips made by persons over the age of 18 with an at-home activity at one end of a trip and a college or university activity at the other end.
- **Home-based Shopping** - trips made with a home activity at one end of a trip and a shopping activity at the other end.
- **Home-based Social-recreational** - trips made with a home activity at one end of a trip and a visiting or recreational activity at the other end.
- **Home-based Serving-passenger** - trips made with a home activity at one end of a trip and a passenger serving activity, such as driving someone somewhere, at the other end.
- **Home-based Other** - trips with a home activity at one end of the trip that are not already accounted for by any of the home-based trip categories described above.
- **Work-based Other** - non-home-based trips where at least one end of a trip is from/to a work location. An example would be running an errand during lunch hour from one's place of employment.
- **Other-based Other** - all other trips that do not begin or end at a trip-maker's home or place of work.

Because of the complexity of the model's processes, it is difficult to report the precise number of vehicle trips that are generated by the Specific Plan's land uses and distributed and assigned by the model to the network of streets and intersections being studied in this report. However, it is possible to present an estimate of the Specific Plan's vehicle trip generation using published trip generation rates normally used to estimate the traffic generated by individual land uses in non-mixed-use areas lacking public transportation. Adjustments can be applied to the conservative trip calculations to roughly emulate the interactions between land uses and mode splits that the SBTAM model derives from socioeconomic data and sophisticated algorithms.

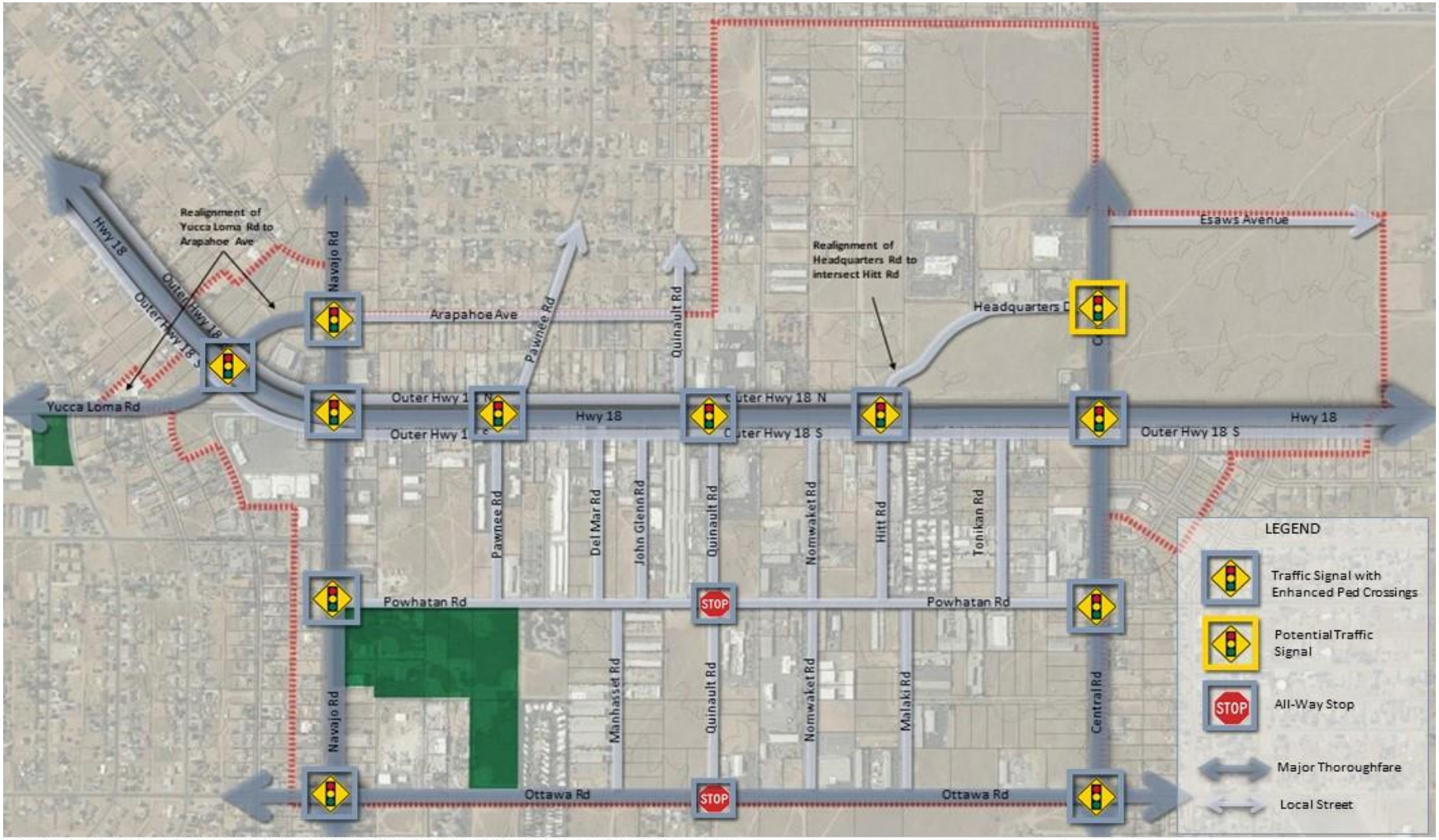
The manual trip generation estimates of the Specific Plan's mix of land uses located in a relatively compact and walkable environment presented in this report are granular and simplistic and likely to over-estimate traffic in some areas and under-estimate in others, but the intent is to demonstrate the general magnitude of vehicular traffic generated by a large amount of land use over a large geographic area.

B. Estimated Vehicular Trip Generation of the Specific Plan

Trip generation rates for the categories of land uses assumed in the Specific Plan are from the Institute of Transportation Engineers (ITE) Trip Generation manual (10th Edition). The rates for average daily traffic and AM and PM peak hour traffic are shown in **Table 3**. The rates were applied to the land uses presented earlier in **Table 2** resulting in the trip estimates shown in **Table 4**. The adjustments reflecting internal capture of trips and other modes of transportation are discussed in the following section. The Specific Plan land use in all five districts at buildout is roughly estimated to generate about 106,000 daily vehicle trips, 5,500 AM peak hour trips and 9,800 PM peak hour vehicular trips.

C. Trip Generation Adjustments

Adjustments to the initial trip generation estimates reflect that the vision for the Village Specific Plan is a higher density mixed-use district located in a relatively compact area with a well-connected multimodal transportation system that encourages public transportation, bicycling and walking. The adjustments are described below.



Refer to the Active Transportation section in the Circulation Plan for pedestrian and bicycle system.

Apple Valley Village Specific Plan

Figure 4
Circulation Plan Alternative 2
(Highway 18 All Traffic Signals Alternative)

Apple Valley Village Specific Plan

Figure 5
Alternative 2 Highway 18 Geometric Detail
(Highway 18 All Signals Alternative)

Table 3: Trip Generation Rates Used for Estimating Specific Plan Traffic

Land Use	Vehicle Trips Per 1,000 SF of Floor Area or Per Dwelling Unit [1]						
	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Retail / Services	37.75	0.58	0.36	0.94	1.83	1.98	3.81
Restaurant / Drinking Establishments	112.18	5.47	4.47	9.94	6.06	3.71	9.77
Office	9.74	1.00	0.16	1.16	0.184	0.966	1.15
Industrial / R&D / High Tech Manufacturing	11.26	0.32	0.11	0.42	0.07	0.42	0.49
Multi-Family Residential	5.44	0.09	0.27	0.36	0.27	0.17	0.44
[1] Trip Generation, 10th Edition. Institute of Transportation Engineers. Washington DC.							

Table 4: Estimated Trip Generation at Buildout of Village Specific Plan

Future Land Use Type	Buildout (GSF / DUs)	Vehicle Trips						
		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
DISTRICT 1								
Retail / Services	1,308,327	49,389	762	467	1,230	2,393	2,592	4,985
Restaurant / Drinking Establishments	145,370	16,308	795	650	1,445	881	540	1,420
Office	907,485	8,839	905	147	1,053	167	877	1,044
Industrial / R&D / High Tech Manufacturing	604,990	6,812	191	64	254	44	252	296
Subtotal Non-Residential Mixed-Use:	2,966,172	81,348	2,653	1,328	3,982	3,485	4,260	7,745
Multi-Family Residential	222	1,208	21	59	80	60	38	98
Subtotal District 1		**82,556**	**2,674**	**1,388**	**4,062**	**3,544**	**4,298**	**7,843**
Internal Capture Within Planning Area		25%	25%	25%	25%	25%	25%	25%
Trips External to Planning Area		61,917	2,005	1,041	3,046	2,658	3,224	5,882
Transit and Active Transportation (20%)		(12,383)	(401)	(208)	(609)	(532)	(645)	(1,176)
TOTAL DISTRICT 1		**49,533**	**1,604**	**833**	**2,437**	**2,127**	**2,579**	**4,706**
DISTRICT 2								
Retail / Services	505,574	19,085	295	181	475	925	1,002	1,926
Restaurant / Drinking Establishments	126,393	14,179	691	565	1,256	766	469	1,235
Office	758,361	7,386	757	123	880	140	733	872
Industrial / R&D / High Tech Manufacturing	1,137,541	12,809	358	119	478	84	474	557
Subtotal Non-Residential Mixed-Use:	2,527,869	53,459	2,101	989	3,089	1,913	2,677	4,591
Multi-Family Residential	89	484	8	24	32	24	15	39
Subtotal District 2		**53,944**	**2,109**	**1,012**	**3,121**	**1,937**	**2,693**	**4,630**
Internal Capture Within Planning Area		25%	25%	25%	25%	25%	25%	25%
Trips External to Planning Area		40,458	1,582	759	2,341	1,453	2,019	3,472
Transit and Active Transportation (20%)		(8,092)	(316)	(152)	(468)	(291)	(404)	(694)
TOTAL DISTRICT 2		**32,366**	**1,265**	**607**	**1,873**	**1,162**	**1,616**	**2,778**
DISTRICT 3								
Retail / Services	574,844	21,700	335	205	540	1,051	1,139	2,190
Restaurant / Drinking Establishments	63,872	7,165	349	286	635	387	237	624
Office	383,229	3,733	382	62	445	71	370	441
Industrial / R&D / High Tech Manufacturing	255,486	2,877	80	27	107	19	106	125
Subtotal Non-Residential Mixed-Use:	1,277,431	35,475	1,147	580	1,727	1,527	1,853	3,380
Subtotal District 3		**35,475**	**1,147**	**580**	**1,727**	**1,527**	**1,853**	**3,380**
Internal Capture Within Planning Area		25%	25%	25%	25%	25%	25%	25%
Trips External to Planning Area		26,606	860	435	1,295	1,146	1,389	2,535
Transit and Active Transportation (20%)		(5,321)	(172)	(87)	(259)	(229)	(278)	(507)
TOTAL DISTRICT 3		**21,285**	**688**	**348**	**1,036**	**916**	**1,112**	**2,028**
DISTRICT 4								
Multi-Family Residential	150	816	14	40	54	40	26	66
Transit and Active Transportation (8%)		(65)	(1)	(3)	(4)	(3)	(2)	(5)
TOTAL DISTRICT 4		**751**	**13**	**37**	**50**	**37**	**24**	**61**
DISTRICT 5								
Multi-Family Residential	466	2,535	44	124	168	125	80	205
Transit and Active Transportation (8%)		(203)	(3)	(10)	(13)	(10)	(6)	(16)
TOTAL DISTRICT 5		**2,332**	**40**	**114**	**154**	**115**	**74**	**189**
GRAND TOTAL ALL DISTRICTS		**106,267**	**3,611**	**1,939**	**5,550**	**4,357**	**5,403**	**9,761**

1. Internal Capture – this adjustment applies to individual mixed-use developments or large-scale activity centers with many types of land uses. For this analysis the internal capture represents trips that stay internal to a District or that travel between adjacent Districts.

   The 25% internal capture rate applied to the Districts with the non-residential mixed-uses (Districts 1, 2, and 3) was validated using the methodology published in the National Cooperative Highway Research Program (NCHRP) Report 684 Enhancing Internal Trip Capture Estimation for Mixed-Use Developments.

2. Transit and Active Transportation – this adjustment represents the increase in transit use, bicycling and walking when attractive and safe facilities are provided and the design of the urban environment encourages alternatives to driving. Reductions for transit and active transportation included:

   - Commercial areas: 8% transit and 12% walk / bike reductions
   - Residential areas: 4% transit and 4% walk / bike reductions

V. Buildout Traffic Forecasts

A. Methodology

For CEQA environmental clearance, the SBTAM regional travel demand forecasting model was used to measure the Specific Plan's Vehicles Miles of Travel (VMT). The same model runs were used to develop year 2040 forecasts with and without buildout of the Specific Plan. The process for converting the SBTAM's link projections to intersection turning movements followed the standard procedure for post-processing model forecast as described in Appendix E of the San Bernardino County Congestion Management Plan. The post-processing procedure is outlined below:

Model Post Processing of Segment Volumes for Future Intersection Analysis

1. Obtain peak hour segment volumes for the base year of the model (2016) and the forecast year (2040) including the Specific Plan land use.
2. Determine the growth in traffic projected by the model at the approaches / departures at each study intersection:
   a. 2040 segment volume minus 2016 segment volume = model growth over 24 years
   b. Adjust the model growth to reflect growth between 2021 (when count data collected) and 2040 = model growth x (19/24)
3. Add growth between 2021 and 2040 to existing 2021 traffic counts at the approaches and departures of each leg of study intersections.
4. Convert directional segment volumes to direction turning volumes (e.g., left, through, right) at each approach of study intersections using methodology in the Transportation Research Board's NCHRP 255 publication.

B. Specific Plan Buildout Traffic Projections

The resulting increase in traffic volume between existing 2021 conditions and 2040 Plus Specific Plan buildout conditions at the study intersections ranges from a low of 27% to a high of 85%. The average increase in traffic volumes at the study intersections is 53%. The following section describes the outcome of the intersection capacity analyses at all the study intersections and highlights the operation difference between the Highway 18 corridor alternatives (Roundabouts versus Traffic Signals).

VI. Traffic Analysis

A. Existing Conditions

The existing conditions scenario represents the baseline from which the buildout traffic analysis is built on. It also identifies, under current roadway and intersection controls and configurations, how much reserve capacity is

available for new development and may identify which intersections will need to be improved before others.

The capacity analysis for existing conditions at seven intersections used AM and PM peak hour traffic counts from the Apple Valley State Route 18 Corridor Enhancement Plan. These counts were conducted in March 2018 and represent pre-COVID traffic volumes.

New counts of the remaining nine intersections were conducted in February 2021 by Newport Traffic Studies, an independent traffic data collection company. These counts were collected during the AM (7:00-9:00 AM) and PM (4:00-6:00 PM) peak periods.

To reflect pre-COVID conditions at the remaining nine study intersections, the intersection of Highway 18 at Navajo was recounted and compared to the 2018 counts. A "COVID Expansion Factor" was calculated based on a Pre COVID-19 count (conducted in 2018) compared to a current traffic count (conducted February 2021) at the intersection of Highway 18 and Navajo Road. Based on this comparison, an expansion factor of 1.45 is applied to AM peak hour and no factor is applied to the PM peak hour traffic counts.

Table 5 presents the capacity analysis for the existing conditions scenario.

Table 5: Existing Conditions Intersection Capacity Analysis

Intersection		Intersection Control Type	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Highway 18 at Navajo Road	TS	29.1	C	42.9	D
2	Highway 18 at Pawnee Road	SSSC	11.3	B	11.3	B
3	Highway 18 at Quinnault Road South	TS	13.5	B	16.0	B
4	Highway 18 at Central Road	TS	31.6	C	31.2	C
5	Central Road at Esaws Avenue	TS	4.6	A	5.5	A
6	Central Road at Headquarters Drive	SSSC	11.4	B	11.1	B
7	Central Road at Powhattan Road	SSSC	15.4	C	16.5	C
8	Central Road at Ottawa Road	SSSC	14.7	B	16.5	C
9	Quinnault Road at Powhattan Road	SSSC	12.1	B	10.8	B
10	Quinnault Road at Ottawa Road	SSSC	8.9	A	8.9	A
11	Navajo Road at Powhattan Road West	SSSC	13.5	B	17.8	C
12	Navajo Road at Powhattan Road East	TS	8.3	A	10.4	B
13	Navajo Road at Ottawa Road	SSSC	16.4	C	27.3	D
14	Highway 18 at Yucca Loma Road	Not Applicable – Intersections Only Occur with Specific Plan				
15	Navajo at Yucca Loma Road					
16	Highway 18 at Hitt Road-Headquarters Dr					

TS – Traffic Signal Controlled Intersection
SSSC – Side Street Stop Controlled Intersection
Delay – seconds per vehicle
LOS – Level of Service

The one intersection of concern is Highway 18 at Navajo Road which is operating at a LOS D with an average of about 43 seconds of delay per vehicle and is approaching its regulatory capacity, but not its physical capacity.

The Town of Apple Valley General Plan Policy 1.A, Program 1.A.4 states that the Town shall require that all intersections maintain a Level of Service D during both the morning and evening peak hour. For signalized intersections, LOS D spans a range of average delay from 35 to 55 seconds per vehicle. Currently, the intersection is operating at about the mid-range of LOS D. Once the delay exceeds 55 seconds, the intersection is deficient with respect to the Town's policy on level of service. The physical capacity of the intersection is reached when delay is greater than 80 seconds and/or the volume to capacity ratio of the intersection reaches and exceeds 1.0.

B. Year 2040 Without Specific Plan Conditions

The Year 2040 Without Specific Plan scenario is based on SBCTA's land use projections for the year 2040 throughout the County and is supposed to represent buildout of each jurisdiction's General Plan. The analysis of this scenario assumes no transportation improvements have occurred over today's conditions within the Specific Plan area. Therefore, this analysis applies 2040 Without Specific Plan traffic projections to existing intersection lane geometries and traffic control.

However, the SBCTA model does include transportation improvements throughout the County if the improvements have been identified in SCAG's Regional Transportation Plan whether funded or unfunded. For example, the SBCTA 2040 model includes the High Desert Corridor (HDC) project—a new right of way alignment connecting communities of San Bernardino and Los Angeles Counties in the high desert area. The HDC project affects the Specific Plan area because its alignment connects with Highway 18 east of the study area. While the ultimate configuration of the HDC could include freeway/expressway, toll lanes, a high-speed rail connection, green energy production and transmission, and bikeway, the SBCTA model includes the HDC as a freeway / expressway.

1. Analysis Findings

Table 6 shows the delay and level of service at the study intersections in the year 2040 without the Specific Plan. All except two intersections are projected to operate within the Town's LOS policy of LOS D or better. The two exceptions are the signal-controlled Highway 18 at Navajo Road (operating at a LOS E in the PM peak hour) and the side-street stop controlled Navajo Road at Ottawa Road (operating at LOS F in the PM peak hour for traffic turning left from Ottawa Road to Northbound Navajo Road). At the remaining intersections, delays are somewhat higher than under existing conditions but not significantly indicating a relatively low level of growth is projected in this area of the Town of Apple Valley.

Table 6: Year 2040 Without Specific Plan Intersection Capacity Analysis

Intersection		Intersection Control Type	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Highway 18 at Navajo Road	TS	39.1	D	73.9	E
2	Highway 18 at Pawnee Road	SSSC	11.9	B	13.3	B
3	Highway 18 at Quinnault Road South	TS	14.2	B	12.9	B
4	Highway 18 at Central Road	TS	30.5	C	30.9	C
5	Central Road at Esaws Avenue	TS	5.4	A	6.2	A
6	Central Road at Headquarters Drive	SSSC	11.6	B	11.6	B
7	Central Road at Powhattan Road	SSSC	23.7	C	21.6	C
8	Central Road at Ottawa Road	SSSC	20.8	C	24.0	C
9	Quinnault Road at Powhattan Road	SSSC	14.6	B	13.1	B
10	Quinnault Road at Ottawa Road	SSSC	9.6	A	9.7	A
11	Navajo Road at Powhattan Road West	SSSC	19.6	C	27.6	D
12	Navajo Road at Powhattan Road East	TS	8.5	A	10.2	B
13	Navajo Road at Ottawa Road	SSSC	27.5	D	152.7	F
14	Highway 18 at Yucca Loma Road	Not Applicable – Intersections Only Occur with Specific Plan				
15	Navajo at Yucca Loma Road					
16	Highway 18 at Hitt Road-Headquarters Dr					

Existing lane geometries and traffic control assumed at Intersections
Shaded cells represent intersections and time periods that exceed the Town of Apple Valley's policy of maintaining LOS D or better
TS – Traffic Signal Controlled Intersection
SSSC – Side Street Stop Controlled Intersection

C. Year 2040 With Specific Plan Buildout Conditions

This scenario evaluates the year 2040 with full buildout of the Specific Plan's land use as presented earlier in **Table 2**. In addition, this scenario evaluates buildout conditions assuming implementation of the Specific Plan's circulation plan including its two alternatives for the Highway 18 corridor: Alternative 1 (All Roundabouts) and Alternative 2 (All Traffic Signals). As described in Section V, the 2040 traffic projections in this scenario are the same as used to analyze the Specific Plan's potential VMT impacts. The VMT analysis is summarized later in this report.

One of the objectives of this analysis is to determine if the circulation plan alternatives provide sufficient capacity to accommodate buildout of the Specific Plan's proposed land uses and, if additional capacity is required, to identify the necessary improvements to maintain the Town's LOS policy. A Specific Plan is intended to be a "self-mitigating" plan in that a workable transportation system is integral to the Plan and environmental assessments or General Plan consistency assessments need not result in negative findings.

1. Analysis of Specific Plan Buildout Under Alternative 1 (All Roundabouts on Highway 18)

Table 7 presents the delay and level of service for the study intersections under Alternative 1 with all roundabouts within the Highway 18 corridor.

Table 7: Year 2040 With Buildout of Specific Plan Intersection Capacity Analysis (Alternative 1 – Roundabouts)

Intersection		Intersection Control	Year 2040 With Specific Plan Buildout			
			AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Highway 18 at Navajo Road	RB	13.8	B	26.3	D
2	Highway 18 at Pawnee Road	RB	13.6	B	32.9	D
3	Highway 18 at Quinnault Road South	RB	11.5	B	15.0	B
4	Highway 18 at Central Road	RB	18.6	C	24.9	C
5	Central Road at Esaws Avenue	SSSC	23.9	C	6.3	A
6	Central Road at Headquarters Drive	TS	13.5	B	12.9	B
7	Central Road at Powhattan Road	TS	11.7	B	12.2	B
8	Central Road at Ottawa Road	TS	12.4	B	13.6	B
9	Quinnault Road at Powhattan Road	AWSC	9.5	A	9.2	A
10	Quinnault Road at Ottawa Road	AWSC	7.8	A	7.5	A
11	Navajo Road at Powhattan Road West	SSSC	16.9	C	36.0	E
12	Navajo Road at Powhattan Road East	TS	9.0	A	11.5	B
13	Navajo Road at Ottawa Road	TS	16.0	B	22.6	C
14	Highway 18 at Yucca Loma Road	RB	8.6	A	10.5	B
15	Navajo at Yucca Loma Road	TS	10.8	B	11.9	B
16	Highway 18 at Hitt Road-Headquarters Dr	RB	15.3	C	16.2	C

Refer to Figure 2 for Circulation Plan under Alternative 1
Shaded cells represent intersections and time periods that exceed the Town of Apple Valley's policy of maintaining LOS D or better.
TS – Traffic Signal Controlled Intersection
RB - Roundabout Controlled Intersection
SSSC – Side Street Stop Controlled Intersection
AWSC – All Way Stop Controlled Intersection

Under Alternative 1, the intersection Navajo Road at Powhattan Road West—a side-street stop-controlled T-intersection with Powhattan Road West being stop-controlled—is projected to operate at LOS E in the PM peak hour. If the intersection meets warrants justifying installation of a traffic signal, this improvement may be considered but being only 400 feet from the signalized intersection at Navajo Road and Powhattan Road East it will require that the two signals be synchronized.

2. Analysis of Specific Plan Buildout Under Alternative 2 (All Traffic Signals on Highway 18)

Table 8 shows the delay and level of service for the study intersections under Alternative 2 with all traffic signals within the Highway 18 corridor.

Table 8: Year 2040 With Buildout of Specific Plan Intersection Capacity Analysis (Alternative 2 –Signals)

Intersection		Intersection Control	Year 2040 With Specific Plan Buildout			
			AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Highway 18 at Navajo Road	TS	35.6	D	31.7	C
2	Highway 18 at Pawnee Road	TS	24.5	C	49.8	D
3	Highway 18 at Quinnault Road South	TS	13.3	B	22.1	C
4	Highway 18 at Central Road	TS	24.3	C	25.4	C
5	Central Road at Esaws Avenue	TS	23.9	C	6.3	A
6	Central Road at Headquarters Drive	SSSC	13.5	B	12.9	B
7	Central Road at Powhattan Road	TS	11.7	B	12.2	B
8	Central Road at Ottawa Road	TS	12.4	B	13.6	B
9	Quinnault Road at Powhattan Road	AWSC	9.5	A	9.2	A
10	Quinnault Road at Ottawa Road	AWSC	7.8	A	7.5	A
11	Navajo Road at Powhattan Road West	SSSC	16.9	C	36	E
12	Navajo Road at Powhattan Road East	TS	9.0	A	11.5	B
13	Navajo Road at Ottawa Road	TS	16.0	B	22.6	C
14	Highway 18 at Yucca Loma Road	TS	35.4	D	40.0	D
15	Navajo at Yucca Loma Road	TS	10.8	B	11.9	B
16	Highway 18 at Hitt Road-Headquarters Dr	TS	45.0	D	42.4	D

Refer to Figure 4 for Circulation Plan under Alternative 2
Shaded cells represent intersections and time periods that exceed the Town of Apple Valley's policy of maintaining LOS D or better.
TS – Traffic Signal Controlled Intersection
RB - Roundabout Controlled Intersection
SSSC – Side Street Stop Controlled Intersection
AWSC – All Way Stop Controlled Intersection

Under Alternative 2 the only intersection in the Specific Plan study area that exceeds the Town's LOS D policy is Navajo Road at Powhattan Road West, the side-street-stop-controlled intersection which has the same problem as in Alternative 1. Again, the potential solution for this level of service issue is addressed in the section on mitigation.

3. Conclusion of Intersection Capacity Analysis

The 2040 with buildout of Specific Plan intersection capacity analysis demonstrates that the Plan's circulation plan can accommodate the vehicular traffic generated by the land use proposed for the Specific Plan area. Further, the analysis shows that buildout of the Specific Plan can be accommodated by both Alternative 1 (All Roundabouts in the Highway 18 Corridor) and Alternative 2 (All Signals in the Highway 18 Corridor). The following section addresses the one intersection, under both alternatives, that fails to meet the Town's LOS D policy.

VII. Mitigation to Achieve the General Plan LOS Policy

The intersection of Navajo Road at Powhattan Road West is a side-street-stop-controlled intersection which operates at LOS E in the PM peak hour for the worst movement from the side street which is the left turn movement. The mitigation is to install a traffic signal (when warranted) coordinated with the existing traffic signal at Navajo Road and Powhattan Road East located about 400 feet to the south.

VIII. Prioritization of Key Projects of the Village Specific Plan Circulation Plan

Each of the following "projects" of the circulation plan should generally be implemented in the priority sequence listed in **Table 9.** Projects may be implemented concurrently. Early priority projects may be eligible for grant funding through the Highway Safety Improvement Program (HSIP) Active Transportation Program (ATP) and should be pursued in the near-term. Other improvement projects may be extensions or add-ons to currently programmed capital projects. Traffic signals may be implemented as part of larger roadway widening projects, but when listed as an individual project, implement signals as they are warranted.

Table 9: Prioritization of Key Capital Improvements Comprising the Village Specific Plan's Circulation Plan

Grant Funding Eligible Projects – Very Near-Term Projects
1. Realignment of Yucca Loma Road into Highway 18. Roundabout improvements on Highway 18 at Yucca Loma Road and Navajo Road
2. Quinault Road at Powhatan Road, and Ottawa Road; install all-way stop controls
Near-Term Projects
3. Central Road widening to five lanes (two in each direction with a center left turn lane), from Highway 18 to Ottawa Road
4. Central Road and Powhatan Road; install traffic signal
5. Central Road and Ottawa Road; install traffic signal
6. Navajo Road and Ottawa Road; install traffic signal
7. Navajo Road and Powhatan Road-West; install traffic signal
Mid-Term and Long-Term Projects
8. Highway 18 and Central Road; reconstruct intersection with roundabout
9. Reconstruct Highway 18 frontage roads to one-way traffic flow between Navajo Road and Quinault Road, with roundabout installation at Pawnee Road and Quinault Road
10. Realign Headquarters Drive to Highway 18 at Hitt Road, with new roundabout intersection
11. Reconstruct Highway 18 frontage roads to one-way traffic flow between Quinault Road and Central Road
12. Central Road and Headquarters Drive; install traffic signal
13. Extension of Yucca Loma Road from Highway 18 to Navajo Road, with reconstruction of north Highway 18 Frontage Road west of Navajo Road
14. Navajo Road and Yucca Loma Road; install traffic signal

IX. Summary of Vehicle Miles Traveled (VMT) Analysis

A VMT analysis was prepared by General Technologies and Solutions in conformance with the guidelines and thresholds of significance approved and adopted by the Town Council on May 11, 2021 in Resolution No. 2021-08 titled "A Resolution of the City Council of the Town of Apple Valley, California, Adopting Thresholds of Significance for Vehicle Miles Traveled (VMT) under the California Environmental Quality Act (CEQA)".

The resolution and its supporting documentation establish the Town's thresholds for determining a potentially significant impact to transportation pursuant to CEQA:

A. Thresholds of Significance

A project would result in a significant project-generated VMT impact if either of the following conditions are satisfied:

1. The baseline project-generated VMT per service population exceeds the Town of Apple Valley General Plan Buildout VMT per service population, or
2. The cumulative project-generated VMT per service population exceeds Town of Apple Valley General Plan Buildout VMT per service population.

The project's effect on VMT would be considered significant if it resulted in either of the following conditions to be satisfied:

3. The baseline link-level boundary Town-wide VMT per service population increases under the plus project condition compared to the no project condition, or
4. The cumulative link-level boundary Town-wide VMT per service population increases under the plus project condition compared to the no project condition.

B. Key Findings of the VMT Analysis

This section provides a summary of the key findings of the VMT analysis. The full analysis report is in Appendix B.

The Specific Plan project's VMT per service population for the baseline and cumulative scenarios was compared with the Town of Apple Valley General Plan Buildout VMT per service population as advised in the Town's guidelines. The Town of Apple Valley General Plan Buildout VMT per service population threshold is 33.2 which was obtained from SBCTA VMT Screening Tool.

Table 10 shows the project VMT metrics for both baseline (2016) and cumulative (2040) conditions along with the regional VMT thresholds. While baseline (2016) Specific Plan VMT per service population (32.7) doesn't indicate an impact (threshold of 33.2), the cumulative scenario (2040) indicates the Specific Plan project VMT per service population (34.9) is above the regional threshold of 33.2 (by about 5%).

It should be noted that as indicated above, 2040 modeling scenario is a conservative estimate as the project land use was included as additional growth and no assumed growth in the model (2040 – 2016) was removed or reallocated. Also, given that the project includes high percentage of retail land use with very high customer base/trips, high VMT is expected.

Table 11 illustrates the project's effect on VMT. The project's effect on VMT is a comparison of roadway VMT within the Town of Apple Valley for both "With project" and "Without project" conditions. As shown in **Table 11**, the Specific Plan project does not show any change in VMT between the Without project and With project conditions indicating there is no significant impact with regards to the project's effect on VMT.

The VMT analysis in the appendix includes a supplementary analysis considering retail customers in the calculation of service population which reduces the Specific Plan's VMT per service population below the threshold resulting in no significant impacts

Table 10: Project VMT Analysis Summary

Year 2016	Village Specific Plan	Town of Apple Valley**
Households	838	
Population	2,074	
Employment	5,222	
Service Population	7,296	
Homebased (HB) VMT	30,891	
Homebased Work (HBW) VMT	65,052	
PA VMT	198,004	
OD VMT	238,556	
HB VMT per capita	14.9	
HBW VMT per employee	12.5	
PA VMT per service population	27.1	
OD VMT per service population	**32.7**	**33.2**

Year 2040	Village Specific Plan	Town of Apple Valley**
Households	838	
Population	2,074	
Employment	5,222	
Service Population	7,296	
Homebased (HB) VMT	35,307	
Homebased Work (HBW) VMT	61,885	
PA VMT	207,311	
OD VMT	254,349	
HB VMT per capita	17.0	
HBW VMT per employee	11.9	
PA VMT per service population	28.4	
OD VMT per service population	**34.9**	**33.2**

*** Threshold value obtained from SBCTA VMT Screening Tool (https://www.arcgis.com/apps/webappviewer/index.html?id=779a71bc659041ad995cd48d9ef4052b)*

Table 11: Roadway VMT within Town of Apple Valley

Year 2016	With Project	Without Project
Roadway VMT	834,100	771,633
Service population	97,931	90,635
VMT per service population	8.5	8.5

Year 2040	With Project	Without Project
Roadway VMT	1,334,074	1,260,479
Service population	133,652	126,356
VMT per service population	10.0	10.0

APPENDICES

APPENDIX A: LAND USE DEVELOPMENT WORKSHEETS

APPENDIX B: VEHICLE MILES TRAVELED (VMT) ANALYSIS REPORT

APPENDIX C: INTERSECTION CAPACITY / LEVEL OF SERVICE WORKSHEETS

APPENDIX A
LAND USE DEVELOPMENT WORKSHEETS

Village Specific Plan Buildout Land Uses

Derivation of Land Use Types from Aggregated Projections

Planning Area / Land Use		Existing Land Uses		Existing Uses Removed By		Buildout (100%)		Growth (Existing to Buildout)	
		Size	Units	Size	Units	Size	Units	Size	Units
District 1									
Mixed-Use Commercial/Industrial/Office/Retail		543,437	Sq. Ft.	93,155	Sq. Ft.	2,907,393	Sq. Ft.	2,363,956	Sq. Ft.
Land Use Breakdown [1]									
West End Signature Development (Commercial)						136,887	Sq. Ft.		
East End Signature Development (Commercial)						457,380	Sq. Ft.		
Commercial (Minus Signature Developments)						2,313,126	Sq. Ft.	2,313,126	
Retail / Services	45%							1,040,907	
Restaurant / Drinking Establishments	5%							115,656	
Office	30%							693,938	
Industrial / R&D / High Tech Manuf	20%							462,625	
Total Non-Residential	**100%**							**2,313,126**	Sq. Ft.
West End Signature Development (Residential)						136,887		42	
East End Signature Development (Residential)						457,380		180	
Residential (Remaining Area)		63	DUs	17	DUs	259	DUs	196	DUs
District 2									
Mixed-Use Commercial/Industrial/Office/Retail		927,800	Sq. Ft.	82,969	Sq. Ft.	3,455,669	Sq. Ft.	2,527,869	Sq. Ft.
Land Use Breakdown									
Retail / Services	20%							505,574	
Restaurant / Drinking Establishments	5%							126,393	
Office	30%							758,361	
Industrial / R&D / High Tech Manuf	45%							1,137,541	
Total Non-Residential	**100%**							**2,527,869**	Sq. Ft.
Residential (Remaining Area)		89	DUs	12	DUs	89	DUs	0	DUs
District 3									
Mixed-Use Commercial/Industrial/Office/Retail		181,088		15,591		1,458,519		1,277,431	Sq. Ft.
Land Use Breakdown									
Retail / Services	20%							255,486	
Restaurant / Drinking Establishments	5%							63,872	
Office	30%							383,229	
Industrial / R&D / High Tech Manuf	45%							574,844	
Total Non-Residential	**100%**							**1,277,431**	Sq. Ft.
Residential		41	DUs	0	DUs	0	DUs	-	DUs
District 4									
Mixed-Use Commercial/Industrial/Office/Retail		69,322	Sq. Ft.			69,322	Sq. Ft.	0	Sq. Ft.
Residential		96	DUs	15	DUs	246	DUs	150	DUs
District 5									
Residential		-				466	DUs	466	DUs

Source of land use data: Apple Valley Village Specific Plan Existing and Proposed Land Uses. Terra Nova Planning & Research, Inc.. June 2, 2021.
[1] Breakdown of aggregate mixed-use land projections into specific types of land uses for estimating trip generation.

Village Specific Plan Buildout Land Uses

Conversion of District Land Use Totals to TAZs

Land Use	District 1 Traffic Analysis Zones (TAZs) (Square Feet or Dwelling Units)							
	1	2	3	4	5	6	7	8
Percentage of TAZ in District by Area (exc 4 & 8)	11%	26%	29%	0%	10%	13%	11%	0%
District 1 (TAZs 1, 2, 3, 5, 6, and 7) at 100% of Buildout								
Retail / Services	114,500	270,636	301,863		104,091	135,318	114,500	
Restaurant / Drinking Establishments	12,722	30,071	33,540		11,566	15,035	12,722	
Office	76,333	180,424	201,242		69,394	90,212	76,333	
Industrial / R&D / High Tech Manuf	50,889	120,283	134,161		46,263	60,141	50,889	
Residential	0	0	0		0	0	0	
East End Signature Development (TAZ 4)								
Retail / Services				205,821				
Restaurant / Drinking Establishments				22,869				
Office				137,214				
Industrial / R&D / High Tech Manuf				91,476				
Residential				180				
West End Signature Development (TAZ 8)								
Retail / Services								61,599
Restaurant / Drinking Establishments								6,844
Office								41,066
Industrial / R&D / High Tech Manuf								27,377
Residential								42
Total Non-Residential	**254,444**	**601,413**	**670,807**	**457,380**	**231,313**	**300,706**	**254,444**	**136,887**

Land Use	District 2 TAZs (Square Feet or Dwelling Units)			
	1	2	3	4
Zonal Percentages	19%	27%	4%	50%
Retail / Services	96,059	136,505	20,223	252,787
Restaurant / Drinking Establishments	24,015	24,015	24,015	24,015
Office	144,089	204,757	30,334	379,180
Industrial / R&D / High Tech Manuf	216,133	307,136	45,502	568,770
Residential	0	0	0	0

Land Use	District 3 TAZs (Square Feet or Dwelling Units)		
		1	2
Zonal Percentages		65%	35%
Retail / Services		166,066	89,420
Restaurant / Drinking Establishments		41,517	22,355
Office		249,099	134,130
Industrial / R&D / High Tech Manuf		373,649	201,195
Residential		0	0

Land Use	District 4 TAZs (Square Feet or Dwelling Units)		
		1	2
Zonal Percentages		14%	86%
Retail / Services		-	-
Restaurant / Drinking Establishments		-	-
Office		-	-
Industrial / R&D / High Tech Manuf		-	-
Residential		21	129

Land Use	District 5 TAZ (Square Feet or Dwelling Units)		
			1
Zonal Percentages			100%
Retail / Services			-
Restaurant / Drinking Establishments			-
Office			-
Industrial / R&D / High Tech Manuf			-
Residential			466

APPENDIX B
VEHICLE MILES TRAVELED (VMT) ANALYSIS REPORT

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GTS | General Technologies and Solutions

MEMORANDUM

Date:	November 30, 2021	**GTS:** 211101.1
To:	Jim Daisa, DEA	
From:	Rawad Hani, GTS	
Subject:	**Vehicle Miles Traveled (VMT) Analysis for Village Specific Plan** **Town of Apple Valley, CA**	

This memorandum describes the development of vehicle miles traveled (VMT) analysis for the proposed Village Specific Plan in the Town of Apple Valley, San Bernardino County, CA (Town). The project encompasses multiple parcels north and south of State Highway 18 between Navajo Rd and Central Rd. It also includes few parcels to the west of State Hwy18 / Navajo Rd and east of State Hwy 18 / Central Rd as shown in Figure 1. As can be seen in the figure, the project area is divided into 5 planning areas. Each planning area consists of one or more planning Traffic Analysis Zones (TAZs).The project primarily consists of non-residential land uses – retail, office, and industrial and some multifamily residential. A summary of the project land uses by project planning areas is shown in Table1.

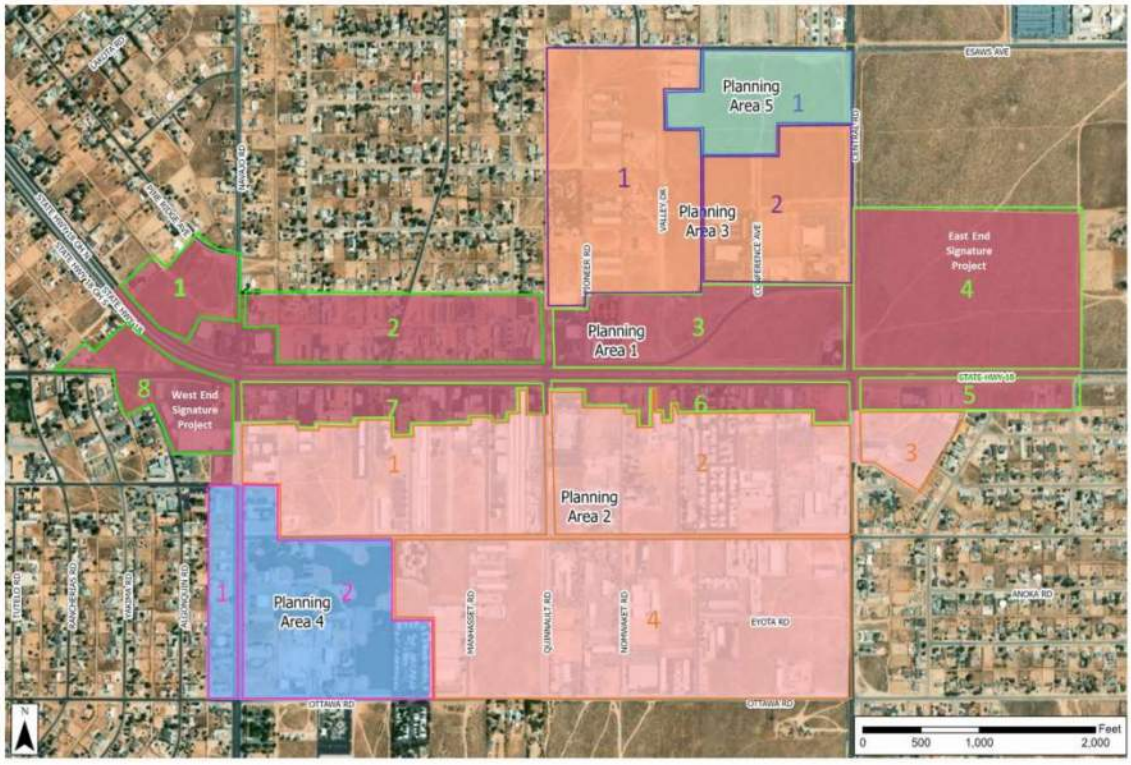


Figure 1. Village Specific Plan - Project Location and Planning Areas (Source: DEA)

Table 1. Village Specific Plan – Project Land uses by Planning Area

Project Planning Area	Retail (SF)	Office (SF)	Industrial (SF)	Multifamily (DUs)
Planning Area 1	1,453,696	907,485	604,990	222
Planning Area 2	631,967	758,361	1,137,541	-
Planning Area 3	319,358	383,229	574,844	-
Planning Area 4	-	-	-	150
Planning Area 5	-	-	-	466
Total	**2,405,021**	**2,049,075**	**2,317,375**	**838**

This VMT analysis evaluated the project using the 2016 and 2040 model years obtained from the San Bernardino County Transportation Authority (SBCTA).

Background

On December 28, 2018, the California Office of Administrative Law cleared the revised California Environmental Quality Act (CEQA) guidelines for use. Among the changes to the guidelines was removal of vehicle delay and level of service from consideration under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled (VMT).

Methodology

The project VMT analysis was conducted using the Town's "*Town of Apple Valley - Town Council Agenda Report, Subject: Adoption of Vehicle Miles Traveled Thresholds of Significance under the California Environmental Quality Act (CEQA)*" (Guidelines), dated May 11, 2021. Given the project is a specific plan and given its size, a full VMT analysis was conducted using San Bernardino County Transportation Analysis Model (SBTAM).

SBTAM model is socioeconomic data based model and so the project land use was converted into model employment categories using general conversion factors. Table 2 summarizes the socioeconomic data for the project.

Table 2. Village Specific Plan – Project socioeconomic estimates

Project Planning Area	Retail (employees)	Office (employees)	Industrial (employees)	Multifamily (DUs)
Planning Area 1	1,245	949	266	222
Planning Area 2	541	793	500	-
Planning Area 3	273	401	253	-
Planning Area 4	-	-	-	150
Planning Area 5	-	-	-	466
Total	**2,059**	**2,143**	**1,019**	**838**

VMT Analysis

Both baseline (2016) and horizon year (2040) model runs were used to estimate project's VMT impacts. SBTAM socioeconomic databases for the scenarios were updated with the project land uses to calculate project VMT. Typically, project VMT is calculated by isolating the project in a new TAZ or multiple TAZs depending on the diversity of project land uses and project size. Since, SBTAM does not allow addition of new TAZs, multiple TAZs far from the project area were borrowed. Ideally each of the project land uses and planning TAZs in each of the planning areas would be modeled in individual TAZs to isolate VMT effects. However, due to inability to split or add new zones in SBTAM, 10 TAZs were used to model the project. Non-residential and residential uses were separated to the extent possible. Land uses for the borrowed TAZs were aggregated with their surrounding TAZs. The project TAZs were utilized to calculate project specific VMT per service population.

The project site currently includes some existing development which would be eliminated as part of project development. Hence, some existing socioeconomic data from the project location TAZs were removed for modeling the "with project" scenarios. The existing land use removed from the model is shown in Table 3. Model runs were conducted using the updated socioeconomic data changes due to project land uses as described above.

Table 3. Village Specific Plan – Existing land uses removed at project location

Project Planning Area	Retail (SF)	Office (SF)	Industrial (SF)	Single Family (DUs)
Planning Areas 1, 2 & 4	(67,320)	(52,837)	(55,967)	(44)
Planning Areas 3 & 5	(3,898)	(4,677)	(7,016)	0

No project specific network modifications were conducted for the model scenarios expect for project specific centroid connectors. Full model runs with 5 feedback loops were conducted for all of the project scenarios. It should be noted that the project land use was included in the model as additional land use for the cumulative (2040) scenario and no shifting of land use from other TAZs was conducted. In that regard, the cumulative VMT analysis may be considered as a conservative estimate.

Based on the Guidelines, a project's Origin/Destination (OD) VMT per service population can be used to evaluate project impact. Both Production/Attraction (PA) VMT and OD VMT per service population were estimated for the project by multiplying PA and OD matrices with the final assignment skims respectively.

The project OD VMT per service population for base and cumulative scenarios was compared with the Town of Apple Valley General Plan Buildout VMT per service population as advised in the guidelines. The Town of Apple Valley General Plan Buildout OD VMT per service population used as threshold is 33.2 which was obtained from SBCTA VMT Screening Tool accessed at the following link: https://www.arcgis.com/apps/webappviewer/index.html?id=779a71bc659041ad995cd48d9ef4052b

Table 4 below shows the project VMT metrics for both baseline (2016) and cumulative (2040) conditions along with the regional VMT thresholds.

Table 4. Project VMT Analysis Summary

Year 2016	Village Specific Plan	Town of Apple Valley**
Households	838	
Population	2,074	
Employment	5,222	
Service Population	7,296	
Homebased (HB) VMT	30,891	
Homebased Work (HBW) VMT	65,052	
PA VMT	198,004	
OD VMT	238,556	
HB VMT per capita	14.9	
HBW VMT per employee	12.5	
PA VMT per service population	27.1	
OD VMT per service population	**32.7**	**33.2**

Year 2040	Village Specific Plan	Town of Apple Valley**
Households	838	
Population	2,074	
Employment	5,222	
Service Population	7,296	
Homebased (HB) VMT	35,307	
Homebased Work (HBW) VMT	61,885	
PA VMT	207,311	
OD VMT	254,349	
HB VMT per capita	17.0	
HBW VMT per employee	11.9	
PA VMT per service population	28.4	
OD VMT per service population	**34.9**	**33.2**

*** Threshold value obtained from SBCTA VMT Screening Tool (https://www.arcgis.com/apps/webappviewer/index.html?id=779a71bc659041ad995cd48d9ef4052b)*

As can be seen from the above table, that while baseline (2016) OD VMT per service population doesn't indicate an impact, cumulative scenario (2040) indicates the project OD VMT per service population is above the regional threshold (by about 5%). It should be noted that as indicated above, 2040 modeling scenario indicates a conservative estimate as the project land use was included as additional growth and no assumed growth in the model (2040 – 2016) was removed or reallocated. Also, given that the project includes high percentage of retail land use with very high customer base/trips, high OD VMT is expected.

Table 5 illustrates the project's effect on VMT. The project's effect on VMT is a comparison of roadway VMT within Town of Apple Valley for both "With project" and "Without project" conditions. As shown in Table 5, the project does not show significant impact with regards to the project's effect on VMT.

Table 5. Roadway VMT within Town of Apple Valley

Year 2016	With Project	Without Project
Roadway VMT	834,100	771,633
Service population	97,931	90,635
VMT per service population	8.5	8.5
Year 2040	**With Project**	**Without Project**
Roadway VMT	1,334,074	1,260,479
Service population	133,652	126,356
VMT per service population	10.0	10.0

VMT Analysis including Customer trips

As shown in Table 4, the project OD VMT is slightly higher than the regional threshold in the cumulative scenario. This is primarily due to significant trips by customers. Typically, the service population estimates only include project population and employment, as majority of the trips are made by the project residents or project employees. However, for uses that include significant customer base like hotels/lodging or commercial uses, some jurisdictions have allowed inclusion of customers/customer trips as part of the service population calculations especially when evaluating those types of land uses using efficiency metrics (VMT per capita, VMT per service population etc.).

GTS has used information from the travel model runs to estimate the number of customers for the project. Trip purpose from the model can be used to differentiate trips made by employees versus trips made by customers. GTS extracted trips by trip purpose for the project TAZs that included only non-residential land uses. GTS recognizes that project non-residential land uses comprise of retail, office, and industrial. Given the modeling constraints mentioned above (number of project TAZs) and given that most of the trips for the trip purposes (highlighted in Table 6) will be due to retail land uses, trips by trip purposes for all non-residential TAZs were used to estimate number of customers.

Table 6 shows the trip ends by trip purpose for all project non-residential TAZs. Trip purposes highlighted in the table are identified as trips by customers based on trip purpose. Trip-ends are converted to trips by dividing trip ends by 2. One trip per day per customer was used to convert trips to number of customers. Even the number of customers estimated through this process is conservative as the trips presented in Table 6 are vehicle trips which usually include greater than 1 for auto occupancy factor or more than 1 person trip.

Table 6. Project Customer Trip Evaluation – For TAZs with non-residential land uses only

Model Tripends by Trip Purpose	**2016**	**2040**
Homebased Work Direct (HBWD)	6,055	6,127
Homebased Work Strategic (HBWS)	1,268	1,279
Homebased Other (HBO)	3,043	3,041
Homebased School (HBSC)	-	-
Homebased Shopping (HBSH)	2,462	2,392
Homebased Serving Passenger (HBSP)	1,504	1,415
Homebased College / University (HBCU)	-	-
Homebased Social Recreation (HBSR)	1,450	1,437
Workbased Other (WBO)	1,917	1,927
Otherbased Other (OBO)	10,826	10,359
Total	**28,525**	**27,977**
Tripends by Customers	**17,781**	**17,229**
Number of Customers / Customer Trips	**8,891**	**8,615**

GTS has re-estimated the VMT efficiency metrics (OD VMT per service population) with the inclusion of number of customers, which is shown in Table 7.

Table 7. Project VMT analysis accounting for Number of customers

2016	**Village Specific Plan**	**Town of Apple Valley****
Households	838	
Population	2,074	
Employment	5,222	
Customers	8,891	
Service Population	16,187	
Homebased (HB) VMT	30,891	
Homebased Work (HBW) VMT	65,052	
PA VMT	198,004	
OD VMT	238,556	
HB VMT per capita	14.9	
HBW VMT per employee	12.5	
PA VMT per service population	12.2	
OD VMT per service population	14.7	33.2

2040	**Village Specific Plan**	**Town of Apple Valley****
Households	838	
Population	2,074	
Employment	5,222	
Customers	8,615	
Service Population	15,911	
Homebased (HB) VMT	35,307	
Homebased Work (HBW) VMT	61,885	
PA VMT	207,311	
OD VMT	254,349	
HB VMT per capita	17.0	
HBW VMT per employee	11.9	
PA VMT per service population	13.0	
OD VMT per service population	16.0	33.2

*** Threshold value obtained from SBCTA VMT Screening Tool (https://www.arcgis.com/apps/webappviewer/index.html?id=779a71bc659041ad995cd48d9ef4052b)*

Conclusion

The VMT analysis demonstrated that while the vehicle miles traveled per employees only shows a slight significant impact, the project has no significant impact with inclusion of number of customers in the service population estimates which is the widely used and reasonable efficiency metric.

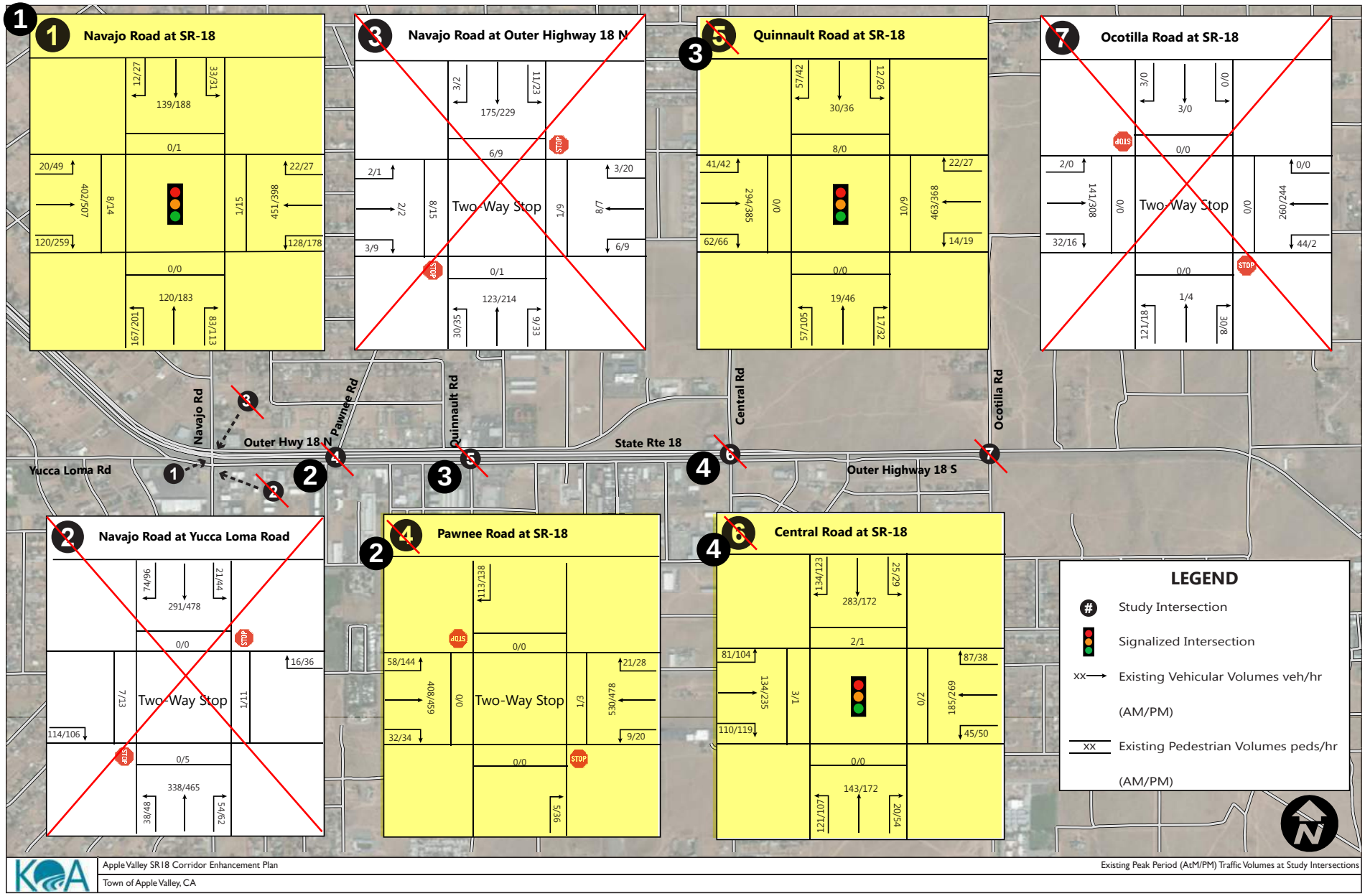
Based on the VMT analysis, it can be assumed that the project doesn't have a significant VMT impact, given the following reasons:

- Cumulative (2040) modeling scenario can be interpreted as a conservative estimate as no reallocation of already assumed growth (2040 – 2016) in the model was done. Project land uses were included in addition to the growth included in the model.
- Retail land uses comprise a substantial portion of the project land uses which has a significant customer base. Inclusion of number of customers in the service population, which is appropriate, would indicate no significant impact.

Also the project OD VMT per service population in cumulative conditions is only 5% above the regional threshold. Cost effective mitigation measures from the most recent California Air Pollution Control Officers Association (CAPCOA) manual can be used to offset the VMT impact. Existing project design features can be explored and compared with measures from CAPCOA to achieve the 5% VMT reduction benefit.

APPENDIX C
INTERSECTION CAPACITY / LEVEL OF SERVICE WORKSHEETS

Figure 2.2.3d. Existing Peak Period (AM/PM) Traffic Volumes at Study Intersections



DAVID EVANS AND ASSOCIATES INC.

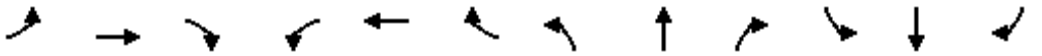
SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 1

E/W STREET : HIGHWAY 18
N/S STREET : NAVAJO RD

INTERSECTION : 1
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

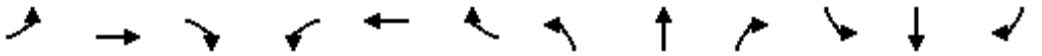
Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
HIGHWAY 18			
EB LEFT	20	17	13
EB THRU	402	627	705
EB RIGHT	120	121	73
WB LEFT	128	134	134
WB THRU	451	609	526
WB RIGHT	22	19	38
NAVAJO RD			
NB LEFT	167	159	74
NB THRU	120	156	127
NB RIGHT	83	88	149
SB LEFT	33	27	49
SB THRU	139	172	146
SB RIGHT	12	9	72
TOTALS		**2138**	**2106**



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	402	120	128	451	22	167	120	83	33	139	12
Future Volume (veh/h)	20	402	120	128	451	22	167	120	83	33	139	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	664	1525	1588	1588	1500	714	1588	1563	1588	801	1538	1126
Adj Flow Rate, veh/h	22	437	130	139	490	24	182	130	92	36	151	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.92	0.92	0.92
Percent Heavy Veh, %	75	6	1	1	8	71	1	3	1	64	5	38
Cap, veh/h	15	737	217	167	1164	57	522	660	568	298	649	403
Arrive On Green	0.02	0.33	0.33	0.11	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	632	2206	651	1512	2766	135	1231	1563	1345	590	1538	954
Grp Volume(v), veh/h	22	286	281	139	252	262	182	130	92	36	151	13
Grp Sat Flow(s),veh/h/ln	632	1449	1408	1512	1425	1476	1231	1563	1345	590	1538	954
Q Serve(g_s), s	2.1	14.7	15.0	8.1	11.2	11.2	10.0	4.7	3.8	3.7	5.7	0.7
Cycle Q Clear(g_c), s	2.1	14.7	15.0	8.1	11.2	11.2	15.7	4.7	3.8	8.4	5.7	0.7
Prop In Lane	1.00		0.46	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	15	484	471	167	600	621	522	660	568	298	649	403
V/C Ratio(X)	1.48	0.59	0.60	0.83	0.42	0.42	0.35	0.20	0.16	0.12	0.23	0.03
Avail Cap(c_a), veh/h	70	484	471	252	600	621	522	660	568	298	649	403
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	24.8	24.9	39.2	18.3	18.3	21.7	16.4	16.1	19.0	16.7	15.2
Incr Delay (d2), s/veh	278.6	5.2	5.5	13.6	2.2	2.1	1.8	0.7	0.6	0.8	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	5.3	5.2	3.5	3.6	3.8	3.0	1.7	1.2	0.5	2.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	322.6	30.0	30.4	52.9	20.5	20.4	23.5	17.1	16.7	19.9	17.5	15.4
LnGrp LOS	F	C	C	D	C	C	C	B	B	B	B	B
Approach Vol, veh/h		589			653			404			200	
Approach Delay, s/veh		41.2			27.4			19.9			17.8	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.9	34.1		42.0	6.1	41.9		42.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	15.0	25.0		38.0	10.0	30.0		38.0				
Max Q Clear Time (g_c+I1), s	10.1	17.0		10.4	4.1	13.2		17.7				
Green Ext Time (p_c), s	0.1	1.9		1.2	0.0	2.4		1.5				

Intersection Summary		
HCM 6th Ctrl Delay		29.1
HCM 6th LOS		C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	557	152	163	536	28	198	147	112	43	163	14
Future Volume (veh/h)	25	557	152	163	536	28	198	147	112	43	163	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	664	1525	1588	1588	1500	714	1588	1563	1588	801	1538	1126
Adj Flow Rate, veh/h	27	605	165	177	583	30	215	160	124	47	177	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.92	0.92	0.92
Percent Heavy Veh, %	75	6	1	1	8	71	1	3	1	64	5	38
Cap, veh/h	17	692	188	207	1151	59	497	660	568	279	649	403
Arrive On Green	0.03	0.31	0.31	0.09	0.28	0.28	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	632	2251	613	1512	2758	142	1201	1563	1345	557	1538	954
Grp Volume(v), veh/h	27	389	381	177	301	312	215	160	124	47	177	15
Grp Sat Flow(s),veh/h/ln	632	1449	1415	1512	1425	1475	1201	1563	1345	557	1538	954
Q Serve(g_s), s	2.5	22.9	23.0	10.4	15.9	16.0	12.8	5.9	5.3	5.3	6.8	0.8
Cycle Q Clear(g_c), s	2.5	22.9	23.0	10.4	15.9	16.0	19.6	5.9	5.3	11.3	6.8	0.8
Prop In Lane	1.00		0.43	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	17	445	435	207	595	615	497	660	568	279	649	403
V/C Ratio(X)	1.57	0.87	0.88	0.85	0.51	0.51	0.43	0.24	0.22	0.17	0.27	0.04
Avail Cap(c_a), veh/h	70	445	435	252	595	615	497	660	568	279	649	403
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.8	29.5	29.5	40.0	24.6	24.7	23.4	16.7	16.5	20.4	17.0	15.3
Incr Delay (d2), s/veh	306.4	20.5	21.2	20.6	3.1	3.0	2.7	0.9	0.9	1.3	1.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	9.7	9.6	5.0	5.9	6.1	3.8	2.1	1.7	0.8	2.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	350.2	50.0	50.8	60.6	27.7	27.6	26.1	17.6	17.4	21.7	18.0	15.4
LnGrp LOS	F	D	D	E	C	C	C	B	B	C	B	B
Approach Vol, veh/h		797			790			499			239	
Approach Delay, s/veh		60.6			35.0			21.2			18.6	
Approach LOS		E			D			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.3	31.7		42.0	6.5	41.5		42.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	15.0	25.0		38.0	10.0	30.0		38.0				
Max Q Clear Time (g_c+I1), s	12.4	25.0		13.3	4.5	18.0		21.6				
Green Ext Time (p_c), s	0.1	0.0		1.5	0.0	2.6		1.9				

Intersection Summary		
HCM 6th Ctrl Delay		39.1
HCM 6th LOS		D

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

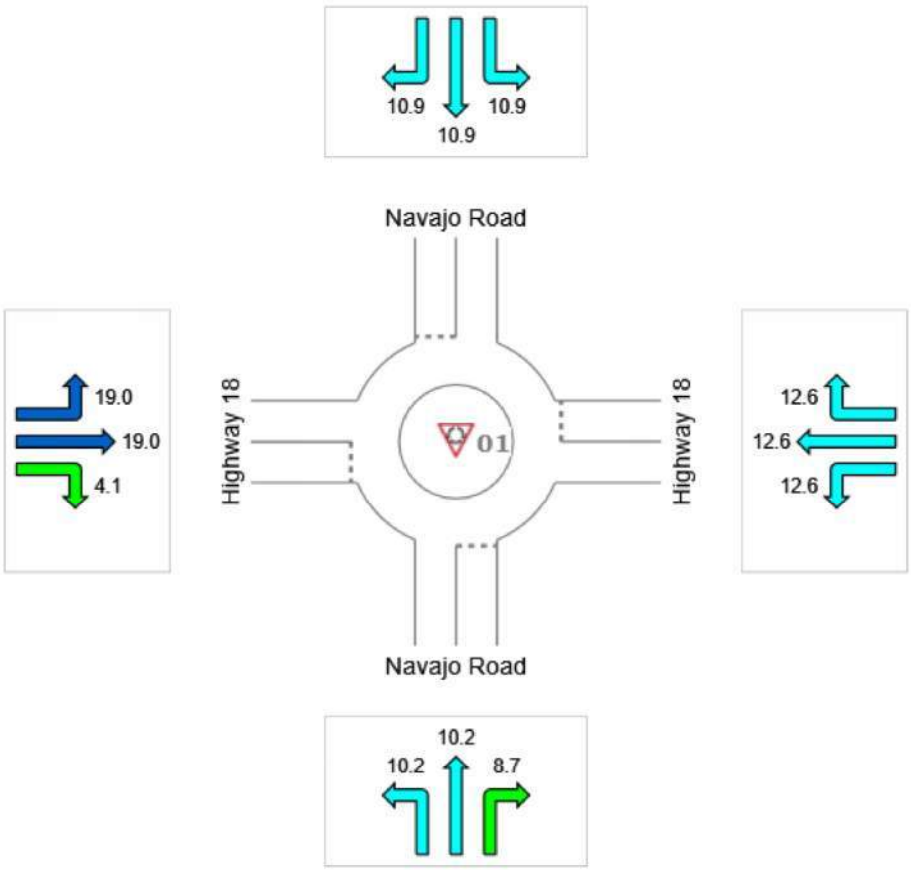
Site: 01 [Highway 18 at Navajo Rd]

Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Delay (Control)	9.6	12.6	10.9	17.7	13.8
LOS	A	B	B	C	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	705	73	134	526	38	74	127	149	49	146	72
Future Volume (veh/h)	13	705	73	134	526	38	74	127	149	49	146	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	664	1525	1588	1588	1500	714	1588	1563	1588	801	1538	1126
Adj Flow Rate, veh/h	14	766	79	146	572	41	80	138	162	53	159	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	75	6	1	1	8	71	1	3	1	64	5	38
Cap, veh/h	10	918	426	245	1249	89	282	495	426	54	563	264
Arrive On Green	0.02	0.32	0.32	0.32	0.93	0.93	0.10	0.32	0.32	0.07	0.29	0.29
Sat Flow, veh/h	632	2898	1345	1512	2698	193	2933	1563	1345	763	1931	904
Grp Volume(v), veh/h	14	766	79	146	302	311	80	138	162	53	118	119
Grp Sat Flow(s),veh/h/ln	632	1449	1345	1512	1425	1465	1467	1563	1345	763	1461	1375
Q Serve(g_s), s	1.9	29.5	5.1	9.7	3.2	3.3	3.0	7.9	11.2	8.3	7.5	8.0
Cycle Q Clear(g_c), s	1.9	29.5	5.1	9.7	3.2	3.3	3.0	7.9	11.2	8.3	7.5	8.0
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	1.00		0.66
Lane Grp Cap(c), veh/h	10	918	426	245	660	679	282	495	426	54	426	401
V/C Ratio(X)	1.42	0.83	0.19	0.60	0.46	0.46	0.28	0.28	0.38	0.97	0.28	0.30
Avail Cap(c_a), veh/h	53	918	426	245	660	679	293	495	426	57	426	401
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	0.79	0.79	0.79	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.1	38.1	29.8	37.3	2.5	2.5	50.4	30.7	31.9	55.6	32.8	32.9
Incr Delay (d2), s/veh	269.4	7.5	0.8	3.1	1.8	1.8	0.5	1.4	2.6	107.6	1.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	10.8	1.7	3.3	0.9	1.0	1.1	3.1	3.9	3.2	2.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	328.4	45.6	30.6	40.3	4.3	4.3	50.9	32.1	34.4	163.2	34.4	34.8
LnGrp LOS	F	D	C	D	A	A	D	C	C	F	C	C
Approach Vol, veh/h		859			759			380			290	
Approach Delay, s/veh		48.8			11.2			37.1			58.1	
Approach LOS		D			B			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.4	42.0	15.6	39.0	5.9	59.6	12.6	42.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	19.0	38.0	12.0	35.0	10.0	47.0	9.0	38.0
Max Q Clear Time (g_c+I1), s	11.7	31.5	5.0	10.0	3.9	5.3	10.3	13.2
Green Ext Time (p_c), s	0.2	2.6	0.1	1.3	0.0	3.5	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	35.6
HCM 6th LOS	D

DAVID EVANS AND ASSOCIATES INC.

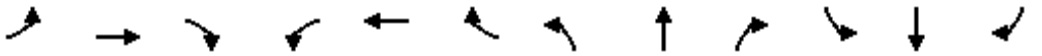
SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 1

E/W STREET : HIGHWAY 18
N/S STREET : NAVAJO RD

INTERSECTION : 1
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

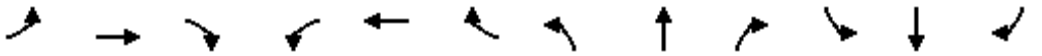
Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
HIGHWAY 18			
EB LEFT	49	32	27
EB THRU	507	648	613
EB RIGHT	259	275	140
WB LEFT	178	229	214
WB THRU	398	605	674
WB RIGHT	27	20	63
NAVAJO RD			
NB LEFT	201	233	103
NB THRU	183	234	170
NB RIGHT	113	141	145
SB LEFT	31	22	41
SB THRU	188	235	227
SB RIGHT	27	19	103
TOTALS	**2161**	**2693**	**2520**



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	507	259	178	398	27	201	183	113	31	188	27
Future Volume (veh/h)	49	507	259	178	398	27	201	183	113	31	188	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1325	1575	1588	1588	1550	1350	1588	1588	1588	1463	1588	1563
Adj Flow Rate, veh/h	53	551	282	193	433	29	218	199	126	34	204	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.92	0.92	0.92
Percent Heavy Veh, %	22	2	1	1	4	20	1	1	1	11	1	3
Cap, veh/h	60	575	294	218	1113	74	470	670	568	413	670	559
Arrive On Green	0.05	0.30	0.30	0.10	0.27	0.27	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1262	1916	979	1512	2802	187	1156	1588	1345	980	1588	1324
Grp Volume(v), veh/h	53	430	403	193	227	235	218	199	126	34	204	29
Grp Sat Flow(s),veh/h/ln	1262	1496	1399	1512	1473	1516	1156	1588	1345	980	1588	1324
Q Serve(g_s), s	3.8	25.4	25.5	11.3	11.3	11.4	13.9	7.5	5.4	2.1	7.7	1.2
Cycle Q Clear(g_c), s	3.8	25.4	25.5	11.3	11.3	11.4	21.5	7.5	5.4	9.6	7.7	1.2
Prop In Lane	1.00		0.70	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	449	420	218	585	602	470	670	568	413	670	559
V/C Ratio(X)	0.89	0.96	0.96	0.88	0.39	0.39	0.46	0.30	0.22	0.08	0.30	0.05
Avail Cap(c_a), veh/h	126	449	420	218	585	602	470	670	568	413	670	559
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	30.9	31.0	39.9	24.1	24.1	24.4	17.2	16.6	20.3	17.2	15.4
Incr Delay (d2), s/veh	32.2	33.2	35.0	31.8	1.9	1.9	3.3	1.1	0.9	0.4	1.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	12.4	11.8	6.1	4.1	4.3	4.0	2.7	1.7	0.5	2.8	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.8	64.1	66.0	71.7	26.0	26.0	27.6	18.3	17.5	20.7	18.4	15.5
LnGrp LOS	E	E	E	E	C	C	C	B	B	C	B	B
Approach Vol, veh/h		886			655			543			267	
Approach Delay, s/veh		65.6			39.5			21.9			18.4	
Approach LOS		E			D			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.0	31.0		42.0	8.2	39.8		42.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	13.0	27.0		38.0	9.0	31.0		38.0				
Max Q Clear Time (g_c+I1), s	13.3	27.5		11.6	5.8	13.4		23.5				
Green Ext Time (p_c), s	0.0	0.0		1.3	0.0	2.2		2.0				

Intersection Summary		
HCM 6th Ctrl Delay	42.9	
HCM 6th LOS	D	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	555	324	274	504	31	279	225	169	33	226	28
Future Volume (veh/h)	46	555	324	274	504	31	279	225	169	33	226	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1325	1575	1588	1588	1550	1350	1588	1588	1588	1463	1588	1563
Adj Flow Rate, veh/h	50	603	352	298	548	34	303	245	188	36	246	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.92	0.92	0.92
Percent Heavy Veh, %	22	2	1	1	4	20	1	1	1	11	1	3
Cap, veh/h	56	546	318	218	1128	70	432	670	568	361	670	559
Arrive On Green	0.04	0.30	0.30	0.10	0.27	0.27	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1262	1819	1062	1512	2817	174	1112	1588	1345	887	1588	1324
Grp Volume(v), veh/h	50	496	459	298	286	296	303	245	188	36	246	30
Grp Sat Flow(s),veh/h/ln	1262	1496	1384	1512	1473	1519	1112	1588	1345	887	1588	1324
Q Serve(g_s), s	3.5	27.0	27.0	13.0	14.7	14.8	23.0	9.5	8.4	2.6	9.5	1.2
Cycle Q Clear(g_c), s	3.5	27.0	27.0	13.0	14.7	14.8	32.6	9.5	8.4	12.1	9.5	1.2
Prop In Lane	1.00		0.77	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	56	449	415	218	589	608	432	670	568	361	670	559
V/C Ratio(X)	0.90	1.11	1.11	1.36	0.49	0.49	0.70	0.37	0.33	0.10	0.37	0.05
Avail Cap(c_a), veh/h	126	449	415	218	589	608	432	670	568	361	670	559
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	31.5	31.5	40.6	25.1	25.2	28.9	17.8	17.5	21.9	17.8	15.4
Incr Delay (d2), s/veh	34.8	74.2	75.8	190.6	2.8	2.8	9.2	1.5	1.6	0.6	1.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	18.0	16.9	16.4	5.6	5.8	6.8	3.5	2.7	0.6	3.5	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.6	105.7	107.3	231.2	28.0	27.9	38.1	19.3	19.0	22.4	19.3	15.6
LnGrp LOS	E	F	F	F	C	C	D	B	B	C	B	B
Approach Vol, veh/h		1005			880			736			312	
Approach Delay, s/veh		105.0			96.8			27.0			19.3	
Approach LOS		F			F			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.0	31.0		42.0	8.0	40.0		42.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	13.0	27.0		38.0	9.0	31.0		38.0				
Max Q Clear Time (g_c+I1), s	15.0	29.0		14.1	5.5	16.8		34.6				
Green Ext Time (p_c), s	0.0	0.0		1.6	0.0	2.6		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			73.9									
HCM 6th LOS			E									

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

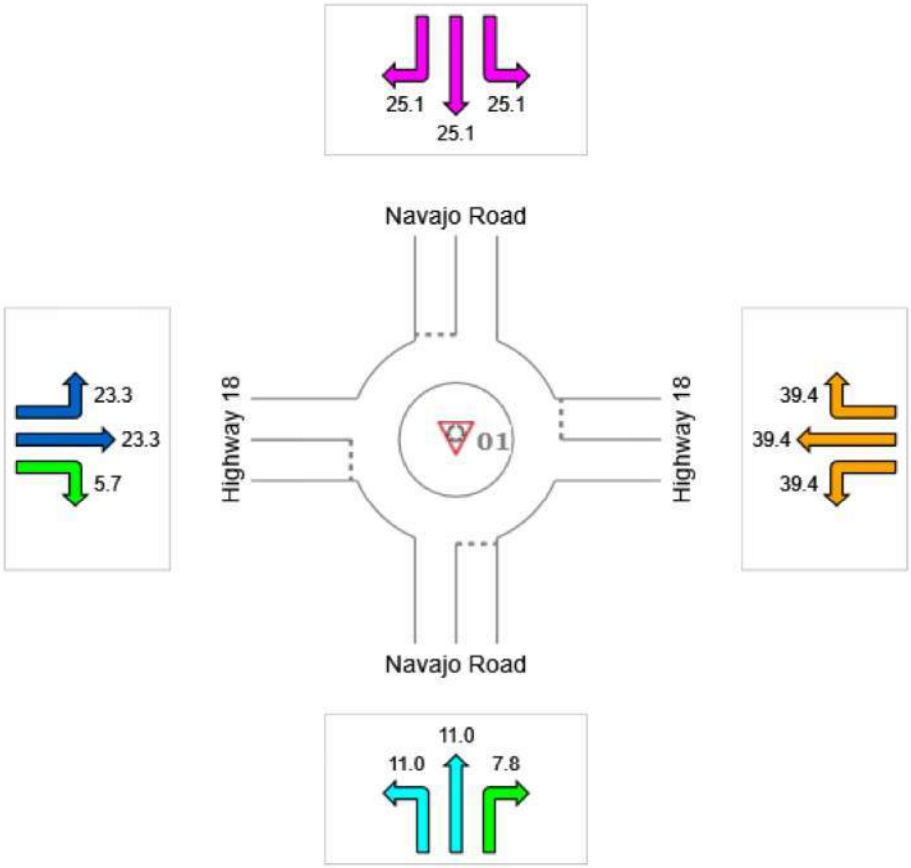
Site: 01 [Highway 18 at Navajo Rd]

Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Delay (Control)	9.9	39.4	25.1	20.1	26.3
LOS	A	E	D	C	D



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 1
North/South Street: NAVAJO RD
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	167	Approach	598	Left	113	159
NB	Through	120	Departure	498	Through	140	156
	Right	83			Right	75	88
North leg	Left	33	Approach	190	Left	25	27
SB	Through	139	Departure	177	Through	192	172
	Right	12			Right	7	9
West leg	Left	20	Approach	668	Left	16	17
EB	Through	402	Departure	724	Through	634	627
	Right	120			Right	138	121
East leg	Left	128	Approach	677	Left	168	134
WB	Through	451	Departure	734	Through	604	609
	Right	22			Right	20	19

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	201	Approach	720	Left	278	233
NB	Through	183	Departure	871	Through	244	234
	Right	113			Right	197	141
North leg	Left	31	Approach	263	Left	14	22
SB	Through	188	Departure	273	Through	240	235
	Right	27			Right	10	19
West leg	Left	49	Approach	882	Left	16	32
EB	Through	507	Departure	783	Through	550	648
	Right	259			Right	317	275
East leg	Left	178	Approach	823	Left	315	229
WB	Through	398	Departure	761	Through	495	605
	Right	27			Right	13	20

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 1
North/South Street: NAVAJO RD
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	167	Approach	370	Left	92	74
NB	Through	120	Departure	387	Through	159	127
	Right	83			Right	149	149
North leg	Left	33	Approach	186	Left	49	49
SB	Through	139	Departure	204	Through	146	146
	Right	12			Right	6	72
West leg	Left	20	Approach	877	Left	13	13
EB	Through	402	Departure	756	Through	881	705
	Right	120			Right	73	73
East leg	Left	128	Approach	813	Left	168	134
WB	Through	451	Departure	1,079	Through	658	526
	Right	22			Right	32	38

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	201	Approach	497	Left	129	103
NB	Through	183	Departure	635	Through	213	170
	Right	113			Right	145	145
North leg	Left	31	Approach	292	Left	41	41
SB	Through	188	Departure	283	Through	227	227
	Right	27			Right	19	103
West leg	Left	49	Approach	946	Left	27	27
EB	Through	507	Departure	989	Through	766	613
	Right	259			Right	140	140
East leg	Left	178	Approach	1,184	Left	268	214
WB	Through	398	Departure	952	Through	842	674
	Right	27			Right	42	63

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : HIGHWAY 18
N/S STREET : PAWNEE RD

INTERSECTION : 2
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	5	7
HIGHWAY 18			
EB LEFT	58	92	92
EB THRU	408	595	741
EB RIGHT	32	55	70
WB LEFT	9	11	50
WB THRU	530	555	612
WB RIGHT	21	30	65
PAWNEE RD			
NB LEFT	0	61	12
NB THRU	0	15	3
NB RIGHT	5	32	98
SB LEFT	0	8	8
SB THRU	0	10	9
SB RIGHT	113	146	140
TOTALS	**1176**	**1610**	**1900**

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	408	32	9	530	21	0	0	5	0	0	113
Future Vol, veh/h	58	408	32	9	530	21	0	0	5	0	0	113
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	9	2	2	9	2	2	2	2	2	2	2
Mvmt Flow	63	443	35	10	576	23	0	0	5	0	0	123

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	599	0	0	478	0	0	-	-	239	-	-	300
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	974	-	-	1081	-	-	0	0	762	0	0	696
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	974	-	-	1081	-	-	-	-	762	-	-	696
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0.1	9.8	11.3
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	762	974	-	-	1081	-	-	696
HCM Lane V/C Ratio	0.007	0.065	-	-	0.009	-	-	0.176
HCM Control Delay (s)	9.8	9	-	-	8.4	-	-	11.3
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	0.6

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	92	595	55	11	555	30	61	15	32	8	10	146
Future Vol, veh/h	92	595	55	11	555	30	61	15	32	8	10	146
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	9	2	2	9	2	2	2	2	2	2	2
Mvmt Flow	100	647	60	12	603	33	66	16	35	9	11	159

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	636	0	0	707	0	0	1208	1537	354	1176	1551	318
Stage 1	-	-	-	-	-	-	877	877	-	644	644	-
Stage 2	-	-	-	-	-	-	331	660	-	532	907	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	943	-	-	887	-	-	139	115	642	147	113	678
Stage 1	-	-	-	-	-	-	310	364	-	428	466	-
Stage 2	-	-	-	-	-	-	656	458	-	499	353	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	943	-	-	887	-	-	89	101	642	111	100	678
Mov Cap-2 Maneuver	-	-	-	-	-	-	89	101	-	111	100	-
Stage 1	-	-	-	-	-	-	277	325	-	383	459	-
Stage 2	-	-	-	-	-	-	484	452	-	401	316	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.2	10.9	11.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	642	943	-	-	887	-	-	678
HCM Lane V/C Ratio	0.054	0.106	-	-	0.013	-	-	0.234
HCM Control Delay (s)	10.9	9.3	-	-	9.1	-	-	11.9
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.4	-	-	0	-	-	0.9

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

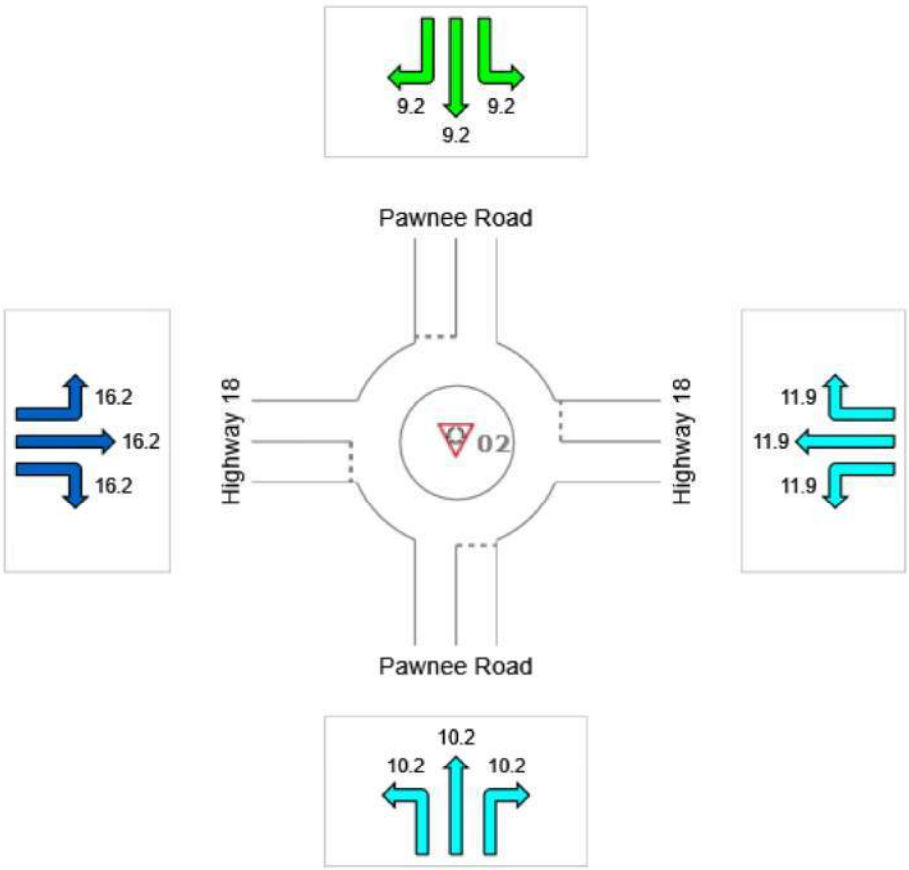
Site: 02 [Highway 18 at Pawnee Rd]

Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Delay (Control)	10.2	11.9	9.2	16.2	13.6
LOS	B	B	A	C	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	741	70	50	612	65	12	3	98	8	9	140
Future Volume (veh/h)	92	741	70	50	612	65	12	3	98	8	9	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1488	1575	1575	1488	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	100	805	76	54	665	71	13	3	107	9	10	152
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	9	2	2	9	2	2	2	2	2	2	2
Cap, veh/h	296	1240	117	159	988	105	104	10	359	16	18	274
Arrive On Green	0.40	0.95	0.95	0.11	0.38	0.38	0.07	0.28	0.28	0.01	0.22	0.22
Sat Flow, veh/h	1500	2610	246	1500	2577	275	1500	37	1304	1500	83	1264
Grp Volume(v), veh/h	100	436	445	54	364	372	13	0	110	9	0	162
Grp Sat Flow(s),veh/h/ln	1500	1413	1443	1500	1413	1438	1500	0	1340	1500	0	1347
Q Serve(g_s), s	5.6	4.8	4.8	4.0	25.7	25.8	1.0	0.0	7.8	0.7	0.0	12.8
Cycle Q Clear(g_c), s	5.6	4.8	4.8	4.0	25.7	25.8	1.0	0.0	7.8	0.7	0.0	12.8
Prop In Lane	1.00		0.17	1.00		0.19	1.00		0.97	1.00		0.94
Lane Grp Cap(c), veh/h	296	671	686	159	542	551	104	0	369	16	0	292
V/C Ratio(X)	0.34	0.65	0.65	0.34	0.67	0.67	0.13	0.00	0.30	0.56	0.00	0.55
Avail Cap(c_a), veh/h	296	671	686	159	542	551	175	0	369	88	0	292
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.64	0.91	0.91	0.91	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.8	1.7	1.7	49.8	30.7	30.8	52.4	0.0	34.4	59.1	0.0	41.8
Incr Delay (d2), s/veh	0.4	3.1	3.1	1.1	6.0	5.9	0.5	0.0	2.1	26.5	0.0	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	1.2	1.2	1.5	9.1	9.3	0.4	0.0	2.7	0.4	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.2	4.8	4.7	50.9	36.7	36.7	53.0	0.0	36.4	85.6	0.0	49.3
LnGrp LOS	C	A	A	D	D	D	D	A	D	F	A	D
Approach Vol, veh/h		981			790			123			171	
Approach Delay, s/veh		7.5			37.7			38.2			51.2	
Approach LOS		A			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.7	61.0	12.3	30.0	27.7	50.0	5.3	37.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	57.0	14.0	26.0	18.0	46.0	7.0	33.0
Max Q Clear Time (g_c+I1), s	6.0	6.8	3.0	14.8	7.6	27.8	2.7	9.8
Green Ext Time (p_c), s	0.0	5.7	0.0	0.6	0.1	3.8	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : HIGHWAY 18
N/S STREET : PAWNEE RD

INTERSECTION : 2
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
HIGHWAY 18			
EB LEFT	144	197	169
EB THRU	459	560	584
EB RIGHT	34	54	46
WB LEFT	20	23	86
WB THRU	478	635	810
WB RIGHT	28	48	103
PAWNEE RD			
NB LEFT	0	39	41
NB THRU	0	14	10
NB RIGHT	36	28	122
SB LEFT	0	15	12
SB THRU	0	13	7
SB RIGHT	138	180	184
TOTALS	**1337**	**1806**	**2174**

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	144	459	34	20	478	28	0	0	36	0	0	138
Future Vol, veh/h	144	459	34	20	478	28	0	0	36	0	0	138
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	157	499	37	22	520	30	0	0	39	0	0	150

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	550	0	0	536	0	0	-	-	268	-	-	275
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	1016	-	-	1028	-	-	0	0	730	0	0	722
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1016	-	-	1028	-	-	-	-	730	-	-	722
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0.3	10.2	11.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	730	1016	-	-	1028	-	-	722
HCM Lane V/C Ratio	0.054	0.154	-	-	0.021	-	-	0.208
HCM Control Delay (s)	10.2	9.2	-	-	8.6	-	-	11.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0.1	-	-	0.8

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	197	560	54	23	635	48	39	14	28	15	13	180
Future Vol, veh/h	197	560	54	23	635	48	39	14	28	15	13	180
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	214	609	59	25	690	52	42	15	30	16	14	196

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	742	0	0	668	0	0	1469	1859	334	1506	1862	371
Stage 1	-	-	-	-	-	-	1067	1067	-	766	766	-
Stage 2	-	-	-	-	-	-	402	792	-	740	1096	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	861	-	-	918	-	-	89	73	662	83	72	626
Stage 1	-	-	-	-	-	-	237	297	-	361	410	-
Stage 2	-	-	-	-	-	-	596	399	-	375	287	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	861	-	-	918	-	-	~ 39	53	662	49	53	626
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 39	53	-	49	53	-
Stage 1	-	-	-	-	-	-	178	223	-	271	399	-
Stage 2	-	-	-	-	-	-	384	388	-	250	216	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0.3	10.7	13.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	662	861	-	-	918	-	-	626
HCM Lane V/C Ratio	0.046	0.249	-	-	0.027	-	-	0.313
HCM Control Delay (s)	10.7	10.6	-	-	9	-	-	13.3
HCM Lane LOS	B	B	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	1	-	-	0.1	-	-	1.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

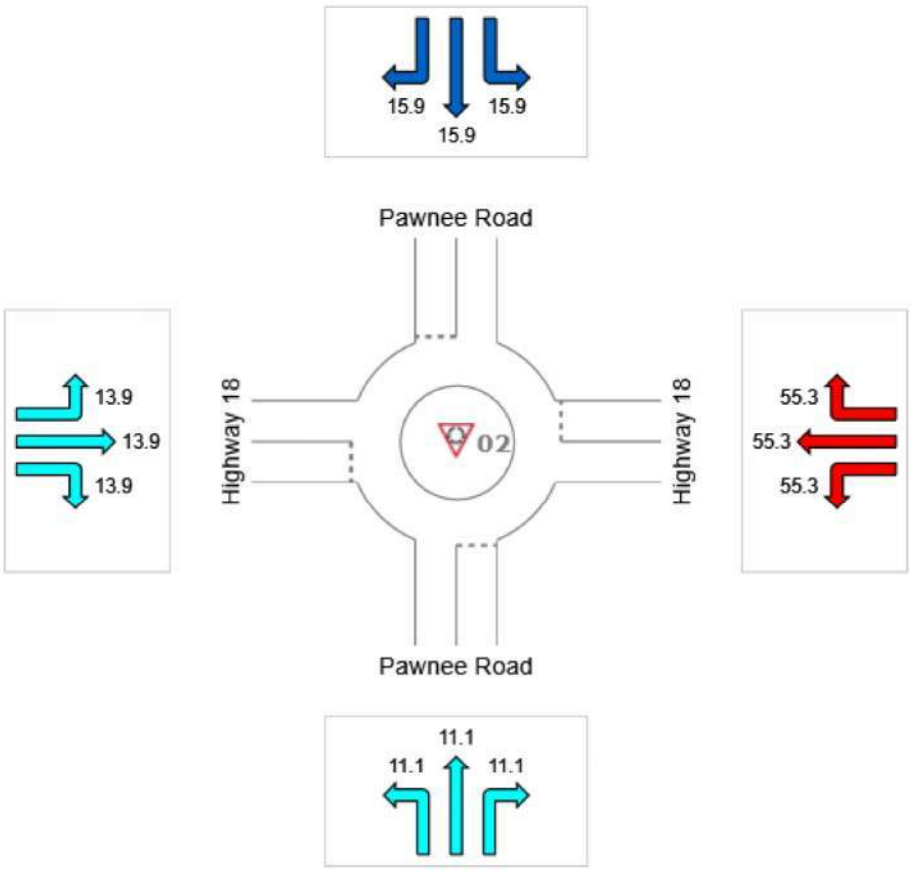
Site: 02 [Highway 18 at Pawnee Rd]

Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Delay (Control)	11.1	55.3	15.9	13.9	32.9
LOS	B	F	C	B	D



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	584	46	86	810	103	41	10	121	12	7	184
Future Volume (veh/h)	169	584	46	86	810	103	41	10	121	12	7	184
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1550	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	184	635	50	93	880	112	45	11	132	13	8	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	371	1468	115	88	876	111	54	28	339	22	13	323
Arrive On Green	0.49	1.00	1.00	0.06	0.33	0.33	0.04	0.27	0.27	0.01	0.25	0.25
Sat Flow, veh/h	1500	2811	221	1500	2628	334	1500	104	1247	1500	52	1291
Grp Volume(v), veh/h	184	338	347	93	493	499	45	0	143	13	0	208
Grp Sat Flow(s),veh/h/ln	1500	1496	1535	1500	1473	1490	1500	0	1351	1500	0	1343
Q Serve(g_s), s	9.9	0.0	0.0	7.0	40.0	40.0	3.6	0.0	10.4	1.0	0.0	16.5
Cycle Q Clear(g_c), s	9.9	0.0	0.0	7.0	40.0	40.0	3.6	0.0	10.4	1.0	0.0	16.5
Prop In Lane	1.00		0.14	1.00		0.22	1.00		0.92	1.00		0.96
Lane Grp Cap(c), veh/h	371	781	802	88	491	497	54	0	367	22	0	336
V/C Ratio(X)	0.50	0.43	0.43	1.06	1.00	1.00	0.83	0.00	0.39	0.59	0.00	0.62
Avail Cap(c_a), veh/h	371	781	802	88	491	497	100	0	367	75	0	336
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	0.80	0.80	0.80	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.3	0.0	0.0	56.5	40.0	40.0	57.5	0.0	35.6	58.8	0.0	39.9
Incr Delay (d2), s/veh	0.7	1.2	1.2	104.0	37.5	37.2	26.0	0.0	3.1	22.8	0.0	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.3	0.3	5.1	18.7	18.9	1.7	0.0	3.7	0.5	0.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	1.2	1.2	160.5	77.5	77.2	83.4	0.0	38.7	81.6	0.0	48.3
LnGrp LOS	C	A	A	F	F	F	F	A	D	F	A	D
Approach Vol, veh/h		869			1085			188			221	
Approach Delay, s/veh		6.5			84.5			49.4			50.2	
Approach LOS		A			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	66.7	8.3	34.0	33.7	44.0	5.8	36.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	59.0	8.0	30.0	26.0	40.0	6.0	32.0
Max Q Clear Time (g_c+I1), s	9.0	2.0	5.6	18.5	11.9	42.0	3.0	12.4
Green Ext Time (p_c), s	0.0	4.0	0.0	0.9	0.4	0.0	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	49.8
HCM 6th LOS	D

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 2
North/South Street: PAWNEE RD
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	5	Left	131	61
NB	Through	0	Departure	41	Through	33	15
	Right	5			Right	72	32
North leg	Left	0	Approach	158	Left	7	8
SB	Through	0	Departure	118	Through	6	10
	Right	113			Right	120	146
West leg	Left	58	Approach	714	Left	63	92
EB	Through	408	Departure	719	Through	513	595
	Right	32			Right	29	55
East leg	Left	9	Approach	591	Left	6	11
WB	Through	530	Departure	592	Through	468	555
	Right	21			Right	23	30

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	36	Left	18	39
NB	Through	0	Departure	54	Through	6	14
	Right	36			Right	12	28
North leg	Left	0	Approach	186	Left	12	15
SB	Through	0	Departure	231	Through	7	13
	Right	138			Right	169	180
West leg	Left	144	Approach	747	Left	182	197
EB	Through	459	Departure	836	Through	524	560
	Right	34			Right	34	54
East leg	Left	20	Approach	698	Left	13	23
WB	Through	478	Departure	548	Through	649	635
	Right	28			Right	43	48

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 2
North/South Street: PAWNEE RD
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	25	Left	12	12
NB	Through	0	Departure	95	Through	3	3
	Right	5			Right	10	98
North leg	Left	0	Approach	159	Left	8	8
SB	Through	0	Departure	127	Through	9	9
	Right	113			Right	140	140
West leg	Left	58	Approach	1,059	Left	92	92
EB	Through	408	Departure	855	Through	913	741
	Right	32			Right	70	70
East leg	Left	9	Approach	764	Left	16	50
WB	Through	530	Departure	931	Through	703	612
	Right	21			Right	32	65

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	96	Left	41	41
NB	Through	0	Departure	85	Through	10	10
	Right	36			Right	45	121.5
North leg	Left	0	Approach	202	Left	12	12
SB	Through	0	Departure	239	Through	7	7
	Right	138			Right	184	184
West leg	Left	144	Approach	938	Left	169	169
EB	Through	459	Departure	1,197	Through	718	584
	Right	34			Right	46	46
East leg	Left	20	Approach	1,059	Left	32	86
WB	Through	478	Departure	775	Through	972	810
	Right	28			Right	61	103

DAVID EVANS AND ASSOCIATES INC.

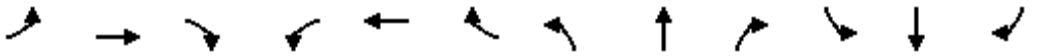
SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : HIGHWAY 18
N/S STREET : QUINNAULT RD

INTERSECTION : 3
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

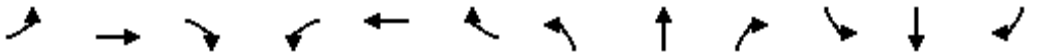
Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
HIGHWAY 18			
EB LEFT	41	29	0
EB THRU	294	502	715
EB RIGHT	62	104	132
WB LEFT	14	18	35
WB THRU	463	499	631
WB RIGHT	22	11	0
QUINNAULT RD			
NB LEFT	57	97	96
NB THRU	19	11	0
NB RIGHT	17	37	90
SB LEFT	12	0	0
SB THRU	30	0	0
SB RIGHT	57	0	0
TOTALS	**1088**	**1308**	**1699**



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	294	62	14	463	22	57	19	17	12	30	57
Future Volume (veh/h)	41	294	62	14	463	22	57	19	17	12	30	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1488	1575	1575	1488	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	45	320	67	15	503	24	62	21	18	13	33	62
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	9	2	2	9	2	2	2	2	2	2	2
Cap, veh/h	56	1768	366	26	2027	97	173	143	121	188	143	121
Arrive On Green	0.04	0.76	0.76	0.02	0.74	0.74	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1500	2332	482	1500	2747	131	1301	1575	1335	1368	1575	1335
Grp Volume(v), veh/h	45	192	195	15	258	269	62	21	18	13	33	62
Grp Sat Flow(s),veh/h/ln	1500	1413	1401	1500	1413	1464	1301	1575	1335	1368	1575	1335
Q Serve(g_s), s	2.7	3.4	3.5	0.9	5.3	5.3	4.2	1.1	1.1	0.8	1.8	4.0
Cycle Q Clear(g_c), s	2.7	3.4	3.5	0.9	5.3	5.3	5.9	1.1	1.1	1.9	1.8	4.0
Prop In Lane	1.00		0.34	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	56	1072	1062	26	1043	1081	173	143	121	188	143	121
V/C Ratio(X)	0.80	0.18	0.18	0.58	0.25	0.25	0.36	0.15	0.15	0.07	0.23	0.51
Avail Cap(c_a), veh/h	150	1072	1062	117	1043	1081	546	595	504	580	595	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	3.0	3.1	43.9	3.8	3.8	40.7	37.7	37.7	38.6	38.0	39.0
Incr Delay (d2), s/veh	22.1	0.4	0.4	18.5	0.6	0.5	1.2	0.5	0.6	0.2	0.8	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.6	0.6	0.4	1.0	1.1	1.4	0.4	0.4	0.3	0.7	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.1	3.4	3.4	62.3	4.3	4.3	42.0	38.1	38.2	38.7	38.8	42.3
LnGrp LOS	E	A	A	E	A	A	D	D	D	D	D	D
Approach Vol, veh/h		432			542			101			108	
Approach Delay, s/veh		9.8			5.9			40.5			40.8	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.6	72.2		12.2	7.4	70.4		12.2				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	7.0	37.0		34.0	9.0	35.0		34.0				
Max Q Clear Time (g_c+I1), s	2.9	5.5		6.0	4.7	7.3		7.9				
Green Ext Time (p_c), s	0.0	2.1		0.4	0.0	2.8		0.3				

Intersection Summary		
HCM 6th Ctrl Delay	13.5	
HCM 6th LOS	B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	413	113	28	477	15	95	19	44	13	42	45
Future Volume (veh/h)	32	413	113	28	477	15	95	19	44	13	42	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1488	1575	1575	1488	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	35	449	123	30	518	16	103	21	48	14	46	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	9	2	2	9	2	2	2	2	2	2	2
Cap, veh/h	49	1551	422	44	1968	61	216	206	175	239	206	175
Arrive On Green	0.03	0.71	0.71	0.03	0.70	0.70	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1500	2197	597	1500	2799	86	1301	1575	1335	1332	1575	1335
Grp Volume(v), veh/h	35	288	284	30	261	273	103	21	48	14	46	49
Grp Sat Flow(s),veh/h/ln	1500	1413	1380	1500	1413	1472	1301	1575	1335	1332	1575	1335
Q Serve(g_s), s	2.1	6.8	6.9	1.8	6.1	6.1	6.9	1.1	2.9	0.8	2.4	3.0
Cycle Q Clear(g_c), s	2.1	6.8	6.9	1.8	6.1	6.1	9.3	1.1	2.9	1.9	2.4	3.0
Prop In Lane	1.00		0.43	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	49	998	975	44	994	1035	216	206	175	239	206	175
V/C Ratio(X)	0.72	0.29	0.29	0.68	0.26	0.26	0.48	0.10	0.27	0.06	0.22	0.28
Avail Cap(c_a), veh/h	150	998	975	117	994	1035	537	595	504	567	595	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	4.9	4.9	43.3	4.9	4.9	39.2	34.4	35.2	35.3	35.0	35.3
Incr Delay (d2), s/veh	18.0	0.7	0.8	17.0	0.6	0.6	1.6	0.2	0.8	0.1	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.5	1.5	0.8	1.3	1.4	2.3	0.4	1.0	0.3	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.2	5.6	5.6	60.2	5.5	5.5	40.8	34.7	36.1	35.4	35.5	36.1
LnGrp LOS	E	A	A	E	A	A	D	C	D	D	D	D
Approach Vol, veh/h		607			564			172			109	
Approach Delay, s/veh		8.8			8.4			38.7			35.8	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	67.6		15.8	6.9	67.3		15.8				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	7.0	37.0		34.0	9.0	35.0		34.0				
Max Q Clear Time (g_c+I1), s	3.8	8.9		5.0	4.1	8.1		11.3				
Green Ext Time (p_c), s	0.0	3.2		0.4	0.0	2.8		0.5				

Intersection Summary		
HCM 6th Ctrl Delay		14.2
HCM 6th LOS		B

DELAY (CONTROL)

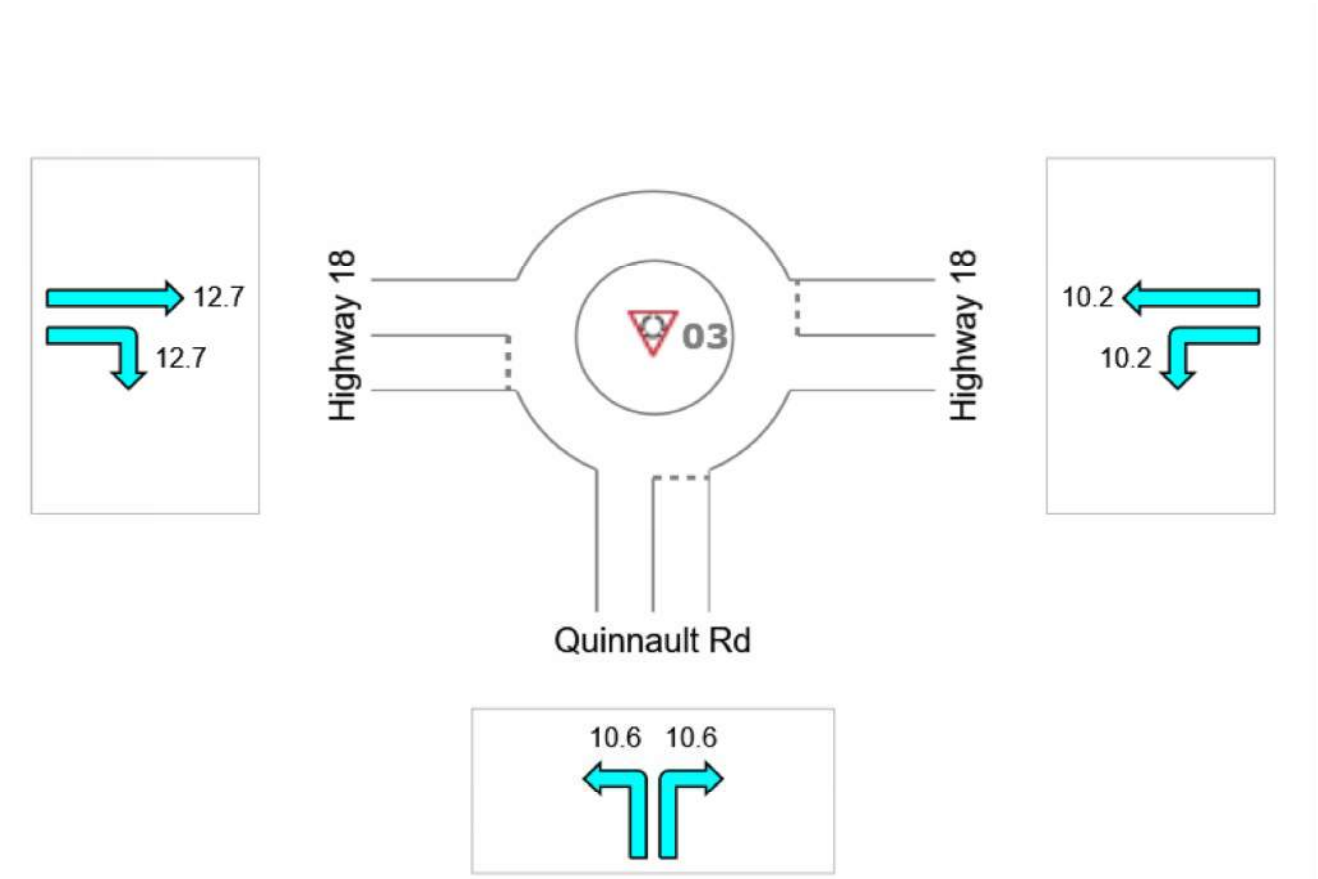
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 03 [Highway 18 at Quinnault Rd] — Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	West	Intersection
Delay (Control)	10.6	10.2	12.7	11.5
LOS	B	B	B	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	715	132	35	631	96	90
Future Volume (veh/h)	715	132	35	631	96	90
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1488	1575	1575	1488	1575	1575
Adj Flow Rate, veh/h	777	143	38	686	104	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	2	2	9	2	2
Cap, veh/h	1610	296	50	2124	119	112
Arrive On Green	0.68	0.68	0.03	0.75	0.16	0.16
Sat Flow, veh/h	2458	439	1500	2901	725	683
Grp Volume(v), veh/h	461	459	38	686	203	0
Grp Sat Flow(s),veh/h/ln	1413	1409	1500	1413	1416	0
Q Serve(g_s), s	14.8	14.8	2.4	7.5	13.2	0.0
Cycle Q Clear(g_c), s	14.8	14.8	2.4	7.5	13.2	0.0
Prop In Lane		0.31	1.00		0.51	0.48
Lane Grp Cap(c), veh/h	954	951	50	2124	232	0
V/C Ratio(X)	0.48	0.48	0.76	0.32	0.88	0.00
Avail Cap(c_a), veh/h	954	951	128	2124	316	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.69	0.69	1.00	0.00
Uniform Delay (d), s/veh	7.4	7.4	45.0	3.8	38.4	0.0
Incr Delay (d2), s/veh	1.4	1.4	14.7	0.3	18.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	3.6	1.0	1.3	5.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.7	8.7	59.7	4.1	56.6	0.0
LnGrp LOS	A	A	E	A	E	A
Approach Vol, veh/h	920			724	203	
Approach Delay, s/veh	8.7			7.0	56.6	
Approach LOS	A			A	E	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	7.1	67.5				74.6	19.4
Change Period (Y+Rc), s	4.0	4.0				4.0	4.0
Max Green Setting (Gmax), s	8.0	53.0				52.0	21.0
Max Q Clear Time (g_c+I1), s	4.4	16.8				9.5	15.2
Green Ext Time (p_c), s	0.0	6.0				4.7	0.3

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

DAVID EVANS AND ASSOCIATES INC.

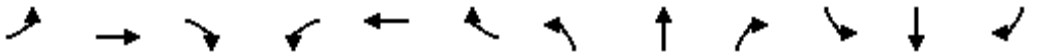
SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : HIGHWAY 18
N/S STREET : QUINNAULT RD

INTERSECTION : 3
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

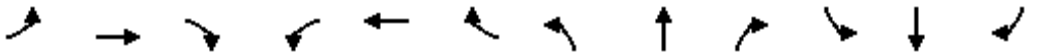
Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
HIGHWAY 18			
EB LEFT	42	23	0
EB THRU	385	489	712
EB RIGHT	66	91	6
WB LEFT	19	29	43
WB THRU	368	567	760
WB RIGHT	27	17	0
QUINNAULT RD			
NB LEFT	105	139	239
NB THRU	46	22	0
NB RIGHT	32	39	82
SB LEFT	26	0	0
SB THRU	36	0	0
SB RIGHT	42	0	0
TOTALS	**1194**	**1416**	**1841**



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	385	66	19	368	27	105	46	32	26	36	42
Future Volume (veh/h)	42	385	66	19	368	27	105	46	32	26	36	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1550	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	46	418	72	21	400	29	114	50	35	28	39	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	57	1809	309	34	1929	139	230	214	181	221	214	181
Arrive On Green	0.04	0.71	0.71	0.02	0.69	0.69	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1500	2556	437	1500	2785	201	1313	1575	1335	1313	1575	1335
Grp Volume(v), veh/h	46	243	247	21	211	218	114	50	35	28	39	46
Grp Sat Flow(s),veh/h/ln	1500	1496	1496	1500	1473	1514	1313	1575	1335	1313	1575	1335
Q Serve(g_s), s	2.7	5.1	5.2	1.2	4.6	4.7	7.6	2.5	2.1	1.8	2.0	2.8
Cycle Q Clear(g_c), s	2.7	5.1	5.2	1.2	4.6	4.7	9.6	2.5	2.1	4.3	2.0	2.8
Prop In Lane	1.00		0.29	1.00		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	57	1059	1059	34	1020	1049	230	214	181	221	214	181
V/C Ratio(X)	0.81	0.23	0.23	0.62	0.21	0.21	0.50	0.23	0.19	0.13	0.18	0.25
Avail Cap(c_a), veh/h	167	1059	1059	133	1020	1049	591	648	549	582	648	549
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	4.6	4.6	43.6	5.0	5.0	38.7	34.7	34.5	36.6	34.4	34.8
Incr Delay (d2), s/veh	22.7	0.5	0.5	16.8	0.5	0.5	1.7	0.6	0.5	0.3	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.2	1.2	0.6	1.1	1.1	2.5	1.0	0.7	0.6	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.7	5.1	5.1	60.4	5.4	5.4	40.3	35.2	35.0	36.9	34.9	35.5
LnGrp LOS	E	A	A	E	A	A	D	D	D	D	C	D
Approach Vol, veh/h		536			450			199			113	
Approach Delay, s/veh		10.3			8.0			38.1			35.6	
Approach LOS		B			A			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	67.7		16.2	7.4	66.3		16.2				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	8.0	33.0		37.0	10.0	31.0		37.0				
Max Q Clear Time (g_c+I1), s	3.2	7.2		6.3	4.7	6.7		11.6				
Green Ext Time (p_c), s	0.0	2.6		0.4	0.0	2.2		0.7				

Intersection Summary	
HCM 6th Ctrl Delay	16.0
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	446	76	27	519	17	127	22	38	10	12	19
Future Volume (veh/h)	21	446	76	27	519	17	127	22	38	10	12	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1550	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	23	485	83	29	564	18	138	24	41	11	13	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	36	1802	307	43	2065	66	254	210	178	241	210	178
Arrive On Green	0.02	0.70	0.70	0.03	0.71	0.71	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1500	2557	435	1500	2913	93	1375	1575	1335	1337	1575	1335
Grp Volume(v), veh/h	23	283	285	29	285	297	138	24	41	11	13	21
Grp Sat Flow(s),veh/h/ln	1500	1496	1497	1500	1473	1533	1375	1575	1335	1337	1575	1335
Q Serve(g_s), s	1.4	6.2	6.3	1.7	6.3	6.3	8.8	1.2	2.5	0.7	0.6	1.2
Cycle Q Clear(g_c), s	1.4	6.2	6.3	1.7	6.3	6.3	9.4	1.2	2.5	1.9	0.6	1.2
Prop In Lane	1.00		0.29	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	36	1054	1054	43	1044	1087	254	210	178	241	210	178
V/C Ratio(X)	0.63	0.27	0.27	0.67	0.27	0.27	0.54	0.11	0.23	0.05	0.06	0.12
Avail Cap(c_a), veh/h	167	1054	1054	133	1044	1087	635	648	549	612	648	549
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	4.8	4.9	43.3	4.7	4.7	38.2	34.3	34.9	35.1	34.1	34.3
Incr Delay (d2), s/veh	16.6	0.6	0.6	16.8	0.6	0.6	1.8	0.2	0.7	0.1	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.4	1.5	0.8	1.4	1.5	3.0	0.5	0.8	0.2	0.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.1	5.5	5.5	60.1	5.4	5.4	40.0	34.5	35.5	35.2	34.2	34.6
LnGrp LOS	E	A	A	E	A	A	D	C	D	D	C	C
Approach Vol, veh/h		591			611			203			45	
Approach Delay, s/veh		7.6			8.0			38.4			34.6	
Approach LOS		A			A			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	67.4		16.0	6.2	67.8		16.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	8.0	33.0		37.0	10.0	31.0		37.0				
Max Q Clear Time (g_c+I1), s	3.7	8.3		3.9	3.4	8.3		11.4				
Green Ext Time (p_c), s	0.0	3.0		0.1	0.0	3.0		0.6				

Intersection Summary		
HCM 6th Ctrl Delay		12.9
HCM 6th LOS		B

DELAY (CONTROL)

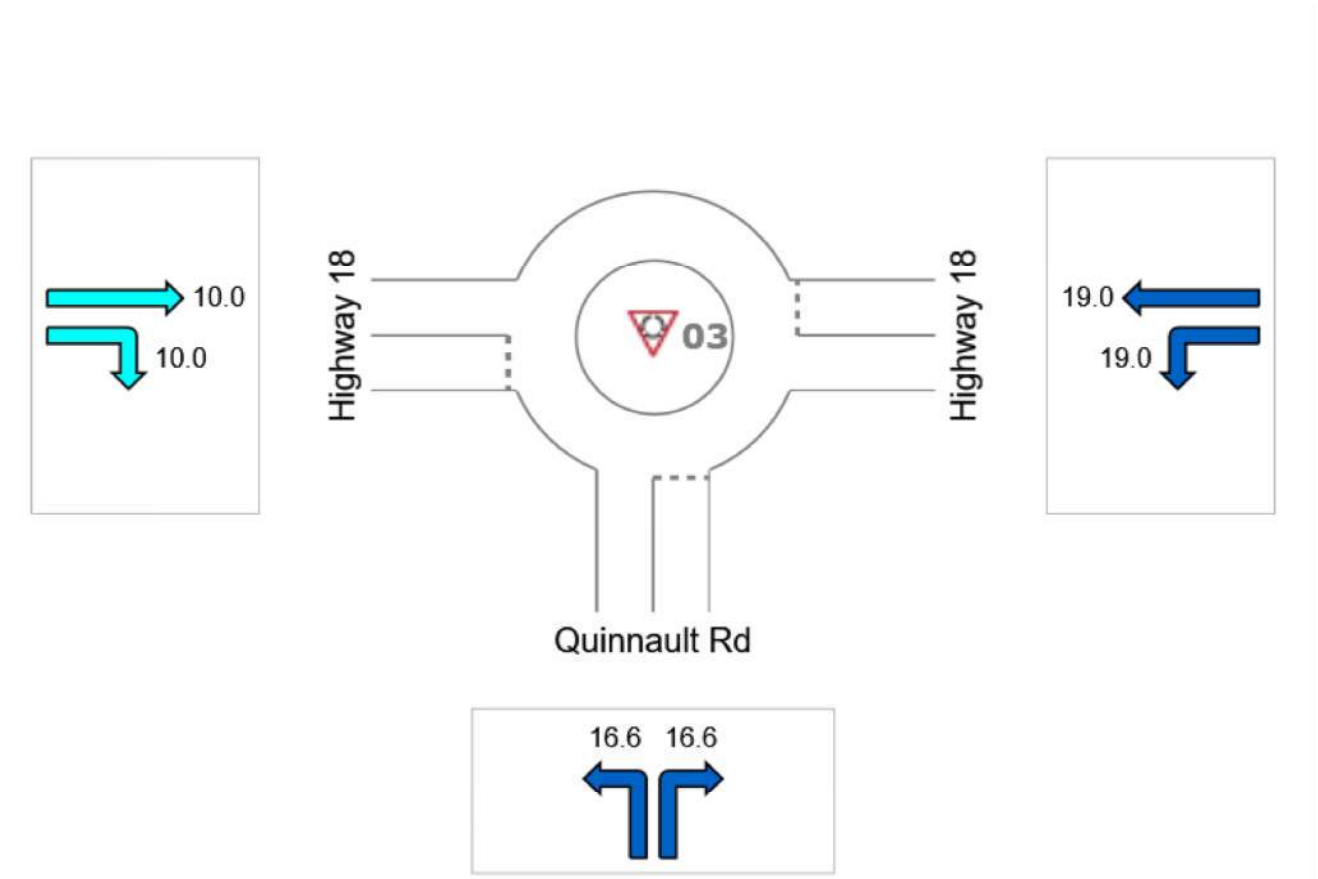
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 03 [Highway 18 at Quinnault Rd] — Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	West	Intersection
Delay (Control)	16.6	19.0	10.0	15.0
LOS	C	C	B	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	711	6	43	760	239	81
Future Volume (veh/h)	711	6	43	760	239	81
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1550	1575	1575
Adj Flow Rate, veh/h	773	7	47	826	260	88
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	4	2	2
Cap, veh/h	1519	14	175	1939	280	95
Arrive On Green	0.50	0.50	0.12	0.66	0.26	0.26
Sat Flow, veh/h	3118	28	1500	3023	1084	367
Grp Volume(v), veh/h	381	399	47	826	349	0
Grp Sat Flow(s),veh/h/ln	1496	1570	1500	1473	1455	0
Q Serve(g_s), s	16.4	16.4	2.7	12.8	22.5	0.0
Cycle Q Clear(g_c), s	16.4	16.4	2.7	12.8	22.5	0.0
Prop In Lane		0.02	1.00		0.74	0.25
Lane Grp Cap(c), veh/h	748	785	175	1939	376	0
V/C Ratio(X)	0.51	0.51	0.27	0.43	0.93	0.00
Avail Cap(c_a), veh/h	748	785	175	1939	409	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.79	0.79	1.00	0.00
Uniform Delay (d), s/veh	16.1	16.1	38.6	7.8	34.8	0.0
Incr Delay (d2), s/veh	2.2	2.1	0.6	0.5	26.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	5.6	1.0	3.2	10.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.3	18.2	39.3	8.3	61.2	0.0
LnGrp LOS	B	B	D	A	E	A
Approach Vol, veh/h	780			873	349	
Approach Delay, s/veh	18.2			10.0	61.2	
Approach LOS	B			A	E	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	15.2	52.0				67.2	28.8
Change Period (Y+Rc), s	4.0	4.0				4.0	4.0
Max Green Setting (Gmax), s	9.6	48.0				48.0	27.0
Max Q Clear Time (g_c+I1), s	14.7	18.4				14.8	24.5
Green Ext Time (p_c), s	0.0	4.5				5.7	0.3

Intersection Summary	
HCM 6th Ctrl Delay	22.1
HCM 6th LOS	C

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 3
North/South Street: QUINNAULT RD
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	57	Approach	93	Left	165	97
NB	Through	19	Departure	106	Through	8	11
	Right	17			Right	67	37
North leg	Left	12	Approach	0	Left	0	0
SB	Through	30	Departure	16	Through	0	0
	Right	57			Right	0	0
West leg	Left	41	Approach	576	Left	6	29
EB	Through	294	Departure	608	Through	405	502
	Right	62			Right	87	104
East leg	Left	14	Approach	547	Left	19	18
WB	Through	463	Departure	472	Through	443	499
	Right	22			Right	3	11

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	105	Approach	183	Left	135	139
NB	Through	46	Departure	121	Through	9	22
	Right	32			Right	44	39
North leg	Left	26	Approach	0	Left	0	0
SB	Through	36	Departure	23	Through	0	0
	Right	42			Right	0	0
West leg	Left	42	Approach	546	Left	7	23
EB	Through	385	Departure	687	Through	467	489
	Right	66			Right	88	91
East leg	Left	19	Approach	577	Left	33	29
WB	Through	368	Departure	511	Through	552	567
	Right	27			Right	6	17

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 3
North/South Street: QUINNAULT RD
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	57	Approach	93	Left	96	96
NB	Through	19	Departure	133	Through	0	0
	Right	17			Right	2	90
North leg	Left	12	Approach	0	Left	0	0
SB	Through	30	Departure	0	Through	0	0
	Right	57			Right	0	0
West leg	Left	41	Approach	915	Left	0	0
EB	Through	294	Departure	781	Through	534	715
	Right	62			Right	132	132
East leg	Left	14	Approach	652	Left	1	35
WB	Through	463	Departure	536	Through	685	631
	Right	22			Right	0	0

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	105	Approach	198	Left	239	239
NB	Through	46	Departure	6	Through	0	0
	Right	32			Right	4	82
North leg	Left	26	Approach	0	Left	0	0
SB	Through	36	Departure	0	Through	0	0
	Right	42			Right	0	0
West leg	Left	42	Approach	773	Left	0	0
EB	Through	385	Departure	1,048	Through	654	712
	Right	66			Right	6	6
East leg	Left	19	Approach	653	Left	0	43
WB	Through	368	Departure	658	Through	809	760
	Right	27			Right	0	0

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : HIGHWAY 18
N/S STREET : CENTRAL RD

INTERSECTION : 4
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
HIGHWAY 18			
EB LEFT	81	104	72
EB THRU	134	286	520
EB RIGHT	110	149	126
WB LEFT	45	52	73
WB THRU	185	212	424
WB RIGHT	87	95	110
CENTRAL RD			
NB LEFT	121	144	189
NB THRU	143	162	204
NB RIGHT	20	38	82
SB LEFT	25	44	72
SB THRU	283	301	368
SB RIGHT	134	142	148
TOTALS	**1368**	**1729**	**2388**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	134	110	45	185	87	121	143	20	25	283	134
Future Volume (veh/h)	81	134	110	45	185	87	121	143	20	25	283	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1488	1575	1575	1488	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	88	146	120	49	201	95	132	155	22	27	308	146
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	9	2	2	9	2	2	2	2	2	2	2
Cap, veh/h	107	1508	712	60	1418	670	213	515	436	366	515	436
Arrive On Green	0.07	0.53	0.53	0.04	0.50	0.50	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1500	2827	1335	1500	2827	1335	937	1575	1335	1207	1575	1335
Grp Volume(v), veh/h	88	146	120	49	201	95	132	155	22	27	308	146
Grp Sat Flow(s),veh/h/ln	1500	1413	1335	1500	1413	1335	937	1575	1335	1207	1575	1335
Q Serve(g_s), s	6.9	3.0	5.5	3.9	4.6	4.6	16.5	8.8	1.4	2.0	19.6	9.9
Cycle Q Clear(g_c), s	6.9	3.0	5.5	3.9	4.6	4.6	36.1	8.8	1.4	10.9	19.6	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	107	1508	712	60	1418	670	213	515	436	366	515	436
V/C Ratio(X)	0.82	0.10	0.17	0.82	0.14	0.14	0.62	0.30	0.05	0.07	0.60	0.33
Avail Cap(c_a), veh/h	225	1508	712	150	1418	670	305	669	567	484	669	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.0	13.8	14.4	57.2	16.0	16.0	48.9	30.1	27.6	34.2	33.8	30.5
Incr Delay (d2), s/veh	14.2	0.1	0.5	23.4	0.2	0.4	2.9	0.3	0.0	0.1	1.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.9	1.6	1.8	1.4	1.4	3.8	3.2	0.4	0.6	7.2	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.2	13.9	14.9	80.6	16.2	16.5	51.8	30.5	27.7	34.3	34.9	31.0
LnGrp LOS	E	B	B	F	B	B	D	C	C	C	C	C
Approach Vol, veh/h		354			345			309			481	
Approach Delay, s/veh		28.0			25.5			39.4			33.7	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.8	68.0		43.2	12.6	64.2		43.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	12.8	45.0		51.0	18.0	39.0		51.0
Max Q Clear Time (g_c+I1), s	5.9	7.5		21.6	8.9	6.6		38.1
Green Ext Time (p_c), s	0.0	1.2		2.1	0.1	1.4		1.1

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	286	149	52	212	95	144	162	38	44	301	142
Future Volume (veh/h)	104	286	149	52	212	95	144	162	38	44	301	142
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1488	1575	1575	1488	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	113	311	162	57	230	103	157	176	41	48	327	154
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	9	2	2	9	2	2	2	2	2	2	2
Cap, veh/h	135	1392	657	70	1270	600	237	569	482	387	569	482
Arrive On Green	0.09	0.49	0.49	0.05	0.45	0.45	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1500	2827	1335	1500	2827	1335	914	1575	1335	1164	1575	1335
Grp Volume(v), veh/h	113	311	162	57	230	103	157	176	41	48	327	154
Grp Sat Flow(s),veh/h/ln	1500	1413	1335	1500	1413	1335	914	1575	1335	1164	1575	1335
Q Serve(g_s), s	8.9	7.5	8.4	4.5	5.9	5.5	20.1	9.6	2.4	3.7	20.1	10.0
Cycle Q Clear(g_c), s	8.9	7.5	8.4	4.5	5.9	5.5	40.2	9.6	2.4	13.4	20.1	10.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	1392	657	70	1270	600	237	569	482	387	569	482
V/C Ratio(X)	0.84	0.22	0.25	0.82	0.18	0.17	0.66	0.31	0.09	0.12	0.58	0.32
Avail Cap(c_a), veh/h	225	1392	657	150	1270	600	295	669	567	461	669	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.8	17.4	17.6	56.7	19.8	19.7	47.1	27.6	25.3	32.4	30.9	27.7
Incr Delay (d2), s/veh	13.0	0.4	0.9	20.1	0.3	0.6	3.9	0.3	0.1	0.1	0.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	2.4	2.6	2.0	1.9	1.7	4.6	3.5	0.7	1.0	7.3	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.8	17.7	18.5	76.8	20.1	20.3	51.0	27.9	25.3	32.5	31.8	28.1
LnGrp LOS	E	B	B	E	C	C	D	C	C	C	C	C
Approach Vol, veh/h		586			390			374			529	
Approach Delay, s/veh		27.4			28.5			37.3			30.8	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	63.1		47.3	14.8	57.9		47.3
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	12.6	45.0		51.0	18.0	39.0		51.0
Max Q Clear Time (g_c+I1), s	6.5	10.4		22.1	10.9	7.9		42.2
Green Ext Time (p_c), s	0.0	2.4		2.3	0.1	1.6		1.2

Intersection Summary	
HCM 6th Ctrl Delay	30.5
HCM 6th LOS	C

DELAY (CONTROL)

Average control delay per vehicle, or average pedestrian delay (seconds)

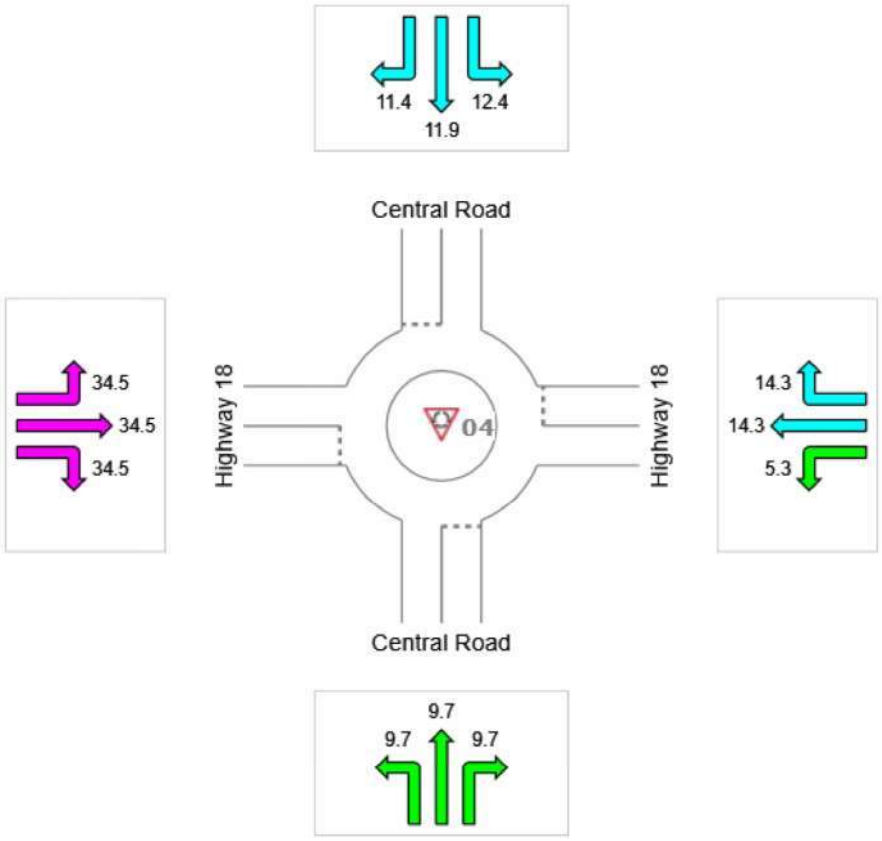
Site: 04 [Highway 18 at Central Rd]

Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Delay (Control)	9.7	13.2	11.9	34.5	18.6
LOS	A	B	B	D	C



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	520	126	73	424	110	189	204	82	72	368	148
Future Volume (veh/h)	72	520	126	73	424	110	189	204	82	72	368	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1488	1575	1575	1488	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	78	565	137	79	461	120	205	222	89	78	400	161
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	9	2	2	9	2	2	2	2	2	2	2
Cap, veh/h	585	1395	659	118	942	445	287	1094	488	396	1094	488
Arrive On Green	0.40	0.99	0.99	0.04	0.33	0.33	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	2910	2827	1335	2910	2827	1335	849	2993	1335	1068	2993	1335
Grp Volume(v), veh/h	78	565	137	79	461	120	205	222	89	78	400	161
Grp Sat Flow(s),veh/h/ln	1455	1413	1335	1455	1413	1335	849	1496	1335	1068	1496	1335
Q Serve(g_s), s	2.0	0.5	0.2	3.2	15.6	7.9	28.0	6.1	5.4	6.5	11.7	10.4
Cycle Q Clear(g_c), s	2.0	0.5	0.2	3.2	15.6	7.9	39.7	6.1	5.4	12.6	11.7	10.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	585	1395	659	118	942	445	287	1094	488	396	1094	488
V/C Ratio(X)	0.13	0.40	0.21	0.67	0.49	0.27	0.71	0.20	0.18	0.20	0.37	0.33
Avail Cap(c_a), veh/h	585	1395	659	218	942	445	359	1347	601	486	1347	601
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.3	0.4	0.4	56.8	31.9	29.3	42.4	26.1	25.9	30.4	27.9	27.5
Incr Delay (d2), s/veh	0.1	0.6	0.5	6.3	1.8	1.5	4.9	0.1	0.2	0.2	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.2	0.1	1.2	5.3	2.6	5.9	2.1	1.7	1.6	4.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	1.0	0.9	63.1	33.7	30.8	47.3	26.2	26.0	30.6	28.1	27.8
LnGrp LOS	C	A	A	E	C	C	D	C	C	C	C	C
Approach Vol, veh/h		780			660			516			639	
Approach Delay, s/veh		3.9			36.7			34.6			28.3	
Approach LOS		A			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.9	63.2		47.9	28.1	44.0		47.9
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	9.6	45.0		54.0	14.0	40.0		54.0
Max Q Clear Time (g_c+I1), s	5.2	2.5		14.6	4.0	17.6		41.7
Green Ext Time (p_c), s	0.1	4.2		3.3	0.1	3.1		2.2

Intersection Summary		
HCM 6th Ctrl Delay		24.3
HCM 6th LOS		C

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : HIGHWAY 18
N/S STREET : CENTRAL RD

INTERSECTION : 4
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
HIGHWAY 18			
EB LEFT	104	116	129
EB THRU	235	279	560
EB RIGHT	119	150	186
WB LEFT	50	82	133
WB THRU	269	369	457
WB RIGHT	38	51	80
CENTRAL RD			
NB LEFT	107	125	138
NB THRU	172	190	256
NB RIGHT	54	70	100
SB LEFT	29	32	37
SB THRU	172	196	224
SB RIGHT	123	107	110
TOTALS	**1472**	**1767**	**2410**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	235	119	50	269	38	107	172	54	29	172	123
Future Volume (veh/h)	104	235	119	50	269	38	107	172	54	29	172	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1550	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	113	255	129	54	292	41	116	187	59	32	187	134
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	135	1850	825	66	1685	764	203	374	317	213	374	317
Arrive On Green	0.09	0.62	0.62	0.04	0.57	0.57	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1500	2993	1335	1500	2945	1335	1059	1575	1335	1134	1575	1335
Grp Volume(v), veh/h	113	255	129	54	292	41	116	187	59	32	187	134
Grp Sat Flow(s),veh/h/ln	1500	1496	1335	1500	1473	1335	1059	1575	1335	1134	1575	1335
Q Serve(g_s), s	8.9	4.3	4.9	4.3	5.7	1.6	12.8	12.3	4.2	3.0	12.3	10.2
Cycle Q Clear(g_c), s	8.9	4.3	4.9	4.3	5.7	1.6	25.1	12.3	4.2	15.3	12.3	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	1850	825	66	1685	764	203	374	317	213	374	317
V/C Ratio(X)	0.84	0.14	0.16	0.82	0.17	0.05	0.57	0.50	0.19	0.15	0.50	0.42
Avail Cap(c_a), veh/h	275	1850	825	163	1685	764	357	604	512	378	604	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	9.6	9.7	56.9	12.2	11.3	50.4	39.6	36.5	46.2	39.6	38.8
Incr Delay (d2), s/veh	12.5	0.2	0.4	21.1	0.2	0.1	2.5	1.0	0.3	0.3	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	1.3	1.4	2.0	1.7	0.5	3.4	4.6	1.3	0.8	4.6	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.3	9.7	10.1	78.0	12.4	11.5	52.9	40.6	36.8	46.5	40.6	39.6
LnGrp LOS	E	A	B	E	B	B	D	D	D	D	D	D
Approach Vol, veh/h		497			387			362			353	
Approach Delay, s/veh		22.7			21.5			43.9			40.8	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	78.2		32.5	14.8	72.7		32.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	13.0	49.0		46.0	22.0	40.0		46.0
Max Q Clear Time (g_c+I1), s	6.3	6.9		17.3	10.9	7.7		27.1
Green Ext Time (p_c), s	0.0	1.9		1.4	0.2	1.8		1.4

Intersection Summary	
HCM 6th Ctrl Delay	31.2
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	279	150	82	369	51	125	190	70	32	196	107
Future Volume (veh/h)	116	279	150	82	369	51	125	190	70	32	196	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1550	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	126	303	163	89	401	55	136	207	76	35	213	116
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	149	1672	746	108	1564	709	223	424	360	234	424	360
Arrive On Green	0.10	0.56	0.56	0.07	0.53	0.53	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1500	2993	1335	1500	2945	1335	1051	1575	1335	1096	1575	1335
Grp Volume(v), veh/h	126	303	163	89	401	55	136	207	76	35	213	116
Grp Sat Flow(s),veh/h/ln	1500	1496	1335	1500	1473	1335	1051	1575	1335	1096	1575	1335
Q Serve(g_s), s	9.9	6.0	7.4	7.0	8.9	2.4	15.1	13.3	5.3	3.3	13.7	8.3
Cycle Q Clear(g_c), s	9.9	6.0	7.4	7.0	8.9	2.4	28.8	13.3	5.3	16.6	13.7	8.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	149	1672	746	108	1564	709	223	424	360	234	424	360
V/C Ratio(X)	0.85	0.18	0.22	0.83	0.26	0.08	0.61	0.49	0.21	0.15	0.50	0.32
Avail Cap(c_a), veh/h	275	1672	746	163	1564	709	343	604	512	359	604	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.1	13.0	13.3	55.0	15.3	13.8	49.2	36.9	34.0	43.8	37.0	35.1
Incr Delay (d2), s/veh	12.2	0.2	0.7	18.7	0.4	0.2	2.7	0.9	0.3	0.3	0.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	1.9	2.2	3.1	2.8	0.7	3.9	4.9	1.7	0.9	5.1	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.3	13.2	14.0	73.7	15.7	14.0	51.9	37.7	34.2	44.1	37.9	35.6
LnGrp LOS	E	B	B	E	B	B	D	D	C	D	D	D
Approach Vol, veh/h		592			545			419			364	
Approach Delay, s/veh		24.5			25.0			41.7			37.8	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.6	71.0		36.3	15.9	67.7		36.3
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	13.6	49.0		46.0	22.0	40.0		46.0
Max Q Clear Time (g_c+I1), s	11.3	9.4		18.6	11.9	10.9		30.8
Green Ext Time (p_c), s	0.1	2.4		1.5	0.2	2.6		1.6

Intersection Summary	
HCM 6th Ctrl Delay	30.9
HCM 6th LOS	C

DELAY (CONTROL)

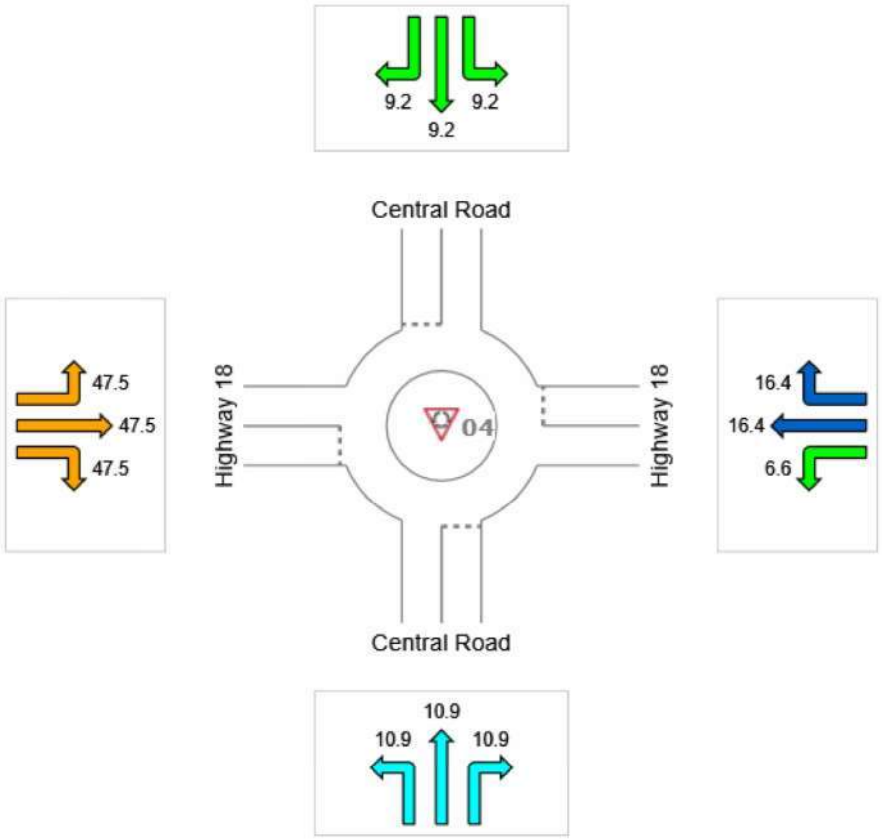
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 04 [Highway 18 at Central Rd] — Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Delay (Control)	10.9	14.5	9.2	47.5	24.9
LOS	B	B	A	E	C



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	129	560	186	133	457	80	138	256	100	37	224	110
Future Volume (veh/h)	129	560	186	133	457	80	138	256	100	37	224	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1550	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	140	609	202	145	497	87	150	278	109	40	243	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	790	1759	784	196	1129	512	242	734	327	227	734	327
Arrive On Green	0.54	1.00	1.00	0.07	0.38	0.38	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	2910	2993	1335	2910	2945	1335	1019	2993	1335	997	2993	1335
Grp Volume(v), veh/h	140	609	202	145	497	87	150	278	109	40	243	120
Grp Sat Flow(s),veh/h/ln	1455	1496	1335	1455	1473	1335	1019	1496	1335	997	1496	1335
Q Serve(g_s), s	2.9	0.0	0.0	5.9	15.0	5.2	17.0	9.3	8.1	4.2	8.0	8.9
Cycle Q Clear(g_c), s	2.9	0.0	0.0	5.9	15.0	5.2	25.0	9.3	8.1	13.5	8.0	8.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	790	1759	784	196	1129	512	242	734	327	227	734	327
V/C Ratio(X)	0.18	0.35	0.26	0.74	0.44	0.17	0.62	0.38	0.33	0.18	0.33	0.37
Avail Cap(c_a), veh/h	790	1759	784	412	1129	512	383	1147	512	365	1147	512
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	0.0	0.0	54.9	27.4	24.4	47.5	37.7	37.2	43.3	37.2	37.6
Incr Delay (d2), s/veh	0.1	0.4	0.6	5.5	1.2	0.7	2.6	0.3	0.6	0.4	0.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.1	0.1	2.2	5.2	1.7	4.3	3.3	2.6	1.0	2.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.7	0.4	0.6	60.4	28.7	25.1	50.1	38.0	37.8	43.6	37.5	38.2
LnGrp LOS	C	A	A	E	C	C	D	D	D	D	D	D
Approach Vol, veh/h		951			729			537			403	
Approach Delay, s/veh		3.4			34.6			41.3			38.3	
Approach LOS		A			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.1	74.5		33.4	36.6	50.0		33.4
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	17.0	45.0		46.0	16.0	46.0		46.0
Max Q Clear Time (g_c+I1), s	7.9	2.0		15.5	4.9	17.0		27.0
Green Ext Time (p_c), s	0.3	4.8		1.9	0.3	3.3		2.4

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 4
North/South Street: CENTRAL RD
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	121	Approach	402	Left	125	144
NB	Through	143	Departure	482	Through	136	162
	Right	20			Right	41	38
North leg	Left	25	Approach	454	Left	51	44
SB	Through	283	Departure	319	Through	299	301
	Right	134			Right	139	142
West leg	Left	81	Approach	474	Left	85	104
EB	Through	134	Departure	488	Through	300	286
	Right	110			Right	127	149
East leg	Left	45	Approach	350	Left	56	52
WB	Through	185	Departure	392	Through	224	212
	Right	87			Right	98	95

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	107	Approach	397	Left	135	125
NB	Through	172	Departure	446	Through	185	190
	Right	54			Right	79	70
North leg	Left	29	Approach	324	Left	29	32
SB	Through	172	Departure	326	Through	190	196
	Right	123			Right	107	107
West leg	Left	104	Approach	526	Left	91	116
EB	Through	235	Departure	662	Through	280	279
	Right	119			Right	157	150
East leg	Left	50	Approach	567	Left	99	82
WB	Through	269	Departure	388	Through	420	369
	Right	38			Right	50	51

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 4
North/South Street: CENTRAL RD
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	121	Approach	475	Left	189	189
NB	Through	143	Departure	568	Through	204	204
	Right	20			Right	82	82
North leg	Left	25	Approach	588	Left	72	72
SB	Through	283	Departure	386	Through	368	368
	Right	134			Right	148	148
West leg	Left	81	Approach	538	Left	72	72
EB	Through	134	Departure	593	Through	340	520
	Right	110			Right	126	126
East leg	Left	45	Approach	439	Left	73	73
WB	Through	185	Departure	494	Through	256	424
	Right	87			Right	110	110

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	107	Approach	492	Left	138	138
NB	Through	172	Departure	543	Through	256	256
	Right	54			Right	100	100
North leg	Left	29	Approach	369	Left	37	37
SB	Through	172	Departure	465	Through	224	224
	Right	123			Right	110	110
West leg	Left	104	Approach	673	Left	129	129
EB	Through	235	Departure	738	Through	362	560
	Right	119			Right	186	186
East leg	Left	50	Approach	701	Left	133	133
WB	Through	269	Departure	500	Through	491	457
	Right	38			Right	80	80

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : ESAWS AVE
N/S STREET : CENTRAL RD

INTERSECTION : 5
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
ESAWS AVE			
EB LEFT	5	5	8
EB THRU	2	2	3
EB RIGHT	3	7	9
WB LEFT	5	6	9
WB THRU	2	2	3
WB RIGHT	2	2	2
CENTRAL RD			
NB LEFT	6	11	13
NB THRU	121	134	172
NB RIGHT	15	17	17
SB LEFT	2	2	2
SB THRU	161	170	288
SB RIGHT	5	5	7
TOTALS	**329**	**363**	**533**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : ESAWS AVE
CONDITION : AM PEAK HOUR

N/S STREET : CENTRAL RD
PHF : 0.84
COVID FACTOR : 45%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	35	0	1	0	0	0	0	0	0	0	0
1	28	0	0	1	0	0	0	0	0	1	0
0	25	0	0	0	0	0	0	0	0	0	0
1	19	0	0	1	0	0	0	0	0	1	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	19	1	0	3	1	0	2	0	0	1	0
2	16	0	0	4	0	0	1	0	0	2	0
5	14	0	0	0	0	0	2	0	0	2	0
3	14	2	0	1	0	0	0	0	0	2	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	1	0	0	0
0	0	2	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	2	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
ESAWS AVE					
EB LEFT	0	3	**3**	**1%**	**5**
EB THRU	0	0	**1**	**1%**	**2**
EB RIGHT	0	2	**2**	**1%**	**3**
WB LEFT	1	2	**3**	**33%**	**5**
WB THRU	0	0	**1**	**1%**	**2**
WB RIGHT	0	0	**1**	**1%**	**2**
CENTRAL RD					
NB LEFT	1	3	**4**	**25%**	**6**
NB THRU	20	63	**83**	**24%**	**121**
NB RIGHT	0	10	**10**	**1%**	**15**
SB LEFT	0	0	**1**	**1%**	**2**
SB THRU	4	107	**111**	**4%**	**161**
SB RIGHT	1	2	**3**	**33%**	**5**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CENTRAL RD
EAST-WEST STREET: ESAWS AVE
JURISDICTION: APPLE VALLEY

DATE: 02-03-21

PEAK HOUR: 07:30AM

NORTH LEG

TOTAL: 114

Rt	Thru	Lt	
3	111		Total
1	35	0	1st
1	30	0	2nd
0	25	0	3rd
1	21	0	4th

EAST LEG TOTAL: 3

	1st	2nd	3rd	4th	Total
Rt	0	0	0	0	
Thru	0	0	0	0	
Lt	0	0	1	2	3

WEST LEG TOTAL: 5

Total	1st	2nd	3rd	4th	
3	2	0	0	1	Lt
	0	0	0	0	Thru
2	0	0	2	0	Rt

PEAK HOUR FACTORS

NORTH LEG = 0.79
SOUTH LEG = 0.90
EAST LEG = 0.38
WEST LEG = 0.63

ALL LEGS = 0.84

SOUTH LEG

TOTAL: 97

	Lt	Thru	Rt
1st	2	25	0
2nd	0	23	2
3rd	0	18	5
4th	2	17	3
Total	4	83	10

HOUR TOTAL: 219

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CENTRAL RD
EAST-WEST STREET : ESAWS AVE

APPLE VALLEY
02-03-21

BEGINNING TIME : 07:00AM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
NORTH LEG												
0	16	0	0	4	0	0	1	0	0	3	0	24
1	27	0	0	1	0	0	1	0	0	1	0	31
0	35	0	1	0	0	0	0	0	0	0	0	36
1	28	0	0	1	0	0	0	0	0	1	0	31
0	25	0	0	0	0	0	0	0	0	0	0	25
1	19	0	0	1	0	0	0	0	0	1	0	22
0	19	0	1	0	0	0	0	0	0	1	0	21
0	27	0	0	2	0	0	1	0	0	1	0	31
3	196	0	2	9	0	0	3	0	0	8	0	221
SOUTH LEG												
1	7	1	0	1	0	0	1	0	0	1	0	12
0	11	0	0	1	0	0	1	0	0	0	0	13
0	19	1	0	3	1	0	2	0	0	1	0	27
2	16	0	0	4	0	0	1	0	0	2	0	25
5	14	0	0	0	0	0	2	0	0	2	0	23
3	14	2	0	1	0	0	0	0	0	2	0	22
0	24	2	1	0	0	0	0	0	0	1	0	28
2	15	1	0	2	0	0	0	0	0	2	0	22
13	120	7	1	12	1	0	7	0	0	11	0	172
EAST LEG												
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	1	0	0	0	1
0	0	2	0	0	0	0	0	0	0	0	0	2
0	0	2	0	0	0	0	0	0	0	0	0	2
0	0	1	0	0	0	0	0	0	0	0	0	1
0	0	5	0	0	0	0	0	1	0	0	0	6
WEST LEG												
1	0	1	0	0	0	1	0	0	0	0	0	3
1	0	0	0	0	0	0	0	0	0	0	0	1
0	0	2	0	0	0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	2
0	0	1	0	0	0	0	0	0	0	0	0	1
3	0	0	0	0	0	0	0	0	0	0	0	3
2	0	0	0	0	0	0	0	0	0	0	0	2
9	0	4	0	0	0	1	0	0	0	0	0	14

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: ESAWS AVE

TIME: 07:00AM-08:00AM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
3	119	0	Total
0	24	0	1st
1	30	0	2nd
1	35	0	3rd
1	30	0	4th

	1st	2nd	3rd	4th	Total
Rt	0	0	0	0	0
Thru	0	0	0	0	0
Lt	0	0	0	0	0

Total	1st	2nd	3rd	4th	
3	1	0	2	0	Lt
0	0	0	0	0	Thru
3	2	1	0	0	Rt

	Lt	Thru	Rt
1st	1	10	1
2nd	0	13	0
3rd	2	25	0
4th	0	23	2
Total	3	71	3

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: ESAWS AVE

TIME: 08:00AM-09:00AM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
2	97	0	Total
0	25	0	1st
1	21	0	2nd
1	20	0	3rd
0	31	0	4th

	1st	2nd	3rd	4th	Total
Rt	0	0	0	0	0
Thru	0	0	0	0	0
Lt	1	2	2	1	6

Total	1st	2nd	3rd	4th	
1	0	1	0	0	Lt
0	0	0	0	0	Thru
7	2	0	3	2	Rt

	Lt	Thru	Rt
1st	0	18	5
2nd	2	17	3
3rd	2	25	1
4th	1	19	2
Total	5	79	11

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	2	3	5	2	2	6	121	15	2	161	5
Future Volume (veh/h)	5	2	3	5	2	2	6	121	15	2	161	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1588	1588	1188	1588	1588	1288	1300	1588	1588	1550	1188
Adj Flow Rate, veh/h	6	2	4	6	2	2	7	144	18	2	192	6
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.80	0.84	0.84
Percent Heavy Veh, %	1	1	1	33	1	1	25	24	1	1	4	33
Cap, veh/h	0	9	19	0	31	26	11	999	1033	4	1181	767
Arrive On Green	0.00	0.02	0.02	0.00	0.02	0.02	0.01	0.77	0.77	0.00	0.76	0.76
Sat Flow, veh/h	0	472	945	0	1588	1345	1227	1300	1345	1512	1550	1007
Grp Volume(v), veh/h	0	0	6	0	2	2	7	144	18	2	192	6
Grp Sat Flow(s),veh/h/ln	0	0	1417	0	1588	1345	1227	1300	1345	1512	1550	1007
Q Serve(g_s), s	0.0	0.0	0.2	0.0	0.1	0.1	0.3	1.7	0.2	0.1	1.9	0.1
Cycle Q Clear(g_c), s	0.0	0.0	0.2	0.0	0.1	0.1	0.3	1.7	0.2	0.1	1.9	0.1
Prop In Lane	0.00		0.67	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	28	0	31	26	11	999	1033	4	1181	767
V/C Ratio(X)	0.00	0.00	0.22	0.00	0.06	0.08	0.62	0.14	0.02	0.48	0.16	0.01
Avail Cap(c_a), veh/h	0	0	1138	0	998	846	214	999	1033	211	1181	767
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	27.6	0.0	27.6	27.6	28.3	1.7	1.6	28.5	1.9	1.6
Incr Delay (d2), s/veh	0.0	0.0	3.8	0.0	0.9	1.2	44.6	0.3	0.0	68.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	31.5	0.0	28.4	28.8	72.9	2.0	1.6	96.7	2.2	1.7
LnGrp LOS	A	A	C	A	C	C	E	A	A	F	A	A
Approach Vol, veh/h		6			4			169			200	
Approach Delay, s/veh		31.5			28.6			4.9			3.1	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.2	48.0	0.0	5.1	4.5	47.6	0.0	5.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	44.0	6.0	46.0	10.0	42.0	16.0	36.0
Max Q Clear Time (g_c+I1), s	2.1	3.7	0.0	2.2	2.3	3.9	0.0	2.1
Green Ext Time (p_c), s	0.0	0.8	0.0	0.0	0.0	1.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	4.6
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	2	7	6	2	2	11	134	17	2	170	5
Future Volume (veh/h)	5	2	7	6	2	2	11	134	17	2	170	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1588	1588	1188	1588	1588	1288	1300	1588	1588	1550	1188
Adj Flow Rate, veh/h	6	2	8	7	2	2	13	160	20	2	202	6
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.80	0.84	0.84
Percent Heavy Veh, %	1	1	1	33	1	1	25	24	1	1	4	33
Cap, veh/h	0	7	28	0	39	33	20	994	1028	4	1163	756
Arrive On Green	0.00	0.02	0.02	0.00	0.02	0.02	0.02	0.76	0.76	0.00	0.75	0.75
Sat Flow, veh/h	0	278	1110	0	1588	1345	1227	1300	1345	1512	1550	1007
Grp Volume(v), veh/h	0	0	10	0	2	2	13	160	20	2	202	6
Grp Sat Flow(s),veh/h/ln	0	0	1388	0	1588	1345	1227	1300	1345	1512	1550	1007
Q Serve(g_s), s	0.0	0.0	0.4	0.0	0.1	0.1	0.6	1.9	0.2	0.1	2.2	0.1
Cycle Q Clear(g_c), s	0.0	0.0	0.4	0.0	0.1	0.1	0.6	1.9	0.2	0.1	2.2	0.1
Prop In Lane	0.00		0.80	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	34	0	39	33	20	994	1028	4	1163	756
V/C Ratio(X)	0.00	0.00	0.29	0.00	0.05	0.06	0.65	0.16	0.02	0.48	0.17	0.01
Avail Cap(c_a), veh/h	0	0	1109	0	992	841	213	994	1028	210	1163	756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	27.6	0.0	27.4	27.4	28.2	1.8	1.6	28.7	2.1	1.8
Incr Delay (d2), s/veh	0.0	0.0	4.6	0.0	0.5	0.7	30.3	0.3	0.0	68.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.1	0.0	0.1	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	32.2	0.0	27.9	28.2	58.5	2.2	1.7	96.9	2.4	1.8
LnGrp LOS	A	A	C	A	C	C	E	A	A	F	A	A
Approach Vol, veh/h		10			4			193			210	
Approach Delay, s/veh		32.2			28.1			5.9			3.3	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.2	48.0	0.0	5.4	4.9	47.2	0.0	5.4
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	44.0	6.0	46.0	10.0	42.0	16.0	36.0
Max Q Clear Time (g_c+I1), s	2.1	3.9	0.0	2.4	2.6	4.2	0.0	2.1
Green Ext Time (p_c), s	0.0	0.8	0.0	0.0	0.0	1.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	5.4
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	3	9	9	3	2	13	172	17	2	288	7
Future Volume (veh/h)	8	3	9	9	3	2	13	172	17	2	288	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1588	1588	1188	1588	1588	1288	1300	1588	1588	1550	1188
Adj Flow Rate, veh/h	9	3	10	10	3	2	14	187	18	2	313	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	33	1	1	25	24	1	1	4	33
Cap, veh/h	0	8	27	0	40	34	644	1134	1173	4	543	352
Arrive On Green	0.00	0.02	0.02	0.00	0.03	0.03	0.52	0.87	0.87	0.00	0.35	0.35
Sat Flow, veh/h	0	322	1073	0	1588	1345	1227	1300	1345	1512	1550	1007
Grp Volume(v), veh/h	0	0	13	0	3	2	14	187	18	2	313	8
Grp Sat Flow(s),veh/h/ln	0	0	1394	0	1588	1345	1227	1300	1345	1512	1550	1007
Q Serve(g_s), s	0.0	0.0	1.1	0.0	0.2	0.2	0.7	2.6	0.2	0.2	19.7	0.6
Cycle Q Clear(g_c), s	0.0	0.0	1.1	0.0	0.2	0.2	0.7	2.6	0.2	0.2	19.7	0.6
Prop In Lane	0.00		0.77	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	34	0	40	34	644	1134	1173	4	543	352
V/C Ratio(X)	0.00	0.00	0.38	0.00	0.07	0.06	0.02	0.16	0.02	0.49	0.58	0.02
Avail Cap(c_a), veh/h	0	0	535	0	476	404	644	1134	1173	101	543	352
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	57.6	0.0	57.1	49.3	13.7	1.1	0.5	59.8	31.8	25.6
Incr Delay (d2), s/veh	0.0	0.0	6.7	0.0	0.8	0.7	0.0	0.3	0.0	70.8	4.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.4	0.0	0.1	0.1	0.2	0.2	0.0	0.1	7.6	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	64.3	0.0	57.9	50.0	13.7	1.5	0.6	130.6	36.2	25.7
LnGrp LOS	A	A	E	A	E	D	B	A	A	F	D	C
Approach Vol, veh/h		13			5			219			323	
Approach Delay, s/veh		64.3			54.7			2.2			36.5	
Approach LOS		E			D			A			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.3	108.6	0.1	7.0	67.0	46.0	0.0	7.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	44.0	6.0	46.0	10.0	42.0	16.0	36.0
Max Q Clear Time (g_c+I1), s	2.2	4.6	0.0	3.1	2.7	21.7	0.0	2.2
Green Ext Time (p_c), s	0.0	1.0	0.0	0.0	0.0	1.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.9
HCM 6th LOS	C

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : ESAWS AVE
N/S STREET : CENTRAL RD

INTERSECTION : 5
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
ESAWS AVE			
EB LEFT	5	7	6
EB THRU	1	2	1
EB RIGHT	19	22	28
WB LEFT	8	8	10
WB THRU	1	2	2
WB RIGHT	2	3	2
CENTRAL RD			
NB LEFT	13	17	23
NB THRU	229	243	323
NB RIGHT	5	5	7
SB LEFT	1	2	1
SB THRU	190	200	250
SB RIGHT	1	2	2
TOTALS	**475**	**513**	**655**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : ESAWS AVE
CONDITION : PM PEAK HOUR

N/S STREET : CENTRAL RD
PHF : 0.87
COVID FACTOR : 0%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	43	1	0	3	0	0	1	0	0	1	0
0	48	0	0	1	0	0	1	0	0	2	0
1	48	0	0	1	0	0	0	0	0	2	0
0	33	0	0	1	0	0	2	0	0	3	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
4	60	5	0	1	0	0	1	0	0	3	0
1	48	4	0	0	0	0	0	0	0	0	0
0	55	3	0	0	0	0	2	0	0	0	0
0	57	1	0	1	0	0	1	0	0	0	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
2	1	1	0	0	0	0	0	0	0	0	0
0	0	2	0	0	0	0	0	0	0	0	0
0	0	3	0	0	0	0	0	0	0	0	0
0	0	2	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
9	0	1	0	0	0	0	0	0	0	0	0
5	1	2	0	0	0	0	0	0	0	0	0
2	0	1	0	0	0	0	0	0	0	0	0
3	0	1	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
ESAWS AVE					
EB LEFT	0	5	**5**	**1%**	**5**
EB THRU	0	1	**1**	**1%**	**1**
EB RIGHT	0	19	**19**	**1%**	**19**
WB LEFT	0	8	**8**	**1%**	**8**
WB THRU	0	1	**1**	**1%**	**1**
WB RIGHT	0	2	**2**	**1%**	**2**
CENTRAL RD					
NB LEFT	0	13	**13**	**1%**	**13**
NB THRU	9	220	**229**	**4%**	**229**
NB RIGHT	0	5	**5**	**1%**	**5**
SB LEFT	0	1	**1**	**1%**	**1**
SB THRU	18	172	**190**	**9%**	**190**
SB RIGHT	0	1	**1**	**1%**	**1**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CENTRAL RD
EAST-WEST STREET: ESAWS AVE
JURISDICTION: APPLE VALLEY

DATE: 02-03-21

PEAK HOUR: 04:00PM

NORTH LEG

TOTAL: 192

Rt	Thru	Lt	
1	190	1	Total
0	48	1	1st
0	52	0	2nd
1	51	0	3rd
0	39	0	4th

EAST LEG TOTAL: 11

	1st	2nd	3rd	4th	Total
Rt	2	0	0	0	2
Thru	1	0	0	0	1
Lt	1	2	3	2	8

WEST LEG TOTAL: 25

Total	1st	2nd	3rd	4th	
5	1	2	1	1	Lt
1	0	1	0	0	Thru
19	9	5	2	3	Rt

PEAK HOUR FACTORS

NORTH LEG = 0.92
SOUTH LEG = 0.83
EAST LEG = 0.69
WEST LEG = 0.63

ALL LEGS = 0.87

SOUTH LEG

TOTAL: 247

	Lt	Thru	Rt
1st	5	65	4
2nd	4	48	1
3rd	3	57	0
4th	1	59	0
Total	13	229	5

HOUR TOTAL: 475

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CENTRAL RD
EAST-WEST STREET : ESAWS AVE

APPLE VALLEY
02-03-21

BEGINNING TIME : 04:00PM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
NORTH LEG												
0	43	1	0	3	0	0	1	0	0	1	0	49
0	48	0	0	1	0	0	1	0	0	2	0	52
1	48	0	0	1	0	0	0	0	0	2	0	52
0	33	0	0	1	0	0	2	0	0	3	0	39
0	54	0	0	0	0	0	0	0	0	0	0	54
1	34	1	0	0	0	0	0	0	0	0	0	36
1	48	0	0	1	0	0	1	0	0	1	0	52
1	36	0	0	1	0	0	0	0	0	0	0	38
4	344	2	0	8	0	0	5	0	0	9	0	372
SOUTH LEG												
4	60	5	0	1	0	0	1	0	0	3	0	74
1	48	4	0	0	0	0	0	0	0	0	0	53
0	55	3	0	0	0	0	2	0	0	0	0	60
0	57	1	0	1	0	0	1	0	0	0	0	60
0	41	1	0	1	0	0	0	0	0	0	0	43
0	40	2	0	3	0	0	0	0	0	0	0	45
1	45	0	0	0	0	0	1	0	0	1	0	48
0	34	0	0	0	0	0	0	0	0	0	0	34
6	380	16	0	6	0	0	5	0	0	4	0	417
EAST LEG												
2	1	1	0	0	0	0	0	0	0	0	0	4
0	0	2	0	0	0	0	0	0	0	0	0	2
0	0	3	0	0	0	0	0	0	0	0	0	3
0	0	2	0	0	0	0	0	0	0	0	0	2
0	0	1	0	0	0	0	0	0	0	0	0	1
0	0	1	0	0	0	0	0	0	0	0	0	1
1	0	1	0	0	0	0	0	0	0	0	0	2
0	0	1	0	0	0	0	0	0	0	0	0	1
3	1	12	0	0	0	0	0	0	0	0	0	16
WEST LEG												
9	0	1	0	0	0	0	0	0	0	0	0	10
5	1	2	0	0	0	0	0	0	0	0	0	8
2	0	1	0	0	0	0	0	0	0	0	0	3
3	0	1	0	0	0	0	0	0	0	0	0	4
2	0	0	0	0	0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	2
1	0	2	0	0	0	0	0	0	0	0	0	3
24	1	7	0	0	0	0	0	0	0	0	0	32

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: ESAWS AVE

TIME: 04:00PM-05:00PM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
1	190	1	Total
0	48	1	1st
0	52	0	2nd
1	51	0	3rd
0	39	0	4th

	1st	2nd	3rd	4th	Total
Rt	2	0	0	0	2
Thru	1	0	0	0	1
Lt	1	2	3	2	8

Total	1st	2nd	3rd	4th	
5	1	2	1	1	Lt
1	0	1	0	0	Thru
19	9	5	2	3	Rt

	Lt	Thru	Rt
1st	5	65	4
2nd	4	48	1
3rd	3	57	0
4th	1	59	0
Total	13	229	5

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: ESAWS AVE

TIME: 05:00PM-06:00PM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
3	176	1	Total
0	54	0	1st
1	34	1	2nd
1	51	0	3rd
1	37	0	4th

	1st	2nd	3rd	4th	Total
Rt	0	0	1	0	1
Thru	0	0	0	0	0
Lt	1	1	1	1	4

Total	1st	2nd	3rd	4th	
2	0	0	0	2	Lt
0	0	0	0	0	Thru
5	2	0	2	1	Rt

	Lt	Thru	Rt
1st	1	42	0
2nd	2	43	0
3rd	0	47	1
4th	0	34	0
Total	3	166	1

Prepared by NEWPORT TRAFFIC STUDIES

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	19	8	1	2	13	229	5	1	190	1
Future Volume (veh/h)	5	1	19	8	1	2	13	229	5	1	190	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1588	1588	1588	1488	1588	1588	1488	1588
Adj Flow Rate, veh/h	6	1	22	9	1	2	15	263	6	1	218	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.80	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	9	1	1	9	1
Cap, veh/h	0	2	48	0	58	49	28	1135	1026	3	1110	1003
Arrive On Green	0.00	0.04	0.04	0.00	0.04	0.04	0.02	0.76	0.76	0.00	0.75	0.75
Sat Flow, veh/h	0	59	1295	0	1588	1345	1512	1488	1345	1512	1488	1345
Grp Volume(v), veh/h	0	0	23	0	1	2	15	263	6	1	218	1
Grp Sat Flow(s),veh/h/ln	0	0	1354	0	1588	1345	1512	1488	1345	1512	1488	1345
Q Serve(g_s), s	0.0	0.0	1.0	0.0	0.0	0.1	0.6	3.1	0.1	0.0	2.6	0.0
Cycle Q Clear(g_c), s	0.0	0.0	1.0	0.0	0.0	0.1	0.6	3.1	0.1	0.0	2.6	0.0
Prop In Lane	0.00		0.96	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	50	0	58	49	28	1135	1026	3	1110	1003
V/C Ratio(X)	0.00	0.00	0.46	0.00	0.02	0.04	0.54	0.23	0.01	0.40	0.20	0.00
Avail Cap(c_a), veh/h	0	0	1033	0	948	803	201	1135	1026	150	1110	1003
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	28.5	0.0	28.0	28.0	29.3	2.1	1.7	30.1	2.3	1.9
Incr Delay (d2), s/veh	0.0	0.0	6.5	0.0	0.1	0.3	15.2	0.5	0.0	79.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.4	0.0	0.0	0.0	0.3	0.2	0.0	0.1	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	35.0	0.0	28.1	28.3	44.5	2.5	1.7	109.6	2.7	2.0
LnGrp LOS	A	A	C	A	C	C	D	A	A	F	A	A
Approach Vol, veh/h		23			3			284			220	
Approach Delay, s/veh		35.0			28.3			4.7			3.2	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.1	50.0	0.0	6.2	5.1	49.0	0.0	6.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	46.0	6.0	46.0	8.0	44.0	16.0	36.0
Max Q Clear Time (g_c+I1), s	2.0	5.1	0.0	3.0	2.6	4.6	0.0	2.1
Green Ext Time (p_c), s	0.0	1.4	0.0	0.1	0.0	1.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	5.5
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	2	22	8	2	3	17	243	5	2	200	2
Future Volume (veh/h)	7	2	22	8	2	3	17	243	5	2	200	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1588	1588	1588	1488	1588	1588	1488	1588
Adj Flow Rate, veh/h	8	2	25	9	2	3	20	279	6	2	230	2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.80	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	9	1	1	9	1
Cap, veh/h	0	4	52	0	65	55	36	1128	1020	4	1097	992
Arrive On Green	0.00	0.04	0.04	0.00	0.04	0.04	0.02	0.76	0.76	0.00	0.74	0.74
Sat Flow, veh/h	0	101	1260	0	1588	1345	1512	1488	1345	1512	1488	1345
Grp Volume(v), veh/h	0	0	27	0	2	3	20	279	6	2	230	2
Grp Sat Flow(s),veh/h/ln	0	0	1361	0	1588	1345	1512	1488	1345	1512	1488	1345
Q Serve(g_s), s	0.0	0.0	1.2	0.0	0.1	0.1	0.8	3.4	0.1	0.1	2.9	0.0
Cycle Q Clear(g_c), s	0.0	0.0	1.2	0.0	0.1	0.1	0.8	3.4	0.1	0.1	2.9	0.0
Prop In Lane	0.00		0.93	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	56	0	65	55	36	1128	1020	4	1097	992
V/C Ratio(X)	0.00	0.00	0.48	0.00	0.03	0.05	0.56	0.25	0.01	0.48	0.21	0.00
Avail Cap(c_a), veh/h	0	0	1032	0	942	798	199	1128	1020	150	1097	992
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	28.5	0.0	27.9	27.9	29.3	2.2	1.8	30.2	2.5	2.1
Incr Delay (d2), s/veh	0.0	0.0	6.3	0.0	0.2	0.4	13.1	0.5	0.0	68.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.5	0.0	0.0	0.0	0.4	0.2	0.0	0.1	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	34.8	0.0	28.1	28.4	42.4	2.7	1.8	98.5	2.9	2.1
LnGrp LOS	A	A	C	A	C	C	D	A	A	F	A	A
Approach Vol, veh/h		27			5			305			234	
Approach Delay, s/veh		34.8			28.3			5.3			3.7	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.2	50.0	0.0	6.5	5.4	48.7	0.0	6.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	46.0	6.0	46.0	8.0	44.0	16.0	36.0
Max Q Clear Time (g_c+I1), s	2.1	5.4	0.0	3.2	2.8	4.9	0.0	2.1
Green Ext Time (p_c), s	0.0	1.5	0.0	0.1	0.0	1.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	6.2
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1	28	10	2	2	23	323	7	1	250	2
Future Volume (veh/h)	6	1	28	10	2	2	23	323	7	1	250	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1588	1588	1588	1488	1588	1588	1488	1588
Adj Flow Rate, veh/h	7	1	32	11	2	2	26	371	8	1	287	2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.80	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	9	1	1	9	1
Cap, veh/h	0	2	60	0	72	61	44	1124	1017	2	1083	979
Arrive On Green	0.00	0.05	0.05	0.00	0.05	0.05	0.03	0.76	0.76	0.00	0.73	0.73
Sat Flow, veh/h	0	41	1311	0	1588	1345	1512	1488	1345	1512	1488	1345
Grp Volume(v), veh/h	0	0	33	0	2	2	26	371	8	1	287	2
Grp Sat Flow(s),veh/h/ln	0	0	1352	0	1588	1345	1512	1488	1345	1512	1488	1345
Q Serve(g_s), s	0.0	0.0	1.5	0.0	0.1	0.1	1.0	4.9	0.1	0.0	4.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	1.5	0.0	0.1	0.1	1.0	4.9	0.1	0.0	4.0	0.0
Prop In Lane	0.00		0.97	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	62	0	72	61	44	1124	1017	2	1083	979
V/C Ratio(X)	0.00	0.00	0.53	0.00	0.03	0.03	0.59	0.33	0.01	0.40	0.27	0.00
Avail Cap(c_a), veh/h	0	0	1022	0	939	796	199	1124	1017	149	1083	979
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	28.4	0.0	27.8	27.8	29.2	2.4	1.8	30.4	2.8	2.3
Incr Delay (d2), s/veh	0.0	0.0	7.0	0.0	0.2	0.2	11.8	0.8	0.0	81.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.6	0.0	0.0	0.0	0.5	0.3	0.0	0.1	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	35.4	0.0	27.9	28.0	41.0	3.2	1.8	111.4	3.4	2.3
LnGrp LOS	A	A	D	A	C	C	D	A	A	F	A	A
Approach Vol, veh/h		33			4			405			290	
Approach Delay, s/veh		35.4			27.9			5.6			3.8	
Approach LOS		D			C			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.1	50.0	0.0	6.8	5.8	48.3	0.0	6.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	46.0	6.0	46.0	8.0	44.0	16.0	36.0
Max Q Clear Time (g_c+I1), s	2.0	6.9	0.0	3.5	3.0	6.0	0.0	2.1
Green Ext Time (p_c), s	0.0	2.0	0.0	0.2	0.0	1.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	6.3
HCM 6th LOS	A

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 5
North/South Street: CENTRAL RD
East/West Street: ESAWS AVE

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	6	Approach	150	Left	16	11
NB	Through	121	Departure	181	Through	140	134
	Right	15			Right	18	17
North leg	Left	2	Approach	183	Left	0	2
SB	Through	161	Departure	141	Through	161	170
	Right	5			Right	1	5
West leg	Left	5	Approach	16	Left	1	5
EB	Through	2	Departure	17	Through	0	2
	Right	3			Right	12	7
East leg	Left	5	Approach	9	Left	7	6
WB	Through	2	Departure	19	Through	0	2
	Right	2			Right	0	2

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	13	Approach	259	Left	18	17
NB	Through	229	Departure	225	Through	242	243
	Right	5			Right	4	5
North leg	Left	1	Approach	206	Left	1	2
SB	Through	190	Departure	253	Through	197	200
	Right	1			Right	2	2
West leg	Left	5	Approach	31	Left	8	7
EB	Through	1	Departure	22	Through	1	2
	Right	19			Right	21	22
East leg	Left	8	Approach	11	Left	7	8
WB	Through	1	Departure	7	Through	2	2
	Right	2			Right	3	3

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 5
North/South Street: CENTRAL RD
East/West Street: ESAWS AVE

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	6	Approach	182	Left	18	13
NB	Through	121	Departure	341	Through	182	172
	Right	15			Right	17	17
North leg	Left	2	Approach	230	Left	1	2
SB	Through	161	Departure	188	Through	316	288
	Right	5			Right	4	7
West leg	Left	5	Approach	17	Left	5	8
EB	Through	2	Departure	24	Through	2	3
	Right	3			Right	15	9
East leg	Left	5	Approach	9	Left	10	9
WB	Through	2	Departure	19	Through	2	3
	Right	2			Right	1	2

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	13	Approach	397	Left	24	23
NB	Through	229	Departure	284	Through	302	323
	Right	5			Right	6	7
North leg	Left	1	Approach	258	Left	0	1
SB	Through	190	Departure	306	Through	245	250
	Right	1			Right	1	2
West leg	Left	5	Approach	36	Left	3	6
EB	Through	1	Departure	25	Through	1	1
	Right	19			Right	31	28
East leg	Left	8	Approach	11	Left	9	10
WB	Through	1	Departure	7	Through	1	2
	Right	2			Right	1	2

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : HEADQUARTERS DR
N/S STREET : CENTRAL RD

INTERSECTION : 6
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
HEADQUARTERS DR			
EB LEFT	3	5	4
EB THRU	0	0	0
EB RIGHT	5	13	7
WB LEFT	0	0	0
WB THRU	0	0	0
WB RIGHT	0	0	0
CENTRAL RD			
NB LEFT	3	12	4
NB THRU	147	156	222
NB RIGHT	0	0	0
SB LEFT	0	0	0
SB THRU	166	174	310
SB RIGHT	5	8	7
TOTALS	**329**	**368**	**554**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : HEADQUARTERS DR
CONDITION : AM PEAK HOUR

N/S STREET : CENTRAL RD
PHF : 0.87
COVID FACTOR : 45%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	33	0	0	0	0	0	0	0	0	0	0
0	28	0	0	1	0	0	0	0	0	1	0
2	27	0	0	0	0	0	0	0	0	0	0
0	22	0	0	1	0	0	0	0	0	1	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	20	1	0	2	0	0	3	0	0	1	0
0	20	1	0	3	0	0	1	0	0	1	0
0	21	0	0	0	0	0	2	0	0	2	0
0	22	0	0	1	0	0	0	0	0	2	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	2	0	1	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
HEADQUARTERS DR					
EB LEFT	2	0	**2**	**100%**	**3**
EB THRU	0	0	**0**	**0%**	**0**
EB RIGHT	3	0	**3**	**100%**	**5**
WB LEFT	0	0	**0**	**0%**	**0**
WB THRU	0	0	**0**	**0%**	**0**
WB RIGHT	0	0	**0**	**0%**	**0**
CENTRAL RD					
NB LEFT	0	2	**2**	**1%**	**3**
NB THRU	18	83	**101**	**18%**	**147**
NB RIGHT	0	0	**0**	**0%**	**0**
SB LEFT	0	0	**0**	**0%**	**0**
SB THRU	4	110	**114**	**4%**	**166**
SB RIGHT	0	3	**3**	**1%**	**5**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CENTRAL RD
EAST-WEST STREET: HEADQUARTERS DR
JURISDICTION: APPLE VALLEY

DATE: 02-03-21

PEAK HOUR: 07:30AM

NORTH LEG

TOTAL: 117

Rt	Thru	Lt	
3	114		Total
1	33		1st
0	30		2nd
2	27		3rd
0	24		4th

EAST LEG TOTAL: 0

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

WEST LEG TOTAL: 5

Total	1st	2nd	3rd	4th	
2	1	0	1	0	Lt
					Thru
3	3	0	0	0	Rt

PEAK HOUR FACTORS

NORTH LEG = 0.86
SOUTH LEG = 0.95
EAST LEG =
WEST LEG = 0.31

ALL LEGS = 0.87

SOUTH LEG

TOTAL: 103

	Lt	Thru	Rt
1st	1	26	
2nd	1	25	
3rd	0	25	
4th	0	25	
Total	2	101	

HOUR TOTAL: 225

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CENTRAL RD
EAST-WEST STREET : HEADQUARTERS DR

APPLE VALLEY
02-03-21

BEGINNING TIME : 07:00AM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
0	16	0	0	4	0	0	1	0	0	3	0	24
1	26	0	0	1	0	0	1	0	0	1	0	30
1	33	0	0	0	0	0	0	0	0	0	0	34
0	28	0	0	1	0	0	0	0	0	1	0	30
2	27	0	0	0	0	0	0	0	0	0	0	29
0	22	0	0	1	0	0	0	0	0	1	0	24
0	24	0	0	0	0	0	0	0	0	1	0	25
0	32	0	0	2	0	0	1	0	0	1	0	36
4	208	0	0	9	0	0	3	0	0	8	0	232
						SOUTH LEG						
0	11	1	0	1	0	0	1	1	0	1	0	16
0	13	2	0	1	0	0	1	0	0	0	0	17
0	20	1	0	2	0	0	3	0	0	1	0	27
0	20	1	0	3	0	0	1	0	0	1	0	26
0	21	0	0	0	0	0	2	0	0	2	0	25
0	22	0	0	1	0	0	0	0	0	2	0	25
0	30	1	0	0	0	0	0	0	0	1	0	32
0	19	0	0	2	0	0	0	0	0	2	0	23
0	156	6	0	10	0	0	8	1	0	10	0	191
						EAST LEG						
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
						WEST LEG						
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	2	0	1	1	0	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	2	0	2	1	0	0	0	0	0	5

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: HEADQUARTERS DR

TIME: 04:00PM-05:00PM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
4	227		Total
1	59		1st
0	62		2nd
1	59		3rd
2	47		4th

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

Total	1st	2nd	3rd	4th	
13	5	2	3	3	Lt
					Thru
17	5	7	1	4	Rt

	Lt	Thru	Rt
1st	2	71	
2nd	4	50	
3rd	4	59	
4th	0	61	
Total	10	241	

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: HEADQUARTERS DR

TIME: 05:00PM-06:00PM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
10	183		Total
5	56		1st
1	37		2nd
2	52		3rd
2	38		4th

	Rt	Thru	Lt
Rt			
Thru			
Lt			

1st 2nd 3rd 4th Total

Total	1st	2nd	3rd	4th	
12	0	5	6	1	Lt
					Thru
8	0	3	3	2	Rt

	Lt	Thru	Rt
1st	2	45	
2nd	0	40	
3rd	0	38	
4th	3	37	
Total	5	160	

Prepared by NEWPORT TRAFFIC STUDIES

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	5	3	147	166	5
Future Vol, veh/h	3	5	3	147	166	5
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	87	87	87	87	87	87
Heavy Vehicles, %	100	100	1	18	4	1
Mvmt Flow	3	6	3	169	191	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	369	194	197	0	-	0
Stage 1	194	-	-	-	-	-
Stage 2	175	-	-	-	-	-
Critical Hdwy	7.4	7.2	4.11	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	4.2	2.209	-	-	-
Pot Cap-1 Maneuver	476	650	1382	-	-	-
Stage 1	651	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	475	650	1382	-	-	-
Mov Cap-2 Maneuver	475	-	-	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	666	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1382	-	571	-	-
HCM Lane V/C Ratio	0.002	-	0.016	-	-
HCM Control Delay (s)	7.6	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	13	12	156	174	8
Future Vol, veh/h	5	13	12	156	174	8
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	87	87	87	87	87	87
Heavy Vehicles, %	100	100	1	18	4	1
Mvmt Flow	6	15	14	179	200	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	412	205	209	0	-	0
Stage 1	205	-	-	-	-	-
Stage 2	207	-	-	-	-	-
Critical Hdwy	7.4	7.2	4.11	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	4.2	2.209	-	-	-
Pot Cap-1 Maneuver	446	640	1368	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	441	640	1368	-	-	-
Mov Cap-2 Maneuver	441	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	641	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1368	-	569	-	-
HCM Lane V/C Ratio	0.01	-	0.036	-	-
HCM Control Delay (s)	7.7	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	7	4	222	310	7
Future Vol, veh/h	4	7	4	222	310	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	92	92	92	92	92	92
Heavy Vehicles, %	100	100	1	18	4	1
Mvmt Flow	4	8	4	241	337	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	590	341	345	0	-	0
Stage 1	341	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Critical Hdwy	7.4	7.2	4.11	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	4.2	2.209	-	-	-
Pot Cap-1 Maneuver	341	525	1220	-	-	-
Stage 1	546	-	-	-	-	-
Stage 2	610	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	340	525	1220	-	-	-
Mov Cap-2 Maneuver	340	-	-	-	-	-
Stage 1	544	-	-	-	-	-
Stage 2	610	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1220	-	438	-	-
HCM Lane V/C Ratio	0.004	-	0.027	-	-
HCM Control Delay (s)	8	0	13.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : HEADQUARTERS DR
N/S STREET : CENTRAL RD

INTERSECTION : 6
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
HEADQUARTERS DR			
EB LEFT	13	18	16
EB THRU	0	0	0
EB RIGHT	17	22	19
WB LEFT	0	0	0
WB THRU	0	0	0
WB RIGHT	0	0	0
CENTRAL RD			
NB LEFT	10	18	13
NB THRU	241	251	388
NB RIGHT	0	0	0
SB LEFT	0	0	0
SB THRU	227	233	281
SB RIGHT	4	8	5
TOTALS	**512**	**550**	**722**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : HEADQUARTERS DR
CONDITION : PM PEAK HOUR
N/S STREET : CENTRAL RD
PHF : 0.90
COVID FACTOR : 0%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	57	0	1	1	0	0	0	0	0	1	0
0	59	0	0	0	0	0	1	0	0	2	0
0	56	0	1	1	0	0	0	0	0	2	0
2	42	0	0	0	0	0	2	0	0	3	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	66	2	0	1	0	0	1	0	0	3	0
0	50	4	0	0	0	0	0	0	0	0	0
0	57	4	0	0	0	0	2	0	0	0	0
0	59	0	0	1	0	0	1	0	0	0	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
5	0	5	0	0	0	0	0	0	0	0	0
6	0	2	0	0	0	0	0	0	1	0	0
1	0	3	0	0	0	0	0	0	0	0	0
4	0	3	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
HEADQUARTERS DR					
EB LEFT	0	13	**13**	**1%**	**13**
EB THRU	0	0	**0**	**0%**	**0**
EB RIGHT	1	16	**17**	**6%**	**17**
WB LEFT	0	0	**0**	**0%**	**0**
WB THRU	0	0	**0**	**0%**	**0**
WB RIGHT	0	0	**0**	**0%**	**0**
CENTRAL RD					
NB LEFT	0	10	**10**	**1%**	**10**
NB THRU	9	232	**241**	**4%**	**241**
NB RIGHT	0	0	**0**	**0%**	**0**
SB LEFT	0	0	**0**	**0%**	**0**
SB THRU	13	214	**227**	**6%**	**227**
SB RIGHT	2	2	**4**	**50%**	**4**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CENTRAL RD
EAST-WEST STREET: HEADQUARTERS DR
JURISDICTION: APPLE VALLEY

DATE: 02-03-21

PEAK HOUR: 04:00PM

NORTH LEG

TOTAL: 231

Rt	Thru	Lt	
4	227		Total
1	59		1st
0	62		2nd
1	59		3rd
2	47		4th

EAST LEG TOTAL: 0

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

WEST LEG TOTAL: 30

Total	1st	2nd	3rd	4th	
13	5	2	3	3	Lt
					Thru
17	5	7	1	4	Rt

SOUTH LEG

TOTAL: 251

	Lt	Thru	Rt
1st	2	71	
2nd	4	50	
3rd	4	59	
4th	0	61	
Total	10	241	

PEAK HOUR FACTORS

NORTH LEG = 0.93
SOUTH LEG = 0.86
EAST LEG =
WEST LEG = 0.75

ALL LEGS = 0.90

HOUR TOTAL: 512

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CENTRAL RD

EAST-WEST STREET : HEADQUARTERS DR

APPLE VALLEY

02-03-21

BEGINNING TIME : 04:00PM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
NORTH LEG												
0	57	0	1	1	0	0	0	0	0	1	0	60
0	59	0	0	0	0	0	1	0	0	2	0	62
0	56	0	1	1	0	0	0	0	0	2	0	60
2	42	0	0	0	0	0	2	0	0	3	0	49
5	56	0	0	0	0	0	0	0	0	0	0	61
1	36	0	0	1	0	0	0	0	0	0	0	38
2	49	0	0	1	0	0	1	0	0	1	0	54
0	38	0	2	0	0	0	0	0	0	0	0	40
10	393	0	4	4	0	0	4	0	0	9	0	424
SOUTH LEG												
0	66	2	0	1	0	0	1	0	0	3	0	73
0	50	4	0	0	0	0	0	0	0	0	0	54
0	57	4	0	0	0	0	2	0	0	0	0	63
0	59	0	0	1	0	0	1	0	0	0	0	61
0	45	1	0	0	0	0	0	1	0	0	0	47
0	38	0	0	2	0	0	0	0	0	0	0	40
0	36	0	0	0	0	0	1	0	0	1	0	38
0	37	3	0	0	0	0	0	0	0	0	0	40
0	388	14	0	4	0	0	5	1	0	4	0	416
EAST LEG												
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
WEST LEG												
5	0	5	0	0	0	0	0	0	0	0	0	10
6	0	2	0	0	0	0	0	0	1	0	0	9
1	0	3	0	0	0	0	0	0	0	0	0	4
4	0	3	0	0	0	0	0	0	0	0	0	7
0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	4	0	0	1	0	0	0	0	0	0	8
3	0	6	0	0	0	0	0	0	0	0	0	9
2	0	1	0	0	0	0	0	0	0	0	0	3
24	0	24	0	0	1	0	0	0	1	0	0	50

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: HEADQUARTERS DR

TIME: 04:00PM-05:00PM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
4	227		Total
1	59		1st
0	62		2nd
1	59		3rd
2	47		4th

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

Total	1st	2nd	3rd	4th	
13	5	2	3	3	Lt
					Thru
17	5	7	1	4	Rt

	Lt	Thru	Rt
1st	2	71	
2nd	4	50	
3rd	4	59	
4th	0	61	
Total	10	241	

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: HEADQUARTERS DR

TIME: 05:00PM-06:00PM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
10	183		Total
5	56		1st
1	37		2nd
2	52		3rd
2	38		4th

	Rt	Thru	Lt
Rt			
Thru			
Lt			

1st 2nd 3rd 4th Total

Total	1st	2nd	3rd	4th	
12	0	5	6	1	Lt
					Thru
8	0	3	3	2	Rt

	Lt	Thru	Rt
1st	2	45	
2nd	0	40	
3rd	0	38	
4th	3	37	
Total	5	160	

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Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	17	10	241	227	4
Future Vol, veh/h	13	17	10	241	227	4
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	90	90	90	90	90	90
Heavy Vehicles, %	1	6	1	6	6	50
Mvmt Flow	14	19	11	268	252	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	544	254	256	0	-	0
Stage 1	254	-	-	-	-	-
Stage 2	290	-	-	-	-	-
Critical Hdwy	6.41	6.26	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.354	2.209	-	-	-
Pot Cap-1 Maneuver	502	775	1315	-	-	-
Stage 1	791	-	-	-	-	-
Stage 2	762	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	497	775	1315	-	-	-
Mov Cap-2 Maneuver	497	-	-	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	762	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1315	-	624	-	-
HCM Lane V/C Ratio	0.008	-	0.053	-	-
HCM Control Delay (s)	7.8	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	22	18	251	233	8
Future Vol, veh/h	18	22	18	251	233	8
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	90	90	90	90	90	90
Heavy Vehicles, %	1	6	1	6	6	50
Mvmt Flow	20	24	20	279	259	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	583	264	268	0	-	0
Stage 1	264	-	-	-	-	-
Stage 2	319	-	-	-	-	-
Critical Hdwy	6.41	6.26	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.354	2.209	-	-	-
Pot Cap-1 Maneuver	476	765	1302	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	467	765	1302	-	-	-
Mov Cap-2 Maneuver	467	-	-	-	-	-
Stage 1	769	-	-	-	-	-
Stage 2	739	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1302	-	594	-	-
HCM Lane V/C Ratio	0.015	-	0.075	-	-
HCM Control Delay (s)	7.8	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	19	13	388	281	5
Future Vol, veh/h	16	19	13	388	281	5
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	90	90	90	90	90	90
Heavy Vehicles, %	1	6	1	6	6	50
Mvmt Flow	18	21	14	431	312	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	774	315	318	0	-	0
Stage 1	315	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Critical Hdwy	6.41	6.26	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.354	2.209	-	-	-
Pot Cap-1 Maneuver	368	716	1248	-	-	-
Stage 1	742	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	362	716	1248	-	-	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	638	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1248	-	495	-	-
HCM Lane V/C Ratio	0.012	-	0.079	-	-
HCM Control Delay (s)	7.9	0	12.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 6
North/South Street: CENTRAL RD
East/West Street: HEADQUARTERS DR

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	3	Approach	158	Left	23	12
NB	Through	147	Departure	183	Through	157	156
	Right	0			Right	0	0
North leg	Left	0	Approach	183	Left	0	0
SB	Through	166	Departure	158	Through	164	174
	Right	5			Right	2	8
West leg	Left	3	Approach	22	Left	1	5
EB	Through	0	Departure	25	Through	0	0
	Right	5			Right	19	13
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	10	Approach	263	Left	20	18
NB	Through	241	Departure	252	Through	246	251
	Right	0			Right	0	0
North leg	Left	0	Approach	239	Left	0	0
SB	Through	227	Departure	266	Through	230	233
	Right	4			Right	9	8
West leg	Left	13	Approach	42	Left	20	18
EB	Through	0	Departure	29	Through	0	0
	Right	17			Right	22	22
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 6
North/South Street: CENTRAL RD
East/West Street: HEADQUARTERS DR

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	3	Approach	225	Left	3	4
NB	Through	147	Departure	317	Through	222	222
	Right	0			Right	0	0
North leg	Left	0	Approach	317	Left	0	0
SB	Through	166	Departure	225	Through	312	310
	Right	5			Right	5	7
West leg	Left	3	Approach	8	Left	3	4
EB	Through	0	Departure	8	Through	0	0
	Right	5			Right	5	7
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	10	Approach	402	Left	11	13
NB	Through	241	Departure	299	Through	392	388
	Right	0			Right	0	0
North leg	Left	0	Approach	286	Left	0	0
SB	Through	227	Departure	405	Through	282	281
	Right	4			Right	3	5
West leg	Left	13	Approach	30	Left	13	16
EB	Through	0	Departure	14	Through	0	0
	Right	17			Right	17	19
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : POWHATTAN RD
N/S STREET : CENTRAL RD

INTERSECTION : 7
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
POWHATTAN RD			
EB LEFT	11	18	14
EB THRU	6	14	8
EB RIGHT	11	11	13
WB LEFT	12	12	14
WB THRU	6	7	6
WB RIGHT	11	20	14
CENTRAL RD			
NB LEFT	48	48	61
NB THRU	289	390	479
NB RIGHT	2	5	4
SB LEFT	8	29	13
SB THRU	174	215	253
SB RIGHT	22	35	26
TOTALS	**600**	**804**	**905**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : POWHATTAN RD
CONDITION : AM PEAK HOUR

N/S STREET : CENTRAL RD
PHF : 0.79
COVID FACTOR : 45%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
2	19	1	0	0	0	0	0	0	0	0	0
3	38	2	0	0	0	0	1	0	0	1	0
6	28	0	0	1	0	0	2	0	0	0	0
4	27	2	0	2	0	0	0	0	0	1	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	44	2	0	0	0	0	2	0	0	1	0
0	53	8	0	0	0	0	3	0	0	4	0
0	59	16	0	2	1	0	1	0	0	4	0
1	25	5	0	0	0	0	1	0	0	0	1

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	1	1	0	0	0	0	0	0	0	0	0
4	0	1	0	0	0	0	0	0	0	0	0
1	2	1	0	0	0	0	0	0	0	0	0
2	1	5	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
2	1	1	0	0	0	0	0	0	0	0	0
2	1	4	0	0	0	0	0	0	1	0	0
2	2	1	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
POWHATTAN RD					
EB LEFT	0	7	**7**	**1%**	**11**
EB THRU	0	4	**4**	**1%**	**6**
EB RIGHT	1	6	**7**	**14%**	**11**
WB LEFT	0	8	**8**	**1%**	**12**
WB THRU	0	4	**4**	**1%**	**6**
WB RIGHT	0	7	**7**	**1%**	**11**
CENTRAL RD					
NB LEFT	2	31	**33**	**6%**	**48**
NB THRU	18	181	**199**	**9%**	**289**
NB RIGHT	0	1	**1**	**1%**	**2**
SB LEFT	0	5	**5**	**1%**	**8**
SB THRU	8	112	**120**	**7%**	**174**
SB RIGHT	0	15	**15**	**1%**	**22**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CENTRAL RD
EAST-WEST STREET: POWHATTAN RD
JURISDICTION: APPLE VALLEY

DATE: 02-02-21

PEAK HOUR: 07:15AM

NORTH LEG

TOTAL: 140

Rt	Thru	Lt	
15	120	5	Total
2	19	1	1st
3	40	2	2nd
6	31	0	3rd
4	30	2	4th

EAST LEG TOTAL: 19

	1st	2nd	3rd	4th	Total
Rt	0	4	1	2	7
Thru	1	0	2	1	4
Lt	1	1	1	5	8

Total	1st	2nd	3rd	4th	
7	1	4	1	1	Lt
4	1	1	2	0	Thru
7	2	3	2	0	Rt

WEST LEG TOTAL: 18

PEAK HOUR FACTORS

NORTH LEG = 0.78
SOUTH LEG = 0.70
EAST LEG = 0.59
WEST LEG = 0.56

ALL LEGS = 0.79

	Lt	Thru	Rt
1st	2	47	0
2nd	8	60	0
3rd	17	66	0
4th	6	26	1
Total	33	199	1

SOUTH LEG

TOTAL: 233

HOUR TOTAL: 410

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CENTRAL RD
EAST-WEST STREET : POWHATTAN RD

APPLE VALLEY
02-02-21

BEGINNING TIME : 07:00AM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
NORTH LEG												
2	22	0	0	2	0	0	0	0	0	0	0	26
2	19	1	0	0	0	0	0	0	0	0	0	22
3	38	2	0	0	0	0	1	0	0	1	0	45
6	28	0	0	1	0	0	2	0	0	0	0	37
4	27	2	0	2	0	0	0	0	0	1	0	36
3	24	0	0	0	0	0	2	0	0	1	0	30
3	31	0	1	0	0	0	1	0	0	0	0	36
3	27	1	0	0	0	0	0	0	1	0	0	32
26	216	6	1	5	0	0	6	0	1	3	0	264
SOUTH LEG												
0	22	2	0	0	0	0	2	0	0	1	0	27
0	44	2	0	0	0	0	2	0	0	1	0	49
0	53	8	0	0	0	0	3	0	0	4	0	68
0	59	16	0	2	1	0	1	0	0	4	0	83
1	25	5	0	0	0	0	1	0	0	0	1	33
1	20	4	0	1	0	0	1	0	0	0	0	27
1	29	3	0	1	0	0	1	0	0	0	0	35
2	36	2	0	1	1	0	1	0	0	0	0	43
5	288	42	0	5	2	0	12	0	0	10	1	365
EAST LEG												
1	1	0	0	0	0	0	0	0	0	0	0	2
0	1	1	0	0	0	0	0	0	0	0	0	2
4	0	1	0	0	0	0	0	0	0	0	0	5
1	2	1	0	0	0	0	0	0	0	0	0	4
2	1	5	0	0	0	0	0	0	0	0	0	8
2	1	0	0	0	0	0	0	0	0	0	0	3
0	1	2	0	0	0	0	0	0	0	0	0	3
4	2	0	0	0	0	0	0	0	0	0	0	6
14	9	10	0	0	0	0	0	0	0	0	0	33
WEST LEG												
1	0	1	0	0	0	0	0	0	0	0	0	2
2	1	1	0	0	0	0	0	0	0	0	0	4
2	1	4	0	0	0	0	0	0	1	0	0	8
2	2	1	0	0	0	0	0	0	0	0	0	5
0	0	1	0	0	0	0	0	0	0	0	0	1
4	0	5	0	0	0	0	0	0	0	0	0	9
4	1	2	0	0	0	0	0	0	0	0	0	7
2	1	6	0	0	0	0	0	0	0	0	0	9
17	6	21	0	0	0	0	0	0	1	0	0	45

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: POWHATTAN RD

TIME: 07:00AM-08:00AM DATE: 02-02-21

NORTH LEG

Rt	Thru	Lt	
13	114	3	Total
2	24	0	1st
2	19	1	2nd
3	40	2	3rd
6	31	0	4th

	1st	2nd	3rd	4th	Total
Rt	1	0	4	1	6
Thru	1	1	0	2	4
Lt	0	1	1	1	3

Total	1st	2nd	3rd	4th	
7	1	1	4	1	Lt
4	0	1	1	2	Thru
8	1	2	3	2	Rt

	Lt	Thru	Rt
1st	2	25	0
2nd	2	47	0
3rd	8	60	0
4th	17	66	0
Total	29	198	0

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: POWHATTAN RD

TIME: 08:00AM-09:00AM DATE: 02-02-21

NORTH LEG

Rt	Thru	Lt	
15	116	3	Total
4	30	2	1st
3	27	0	2nd
4	32	0	3rd
4	27	1	4th

	1st	2nd	3rd	4th	Total
Rt	2	2	0	4	8
Thru	1	1	1	2	5
Lt	5	0	2	0	7

Total	1st	2nd	3rd	4th	
14	1	5	2	6	Lt
2	0	0	1	1	Thru
10	0	4	4	2	Rt

	Lt	Thru	Rt
1st	6	26	1
2nd	4	22	1
3rd	3	31	1
4th	3	38	2
Total	16	117	5

Prepared by NEWPORT TRAFFIC STUDIES

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	6	11	12	6	11	48	289	2	8	174	22
Future Vol, veh/h	11	6	11	12	6	11	48	289	2	8	174	22
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	1	14	1	1	1	6	9	1	1	7	1
Mvmt Flow	14	8	14	15	8	14	61	366	3	10	220	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	755	745	234	755	758	368	248	0	0	369	0	0
Stage 1	254	254	-	490	490	-	-	-	-	-	-	-
Stage 2	501	491	-	265	268	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.34	7.11	6.51	6.21	4.16	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.426	3.509	4.009	3.309	2.254	-	-	2.209	-	-
Pot Cap-1 Maneuver	326	344	776	326	338	680	1295	-	-	1195	-	-
Stage 1	753	699	-	562	550	-	-	-	-	-	-	-
Stage 2	554	550	-	742	689	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	297	321	776	298	315	680	1295	-	-	1195	-	-
Mov Cap-2 Maneuver	297	321	-	298	315	-	-	-	-	-	-	-
Stage 1	709	692	-	529	518	-	-	-	-	-	-	-
Stage 2	503	518	-	713	682	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	15.4	1.1	0.3
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1295	-	-	401	384	1195	-	-
HCM Lane V/C Ratio	0.047	-	-	0.088	0.096	0.008	-	-
HCM Control Delay (s)	7.9	0	-	14.8	15.4	8	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	0	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	14	11	12	7	20	48	390	5	29	215	35
Future Vol, veh/h	18	14	11	12	7	20	48	390	5	29	215	35
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	1	14	1	1	1	6	9	1	1	7	1
Mvmt Flow	23	18	14	15	9	25	61	494	6	37	272	44

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1004	990	294	1003	1009	497	316	0	0	500	0	0
Stage 1	368	368	-	619	619	-	-	-	-	-	-	-
Stage 2	636	622	-	384	390	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.34	7.11	6.51	6.21	4.16	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.426	3.509	4.009	3.309	2.254	-	-	2.209	-	-
Pot Cap-1 Maneuver	221	247	718	222	241	575	1222	-	-	1069	-	-
Stage 1	654	623	-	478	482	-	-	-	-	-	-	-
Stage 2	468	480	-	641	609	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	188	220	718	188	215	575	1222	-	-	1069	-	-
Mov Cap-2 Maneuver	188	220	-	188	215	-	-	-	-	-	-	-
Stage 1	609	597	-	445	449	-	-	-	-	-	-	-
Stage 2	408	447	-	584	583	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.7	19.5	0.9	0.9
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1222	-	-	246	297	1069	-	-
HCM Lane V/C Ratio	0.05	-	-	0.221	0.166	0.034	-	-
HCM Control Delay (s)	8.1	0	-	23.7	19.5	8.5	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.8	0.6	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	8	13	14	6	14	61	479	4	13	253	26
Future Volume (veh/h)	14	8	13	14	6	14	61	479	4	13	253	26
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1588	1425	1588	1588	1588	1525	1488	1588	1588	1513	1588
Adj Flow Rate, veh/h	15	9	14	15	7	15	66	521	4	14	275	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	14	1	1	1	6	9	1	1	7	1
Cap, veh/h	125	26	41	124	21	45	79	1184	9	25	1033	105
Arrive On Green	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.80	0.80	0.02	0.77	0.77
Sat Flow, veh/h	1401	560	871	1399	450	964	1452	1474	11	1512	1350	137
Grp Volume(v), veh/h	15	0	23	15	0	22	66	0	525	14	0	303
Grp Sat Flow(s),veh/h/ln	1401	0	1431	1399	0	1414	1452	0	1486	1512	0	1488
Q Serve(g_s), s	0.9	0.0	1.4	0.9	0.0	1.4	4.1	0.0	9.7	0.8	0.0	5.4
Cycle Q Clear(g_c), s	2.3	0.0	1.4	2.3	0.0	1.4	4.1	0.0	9.7	0.8	0.0	5.4
Prop In Lane	1.00		0.61	1.00		0.68	1.00		0.01	1.00		0.09
Lane Grp Cap(c), veh/h	125	0	67	124	0	67	79	0	1193	25	0	1138
V/C Ratio(X)	0.12	0.00	0.34	0.12	0.00	0.33	0.83	0.00	0.44	0.56	0.00	0.27
Avail Cap(c_a), veh/h	495	0	445	494	0	440	129	0	1193	101	0	1138
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.6	0.0	41.5	42.7	0.0	41.5	42.1	0.0	2.7	43.9	0.0	3.1
Incr Delay (d2), s/veh	0.4	0.0	3.0	0.4	0.0	2.9	20.9	0.0	1.2	18.6	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.5	0.3	0.0	0.5	1.9	0.0	2.1	0.4	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.1	0.0	44.5	43.1	0.0	44.4	63.0	0.0	3.9	62.5	0.0	3.7
LnGrp LOS	D	A	D	D	A	D	E	A	A	E	A	A
Approach Vol, veh/h		38			37			591			317	
Approach Delay, s/veh		43.9			43.9			10.5			6.3	
Approach LOS		D			D			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	76.3		8.2	8.9	72.9		8.2				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	44.0		28.0	8.0	42.0		28.0				
Max Q Clear Time (g_c+I1), s	2.8	11.7		4.3	6.1	7.4		4.3				
Green Ext Time (p_c), s	0.0	3.8		0.1	0.0	2.0		0.1				

Intersection Summary		
HCM 6th Ctrl Delay		11.7
HCM 6th LOS		B

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : POWHATTAN RD
N/S STREET : CENTRAL RD

INTERSECTION : 7
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
POWHATTAN RD			
EB LEFT	23	26	26
EB THRU	16	18	17
EB RIGHT	46	54	58
WB LEFT	12	17	17
WB THRU	18	22	19
WB RIGHT	10	13	13
CENTRAL RD			
NB LEFT	23	25	27
NB THRU	324	383	446
NB RIGHT	7	9	10
SB LEFT	12	15	17
SB THRU	301	398	487
SB RIGHT	24	28	30
TOTALS	**816**	**1008**	**1167**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : POWHATTAN RD
CONDITION : PM PEAK HOUR
N/S STREET : CENTRAL RD
PHF : 0.96
COVID FACTOR : 0%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
9	67	4	0	2	0	0	1	0	0	0	0
3	72	1	0	3	0	1	0	0	0	0	0
3	75	3	0	1	0	0	1	0	0	1	0
8	75	4	0	2	0	0	0	0	0	1	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
2	87	4	0	3	0	0	0	0	0	0	0
2	89	2	0	0	0	0	1	0	0	0	0
1	83	8	0	1	1	0	1	0	0	1	0
2	57	8	0	0	0	0	0	0	0	1	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	5	2	0	0	0	0	0	0	0	0	0
6	1	5	0	0	0	0	0	0	0	0	0
0	7	2	0	0	0	0	0	0	0	0	0
3	5	3	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
8	1	5	0	0	0	0	0	0	0	0	0
14	4	8	0	0	0	0	0	0	0	0	0
12	4	5	0	0	0	0	0	0	0	0	0
12	7	5	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
POWHATTAN RD					
EB LEFT	0	23	**23**	**1%**	**23**
EB THRU	0	16	**16**	**1%**	**16**
EB RIGHT	0	46	**46**	**1%**	**46**
WB LEFT	0	12	**12**	**1%**	**12**
WB THRU	0	18	**18**	**1%**	**18**
WB RIGHT	0	10	**10**	**1%**	**10**
CENTRAL RD					
NB LEFT	1	22	**23**	**4%**	**23**
NB THRU	8	316	**324**	**2%**	**324**
NB RIGHT	0	7	**7**	**1%**	**7**
SB LEFT	0	12	**12**	**1%**	**12**
SB THRU	12	289	**301**	**4%**	**301**
SB RIGHT	1	23	**24**	**4%**	**24**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CENTRAL RD
EAST-WEST STREET: POWHATTAN RD
JURISDICTION: APPLE VALLEY

DATE: 02-02-21

PEAK HOUR: 04:15PM

NORTH LEG

TOTAL: 337

Rt	Thru	Lt	
24	301	12	Total
9	70	4	1st
4	75	1	2nd
3	78	3	3rd
8	78	4	4th

EAST LEG TOTAL: 40

	1st	2nd	3rd	4th	Total
Rt	1	6	0	3	10
Thru	5	1	7	5	18
Lt	2	5	2	3	12

WEST LEG TOTAL: 85

Total	1st	2nd	3rd	4th	
23	5	8	5	5	Lt
16	1	4	4	7	Thru
46	8	14	12	12	Rt

PEAK HOUR FACTORS

NORTH LEG = 0.94
SOUTH LEG = 0.92
EAST LEG = 0.83
WEST LEG = 0.82

ALL LEGS = 0.96

SOUTH LEG

TOTAL: 354

	Lt	Thru	Rt
1st	4	90	2
2nd	2	90	2
3rd	9	86	1
4th	8	58	2
Total	23	324	7

HOUR TOTAL: 816

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CENTRAL RD
EAST-WEST STREET : POWHATTAN RD

APPLE VALLEY
02-02-21

BEGINNING TIME : 04:00PM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
					NORTH LEG							
5	62	2	0	0	0	0	0	0	0	0	0	69
9	67	4	0	2	0	0	1	0	0	0	0	83
3	72	1	0	3	0	1	0	0	0	0	0	80
3	75	3	0	1	0	0	1	0	0	1	0	84
8	75	4	0	2	0	0	0	0	0	1	0	90
3	69	4	0	0	0	0	0	0	0	2	0	78
4	63	8	0	1	0	0	0	0	0	2	0	78
4	49	2	0	1	0	0	1	0	0	1	0	58
39	532	28	0	10	0	1	3	0	0	7	0	620
					SOUTH LEG							
1	66	1	0	1	0	0	0	0	0	0	0	69
2	87	4	0	3	0	0	0	0	0	0	0	96
2	89	2	0	0	0	0	1	0	0	0	0	94
1	83	8	0	1	1	0	1	0	0	1	0	96
2	57	8	0	0	0	0	0	0	0	1	0	68
5	64	5	0	2	0	0	1	0	0	1	0	78
4	52	4	0	0	0	0	0	0	0	0	0	60
0	60	4	0	0	0	0	0	0	0	1	0	65
17	558	36	0	7	1	0	3	0	0	4	0	626
					EAST LEG							
2	4	1	0	0	0	0	0	0	0	0	0	7
1	5	2	0	0	0	0	0	0	0	0	0	8
6	1	5	0	0	0	0	0	0	0	0	0	12
0	7	2	0	0	0	0	0	0	0	0	0	9
3	5	3	0	0	0	0	0	0	0	0	0	11
3	3	4	1	0	0	0	0	0	0	0	0	11
5	2	2	0	0	0	0	0	0	0	0	0	9
0	1	1	0	0	0	0	0	0	0	0	0	2
20	28	20	1	0	0	0	0	0	0	0	0	69
					WEST LEG							
7	3	4	0	0	0	0	0	0	0	0	0	14
8	1	5	0	0	0	0	0	0	0	0	0	14
14	4	8	0	0	0	0	0	0	0	0	0	26
12	4	5	0	0	0	0	0	0	0	0	0	21
12	7	5	0	0	0	0	0	0	0	0	0	24
9	0	8	0	0	0	0	0	0	0	0	0	17
6	3	7	0	0	0	0	0	0	0	0	1	17
3	3	2	0	0	0	0	0	0	0	0	0	8
71	25	44	0	0	0	0	0	0	0	0	1	141

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: POWHATTAN RD

TIME: 04:00PM-05:00PM DATE: 02-02-21

NORTH LEG

Rt	Thru	Lt	
21	285	10	Total
5	62	2	1st
9	70	4	2nd
4	75	1	3rd
3	78	3	4th

	1st	2nd	3rd	4th	Total
Rt	2	1	6	0	9
Thru	4	5	1	7	17
Lt	1	2	5	2	10

Total	1st	2nd	3rd	4th	
22	4	5	8	5	Lt
12	3	1	4	4	Thru
41	7	8	14	12	Rt

	Lt	Thru	Rt
1st	1	67	1
2nd	4	90	2
3rd	2	90	2
4th	9	86	1
Total	16	333	6

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: POWHATTAN RD

TIME: 05:00PM-06:00PM DATE: 02-02-21

NORTH LEG

Rt	Thru	Lt	
19	267	18	Total
8	78	4	1st
3	71	4	2nd
4	66	8	3rd
4	52	2	4th

	1st	2nd	3rd	4th	Total
Rt	3	4	5	0	12
Thru	5	3	2	1	11
Lt	3	4	2	1	10

Total	1st	2nd	3rd	4th	
23	5	8	8	2	Lt
13	7	0	3	3	Thru
30	12	9	6	3	Rt

	Lt	Thru	Rt
1st	8	58	2
2nd	5	68	5
3rd	4	52	4
4th	4	61	0
Total	21	239	11

Prepared by NEWPORT TRAFFIC STUDIES

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	16	46	12	18	10	23	324	7	12	301	24
Future Vol, veh/h	23	16	46	12	18	10	23	324	7	12	301	24
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	1	1	4	4	1	1	4	4
Mvmt Flow	24	17	48	13	19	10	24	338	7	13	314	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	757	746	327	775	755	342	339	0	0	345	0	0
Stage 1	353	353	-	390	390	-	-	-	-	-	-	-
Stage 2	404	393	-	385	365	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.14	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.236	-	-	2.209	-	-
Pot Cap-1 Maneuver	325	343	717	316	339	703	1209	-	-	1220	-	-
Stage 1	666	633	-	636	609	-	-	-	-	-	-	-
Stage 2	625	608	-	640	625	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	297	330	717	276	326	703	1209	-	-	1220	-	-
Mov Cap-2 Maneuver	297	330	-	276	326	-	-	-	-	-	-	-
Stage 1	649	625	-	620	594	-	-	-	-	-	-	-
Stage 2	581	593	-	574	617	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15	16.5	0.5	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1209	-	-	447	354	1220	-	-
HCM Lane V/C Ratio	0.02	-	-	0.198	0.118	0.01	-	-
HCM Control Delay (s)	8	0	-	15	16.5	8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.4	0	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	26	18	54	17	22	13	25	383	9	15	398	28
Future Vol, veh/h	26	18	54	17	22	13	25	383	9	15	398	28
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	1	1	4	4	1	1	4	4
Mvmt Flow	27	19	56	18	23	14	26	399	9	16	415	29

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	936	922	430	955	932	404	444	0	0	408	0	0
Stage 1	462	462	-	456	456	-	-	-	-	-	-	-
Stage 2	474	460	-	499	476	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.14	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.236	-	-	2.209	-	-
Pot Cap-1 Maneuver	246	271	627	239	268	649	1106	-	-	1156	-	-
Stage 1	582	566	-	586	570	-	-	-	-	-	-	-
Stage 2	573	568	-	555	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	216	258	627	198	255	649	1106	-	-	1156	-	-
Mov Cap-2 Maneuver	216	258	-	198	255	-	-	-	-	-	-	-
Stage 1	565	556	-	568	553	-	-	-	-	-	-	-
Stage 2	522	551	-	479	548	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.2	21.6	0.5	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1106	-	-	355	271	1156	-	-
HCM Lane V/C Ratio	0.024	-	-	0.288	0.2	0.014	-	-
HCM Control Delay (s)	8.3	0	-	19.2	21.6	8.2	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.7	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	17	58	17	19	13	27	446	10	17	487	30
Future Volume (veh/h)	26	17	58	17	19	13	27	446	10	17	487	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1588	1588	1550	1550	1588	1588	1550	1550
Adj Flow Rate, veh/h	27	18	60	18	20	14	28	465	10	18	507	31
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	4	4	1	1	4	4
Cap, veh/h	174	29	96	127	78	54	41	1145	25	30	1084	66
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.03	0.76	0.76	0.02	0.75	0.75
Sat Flow, veh/h	1386	322	1073	1331	869	609	1476	1512	33	1512	1446	88
Grp Volume(v), veh/h	27	0	78	18	0	34	28	0	475	18	0	538
Grp Sat Flow(s),veh/h/ln	1386	0	1394	1331	0	1478	1476	0	1544	1512	0	1534
Q Serve(g_s), s	1.7	0.0	4.9	1.2	0.0	1.9	1.7	0.0	9.7	1.1	0.0	12.2
Cycle Q Clear(g_c), s	3.6	0.0	4.9	6.0	0.0	1.9	1.7	0.0	9.7	1.1	0.0	12.2
Prop In Lane	1.00		0.77	1.00		0.41	1.00		0.02	1.00		0.06
Lane Grp Cap(c), veh/h	174	0	124	127	0	132	41	0	1169	30	0	1150
V/C Ratio(X)	0.16	0.00	0.63	0.14	0.00	0.26	0.68	0.00	0.41	0.59	0.00	0.47
Avail Cap(c_a), veh/h	481	0	434	422	0	460	98	0	1169	101	0	1150
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.9	0.0	39.5	42.5	0.0	38.2	43.3	0.0	3.8	43.7	0.0	4.4
Incr Delay (d2), s/veh	0.4	0.0	5.1	0.5	0.0	1.0	17.7	0.0	1.0	16.9	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	1.8	0.4	0.0	0.7	0.8	0.0	2.5	0.5	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	0.0	44.6	43.0	0.0	39.2	61.0	0.0	4.9	60.7	0.0	5.7
LnGrp LOS	D	A	D	D	A	D	E	A	A	E	A	A
Approach Vol, veh/h		105			52			503			556	
Approach Delay, s/veh		43.5			40.5			8.0			7.5	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	72.2		12.0	6.5	71.4		12.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	44.0		28.0	6.0	44.0		28.0				
Max Q Clear Time (g_c+I1), s	3.1	11.7		6.9	3.7	14.2		8.0				
Green Ext Time (p_c), s	0.0	3.3		0.4	0.0	3.9		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			12.2									
HCM 6th LOS			B									

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 7
North/South Street: CENTRAL RD
East/West Street: POWHATTAN RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	48	Approach	466	Left	23	48
NB	Through	289	Departure	236	Through	372	390
	Right	2			Right	2	5
North leg	Left	8	Approach	248	Left	46	29
SB	Through	174	Departure	429	Through	224	215
	Right	22			Right	53	35
West leg	Left	11	Approach	31	Left	25	18
EB	Through	6	Departure	83	Through	12	14
	Right	11			Right	5	11
East leg	Left	12	Approach	32	Left	7	12
WB	Through	6	Departure	60	Through	6	7
	Right	11			Right	31	20

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	23	Approach	417	Left	23	25
NB	Through	324	Departure	472	Through	384	383
	Right	7			Right	8	9
North leg	Left	12	Approach	442	Left	15	15
SB	Through	301	Departure	421	Through	403	398
	Right	24			Right	25	28
West leg	Left	23	Approach	91	Left	23	26
EB	Through	16	Departure	69	Through	17	18
	Right	46			Right	51	54
East leg	Left	12	Approach	52	Left	18	17
WB	Through	18	Departure	40	Through	21	22
	Right	10			Right	14	13

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 7
North/South Street: CENTRAL RD
East/West Street: POWHATTAN RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	48	Approach	549	Left	53	61
NB	Through	289	Departure	281	Through	490	479
	Right	2			Right	4	4
North leg	Left	8	Approach	296	Left	14	13
SB	Through	174	Departure	514	Through	258	253
	Right	22			Right	23	26
West leg	Left	11	Approach	29	Left	11	14
EB	Through	6	Departure	80	Through	7	8
	Right	11			Right	11	13
East leg	Left	12	Approach	29	Left	12	14
WB	Through	6	Departure	24	Through	4	6
	Right	11			Right	12	14

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	23	Approach	486	Left	24	27
NB	Through	324	Departure	568	Through	450	446
	Right	7			Right	10	10
North leg	Left	12	Approach	541	Left	17	17
SB	Through	301	Departure	485	Through	500	487
	Right	24			Right	26	30
West leg	Left	23	Approach	88	Left	22	26
EB	Through	16	Departure	67	Through	15	17
	Right	46			Right	51	58
East leg	Left	12	Approach	47	Left	17	17
WB	Through	18	Departure	42	Through	17	19
	Right	10			Right	13	13

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : OTTOWA RD
N/S STREET : CENTRAL RD

INTERSECTION : 8
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
OTTOWA RD			
EB LEFT	6	14	11
EB THRU	6	8	8
EB RIGHT	6	7	10
WB LEFT	22	19	24
WB THRU	12	12	18
WB RIGHT	40	61	49
CENTRAL RD			
NB LEFT	14	14	28
NB THRU	304	406	500
NB RIGHT	15	15	19
SB LEFT	14	21	16
SB THRU	192	233	265
SB RIGHT	6	11	11
TOTALS	**637**	**821**	**959**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : OTTOWA RD
CONDITION : AM PEAK HOUR

N/S STREET : CENTRAL RD
PHF : 0.81
COVID FACTOR : 45%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
4	14	3	0	0	0	0	0	0	0	0	0
0	40	2	0	0	0	0	1	0	0	2	0
0	31	1	0	0	1	0	2	0	0	0	0
0	38	2	0	2	0	0	0	0	0	2	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
2	39	2	0	0	0	1	2	0	0	1	0
2	53	2	0	0	0	0	2	0	0	3	0
2	70	4	0	2	0	0	1	0	0	4	0
3	30	1	0	0	0	0	1	0	0	1	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
6	1	1	0	0	0	0	0	0	0	0	0
9	4	8	0	0	0	1	0	0	1	0	0
6	3	5	0	0	0	0	0	0	0	0	0
4	0	1	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	0	1	0	0	0	0	0	0	0	0	0
0	3	1	0	0	0	0	0	0	0	0	0
1	0	2	0	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
OTTOWA RD					
EB LEFT	0	4	**4**	**1%**	**6**
EB THRU	0	4	**4**	**1%**	**6**
EB RIGHT	0	4	**4**	**1%**	**6**
WB LEFT	0	15	**15**	**1%**	**22**
WB THRU	0	8	**8**	**1%**	**12**
WB RIGHT	2	25	**27**	**7%**	**40**
CENTRAL RD					
NB LEFT	0	9	**9**	**1%**	**14**
NB THRU	17	192	**209**	**8%**	**304**
NB RIGHT	1	9	**10**	**10%**	**15**
SB LEFT	1	8	**9**	**11%**	**14**
SB THRU	9	123	**132**	**7%**	**192**
SB RIGHT	0	4	**4**	**1%**	**6**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CENTRAL RD
EAST-WEST STREET: OTTOWA RD
JURISDICTION: APPLE VALLEY

DATE: 02-03-21

PEAK HOUR: 07:15AM

NORTH LEG

TOTAL: 145

Rt	Thru	Lt	
4	132	9	Total
4	14	3	1st
0	43	2	2nd
0	33	2	3rd
0	42	2	4th

EAST LEG TOTAL: 50

	1st	2nd	3rd	4th	Total
Rt	6	11	6	4	27
Thru	1	4	3	0	8
Lt	1	8	5	1	15

WEST LEG TOTAL: 12

Total	1st	2nd	3rd	4th	
4	1	1	2	0	Lt
4	0	3	0	1	Thru
4	1	0	1	2	Rt

PEAK HOUR FACTORS

NORTH LEG = 0.81
SOUTH LEG = 0.69
EAST LEG = 0.54
WEST LEG = 0.75

ALL LEGS = 0.81

SOUTH LEG

TOTAL: 228

	Lt	Thru	Rt
1st	2	42	3
2nd	2	58	2
3rd	4	77	2
4th	1	32	3
Total	9	209	10

HOUR TOTAL: 435

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CENTRAL RD
EAST-WEST STREET : OTTOWA RD

APPLE VALLEY
02-03-21

BEGINNING TIME : 07:00AM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
NORTH LEG												
0	23	1	0	2	0	0	0	0	0	0	0	26
4	14	3	0	0	0	0	0	0	0	0	0	21
0	40	2	0	0	0	0	1	0	0	2	0	45
0	31	1	0	0	1	0	2	0	0	0	0	35
0	38	2	0	2	0	0	0	0	0	2	0	44
1	27	2	0	0	0	0	2	0	0	1	0	33
2	31	3	0	0	0	0	1	0	0	0	0	37
0	28	3	0	0	0	0	0	0	0	0	0	31
7	232	17	0	4	1	0	6	0	0	5	0	272
SOUTH LEG												
1	22	1	0	0	0	1	1	0	0	0	0	26
2	39	2	0	0	0	1	2	0	0	1	0	47
2	53	2	0	0	0	0	2	0	0	3	0	62
2	70	4	0	2	0	0	1	0	0	4	0	83
3	30	1	0	0	0	0	1	0	0	1	0	36
1	18	2	0	1	0	0	1	0	0	0	0	23
1	34	3	0	1	0	0	0	0	0	0	0	39
2	36	2	0	1	0	0	1	0	0	0	0	42
14	302	17	0	5	0	2	9	0	0	9	0	358
EAST LEG												
2	0	1	0	0	0	1	0	0	1	1	0	6
6	1	1	0	0	0	0	0	0	0	0	0	8
9	4	8	0	0	0	1	0	0	1	0	0	23
6	3	5	0	0	0	0	0	0	0	0	0	14
4	0	1	0	0	0	0	0	0	0	0	0	5
7	3	5	0	0	0	0	0	0	0	0	0	15
1	0	6	0	0	0	0	0	0	0	0	0	7
2	1	6	0	0	0	0	0	0	0	0	0	9
37	12	33	0	0	0	2	0	0	2	1	0	87
WEST LEG												
1	0	1	0	0	0	0	0	0	0	0	0	2
1	0	1	0	0	0	0	0	0	0	0	0	2
0	3	1	0	0	0	0	0	0	0	0	0	4
1	0	2	0	0	0	0	0	0	0	0	0	3
2	1	0	0	0	0	0	0	0	0	0	0	3
0	1	0	0	0	0	0	0	0	0	0	0	1
2	0	2	0	0	0	0	1	0	0	0	0	5
3	5	0	0	0	0	0	0	0	0	0	0	8
10	10	7	0	0	0	0	1	0	0	0	0	28

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: OTTOWA RD

TIME: 07:00AM-08:00AM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
4	115	8	Total
0	25	1	1st
4	14	3	2nd
0	43	2	3rd
0	33	2	4th

	1st	2nd	3rd	4th	Total
Rt	4	6	11	6	27
Thru	1	1	4	3	9
Lt	1	1	8	5	15

Total	1st	2nd	3rd	4th	
5	1	1	1	2	Lt
3	0	0	3	0	Thru
3	1	1	0	1	Rt

	Lt	Thru	Rt
1st	1	23	2
2nd	2	42	3
3rd	2	58	2
4th	4	77	2
Total	9	200	9

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: OTTOWA RD

TIME: 08:00AM-09:00AM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
3	132	10	Total
0	42	2	1st
1	30	2	2nd
2	32	3	3rd
0	28	3	4th

	1st	2nd	3rd	4th	Total
Rt	4	7	1	2	14
Thru	0	3	0	1	4
Lt	1	5	6	6	18

Total	1st	2nd	3rd	4th	
2	0	0	2	0	Lt
8	1	1	1	5	Thru
7	2	0	2	3	Rt

	Lt	Thru	Rt
1st	1	32	3
2nd	2	20	1
3rd	3	35	1
4th	2	38	2
Total	8	125	7

Prepared by NEWPORT TRAFFIC STUDIES

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↱		↰	↱	
Traffic Vol, veh/h	6	6	6	22	12	40	14	304	15	14	192	6
Future Vol, veh/h	6	6	6	22	12	40	14	304	15	14	192	6
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	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	1	1	1	1	1	7	1	8	10	11	7	1
Mvmt Flow	7	7	7	27	15	49	17	375	19	17	237	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	726	703	241	701	697	385	244	0	0	394	0	0
Stage 1	275	275	-	419	419	-	-	-	-	-	-	-
Stage 2	451	428	-	282	278	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.27	4.11	-	-	4.21	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.363	2.209	-	-	2.299	-	-
Pot Cap-1 Maneuver	341	363	800	355	366	652	1328	-	-	1117	-	-
Stage 1	733	684	-	614	592	-	-	-	-	-	-	-
Stage 2	590	586	-	727	682	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	299	353	800	339	356	652	1328	-	-	1117	-	-
Mov Cap-2 Maneuver	299	353	-	339	356	-	-	-	-	-	-	-
Stage 1	723	674	-	606	584	-	-	-	-	-	-	-
Stage 2	525	578	-	702	672	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	14.7	0.3	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1328	-	-	404	463	1117	-	-
HCM Lane V/C Ratio	0.013	-	-	0.055	0.197	0.015	-	-
HCM Control Delay (s)	7.7	-	-	14.4	14.7	8.3	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.7	0	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑		↰	↑	
Traffic Vol, veh/h	14	8	7	19	12	61	14	406	15	21	233	11
Future Vol, veh/h	14	8	7	19	12	61	14	406	15	21	233	11
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	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	1	1	1	1	1	7	1	8	10	11	7	1
Mvmt Flow	17	10	9	23	15	75	17	501	19	26	288	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	937	901	295	902	899	511	302	0	0	520	0	0
Stage 1	347	347	-	545	545	-	-	-	-	-	-	-
Stage 2	590	554	-	357	354	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.27	4.11	-	-	4.21	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.363	2.209	-	-	2.299	-	-
Pot Cap-1 Maneuver	246	279	747	260	280	553	1265	-	-	1002	-	-
Stage 1	671	637	-	524	520	-	-	-	-	-	-	-
Stage 2	496	515	-	663	632	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	198	268	747	242	269	553	1265	-	-	1002	-	-
Mov Cap-2 Maneuver	198	268	-	242	269	-	-	-	-	-	-	-
Stage 1	662	620	-	517	513	-	-	-	-	-	-	-
Stage 2	410	508	-	628	616	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.8	17.8	0.3	0.7
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1265	-	-	264	394	1002	-	-
HCM Lane V/C Ratio	0.014	-	-	0.136	0.288	0.026	-	-
HCM Control Delay (s)	7.9	-	-	20.8	17.8	8.7	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	1.2	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	8	10	24	18	49	28	500	19	16	265	11
Future Volume (veh/h)	11	8	10	24	18	49	28	500	19	16	265	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1588	1513	1588	1500	1475	1463	1513	1588
Adj Flow Rate, veh/h	12	9	11	26	20	53	30	543	21	17	288	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	7	1	8	10	11	7	1
Cap, veh/h	118	51	63	173	30	81	44	1102	43	27	1093	46
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.03	0.77	0.77	0.02	0.76	0.76
Sat Flow, veh/h	1338	650	794	1403	385	1019	1512	1435	55	1393	1442	60
Grp Volume(v), veh/h	12	0	20	26	0	73	30	0	564	17	0	300
Grp Sat Flow(s),veh/h/ln	1338	0	1445	1403	0	1404	1512	0	1490	1393	0	1502
Q Serve(g_s), s	0.8	0.0	1.2	1.6	0.0	4.5	1.8	0.0	12.7	1.1	0.0	5.4
Cycle Q Clear(g_c), s	5.3	0.0	1.2	2.7	0.0	4.5	1.8	0.0	12.7	1.1	0.0	5.4
Prop In Lane	1.00		0.55	1.00		0.73	1.00		0.04	1.00		0.04
Lane Grp Cap(c), veh/h	118	0	114	173	0	111	44	0	1145	27	0	1139
V/C Ratio(X)	0.10	0.00	0.17	0.15	0.00	0.66	0.68	0.00	0.49	0.63	0.00	0.26
Avail Cap(c_a), veh/h	429	0	449	498	0	437	101	0	1145	93	0	1139
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.8	0.0	38.7	40.0	0.0	40.2	43.3	0.0	3.9	43.8	0.0	3.3
Incr Delay (d2), s/veh	0.4	0.0	0.7	0.4	0.0	6.4	16.5	0.0	1.5	22.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.4	0.6	0.0	1.7	0.9	0.0	3.1	0.5	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	0.0	39.4	40.4	0.0	46.7	59.8	0.0	5.4	66.0	0.0	3.9
LnGrp LOS	D	A	D	D	A	D	E	A	A	E	A	A
Approach Vol, veh/h		32			99			594			317	
Approach Delay, s/veh		40.8			45.0			8.2			7.2	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	73.1		11.1	6.6	72.2		11.1
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	6.6	44.0		28.0	6.0	44.0		28.0
Max Q Clear Time (g_c+I1), s	3.1	14.7		7.3	3.8	7.4		6.5
Green Ext Time (p_c), s	0.0	4.2		0.1	0.0	2.0		0.4

Intersection Summary		
HCM 6th Ctrl Delay		12.4
HCM 6th LOS		B

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : OTTOWA RD
N/S STREET : CENTRAL RD

INTERSECTION : 8
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
OTTOWA RD			
EB LEFT	11	16	17
EB THRU	14	19	17
EB RIGHT	19	30	31
WB LEFT	29	34	36
WB THRU	6	8	8
WB RIGHT	27	29	31
CENTRAL RD			
NB LEFT	15	22	23
NB THRU	293	352	413
NB RIGHT	22	24	25
SB LEFT	37	41	46
SB THRU	304	411	494
SB RIGHT	7	11	12
TOTALS	**784**	**997**	**1153**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : OTTOWA RD
CONDITION : PM PEAK HOUR

N/S STREET : CENTRAL RD
PHF : 0.92
COVID FACTOR : 0%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
4	65	6	0	2	0	0	1	0	0	0	0
2	78	8	0	3	0	0	0	0	0	0	0
1	67	15	0	1	0	0	1	0	0	1	0
0	82	8	0	2	0	0	0	0	0	1	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
6	80	3	0	3	1	0	0	0	0	0	0
7	62	6	0	0	0	0	1	0	0	0	0
8	82	3	0	1	0	0	1	1	0	1	0
1	61	1	0	0	0	0	0	0	0	1	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
11	0	4	0	0	0	0	0	0	0	0	0
9	4	8	0	0	0	0	0	0	0	0	0
7	0	9	0	0	0	0	0	0	0	0	0
0	1	8	0	0	0	0	1	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
4	3	5	0	0	0	0	0	0	0	0	0
8	3	1	0	0	0	0	0	0	0	0	0
3	7	3	0	0	0	0	0	0	0	0	0
4	1	2	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
OTTOWA RD					
EB LEFT	0	11	**11**	**1%**	**11**
EB THRU	0	14	**14**	**1%**	**14**
EB RIGHT	0	19	**19**	**1%**	**19**
WB LEFT	0	29	**29**	**1%**	**29**
WB THRU	1	5	**6**	**17%**	**6**
WB RIGHT	0	27	**27**	**1%**	**27**
CENTRAL RD					
NB LEFT	2	13	**15**	**13%**	**15**
NB THRU	8	285	**293**	**3%**	**293**
NB RIGHT	0	22	**22**	**1%**	**22**
SB LEFT	0	37	**37**	**1%**	**37**
SB THRU	12	292	**304**	**4%**	**304**
SB RIGHT	0	7	**7**	**1%**	**7**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CENTRAL RD
EAST-WEST STREET: OTTOWA RD
JURISDICTION: APPLE VALLEY

DATE: 02-02-21

PEAK HOUR: 04:15PM

NORTH LEG

TOTAL: 348

Rt	Thru	Lt	
7	304	37	Total
4	68	6	1st
2	81	8	2nd
1	70	15	3rd
0	85	8	4th

EAST LEG TOTAL: 62

	1st	2nd	3rd	4th	Total
Rt	11	9	7	0	27
Thru	0	4	0	2	6
Lt	4	8	9	8	29

WEST LEG TOTAL: 44

Total	1st	2nd	3rd	4th	
11	5	1	3	2	Lt
14	3	3	7	1	Thru
19	4	8	3	4	Rt

PEAK HOUR FACTORS

NORTH LEG = 0.94
SOUTH LEG = 0.85
EAST LEG = 0.74
WEST LEG = 0.85

ALL LEGS = 0.92

SOUTH LEG

TOTAL: 330

	Lt	Thru	Rt
1st	4	83	6
2nd	6	63	7
3rd	4	85	8
4th	1	62	1
Total	15	293	22

HOUR TOTAL: 784

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CENTRAL RD
EAST-WEST STREET : OTTOWA RD

APPLE VALLEY
02-02-21

BEGINNING TIME : 04:00PM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
NORTH LEG												
3	64	5	0	0	0	0	0	0	0	0	0	72
4	65	6	0	2	0	0	1	0	0	0	0	78
2	78	8	0	3	0	0	0	0	0	0	0	91
1	67	15	0	1	0	0	1	0	0	1	0	86
0	82	8	0	2	0	0	0	0	0	1	0	93
3	71	9	1	0	0	0	0	0	0	2	0	86
3	59	7	1	1	0	0	0	0	0	2	0	73
2	41	9	0	1	0	0	1	0	0	1	0	55
18	527	67	2	10	0	0	3	0	0	7	0	634
SOUTH LEG												
5	61	5	0	0	0	0	0	0	0	0	0	71
6	80	3	0	3	1	0	0	0	0	0	0	93
7	62	6	0	0	0	0	1	0	0	0	0	76
8	82	3	0	1	0	0	1	1	0	1	0	97
1	61	1	0	0	0	0	0	0	0	1	0	64
12	67	0	0	2	0	0	1	0	0	1	0	83
9	54	3	0	0	0	0	0	0	0	0	0	66
10	55	0	0	0	0	0	0	0	0	1	0	66
58	522	21	0	6	1	0	3	1	0	4	0	616
EAST LEG												
5	3	3	1	0	0	0	0	0	0	0	0	12
11	0	4	0	0	0	0	0	0	0	0	0	15
9	4	8	0	0	0	0	0	0	0	0	0	21
7	0	9	0	0	0	0	0	0	0	0	0	16
0	1	8	0	0	0	0	1	0	0	0	0	10
4	1	5	0	0	0	0	0	0	0	0	0	10
6	3	5	0	0	0	0	0	0	0	0	0	14
4	2	4	0	0	0	0	0	0	0	0	0	10
46	14	46	1	0	0	0	1	0	0	0	0	108
WEST LEG												
2	3	4	0	0	0	0	0	0	0	0	0	9
4	3	5	0	0	0	0	0	0	0	0	0	12
8	3	1	0	0	0	0	0	0	0	0	0	12
3	7	3	0	0	0	0	0	0	0	0	0	13
4	1	2	0	0	0	0	0	0	0	0	0	7
1	3	3	0	1	0	0	0	0	0	0	0	8
4	5	5	0	0	0	0	0	0	0	0	0	14
3	12	3	0	0	0	0	0	0	0	0	0	18
29	37	26	0	1	0	0	0	0	0	0	0	93

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: OTTOWA RD

TIME: 04:00PM-05:00PM DATE: 02-02-21

NORTH LEG

Rt	Thru	Lt	
10	283	34	Total
3	64	5	1st
4	68	6	2nd
2	81	8	3rd
1	70	15	4th

	1st	2nd	3rd	4th	Total
Rt	6	11	9	7	33
Thru	3	0	4	0	7
Lt	3	4	8	9	24

Total	1st	2nd	3rd	4th	
13	4	5	1	3	Lt
16	3	3	3	7	Thru
17	2	4	8	3	Rt

	Lt	Thru	Rt
1st	5	61	5
2nd	4	83	6
3rd	6	63	7
4th	4	85	8
Total	19	292	26

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CENTRAL RD

EAST-WEST STREET: OTTOWA RD

TIME: 05:00PM-06:00PM DATE: 02-02-21

NORTH LEG

Rt	Thru	Lt	
10	264	33	Total
0	85	8	1st
4	73	9	2nd
4	62	7	3rd
2	44	9	4th

	1st	2nd	3rd	4th	Total
Rt	0	4	6	4	14
Thru	2	1	3	2	8
Lt	8	5	5	4	22

Total	1st	2nd	3rd	4th	
13	2	3	5	3	Lt
22	1	4	5	12	Thru
12	4	1	4	3	Rt

	Lt	Thru	Rt
1st	1	62	1
2nd	0	71	12
3rd	3	54	9
4th	0	56	10
Total	4	243	32

Prepared by NEWPORT TRAFFIC STUDIES

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↱		↰	↱	
Traffic Vol, veh/h	11	14	19	29	6	27	15	293	22	37	304	7
Future Vol, veh/h	11	14	19	29	6	27	15	293	22	37	304	7
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	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	17	1	13	4	1	1	4	1
Mvmt Flow	12	15	21	32	7	29	16	318	24	40	330	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	794	788	334	794	780	330	338	0	0	342	0	0
Stage 1	414	414	-	362	362	-	-	-	-	-	-	-
Stage 2	380	374	-	432	418	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.67	6.21	4.23	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.67	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.67	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.153	3.309	2.317	-	-	2.209	-	-
Pot Cap-1 Maneuver	307	324	710	307	310	714	1162	-	-	1223	-	-
Stage 1	618	595	-	659	600	-	-	-	-	-	-	-
Stage 2	644	619	-	604	566	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	279	309	710	277	295	714	1162	-	-	1223	-	-
Mov Cap-2 Maneuver	279	309	-	277	295	-	-	-	-	-	-	-
Stage 1	609	575	-	650	592	-	-	-	-	-	-	-
Stage 2	602	610	-	552	547	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.4	16.5	0.4	0.9
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1162	-	-	395	381	1223	-	-
HCM Lane V/C Ratio	0.014	-	-	0.121	0.177	0.033	-	-
HCM Control Delay (s)	8.1	-	-	15.4	16.5	8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑		↰	↑	
Traffic Vol, veh/h	16	19	30	34	8	29	22	352	24	41	411	11
Future Vol, veh/h	16	19	30	34	8	29	22	352	24	41	411	11
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	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	17	1	13	4	1	1	4	1
Mvmt Flow	17	21	33	37	9	32	24	383	26	45	447	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1008	1000	453	1014	993	396	459	0	0	409	0	0
Stage 1	543	543	-	444	444	-	-	-	-	-	-	-
Stage 2	465	457	-	570	549	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.67	6.21	4.23	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.67	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.67	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.153	3.309	2.317	-	-	2.209	-	-
Pot Cap-1 Maneuver	220	244	609	218	231	656	1046	-	-	1155	-	-
Stage 1	526	521	-	595	550	-	-	-	-	-	-	-
Stage 2	580	569	-	508	493	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	194	229	609	183	217	656	1046	-	-	1155	-	-
Mov Cap-2 Maneuver	194	229	-	183	217	-	-	-	-	-	-	-
Stage 1	514	501	-	581	537	-	-	-	-	-	-	-
Stage 2	531	556	-	443	474	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.5	24	0.5	0.7
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1046	-	-	303	266	1155	-	-
HCM Lane V/C Ratio	0.023	-	-	0.233	0.29	0.039	-	-
HCM Control Delay (s)	8.5	-	-	20.5	24	8.2	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	1.2	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	17	31	36	8	31	23	413	25	46	494	12
Future Volume (veh/h)	17	17	31	36	8	31	23	413	25	46	494	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1388	1588	1438	1550	1588	1588	1550	1588
Adj Flow Rate, veh/h	18	18	34	39	9	34	25	449	27	50	537	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	17	1	13	4	1	1	4	1
Cap, veh/h	152	42	80	150	22	83	35	1073	65	60	1138	28
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.03	0.74	0.74	0.04	0.75	0.75
Sat Flow, veh/h	1374	492	929	1363	254	961	1369	1447	87	1512	1507	36
Grp Volume(v), veh/h	18	0	52	39	0	43	25	0	476	50	0	550
Grp Sat Flow(s),veh/h/ln	1374	0	1420	1363	0	1215	1369	0	1534	1512	0	1544
Q Serve(g_s), s	1.1	0.0	3.1	2.5	0.0	3.0	1.6	0.0	10.5	3.0	0.0	12.2
Cycle Q Clear(g_c), s	4.2	0.0	3.1	5.6	0.0	3.0	1.6	0.0	10.5	3.0	0.0	12.2
Prop In Lane	1.00		0.65	1.00		0.79	1.00		0.06	1.00		0.02
Lane Grp Cap(c), veh/h	152	0	122	150	0	104	35	0	1137	60	0	1165
V/C Ratio(X)	0.12	0.00	0.43	0.26	0.00	0.41	0.71	0.00	0.42	0.83	0.00	0.47
Avail Cap(c_a), veh/h	461	0	442	457	0	378	107	0	1137	118	0	1165
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.9	0.0	39.0	41.7	0.0	39.0	43.5	0.0	4.4	42.9	0.0	4.2
Incr Delay (d2), s/veh	0.3	0.0	2.3	0.9	0.0	2.6	22.7	0.0	1.1	24.6	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	1.2	0.9	0.0	1.0	0.8	0.0	2.8	1.5	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	0.0	41.4	42.6	0.0	41.6	66.2	0.0	5.5	67.5	0.0	5.6
LnGrp LOS	D	A	D	D	A	D	E	A	A	E	A	A
Approach Vol, veh/h		70			82			501			600	
Approach Delay, s/veh		41.3			42.1			8.5			10.7	
Approach LOS		D			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.6	70.7		11.7	6.3	71.9		11.7
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.6	43.0		28.0	7.0	43.0		28.0
Max Q Clear Time (g_c+I1), s	5.0	12.5		6.2	3.6	14.2		7.6
Green Ext Time (p_c), s	0.0	3.3		0.3	0.0	4.0		0.3

Intersection Summary	
HCM 6th Ctrl Delay	13.6
HCM 6th LOS	B

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 8
North/South Street: CENTRAL RD
East/West Street: OTTOWA RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	14	Approach	477	Left	6	14
NB	Through	304	Departure	257	Through	367	406
	Right	15			Right	4	15
North leg	Left	14	Approach	251	Left	29	21
SB	Through	192	Departure	477	Through	246	233
	Right	6			Right	18	11
West leg	Left	6	Approach	26	Left	24	14
EB	Through	6	Departure	32	Through	6	8
	Right	6			Right	4	7
East leg	Left	22	Approach	76	Left	7	19
WB	Through	12	Departure	39	Through	9	12
	Right	40			Right	85	61

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	15	Approach	399	Left	24	22
NB	Through	293	Departure	479	Through	352	352
	Right	22			Right	21	24
North leg	Left	37	Approach	461	Left	36	41
SB	Through	304	Departure	394	Through	415	411
	Right	7			Right	11	11
West leg	Left	11	Approach	69	Left	17	16
EB	Through	14	Departure	43	Through	18	19
	Right	19			Right	34	30
East leg	Left	29	Approach	63	Left	30	34
WB	Through	6	Departure	75	Through	7	8
	Right	27			Right	25	29

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 8
North/South Street: CENTRAL RD
East/West Street: OTTOWA RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	14	Approach	553	Left	32	28
NB	Through	304	Departure	297	Through	508	500
	Right	15			Right	15	19
North leg	Left	14	Approach	296	Left	13	16
SB	Through	192	Departure	560	Through	267	265
	Right	6			Right	13	11
West leg	Left	6	Approach	29	Left	12	11
EB	Through	6	Departure	61	Through	7	8
	Right	6			Right	10	10
East leg	Left	22	Approach	76	Left	19	24
WB	Through	12	Departure	35	Through	16	18
	Right	40			Right	40	49

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	15	Approach	462	Left	24	23
NB	Through	293	Departure	567	Through	418	413
	Right	22			Right	20	25
North leg	Left	37	Approach	557	Left	39	46
SB	Through	304	Departure	463	Through	505	494
	Right	7			Right	13	12
West leg	Left	11	Approach	66	Left	18	17
EB	Through	14	Departure	43	Through	15	17
	Right	19			Right	32	31
East leg	Left	29	Approach	63	Left	29	36
WB	Through	6	Departure	74	Through	7	8
	Right	27			Right	27	31

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : POWHATTAN RD
N/S STREET : QUINNAULT RD

INTERSECTION : 9
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	5	7
POWHATTAN RD			
EB LEFT	127	118	175
EB THRU	22	19	28
EB RIGHT	3	23	26
WB LEFT	2	15	13
WB THRU	9	8	10
WB RIGHT	60	56	59
QUINNAULT RD			
NB LEFT	2	20	8
NB THRU	5	51	19
NB RIGHT	2	14	7
SB LEFT	16	17	18
SB THRU	6	52	44
SB RIGHT	138	155	176
TOTALS	**392**	**548**	**583**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : POWHATTAN RD
CONDITION : AM PEAK HOUR

N/S STREET : QUINNAULT RD
PHF : 0.88
COVID FACTOR : 45%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
19	1	6	0	0	0	0	0	0	0	0	0
27	1	0	3	0	0	0	0	0	0	0	0
25	1	3	2	0	0	0	0	0	0	0	0
15	1	2	4	0	0	0	0	0	0	0	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	2	0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
16	3	0	0	0	0	0	0	0	0	0	0
9	2	0	0	0	0	0	0	0	0	0	0
7	1	0	0	0	0	0	0	0	0	0	0
7	0	0	2	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	0	26	0	0	3	0	0	0	0	0	0
0	4	25	0	0	1	0	0	1	0	0	0
1	8	12	0	0	3	0	0	1	0	0	0
0	3	13	0	0	2	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
POWHATTAN RD					
EB LEFT	11	76	**87**	**13%**	**127**
EB THRU	0	15	**15**	**1%**	**22**
EB RIGHT	0	2	**2**	**1%**	**3**
WB LEFT	0	0	**1**	**1%**	**2**
WB THRU	0	6	**6**	**1%**	**9**
WB RIGHT	2	39	**41**	**5%**	**60**
QUINNAULT RD					
NB LEFT	0	1	**1**	**1%**	**2**
NB THRU	0	3	**3**	**1%**	**5**
NB RIGHT	0	0	**1**	**1%**	**2**
SB LEFT	0	11	**11**	**1%**	**16**
SB THRU	0	4	**4**	**1%**	**6**
SB RIGHT	9	86	**95**	**9%**	**138**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: QUINNAULT RD
EAST-WEST STREET: POWHATTAN RD
JURISDICTION: APPLE VALLEY

DATE: 02-03-21

PEAK HOUR: 07:45AM

NORTH LEG

TOTAL: 110

Rt	Thru	Lt	
95	4	11	Total
19	1	6	1st
30	1	0	2nd
27	1	3	3rd
19	1	2	4th

EAST LEG TOTAL: 47

	1st	2nd	3rd	4th	Total
Rt	16	9	7	9	41
Thru	3	2	1	0	6
Lt	0	0	0	0	

WEST LEG TOTAL: 104

Total	1st	2nd	3rd	4th	
87	29	27	16	15	Lt
15	0	4	8	3	Thru
2	1	0	1	0	Rt

PEAK HOUR FACTORS

NORTH LEG = 0.89
SOUTH LEG = 0.50
EAST LEG = 0.62
WEST LEG = 0.84

ALL LEGS = 0.88

SOUTH LEG

TOTAL: 4

	Lt	Thru	Rt
1st	0	0	0
2nd	0	2	0
3rd	0	1	0
4th	1	0	0
Total	1	3	

HOUR TOTAL: 265

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: QUINNAULT RD

EAST-WEST STREET: POWHATTAN RD

TIME: 07:00AM-08:00AM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
43	3	12	Total
5	0	0	1st
6	0	1	2nd
13	2	5	3rd
19	1	6	4th

	1st	2nd	3rd	4th	Total
Rt	3	2	9	16	30
Thru	0	2	0	3	5
Lt	0	0	0	0	0

Total	1st	2nd	3rd	4th	
69	12	16	12	29	Lt
10	3	5	2	0	Thru
1	0	0	0	1	Rt

	Lt	Thru	Rt
1st	0	1	0
2nd	0	0	0
3rd	0	0	0
4th	0	0	0
Total	0	1	0

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: QUINNAULT RD

EAST-WEST STREET: POWHATTAN RD

TIME: 08:00AM-09:00AM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
96	6	8	Total
30	1	0	1st
27	1	3	2nd
19	1	2	3rd
20	3	3	4th

	1st	2nd	3rd	4th	Total
Rt	9	7	9	5	30
Thru	2	1	0	1	4
Lt	0	0	0	1	1

Total	1st	2nd	3rd	4th	
87	27	16	15	29	Lt
19	4	8	3	4	Thru
1	0	1	0	0	Rt

	Lt	Thru	Rt
1st	0	2	0
2nd	0	1	0
3rd	1	0	0
4th	0	2	0
Total	1	5	0

Prepared by NEWPORT TRAFFIC STUDIES

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↰	↱
Traffic Vol, veh/h	127	22	3	2	9	60	2	5	2	16	6	138
Future Vol, veh/h	127	22	3	2	9	60	2	5	2	16	6	138
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	13	1	1	1	1	5	1	1	1	1	1	9
Mvmt Flow	144	25	3	2	10	68	2	6	2	18	7	157

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	78	0	0	28	0	0	445	397	27	367	364	44
Stage 1	-	-	-	-	-	-	315	315	-	48	48	-
Stage 2	-	-	-	-	-	-	130	82	-	319	316	-
Critical Hdwy	4.23	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.317	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.381
Pot Cap-1 Maneuver	1454	-	-	1592	-	-	525	542	1051	591	566	1006
Stage 1	-	-	-	-	-	-	698	657	-	968	857	-
Stage 2	-	-	-	-	-	-	876	829	-	695	657	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1454	-	-	1592	-	-	404	487	1051	539	508	1006
Mov Cap-2 Maneuver	-	-	-	-	-	-	404	487	-	539	508	-
Stage 1	-	-	-	-	-	-	628	591	-	870	856	-
Stage 2	-	-	-	-	-	-	733	828	-	617	591	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	6.5	0.2	12	9.6
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	526	1454	-	-	1592	-	-	530	1006
HCM Lane V/C Ratio	0.019	0.099	-	-	0.001	-	-	0.047	0.156
HCM Control Delay (s)	12	7.7	0	-	7.3	0	-	12.1	9.2
HCM Lane LOS	B	A	A	-	A	A	-	B	A
HCM 95th %tile Q(veh)	0.1	0.3	-	-	0	-	-	0.1	0.6

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↱
Traffic Vol, veh/h	118	19	23	15	8	56	20	51	14	17	52	155
Future Vol, veh/h	118	19	23	15	8	56	20	51	14	17	52	155
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	13	1	1	1	1	5	1	1	1	1	1	9
Mvmt Flow	134	22	26	17	9	64	23	58	16	19	59	176

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	73	0	0	48	0	0	496	410	35	415	391	41
Stage 1	-	-	-	-	-	-	303	303	-	75	75	-
Stage 2	-	-	-	-	-	-	193	107	-	340	316	-
Critical Hdwy	4.23	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.317	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.381
Pot Cap-1 Maneuver	1460	-	-	1566	-	-	486	533	1041	550	546	1010
Stage 1	-	-	-	-	-	-	708	665	-	937	834	-
Stage 2	-	-	-	-	-	-	811	809	-	677	657	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1460	-	-	1566	-	-	335	477	1041	453	489	1010
Mov Cap-2 Maneuver	-	-	-	-	-	-	335	477	-	453	489	-
Stage 1	-	-	-	-	-	-	641	602	-	848	825	-
Stage 2	-	-	-	-	-	-	615	800	-	545	595	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.7	1.4	14.6	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	472	1460	-	-	1566	-	-	480	1010
HCM Lane V/C Ratio	0.205	0.092	-	-	0.011	-	-	0.163	0.174
HCM Control Delay (s)	14.6	7.7	0	-	7.3	0	-	14	9.3
HCM Lane LOS	B	A	A	-	A	A	-	B	A
HCM 95th %tile Q(veh)	0.8	0.3	-	-	0	-	-	0.6	0.6

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	175	28	26	13	10	59	8	19	7	18	44	176
Future Vol, veh/h	175	28	26	13	10	59	8	19	7	18	44	176
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	13	1	1	1	1	5	1	1	1	1	1	9
Mvmt Flow	190	30	28	14	11	64	9	21	8	20	48	191
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	10.7	8.2	8.4	9
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	24%	76%	16%	29%	0%
Vol Thru, %	56%	12%	12%	71%	0%
Vol Right, %	21%	11%	72%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	34	229	82	62	176
LT Vol	8	175	13	18	0
Through Vol	19	28	10	44	0
RT Vol	7	26	59	0	176
Lane Flow Rate	37	249	89	67	191
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.052	0.346	0.112	0.104	0.249
Departure Headway (Hd)	5.099	4.999	4.534	5.537	4.685
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	697	717	785	646	763
Service Time	3.166	3.045	2.59	3.285	2.433
HCM Lane V/C Ratio	0.053	0.347	0.113	0.104	0.25
HCM Control Delay	8.4	10.7	8.2	8.9	9
HCM Lane LOS	A	B	A	A	A
HCM 95th-tile Q	0.2	1.5	0.4	0.3	1

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : POWHATTAN RD
N/S STREET : QUINNAULT RD

INTERSECTION : 9
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
POWHATTAN RD			
EB LEFT	50	73	88
EB THRU	45	43	53
EB RIGHT	2	9	13
WB LEFT	1	5	4
WB THRU	58	55	77
WB RIGHT	22	34	28
QUINNAULT RD			
NB LEFT	1	13	21
NB THRU	3	49	42
NB RIGHT	1	13	11
SB LEFT	19	24	19
SB THRU	8	42	32
SB RIGHT	91	108	140
TOTALS	**301**	**468**	**528**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : POWHATTAN RD
CONDITION : PM PEAK HOUR

N/S STREET : QUINNAULT RD
PHF : 0.87
COVID FACTOR : 0%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
25	0	5	0	0	0	0	0	0	0	1	0
23	0	7	0	1	0	1	0	0	0	0	0
20	4	4	0	0	0	0	0	0	0	0	0
22	2	3	0	0	0	0	0	0	0	0	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
3	9	0	1	0	0	0	0	0	0	0	0
5	14	0	0	0	0	0	0	0	0	0	0
6	19	0	1	1	0	0	0	0	0	1	0
6	14	0	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	12	10	0	0	1	0	0	0	0	0	0
0	12	14	0	0	0	0	0	0	0	0	0
1	14	10	0	0	4	0	0	0	0	0	0
0	7	11	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
POWHATTAN RD					
EB LEFT	5	45	**50**	**10%**	**50**
EB THRU	0	45	**45**	**1%**	**45**
EB RIGHT	0	2	**2**	**1%**	**2**
WB LEFT	0	0	**1**	**1%**	**1**
WB THRU	2	56	**58**	**3%**	**58**
WB RIGHT	2	20	**22**	**9%**	**22**
QUINNAULT RD					
NB LEFT	0	1	**1**	**1%**	**1**
NB THRU	0	3	**3**	**1%**	**3**
NB RIGHT	0	0	**1**	**1%**	**1**
SB LEFT	0	19	**19**	**1%**	**19**
SB THRU	2	6	**8**	**25%**	**8**
SB RIGHT	1	90	**91**	**1%**	**91**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: QUINNAULT RD
EAST-WEST STREET: POWHATTAN RD
JURISDICTION: APPLE VALLEY

DATE: 02-03-21

PEAK HOUR: 04:15PM

NORTH LEG

TOTAL: 118

Rt	Thru	Lt	
91	8	19	Total
25	1	5	1st
24	1	7	2nd
20	4	4	3rd
22	2	3	4th

EAST LEG TOTAL: 80

	1st	2nd	3rd	4th	Total
Rt	4	5	7	6	22
Thru	9	14	21	14	58
Lt	0	0	0	0	

WEST LEG TOTAL: 97

Total	1st	2nd	3rd	4th	
50	11	14	14	11	Lt
45	12	12	14	7	Thru
2	1	0	1	0	Rt

SOUTH LEG

TOTAL: 4

	Lt	Thru	Rt
1st	0	0	0
2nd	1	1	0
3rd	0	1	0
4th	0	1	0
Total	1	3	

PEAK HOUR FACTORS

NORTH LEG = 0.92
SOUTH LEG = 0.50
EAST LEG = 0.71
WEST LEG = 0.84

ALL LEGS = 0.87

HOUR TOTAL: 299

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : QUINNAULT RD — APPLE VALLEY

EAST-WEST STREET : POWHATTAN RD — 02-03-21

BEGINNING TIME : 04:00PM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
NORTH LEG												
21	2	5	0	0	0	0	0	0	0	0	0	28
25	0	5	0	0	0	0	0	0	0	1	0	31
23	0	7	0	1	0	1	0	0	0	0	0	32
20	4	4	0	0	0	0	0	0	0	0	0	28
22	2	3	0	0	0	0	0	0	0	0	0	27
12	2	6	0	0	0	0	0	0	0	0	0	20
15	2	4	0	0	0	0	0	0	0	0	0	21
17	2	3	0	0	0	0	0	0	0	0	0	22
155	14	37	0	1	0	1	0	0	0	1	0	209
SOUTH LEG												
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	0	0	0	0	0	0	0	0	0	2
0	1	0	0	0	0	0	0	0	0	0	0	1
0	1	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0	0	1
0	1	0	0	0	0	0	0	0	0	0	0	1
0	5	1	0	0	0	0	0	0	0	0	0	6
EAST LEG												
4	10	0	0	0	0	0	0	0	0	0	0	14
3	9	0	1	0	0	0	0	0	0	0	0	13
5	14	0	0	0	0	0	0	0	0	0	0	19
6	19	0	1	1	0	0	0	0	0	1	0	28
6	14	0	0	0	0	0	0	0	0	0	0	20
3	5	0	0	0	0	0	1	0	0	0	0	9
3	11	0	0	0	0	0	0	0	0	0	0	14
2	5	0	0	0	0	0	0	0	0	0	0	7
32	87	0	2	1	0	0	1	0	0	1	0	124
WEST LEG												
0	8	10	0	0	0	0	0	0	0	0	0	18
1	12	10	0	0	1	0	0	0	0	0	0	24
0	12	14	0	0	0	0	0	0	0	0	0	26
1	14	10	0	0	4	0	0	0	0	0	0	29
0	7	11	0	0	0	0	0	0	0	0	0	18
1	14	7	0	0	0	0	0	0	0	0	0	22
1	15	5	0	0	0	0	0	0	0	0	0	21
0	9	11	0	0	0	0	0	0	0	0	0	20
4	91	78	0	0	5	0	0	0	0	0	0	178

Prepared by Newport Traffic Studies

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : QUINNAULT RD
EAST-WEST STREET : POWHATTAN RD

APPLE VALLEY
02-03-21

BEGINNING TIME : 07:00AM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
NORTH LEG												
5	0	0	0	0	0	0	0	0	0	0	0	5
5	0	1	1	0	0	0	0	0	0	0	0	7
12	2	5	1	0	0	0	0	0	0	0	0	20
19	1	6	0	0	0	0	0	0	0	0	0	26
27	1	0	3	0	0	0	0	0	0	0	0	31
25	1	3	2	0	0	0	0	0	0	0	0	31
15	1	2	4	0	0	0	0	0	0	0	0	22
18	3	3	2	0	0	0	0	0	0	0	0	26
126	9	20	13	0	0	0	0	0	0	0	0	168
SOUTH LEG												
0	1	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	2	0	0	0	0	0	0	0	0	0	0	2
0	1	0	0	0	0	0	0	0	0	0	0	1
0	0	1	0	0	0	0	0	0	0	0	0	1
0	2	0	0	0	0	0	0	0	0	0	0	2
0	6	1	0	0	0	0	0	0	0	0	0	7
EAST LEG												
3	0	0	0	0	0	0	0	0	0	0	0	3
2	2	0	0	0	0	0	0	0	0	0	0	4
8	0	0	1	0	0	0	0	0	0	0	0	9
16	3	0	0	0	0	0	0	0	0	0	0	19
9	2	0	0	0	0	0	0	0	0	0	0	11
7	1	0	0	0	0	0	0	0	0	0	0	8
7	0	0	2	0	0	0	0	0	0	0	0	9
4	1	1	0	0	0	1	0	0	0	0	0	7
56	9	1	3	0	0	1	0	0	0	0	0	70
WEST LEG												
0	3	12	0	0	0	0	0	0	0	0	0	15
0	5	15	0	0	1	0	0	0	0	0	0	21
0	2	12	0	0	0	0	0	0	0	0	0	14
1	0	26	0	0	3	0	0	0	0	0	0	30
0	4	25	0	0	1	0	0	1	0	0	0	31
1	8	12	0	0	3	0	0	1	0	0	0	25
0	3	13	0	0	2	0	0	0	0	0	0	18
0	4	25	0	0	4	0	0	0	0	0	0	33
2	29	140	0	0	14	0	0	2	0	0	0	187

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: QUINNAULT RD

EAST-WEST STREET: POWHATTAN RD

TIME: 04:00PM-05:00PM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
90	8	21	Total
21	2	5	1st
25	1	5	2nd
24	1	7	3rd
20	4	4	4th

	1st	2nd	3rd	4th	Total
Rt	4	4	5	7	20
Thru	10	9	14	21	54
Lt	0	0	0	0	0

Total	1st	2nd	3rd	4th	
49	10	11	14	14	Lt
46	8	12	12	14	Thru
2	0	1	0	1	Rt

	Lt	Thru	Rt
1st	0	0	0
2nd	0	0	0
3rd	1	1	0
4th	0	1	0
Total	1	2	0

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INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: QUINNAULT RD

EAST-WEST STREET: POWHATTAN RD

TIME: 05:00PM-06:00PM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
66	8	16	Total
22	2	3	1st
12	2	6	2nd
15	2	4	3rd
17	2	3	4th

	1st	2nd	3rd	4th	Total
Rt	6	3	3	2	14
Thru	14	6	11	5	36
Lt	0	0	0	0	0

Total	1st	2nd	3rd	4th	
34	11	7	5	11	Lt
45	7	14	15	9	Thru
2	0	1	1	0	Rt

	Lt	Thru	Rt
1st	0	1	0
2nd	0	0	0
3rd	0	1	0
4th	0	1	0
Total	0	3	0

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Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↰	↱
Traffic Vol, veh/h	50	45	2	1	58	22	1	3	1	19	8	91
Future Vol, veh/h	50	45	2	1	58	22	1	3	1	19	8	91
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	1	1	1	3	9	1	25	1	1	25	1
Mvmt Flow	57	52	2	1	67	25	1	3	1	22	9	105

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	92	0	0	54	0	0	306	261	53	251	250	80
Stage 1	-	-	-	-	-	-	167	167	-	82	82	-
Stage 2	-	-	-	-	-	-	139	94	-	169	168	-
Critical Hdwy	4.2	-	-	4.11	-	-	7.11	6.75	6.21	7.11	6.75	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.75	-	6.11	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.75	-	6.11	5.75	-
Follow-up Hdwy	2.29	-	-	2.209	-	-	3.509	4.225	3.309	3.509	4.225	3.309
Pot Cap-1 Maneuver	1454	-	-	1558	-	-	648	606	1017	704	615	983
Stage 1	-	-	-	-	-	-	837	719	-	929	784	-
Stage 2	-	-	-	-	-	-	866	774	-	835	718	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1454	-	-	1558	-	-	554	581	1017	678	590	983
Mov Cap-2 Maneuver	-	-	-	-	-	-	554	581	-	678	590	-
Stage 1	-	-	-	-	-	-	804	690	-	892	783	-
Stage 2	-	-	-	-	-	-	764	773	-	797	689	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.9	0.1	10.8	9.5
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	629	1454	-	-	1558	-	-	649	983
HCM Lane V/C Ratio	0.009	0.04	-	-	0.001	-	-	0.048	0.106
HCM Control Delay (s)	10.8	7.6	0	-	7.3	0	-	10.8	9.1
HCM Lane LOS	B	A	A	-	A	A	-	B	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.1	0.4

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↱
Traffic Vol, veh/h	73	43	9	5	55	34	13	49	13	24	42	108
Future Vol, veh/h	73	43	9	5	55	34	13	49	13	24	42	108
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	1	1	1	3	9	1	25	1	1	25	1
Mvmt Flow	84	49	10	6	63	39	15	56	15	28	48	124

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	102	0	0	59	0	0	403	336	54	353	322	83
Stage 1	-	-	-	-	-	-	222	222	-	95	95	-
Stage 2	-	-	-	-	-	-	181	114	-	258	227	-
Critical Hdwy	4.2	-	-	4.11	-	-	7.11	6.75	6.21	7.11	6.75	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.75	-	6.11	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.75	-	6.11	5.75	-
Follow-up Hdwy	2.29	-	-	2.209	-	-	3.509	4.225	3.309	3.509	4.225	3.309
Pot Cap-1 Maneuver	1441	-	-	1551	-	-	560	549	1016	604	559	979
Stage 1	-	-	-	-	-	-	783	679	-	914	774	-
Stage 2	-	-	-	-	-	-	823	759	-	749	675	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1441	-	-	1551	-	-	433	514	1016	519	523	979
Mov Cap-2 Maneuver	-	-	-	-	-	-	433	514	-	519	523	-
Stage 1	-	-	-	-	-	-	736	638	-	859	771	-
Stage 2	-	-	-	-	-	-	671	756	-	632	635	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.5	0.4	12.9	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	543	1441	-	-	1551	-	-	522	979
HCM Lane V/C Ratio	0.159	0.058	-	-	0.004	-	-	0.145	0.127
HCM Control Delay (s)	12.9	7.7	0	-	7.3	0	-	13.1	9.2
HCM Lane LOS	B	A	A	-	A	A	-	B	A
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0	-	-	0.5	0.4

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	88	53	13	4	77	28	21	42	11	19	32	140
Future Vol, veh/h	88	53	13	4	77	28	21	42	11	19	32	140
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	10	1	1	1	3	9	1	25	1	1	25	1
Mvmt Flow	101	61	15	5	89	32	24	48	13	22	37	161
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	9.8	8.8	8.8	9.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	28%	57%	4%	37%	0%
Vol Thru, %	57%	34%	71%	63%	0%
Vol Right, %	15%	8%	26%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	74	154	109	51	140
LT Vol	21	88	4	19	0
Through Vol	42	53	77	32	0
RT Vol	11	13	28	0	140
Lane Flow Rate	85	177	125	59	161
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.118	0.248	0.165	0.09	0.226
Departure Headway (Hd)	5.014	5.035	4.751	5.535	5.053
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	709	710	750	645	706
Service Time	3.081	3.087	2.809	3.291	2.808
HCM Lane V/C Ratio	0.12	0.249	0.167	0.091	0.228
HCM Control Delay	8.8	9.8	8.8	8.8	9.3
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.4	1	0.6	0.3	0.9

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 9
North/South Street: QUINNAULT RD
East/West Street: POWHATTAN RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	2	Approach	45	Left	47	20
NB	Through	5	Departure	124	Through	120	51
	Right	2			Right	28	14
North leg	Left	16	Approach	261	Left	7	17
SB	Through	6	Departure	225	Through	76	52
	Right	138			Right	99	155
West leg	Left	127	Approach	158	Left	73	118
EB	Through	22	Departure	151	Through	8	19
	Right	3			Right	30	23
East leg	Left	2	Approach	78	Left	18	15
WB	Through	9	Departure	43	Through	5	8
	Right	60			Right	32	56

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	1	Approach	105	Left	14	13
NB	Through	3	Departure	74	Through	75	49
	Right	1			Right	16	13
North leg	Left	19	Approach	174	Left	22	24
SB	Through	8	Departure	164	Through	59	42
	Right	91			Right	94	108
West leg	Left	50	Approach	100	Left	58	73
EB	Through	45	Departure	155	Through	33	43
	Right	2			Right	9	9
East leg	Left	1	Approach	82	Left	6	5
WB	Through	58	Departure	71	Through	46	55
	Right	22			Right	31	34

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 9
North/South Street: QUINNAULT RD
East/West Street: POWHATTAN RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	2	Approach	47	Left	11	8
NB	Through	5	Departure	115	Through	23	19
	Right	2			Right	7	7
North leg	Left	16	Approach	254	Left	12	18
SB	Through	6	Departure	225	Through	59	44
	Right	138			Right	151	176
West leg	Left	127	Approach	257	Left	160	175
EB	Through	22	Departure	170	Through	22	28
	Right	3			Right	41	26
East leg	Left	2	Approach	75	Left	15	13
WB	Through	9	Departure	41	Through	8	10
	Right	60			Right	42	59

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	1	Approach	99	Left	41	21
NB	Through	3	Departure	64	Through	59	42
	Right	1			Right	12	11
North leg	Left	19	Approach	163	Left	9	19
SB	Through	8	Departure	159	Through	38	32
	Right	91			Right	139	140
West leg	Left	50	Approach	138	Left	86	88
EB	Through	45	Departure	254	Through	47	53
	Right	2			Right	22	13
East leg	Left	1	Approach	81	Left	4	4
WB	Through	58	Departure	68	Through	74	77
	Right	22			Right	14	28

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : OTTOWA RD
N/S STREET : QUINNAULT RD

INTERSECTION : 10
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
OTTOWA RD			
EB LEFT	8	53	50
EB THRU	51	74	76
EB RIGHT	0	0	0
WB LEFT	0	0	0
WB THRU	35	52	51
WB RIGHT	2	14	14
QUINNAULT RD			
NB LEFT	0	0	0
NB THRU	0	0	0
NB RIGHT	0	0	0
SB LEFT	5	10	9
SB THRU	0	0	0
SB RIGHT	6	12	10
TOTALS	**107**	**215**	**210**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : OTTOWA RD
CONDITION : AM PEAK HOUR

N/S STREET : QUINNAULT RD
PHF : 0.78
COVID FACTOR : 45%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
2	0	0	0	0	0	0	0	0	0	0	0
0	0	2	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	9	0	0	1	0	0	0	0	0	0	0
1	6	0	0	1	0	0	0	0	0	0	0
0	3	0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0	3	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	9	0	0	1	0	0	0	0	0	0	0
0	11	2	0	0	0	0	0	0	0	0	0
0	5	2	0	0	0	0	0	0	0	0	0
0	8	1	0	0	0	0	0	0	0	1	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
OTTOWA RD					
EB LEFT	0	5	**5**	**1%**	**8**
EB THRU	2	33	**35**	**6%**	**51**
EB RIGHT	0	0	**0**	**0%**	**0**
WB LEFT	0	0	**0**	**0%**	**0**
WB THRU	6	18	**24**	**25%**	**35**
WB RIGHT	0	1	**1**	**1%**	**2**
QUINNAULT RD					
NB LEFT	0	0	**0**	**0%**	**0**
NB THRU	0	0	**0**	**0%**	**0**
NB RIGHT	0	0	**0**	**0%**	**0**
SB LEFT	0	3	**3**	**1%**	**5**
SB THRU	0	0	**0**	**0%**	**0**
SB RIGHT	0	4	**4**	**1%**	**6**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: QUINNAULT RD
EAST-WEST STREET: OTTOWA RD
JURISDICTION: APPLE VALLEY

DATE: 02-03-21

PEAK HOUR: 07:30AM

NORTH LEG

TOTAL: 7

Rt	Thru	Lt	
4		3	Total
2		0	1st
0		2	2nd
0		1	3rd
2		0	4th

EAST LEG TOTAL: 25

	1st	2nd	3rd	4th	Total
Rt	0	1	0	0	1
Thru	10	7	4	3	24
Lt					

WEST LEG TOTAL: 40

Total	1st	2nd	3rd	4th	
5	0	2	2	1	Lt
35	10	11	5	9	Thru
					Rt

SOUTH LEG

TOTAL: 0

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

PEAK HOUR FACTORS

NORTH LEG = 0.88
SOUTH LEG =
EAST LEG = 0.63
WEST LEG = 0.77

ALL LEGS = 0.78

HOUR TOTAL: 72

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : QUINNAULT RD

EAST-WEST STREET : OTTOWA RD

APPLE VALLEY

02-03-21

BEGINNING TIME : 04:00PM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
NORTH LEG												
0	0	2	0	0	0	0	0	0	0	0	0	2
1	0	0	0	0	0	0	0	0	1	0	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	2	0	0	0	0	0	0	0	0	0	3
1	0	1	0	0	0	0	0	0	0	0	0	2
2	0	1	0	0	0	0	0	0	0	0	0	3
1	0	2	0	0	0	0	0	0	0	0	0	3
2	0	0	0	0	0	0	0	0	0	0	0	2
8	0	8	0	0	0	0	0	0	1	0	0	17
SOUTH LEG												
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
EAST LEG												
0	6	0	0	0	0	0	0	0	0	0	0	6
0	10	0	0	0	0	0	0	0	0	0	0	10
0	10	0	0	0	0	0	0	0	0	0	0	10
0	12	0	0	0	0	0	0	0	0	0	0	12
0	11	0	0	0	0	0	0	0	0	0	0	11
0	9	0	0	0	0	0	0	0	0	0	0	9
1	3	0	0	0	0	0	0	0	0	0	0	4
1	7	0	0	0	0	0	0	0	0	0	0	8
2	68	0	0	0	0	0	0	0	0	0	0	70
WEST LEG												
0	10	0	0	0	0	0	0	0	0	0	0	10
0	8	0	0	0	0	0	0	0	0	0	0	8
0	8	2	0	0	0	0	0	0	0	0	0	10
0	10	1	0	0	0	0	0	0	0	0	0	11
0	7	1	0	0	0	0	0	0	0	0	0	8
0	6	0	0	0	0	0	0	0	0	0	0	6
0	2	0	0	0	0	0	0	0	0	0	0	2
0	4	0	0	0	0	0	0	0	0	0	0	4
0	55	4	0	0	0	0	0	0	0	0	0	59

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: QUINNAULT RD

EAST-WEST STREET: OTTOWA RD

TIME: 07:00AM-08:00AM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
2		2	Total
0		0	1st
0		0	2nd
2		0	3rd
0		2	4th

	1st	2nd	3rd	4th	Total
Rt	0	1	0	1	2
Thru	5	2	10	7	24
Lt					

Total	1st	2nd	3rd	4th	
3	1	0	0	2	Lt
30	3	6	10	11	Thru
					Rt

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: QUINNAULT RD

EAST-WEST STREET: OTTOWA RD

TIME: 08:00AM-09:00AM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
2		6	Total
0		1	1st
2		0	2nd
0		1	3rd
0		4	4th

	1st	2nd	3rd	4th	Total
Rt	0	0	1	0	1
Thru	4	3	9	6	22
Lt					

Total	1st	2nd	3rd	4th	
5	2	1	0	2	Lt
24	5	9	4	6	Thru
					Rt

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

Prepared by NEWPORT TRAFFIC STUDIES

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	51	35	2	5	6
Future Vol, veh/h	8	51	35	2	5	6
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	78	78	78	78	78	78
Heavy Vehicles, %	1	6	25	1	1	1
Mvmt Flow	10	65	45	3	6	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	48	0	-	0	132	47
Stage 1	-	-	-	-	47	-
Stage 2	-	-	-	-	85	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1566	-	-	-	864	1025
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	941	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1566	-	-	-	858	1025
Mov Cap-2 Maneuver	-	-	-	-	858	-
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	941	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1566	-	-	-	942
HCM Lane V/C Ratio	0.007	-	-	-	0.015
HCM Control Delay (s)	7.3	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	53	74	52	14	10	12
Future Vol, veh/h	53	74	52	14	10	12
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	78	78	78	78	78	78
Heavy Vehicles, %	1	6	25	1	1	1
Mvmt Flow	68	95	67	18	13	15

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	85	0	-	0	307	76
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	231	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1518	-	-	-	687	988
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	810	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1518	-	-	-	655	988
Mov Cap-2 Maneuver	-	-	-	-	655	-
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	810	-

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1518	-	-	-	803
HCM Lane V/C Ratio	0.045	-	-	-	0.035
HCM Control Delay (s)	7.5	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	76	51	14	9	10
Future Vol, veh/h	50	76	51	14	9	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	6	25	1	1	1
Mvmt Flow	54	83	55	15	10	11
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.9	7.8	7.3
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	40%	0%	47%
Vol Thru, %	60%	78%	0%
Vol Right, %	0%	22%	53%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	126	65	19
LT Vol	50	0	9
Through Vol	76	51	0
RT Vol	0	14	10
Lane Flow Rate	137	71	21
Geometry Grp	1	1	1
Degree of Util (X)	0.155	0.085	0.024
Departure Headway (Hd)	4.085	4.334	4.155
Convergence, Y/N	Yes	Yes	Yes
Cap	877	824	867
Service Time	2.115	2.374	2.155
HCM Lane V/C Ratio	0.156	0.086	0.024
HCM Control Delay	7.9	7.8	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.5	0.3	0.1

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : OTTOWA RD
N/S STREET : QUINNAULT RD

INTERSECTION : 10
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
OTTOWA RD			
EB LEFT	4	23	21
EB THRU	33	50	50
EB RIGHT	0	0	0
WB LEFT	0	0	0
WB THRU	43	74	71
WB RIGHT	1	5	4
QUINNAULT RD			
NB LEFT	0	0	0
NB THRU	0	0	0
NB RIGHT	0	0	0
SB LEFT	3	25	21
SB THRU	0	0	0
SB RIGHT	4	45	38
TOTALS	**88**	**222**	**205**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : OTTOWA RD
CONDITION : PM PEAK HOUR

N/S STREET : QUINNAULT RD
PHF : 0.84
COVID FACTOR : 0%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	0	0	0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	0	0	0	0
1	0	2	0	0	0	0	0	0	0	0	0
1	0	1	0	0	0	0	0	0	0	0	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	10	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0
0	12	0	0	0	0	0	0	0	0	0	0
0	11	0	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	8	0	0	0	0	0	0	0	0	0	0
0	8	2	0	0	0	0	0	0	0	0	0
0	10	1	0	0	0	0	0	0	0	0	0
0	7	1	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
OTTOWA RD					
EB LEFT	0	4	**4**	**1%**	**4**
EB THRU	0	33	**33**	**1%**	**33**
EB RIGHT	0	0	**0**	**0%**	**0**
WB LEFT	0	0	**0**	**0%**	**0**
WB THRU	0	43	**43**	**1%**	**43**
WB RIGHT	0	0	**0**	**1%**	**1**
QUINNAULT RD					
NB LEFT	0	0	**0**	**0%**	**0**
NB THRU	0	0	**0**	**0%**	**0**
NB RIGHT	0	0	**0**	**0%**	**0**
SB LEFT	0	3	**3**	**1%**	**3**
SB THRU	0	0	**0**	**0%**	**0**
SB RIGHT	1	3	**4**	**25%**	**4**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: QUINNAULT RD
EAST-WEST STREET: OTTOWA RD
JURISDICTION: APPLE VALLEY

DATE: 02-03-21

PEAK HOUR: 04:15PM

NORTH LEG

TOTAL: 7

Rt	Thru	Lt	
4		3	Total
2		0	1st
0		0	2nd
1		2	3rd
1		1	4th

EAST LEG TOTAL: 43

	1st	2nd	3rd	4th	Total
Rt	0	0	0	0	
Thru	10	10	12	11	43
Lt					

WEST LEG TOTAL: 37

Total	1st	2nd	3rd	4th	
4	0	2	1	1	Lt
33	8	8	10	7	Thru
					Rt

PEAK HOUR FACTORS

NORTH LEG = 0.58
SOUTH LEG =
EAST LEG = 0.90
WEST LEG = 0.84

ALL LEGS = 0.84

SOUTH LEG

TOTAL: 0

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

HOUR TOTAL: 87

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : QUINNAULT RD
EAST-WEST STREET : OTTOWA ERD

APPLE VALLEY
02-03-21

BEGINNING TIME : 07:00AM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
NORTH LEG												
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	2
0	0	2	0	0	0	0	0	0	0	0	0	2
0	0	1	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	2
0	0	1	0	0	0	0	0	0	0	0	0	1
0	0	4	0	0	0	0	0	0	0	0	0	4
4	0	8	0	0	0	0	0	0	0	0	0	12
SOUTH LEG												
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
EAST LEG												
0	5	0	0	0	0	0	0	0	0	0	0	5
1	2	0	0	0	0	0	0	0	0	0	0	3
0	9	0	0	1	0	0	0	0	0	0	0	10
1	6	0	0	1	0	0	0	0	0	0	0	8
0	3	0	0	0	0	0	1	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	3	0	3
1	8	0	0	1	0	0	0	0	0	0	0	10
0	6	0	0	0	0	0	0	0	0	0	0	6
3	39	0	0	3	0	0	1	0	0	3	0	49
WEST LEG												
0	3	1	0	0	0	0	0	0	0	0	0	4
0	4	0	0	2	0	0	0	0	0	0	0	6
0	9	0	0	1	0	0	0	0	0	0	0	10
0	11	2	0	0	0	0	0	0	0	0	0	13
0	5	2	0	0	0	0	0	0	0	0	0	7
0	8	1	0	0	0	0	0	0	0	1	0	10
0	2	0	0	1	0	0	1	0	0	0	0	4
0	6	2	0	0	0	0	0	0	0	0	0	8
0	48	8	0	4	0	0	1	0	0	1	0	62

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: QUINNAULT RD

EAST-WEST STREET: OTTOWA RD

TIME: 04:00PM-05:00PM DATE: 02-03-21

NORTH LEG

3		4	Total
0		2	1st
2		0	2nd
0		0	3rd
1		2	4th
Rt	Thru	Lt	

	1st	2nd	3rd	4th	Total
Rt	0	0	0	0	0
Thru	6	10	10	12	38
Lt					

Total	1st	2nd	3rd	4th	
3	0	0	2	1	Lt
36	10	8	8	10	Thru
					Rt

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: QUINNAULT RD

EAST-WEST STREET: OTTOWA RD

TIME: 05:00PM-06:00PM DATE: 02-03-21

NORTH LEG

Rt	Thru	Lt	
6		4	Total
1		1	1st
2		1	2nd
1		2	3rd
2		0	4th

	1st	2nd	3rd	4th	Total
Rt	0	0	1	1	2
Thru	11	9	3	7	30
Lt					

Total	1st	2nd	3rd	4th	
1	1	0	0	0	Lt
19	7	6	2	4	Thru
					Rt

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

Prepared by NEWPORT TRAFFIC STUDIES

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	33	43	1	3	4
Future Vol, veh/h	4	33	43	1	3	4
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	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	0	1	25
Mvmt Flow	5	39	51	1	4	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	52	0	-	0	101	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	49	-
Critical Hdwy	4.11	-	-	-	6.41	6.45
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.525
Pot Cap-1 Maneuver	1560	-	-	-	900	954
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	976	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1560	-	-	-	897	954
Mov Cap-2 Maneuver	-	-	-	-	897	-
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	976	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1560	-	-	-	929
HCM Lane V/C Ratio	0.003	-	-	-	0.009
HCM Control Delay (s)	7.3	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	23	50	74	5	25	45
Future Vol, veh/h	23	50	74	5	25	45
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	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	0	1	25
Mvmt Flow	27	60	88	6	30	54

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	94	0	-	0	205	91
Stage 1	-	-	-	-	91	-
Stage 2	-	-	-	-	114	-
Critical Hdwy	4.11	-	-	-	6.41	6.45
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.525
Pot Cap-1 Maneuver	1506	-	-	-	786	907
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	913	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1506	-	-	-	771	907
Mov Cap-2 Maneuver	-	-	-	-	771	-
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	913	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1506	-	-	-	853
HCM Lane V/C Ratio	0.018	-	-	-	0.098
HCM Control Delay (s)	7.4	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	50	71	4	21	38
Future Vol, veh/h	21	50	71	4	21	38
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	1	1	1	0	1	25
Mvmt Flow	25	60	85	5	25	45
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	7.6	7.3
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	0%	36%
Vol Thru, %	70%	95%	0%
Vol Right, %	0%	5%	64%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	71	75	59
LT Vol	21	0	21
Through Vol	50	71	0
RT Vol	0	4	38
Lane Flow Rate	85	89	70
Geometry Grp	1	1	1
Degree of Util (X)	0.098	0.101	0.076
Departure Headway (Hd)	4.166	4.072	3.898
Convergence, Y/N	Yes	Yes	Yes
Cap	855	875	905
Service Time	2.214	2.12	1.983
HCM Lane V/C Ratio	0.099	0.102	0.077
HCM Control Delay	7.7	7.6	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	0.3	0.2

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 10
North/South Street: QUINNAULT RD
East/West Street: OTTOWA RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	17	Left	0	0
NB	Through	0	Departure	22	Through	0	0
	Right	0			Right	0	0
North leg	Left	5	Approach	24	Left	10	10
SB	Through	0	Departure	90	Through	0	0
	Right	6			Right	13	12
West leg	Left	8	Approach	126	Left	70	53
EB	Through	51	Departure	57	Through	54	74
	Right	0			Right	0	0
East leg	Left	0	Approach	66	Left	0	0
WB	Through	35	Departure	64	Through	44	52
	Right	2			Right	20	14

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	18	Left	0	0
NB	Through	0	Departure	19	Through	0	0
	Right	0			Right	0	0
North leg	Left	3	Approach	96	Left	27	25
SB	Through	0	Departure	36	Through	0	0
	Right	4			Right	69	45
West leg	Left	4	Approach	66	Left	31	23
EB	Through	33	Departure	122	Through	34	50
	Right	0			Right	0	0
East leg	Left	0	Approach	58	Left	0	0
WB	Through	43	Departure	61	Through	53	74
	Right	1			Right	5	5

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 10
North/South Street: QUINNAULT RD
East/West Street: OTTOWA RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	21	Left	0	0
NB	Through	0	Departure	26	Through	0	0
	Right	0			Right	0	0
North leg	Left	5	Approach	20	Left	9	9
SB	Through	0	Departure	84	Through	0	0
	Right	6			Right	10	10
West leg	Left	8	Approach	126	Left	64	50
EB	Through	51	Departure	53	Through	58	76
	Right	0			Right	0	0
East leg	Left	0	Approach	66	Left	0	0
WB	Through	35	Departure	67	Through	43	51
	Right	2			Right	20	14

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	20	Left	0	0
NB	Through	0	Departure	24	Through	0	0
	Right	0			Right	0	0
North leg	Left	3	Approach	80	Left	21	21
SB	Through	0	Departure	33	Through	0	0
	Right	4			Right	58	38
West leg	Left	4	Approach	67	Left	29	21
EB	Through	33	Departure	112	Through	37	50
	Right	0			Right	0	0
East leg	Left	0	Approach	58	Left	0	0
WB	Through	43	Departure	58	Through	54	71
	Right	1			Right	4	4

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : POWHATTAN RD WEST
N/S STREET : NAVAJO RD

INTERSECTION : 11
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
POWHATTAN RD WEST			
EB LEFT	18	40	32
EB THRU	0	0	0
EB RIGHT	22	21	34
WB LEFT	0	0	0
WB THRU	0	0	0
WB RIGHT	0	0	0
NAVAJO RD			
NB LEFT	40	37	54
NB THRU	305	422	497
NB RIGHT	0	0	0
SB LEFT	0	0	0
SB THRU	312	371	408
SB RIGHT	18	33	23
TOTALS	**715**	**924**	**1048**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : POWHATTAN RD WEST
CONDITION : AM PEAK HOUR
N/S STREET : NAVAJO RD
PHF : 0.80
COVID FACTOR : 45%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
3	46	0	0	2	0	0	1	0	0	1	0
1	49	0	1	0	0	0	0	0	0	0	0
5	47	0	0	4	0	0	1	0	0	0	0
2	59	0	0	3	0	0	2	0	0	0	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	51	4	0	1	0	0	0	0	0	1	0
0	46	7	0	2	0	0	0	0	0	2	0
0	34	6	0	3	0	0	2	0	0	0	0
0	63	7	0	3	1	0	1	0	0	1	2

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
3	0	0	0	0	0	0	0	0	0	0	0
4	0	4	0	0	0	0	0	0	0	0	0
3	0	3	0	0	0	0	0	0	0	0	0
3	0	5	2	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
POWHATTAN RD WEST					
EB LEFT	0	12	**12**	**1%**	**18**
EB THRU	0	0	**0**	**0%**	**0**
EB RIGHT	2	13	**15**	**13%**	**22**
WB LEFT	0	0	**0**	**0%**	**0**
WB THRU	0	0	**0**	**0%**	**0**
WB RIGHT	0	0	**0**	**0%**	**0**
NAVAJO RD					
NB LEFT	3	24	**27**	**11%**	**40**
NB THRU	16	194	**210**	**8%**	**305**
NB RIGHT	0	0	**0**	**0%**	**0**
SB LEFT	0	0	**0**	**0%**	**0**
SB THRU	14	201	**215**	**7%**	**312**
SB RIGHT	1	11	**12**	**8%**	**18**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: NAVAJO RD
EAST-WEST STREET: POWHATTAN RD W
JURISDICTION: APPLE VALLEY

DATE: 02-04-21

PEAK HOUR: 08:00AM

NORTH LEG

TOTAL: 227

Rt	Thru	Lt	
12	215		Total
3	50		1st
2	49		2nd
5	52		3rd
2	64		4th

EAST LEG TOTAL: 0

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

WEST LEG TOTAL: 27

Total	1st	2nd	3rd	4th	
12	0	4	3	5	Lt
					Thru
15	3	4	3	5	Rt

SOUTH LEG

TOTAL: 237

	Lt	Thru	Rt
1st	4	53	
2nd	7	50	
3rd	6	39	
4th	10	68	
Total	27	210	

PEAK HOUR FACTORS

NORTH LEG = 0.86
SOUTH LEG = 0.76
EAST LEG =
WEST LEG = 0.68

ALL LEGS = 0.80

HOUR TOTAL: 491

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : NAVAJO RD

EAST-WEST STREET : POWHATTAN RD W

APPLE VALLEY

02-04-21

BEGINNING TIME : 07:00AM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
NORTH LEG												
1	42	0	0	2	0	0	0	0	0	0	0	45
2	46	0	0	2	0	0	1	0	0	1	0	52
2	39	0	0	2	0	0	2	0	1	0	0	46
1	48	0	0	3	0	1	0	0	0	2	0	55
3	46	0	0	2	0	0	1	0	0	1	0	53
1	49	0	1	0	0	0	0	0	0	0	0	51
5	47	0	0	4	0	0	1	0	0	0	0	57
2	59	0	0	3	0	0	2	0	0	0	0	66
17	376	0	1	18	0	1	7	0	1	4	0	425
SOUTH LEG												
0	32	2	0	1	0	0	0	0	0	0	0	35
0	37	2	0	2	0	0	2	0	0	2	1	46
0	66	7	0	1	0	0	0	0	0	1	0	75
0	50	4	0	3	0	0	3	0	0	1	0	61
0	51	4	0	1	0	0	0	0	0	1	0	57
0	46	7	0	2	0	0	0	0	0	2	0	57
0	34	6	0	3	0	0	2	0	0	0	0	45
0	63	7	0	3	1	0	1	0	0	1	2	78
0	379	39	0	16	1	0	8	0	0	8	3	454
EAST LEG												
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
WEST LEG												
2	0	2	0	0	0	0	0	0	0	0	0	4
5	0	3	0	0	0	0	0	0	0	0	0	8
4	0	2	0	0	0	0	0	0	0	0	0	6
4	0	1	0	0	0	0	0	0	0	0	0	5
3	0	0	0	0	0	0	0	0	0	0	0	3
4	0	4	0	0	0	0	0	0	0	0	0	8
3	0	3	0	0	0	0	0	0	0	0	0	6
3	0	5	2	0	0	0	0	0	0	0	0	10
28	0	20	2	0	0	0	0	0	0	0	0	50

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: POWHATTAN RD W

TIME: 07:00AM-08:00AM DATE: 02-04-21

NORTH LEG

Rt	Thru	Lt	
8	190		Total
1	44		1st
2	50		2nd
3	43		3rd
2	53		4th

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

Total	1st	2nd	3rd	4th	
8	2	3	2	1	Lt
					Thru
15	2	5	4	4	Rt

	Lt	Thru	Rt
1st	2	33	
2nd	3	43	
3rd	7	68	
4th	4	57	
Total	16	201	

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: POWHATTAN RD W

TIME: 08:00AM-09:00AM DATE: 02-04-21

NORTH LEG

Rt	Thru	Lt	
12	215		Total
3	50		1st
2	49		2nd
5	52		3rd
2	64		4th

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

Total	1st	2nd	3rd	4th	
12	0	4	3	5	Lt
					Thru
15	3	4	3	5	Rt

	Lt	Thru	Rt
1st	4	53	
2nd	7	50	
3rd	6	39	
4th	10	68	
Total	27	210	

Prepared by NEWPORT TRAFFIC STUDIES

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	18	0	22	0	0	0	40	305	0	0	312	18
Future Vol, veh/h	18	0	22	0	0	0	40	305	0	0	312	18
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	-	-	-	-	-	-	80	-	-	60	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	1	0	13	0	0	0	11	8	0	0	7	8
Mvmt Flow	23	0	28	0	0	0	50	381	0	0	390	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	693	883	207	676	894	191	413	0	0	381	0	0
Stage 1	402	402	-	481	481	-	-	-	-	-	-	-
Stage 2	291	481	-	195	413	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.5	7.16	7.5	6.5	6.9	4.32	-	-	4.1	-	-
Critical Hdwy Stg 1	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4	3.43	3.5	4	3.3	2.31	-	-	2.2	-	-
Pot Cap-1 Maneuver	332	287	766	343	283	825	1081	-	-	1189	-	-
Stage 1	599	604	-	540	557	-	-	-	-	-	-	-
Stage 2	695	557	-	794	597	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	320	274	766	319	270	825	1081	-	-	1189	-	-
Mov Cap-2 Maneuver	320	274	-	319	270	-	-	-	-	-	-	-
Stage 1	571	604	-	515	531	-	-	-	-	-	-	-
Stage 2	663	531	-	765	597	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.5	0	1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1081	-	-	471	-	1189	-	-
HCM Lane V/C Ratio	0.046	-	-	0.106	-	-	-	-
HCM Control Delay (s)	8.5	-	-	13.5	0	0	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	-	0	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	0	21	0	0	0	37	422	0	0	371	33
Future Vol, veh/h	40	0	21	0	0	0	37	422	0	0	371	33
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	-	-	-	-	-	-	80	-	-	60	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	1	0	13	0	0	0	11	8	0	0	7	8
Mvmt Flow	50	0	26	0	0	0	46	528	0	0	464	41

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	841	1105	253	852	1125	264	505	0	0	528	0	0
Stage 1	485	485	-	620	620	-	-	-	-	-	-	-
Stage 2	356	620	-	232	505	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.5	7.16	7.5	6.5	6.9	4.32	-	-	4.1	-	-
Critical Hdwy Stg 1	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4	3.43	3.5	4	3.3	2.31	-	-	2.2	-	-
Pot Cap-1 Maneuver	259	213	714	256	207	741	995	-	-	1049	-	-
Stage 1	535	555	-	447	483	-	-	-	-	-	-	-
Stage 2	637	483	-	756	544	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	250	203	714	238	197	741	995	-	-	1049	-	-
Mov Cap-2 Maneuver	250	203	-	238	197	-	-	-	-	-	-	-
Stage 1	510	555	-	426	461	-	-	-	-	-	-	-
Stage 2	608	461	-	728	544	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.6	0	0.7	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	995	-	-	322	-	1049	-	-
HCM Lane V/C Ratio	0.046	-	-	0.237	-	-	-	-
HCM Control Delay (s)	8.8	-	-	19.6	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	-	0	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	0	34	0	0	0	54	497	0	0	408	23
Future Vol, veh/h	32	0	34	0	0	0	54	497	0	0	408	23
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	-	-	-	-	-	-	80	-	-	60	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	0	13	0	0	0	11	8	0	0	7	8
Mvmt Flow	35	0	37	0	0	0	59	540	0	0	443	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	844	1114	234	880	1126	270	468	0	0	540	0	0
Stage 1	456	456	-	658	658	-	-	-	-	-	-	-
Stage 2	388	658	-	222	468	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.5	7.16	7.5	6.5	6.9	4.32	-	-	4.1	-	-
Critical Hdwy Stg 1	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4	3.43	3.5	4	3.3	2.31	-	-	2.2	-	-
Pot Cap-1 Maneuver	258	210	735	245	207	734	1029	-	-	1039	-	-
Stage 1	556	572	-	424	464	-	-	-	-	-	-	-
Stage 2	610	464	-	766	565	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	247	198	735	222	195	734	1029	-	-	1039	-	-
Mov Cap-2 Maneuver	247	198	-	222	195	-	-	-	-	-	-	-
Stage 1	524	572	-	400	438	-	-	-	-	-	-	-
Stage 2	575	438	-	727	565	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.9	0	0.9	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1029	-	-	375	-	1039	-	-
HCM Lane V/C Ratio	0.057	-	-	0.191	-	-	-	-
HCM Control Delay (s)	8.7	-	-	16.9	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	-	0	-	-

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : POWHATTAN RD WEST
N/S STREET : NAVAJO RD

INTERSECTION : 11
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
POWHATTAN RD WEST			
EB LEFT	28	35	38
EB THRU	0	0	0
EB RIGHT	29	35	39
WB LEFT	0	0	0
WB THRU	0	0	0
WB RIGHT	0	0	0
NAVAJO RD			
NB LEFT	64	75	83
NB THRU	448	551	595
NB RIGHT	0	0	0
SB LEFT	0	0	0
SB THRU	498	656	726
SB RIGHT	24	31	35
TOTALS	**1091**	**1383**	**1516**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : POWHATTAN RD WEST
CONDITION : PM PEAK HOUR
N/S STREET : NAVAJO RD
PHF : 0.95
COVID FACTOR : 0%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
9	126	0	0	6	0	0	0	0	0	2	0
5	123	0	0	4	0	0	1	0	0	0	0
3	110	0	0	0	0	0	1	0	0	1	0
7	123	0	0	0	0	0	1	0	0	0	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	84	16	0	0	0	0	1	0	0	1	0
0	103	21	0	1	0	0	0	0	0	1	0
0	138	14	0	2	0	0	0	0	0	0	0
0	115	13	0	0	0	0	0	0	0	2	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
4	0	8	0	0	0	0	0	0	0	0	0
10	0	7	0	0	0	0	0	0	0	0	0
11	0	8	0	0	0	0	0	0	0	0	0
4	0	5	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
POWHATTAN RD WEST					
EB LEFT	0	28	**28**	**1%**	**28**
EB THRU	0	0	**0**	**0%**	**0**
EB RIGHT	0	29	**29**	**1%**	**29**
WB LEFT	0	0	**0**	**0%**	**0**
WB THRU	0	0	**0**	**0%**	**0**
WB RIGHT	0	0	**0**	**0%**	**0**
NAVAJO RD					
NB LEFT	0	64	**64**	**1%**	**64**
NB THRU	8	440	**448**	**2%**	**448**
NB RIGHT	0	0	**0**	**0%**	**0**
SB LEFT	0	0	**0**	**0%**	**0**
SB THRU	16	482	**498**	**3%**	**498**
SB RIGHT	0	24	**24**	**1%**	**24**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: NAVAJO RD
EAST-WEST STREET: POWHATTAN RD W
JURISDICTION: APPLE VALLEY

DATE: 02-04-21

PEAK HOUR: 04:30PM

NORTH LEG

TOTAL: 522

Rt	Thru	Lt	
24	498		Total
9	134		1st
5	128		2nd
3	112		3rd
7	124		4th

EAST LEG TOTAL: 0

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

Total	1st	2nd	3rd	4th	
28	8	7	8	5	Lt
					Thru
29	4	10	11	4	Rt

WEST LEG TOTAL: 57

PEAK HOUR FACTORS

NORTH LEG = 0.91
SOUTH LEG = 0.83
EAST LEG =
WEST LEG = 0.75

ALL LEGS = 0.95

	Lt	Thru	Rt
1st	16	86	
2nd	21	105	
3rd	14	140	
4th	13	117	
Total	64	448	

SOUTH LEG

TOTAL: 512

HOUR TOTAL: 1,091

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : NAVAJO RD — APPLE VALLEY

EAST-WEST STREET : POWHATTAN RD W — 02-04-21

BEGINNING TIME : 04:00PM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
NORTH LEG												
6	102	0	0	0	0	0	0	0	0	0	0	108
4	118	0	0	1	0	0	0	0	0	0	0	123
9	126	0	0	6	0	0	0	0	0	2	0	143
5	123	0	0	4	0	0	1	0	0	0	0	133
3	110	0	0	0	0	0	1	0	0	1	0	115
7	123	0	0	0	0	0	1	0	0	0	0	131
12	88	0	0	1	0	0	0	0	0	1	0	102
15	94	0	0	2	0	0	1	0	0	0	0	112
61	884	0	0	14	0	0	4	0	0	4	0	967
SOUTH LEG												
0	83	10	0	0	0	0	0	0	0	0	0	93
0	90	11	0	1	0	0	0	0	0	1	0	103
0	84	16	0	0	0	0	1	0	0	1	0	102
0	103	21	0	1	0	0	0	0	0	1	0	126
0	138	14	0	2	0	0	0	0	0	0	0	154
0	115	13	0	0	0	0	0	0	0	2	0	130
0	105	9	0	0	0	0	0	0	0	1	0	115
0	109	11	0	1	0	0	1	0	0	0	0	122
0	827	105	0	5	0	0	2	0	0	6	0	945
EAST LEG												
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
WEST LEG												
6	0	3	0	0	0	0	0	0	0	0	0	9
2	0	1	0	0	0	0	0	0	0	0	0	3
4	0	8	0	0	0	0	0	0	0	0	0	12
10	0	7	0	0	0	0	0	0	0	0	0	17
11	0	8	0	0	0	0	0	0	0	0	0	19
4	0	5	0	0	0	0	0	0	0	0	0	9
5	0	4	0	0	0	0	0	0	0	0	0	9
1	0	4	0	0	0	0	0	0	0	0	0	5
43	0	40	0	0	0	0	0	0	0	0	0	83

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: POWHATTAN RD W

TIME: 04:00PM-05:00PM DATE: 02-04-21

NORTH LEG

Rt	Thru	Lt	
24	483		Total
6	102		1st
4	119		2nd
9	134		3rd
5	128		4th

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

Total	1st	2nd	3rd	4th	
19	3	1	8	7	Lt
					Thru
22	6	2	4	10	Rt

	Lt	Thru	Rt
1st	10	83	
2nd	11	92	
3rd	16	86	
4th	21	105	
Total	58	366	

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: POWHATTAN RD W

TIME: 05:00PM-06:00PM DATE: 02-04-21

NORTH LEG

Rt	Thru	Lt	
37	423		Total
3	112		1st
7	124		2nd
12	90		3rd
15	97		4th

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

Total	1st	2nd	3rd	4th	
21	8	5	4	4	Lt
					Thru
21	11	4	5	1	Rt

	Lt	Thru	Rt
1st	14	140	
2nd	13	117	
3rd	9	106	
4th	11	111	
Total	47	474	

Prepared by NEWPORT TRAFFIC STUDIES

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	28	0	29	0	0	0	64	448	0	0	498	24
Future Vol, veh/h	28	0	29	0	0	0	64	448	0	0	498	24
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	-	-	-	-	-	-	80	-	-	60	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	0	1	0	0	0	11	8	0	0	7	8
Mvmt Flow	29	0	31	0	0	0	67	472	0	0	524	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	907	1143	275	868	1155	236	549	0	0	472	0	0
Stage 1	537	537	-	606	606	-	-	-	-	-	-	-
Stage 2	370	606	-	262	549	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.5	6.92	7.5	6.5	6.9	4.32	-	-	4.1	-	-
Critical Hdwy Stg 1	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4	3.31	3.5	4	3.3	2.31	-	-	2.2	-	-
Pot Cap-1 Maneuver	232	202	726	250	199	772	957	-	-	1100	-	-
Stage 1	498	526	-	456	490	-	-	-	-	-	-	-
Stage 2	625	490	-	726	520	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	219	188	726	227	185	772	957	-	-	1100	-	-
Mov Cap-2 Maneuver	219	188	-	227	185	-	-	-	-	-	-	-
Stage 1	463	526	-	424	456	-	-	-	-	-	-	-
Stage 2	581	456	-	695	520	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.8	0	1.1	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	957	-	-	340	-	1100	-	-
HCM Lane V/C Ratio	0.07	-	-	0.176	-	-	-	-
HCM Control Delay (s)	9	-	-	17.8	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.6	-	0	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	0	35	0	0	0	75	551	0	0	656	31
Future Vol, veh/h	35	0	35	0	0	0	75	551	0	0	656	31
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	-	-	-	-	-	-	80	-	-	60	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	0	1	0	0	0	11	8	0	0	7	8
Mvmt Flow	37	0	37	0	0	0	79	580	0	0	691	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1156	1446	362	1084	1462	290	724	0	0	580	0	0
Stage 1	708	708	-	738	738	-	-	-	-	-	-	-
Stage 2	448	738	-	346	724	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.5	6.92	7.5	6.5	6.9	4.32	-	-	4.1	-	-
Critical Hdwy Stg 1	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4	3.31	3.5	4	3.3	2.31	-	-	2.2	-	-
Pot Cap-1 Maneuver	153	133	638	174	130	713	817	-	-	1004	-	-
Stage 1	394	441	-	380	427	-	-	-	-	-	-	-
Stage 2	562	427	-	649	433	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	142	120	638	152	117	713	817	-	-	1004	-	-
Mov Cap-2 Maneuver	142	120	-	152	117	-	-	-	-	-	-	-
Stage 1	356	441	-	343	386	-	-	-	-	-	-	-
Stage 2	508	386	-	612	433	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.6	0	1.2	0
HCM LOS	D	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	817	-	-	232	-	1004	-	-
HCM Lane V/C Ratio	0.097	-	-	0.318	-	-	-	-
HCM Control Delay (s)	9.9	-	-	27.6	0	0	-	-
HCM Lane LOS	A	-	-	D	A	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.3	-	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	0	39	0	0	0	83	595	0	0	726	35
Future Vol, veh/h	38	0	39	0	0	0	83	595	0	0	726	35
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	-	-	-	-	-	-	80	-	-	60	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	0	1	0	0	0	11	8	0	0	7	8
Mvmt Flow	40	0	41	0	0	0	87	626	0	0	764	37

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1270	1583	401	1182	1601	313	801	0	0	626	0	0
Stage 1	783	783	-	800	800	-	-	-	-	-	-	-
Stage 2	487	800	-	382	801	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.5	6.92	7.5	6.5	6.9	4.32	-	-	4.1	-	-
Critical Hdwy Stg 1	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4	3.31	3.5	4	3.3	2.31	-	-	2.2	-	-
Pot Cap-1 Maneuver	126	110	602	147	107	689	762	-	-	965	-	-
Stage 1	355	407	-	349	400	-	-	-	-	-	-	-
Stage 2	533	400	-	618	400	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	115	97	602	125	95	689	762	-	-	965	-	-
Mov Cap-2 Maneuver	115	97	-	125	95	-	-	-	-	-	-	-
Stage 1	315	407	-	309	354	-	-	-	-	-	-	-
Stage 2	472	354	-	576	400	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	36	0	1.3	0
HCM LOS	E	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	762	-	-	195	-	965	-	-
HCM Lane V/C Ratio	0.115	-	-	0.416	-	-	-	-
HCM Control Delay (s)	10.3	-	-	36	0	0	-	-
HCM Lane LOS	B	-	-	E	A	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	1.9	-	0	-	-

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 11
North/South Street: NAVAJO RD
East/West Street: POWHATTAN RD WEST

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

			Forecast Future Year				
Approach Direction		**Base Year Count**		**Link Volume**		**Turn Volume**	**Balanced Volume**
South leg	Left	40	Approach	483	Left	10	37
NB	Through	305	Departure	390	Through	398	422
	Right	0			Right	0	0
North leg	Left	0	Approach	386	Left	0	0
SB	Through	312	Departure	467	Through	384	371
	Right	18			Right	55	33
West leg	Left	18	Approach	53	Left	69	40
EB	Through	0	Departure	65	Through	0	0
	Right	22			Right	6	21
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

P.M. Peak Hour

			Forecast Future Year				
Approach Direction		**Base Year Count**		**Link Volume**		**Turn Volume**	**Balanced Volume**
South leg	Left	64	Approach	621	Left	71	75
NB	Through	448	Departure	689	Through	553	551
	Right	0			Right	0	0
North leg	Left	0	Approach	690	Left	0	0
SB	Through	498	Departure	588	Through	657	656
	Right	24			Right	31	31
West leg	Left	28	Approach	67	Left	35	35
EB	Through	0	Departure	102	Through	0	0
	Right	29			Right	32	35
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 11
North/South Street: NAVAJO RD
East/West Street: POWHATTAN RD WEST

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

			Forecast Future Year				
Approach Direction		**Base Year Count**		**Link Volume**		**Turn Volume**	**Balanced Volume**
South leg	Left	40	Approach	542	Left	49	54
NB	Through	305	Departure	440	Through	503	497
	Right	0			Right	0	0
North leg	Left	0	Approach	427	Left	0	0
SB	Through	312	Departure	537	Through	406	408
	Right	18			Right	21	23
West leg	Left	18	Approach	67	Left	34	32
EB	Through	0	Departure	70	Through	0	0
	Right	22			Right	34	34
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

P.M. Peak Hour

			Forecast Future Year				
Approach Direction		**Base Year Count**		**Link Volume**		**Turn Volume**	**Balanced Volume**
South leg	Left	64	Approach	674	Left	79	83
NB	Through	448	Departure	760	Through	597	595
	Right	0			Right	0	0
North leg	Left	0	Approach	770	Left	0	0
SB	Through	498	Departure	636	Through	725	726
	Right	24			Right	37	35
West leg	Left	28	Approach	75	Left	39	38
EB	Through	0	Departure	116	Through	0	0
	Right	29			Right	35	39
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : POWHATTAN RD EAST
N/S STREET : NAVAJO RD

INTERSECTION : 12
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
POWHATTAN RD EAST			
EB LEFT	0	0	0
EB THRU	0	0	0
EB RIGHT	0	0	0
WB LEFT	72	66	92
WB THRU	0	0	0
WB RIGHT	77	113	96
NAVAJO RD			
NB LEFT	0	0	0
NB THRU	256	348	445
NB RIGHT	82	79	152
SB LEFT	86	110	119
SB THRU	248	304	334
SB RIGHT	0	0	0
TOTALS	**821**	**1020**	**1238**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : POWHATTAN RD EAST
CONDITION : AM PEAK HOUR
N/S STREET : NAVAJO RD
PHF : 0.85
COVID FACTOR : 45%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	34	15	0	1	1	0	1	0	0	1	0
0	39	13	0	0	0	0	1	0	0	0	0
0	41	9	0	1	3	0	1	0	0	1	0
0	47	14	0	3	2	0	0	2	0	0	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
18	40	0	1	0	0	0	0	0	0	1	0
6	39	0	0	2	0	1	0	0	0	2	0
6	34	0	2	0	0	0	2	0	1	0	0
18	50	0	2	3	0	0	1	0	1	2	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
15	0	16	1	0	0	0	0	0	0	0	0
15	0	13	0	0	1	0	0	0	0	0	0
8	0	8	3	0	1	0	0	0	0	0	0
10	0	8	1	0	0	0	0	0	0	0	2

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
POWHATTAN RD EAST					
EB LEFT	0	0	**0**	**0%**	**0**
EB THRU	0	0	**0**	**0%**	**0**
EB RIGHT	0	0	**0**	**0%**	**0**
WB LEFT	4	45	**49**	**8%**	**72**
WB THRU	0	0	**0**	**0%**	**0**
WB RIGHT	5	48	**53**	**9%**	**77**
NAVAJO RD					
NB LEFT	0	0	**0**	**0%**	**0**
NB THRU	13	163	**176**	**7%**	**256**
NB RIGHT	8	48	**56**	**14%**	**82**
SB LEFT	8	51	**59**	**14%**	**86**
SB THRU	10	161	**171**	**6%**	**248**
SB RIGHT	0	0	**0**	**0%**	**0**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: NAVAJO RD
EAST-WEST STREET: POWHATTAN RD E
JURISDICTION: APPLE VALLEY

DATE: 02-04-21

PEAK HOUR: 08:00AM

NORTH LEG

TOTAL: 230

	Rt	Thru	Lt	
		171	59	Total
		37	16	1st
		40	13	2nd
		44	12	3rd
		50	18	4th

EAST LEG TOTAL: 102

	1st	2nd	3rd	4th	Total
Rt	16	15	11	11	53
Thru					
Lt	16	14	9	10	49

WEST LEG TOTAL: 0

	Total	1st	2nd	3rd	4th
Lt					
Thru					
Rt					

PEAK HOUR FACTORS

NORTH LEG = 0.85
SOUTH LEG = 0.75
EAST LEG = 0.80
WEST LEG =

ALL LEGS = 0.85

SOUTH LEG

TOTAL: 232

	Lt	Thru	Rt
1st		41	19
2nd		43	7
3rd		36	9
4th		56	21
Total		176	56

HOUR TOTAL: 564

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : NAVAJO RD

EAST-WEST STREET : POWHATTAN RD E

APPLE VALLEY

02-04-21

BEGINNING TIME : 07:00AM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
NORTH LEG												
0	35	9	0	2	0	0	0	0	0	0	0	46
0	41	11	0	1	1	0	1	0	0	1	0	56
0	33	7	0	2	1	0	2	0	0	1	0	46
0	34	17	0	1	2	0	0	0	0	2	0	56
0	34	15	0	1	1	0	1	0	0	1	0	53
0	39	13	0	0	0	0	1	0	0	0	0	53
0	41	9	0	1	3	0	1	0	0	1	0	56
0	47	14	0	3	2	0	0	2	0	0	0	68
0	304	95	0	11	10	0	6	2	0	6	0	434
SOUTH LEG												
5	30	0	0	1	0	0	0	0	1	0	0	37
7	39	0	0	1	0	0	1	0	0	1	0	49
5	65	0	1	1	0	1	0	0	0	1	0	74
16	47	0	1	3	0	0	3	0	0	0	0	70
18	40	0	1	0	0	0	0	0	0	1	0	60
6	39	0	0	2	0	1	0	0	0	2	0	50
6	34	0	2	0	0	0	2	0	1	0	0	45
18	50	0	2	3	0	0	1	0	1	2	0	77
81	344	0	7	11	0	2	7	0	3	7	0	462
EAST LEG												
4	0	5	0	0	0	0	0	0	0	0	0	9
2	0	5	1	0	0	1	0	0	0	0	0	9
7	0	6	0	0	0	1	0	1	0	0	0	15
8	0	12	0	0	0	0	0	0	0	0	0	20
15	0	16	1	0	0	0	0	0	0	0	0	32
15	0	13	0	0	1	0	0	0	0	0	0	29
8	0	8	3	0	1	0	0	0	0	0	0	20
10	0	8	1	0	0	0	0	0	0	0	2	21
69	0	73	6	0	2	2	0	1	0	0	2	155
WEST LEG												
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: POWHATTAN RD E

TIME: 07:00AM-08:00AM DATE: 02-04-21

NORTH LEG

	156	48	Total
	37	9	1st
	44	12	2nd
	38	8	3rd
	37	19	4th
Rt	Thru	Lt	

Rt	4	4	8	8	24
Thru					
Lt	5	5	7	12	29
	1st	2nd	3rd	4th	Total

Total	1st	2nd	3rd	4th	
					Lt
					Thru
					Rt

	Lt	Thru	Rt
1st		31	6
2nd		42	7
3rd		67	7
4th		53	17
Total		193	37

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: POWHATTAN RD E

TIME: 08:00AM-09:00AM DATE: 02-04-21

NORTH LEG

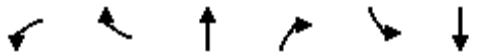
	171	59	Total
	37	16	1st
	40	13	2nd
	44	12	3rd
	50	18	4th
Rt	Thru	Lt	

Rt	16	15	11	11	53
Thru					
Lt	16	14	9	10	49
	1st	2nd	3rd	4th	Total

Total	1st	2nd	3rd	4th	
					Lt
					Thru
					Rt

	Lt	Thru	Rt
1st		41	19
2nd		43	7
3rd		36	9
4th		56	21
Total		176	56

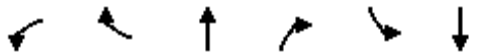
Prepared by NEWPORT TRAFFIC STUDIES



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	72	77	256	82	86	248
Future Volume (veh/h)	72	77	256	82	86	248
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1500	1488	1513	1425	1425	1525
Adj Flow Rate, veh/h	85	91	301	96	101	292
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	9	7	14	14	6
Cap, veh/h	146	129	1687	528	771	2269
Arrive On Green	0.10	0.10	0.78	0.78	0.78	0.78
Sat Flow, veh/h	1429	1261	2230	674	894	2974
Grp Volume(v), veh/h	85	91	199	198	101	292
Grp Sat Flow(s),veh/h/ln	1429	1261	1437	1391	894	1449
Q Serve(g_s), s	4.0	4.9	2.4	2.5	2.3	1.7
Cycle Q Clear(g_c), s	4.0	4.9	2.4	2.5	4.8	1.7
Prop In Lane	1.00	1.00		0.48	1.00	
Lane Grp Cap(c), veh/h	146	129	1125	1090	771	2269
V/C Ratio(X)	0.58	0.70	0.18	0.18	0.13	0.13
Avail Cap(c_a), veh/h	694	612	1125	1090	771	2269
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	30.4	1.9	1.9	2.5	1.8
Incr Delay (d2), s/veh	3.6	6.8	0.3	0.4	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.7	0.4	0.4	0.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	33.6	37.2	2.3	2.3	2.9	1.9
LnGrp LOS	C	D	A	A	A	A
Approach Vol, veh/h	176		397			393
Approach Delay, s/veh	35.4		2.3			2.2
Approach LOS	D		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		58.8			58.8	11.2
Change Period (Y+Rc), s		4.0			4.0	4.0
Max Green Setting (Gmax), s		28.0			28.0	34.0
Max Q Clear Time (g_c+I1), s		4.5			6.8	6.9
Green Ext Time (p_c), s		2.4			2.4	0.5

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	66	113	348	79	110	304
Future Volume (veh/h)	66	113	348	79	110	304
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1500	1488	1513	1425	1425	1525
Adj Flow Rate, veh/h	78	133	409	93	129	358
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	9	7	14	14	6
Cap, veh/h	196	173	1744	393	666	2169
Arrive On Green	0.14	0.14	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1429	1261	2406	525	811	2974
Grp Volume(v), veh/h	78	133	251	251	129	358
Grp Sat Flow(s),veh/h/ln	1429	1261	1437	1418	811	1449
Q Serve(g_s), s	3.5	7.1	3.7	3.8	4.0	2.5
Cycle Q Clear(g_c), s	3.5	7.1	3.7	3.8	7.8	2.5
Prop In Lane	1.00	1.00		0.37	1.00	
Lane Grp Cap(c), veh/h	196	173	1075	1061	666	2169
V/C Ratio(X)	0.40	0.77	0.23	0.24	0.19	0.17
Avail Cap(c_a), veh/h	694	612	1075	1061	666	2169
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	29.1	2.7	2.7	3.9	2.5
Incr Delay (d2), s/veh	1.3	7.0	0.5	0.5	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.4	0.8	0.8	0.6	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.9	36.1	3.2	3.2	4.5	2.7
LnGrp LOS	C	D	A	A	A	A
Approach Vol, veh/h	211		502			487
Approach Delay, s/veh	33.4		3.2			3.2
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		56.4			56.4	13.6
Change Period (Y+Rc), s		4.0			4.0	4.0
Max Green Setting (Gmax), s		28.0			28.0	34.0
Max Q Clear Time (g_c+I1), s		5.8			9.8	9.1
Green Ext Time (p_c), s		3.1			3.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	8.5
HCM 6th LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	92	96	445	152	119	334
Future Volume (veh/h)	92	96	445	152	119	334
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1500	1488	1513	1425	1425	1525
Adj Flow Rate, veh/h	100	104	484	165	129	363
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	9	7	14	14	6
Cap, veh/h	157	138	1681	569	605	2311
Arrive On Green	0.11	0.11	0.80	0.80	0.80	0.80
Sat Flow, veh/h	1429	1261	2183	714	708	2974
Grp Volume(v), veh/h	100	104	329	320	129	363
Grp Sat Flow(s),veh/h/ln	1429	1261	1437	1384	708	1449
Q Serve(g_s), s	5.8	6.9	5.2	5.3	5.1	2.5
Cycle Q Clear(g_c), s	5.8	6.9	5.2	5.3	10.3	2.5
Prop In Lane	1.00	1.00		0.52	1.00	
Lane Grp Cap(c), veh/h	157	138	1146	1104	605	2311
V/C Ratio(X)	0.64	0.75	0.29	0.29	0.21	0.16
Avail Cap(c_a), veh/h	710	627	1146	1104	605	2311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	37.4	2.3	2.3	3.7	2.0
Incr Delay (d2), s/veh	4.2	7.9	0.6	0.7	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.4	1.1	1.0	0.7	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.1	45.3	2.9	3.0	4.5	2.2
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	204		649			492
Approach Delay, s/veh	43.2		2.9			2.8
Approach LOS	D		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		73.0			73.0	13.5
Change Period (Y+Rc), s		4.0			4.0	4.0
Max Green Setting (Gmax), s		69.0			69.0	43.0
Max Q Clear Time (g_c+I1), s		7.3			12.3	8.9
Green Ext Time (p_c), s		4.8			4.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	9.0
HCM 6th LOS	A

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : POWHATTAN RD EAST
N/S STREET : NAVAJO RD

INTERSECTION : 12
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
POWHATTAN RD EAST			
EB LEFT	0	0	0
EB THRU	0	0	0
EB RIGHT	0	0	0
WB LEFT	142	157	215
WB THRU	0	0	0
WB RIGHT	158	172	199
NAVAJO RD			
NB LEFT	0	0	0
NB THRU	353	441	486
NB RIGHT	113	122	149
SB LEFT	107	121	131
SB THRU	419	554	639
SB RIGHT	0	0	0
TOTALS	**1292**	**1567**	**1819**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : POWHATTAN RD EAST
CONDITION : PM PEAK HOUR

N/S STREET : NAVAJO RD
PHF : 0.90
COVID FACTOR : 0%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	108	19	0	5	1	0	0	0	0	2	0
0	98	38	0	1	3	0	1	0	0	0	0
0	103	21	0	0	0	0	0	1	0	0	1
0	100	23	0	0	0	0	1	0	0	0	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
22	70	0	1	0	0	1	1	0	1	0	0
46	89	0	2	1	0	0	0	0	0	1	0
25	97	0	0	0	0	0	0	0	0	0	0
15	93	0	0	0	0	0	0	0	0	1	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
33	0	42	0	0	0	0	0	1	0	0	0
37	0	28	0	0	0	0	0	0	0	0	0
55	0	52	2	0	1	0	0	0	0	0	0
30	0	18	0	0	0	0	0	0	1	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
POWHATTAN RD EAST					
EB LEFT	0	0	**0**	**0%**	**0**
EB THRU	0	0	**0**	**0%**	**0**
EB RIGHT	0	0	**0**	**0%**	**0**
WB LEFT	2	140	**142**	**1%**	**142**
WB THRU	0	0	**0**	**0%**	**0**
WB RIGHT	3	155	**158**	**2%**	**158**
NAVAJO RD					
NB LEFT	0	0	**0**	**0%**	**0**
NB THRU	4	349	**353**	**1%**	**353**
NB RIGHT	5	108	**113**	**4%**	**113**
SB LEFT	6	101	**107**	**6%**	**107**
SB THRU	10	409	**419**	**2%**	**419**
SB RIGHT	0	0	**0**	**0%**	**0**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: NAVAJO RD
EAST-WEST STREET: POWHATTAN RD E
JURISDICTION: APPLE VALLEY

DATE: 02-04-21

PEAK HOUR: 04:30PM

NORTH LEG

TOTAL: 526

	419	107	Total
	115	20	1st
	100	41	2nd
	103	23	3rd
	101	23	4th
Rt	Thru	Lt	

EAST LEG TOTAL: 300

Rt	33	37	57	31	158
Thru					
Lt	43	28	53	18	142
	1st	2nd	3rd	4th	Total

WEST LEG TOTAL: 0

Total	1st	2nd	3rd	4th	
					Lt
					Thru
					Rt

PEAK HOUR FACTORS

NORTH LEG = 0.93
SOUTH LEG = 0.84
EAST LEG = 0.68
WEST LEG =

ALL LEGS = 0.90

SOUTH LEG

TOTAL: 466

	Lt	Thru	Rt
1st		71	25
2nd		91	48
3rd		97	25
4th		94	15
Total		353	113

HOUR TOTAL: 1,292

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : NAVAJO RD — APPLE VALLEY

EAST-WEST STREET : POWHATTAN RD E — 02-04-21

BEGINNING TIME : 04:00PM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
NORTH LEG												
0	93	16	0	0	0	0	0	0	0	0	0	109
0	99	22	0	2	0	0	0	0	0	0	0	123
0	108	19	0	5	1	0	0	0	0	2	0	135
0	98	38	0	1	3	0	1	0	0	0	0	141
0	103	21	0	0	0	0	0	1	0	0	1	126
0	100	23	0	0	0	0	1	0	0	0	0	124
0	86	13	0	0	1	0	0	0	0	0	1	101
0	79	12	0	0	2	0	1	0	0	0	0	94
0	766	164	0	8	7	0	3	1	0	2	2	953
SOUTH LEG												
25	66	0	0	0	0	0	0	0	0	0	0	91
20	70	0	1	1	0	0	0	0	0	1	0	93
22	70	0	1	0	0	1	1	0	1	0	0	96
46	89	0	2	1	0	0	0	0	0	1	0	139
25	97	0	0	0	0	0	0	0	0	0	0	122
15	93	0	0	0	0	0	0	0	0	1	0	109
19	81	0	1	0	0	0	0	0	0	1	0	102
19	87	0	1	0	0	0	1	0	0	0	0	108
191	653	0	6	2	0	1	2	0	1	4	0	860
EAST LEG												
28	0	27	0	0	0	0	0	0	0	0	0	55
30	0	32	0	0	0	0	0	0	0	0	0	62
33	0	42	0	0	0	0	0	1	0	0	0	76
37	0	28	0	0	0	0	0	0	0	0	0	65
55	0	52	2	0	1	0	0	0	0	0	0	110
30	0	18	0	0	0	0	0	0	1	0	0	49
36	0	31	0	0	0	0	0	0	0	0	0	67
31	0	46	1	0	0	0	0	0	0	0	0	78
280	0	276	3	0	1	0	0	1	1	0	0	562
WEST LEG												
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: POWHATTAN RD E

TIME: 04:00PM-05:00PM DATE: 02-04-21

NORTH LEG

	409	99	Total
	93	16	1st
	101	22	2nd
	115	20	3rd
	100	41	4th
	Rt	Thru	Lt

Rt	28	30	33	37	128
Thru					
Lt	27	32	43	28	130
	1st	2nd	3rd	4th	Total

Total	1st	2nd	3rd	4th	
					Lt
					Thru
					Rt

	Lt	Thru	Rt
1st		66	25
2nd		72	21
3rd		71	25
4th		91	48
Total		300	119

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INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: POWHATTAN RD E

TIME: 05:00PM-06:00PM **DATE: 02-04-21**

NORTH LEG

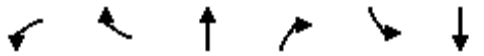
	370	75	Total
	103	23	1st
	101	23	2nd
	86	15	3rd
	80	14	4th
	Rt	Thru	Lt

Rt	57	31	36	32	156
Thru					
Lt	53	18	31	46	148
	1st	2nd	3rd	4th	Total

Total	1st	2nd	3rd	4th	
					Lt
					Thru
					Rt

	Lt	Thru	Rt
1st		97	25
2nd		94	15
3rd		82	20
4th		88	20
Total		361	80

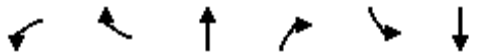
Prepared by NEWPORT TRAFFIC STUDIES



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	142	158	353	113	107	419
Future Volume (veh/h)	142	158	353	113	107	419
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1588	1575	1575	1550	1575	1525
Adj Flow Rate, veh/h	158	176	392	126	119	466
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	2	2	4	2	6
Cap, veh/h	256	226	1600	508	681	2076
Arrive On Green	0.17	0.17	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1512	1335	2313	710	883	2974
Grp Volume(v), veh/h	158	176	261	257	119	466
Grp Sat Flow(s),veh/h/ln	1512	1335	1496	1447	883	1449
Q Serve(g_s), s	6.8	8.8	4.2	4.3	3.8	3.8
Cycle Q Clear(g_c), s	6.8	8.8	4.2	4.3	8.0	3.8
Prop In Lane	1.00	1.00		0.49	1.00	
Lane Grp Cap(c), veh/h	256	226	1072	1037	681	2076
V/C Ratio(X)	0.62	0.78	0.24	0.25	0.17	0.22
Avail Cap(c_a), veh/h	734	648	1072	1037	681	2076
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	27.8	3.4	3.4	4.8	3.4
Incr Delay (d2), s/veh	2.4	5.7	0.5	0.6	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	3.0	1.0	1.0	0.6	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.4	33.5	4.0	4.0	5.4	3.6
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	334		518			585
Approach Delay, s/veh	31.6		4.0			4.0
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		54.1			54.1	15.9
Change Period (Y+Rc), s		4.0			4.0	4.0
Max Green Setting (Gmax), s		28.0			28.0	34.0
Max Q Clear Time (g_c+I1), s		6.3			10.0	10.8
Green Ext Time (p_c), s		3.2			3.6	1.0

Intersection Summary		
HCM 6th Ctrl Delay	10.4	
HCM 6th LOS	B	



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	157	172	441	122	121	554
Future Volume (veh/h)	157	172	441	122	121	554
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1588	1575	1575	1550	1575	1525
Adj Flow Rate, veh/h	174	191	490	136	134	616
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	2	2	4	2	6
Cap, veh/h	274	242	1632	450	602	2041
Arrive On Green	0.18	0.18	0.70	0.70	0.70	0.70
Sat Flow, veh/h	1512	1335	2396	639	799	2974
Grp Volume(v), veh/h	174	191	315	311	134	616
Grp Sat Flow(s),veh/h/ln	1512	1335	1496	1460	799	1449
Q Serve(g_s), s	7.5	9.6	5.5	5.6	5.3	5.6
Cycle Q Clear(g_c), s	7.5	9.6	5.5	5.6	10.9	5.6
Prop In Lane	1.00	1.00		0.44	1.00	
Lane Grp Cap(c), veh/h	274	242	1054	1028	602	2041
V/C Ratio(X)	0.63	0.79	0.30	0.30	0.22	0.30
Avail Cap(c_a), veh/h	734	648	1054	1028	602	2041
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	27.4	3.9	3.9	5.9	3.9
Incr Delay (d2), s/veh	2.4	5.6	0.7	0.8	0.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.3	1.4	1.4	0.9	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.9	33.0	4.6	4.6	6.8	4.3
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	365		626			750
Approach Delay, s/veh	31.1		4.6			4.7
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		53.3			53.3	16.7
Change Period (Y+Rc), s		4.0			4.0	4.0
Max Green Setting (Gmax), s		28.0			28.0	34.0
Max Q Clear Time (g_c+I1), s		7.6			12.9	11.6
Green Ext Time (p_c), s		3.9			4.6	1.2

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	215	199	486	149	131	639
Future Volume (veh/h)	215	199	486	149	131	639
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1588	1575	1575	1550	1575	1525
Adj Flow Rate, veh/h	239	221	540	166	146	710
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	2	2	4	2	6
Cap, veh/h	313	276	1532	469	531	1967
Arrive On Green	0.21	0.21	0.68	0.68	0.68	0.68
Sat Flow, veh/h	1512	1335	2335	691	742	2974
Grp Volume(v), veh/h	239	221	357	349	146	710
Grp Sat Flow(s),veh/h/ln	1512	1335	1496	1451	742	1449
Q Serve(g_s), s	10.4	11.0	7.1	7.1	7.2	7.3
Cycle Q Clear(g_c), s	10.4	11.0	7.1	7.1	14.4	7.3
Prop In Lane	1.00	1.00		0.48	1.00	
Lane Grp Cap(c), veh/h	313	276	1016	985	531	1967
V/C Ratio(X)	0.76	0.80	0.35	0.35	0.27	0.36
Avail Cap(c_a), veh/h	734	648	1016	985	531	1967
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	26.4	4.7	4.8	7.8	4.8
Incr Delay (d2), s/veh	3.9	5.3	1.0	1.0	1.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	3.7	1.8	1.8	1.2	1.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	30.0	31.7	5.7	5.8	9.1	5.3
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	460		706			856
Approach Delay, s/veh	30.8		5.7			5.9
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		51.5			51.5	18.5
Change Period (Y+Rc), s		4.0			4.0	4.0
Max Green Setting (Gmax), s		28.0			28.0	34.0
Max Q Clear Time (g_c+I1), s		9.1			16.4	13.0
Green Ext Time (p_c), s		4.4			4.6	1.5

Intersection Summary	
HCM 6th Ctrl Delay	11.5
HCM 6th LOS	B

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 12
North/South Street: NAVAJO RD
East/West Street: POWHATTAN RD EAST

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	475	Left	0	0
NB	Through	256	Departure	371	Through	320	348
	Right	82			Right	34	79
North leg	Left	86	Approach	390	Left	140	110
SB	Through	248	Departure	471	Through	332	304
	Right	0			Right	0	0
West leg	Left	0	Approach	0	Left	0	0
EB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0
East leg	Left	72	Approach	151	Left	39	66
WB	Through	0	Departure	174	Through	0	0
	Right	77			Right	151	113

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	571	Left	0	0
NB	Through	353	Departure	720	Through	459	441
	Right	113			Right	111	122
North leg	Left	107	Approach	688	Left	112	121
SB	Through	419	Departure	620	Through	576	554
	Right	0			Right	0	0
West leg	Left	0	Approach	0	Left	0	0
EB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0
East leg	Left	142	Approach	305	Left	144	157
WB	Through	0	Departure	223	Through	0	0
	Right	158			Right	161	172

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 12
North/South Street: NAVAJO RD
East/West Street: POWHATTAN RD EAST

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	625	Left	0	0
NB	Through	256	Departure	432	Through	454	445
	Right	82			Right	170	152
North leg	Left	86	Approach	440	Left	103	119
SB	Through	248	Departure	530	Through	338	334
	Right	0			Right	0	0
West leg	Left	0	Approach	0	Left	0	0
EB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0
East leg	Left	72	Approach	170	Left	94	92
WB	Through	0	Departure	273	Through	0	0
	Right	77			Right	76	96

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	653	Left	0	0
NB	Through	353	Departure	881	Through	498	486
	Right	113			Right	152	149
North leg	Left	107	Approach	759	Left	109	131
SB	Through	419	Departure	673	Through	652	639
	Right	0			Right	0	0
West leg	Left	0	Approach	0	Left	0	0
EB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0
East leg	Left	142	Approach	404	Left	229	215
WB	Through	0	Departure	261	Through	0	0
	Right	158			Right	175	199

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : OTTOWA RD
N/S STREET : NAVAJO RD

INTERSECTION : 13
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	1	3	5
OTTOWA RD			
EB LEFT	28	44	38
EB THRU	22	30	32
EB RIGHT	14	12	17
WB LEFT	14	14	18
WB THRU	29	30	31
WB RIGHT	29	56	42
NAVAJO RD			
NB LEFT	18	17	25
NB THRU	327	431	592
NB RIGHT	38	49	74
SB LEFT	24	59	39
SB THRU	275	320	371
SB RIGHT	14	21	16
TOTALS	**832**	**1083**	**1295**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : OTTOWA RD
CONDITION : AM PEAK HOUR

N/S STREET : NAVAJO RD
PHF : 0.95
COVID FACTOR : 45%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	37	3	0	1	1	0	3	0	0	1	0
0	45	7	0	1	0	0	0	0	0	2	0
1	51	2	0	1	0	0	1	0	0	1	0
7	43	3	0	1	0	0	1	0	0	0	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
4	62	1	0	2	0	0	1	1	0	0	0
6	59	5	0	4	0	0	3	0	0	0	0
7	54	3	0	1	0	0	0	0	0	0	0
9	34	2	0	2	0	0	1	0	0	2	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
4	5	2	0	0	0	0	0	0	1	0	0
4	4	0	0	0	0	0	0	0	0	0	0
3	4	2	0	0	1	0	0	0	1	0	0
7	7	3	0	0	0	0	0	1	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
3	3	7	0	0	0	0	0	0	0	0	0
2	4	4	0	0	0	0	0	0	0	0	0
4	3	4	0	0	0	0	0	0	0	1	0
0	4	4	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
OTTOWA RD					
EB LEFT	0	19	**19**	**1%**	**28**
EB THRU	1	14	**15**	**7%**	**22**
EB RIGHT	0	9	**9**	**1%**	**14**
WB LEFT	2	7	**9**	**22%**	**14**
WB THRU	0	20	**20**	**1%**	**29**
WB RIGHT	2	18	**20**	**10%**	**29**
NAVAJO RD					
NB LEFT	1	11	**12**	**8%**	**18**
NB THRU	16	209	**225**	**7%**	**327**
NB RIGHT	0	26	**26**	**1%**	**38**
SB LEFT	1	15	**16**	**6%**	**24**
SB THRU	13	176	**189**	**7%**	**275**
SB RIGHT	0	9	**9**	**1%**	**14**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: NAVAJO RD
EAST-WEST STREET: OTTOWA RD
JURISDICTION: APPLE VALLEY

DATE: 02-04-21

PEAK HOUR: 07:30AM

NORTH LEG

TOTAL: 214

Rt	Thru	Lt	
9	189	16	Total
1	42	4	1st
0	48	7	2nd
1	54	2	3rd
7	45	3	4th

EAST LEG TOTAL: 49

	1st	2nd	3rd	4th	Total
Rt	5	4	4	7	20
Thru	5	4	4	7	20
Lt	2	0	3	4	9

WEST LEG TOTAL: 43

Total	1st	2nd	3rd	4th	
19	7	4	4	4	Lt
15	3	4	4	4	Thru
9	3	2	4	0	Rt

PEAK HOUR FACTORS

NORTH LEG = 0.94
SOUTH LEG = 0.85
EAST LEG = 0.68
WEST LEG = 0.83

ALL LEGS = 0.95

SOUTH LEG

TOTAL: 263

	Lt	Thru	Rt
1st	2	65	4
2nd	5	66	6
3rd	3	55	7
4th	2	39	9
Total	12	225	26

HOUR TOTAL: 569

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : NAVAJO RD
EAST-WEST STREET : OTTOWA RD

APPLE VALLEY
02-04-21

BEGINNING TIME : 07:00AM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
NORTH LEG												
0	36	3	0	2	0	0	0	0	0	0	0	41
1	41	3	0	1	0	0	1	0	0	1	0	48
1	37	3	0	1	1	0	3	0	0	1	0	47
0	45	7	0	1	0	0	0	0	0	2	0	55
1	51	2	0	1	0	0	1	0	0	1	0	57
7	43	3	0	1	0	0	1	0	0	0	0	55
1	45	5	0	2	0	0	1	0	0	1	1	56
2	47	8	0	3	0	0	0	0	0	2	0	62
13	345	34	0	12	1	0	7	0	0	8	1	421
SOUTH LEG												
0	30	2	0	0	0	0	0	0	0	0	0	32
2	37	1	0	1	0	0	1	1	0	0	0	43
4	62	1	0	2	0	0	1	1	0	0	0	71
6	59	5	0	4	0	0	3	0	0	0	0	77
7	54	3	0	1	0	0	0	0	0	0	0	65
9	34	2	0	2	0	0	1	0	0	2	0	50
6	29	1	0	1	0	0	2	0	0	1	0	40
8	59	2	0	5	0	0	1	0	0	1	0	76
42	364	17	0	16	0	0	9	2	0	4	0	454
EAST LEG												
0	6	0	1	0	0	0	0	0	1	0	0	8
3	5	0	0	0	0	0	0	0	1	0	0	9
4	5	2	0	0	0	0	0	0	1	0	0	12
4	4	0	0	0	0	0	0	0	0	0	0	8
3	4	2	0	0	1	0	0	0	1	0	0	11
7	7	3	0	0	0	0	0	1	0	0	0	18
7	1	4	1	0	0	0	1	0	0	0	0	14
6	4	3	0	0	0	0	0	0	2	0	0	15
34	36	14	2	0	1	0	1	1	6	0	0	95
WEST LEG												
1	4	3	0	0	0	0	0	0	0	0	0	8
2	4	5	0	0	0	0	0	0	0	0	0	11
3	3	7	0	0	0	0	0	0	0	0	0	13
2	4	4	0	0	0	0	0	0	0	0	0	10
4	3	4	0	0	0	0	0	0	0	1	0	12
0	4	4	0	0	0	0	0	0	0	0	0	8
3	6	2	0	0	0	0	0	0	0	0	0	11
3	4	6	0	0	0	0	0	0	0	0	0	13
18	32	35	0	0	0	0	0	0	0	1	0	86

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: OTTOWA RD

TIME: 07:00AM-08:00AM DATE: 02-04-21

NORTH LEG

Rt	Thru	Lt	
2	172	17	Total
0	38	3	1st
1	44	3	2nd
1	42	4	3rd
0	48	7	4th

	1st	2nd	3rd	4th	Total
Rt	2	4	5	4	15
Thru	6	5	5	4	20
Lt	0	0	2	0	2

Total	1st	2nd	3rd	4th	
19	3	5	7	4	Lt
15	4	4	3	4	Thru
8	1	2	3	2	Rt

	Lt	Thru	Rt
1st	2	30	0
2nd	2	39	2
3rd	2	65	4
4th	5	66	6
Total	11	200	12

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: OTTOWA RD

TIME: 08:00AM-09:00AM DATE: 02-04-21

NORTH LEG

11	200	19	Total
1	54	2	1st
7	45	3	2nd
1	49	6	3rd
2	52	8	4th
Rt	Thru	Lt	

Rt	4	7	8	8	27
Thru	4	7	2	4	17
Lt	3	4	4	3	14
	1st	2nd	3rd	4th	Total

Total	1st	2nd	3rd	4th	
16	4	4	2	6	Lt
18	4	4	6	4	Thru
10	4	0	3	3	Rt

	Lt	Thru	Rt
1st	3	55	7
2nd	2	39	9
3rd	1	33	6
4th	2	66	8
Total	8	193	30

Prepared by NEWPORT TRAFFIC STUDIES

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	22	14	14	29	29	18	327	38	24	275	14
Future Vol, veh/h	28	22	14	14	29	29	18	327	38	24	275	14
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	-	-	-	-	-	-	75	-	-	65	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	7	1	22	1	10	8	7	1	6	7	1
Mvmt Flow	29	23	15	15	31	31	19	344	40	25	289	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	573	769	152	608	756	192	304	0	0	384	0	0
Stage 1	347	347	-	402	402	-	-	-	-	-	-	-
Stage 2	226	422	-	206	354	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.64	6.92	7.94	6.52	7.1	4.26	-	-	4.22	-	-
Critical Hdwy Stg 1	6.52	5.64	-	6.94	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.64	-	6.94	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.07	3.31	3.72	4.01	3.4	2.28	-	-	2.26	-	-
Pot Cap-1 Maneuver	404	321	870	341	338	793	1211	-	-	1143	-	-
Stage 1	645	621	-	545	601	-	-	-	-	-	-	-
Stage 2	759	574	-	722	631	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	350	309	870	307	325	793	1211	-	-	1143	-	-
Mov Cap-2 Maneuver	350	309	-	307	325	-	-	-	-	-	-	-
Stage 1	635	607	-	536	591	-	-	-	-	-	-	-
Stage 2	681	565	-	668	617	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.4	15.4	0.4	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1211	-	-	383	420	1143	-	-
HCM Lane V/C Ratio	0.016	-	-	0.176	0.18	0.022	-	-
HCM Control Delay (s)	8	-	-	16.4	15.4	8.2	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.7	0.1	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	30	12	14	30	56	17	431	49	59	320	21
Future Vol, veh/h	44	30	12	14	30	56	17	431	49	59	320	21
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	-	-	-	-	-	-	75	-	-	65	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	7	1	22	1	10	8	7	1	6	7	1
Mvmt Flow	46	32	13	15	32	59	18	454	52	62	337	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	751	1014	180	825	999	253	359	0	0	506	0	0
Stage 1	472	472	-	516	516	-	-	-	-	-	-	-
Stage 2	279	542	-	309	483	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.64	6.92	7.94	6.52	7.1	4.26	-	-	4.22	-	-
Critical Hdwy Stg 1	6.52	5.64	-	6.94	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.64	-	6.94	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.07	3.31	3.72	4.01	3.4	2.28	-	-	2.26	-	-
Pot Cap-1 Maneuver	301	229	835	233	244	723	1154	-	-	1027	-	-
Stage 1	544	545	-	462	535	-	-	-	-	-	-	-
Stage 2	707	506	-	623	554	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	233	212	835	192	226	723	1154	-	-	1027	-	-
Mov Cap-2 Maneuver	233	212	-	192	226	-	-	-	-	-	-	-
Stage 1	535	512	-	455	526	-	-	-	-	-	-	-
Stage 2	601	498	-	541	521	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.5	19.5	0.3	1.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1154	-	-	249	353	1027	-	-
HCM Lane V/C Ratio	0.016	-	-	0.364	0.298	0.06	-	-
HCM Control Delay (s)	8.2	-	-	27.5	19.5	8.7	-	-
HCM Lane LOS	A	-	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.6	1.2	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	32	17	18	31	42	25	592	74	39	371	16
Future Volume (veh/h)	38	32	17	18	31	42	25	592	74	39	371	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1588	1513	1588	1325	1588	1475	1500	1513	1588	1525	1513	1588
Adj Flow Rate, veh/h	41	35	18	20	34	46	27	643	80	42	403	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	7	1	22	1	10	8	7	1	6	7	1
Cap, veh/h	54	88	45	28	48	66	39	1727	215	52	1911	80
Arrive On Green	0.04	0.09	0.09	0.02	0.08	0.08	0.03	0.67	0.67	0.04	0.68	0.68
Sat Flow, veh/h	1512	941	484	1262	611	827	1429	2573	320	1452	2810	118
Grp Volume(v), veh/h	41	0	53	20	0	80	27	359	364	42	206	214
Grp Sat Flow(s),veh/h/ln	1512	0	1425	1262	0	1439	1429	1437	1455	1452	1437	1491
Q Serve(g_s), s	2.4	0.0	3.2	1.4	0.0	4.9	1.7	9.8	9.9	2.6	4.8	4.8
Cycle Q Clear(g_c), s	2.4	0.0	3.2	1.4	0.0	4.9	1.7	9.8	9.9	2.6	4.8	4.8
Prop In Lane	1.00		0.34	1.00		0.57	1.00		0.22	1.00		0.08
Lane Grp Cap(c), veh/h	54	0	133	28	0	114	39	965	977	52	977	1014
V/C Ratio(X)	0.76	0.00	0.40	0.72	0.00	0.70	0.69	0.37	0.37	0.80	0.21	0.21
Avail Cap(c_a), veh/h	101	0	570	84	0	575	95	965	977	97	977	1014
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	0.0	38.4	43.7	0.0	40.4	43.4	6.5	6.5	43.1	5.4	5.4
Incr Delay (d2), s/veh	19.5	0.0	1.9	29.9	0.0	7.6	19.7	1.1	1.1	23.6	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.2	0.7	0.0	1.9	0.8	2.8	2.9	1.3	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.5	0.0	40.4	73.6	0.0	48.0	63.1	7.6	7.6	66.6	5.9	5.9
LnGrp LOS	E	A	D	E	A	D	E	A	A	E	A	A
Approach Vol, veh/h		94			100			750			462	
Approach Delay, s/veh		50.0			53.1			9.6			11.4	
Approach LOS		D			D			A			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	64.4	6.0	12.4	6.5	65.2	7.2	11.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	26.0	6.0	36.0	6.0	26.0	6.0	36.0
Max Q Clear Time (g_c+I1), s	4.4	11.9	3.4	5.2	3.7	6.8	4.4	6.9
Green Ext Time (p_c), s	0.0	4.0	0.0	0.2	0.0	2.4	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	16.0
HCM 6th LOS	B

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : OTTOWA RD
N/S STREET : NAVAJO RD

INTERSECTION : 13
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future Year 2040 Condition	Future + Project Year 2040 Condition
Scenario #	2	4	6
OTTOWA RD			
EB LEFT	32	34	37
EB THRU	23	26	26
EB RIGHT	23	28	31
WB LEFT	55	92	93
WB THRU	16	23	21
WB RIGHT	38	56	57
NAVAJO RD			
NB LEFT	13	16	17
NB THRU	386	481	555
NB RIGHT	31	43	45
SB LEFT	43	55	61
SB THRU	476	632	770
SB RIGHT	52	58	66
TOTALS	**1188**	**1544**	**1779**

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	15-Dec-21	TNPR0000-0001	2	OF 2

E/W STREET : OTTOWA RD
CONDITION : PM PEAK HOUR

N/S STREET : NAVAJO RD
PHF : 0.91
COVID FACTOR : 0%

NORTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
17	104	7	0	1	1	0	0	0	0	0	0
15	124	8	0	4	1	0	1	0	0	2	0
6	108	15	0	1	0	0	1	0	0	0	0
14	129	11	0	1	0	0	0	0	0	0	0

SOUTH LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
10	72	5	0	2	0	0	0	0	0	1	0
6	90	3	0	1	0	0	2	0	0	0	0
11	120	2	0	3	0	0	0	0	0	1	0
4	94	3	0	0	0	0	0	0	0	0	0

EAST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
8	7	6	0	0	0	0	0	0	0	0	0
3	3	13	0	0	0	0	0	0	0	0	1
6	3	10	0	0	0	0	0	0	0	0	0
21	3	25	0	0	0	0	0	0	0	0	0

WEST LEG											
AUTO			LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
9	10	7	0	1	0	0	0	0	0	0	0
2	5	5	0	0	0	0	0	0	0	0	1
5	0	9	0	0	0	1	0	0	0	0	0
6	7	10	0	0	0	0	0	0	0	0	0

	Truck Volumes	Auto Volumes	Totals	Truck Percentage	Calibrated Totals
OTTOWA RD					
EB LEFT	1	31	**32**	**3%**	**32**
EB THRU	1	22	**23**	**4%**	**23**
EB RIGHT	1	22	**23**	**4%**	**23**
WB LEFT	1	54	**55**	**2%**	**55**
WB THRU	0	16	**16**	**1%**	**16**
WB RIGHT	0	38	**38**	**1%**	**38**
NAVAJO RD					
NB LEFT	0	13	**13**	**1%**	**13**
NB THRU	10	376	**386**	**3%**	**386**
NB RIGHT	0	31	**31**	**1%**	**31**
SB LEFT	2	41	**43**	**5%**	**43**
SB THRU	11	465	**476**	**2%**	**476**
SB RIGHT	0	52	**52**	**1%**	**52**

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: NAVAJO RD
EAST-WEST STREET: OTTOWA RD
JURISDICTION: APPLE VALLEY

DATE: 02-04-21

PEAK HOUR: 04:15PM

NORTH LEG

TOTAL: 571

Rt	Thru	Lt	
52	476	43	Total
17	105	8	1st
15	131	9	2nd
6	110	15	3rd
14	130	11	4th

EAST LEG TOTAL: 109

	1st	2nd	3rd	4th	Total
Rt	8	3	6	21	38
Thru	7	3	3	3	16
Lt	6	14	10	25	55

WEST LEG TOTAL: 78

Total	1st	2nd	3rd	4th	
32	7	6	9	10	Lt
23	11	5	0	7	Thru
23	9	2	6	6	Rt

PEAK HOUR FACTORS

NORTH LEG = 0.92
SOUTH LEG = 0.78
EAST LEG = 0.56
WEST LEG = 0.72

ALL LEGS = 0.91

SOUTH LEG

TOTAL: 430

	Lt	Thru	Rt
1st	5	75	10
2nd	3	93	6
3rd	2	124	11
4th	3	94	4
Total	13	386	31

HOUR TOTAL: 1,188

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : NAVAJO RD
EAST-WEST STREET : OTTOWA RD

APPLE VALLEY
02-04-21

BEGINNING TIME : 04:00PM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
					NORTH LEG							
11	98	10	0	0	0	0	0	0	0	0	0	119
17	104	7	0	1	1	0	0	0	0	0	0	130
15	124	8	0	4	1	0	1	0	0	2	0	155
6	108	15	0	1	0	0	1	0	0	0	0	131
14	129	11	0	1	0	0	0	0	0	0	0	155
12	102	6	0	0	0	0	1	0	0	0	0	121
12	98	6	0	0	0	0	0	0	0	0	0	116
10	113	8	0	0	0	0	1	0	0	0	0	132
97	876	71	0	7	2	0	4	0	0	2	0	1059
					SOUTH LEG							
7	80	4	0	0	0	0	0	0	0	0	0	91
10	72	5	0	2	0	0	0	0	0	1	0	90
6	90	3	0	1	0	0	2	0	0	0	0	102
11	120	2	0	3	0	0	0	0	0	1	0	137
4	94	3	0	0	0	0	0	0	0	0	0	101
7	97	1	0	0	0	0	0	0	0	0	0	105
8	74	0	0	1	0	0	0	0	0	2	0	85
5	90	4	0	1	0	0	1	0	0	0	0	101
58	717	22	0	8	0	0	3	0	0	4	0	812
					EAST LEG							
5	10	4	0	0	0	0	0	0	0	0	0	19
8	7	6	0	0	0	0	0	0	0	0	0	21
3	3	13	0	0	0	0	0	0	0	0	1	20
6	3	10	0	0	0	0	0	0	0	0	0	19
21	3	25	0	0	0	0	0	0	0	0	0	49
14	5	5	0	0	0	0	0	0	0	0	0	24
13	4	11	0	0	0	0	0	0	0	0	0	28
5	9	3	0	0	0	0	0	0	0	0	0	17
75	44	77	0	0	0	0	0	0	0	0	1	197
					WEST LEG							
5	4	5	0	0	0	0	0	0	0	0	0	14
9	10	7	0	1	0	0	0	0	0	0	0	27
2	5	5	0	0	0	0	0	0	0	0	1	13
5	0	9	0	0	0	1	0	0	0	0	0	15
6	7	10	0	0	0	0	0	0	0	0	0	23
7	4	3	0	0	0	0	0	0	0	0	1	15
4	7	13	0	0	0	0	0	0	0	0	0	24
3	4	8	0	0	0	0	0	0	0	0	0	15
41	41	60	0	1	0	1	0	0	0	0	2	146

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: OTTOWA RD

TIME: 04:00PM-05:00PM DATE: 02-04-21

NORTH LEG

49	444	42	Total
11	98	10	1st
17	105	8	2nd
15	131	9	3rd
6	110	15	4th
Rt	Thru	Lt	

	1st	2nd	3rd	4th	Total
Rt	5	8	3	6	22
Thru	10	7	3	3	23
Lt	4	6	14	10	34

Total	1st	2nd	3rd	4th	
27	5	7	6	9	Lt
20	4	11	5	0	Thru
22	5	9	2	6	Rt

	Lt	Thru	Rt
1st	4	80	7
2nd	5	75	10
3rd	3	93	6
4th	2	124	11
Total	14	372	34

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: NAVAJO RD

EAST-WEST STREET: OTTOWA RD

TIME: 05:00PM-06:00PM DATE: 02-04-21

NORTH LEG

Rt	Thru	Lt	
48	445	31	Total
14	130	11	1st
12	103	6	2nd
12	98	6	3rd
10	114	8	4th

	1st	2nd	3rd	4th	Total
Rt	21	14	13	5	53
Thru	3	5	4	9	21
Lt	25	5	11	3	44

Total	1st	2nd	3rd	4th	
35	10	4	13	8	Lt
22	7	4	7	4	Thru
20	6	7	4	3	Rt

	Lt	Thru	Rt
1st	3	94	4
2nd	1	97	7
3rd	0	77	8
4th	4	92	5
Total	8	360	24

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: NAVAJO RD
EAST-WEST STREET: OTTOWA RD
JURISDICTION: APPLE VALLEY

DATE: 02-04-21

PEAK HOUR: 04:15PM

NORTH LEG

TOTAL: 571

Rt	Thru	Lt	
52	476	43	Total
17	105	8	1st
15	131	9	2nd
6	110	15	3rd
14	130	11	4th

EAST LEG TOTAL: 109

	1st	2nd	3rd	4th	Total
Rt	8	3	6	21	38
Thru	7	3	3	3	16
Lt	6	14	10	25	55

WEST LEG TOTAL: 78

Total	1st	2nd	3rd	4th	
32	7	6	9	10	Lt
23	11	5	0	7	Thru
23	9	2	6	6	Rt

PEAK HOUR FACTORS

NORTH LEG = 0.92
SOUTH LEG = 0.78
EAST LEG = 0.56
WEST LEG = 0.72

ALL LEGS = 0.91

SOUTH LEG

TOTAL: 430

	Lt	Thru	Rt
1st	5	75	10
2nd	3	93	6
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Total	13	386	31

HOUR TOTAL: 1,188

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : NAVAJO RD
EAST-WEST STREET : OTTOWA RD

APPLE VALLEY
02-04-21

BEGINNING TIME : 04:00PM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
					NORTH LEG							
11	98	10	0	0	0	0	0	0	0	0	0	119
17	104	7	0	1	1	0	0	0	0	0	0	130
15	124	8	0	4	1	0	1	0	0	2	0	155
6	108	15	0	1	0	0	1	0	0	0	0	131
14	129	11	0	1	0	0	0	0	0	0	0	155
12	102	6	0	0	0	0	1	0	0	0	0	121
12	98	6	0	0	0	0	0	0	0	0	0	116
10	113	8	0	0	0	0	1	0	0	0	0	132
97	876	71	0	7	2	0	4	0	0	2	0	1059
					SOUTH LEG							
7	80	4	0	0	0	0	0	0	0	0	0	91
10	72	5	0	2	0	0	0	0	0	1	0	90
6	90	3	0	1	0	0	2	0	0	0	0	102
11	120	2	0	3	0	0	0	0	0	1	0	137
4	94	3	0	0	0	0	0	0	0	0	0	101
7	97	1	0	0	0	0	0	0	0	0	0	105
8	74	0	0	1	0	0	0	0	0	2	0	85
5	90	4	0	1	0	0	1	0	0	0	0	101
58	717	22	0	8	0	0	3	0	0	4	0	812
					EAST LEG							
5	10	4	0	0	0	0	0	0	0	0	0	19
8	7	6	0	0	0	0	0	0	0	0	0	21
3	3	13	0	0	0	0	0	0	0	0	1	20
6	3	10	0	0	0	0	0	0	0	0	0	19
21	3	25	0	0	0	0	0	0	0	0	0	49
14	5	5	0	0	0	0	0	0	0	0	0	24
13	4	11	0	0	0	0	0	0	0	0	0	28
5	9	3	0	0	0	0	0	0	0	0	0	17
75	44	77	0	0	0	0	0	0	0	0	1	197
					WEST LEG							
5	4	5	0	0	0	0	0	0	0	0	0	14
9	10	7	0	1	0	0	0	0	0	0	0	27
2	5	5	0	0	0	0	0	0	0	0	1	13
5	0	9	0	0	0	1	0	0	0	0	0	15
6	7	10	0	0	0	0	0	0	0	0	0	23
7	4	3	0	0	0	0	0	0	0	0	1	15
4	7	13	0	0	0	0	0	0	0	0	0	24
3	4	8	0	0	0	0	0	0	0	0	0	15
41	41	60	0	1	0	1	0	0	0	0	2	146

Prepared by Newport Traffic Studies

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	23	23	55	16	38	13	386	31	43	476	52
Future Vol, veh/h	32	23	23	55	16	38	13	386	31	43	476	52
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	-	-	-	-	-	-	75	-	-	65	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	4	4	2	1	1	1	2	1	5	2	1
Mvmt Flow	35	25	25	60	18	42	14	424	34	47	523	57

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	895	1132	290	837	1143	229	580	0	0	458	0	0
Stage 1	646	646	-	469	469	-	-	-	-	-	-	-
Stage 2	249	486	-	368	674	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.58	6.98	7.54	6.52	6.92	4.12	-	-	4.2	-	-
Critical Hdwy Stg 1	6.56	5.58	-	6.54	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.58	-	6.54	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.04	3.34	3.52	4.01	3.31	2.21	-	-	2.25	-	-
Pot Cap-1 Maneuver	234	199	701	259	200	777	997	-	-	1078	-	-
Stage 1	424	460	-	544	562	-	-	-	-	-	-	-
Stage 2	730	544	-	624	454	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	197	188	701	214	189	777	997	-	-	1078	-	-
Mov Cap-2 Maneuver	197	188	-	214	189	-	-	-	-	-	-	-
Stage 1	418	440	-	536	554	-	-	-	-	-	-	-
Stage 2	659	536	-	542	434	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.3	27.3	0.3	0.6
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	997	-	-	246	279	1078	-	-
HCM Lane V/C Ratio	0.014	-	-	0.348	0.429	0.044	-	-
HCM Control Delay (s)	8.7	-	-	27.3	27.3	8.5	-	-
HCM Lane LOS	A	-	-	D	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.5	2	0.1	-	-

Intersection	
Int Delay, s/veh	21

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	34	26	28	92	23	56	16	481	43	55	632	58
Future Vol, veh/h	34	26	28	92	23	56	16	481	43	55	632	58
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	-	-	-	-	-	-	75	-	-	65	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	4	4	2	1	1	1	2	1	5	2	1
Mvmt Flow	37	29	31	101	25	62	18	529	47	60	695	64

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1160	1459	380	1071	1468	288	759	0	0	576	0	0
Stage 1	847	847	-	589	589	-	-	-	-	-	-	-
Stage 2	313	612	-	482	879	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.58	6.98	7.54	6.52	6.92	4.12	-	-	4.2	-	-
Critical Hdwy Stg 1	6.56	5.58	-	6.54	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.58	-	6.54	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.04	3.34	3.52	4.01	3.31	2.21	-	-	2.25	-	-
Pot Cap-1 Maneuver	149	126	612	175	128	712	855	-	-	973	-	-
Stage 1	321	371	-	461	496	-	-	-	-	-	-	-
Stage 2	670	477	-	534	366	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	107	116	612	127	118	712	855	-	-	973	-	-
Mov Cap-2 Maneuver	107	116	-	127	118	-	-	-	-	-	-	-
Stage 1	314	348	-	451	486	-	-	-	-	-	-	-
Stage 2	568	467	-	437	343	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	64.6	152.7	0.3	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	855	-	-	150	171	973	-	-
HCM Lane V/C Ratio	0.021	-	-	0.645	1.099	0.062	-	-
HCM Control Delay (s)	9.3	-	-	64.6	152.7	8.9	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.6	9.5	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	26	31	93	21	57	17	555	45	61	770	66
Future Volume (veh/h)	37	26	31	93	21	57	17	555	45	61	770	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1563	1550	1550	1575	1588	1588	1588	1575	1588	1538	1575	1588
Adj Flow Rate, veh/h	41	29	34	102	23	63	19	610	49	67	846	73
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	4	4	2	1	1	1	2	1	5	2	1
Cap, veh/h	53	44	52	99	37	102	32	1782	143	80	1865	161
Arrive On Green	0.04	0.07	0.07	0.07	0.10	0.10	0.02	0.63	0.63	0.05	0.67	0.67
Sat Flow, veh/h	1488	650	762	1500	375	1027	1512	2806	225	1464	2788	241
Grp Volume(v), veh/h	41	0	63	102	0	86	19	325	334	67	454	465
Grp Sat Flow(s),veh/h/ln	1488	0	1413	1500	0	1403	1512	1496	1535	1464	1496	1532
Q Serve(g_s), s	2.5	0.0	4.0	6.0	0.0	5.4	1.1	9.2	9.2	4.1	13.1	13.1
Cycle Q Clear(g_c), s	2.5	0.0	4.0	6.0	0.0	5.4	1.1	9.2	9.2	4.1	13.1	13.1
Prop In Lane	1.00		0.54	1.00		0.73	1.00		0.15	1.00		0.16
Lane Grp Cap(c), veh/h	53	0	97	99	0	139	32	950	974	80	1001	1025
V/C Ratio(X)	0.78	0.00	0.65	1.03	0.00	0.62	0.60	0.34	0.34	0.83	0.45	0.45
Avail Cap(c_a), veh/h	98	0	574	99	0	570	100	950	974	97	1001	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	0.0	41.3	42.5	0.0	39.4	44.2	7.7	7.7	42.6	7.2	7.2
Incr Delay (d2), s/veh	21.2	0.0	7.2	99.2	0.0	4.5	16.8	1.0	1.0	38.4	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.6	4.9	0.0	2.0	0.6	2.9	3.0	2.3	4.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.7	0.0	48.6	141.7	0.0	43.8	61.0	8.7	8.7	81.0	8.6	8.6
LnGrp LOS	E	A	D	F	A	D	E	A	A	F	A	A
Approach Vol, veh/h		104			188			678			986	
Approach Delay, s/veh		54.9			96.9			10.2			13.5	
Approach LOS		D			F			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	61.8	10.0	10.2	5.9	64.9	7.2	13.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	5.0	26.0	6.0	37.0	6.0	26.0	6.0	37.0
Max Q Clear Time (g_c+I1), s	6.1	11.2	8.0	6.0	3.1	15.1	4.5	7.4
Green Ext Time (p_c), s	0.0	3.6	0.0	0.3	0.0	4.4	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	22.6
HCM 6th LOS	C

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 13
North/South Street: NAVAJO RD
East/West Street: OTTOWA RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	18	Approach	564	Left	5	17
NB	Through	327	Departure	341	Through	367	431
	Right	38			Right	22	49
North leg	Left	24	Approach	364	Left	104	59
SB	Through	275	Departure	521	Through	330	320
	Right	14			Right	32	21
West leg	Left	28	Approach	67	Left	63	44
EB	Through	22	Departure	62	Through	25	30
	Right	14			Right	4	12
East leg	Left	14	Approach	88	Left	6	14
WB	Through	29	Departure	151	Through	25	30
	Right	29			Right	91	56

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	13	Approach	544	Left	15	16
NB	Through	386	Departure	763	Through	478	481
	Right	31			Right	48	43
North leg	Left	43	Approach	730	Left	54	55
SB	Through	476	Departure	561	Through	630	632
	Right	52			Right	50	58
West leg	Left	32	Approach	79	Left	28	34
EB	Through	23	Departure	88	Through	25	26
	Right	23			Right	26	28
East leg	Left	55	Approach	184	Left	106	92
WB	Through	16	Departure	126	Through	22	23
	Right	38			Right	56	56

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 13
North/South Street: NAVAJO RD
East/West Street: OTTOWA RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	18	Approach	705	Left	23	25
NB	Through	327	Departure	405	Through	600	592
	Right	38			Right	82	74
North leg	Left	24	Approach	425	Left	40	39
SB	Through	275	Departure	671	Through	372	371
	Right	14			Right	13	16
West leg	Left	28	Approach	76	Left	32	38
EB	Through	22	Departure	63	Through	29	32
	Right	14			Right	15	17
East leg	Left	14	Approach	84	Left	18	18
WB	Through	29	Departure	151	Through	27	31
	Right	29			Right	39	42

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	13	Approach	625	Left	16	17
NB	Through	386	Departure	911	Through	558	555
	Right	31			Right	47	45
North leg	Left	43	Approach	891	Left	57	61
SB	Through	476	Departure	643	Through	782	770
	Right	52			Right	56	66
West leg	Left	32	Approach	82	Left	31	37
EB	Through	23	Departure	91	Through	23	26
	Right	23			Right	28	31
East leg	Left	55	Approach	174	Left	101	93
WB	Through	16	Departure	127	Through	19	21
	Right	38			Right	54	57

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 1

E/W STREET : HIGHWAY 18
N/S STREET : YUCCA LOMA RD

INTERSECTION : 14
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future + Project Year 2040 Condition
Scenario #	1	5
HIGHWAY 18		
EB LEFT	0	9
EB THRU	542	584
EB RIGHT	0	282
WB LEFT	0	133
WB THRU	630	527
WB RIGHT	0	12
YUCCA LOMA RD		
NB LEFT	0	245
NB THRU	0	156
NB RIGHT	0	190
SB LEFT	0	17
SB THRU	0	58
SB RIGHT	0	3
TOTALS		**2216**

DELAY (CONTROL)

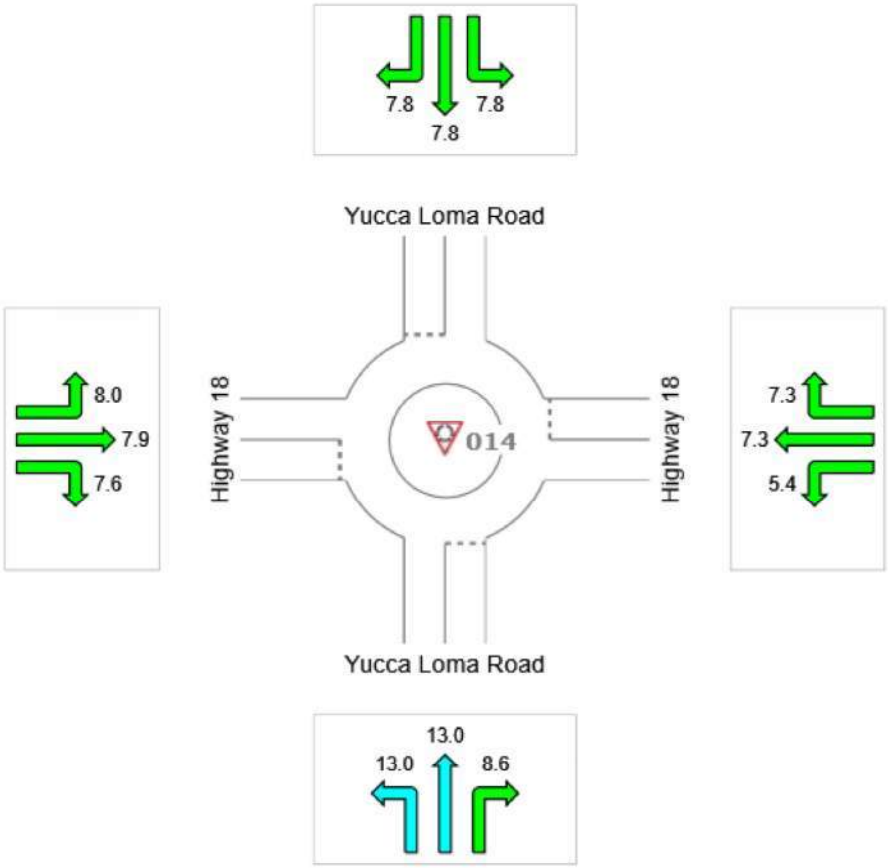
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 014 [Highway 18 at Yucca Loma Rd] — Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Delay (Control)	11.6	6.9	7.8	7.8	8.6
LOS	B	A	A	A	A



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	584	282	133	527	12	245	156	190	17	58	3
Future Volume (veh/h)	9	584	282	133	527	12	245	156	190	17	58	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1488	1575	1575	1488	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	10	635	307	145	573	13	266	170	207	18	63	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	9	2	2	9	2	2	2	2	2	2	2
Cap, veh/h	18	824	389	933	1697	38	291	286	242	109	90	4
Arrive On Green	0.01	0.29	0.29	0.64	1.00	1.00	0.19	0.18	0.18	0.07	0.06	0.06
Sat Flow, veh/h	1500	2827	1335	2910	2825	64	1500	1575	1335	1500	1491	71
Grp Volume(v), veh/h	10	635	307	145	286	300	266	170	207	18	0	66
Grp Sat Flow(s),veh/h/ln	1500	1413	1335	1455	1413	1476	1500	1575	1335	1500	0	1562
Q Serve(g_s), s	0.8	24.6	16.1	2.4	0.0	0.0	20.9	11.9	18.0	1.4	0.0	5.0
Cycle Q Clear(g_c), s	0.8	24.6	16.1	2.4	0.0	0.0	20.9	11.9	18.0	1.4	0.0	5.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	18	824	389	933	849	887	291	286	242	109	0	94
V/C Ratio(X)	0.56	0.77	0.79	0.16	0.34	0.34	0.91	0.59	0.85	0.17	0.00	0.70
Avail Cap(c_a), veh/h	75	824	389	933	849	887	363	709	601	109	0	404
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	59.0	38.8	15.6	15.0	0.0	0.0	47.4	45.0	47.6	52.2	0.0	55.3
Incr Delay (d2), s/veh	25.2	6.9	14.9	0.1	0.2	0.2	23.9	2.0	8.3	0.7	0.0	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	9.3	6.4	0.8	0.0	0.0	9.7	4.8	6.5	0.5	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.2	45.7	30.5	15.1	0.2	0.2	71.3	47.0	55.9	52.9	0.0	64.3
LnGrp LOS	F	D	C	B	A	A	E	D	E	D	A	E
Approach Vol, veh/h		952			731			643			84	
Approach Delay, s/veh		41.2			3.2			59.9			61.9	
Approach LOS		D			A			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	39.0	27.3	11.2	5.4	76.1	12.7	25.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	9.0	35.0	29.0	31.0	6.0	38.0	6.0	54.0
Max Q Clear Time (g_c+I1), s	4.4	26.6	22.9	7.0	2.8	2.0	3.4	20.0
Green Ext Time (p_c), s	0.2	3.5	0.4	0.3	0.0	4.0	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	35.4
HCM 6th LOS	D

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 1

E/W STREET : HIGHWAY 18
N/S STREET : YUCCA LOMA RD

INTERSECTION : 14
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future + Project Year 2040 Condition
Scenario #	2	6
HIGHWAY 18		
EB LEFT	0	16
EB THRU	815	595
EB RIGHT	0	350
WB LEFT	0	251
WB THRU	626	613
WB RIGHT	0	16
YUCCA LOMA RD		
NB LEFT	0	251
NB THRU	0	144
NB RIGHT	0	160
SB LEFT	0	25
SB THRU	0	134
SB RIGHT	0	16
TOTALS	**1441**	**2571**

DELAY (CONTROL)

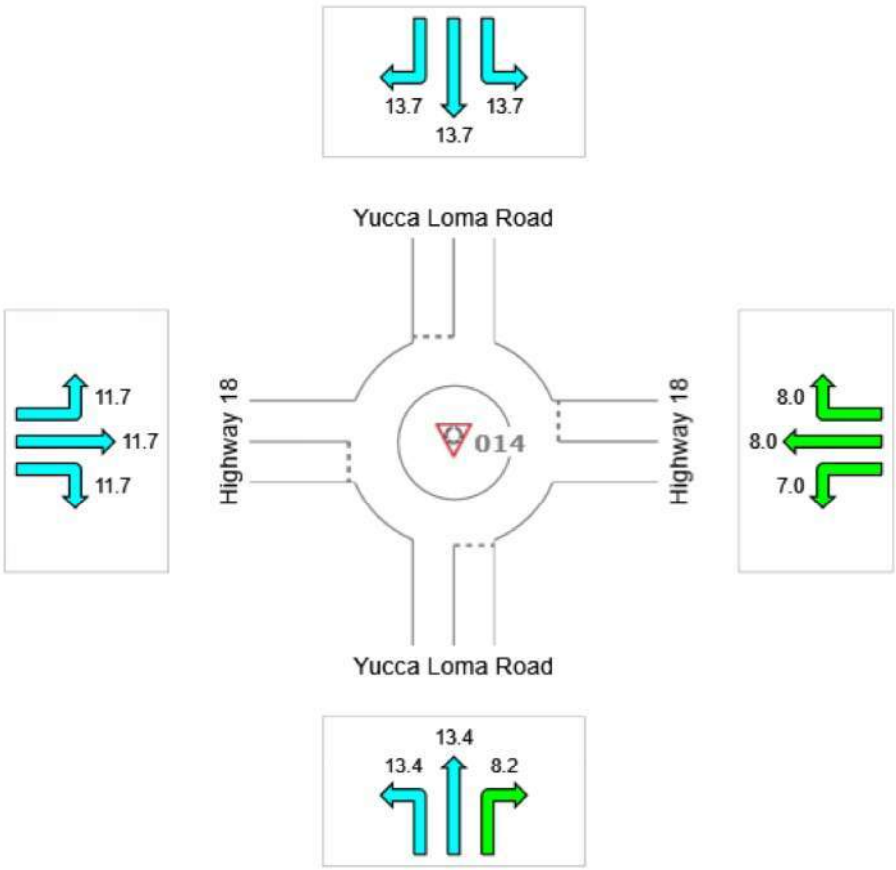
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 014 [Highway 18 at Yucca Loma Rd] — Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Delay (Control)	11.9	7.7	13.7	11.7	10.5
LOS	B	A	B	B	B



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	595	350	251	613	16	251	144	160	25	134	16
Future Volume (veh/h)	16	595	350	251	613	16	251	144	160	25	134	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	17	647	380	273	666	17	273	157	174	27	146	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	27	798	356	805	1566	40	296	470	399	37	174	20
Arrive On Green	0.02	0.27	0.27	0.55	1.00	1.00	0.20	0.30	0.30	0.02	0.13	0.13
Sat Flow, veh/h	1500	2993	1335	2910	2982	76	1500	1575	1335	1500	1385	161
Grp Volume(v), veh/h	17	647	380	273	334	349	273	157	174	27	0	163
Grp Sat Flow(s),veh/h/ln	1500	1496	1335	1455	1496	1561	1500	1575	1335	1500	0	1546
Q Serve(g_s), s	1.4	24.3	20.5	6.2	0.0	0.0	21.4	9.3	6.4	2.1	0.0	12.4
Cycle Q Clear(g_c), s	1.4	24.3	20.5	6.2	0.0	0.0	21.4	9.3	6.4	2.1	0.0	12.4
Prop In Lane	1.00		1.00	1.00		0.05	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	27	798	356	805	786	820	296	470	399	37	0	195
V/C Ratio(X)	0.63	0.81	1.07	0.34	0.43	0.43	0.92	0.33	0.44	0.73	0.00	0.84
Avail Cap(c_a), veh/h	75	798	356	805	786	820	338	669	567	88	0	399
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.5	41.2	18.0	20.8	0.0	0.0	47.2	32.8	8.8	58.1	0.0	51.3
Incr Delay (d2), s/veh	21.6	8.8	66.8	0.2	1.3	1.2	27.9	0.4	0.8	23.5	0.0	9.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	9.9	12.8	1.9	0.3	0.3	10.3	3.6	3.9	1.1	0.0	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.1	49.9	84.8	21.0	1.3	1.2	75.1	33.2	9.6	81.6	0.0	60.4
LnGrp LOS	F	D	F	C	A	A	E	C	A	F	A	E
Approach Vol, veh/h		1044			956			604			190	
Approach Delay, s/veh		63.1			6.9			45.3			63.4	
Approach LOS		E			A			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	36.0	27.7	19.1	6.2	67.0	7.0	39.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.6	32.0	27.0	31.0	6.0	40.0	7.0	51.0
Max Q Clear Time (g_c+I1), s	3.2	26.3	23.4	14.4	3.4	2.0	4.1	11.3
Green Ext Time (p_c), s	0.5	2.8	0.3	0.7	0.0	4.8	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	40.0
HCM 6th LOS	D

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 14
North/South Street: YUCCA LOMA RD
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	36	Left	127	81
NB	Through	0	Departure	34	Through	22	18
	Right	0			Right	90	61
North leg	Left	0	Approach	25	Left	11	15
SB	Through	0	Departure	27	Through	7	17
	Right	0			Right	3	6
West leg	Left	0	Approach	668	Left	2	7
EB	Through	542	Departure	724	Through	566	689
	Right	0			Right	11	33
East leg	Left	0	Approach	724	Left	16	41
WB	Through	630	Departure	668	Through	594	728
	Right	0			Right	3	8

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	46	Left	24	74
NB	Through	0	Departure	52	Through	6	14
	Right	0			Right	16	51
North leg	Left	0	Approach	26	Left	11	18
SB	Through	0	Departure	24	Through	6	14
	Right	0			Right	8	12
West leg	Left	0	Approach	882	Left	11	18
EB	Through	815	Departure	783	Through	855	887
	Right	0			Right	24	82
East leg	Left	0	Approach	783	Left	22	78
WB	Through	626	Departure	882	Through	750	765
	Right	0			Right	8	14

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 14
North/South Street: YUCCA LOMA RD
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	608	Left	227	245
NB	Through	0	Departure	297	Through	124	156
	Right	0			Right	190	190
North leg	Left	0	Approach	88	Left	17	17
SB	Through	0	Departure	145	Through	58	58
	Right	0			Right	3	3
West leg	Left	0	Approach	877	Left	9	9
EB	Through	542	Departure	756	Through	670	584
	Right	0			Right	106	282
East leg	Left	0	Approach	756	Left	133	133
WB	Through	630	Departure	877	Through	525	527
	Right	0			Right	12	12

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	472	Left	225	251
NB	Through	0	Departure	582	Through	101	144
	Right	0			Right	160	160
North leg	Left	0	Approach	170	Left	25	25
SB	Through	0	Departure	133	Through	134	134
	Right	0			Right	16	16
West leg	Left	0	Approach	946	Left	16	16
EB	Through	815	Departure	989	Through	762	595
	Right	0			Right	197	350
East leg	Left	0	Approach	989	Left	251	251
WB	Through	626	Departure	946	Through	748	613
	Right	0			Right	16	16

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 1

E/W STREET : YUCCA LOMA RD
N/S STREET : NAVAJO RD

INTERSECTION : 15
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future + Project Year 2040 Condition
Scenario #	1	5
YUCCA LOMA RD		
EB LEFT	0	29
EB THRU	0	0
EB RIGHT	0	33
WB LEFT	0	0
WB THRU	0	0
WB RIGHT	0	0
NAVAJO RD		
NB LEFT	0	36
NB THRU	162	164
NB RIGHT	0	0
SB LEFT	0	0
SB THRU	184	162
SB RIGHT	0	3
TOTALS		**427**

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	33	36	164	162	3
Future Volume (veh/h)	29	33	36	164	162	3
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	32	36	39	178	176	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	79	70	57	2494	2223	38
Arrive On Green	0.05	0.05	0.04	0.83	0.74	0.74
Sat Flow, veh/h	1500	1335	1500	3071	3090	51
Grp Volume(v), veh/h	32	36	39	178	87	92
Grp Sat Flow(s),veh/h/ln	1500	1335	1500	1496	1496	1566
Q Serve(g_s), s	1.4	1.8	1.8	0.7	1.1	1.1
Cycle Q Clear(g_c), s	1.4	1.8	1.8	0.7	1.1	1.1
Prop In Lane	1.00	1.00	1.00			0.03
Lane Grp Cap(c), veh/h	79	70	57	2494	1105	1156
V/C Ratio(X)	0.41	0.51	0.68	0.07	0.08	0.08
Avail Cap(c_a), veh/h	471	420	171	2494	1105	1156
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.97	0.97	1.00	1.00
Uniform Delay (d), s/veh	32.1	32.3	33.3	1.0	2.5	2.5
Incr Delay (d2), s/veh	3.4	5.7	13.2	0.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.5	0.8	0.1	0.2	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	35.5	38.0	46.4	1.1	2.7	2.7
LnGrp LOS	D	D	D	A	A	A
Approach Vol, veh/h	68			217	179	
Approach Delay, s/veh	36.8			9.2	2.7	
Approach LOS	D			A	A	

Timer - Assigned Phs	2		4	5	6
Phs Duration (G+Y+Rc), s	62.3		7.7	6.7	55.7
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s	40.0		22.0	8.0	28.0
Max Q Clear Time (g_c+I1), s	2.7		3.8	3.8	3.1
Green Ext Time (p_c), s	1.2		0.1	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 1

E/W STREET : YUCCA LOMA RD
N/S STREET : NAVAJO RD

INTERSECTION : 15
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future + Project Year 2040 Condition
Scenario #	2	6
YUCCA LOMA RD		
EB LEFT	0	50
EB THRU	0	0
EB RIGHT	0	64
WB LEFT	0	0
WB THRU	0	0
WB RIGHT	0	0
NAVAJO RD		
NB LEFT	0	46
NB THRU	259	222
NB RIGHT	0	0
SB LEFT	0	0
SB THRU	246	256
SB RIGHT	0	7
TOTALS	**505**	**645**

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	64	46	222	256	7
Future Volume (veh/h)	50	64	46	222	256	7
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	54	70	50	241	278	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	114	102	67	2422	2103	60
Arrive On Green	0.08	0.08	0.04	0.81	0.71	0.71
Sat Flow, veh/h	1500	1335	1500	3071	3049	85
Grp Volume(v), veh/h	54	70	50	241	140	146
Grp Sat Flow(s),veh/h/ln	1500	1335	1500	1496	1496	1560
Q Serve(g_s), s	2.4	3.6	2.3	1.2	2.1	2.1
Cycle Q Clear(g_c), s	2.4	3.6	2.3	1.2	2.1	2.1
Prop In Lane	1.00	1.00	1.00			0.05
Lane Grp Cap(c), veh/h	114	102	67	2422	1059	1104
V/C Ratio(X)	0.47	0.69	0.75	0.10	0.13	0.13
Avail Cap(c_a), veh/h	471	420	150	2422	1059	1104
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.95	0.95	1.00	1.00
Uniform Delay (d), s/veh	31.0	31.5	33.1	1.4	3.3	3.3
Incr Delay (d2), s/veh	3.0	8.0	14.7	0.1	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.8	1.1	0.1	0.5	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.0	39.5	47.8	1.5	3.6	3.5
LnGrp LOS	C	D	D	A	A	A
Approach Vol, veh/h	124			291	286	
Approach Delay, s/veh	37.1			9.4	3.5	
Approach LOS	D			A	A	

Timer - Assigned Phs	2		4	5	6
Phs Duration (G+Y+Rc), s	60.7		9.3	7.1	53.6
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s	40.0		22.0	7.0	29.0
Max Q Clear Time (g_c+I1), s	3.2		5.6	4.3	4.1
Green Ext Time (p_c), s	1.7		0.3	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	11.9
HCM 6th LOS	B

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 15
North/South Street: NAVAJO RD
East/West Street: YUCCA LOMA RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	190	Left	25	35
NB	Through	162	Departure	177	Through	185	157
	Right	0			Right	0	0
North leg	Left	0	Approach	177	Left	0	0
SB	Through	184	Departure	190	Through	158	193
	Right	0			Right	0	3
West leg	Left	0	Approach	27	Left	5	18
EB	Through	0	Departure	25	Through	0	0
	Right	0			Right	19	15
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	263	Left	21	36
NB	Through	259	Departure	273	Through	248	250
	Right	0			Right	0	0
North leg	Left	0	Approach	273	Left	0	0
SB	Through	246	Departure	263	Through	264	254
	Right	0			Right	5	7
West leg	Left	0	Approach	24	Left	15	24
EB	Through	0	Departure	26	Through	0	0
	Right	0			Right	9	22
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 15
North/South Street: NAVAJO RD
East/West Street: YUCCA LOMA RD

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	244	Left	18	36
NB	Through	162	Departure	197	Through	194	164
	Right	0			Right	0	0
North leg	Left	0	Approach	183	Left	0	0
SB	Through	184	Departure	198	Through	184	162
	Right	0			Right	0	3
West leg	Left	0	Approach	18	Left	4	29
EB	Through	0	Departure	18	Through	0	0
	Right	0			Right	13	33
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume			Turn Volume	Balanced Volume
South leg	Left	0	Approach	307	Left	34	46
NB	Through	259	Departure	331	Through	258	222
	Right	0			Right	0	0
North leg	Left	0	Approach	280	Left	0	0
SB	Through	246	Departure	276	Through	292	256
	Right	0			Right	2	7
West leg	Left	0	Approach	56	Left	18	50
EB	Through	0	Departure	36	Through	0	0
	Right	0			Right	39	64
East leg	Left	0	Approach	0	Left	0	0
WB	Through	0	Departure	0	Through	0	0
	Right	0			Right	0	0

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : HIGHWAY 18
N/S STREET : HITT RD/HEADQUARTERS DR

INTERSECTION : 16
CONDITION : AM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future + Project Year 2040 Condition
Scenario #	1	5
HIGHWAY 18		
EB LEFT	0	96
EB THRU	325	651
EB RIGHT	0	58
WB LEFT	0	34
WB THRU	440	595
WB RIGHT	0	132
HITT RD/HEADQUARTERS DR		
NB LEFT	0	16
NB THRU	0	41
NB RIGHT	0	19
SB LEFT	0	48
SB THRU	0	92
SB RIGHT	0	55
TOTALS	**765**	**1837**

DELAY (CONTROL)

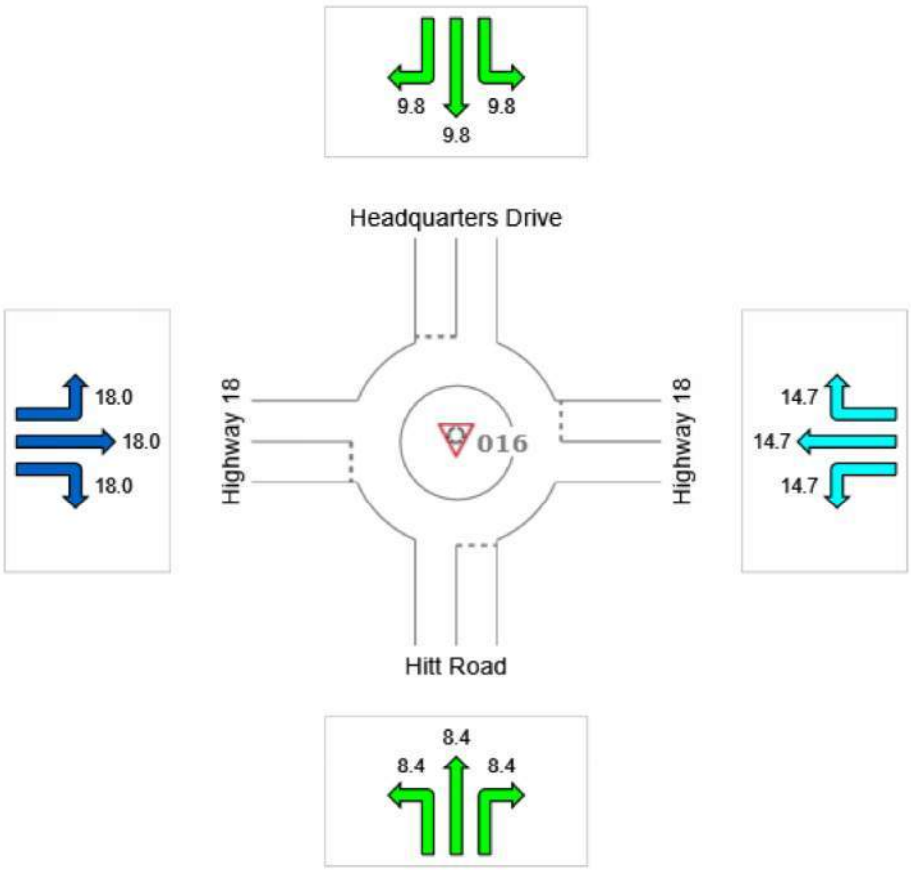
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 016 [Highway 18 at Headquarters Drive/Hitt Road] — Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Delay (Control)	8.4	14.7	9.8	18.0	15.3
LOS	A	B	A	C	C



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	651	58	34	595	132	16	41	19	48	92	55
Future Volume (veh/h)	96	651	58	34	595	132	16	41	19	48	92	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1488	1575	1575	1488	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	104	708	63	37	647	143	17	45	21	52	100	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	9	2	2	9	2	2	2	2	2	2	2
Cap, veh/h	113	1006	89	236	1072	237	27	288	134	64	485	411
Arrive On Green	0.08	0.38	0.38	0.05	0.15	0.15	0.02	0.28	0.28	0.04	0.31	0.31
Sat Flow, veh/h	1500	2625	233	1500	2302	508	1500	1016	474	1500	1575	1335
Grp Volume(v), veh/h	104	381	390	37	397	393	17	0	66	52	100	60
Grp Sat Flow(s),veh/h/ln	1500	1413	1446	1500	1413	1396	1500	0	1490	1500	1575	1335
Q Serve(g_s), s	8.3	27.3	27.3	2.8	31.4	31.5	1.4	0.0	4.0	4.1	5.6	3.9
Cycle Q Clear(g_c), s	8.3	27.3	27.3	2.8	31.4	31.5	1.4	0.0	4.0	4.1	5.6	3.9
Prop In Lane	1.00		0.16	1.00		0.36	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	113	542	554	236	659	651	27	0	422	64	485	411
V/C Ratio(X)	0.92	0.70	0.70	0.16	0.60	0.60	0.63	0.00	0.16	0.82	0.21	0.15
Avail Cap(c_a), veh/h	113	542	554	236	659	651	175	0	422	175	485	411
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	0.87	0.87	0.87	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.2	31.2	31.2	49.3	40.4	40.4	58.5	0.0	32.2	57.0	30.7	30.1
Incr Delay (d2), s/veh	56.0	6.5	6.3	0.3	3.5	3.6	21.6	0.0	0.8	21.8	1.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	10.2	10.4	1.1	12.6	12.5	0.7	0.0	1.5	1.9	2.3	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	111.2	37.7	37.6	49.5	44.0	44.0	80.1	0.0	33.0	78.8	31.7	30.9
LnGrp LOS	F	D	D	D	D	D	F	A	C	E	C	C
Approach Vol, veh/h		875			827			83			212	
Approach Delay, s/veh		46.4			44.2			42.7			43.0	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	50.0	6.2	40.9	13.0	59.9	9.1	38.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	10.0	46.0	14.0	34.0	9.0	47.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	4.3	29.3	3.4	7.6	10.3	33.5	6.1	6.0
Green Ext Time (p_c), s	0.0	4.6	0.0	0.7	0.0	4.3	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	45.0
HCM 6th LOS	D

DAVID EVANS AND ASSOCIATES INC.

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	15-Dec-21	TNPR0000-0001	1 OF 2

E/W STREET : HIGHWAY 18
N/S STREET : HITT RD/HEADQUARTERS D

INTERSECTION : 16
CONDITION : PM PEAK HOUR

TURN MOVEMENTS

Condition	Existing Condition	Future + Project Year 2040 Condition
Scenario #	2	6
HIGHWAY 18		
EB LEFT	0	55
EB THRU	458	716
EB RIGHT	0	22
WB LEFT	0	13
WB THRU	499	620
WB RIGHT	0	72
HITT RD/HEADQUARTERS DR		
NB LEFT	0	62
NB THRU	0	65
NB RIGHT	0	32
SB LEFT	0	127
SB THRU	0	62
SB RIGHT	0	121
TOTALS	**957**	**1967**

DELAY (CONTROL)

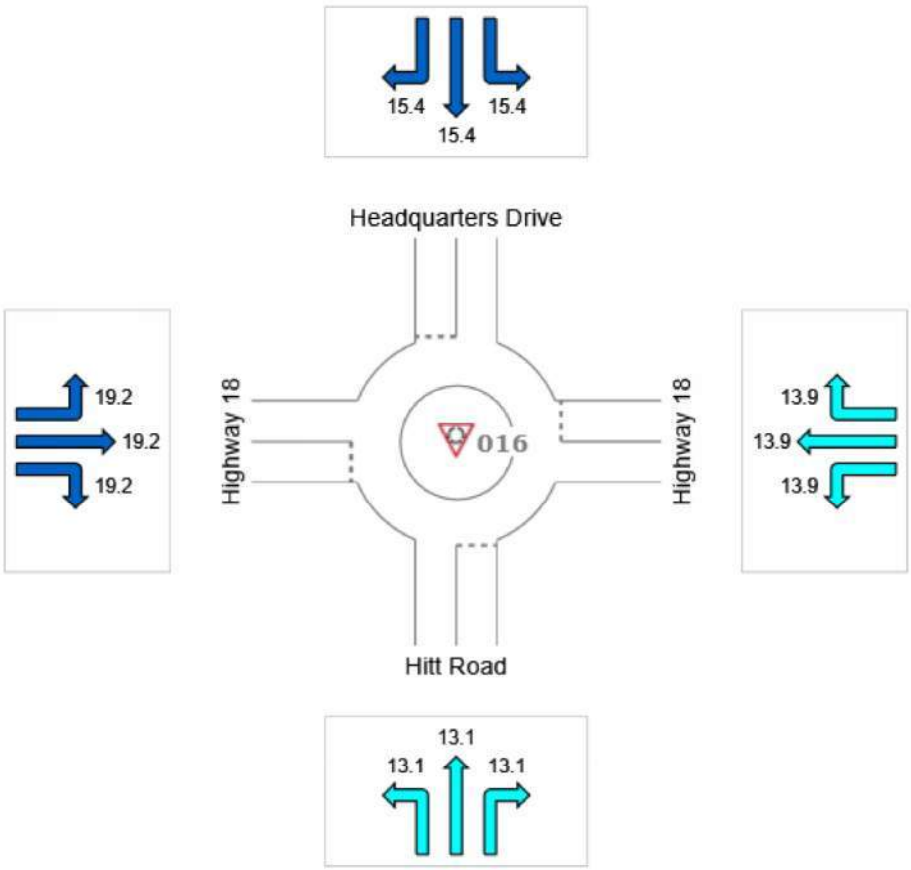
Average control delay per vehicle, or average pedestrian delay (seconds)

Site: 016 [Highway 18 at Headquarters Drive/Hitt Road] — Network: N101 [Village Center]

Future Conditions - Roundabout Alternative
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Delay (Control)	13.1	13.9	15.4	19.2	16.2
LOS	B	B	C	C	C



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Roundabout Level of Service Method: Same as Sign Control

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	716	22	13	620	72	62	65	32	127	62	121
Future Volume (veh/h)	55	716	22	13	620	72	62	65	32	127	62	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1550	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	60	778	24	14	674	78	67	71	35	138	67	132
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	128	1136	35	153	1064	123	159	274	135	159	433	367
Arrive On Green	0.09	0.38	0.38	0.07	0.27	0.27	0.11	0.28	0.28	0.11	0.28	0.28
Sat Flow, veh/h	1500	2963	91	1500	2660	307	1500	996	491	1500	1575	1335
Grp Volume(v), veh/h	60	393	409	14	373	379	67	0	106	138	67	132
Grp Sat Flow(s),veh/h/ln	1500	1496	1559	1500	1473	1495	1500	0	1487	1500	1575	1335
Q Serve(g_s), s	4.6	26.3	26.3	1.0	26.8	26.8	5.0	0.0	6.7	10.9	3.9	9.5
Cycle Q Clear(g_c), s	4.6	26.3	26.3	1.0	26.8	26.8	5.0	0.0	6.7	10.9	3.9	9.5
Prop In Lane	1.00		0.06	1.00		0.21	1.00		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	128	574	597	153	589	598	159	0	409	159	433	367
V/C Ratio(X)	0.47	0.68	0.68	0.09	0.63	0.63	0.42	0.00	0.26	0.87	0.15	0.36
Avail Cap(c_a), veh/h	128	574	597	153	589	598	163	0	409	163	433	367
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	0.91	0.91	0.91	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	30.9	30.9	50.7	36.2	36.2	50.2	0.0	34.0	52.8	32.9	35.0
Incr Delay (d2), s/veh	2.4	5.8	5.6	0.2	4.7	4.6	1.8	0.0	1.5	35.3	0.8	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	10.3	10.7	0.4	10.8	11.0	2.0	0.0	2.6	5.7	1.6	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.6	36.8	36.5	50.9	40.8	40.8	51.9	0.0	35.5	88.1	33.7	37.7
LnGrp LOS	D	D	D	D	D	D	D	A	D	F	C	D
Approach Vol, veh/h		862			766			173			337	
Approach Delay, s/veh		37.9			41.0			41.9			57.5	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	50.0	16.7	37.0	14.3	52.0	16.7	37.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	12.3	46.0	13.0	33.0	10.0	48.0	13.0	33.0
Max Q Clear Time (g_c+I1), s	13.0	28.3	7.0	11.5	6.6	28.8	12.9	8.7
Green Ext Time (p_c), s	0.0	4.8	0.1	0.7	0.0	4.7	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	42.4
HCM 6th LOS	D

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 16
North/South Street: HITT RD/HEADQUARTERS DR
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	0	Approach 60	Left	76	46
NB	Through	0	Departure 158	Through	76	38
	Right	0		Right	92	46
North leg	Left	0	Approach 202	Left	34	43
SB	Through	0	Departure 112	Through	102	70
	Right	0		Right	40	60
West leg	Left	0	Approach 474	Left	14	33
EB	Through	325	Departure 488	Through	374	450
	Right	0		Right	34	56
East leg	Left	0	Approach 488	Left	23	35
WB	Through	440	Departure 501	Through	371	422
	Right	0		Right	22	41

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	0	Approach 157	Left	46	61
NB	Through	0	Departure 92	Through	79	62
	Right	0		Right	23	37
North leg	Left	0	Approach 181	Left	56	52
SB	Through	0	Departure 164	Through	61	51
	Right	0		Right	55	49
West leg	Left	0	Approach 526	Left	38	39
EB	Through	458	Departure 662	Through	446	456
	Right	0		Right	20	33
East leg	Left	0	Approach 662	Left	11	43
WB	Through	499	Departure 526	Through	561	503
	Right	0		Right	47	55

CALCULATION OF FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES (NCHRP 255)

Intersection No.: 16
North/South Street: HITT RD/HEADQUARTERS DR
East/West Street: HIGHWAY 18

Analysis Condition: YEAR 2040 FUTURE TRAFFIC W VILLAGE SPECIFIC PLAN

A.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	0	Approach 64	Left	16	16
NB	Through	0	Departure 184	Through	41	41
	Right	0		Right	19	19
North leg	Left	0	Approach 164	Left	48	48
SB	Through	0	Departure 269	Through	92	92
	Right	0		Right	55	55
West leg	Left	0	Approach 538	Left	96	96
EB	Through	325	Departure 593	Through	497	651
	Right	0		Right	58	58
East leg	Left	0	Approach 593	Left	34	34
WB	Through	440	Departure 565	Through	523	595
	Right	0		Right	132	132

P.M. Peak Hour

Approach Direction		Base Year Count	Forecast Future Year Link Volume		Turn Volume	Balanced Volume
South leg	Left	0	Approach 182	Left	62	62
NB	Through	0	Departure 97	Through	65	65
	Right	0		Right	32	32
North leg	Left	0	Approach 355	Left	127	127
SB	Through	0	Departure 192	Through	62	62
	Right	0		Right	121	121
West leg	Left	0	Approach 673	Left	55	55
EB	Through	458	Departure 738	Through	514	716
	Right	0		Right	22	22
East leg	Left	0	Approach 738	Left	13	13
WB	Through	499	Departure 673	Through	555	620
	Right	0		Right	72	72