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4240 BULLFROG ROAD
TRAFFIC IMPACT ANALYSIS

Cle Elum, WA

July 2024

Prepared for:
Kamiak,
City of Cle Elum,
and
Kittitas County

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EXECUTIVE SUMMARY

This Traffic Impact Analysis summarizes the traffic impacts associated with development of 4240 Bullfrog Road, a housing development west of Bullfrog Road and south of the SR 903 and Bullfrog Road roundabout, in the City of Cle Elum. The Project includes 50 multifamily (low-rise) units.

Full occupancy is anticipated by 2025. Through a scoping process with Cle Elum and Kittitas County additional horizon years in 2031 and 2037.

The Project is forecast to generate up to:

- 338 new weekday trips, split 50% in and 50% out.
- 20 new AM peak hour trips, split 5 in and 15 out.
- 26 new PM peak hour trips, split 16 in and 10 out.

The study intersections and the Bullfrog Road and SR 903 corridors operate at LOS C or better with the Project and satisfy local LOS thresholds. There are no offsite LOS improvements required based on the Project's impacts to the study area.

Project trips do not meet warrants for left-turn or right-turn lanes on Bullfrog Road at the Site Access.

The 47° North Updated Transportation Analysis identified future 2031 and 2037 improvements at the Bullfrog Road intersections with the I-90 ramps and Tumble Creek Drive. PM peak hour Project trips are forecast to contribute to less than 1% of the future intersection traffic volumes at these three intersections. The Applicant is recommended to verify with Kittitas County the type of agreement necessary for a voluntary contribution to future these improvements.

INTRODUCTION

This Traffic Impact Analysis documents the traffic impacts associated with development of 4240 Bullfrog Road, a housing development west of Bullfrog Road and south of the SR 903 and Bullfrog Road roundabout, in the City of Cle Elum. The purpose of this report is to identify potentially significant and adverse traffic impacts resulting from the Project and, where appropriate, outline programmatic and/or physical improvements to minimize or eliminate those impacts. The conclusions and recommendations from this report are intended to support the City of Cle Elum, Kittitas County, and the Applicant with development of the site.

This Traffic Impact Analysis is formatted to generally conform to the scope outlined in the May 15, 2024, scoping memorandum to the City of Cle Elum and Kittitas County.

Project Location

The Project is in the City of Cle Elum on Kittitas County Parcel #11360.

The property's underlying zoning is general commercial. The existing parcel comprises 1.72 acres and is occupied by five manufactured homes that are currently used as a marketing center owned and operated by Suncadia Resort.

A vicinity map is included as **Figure 1**.

Project Description

The Applicant proposes to develop 50 multifamily (low-rise) units.

Site access is from an existing driveway off Bullfrog Road that is shared with Swiftwater Learning Center and a property owned by Inland Telephone Company.

A site plan is included as **Figure 2**. Build-out is anticipated by 2025.

EXISTING CONDITIONS

This section describes the existing transportation network in the study area.

Primary Roadways

The primary roadways in the study area are described below:

- Bullfrog Road is maintained by Kittitas County and is classified as a Major Collector between I-90 and SR 903. Near the Project, Bullfrog Road has one lane in each direction, an approximate paved width of 26 feet, with 12-foot travel lanes and 1-foot shoulders, and a 50-mph posted speed.
- State Route 903 is classified as a Major Collector. The Bullfrog Road / SR 903 roundabout intersection is approximately 700 feet north of the Site Access. SR 903 has a posted speed of 35 mph, north of Bullfrog Road, and 45 mph, east of Bullfrog Road.

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Figure 1:
Vicinity Map

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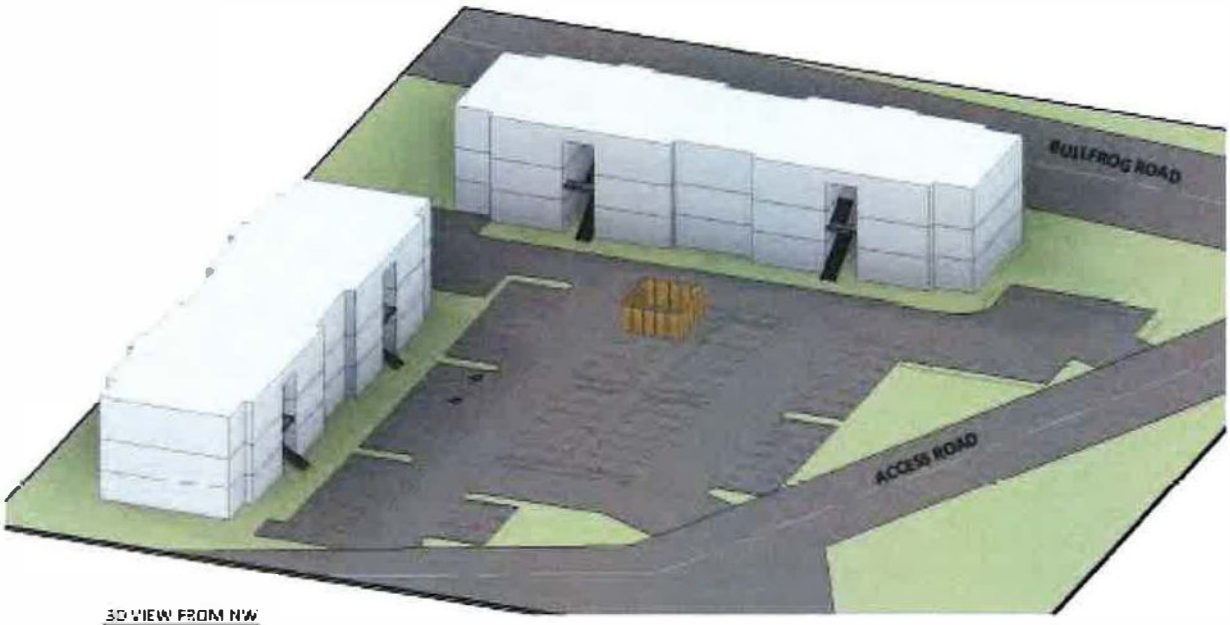
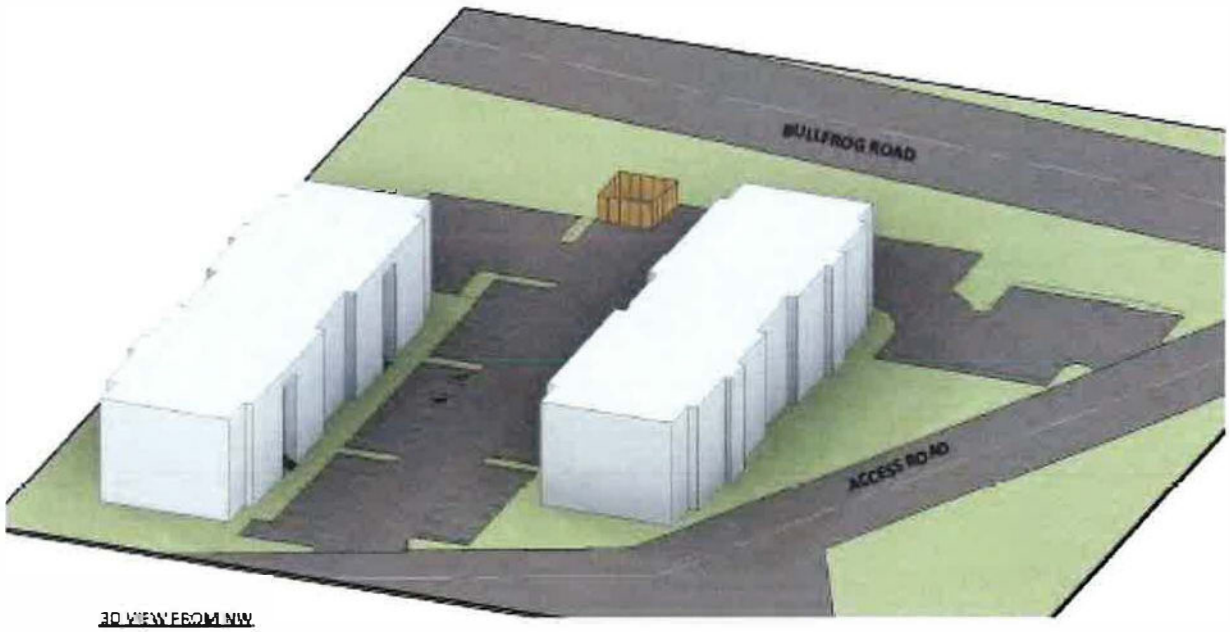


OPTION 1



OPTION 2

Figure 2:
Site Plan Concepts

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- Firehouse Road is a two-lane local access road providing primary access to the Kittitas County Fire District #7 station and secondary access to Suncadia Resort. Firehouse Road is stop-sign controlled at Bullfrog Road and is approximately 350 feet south of the Project access.
- Suncadia Trail is the primary access to Suncadia Resort. Suncadia Trail intersects Bullfrog Road at a roundabout intersection.

Study Area

The scoping process identified without and with project intersection analyses during the AM and PM weekday peak hour periods at the following area intersections:

- Bullfrog Road / Suncadia Trail
- Bullfrog Road / Firehouse Road
- Bullfrog Road / Project Access
- Bullfrog Road / SR 903

The AM and PM peak hours are defined as the highest 4 consecutive 15-minute traffic volume intervals between 7-9 AM and 4-6 PM.

The City of Cle Elum additionally requested corridor level of service analyses on Bullfrog Road and SR 903.

Public Transportation Services

There is no public transit in the vicinity of the Project and public transit is not anticipated to be a major travel resource for the Project.

Traffic Volumes

AM and PM peak hour intersection turning movement volumes were collected on Tuesday, June 18, 2024, at the study intersections.

Table 1 summarizes the 2024 peak hour intersection turning movement volume counts. Copies of the turning movement volumes are included in the **Appendix**.

Table 1: Peak Hour Turning Movement Counts (Unadjusted)

Intersection		Eastbound			Westbound			Northbound			Southbound		
		Lt	Th	Rt	Lt	Th	Rt	Lt	Th	Rt	Lt	Th	Rt
Bullfrog & Suncadia	AM	79	68	0	0	65	100	0	0	0	55	0	42
	PM	50	98	0	0	44	66	0	0	0	106	0	85
Bullfrog & Firehouse	AM	6	0	12	0	0	1	7	117	0	0	154	26
	PM	17	0	4	0	0	0	2	204	0	0	122	1
Bullfrog & Site Access	AM	0	0	0	0	0	2	0	126	1	5	181	0
	PM	0	0	0	0	0	1	0	221	1	1	123	0
Bullfrog & SR 903	AM	0	0	0	111	0	120	0	49	70	151	74	0
	PM	0	0	0	89	0	282	0	138	158	269	100	0

Peak hour study intersection counts were collected after the 2023-24 school year. To adjust the volumes to represent conditions when Cle Elum Roslyn High School and Elementary students were still in school, PM peak hour volumes were collected at Alliance Road / SR 903, on Tuesday, June 18, 2024, and compared to year 2022 and 2023 intersection volumes at Alliance Road / SR 903 collected during the school year and compiled as part of the annual Suncadia Transportation Monitoring Program (TMP).

Table 2 compares the volumes at the major school driveway and Alliance Road / SR 903 intersection.

Table 2: Alliance Road / SR 903 Intersection Volumes

Year	Eastbound			Westbound			Northbound			Southbound			Total
	Lt	Th	Rt	Lt	Th	Rt	Lt	Th	Rt	Lt	Th	Rt	Vol.
2022 *	1	294	45	84	285	23	22	0	50	12	1	1	818
2023 *	2	316	53	91	289	11	15	0	49	5	1	5	837
2024 **	2	310	4	12	272	7	3	1	11	7	0	4	633

* Annual Suncadia Transportation Monitoring Program, data collected during the school year

** Data collected after the school year

Overall, the total intersection volumes were 2% higher in 2023 than in 2022. The post-school year 2024 total intersection volumes were 24% less than in 2023. The 2024 volumes on Alliance Road and on SR 903 were relatively consistent with those collected in 2024; however, and as expected, there was a significantly lower number of vehicles entering and existing the school driveway.

Assuming a similar growth pattern between 2023 and 2024, as in 2022 and 2023, the peak hour study intersection volumes were adjusted by +35% to represent traffic conditions when schools are in session.

Figure 3 illustrates the adjusted AM and PM peak hour turning movement volumes at the Bullfrog Road study intersections. For the existing conditions analysis, the volumes were rounded to the nearest multiple of "5."

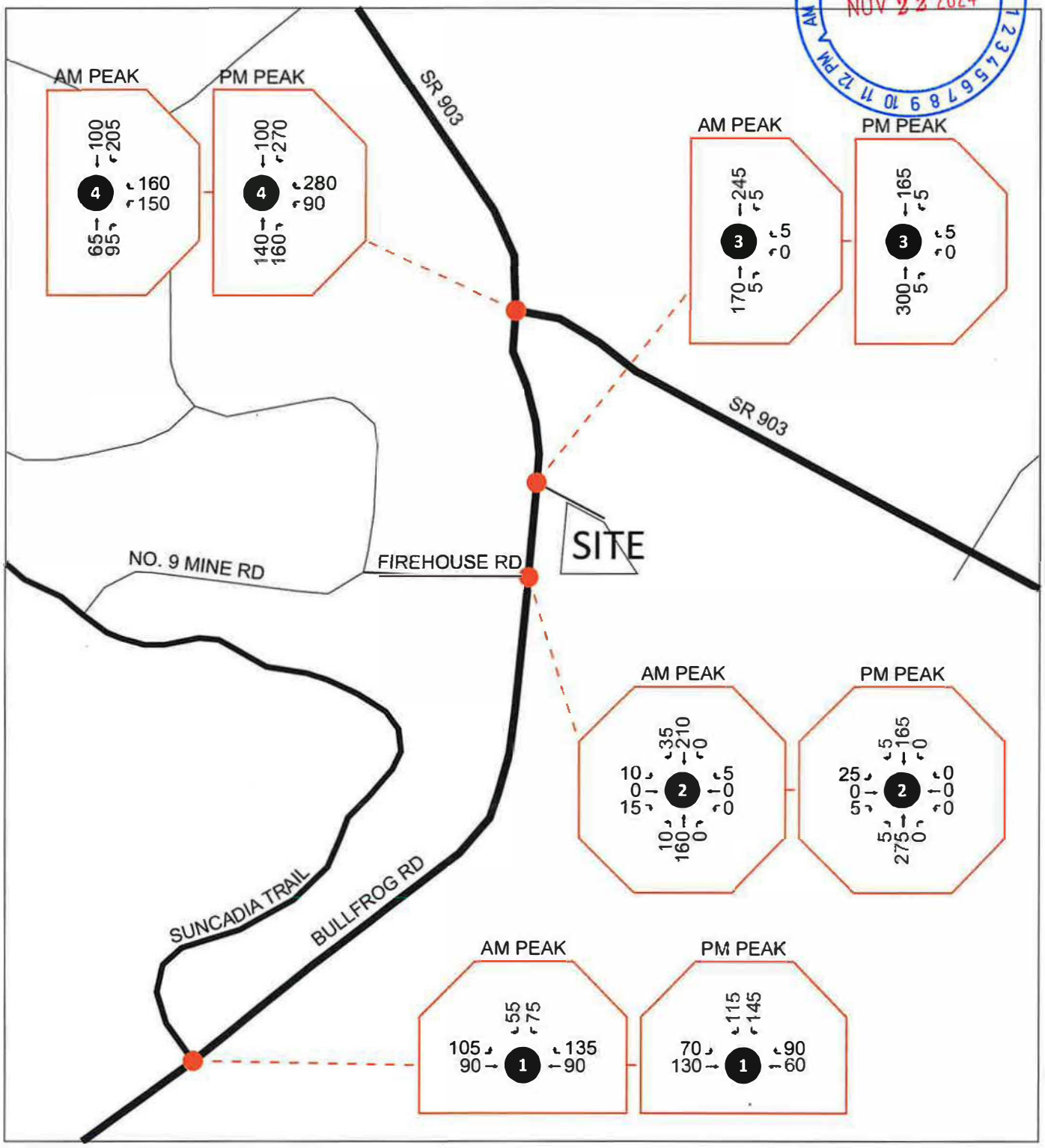

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Figure 3:
2024 Existing Peak Hour Intersection Volumes

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FUTURE CONDITIONS WITHOUT THE PROJECT

The horizon analysis years for this analysis are 2025, built-out, and 2031 and 2037, corresponding to the horizon scenarios of the 47° North pipeline development south and east of the Project site. This section describes the future traffic without the Project.

Local Improvements

There are no near-term 6-year transportation improvements in Kittitas County, the City of Cle Elum, or on WSDOT facilities between now and 2025.

Future improvements, triggered by pipeline development, are listed in the following section.

Pipeline Projects

The following outlines the pipeline projects included in this analysis:

- Suncadia Master Plan Resort. Kittitas County.
- 47° North (Bullfrog Flats). City of Cle Elum.
- City Heights. City of Cle Elum.
- Upper Kittitas County Community Recreation Center. Cle Elum.

Suncadia Master Plan Resort (MPR)

The Suncadia MPR is in Kittitas County, north of I-90, south of SR 903 and west of Bullfrog Road. *Transportation Solutions, Inc.* prepared the Transportation Monitoring Program (TMP) reports for Suncadia, recently in February 2023 (full TMP) and in October 2023 (limited scope TMP). **Table 3** is an excerpt from Table 15: Forecasted MPR External Trip Generation and Trips per Residential Unit of the February 2023 TMP Report that highlights the weekday peak growth from the MPR compared to 5-year, 10-year, and 30-year forecasts from the FEIS compared to the 2023 volumes generated by the MPR.

Table 3: Suncadia MPR – Summer PM Peak Hour Trip Generation by Build-Out Horizon

Time-Period *	5 Year Forecast	10 Year Forecast	30 Year Forecast	2023 Trips
Weekend Trips	602	1,000	1,464	430
Weekday Trips	518	757	1,078	485
Residential Units	867	2,264	4,649	1,212

* Source: Suncadia Master Planned Resort. 2023 Transportation Monitoring Program. February 2023. Existing trip data was compiled in 2022.

47° North (Bullfrog Flats)

47° North is in the City of Cle Elum, north of I-90, south of SR 903 and east of Bullfrog Road. *Transportation Engineering NorthWest* prepared the traffic analysis for 47° North. **Table 4** is an excerpt from the Table 4 Revised Proposal Trip Generation Summary from the 47° North Updated Transportation Impact Analysis and summarizes the trip generation forecasts for the 2025 and 2031 preferred development options.

Table 4: 47° North Trip Generation by Build-Out Horizon

Weekday PM Peak Hour *	In	Out	Total
2025 Development Program	409	312	721
2031 Development Program	742	560	1,302

* Source: 47° North Updated Transportation Analysis. January 2023.

Kittitas County (via Fehr and Peers) provided the following background traffic growth assumptions in memorandums dated July 2, 2020, and September 18, 2023, to the 47° North EIS Team, regarding traffic growth assumptions for the 47° North Updated Transportation Analysis:

- Suncadia assumed growth of 63 new single-family units per year over the planning period.
- City Heights assumed growth of 48 new single-family units per year over the planning period.
- Cle Elum Pines assumed growth of 4.5 new single-family units per year over the planning period.

Future traffic mitigation triggered by 47° North, on Bullfrog Road includes:

- Bullfrog Road / I-90 EB Ramps – 2031 Compact Roundabout
- Bullfrog Road / Tumble Creek Drive – 2031 Refuge/merge lane on Bullfrog Road
- Bullfrog Road / I-90 WB Ramps – 2037 Compact Roundabout

City Heights

City Heights is in the City of Cle Elum, north of SR 903 and north of downtown Cle Elum and Coal Mines Trail. The FEIS for City Heights was completed in November 2010 and full build-out was anticipated by 2022. The preferred development alternative was forecast to generate 607 AM peak hour trips and 839 PM peak hour trips.

Suncadia's MPR was prepared prior to City Heights and as City Heights is developed, subsequent Suncadia TMP reports include traffic currently being generated by build-out of City Heights.

The City Heights FEIS did not identify transportation improvements on Bullfrog Road and or on SR 903 near the elementary and high schools.

Upper Kittitas County Community Recreation Center

The Upper Kittitas County Community Recreation Center is in the City of Cle Elum, south of the Project site, east of Bullfrog Road, and with access to Bullfrog Road between Suncadia Trail and Firehouse Road.

The Upper Kittitas County Rec Center Trip Generation and Distribution Technical Memo, December 21, 2023, by *SCJ Alliance Consulting Services*, forecasted that the community center would generate 121 AM peak hour and 155 PM peak hour trips to Bullfrog Road. The community center is anticipated to be complete by 2026. A traffic impact analysis for the community center is not available.

Traffic Volumes

The existing AM peak hour volumes were approximately 10% lower than the existing PM peak hour volumes on Bullfrog Road south of SR 903. The existing AM peak hour volumes were approximately 33% lower than the existing PM peak hour volumes at Bullfrog Road / SR 903.

Future AM peak hour traffic conditions without the Project were forecast by (1) adjusting the future PM peak hour volumes from the 47° North Updated Transportation Analysis, discussed below, by the differences observed in the intersection AM and PM peak hour volumes and (2) adding AM peak hour trips generated by the Upper Kittitas County Community Recreation Center.

Future PM peak hour traffic conditions without the Project include (1) the weekday PM peak hour traffic forecasts from the 47° North Updated Transportation Analysis and (2) trips generated by the Upper Kittitas County Community Recreation Center.

PM peak hour trips generated by the Upper Kittitas County Rec Center were added to the 2025, 2031, and 2037 "with Revised Proposal" volumes projected in the 47° North Updated Transportation Analysis. The 47° North Updated Transportation Analysis included future traffic growth in the study area and trips generated by Suncadia, City Heights, and 47° North, refer to the 47° North Updated Transportation Analysis. January 2023, Figure 19 (2025), Figure 22 (2031), and Figure 25 (2037) for the Weekday PM Peak Hour Traffic Volumes with Revised Proposal.

Intersection turning movement volume figures for the future conditions without the Project include:

- **Figures 4** illustrates the 2025 AM and PM peak hour volumes without the Project.
- **Figures 5** illustrates the 2031 AM and PM peak hour volumes without the Project.
- **Figures 6** illustrates the 2037 AM and PM peak hour volumes without the Project.

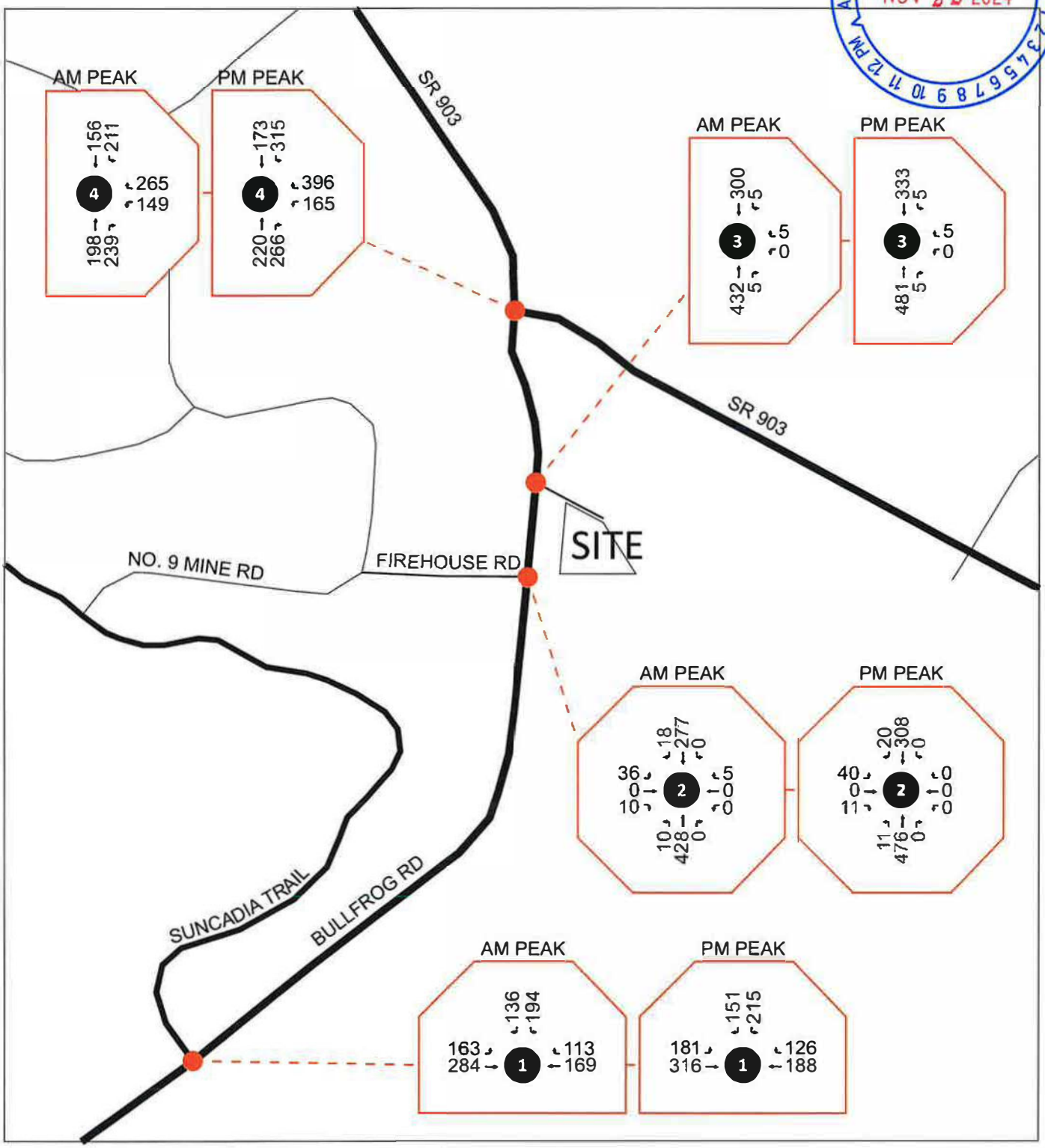

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Figure 4:
2025 Peak Hour Intersection Volumes without the Project

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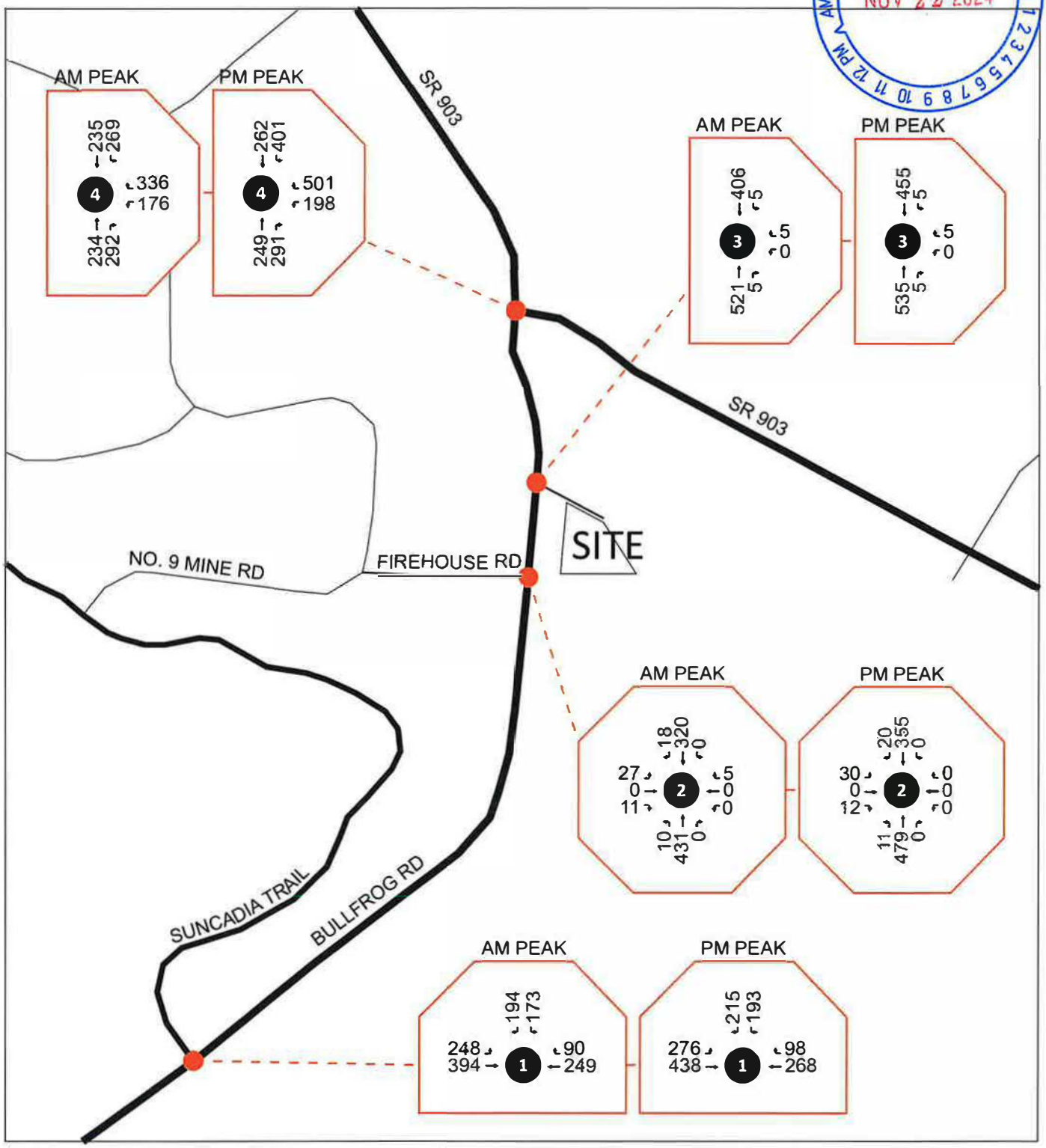

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Figure 5:
2031 Peak Hour Intersection Volumes without the Project

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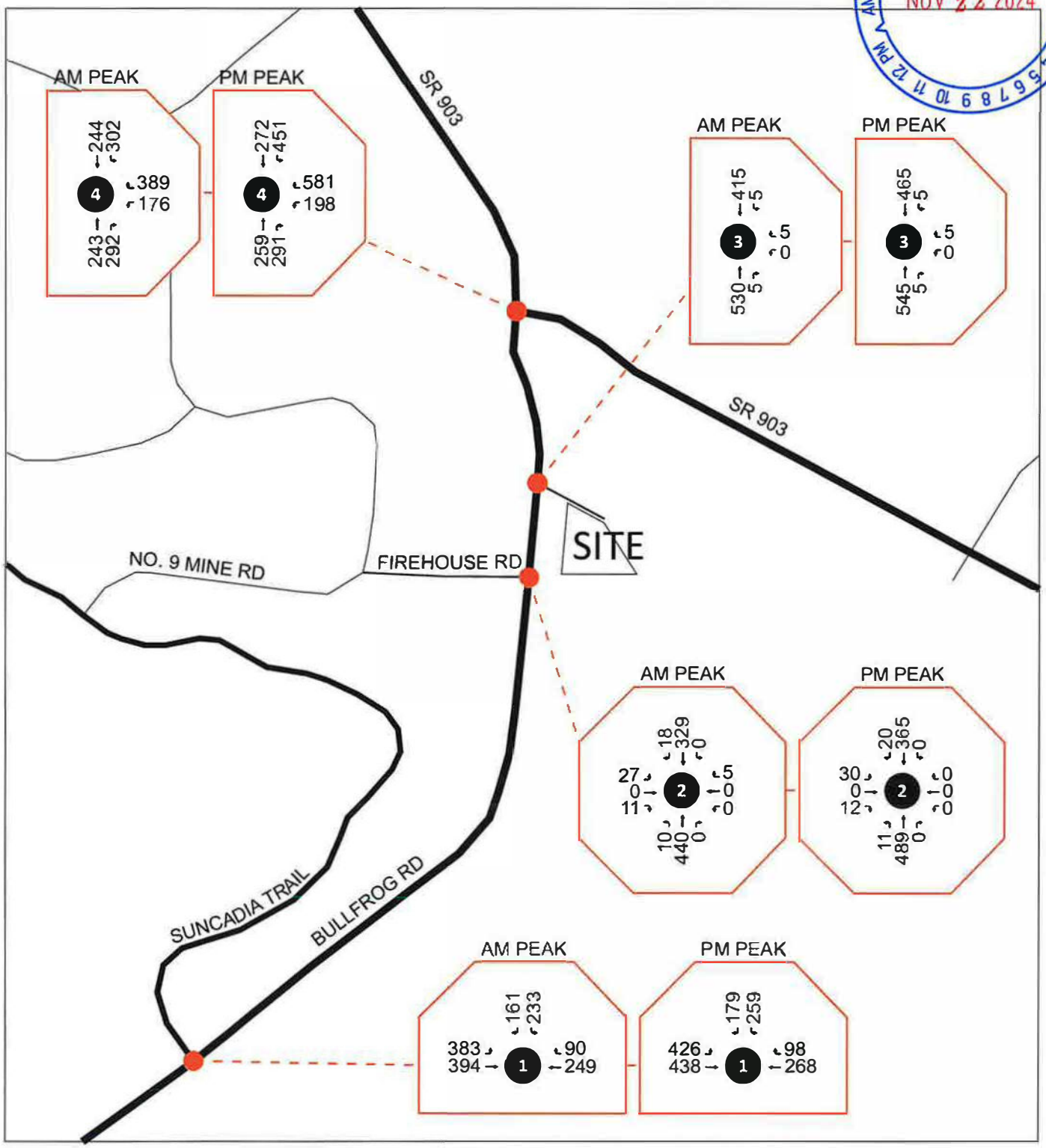

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Figure 6:
2037 Peak Hour Intersection Volumes without the Project

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PROJECT IMPACTS

This section summarizes the Project's trip generation, trip distribution and travel assignment forecasts, verified by the City of Cle Elum and Kittitas County via the scoping memorandum.

Trip Generation

The Institute of Transportation Engineers (ITE), *Trip Generation Manual, 11th Edition*, was used to forecast the baseline trip generation for the project. **Table 5** summarizes the trip generation forecast.

Table 5: ITE Land Use 220, Multifamily Housing (Low-Rise) Trip Generation

Time-Period	Dwelling Units	Avg. Trip Rate	In	Out	Total
Weekday Daily Trips	50	6.74 / unit	169	169	338
AM Peak Hour Trips	50	0.40 / unit	5	15	20
PM Peak Hour Trips	50	0.51 / unit	16	10	26

The existing site also includes 5 manufactured homes and a 1,707-square foot marketing center for Suncadia. To be conservative, trips generated by existing uses operating onsite are not credited toward the number of net new trips generated by the Project.

Trip Distribution and Travel Assignment

AM and PM peak hour trips were distributed to the roadway network based on the Kittitas County Travel Demand Model. Project trips were forecast: 25% of the Project traffic to/from SR 903 north of Bullfrog Road, 25% to/from SR 903 east of Bullfrog Road, 35% to/from the Bullfrog Road / I-90 ramps, and 15% to/from Suncadia.

The trip assignment was forecast by multiplying the peak hour trip distribution percentages by the number of project-generated trips.

Figure 7 illustrates the peak hour trip distribution and assignment forecasts.

FUTURE CONDITIONS WITH THE PROJECT

Future traffic volumes with the Project were computed by adding the Project trips to the future traffic volume conditions without the Project.

- **Figure 8** illustrates the 2025 AM and PM peak hour volumes with the Project.
- **Figure 9** illustrates the 2031 AM and PM peak hour volumes with the Project.
- **Figure 10** illustrates the 2037 AM and PM peak hour volumes with the Project.

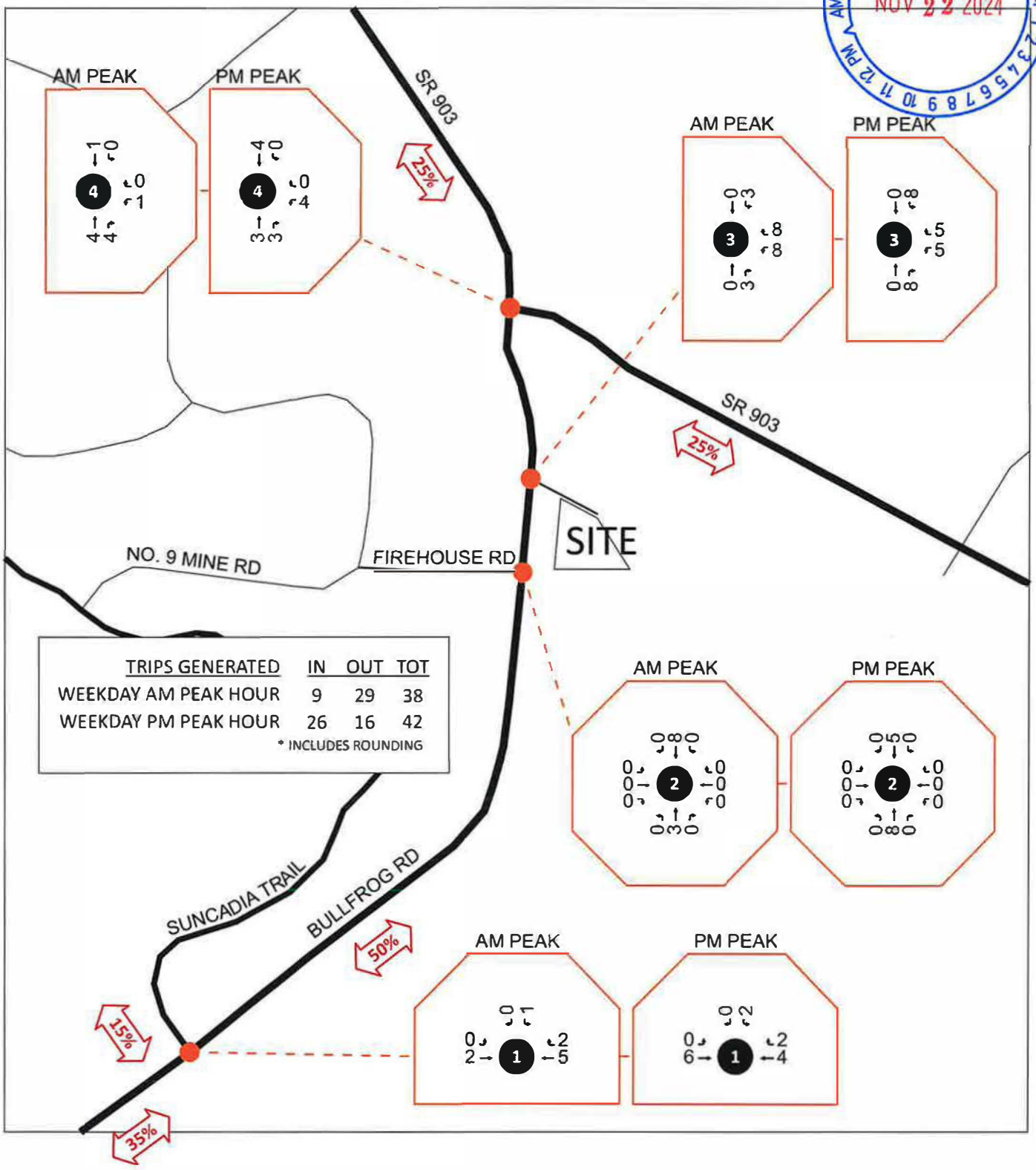

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Figure 7:
Peak Hour Trip Distribution and Travel Assignment

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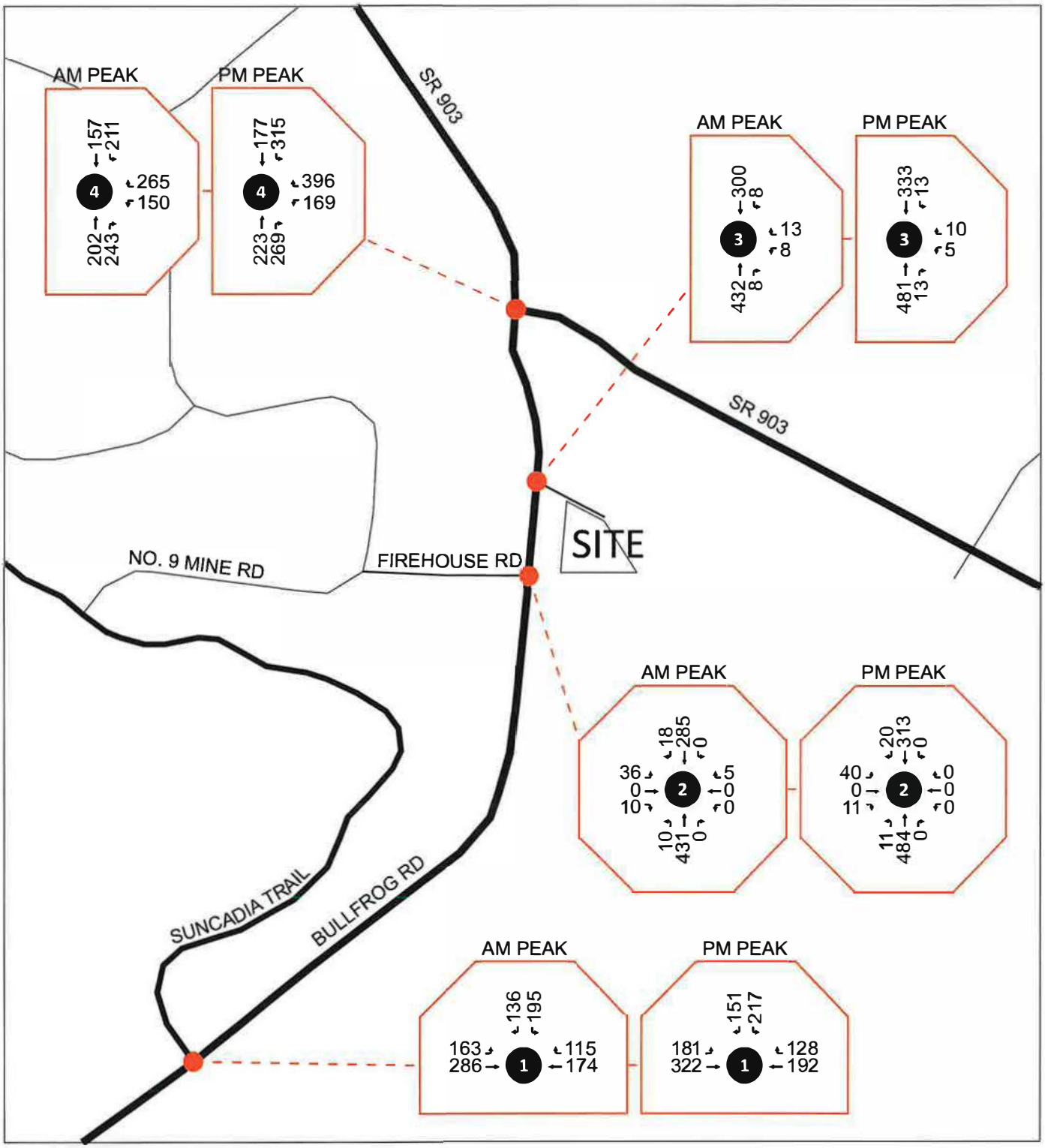

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Figure 8:
2025 Peak Hour Intersection Volumes with the Project

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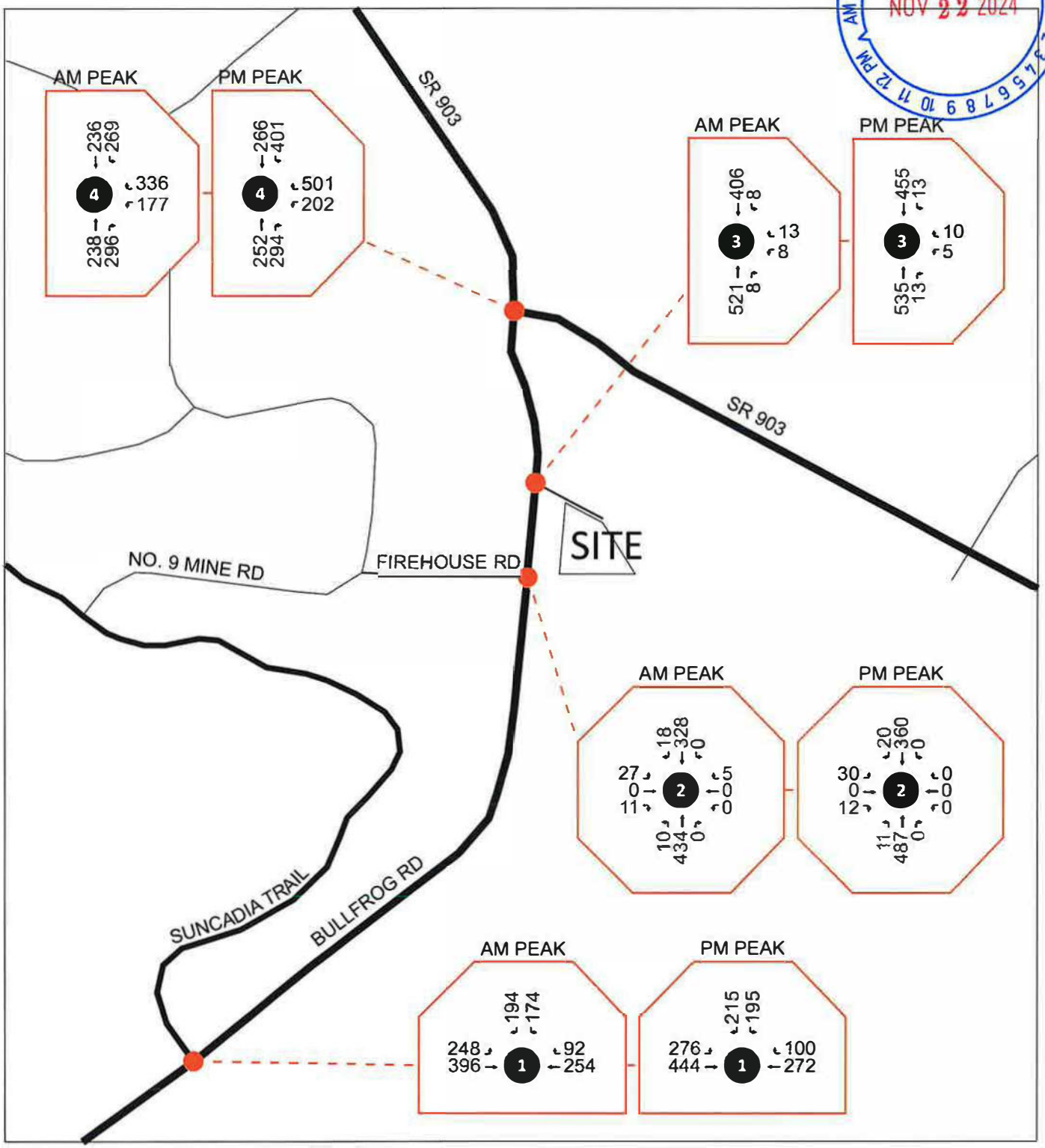

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Figure 9:
2031 Peak Hour Intersection Volumes with the Project

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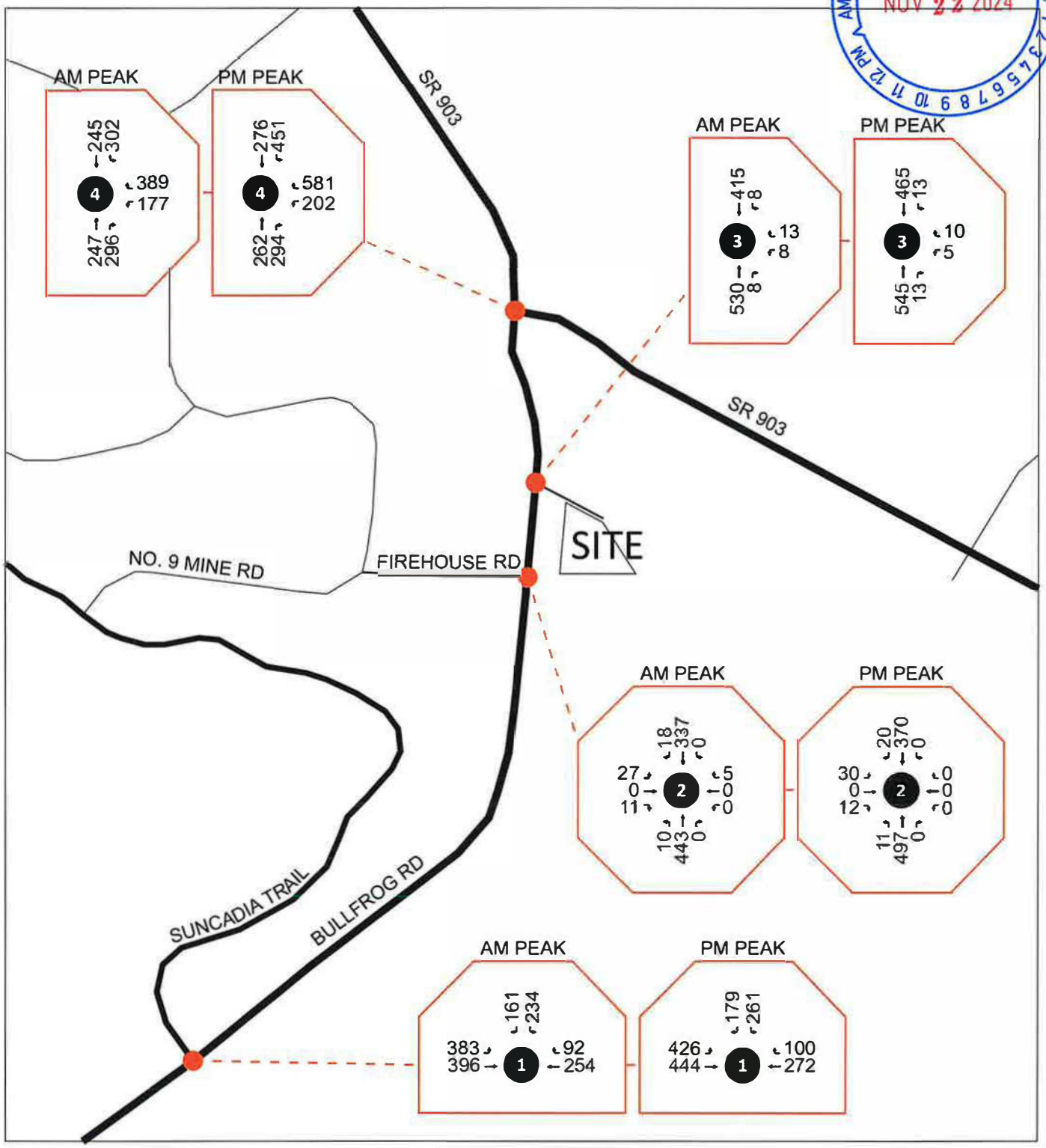

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Figure 10:
2037 Peak Hour Intersection Volumes with the Project

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TRAFFIC OPERATIONS ANALYSIS

This section summarizes the intersection and road segments traffic operations for 2024 existing conditions and for 2025, 2031, and 2037 conditions without and with the Project.

- WSDOT facilities, such as SR 903, have an LOS standard of LOS C.
- The City of Cle Elum Transportation Element of the Comprehensive Plan states that LOS C is adopted standard for City streets.
- The Kittitas County Comprehensive Plan states that LOS D is acceptable for roads within urban growth boundaries, like Bullfrog Road. The County standard is also specific to the PM peak hour.

Intersection Analysis

Study intersections were evaluated using both the Synchro, version 11, computer program, for stop-sign controlled intersections, and Sidra, version 9.1, computer program, for roundabout intersections.

From the turning movement counts collected in June 2024, the peak hour factors, heavy vehicle percentages, and pedestrian and bicycle volumes were used for the 2024 and 2025 operations analyses. The peak hour factors were increased to 1.0 to represent future congestion for the 2031 and 2037 analysis, consistent with the 47° North Updated Transportation Analysis. The stop-sign controlled intersections were evaluated using HCM 6 methodology, and the roundabouts were evaluated based on WSDOT Sidra Policy Settings.

For this analysis, the Site Access was evaluated with separate left-turn and right-turn lanes. For situations where shared lanes have a small turn volume, the addition of right-turn traffic can reduce the approach delay, per the HCM 6 delay equations, which is not practical for the added traffic. The analysis that follows reports the left-turn LOS and delay at the Site Access.

Table 6 summarizes the study intersection AM and PM peak hour study intersection LOS. Copies of the operations output reports are included in the **Appendix**.

Table 6: Intersection Level of Service and Delay

Bullfrog Road at	2024	2025		2031 **		2037 **	
AM Peak Hour	**Existing ***	**Without ***	**Project ***	**Without ***	**Project ***	**Without ***	**Project ***
Suncadia Trial	A (6.5)	A (7.0)	A (7.0)	A (7.3)	A (7.3)	A (8.7)	A (8.7)
Firehouse Road	B (11.4)	C (19.8)	C (20.2)	C (16.9)	C (17.2)	C (17.2)	C (17.5)
Site Access	A (9.4)	B (11.7)	C (17.8)	B (11.5)	C (17.8)	B (11.6)	C (18.1)
SR 903	A (7.8)	A (7.9)	A (7.9)	A (7.8)	A (7.8)	A (8.0)	A (8.0)
PM Peak Hour	**Existing ***	**Without ***	**Project ***	**Without ***	**Project ***	**Without ***	**Project ***
Suncadia Trial	A (5.8)	A (7.1)	A (7.2)	A (7.2)	A (7.3)	A (8.9)	A (8.9)
Firehouse Road	B (12.7)	C (21.4)	C (22.0)	C (17.5)	C (17.8)	C (17.9)	C (18.2)
Site Access	B (10.2)	B (11.9)	C (18.7)	B (11.6)	C (19.2)	C (19.1)	C (19.6)
SR 903	A (7.4)	A (8.3)	A (8.4)	A (8.1)	A (8.2)	A (8.7)	A (8.8)

* LOS (delay, in seconds)

** Peak Hour Factor changed to 1.00

In general, the AM peak hour traffic operations are better than the PM peak hour traffic operations. The intersection traffic operations are summarized below:

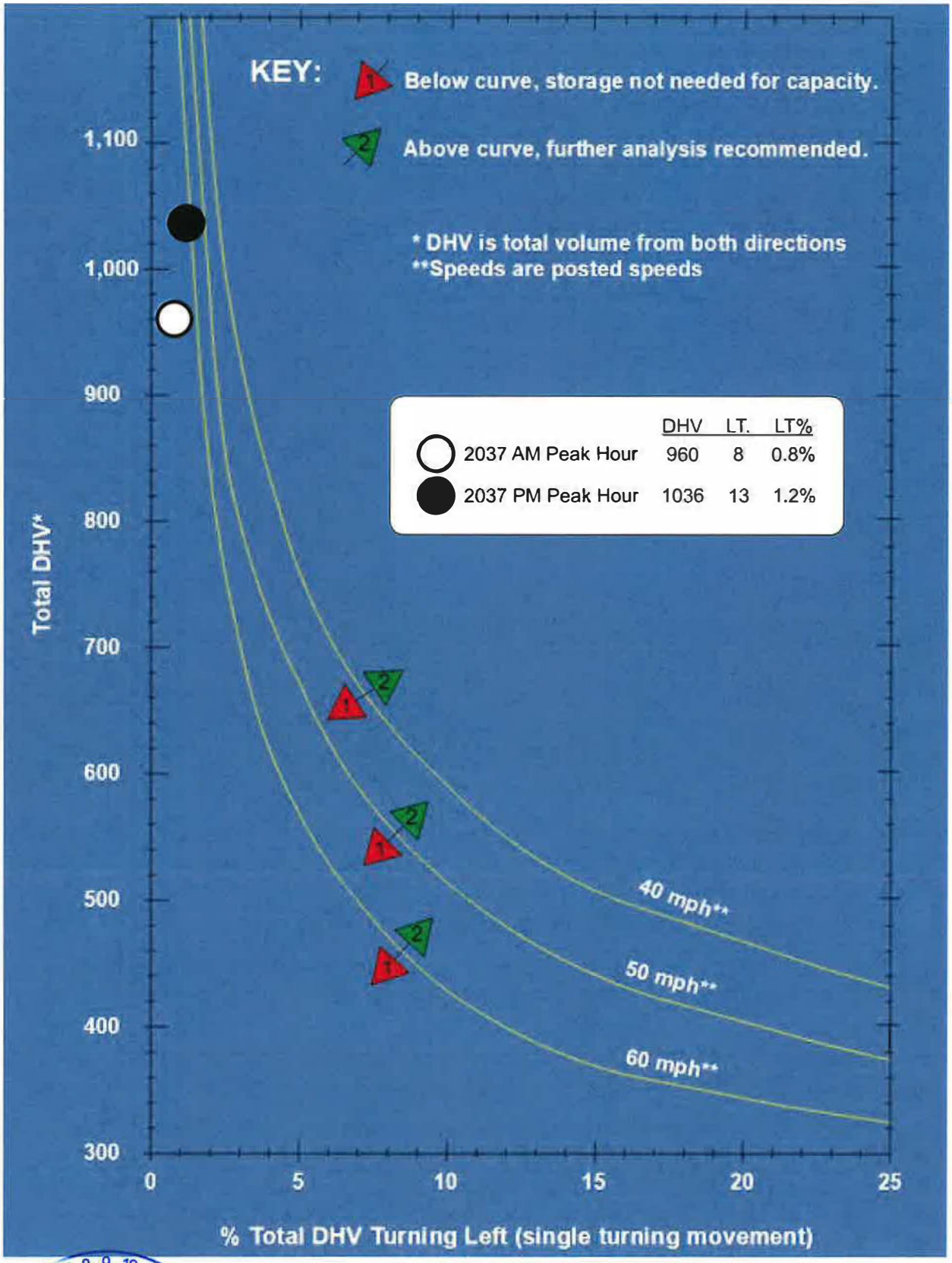
- **Bullfrog Road / Suncadia Trail.** The roundabout operates at LOS A with the Project in the AM and PM peak hours and satisfies the County standards. In the AM and PM peak hours the roundabout's volume-to-capacity (V/C) ratios are 0.73 or less, are less than 0.85, and satisfy the WSDOT guidelines. The maximum 95th-percentile eastbound queue on Bullfrog Road is 198 feet, the westbound queue on Bullfrog Road is 52 feet, and the southbound queue out from the resort is 66 feet. Vehicle queues do not impede traffic operations at adjacent intersections.
- **Bullfrog Road / Firehouse Road.** The intersection operates at LOS C with the Project in the AM and PM peak hours and satisfies the County standards. The peak hour V/C ratios of individual movements are less than 0.20 and show no significant capacity impacts. The forecasted queues also do not impact adjacent intersections or driveways.

  Figure 11 evaluates the left-turn lane warrants using the 2037 AM and PM peak hour traffic volumes with the Project and WSDOT 1310 Design Manual, Exhibit 1310-9 Left-Turn Storage Guidelines: Two-Lane, Unsignalized. The peak hour design hourly volumes and percent left-turn volumes are below the 50-mph curve and a dedicated southbound left-turn lane on Bullfrog Road at the Site Access is not warranted.

  Figure 12 evaluates the right-turn lane warrants using the 2037 AM and PM peak hour traffic volumes with the Project and WSDOT 1310 Design Manual, Exhibit 1310-24 Right-Turn Lane Guidelines. The peak hour northbound approach volumes and right-turn volumes satisfy the criteria for a radius only and a dedicated northbound right-turn pocket, taper, or turn lane on Bullfrog Road at the Site Access are not warranted.
- **Bullfrog Road / Site Access.** The Site Access operates at LOS C with the Project in the AM and PM peak hours and satisfies the County standards. The peak hour V/C ratios of individual movements are less than 0.10 and show no significant capacity impacts. The forecasted queues also do not impact adjacent intersections or driveways.
- **Bullfrog Road / SR 903.** The roundabout operates at LOS A with the Project in the AM and PM peak hours and satisfies the County standards. In the AM and PM peak hours the roundabout's V/C ratios are 0.68 or less and satisfy the WSDOT guidelines. The maximum 95th-percentile westbound queue on SR 903 is 189 feet, the northbound queue on Bullfrog Road is 121 feet, and the southbound queue on SR 903 is 152 feet. Vehicle queues do not impede traffic operations at adjacent intersections.

Road Corridor Analysis

Road corridor LOS was evaluated using the corridor LOS Florida Department of Transportation's (FDOT) 2023 Multimodal Quality/Level of Service Handbook. Bullfrog Road south of the SR 903 roundabout was characterized as a C2-Rural highway segment and SR 903 north and east of Bullfrog Road are characterized as C2T-Rural Town highway segments.



WSDOT Design Manual (October 2023) Exhibit 1310-24 Right-Turn Lane Guidelines

Figure 11:
Left-Turn Lane Warrant
2037 Peak Hour Intersection Volumes with the Project

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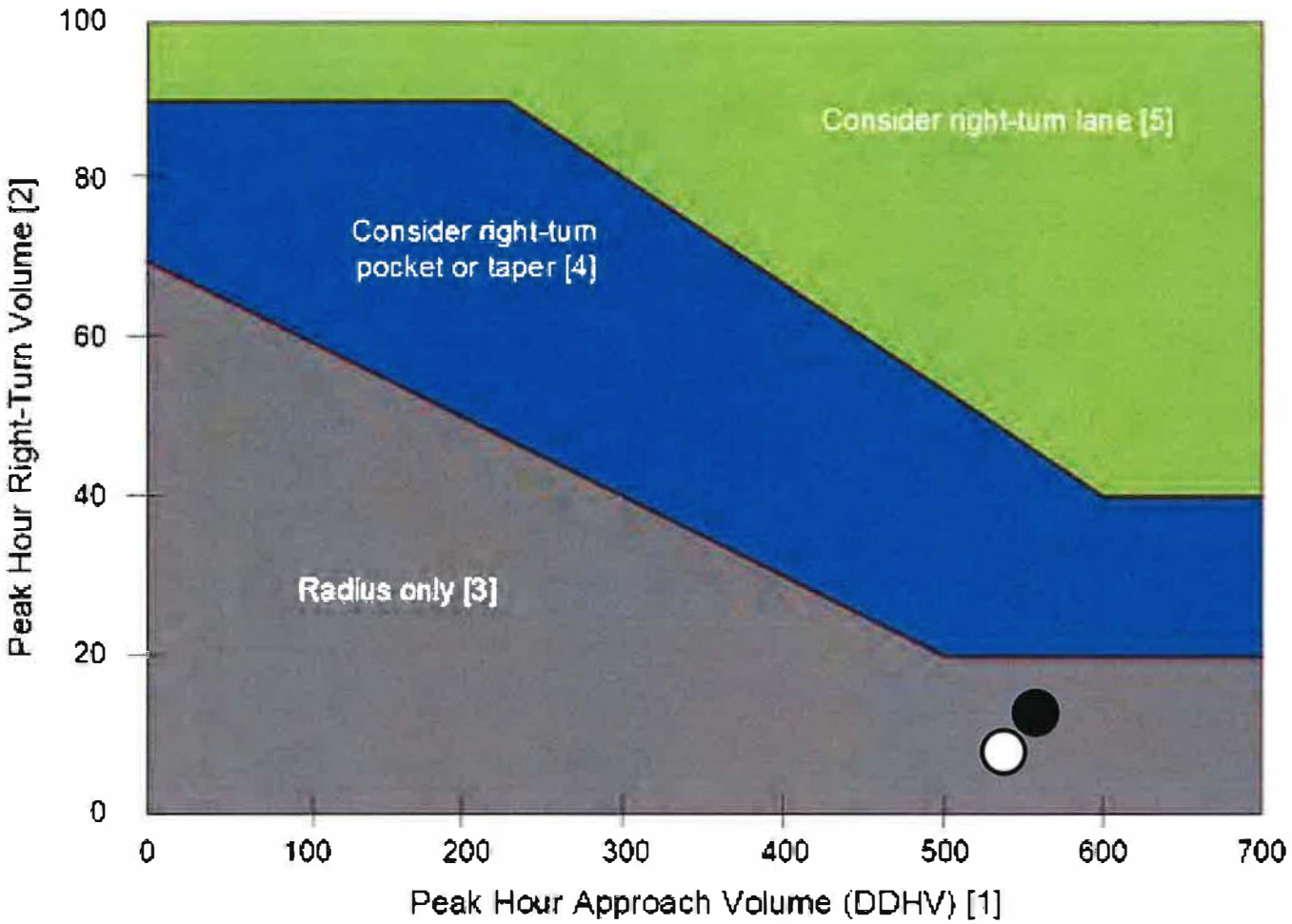


Notes:

[1] For two-lane highways, use the peak hour DDHV (through + right-turn). For multilane, highways (posted speed 45 mph or above), use the right-lane peak hour approach volume (through + right-turn).

[2] When all three of the following conditions are met, reduce the right-turn DDHV by 20:
- o The posted speed is 45 mph or below
- o The right-turn volume is greater than 40 VPH
- o The peak hour approach volume (DDHV) is less than 300 VPH

[3] For right-turn corner design, see Exhibit 1310-8.

[4] For right-turn pocket or taper design, see Exhibit 1310-25.

[5] For right-turn lane design, see Exhibit 1310-26.

WSDOT Design Manual (October 2023) Exhibit 1310-24 Right-Turn Lane Guidelines

	APP.	RT.
○ 2037 AM Peak Hour	538	8
● 2037 PM Peak Hour	558	13

Figure 12:
Right-Turn Lane Warrant
2037 Peak Hour Intersection Volumes with the Project

4240 BULLFROG ROAD
HOUSING TRAFFIC STUDY

Transportation Solutions
INNOVATIVE | PRACTICAL | EQUITABLE

Table 7 summarizes the corridor volumes and LOS analysis.

Table 7: Corridor Volumes and Level of Service

Road Segment	LOS D Threshold	2025		2031		2037	
		Without	Project	Without	Project	Without	Project
Bullfrog I-90 to SR 903	1,350 *	835	847	1065	1076	1131	1143
SR 903 n/o Bullfrog	1,710 **	1104	1111	1413	1420	1563	1570
SR 903 e/o Bullfrog	1,710 **	1142	1149	1391	1398	1521	1528

* FDOT C1 & C2 Motor Vehicle Highway Generalized Service Volume Tables

** FDOT C2T, C4, C5 & C6 Motor Vehicle Highway Generalized Service Volume Tables

The corridors operate at LOS C, less than the LOS D thresholds, and satisfy the local LOS standards.

PROPORTIONATE SHARE IMPACTS; IMPROVEMENT BY OTHERS

Traffic conditions with the Project satisfy the local LOS thresholds for the study area. Offsite mitigation is not required. The Applicant will be required to meet their frontage requirements and may be required to contribute proportionally to the following three intersection improvements identified in the 47° North Updated Transportation Analysis:

- Bullfrog Road / I-90 EB Ramps – 2031 Compact Roundabout
- Bullfrog Road / Tumble Creek Drive – 2031 Refuge/merge lane on Bullfrog Road
- Bullfrog Road / I-90 WB Ramps – 2037 Compact Roundabout

Table 8 summarizes the corridor volumes and LOS analysis.

Table 8: Offsite Proportionate Share Contribution PM Peak Hour Trips

Bullfrog Road at Year Scenario	Eastbound			Westbound			Northbound			Southbound			Share
	Lt	Th	Rt	Lt	Th	Rt	Lt	Th	Rt	Lt	Th	Rt	(%)
I-90 EB Ramps													
2031 w/o-Project	393	10	30	0	0	0	0	20	30	263	30	0	
2031 with-Project	397	10	30	0	0	0	0	20	30	264	30	0	0.64%
Tumble Creek Dr													
2031 w/o-Project	65	0	80	0	0	0	130	682	0	0	394	51	
2031 with-Project	65	0	80	0	0	0	130	688	0	0	398	51	0.64%
I-90 WB Ramps													
2037 w/o-Project	0	0	0	40	10	609	10	413	0	0	343	221	
2037 with-Project	0	0	0	40	10	611	10	417	0	0	344	224	0.55%

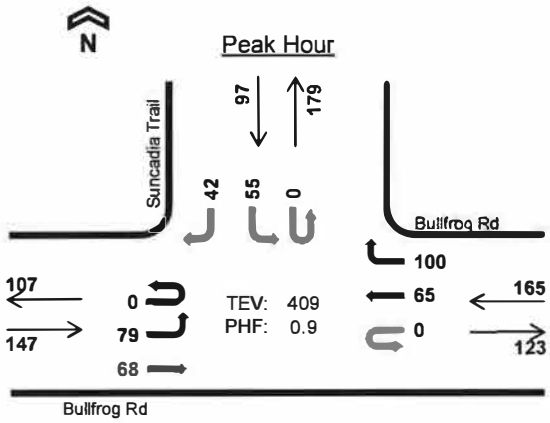
Overall, the Project adds 18 new PM peak hour trips to the Bullfrog Road intersections at the I-90 eastbound and westbound ramps and at Tumble Creek Drive. The Project's proportionate share impact at the three intersections is less than 1%. Pending the status of the development of 47° North, the Applicant is recommended to coordinate with the Kittitas County regarding the type of agreement necessary for a voluntary contribution to non-Project impacts.

APPENDIX

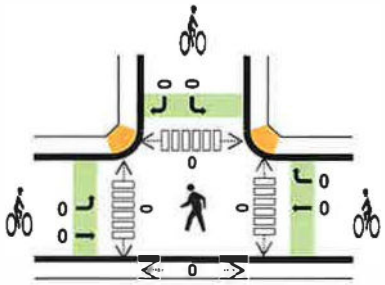
- Traffic Volumes
- Pipeline Distribution
- 2024 Existing Peak Hour Intersection Level of Service
- 2025 Peak Hour Intersection Level of Service without and with the Project
- 2031 Peak Hour Intersection Level of Service without and with the Project
- 2037 2025 Peak Hour Intersection Level of Service without and with the Project
- FDOT Multimodal Quality/Level of Service Handbook Excerpts

Traffic Volumes

Suncadia Trail
Bullfrog Rd



Date: 06/18/2024
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM



	HV %:	PHF
EB	7.5%	0.90
WB	11.5%	0.79
NB	-	-
SB	4.1%	0.78
TOTAL	8.3%	0.90

Two-Hour Count Summaries

Interval Start		Bullfrog Rd Eastbound				Bullfrog Rd Westbound				0 Northbound				Suncadia Trail Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	12	7	0	0	0	17	16	0	0	0	0	0	4	0	6	62	0
7:15 AM		0	13	11	0	0	0	16	23	0	0	0	0	0	5	0	6	74	0
7:30 AM		0	18	12	0	0	0	12	29	0	0	0	0	0	6	0	6	83	0
7:45 AM		0	25	24	0	0	0	21	24	0	0	0	0	0	3	0	9	106	325
8:00 AM		**0**	**20**	**16**	**0**	**0**	**0**	**17**	**16**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**13**	**87**	350
8:15 AM		**0**	**18**	**14**	**0**	**0**	**0**	**20**	**21**	**0**	**0**	**0**	**0**	**0**	**18**	**0**	**13**	**104**	380
8:30 AM		**0**	**20**	**18**	**0**	**0**	**0**	**12**	**27**	**0**	**0**	**0**	**0**	**0**	**19**	**0**	**8**	**104**	401
8:45 AM		**0**	**21**	**20**	**0**	**0**	**0**	**16**	**36**	**0**	**0**	**0**	**0**	**0**	**13**	**0**	**8**	**114**	**409**
Count Total		0	147	122	0	0	0	131	192	0	0	0	0	0	73	0	69	734	0
Peak Hour	**All**	**0**	**79**	**88**	**0**	**0**	**0**	**65**	**100**	**0**	**0**	**0**	**0**	**0**	**55**	**0**	**42**	**409**	**0**
	HV	**0**	**4**	**7**	**0**	**0**	**0**	**10**	**9**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**34**	**0**
	HV%	-	**5%**	**10%**	-	-	-	**15%**	**9%**	-	-	-	-	-	**4%**	-	**5%**	**8%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	3	0	1	*4*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	1	3	0	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	2	4	0	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	4	2	0	1	*7*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	**1**	**4**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	**3**	**4**	**0**	**1**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	**6**	**3**	**0**	**1**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	**1**	**8**	**0**	**2**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	18	31	0	6	*55*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**11**	**19**	**0**	**4**	***34***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Bullfrog Rd Eastbound				Bullfrog Rd Westbound				0 Northbound				Suncadia Trail Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	1	4	0
7:15 AM	0	0	1	0	0	0	1	2	0	0	0	0	0	0	0	0	4	0
7:30 AM	0	1	1	0	0	0	1	3	0	0	0	0	0	0	0	0	6	0
7:45 AM	0	2	2	0	0	0	2	0	0	0	0	0	0	1	0	0	7	21
8:00 AM	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**22**
8:15 AM	**0**	**1**	**2**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**8**	**26**
8:30 AM	**0**	**1**	**5**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**10**	30
8:45 AM	**0**	**1**	**0**	**0**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**11**	**34**
Count Total	0	7	11	0	0	0	17	14	0	0	0	0	0	3	0	3	55	0
Peak Hour	**0**	**4**	**7**	**0**	**0**	**0**	**10**	**9**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**34**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Bullfrog Rd Eastbound			Bullfrog Rd Westbound			0 Northbound			Suncadia Trail Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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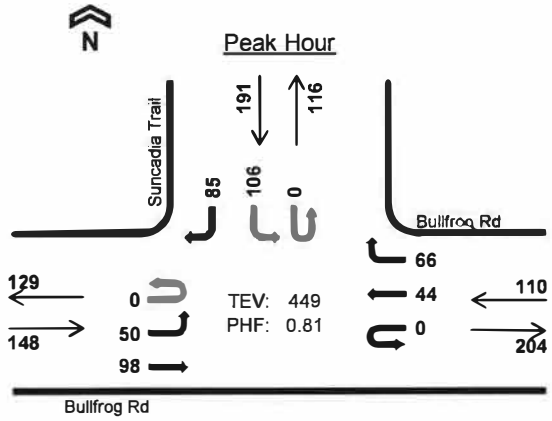
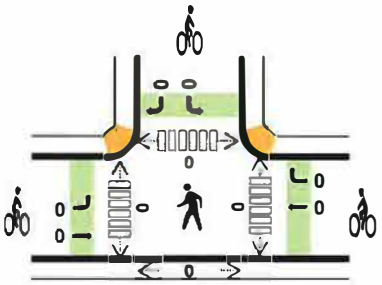
Suncadia Trail
Bullfrog Rd

Date: 06/18/2024
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM





	HV %:	PHF
EB	3.4%	0.84
WB	3.6%	0.79
NB	-	-
SB	2.6%	0.72
TOTAL	3.1%	0.81

Two-Hour Count Summaries

Interval Start		Bullfrog Rd Eastbound				Bullfrog Rd Westbound				0 Northbound				Suncadia Trail Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		**0**	**13**	**25**	**0**	**0**	**0**	**14**	**21**	**0**	**0**	**0**	**0**	**0**	**29**	**0**	**37**	**139**	0
4:15 PM		**0**	**12**	**24**	**0**	**0**	**0**	**9**	**11**	**0**	**0**	**0**	**0**	**0**	**26**	**0**	**18**	**100**	0
4:30 PM		**0**	**15**	**29**	**0**	**0**	**0**	**11**	**16**	**0**	**0**	**0**	**0**	**0**	**25**	**0**	**20**	**116**	0
4:45 PM		**0**	**10**	**20**	**0**	**0**	**0**	**10**	**18**	**0**	**0**	**0**	**0**	**0**	**26**	**0**	**10**	**94**	**449**
5:00 PM		0	9	31	0	0	0	21	19	0	0	0	0	0	26	0	21	127	437
5:15 PM		0	12	24	0	0	0	16	11	0	0	0	0	0	24	0	13	100	437
5:30 PM		0	6	27	0	0	0	15	10	0	0	0	0	1	25	0	16	100	421
5:45 PM		0	4	20	0	0	0	9	14	0	0	0	0	0	23	0	13	83	410
Count Total		0	81	200	0	0	0	105	120	0	0	0	0	1	204	0	148	859	0
Peak Hour	**All**	**0**	**50**	**98**	**0**	**0**	**0**	**44**	**66**	**0**	**0**	**0**	**0**	**0**	**106**	**0**	**85**	**449**	**0**
	HV	**0**	**1**	**4**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**1**	**14**	**0**
	HV%	-	**2%**	**4%**	-	-	-	**7%**	**2%**	-	-	-	-	-	**4%**	-	**1%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	**1**	**1**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:15 PM	**2**	**3**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:30 PM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**1**	**0**	**0**	**4**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	6	5	0	6	*17*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**5**	**4**	**0**	**5**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Bullfrog Rd Eastbound				Bullfrog Rd Westbound				0 Northbound				Suncadia Trail Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	0	1	0	0	**3**	0
4:15 PM	**0**	**1**	**1**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	0
4:30 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**
4:45 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**5**	**14**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	7
5:30 PM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	8
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	1	5	0	0	0	3	2	0	0	0	0	0	5	0	1	17	0
Peak Hour	**0**	**1**	**4**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**1**	**14**	**0**

Two-Hour Count Summaries - Bikes

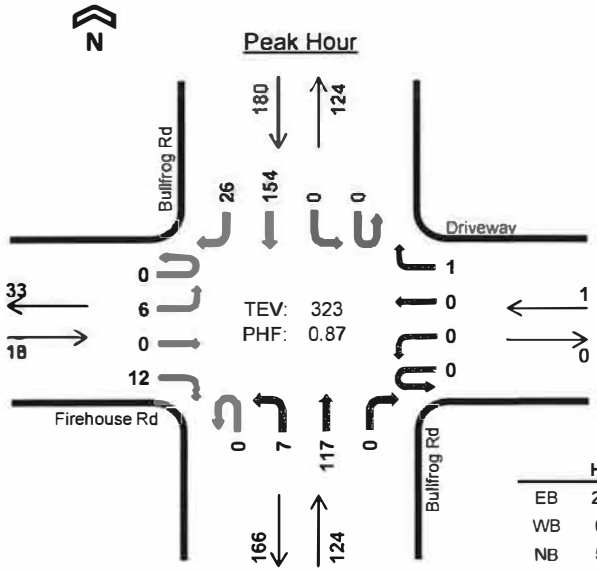
Interval Start	Bullfrog Rd Eastbound			Bullfrog Rd Westbound			0 Northbound			Suncadia Trail Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

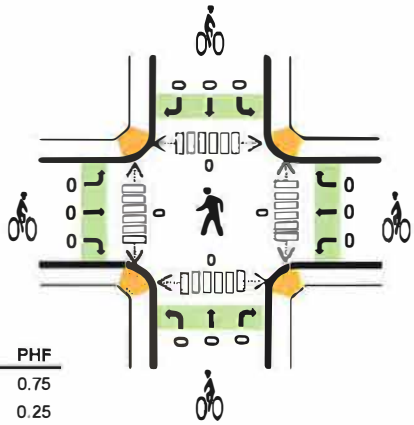
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

project.manager.wa@idaxdata.com

Bullfrog Rd
Firehouse Rd

Date: 06/18/2024
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
EB	22.2%	0.75
WB	0.0%	0.25
NB	5.6%	0.89
SB	10.6%	0.83
TOTAL	9.3%	0.87

Two-Hour Count Summaries

Interval Start	Firehouse Rd Eastbound				Driveway Westbound				Bullfrog Rd Northbound				Bullfrog Rd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	0	0	0	0	0	0	0	0	10	0	0	0	35	4	50	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	14	0	0	1	37	3	56	0
7:30 AM	0	1	0	0	0	0	0	0	0	0	20	0	0	0	41	2	64	0
7:45 AM	0	5	0	3	0	0	0	0	0	2	25	0	0	0	42	11	88	258
8:00 AM	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**19**	**0**	**0**	**0**	**33**	**8**	**66**	274
8:15 AM	**0**	**1**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**1**	**33**	**0**	**0**	**0**	**35**	**3**	**78**	296
8:30 AM	**0**	**1**	**0**	**4**	**0**	**0**	**0**	**1**	**0**	**2**	**31**	**0**	**0**	**0**	**39**	**8**	**86**	318
8:45 AM	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**34**	**0**	**0**	**0**	**47**	**7**	**93**	**323**
Count Total	0	13	0	15	0	0	0	1	0	10	186	0	0	1	309	46	581	0
Peak Hour All	**0**	**6**	**0**	**12**	**0**	**0**	**0**	**1**	**0**	**7**	**117**	**0**	**0**	**0**	**154**	**26**	**323**	**0**
Peak Hour HV	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**17**	**2**	**30**	**0**
Peak Hour HV%	-	**33%**	-	**17%**	-	-	-	**0%**	-	**0%**	**6%**	-	-	-	**11%**	**8%**	**9%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	0	0	3	*4*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	0	1	4	*5*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	1	0	2	3	*6*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	0	0	4	5	*9*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	**1**	**0**	**1**	**4**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**2**	**0**	**1**	**3**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:30 AM	**0**	**0**	**4**	**4**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:45 AM	**1**	**0**	**1**	**8**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	6	0	14	34	*54*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hour	**4**	**0**	**7**	**19**	***30***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Firehouse Rd Eastbound				Driveway Westbound				Bullfrog Rd Northbound				Bullfrog Rd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	4	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	1	5	0
7:30 AM	0	1	0	0	0	0	0	0	0	0	2	0	0	0	3	0	6	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	3	2	9	24
8:00 AM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**1**	**6**	**26**
8:15 AM	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**6**	**27**
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**3**	**1**	**8**	**29**
8:45 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**10**	**30**
Count Total	0	4	0	2	0	0	0	0	0	0	14	0	0	0	29	5	54	0
Peak Hour	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**17**	**2**	**30**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Firehouse Rd Eastbound			Driveway Westbound			Bullfrog Rd Northbound			Bullfrog Rd Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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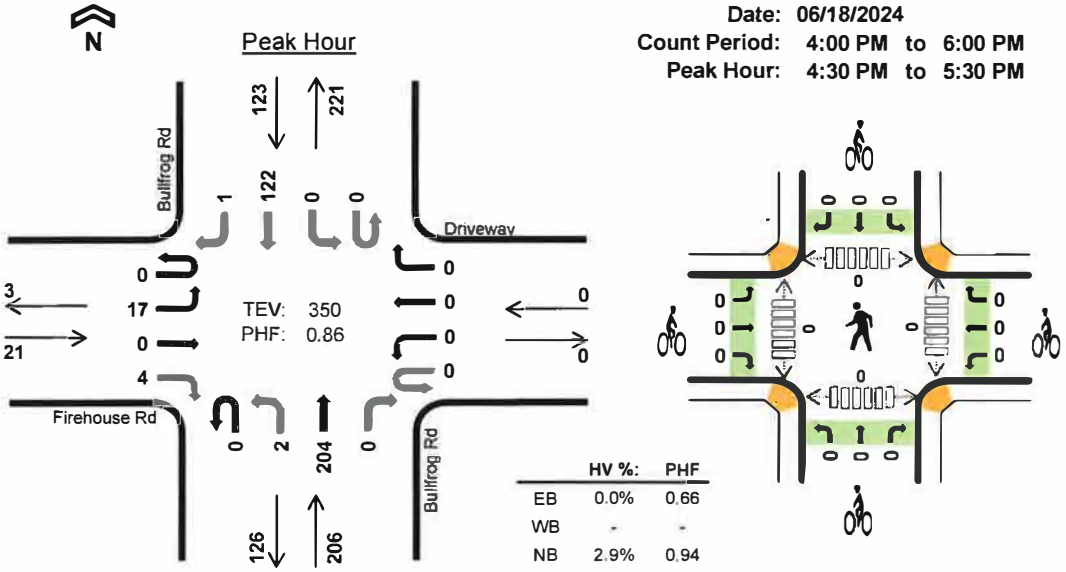
Bullfrog Rd
Firehouse Rd

Date: 06/18/2024
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	0.0%	0.66
WB	-	-
NB	2.9%	0.94
SB	0.0%	0.77
TOTAL	1.7%	0.86

Two-Hour Count Summaries

Interval Start		Firehouse Rd Eastbound				Driveway Westbound				Bullfrog Rd Northbound				Bullfrog Rd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	7	0	1	0	0	0	0	0	0	59	0	1	1	32	5	106	0
4:15 PM		0	3	0	1	0	0	0	0	0	0	45	0	0	0	19	1	69	0
4:30 PM		**0**	**7**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**54**	**0**	**0**	**0**	**28**	**0**	**91**	0
4:45 PM		**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**43**	**0**	**0**	**0**	**27**	**0**	**72**	338
5:00 PM		**0**	**6**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**55**	**0**	**0**	**0**	**39**	**1**	**102**	334
5:15 PM		**0**	**3**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**52**	**0**	**0**	**0**	**28**	**0**	**85**	**350**
5:30 PM		0	5	0	0	0	0	0	0	0	0	48	0	0	0	22	1	76	335
5:45 PM		0	3	0	4	0	0	0	0	0	0	44	0	0	0	20	0	71	334
Count Total		0	35	0	10	0	0	0	0	0	2	400	0	1	1	215	8	672	0
Peak Hour	**All**	**0**	**17**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**2**	**204**	**0**	**0**	**0**	**122**	**1**	**350**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**6**	**0**
	HV%	-	**0%**	-	**0%**	-	-	-	-	-	**0%**	**3%**	-	-	-	**0%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	0	0	2	2	*4*	0	0	0	1	*1*	0	0	0	0	*0*
4:15 PM	1	0	1	2	*4*	0	0	0	1	*1*	0	0	0	0	*0*
4:30 PM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**0**	**0**	**4**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	1	0	10	5	*16*	0	0	0	2	*2*	0	0	0	0	*0*
Peak Hour	**0**	**0**	**6**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Firehouse Rd Eastbound				Driveway Westbound				Bullfrog Rd Northbound				Bullfrog Rd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	1	4	0
4:15 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2	0	4	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**4**	**13**
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**6**
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	6
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
Count Total	0	0	0	1	0	0	0	0	0	0	10	0	0	0	4	1	16	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**6**	**0**

Two-Hour Count Summaries - Bikes

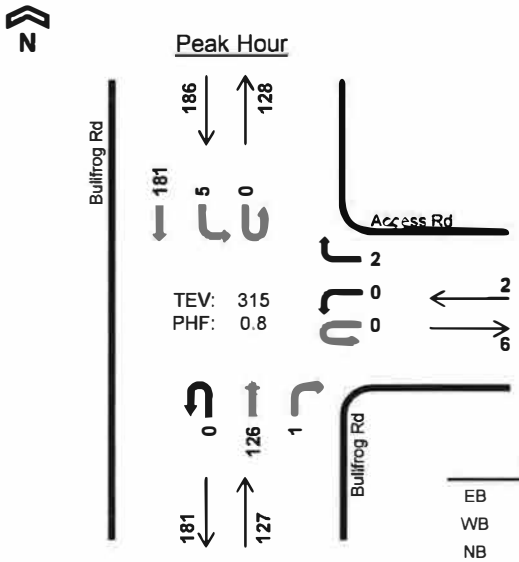
Interval Start	Firehouse Rd Eastbound			Driveway Westbound			Bullfrog Rd Northbound			Bullfrog Rd Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

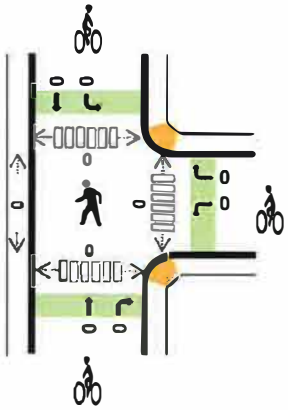
Bullfrog Rd
Access Rd

idax

Date: 06/18/2024
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM



	HV %:	PHF
EB	-	-
WB	0.0%	0.25
NB	7.1%	0.84
SB	10.2%	0.80
TOTAL	8.9%	0.80



Two-Hour Count Summaries

Interval Start	0 Eastbound				Access Rd Westbound				Bullfrog Rd Northbound				Bullfrog Rd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	1	0	0	9	1	0	2	37	0	50	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	15	0	0	4	42	0	61	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	18	1	0	1	43	0	64	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	29	0	0	0	53	0	82	257
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**22**	**0**	**0**	**0**	**43**	**0**	**65**	272
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**33**	**0**	**0**	**1**	**38**	**0**	**72**	283
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**33**	**1**	**0**	**1**	**45**	**0**	**80**	299
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**38**	**0**	**0**	**3**	**55**	**0**	**98**	**315**
Count Total	0	0	0	0	0	0	0	4	0	0	197	3	0	12	356	0	572	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**126**	**1**	**0**	**5**	**181**	**0**	**315**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**19**	**0**	**28**	**0**
Peak Hour HV%	-	-	-	-	-	-	-	**0%**	-	-	**7%**	**0%**	-	**0%**	**10%**	-	**9%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	1	3	*4*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	0	1	4	*5*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	0	0	3	3	*6*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	0	0	4	5	*9*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	**0**	**0**	**1**	**4**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	**0**	**0**	**2**	**3**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	**0**	**0**	**4**	**4**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	**0**	**0**	**2**	**8**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	0	0	18	34	*52*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**0**	**9**	**19**	***28***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	0				Access Rd				Bullfrog Rd				Bullfrog Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	5	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	6	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	5	0	9	24
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**4**	**0**	**5**	**25**
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**0**	**5**	**25**
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**4**	**0**	**8**	**27**
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**8**	**0**	**10**	**28**
Count Total	0	0	0	0	0	0	0	0	0	0	18	0	0	0	34	0	52	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**19**	**0**	**28**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	0			Access Rd			Bullfrog Rd			Bullfrog Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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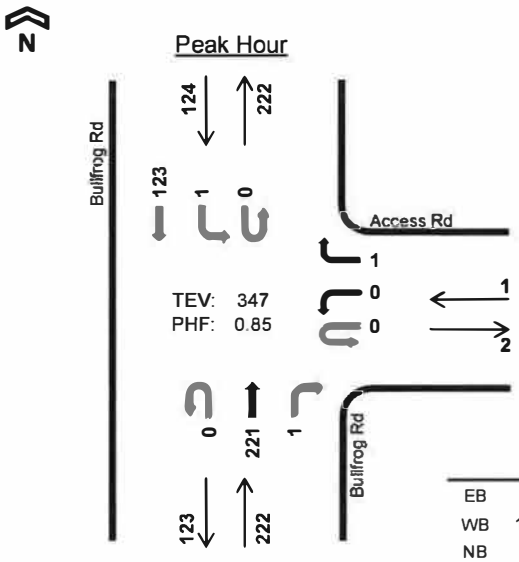
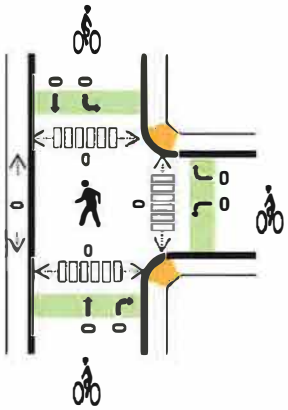
Bullfrog Rd
Access Rd

Date: 06/18/2024
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM





	HV %:	PHF
EB	-	-
WB	100.0%	0.25
NB	2.7%	0.91
SB	0.0%	0.76
TOTAL	2.0%	0.85

Two-Hour Count Summaries

Interval Start		0 Eastbound				Access Rd Westbound				Bullfrog Rd Northbound				Bullfrog Rd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	0	0	0	0	0	3	0	0	63	0	0	1	41	0	108	0
4:15 PM		0	0	0	0	0	1	0	1	0	0	50	0	0	0	19	0	71	0
4:30 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**59**	**0**	**0**	**0**	**26**	**0**	**85**	0
4:45 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**44**	**1**	**0**	**0**	**28**	**0**	**74**	338
5:00 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**61**	**0**	**0**	**1**	**40**	**0**	**102**	332
5:15 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**57**	**0**	**0**	**0**	**29**	**0**	**86**	**347**
5:30 PM		0	0	0	0	0	0	0	0	0	0	53	0	0	0	22	0	75	337
5:45 PM		0	0	0	0	0	0	0	1	0	0	50	0	0	0	20	0	71	334
Count Total		0	0	0	0	0	1	0	6	0	0	437	1	0	2	225	0	672	0
Peak Hour	**All**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**221**	**1**	**0**	**1**	**123**	**0**	**347**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	**1**	**0**	**0**	**0**	**0**	**7**	**0**
	HV%	-	-	-	-	-	-	-	**100%**	-	-	**2%**	**100%**	-	**0%**	**0%**	-	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	2	2	*4*	0	0	0	1	*1*	0	0	0	0	*0*
4:15 PM	0	0	1	2	*3*	0	0	0	1	*1*	0	0	0	0	*0*
4:30 PM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**0**	**1**	**3**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	1	10	5	*16*	0	0	0	2	*2*	0	0	0	0	*0*
Peak Hr	**0**	**1**	**6**	**0**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	0				Access Rd				Bullfrog Rd				Bullfrog Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	4	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**4**	**12**
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**7**
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	7
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
Count Total	0	0	0	0	0	0	0	1	0	0	9	1	0	0	5	0	16	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	**1**	**0**	**0**	**0**	**0**	**7**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	0			Access Rd			Bullfrog Rd			Bullfrog Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	2	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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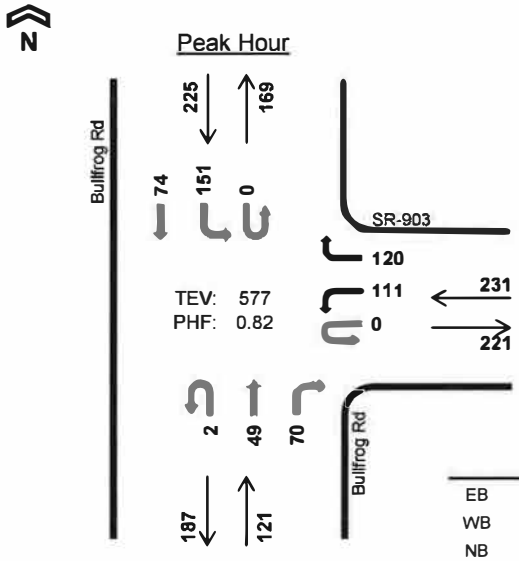
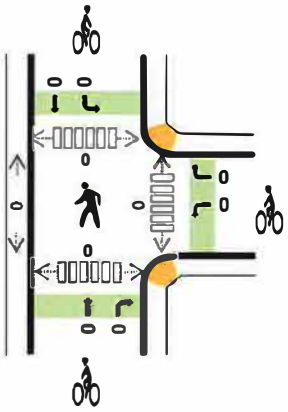
Bullfrog Rd
SR-903

Date: 06/18/2024
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
EB	-	-
WB	10.0%	0.73
NB	8.3%	0.86
SB	2.2%	0.88
TOTAL	6.6%	0.82

Two-Hour Count Summaries

Interval Start		0 Eastbound				SR-903 Westbound				Bullfrog Rd Northbound				Bullfrog Rd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	0	0	22	0	17	0	0	4	9	0	13	12	0	77	0
7:15 AM		0	0	0	0	1	28	0	21	0	0	10	4	0	22	18	0	104	0
7:30 AM		0	0	0	0	0	28	0	16	0	0	5	15	0	19	12	0	95	0
7:45 AM		0	0	0	0	0	31	0	27	1	0	18	12	0	38	14	0	141	417
8:00 AM		**0**	**0**	**0**	**0**	**0**	**21**	**0**	**16**	**0**	**0**	**12**	**9**	**0**	**30**	**13**	**0**	**101**	**441**
8:15 AM		**0**	**0**	**0**	**0**	**0**	**20**	**0**	**28**	**1**	**0**	**9**	**20**	**0**	**41**	**23**	**0**	**142**	**479**
8:30 AM		**0**	**0**	**0**	**0**	**0**	**32**	**0**	**35**	**0**	**0**	**14**	**21**	**0**	**38**	**18**	**0**	**158**	**542**
8:45 AM		**0**	**0**	**0**	**0**	**0**	**38**	**0**	**41**	**1**	**0**	**14**	**20**	**0**	**42**	**20**	**0**	**176**	**577**
Count Total		0	0	0	0	1	220	0	201	3	0	86	110	0	243	130	0	994	0
Peak Hour	**All**	**0**	**0**	**0**	**0**	**0**	**111**	**0**	**120**	**2**	**0**	**49**	**70**	**0**	**151**	**74**	**0**	**577**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**13**	**0**	**10**	**0**	**0**	**1**	**9**	**0**	**2**	**3**	**0**	**38**	**0**
	HV%	-	-	-	-	-	**12%**	-	**8%**	**0%**	-	**2%**	**13%**	-	**1%**	**4%**	-	**7%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	4	2	1	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	5	1	1	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	0	5	2	0	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	0	8	4	1	*13*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	**0**	**4**	**1**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	**0**	**5**	**3**	**2**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	**0**	**5**	**4**	**2**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	**0**	**9**	**2**	**1**	***12***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	0	45	19	8	*72*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**23**	**10**	**5**	***38***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	0				SR-903				Bullfrog Rd				Bullfrog Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	3	0	1	0	0	1	1	0	0	1	0	7	0
7:15 AM	0	0	0	0	0	4	0	1	0	0	0	1	0	0	1	0	7	0
7:30 AM	0	0	0	0	0	2	0	3	0	0	0	2	0	0	0	0	7	0
7:45 AM	0	0	0	0	0	6	0	2	0	0	2	2	0	1	0	0	13	34
8:00 AM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**5**	**32**
8:15 AM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**3**	**0**	**0**	**1**	**2**	**0**	**1**	**1**	**0**	**10**	**35**
8:30 AM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**3**	**0**	**0**	**0**	**4**	**0**	**1**	**1**	**0**	**11**	**39**
8:45 AM	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**12**	**38**
Count Total	0	0	0	0	0	28	0	17	0	0	4	15	0	3	5	0	72	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**13**	**0**	**10**	**0**	**0**	**1**	**9**	**0**	**2**	**3**	**0**	**38**	**0**

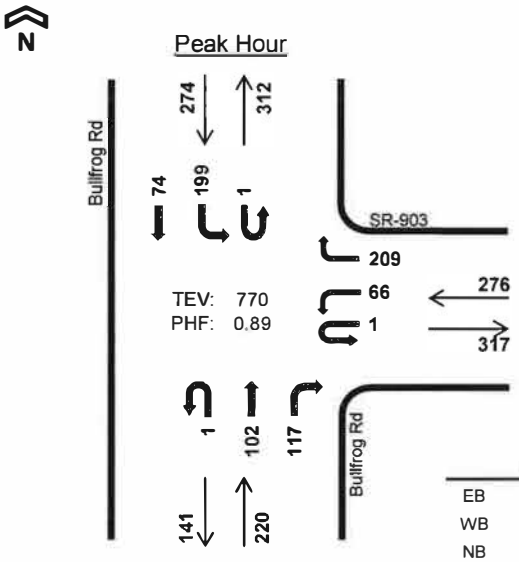
Two-Hour Count Summaries - Bikes

Interval Start	0			SR-903			Bullfrog Rd			Bullfrog Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

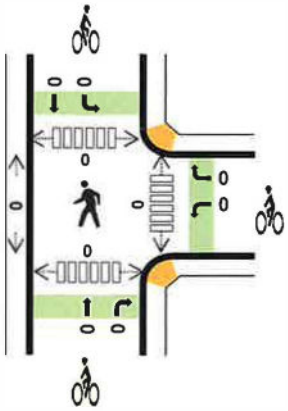
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Bullfrog Rd
SR-903

Date: 06/18/2024
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	-	-
WB	0.7%	0.95
NB	2.3%	0.87
SB	2.2%	0.77
TOTAL	1.7%	0.89



Two-Hour Count Summaries

Interval Start		0 Eastbound				SR-903 Westbound				Bullfrog Rd Northbound				Bullfrog Rd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	0	0	0	19	0	43	0	0	24	45	0	42	27	0	200	0
4:15 PM		0	0	0	0	0	9	0	49	0	0	17	36	0	41	8	0	160	0
4:30 PM		**0**	**0**	**0**	**0**	**0**	**19**	**0**	**54**	**1**	**0**	**32**	**30**	**0**	**48**	**18**	**0**	**202**	0
4:45 PM		**0**	**0**	**0**	**0**	**1**	**14**	**0**	**56**	**0**	**0**	**18**	**29**	**0**	**35**	**17**	**0**	**170**	732
5:00 PM		**0**	**0**	**0**	**0**	**0**	**23**	**0**	**49**	**0**	**0**	**27**	**29**	**1**	**69**	**19**	**0**	**217**	749
5:15 PM		**0**	**0**	**0**	**0**	**0**	**10**	**0**	**50**	**0**	**0**	**25**	**29**	**0**	**47**	**20**	**0**	**181**	**770**
5:30 PM		0	0	0	0	0	13	0	43	0	0	23	27	0	49	14	0	169	737
5:45 PM		0	0	0	0	0	10	0	38	0	0	24	26	0	41	14	0	153	720
Count Total		0	0	0	0	1	117	0	382	1	0	190	251	1	372	137	0	1,452	0
Peak Hour	**All**	**0**	**0**	**0**	**0**	**1**	**66**	**0**	**209**	**1**	**0**	**102**	**117**	**1**	**199**	**74**	**0**	**770**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**4**	**0**	**6**	**0**	**0**	**13**	**0**
	HV%	-	-	-	-	**0%**	**0%**	-	**1%**	**0%**	-	**1%**	**3%**	**0%**	**3%**	**0%**	-	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	2	3	1	*6*	0	0	0	1	*1*	0	0	0	0	*0*
4:15 PM	0	1	1	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	**0**	**1**	**1**	**2**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**0**	**1**	**3**	**2**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:30 PM	0	0	2	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	5	11	9	*25*	0	0	0	1	*1*	0	0	0	0	*0*
Peak Hr	**0**	**2**	**5**	**6**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	0				SR-903				Bullfrog Rd				Bullfrog Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	1	0	1	0	0	1	2	0	0	1	0	6	0
4:15 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	3	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**4**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**2**	**0**	**0**	**6**	19
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	14
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**2**	**13**
5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	11
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	6
Count Total	0	0	0	0	0	2	0	3	0	0	4	7	0	7	2	0	25	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**4**	**0**	**6**	**0**	**0**	**13**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	0			SR-903			Bullfrog Rd			Bullfrog Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	1	0	0	1	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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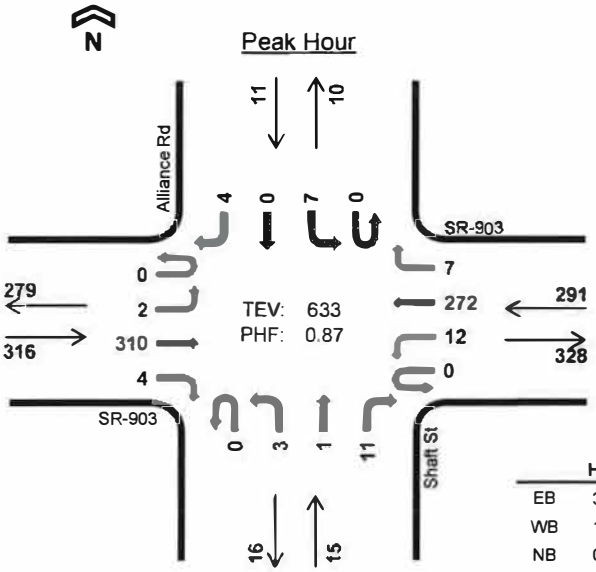
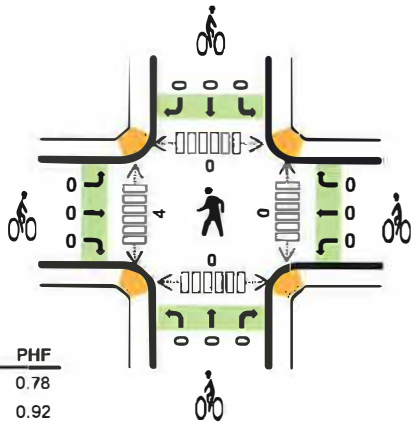
Alliance Rd
SR-903

Date: 06/18/2024
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM

Peak Hour





	HV %:	PHF
EB	3.2%	0.78
WB	1.0%	0.92
NB	0.0%	0.47
SB	9.1%	0.69
TOTAL	2.2%	0.87

Two-Hour Count Summaries

Interval Start		SR-903 Eastbound				SR-903 Westbound				Shaft St Northbound				Alliance Rd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	91	0	0	3	62	1	0	1	0	5	0	3	0	0	166	0
4:15 PM		**0**	**2**	**72**	**4**	**0**	**8**	**55**	**2**	**0**	**0**	**0**	**8**	**0**	**2**	**0**	**1**	**154**	0
4:30 PM		**0**	**0**	**74**	**0**	**0**	**2**	**75**	**2**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**155**	0
4:45 PM		**0**	**0**	**63**	**0**	**0**	**1**	**69**	**2**	**0**	**2**	**1**	**2**	**0**	**2**	**0**	**1**	**143**	618
5:00 PM		**0**	**0**	**101**	**0**	**0**	**1**	**73**	**1**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**2**	**181**	**633**
5:15 PM		0	0	76	0	0	0	55	3	0	0	0	3	0	0	0	0	137	616
5:30 PM		0	0	83	0	0	0	60	0	0	2	0	0	0	0	0	0	145	606
5:45 PM		0	0	63	0	0	2	53	0	0	1	0	1	0	1	0	0	121	584
Count Total		0	2	623	4	0	17	502	11	0	7	1	20	0	11	0	4	1,202	0
Peak Hour	**All**	**0**	**2**	**310**	**4**	**0**	**12**	**272**	**7**	**0**	**3**	**1**	**11**	**0**	**7**	**0**	**4**	**633**	**0**
	HV	**0**	**0**	**10**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**14**	**0**
	HV%	-	**0%**	**3%**	**0%**	-	**0%**	**1%**	**0%**	-	**0%**	**0%**	**0%**	-	**0%**	-	**25%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	2	1	0	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	**2**	**1**	**0**	**1**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**2**	**1**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**0**	*4*
4:45 PM	**4**	**1**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	14	6	0	1	*21*	0	0	0	0	*0*	0	4	0	0	*4*
Peak Hour	**10**	**3**	**0**	**1**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**0**	***4***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	SR-903 Eastbound				SR-903 Westbound				Shaft St Northbound				Alliance Rd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0
4:15 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	0
4:30 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	0
4:45 PM	**0**	**0**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**15**
5:00 PM	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**14**
5:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	12
5:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	11
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Count Total	0	0	14	0	0	0	6	0	0	0	0	0	0	0	0	1	21	0
Peak Hour	**0**	**0**	**10**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**14**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	SR-903 Eastbound			SR-903 Westbound			Shaft St Northbound			Alliance Rd Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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Pipeline Distribution

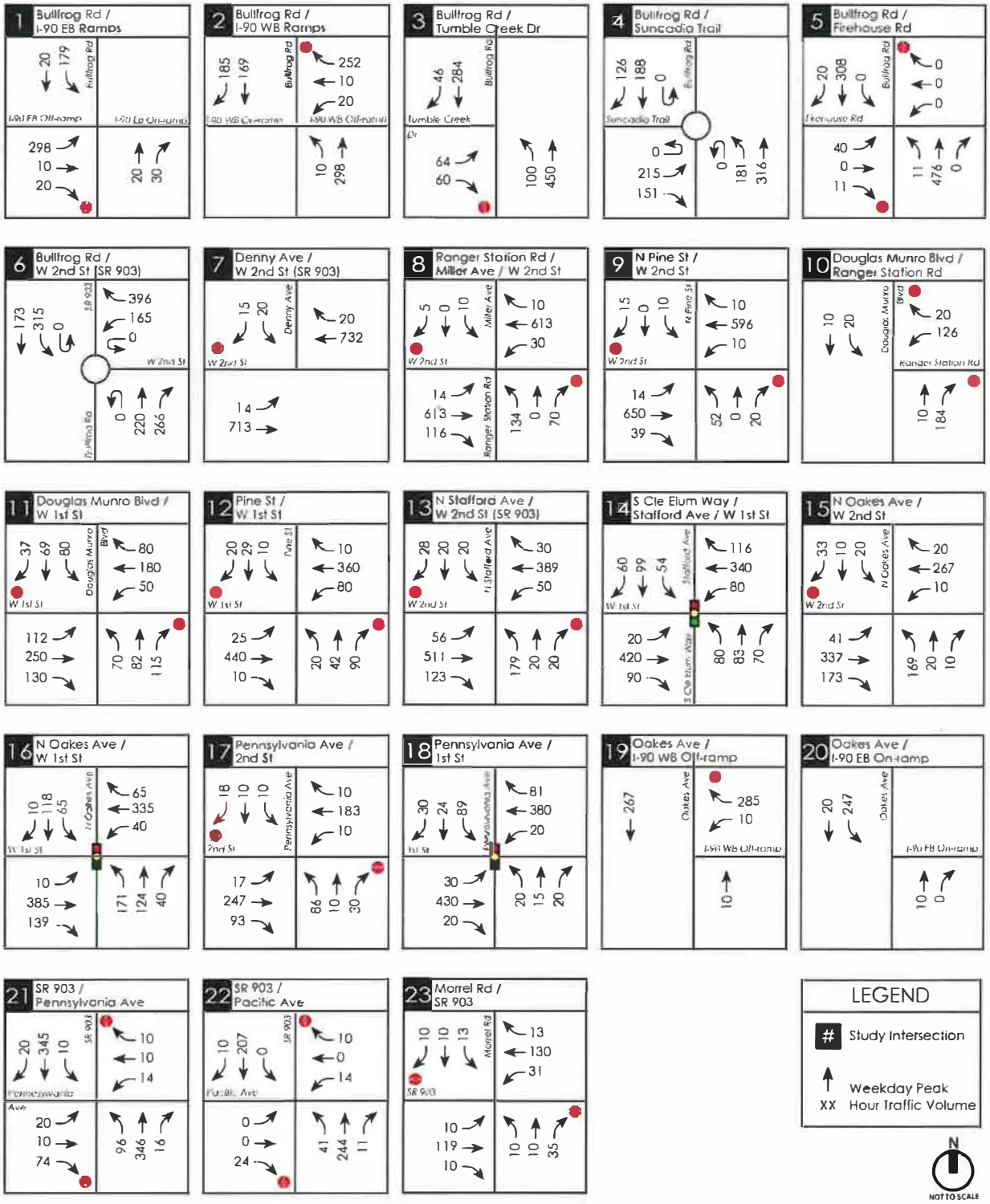


Figure 19: 2025 Weekday PM Peak Traffic Volumes with Revised Proposal (Page 1)

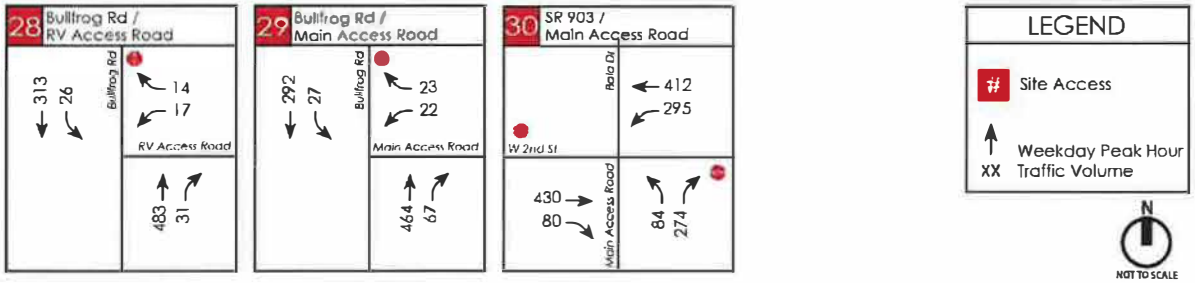


Figure 19: 2025 Weekday PM Peak Traffic Volumes with Revised Proposal (Page 2)

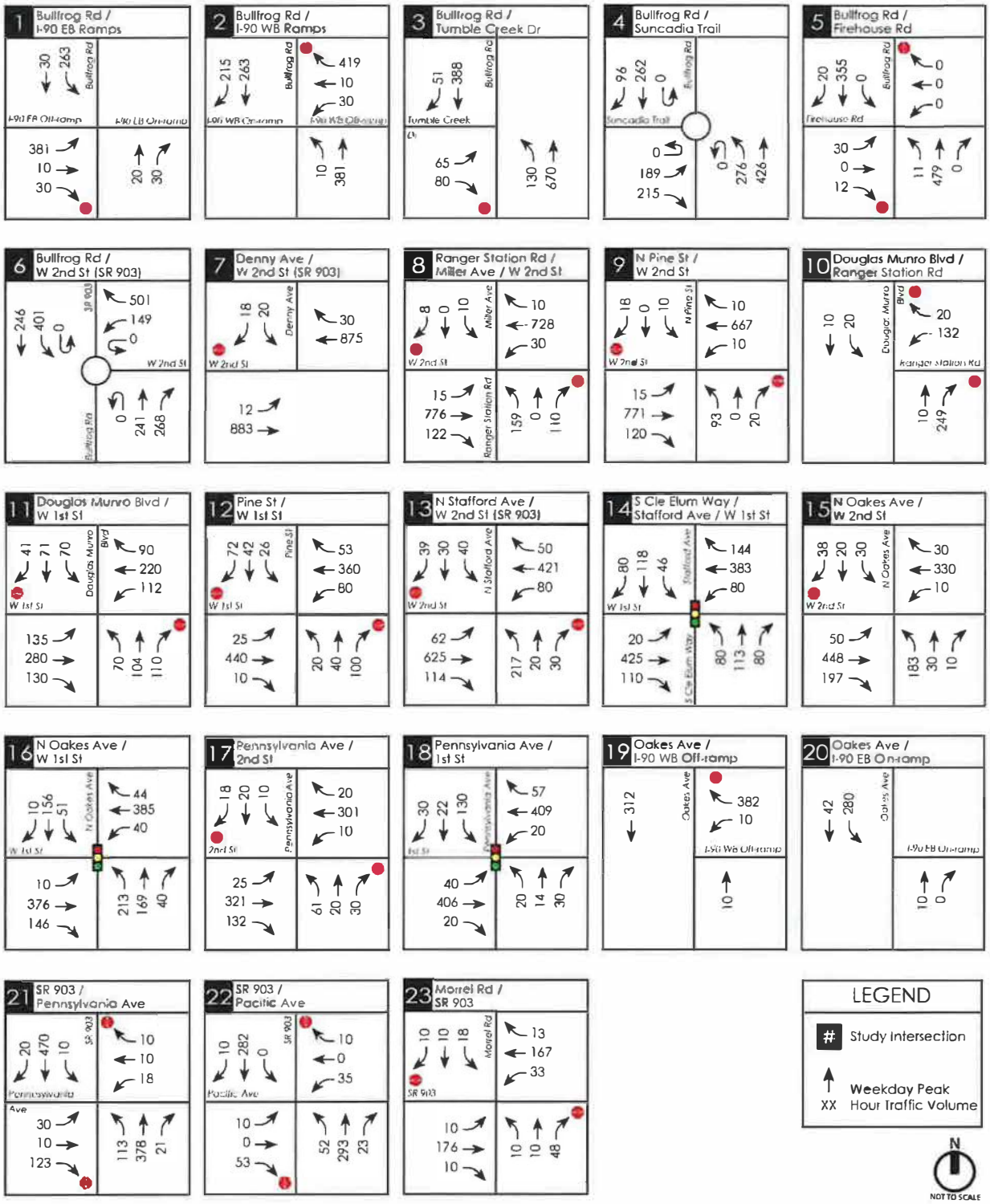


Figure 22: 2031 Weekday PM Peak Traffic Volumes with Revised Proposal (Page 1)

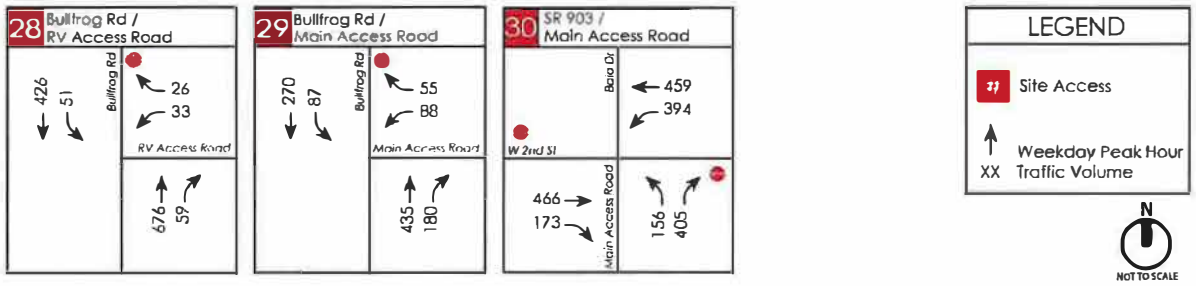


Figure 22: 2031 Weekday PM Peak Traffic Volumes with Revised Proposal (Page 2)

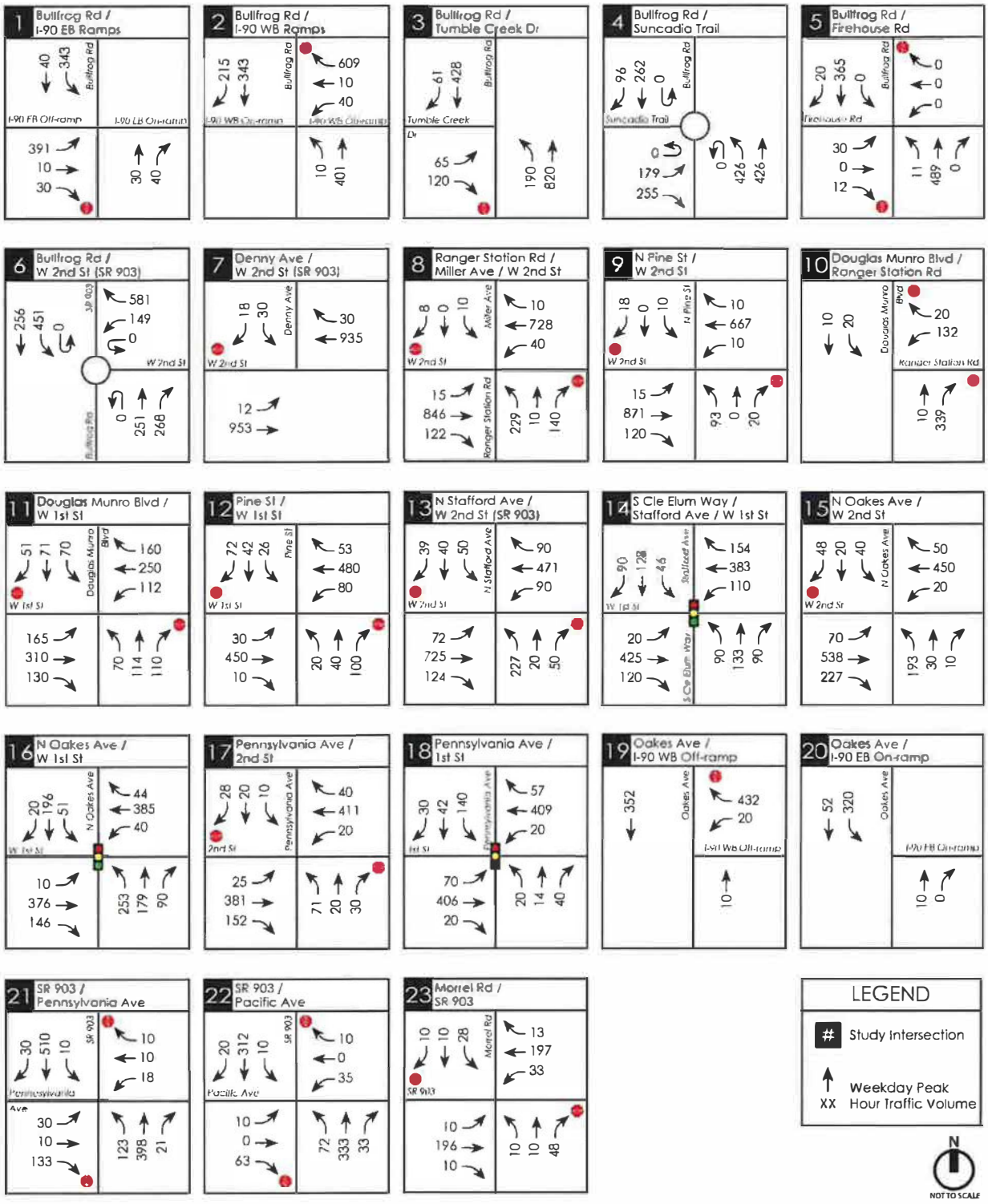


Figure 25: 2037 Weekday PM Peak Traffic Volumes with Revised Proposal (Page 1)

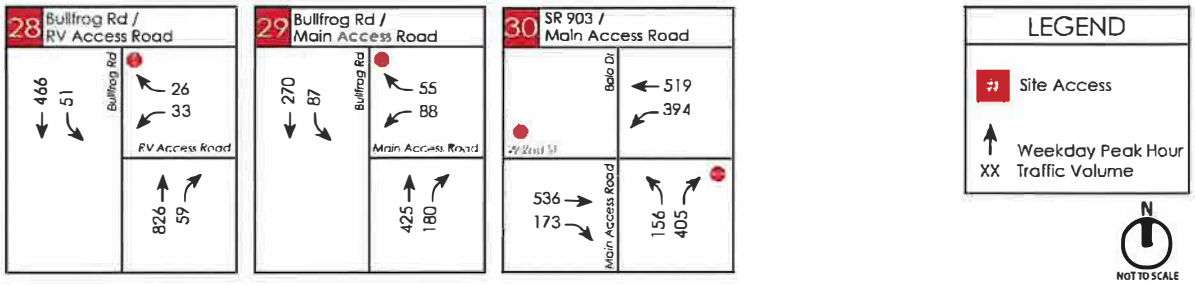


Figure 25: 2037 Weekday PM Peak Traffic Volumes with Revised Proposal (Page 2)

Project Description

Kittitas County proposes to construct a Community Recreation Center in the City of Cle Elum. The facility will include several amenities including but not limited to a gymnasium, adatatorium, locker rooms with showers/restrooms, studio fitness rooms, lounge areas, a child watch area, a health clinic, a fitness center, an indoor track, and a rooftop outdoor fitness area. There will also be outdoor facilities that will be designated as public open space, which include a splash pad and green space. As of now, the plans call for 226 parking stalls, with 66 additional stalls for potential future expansion. Currently, the site is heavily forested with mostly coniferous trees. Trees will be selectively removed for only the necessary building and parking improvements.

Access to the project will be provided by one full access driveway along Bullfrog Road. It is expected that the site will be developed in a single phase to be opened in 2026. A preliminary site plan for the project is attached.

Project Traffic Characteristics

The two project-related characteristics having the most effect on area traffic conditions are peak hour trip generation and the directional distribution of traffic volumes on the surrounding roadway network. These are discussed in this section.

Project Trip Generation

Vehicle trip generation was estimated using the trip generation rates contained in the 11th edition of the Trip Generation Manual by the *Institute of Transportation Engineers (ITE)*. The land-use categories Recreational Community Center (land use code 495) and Medical-Dental Office Building (land use code 720) were used. For this analysis, the "fitted-curve" equation was used when available to estimate trips in preference to using the average trip rate as this approach was recommended by ITE. The AM peak hour, PM peak hour, and Daily trip generation rates are attached.

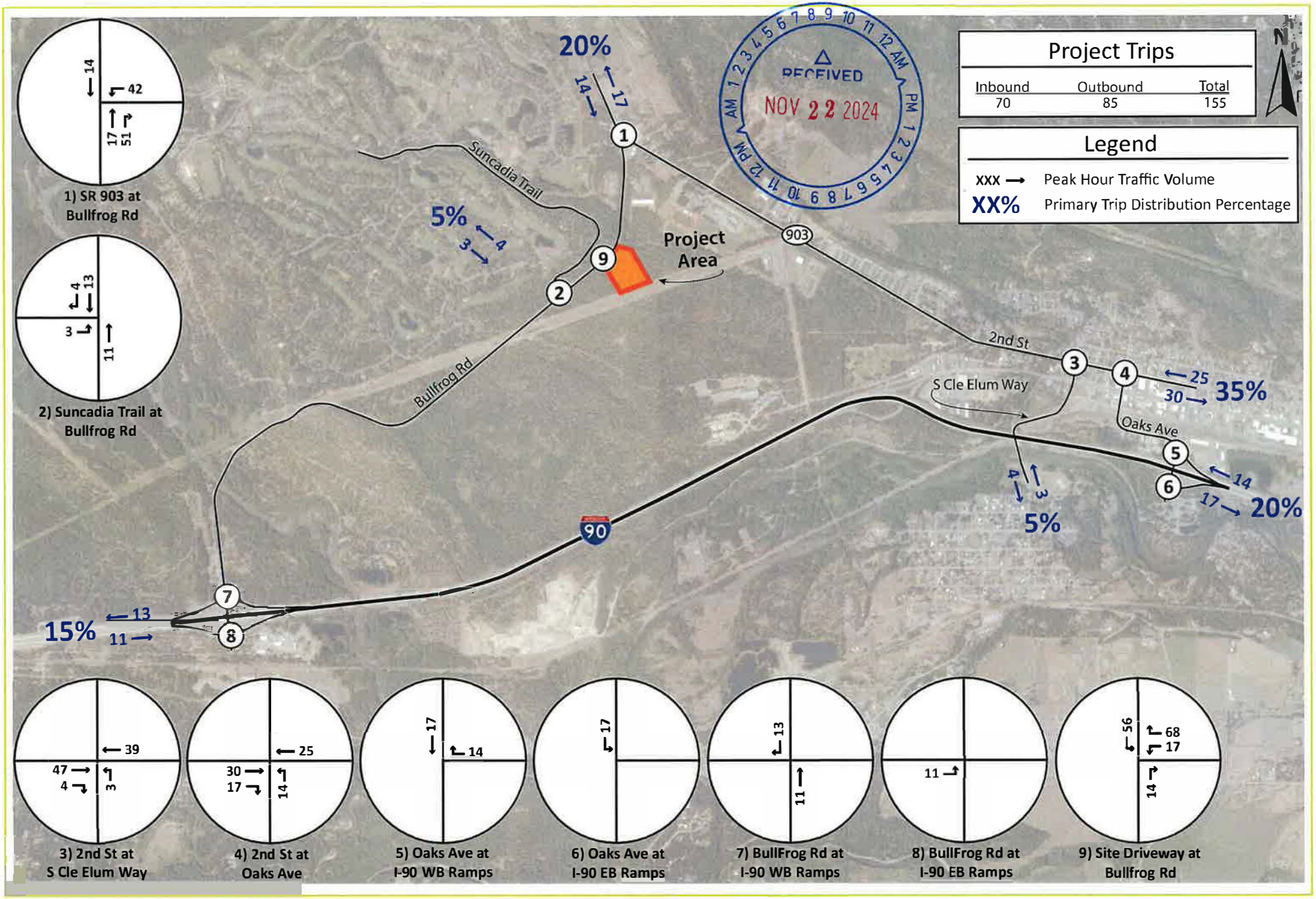
The total trip generation expected from this project is calculated by applying the unit measure to the appropriate trip generation rate. The trip generation for the proposed project is shown in **Table 1** below.

Table 1. Project Trip Generation

Peak Period	Total Trips	Enter	Exit
AM peak hour of Adjacent Street	155	70	85
PM peak hour of Adjacent Street	121	82	39
Daily	1,765	882	883

Site Traffic Distribution and Assignment

We have prepared a trip distribution and assignment for the proposed development. The directional distribution of traffic to and from the proposed project was based on the distribution percentages used for the 47 Degrees North development. The resultant traffic distribution percentages and traffic assignments are shown on **Figure 2** for the PM peak hour.



SCJ ALLIANCE
CONSULTING SERVICES

Upper Kittitas County Recreation Center
Cle Elum, Washington
Trip Generation and Distribution Letter

Figure 2
PM Peak Hour Site Generated Traffic Volumes

2024 Existing Peak Hour Intersection Level of Service

MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2024 AM Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Anival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	100	12.0	100	12.0	0.206	6.2	LOS A	0.8	21.8	0.23	0.51	0.23	39.8
14	R2	All MCs	150	12.0	150	12.0	0.206	6.0	LOS A	0.8	21.8	0.23	0.51	0.23	30.5
Approach			250	12.0	250	12.0	0.206	6.1	LOS A	0.8	21.8	0.23	0.51	0.23	33.7
North: Suncadia Trail Rd															
5	L2	All MCs	83	4.0	83	4.0	0.126	5.8	LOS A	0.5	12.9	0.22	0.42	0.22	29.0
12	R2	All MCs	61	4.0	61	4.0	0.126	1.5	LOS A	0.5	12.9	0.22	0.42	0.22	29.4
Approach			144	4.0	144	4.0	0.126	4.0	LOS A	0.5	12.9	0.22	0.42	0.22	29.1
West: Bullfrog Rd															
3	L2	All MCs	117	8.0	117	8.0	0.169	12.0	LOS B	0.7	18.4	0.19	0.59	0.19	29.4
8	T1	All MCs	100	8.0	100	8.0	0.169	6.0	LOS A	0.7	18.4	0.19	0.59	0.19	38.6
Approach			217	8.0	217	8.0	0.169	9.3	LOS A	0.7	18.4	0.19	0.59	0.19	33.0
All Vehicles			**611**	**8.7**	**611**	**8.7**	**0.206**	**6.7**	**LOS A**	**0.8**	**21.8**	**0.21**	**0.52**	**0.21**	**32.3**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Organisation: TRANSPORTATION SOLUTIONS, INC. | Licence: NETWORK / 1PC | Processed: Thursday, July 11, 2024 4:31:19 PM
Project: C:\Users\Daniel Hodun\TSI Dropbox\Daniel Hodun\TSI Projects\2024\224021 4240 Bullfrog Road TIA\Level of Service \Roundabouts.sip9

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	0	15	0	0	5	10	160	0	0	210	35
Future Vol, veh/h	10	0	15	0	0	5	10	160	0	0	210	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	22	22	22	0	0	0	6	6	6	11	11	11
Mvmt Flow	11	0	17	0	0	6	11	184	0	0	241	40

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	470	467	261	476	487	184	281	0	0	184	0	0
Stage 1	261	261	-	206	206	-	-	-	-	-	-	-
Stage 2	209	206	-	270	281	-	-	-	-	-	-	-
Critical Hdwy	7.32	6.72	6.42	7.1	6.5	6.2	4.16	-	-	4.21	-	-
Critical Hdwy Stg 1	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.698	4.198	3.498	3.5	4	3.3	2.254	-	-	2.299	-	-
Pot Cap-1 Maneuver	472	465	732	503	484	864	1259	-	-	1338	-	-
Stage 1	702	657	-	801	735	-	-	-	-	-	-	-
Stage 2	750	695	-	740	682	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	465	460	732	487	479	864	1259	-	-	1338	-	-
Mov Cap-2 Maneuver	465	460	-	487	479	-	-	-	-	-	-	-
Stage 1	695	657	-	793	728	-	-	-	-	-	-	-
Stage 2	738	688	-	723	682	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	9.2	0.5	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1259	-	-	595	864	1338	-	-
HCM Lane V/C Ratio	0.009	-	-	0.048	0.007	-	-	-
HCM Control Delay (s)	7.9	0	-	11.4	9.2	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	170	5	5	245
Future Vol, veh/h	0	5	170	5	5	245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	7	7	10	10
Mvmt Flow	0	6	213	6	6	306

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	534	216	0	0	219	0
Stage 1	216	-	-	-	-	-
Stage 2	318	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.2	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.29	-
Pot Cap-1 Maneuver	510	829	-	-	1304	-
Stage 1	825	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	507	829	-	-	1304	-
Mov Cap-2 Maneuver	507	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	738	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	829	1304	-
HCM Lane V/C Ratio	-	-	-	0.008	0.005	-
HCM Control Delay (s)	-	-	0	9.4	7.8	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2024 AM Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	79	8.0	79	8.0	0.177	6.9	LOS A	0.9	24.1	0.42	0.55	0.42	38.4
18	R2	All MCs	116	8.0	116	8.0	0.177	6.6	LOS A	0.9	24.1	0.42	0.55	0.42	35.6
Approach			195	8.0	195	8.0	0.177	6.7	LOS A	0.9	24.1	0.42	0.55	0.42	36.7
East: SR 903															
1	L2	All MCs	183	10.0	183	10.0	0.307	9.1	LOS A	1.9	51.6	0.29	0.51	0.29	33.0
16	R2	All MCs	195	10.0	195	10.0	0.307	3.6	LOS A	1.9	51.6	0.29	0.51	0.29	32.6
Approach			378	10.0	378	10.0	0.307	6.3	LOS A	1.9	51.6	0.29	0.51	0.29	32.8
North: SR 903															
7	L2	All MCs	250	2.0	250	2.0	0.306	11.9	LOS B	1.9	48.9	0.44	0.61	0.44	32.6
4	T1	All MCs	122	2.0	122	2.0	0.306	5.9	LOS A	1.9	48.9	0.44	0.61	0.44	37.1
Approach			372	2.0	372	2.0	0.306	10.0	LOS A	1.9	48.9	0.44	0.61	0.44	34.0
All Vehicles			**945**	**6.4**	**945**	**6.4**	**0.307**	**7.8**	**LOS A**	**1.9**	**51.6**	**0.38**	**0.55**	**0.38**	**34.0**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2024 PM Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	74	4.0	74	4.0	0.138	5.9	LOS A	0.5	13.4	0.18	0.50	0.18	41.3
14	R2	All MCs	111	4.0	111	4.0	0.138	5.6	LOS A	0.5	13.4	0.18	0.50	0.18	30.6
Approach			185	4.0	185	4.0	0.138	5.7	LOS A	0.5	13.4	0.18	0.50	0.18	34.2
North: Suncadia Trail Rd															
5	L2	All MCs	179	3.0	179	3.0	0.271	5.7	LOS A	1.2	31.1	0.21	0.41	0.21	29.2
12	R2	All MCs	142	3.0	142	3.0	0.271	1.5	LOS A	1.2	31.1	0.21	0.41	0.21	29.5
Approach			321	3.0	321	3.0	0.271	3.8	LOS A	1.2	31.1	0.21	0.41	0.21	29.3
West: Bullfrog Rd															
3	L2	All MCs	86	3.0	86	3.0	0.193	12.3	LOS B	0.8	21.2	0.29	0.57	0.29	29.6
8	T1	All MCs	160	3.0	160	3.0	0.193	6.3	LOS A	0.8	21.2	0.29	0.57	0.29	39.6
Approach			247	3.0	247	3.0	0.193	8.4	LOS A	0.8	21.2	0.29	0.57	0.29	35.4
All Vehicles			**753**	**3.2**	**753**	**3.2**	**0.271**	**5.8**	**LOS A**	**1.2**	**31.1**	**0.23**	**0.48**	**0.23**	**32.3**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	0	5	0	0	0	5	275	0	0	165	5
Future Vol, veh/h	25	0	5	0	0	0	5	275	0	0	165	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	0	0	0
Mvmt Flow	29	0	6	0	0	0	6	320	0	0	192	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	527	527	195	530	530	320	198	0	0	320	0	0
Stage 1	195	195	-	332	332	-	-	-	-	-	-	-
Stage 2	332	332	-	198	198	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.13	-	-	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	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	465	459	851	463	457	725	1369	-	-	1251	-	-
Stage 1	811	743	-	686	648	-	-	-	-	-	-	-
Stage 2	686	648	-	808	741	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	463	457	851	458	455	725	1369	-	-	1251	-	-
Mov Cap-2 Maneuver	463	457	-	458	455	-	-	-	-	-	-	-
Stage 1	807	743	-	683	645	-	-	-	-	-	-	-
Stage 2	683	645	-	802	741	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	0	0.1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1369	-	-	501	-	1251	-	-
HCM Lane V/C Ratio	0.004	-	-	0.07	-	-	-	-
HCM Control Delay (s)	7.6	0	-	12.7	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	300	5	5	165
Future Vol, veh/h	0	5	300	5	5	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	3	3	0	0
Mvmt Flow	0	6	353	6	6	194

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	562	356	0	0	359	0
Stage 1	356	-	-	-	-	-
Stage 2	206	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	492	693	-	-	1211	-
Stage 1	713	-	-	-	-	-
Stage 2	833	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	489	693	-	-	1211	-
Mov Cap-2 Maneuver	489	-	-	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	828	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	693	1211	-
HCM Lane V/C Ratio	-	-	-	0.008	0.005	-
HCM Control Delay (s)	-	-	0	10.2	8	0
HCM Lane LOS	-	-	A	B	A	A
HCM 95th %tile Q(veh)	-	-	-	0	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2024 PM Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	171	2.0	171	2.0	0.322	7.2	LOS A	1.9	48.0	0.52	0.58	0.52	39.0
18	R2	All MCs	195	2.0	195	2.0	0.322	7.0	LOS A	1.9	48.0	0.52	0.58	0.52	35.3
Approach			366	2.0	366	2.0	0.322	7.1	LOS A	1.9	48.0	0.52	0.58	0.52	37.0
East: SR 903															
1	L2	All MCs	110	1.0	110	1.0	0.358	9.5	LOS A	2.4	60.3	0.43	0.51	0.43	34.6
16	R2	All MCs	341	1.0	341	1.0	0.358	3.9	LOS A	2.4	60.3	0.43	0.51	0.43	34.1
Approach			451	1.0	451	1.0	0.358	5.3	LOS A	2.4	60.3	0.43	0.51	0.43	34.2
North: SR 903															
7	L2	All MCs	329	2.0	329	2.0	0.346	11.5	LOS B	2.4	61.0	0.36	0.59	0.36	32.6
4	T1	All MCs	122	2.0	122	2.0	0.346	5.4	LOS A	2.4	61.0	0.36	0.59	0.36	37.1
Approach			451	2.0	451	2.0	0.346	9.8	LOS A	2.4	61.0	0.36	0.59	0.36	33.7
All Vehicles			**1268**	**1.6**	**1268**	**1.6**	**0.358**	**7.4**	LOS A	**2.4**	**61.0**	**0.43**	**0.56**	**0.43**	**34.8**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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2025 Peak Hour Intersection Level of Service without and with the Project

MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2025 AM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	188	12.0	188	12.0	0.272	6.5	LOS A	1.2	33.6	0.33	0.52	0.33	39.4
14	R2	All MCs	126	12.0	126	12.0	0.272	6.3	LOS A	1.2	33.6	0.33	0.52	0.33	30.3
Approach			313	12.0	313	12.0	0.272	6.4	LOS A	1.2	33.6	0.33	0.52	0.33	35.1
North: Suncadia Trail Rd															
5	L2	All MCs	216	4.0	216	4.0	0.346	6.4	LOS A	1.8	45.2	0.39	0.49	0.39	28.7
12	R2	All MCs	151	4.0	151	4.0	0.346	2.2	LOS A	1.8	45.2	0.39	0.49	0.39	29.1
Approach			367	4.0	367	4.0	0.346	4.7	LOS A	1.8	45.2	0.39	0.49	0.39	28.9
West: Bullfrog Rd															
3	L2	All MCs	181	8.0	181	8.0	0.425	12.9	LOS B	2.4	64.4	0.43	0.59	0.43	29.3
8	T1	All MCs	316	8.0	316	8.0	0.425	6.8	LOS A	2.4	64.4	0.43	0.59	0.43	38.4
Approach			497	8.0	497	8.0	0.425	9.0	LOS A	2.4	64.4	0.43	0.59	0.43	34.5
All Vehicles			**1177**	**7.8**	**1177**	**7.8**	**0.425**	**7.0**	**LOS A**	**2.4**	**64.4**	**0.39**	**0.54**	0.39	32.7

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	36	0	10	0	0	5	10	428	0	0	277	18
Future Vol, veh/h	36	0	10	0	0	5	10	428	0	0	277	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	22	22	22	0	0	0	6	6	6	11	11	11
Mvmt Flow	41	0	11	0	0	6	11	492	0	0	318	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	846	843	329	848	853	492	339	0	0	492	0	0
Stage 1	329	329	-	514	514	-	-	-	-	-	-	-
Stage 2	517	514	-	334	339	-	-	-	-	-	-	-
Critical Hdwy	7.32	6.72	6.42	7.1	6.5	6.2	4.16	-	-	4.21	-	-
Critical Hdwy Stg 1	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.698	4.198	3.498	3.5	4	3.3	2.254	-	-	2.299	-	-
Pot Cap-1 Maneuver	261	279	669	284	299	581	1198	-	-	1026	-	-
Stage 1	644	612	-	547	539	-	-	-	-	-	-	-
Stage 2	506	504	-	684	643	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	256	275	669	276	295	581	1198	-	-	1026	-	-
Mov Cap-2 Maneuver	256	275	-	276	295	-	-	-	-	-	-	-
Stage 1	636	612	-	540	532	-	-	-	-	-	-	-
Stage 2	494	497	-	672	643	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.8	11.3	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1198	-	-	296	581	1026	-	-
HCM Lane V/C Ratio	0.01	-	-	0.179	0.01	-	-	-
HCM Control Delay (s)	8	0	-	19.8	11.3	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	432	5	5	300
Future Vol, veh/h	0	5	432	5	5	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	7	7	10	10
Mvmt Flow	0	6	540	6	6	375

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	930	543	0	0	546	0
Stage 1	543	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.2	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.29	-
Pot Cap-1 Maneuver	299	544	-	-	984	-
Stage 1	586	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	297	544	-	-	984	-
Mov Cap-2 Maneuver	297	-	-	-	-	-
Stage 1	586	-	-	-	-	-
Stage 2	685	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	544	984	-
HCM Lane V/C Ratio	-	-	-	0.011	0.006	-
HCM Control Delay (s)	-	-	0	11.7	8.7	0
HCM Lane LOS	-	-	A	B	A	A
HCM 95th %tile Q(veh)	-	-	-	0	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2025 AM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	241	8.0	241	8.0	0.489	7.5	LOS A	3.4	90.0	0.57	0.58	0.57	37.9
18	R2	All MCs	291	8.0	291	8.0	0.489	7.2	LOS A	3.4	90.0	0.57	0.58	0.57	35.1
Approach			533	8.0	533	8.0	0.489	7.3	LOS A	3.4	90.0	0.57	0.58	0.57	36.3
East: SR 903															
1	L2	All MCs	182	10.0	182	10.0	0.483	10.6	LOS B	3.5	94.6	0.60	0.59	0.60	32.7
16	R2	All MCs	323	10.0	323	10.0	0.483	5.0	LOS A	3.5	94.6	0.60	0.59	0.60	32.3
Approach			505	10.0	505	10.0	0.483	7.0	LOS A	3.5	94.6	0.60	0.59	0.60	32.5
North: SR 903															
7	L2	All MCs	257	2.0	257	2.0	0.373	12.0	LOS B	2.7	68.1	0.50	0.59	0.50	32.7
4	T1	All MCs	190	2.0	190	2.0	0.373	6.0	LOS A	2.7	68.1	0.50	0.59	0.50	37.3
Approach			448	2.0	448	2.0	0.373	9.5	LOS A	2.7	68.1	0.50	0.59	0.50	34.5
All Vehicles			**1485**	**6.9**	**1485**	**6.9**	**0.489**	7.9	LOS A	**3.5**	**94.6**	0.56	**0.59**	0.56	**34.4**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2025 PM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	232	4.0	232	4.0	0.315	6.5	LOS A	1.6	40.6	0.37	0.53	0.37	40.5
14	R2	All MCs	156	4.0	156	4.0	0.315	6.2	LOS A	1.6	40.6	0.37	0.53	0.37	30.2
Approach			388	4.0	388	4.0	0.315	6.4	LOS A	1.6	40.6	0.37	0.53	0.37	35.6
North: Suncadia Trail Rd															
5	L2	All MCs	265	3.0	265	3.0	0.431	6.7	LOS A	2.4	62.0	0.46	0.52	0.46	28.7
12	R2	All MCs	186	3.0	186	3.0	0.431	2.5	LOS A	2.4	62.0	0.46	0.52	0.46	29.1
Approach			452	3.0	452	3.0	0.431	5.0	LOS A	2.4	62.0	0.46	0.52	0.46	28.9
West: Bullfrog Rd															
3	L2	All MCs	223	3.0	223	3.0	0.511	13.0	LOS B	3.3	85.1	0.52	0.62	0.52	29.1
8	T1	All MCs	390	3.0	390	3.0	0.511	7.0	LOS A	3.3	85.1	0.52	0.62	0.52	38.8
Approach			614	3.0	614	3.0	0.511	9.2	LOS A	3.3	85.1	0.52	0.62	0.52	34.6
All Vehicles			**1453**	**3.3**	**1453**	**3.3**	**0.511**	**7.1**	**LOS A**	**3.3**	**85.1**	**0.46**	**0.56**	**0.46**	**32.8**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	0	11	0	0	0	11	476	0	0	308	20
Future Vol, veh/h	40	0	11	0	0	0	11	476	0	0	308	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	0	0	0
Mvmt Flow	47	0	13	0	0	0	13	553	0	0	358	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	949	949	370	955	960	553	381	0	0	553	0	0
Stage 1	370	370	-	579	579	-	-	-	-	-	-	-
Stage 2	579	579	-	376	381	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.13	-	-	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	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	242	262	680	240	259	537	1172	-	-	1027	-	-
Stage 1	654	624	-	504	504	-	-	-	-	-	-	-
Stage 2	504	504	-	649	617	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	239	258	680	233	255	537	1172	-	-	1027	-	-
Mov Cap-2 Maneuver	239	258	-	233	255	-	-	-	-	-	-	-
Stage 1	644	624	-	496	496	-	-	-	-	-	-	-
Stage 2	496	496	-	637	617	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.4	0	0.2	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1172	-	-	278	-	1027	-	-
HCM Lane V/C Ratio	0.011	-	-	0.213	-	-	-	-
HCM Control Delay (s)	8.1	0	-	21.4	0	0	-	-
HCM Lane LOS	A	A	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	481	5	5	333
Future Vol, veh/h	0	5	481	5	5	333
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	3	3	0	0
Mvmt Flow	0	6	566	6	6	392

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	973	569	0	0	572	0
Stage 1	569	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	282	525	-	-	1011	-
Stage 1	570	-	-	-	-	-
Stage 2	679	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	280	525	-	-	1011	-
Mov Cap-2 Maneuver	280	-	-	-	-	-
Stage 1	570	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	525	1011	-
HCM Lane V/C Ratio	-	-	-	0.011	0.006	-
HCM Control Delay (s)	-	-	0	11.9	8.6	0
HCM Lane LOS	-	-	A	B	A	A
HCM 95th %tile Q(veh)	-	-	-	0	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2025 PM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	268	2.0	268	2.0	0.555	8.4	LOS A	4.5	114.9	0.71	0.66	0.74	38.3
18	R2	All MCs	324	2.0	324	2.0	0.555	8.2	LOS A	4.5	114.9	0.71	0.66	0.74	34.8
Approach			593	2.0	593	2.0	0.555	8.3	LOS A	4.5	114.9	0.71	0.66	0.74	36.3
East: SR 903															
1	L2	All MCs	201	1.0	201	1.0	0.593	10.6	LOS B	5.2	132.0	0.69	0.60	0.69	33.9
16	R2	All MCs	483	1.0	483	1.0	0.593	5.0	LOS A	5.2	132.0	0.69	0.60	0.69	33.4
Approach			684	1.0	684	1.0	0.593	6.7	LOS A	5.2	132.0	0.69	0.60	0.69	33.6
North: SR 903															
7	L2	All MCs	384	2.0	384	2.0	0.500	12.3	LOS B	4.2	106.0	0.58	0.60	0.58	32.4
4	T1	All MCs	211	2.0	211	2.0	0.500	6.2	LOS A	4.2	106.0	0.58	0.60	0.58	36.8
Approach			595	2.0	595	2.0	0.500	10.1	LOS B	4.2	106.0	0.58	0.60	0.58	33.8
All Vehicles			1872	1.6	1872	1.6	0.593	8.3	LOS A	5.2	132.0	0.66	0.62	0.67	34.5

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2025 AM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	193	12.0	193	12.0	0.278	6.5	LOS A	1.3	34.7	0.33	0.52	0.33	39.3
14	R2	All MCs	128	12.0	128	12.0	0.278	6.3	LOS A	1.3	34.7	0.33	0.52	0.33	30.3
Approach			321	12.0	321	12.0	0.278	6.4	LOS A	1.3	34.7	0.33	0.52	0.33	35.2
North: Suncadia Trail Rd															
5	L2	All MCs	217	4.0	217	4.0	0.348	6.5	LOS A	1.8	45.6	0.40	0.49	0.40	28.7
12	R2	All MCs	151	4.0	151	4.0	0.348	2.2	LOS A	1.8	45.6	0.40	0.49	0.40	29.1
Approach			368	4.0	368	4.0	0.348	4.7	LOS A	1.8	45.6	0.40	0.49	0.40	28.9
West: Bullfrog Rd															
3	L2	All MCs	181	8.0	181	8.0	0.427	12.9	LOS B	2.4	65.1	0.44	0.59	0.44	29.3
8	T1	All MCs	318	8.0	318	8.0	0.427	6.8	LOS A	2.4	65.1	0.44	0.59	0.44	38.4
Approach			499	8.0	499	8.0	0.427	9.0	LOS A	2.4	65.1	0.44	0.59	0.44	34.5
All Vehicles			1188	7.8	1188	7.8	0.427	7.0	LOS A	2.4	65.1	0.40	0.54	0.40	32.7

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	36	0	10	0	0	5	10	431	0	0	285	18
Future Vol, veh/h	36	0	10	0	0	5	10	431	0	0	285	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	22	22	22	0	0	0	6	6	6	11	11	11
Mvmt Flow	41	0	11	0	0	6	11	495	0	0	328	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	859	856	339	861	866	495	349	0	0	495	0	0
Stage 1	339	339	-	517	517	-	-	-	-	-	-	-
Stage 2	520	517	-	344	349	-	-	-	-	-	-	-
Critical Hdwy	7.32	6.72	6.42	7.1	6.5	6.2	4.16	-	-	4.21	-	-
Critical Hdwy Stg 1	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.698	4.198	3.498	3.5	4	3.3	2.254	-	-	2.299	-	-
Pot Cap-1 Maneuver	255	274	660	278	293	579	1188	-	-	1024	-	-
Stage 1	636	606	-	545	537	-	-	-	-	-	-	-
Stage 2	504	502	-	676	637	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	250	270	660	270	289	579	1188	-	-	1024	-	-
Mov Cap-2 Maneuver	250	270	-	270	289	-	-	-	-	-	-	-
Stage 1	628	606	-	538	530	-	-	-	-	-	-	-
Stage 2	493	495	-	664	637	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.2	11.3	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1188	-	-	289	579	1024	-	-
HCM Lane V/C Ratio	0.01	-	-	0.183	0.01	-	-	-
HCM Control Delay (s)	8.1	0	-	20.2	11.3	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	13	432	8	8	300
Future Vol, veh/h	8	13	432	8	8	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	7	7	10	10
Mvmt Flow	10	16	540	10	10	375

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	940	545	0	0	550	0
Stage 1	545	-	-	-	-	-
Stage 2	395	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.2	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.29	-
Pot Cap-1 Maneuver	295	542	-	-	981	-
Stage 1	585	-	-	-	-	-
Stage 2	685	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	291	542	-	-	981	-
Mov Cap-2 Maneuver	291	-	-	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	676	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	291	542	981	-
HCM Lane V/C Ratio	-	-	0.034	0.03	0.01	-
HCM Control Delay (s)	-	-	17.8	11.8	8.7	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2025 AM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	246	8.0	246	8.0	0.498	7.5	LOS A	3.5	92.7	0.57	0.58	0.57	37.9
18	R2	All MCs	296	8.0	296	8.0	0.498	7.2	LOS A	3.5	92.7	0.57	0.58	0.57	35.1
Approach			543	8.0	543	8.0	0.498	7.3	LOS A	3.5	92.7	0.57	0.58	0.57	36.3
East: SR 903															
1	L2	All MCs	183	10.0	183	10.0	0.486	10.6	LOS B	3.5	95.6	0.61	0.59	0.61	32.7
16	R2	All MCs	323	10.0	323	10.0	0.486	5.1	LOS A	3.5	95.6	0.61	0.59	0.61	32.3
Approach			506	10.0	506	10.0	0.486	7.1	LOS A	3.5	95.6	0.61	0.59	0.61	32.5
North: SR 903															
7	L2	All MCs	257	2.0	257	2.0	0.375	12.0	LOS B	2.7	68.6	0.50	0.59	0.50	32.7
4	T1	All MCs	191	2.0	191	2.0	0.375	6.0	LOS A	2.7	68.6	0.50	0.59	0.50	37.3
Approach			449	2.0	449	2.0	0.375	9.5	LOS A	2.7	68.6	0.50	0.59	0.50	34.5
All Vehicles			**1498**	**6.9**	**1498**	**6.9**	**0.498**	**7.9**	**LOS A**	**3.5**	**95.6**	**0.56**	**0.59**	**0.56**	**34.4**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: C:\Users\Daniel Hodun\TSI Dropbox\Daniel Hodun\TSI Projects\2024\224021 4240 Bullfrog Road TIA\Level of Service \Roundabouts.sip9

MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2025 PM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	237	4.0	237	4.0	0.321	6.5	LOS A	1.6	41.7	0.38	0.53	0.38	40.5
14	R2	All MCs	158	4.0	158	4.0	0.321	6.2	LOS A	1.6	41.7	0.38	0.53	0.38	30.2
Approach			395	4.0	395	4.0	0.321	6.4	LOS A	1.6	41.7	0.38	0.53	0.38	35.6
North: Suncadia Trail Rd															
5	L2	All MCs	268	3.0	268	3.0	0.435	6.8	LOS A	2.5	62.8	0.47	0.52	0.47	28.7
12	R2	All MCs	186	3.0	186	3.0	0.435	2.5	LOS A	2.5	62.8	0.47	0.52	0.47	29.0
Approach			454	3.0	454	3.0	0.435	5.0	LOS A	2.5	62.8	0.47	0.52	0.47	28.8
West: Bullfrog Rd															
3	L2	All MCs	223	3.0	223	3.0	0.518	13.1	LOS B	3.4	87.1	0.53	0.62	0.53	29.1
8	T1	All MCs	398	3.0	398	3.0	0.518	7.0	LOS A	3.4	87.1	0.53	0.62	0.53	38.8
Approach			621	3.0	621	3.0	0.518	9.2	LOS A	3.4	87.1	0.53	0.62	0.53	34.7
All Vehicles			**1470**	**3.3**	**1470**	**3.3**	**0.518**	**7.2**	**LOS A**	**3.4**	**87.1**	**0.47**	**0.57**	**0.47**	**32.8**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	0	11	0	0	0	11	484	0	0	313	20
Future Vol, veh/h	40	0	11	0	0	0	11	484	0	0	313	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	0	0	0
Mvmt Flow	47	0	13	0	0	0	13	563	0	0	364	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	965	965	376	971	976	563	387	0	0	563	0	0
Stage 1	376	376	-	589	589	-	-	-	-	-	-	-
Stage 2	589	589	-	382	387	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.13	-	-	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	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	236	257	675	234	253	530	1166	-	-	1019	-	-
Stage 1	649	620	-	498	499	-	-	-	-	-	-	-
Stage 2	498	499	-	645	613	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	233	253	675	227	249	530	1166	-	-	1019	-	-
Mov Cap-2 Maneuver	233	253	-	227	249	-	-	-	-	-	-	-
Stage 1	639	620	-	490	491	-	-	-	-	-	-	-
Stage 2	490	491	-	633	613	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22	0	0.2	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1166	-	-	271	-	1019	-	-
HCM Lane V/C Ratio	0.011	-	-	0.219	-	-	-	-
HCM Control Delay (s)	8.1	0	-	22	0	0	-	-
HCM Lane LOS	A	A	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	10	481	13	13	333
Future Vol, veh/h	5	10	481	13	13	333
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	3	3	0	0
Mvmt Flow	6	12	566	15	15	392

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	996	574	0	0	581	0
Stage 1	574	-	-	-	-	-
Stage 2	422	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	273	522	-	-	1003	-
Stage 1	567	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	268	522	-	-	1003	-
Mov Cap-2 Maneuver	268	-	-	-	-	-
Stage 1	567	-	-	-	-	-
Stage 2	653	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.3	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	268	522	1003	-
HCM Lane V/C Ratio	-	-	0.022	0.023	0.015	-
HCM Control Delay (s)	-	-	18.7	12.1	8.6	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2025 PM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	272	2.0	272	2.0	0.563	8.5	LOS A	4.7	118.5	0.71	0.67	0.76	38.3
18	R2	All MCs	328	2.0	328	2.0	0.563	8.2	LOS A	4.7	118.5	0.71	0.67	0.76	34.8
Approach			600	2.0	600	2.0	0.563	8.4	LOS A	4.7	118.5	0.71	0.67	0.76	36.3
East: SR 903															
1	L2	All MCs	206	1.0	206	1.0	0.600	10.7	LOS B	5.4	135.9	0.70	0.61	0.71	33.9
16	R2	All MCs	483	1.0	483	1.0	0.600	5.1	LOS A	5.4	135.9	0.70	0.61	0.71	33.4
Approach			689	1.0	689	1.0	0.600	6.8	LOS A	5.4	135.9	0.70	0.61	0.71	33.6
North: SR 903															
7	L2	All MCs	384	2.0	384	2.0	0.506	12.3	LOS B	4.3	108.1	0.59	0.61	0.59	32.4
4	T1	All MCs	216	2.0	216	2.0	0.506	6.3	LOS A	4.3	108.1	0.59	0.61	0.59	36.8
Approach			600	2.0	600	2.0	0.506	10.1	LOS B	4.3	108.1	0.59	0.61	0.59	33.8
All Vehicles			**1889**	**1.6**	**1889**	**1.6**	**0.600**	**8.4**	LOS A	**5.4**	**135.9**	**0.67**	**0.63**	**0.69**	**34.5**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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2031 Peak Hour Intersection Level of Service without and with the Project

MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2031 AM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	249	12.0	249	12.0	0.307	6.9	LOS A	1.5	40.1	0.40	0.55	0.40	39.0
14	R2	All MCs	90	12.0	90	12.0	0.307	6.6	LOS A	1.5	40.1	0.40	0.55	0.40	30.1
Approach			339	12.0	339	12.0	0.307	6.8	LOS A	1.5	40.1	0.40	0.55	0.40	36.2
North: Suncadia Trail Rd															
5	L2	All MCs	173	4.0	173	4.0	0.364	6.8	LOS A	1.9	49.3	0.46	0.51	0.46	28.8
12	R2	All MCs	194	4.0	194	4.0	0.364	2.6	LOS A	1.9	49.3	0.46	0.51	0.46	29.2
Approach			367	4.0	367	4.0	0.364	4.6	LOS A	1.9	49.3	0.46	0.51	0.46	29.0
West: Bullfrog Rd															
3	L2	All MCs	248	8.0	248	8.0	0.535	12.8	LOS B	3.6	95.8	0.46	0.59	0.46	29.2
8	T1	All MCs	394	8.0	394	8.0	0.535	6.8	LOS A	3.6	95.8	0.46	0.59	0.46	38.2
Approach			642	8.0	642	8.0	0.535	9.1	LOS A	3.6	95.8	0.46	0.59	0.46	34.2
All Vehicles			**1348**	**7.9**	**1348**	**7.9**	**0.535**	**7.3**	**LOS A**	**3.6**	**95.8**	**0.45**	**0.55**	**0.45**	**33.0**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	0	11	0	0	5	10	431	0	0	320	18
Future Vol, veh/h	27	0	11	0	0	5	10	431	0	0	320	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	22	22	22	0	0	0	6	6	6	11	11	11
Mvmt Flow	27	0	11	0	0	5	10	431	0	0	320	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	783	780	329	786	789	431	338	0	0	431	0	0
Stage 1	329	329	-	451	451	-	-	-	-	-	-	-
Stage 2	454	451	-	335	338	-	-	-	-	-	-	-
Critical Hdwy	7.32	6.72	6.42	7.1	6.5	6.2	4.16	-	-	4.21	-	-
Critical Hdwy Stg 1	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.698	4.198	3.498	3.5	4	3.3	2.254	-	-	2.299	-	-
Pot Cap-1 Maneuver	288	304	669	312	325	629	1199	-	-	1082	-	-
Stage 1	644	612	-	592	574	-	-	-	-	-	-	-
Stage 2	549	539	-	683	644	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	283	301	669	304	321	629	1199	-	-	1082	-	-
Mov Cap-2 Maneuver	283	301	-	304	321	-	-	-	-	-	-	-
Stage 1	637	612	-	585	568	-	-	-	-	-	-	-
Stage 2	539	533	-	672	644	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.9	10.8	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1199	-	-	340	629	1082	-	-
HCM Lane V/C Ratio	0.008	-	-	0.112	0.008	-	-	-
HCM Control Delay (s)	8	0	-	16.9	10.8	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	521	5	5	406
Future Vol, veh/h	0	5	521	5	5	406
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	7	7	10	10
Mvmt Flow	0	5	521	5	5	406

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	940	524	0	0	526	0
Stage 1	524	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.2	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.29	-
Pot Cap-1 Maneuver	295	557	-	-	1001	-
Stage 1	598	-	-	-	-	-
Stage 2	670	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	293	557	-	-	1001	-
Mov Cap-2 Maneuver	293	-	-	-	-	-
Stage 1	598	-	-	-	-	-
Stage 2	666	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	557	1001	-
HCM Lane V/C Ratio	-	-	-	0.009	0.005	-
HCM Control Delay (s)	-	-	0	11.5	8.6	0
HCM Lane LOS	-	-	A	B	A	A
HCM 95th %tile Q(veh)	-	-	-	0	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2031 AM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	234	8.0	234	8.0	0.487	7.5	LOS A	3.4	89.6	0.58	0.59	0.58	37.9
18	R2	All MCs	292	8.0	292	8.0	0.487	7.2	LOS A	3.4	89.6	0.58	0.59	0.58	35.1
Approach			526	8.0	526	8.0	0.487	7.4	LOS A	3.4	89.6	0.58	0.59	0.58	36.3
East: SR 903															
1	L2	All MCs	176	10.0	176	10.0	0.486	10.5	LOS B	3.6	96.2	0.60	0.58	0.60	32.8
16	R2	All MCs	336	10.0	336	10.0	0.486	5.0	LOS A	3.6	96.2	0.60	0.58	0.60	32.4
Approach			512	10.0	512	10.0	0.486	6.9	LOS A	3.6	96.2	0.60	0.58	0.60	32.5
North: SR 903															
7	L2	All MCs	269	2.0	269	2.0	0.418	12.0	LOS B	3.2	80.0	0.51	0.59	0.51	32.8
4	T1	All MCs	235	2.0	235	2.0	0.418	6.0	LOS A	3.2	80.0	0.51	0.59	0.51	37.3
Approach			504	2.0	504	2.0	0.418	9.2	LOS A	3.2	80.0	0.51	0.59	0.51	34.7
All Vehicles			**1542**	**6.7**	**1542**	**6.7**	**0.487**	**7.8**	**LOS A**	**3.6**	**96.2**	**0.56**	**0.58**	**0.56**	**34.5**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2031 PM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	268	4.0	268	4.0	0.306	6.7	LOS A	1.5	39.2	0.41	0.55	0.41	40.2
14	R2	All MCs	98	4.0	98	4.0	0.306	6.4	LOS A	1.5	39.2	0.41	0.55	0.41	30.1
Approach			366	4.0	366	4.0	0.306	6.6	LOS A	1.5	39.2	0.41	0.55	0.41	36.9
North: Suncadia Trail Rd															
5	L2	All MCs	193	3.0	193	3.0	0.400	6.9	LOS A	2.2	56.0	0.48	0.51	0.48	28.9
12	R2	All MCs	215	3.0	215	3.0	0.400	2.6	LOS A	2.2	56.0	0.48	0.51	0.48	29.2
Approach			408	3.0	408	3.0	0.400	4.6	LOS A	2.2	56.0	0.48	0.51	0.48	29.1
West: Bullfrog Rd															
3	L2	All MCs	276	3.0	276	3.0	0.569	12.8	LOS B	4.1	104.1	0.49	0.60	0.49	29.2
8	T1	All MCs	438	3.0	438	3.0	0.569	6.8	LOS A	4.1	104.1	0.49	0.60	0.49	38.9
Approach			714	3.0	714	3.0	0.569	9.1	LOS A	4.1	104.1	0.49	0.60	0.49	34.4
All Vehicles			1488	3.2	1488	3.2	0.569	7.2	LOS A	4.1	104.1	0.47	0.56	0.47	33.3

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	0	12	0	0	0	11	479	0	0	355	20
Future Vol, veh/h	30	0	12	0	0	0	11	479	0	0	355	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	0	0	0
Mvmt Flow	30	0	12	0	0	0	11	479	0	0	355	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	866	866	365	872	876	479	375	0	0	479	0	0
Stage 1	365	365	-	501	501	-	-	-	-	-	-	-
Stage 2	501	501	-	371	375	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.13	-	-	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	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	276	293	685	273	290	591	1178	-	-	1094	-	-
Stage 1	658	627	-	556	546	-	-	-	-	-	-	-
Stage 2	556	546	-	653	621	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	273	289	685	266	286	591	1178	-	-	1094	-	-
Mov Cap-2 Maneuver	273	289	-	266	286	-	-	-	-	-	-	-
Stage 1	649	627	-	549	539	-	-	-	-	-	-	-
Stage 2	549	539	-	642	621	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	0	0.2	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1178	-	-	330	-	1094	-	-
HCM Lane V/C Ratio	0.009	-	-	0.127	-	-	-	-
HCM Control Delay (s)	8.1	0	-	17.5	0	0	-	-
HCM Lane LOS	A	A	-	C	A	A	-	-
HCM 95th %tileQ(veh)	0	-	-	0.4	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	535	5	5	455
Future Vol, veh/h	0	5	535	5	5	455
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	3	3	0	0
Mvmt Flow	0	5	535	5	5	455

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1003	538	0	0	540	0
Stage 1	538	-	-	-	-	-
Stage 2	465	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	271	547	-	-	1039	-
Stage 1	589	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	269	547	-	-	1039	-
Mov Cap-2 Maneuver	269	-	-	-	-	-
Stage 1	589	-	-	-	-	-
Stage 2	632	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	547	1039	-
HCM Lane V/C Ratio	-	-	-	0.009	0.005	-
HCM Control Delay (s)	-	-	0	11.6	8.5	0
HCM Lane LOS	-	-	A	B	A	A
HCM 95th %tile Q(veh)	-	-	-	0	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2031 PM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	249	2.0	249	2.0	0.514	8.2	LOS A	3.9	98.9	0.70	0.65	0.71	38.4
18	R2	All MCs	291	2.0	291	2.0	0.514	7.9	LOS A	3.9	98.9	0.70	0.65	0.71	34.8
Approach			540	2.0	540	2.0	0.514	8.0	LOS A	3.9	98.9	0.70	0.65	0.71	36.4
East: SR 903															
1	L2	All MCs	198	1.0	198	1.0	0.597	10.4	LOS B	5.3	132.5	0.67	0.59	0.67	34.0
16	R2	All MCs	501	1.0	501	1.0	0.597	4.9	LOS A	5.3	132.5	0.67	0.59	0.67	33.5
Approach			699	1.0	699	1.0	0.597	6.4	LOS A	5.3	132.5	0.67	0.59	0.67	33.6
North: SR 903															
7	L2	All MCs	401	2.0	401	2.0	0.555	12.4	LOS B	4.9	125.6	0.61	0.60	0.61	32.4
4	T1	All MCs	262	2.0	262	2.0	0.555	6.3	LOS A	4.9	125.6	0.61	0.60	0.61	36.9
Approach			663	2.0	663	2.0	0.555	10.0	LOS A	4.9	125.6	0.61	0.60	0.61	34.0
All Vehicles			1902	1.6	1902	1.6	0.597	8.1	LOS A	5.3	132.5	0.66	0.61	0.66	34.5

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2031 AM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	254	12.0	254	12.0	0.314	6.9	LOS A	1.5	41.2	0.41	0.55	0.41	39.0
14	R2	All MCs	92	12.0	92	12.0	0.314	6.6	LOS A	1.5	41.2	0.41	0.55	0.41	30.1
Approach			346	12.0	346	12.0	0.314	6.8	LOS A	1.5	41.2	0.41	0.55	0.41	36.2
North: Suncadia Trail Rd															
5	L2	All MCs	174	4.0	174	4.0	0.367	6.9	LOS A	1.9	49.8	0.47	0.51	0.47	28.8
12	R2	All MCs	194	4.0	194	4.0	0.367	2.6	LOS A	1.9	49.8	0.47	0.51	0.47	29.2
Approach			368	4.0	368	4.0	0.367	4.6	LOS A	1.9	49.8	0.47	0.51	0.47	29.0
West: Bullfrog Rd															
3	L2	All MCs	248	8.0	248	8.0	0.538	12.8	LOS B	3.6	96.6	0.46	0.59	0.46	29.2
8	T1	All MCs	396	8.0	396	8.0	0.538	6.8	LOS A	3.6	96.6	0.46	0.59	0.46	38.2
Approach			644	8.0	644	8.0	0.538	9.1	LOS A	3.6	96.6	0.46	0.59	0.46	34.2
All Vehicles			**1358**	**7.9**	**1358**	**7.9**	**0.538**	**7.3**	**LOS A**	**3.6**	**96.6**	**0.45**	**0.56**	**0.45**	**33.0**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	0	11	0	0	5	10	434	0	0	328	18
Future Vol, veh/h	27	0	11	0	0	5	10	434	0	0	328	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	22	22	22	0	0	0	6	6	6	11	11	11
Mvmt Flow	27	0	11	0	0	5	10	434	0	0	328	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	794	791	337	797	800	434	346	0	0	434	0	0
Stage 1	337	337	-	454	454	-	-	-	-	-	-	-
Stage 2	457	454	-	343	346	-	-	-	-	-	-	-
Critical Hdwy	7.32	6.72	6.42	7.1	6.5	6.2	4.16	-	-	4.21	-	-
Critical Hdwy Stg 1	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.698	4.198	3.498	3.5	4	3.3	2.254	-	-	2.299	-	-
Pot Cap-1 Maneuver	283	300	662	307	320	626	1191	-	-	1079	-	-
Stage 1	637	607	-	589	573	-	-	-	-	-	-	-
Stage 2	547	537	-	676	639	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	278	297	662	299	316	626	1191	-	-	1079	-	-
Mov Cap-2 Maneuver	278	297	-	299	316	-	-	-	-	-	-	-
Stage 1	630	607	-	583	567	-	-	-	-	-	-	-
Stage 2	537	531	-	665	639	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	10.8	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1191	-	-	334	626	1079	-	-
HCM Lane V/C Ratio	0.008	-	-	0.114	0.008	-	-	-
HCM Control Delay (s)	8	0	-	17.2	10.8	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	-	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	13	521	8	8	406
Future Vol, veh/h	8	13	521	8	8	406
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	7	7	10	10
Mvmt Flow	8	13	521	8	8	406

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	947	525	0	0	529	0
Stage 1	525	-	-	-	-	-
Stage 2	422	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.2	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.29	-
Pot Cap-1 Maneuver	292	556	-	-	999	-
Stage 1	598	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	289	556	-	-	999	-
Mov Cap-2 Maneuver	289	-	-	-	-	-
Stage 1	598	-	-	-	-	-
Stage 2	659	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	289	556	999	-
HCM Lane V/C Ratio	-	-	0.028	0.023	0.008	-
HCM Control Delay (s)	-	-	17.8	11.6	8.6	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2031 AM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	238	8.0	238	8.0	0.495	7.5	LOS A	3.5	91.8	0.58	0.59	0.58	37.8
18	R2	All MCs	296	8.0	296	8.0	0.495	7.3	LOS A	3.5	91.8	0.58	0.59	0.58	35.1
Approach			534	8.0	534	8.0	0.495	7.4	LOS A	3.5	91.8	0.58	0.59	0.58	36.3
East: SR 903															
1	L2	All MCs	177	10.0	177	10.0	0.489	10.6	LOS B	3.6	97.0	0.60	0.58	0.60	32.8
16	R2	All MCs	336	10.0	336	10.0	0.489	5.0	LOS A	3.6	97.0	0.60	0.58	0.60	32.4
Approach			513	10.0	513	10.0	0.489	6.9	LOS A	3.6	97.0	0.60	0.58	0.60	32.5
North: SR 903															
7	L2	All MCs	269	2.0	269	2.0	0.419	12.1	LOS B	3.2	80.4	0.52	0.59	0.52	32.8
4	T1	All MCs	236	2.0	236	2.0	0.419	6.0	LOS A	3.2	80.4	0.52	0.59	0.52	37.3
Approach			505	2.0	505	2.0	0.419	9.2	LOS A	3.2	80.4	0.52	0.59	0.52	34.8
All Vehicles			**1552**	**6.7**	**1552**	**6.7**	**0.495**	**7.8**	**LOS A**	**3.6**	**97.0**	**0.57**	**0.59**	**0.57**	**34.5**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2031 PM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	272	4.0	272	4.0	0.311	6.7	LOS A	1.6	40.1	0.41	0.55	0.41	40.2
14	R2	All MCs	100	4.0	100	4.0	0.311	6.4	LOS A	1.6	40.1	0.41	0.55	0.41	30.1
Approach			372	4.0	372	4.0	0.311	6.6	LOS A	1.6	40.1	0.41	0.55	0.41	36.9
North: Suncadia Trail Rd															
5	L2	All MCs	195	3.0	195	3.0	0.403	6.9	LOS A	2.2	56.7	0.49	0.52	0.49	28.9
12	R2	All MCs	215	3.0	215	3.0	0.403	2.7	LOS A	2.2	56.7	0.49	0.52	0.49	29.2
Approach			410	3.0	410	3.0	0.403	4.7	LOS A	2.2	56.7	0.49	0.52	0.49	29.1
West: Bullfrog Rd															
3	L2	All MCs	276	3.0	276	3.0	0.575	12.8	LOS B	4.1	106.0	0.50	0.60	0.50	29.2
8	T1	All MCs	444	3.0	444	3.0	0.575	6.8	LOS A	4.1	106.0	0.50	0.60	0.50	38.8
Approach			720	3.0	720	3.0	0.575	9.1	LOS A	4.1*	106.0	0.50	0.60	0.50	34.5
All Vehicles			**1502**	**3.2**	**1502**	**3.2**	**0.575**	**7.3**	**LOS A**	**4.1**	**106.0**	**0.47**	**0.56**	**0.47**	**33.3**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	0	12	0	0	0	11	487	0	0	360	20
Future Vol, veh/h	30	0	12	0	0	0	11	487	0	0	360	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	0	0	0
Mvmt Flow	30	0	12	0	0	0	11	487	0	0	360	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	879	879	370	885	889	487	380	0	0	487	0	0
Stage 1	370	370	-	509	509	-	-	-	-	-	-	-
Stage 2	509	509	-	376	380	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.13	-	-	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	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	270	288	680	268	285	585	1173	-	-	1086	-	-
Stage 1	654	624	-	550	541	-	-	-	-	-	-	-
Stage 2	550	541	-	649	617	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	267	284	680	261	281	585	1173	-	-	1086	-	-
Mov Cap-2 Maneuver	267	284	-	261	281	-	-	-	-	-	-	-
Stage 1	645	624	-	543	534	-	-	-	-	-	-	-
Stage 2	543	534	-	638	617	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.8	0	0.2	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1173	-	-	323	-	1086	-	-
HCM Lane V/C Ratio	0.009	-	-	0.13	-	-	-	-
HCM Control Delay (s)	8.1	0	-	17.8	0	0	-	-
HCM Lane LOS	A	A	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	10	535	13	13	455
Future Vol, veh/h	5	10	535	13	13	455
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	3	3	0	0
Mvmt Flow	5	10	535	13	13	455

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1023	542	0	0	548	0
Stage 1	542	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	263	544	-	-	1032	-
Stage 1	587	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	259	544	-	-	1032	-
Mov Cap-2 Maneuver	259	-	-	-	-	-
Stage 1	587	-	-	-	-	-
Stage 2	615	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	259	544	1032	-
HCM Lane V/C Ratio	-	-	0.019	0.018	0.013	-
HCM Control Delay (s)	-	-	19.2	11.7	8.5	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2031 PM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	252	2.0	252	2.0	0.523	8.3	LOS A	4.0	102.5	0.70	0.66	0.73	38.3
18	R2	All MCs	294	2.0	294	2.0	0.523	8.0	LOS A	4.0	102.5	0.70	0.66	0.73	34.8
Approach			546	2.0	546	2.0	0.523	8.1	LOS A	4.0	102.5	0.70	0.66	0.73	36.4
East: SR 903															
1	L2	All MCs	202	1.0	202	1.0	0.604	10.5	LOS B	5.4	135.7	0.68	0.59	0.68	34.0
16	R2	All MCs	501	1.0	501	1.0	0.604	4.9	LOS A	5.4	135.7	0.68	0.59	0.68	33.5
Approach			703	1.0	703	1.0	0.604	6.5	LOS A	5.4	135.7	0.68	0.59	0.68	33.6
North: SR 903															
7	L2	All MCs	401	2.0	401	2.0	0.562	12.4	LOS B	5.0	128.0	0.62	0.60	0.62	32.4
4	T1	All MCs	266	2.0	266	2.0	0.562	6.4	LOS A	5.0	128.0	0.62	0.60	0.62	36.8
Approach			667	2.0	667	2.0	0.562	10.0	LOS A	5.0	128.0	0.62	0.60	0.62	34.0
All Vehicles			**1916**	**1.6**	**1916**	**1.6**	**0.604**	**8.2**	LOS A	**5.4**	**135.7**	**0.67**	**0.62**	**0.68**	**34.5**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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2037 Peak Hour Intersection Level of Service without and with the Project

MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2037 AM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
3	L2	All MCs	383	8.0	383	8.0	0.680	14.1	LOS B	6.2	164.0	0.64	0.66	0.68	28.7
8	T1	All MCs	394	8.0	394	8.0	0.680	8.0	LOS A	6.2	164.0	0.64	0.66	0.68	37.3
Approach			777	8.0	777	8.0	0.680	11.0	LOS B	6.2	164.0	0.64	0.66	0.68	32.5
North: Bullfrog Rd															
4	T1	All MCs	249	12.0	249	12.0	0.347	7.6	LOS A	1.8	50.5	0.54	0.61	0.54	38.5
14	R2	All MCs	90	12.0	90	12.0	0.347	7.3	LOS A	1.8	50.5	0.54	0.61	0.54	29.8
Approach			339	12.0	339	12.0	0.347	7.5	LOS A	1.8	50.5	0.54	0.61	0.54	35.7
West: Suncadia Trail Rd															
5	L2	All MCs	233	4.0	233	4.0	0.397	6.9	LOS A	2.2	57.2	0.50	0.54	0.50	28.6
12	R2	All MCs	161	4.0	161	4.0	0.397	2.7	LOS A	2.2	57.2	0.50	0.54	0.50	28.9
Approach			394	4.0	394	4.0	0.397	5.2	LOS A	2.2	57.2	0.50	0.54	0.50	28.7
All Vehicles			1510	7.9	1510	7.9	0.680	8.7	LOS A	6.2	164.0	0.58	0.62	0.60	32.0

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	0	11	0	0	5	10	440	0	0	329	18
Future Vol, veh/h	27	0	11	0	0	5	10	440	0	0	329	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	22	22	22	0	0	0	6	6	6	11	11	11
Mvmt Flow	27	0	11	0	0	5	10	440	0	0	329	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	801	798	338	804	807	440	347	0	0	440	0	0
Stage 1	338	338	-	460	460	-	-	-	-	-	-	-
Stage 2	463	460	-	344	347	-	-	-	-	-	-	-
Critical Hdwy	7.32	6.72	6.42	7.1	6.5	6.2	4.16	-	-	4.21	-	-
Critical Hdwy Stg 1	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.698	4.198	3.498	3.5	4	3.3	2.254	-	-	2.299	-	-
Pot Cap-1 Maneuver	280	297	661	304	317	621	1190	-	-	1074	-	-
Stage 1	637	606	-	585	569	-	-	-	-	-	-	-
Stage 2	543	533	-	676	638	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	276	294	661	296	314	621	1190	-	-	1074	-	-
Mov Cap-2 Maneuver	276	294	-	296	314	-	-	-	-	-	-	-
Stage 1	630	606	-	579	563	-	-	-	-	-	-	-
Stage 2	533	527	-	665	638	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	10.8	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1190	-	-	332	621	1074	-	-
HCM Lane V/C Ratio	0.008	-	-	0.114	0.008	-	-	-
HCM Control Delay (s)	8.1	0	-	17.2	10.8	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	530	5	5	415
Future Vol, veh/h	0	5	530	5	5	415
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	7	7	10	10
Mvmt Flow	0	5	530	5	5	415

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	958	533	0	0	535	0
Stage 1	533	-	-	-	-	-
Stage 2	425	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.2	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.29	-
Pot Cap-1 Maneuver	288	551	-	-	994	-
Stage 1	593	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	286	551	-	-	994	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	593	-	-	-	-	-
Stage 2	659	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	551	994	-
HCM Lane V/C Ratio	-	-	-	0.009	0.005	-
HCM Control Delay (s)	-	-	0	11.6	8.6	0
HCM Lane LOS	-	-	A	B	A	A
HCM 95th %tile Q(veh)	-	-	-	0	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2037 AM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	243	8.0	243	8.0	0.510	7.8	LOS A	3.6	95.7	0.62	0.61	0.62	37.7
18	R2	All MCs	292	8.0	292	8.0	0.510	7.5	LOS A	3.6	95.7	0.62	0.61	0.62	35.0
Approach			535	8.0	535	8.0	0.510	7.6	LOS A	3.6	95.7	0.62	0.61	0.62	36.2
East: SR 903															
1	L2	All MCs	176	10.0	176	10.0	0.542	10.7	LOS B	4.2	114.5	0.65	0.59	0.65	32.8
16	R2	All MCs	389	10.0	389	10.0	0.542	5.2	LOS A	4.2	114.5	0.65	0.59	0.65	32.4
Approach			565	10.0	565	10.0	0.542	6.9	LOS A	4.2	114.5	0.65	0.59	0.65	32.5
North: SR 903															
7	L2	All MCs	302	2.0	302	2.0	0.454	12.1	LOS B	3.6	91.2	0.54	0.59	0.54	32.7
4	T1	All MCs	244	2.0	244	2.0	0.454	6.1	LOS A	3.6	91.2	0.54	0.59	0.54	37.2
Approach			546	2.0	546	2.0	0.454	9.4	LOS A	3.6	91.2	0.54	0.59	0.54	34.6
All Vehicles			1646	6.7	1646	6.7	0.542	8.0	LOS A	4.2	114.5	0.60	0.60	0.60	34.3

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2037 PM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	268	4.0	268	4.0	0.346	7.3	LOS A	2.0	50.9	0.57	0.61	0.57	39.6
14	R2	All MCs	98	4.0	98	4.0	0.346	7.1	LOS A	2.0	50.9	0.57	0.61	0.57	29.7
Approach			366	4.0	366	4.0	0.346	7.3	LOS A	2.0	50.9	0.57	0.61	0.57	36.4
North: Suncadia Trail Rd															
5	L2	All MCs	259	3.0	259	3.0	0.437	6.9	LOS A	2.6	65.5	0.52	0.54	0.52	28.6
12	R2	All MCs	179	3.0	179	3.0	0.437	2.7	LOS A	2.6	65.5	0.52	0.54	0.52	29.0
Approach			438	3.0	438	3.0	0.437	5.2	LOS A	2.6	65.5	0.52	0.54	0.52	28.8
West: Bullfrog Rd															
3	L2	All MCs	426	3.0	426	3.0	0.724	14.5	LOS B	7.5	192.5	0.70	0.69	0.76	28.5
8	T1	All MCs	438	3.0	438	3.0	0.724	8.4	LOS A	7.5	192.5	0.70	0.69	0.76	37.7
Approach			864	3.0	864	3.0	0.724	11.4	LOS B	7.5	192.5	0.70	0.69	0.76	32.6
All Vehicles			**1668**	**3.2**	**1668**	**3.2**	**0.724**	**8.9**	**LOS A**	**7.5**	**192.5**	**0.62**	**0.63**	**0.66**	**32.2**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	0	12	0	0	0	11	489	0	0	365	20
Future Vol, veh/h	30	0	12	0	0	0	11	489	0	0	365	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	3	0	0	0	0
Mvmt Flow	30	0	12	0	0	0	11	489	0	0	365	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	886	886	375	892	896	489	385	0	0	489	0	0
Stage 1	375	375	-	511	511	-	-	-	-	-	-	-
Stage 2	511	511	-	381	385	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	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	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	267	286	676	265	282	583	1185	-	-	1085	-	-
Stage 1	650	621	-	549	540	-	-	-	-	-	-	-
Stage 2	549	540	-	645	614	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	264	282	676	258	278	583	1185	-	-	1085	-	-
Mov Cap-2 Maneuver	264	282	-	258	278	-	-	-	-	-	-	-
Stage 1	642	621	-	542	533	-	-	-	-	-	-	-
Stage 2	542	533	-	634	614	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.9	0	0.2	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1185	-	-	320	-	1085	-	-
HCM Lane V/C Ratio	0.009	-	-	0.131	-	-	-	-
HCM Control Delay (s)	8.1	0	-	17.9	0	0	-	-
HCM Lane LOS	A	A	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	0	545	5	5	465
Future Vol, veh/h	5	0	545	5	5	465
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	50	0	0
Mvmt Flow	5	0	545	5	5	465

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1023	548	0	0	550	0
Stage 1	548	-	-	-	-	-
Stage 2	475	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	263	540	-	-	1030	-
Stage 1	583	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	261	540	-	-	1030	-
Mov Cap-2 Maneuver	261	-	-	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	626	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.1	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	261	-	1030	-
HCM Lane V/C Ratio	-	-	0.019	-	0.005	-
HCM Control Delay (s)	-	-	19.1	0	8.5	0
HCM Lane LOS	-	-	C	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	-	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2037 PM wo Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	259	2.0	259	2.0	0.551	9.1	LOS A	4.6	117.7	0.76	0.70	0.82	38.1
18	R2	All MCs	291	2.0	291	2.0	0.551	8.8	LOS A	4.6	117.7	0.76	0.70	0.82	34.6
Approach			550	2.0	550	2.0	0.551	8.9	LOS A	4.6	117.7	0.76	0.70	0.82	36.2
East: SR 903															
1	L2	All MCs	198	1.0	198	1.0	0.675	11.3	LOS B	7.3	184.2	0.76	0.64	0.80	33.9
16	R2	All MCs	581	1.0	581	1.0	0.675	5.8	LOS A	7.3	184.2	0.76	0.64	0.80	33.4
Approach			779	1.0	779	1.0	0.675	7.2	LOS A	7.3	184.2	0.76	0.64	0.80	33.5
North: SR 903															
7	L2	All MCs	451	2.0	451	2.0	0.609	12.5	LOS B	5.9	149.9	0.67	0.61	0.67	32.2
4	T1	All MCs	272	2.0	272	2.0	0.609	6.5	LOS A	5.9	149.9	0.67	0.61	0.67	36.7
Approach			723	2.0	723	2.0	0.609	10.2	LOS B	5.9	149.9	0.67	0.61	0.67	33.8
All Vehicles			**2052**	**1.6**	**2052**	**1.6**	**0.675**	**8.7**	**LOS A**	**7.3**	**184.2**	**0.73**	**0.64**	**0.76**	**34.3**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2037 AM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	254	12.0	254	12.0	0.354	7.6	LOS A	1.9	51.9	0.55	0.61	0.55	38.5
14	R2	All MCs	92	12.0	92	12.0	0.354	7.3	LOS A	1.9	51.9	0.55	0.61	0.55	29.8
Approach			346	12.0	346	12.0	0.354	7.5	LOS A	1.9	51.9	0.55	0.61	0.55	35.7
North: Suncadia Trail Rd															
5	L2	All MCs	234	4.0	234	4.0	0.400	6.9	LOS A	2.2	57.8	0.50	0.54	0.50	28.6
12	R2	All MCs	161	4.0	161	4.0	0.400	2.7	LOS A	2.2	57.8	0.50	0.54	0.50	28.9
Approach			395	4.0	395	4.0	0.400	5.2	LOS A	2.2	57.8	0.50	0.54	0.50	28.7
West: Bullfrog Rd															
3	L2	All MCs	383	8.0	383	8.0	0.683	14.1	LOS B	6.2	166.0	0.64	0.66	0.68	28.7
8	T1	All MCs	396	8.0	396	8.0	0.683	8.1	LOS A	6.2	166.0	0.64	0.66	0.68	37.3
Approach			779	8.0	779	8.0	0.683	11.0	LOS B	6.2	166.0	0.64	0.66	0.68	32.5
All Vehicles			**1520**	**7.9**	**1520**	**7.9**	**0.683**	**8.7**	**LOS A**	**6.2**	**166.0**	**0.58**	**0.62**	**0.61**	**32.0**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	0	11	0	0	5	10	443	0	0	337	18
Future Vol, veh/h	27	0	11	0	0	5	10	443	0	0	337	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	22	22	22	0	0	0	6	6	6	11	11	11
Mvmt Flow	27	0	11	0	0	5	10	443	0	0	337	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	812	809	346	815	818	443	355	0	0	443	0	0
Stage 1	346	346	-	463	463	-	-	-	-	-	-	-
Stage 2	466	463	-	352	355	-	-	-	-	-	-	-
Critical Hdwy	7.32	6.72	6.42	7.1	6.5	6.2	4.16	-	-	4.21	-	-
Critical Hdwy Stg 1	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.32	5.72	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.698	4.198	3.498	3.5	4	3.3	2.254	-	-	2.299	-	-
Pot Cap-1 Maneuver	275	293	654	298	313	619	1182	-	-	1071	-	-
Stage 1	630	601	-	583	568	-	-	-	-	-	-	-
Stage 2	541	532	-	669	633	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	271	290	654	291	310	619	1182	-	-	1071	-	-
Mov Cap-2 Maneuver	271	290	-	291	310	-	-	-	-	-	-	-
Stage 1	623	601	-	577	562	-	-	-	-	-	-	-
Stage 2	531	526	-	658	633	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	10.9	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1182	-	-	326	619	1071	-	-
HCM Lane V/C Ratio	0.008	-	-	0.117	0.008	-	-	-
HCM Control Delay (s)	8.1	0	-	17.5	10.9	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	13	530	8	8	415
Future Vol, veh/h	8	13	530	8	8	415
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	7	7	10	10
Mvmt Flow	8	13	530	8	8	415

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	965	534	0	0	538	0
Stage 1	534	-	-	-	-	-
Stage 2	431	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.2	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.29	-
Pot Cap-1 Maneuver	285	550	-	-	991	-
Stage 1	592	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	282	550	-	-	991	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	653	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	282	550	991	-
HCM Lane V/C Ratio	-	-	0.028	0.024	0.008	-
HCM Control Delay (s)	-	-	18.1	11.7	8.7	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2037 AM w Project)]

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Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows [HV %]	Arrival Flows [Total veh/h]	Arrival Flows [HV %]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh]	95% Back Of Queue [Dist ft]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	247	8.0	247	8.0	0.517	7.8	LOS A	3.7	97.9	0.63	0.61	0.63	37.7
18	R2	All MCs	296	8.0	296	8.0	0.517	7.5	LOS A	3.7	97.9	0.63	0.61	0.63	34.9
Approach			543	8.0	543	8.0	0.517	7.7	LOS A	3.7	97.9	0.63	0.61	0.63	36.1
East: SR 903															
1	L2	All MCs	177	10.0	177	10.0	0.546	10.8	LOS B	4.3	115.5	0.65	0.60	0.65	32.8
16	R2	All MCs	389	10.0	389	10.0	0.546	5.2	LOS A	4.3	115.5	0.65	0.60	0.65	32.4
Approach			566	10.0	566	10.0	0.546	7.0	LOS A	4.3	115.5	0.65	0.60	0.65	32.5
North: SR 903															
7	L2	All MCs	302	2.0	302	2.0	0.455	12.1	LOS B	3.6	91.7	0.54	0.59	0.54	32.7
4	T1	All MCs	245	2.0	245	2.0	0.455	6.1	LOS A	3.6	91.7	0.54	0.59	0.54	37.2
Approach			547	2.0	547	2.0	0.455	9.4	LOS A	3.6	91.7	0.54	0.59	0.54	34.6
All Vehicles			**1656**	**6.7**	**1656**	**6.7**	**0.546**	**8.0**	**LOS A**	**4.3**	**115.5**	**0.61**	**0.60**	**0.61**	**34.3**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Bullfrog Rd & Suncadia Trail (Site Folder: 2037 PM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Bullfrog Rd															
4	T1	All MCs	272	4.0	272	4.0	0.353	7.4	LOS A	2.0	52.2	0.57	0.61	0.57	39.6
14	R2	All MCs	100	4.0	100	4.0	0.353	7.1	LOS A	2.0	52.2	0.57	0.61	0.57	29.7
Approach			372	4.0	372	4.0	0.353	7.3	LOS A	2.0	52.2	0.57	0.61	0.57	36.4
North: Suncadia Trail Rd															
5	L2	All MCs	261	3.0	261	3.0	0.440	7.0	LOS A	2.6	66.3	0.52	0.55	0.52	28.6
12	R2	All MCs	179	3.0	179	3.0	0.440	2.7	LOS A	2.6	66.3	0.52	0.55	0.52	29.0
Approach			440	3.0	440	3.0	0.440	5.2	LOS A	2.6	66.3	0.52	0.55	0.52	28.8
West: Bullfrog Rd															
3	L2	All MCs	426	3.0	426	3.0	0.730	14.6	LOS B	7.7	197.9	0.71	0.69	0.78	28.5
8	T1	All MCs	444	3.0	444	3.0	0.730	8.5	LOS A	7.7	197.9	0.71	0.69	0.78	37.7
Approach			870	3.0	870	3.0	0.730	11.5	LOS B	7.7	197.9	0.71	0.69	0.78	32.6
All Vehicles			**1682**	**3.2**	**1682**	**3.2**	**0.730**	**8.9**	**LOS A**	**7.7**	**197.9**	**0.63**	**0.64**	**0.67**	**32.2**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	0	12	0	0	0	11	497	0	0	370	20
Future Vol, veh/h	30	0	12	0	0	0	11	497	0	0	370	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	3	0	0	0	0
Mvmt Flow	30	0	12	0	0	0	11	497	0	0	370	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	899	899	380	905	909	497	390	0	0	497	0	0
Stage 1	380	380	-	519	519	-	-	-	-	-	-	-
Stage 2	519	519	-	386	390	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	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	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	262	281	671	260	277	577	1180	-	-	1077	-	-
Stage 1	646	617	-	544	536	-	-	-	-	-	-	-
Stage 2	544	536	-	641	611	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	259	277	671	253	273	577	1180	-	-	1077	-	-
Mov Cap-2 Maneuver	259	277	-	253	273	-	-	-	-	-	-	-
Stage 1	638	617	-	537	529	-	-	-	-	-	-	-
Stage 2	537	529	-	630	611	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.2	0	0.2	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1180	-	-	314	-	1077	-	-
HCM Lane V/C Ratio	0.009	-	-	0.134	-	-	-	-
HCM Control Delay (s)	8.1	0	-	18.2	0	0	-	-
HCM Lane LOS	A	A	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	10	545	13	13	465
Future Vol, veh/h	5	10	545	13	13	465
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	50	0	0
Mvmt Flow	5	10	545	13	13	465

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1043	552	0	0	558	0
Stage 1	552	-	-	-	-	-
Stage 2	491	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	256	537	-	-	1023	-
Stage 1	581	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	252	537	-	-	1023	-
Mov Cap-2 Maneuver	252	-	-	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	608	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	252	537	1023	-
HCM Lane V/C Ratio	-	-	0.02	0.019	0.013	-
HCM Control Delay (s)	-	-	19.6	11.8	8.6	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0	-

MOVEMENT SUMMARY

Site: 4 [SR 903 & Bullfrog Rd (Site Folder: 2037 PM w Project)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing RAB
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Bullfrog Rd															
8	T1	All MCs	262	2.0	262	2.0	0.558	9.1	LOS A	4.8	120.8	0.76	0.70	0.83	38.1
18	R2	All MCs	294	2.0	294	2.0	0.558	8.8	LOS A	4.8	120.8	0.76	0.70	0.83	34.6
Approach			556	2.0	556	2.0	0.558	9.0	LOS A	4.8	120.8	0.76	0.70	0.83	36.1
East: SR 903															
1	L2	All MCs	202	1.0	202	1.0	0.681	11.4	LOS B	7.5	188.6	0.77	0.65	0.82	33.8
16	R2	All MCs	581	1.0	581	1.0	0.681	5.9	LOS A	7.5	188.6	0.77	0.65	0.82	33.3
Approach			783	1.0	783	1.0	0.681	7.3	LOS A	7.5	188.6	0.77	0.65	0.82	33.5
North: SR 903															
7	L2	All MCs	451	2.0	451	2.0	0.615	12.5	LOS B	6.0	152.2	0.68	0.61	0.68	32.2
4	T1	All MCs	276	2.0	276	2.0	0.615	6.5	LOS A	6.0	152.2	0.68	0.61	0.68	36.6
Approach			727	2.0	727	2.0	0.615	10.2	LOS B	6.0	152.2	0.68	0.61	0.68	33.8
All Vehicles			**2066**	**1.6**	**2066**	**1.6**	**0.681**	**8.8**	**LOS A**	7.5	**188.6**	**0.73**	**0.65**	**0.77**	**34.3**

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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FDOT Multimodal Quality/Level of Service Handbook Excerpts

C1 & C2

Motor Vehicle Highway Generalized Service Volume Tables

(C1-Natural & C2-Rural)

Peak Hour Directional

	B	C	D	E
1 Lane	240	430	730	1,490
2 Lane	1,670	2,390	2,910	3,340
3 Lane	2,510	3,570	4,370	5,010

Peak Hour Two-Way

	B	C	D	E
2 Lane	440	780	1,330	2,710
4 Lane	3,040	4,350	5,290	6,070
6 Lane	4,560	6,490	7,950	9,110

AADT

	B	C	D	E
2 Lane	4,600	8,200	14,000	28,500
4 Lane	32,000	45,800	55,700	63,900
6 Lane	48,000	68,300	83,700	95,900

Adjustment Factors

2 Lane Divided Roadway with Exclusive Left Turn Adjustment: Multiply by 1.05
Multilane Undivided Highway with Exclusive Left Turn Adjustment: Multiply by 0.95
Multilane Undivided Highway without Exclusive Left Turn Adjustment:: Multiply by 0.75

This table does not constitute a standard and should be used only for general planning applications. The table should not be used for corridor or intersection design, where more refined techniques exist.

C1 & C2

Motor Vehicle Highway Generalized Service Volume Tables

Input Parameters

Roadway Characteristics

	C1	C2
Number of Lanes (one direction)	1	2-3
Posted Speed (mph)	55	55
Base Free Flow Speed (mph)	60	60
Median Type	Undivided	Divided
Shoulder Width (feet)	3	6
Lane Width (feet)	12	12
% No Passing Zone	20%	
Access-Point Density (access/mile)	2	2
Terrain	Level	Level

Traffic Characteristics

	C1	C2
Planning Analysis Hour Factor (K)	0.095	0.095
Directional Distribution Factor (D)	0.55	0.55
Peak Hour Factor (PHF)	0.88	0.88
Heavy Vehicle Percent (%)	5%	10%
Speed Adjustment Factor (SAF)	0.975	0.975
Capacity Adjustment Factor (CAF)	0.968	0.968

C2T, C4, C5, & C6

Motor Vehicle Arterial Generalized Service Volume Tables

(C2T-Rural Town)

Peak Hour Directional

	B	C	D	E
1 Lane	*	720	940	**
2 Lane	*	1,140	1,640	**
3 Lane	*	2,120	2,510	**

Peak Hour Two-Way

	B	C	D	E
2 Lane	*	1,310	1,710	**
4 Lane	*	2,070	2,980	**
6 Lane	*	3,850	4,560	**

AADT

	B	C	D	E
2 Lane	*	13,800	18,000	**
4 Lane	*	21,800	31,400	**
6 Lane	*	40,500	48,000	**

(C4-Urban General)

	B	C	D	E
1 Lane	*	*	870	1,190
2 Lane	*	1,210	1,790	2,020
3 Lane	*	2,210	2,810	2,990
4 Lane	*	2,590	3,310	3,510

	B	C	D	E
2 Lane	*	*	1,580	2,160
4 Lane	*	2,200	3,250	3,670
6 Lane	*	4,020	5,110	5,440
8 Lane	*	4,710	6,020	6,380

	B	C	D	E
2 Lane	*	*	17,600	24,000
4 Lane	*	24,400	36,100	40,800
6 Lane	*	44,700	56,800	60,400
8 Lane	*	52,300	66,900	70,900

(C5-Urban Center)

	B	C	D	E
1 Lane	*	*	690	1,080
2 Lane	*	1,290	1,900	2,130
3 Lane	*	1,410	2,670	3,110
4 Lane	*	2,910	3,560	3,640

	B	C	D	E
2 Lane	*	*	1,250	1,960
4 Lane	*	2,350	3,450	3,870
6 Lane	*	2,560	4,850	5,650
8 Lane	*	5,290	6,470	6,620

	B	C	D	E
2 Lane	*	*	13,900	21,800
4 Lane	*	26,100	38,300	43,000
6 Lane	*	28,400	53,900	62,800
8 Lane	*	58,800	71,900	73,600

(C6-Urban Core)

	B	C	D	E
1 Lane	*	***	790	1,030
2 Lane	*	***	1,490	1,920
3 Lane	*	***	2,730	2,940
4 Lane	*	***	3,250	3,490

	B	C	D	E
2 Lane	*	***	1,440	1,870
4 Lane	*	***	2,710	3,490
6 Lane	*	***	4,960	5,350
8 Lane	*	***	5,910	6,350

	B	C	D	E
2 Lane	*	***	16,000	20,800
4 Lane	*	***	30,100	38,800
6 Lane	*	***	55,100	59,400
8 Lane	*	***	65,700	70,600

Adjustment Factors

The peak hour directional service volumes should be adjust by multiplying by 1.2 for one-way facilities
The AADT service volumes should be adjusted by multiplying 0.6 for one way facilities 2 Lane Divided Roadway with an Exclusive Left Turn Lane(s): Multiply by 1.05
2 lane Undivided Roadway with No Exclusive Left Turn Lane(s): Multiply by 0.80

Exclusive right turn lane(s): Multiply by 1.05
Multilane Undivided Roadway with an Exclusive Left Turn Lane(s): Multiply by 0.95
Multilane Roadway with No Exclusive Left Turn Lane(s): Multiply by 0.75
Non-State Signalized Roadway: Multiply by 0.90

This table does not constitute a standard and should be used only for general planning applications. The table should not be used for corridor or intersection design, where more refined techniques exist.
*Cannot be achieved using table input value defaults. **Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached.
***LOS C thresholds are not applicable for C6 as C6 roadway facilities are neither planned nor designed to achieve automobile LOS C.

C2T, C4, C5, & C6

Motor Vehicle Arterial Generalized Service Volume Tables

Input Parameters

Roadway Characteristics

	C2T	C4	C5	C6
Number of Lanes (one direction)	1-3	1-4	1-4	1-4
Posted Speed (mph)	40	45	35	30
Facility Length (miles)	0.78	1.83	1.18	0.74
Number of Signals	4	9	9	7

Traffic Characteristics

	C2T	C4	C5	C6
Planning Analysis Hour Factor (K)	0.095	0.09	0.09	0.09
Directional Distribution Factor (D)	0.55	0.55	0.55	0.55
Peak Hour Factor (PHF)	0.92	0.95	0.95	0.95
Base Saturation Flow Rate	1,700	1,950	1,950	1,950
Heavy Vehicle Percent (%)	5	3	2	2
Lane Width	11	11	10	10
Median Type	Non Restrictive	Non Restrictive	Non Restrictive	Non Restrictive
Roadway Edge Type	Curb	Curb	Curb	Curb
On-Street Parking	50%	100%	100%	100%

Signal Characteristics

	C2T	C4		C5		C6	
Cycle Length	90	170		150		120	
Major Street Through g/c	0.47	0.52 (1,2,3 lanes)	0.47 (4 lanes)	0.55 (1,2,3 lanes)	0.48 (4 lanes)	0.52 (1,2,3 lanes)	0.46 (4 lanes)
Yellow Change Interval	4.4	4.8		4		3.7	
Red Change Interval	2	2		2		2	