



Whipple Consulting Engineers, Inc.

Revised  
June 19, 2019  
W.O. No. 2015-1409

City of Spokane  
Department of Engineering Services  
801 W. Spokane Falls Boulevard  
Spokane, WA 99201

Attn: Inga Note, P.E.

Re: **Woodridge View 3<sup>rd</sup> Addition**  
**Navaho Drive & Wieber Drive**  
**Revised Expanded Traffic (Trip) Distribution Letter**

Dear Inga,

*This Expanded Trip Generation and Distribution letter is being revised with the addition of the intersection of Indian Trail Road & Strong Road for Level of Service analysis and background projects. This Trip Generation and Distribution Letter will also add the Level of Service analysis for the year 2024 both without and with the project trips.*

The purpose of this document is to provide an expanded Trip Generation and Distribution letter (TGDL) for the proposed Woodridge View 3<sup>rd</sup> Addition Subdivision to be located along the Northeast side of Navaho Drive. As shown on Figure 2, Preliminary Site Plan. This letter will follow the standards for doing Trip Distribution Letters as required by the City of Spokane and the Institute of Transportation Engineers (ITE).

### **PROJECT DESCRIPTION**

The Woodridge View 3<sup>rd</sup> Addition is proposed to develop 40± acres of an 88.35± acre parcel. The land currently has a water tank that has an access that extends north from the northern end of Wieber Drive but is otherwise undeveloped with field grass, trees and weeds. The Woodridge View 3<sup>rd</sup> Addition will have 138 units of single family or single family attached housing. The property is proposed to be accessed by a proposed extension to Skyline Drive that will go generally north/south until it curves right under the current power lines where it is proposed to intersect with the proposed extension to Wieber Drive that will generally go east/west under the current power lines.

The project proposes to provide a network of connecting roadways underneath the current power lines. This network of roads connects the north ends of Wieber and Skyline Drives, and provides connectivity to the east. At the eastern end, the roadway sweeps south into the proposed Rustle Drive located along the ridge within Spokane County. Within the plat there are four (4) proposed access roads that extend west from Rustle Drive to Mountaincrest Drive which runs along the edge of the bench. The project proposes a connecting road (Between Drive) from Wieber Drive across the face of the hillside to Mountaincrest Drive. Please see Figure 2, Preliminary Site Plan.

## **VICINITY / SITE PLAN**

The site is currently listed on the Comprehensive Plan Map as Residential 4-10 and conservation open space (under the powerlines). The property is currently zoned as Residential Single Family (RSF). The site lies on the NE ¼ of Section 15, T. 26 N., R. 42 E., W.M. within the City of Spokane, Washington. The parcel number for the site is 26155.0002. A vicinity map is included as Figure 1, along with a preliminary site plan as Figure 2.

## **TRIP GENERATION AND DISTRIBUTION**

### **Trip Types**

The proposed land use is single family residential; ITE has developed data regarding various trip types that all developments experience. These are found in several places, however, for this analysis the *Trip Generation Manual 10<sup>th</sup> Edition* as well as the Institute of transportation Engineers (ITE) *Trip Generation Handbook* were used to develop the criteria for this analysis.

Generally all existing and proposed developments will be made up of one or more of the following four trip types: new (destination) trips, pass-by trips, diverted trips, and shared (internal trips). In order to better understand the trip types available for land access a description of each specific trip type follows.

**New (Destination) Trips** - These types of trips occur only to access a specific land use such as a new retail development or a new residential subdivision. These types of trips will travel to and from the new site and a single other destination such as home or work. This is the only trip type that will result in a net increase in the total amount of traffic within the study area. The reason primarily is that these trips represent planned trips to a specific destination that never took trips to that part of the City prior to the development being constructed and occupied. This project will develop new trips.

**Pass-by Trips** - These trips represent vehicles which currently use adjacent roadways providing primary access to new land uses or projects and are trips of convenience. These trips, however, have an ultimate destination other than the project in question. They should be viewed as customers who stop in on their way home from work. An example would be on payday, where an individual generally drives by their bank every day without stopping, except on payday. On that day, this driver would drive into the bank, perform the prerequisite banking and then continue on home. In this example, the trip started from work with a destination of home, however on the way, the driver stopped at the grocery store/latte stand and/or bank directly adjacent to their path. Pass-by trips are most always associated with commercial/retail types of development along major roadways. Therefore, for this project pass-by trips will not be considered.

**Diverted (Linked) Trips** - These trips occur when a vehicle takes a different route than normal to access a specific facility. Diverted trips are similar to pass-by trips, but diverted trips occur from roadways, which do not provide direct access to the site. Instead, one or more streets must be utilized to get to and from the site. For this project, no diverted trips are anticipated.

**Shared / Internal / Trips** - These are trips which occur on the site where a vehicle/ consumer/ tenant will stop at more than one place on the site. For example, someone destined for a certain shop at a commercial site may stop at a bank just before or after they visit the shop that they went to the site to visit. This trip type reduces the number of new trips generated on the public road system and is most commonly used for commercial developments. These trips are incorporated within the ITE shopping center land use. For this project, no shared/internal trips are anticipated.

### **Trip Generation Characteristics for the Existing and Proposed land uses**

As noted earlier, trip generation rates for the AM and PM peak hours are determined by the use of the *Trip Generation Manual, 10<sup>th</sup> Edition* published by the Institute of Transportation Engineers (ITE). The purpose of the *Trip Generation Manual* is to compile and quantify empirical data into trip generation rates for specific land uses within the US, UK and Canada.

#### Proposed Land Use

For the proposed 138 units of single family residential development, Land Use Code (LUC) #210, Single Family Detached Housing was used to establish the number of potential trips generated by the proposed land use for the single family residential lots. The trip generation rates and the anticipated number of AM and PM peak hour trips for the single family residential land use are shown on Table 1.

**Table 1-Trip Generation Rates for LUC # 210 – Single Family Detached Housing (Fig. 3)**

Dwelling Units	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. @ 0.74 trips/units	Directional Distribution		Vol. @ 0.99 trips / Units	Directional Distribution	
		25% In	75% Out		63% In	37% Out
138	103	26	77	137	86	51
<b>Average Daily Trip Ends (ADT)</b>						
<b>Units</b>	<b>Rate</b>	<b>ADT</b>				
138	9.44	1,303				

As shown in Table 1, the proposed land uses are anticipated to generate a total of 103 trips in the AM peak hour with 26 trips entering the site and 77 trips exiting the site. In the PM peak hour, the proposed land use is anticipated to generate a total of 137 trips in the PM peak hour with 86 trips entering the site and 51 trips exiting the site. The proposed land use is anticipated to generate 1,303 average daily trips to/from the project. Please see Figure 3 for Trip Distribution.

## **TRIP DISTRIBUTION**

As previously discussed, and as shown on the site plan (Figure 2), the site will be accessed from proposed extensions to Wieber Drive and Skyline Drive.

**Skyline Route** is an access route to/from the site. The route extends south from the site on Skyline Drive to Prairie Drive. The route then extends west on Prairie Drive until it turns south and becomes Fleetwood Street. The route then extends south on Fleetwood Street to Seminole Drive. The route then extends west on Seminole Drive until Woodridge Drive. The route then extends south on Woodridge Drive until Navaho Avenue. Once at Navaho Avenue the trips can either go to/from the west on Navaho Avenue to Indian Trail Road or go to/from the east on Navaho Avenue to Farmdale Street where they can go to/from the south to Barnes Road.

**Wieber Route** is an access route to/from the site. The route extends south from the site on Wieber Drive to Shawnee Avenue. The route then extends west on Shawnee Avenue to the intersection of Shawnee Avenue and Farmdale Street. From the intersection of Shawnee Avenue and Farmdale Street the trips can either continue to go to/from the west on Shawnee Avenue to Indian Trail Road or go to/from the south on Farmdale Street to Barnes Road.

**Skyline Drive** is generally a north/south, two-way, 2-lane local access road. Skyline Drive extends north from Prairie Drive to its termination at an intersection with Navaho Drive. Skyline Drive serves single family residential land uses. The speed limit on Skyline Drive is 25 MPH.

**Prairie Drive** is generally an east/west, two-way, 2-lane local access road. Prairie Drive extends west from Wieber Drive through Skyline Drive and Fleetwood Court before turning south into Fleetwood Street. Prairie Drive serves single family residential land uses. The speed limit on Prairie Drive is 25 MPH.

**Fleetwood Street** is generally a north/south, two-way, 2-lane local access road. Fleetwood Street extends north from Alpine Drive through Navaho Avenue and Seminole Drive before turning into Prairie Drive. Fleetwood Street serves single family residential land uses. The speed limit on Fleetwood Street is 25 MPH.

**Seminole Drive** is generally an east/west, two-way, 2-lane local access road. Seminole Drive extends east from Woodridge Drive through Fleetwood Street, Navaho Avenue and Alpine Drive before turning south and extending through Elderberry Avenue to Shawnee Avenue. Seminole Drive serves single family residential land uses. The speed limit on Seminole Drive is 25 MPH.

**Woodridge Drive** is generally a north/south, two-way, 2-lane local access road. Woodridge Drive extends south from Bedford Avenue through Russett Drive, Seminole Drive, Navaho Avenue and Shawnee Avenue to Lamar Avenue. Woodridge Drive serves single family residential land uses. The speed limit on Woodridge Drive is 25 MPH.

**Navaho Avenue** is generally an east/west, two-way, 2-lane local access road. Navaho Avenue extends west from Seminole Drive through Fleetwood Street, Larchwood Street, Woodridge Drive, Ridgecrest Drive, Arrowhead Drive, Indian Trail Road and Fotheringham Street to Moore Street. Navaho Avenue serves single family residential land uses. The speed limit on Navaho Avenue is 25 MPH.

**Indian Trail Road** is generally a north/south, two-way, 2-, 3-, 4- & 5-lane principal arterial. Indian Trail Road extends north from Francis Avenue through Strong Road, Lowell Avenue, Barnes Road and Shawnee Avenue to Rutter Parkway. Indian Trail Road serves generally single family residential and rural land uses. The posted speed limits on Indian Trail Road are 30, 35 and 45 MPH.

**Farmdale Street** is generally a north/south, two-way, 2-lane local access road. Farmdale Street extends south from Navaho Avenue through Shawnee Avenue and Barnes Road to Lowell Avenue. Farmdale Street serves single family residential land uses. The speed limit on Farmdale Street is 25 MPH.

**Wieber Drive** is generally a north/south, two-way, 2-lane local access road. Wieber Drive begins just south of Shawnee Avenue and extends north through Shawnee Avenue and Prairie Drive to Navaho Drive. Wieber Drive serves single family residential land uses. The speed limit on Wieber Drive is 25 MPH.

**Shawnee Avenue** is generally an east/west, two-way, 2-lane collector road. Shawnee Avenue extends west from Wieber Drive through Farmdale Street, Woodridge Drive, Indian Trail Road, Moore Street and Sundance Drive to Comanche Drive. Shawnee Avenue serves single family residential land uses. The posted speed limit on Shawnee Avenue is 25 MPH.

**Barnes Road** is generally an east/west, two-way, 2-, 3-, 4- & 5-lane collector. Barnes Road begins just east of Pheobe Drive and extends west through Pheobe Drive, Seminole, James Drive, Farmdale Street, Indian Trail Road, Pamela Street, Greenwood Street and Sundance Drive before its termination. Barnes Road serves single family residential land uses. The posted speed limit on Barnes Road is 30 MPH.

Considering many factors such as the surrounding transportation facilities, typical commuting patterns, existing development in the area, and Average Daily Traffic counts, traffic for the proposed development is anticipated as follows: It is anticipated that 70% of the trips will go to/from the south to Navaho Drive via the Skyline Route. The trips will then distribute with 60% going to/from the west via Navaho Avenue to Indian Trail Road and 10% going to/from the east on Barnes Road via Farmdale Street and Navaho Avenue.

It is anticipated that 30% of the trips will go to/from the south to Shawnee Avenue via the Wieber Route. The trips will then distribute with 20% of trips going to/from the west via Shawnee Avenue to Indian Trail Road and 10% of trips going to/from the east on Barnes Road via Farmdale Street.

A total of 80% of trips from the site are expected to go to/from Indian Trail Road. The trips will then distribute with 75% of trips going to/from the south on Indian Trail Road and 5% of trips going to/from the north on Indian Trail Road. A total of 20% of Trips are expected to go to/from the east on Barnes Road and Strong Road.

### **Impacted Intersections $\geq$ 20 PM Peak Hour Trips**

The trip generation and distribution as a result of the proposed project has identified the following affected intersections for potential additional analysis.

- Indian Trail Road & Navaho Avenue
- Indian Trail Road & Shawnee Avenue
- Shawnee Avenue & Farmdale Street
- Barnes Road & Farmdale Street

### **Traffic Impact Fee**

A transportation impact fee for the City of Spokane is considered here. The City of Spokane code has established transportation impact fees under Spokane Municipal Code Title 17 Chapter 17D.075.180. The proposed project is adjacent to the Northwest Service area and as such is subject to the current Impact Fee Schedule. Table 2 calculates the anticipated Impact fee for the proposed project.

**Table 2 – Proposed Land Use Impact Fee**

Land Use	LUC	Quantity	Unit of Measure	Fee per unit	Fee
LUC # 210 Single Family Residential	210	138	Dwellings	\$749.20	\$103,389.60
<b>Total</b>	-	-	-	-	<b>\$103,389.60</b>

### **Pre-Analysis Summary**

An existing traffic volume count for the intersections of Indian Trail Road & Navaho Avenue, Indian Trail Road & Shawnee Avenue and Barnes Road & Farmdale Street was taken and recorded. The traffic counts were then used to do an existing Level of Service analysis. The existing Levels of Service at the intersections were calculated using the methods from the *2010 Highway Capacity Manual* as implemented in Synchro, *version 9 - Build 915*. The existing Levels of Service for the intersection within the study area are summarized in Table 3. The Levels of Service for the year 2024 without the project scenario are summarized in Table 4. The Levels of Service for the year 2024 with the project scenario are summarized in Table 5.

The City of Spokane has requested an additional Level of Service analysis for the intersection of Indian Trail Road and Pacific Park Drive/Strong Road. The intersection of Indian Trail Road and Pacific Park Drive/Strong Road has been modeled with its recent reconfiguration with two (2) southbound lanes.



For this analysis the appropriate background projects have been added to the scoped intersections including those projected listed in the McCarrolls East Traffic Study as well as the McCarrolls East project trips. It's noted that without the connection to Barnes Road via Pamela Street, project trips projected to go east up to the Five Mile Plateau will utilize the intersections of James and Farmdale Streets. The project trips have been added to the assumption made from the previously completed analysis.

**Table 3 - Year 2019 Existing Level of Service**

Intersections	(U)nsignalized (S)ignalized	AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Indian Trail Road & Navaho Avenue	U	13.6	B	15.3	C
Indian Trail Road & Shawnee Avenue	S	30.4	C	26.8	C
Barnes Road & Farmdale Street	U	11.3	B	11.7	B
Indian Trail Road & Strong Road	S	19.3	B	18.4	B

As shown in Table 3, the existing intersections within the study area are currently operating within acceptable levels of service.

**Table 4 - Year 2024 Level of Service Without Project**

Intersections	(U)nsignalized (S)ignalized	AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Indian Trail Road & Navaho Avenue	U	15.6	C	18.4	C
Indian Trail Road & Shawnee Avenue	S	31.3	C	27.0	C
Barnes Road & Farmdale Street	U	12.0	B	12.7	B
Indian Trail Road & Strong Road	S	20.4	C	18.3	B

As shown in Table 3, the intersections within the study area are anticipated to operate within acceptable levels of service in the year 2024 without the project scenario.

**Table 5 - Year 2024 Level of Service With Project**

Intersections	(U)nsignalized (S)ignalized	AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Indian Trail Road & Navaho Avenue	U	17.6	C	21.2	C
Indian Trail Road & Shawnee Avenue	S	34.3	C	27.4	C
Barnes Road & Farmdale Street	U	12.8	B	14.0	B
Indian Trail Road & Strong Road	S	20.7	C	18.4	B

As shown in Table 3, the intersections within the study area are anticipated to operate within acceptable levels of service in the year 2024 with the project scenario.

The intersection of **Indian Trail Road & Navaho Avenue** is an unsignalized controlled intersection with Indian Trail Road having control. The intersection was observed and counted. There were no standing queues observed and traffic was able to flow freely during the time period. The intersection Level of service is currently acceptable in the AM and PM Peak hours.

The intersection of **Indian Trail Road & Shawnee Avenue** is a signalized intersection. The intersection was observed and counted. There were no standing queues observed and traffic was able to flow freely during the time period. The intersection Level of service is currently acceptable in the AM and PM Peak hours.

The intersection of **Shawnee Avenue & Farmdale Street** is an unsignalized controlled intersection with Shawnee Avenue having control. The intersection was observed. There were no standing queues observed and traffic was able to flow freely during the time period.

The intersection of **Barnes Road & Farmdale Street** is an unsignalized controlled intersection with Barnes Road having control. The intersection was observed and counted. There were no standing queues observed and traffic was able to flow freely during the time period. The intersection Level of service is currently acceptable in the AM and PM Peak hours.

The existing counts and level of service calculations are included in the appendix

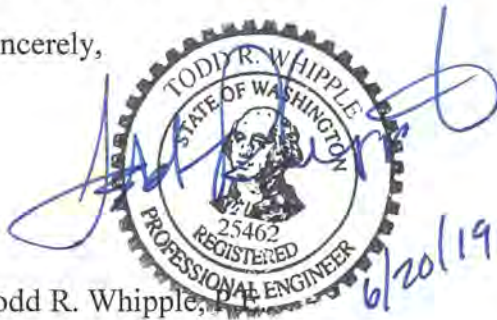


## CONCLUSIONS AND RECOMMENDATIONS

It is anticipated that the proposed project will generate 103 trips in the AM peak hour and 137 trips in the PM peak hour trips. Based upon the number of anticipated trips, and the distribution of those trips, we believe and have demonstrated that while the generated trips will contribute to the intersections of the transportation system that those trips would have a minimal impact on the transportation system given the current and anticipated intersection level of service. Therefore, we recommend that the project pay the anticipated impact fee of \$103,389.60, at the time of building permit, extend Skyline and Wieber Drives, complete frontage improvements and be allowed to move forward without further traffic analysis.

Should you have any questions related to this document please do not hesitate to contact us at (509) 893-2617.

Sincerely,



Todd R. Whipple,

TRW/tae

encl. Appendix (Vicinity Map, Site Plan, Trip Dist %, Photos)

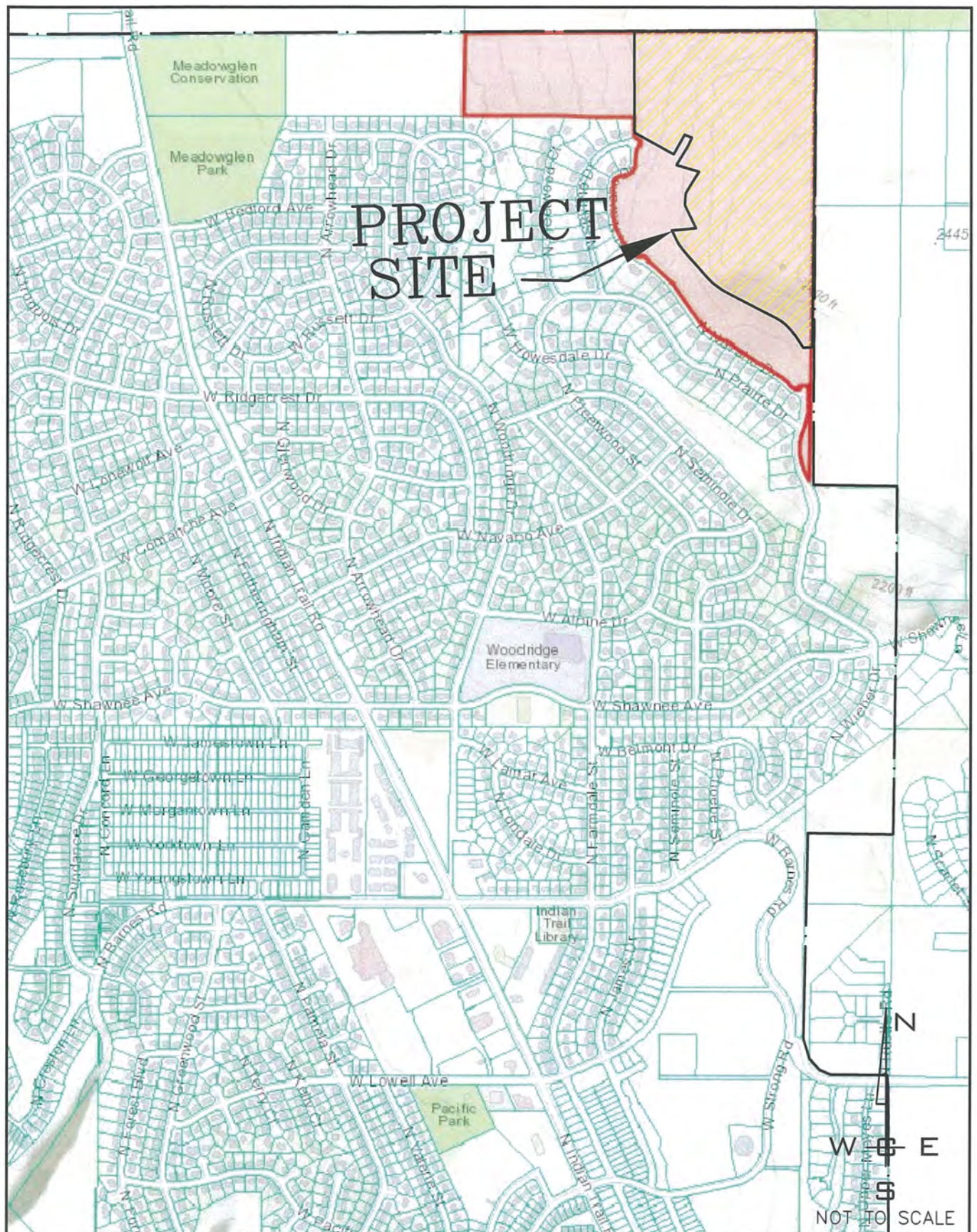
cc:

Sponsor  
File

## **APPENDIX**

1. Vicinity Map
2. Site Plan
3. Trip Distribution by Percent
4. AM Existing Volumes & LOS
5. PM Existing Volumes & LOS
6. AM 2024 without Project Volumes & LOS
7. PM 2024 without Project Volumes & LOS
8. AM 2024 with Project Volumes & LOS
9. PM 2024 with Project Volumes & LOS
10. Raw Traffic Counts
11. Existing LOS Calculations
12. Year 2024 W/O Project LOS Calculations
13. Year 2024 with Project LOS Calculations





PROJ #: 15-1409  
 DATE: 11/06/18  
 DRAWN: BNG  
 APPROVED: TRW

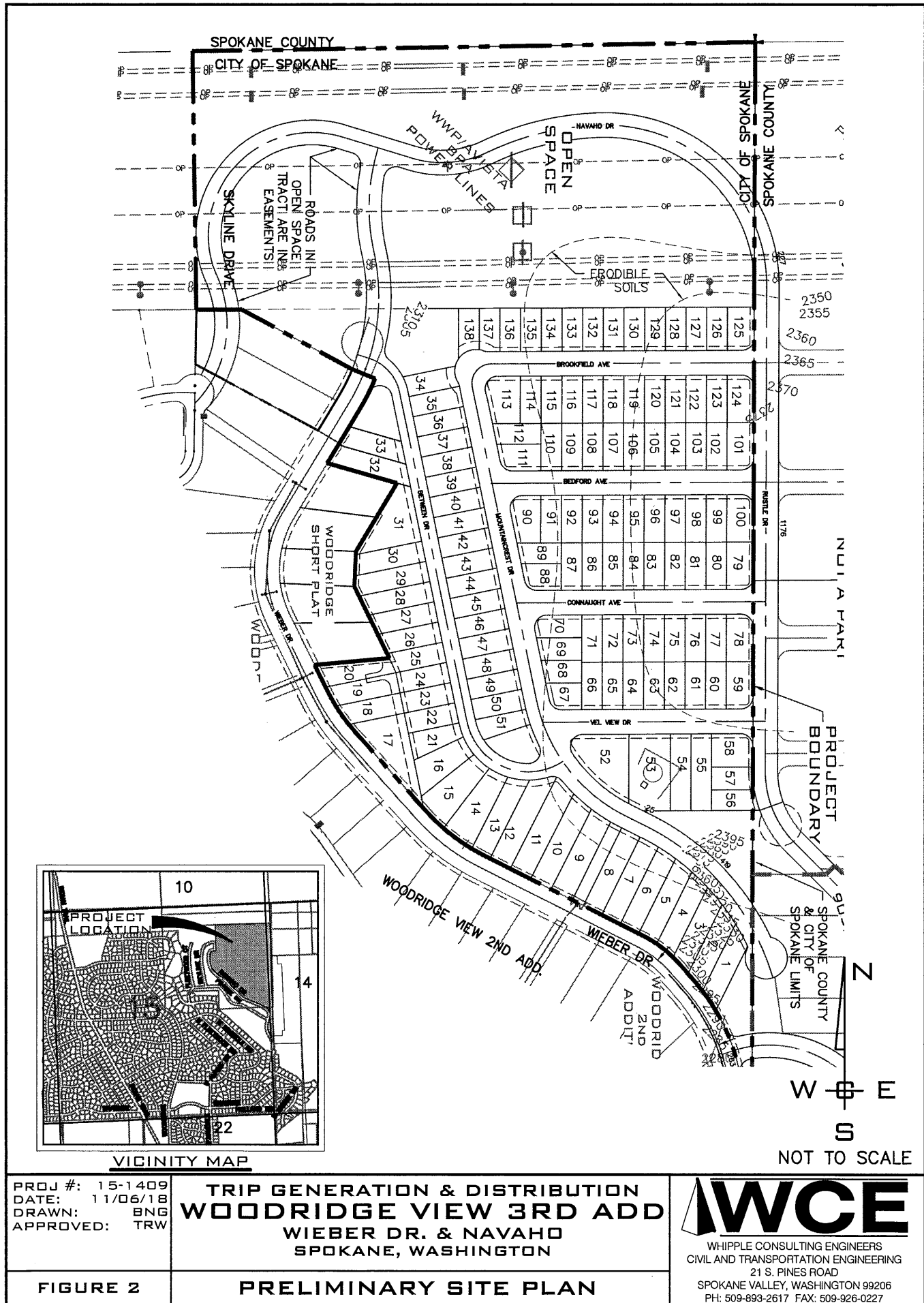
**TRIP GENERATION & DISTRIBUTION**  
**WOODRIDGE VIEW 3RD ADD**  
**WIEBER DR. & NAVAHO**  
**SPOKANE, WASHINGTON**

**FIGURE 1**

**VICINITY MAP**

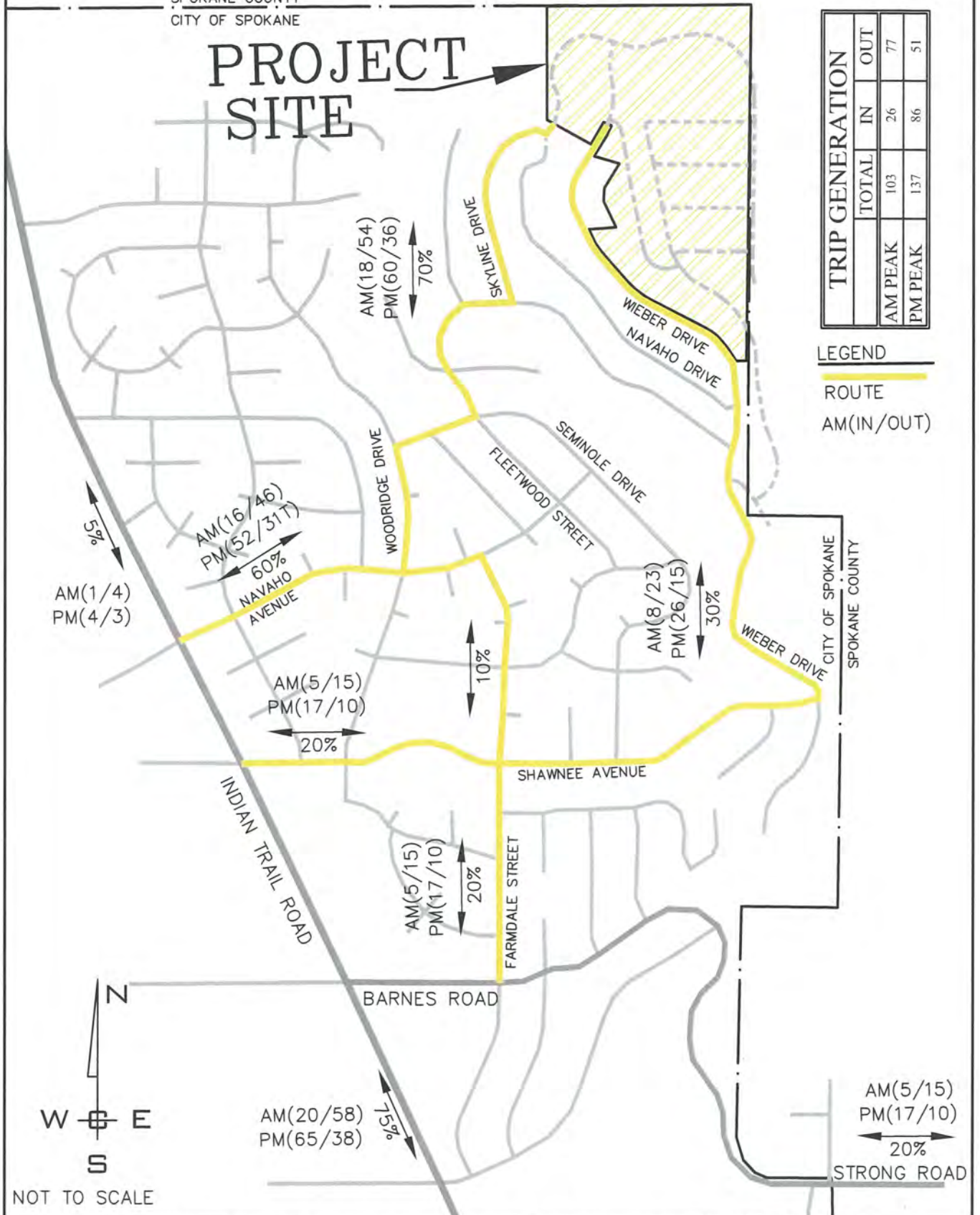
**WCE**  
 WHIPPLE CONSULTING ENGINEERS  
 CIVIL AND TRANSPORTATION ENGINEERING  
 21 S. PINES ROAD  
 SPOKANE VALLEY, WASHINGTON 99206  
 PH: 509-893-2617 FAX: 509-926-0227





SPOKANE COUNTY  
CITY OF SPOKANE

# PROJECT SITE



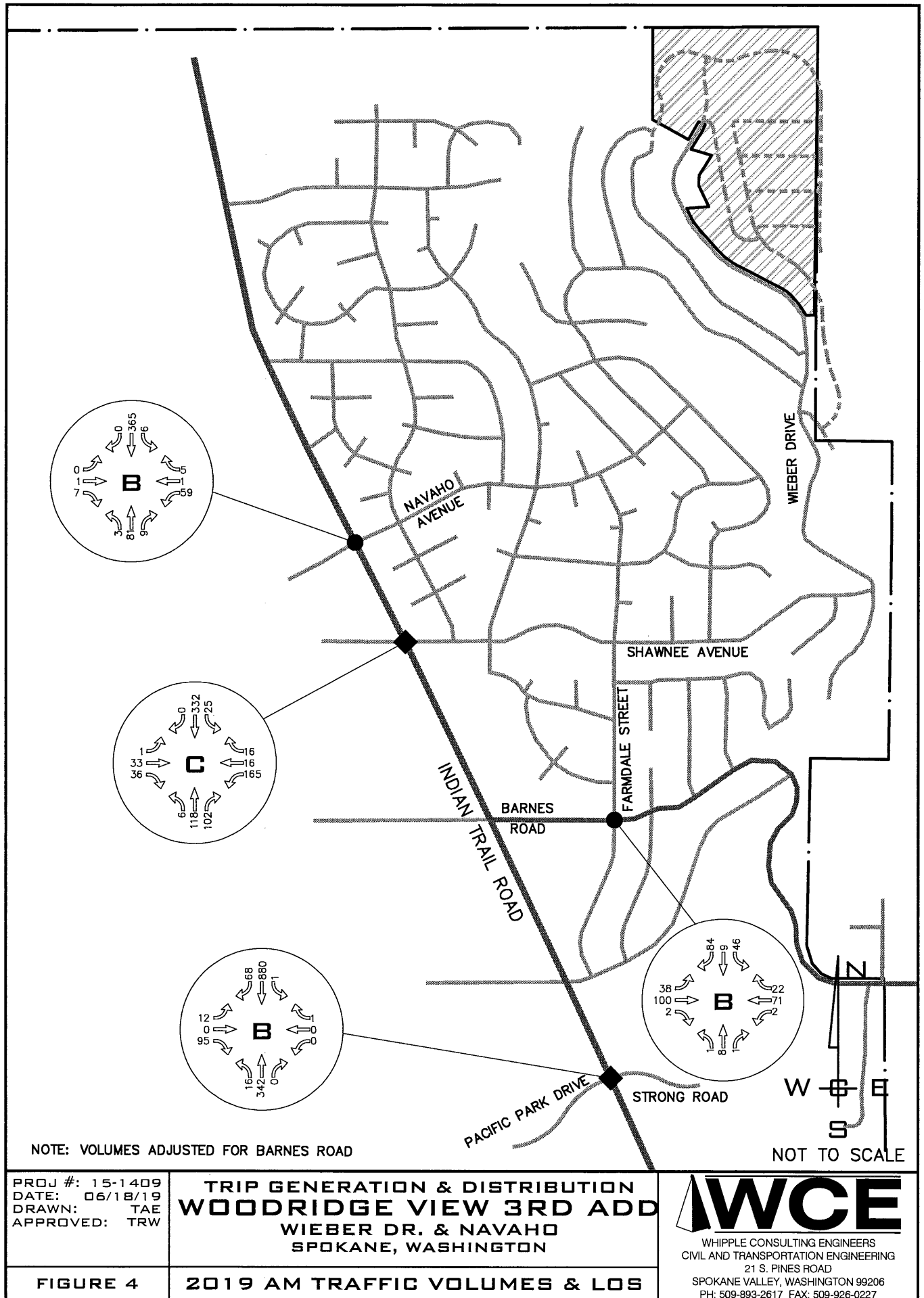
PROJ #: 15-1409  
DATE: 11/06/18  
DRAWN: BNG  
APPROVED: TRW

**TRIP GENERATION & DISTRIBUTION**  
**WOODRIDGE VIEW 3RD ADD**  
WIEBER DR. & NAVAHO  
SPOKANE, WASHINGTON

FIGURE 3

PROJECT TRIP DISTRIBUTION

**WCE**  
WHIPPLE CONSULTING ENGINEERS  
CIVIL AND TRANSPORTATION ENGINEERING  
21 S. PINES ROAD  
SPOKANE VALLEY, WASHINGTON 99206  
PH: 509-893-2617 FAX: 509-926-0227



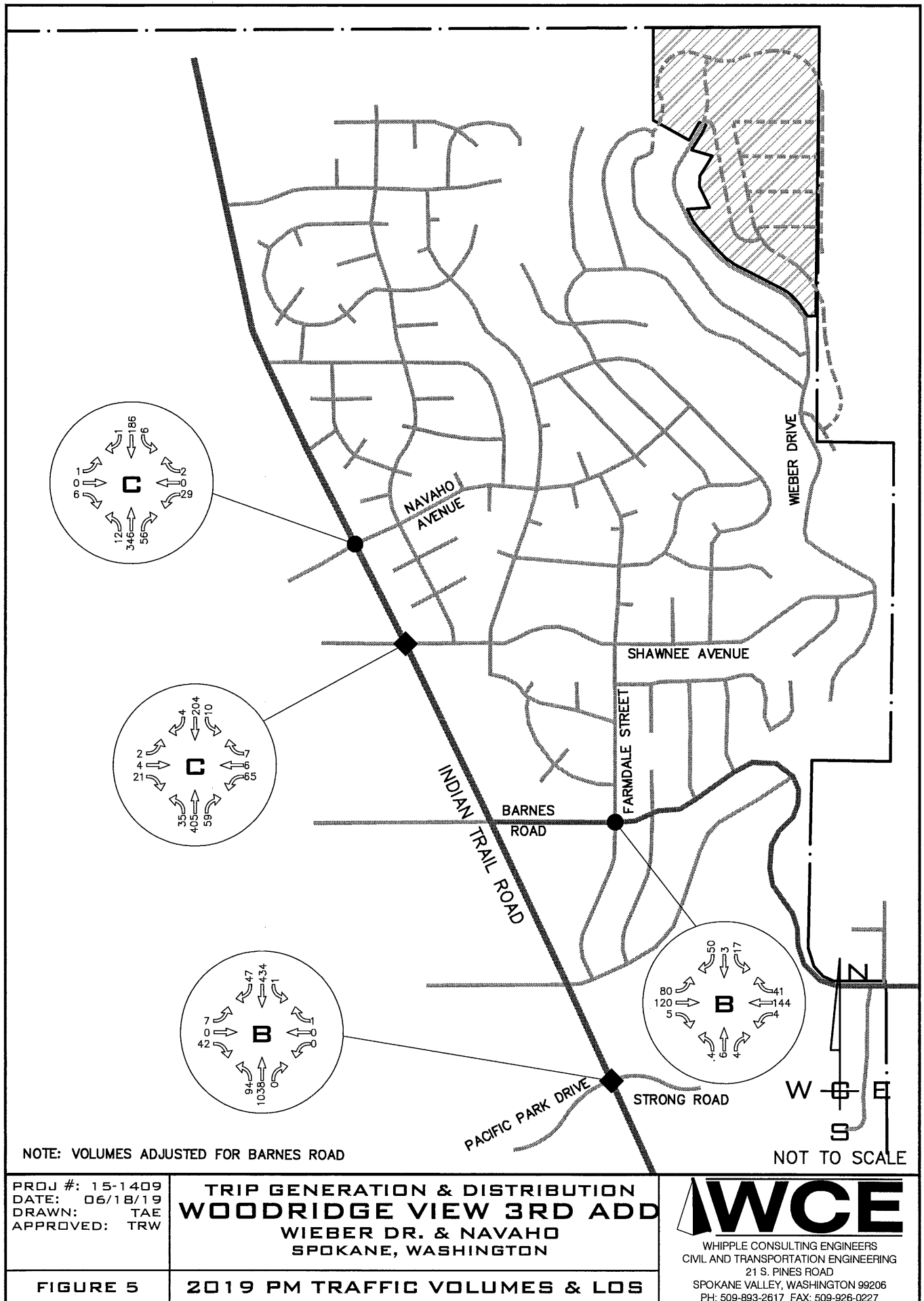
PROJ #: 15-1409  
 DATE: 06/18/19  
 DRAWN: TAE  
 APPROVED: TRW

**TRIP GENERATION & DISTRIBUTION**  
**WOODRIDGE VIEW 3RD ADD**  
**WIEBER DR. & NAVAHO**  
**SPOKANE, WASHINGTON**

**FIGURE 4**

**2019 AM TRAFFIC VOLUMES & LOS**

**WCE**  
 WHIPPLE CONSULTING ENGINEERS  
 CIVIL AND TRANSPORTATION ENGINEERING  
 21 S. PINES ROAD  
 SPOKANE VALLEY, WASHINGTON 99206  
 PH: 509-893-2617 FAX: 509-926-0227

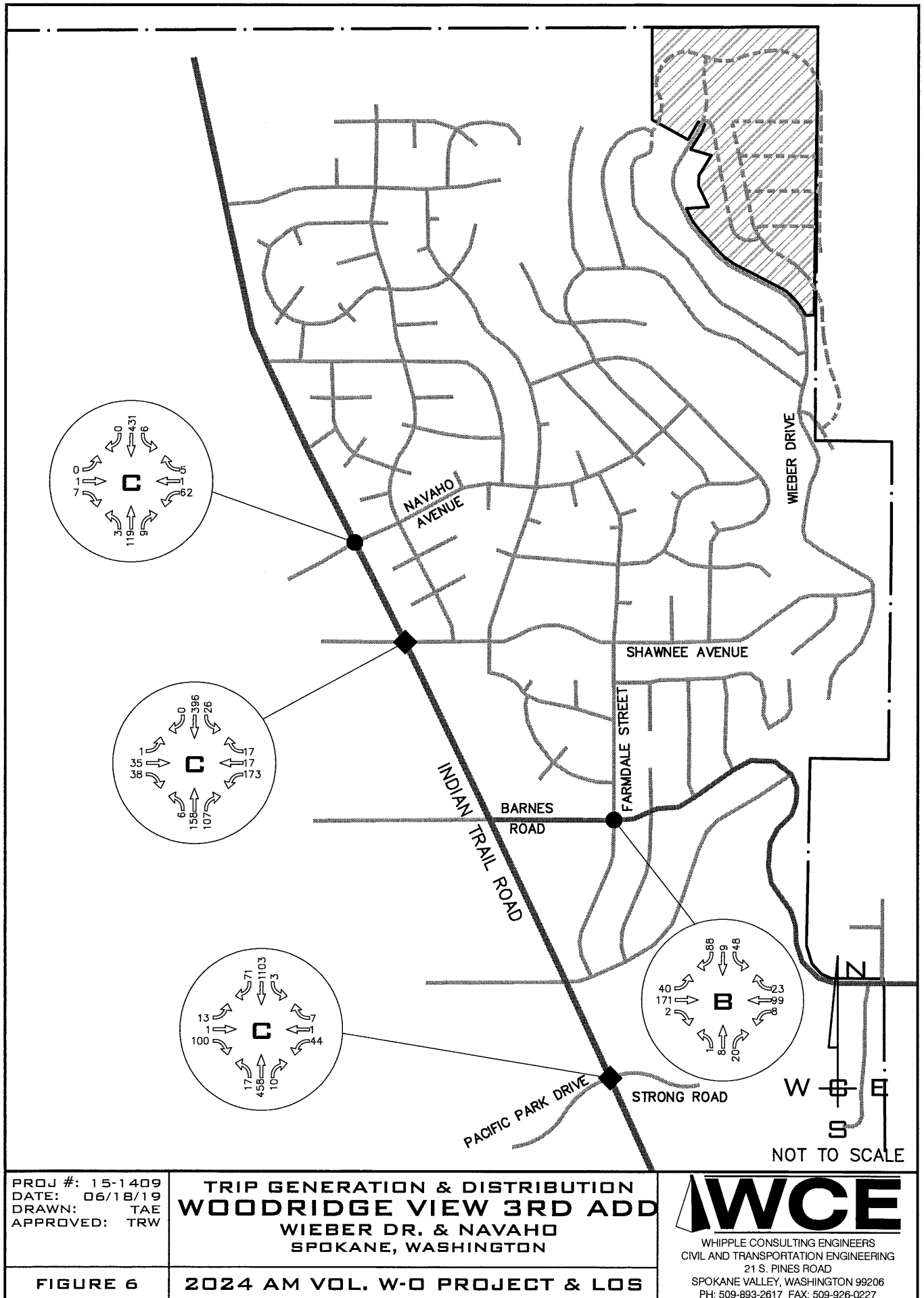


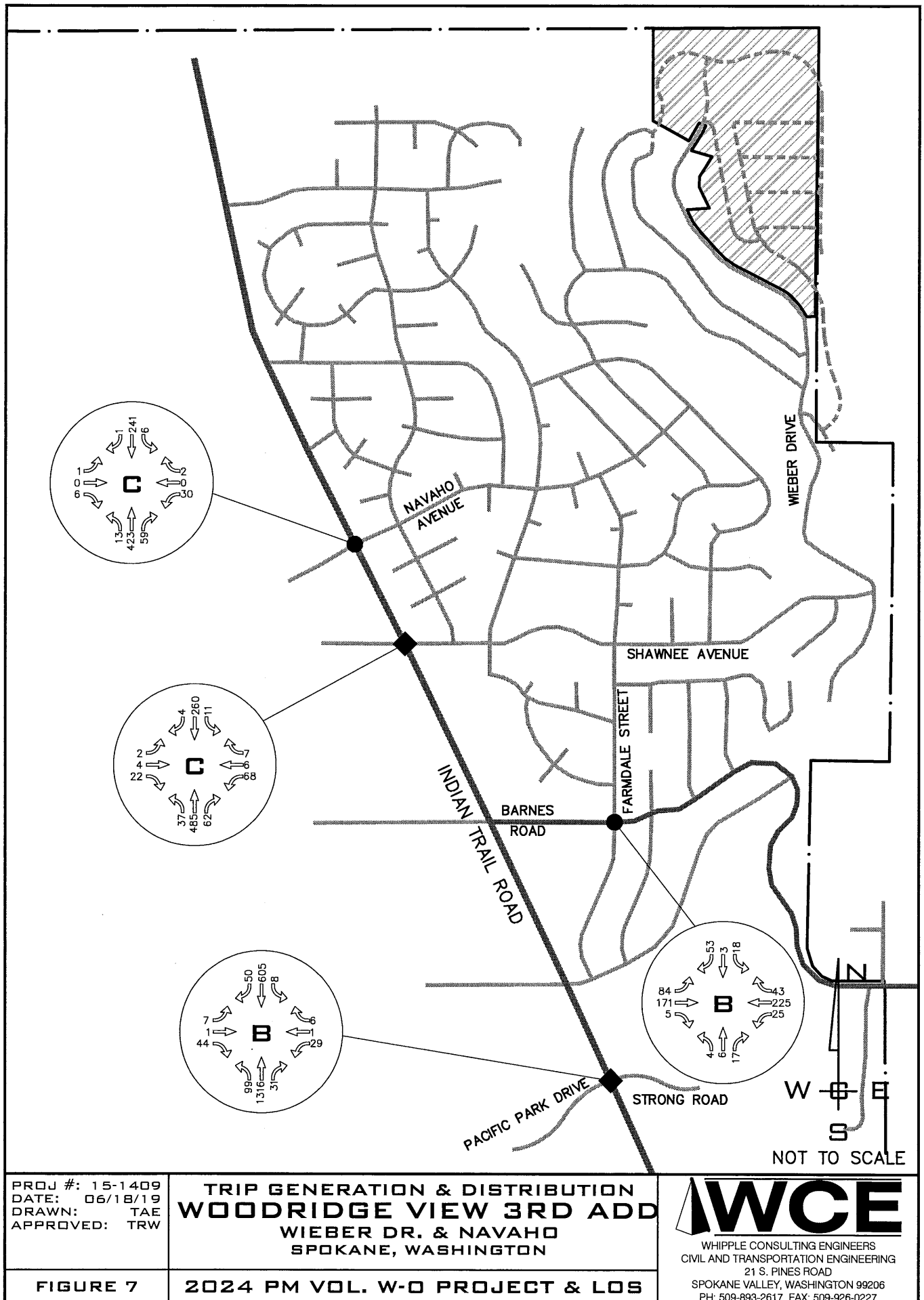
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 APPROVED: TRW

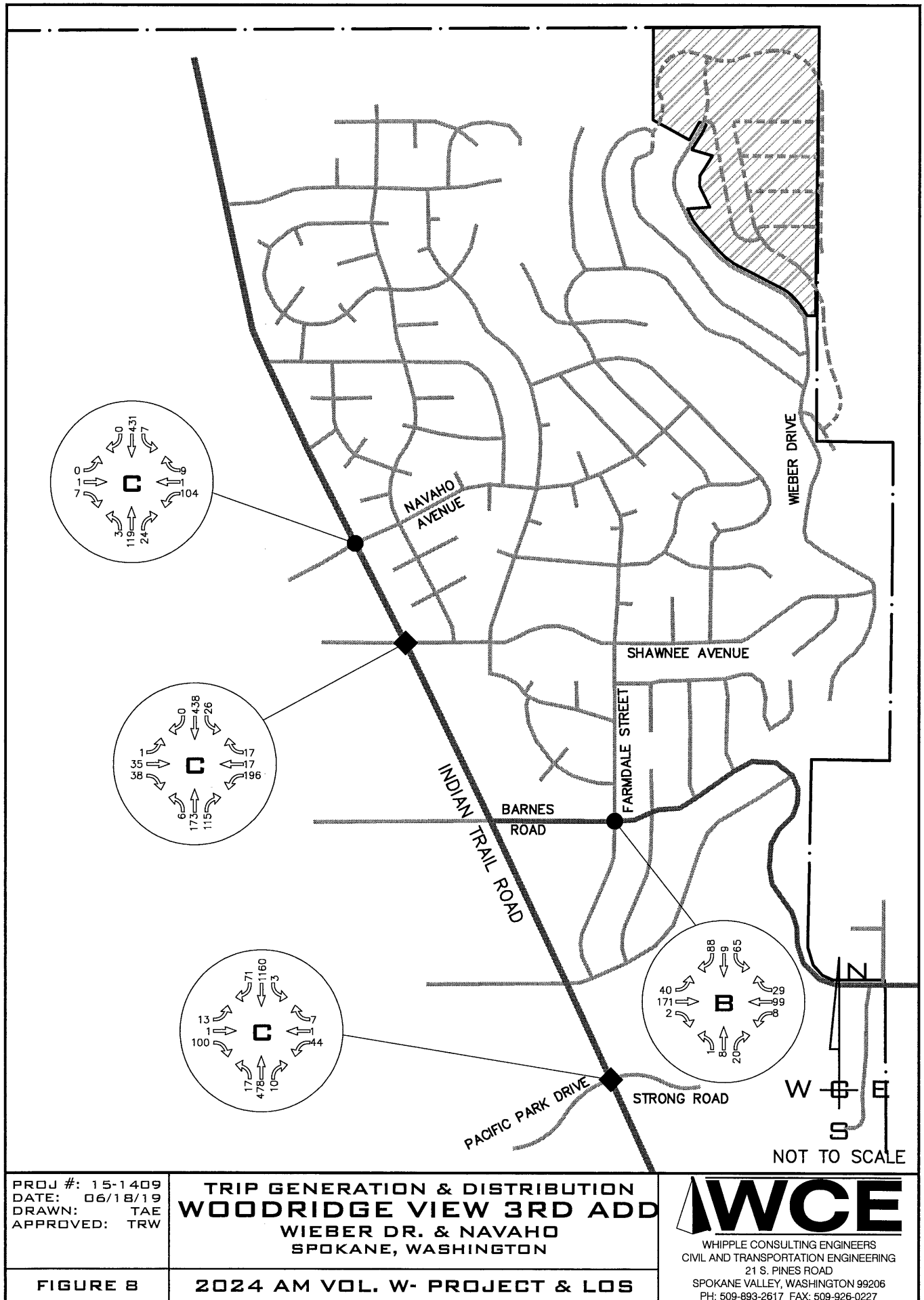
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**WIEBER DR. & NAVAHO**  
**SPOKANE, WASHINGTON**

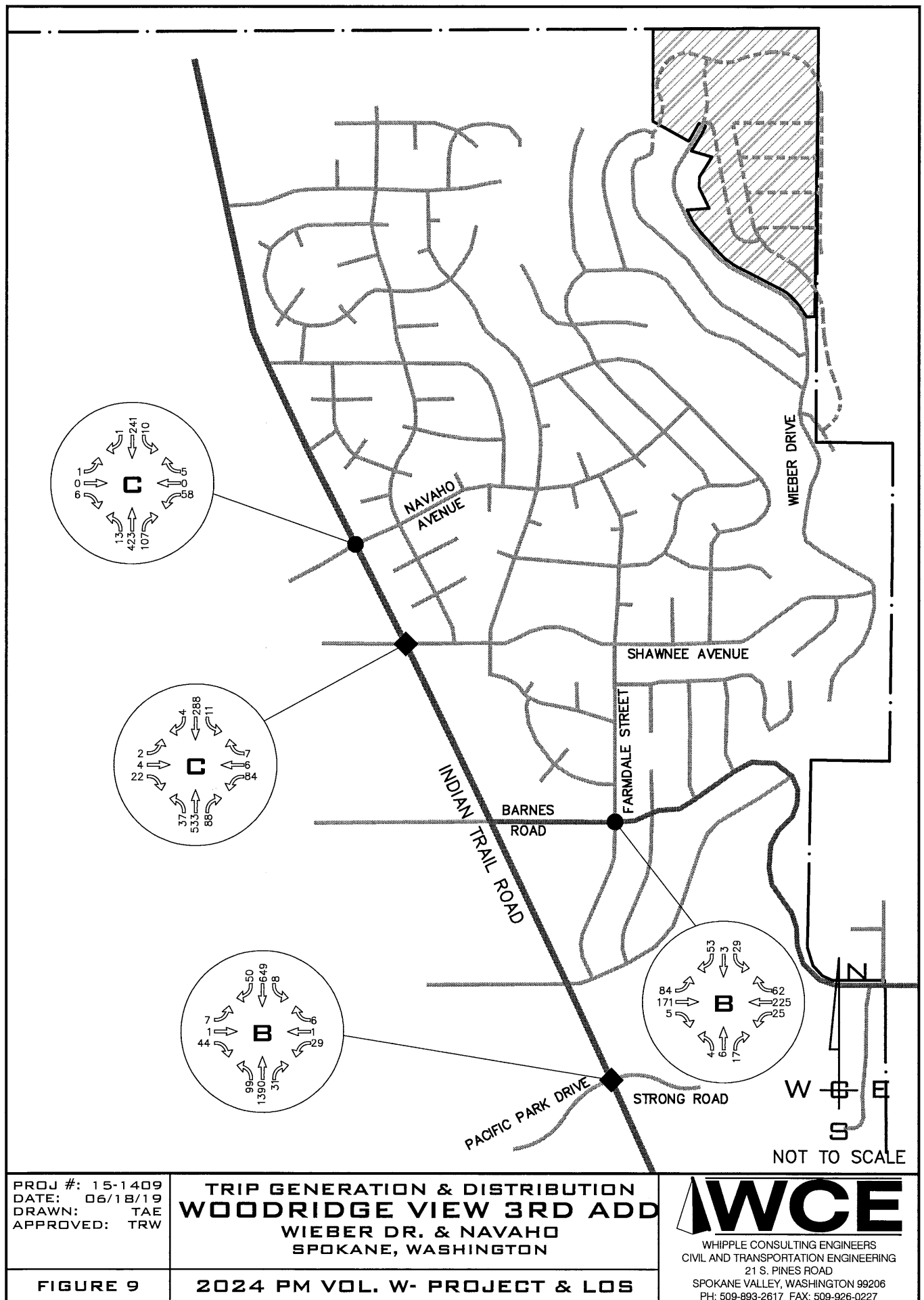
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 PH: 509-893-2617 FAX: 509-926-0227











PROJECT: WCE Woodridge  
JOB NO. 19-10

INTERSECTION: Navaho Avenue & Indian Trail Road

TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/16/2019  
Counter Analyst  
Mivision BNG



Phone: (509) 951-1851  
email: beng@trfants.com

AM PEAK HOURS  
15 Minute Period Beginning @

APPROACH	MOVEMENT	6:30 AM	6:45 AM	7:00 AM	7:15 AM	7:30 AM	7:45 AM	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left	0	0	0	0	0	0	0	0	0	0	0	0
	Through	0	0	0	0	0	0	0	0	0	0	0	0
	Right	1	0	1	0	0	0	0	0	0	0	0	0
	App. Total	1	0	1	0	0	0	0	0	0	0	0	0
Westbound	Left	15	0	15	0	16	0	11	0	17	0	9	1
	Through	0	0	0	0	0	0	0	0	0	0	0	0
	Right	0	0	0	0	0	0	0	0	0	0	0	0
	App. Total	15	0	15	0	16	0	11	0	17	0	9	1
Northbound	Left	0	0	0	0	0	0	0	0	0	0	0	0
	Through	10	0	18	5	17	3	25	4	27	3	32	2
	Right	0	0	0	0	0	0	0	0	0	0	0	0
	App. Total	10	0	18	5	17	3	25	4	27	3	32	2
Southbound	Left	0	0	0	0	0	0	0	0	0	0	0	0
	Through	60	1	52	1	88	1	94	5	97	1	69	2
	Right	0	0	0	0	0	0	0	0	0	0	0	0
	App. Total	60	1	52	1	88	1	94	5	97	1	69	2
Total Intersection Volume		86	1	84	3	128	6	135	9	132	2	124	7
Intersection Pct Trucks		1.1%		3.4%		4.5%		6.3%		1.5%		5.3%	

Pedestrian Volumes

APPROACH	MOVEMENT	6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15
		Ped	Ped	Ped	Ped	Ped	Ped	Ped	Ped	Ped	Ped	Ped	Ped
Eastbound	Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0
	Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0
	Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0
	Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0	0	0

Bicycle Volumes

APPROACH	MOVEMENT	6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15
		bike	bike	bike	bike	bike	bike	bike	bike	bike	bike	bike	bike
Eastbound	Through												
	Through												
	Through												
	Through												
Total		0	0	0	0	0	0	0	0	0	0	0	0

Intersection Total	Pct Trucks
One Hour Volumes	
6:30 AM	452
6:45 AM	499
7:00 AM	537
7:15 AM	534
7:30 AM	522
7:45 AM	520
8:00 AM	503
8:15 AM	476
8:30 AM	455



PROJECT: WCE Woodridge  
 JOB NO. 19-10  
 INTERSECTION: Navaho Avenue & Indian Trail Road

Data Transfer  
 Intersection No.

1

DATE OF COUNT: 1/16/2019  
 Counter Analyst  
 Miovision BNG

TRAFFIC COUNT REDUCTION WORKSHEET  
 AM PEAK HOUR BREAKDOWN

Phone: (509) 951-1851  
 email: beng@trfcnts.com

Traffic Counts  
 & Surveys Inc.

APPROACH	MOVEMENT	7:00 AM	7:15 AM	7:30 AM	7:45 AM	TOTAL	P.H.F.	Pct Trucks	App Dist
		pass	trk	pass	trk	pass	trk		
Eastbound	Left	0	0	0	0	0	0	0	0.00%
	Through	1	0	0	0	0	0	0	12.50%
	Right	2	1	0	2	0	0	0	87.50%
	App. Total	3	1	0	2	0	0	0	
Westbound	Pct Trucks	0	0	0	0	0	0	0	
	Left	15	19	0	9	0	0	0	90.77%
	Through	1	0	0	0	0	0	0	1.54%
	Right	1	1	0	1	0	0	0	7.69%
Northbound	App. Total	17	20	0	10	0	0	0	
	Pct Trucks	0	0	0	0	0	0	0	
	Left	1	0	1	0	0	0	0	3.23%
	Through	16	17	3	1	0	0	0	87.10%
Southbound	Right	2	2	0	0	0	0	0	9.68%
	App. Total	19	19	4	1	0	0	0	
	Pct Trucks	0.208333	0.173913	0.066667	0.032258				
	Left	1	1	1	3	0	0	0	1.62%
Total Intersection Volume	Through	88	94	5	78	1	0	0	98.38%
	Right	0	0	0	0	0	0	0	0.00%
	App. Total	89	95	5	81	1	0	0	
	Pct Trucks	0.011111	0.05	0.010101	0.012195				
Intersection Pct Trucks		128	6	135	2	123	2	537	4%

Pedestrian Volumes

APPROACH	MOVEMENT	7:00	7:15	7:30	7:45	Confl.
		Ped	Ped	Ped	Ped	Ped
Eastbound	Crosswalk	0	0	0	0	0
	Crosswalk	0	1	0	1	2
	Crosswalk	0	0	0	0	0
	Crosswalk	0	1	0	0	1
Total		0	2	0	1	

Bicycles Volumes

APPROACH	MOVEMENT	7:00	7:15	7:30	7:45	Confl.
		bike	bike	bike	bike	Bike
Eastbound	Through					0
	Through					0
	Through					0
	Through					0
Total		0	0	0	0	

Notes

Miovision Vehicle classification

Passenger Vehicle	Truck Vehicle

All Vehicles (see classification)

PROJECT: WCE Woodridge  
JOB NO. 19-10

INTERSECTION: Navaho Avenue & Indian Trail Road

TRAFFIC COUNT REDUCTION WORKSHEET



Phone: (509) 951-1851  
email: beng@trfcnts.com

DATE OF COUNT: 1/16/2019  
Counter Analyst  
Division BNG

PM PEAK HOURS  
15 Minute Period Beginning @

APPROACH	MOVEMENT	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	6:00 PM	6:15 PM
Eastbound	Left	0	0	0	0	0	0	0	0	0	0	0	0
	Through	0	0	0	0	0	0	0	0	0	0	0	0
	Right	2	3	1	0	0	0	0	0	0	0	0	0
	App. Total	2	3	1	0	0	0	0	0	0	0	0	0
	Pct Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Westbound	Left	6	1	8	0	5	0	6	0	6	0	10	0
	Through	0	0	0	0	0	0	0	0	0	0	0	0
	Right	1	0	1	0	0	0	0	0	0	0	0	0
	App. Total	7	1	9	0	5	0	6	0	6	0	10	0
	Pct Trucks	0.125	0	0	0	0	0	0	0	0	0	0	0
Northbound	Left	1	0	3	1	1	0	2	0	3	0	0	0
	Through	76	4	93	1	78	1	84	2	83	2	69	2
	Right	12	0	13	1	15	0	14	0	16	0	12	0
	App. Total	89	4	109	3	94	1	100	2	100	2	81	2
	Pct Trucks	0.043	0.027	0.027	0.011	0.02	0.019	0	0.03	0.035	0.02	0.024	0
Southbound	Left	1	0	1	0	3	0	1	0	0	0	0	0
	Through	41	1	42	5	42	2	34	2	36	2	44	3
	Right	0	0	0	0	1	0	0	0	0	0	0	0
	App. Total	42	1	43	5	46	2	35	2	36	2	44	3
	Pct Trucks	0.023	0.104	0.042	0.054	0.054	0.033	0	0.027	0.023	0.051	0.064	0.086
Total Intersection Volume		140	6	164	8	147	3	142	4	144	6	137	5
Intersection Pct Trucks		4.1%	4.7%	2.0%	2.7%	2.3%	0.0%	2.7%	2.9%	4.0%	1.8%	3.5%	2.5%

Pedestrian Volumes  
15 Minute Period Beginning @

APPROACH	MOVEMENT	3:30	3:45	4:00	4:15	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15
Eastbound	Crosswalk	1	0	0	0	0	0	0	0	0	0	0	0
	Crosswalk	0	0	0	0	1	2	0	0	0	0	0	0
	Crosswalk	1	0	0	0	0	0	0	0	0	0	0	0
	Crosswalk	0	2	0	0	0	0	0	0	1	0	0	0
	Total	2	2	0	0	1	2	0	0	1	0	0	0

Bicycle Volumes  
15 Minute Period Beginning @

APPROACH	MOVEMENT	3:30	3:45	4:00	4:15	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15
Eastbound	Through												
	Through												
	Through												
	Through												
	Total	0	0	0	0	0	0	0	0	0	0	0	0

Intersection Total		Pct	
One Hour Volumes		Trucks	
3:30 PM	614	3.4%	
3:45 PM	645	2.9%	
4:00 PM	641	1.7%	
4:15 PM	637	1.9%	
4:30 PM	628	1.9%	
4:45 PM	601	2.3%	
5:00 PM	596	2.9%	
5:15 PM	592	3.0%	
5:30 PM	574	3.0%	



PROJECT: WCE Woodridge  
 JOB NO. 19-10  
 INTERSECTION: Navaho Avenue & Indian Trail Road

Data Transfer  
 Intersection No.

1

DATE OF COUNT: 1/16/2019  
 Counter Analyst  
 Miovision BNG

TRAFFIC COUNT REDUCTION WORKSHEET  
 PM PEAK HOUR BREAKDOWN

Phone: (509) 951-1851  
 email: beng@trfcs.com

Traffic Counts  
 & Surveys, Inc.

APPROACH	MOVEMENT	3:45 PM	4:00 PM	4:15 PM	4:30 PM	TOTAL	P.H.F.	Pct Trucks	App Dist
		pass	trk	pass	trk	pass	trk		
Eastbound	Left	0	1	0	0	0	0	0%	14.29%
	Through	0	0	0	0	0	0	0%	0.00%
	Right	3	1	0	0	2	6	0%	85.71%
	App. Total	3	2	0	0	2	7	0%	
Westbound	Pct Trucks	0	0	0	0	0	0		
	Left	8	5	6	10	29	0.73	0%	93.55%
	Through	0	0	0	0	0	0	0%	0.00%
	Right	1	0	1	0	2	0.50	0%	6.45%
Northbound	App. Total	9	5	7	10	31	0.78		
	Pct Trucks	0	0	0	0	0	0		
	Left	3	1	2	4	12	0.60	17%	2.90%
	Through	93	78	84	86	346	0.92	1%	83.57%
Southbound	Right	13	15	14	13	56	0.93	2%	13.53%
	App. Total	109	94	100	103	414	0.92		
	Pct Trucks	0.026786	0.010526	0.019608	0.019048				
	Left	1	3	1	1	6	0.50	0%	3.11%
Total Intersection Volume	Through	42	42	34	57	186	0.79	6%	96.37%
	Right	0	1	0	0	1	0.25	0%	0.52%
	App. Total	43	46	35	58	193	0.80		
	Pct Trucks	0.104167	0.041667	0.054054	0.033333				
Total Intersection Volume		164	147	142	173	645	0.91	3%	
Intersection Pct Trucks			4.7%	2.0%	2.7%				

Pedestrian Volumes

APPROACH	MOVEMENT	3:45	4:00	4:15	4:30	Confl.
		Ped	Ped	Ped	Ped	Ped
Eastbound	Crosswalk	0	0	0	0	0
Westbound	Crosswalk	0	0	0	1	1
Northbound	Crosswalk	0	0	0	0	0
Southbound	Crosswalk	2	0	0	0	2
Total		2	0	0	1	

Bicycles Volumes

APPROACH	MOVEMENT	5:00	5:15	5:30	5:45	Confl.
		bike	bike	bike	bike	Bike
Eastbound	Through					0
Westbound	Through					0
Northbound	Through					0
Southbound	Through	0	0	0	0	0
Total		0	0	0	0	

Notes

Miovision Vehicle classification

Passenger Vehicle	Truck Vehicle
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PROJECT: WCE Woodridge  
JOB NO: 19-10

INTERSECTION: Barnes Road & Farmdale Street

TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/17/2019  
Counter Analyst  
Division BNG

Phone: (509) 951-1851  
email: beng@trfcounts.com



AM PEAK HOURS  
15 Minute Period Beginning @

APPROACH	MOVEMENT	6:30 AM	6:45 AM	7:00 AM	7:15 AM	7:30 AM	7:45 AM	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM
Eastbound	Left	2	0	1	4	0	5	1	0	6	1	8	0
	Through	10	1	15	0	16	0	27	0	39	0	23	1
	Right	0	0	0	0	0	0	0	1	0	0	0	0
	App. Total	12	1	25	1	20	0	32	1	46	1	31	1
	Pct Trucks	0.077	0.038			0.03		0.045	0.04		0.021	0.031	0
Westbound	Left	0	0	0	0	0	0	0	1	0	0	0	0
	Through	12	0	10	0	13	0	16	0	15	1	17	0
	Right	1	0	1	0	6	0	4	0	2	0	3	0
	App. Total	13	0	11	0	19	0	20	1	17	1	23	0
	Pct Trucks	0	0	0	0	0	0	0.048	0	0	0.056	0.031	0
Northbound	Left	3	0	4	0	4	0	3	0	0	0	0	0
	Through	0	0	0	1	0	0	0	1	0	1	0	0
	Right	0	0	0	0	0	0	0	0	0	0	0	0
	App. Total	3	0	4	0	5	0	3	0	1	0	1	0
	Pct Trucks	0	0	0	0	0	0	0	0	0.25	0	0	0
Southbound	Left	2	0	6	0	7	0	7	0	17	0	7	0
	Through	0	0	0	3	0	2	0	2	0	5	0	1
	Right	24	0	23	0	20	0	25	2	29	3	15	0
	App. Total	26	0	29	0	30	0	34	2	51	3	23	0
	Pct Trucks	0	0	0	0	0	0	0.081	0.042	0.043	0.056	0	0
Total Intersection Volume		54	1	69	1	74	0	83	4	92	6	91	1
Intersection Pct Trucks		1.8%		1.4%		0.0%		4.6%		1.1%		1.4%	2.0%

Pedestrian Volumes

APPROACH	MOVEMENT	6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15
Eastbound	Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0
	Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0
	Crosswalk	0	0	0	0	0	0	0	1	1	0	0	0
	Crosswalk	0	0	1	0	0	0	2	1	0	0	0	0
Total		0	0	1	0	0	0	2	2	1	0	0	0

Bicycle Volumes

APPROACH	MOVEMENT	6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15
Eastbound	Through												
	Through												
	Through												
	Through												
Total		0	0	0	0	0	0	0	0	0	0	0	0

Intersection Total		Pct	
One Hour Volumes		Trucks	
6:30 AM	286	2.1%	
6:45 AM	324	1.9%	
7:00 AM	323	1.9%	
7:15 AM	319	2.5%	
7:30 AM	332	2.1%	
7:45 AM	359	3.3%	
8:00 AM	382	3.1%	
8:15 AM	384	2.9%	
8:30 AM	334	2.7%	



PROJECT: WCE Woodridge  
 JOB NO: 19-10  
 INTERSECTION: Barnes Road & Farmdale Street

Data Transfer  
 Intersection No.

1

DATE OF COUNT: 1/17/2019  
 Counter Analyst  
 Miovision BNG

TRAFFIC COUNT REDUCTION WORKSHEET  
 AM PEAK HOUR BREAKDOWN

Phone: (509) 951-1851  
 email: beng@trfcnts.com



APPROACH	MOVEMENT	8:15 AM	8:30 AM	8:45 AM	9:00 AM	TOTAL	P.H.F.	Pct Trucks	App Dist
Eastbound	Left	11	6	1	8	38	0.79	3%	27.14%
	Through	16	39	0	23	100	0.64	1%	71.43%
	Right	1	1	0	0	2	0.50	0%	1.43%
	App. Total	28	46	1	31	140	0.74		
Westbound	Pct Trucks	0	0.021277	0	0.03125				
	Left	1	0	0	0	2	0.50	0%	2.11%
	Through	10	15	1	17	71	0.63	3%	74.74%
	Right	11	2	0	6	22	0.50	0%	23.16%
Northbound	App. Total	22	17	1	23	95	0.74		
	Pct Trucks	0	0.055556	0.03125	0				
	Left	0	0	0	0	1	0.25	0%	10.00%
	Through	3	1	1	1	8	0.50	25%	80.00%
Southbound	Right	0	0	0	0	1	0.25	0%	10.00%
	App. Total	3	1	1	1	10	0.63		
	Pct Trucks	0.25	0	1	0				
	Left	17	17	7	5	46	0.68	0%	33.09%
Total Intersection Volume	Through	2	5	1	1	9	0.45	0%	6.47%
	Right	25	29	3	10	84	0.66	6%	60.43%
	App. Total	44	51	3	16	139	0.64		
	Pct Trucks	0.043478	0.055556	0	0				
Intersection Pct Trucks		97	114	6	71	384	0.80	3%	
			3.0%	5.0%	1.1%				

Pedestrian Volumes

APPROACH	MOVEMENT	8:15	8:30	8:45	9:00	Confl.
Eastbound	Ped	0	0	0	0	
	Crosswalk	0	0	0	0	
	Through	0	0	0	0	
	Total	0	0	0	0	
Westbound	Ped	1	1	0	0	
	Crosswalk	1	1	0	0	
	Through	0	0	0	0	
	Total	2	2	0	0	
Northbound	Ped	0	0	0	0	
	Crosswalk	0	0	0	0	
	Through	0	0	0	0	
	Total	0	0	0	0	
Southbound	Ped	0	0	0	0	
	Crosswalk	0	0	0	0	
	Through	0	0	0	0	
	Total	0	0	0	0	

Bicycles Volumes

APPROACH	MOVEMENT	8:15	8:30	8:45	9:00	Confl.
Eastbound	bike	0	0	0	0	
	Crosswalk	0	0	0	0	
	Through	0	0	0	0	
	Total	0	0	0	0	
Westbound	bike	0	0	0	0	
	Crosswalk	0	0	0	0	
	Through	0	0	0	0	
	Total	0	0	0	0	
Northbound	bike	0	0	0	0	
	Crosswalk	0	0	0	0	
	Through	0	0	0	0	
	Total	0	0	0	0	
Southbound	bike	0	0	0	0	
	Crosswalk	0	0	0	0	
	Through	0	0	0	0	
	Total	0	0	0	0	

Notes

Miovision Vehicle classification

Passenger Vehicle	Truck Vehicle



PROJECT: WCE Woodridge  
JOB NO. 19-10

INTERSECTION: Barnes Road & Farmdale Street

TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/17/2019  
Counter Analyst  
Division BNG

Phone: (509) 951-1851  
email: beng@trfnts.com



PM PEAK HOURS

BNG		15 Minute Period Beginning @																							
APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left	20	0	40	1	24	0	26	1	20	0	21	0	25	0	14	0	28	0	18	0	26	0	19	0
	Through	31	0	23	0	22	0	28	0	34	1	24	0	27	0	34	0	24	0	24	0	20	0	27	1
	Right	0	0	1	0	1	0	1	0	1	0	1	0	1	0	3	0	2	0	1	0	0	0	1	0
	App. Total	51	0	64	1	47	0	55	1	55	1	46	0	52	0	51	0	54	0	43	0	46	0	47	1
	Pct Trucks	0	0	0.015	0	0.018	0	0.018	0	0.018	0	0.018	0	0	0	0	0	0	0	0	0	0	0	0.021	0.021
Westbound	Left	0	0	1	0	0	0	0	0	1	0	1	0	0	0	2	0	0	0	1	0	1	0	1	0
	Through	25	0	33	0	39	1	31	0	32	0	39	0	31	0	42	0	28	0	33	1	27	0	21	0
	Right	9	0	13	0	4	1	12	0	11	0	8	0	8	0	14	0	4	0	13	0	5	0	4	0
	App. Total	34	0	47	0	43	2	43	0	44	0	48	0	39	0	58	0	32	0	47	1	33	0	26	0
	Pct Trucks	0	0	0	0	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0.021	0	0	0	0	0
Northbound	Left	1	0	0	0	0	0	1	0	0	0	2	0	2	0	0	0	2	0	0	0	0	0	1	0
	Through	0	0	0	0	1	0	2	0	3	0	1	0	0	0	2	0	1	0	1	0	0	0	2	0
	Right	1	0	0	0	0	0	1	0	0	0	1	0	1	0	2	0	1	0	0	0	0	0	1	0
	App. Total	2	0	0	0	1	0	4	0	3	0	4	0	3	0	4	0	4	0	1	1	0	0	4	0
	Pct Trucks	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
Southbound	Left	9	0	3	0	7	0	4	0	4	0	2	0	9	0	2	0	9	0	4	0	2	0	5	0
	Through	0	0	0	0	1	0	4	0	0	0	2	0	0	0	1	0	1	0	4	0	0	0	3	0
	Right	5	0	15	0	9	0	7	0	14	0	11	0	11	0	14	0	6	0	11	1	7	0	8	0
	App. Total	14	0	18	0	17	0	15	0	18	0	15	0	20	0	17	0	16	0	19	1	9	0	16	0
	Pct Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0	0	0	0
Total Intersection Volume		101	0	129	1	108	2	117	1	120	1	113	0	114	0	130	0	106	1	110	2	88	0	93	1
Intersection Pct Trucks		0.0%	0.8%	0.8%	1.8%	0.8%	1.8%	0.8%	0.8%	0.8%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.9%	1.8%	0.0%	0.0%	0.0%	1.1%	1.1%

Intersection Total		Pct	
One Hour Volumes		Trucks	
3:30 PM	459	479	0.9%
3:45 PM	479	479	1.0%
4:00 PM	462	462	0.9%
4:15 PM	466	466	0.4%
4:30 PM	478	478	0.2%
4:45 PM	464	464	0.2%
5:00 PM	463	463	0.6%
5:15 PM	437	437	0.7%
5:30 PM	401	401	1.0%

Pedestrian Volumes		15 Minute Period Beginning @											
APPROACH	MOVEMENT	3:30	3:45	4:00	4:15	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15
Eastbound	Crosswalk	0	0	0	1	0	0	0	0	0	0	0	0
	Crosswalk	0	2	0	0	0	0	0	0	0	0	0	1
	Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0
	Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0
	Crosswalk	0	0	0	1	0	0	0	0	0	0	0	0
Total		0	2	0	2	0	0	0	0	0	0	0	1

Bicycle Volumes		15 Minute Period Beginning @											
APPROACH	MOVEMENT	3:30	3:45	4:00	4:15	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15
Eastbound	bike	0	0	0	0	0	0	0	0	0	0	0	0
	bike	0	0	0	0	0	0	0	0	0	0	0	0
	bike	0	0	0	0	0	0	0	0	0	0	0	0
	bike	0	0	0	0	0	0	0	0	0	0	0	0
	bike	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0	0	0



PROJECT: WCE Woodridge  
 JOB NO. 19-10  
 INTERSECTION: Barnes Road & Farmdale Street

Data Transfer  
 Intersection No.

1

DATE OF COUNT: 1/17/2019  
 Counter Analyst  
 Miovision BNG

TRAFFIC COUNT REDUCTION WORKSHEET  
 PM PEAK HOUR BREAKDOWN

Phone: (509) 951-1851  
 email: beng@trfnts.com

Traffic Counts  
 & Surveys, Inc.

APPROACH	MOVEMENT	4:30 PM	4:45 PM	5:00 PM	5:15 PM	TOTAL	P.H.F.	Pct Trucks	App Dist
		pass	trk	pass	trk	pass	trk		
Eastbound	Left	20	21	0	14	0	80	0.80	39.02%
	Through	34	24	0	34	0	120	0.86	58.54%
	Right	1	1	0	3	0	5	0.42	2.44%
	App. Total	55	46	0	51	0	205	0.92	
	Pct Trucks	0.017857		0	0	0			
Westbound	Left	1	1	0	2	0	4	0.50	2.12%
	Through	32	39	0	42	0	144	0.86	76.19%
	Right	11	8	0	14	0	41	0.73	21.69%
	App. Total	44	48	0	58	0	189	0.81	
	Pct Trucks	0	0	0	0	0			
Northbound	Left	0	2	0	0	0	4	0.50	28.57%
	Through	3	1	0	2	0	6	0.50	42.86%
	Right	0	1	0	2	0	4	0.50	28.57%
	App. Total	3	4	0	4	0	14	0.88	
	Pct Trucks	0	0	0	0	0			
Southbound	Left	4	2	0	2	0	17	0.47	24.29%
	Through	0	2	0	1	0	3	0.38	4.29%
	Right	14	11	0	14	0	50	0.89	71.43%
	App. Total	18	15	0	17	0	70	0.88	
	Pct Trucks	0	0	0	0	0			
Total Intersection Volume		120	113	0	130	0	478	0.92	
Intersection Pct Trucks		0.8%	0.0%	0.0%	0.0%	0		0%	

Pedestrian Volumes

APPROACH	MOVEMENT	4:30	4:45	5:00	5:15	Confl.
		Ped	Ped	Ped	Ped	Ped
Eastbound	Crosswalk	0	0	0	0	0
Westbound	Crosswalk	0	0	0	0	0
Northbound	Crosswalk	0	0	0	0	0
Southbound	Crosswalk	0	0	0	0	0
Total		0	0	0	0	0

Bicycles Volumes

APPROACH	MOVEMENT	5:00	5:15	5:30	5:45	Confl.
		bike	bike	bike	bike	Bike
Eastbound	Through					0
Westbound	Through					0
Northbound	Through					0
Southbound	Through					0
Total		0	0	0	0	0

Notes

Miovision Vehicle classification	
Passenger Vehicle	Truck Vehicle

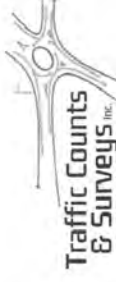


PROJECT: WCE Woodridge  
JOB NO. 19-10

INTERSECTION: Shawnee Avenue & Indian Trail Road

TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/16/2019  
Counter Analyst  
Division BNG



Phone: (509) 951-1851  
email: beng@trfcs.com

AM PEAK HOURS

		15 Minute Period Beginning @													
APPROACH	MOVEMENT	6:30 AM	6:45 AM	7:00 AM	7:15 AM	7:30 AM	7:45 AM	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	pass	trk
Eastbound	Left	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Through	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Right	8	0	12	9	0	9	0	14	0	11	0	7	0	12
	App. Total	8	0	12	9	0	9	0	14	0	11	0	7	0	12
Westbound	Pct Trucks	0	0	0	0	0	0	0	0.083	0	0	0	0	0	0.077
	Left	13	0	16	0	22	0	29	0	13	0	24	1	36	0
	Through	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Right	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Northbound	App. Total	13	0	16	0	23	0	31	0	14	0	24	1	36	0
	Pct Trucks	0	0.059	0	0.08	0	0	0.033	0	0	0.011	0	0.027	0	0
	Left	2	0	1	0	2	0	1	0	0	0	1	0	2	0
	Through	10	0	18	2	18	4	16	4	14	1	25	2	26	3
Southbound	Right	2	0	4	1	7	4	11	2	6	1	17	0	34	0
	App. Total	14	0	23	3	27	8	28	6	20	2	44	2	61	4
	Pct Trucks	0	0.115	0.029	0.043	0.091	0.176	0.043	0.062	0.065	0.062	0.065	0.075	0.035	0.021
	Left	1	0	1	0	2	0	2	0	0	0	6	0	7	1
Total Intersection Volumes	Through	75	1	65	1	103	1	114	4	113	1	81	1	83	1
	Right	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	App. Total	75	1	65	1	103	1	114	4	113	1	81	1	83	1
	Pct Trucks	0.013	0.015	0.015	0.009	0.009	0.041	0.041	0.009	0.009	0.011	0.011	0.011	0.011	0.011
Intersection Pct Trucks		111	1	117	5	164	11	185	11	162	3	175	4	202	7
		0.9%	4.1%	6.3%	5.6%	1.8%	2.2%	3.3%	2.6%	3.2%	1.4%	3.2%	1.4%	3.2%	1.4%

		15 Minute Period Beginning @											
APPROACH	MOVEMENT	6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15
Eastbound	Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0
	Crosswalk	0	1	0	0	0	1	15	2	0	0	0	0
	Crosswalk	0	0	0	0	0	0	0	0	0	1	0	0
	Crosswalk	0	1	0	0	0	0	1	0	0	0	0	0
Total		0	2	0	0	0	1	16	2	2	1	0	0

		15 Minute Period Beginning @											
APPROACH	MOVEMENT	6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15
Eastbound	bike												
	bike												
	bike												
	bike												
Total		0	0	0	0	0	0	0	0	0	0	0	0

		Intersection Total		Pct	
		One Hour Volumes		Trucks	
6:30 AM		605		4.6%	
6:45 AM		658		4.6%	
7:00 AM		715		4.1%	
7:15 AM		749		3.3%	
7:30 AM		826		2.5%	
7:45 AM		850		2.8%	
8:00 AM		809		2.7%	
8:15 AM		724		2.6%	
8:30 AM		595		2.4%	



PROJECT: WCE Woodridge  
 JOB NO. 19-10  
 INTERSECTION: Shawnee Avenue & Indian Trail Road

Data Transfer  
 Intersection No.

DATE OF COUNT: 1/16/2019  
 Counter Analyst  
 Miovision BNG

TRAFFIC COUNT REDUCTION WORKSHEET  
 AM PEAK HOUR BREAKDOWN

Phone: (509) 951-1851  
 email: beng@trfounts.com

Traffic Counts  
 & Surveys

APPROACH	MOVEMENT	7:45 AM	8:00 AM	8:15 AM	8:30 AM	P.H.F.	Pct Trucks	App Dist
		pass	trk	pass	trk	TOTAL		
Eastbound	Left	1	0	0	0	1	0.25	1.43%
	Through	2	7	0	0	33	0.34	47.14%
	Right	12	0	11	8	36	0.75	51.43%
	App. Total	15	11	35	8	70	0.50	
	Pct Trucks	0	0.083333	0	0			
Westbound	Left	24	36	73	29	165	0.56	83.76%
	Through	1	2	9	4	16	0.44	8.12%
	Right	4	2	7	3	16	0.57	8.12%
	App. Total	29	40	89	36	197	0.55	
	Pct Trucks	0.033333	0	0.011111	0.027027			
Northbound	Left	2	1	0	2	6	0.75	2.65%
	Through	25	26	23	33	118	0.84	52.21%
	Right	17	34	35	14	102	0.73	45.13%
	App. Total	44	61	58	49	226	0.87	
	Pct Trucks	0.043478	0.061538	0.064516	0.075472			
Southbound	Left	6	7	11	0	25	0.57	7.00%
	Through	81	83	73	90	332	0.91	93.00%
	Right	0	0	0	0	0		0.00%
	App. Total	87	90	84	90	357	0.97	
	Pct Trucks	0.011364	0.021739	0.023256	0.010989			
Total Intersection Volume		175	202	266	183	850	0.78	
Intersection Pct Trucks		2.2%	3.3%	2.6%	3.2%		3%	

Pedestrian Volumes

APPROACH	MOVEMENT	7:45	8:00	8:15	8:30	Confl.
		Ped	Ped	Ped	Ped	Ped TOTAL
Eastbound	Crosswalk	0	0	0	0	0
	Crosswalk	1	15	2	2	20
	Crosswalk	0	0	0	0	0
	Crosswalk	0	1	0	0	1
Total		1	16	2	2	

Bicycles Volumes

APPROACH	MOVEMENT	7:45	8:00	8:15	8:30	Confl.
		bike	bike	bike	bike	Bike TOTAL
Eastbound	Through					0
	Through					0
	Through					0
	Through	0	0	0	0	0
Total		0	0	0	0	

Notes

Miovision Vehicle classification	
Passenger Vehicle	Truck Vehicle





PROJECT: WCE Woodridge  
JOB NO. 19-10

INTERSECTION: Shawnee Avenue & Indian Trail Road

TRAFFIC COUNT REDUCTION WORKSHEET



DATE OF COUNT: 1/16/2019  
Counter Analyst  
Division BNG

Phone: (509) 951-1851  
email: beng@trfcnts.com

PM PEAK HOURS  
15 Minute Period Beginning @

APPROACH	MOVEMENT	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	6:00 PM	6:15 PM
Eastbound	Left	0	0	0	2	0	0	1	0	0	2	0	0
	Through	0	0	1	0	0	0	0	0	0	0	0	0
	Right	7	4	6	5	5	10	3	4	6	3	5	3
	App. Total	7	5	7	9	5	11	5	4	7	6	7	3
	Pct Trucks	0	0	0.125	0	0	0	0	0	0	0	0	0
Westbound	Left	17	22	18	15	9	10	11	7	7	7	25	9
	Through	2	0	2	0	0	0	0	0	0	2	1	0
	Right	5	2	1	0	2	0	2	1	0	3	4	0
	App. Total	24	26	21	17	11	10	14	10	7	12	30	9
	Pct Trucks	0.04	0.037	0.043	0	0	0	0.067	0	0	0	0	0
Northbound	Left	5	9	6	8	12	7	7	9	7	7	10	9
	Through	84	109	91	97	102	109	95	81	98	98	75	81
	Right	9	15	21	13	10	13	16	13	20	31	12	13
	App. Total	98	133	118	118	124	129	118	103	125	136	97	103
	Pct Trucks	0.01	0.007	0.017	0	0.024	0.037	0.017	0	0.016	0	0	0
Southbound	Left	2	3	1	3	3	2	1	3	1	3	8	1
	Through	44	49	47	37	66	50	45	43	47	56	31	38
	Right	1	3	0	0	1	1	0	0	0	0	1	0
	App. Total	47	55	48	40	70	53	46	46	48	59	60	39
	Pct Trucks	0.041	0.035	0.04	0	0.014	0.019	0.061	0.042	0.059	0.048	0	0
Total Intersection Volume		176	219	195	184	210	203	183	163	187	213	194	154
Intersection Pct Trucks		2.2%	1.8%	3.0%	0.0%	1.9%	2.9%	3.2%	1.2%	2.6%	1.4%	0.0%	0.0%

Pedestrian Volumes

APPROACH	MOVEMENT	3:30	3:45	4:00	4:15	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15
Eastbound	Crosswalk	1	0	0	0	0	2	0	0	0	0	0	0
	Crosswalk	0	0	2	1	0	0	0	0	3	2	0	0
	Crosswalk	0	0	1	0	0	0	0	0	0	0	0	0
	Crosswalk	0	0	0	3	0	0	0	0	1	0	0	0
	Total	1	0	3	4	2	2	0	0	4	2	0	0

Bicycle Volumes

APPROACH	MOVEMENT	3:30	3:45	4:00	4:15	4:30	4:45	5:00	5:15	5:30	5:45	6:00	6:15
Eastbound	Through												
	Through												
	Through												
	Through												
	Total	0	0	0	0	0	0	0	0	0	0	0	0

































Intersection Total		Pct Trucks	
One Hour Volumes			
3:30 PM	788	1.8%	
3:45 PM	822	1.7%	
4:00 PM	808	2.0%	
4:15 PM	796	2.0%	
4:30 PM	777	2.3%	
4:45 PM	755	2.5%	
5:00 PM	762	2.1%	
5:15 PM	767	1.3%	
5:30 PM	756	1.1%	

APPROACH	MOVEMENT	3:45 PM			4:00 PM			4:15 PM			4:30 PM			TOTAL	P.H.F.	Pct Trucks	App Dist
		pass	trk	trk	pass	trk	trk	pass	trk	trk	pass	trk	trk				
Eastbound	Left		0	0	0	0	0	0	2	0	0	0	2	0.25	0%	7.41%	
	Through		1	0	1	0	0	0	2	0	0	0	4	0.50	0%	14.81%	
	Right		4	0	6	1	0	0	5	0	0	0	21	0.75	5%	77.78%	
	App. Total		5	0	7	1	0	0	9	0	0	0	27	0.75			
	Pct Trucks		0	0	0	0.125	0	0	0	0	0	0					
Westbound	Left		22	0	18	0	0	1	15	0	0	9	65	0.74	2%	83.33%	
	Through		2	0	2	0	0	0	2	0	0	0	6	0.75	0%	7.69%	
	Right		2	1	2	0	0	0	0	0	0	2	7	0.58	14%	8.97%	
	App. Total		26	1	22	1	0	1	17	0	0	11	78	0.72			
	Pct Trucks		0.037037		0.043478		0	0	0	0	0	0					
Northbound	Left		9	0	6	0	0	0	8	0	0	12	35	0.73	0%	7.01%	
	Through		109	1	91	2	0	2	97	0	0	102	3	405	0.92	1%	81.16%
	Right		15	0	21	0	0	0	13	0	0	10	59	0.70	0%	11.82%	
	App. Total		133	1	118	2	0	2	118	0	0	124	3	499	0.93		
	Pct Trucks		0.007463		0.016667		0	0	0	0.023622		0					
Southbound	Left		3	0	1	0	0	0	3	0	0	3	10	0.83	0%	4.59%	
	Through		49	2	47	2	0	2	37	0	0	66	1	204	0.76	2%	93.58%
	Right		3	0	0	0	0	0	0	0	0	1	0	4	0.33	0%	1.83%
	App. Total		55	2	48	2	0	2	40	0	0	70	1	218	0.77		
	Pct Trucks		0.035088		0.04		0	0.04	0	0	0	0.014085					
Total Intersection Volume			219	4	195	6	184	0	210	0	210	4	822	0.92	2%		
Intersection Pct Trucks					1.8%	3.0%	0.0%			0.0%		1.9%					

Pedestrian Volumes										Confl.	
		3:45		4:00		4:15		4:30			
		Ped		Ped		Ped		Ped		Ped	
APPROACH		MOVEMENT								TOTAL	
Eastbound		0	0	0	0	0	0	0	0	0	0
Westbound		0	0	0	0	2	1	3	1	3	1
Northbound		0	0	0	0	1	0	1	0	1	1
Southbound		0	0	0	0	0	3	3	3	3	3
Total		0	0	0	0	3	4	4	4	4	4

Bicycles Volumes		5:00	5:15	5:30	5:45	Confl.
APPROACH	MOVEMENT	bike	bike	bike	bike	Bike
Eastbound	Through					TOTAL
Westbound	Through					0
Northbound	Through					0
Southbound	Through					0
	Total	0	0	0	0	

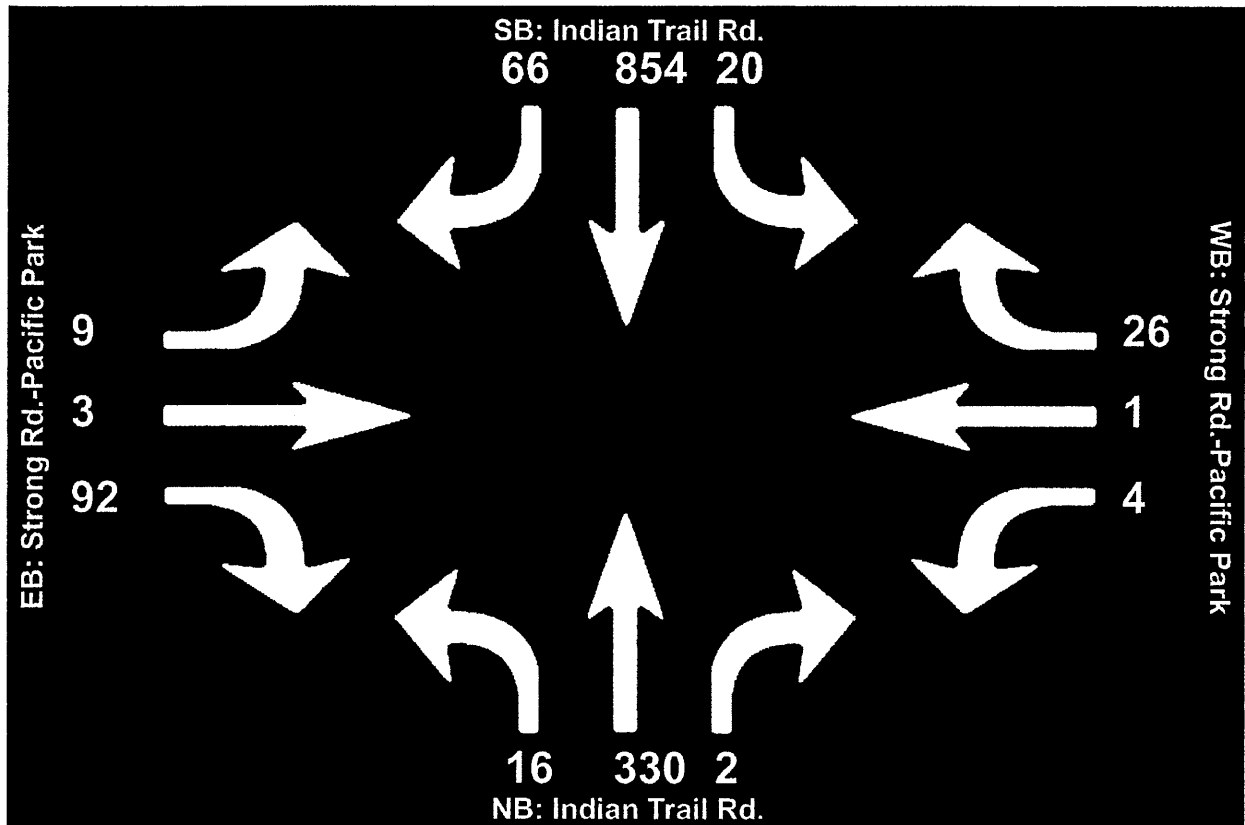
## Notes

Mission Vehicle classification	
Passenger Vehicle	Truck Vehicle
 Motorcycle  Van  SUV  Car  Light Truck  Truck  Tractor  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer	 Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer  Tractor-trailer



## Intersection Peak Hour

**Location:** Indian Trail Rd. at Strong Rd.-Pacific Park, Spokane, WA.  
**GPS Coordinates:**  
**Date:** 2016-03-03  
**Day of week:** Thursday  
**Weather:** Rain  
**Analyst:** Mike McCluskey



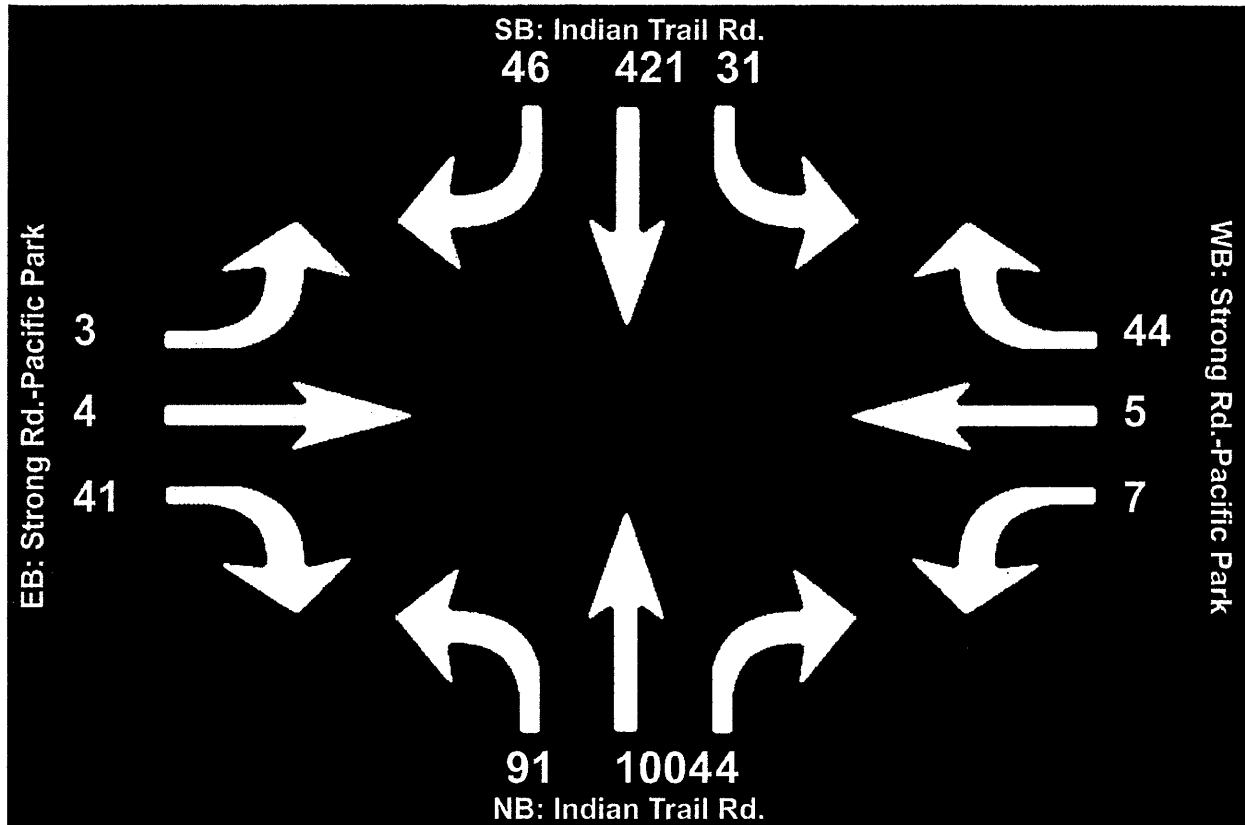
## Intersection Peak Hour

07:30 - 08:30

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	20	854	66	4	1	26	16	330	2	9	3	92	1423
Factor	0.50	0.86	0.53	0.33	0.25	0.72	0.57	0.91	0.25	0.75	0.38	0.79	0.90
Approach Factor	0.84			0.70			0.92			0.81			

## Intersection Peak Hour

**Location:** Indian Trail Rd. at Strong Rd.-Pacific Park, Spokane, WA.  
**GPS Coordinates:**  
**Date:** 2016-03-03  
**Day of week:** Thursday  
**Weather:** Cloudy  
**Analyst:** Mike McCluskey



## Intersection Peak Hour

17:00 - 18:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	31	421	46	7	5	44	91	1004	4	3	4	41	1701
Factor	0.77	0.92	0.77	0.58	0.42	0.73	0.84	0.87	0.50	0.25	0.50	0.68	0.94
Approach Factor	0.94			0.74			0.89			0.75			

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	0	1	7	59	1	5	3	81	9	6	365	0
Future Vol, veh/h	0	1	7	59	1	5	3	81	9	6	365	0
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	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	33	12	0	0	2	0
Mvmt Flow	0	1	8	63	1	5	3	87	10	6	392	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	505	507	392	507	502	92	392	0	0	97	0	0
Stage 1	404	404	-	98	98	-	-	-	-	-	-	-
Stage 2	101	103	-	409	404	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.43	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.497	-	-	2.2	-	-
Pot Cap-1 Maneuver	481	471	661	479	474	971	1016	-	-	1509	-	-
Stage 1	627	603	-	913	818	-	-	-	-	-	-	-
Stage 2	910	814	-	623	603	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	475	468	661	470	471	971	1016	-	-	1509	-	-
Mov Cap-2 Maneuver	475	468	-	470	471	-	-	-	-	-	-	-
Stage 1	625	601	-	910	816	-	-	-	-	-	-	-
Stage 2	901	812	-	612	601	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.8	13.6	0.3	0.1
HCM LOS	B	B		























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1016	-	-	629 489	1509	-	-
HCM Lane V/C Ratio	0.003	-	-	0.014 0.143	0.004	-	-
HCM Control Delay (s)	8.6	-	-	10.8 13.6	7.4	-	-
HCM Lane LOS	A	-	-	B B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 0.5	0	-	-



# HCM 2010 Signalized Intersection Summary

## 2: Indian Trail Road & Shawnee Ave

AM Existing  
06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	33	36	165	16	16	6	118	102	25	332	0
Future Volume (veh/h)	1	33	36	165	16	16	6	118	102	25	332	0
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	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
Adj Sat Flow, veh/h/ln	1800	1772	1800	1765	1800	1800	1538	1651	1835	1731	1765	1872
Adj Flow Rate, veh/h	1	42	46	212	21	21	8	151	131	32	426	0
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	0	0	2	0	0	17	9	2	4	2	0
Cap, veh/h	390	190	208	343	203	203	460	889	840	667	989	892
Arrive On Green	0.25	0.25	0.24	0.25	0.25	0.24	0.02	0.54	0.54	0.04	0.56	0.00
Sat Flow, veh/h	1301	770	843	1225	822	822	1465	1651	1560	1648	1765	1591
Grp Volume(v), veh/h	1	0	88	212	0	42	8	151	131	32	426	0
Grp Sat Flow(s),veh/h/ln	1301	0	1613	1225	0	1645	1465	1651	1560	1648	1765	1591
Q Serve(g_s), s	0.0	0.0	3.3	12.7	0.0	1.5	0.2	3.5	3.2	0.6	10.6	0.0
Cycle Q Clear(g_c), s	1.5	0.0	3.3	16.0	0.0	1.5	0.2	3.5	3.2	0.6	10.6	0.0
Prop In Lane	1.00		0.52	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	390	0	397	343	0	405	460	889	840	667	989	892
V/C Ratio(X)	0.00	0.00	0.22	0.62	0.00	0.10	0.02	0.17	0.16	0.05	0.43	0.00
Avail Cap(c_a), veh/h	415	0	429	367	0	437	638	889	840	831	989	892
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	0.00
Uniform Delay (d), s/veh	22.7	0.0	22.9	29.2	0.0	22.2	7.9	8.9	8.8	6.8	9.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	2.8	0.0	0.1	0.0	0.4	0.4	0.0	1.4	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	1.5	4.6	0.0	0.7	0.1	1.7	1.5	0.3	5.5	0.0
LnGrp Delay(d),s/veh	22.7	0.0	23.1	32.0	0.0	22.3	7.9	9.3	9.2	6.9	11.0	0.0
LnGrp LOS	C		C	C		C	A	A	A	A	B	
Approach Vol, veh/h	89		254				290		458			
Approach Delay, s/veh	23.1		30.4				9.2		10.7			
Approach LOS	C		C				A		B			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			4	5	6	8				
Phs Duration (G+Y+Rc), s	7.5	45.0			23.5	5.8	46.7	23.5				
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	10.0	40.0			20.0	10.0	40.0	20.0				
Max Q Clear Time (g_c+I1), s	2.6	5.5			18.0	2.2	12.6	5.3				
Green Ext Time (p_c), s	0.0	5.0			0.4	0.0	4.8	1.6				
Intersection Summary												
HCM 2010 Ctrl Delay			15.9									
HCM 2010 LOS			B									
Notes												



Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	38	100	2	2	71	22	1	8	1	46	9	84
Future Vol, veh/h	38	100	2	2	71	22	1	8	1	46	9	84
Conflicting Peds, #/hr	0	0	0	0	0	0	1	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	80	92	80	92	80	80	80	80	92
Heavy Vehicles, %	2	2	2	0	2	0	2	25	0	0	0	2
Mvmt Flow	41	109	2	3	77	28	1	10	1	58	11	91

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	105	0	0	111	0	0	341	303	110	295	290	92
Stage 1	-	-	-	-	-	-	192	192	-	97	97	-
Stage 2	-	-	-	-	-	-	149	111	-	198	193	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.12	6.75	6.2	7.1	6.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.75	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.75	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.518	4.225	3.3	3.5	4	3.318
Pot Cap-1 Maneuver	1486	-	-	1492	-	-	613	574	949	661	624	965
Stage 1	-	-	-	-	-	-	810	700	-	914	819	-
Stage 2	-	-	-	-	-	-	854	761	-	808	745	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1486	-	-	1492	-	-	534	556	949	636	605	964
Mov Cap-2 Maneuver	-	-	-	-	-	-	534	556	-	636	605	-
Stage 1	-	-	-	-	-	-	787	680	-	887	817	-
Stage 2	-	-	-	-	-	-	760	759	-	772	723	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	0.2	11.3	10.7
HCM LOS			B	B





















Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	583	1486	-	-	1492	-	-	786
HCM Lane V/C Ratio	0.019	0.028	-	-	0.002	-	-	0.204
HCM Control Delay (s)	11.3	7.5	0	-	7.4	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.8



# HCM 2010 Signalized Intersection Summary

## 4: Indian Trail Road & Pacific Park Dr/Strong Rd

AM Existing  
06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	95	0	0	1	16	342	0	1	880	68
Future Volume (veh/h)	12	0	95	0	0	1	16	342	0	1	880	68
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1800	1765	1765	1765	1765	1800	1714	1714	1800	1714	1714	1800
Adj Flow Rate, veh/h	13	0	106	0	0	1	18	380	0	1	978	76
Adj No. of Lanes	0	1	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	351	0	220	157	246	219	416	2210	0	742	2078	161
Arrive On Green	0.15	0.00	0.15	0.00	0.00	0.15	0.68	0.68	0.00	0.68	0.68	0.68
Sat Flow, veh/h	1323	0	1500	1215	1676	1492	490	3343	0	919	3062	238
Grp Volume(v), veh/h	13	0	106	0	0	1	18	380	0	1	520	534
Grp Sat Flow(s),veh/h/ln	1323	0	1500	1215	1676	1492	490	1629	0	919	1629	1671
Q Serve(g_s), s	0.4	0.0	3.0	0.0	0.0	0.0	0.8	1.9	0.0	0.0	6.9	6.9
Cycle Q Clear(g_c), s	0.4	0.0	3.0	0.0	0.0	0.0	7.7	1.9	0.0	2.0	6.9	6.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.14
Lane Grp Cap(c), veh/h	351	0	220	157	246	219	416	2210	0	742	1105	1134
V/C Ratio(X)	0.04	0.00	0.48	0.00	0.00	0.00	0.04	0.17	0.00	0.00	0.47	0.47
Avail Cap(c_a), veh/h	911	0	852	670	953	848	469	2563	0	841	1281	1315
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	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	17.9	0.0	0.0	16.7	5.3	2.7	0.0	3.0	3.5	3.5
Incr Delay (d2), s/veh	0.0	0.0	1.6	0.0	0.0	0.0	0.2	0.2	0.0	0.0	1.4	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	0.1	0.0	1.3	0.0	0.0	0.0	0.1	0.9	0.0	0.0	3.5	3.6
LnGrp Delay(d),s/veh	16.9	0.0	19.6	0.0	0.0	16.7	5.5	2.8	0.0	3.0	4.9	4.9
LnGrp LOS	B		B			B	A	A		A	A	A
Approach Vol, veh/h	119				1		398				1055	
Approach Delay, s/veh	19.3				16.7		3.0				4.9	
Approach LOS	B				B		A				A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	35.1		10.7		35.1		10.7					
Change Period (Y+Rc), s	4.9		* 4.2		4.9		* 4.2					
Max Green Setting (Gmax), s	35.1		* 26		35.1		* 26					
Max Q Clear Time (g_c+I1), s	9.7		2.0		8.9		5.0					
Green Ext Time (p_c), s	20.4		0.5		21.0		0.4					
Intersection Summary												
HCM 2010 Ctrl Delay	5.5											
HCM 2010 LOS	A											
Notes												



Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Traffic Vol, veh/h	1	0	6	29	0	2	12	346	56	6	186	1
Future Vol, veh/h	1	0	6	29	0	2	12	346	56	6	186	1
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	-	-	-	-	-	-	100	-	-	100	-	-
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, %	0	0	0	0	0	0	17	1	2	0	6	0
Mvmt Flow	1	0	7	32	0	2	13	380	62	7	204	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	657	687	205	659	656	411	205	0	0	442	0	0
Stage 1	219	219	-	437	437	-	-	-	-	-	-	-
Stage 2	438	468	-	222	219	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.27	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.353	-	-	2.2	-	-
Pot Cap-1 Maneuver	381	372	841	380	388	645	1282	-	-	1129	-	-
Stage 1	788	726	-	602	583	-	-	-	-	-	-	-
Stage 2	601	565	-	785	726	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	375	366	841	372	382	645	1282	-	-	1129	-	-
Mov Cap-2 Maneuver	375	366	-	372	382	-	-	-	-	-	-	-
Stage 1	780	722	-	596	577	-	-	-	-	-	-	-
Stage 2	593	559	-	774	722	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	15.3	0.2	0.3
HCM LOS	B	C		























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1282	-	-	714 382	1129	-	-
HCM Lane V/C Ratio	0.01	-	-	0.011 0.089	0.006	-	-
HCM Control Delay (s)	7.8	-	-	10.1 15.3	8.2	-	-
HCM Lane LOS	A	-	-	B C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 0.3	0	-	-



# HCM 2010 Signalized Intersection Summary

## 2: Indian Trail Road & Shawnee Ave

PM Existing  
06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	4	21	65	6	7	35	405	59	10	204	4
Future Volume (veh/h)	2	4	21	65	6	7	35	405	59	10	204	4
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.98		0.98	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
Adj Sat Flow, veh/h/ln	1800	1726	1800	1765	1675	1800	1800	1782	1872	1800	1765	1872
Adj Flow Rate, veh/h	2	4	23	71	7	8	38	440	64	11	222	4
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
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, %	0	0	0	2	0	0	0	1	0	0	2	0
Cap, veh/h	293	33	188	278	106	121	806	1124	1004	592	1071	966
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.05	0.63	0.63	0.03	0.61	0.61
Sat Flow, veh/h	1324	219	1260	1285	707	809	1714	1782	1591	1714	1765	1591
Grp Volume(v), veh/h	2	0	27	71	0	15	38	440	64	11	222	4
Grp Sat Flow(s),veh/h/ln	1324	0	1479	1285	0	1516	1714	1782	1591	1714	1765	1591
Q Serve(g_s), s	0.1	0.0	1.1	3.4	0.0	0.6	0.5	8.2	1.0	0.2	3.8	0.1
Cycle Q Clear(g_c), s	0.7	0.0	1.1	4.5	0.0	0.6	0.5	8.2	1.0	0.2	3.8	0.1
Prop In Lane	1.00		0.85	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	293	0	221	278	0	226	806	1124	1004	592	1071	966
V/C Ratio(X)	0.01	0.00	0.12	0.26	0.00	0.07	0.05	0.39	0.06	0.02	0.21	0.00
Avail Cap(c_a), veh/h	492	0	443	472	0	454	996	1124	1004	823	1071	966
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(l)	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	24.9	0.0	24.9	26.8	0.0	24.7	4.1	6.1	4.8	4.9	6.0	5.2
Incr Delay (d2), s/veh	0.0	0.0	0.2	0.5	0.0	0.1	0.0	1.0	0.1	0.0	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	1.2	0.0	0.2	0.2	4.2	0.5	0.1	2.0	0.0
LnGrp Delay(d),s/veh	24.9	0.0	25.2	27.3	0.0	24.8	4.2	7.1	4.9	4.9	6.4	5.2
LnGrp LOS	C		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h	29		86				542				237	
Approach Delay, s/veh	25.2		26.8				6.7				6.3	
Approach LOS	C		C				A				A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	5.9	46.6	14.9		7.5	45.0	14.9					
Change Period (Y+Rc), s	5.0	5.0	5.0		5.0	5.0	5.0					
Max Green Setting (Gmax), s	10.0	40.0	20.0		10.0	40.0	20.0					
Max Q Clear Time (g_c+I1), s	2.2	10.2	6.5		2.5	5.8	3.1					
Green Ext Time (p_c), s	0.0	5.0	0.4		0.0	5.1	0.4					
Intersection Summary												
HCM 2010 Ctrl Delay			9.1									
HCM 2010 LOS			A									
Notes												



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	80	120	5	4	144	41	4	6	4	17	3	50
Future Vol, veh/h	80	120	5	4	144	41	4	6	4	17	3	50
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	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	1	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	87	130	5	4	157	45	4	7	4	18	3	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	202	0	0	135	0	0	523	517	133	500	497	180
Stage 1	-	-	-	-	-	-	307	307	-	188	188	-
Stage 2	-	-	-	-	-	-	216	210	-	312	309	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1382	-	-	1462	-	-	468	465	922	484	477	868
Stage 1	-	-	-	-	-	-	707	665	-	818	748	-
Stage 2	-	-	-	-	-	-	791	732	-	703	663	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1382	-	-	1462	-	-	413	432	922	451	443	868
Mov Cap-2 Maneuver	-	-	-	-	-	-	413	432	-	451	443	-
Stage 1	-	-	-	-	-	-	659	620	-	762	746	-
Stage 2	-	-	-	-	-	-	736	730	-	645	618	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3	0.2	11.7	10.9
HCM LOS			B	B





















Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	549	1382	-	-	1462	-	-	686
HCM Lane V/C Ratio	0.02	0.063	-	-	0.003	-	-	0.111
HCM Control Delay (s)	11.7	7.8	0	-	7.5	0	-	10.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.4



# HCM 2010 Signalized Intersection Summary

## 4: Indian Trail Road & Pacific Park Dr/Strong Rd

PM Existing  
06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	42	0	0	1	94	1038	0	1	434	47
Future Volume (veh/h)	7	0	42	0	0	1	94	1038	0	1	434	47
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		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
Adj Sat Flow, veh/h/ln	1800	1765	1765	1765	1765	1800	1714	1714	1800	1714	1714	1800
Adj Flow Rate, veh/h	7	0	45	0	0	1	100	1104	0	1	462	50
Adj No. of Lanes	0	1	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	344	0	220	150	246	219	661	2237	0	396	2037	220
Arrive On Green	0.15	0.00	0.15	0.00	0.00	0.15	0.69	0.69	0.00	0.69	0.69	0.69
Sat Flow, veh/h	1323	0	1500	1284	1676	1495	813	3343	0	468	2966	320
Grp Volume(v), veh/h	7	0	45	0	0	1	100	1104	0	1	253	259
Grp Sat Flow(s),veh/h/ln	1323	0	1500	1284	1676	1495	813	1629	0	468	1629	1657
Q Serve(g_s), s	0.2	0.0	1.3	0.0	0.0	0.0	2.5	7.7	0.0	0.0	2.8	2.8
Cycle Q Clear(g_c), s	0.2	0.0	1.3	0.0	0.0	0.0	5.3	7.7	0.0	7.8	2.8	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.19
Lane Grp Cap(c), veh/h	344	0	220	150	246	219	661	2237	0	396	1118	1138
V/C Ratio(X)	0.02	0.00	0.20	0.00	0.00	0.00	0.15	0.49	0.00	0.00	0.23	0.23
Avail Cap(c_a), veh/h	868	0	812	657	908	810	712	2442	0	426	1221	1242
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	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.6	0.0	18.0	0.0	0.0	17.5	3.8	3.6	0.0	5.4	2.8	2.8
Incr Delay (d2), s/veh	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.8	0.0	0.0	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	0.1	0.0	0.6	0.0	0.0	0.0	0.6	3.6	0.0	0.0	1.3	1.4
LnGrp Delay(d),s/veh	17.6	0.0	18.5	0.0	0.0	17.5	4.3	4.3	0.0	5.4	3.3	3.3
LnGrp LOS	B		B			B	A	A		A	A	A
Approach Vol, veh/h	52		1				1204				513	
Approach Delay, s/veh	18.4		17.5				4.3				3.3	
Approach LOS	B		B				A				A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	37.0		11.0		37.0		11.0					
Change Period (Y+Rc), s	4.9		* 4.2		4.9		* 4.2					
Max Green Setting (Gmax), s	35.1		* 26		35.1		* 26					
Max Q Clear Time (g_c+I1), s	9.7		2.0		9.8		3.3					
Green Ext Time (p_c), s	22.4		0.2		22.3		0.1					
Intersection Summary												
HCM 2010 Ctrl Delay			4.4									
HCM 2010 LOS			A									
Notes												



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	0	1	7	62	1	5	3	119	9	6	431	0
Future Vol, veh/h	0	1	7	62	1	5	3	119	9	6	431	0
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	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	33	12	0	0	2	0
Mvmt Flow	0	1	8	67	1	5	3	128	10	6	463	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	617	619	463	619	614	133	463	0	0	138	0	0
Stage 1	475	475	-	139	139	-	-	-	-	-	-	-
Stage 2	142	144	-	480	475	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.43	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.497	-	-	2.2	-	-
Pot Cap-1 Maneuver	405	407	603	404	410	922	953	-	-	1458	-	-
Stage 1	574	561	-	869	785	-	-	-	-	-	-	-
Stage 2	866	782	-	571	561	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	400	404	603	396	407	922	953	-	-	1458	-	-
Mov Cap-2 Maneuver	400	404	-	396	407	-	-	-	-	-	-	-
Stage 1	572	559	-	866	783	-	-	-	-	-	-	-
Stage 2	857	780	-	560	559	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	15.6	0.2	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	953	-	-	568 414	1458	-	-
HCM Lane V/C Ratio	0.003	-	-	0.015 0.177	0.004	-	-
HCM Control Delay (s)	8.8	-	-	11.4 15.6	7.5	-	-
HCM Lane LOS	A	-	-	B C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 0.6	0	-	-

























# HCM 2010 Signalized Intersection Summary

## 2: Indian Trail Road & Shawnee Ave

2024 AM Without Project

06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	35	38	173	17	17	6	158	107	26	396	0
Future Volume (veh/h)	1	35	38	173	17	17	6	158	107	26	396	0
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	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
Adj Sat Flow, veh/h/ln	1800	1772	1800	1765	1800	1800	1538	1651	1835	1731	1765	1872
Adj Flow Rate, veh/h	1	45	49	222	22	22	8	203	137	33	508	0
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	0	0	2	0	0	17	9	2	4	2	0
Cap, veh/h	398	197	214	347	209	209	400	878	830	616	979	883
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.02	0.53	0.53	0.04	0.55	0.00
Sat Flow, veh/h	1299	773	841	1219	823	823	1465	1651	1560	1648	1765	1591
Grp Volume(v), veh/h	1	0	94	222	0	44	8	203	137	33	508	0
Grp Sat Flow(s),veh/h/ln	1299	0	1614	1219	0	1645	1465	1651	1560	1648	1765	1591
Q Serve(g_s), s	0.0	0.0	3.6	13.6	0.0	1.6	0.2	5.0	3.5	0.7	13.8	0.0
Cycle Q Clear(g_c), s	1.6	0.0	3.6	17.1	0.0	1.6	0.2	5.0	3.5	0.7	13.8	0.0
Prop In Lane	1.00		0.52	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	398	0	411	347	0	418	400	878	830	616	979	883
V/C Ratio(X)	0.00	0.00	0.23	0.64	0.00	0.11	0.02	0.23	0.17	0.05	0.52	0.00
Avail Cap(c_a), veh/h	408	0	424	358	0	432	576	878	830	776	979	883
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	0.00
Uniform Delay (d), s/veh	22.6	0.0	22.7	29.5	0.0	22.0	8.7	9.6	9.2	7.2	10.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	3.6	0.0	0.1	0.0	0.6	0.4	0.0	2.0	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	1.6	4.9	0.0	0.7	0.1	2.4	1.6	0.3	7.2	0.0
LnGrp Delay(d),s/veh	22.6	0.0	23.0	33.1	0.0	22.1	8.7	10.2	9.7	7.2	12.7	0.0
LnGrp LOS	C		C	C		C	A	B	A	A	B	
Approach Vol, veh/h	95		266				348			541		
Approach Delay, s/veh	23.0		31.3				10.0			12.3		
Approach LOS	C		C				A			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	7.5	45.0	24.4		5.8	46.7	24.4					
Change Period (Y+Rc), s	5.0	5.0	5.0		5.0	5.0	5.0					
Max Green Setting (Gmax), s	10.0	40.0	20.0		10.0	40.0	20.0					
Max Q Clear Time (g_c+I1), s	2.7	7.0	19.1		2.2	15.8	5.6					
Green Ext Time (p_c), s	0.0	6.2	0.2		0.0	5.8	1.7					
Intersection Summary												
HCM 2010 Ctrl Delay			16.5									
HCM 2010 LOS			B									
Notes												



Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	40	171	2	8	99	23	1	8	20	48	9	88
Future Vol, veh/h	40	171	2	8	99	23	1	8	20	48	9	88
Conflicting Peds, #/hr	0	0	0	0	0	0	1	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	80	92	80	92	80	80	80	80	92
Heavy Vehicles, %	2	2	2	0	2	0	2	25	0	0	0	2
Mvmt Flow	43	186	2	10	108	29	1	10	25	60	11	96

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	137	0	0	188	0	0	470	430	187	434	417	124
Stage 1	-	-	-	-	-	-	273	273	-	143	143	-
Stage 2	-	-	-	-	-	-	197	157	-	291	274	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.12	6.75	6.2	7.1	6.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.75	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.75	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.518	4.225	3.3	3.5	4	3.318
Pot Cap-1 Maneuver	1447	-	-	1398	-	-	504	485	860	536	530	927
Stage 1	-	-	-	-	-	-	733	644	-	865	782	-
Stage 2	-	-	-	-	-	-	805	726	-	721	687	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1447	-	-	1398	-	-	430	465	860	496	508	926
Mov Cap-2 Maneuver	-	-	-	-	-	-	430	465	-	496	508	-
Stage 1	-	-	-	-	-	-	709	623	-	836	776	-
Stage 2	-	-	-	-	-	-	705	720	-	666	664	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.5	10.5	12
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	692	1447	-	-	1398	-	-	677
HCM Lane V/C Ratio	0.051	0.03	-	-	0.007	-	-	0.247
HCM Control Delay (s)	10.5	7.6	0	-	7.6	0	-	12
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	1























# HCM 2010 Signalized Intersection Summary

## 4: Indian Trail Road & Pacific Park Dr/Strong Rd

2024 AM Without Project

06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1	100	44	1	7	17	458	10	3	1103	71
Future Volume (veh/h)	13	1	100	44	1	7	17	458	10	3	1103	71
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1800	1765	1765	1765	1765	1800	1714	1714	1800	1714	1714	1800
Adj Flow Rate, veh/h	14	1	111	49	1	8	19	509	11	3	1226	79
Adj No. of Lanes	0	1	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	329	19	234	320	262	233	328	2230	48	649	2125	137
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.68	0.68	0.68	0.68	0.68	0.68
Sat Flow, veh/h	1216	119	1500	1209	1676	1492	387	3260	70	808	3107	200
Grp Volume(v), veh/h	15	0	111	49	1	8	19	254	266	3	642	663
Grp Sat Flow(s),veh/h/ln	1335	0	1500	1209	1676	1492	387	1629	1702	808	1629	1678
Q Serve(g_s), s	0.3	0.0	3.4	1.8	0.0	0.2	1.4	2.9	2.9	0.1	10.3	10.3
Cycle Q Clear(g_c), s	0.5	0.0	3.4	2.3	0.0	0.2	11.7	2.9	2.9	3.0	10.3	10.3
Prop In Lane	0.93		1.00	1.00		1.00	1.00		0.04	1.00		0.12
Lane Grp Cap(c), veh/h	347	0	234	320	262	233	328	1114	1164	649	1114	1148
V/C Ratio(X)	0.04	0.00	0.47	0.15	0.00	0.03	0.06	0.23	0.23	0.00	0.58	0.58
Avail Cap(c_a), veh/h	834	0	779	758	870	774	342	1170	1223	677	1170	1206
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	19.3	19.0	17.8	17.9	7.2	3.0	3.0	3.5	4.1	4.1
Incr Delay (d2), s/veh	0.1	0.0	1.5	0.2	0.0	0.1	0.3	0.5	0.5	0.0	2.2	2.1
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	0.2	0.0	1.5	0.6	0.0	0.1	0.2	1.4	1.5	0.0	5.1	5.3
LnGrp Delay(d),s/veh	18.1	0.0	20.7	19.3	17.8	18.0	7.5	3.4	3.4	3.5	6.3	6.3
LnGrp LOS	B		C	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h	126		58				539		1308			
Approach Delay, s/veh	20.4		19.1				3.6		6.3			
Approach LOS	C		B				A		A			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	38.3		11.8		38.3		11.8					
Change Period (Y+Rc), s	4.9		* 4.2		4.9		* 4.2					
Max Green Setting (Gmax), s	35.1		* 26		35.1		* 26					
Max Q Clear Time (g_c+I1), s	13.7		4.3		12.3		5.4					
Green Ext Time (p_c), s	19.7		0.7		20.8		0.7					
Intersection Summary												
HCM 2010 Ctrl Delay			6.8									
HCM 2010 LOS			A									
Notes												



Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	1	0	6	30	0	2	13	423	59	6	241	1
Future Vol, veh/h	1	0	6	30	0	2	13	423	59	6	241	1
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	-	-	-	-	-	-	100	-	-	100	-	-
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, %	0	0	0	0	0	0	17	1	2	0	6	0
Mvmt Flow	1	0	7	33	0	2	14	465	65	7	265	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	807	838	266	809	806	498	266	0	0	530	0	0
Stage 1	280	280	-	526	526	-	-	-	-	-	-	-
Stage 2	527	558	-	283	280	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.27	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.353	-	-	2.2	-	-
Pot Cap-1 Maneuver	302	305	778	301	318	576	1216	-	-	1048	-	-
Stage 1	731	683	-	539	532	-	-	-	-	-	-	-
Stage 2	538	515	-	728	683	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	297	299	778	294	312	576	1216	-	-	1048	-	-
Mov Cap-2 Maneuver	297	299	-	294	312	-	-	-	-	-	-	-
Stage 1	722	678	-	533	526	-	-	-	-	-	-	-
Stage 2	530	509	-	717	678	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.8	18.4	0.2	0.2
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1216	-	-	632 303	1048	-	-
HCM Lane V/C Ratio	0.012	-	-	0.012 0.116	0.006	-	-
HCM Control Delay (s)	8	-	-	10.8 18.4	8.5	-	-
HCM Lane LOS	A	-	-	B C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 0.4	0	-	-

























# HCM 2010 Signalized Intersection Summary

## 2: Indian Trail Road & Shawnee Ave

2024 PM Without Project

06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	4	22	68	6	7	37	485	62	11	260	4
Future Volume (veh/h)	2	4	22	68	6	7	37	485	62	11	260	4
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.98		0.98	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
Adj Sat Flow, veh/h/ln	1800	1726	1800	1765	1675	1800	1800	1782	1872	1800	1765	1872
Adj Flow Rate, veh/h	2	4	24	74	7	8	40	527	67	12	283	4
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
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, %	0	0	0	2	0	0	0	1	0	0	2	0
Cap, veh/h	294	32	190	278	106	121	753	1122	1001	530	1068	963
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.05	0.63	0.63	0.03	0.61	0.61
Sat Flow, veh/h	1325	211	1266	1284	707	808	1714	1782	1591	1714	1765	1591
Grp Volume(v), veh/h	2	0	28	74	0	15	40	527	67	12	283	4
Grp Sat Flow(s),veh/h/ln	1325	0	1477	1284	0	1516	1714	1782	1591	1714	1765	1591
Q Serve(g_s), s	0.1	0.0	1.1	3.6	0.0	0.6	0.6	10.5	1.1	0.2	5.1	0.1
Cycle Q Clear(g_c), s	0.7	0.0	1.1	4.7	0.0	0.6	0.6	10.5	1.1	0.2	5.1	0.1
Prop In Lane	1.00		0.86	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	294	0	222	278	0	227	753	1122	1001	530	1068	963
V/C Ratio(X)	0.01	0.00	0.13	0.27	0.00	0.07	0.05	0.47	0.07	0.02	0.26	0.00
Avail Cap(c_a), veh/h	491	0	441	469	0	453	940	1122	1001	758	1068	963
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	24.9	0.0	25.0	26.9	0.0	24.7	4.3	6.6	4.8	5.2	6.3	5.3
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.5	0.0	0.1	0.0	1.4	0.1	0.0	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	0.5	1.3	0.0	0.2	0.3	5.6	0.5	0.1	2.6	0.0
LnGrp Delay(d),s/veh	24.9	0.0	25.2	27.4	0.0	24.8	4.3	8.0	5.0	5.2	6.9	5.3
LnGrp LOS	C		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h	30		89				634				299	
Approach Delay, s/veh	25.2		27.0				7.4				6.8	
Approach LOS	C		C				A				A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	6.0	46.6	14.9		7.6	45.0	14.9					
Change Period (Y+Rc), s	5.0	5.0	5.0		5.0	5.0	5.0					
Max Green Setting (Gmax), s	10.0	40.0	20.0		10.0	40.0	20.0					
Max Q Clear Time (g_c+I1), s	2.2	12.5	6.7		2.6	7.1	3.1					
Green Ext Time (p_c), s	0.0	6.2	0.4		0.0	6.5	0.4					
Intersection Summary												
HCM 2010 Ctrl Delay			9.4									
HCM 2010 LOS			A									
Notes												



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	84	171	5	25	225	43	4	6	17	18	3	53
Future Vol, veh/h	84	171	5	25	225	43	4	6	17	18	3	53
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	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	1	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	91	186	5	27	245	47	4	7	18	20	3	58

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	292	0	0	191	0	0	724	717	189	706	696	269
Stage 1	-	-	-	-	-	-	371	371	-	323	323	-
Stage 2	-	-	-	-	-	-	353	346	-	383	373	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1281	-	-	1395	-	-	344	358	858	353	368	775
Stage 1	-	-	-	-	-	-	653	623	-	693	654	-
Stage 2	-	-	-	-	-	-	668	639	-	644	622	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1281	-	-	1395	-	-	292	322	858	314	331	775
Mov Cap-2 Maneuver	-	-	-	-	-	-	292	322	-	314	331	-
Stage 1	-	-	-	-	-	-	601	573	-	638	639	-
Stage 2	-	-	-	-	-	-	601	624	-	573	572	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0.7	11.3	12.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	598	1281	-	-	1395	-	-	549
HCM Lane V/C Ratio	0.042	0.071	-	-	0.019	-	-	0.147
HCM Control Delay (s)	11.3	8	0	-	7.6	0	-	12.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0.1	-	-	0.5























# HCM 2010 Signalized Intersection Summary

## 4: Indian Trail Road & Pacific Park Dr/Strong Rd

2024 PM Without Project

06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1	44	29	1	6	99	1316	31	8	605	50
Future Volume (veh/h)	7	1	44	29	1	6	99	1316	31	8	605	50
Number	3	8	18	7	4	14	5	2	12	1	6	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
Adj Sat Flow, veh/h/ln	1800	1765	1765	1765	1765	1800	1714	1714	1800	1714	1714	1800
Adj Flow Rate, veh/h	7	1	47	31	1	6	105	1400	33	9	644	53
Adj No. of Lanes	0	1	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	346	41	284	372	318	283	525	2151	51	273	2015	166
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.66	0.66	0.66	0.66	0.66	0.66
Sat Flow, veh/h	1161	216	1500	1281	1676	1494	685	3253	77	342	3047	250
Grp Volume(v), veh/h	8	0	47	31	1	6	105	700	733	9	344	353
Grp Sat Flow(s),veh/h/ln	1377	0	1500	1281	1676	1494	685	1629	1701	342	1629	1669
Q Serve(g_s), s	0.0	0.0	1.4	1.1	0.0	0.2	4.2	13.7	13.7	0.9	4.9	4.9
Cycle Q Clear(g_c), s	0.2	0.0	1.4	1.3	0.0	0.2	9.0	13.7	13.7	14.6	4.9	4.9
Prop In Lane	0.87		1.00	1.00		1.00	1.00		0.05	1.00		0.15
Lane Grp Cap(c), veh/h	387	0	284	372	318	283	525	1077	1125	273	1077	1104
V/C Ratio(X)	0.02	0.00	0.17	0.08	0.00	0.02	0.20	0.65	0.65	0.03	0.32	0.32
Avail Cap(c_a), veh/h	790	0	728	751	813	725	532	1094	1142	276	1094	1121
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.7	0.0	18.2	18.2	17.6	17.7	5.8	5.4	5.4	9.7	3.9	3.9
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.1	0.0	0.0	0.9	3.0	2.9	0.2	0.8	0.8
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	0.1	0.0	0.6	0.4	0.0	0.1	0.9	6.9	7.2	0.1	2.3	2.4
LnGrp Delay(d),s/veh	17.7	0.0	18.4	18.3	17.6	17.7	6.7	8.4	8.3	10.0	4.7	4.7
LnGrp LOS	B		B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		55			38			1538			706	
Approach Delay, s/veh		18.3			18.2			8.3			4.7	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		39.4		14.2		39.4		14.2				
Change Period (Y+Rc), s		4.9		* 4.2		4.9		* 4.2				
Max Green Setting (Gmax), s		35.1		* 26		35.1		* 26				
Max Q Clear Time (g_c+I1), s		15.7		3.3		16.6		3.4				
Green Ext Time (p_c), s		18.8		0.3		17.9		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			7.6									
HCM 2010 LOS			A									
Notes												



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	0	1	7	104	1	9	3	119	24	7	431	0
Future Vol, veh/h	0	1	7	104	1	9	3	119	24	7	431	0
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	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	33	12	0	0	2	0
Mvmt Flow	0	1	8	112	1	10	3	128	26	8	463	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	632	639	463	631	626	141	463	0	0	154	0	0
Stage 1	479	479	-	147	147	-	-	-	-	-	-	-
Stage 2	153	160	-	484	479	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.43	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.497	-	-	2.2	-	-
Pot Cap-1 Maneuver	396	397	603	396	403	912	953	-	-	1439	-	-
Stage 1	571	558	-	860	779	-	-	-	-	-	-	-
Stage 2	854	769	-	568	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	388	393	603	388	399	912	953	-	-	1439	-	-
Mov Cap-2 Maneuver	388	393	-	388	399	-	-	-	-	-	-	-
Stage 1	569	555	-	857	777	-	-	-	-	-	-	-
Stage 2	841	767	-	557	555	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.5	17.6	0.2	0.1
HCM LOS	B	C		























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	953	-	-	565 407	1439	-	-
HCM Lane V/C Ratio	0.003	-	-	0.015 0.301	0.005	-	-
HCM Control Delay (s)	8.8	-	-	11.5 17.6	7.5	-	-
HCM Lane LOS	A	-	-	B C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 1.2	0	-	-



# HCM 2010 Signalized Intersection Summary

## 2: Indian Trail Road & Shawnee Ave

2024 AM With Project  
06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	35	38	196	17	17	6	173	115	26	438	0
Future Volume (veh/h)	1	35	38	196	17	17	6	173	115	26	438	0
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	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
Adj Sat Flow, veh/h/ln	1800	1772	1800	1765	1800	1800	1538	1651	1835	1731	1765	1872
Adj Flow Rate, veh/h	1	45	49	251	22	22	8	222	147	33	562	0
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	0	0	2	0	0	17	9	2	4	2	0
Cap, veh/h	405	201	219	355	214	214	362	871	823	592	971	875
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.02	0.53	0.53	0.04	0.55	0.00
Sat Flow, veh/h	1300	773	841	1219	823	823	1465	1651	1560	1648	1765	1591
Grp Volume(v), veh/h	1	0	94	251	0	44	8	222	147	33	562	0
Grp Sat Flow(s),veh/h/ln	1300	0	1614	1219	0	1645	1465	1651	1560	1648	1765	1591
Q Serve(g_s), s	0.0	0.0	3.6	15.8	0.0	1.6	0.2	5.7	3.8	0.7	16.3	0.0
Cycle Q Clear(g_c), s	1.6	0.0	3.6	19.3	0.0	1.6	0.2	5.7	3.8	0.7	16.3	0.0
Prop In Lane	1.00		0.52	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	405	0	420	355	0	429	362	871	823	592	971	875
V/C Ratio(X)	0.00	0.00	0.22	0.71	0.00	0.10	0.02	0.25	0.18	0.06	0.58	0.00
Avail Cap(c_a), veh/h	405	0	420	355	0	429	536	871	823	750	971	875
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	0.00
Uniform Delay (d), s/veh	22.4	0.0	22.6	30.1	0.0	21.8	9.3	10.0	9.6	7.5	11.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	6.4	0.0	0.1	0.0	0.7	0.5	0.0	2.5	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	1.6	5.9	0.0	0.7	0.1	2.8	1.7	0.3	8.5	0.0
LnGrp Delay(d),s/veh	22.4	0.0	22.8	36.5	0.0	21.9	9.3	10.7	10.0	7.5	14.0	0.0
LnGrp LOS	C		C	D		C	A	B	B	A	B	
Approach Vol, veh/h		95			295			377			595	
Approach Delay, s/veh		22.8			34.3			10.4			13.7	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	45.0		25.0	5.8	46.8		25.0				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	10.0	40.0		20.0	10.0	40.0		20.0				
Max Q Clear Time (g_c+I1), s	2.7	7.7		21.3	2.2	18.3		5.6				
Green Ext Time (p_c), s	0.0	7.0		0.0	0.0	6.3		1.8				
Intersection Summary												
HCM 2010 Ctrl Delay			17.9									
HCM 2010 LOS			B									
Notes												



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	40	171	2	8	99	29	1	8	20	65	9	88
Future Vol, veh/h	40	171	2	8	99	29	1	8	20	65	9	88
Conflicting Peds, #/hr	0	0	0	0	0	0	1	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	80	92	80	92	80	80	80	80	92
Heavy Vehicles, %	2	2	2	0	2	0	2	25	0	0	0	2
Mvmt Flow	43	186	2	10	108	36	1	10	25	81	11	96

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	144	0	0	188	0	0	474	437	187	437	420	127
Stage 1	-	-	-	-	-	-	273	273	-	146	146	-
Stage 2	-	-	-	-	-	-	201	164	-	291	274	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.12	6.75	6.2	7.1	6.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.75	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.75	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.518	4.225	3.3	3.5	4	3.318
Pot Cap-1 Maneuver	1438	-	-	1398	-	-	501	480	860	533	528	923
Stage 1	-	-	-	-	-	-	733	644	-	861	780	-
Stage 2	-	-	-	-	-	-	801	721	-	721	687	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1438	-	-	1398	-	-	427	460	860	493	506	922
Mov Cap-2 Maneuver	-	-	-	-	-	-	427	460	-	493	506	-
Stage 1	-	-	-	-	-	-	709	623	-	833	774	-
Stage 2	-	-	-	-	-	-	701	715	-	666	664	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.5	10.5	12.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	689	1438	-	-	1398	-	-	647
HCM Lane V/C Ratio	0.051	0.03	-	-	0.007	-	-	0.291
HCM Control Delay (s)	10.5	7.6	0	-	7.6	0	-	12.8
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	1.2























# HCM 2010 Signalized Intersection Summary

## 4: Indian Trail Road & Pacific Park Dr/Strong Rd

2024 AM With Project

06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1	100	44	1	7	17	478	10	3	1160	71
Future Volume (veh/h)	13	1	100	44	1	7	17	478	10	3	1160	71
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln	1800	1765	1765	1765	1765	1800	1714	1714	1800	1714	1714	1800
Adj Flow Rate, veh/h	14	1	111	49	1	8	19	531	11	3	1289	79
Adj No. of Lanes	0	1	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	326	18	233	317	260	231	312	2240	46	638	2140	131
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.69	0.69	0.69	0.69	0.69	0.69
Sat Flow, veh/h	1216	119	1500	1209	1676	1491	364	3263	68	792	3118	191
Grp Volume(v), veh/h	15	0	111	49	1	8	19	265	277	3	672	696
Grp Sat Flow(s),veh/h/ln	1334	0	1500	1209	1676	1491	364	1629	1702	792	1629	1680
Q Serve(g_s), s	0.3	0.0	3.4	1.8	0.0	0.2	1.5	3.1	3.1	0.1	11.1	11.2
Cycle Q Clear(g_c), s	0.5	0.0	3.4	2.4	0.0	0.2	12.7	3.1	3.1	3.2	11.1	11.2
Prop In Lane	0.93		1.00	1.00		1.00	1.00		0.04	1.00		0.11
Lane Grp Cap(c), veh/h	345	0	233	317	260	231	312	1118	1169	638	1118	1153
V/C Ratio(X)	0.04	0.00	0.48	0.15	0.00	0.03	0.06	0.24	0.24	0.00	0.60	0.60
Avail Cap(c_a), veh/h	827	0	772	752	863	767	321	1160	1213	658	1160	1197
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	19.5	19.3	18.0	18.1	7.6	3.0	3.0	3.6	4.2	4.2
Incr Delay (d2), s/veh	0.1	0.0	1.5	0.2	0.0	0.1	0.4	0.5	0.5	0.0	2.4	2.3
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	0.2	0.0	1.5	0.6	0.0	0.1	0.2	1.5	1.5	0.0	5.6	5.8
LnGrp Delay(d),s/veh	18.3	0.0	21.0	19.5	18.0	18.2	8.0	3.5	3.4	3.6	6.6	6.6
LnGrp LOS	B		C	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		126			58			561			1371	
Approach Delay, s/veh		20.7			19.3			3.6			6.6	
Approach LOS		C			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.7		11.8		38.7		11.8				
Change Period (Y+Rc), s		4.9		* 4.2		4.9		* 4.2				
Max Green Setting (Gmax), s		35.1		* 26		35.1		* 26				
Max Q Clear Time (g_c+I1), s		14.7		4.4		13.2		5.4				
Green Ext Time (p_c), s		19.1		0.7		20.4		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			7.0									
HCM 2010 LOS			A									
Notes												



Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Traffic Vol, veh/h	1	0	6	58	0	5	13	423	107	10	241	1
Future Vol, veh/h	1	0	6	58	0	5	13	423	107	10	241	1
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	-	-	-	-	-	-	100	-	-	100	-	-
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, %	0	0	0	0	0	0	17	1	2	0	6	0
Mvmt Flow	1	0	7	64	0	5	14	465	118	11	265	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	843	899	266	843	840	524	266	0	0	583	0	0
Stage 1	288	288	-	552	552	-	-	-	-	-	-	-
Stage 2	555	611	-	291	288	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.27	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.353	-	-	2.2	-	-
Pot Cap-1 Maneuver	286	281	778	286	304	557	1216	-	-	1001	-	-
Stage 1	724	677	-	522	518	-	-	-	-	-	-	-
Stage 2	520	487	-	721	677	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	278	275	778	279	297	557	1216	-	-	1001	-	-
Mov Cap-2 Maneuver	278	275	-	279	297	-	-	-	-	-	-	-
Stage 1	715	670	-	516	512	-	-	-	-	-	-	-
Stage 2	509	481	-	707	670	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.9	21.2	0.2	0.3
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1216	-	-	619 291	1001	-	-
HCM Lane V/C Ratio	0.012	-	-	0.012 0.238	0.011	-	-
HCM Control Delay (s)	8	-	-	10.9 21.2	8.6	-	-
HCM Lane LOS	A	-	-	B C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 0.9	0	-	-

























## HCM 2010 Signalized Intersection Summary

### 2: Indian Trail Road & Shawnee Ave

2024 PM With Project

06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	4	22	84	6	7	37	533	88	11	288	4
Future Volume (veh/h)	2	4	22	84	6	7	37	533	88	11	288	4
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.99		0.98	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
Adj Sat Flow, veh/h/ln	1800	1726	1800	1765	1675	1800	1800	1782	1872	1800	1765	1872
Adj Flow Rate, veh/h	2	4	24	91	7	8	40	579	96	12	313	4
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
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, %	0	0	0	2	0	0	0	1	0	0	2	0
Cap, veh/h	298	32	194	282	109	124	724	1117	997	483	1064	959
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.05	0.63	0.63	0.03	0.60	0.60
Sat Flow, veh/h	1325	211	1266	1285	708	809	1714	1782	1591	1714	1765	1591
Grp Volume(v), veh/h	2	0	28	91	0	15	40	579	96	12	313	4
Grp Sat Flow(s), veh/h/ln	1325	0	1477	1285	0	1516	1714	1782	1591	1714	1765	1591
Q Serve(g_s), s	0.1	0.0	1.1	4.5	0.0	0.6	0.6	12.2	1.6	0.2	5.8	0.1
Cycle Q Clear(g_c), s	0.7	0.0	1.1	5.6	0.0	0.6	0.6	12.2	1.6	0.2	5.8	0.1
Prop In Lane	1.00		0.86	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	298	0	227	282	0	233	724	1117	997	483	1064	959
V/C Ratio(X)	0.01	0.00	0.12	0.32	0.00	0.06	0.06	0.52	0.10	0.02	0.29	0.00
Avail Cap(c_a), veh/h	489	0	440	467	0	451	910	1117	997	710	1064	959
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	24.8	0.0	24.9	27.2	0.0	24.6	4.4	7.0	5.0	5.5	6.5	5.4
Incr Delay (d2), s/veh	0.0	0.0	0.2	0.7	0.0	0.1	0.0	1.7	0.2	0.0	0.7	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	1.6	0.0	0.2	0.3	6.5	0.7	0.1	3.0	0.0
LnGrp Delay(d),s/veh	24.9	0.0	25.1	27.8	0.0	24.7	4.4	8.7	5.2	5.5	7.2	5.4
LnGrp LOS	C		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h		30			106			715			329	
Approach Delay, s/veh		25.1			27.4			8.0			7.1	
Approach LOS		C			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	46.6		15.2	7.6	45.0		15.2				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	10.0	40.0		20.0	10.0	40.0		20.0				
Max Q Clear Time (g_c+I1), s	2.2	14.2		7.6	2.6	7.8		3.1				
Green Ext Time (p_c), s	0.0	7.1		0.4	0.0	7.5		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			9.9									
HCM 2010 LOS			A									
Notes												



Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	84	171	5	25	225	62	4	6	17	29	3	53
Future Vol, veh/h	84	171	5	25	225	62	4	6	17	29	3	53
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	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	1	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	91	186	5	27	245	67	4	7	18	32	3	58

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	312	0	0	191	0	0	734	737	189	716	706	279
Stage 1	-	-	-	-	-	-	371	371	-	333	333	-
Stage 2	-	-	-	-	-	-	363	366	-	383	373	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1260	-	-	1395	-	-	338	348	858	348	363	765
Stage 1	-	-	-	-	-	-	653	623	-	685	647	-
Stage 2	-	-	-	-	-	-	660	626	-	644	622	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1260	-	-	1395	-	-	286	312	858	309	326	765
Mov Cap-2 Maneuver	-	-	-	-	-	-	286	312	-	309	326	-
Stage 1	-	-	-	-	-	-	600	573	-	630	631	-
Stage 2	-	-	-	-	-	-	593	611	-	572	572	-





















Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0.6	11.4	14
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	589	1260	-	-	1395	-	-	493
HCM Lane V/C Ratio	0.042	0.072	-	-	0.019	-	-	0.187
HCM Control Delay (s)	11.4	8.1	0	-	7.6	0	-	14
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0.1	-	-	0.7



HCM 2010 Signalized Intersection Summary  
4: Indian Trail Road & Pacific Park Dr/Strong Rd

2024 PM With Project  
06/18/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1	44	29	1	6	99	1390	31	8	649	50
Future Volume (veh/h)	7	1	44	29	1	6	99	1390	31	8	649	50
Number	3	8	18	7	4	14	5	2	12	1	6	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
Adj Sat Flow, veh/h/ln	1800	1765	1765	1765	1765	1800	1714	1714	1800	1714	1714	1800
Adj Flow Rate, veh/h	7	1	47	31	1	6	105	1479	33	9	690	53
Adj No. of Lanes	0	1	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	345	41	283	371	317	282	504	2158	48	255	2030	156
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.66	0.66	0.66	0.66	0.66	0.66
Sat Flow, veh/h	1161	215	1500	1281	1676	1494	656	3257	73	317	3065	235
Grp Volume(v), veh/h	8	0	47	31	1	6	105	739	773	9	366	377
Grp Sat Flow(s),veh/h/ln	1377	0	1500	1281	1676	1494	656	1629	1701	317	1629	1672
Q Serve(g_s), s	0.0	0.0	1.4	1.1	0.0	0.2	4.5	15.1	15.1	1.0	5.3	5.3
Cycle Q Clear(g_c), s	0.2	0.0	1.4	1.3	0.0	0.2	9.8	15.1	15.1	16.1	5.3	5.3
Prop In Lane	0.87		1.00	1.00		1.00	1.00		0.04	1.00		0.14
Lane Grp Cap(c), veh/h	386	0	283	371	317	282	504	1079	1127	255	1079	1107
V/C Ratio(X)	0.02	0.00	0.17	0.08	0.00	0.02	0.21	0.68	0.69	0.04	0.34	0.34
Avail Cap(c_a), veh/h	787	0	725	748	810	722	508	1089	1138	257	1089	1118
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	18.3	18.3	17.7	17.8	6.1	5.6	5.6	10.6	4.0	4.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.1	0.0	0.0	0.9	3.5	3.4	0.3	0.9	0.8
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	0.1	0.0	0.6	0.4	0.0	0.1	0.9	7.6	7.9	0.1	2.6	2.7
LnGrp Delay(d),s/veh	17.8	0.0	18.5	18.4	17.7	17.8	7.0	9.1	9.0	10.9	4.8	4.8
LnGrp LOS	B		B	B	B	B	A	A	A	B	A	A
Approach Vol, veh/h		55			38			1617			752	
Approach Delay, s/veh		18.4			18.3			9.0			4.9	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		39.7		14.2		39.7		14.2				
Change Period (Y+Rc), s		4.9		* 4.2		4.9		* 4.2				
Max Green Setting (Gmax), s		35.1		* 26		35.1		* 26				
Max Q Clear Time (g_c+I1), s		17.1		3.3		18.1		3.4				
Green Ext Time (p_c), s		17.6		0.3		16.6		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			8.1									
HCM 2010 LOS			A									
Notes												