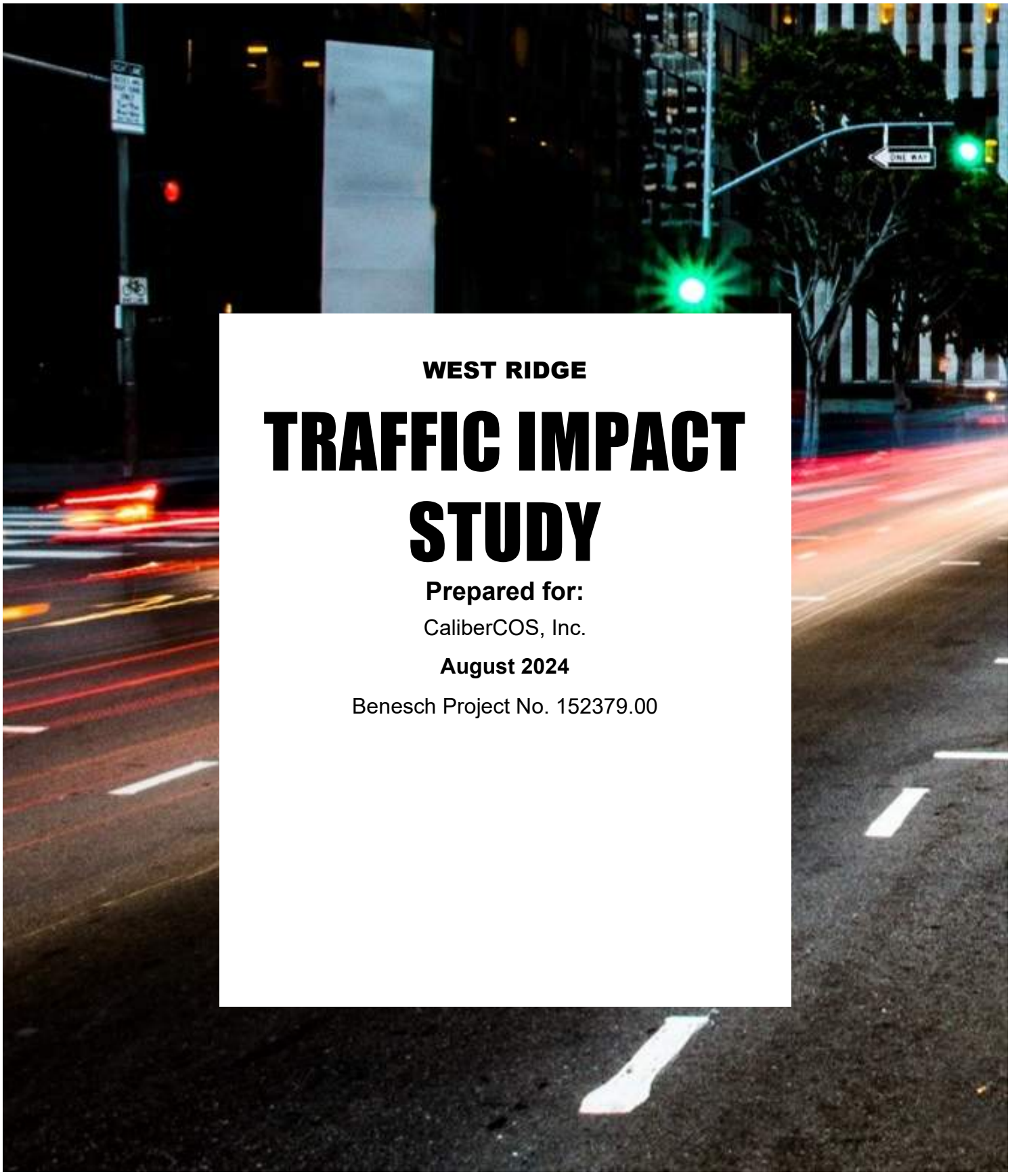

WEST RIDGE

TRAFFIC IMPACT STUDY

Prepared for:

CaliberCOS, Inc.

August 2024

Benesch Project No. 152379.00

benesch

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1. INTRODUCTION

This report documents analyses conducted to assess the traffic impacts of a proposed development in Loveland, Colorado. The development is located in the northwest corner of the Interstate 25 (I-25) & State Highway 402 (SH 402) interchange. The approximate location of the proposed development is shown on the Vicinity Map in **Figure 1**.

This report presents the potential impacts of the proposed development on the existing roadway network and, as appropriate, recommends additional turn lanes, storage bay modifications, and intersection control methods per City of Loveland, Larimer County, and Colorado Department of Transportation (CDOT) standards. The study intersections include the following:

- Boise Avenue & SH 402
- County Road 9E (CR 9E) & SH 402
- Charlotte Court / CR 7 & SH 402
- Park & Ride Access & SH 402
- I-25 Southbound Ramps & SH 402
- I-25 Northbound Ramps & SH 402
- Frontage Road & SH 402

The following scenarios were analyzed considering weekday AM and PM peak hour periods:

- Existing Conditions
- 2030 Background
- 2045 Background
- 2030 Total Traffic
- 2045 Total Traffic

The current site plan also contemplates a new, full movement access along SH 402 between the southbound I-25 ramp terminal and Larimer County Road 7 (LCR). This contrasts with the recommendations of the SH 402 Access Control Plan (*SH 402 ACP*) that shows access at this location as three-quarter movement. As such, a full movement drive at this location would require an amendment to the *SH 402 ACP* predicated on an analysis of the corridor with the higher level of access supporting no negative impacts to operations or safety. A section of this report is dedicated to addressing site access with respect to the impact on the *SH 402 ACP*.

A scoping effort was conducted with representatives from CDOT, Larimer County, Town of Johnstown, and City of Loveland and was documented in a scoping form. This was approved by the parties mentioned above and is included in **Appendix A** for reference.

Figure 1. Vicinity Map.

2. DATA COLLECTION

The data collection effort included acquiring peak period turning movement counts and existing intersection signal timings. Existing street and intersection geometry and storage lengths were collected from aerial photos.

Peak hour turning movement counts were collected at the following intersections:

- Boise Avenue & SH 402
- CR 9 & SH 402
- I-25 Southbound Ramps & SH 402
- I-25 Northbound Ramps & SH 402
- I-25 Frontage Roade & SH 402

Counts were conducted during the AM peak hour from 7:00 AM – 9:00 AM and PM peak hour from 4:00pm – 6:00pm. Peak hours occurred from 7:15 AM – 8:15 AM and 4:15 PM – 5:15 PM for the AM and PM periods, respectively.

Additionally, 12-hour turning movement counts were collected at the following locations:

- Charlotte Court & SH 402
- Park & Ride Access & SH 402

Counts included bike and pedestrian volumes. All the turning movement count data was taken on Thursday, October 20, 2022 under clear weather and typical traffic conditions. Finally, twenty-four-hour directional counts were taken at the approximate location of the site access point.

Lane configuration and traffic control were collected from the CDOT and aerial images.

Signal timings for the intersection of Boise Avenue and SH 402 were provided by the City of Loveland. Adaptive intersection timing plans are currently used at the intersection, so typical peak operations movement splits and cycle lengths were assumed based on data logs provided. These signal timings were used for peak hour period analysis.

All data collection was conducted in coordination with the requirements set forth in a scoping meeting conducted on February 23, 2023. Existing peak hour traffic count data is illustrated in **Figure 2**. All traffic count data is provided in **Appendix B.**

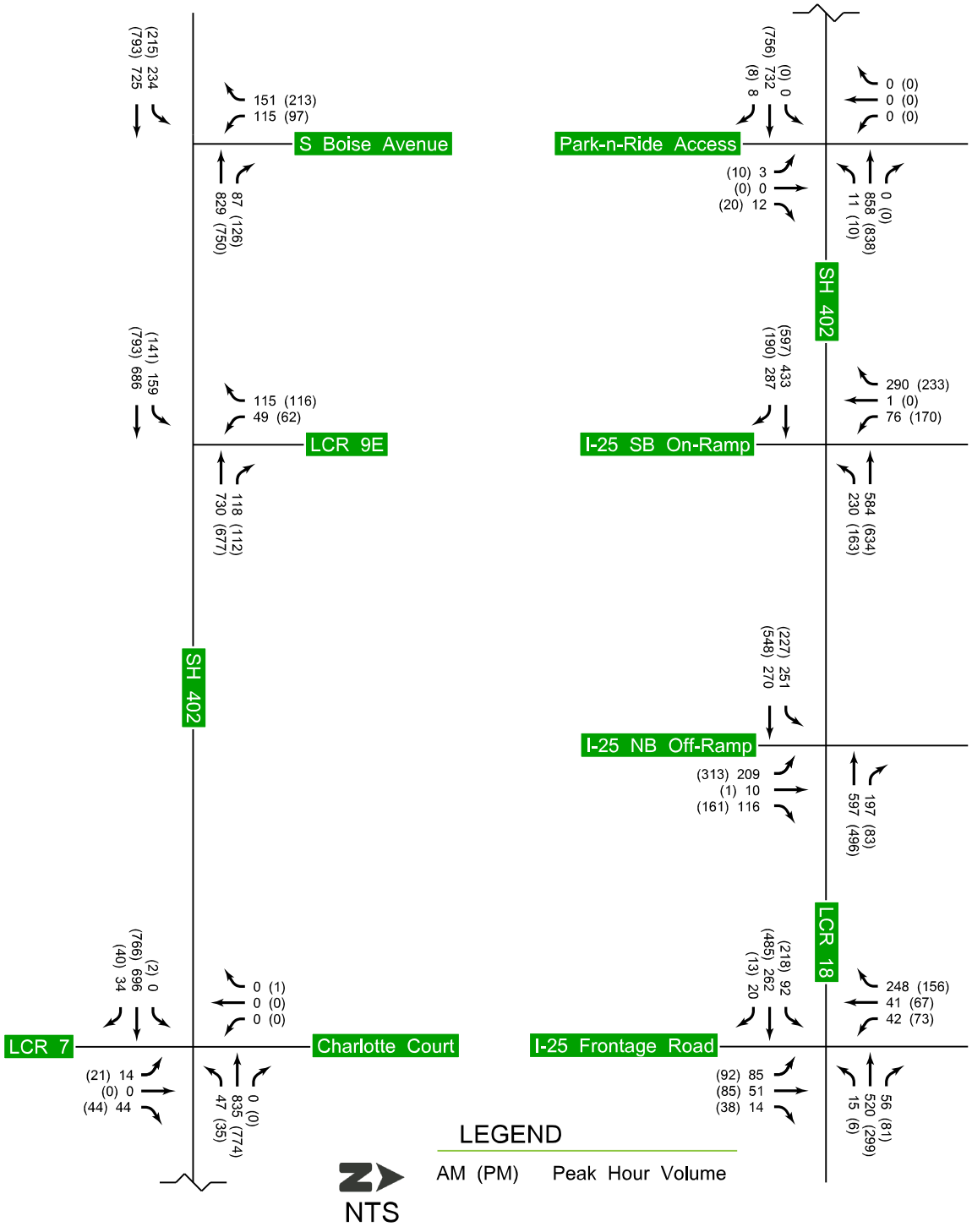


Figure 2. Existing Conditions, Peak Hour Volumes.

3. EXISTING CONDITIONS

Existing traffic conditions were evaluated to identify any existing deficiencies and to provide a baseline for comparison purposes.

3.1 Existing Network Characteristics

Within the study area there are six roadways that were considered during analysis: SH 402, Boise Avenue, CR 9E, CR 7/Charlotte Court, I-25, and Frontage Road.

Roadway functional classifications for these streets were obtained from the *Connect Loveland Transportation Master Plan*. Other data was obtained from aerial imagery and from the CDOT Online Transportation Information System (OTIS). Current network characteristics were determined and are summarized in **Table 1**.

Table 1. Existing Network Summary.

Roadway	Functional Classification	Typical Section	Median Type	Posted Speed
SH 402 (W of I-25)	Minor Arterial*	Two Lane	Undivided	55 mph
SH 402 (I-25 to Frontage Rd)	Minor Arterial*	Four Lane	Divided	35 mph
SH 402 (E of Frontage Rd)	Minor Arterial*	Two Lane	Undivided	55 mph
Boise Avenue	Minor Arterial	Two Lane	Undivided	35 mph
CR 9E	Minor Arterial	Two Lane	Undivided	45 mph
CR 7	Major Collector	Two Lane	Undivided	45 mph
Charlotte Court	Local	Two Lane	Undivided	25 mph
I-25	Freeway	Four Lane	Divided	75 mph
Frontage Road	Major Collector	Two Lane	Undivided	35 mph

*CDOT Classification is Non-Rural Principal Highway (NR-A)

A short-duration count station is located as MP 4.306, approximately one-quarter mile east of LCR 9, shows the daily traffic at 13,400 vehicle per day (vpd) as of June 2019. Traffic counts at this station have been consistent (between 13,000 vpd and 14,000 vpd) since 2012, with a temporary increase in 2018 to 15,500 vpd. All volumes discussed above are seasonally adjusted using monthly summaries from the continuous count station located on US 34, just north of the site.

The intersection of Boise Avenue & SH 402 is signalized. The I-25 & SH 402 ramp terminal intersections as well as the Frontage Road are multilane roundabouts. All other study intersections are currently two-way stop controlled (TWSC). Existing lane configuration and traffic control for the study network are illustrated in **Figure 3**.

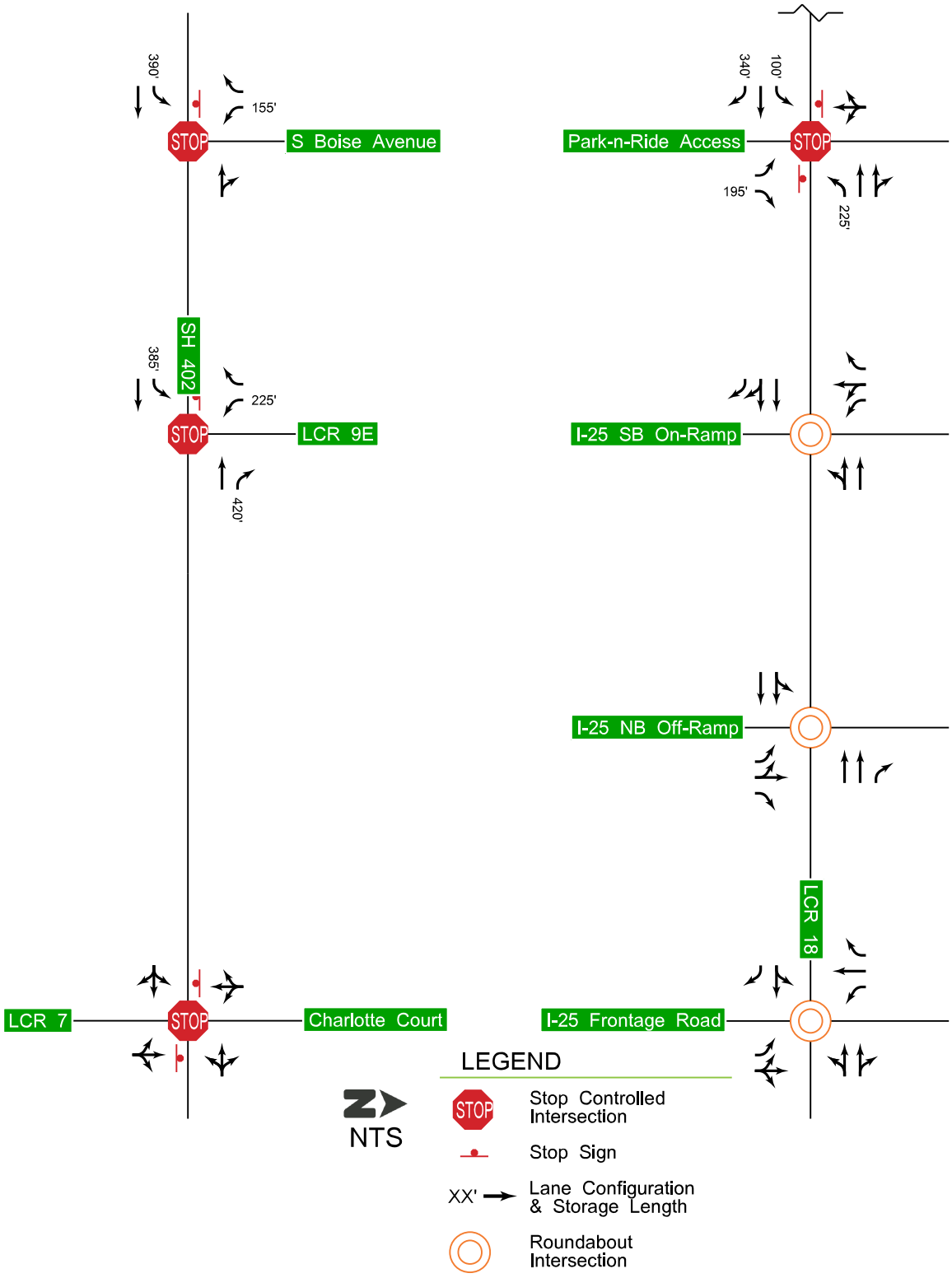


Figure 3. Existing Conditions, Lane Configuration and Traffic Control.

3.2 Existing Conditions Capacity Analysis

Capacity analysis was performed for the study intersections using the existing lane configurations and traffic control. Analysis was conducted using Synchro Version 11 based on the *Highway Capacity Manual* (HCM) delay methodologies. SIDRA was also used to analyze the capacity of the roundabout, which uses its own capacity model based on HCM methodologies called SIDRA Roundabout (HCM). For simplicity, the amount of control delay is equated to a grade or Level of Service (LOS) based on thresholds of driver acceptance. The amount of delay is assigned a letter grade A through F, LOS A representing little or no delay and LOS F representing very high delay. **Table 2** shows the delays associated with each LOS grade for signalized and unsignalized intersections, respectively. Queuing analysis was conducted referencing the 95th percentile queue length. This represents the queue length that has a 5 percent probability of being exceeded during the peak hour period.

Table 2. Intersection Level of Service Criteria.

Level of Service	Average Control Delay (seconds)	
	Signalized	Unsignalized
A	< 10	< 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50
Highway Capacity Manual (6th Edition)		

The analyzed intersections along SH 402 are operating at an overall LOS D or better during both peak hours. Individual movements at all intersections are operating at a LOS D or better with adequate storage for the 95th percentile queue lengths during all peak hours with the exception of the following:

- Boise Avenue & SH 402 - The southbound left-turn lane movement (AM/PM) operates at a LOS E. The average delay per vehicle for this movement is 67/74 seconds. The southbound right-turn lane movement (PM) operates at LOS E. The average delay per vehicle for this movement is 58 seconds.
- CR 9E & SH 402 - The southbound left-turn lane movement (AM/PM) operates at a LOS F. The average delay per vehicle for this movement is 236/257.
- CR 7/Charlotte Court & SH 402 - The northbound approach (AM/PM) operates at a LOS E/F. The average delay per vehicle for this movement is 43/57.

- Park-n-Ride & SH 402 – The northbound left-turn lane movement (AM/PM) operates at LOS E. The average delay per vehicle for this movement is 36/37 seconds.

It is common for minor street stop control approaches to arterials to operate with higher delays during peak periods when traffic volumes are highest.

The Existing Conditions Capacity Analysis Summary is illustrated in Table 3. Detailed results are provided in **Appendix C.**

Table 3. Existing Conditions, Capacity Analysis Summary

Intersection	Movement	AM		PM	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Boise & SH 402 Signal	EBL	C	29.6	B	12.2
	EBT	A	5.9	A	5.3
	WBTR	B	19.1	B	12.3
	SBL	E	66.7	E	74.1
	SBR	D	46.9	E	57.5
	Overall	**B**	**18.9**	**B**	**13.7**
LCR 9E & SH 402 TWSC	EBL	B	11.6	B	10.6
	SBL	F	235.6	F	256.6
	SBR	C	19.6	C	17.2
LCR 7 & SH 402 TWSC	NB	E	43.2	F	57.1
	SB	A	0.0	A	9.6
	EB	A	0.0	A	10.0
	WB	A	9.7	B	14.8
Park/Ride & SH 402 TWSC	NBL	E	35.8	E	37.4
	NBR	C	15.2	C	15.5
	EBL*	A	0.0	A	0.0
	WBL	A	9.6	A	9.7
I-25 SB & SH 402 Roundabout	WB	A	4.5	A	4,3
	SB	A	6.1	A	6.4
	EB	A	4.1	A	6.1
I-25 NB & SH 402 Roundabout	NB	A	6.0	A	8.1
	WB	A	8.5	A	8.5
	EB	A	3.8	A	4.2
Frontage Road & SH 402 Roundabout	NB	A	5.5	B	10.1
	WB	A	6.9	A	6.7
	SB	A	8.9	A	5.6
	EB	A	6.0	B	11.5

*No volume was observed for this movement during peak hours.

3.3 Crash Analysis

Crash data was provided from CDOT between MP 3.5 and MP 4.31 along SH 402. This is approximately 1,100 feet west of the LCR 7 intersection through the I-25 interchange. Crash data was provided for the period between January 2018 and December 2022 (5 years). During that time:

- Only one fatality was reported in 2018, which was located at the LCR 7 intersection and was an approach turn crash involving an impaired driver.
- There were four crashes at non intersection locations, while the remaining 127 crashes were intersection related.
- Property damage only (PDO) crashes increased in 2021 and 2020 at the I-25 ramp terminals after their reconstruction as roundabouts. This is a common phenomenon after roundabouts are constructed and occurs in the first few years as drivers familiarize themselves with navigation. Injury crashes decreased during this same period.

Injury and PDO crashes are summarized **Figure 4** and **Figure 5** below.

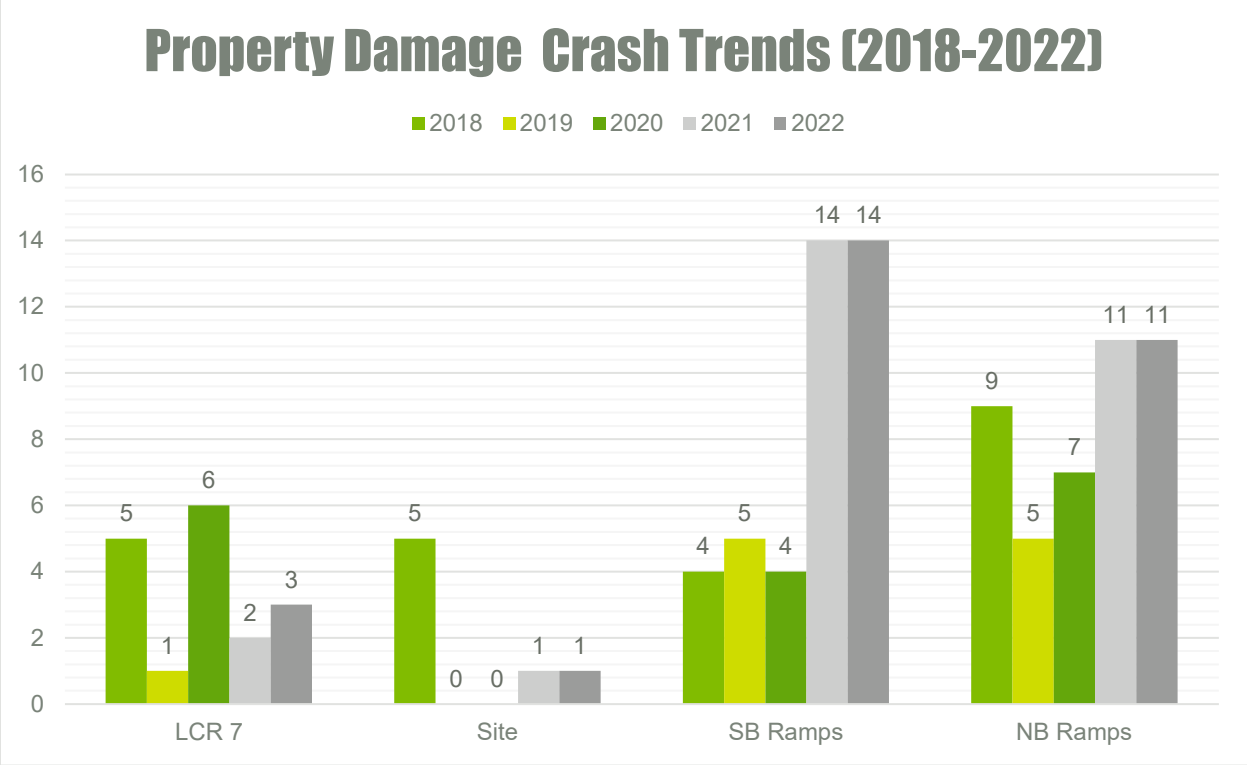


Figure 4. PDO Crash Trends (2018-2022)

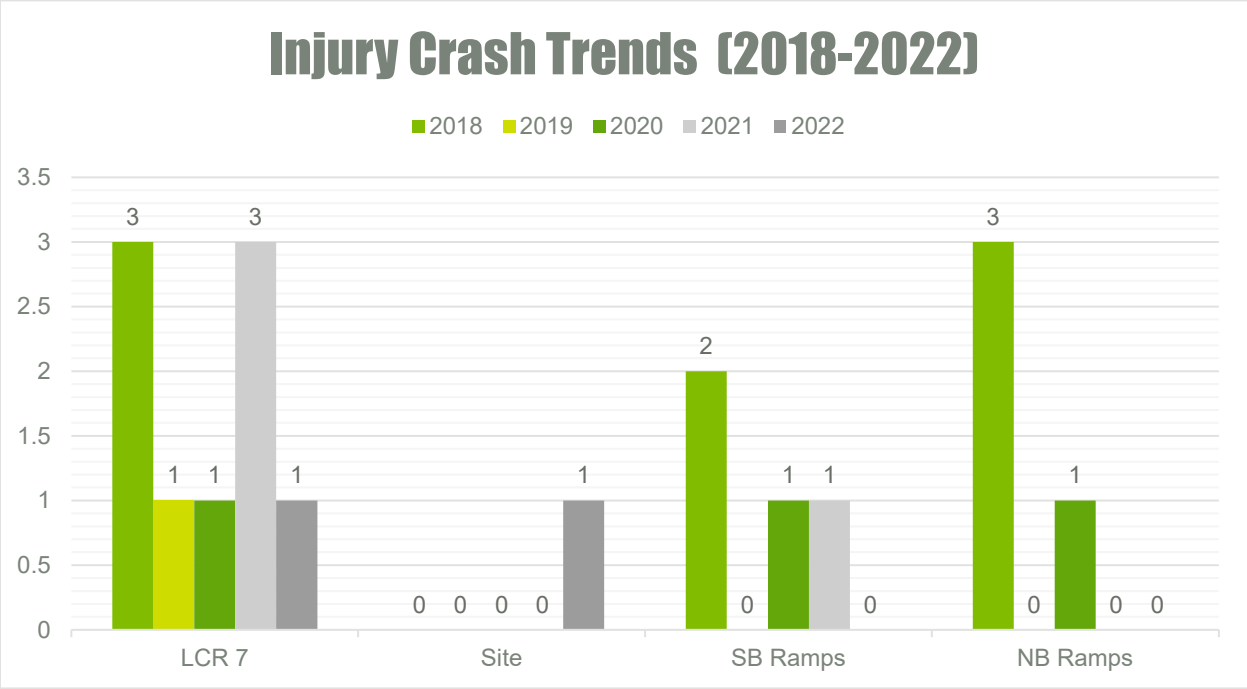


Figure 5. Injury Crash Trends (2018-2022)

The CDOT Traffic Safety & Engineering Services division has published Safety Performance Function (SPF) models in interactive worksheets. These worksheets include calibrated SPF models for various CDOT facility types and are based on the methodology prescribed in the *Highway Safety Manual*. The primary outputs of these tools are annual crashes (CPMPY) and level of safety service (LOSS) for both all crashes and fatal or injury (FI) crashes. LOSS is a qualitative representation of the how far above or below the predicted crashes are as compared to the expected crashes and depicts the potential for crash reduction.

Table 4. Intersection Safety Performance

Intersection	All CPMPY	All LOSS	FI CPMPY	FI LOSS
LCR 7	5.28	3	1.92	3
Park/Ride (Site)	1.39	4	0.23	2
SB Ramps	6.33	4	0.67	3
NB Ramps	6.59	4	0.67	3

The analysis above indicates that all intersections could be candidates for some crash reduction. It should be noted that the PDO crashes at the I-25 ramp terminals increased after installation of the roundabouts, as discussed above. Also note that the LCR 7 intersection is recommended for turn lane improvements and a traffic signal in latter sections of this report which are anticipated to improve overall safety at the intersection. Detail results of the crash analyses, including existing crash data are included in **Appendix D.**

4. BACKGROUND CONDITIONS

This scenario considers operations of the future roadway network considering background traffic growth without the proposed development. Future average daily traffic (ADT) volumes were obtained by applying growth rates obtained from the CDOT OTIS and as agreed upon during the scoping effort for this study. Anticipated growth percentages (1.5% annually) were applied directly to peak hour volumes for all analysis periods to develop the background traffic volumes for the future years 2030 and 2045. Additionally, a new signalized intersection called Boyd Lake Road is anticipated to be built between LCR 9E and LCR 7. Traffic volumes for this new intersection were also agreed upon during the scoping effort. These are illustrated in **Figure 6** and **Figure 7** on the following pages.

4.1 Signal Warrants

A traffic signal may be justified if traffic conditions meet any of the applicable nine signal warrants described in the 2009 Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD provides criteria for conducting an engineering study to determine whether a traffic signal is appropriate at any intersection. Based on the data available, Four-Hour Vehicular Volume Warrant (Warrant 2), the Peak Hour Warrant (Warrant 3), and the Crash Experience (Warrant 7) were evaluated for the existing unsignalized study intersections. The remaining warrant were not applicable for the corridor conditions.

The unsignalized study intersections of SH 402 & LCR 9E and SH 402 & LCR 7 satisfy at least one warrant under 2030 Background conditions. SH 402 & LCR 9E satisfies volume-based warrants and SH 402 & LCR 7 satisfies crash-based warrants with multiple 12-month periods with five or more crashes recorded. Signal warrants are summarized in **Table 5**.

Table 5. 2030 Background Conditions Signal Warrant Analysis Summary

Intersection	Warrant 2 (4-Hour)	Warrant 3 (Peak Hour)	Warrant 7 (Crash Experience)	Signalized?
SH 402 & LCR 9E	Satisfied	Satisfied	Not Satisfied	Yes
SH 402 & LCR 7	Not Satisfied	Not Satisfied	Satisfied	Yes

Signal warrant volume analysis sheets are provided in **Appendix E**.

Figure 6. 2030 Background Conditions, Peak Hour Volumes

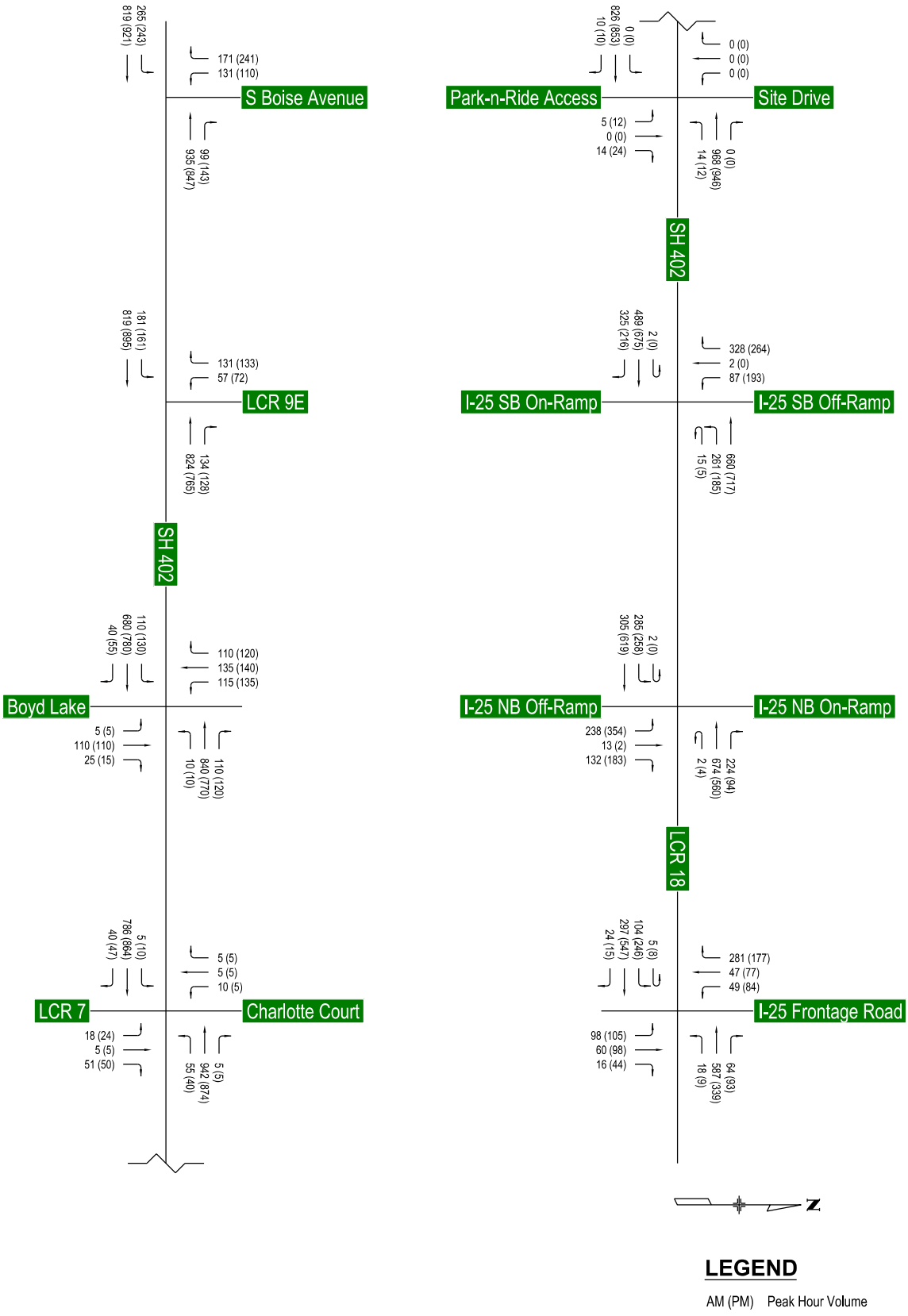
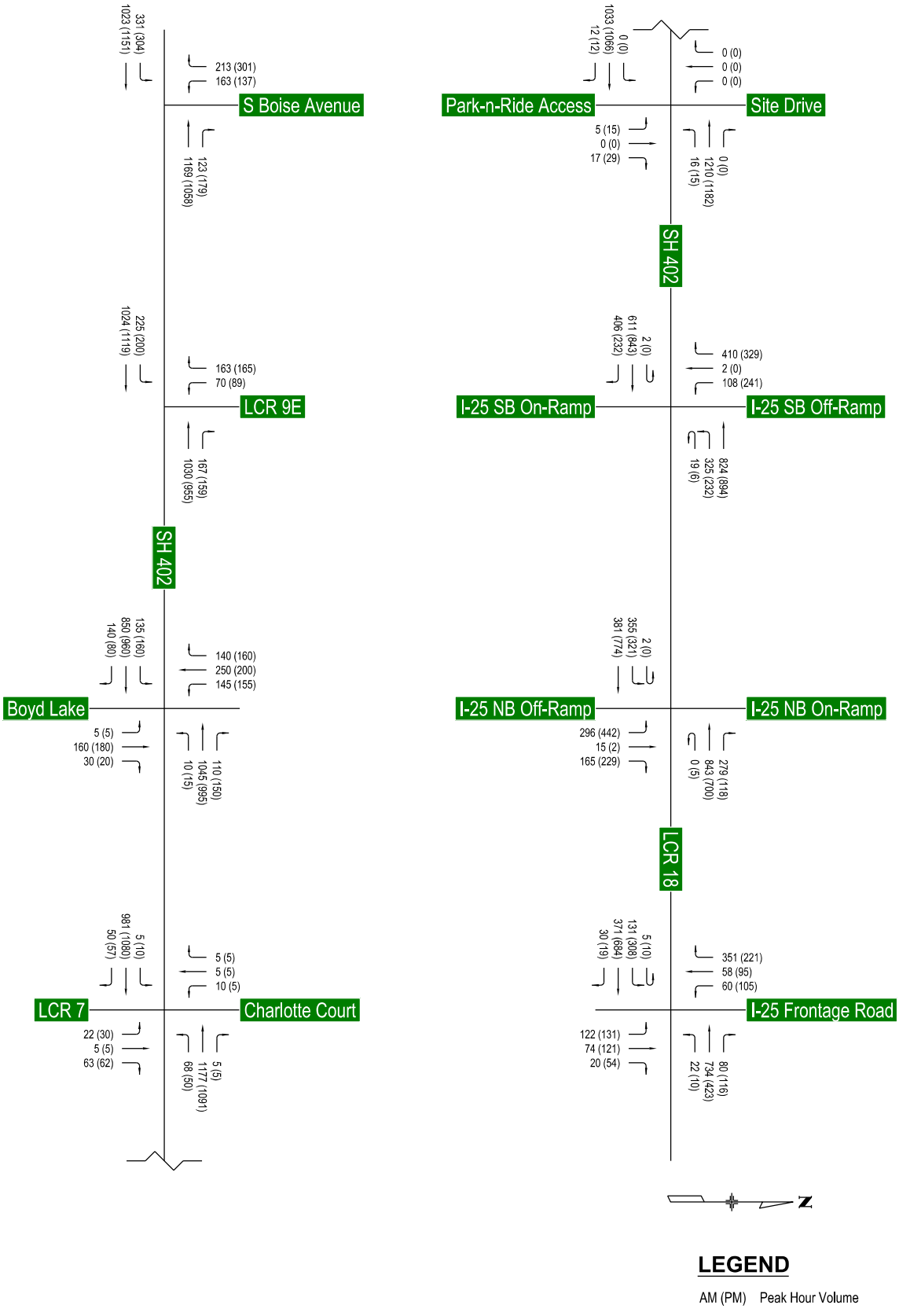


Figure 7. 2045 Background Conditions, Peak Hour Volumes



4.2 Geometric Improvements

Based on the *SH 402 ACP*, the corridor from Boise Avenue to I-25 is anticipated to be widened to improve capacity along the corridor. This is not anticipated to occur by the Future Year 2030 conditions, so this improvement has been included in the analysis only for the Future Year 2045 conditions. Additionally, the Future Year 2045 analysis also assumed that Country Road 18 would be widened immediately east of the Frontage Road roundabouts.

4.2.1 Turn Lane Warrants

4.2.1.1 Left-Turn Lanes

The CDOT State Highway Access Code (SHAC) states that for an NR-A highway that left-turn auxiliary lanes are required for left turn volumes greater that 10 vehicles per hour (vph). Based on 2030 Background Traffic conditions, the following left-turn lanes are warranted based on the AM and PM peak hour periods:

- Eastbound and Westbound at SH 402 & LCR 7
    - The westbound left turn movement exceeds this in the Existing Conditions and by 2030, the eastbound left turn movement may also exceed the threshold.
- Eastbound and Westbound at SH 402 & Boyd Lake Road
    - It is anticipated that the turning volumes will exceed the threshold upon construction. Furthermore, this intersection is assumed to be signalized immediately.

4.2.1.2 Right-Turn Lanes

The SHAC states that for an NR-A highway that right-turn auxiliary lanes are required for right turn volumes greater that 25 vph. Based on 2030 Background Traffic conditions, the following right-turn lanes are warranted based on the AM and PM peak hour periods:

- Westbound at SH 402 & Boise
    - The westbound right turn movement exceeds this in the Existing Conditions
- Eastbound at SH 402 & LCR 7
    - The eastbound right turn movement exceeds this in the Existing Conditions.

4.3 Background Conditions Capacity Analysis

4.3.1 2030 Background Capacity Analysis

Capacity analysis was performed for Future Year 2030 conditions using the methodologies presented in **Section 3.2**.

All the signalized intersections are expected to operate at an overall LOS C or better during both peak hour periods. Individual movements are expected to operate at a LOS D or better with acceptable 95th-percentile queue lengths during both peak hour periods with the exceptions of the movements summarized below.

- Boise Avenue & SH 402 - The southbound left-turn lane movement (AM) is expected to operate at a LOS E. The average delay per vehicle for this movement is 61 seconds.
- Park-n-Ride Access & SH 402 - The northbound left-turn lane movement (AM/PM) is expected to operate at a LOS E/F. The average delay per vehicle for this movement is 46/50 seconds.

All the roundabout intersections are expected to operate at an overall and by movement LOS B or better. The Future Year 2030 Capacity Analysis Summary is illustrated in **Tables 6** and **7**. Detailed results are provided in **Appendix G.**

4.3.2 2045 Background Capacity Analysis

Capacity analysis was performed for Future Year 2045 conditions using the methodologies presented in **Section 3.2**.

All the signalized intersections are expected to operate at an overall LOS C or better both peak hour periods. Individual movements are expected to operate at a LOS D or better with acceptable 95th-percentile queue lengths during both peak hour periods with the exceptions of the movements summarized below.

- Park-n-Ride Access & SH 402 - The northbound left-turn lane movement (AM/PM) is expected to operate at a LOS F. The average delay per vehicle for this movement is 103/129 seconds.

All the roundabout intersections are expected to operate at an overall and by movement LOS B or better. The Future Year 2045 capacity analysis summary is illustrated in **Tables 6** and **7**. Detailed results are provided in **Appendix G**.

Table 6. Future Year Background Conditions, Capacity Analysis Summary (Pt. 1)

Intersection	Movement	2030				2045			
		AM		PM		AM		PM	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Boise & SH 402 Signal	EBL	D	43.2	C	27.4	C	29.5	B	17.6
	EBT	A	5.1	B	12.4	A	4.4	A	7.2
	WBT	D	37.1	C	21.1	C	29.3	B	14.2
	WBR	A	6.3	A	2.9	B	17.0	A	2.8
	SBL	E	61.1	D	37.6	D	51.5	D	52.2
	SBR	C	30.6	C	32.2	C	20.7	D	50.2
	Overall	**C**	**26.6**	**B**	**19.0**	**C**	**21.0**	**B**	**16.3**
LCR 9E & SH 402 Signal	EBL	A	9.0	B	12.8	B	19.8	A	9.1
	EBT	A	8.8	A	9.5	A	6.4	A	8.8
	WBT	A	6.2	B	14.3	C	29.1	A	5.9
	WBR	A	0.8	A	2.0	A	6.1	A	1.0
	SBL	D	46.3	D	45.8	D	37.3	D	48.4
	SBR	D	38.9	D	38.5	C	33.7	D	43.3
	Overall	**A**	**8.8**	**B**	**12.9**	**B**	**18.8**	**B**	**10.4**
Boyd Lake & SH 402 Signal	EBL	B	19.5	C	21.1	B	12.4	C	20.8
	EBT	C	24.8	C	21.5	A	0.5	D	40.9
	EBR	B	12.2	A	9.8	A	0.1	C	26.8
	WBL	B	13.4	B	16.6	B	11.2	B	18.9
	WBT	C	21.5	C	25.2	B	17.1	C	24.4
	WBR	A	7.3	A	8.6	A	7.3	B	11.7
	NBL	D	41.2	D	42.9	D	39.3	D	44.5
	NBT	D	48.1	D	51.0	D	50.0	D	54.1
	NBR	A	0.0	A	0.0	A	0.0	A	0.0
	SBL	D	40.4	D	43.1	D	36.2	D	39.1
	SBT	D	41.2	D	42.5	C	33.1	D	38.1
	SBR	C	34.7	C	33.1	C	29.4	C	30.6
	Overall	**C**	**26.0**	**C**	**26.4**	**B**	**15.9**	**C**	**33.1**

Table 7. Future Year Background Conditions, Capacity Analysis Summary (Pt. 2)

Intersection	Movement	2030				2045			
		AM		PM		AM		PM	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
LCR 7 & SH 402 Signal	EBL	B	13.5	B	14.8	A	8.0	A	7.1
	EBT	B	14.6	B	19.9	B	10.8	B	10.2
	EBR	A	6.6	A	8.2	A	7.1	A	6.6
	WBL	B	10.9	B	16.2	A	7.4	A	7.3
	WBT	B	17.1	B	19.8	A	9.9	A	9.2
	WBR	A	0.0	A	0.0	A	0.0	A	0.0
	NBL	D	43.2	D	39.2	D	35.1	D	51.5
	NBTR	D	45.3	D	40.2	D	37.6	D	53.7
	SBL	D	45.8	D	40.8	D	37.7	D	54.0
	SBTR	D	42.1	D	38.0	C	34.0	D	49.4
	Overall	**B**	**17.1**	**C**	**20.6**	**B**	**11.4**	**B**	**11.6**
Park/Ride & SH 402 TWSC	NBL	E	45.7	F	50.0	F	103.2	F	129.4
	NBR	C	16.4	C	17.3	B	13.4	B	13.6
	EBL	A	0.0	A	0.0	A	0.0	A	0.0
	WBL	B	10.0	B	10.1	B	11.3	B	11.5
I-25 SB & SH 402 Roundabout	WB	A	4.7	A	4.3	A	5.2	A	4.7
	SB	A	6.7	A	5.5	B	10.2	A	6.9
	EB	A	3.7	A	5.6	A	4.6	A	7.4
I-25 NB & SH 402 Roundabout	NB	A	5.0	A	5.7	A	5.7	A	7.0
	WB	A	7.3	A	7.2	B	11.1	B	10.1
	EB	A	3.9	A	4.6	A	4.3	A	5.2
Frontage Road & SH 402 Roundabout	NB	A	5.4	B	15.2	A	6.9	B	12.0
	WB	A	4.6	A	7.7	B	11.9	A	9.2
	SB	A	4.2	A	4.6	A	8.7	A	5.2
	EB	A	7.3	B	19.8	A	6.2	A	9.2

4.4 Background Conditions Queuing Analysis

A queueing analysis was performed for the road network for each volume scenario to understand the required storage length for turn lanes at intersections along SH 402. The 95th percentile queue lengths were reported for each location. In general, most existing turn lanes have adequate storage to contain the expected queues. The eastbound left-turn lane length at Boise Avenue is 400 feet with queues of 325 feet. This leaves approximately 355 feet of deceleration, when including the taper length in deceleration. The SHAC prescribes 435 feet for a posted speed of 45 mph.

Several through movements are expected to reach or exceed 500 feet along SH 402 in the 2030 Background scenario due to the street approaching capacity for a two-lane highway. These are mitigated with the four-lane widening in the 2045 Background scenario. The expected queues are listed in **Table 8**.

Detailed results are provided in **Appendix G**.

Table 8. Future Year Background Conditions, Queuing Analysis Summary

Intersection	Movement	2030		2045		Link Distance (ft)
		AM	PM	AM	PM	
		Queue (ft)	Queue (ft)	Queue (ft)	Queue (ft)	
Boise & SH 402 Signal	EBL	325	225	275	235	1200
	EBT	190	250	110	165	
	WBT	550	505	195	275	7200
	WBR	240	320	65	135	
	SBL	175	120	165	170	785
	SBR	220	165	225	180	
	-	-	-	-	-	-
LCR 9E & SH 402 Signal	EBL	225	125	185	180	720
	EBT	250	255	130	135	
	WBT	200	150	185	145	3135
	WBR	35	50	50	35	
	SBL	110	90	85	115	740
	SBR	130	105	125	120	
	-	-	-	-	-	-
Boyd Lake & SH 402 Signal	EBL	105	110	105	215	3125
	EBT	325	310	95	310	
	EBR	25	20	35	115	
	WBL	145	25	35	95	3900
	WBT	475	510	190	270	
	WBR	260	425	25	45	
	NBL	15	30	20	70	675
	NBT	120	120	165	235	
	NBL	40	30	95	95	
	SBL	145	190	150	165	820
	SBT	140	180	190	280	
	SBR	60	110	130	125	
	-	-	-	-	-	-

Intersection	Movement	2030		2045		Link Distance (ft)
		AM	PM	AM	PM	
		Queue (ft)	Queue (ft)	Queue (ft)	Queue (ft)	
LCR 7 & SH 402 Signal	EBL	30	100	20	25	3900
	EBT	315	390	95	150	
	EBR	30	170	15	35	
	WBL	65	50	60	45	1160
	WBT	235	260	145	145	
	WBR	15	15	10	10	
	NBL	55	85	45	75	520
	NBTR	55	105	50	65	
	SBL	30	20	40	0	680
	SBTR	20	15	20	25	
	-	-	-	-	-	-
Park/Ride & SH 402 TWSC	NBL	25	45	25	45	540
	NBR	45	50	40	40	
	EBR	0	0	0	0	1160
	WBL	25	25	30	30	1165
I-25 SB & SH 402 Roundabout	WB	90	0	130	0	680
	SB	10	15	10	20	710
	EB	35	50	50	85	1165
I-25 NB & SH 402 Roundabout	NB	20	25	25	35	720
	WB	65	50	150	95	840
	EB	50	80	70	110	680
Frontage Road & SH 402 Roundabout	NB	20	70	20	45	735
	WB	10	40	125	50	1440
	SB	30	25	80	30	850
	EB	65	535	45	85	840

5. SITE CHARACTERISTICS

The proposed development is a mixed-use site. The development is assumed to be built out by 2030 for the purposed of this study. The proposed project area is presented in **Figure 8**.

5.1 Trip Generation

To determine the impact of potential site traffic on the roadway network, expected trips associated with the proposed site were generated and applied to the study network. The Institute of Transportation Engineers (ITE) provides methods for estimating traffic volumes of common land uses in the *Trip Generation Manual (11th Edition)*. Trip generation characteristics absent any trip reductions expected for the site are shown in **Table 9**.

Based on the *ITE Trip Generation Handbook*, a mixed-use reduction was applied based on methodologies laid out the National Cooperative Highway Research Program (NCHRP) 684 methodology. A pass-by reduction was also applied for Land Use Code (LUC) 934 and LUC 945. Detailed ITE trip generation information is provided in **Appendix F**.

Table 9. West Ridge Trip Generation Summary

Land Use	ITE Code	Average Weekday	Net AM Peak Hour			Net PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
General Light Industrial	110	3,166	448	395	53	271	38	233
Single-Family Detached Housing	210	1,142	80	20	60	73	46	27
Single-Family Attached Housing	215	1,448	91	23	68	74	44	30
Shopping Plaza (40k-105k, No Supermarket)	821	5,064	121	76	45	250	123	127
Strip Retail Plaza (<40k)	822	382	16	10	6	31	16	15
High-Turnover (Sit-Down Restaurant)	932	2,144	179	99	80	116	71	45
Fast-Food Restaurant with Drive-Through Window	934	7,013	624	319	305	318	166	152
Convenience Store/Gas Station GFA (2-4k)	945	2,121	120	60	60	95	48	47

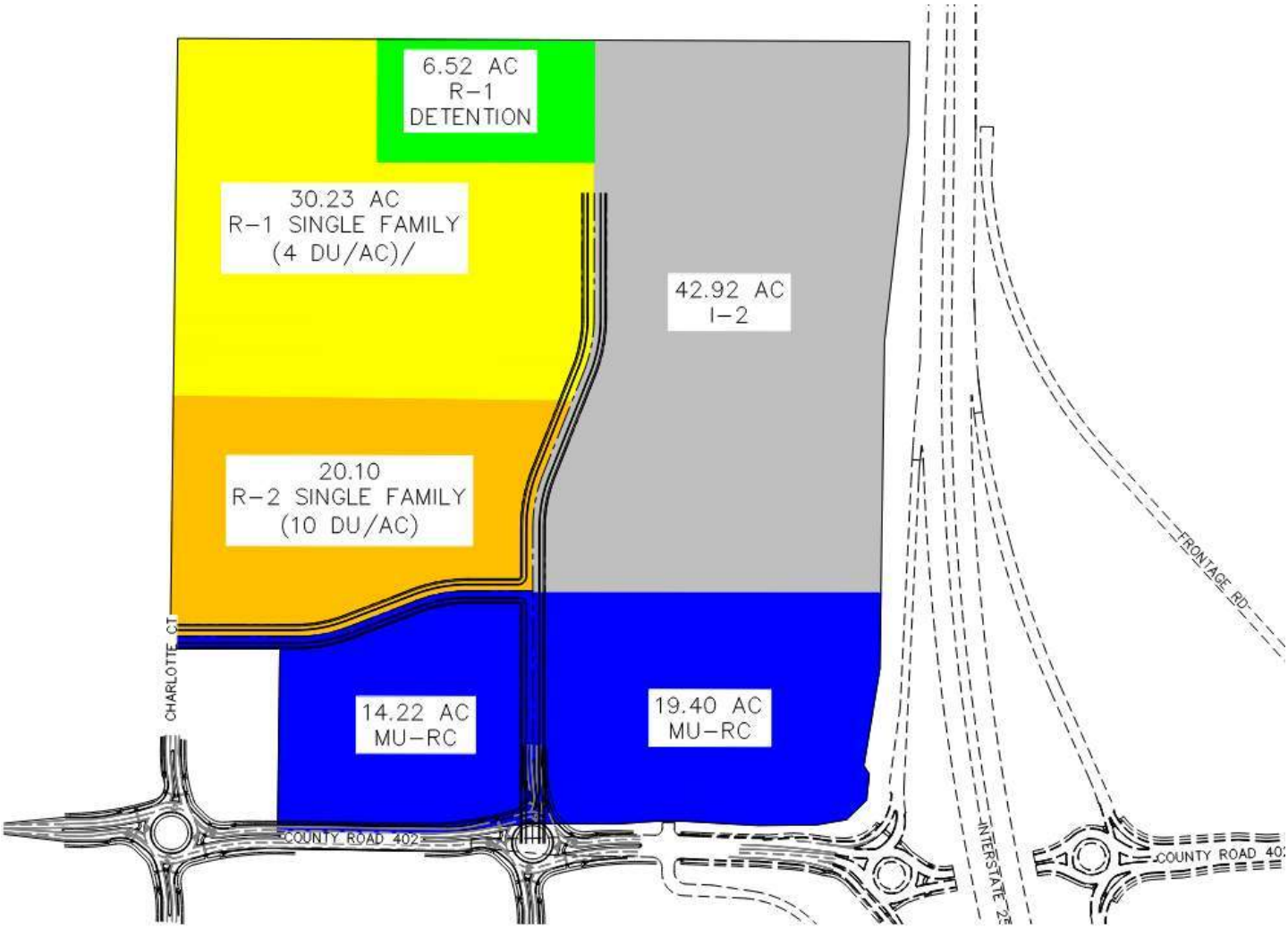


Figure 8. Site Plan.

5.2 Access Characteristics

As shown on the site plan presented in **Figure 8**, the proposed development is located on the northwest quadrant of the I-25 & SH 402 interchange. Two access points for the proposed development are planned: one drive along SH 402 and one full access drive along Charlette Court. The exact location of the access along SH 402 is undetermined; however, it is intended to generally be located midway between the southbound I-25 ramp terminal and LCR 7. This location is consistent with an unnamed drive (access point 90) shown in the *SH 402 ACP*.

The access along SH 402 is shown as full movement in the proposed site plan, which is a higher form of access than what is shown in the *SH 402 ACP*. Therefore, the access will also be considered as right-in, right-out (RIRO) and three-quarter movement (3/4 movement) to understand traffic operations as compared to the *SH 402 ACP* recommendations.

5.3 Trip Distribution

Trip generation and distribution was provided to agency staff for review using the LCUASS TIS Base Assumptions form. The expected trip distribution volumes for the proposed development are shown in **Figure 9**. The resulting Site Trips, including pass-by reductions, are shown in **Figure 10**.

Note that the SH 402 & Site Access and SH 402 & LCR 7 intersections are shown with three different distributions, concurrent to the three access configurations being examined for the site. The study is being conducted under the assumption that these are the only two intersections in the study area that would have significant differences in traffic resulting from the various access configurations.

5.4 Erlich City Development

For the 2045 scenario it is assumed that the Erlich City development will have been started or completed. This development is slated for the south side of SH 402 opposite the West Ridge development. The Elich City development is in the preliminary zoning phase and therefore details are scarce. However, initial documents show the development connecting to SH 402 at LCR 7 and the West Ridge site access point as well as connecting to LCR 16 to the south.

Like the West Ridge process the potential site traffic was developed using ITE Trip Generation Manual and applied to the roadway network. Trip generation characteristics absent any trip reductions expected for the site are shown in **Table 10**. Also like the West Ridge development, a mixed-use reduction was applied based on methodologies laid out the NCHRP 684 methodology

and pass-by reductions also applied for LUC 934 and LUC 945. Detailed ITE trip generation information is provided in **Appendix F**.

For trip distribution the northernmost plots of land are predicted to access SH 402 while 1/3rd of the southern plots are predicted to access SH 402 while the remaining traffic accesses LCR 16. This distribution is included in the **Table 10** trip distribution. A similar distribution pattern to West Ridge was applied with a slight bias to traffic accessing I-25 due to a lack of northbound on ramp at LCR 16 and I-25. The expected trip distribution volumes for the proposed development are shown in **Figure 11**. The resulting Site Trips, including pass-by reductions, are shown in **Figure 12**.

Table 10. Erlich City Trip Generation Summary

Land Use	ITE Code	Average Weekday	Net AM Peak Hour			Net PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
Low-Rise Residential with Ground Floor Retail	230	3,440	317	73	244	216	154	62
Business Park	770	4,479	389	331	58	293	77	216
Shopping Center (>150k)	820	4,997	91	57	34	306	147	159
Shopping Plaza (40k-150k)	821	3,039	63	40	23	156	77	79
Strip Retail Plaza (<40k)	822	1,226	43	26	17	99	50	49
High-Turnover (Sit-Down Restaurant)	932	1,448	104	58	46	82	51	31
Fast-Food Restaurant with Drive-Through Window	934	4,208	322	165	157	199	104	95

The resulting 2030 Total Traffic Conditions and 2045 Total Traffic Conditions volume scenarios are illustrated in **Figure 13** and **Figure 14**, respectively.

Figure 9. West Ridge Trip Distribution

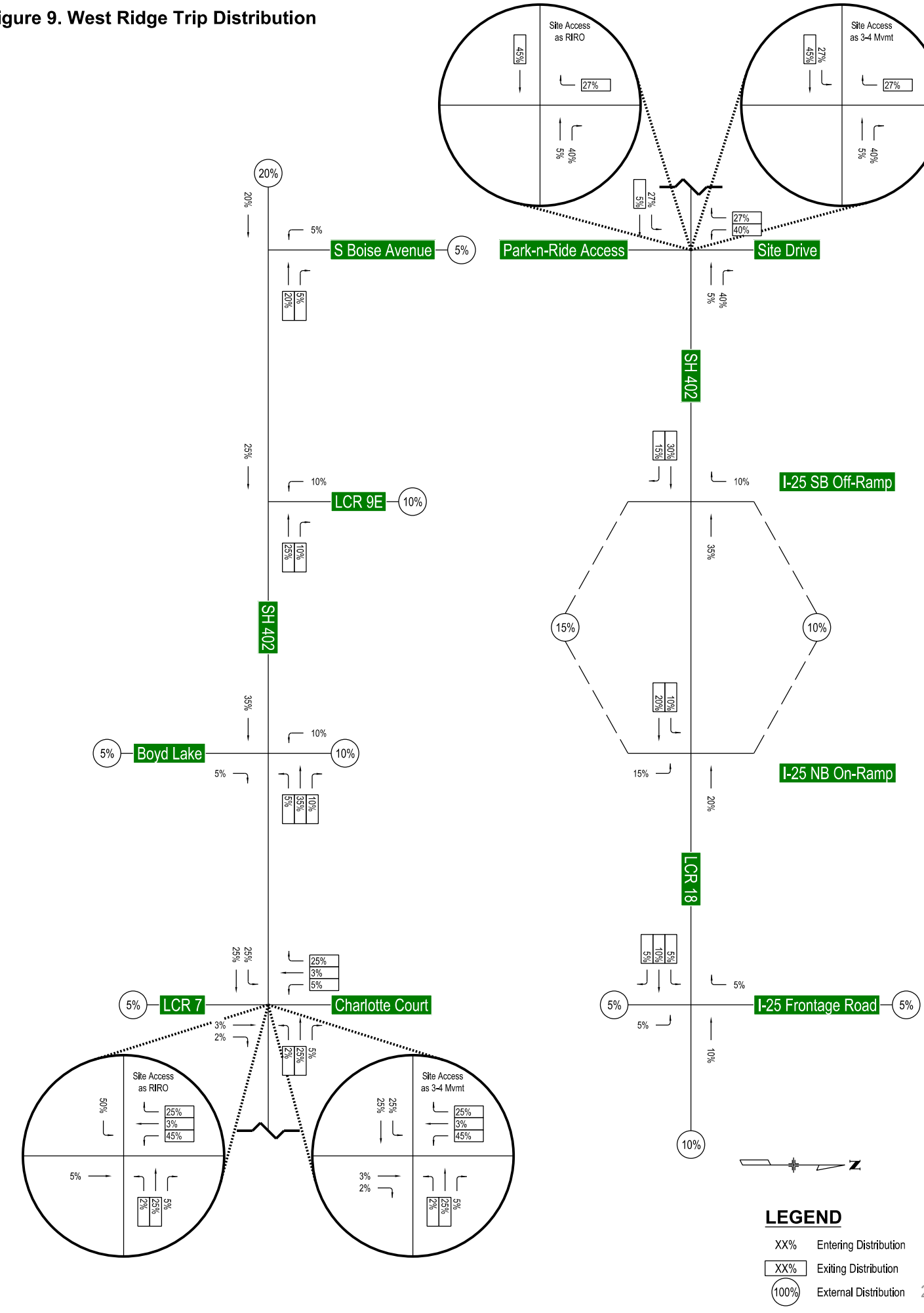


Figure 10. West Ridge Site Trips

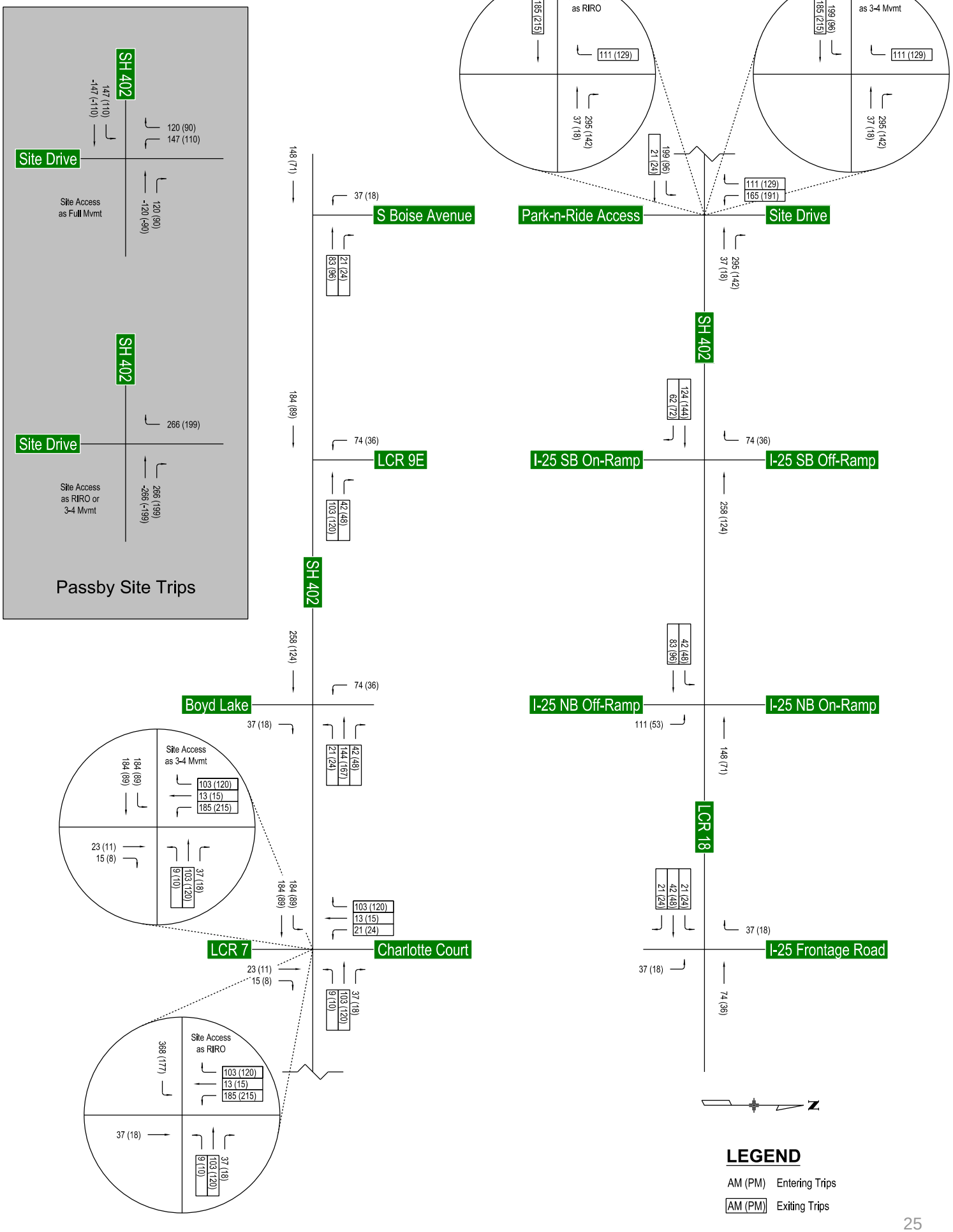


Figure 11. Erlich City Trip Distribution

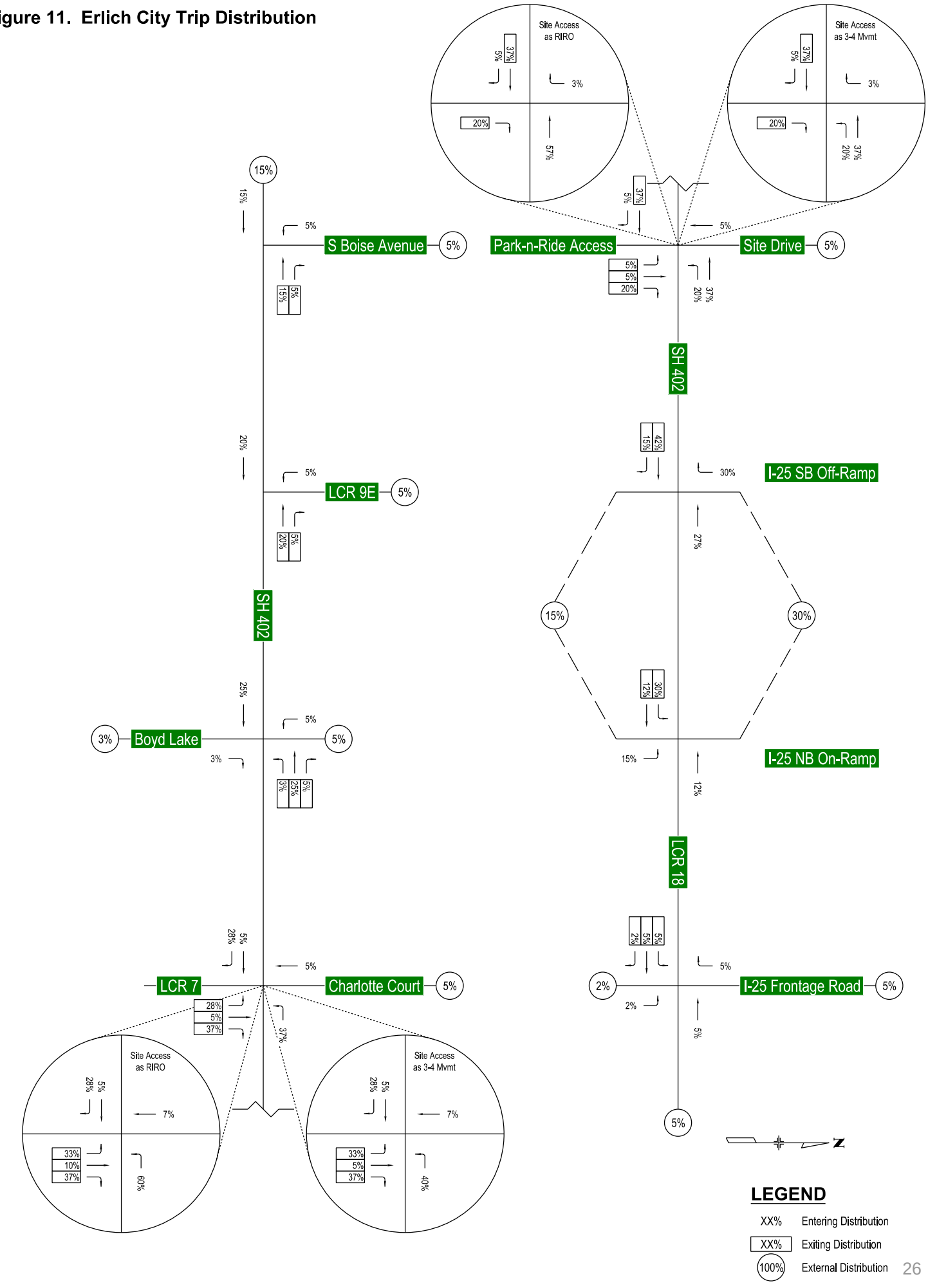


Figure 12. Erlich City Site Trips

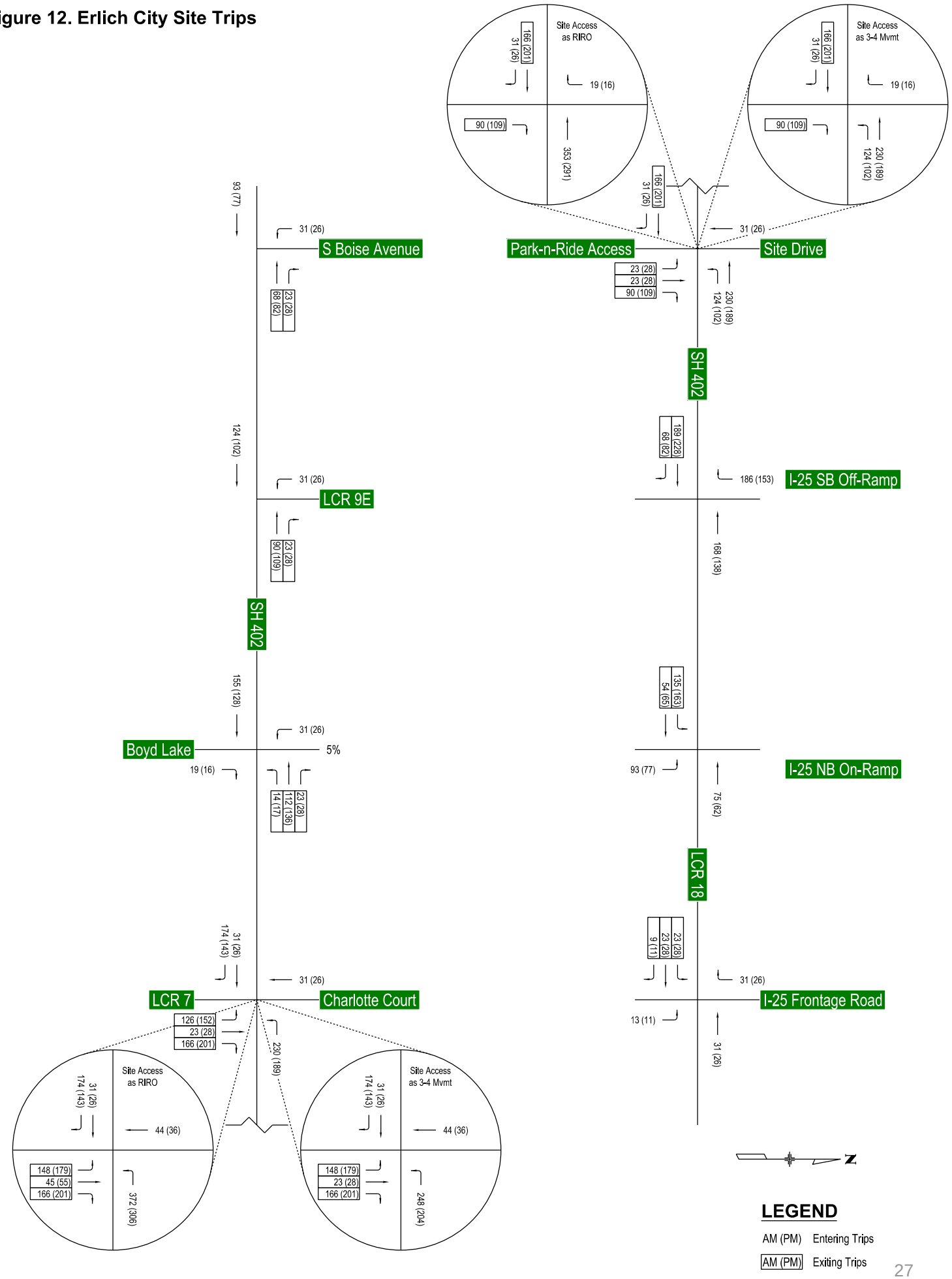


Figure 13. 2030 Total Traffic Conditions, Peak Hour Volumes

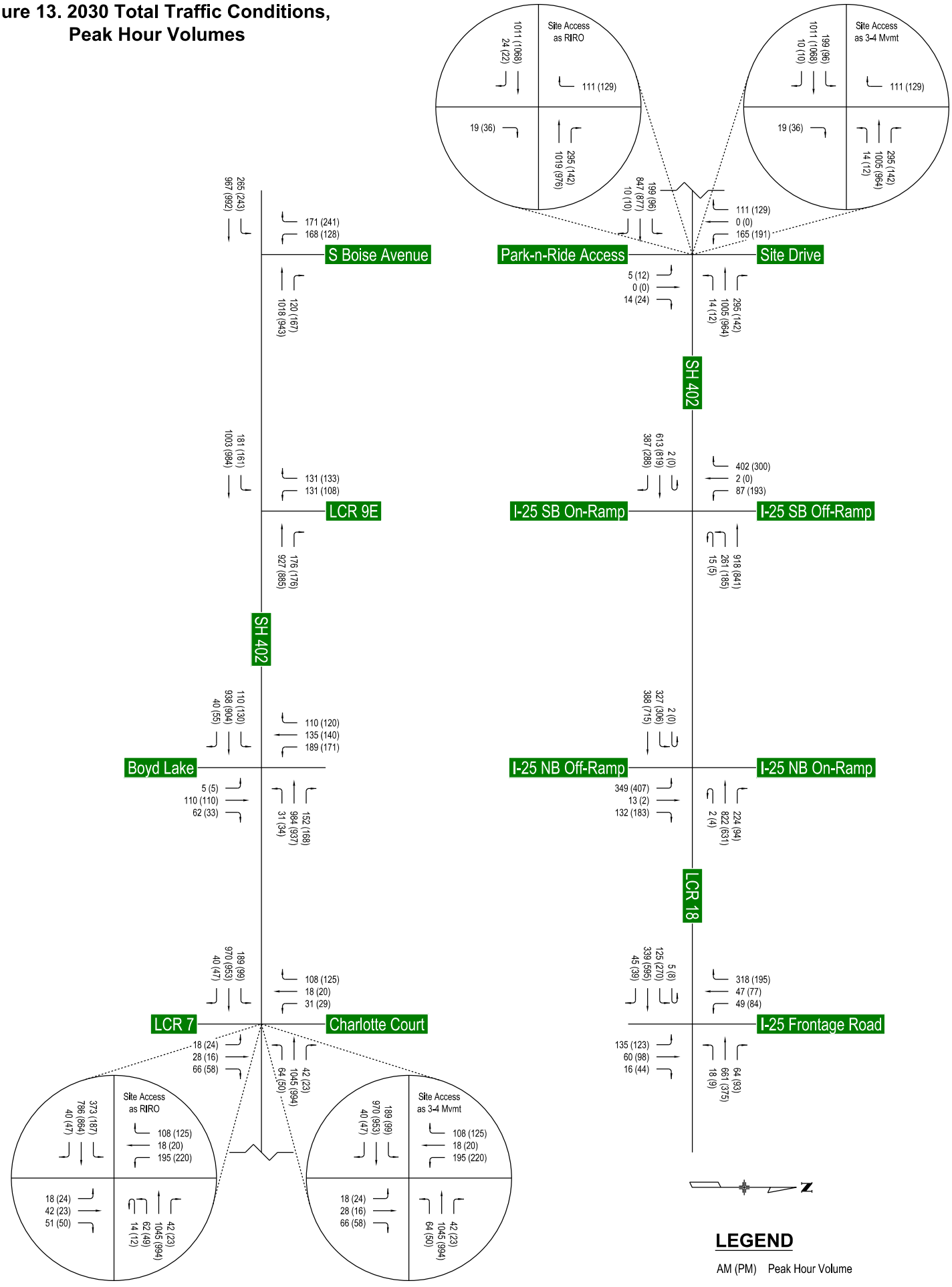
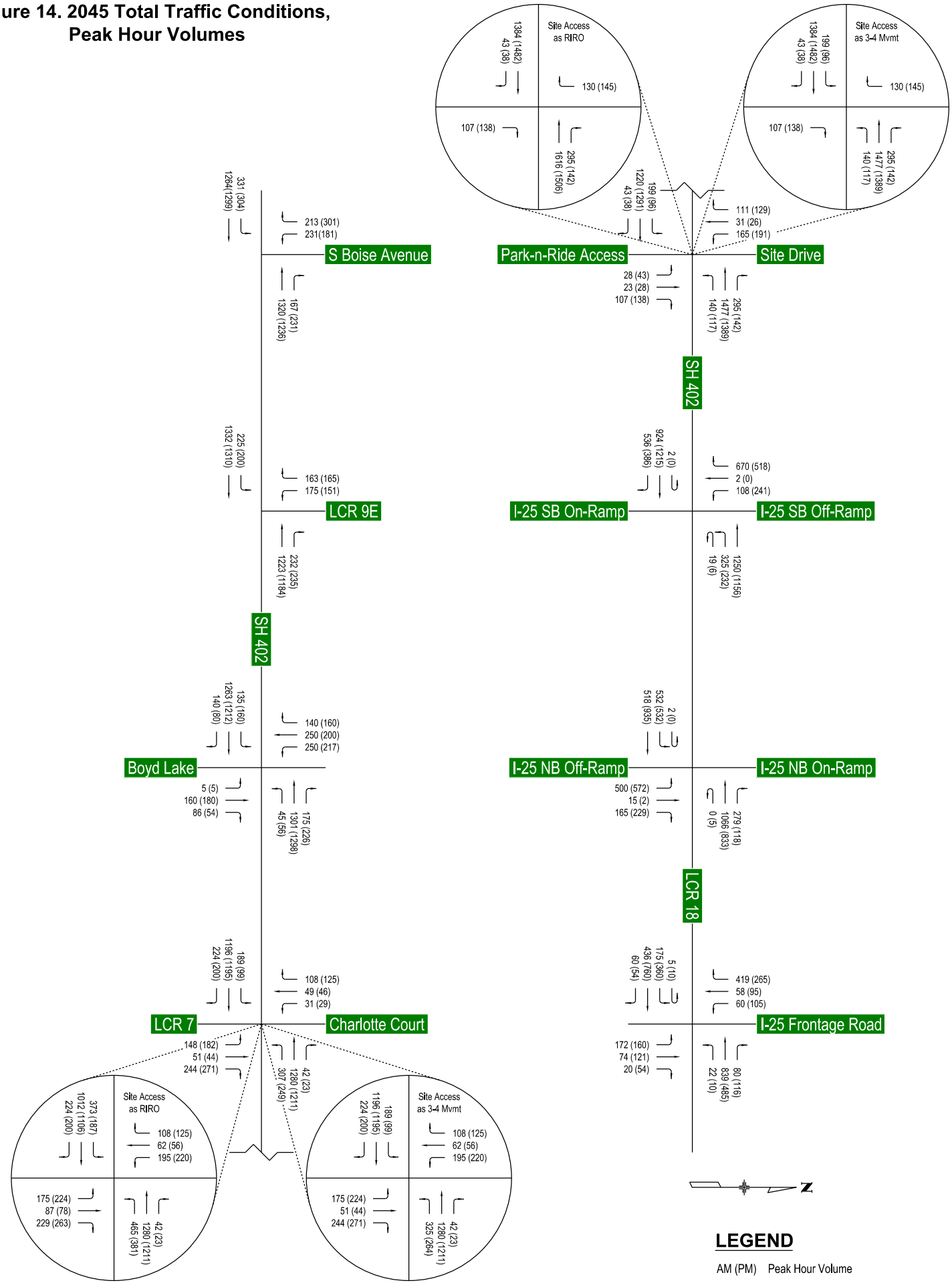


Figure 14. 2045 Total Traffic Conditions, Peak Hour Volumes



6. SITE ACCESS ANALYSIS

This analysis contemplates several configurations of the Site Access, some of which are not aligned with the recommendations of the *SH 402 ACP*. Therefore, specific analyses were conducted to understand the relative operations resulting from various combinations of access and intersection control at the Site Access and LCR 7. All analyses in this section were performed for the 2045 volume scenarios that included the ultimate widening for SH 402.

6.1 Safety Analysis

Methodology found in the 2010 Highway Safety Manual (HSM) was used to estimate the relative difference in number of expected crashes near the site, relative to several access and intersection control alternatives. This analysis also included the LCR 7 intersection because restrictions at the Site Access would result in traffic increases, and therefore increased potential for crashes, at this location.

The HSM includes methodology that predicts crashes using the traffic and geometric characteristics of the roadway, as well as observed crash data that is used for calibration. Safety Performance Functions (SPF), the statistical "base" models, are developed using the daily traffic volumes and base geometric conditions. To provide a relative comparison among the access and intersection control alternatives, the predicted crash frequency is then multiplied by the Crash Modification Factors (CMF) associated with planned geometric or traffic control alternatives. For this analysis, the methodology used is included in Chapter 12 of HSM, Predictive Method for Urban and Suburban Arterials methodology. It provides calculations based on single or multiple vehicle crash types, for roadway segments and intersections, and by crash severity.

Six different scenarios were analyzed for the impact various access configurations may have on safety. These include a signal at LCR 7 combined with the Site Access as a RIRO, 3-4 movement, signalized full movement, and roundabout. The remaining two combinations included a roundabout at LCR 7 with the Site Access as a 3-4 movement and roundabout. Results of the analysis are summarized below in **Tables 11** through **13**. Detailed results of the crash analysis are provided in **Appendix H**.

Table 11 shows the effect on crashes at the LCR 7 intersection. This summary shows that a combination of two roundabouts is expected to have the fewest predicted crashes. Note that the crashes at LCR 7 would be expected to increase slightly due to an increase in volume. Additionally, a FHWA publication titled *Safety Evaluation of Turning Movement Restrictions at Stop-Controlled Intersections* shows a CMF of 1.10 at the downstream intersection which is primarily related to additional U-turns.

Table 11. Predicted Crashes for LCR 7 & Highway 402

Access Combination		Crashes		
LCR 7	Access	FAT/INJ	PDO	Total
Signal	RIRO	2.6	4.7	7.3
Signal	3/4 Mvmt	2.5	4.4	6.9
Signal	RAB	2.3	4.2	6.5
Signal	Signal	2.3	4.2	6.5
RAB	RAB	1.9	3.4	5.3
RAB	3/4 Mvmt	2.0	3.6	5.6

Table 12 shows the predicted number of annual crashes at the Site Access. As expected, the RIRO configuration shows the fewest crashes due to several conflict points being omitted. 3-4 Movement crashes are the next least with limited conflict points and as expected roundabouts will have less crashes compared to signals.

Table 12. Predicted Crashes for Site Access & Highway 402

Access Combination		Crashes		
LCR 7	Access	FAT/INJ	PDO	Total
Signal	RIRO (North)	0.8	1.4	2.2
Signal	RIRO (South)	0.7	1.2	1.9
Signal	3/4 Mvmt	1.5	1.8	3.3
Signal	RAB	1.9	3.3	5.2
Signal	Signal	2.4	4.2	6.6
RAB	RAB	1.9	3.3	5.2
RAB	3/4 Mvmt	1.5	1.8	3.3

Finally, total crashes are summarized in **Table 13** below. These show the scenario with both intersections as roundabouts as having a similar number of predicted annual crashes with the one with a signal at LCR7 and a 3-4 movement at the Site Access. The combinations with LCR 7 as a signal or roundabout and Site Access as a 3-4 movement and the one with LCR 7 and Site Access as roundabouts demonstrated the fewest predicted annual crashes.

Table 13. Total Predicted Crashes

Access Combination		Crashes		
LCR 7	Access	FAT/INJ	PDO	Total
Signal	RIRO	4.1	7.3	11.4
Signal	3/4 Mvmt	4.0	6.2	10.2
Signal	RAB	4.2	7.5	11.7
Signal	Signal	4.7	8.4	13.1
RAB	RAB	3.8	6.7	10.5
RAB	3/4 Mvmt	3.5	5.4	8.9

6.2 Capacity Analysis

Capacity analyses were conducted for the SH 402 & LCR 7 and SH 402 & Site Access intersections under the access and traffic control combinations discussed in the crash analysis section above. These analyses were conducted using the 2045 Total Traffic volume scenario. Analysis was conducted using Synchro Version 11 based on the *Highway Capacity Manual* (HCM) delay methodologies. SIDRA was also used to analyze the capacity of the roundabouts. Results of the analyses indicate that the two intersections are expected to operate with the least total delay if LCR 7 is a signal and the Site Access is a RIRO movement. If both intersections were to be full movement intersections the signal options would provide better AM peak hour operations while there would be similar PM operations.

The Site Access and LCR 7 intersections were analyzed as both a 2x1 and 2x2 lane configuration with and without right-turn bypasses. Acceptable delay for the Site Access was achieved with two-lane approaches and two circulating lanes for eastbound and westbound, a westbound right-turn bypass lane, one-lane approaches (through/left) with a single circulating lane for northbound and southbound, and northbound and southbound right-turn bypasses. For the LCR 7 roundabout acceptable delay was achieved with two-lane approaches and two circulating lanes for eastbound and westbound, eastbound and westbound right-turn bypasses, and two-lane approaches (right and through/left) with a single circulating lane for northbound and southbound.

A summary of the overall intersection delay for each alternative is shown in **Table 14** below. Detailed results are provided in **Appendix I.**

Table 14. Intersection Level of Service Summary

Access Combination		LCR 7		Site Access	
LCR 7	**Access**	**AM**	**PM**	**AM**	**PM**
Signal	RIRO	C (28.2)	C (29.8)	A (1.7)	A (2.3)
Signal	3/4 Mvmt	C (27.4)	C (30.5)	A (4.6)	A (3.2)
Signal	RAB	C (22.0)	C (24.1)	C (25.1)	B (18.2)
Signal	Signal	B (16.1)	B (16.1)	B (17.2)	B (17.4)
RAB	RAB	C (26.6)	B (17.4)	C (25.1)	B (18.2)
RAB	3/4 Mvmt	D (40.3)	C (25.4)	A (4.6)	A (3.2)

6.3 Queuing Analysis

The 95th percentile queuing was also analyzed at the two intersections for the various access and intersection control alternatives. **Tables 15** and **16** show the critical queue lengths, meaning those that are the longest of any movement (left, through, or right) at an approach. Eastbound and westbound link distances are shown to demonstrate any conflicts between queues along SH 402.

Those shown in italics in the tables below are left turn queues. All other critical queues are through movements. As shown below, once SH 402 is widened to four lanes in each direction queues are reduced to manageable lengths and are expected to be able to be stored within turn lanes of reasonable length. Therefore, queuing was shown to not be a determining factor in the selection of an access alternative.

Table 15. Critical Queue Summary - SH 402 & LCR 7

Access Combination		AM		PM	
LCR 7	**Access**	**EB**	**WB**	**EB**	**WB**
Signal	RIRO	375'	285'	315'	275'
Signal	3/4 Mvmt	360'	260'	385'	325'
Signal	RAB	325'	265'	295'	220'
Signal	Signal	375'	280'	335'	210'
RAB	RAB	475'	730'	420'	290'
RAB	3/4 Mvmt	880'	845'	485'	510'
Link Distance		3900'	1160'	3900'	1160'

Table 16. Critical Queue Summary - SH 402 & Site Access

Access Combination		AM		PM	
LCR 7	**Access**	**EB**	**WB**	**EB**	**WB**
Signal	RIRO	-	-	-	-
Signal	3/4 Mvmt	*138'*	*43'*	*28'*	*38'*
Signal	RAB	800'	610'	555'	350'
Signal	Signal	280'	325'	305'	320'
RAB	RAB	800'	610'	555'	350'
RAB	3/4 Mvmt	*138'*	*43'*	*28'*	*38'*
Link Distance		1160'	1165'	1160'	1165'

7. TOTAL TRAFFIC CONDITIONS

This scenario considers operations of the future roadway network considering background traffic growth (as presented in **Section 4**) with the addition of proposed development volumes. **Figure 13** and **Figure 14** illustrate the expected 2030 Total Traffic and 2045 Total Traffic volumes, respectively (as presented in **Section 5**).

7.1 2030 Total Traffic Capacity Analysis

Capacity analysis was performed for 2030 plus Site Conditions using the methodologies described in **Section 3.2**. The 2030 Total Traffic conditions are based on geometry and intersection control that is LCR 7 with two approach lanes to a two-lane circulating roundabout on SH 402 and single approach lanes with one-lane circulating for the north and south approaches. It also assumes the new Site Access is constructed with two approach lanes to a two-lane circulating roundabout with the north leg only having one approach. The Park-n-Ride intersection would remain in place and be converted to a RIRO driveway. All other intersections west of LCR 7 are as shown in the 2030 Background scenarios and those east of the Site Access are unchanged from Existing conditions. The same or similar transitions between the intersections of LCR 7 and the Site Access would be constructed in accordance with the adjusted intersection location. The SH 402 four-lane widening is not considered for this scenario.

All the signalized intersections are expected to operate at an overall LOS D or better both peak hour periods. Individual movements are expected to operate at a LOS D or better with acceptable 95th-percentile queue lengths during both peak hour periods with the exceptions of the movements summarized below.

- Boise Avenue & SH 402 - The eastbound left-turn lane movement (AM) is expected to operate at LOS E. The average delay per vehicle for this movement is 64 seconds. The southbound left-turn lane movement (AM) is expected to operate at a LOS E. The average delay per vehicle for this movement is 69 seconds.
- Boyd Lake Avenue & SH 402 – The northbound thru lane movement (AM) is expected to operate at a LOS E. The average delay per vehicle for this movement is 71 seconds. The southbound left-turn lane (AM/PM) is expected to operate at LOS E. The average delay per vehicle for this movement is 68/69 seconds.

All the roundabout intersections are expected to operate at an overall and by movement LOS C or better. The 2030 plus Site capacity analysis summary is illustrated in **Table 17** and **18**. The 95th percentile queues are summarized in **Table 19.** Detailed results are provided in **Appendix J.**

7.2 2045 Total Traffic Capacity Analysis

Capacity analysis was performed for 2045 Total Traffic Conditions using the methodologies described in **Section 3.2**. The 2045 Total Traffic conditions are based on geometry and intersection control described in **Section 6.2** with LCR 7 and Site Access are 2x1 roundabouts with the necessary right-turn bypasses. The Park-n-Ride access has been eliminated and tied into the south leg of the Site Access roundabout with the Erlich city development. The SH 402 four-lane widening has been implemented and all other study intersections west of LCR 7 have been signalized and improved with left and right turn lanes. The roundabouts east of LCR 7 are unchanged from 2030 Total Traffic conditions with the exception of County Road 18 being widened immediately east of the Frontage Road roundabout to allow two eastbound through lanes.

All the signalized intersections are expected to operate at an overall LOS D or better both peak hour periods. Individual movements are expected to operate at a LOS D or better with acceptable 95th-percentile queue lengths during both peak hour periods. All roundabout intersections are expected to operate at an overall LOS C or better both peak hour periods. Individual movements are expected to operate at a LOS C or better with acceptable 95th-percentile queue lengths during both peak hour periods with the exceptions of the movements summarized below.

- I-25 NB & SH 402 - The westbound movement (AM) is expected to operate at LOS E. The average delay per vehicle for this movement is 50 seconds. The westbound 95th-percentile queue (AM) is expected to be 670’.
- LCR 7/Charlotte Court & SH 402 - The westbound 95th-percentile queue (AM) is expected to be 730’.
- Site Access/Erlich City Access & SH 402 - The 95th-percentile queue (AM) is expected to be 800’. The eastbound 95th-percentile queue (AM/PM) is expected to be 610’/555’.

The queue lengths are exacerbated by the high existing percentage of heavy vehicles. Lower percentages of heavy vehicles may occur if SH 402 becomes a roundabout corridor which will reduce these queues. The 2045 plus Site capacity analysis summary is illustrated in **Table 17** and **Table 18**. The 95th percentile queues are summarized in **Table 19.** Detailed results are provided in **Appendix J.**

Table 17. Total Traffic Conditions, Capacity Analysis Summary (Pt. 1)

Intersection	Movement	2030				2045			
		AM		PM		AM		PM	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Boise & SH 402 Signal	EBL	E	64.3	C	30.9	D	36.7	C	26.9
	EBT	A	8.3	B	11.5	A	6.6	A	7.4
	WBT	C	26.9	C	25.4	D	35.8	B	15.6
	WBR	A	3.2	A	3.3	A	8.4	A	3.6
	SBL	E	68.8	C	33.7	D	53.4	D	39.2
	SBR	D	35.7	C	25.7	C	20.1	D	35.1
	Overall	**C**	**26.2**	**B**	**19.9**	**C**	**24.5**	**B**	**15.8**
LCR 9E & SH 402 Signal	EBL	C	28.1	C	21.7	A	7.7	A	6.4
	EBT	B	11.6	B	11.9	A	8.7	A	7.2
	WBT	B	16.2	C	25.0	A	1.1	A	0.3
	WBR	A	1.7	A	3.3	A	0.2	A	0.0
	SBL	D	47.3	D	38.1	D	43.2	D	43.1
	SBR	D	35.3	C	26.2	C	32.0	D	37.1
	Overall	**B**	**16.4**	**B**	**18.6**	**A**	**8.2**	**A**	**6.4**
Boyd Lake & SH 402 Signal	EBL	D	43.6	C	32.0	B	18.3	C	23.1
	EBT	C	22.2	B	19.9	C	29.3	C	34.8
	EBR	A	6.9	A	6.5	B	16.6	C	20.4
	WBL	C	21.4	B	17.6	C	31.9	B	16.8
	WBT	D	39.8	C	29.2	C	20.3	C	22.6
	WBR	A	8.6	A	7.8	A	6.7	B	13.6
	NBL	D	50.5	D	42.6	D	39.3	C	32.4
	NBT	E	70.6	D	38.4	D	48.8	C	28.6
	NBR	D	49.4	A	0.0	D	43.5	C	25.4
	SBL	E	67.8	E	68.6	D	49.4	D	45.9
	SBT	D	40.6	D	39.4	C	31.3	C	29.0
	SBR	C	34.4	C	33.8	C	29.4	C	23.6
	Overall	**D**	**35.5**	**C**	**28.7**	**C**	**27.7**	**C**	**28.4**

Table 178. Total Traffic Conditions, Capacity Analysis Summary (Pt. 2)

Intersection	Movement	2030				2045			
		AM		PM		AM		PM	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
LCR 7 & SH 402 Roundabout	NB	B	11.5	A	9.7	C	31.1	C	23.7
	WB	B	10.1	A	7.8	C	31.7	B	18.8
	SB	B	14.4	B	12.8	C	20.7	B	17.8
	EB	A	8.4	A	7.5	C	20.8	B	13.8
Site Access & SH 402 Roundabout	NB	-	-	-	-	B	10.1	B	10.3
	WB	A	12.0	A	8.5	C	25.3	B	14.1
	SB	C	31.9	C	28.6	C	27.0	B	17.6
	EB	A	8.9	A	9.3	C	26.1	C	24.2
Park/Ride & SH 402 RIRO	EBR	A	0.0	A	0.0	-	-	-	-
	NBR	B	13.0	B	13.8	-	-	-	-
I-25 SB & SH 402 Roundabout	WB	A	5.9	A	5.4	B	19.8	A	5.2
	SB	B	10.6	A	6.2	C	27.4	B	13.5
	EB	A	4.3	A	6.3	A	6.8	B	11.3
I-25 NB & SH 402 Roundabout	NB	A	6.0	A	6.4	A	8.7	B	10.2
	WB	B	11.8	A	8.8	E	50.2	C	22.2
	EB	A	4.3	A	4.9	A	5.3	A	6.1
Frontage Road & SH 402 Roundabout	NB	A	6.5	B	15.4	A	8.7	B	11.2
	WB	B	10.4	A	8.0	B	17.4	B	10.0
	SB	A	7.6	A	4.7	C	30.4	A	5.3
	EB	A	8.6	B	19.3	A	7.2	B	10.3

Table 19. Total Traffic Conditions, Queuing Analysis Summary

Intersection	Movement	2030		2045		Link Distance (ft)
		AM	PM	AM	PM	
		Queue (ft)	Queue (ft)	Queue (ft)	Queue (ft)	
Boise & SH 402 Signal	EBL	430	200	340	225	1200
	EBT	620	265	170	150	
	WBT	1120	385	390	285	7200
	WBR	720	75	65	80	
	SBL	210	145	230	195	785
	SBR	190	150	185	200	
	-	-	-	-	-	-
LCR 9E & SH 402 Signal	EBL	240	120	150	175	7200
	EBT	285	220	175	155	
	WBT	465	420	335	260	3135
	WBR	55	55	95	80	
	SBL	155	125	185	185	740
	SBR	145	85	120	105	
	-	-	-	-	-	-
Boyd Lake & SH 402 Signal	EBL	135	115	115	130	3125
	EBT	350	240	290	310	
	EBR	25	25	90	45	
	WBL	50	40	70	55	3900
	WBT	565	285	275	270	
	WBR	50	40	55	90	
	NBL	20	25	20	35	675
	NBT	130	150	170	140	
	NBR	80	45	60	45	
	SBL	190	350	265	325	820
	SBT	165	355	205	275	
	SBR	115	80	95	90	
	-	-	-	-	-	-

Intersection	Movement	2030		2045		Link Distance (ft)
		AM	PM	AM	PM	
		Queue (ft)	Queue (ft)	Queue (ft)	Queue (ft)	
LCR 7 & SH 402 Roundabout	NB	30	20	115	105	3900
	WB	120	90	730	420	1160
	SB	45	45	50	50	520
	EB	110	90	475	290	680
Site Access/Park-n-Ride & SH 402 Roundabout	NB	-	-	30	35	540
	WB	210	120	800	350	1165
	SB	150	155	120	95	680
	EB	115	115	610	555	1160
Park/Ride & SH 402 RIRO	EBR	0	0	-	-	-
	NBR	35	40	-	-	-
I-25 SB & SH 402 Roundabout	WB	135	95	255	0	680
	SB	10	15	15	20	710
	EB	50	65	115	220	1165
I-25 NB & SH 402 Roundabout	NB	30	30	55	70	720
	WB	145	75	670	210	840
	EB	70	100	0	195	680
Frontage Road & SH 402 Roundabout	NB	30	75	45	40	735
	WB	90	45	210	65	1440
	SB	60	25	245	35	850
	EB	95	535	65	105	840

8. ACCESS CONTROL PLAN AMENDMENT

In March 2021, CDOT and the communities along SH 402 between I-25 and US 287 approved the *SH 402 Access Control Plan*. The approval of the proposed access to the West Ridge development will require an amendment to the plan. The adopted plan anticipates the following access configuration near the location of the proposed access:

- Access point 87 (LCR 7 & Charlotte Court)
  - Full movement; Four-legged Intersection; candidate for signalization
- Access points 89 and 90 (~1,175 feet west of SB I-25 RAB)
  - ¾ movement (conditional); unsignalized
  - May be limited to right-in, right-out if safety or operational issues develop
- Access point 91 (Park-n-ride access ~725 feet west of SB I-25 RAB)
  - Close access and move to Access point 90
- Access point 91.5 (~725 feet west of SB I-25 RAB)
  - right-in, right-out (conditional); unsignalized
  - shall close when Access 89 is implemented.

Access for this site is being considered for a location at access points 89/90 as shown in the *SH 402 ACP*. The proposal will generally follow the consolidation as described above but would elevate the level of access at access point 89/90 to full movement. For this to be acceptable, an evaluation of the proposed changes would need to demonstrate no overall negative impacts as compared to the *SH 402 ACP*.

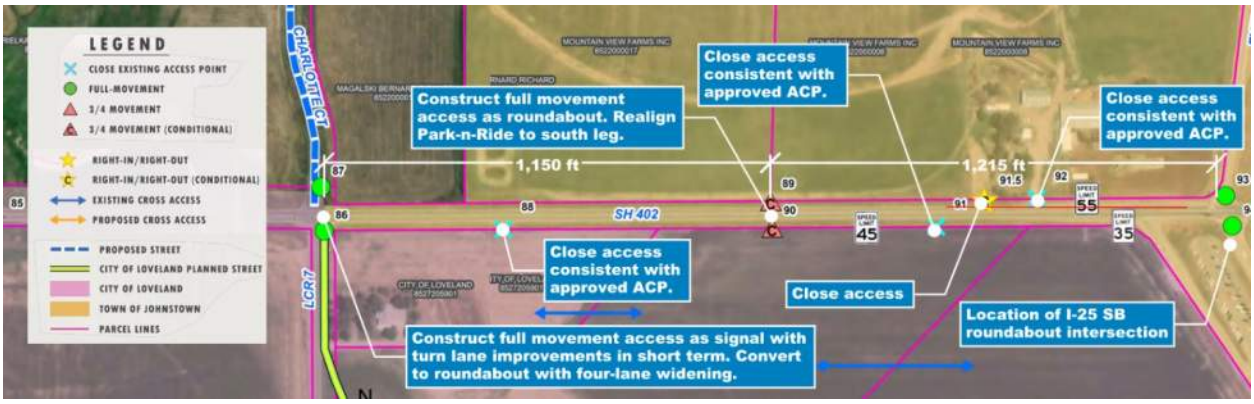
An interim analysis contemplates the following changes to the access for the Design Year 2030.

- Access point 87 (LCR 7 & Charlotte Court)
  - Full movement signalized intersection on opening day
  - Convert to a roundabout
- Access points 89 and 90 (~1,165 feet west of SB I-25 RAB)
  - Full movement roundabout intersection
- Access point 91 (Park-n-ride access ~725 feet west of SB I-25 RAB)
  - Converted to a RIRO driveway
- Access point 91.5 (~725 feet west of SB I-25 RAB)
  - Close with construction of the site

The final analysis contemplates the following additional changes to the access for the Design Year 2045.

- Access point 87 (LCR 7 & Charlotte Court)
  - A roundabout with four-lane widening
- Access point 91 (Park-n-ride access ~725 feet west of SB I-25 RAB)
  - Close access and move to Access point 90 to be south leg of the roundabout

The proposed location for access points 89/90, which would be the Site Access on the north leg and the Erlich City and Park-n-Ride access as the south leg, would result in a center-to-center intersection spacing of approximately 1,160 feet among LCR 7, the Site Access, and the Southbound I-25 Ramp Terminal. Proposed access modifications are depicted in **Figure 15**.



Background Image Credit: Loveland State Highway 402 Access Control Plan (Stolfus & Associates)

Figure 15. SH 402 ACP Proposed Modifications

Several analyses were conducted to determine the optimal access configurations and intersection control including capacity and queuing analyses and predictive crash analysis. Analyses were focused on the relative differences at SH 402 & LCR 7 and SH 402 & Site Access as those would be impacted by changes in traffic patterns due to access restrictions at the Site Access.

Analyses are discussed in detail within Section 6 and Section 7 of this report. To reiterate the findings of those analyses, an ultimate configuration of full-movement intersections as roundabouts at SH 402 & LCR 7 and SH 402 & Site Access are expected to provide comparable operations, as the base condition of full movement (signalized) at SH 402 & LCR 7 and three-quarter movement at SH 402 & Site Access. This is due to the following factors:

- Safety Analysis – The Site Access as a roundabout is expected to perform similarly as to the three-quarter condition and the LCR 7 intersection slightly better due to the benefits of conversion to a roundabout and elimination of traffic diversion from the Site Access.

- Capacity Analysis – As roundabouts in the ultimate condition the SH 402 & LCR 7 and SH 402 & Site Access intersections show similar PM delay. While AM delay is slightly higher, but still acceptable.
- Queueing Analysis – Similar to capacity analysis results, 95th percentile queues are expected to be higher in the AM and similar in the PM.
- 2030 RIRO Park-n-Ride – The interim Park-n-Ride conversion to a RIRO has no noticeable effect on 2030 safety, capacity, or queuing. Additional U-turns at the adjacent roundabouts also do not have noticeable effects on those intersections. For safety it is recommended that the median between eastbound and westbound traffic be raised to eliminate any left-turn or mid-block U-turn movements.

In addition to the analyses discussed above, configuring the SH 402 & LCR 7 and SH 402 & Site Access intersections as roundabouts is a natural extension of the three roundabouts located at the I-25 ramp terminals and the frontage road. As the area urbanizes, this segment of the corridor can provide an ideal setting for all users to feel comfortable traveling the corridor and provide improved safety and traffic calming over an alternative with conventional intersections.

The Town of Johnstown and the developer of the property are respectfully requesting an amendment to the *SH 402 ACP* to allow the intersection to be constructed as a full movement roundabout. Traffic analysis of the intersection under this configuration are shown to be acceptable and, in some ways, more beneficial as compared to the current configuration shown in the *SH 402 ACP*.

The approved *SH 402 ACP* shows SH 402 & LCR 7 as a full-movement signal and the Site Access as a three-quarter movement intersection midway between LCR 7 and the Southbound I-25 Ramp Terminal. It is recommended that the Site Access be modified in the *SH 402 ACP* from the ¾ movement intersection to roundabout on opening day of the development. The LCR 7 intersection may be constructed as a signal with turn lane improvements on opening day but should ultimately be constructed as a roundabout when the four-lane widening is performed.

9. SUMMARY

This study documents the expected traffic volumes added to the network and identifies recommendations related to site access and public improvements for each a mixed-use development in Johnstown, Colorado. This site is located on the northwest corner of the I-25 & SH 402 interchange. Based on the preceding analysis, the following can be concluded:

- The site is expected to add 22,480 daily trips, 1,679 trips in the AM peak hour, and 1,228 trips in the PM peak hour.
- The proposed site access is a full-movement intersection along SH 402 between LCR 7 and SB I-25 ramps and a full-movement intersection on LCR 7. The access along SH 402 is a higher level of access as compared to what is shown in the *SH 402 ACP*. This requires an ACP amendment.
- Several design alternatives were considered for the intersections of SH 402 & LCR 7 and SH 402 & Site Access. These include various combinations of LCR as a signal or roundabout combined with Site Access as a signal, RIRO, 3-4 movement, or roundabout.
- The alternative with both intersections as roundabouts appears to perform similarly to signalized intersections is the recommended configuration for the long-term horizon.
    - In the short term a traffic signal may be constructed here until the ultimate widening of SH 402 is performed.

Proposed drives and recommended improvements should be constructed following agency guidelines. Additionally, the following improvements should be made commensurate to each traffic volume scenario shown below.

9.1 Existing Conditions

No improvements.

9.2 2030 Background Conditions

Boise Ave and SH 402:

- Add westbound right-turn lane

CR 9E and SH 402:

- Signalize Intersection

CR 7/Charlotte Court and SH 402:

- Roundabout Intersection. Two-lane eastbound and westbound approaches with two-circulating lanes and one-lane northbound and southbound approaches with one-circulating lane.

- Signalize Intersection. Note interim signalization is justified based on linear growth to ultimate traffic volumes should it be selected. Eastbound left-turn and right-turn lanes and a westbound left-turn lane will be required for a signalized intersection.

9.3 2045 Background Conditions

- Widen SH 402 to a four-lane divided section.
- Widen County Road 18 immediately east of Frontage Road to a four-lane divided section.
- Left and right turn lanes should be constructed along all SH 402 (EB/WB) approaches.
- Signalized intersections will include:
    - Boise Avenue
    - LCR 9E
    - Boyd Lake Road
- Roundabout intersections should include:
    - LCR 7
    - I-25SB Ramps
    - I-25 NB Ramps
    - Frontage Road

9.4 2030 Total Traffic Conditions

Park-n-Ride and SH 402:

- Construct intersection as RIRO.
- Construct raised median between Site Access and SB I-25 ramps.

Site Access and SH 402:

- Construct intersection as roundabout. Two-lane approach and two-circulating lanes eastbound and westbound and one-lane approach and one-circulating lane southbound.

LCR 7/Charlotte Court and SH 402:

A traffic signal with dedicated left and right turn lanes for each approach is expected to provide acceptable operations in the short term and approximately ten years beyond that. Note that this intersection satisfies the crash signal warrant. Should the intersection not be signalized by the opening day of the site, it is expected that the intersection would satisfy volume-based signal warrants with site traffic. Additional turn lane improvements should include left and right turn lanes on all approaches.

An exhibit showing the potential configuration of the SH 402 Corridor with a signal at LCR 7 and the ultimate roundabout at the Site Access is shown in **Appendix K**.

Contingent on funding becoming available, it would be ideal to construct the intersection in its final configuration as a roundabout immediately. This would optimize traffic operations, avoid

“throw away” infrastructure, and avoid future disruption of traffic during reconstruction. If constructed, the roundabout should be coupled with widening of SH 402.

9.5 2045 Total Traffic Conditions

- Close Park-n-Ride access and combine with Erlich City for south leg of Site Access roundabout.
- Construct the Site Access as a roundabout, aligning the access to the property south of SH 402 as the south leg. Add right-turn bypasses for westbound, northbound, and southbound approaches.
- Construct LCR 7/Charlotte Ct as a roundabout adding right-turn bypasses for eastbound and westbound approaches.

An exhibit showing the ultimate recommended configuration of the SH 402 Corridor with a roundabout at LCR 7 and the Site Access is shown in **Appendix K**.

APPENDIX A

Traffic Impact Study Scoping Form

Attachment A
Transportation Impact Study Base Assumptions

Project Information			
Project Name	West Ridge		
Project Location	Northwest corner of I-25 & Highway 402		
TIS Assumptions			
Type of Study	Full: X		Intermediate:
	MTIS:		Memo:
Study Area Boundaries	North: Property Line		South: Highway 402
	East: I-25 Frontage Road		West: Boise Ave
Study Years	Short Range: 2030		Long Range: 2045
Future Traffic Growth Rate	1.5% (per 1.35 20yr growth factor from CDOT OTIS)		
Study Intersections	1. All access drives		5. LCR 7 & Hwy 402
	2. Boise & Hwy 402		6. I-25 SB Ramps & Hwy 402
	3. Boyd Lake Rd & Hwy 402 (future)		7. I-25 NB Ramps & Hwy 402
	4. LCR 9 & Hwy 402		8. I-25 Frontage Rd & Hwy 402
Time Period for Study	AM: 7:00-9:00	PM: 4:00-6:00	Sat Noon:
Trip Generation Rates	See attached		
Trip Adjustment Factors	Passby: See attached	Captive Market: 10% Daily (estimated); 10% AM; 20% PM	
Overall Trip Distribution	SEE ATTACHED SKETCH		
Mode Split Assumptions	100% vehicular		
Design Vehicle Information	WB-67		
Committed Roadway Improvements	LCR 7 Extension (north leg) and full signalization Future 4-Lane widening of Highway 402 Future Boyd Lake Road intersection (signalized)		
Other Traffic Studies	Highway 402 Access Control Plan		
Areas Requiring Special Study	HSM-Based Safety Analysis Progression Analysis - include flows and queues in the TSD		

Date: February 23, 2023

Traffic Engineer: _____

Local Entity Engineer: _____

APPENDIX B
Data Collection

All Traffic Data Services

SITE 7_E - CO-402 EAST OF CHARLOTTE COURT

Time	EB	WB	Total
10/20/2022	10	11	21
10/20/2022 12:15:00 AM	6	13	19
10/20/2022 12:30:00 AM	5	8	13
10/20/2022 12:45:00 AM	4	6	10
10/20/2022 1:00:00 AM	4	7	11
10/20/2022 1:15:00 AM	2	6	8
10/20/2022 1:30:00 AM	3	9	12
10/20/2022 1:45:00 AM	3	4	7
10/20/2022 2:00:00 AM	3	6	9
10/20/2022 2:15:00 AM	6	5	11
10/20/2022 2:30:00 AM	6	6	12
10/20/2022 2:45:00 AM	4	3	7
10/20/2022 3:00:00 AM	5	5	10
10/20/2022 3:15:00 AM	13	4	17
10/20/2022 3:30:00 AM	9	3	12
10/20/2022 3:45:00 AM	22	7	29
10/20/2022 4:00:00 AM	22	8	30
10/20/2022 4:15:00 AM	30	8	38
10/20/2022 4:30:00 AM	35	17	52
10/20/2022 4:45:00 AM	38	23	61
10/20/2022 5:00:00 AM	73	13	86
10/20/2022 5:15:00 AM	82	28	110
10/20/2022 5:30:00 AM	93	64	157
10/20/2022 5:45:00 AM	135	70	205
10/20/2022 6:00:00 AM	128	78	206
10/20/2022 6:15:00 AM	148	107	255
10/20/2022 6:30:00 AM	189	149	338
10/20/2022 6:45:00 AM	178	168	346
10/20/2022 7:00:00 AM	186	156	342
10/20/2022 7:15:00 AM	186	215	401
10/20/2022 7:30:00 AM	191	252	443
10/20/2022 7:45:00 AM	204	209	413
10/20/2022 8:00:00 AM	159	206	365
10/20/2022 8:15:00 AM	152	167	319
10/20/2022 8:30:00 AM	154	165	319
10/20/2022 8:45:00 AM	136	162	298
10/20/2022 9:00:00 AM	115	120	235
10/20/2022 9:15:00 AM	134	107	241
10/20/2022 9:30:00 AM	103	131	234
10/20/2022 9:45:00 AM	99	126	225
10/20/2022 10:00:00 AM	110	107	217
10/20/2022 10:15:00 AM	93	114	207
10/20/2022 10:30:00 AM	118	115	233
10/20/2022 10:45:00 AM	105	140	245
10/20/2022 11:00:00 AM	124	98	222
10/20/2022 11:15:00 AM	104	108	212
10/20/2022 11:30:00 AM	116	123	239
10/20/2022 11:45:00 AM	106	105	211
Total	3,951	3,762	7,713
Percentage	51.2%	48.8%	
Peak Hour	7:00 AM	7:15 AM	7:15 AM
Volume	767	882	1,622
PHF	0.940	0.875	0.915

All Traffic Data Services

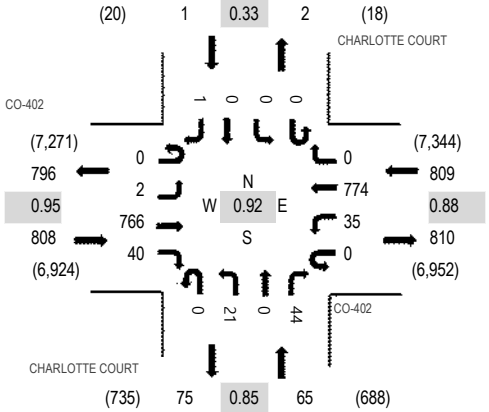
SITE 7_E - CO-402 EAST OF CHARLOTTE COURT

Time	EB	WB	Total
10/20/2022 12:00:00 PM	109	136	245
10/20/2022 12:15:00 PM	114	108	222
10/20/2022 12:30:00 PM	121	139	260
10/20/2022 12:45:00 PM	93	120	213
10/20/2022 1:00:00 PM	107	113	220
10/20/2022 1:15:00 PM	117	130	247
10/20/2022 1:30:00 PM	132	138	270
10/20/2022 1:45:00 PM	113	122	235
10/20/2022 2:00:00 PM	128	149	277
10/20/2022 2:15:00 PM	144	130	274
10/20/2022 2:30:00 PM	134	164	298
10/20/2022 2:45:00 PM	162	163	325
10/20/2022 3:00:00 PM	138	159	297
10/20/2022 3:15:00 PM	145	172	317
10/20/2022 3:30:00 PM	172	187	359
10/20/2022 3:45:00 PM	175	217	392
10/20/2022 4:00:00 PM	190	197	387
10/20/2022 4:15:00 PM	197	188	385
10/20/2022 4:30:00 PM	211	186	397
10/20/2022 4:45:00 PM	205	199	404
10/20/2022 5:00:00 PM	189	187	376
10/20/2022 5:15:00 PM	205	237	442
10/20/2022 5:30:00 PM	183	208	391
10/20/2022 5:45:00 PM	130	167	297
10/20/2022 6:00:00 PM	125	152	277
10/20/2022 6:15:00 PM	133	149	282
10/20/2022 6:30:00 PM	124	137	261
10/20/2022 6:45:00 PM	89	130	219
10/20/2022 7:00:00 PM	65	88	153
10/20/2022 7:15:00 PM	64	99	163
10/20/2022 7:30:00 PM	62	68	130
10/20/2022 7:45:00 PM	55	56	111
10/20/2022 8:00:00 PM	38	59	97
10/20/2022 8:15:00 PM	46	38	84
10/20/2022 8:30:00 PM	46	50	96
10/20/2022 8:45:00 PM	37	59	96
10/20/2022 9:00:00 PM	29	41	70
10/20/2022 9:15:00 PM	38	39	77
10/20/2022 9:30:00 PM	33	35	68
10/20/2022 9:45:00 PM	26	30	56
10/20/2022 10:00:00 PM	23	20	43
10/20/2022 10:15:00 PM	26	27	53
10/20/2022 10:30:00 PM	12	24	36
10/20/2022 10:45:00 PM	8	24	32
10/20/2022 11:00:00 PM	10	18	28
10/20/2022 11:15:00 PM	8	13	21
10/20/2022 11:30:00 PM	5	14	19
10/20/2022 11:45:00 PM	10	7	17
Total	4,726	5,293	10,019
Percentage	47.2%	52.8%	
Peak Hour	4:30 PM	4:45 PM	4:30 PM
Volume	810	831	1,619
PHF	0.960	0.877	0.916
Grand Total	8,677	9,055	17,732
Percentage	48.9%	51.1%	

(303) 216-2439
www.alltrafficdata.net

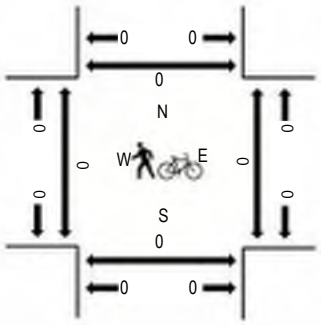
Location: 7 CHARLOTTE COURT & CO-402 AM
Date: Thursday, October 20, 2022
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	CO-402 Eastbound				CO-402 Westbound				CHARLOTTE COURT Northbound				CHARLOTTE COURT Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
6:00 AM	0	1	121	4	0	4	74	0	0	3	0	7	0	0	0	1	215	1,176	0	0	0	0
6:15 AM	0	0	143	5	0	14	93	0	0	3	0	4	0	1	0	0	263	1,310	0	0	0	0
6:30 AM	0	0	177	2	0	9	140	0	0	3	0	12	0	0	0	0	343	1,454	0	0	0	0
6:45 AM	0	0	167	4	0	9	159	0	0	5	0	10	0	1	0	0	355	1,568	0	0	0	0
7:00 AM	0	0	181	3	0	10	146	0	0	4	0	5	0	0	0	0	349	1,639	0	0	0	0
7:15 AM	0	0	172	3	0	10	205	0	0	3	0	14	0	0	0	0	407	1,671	0	0	0	0
7:30 AM	0	0	177	10	0	8	244	0	0	4	0	14	0	0	0	0	457	1,590	0	0	0	0
7:45 AM	0	0	196	9	0	12	197	0	0	3	0	8	0	0	0	1	426	1,461	0	0	0	0
8:00 AM	0	0	151	12	0	17	189	0	0	4	0	8	0	0	0	0	381	1,352	0	0	0	0
8:15 AM	0	0	145	4	0	12	155	0	0	2	0	7	0	0	0	1	326	1,216	0	0	0	0
8:30 AM	0	0	148	7	0	6	159	0	0	2	0	5	0	1	0	0	328	1,145	0	0	0	0
8:45 AM	0	1	131	11	0	6	156	0	0	7	0	5	0	0	0	0	317	1,067	0	0	0	0
9:00 AM	0	1	108	4	1	7	112	0	0	6	0	6	0	0	0	0	245	978	0	0	0	0
9:15 AM	0	0	125	6	0	4	102	1	0	7	0	9	0	0	0	1	255	965	0	0	0	0
9:30 AM	0	1	96	7	0	9	122	0	0	8	0	7	0	0	0	0	250	934	0	0	0	0
9:45 AM	0	0	94	1	0	7	118	1	0	2	0	5	0	0	0	0	228	931	0	0	0	0
10:00 AM	0	0	103	7	0	2	105	0	0	8	0	7	0	0	0	0	232	962	0	0	0	0
10:15 AM	1	0	87	4	0	14	100	0	0	12	0	6	0	0	0	0	224	971	0	0	0	0
10:30 AM	0	0	108	6	0	5	110	0	0	8	0	9	0	1	0	0	247	979	0	0	0	0
10:45 AM	0	0	99	5	0	7	133	0	0	7	0	5	0	1	0	2	259	990	0	0	0	0
11:00 AM	0	0	120	9	0	10	88	0	0	10	0	4	0	0	0	0	241	968	0	0	0	0
11:15 AM	0	0	98	6	0	3	105	0	0	14	0	6	0	0	0	0	232	992	0	0	0	0
11:30 AM	0	0	109	9	0	5	118	0	0	10	0	7	0	0	0	0	258	1,003	0	0	0	0
11:45 AM	0	1	98	10	0	8	97	0	0	14	0	8	0	0	1	0	237	1,025	0	0	0	0
12:00 PM	0	0	102	10	0	4	131	1	0	9	0	7	1	0	0	0	265	1,015	0	0	0	0
12:15 PM	0	0	104	8	0	10	97	1	0	13	0	10	0	0	0	0	243	989	0	0	0	0
12:30 PM	0	0	113	11	0	5	134	0	0	8	0	8	0	0	0	1	280	1,009	0	0	0	0
12:45 PM	0	0	88	8	0	7	112	1	0	6	0	5	0	0	0	0	227	1,020	0	0	0	0
1:00 PM	0	0	104	10	0	4	109	0	0	9	0	3	0	0	0	0	239	1,036	0	0	0	0
1:15 PM	0	0	114	11	0	8	122	0	0	5	0	3	0	0	0	0	263	1,088	0	0	0	0
1:30 PM	0	0	125	10	0	11	127	0	0	11	0	7	0	0	0	0	291	1,108	0	0	0	0
1:45 PM	0	0	108	4	0	3	119	0	0	4	0	5	0	0	0	0	243	1,130	0	0	0	0
2:00 PM	0	1	124	6	0	7	142	0	0	6	0	4	0	0	0	1	291	1,225	0	0	1	0
2:15 PM	0	0	133	5	0	5	125	0	0	4	0	11	0	0	0	0	283	1,247	0	0	0	0
2:30 PM	0	0	130	6	0	8	156	0	0	9	0	4	0	0	0	0	313	1,299	0	0	0	0

2:45 PM	0	0	155	5	0	5	158	0	0	8	0	7	0	0	0	0	338	1,365	0	0	0	0
3:00 PM	0	0	129	9	0	9	149	1	0	6	0	9	0	0	0	1	313	1,434	0	0	0	0
3:15 PM	0	2	133	7	0	8	164	0	0	7	0	11	0	1	0	2	335	1,521	0	0	0	0
3:30 PM	0	0	160	9	0	10	177	0	0	11	0	12	0	0	0	0	379	1,583	0	0	0	0
3:45 PM	0	0	166	6	0	14	202	1	0	9	0	9	0	0	0	0	407	1,620	0	0	0	0
4:00 PM	0	0	183	6	0	10	187	0	0	7	0	7	0	0	0	0	400	1,631	0	0	0	0
4:15 PM	0	0	191	6	0	7	181	0	0	6	0	6	0	0	0	0	397	1,624	0	0	0	0
4:30 PM	0	0	200	13	0	13	173	0	0	6	0	11	0	0	0	0	416	1,683	0	0	0	0
4:45 PM	0	2	196	9	0	6	193	0	0	3	0	9	0	0	0	0	418	1,670	0	0	0	0
5:00 PM	0	0	177	8	0	10	177	0	0	9	0	12	0	0	0	0	393	1,560	0	0	0	0
5:15 PM	0	0	193	10	0	6	231	0	0	3	0	12	0	0	0	1	456		0	0	0	0
5:30 PM	0	0	171	9	0	15	193	0	0	3	0	12	0	0	0	0	403		0	0	0	0
5:45 PM	0	0	118	8	0	9	158	0	0	3	0	12	0	0	0	0	308		0	0	0	0
Count Total	1	10	6,571	342	1	392	6,944	7	0	314	0	374	1	6	1	12	14,976		0	0	1	0
Peak Hour	0	2	766	40	0	35	774	0	0	21	0	44	0	0	0	1	1,683		0	0	0	0

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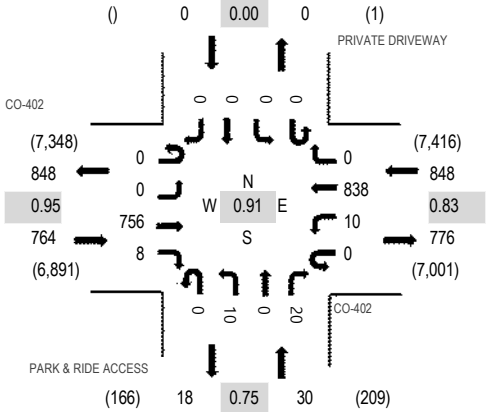
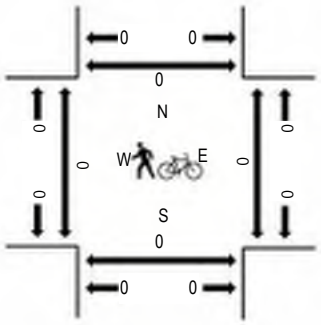
Location: 8 PARK & RIDE ACCESS & CO-402 AM
Date: Thursday, October 20, 2022
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	CO-402 Eastbound				CO-402 Westbound				PARK & RIDE ACCESS Northbound				PRIVATE DRIVEWAY Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
6:00 AM	0	0	120	0	0	12	75	0	0	3	0	7	0	0	0	0	217	1,172	0	0	0	0
6:15 AM	0	0	152	1	0	3	111	0	0	0	0	5	0	0	0	0	272	1,352	0	0	0	0
6:30 AM	0	0	182	1	0	2	140	0	0	1	0	1	0	0	0	0	327	1,467	0	0	0	0
6:45 AM	0	0	179	2	0	7	165	0	0	0	0	3	0	0	0	0	356	1,585	0	0	0	0
7:00 AM	0	0	180	3	0	6	201	0	0	2	0	5	0	0	0	0	397	1,624	0	0	0	0
7:15 AM	0	0	176	4	0	1	206	0	0	0	0	0	0	0	0	0	387	1,585	0	0	0	0
7:30 AM	0	0	178	1	0	4	259	0	0	0	0	3	0	0	0	0	445	1,511	0	0	0	0
7:45 AM	0	0	198	0	0	0	192	0	0	1	0	4	0	0	0	0	395	1,380	0	0	0	0
8:00 AM	0	0	151	2	0	1	200	0	0	1	0	3	0	0	0	0	358	1,270	0	0	0	0
8:15 AM	0	0	147	1	0	0	163	0	0	0	0	2	0	0	0	0	313	1,151	0	0	0	0
8:30 AM	0	0	151	1	0	2	159	0	0	0	0	1	0	0	0	0	314	1,080	0	0	0	0
8:45 AM	0	0	124	2	0	0	155	0	0	1	0	3	0	0	0	0	285	1,005	0	0	0	0
9:00 AM	0	0	116	1	0	4	114	0	0	0	0	4	0	0	0	0	239	953	0	0	0	0
9:15 AM	0	0	135	1	0	0	104	0	0	1	0	1	0	0	0	0	242	933	0	0	0	0
9:30 AM	0	0	103	0	0	2	129	0	0	1	0	4	0	0	0	0	239	899	0	0	0	0
9:45 AM	0	0	100	1	0	2	127	0	0	0	0	3	0	0	0	0	233	891	0	0	0	0
10:00 AM	0	0	110	0	0	1	105	0	0	1	0	2	0	0	0	0	219	906	0	0	0	0
10:15 AM	0	0	95	0	0	3	107	0	0	0	0	3	0	0	0	0	208	909	0	0	0	0
10:30 AM	0	0	115	3	0	0	113	0	0	0	0	0	0	0	0	0	231	926	0	0	0	0
10:45 AM	0	1	108	0	0	0	136	0	0	0	0	3	0	0	0	0	248	929	0	0	0	0
11:00 AM	0	0	121	1	0	2	97	0	0	1	0	0	0	0	0	0	222	901	0	0	0	0
11:15 AM	0	0	108	2	0	2	109	0	0	0	0	4	0	0	0	0	225	930	0	0	0	0
11:30 AM	0	0	115	0	0	0	118	0	0	0	0	1	0	0	0	0	234	934	0	0	0	0
11:45 AM	0	0	110	0	0	2	108	0	0	0	0	0	0	0	0	0	220	956	0	0	0	0
12:00 PM	0	0	109	1	0	4	133	0	0	1	0	3	0	0	0	0	251	961	0	0	0	0
12:15 PM	0	0	112	2	0	1	110	0	0	1	0	3	0	0	0	0	229	913	0	0	0	0
12:30 PM	0	0	121	0	0	0	133	0	0	0	0	2	0	0	0	0	256	947	0	0	0	0
12:45 PM	0	0	99	1	0	1	123	0	0	0	0	1	0	0	0	0	225	962	0	0	0	0
1:00 PM	0	0	95	0	0	2	106	0	0	0	0	0	0	0	0	0	203	1,005	0	0	0	0
1:15 PM	0	0	123	2	0	0	132	0	0	1	0	5	0	0	0	0	263	1,081	0	0	0	0
1:30 PM	0	0	130	1	0	3	136	0	0	0	0	1	0	0	0	0	271	1,073	0	0	0	0
1:45 PM	0	0	127	0	0	1	134	0	0	2	0	4	0	0	0	0	268	1,089	0	0	0	0
2:00 PM	0	0	125	0	0	2	148	0	0	1	0	3	0	0	0	0	279	1,164	0	0	0	0
2:15 PM	0	0	120	0	0	2	129	0	0	2	0	2	0	0	0	0	255	1,204	0	0	0	0
2:30 PM	0	0	123	0	0	0	161	0	0	0	0	3	0	0	0	0	287	1,268	0	0	0	0

2:45 PM	0	0	172	2	0	4	158	0	0	0	0	7	0	0	0	0	343	1,356	0	0	0	0
3:00 PM	0	0	139	1	0	4	163	0	0	3	0	9	0	0	0	0	319	1,418	0	0	0	0
3:15 PM	0	0	142	2	0	1	167	0	0	3	0	4	0	0	0	0	319	1,502	0	0	0	0
3:30 PM	0	0	167	3	0	7	189	0	0	2	0	7	0	0	0	0	375	1,572	0	0	0	0
3:45 PM	0	0	182	1	0	6	208	0	0	2	0	6	0	0	0	0	405	1,591	0	0	0	0
4:00 PM	0	0	190	2	0	2	202	0	0	0	0	7	0	0	0	0	403	1,595	0	0	0	0
4:15 PM	0	0	186	1	0	3	190	0	0	2	0	7	0	0	0	0	389	1,578	0	0	0	0
4:30 PM	0	0	209	0	0	2	178	0	0	1	0	4	0	0	0	0	394	1,641	0	0	0	0
4:45 PM	0	0	202	2	0	2	195	0	0	2	0	6	0	0	0	0	409	1,642	0	0	0	0
5:00 PM	0	0	176	1	0	3	197	0	0	4	0	5	0	0	0	0	386	1,547	0	0	0	0
5:15 PM	0	0	203	3	0	4	236	0	0	1	0	5	0	0	0	0	452		0	0	0	0
5:30 PM	0	0	175	2	0	1	210	0	0	3	0	4	0	0	0	0	395		0	0	0	0
5:45 PM	0	0	135	0	0	1	173	0	0	0	0	5	0	0	0	0	314		0	0	0	0
Count Total	0	1	6,836	54	0	112	7,304	0	0	44	0	165	0	0	0	0	14,516		0	0	0	0
Peak Hour	0	0	756	8	0	10	838	0	0	10	0	20	0	0	0	0	1,642		0	0	0	0

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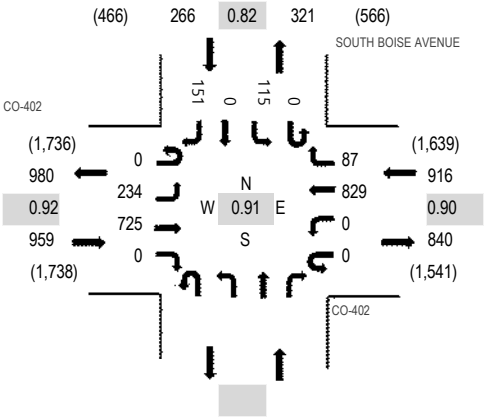
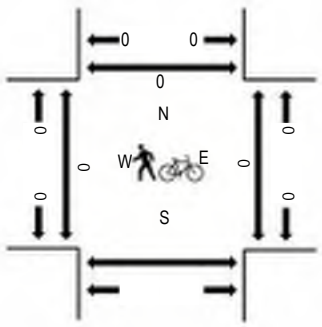
Location: 1 SOUTH BOISE AVENUE & CO-402 AM
Date: Thursday, October 20, 2022
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	CO-402 Eastbound				CO-402 Westbound				Northbound				SOUTH BOISE AVENUE Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	34	154	0	0	0	144	11					0	17	0	35	395	2,053	0	0		0
7:15 AM	0	62	173	0	0	0	195	16					0	20	0	32	498	2,141	0	0		0
7:30 AM	0	63	197	0	0	0	226	32					0	31	0	38	587	2,116	0	0		0
7:45 AM	0	65	177	0	0	0	225	25					0	35	0	46	573	1,957	0	0		0
8:00 AM	0	44	178	0	0	0	183	14					0	29	0	35	483	1,790	0	0		0
8:15 AM	0	45	155	0	0	0	199	26					0	17	0	31	473		0	0		0
8:30 AM	0	34	163	0	0	0	164	17					0	21	0	29	428		0	0		0
8:45 AM	0	43	151	0	0	0	127	35					0	23	0	27	406		0	0		0
Count Total	0	390	1,348	0	0	0	1,463	176					0	193	0	273	3,843		0	0		0
Peak Hour	0	234	725	0	0	0	829	87					0	115	0	151	2,141		0	0		0

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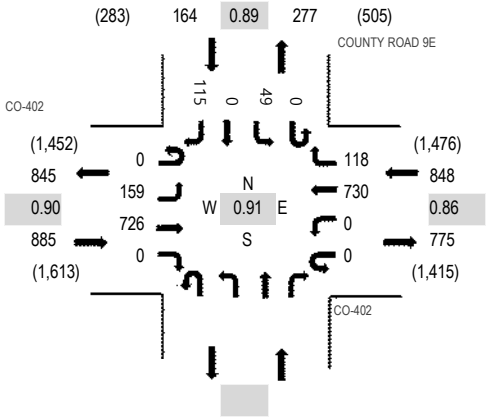
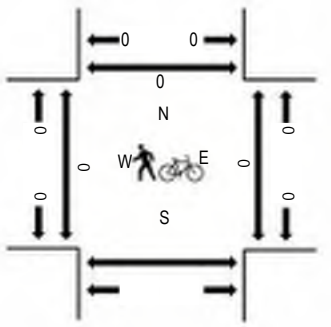
Location: 2 COUNTY ROAD 9E & CO-402 AM
Date: Thursday, October 20, 2022
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	CO-402 Eastbound				CO-402 Westbound				Northbound				COUNTY ROAD 9E Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	33	167	0	0	0	123	25					0	7	0	20	375	1,852	0	0		0
7:15 AM	0	29	181	0	0	0	175	33					0	13	0	32	463	1,897	0	0		0
7:30 AM	0	44	188	0	0	0	214	32					0	9	0	32	519	1,822	0	0		0
7:45 AM	0	51	197	0	0	0	179	22					0	12	0	34	495	1,652	0	0		0
8:00 AM	0	35	160	0	0	0	162	31					0	15	0	17	420	1,520	0	0		0
8:15 AM	0	42	151	0	0	0	129	29					0	12	0	25	388		0	0		0
8:30 AM	0	31	132	0	0	0	141	18					0	13	0	14	349		0	0		0
8:45 AM	0	26	146	0	0	0	139	24					0	12	0	16	363		0	0		0
Count Total	0	291	1,322	0	0	0	1,262	214					0	93	0	190	3,372		0	0		0
Peak Hour	0	159	726	0	0	0	730	118					0	49	0	115	1,897		0	0		0

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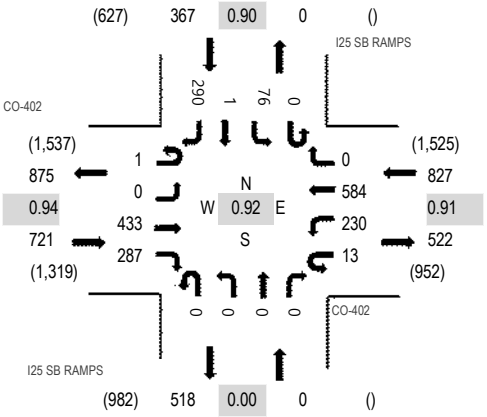
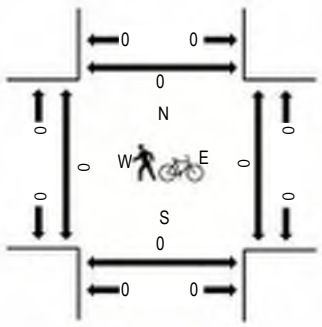
Location: 3 I25 SB RAMPS & CO-402 AM
Date: Thursday, October 20, 2022
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	CO-402 Eastbound				CO-402 Westbound				I25 SB RAMPS Northbound				I25 SB RAMPS Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	0	80	78	2	63	123	0	0	0	0	0	0	15	1	42	404	1,885	0	0	0	0
7:15 AM	1	0	110	81	5	74	149	0	0	0	0	0	0	23	0	79	522	1,915	0	0	0	0
7:30 AM	0	0	100	79	4	50	148	0	0	0	0	0	0	27	1	56	465	1,772	0	0	0	0
7:45 AM	0	0	120	65	3	55	149	0	0	0	0	0	0	15	0	87	494	1,700	0	0	0	0
8:00 AM	0	0	103	62	1	51	138	0	0	0	0	0	0	11	0	68	434	1,586	0	0	0	0
8:15 AM	0	0	97	69	2	45	104	0	0	0	0	0	0	22	0	40	379		0	0	0	0
8:30 AM	0	0	80	60	1	48	136	0	0	0	0	0	0	15	0	53	393		0	0	0	0
8:45 AM	0	0	87	47	1	52	121	0	0	0	0	0	0	28	1	43	380		0	0	0	0
Count Total	1	0	777	541	19	438	1,068	0	0	0	0	0	0	156	3	468	3,471		0	0	0	0
Peak Hour	1	0	433	287	13	230	584	0	0	0	0	0	0	76	1	290	1,915		0	0	0	0

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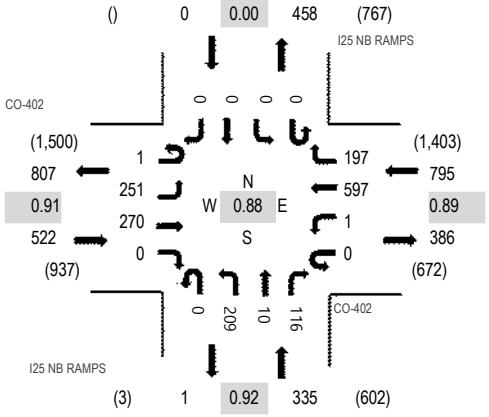
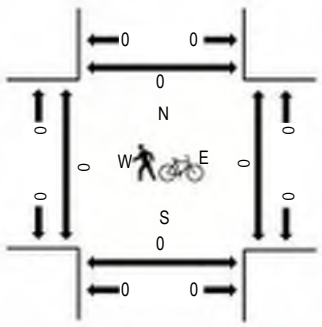
Location: 4 I25 NB RAMPS & CO-402 AM
Date: Thursday, October 20, 2022
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	CO-402 Eastbound				CO-402 Westbound				I25 NB RAMPS Northbound				I25 NB RAMPS Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	43	51	0	0	1	159	31	0	30	0	14	0	0	0	0	329	1,622	0	0	0	0
7:15 AM	0	72	72	0	0	0	179	53	0	53	3	35	0	0	0	0	467	1,652	0	0	0	0
7:30 AM	1	58	69	0	0	0	141	74	0	53	0	27	0	0	0	0	423	1,520	0	0	0	0
7:45 AM	0	67	73	0	0	1	143	41	0	53	1	24	0	0	0	0	403	1,413	0	0	0	0
8:00 AM	0	54	56	0	0	0	134	29	0	50	6	30	0	0	0	0	359	1,320	0	0	0	0
8:15 AM	0	47	66	0	0	0	126	29	0	46	1	20	0	0	0	0	335		0	0	0	0
8:30 AM	0	48	47	0	0	0	115	19	0	66	1	20	0	0	0	0	316		0	0	0	0
8:45 AM	0	64	49	0	0	1	101	26	0	50	0	19	0	0	0	0	310		0	0	0	0
Count Total	1	453	483	0	0	3	1,098	302	0	401	12	189	0	0	0	0	2,942		0	0	0	0
Peak Hour	1	251	270	0	0	1	597	197	0	209	10	116	0	0	0	0	1,652		0	0	0	0

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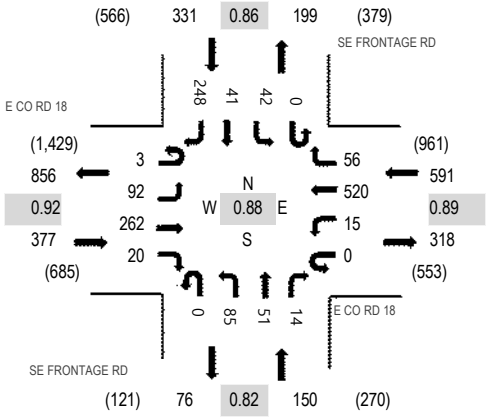
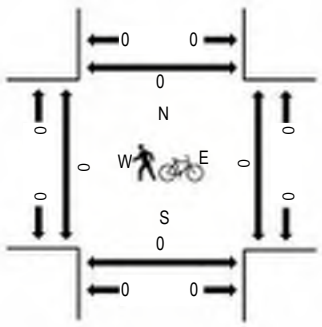
Location: 5 SE FRONTAGE RD & E CO RD 18 AM
Date: Thursday, October 20, 2022
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	E CO RD 18 Eastbound				E CO RD 18 Westbound				SE FRONTAGE RD Northbound				SE FRONTAGE RD Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	2	15	49	2	0	1	105	6	0	18	9	4	0	14	10	64	299	1,449	0	0	0	0
7:15 AM	0	27	71	8	0	1	153	13	0	18	8	4	0	8	7	66	384	1,439	0	0	0	0
7:30 AM	1	29	67	5	0	3	141	24	0	28	14	4	0	13	15	68	412	1,308	0	0	0	0
7:45 AM	0	21	75	5	0	10	121	13	0	21	20	2	0	7	9	50	354	1,134	0	0	0	0
8:00 AM	3	30	48	2	0	1	109	12	0	16	7	1	0	7	7	46	289	1,033	0	0	0	0
8:15 AM	0	24	58	5	0	1	74	8	0	18	6	0	0	7	4	48	253		0	0	0	0
8:30 AM	2	18	43	6	0	3	71	8	0	14	9	5	0	13	6	40	238		0	0	0	0
8:45 AM	0	23	43	3	0	1	66	16	0	22	19	3	0	7	6	44	253		0	0	0	0
Count Total	8	187	454	36	0	21	840	100	0	155	92	23	0	76	64	426	2,482		0	0	0	0
Peak Hour	3	92	262	20	0	15	520	56	0	85	51	14	0	42	41	248	1,449		0	0	0	0

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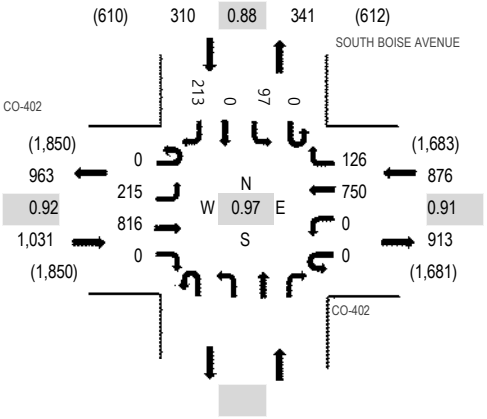
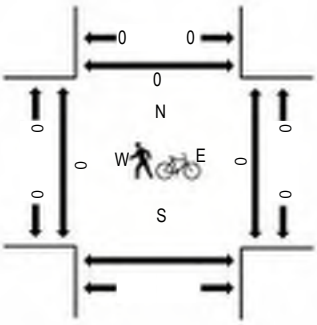
Location: 1 SOUTH BOISE AVENUE & CO-402 PM
Date: Thursday, October 20, 2022
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	CO-402 Eastbound				CO-402 Westbound				Northbound				SOUTH BOISE AVENUE Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	47	183	0	0	0	211	29					0	26	0	49	545	2,217	0	0		0
4:15 PM	0	60	195	0	0	0	214	24					0	19	0	62	574	2,155	0	0		0
4:30 PM	0	60	220	0	0	0	155	38					0	25	0	53	551	2,127	0	0		0
4:45 PM	0	48	218	0	0	0	170	35					0	27	0	49	547	2,064	0	0		0
5:00 PM	0	42	171	0	0	0	146	29					0	38	0	57	483	1,926	0	0		0
5:15 PM	0	40	199	0	0	0	183	37					0	23	0	64	546		0	0		0
5:30 PM	0	35	168	0	0	0	193	36					0	15	0	41	488		0	0		0
5:45 PM	0	31	133	0	0	0	162	21					0	21	0	41	409		0	0		0
Count Total	0	363	1,487	0	0	0	1,434	249					0	194	0	416	4,143		0	0		0
Peak Hour	0	215	816	0	0	0	750	126					0	97	0	213	2,217		0	0		0

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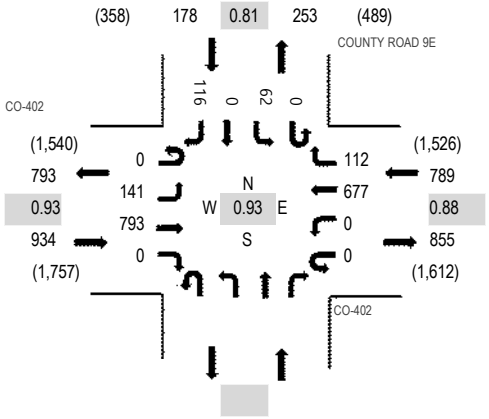
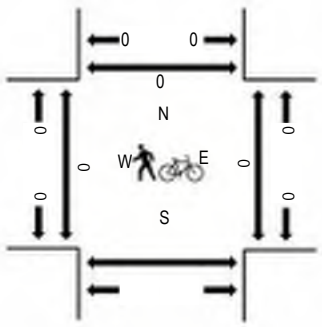
Location: 2 COUNTY ROAD 9E & CO-402 PM
Date: Thursday, October 20, 2022
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	CO-402 Eastbound				CO-402 Westbound				Northbound				COUNTY ROAD 9E Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	41	182	0	0	0	169	24					0	24	0	35	475	1,882	0	0		0
4:15 PM	0	22	201	0	0	0	156	31					0	17	0	29	456	1,847	0	0		0
4:30 PM	0	31	209	0	0	0	158	19					0	15	0	23	455	1,901	0	0		0
4:45 PM	0	48	204	0	0	0	173	23					0	22	0	26	496	1,889	0	0		0
5:00 PM	0	27	184	0	0	0	153	33					0	12	0	31	440	1,759	0	0		0
5:15 PM	0	35	196	0	0	0	193	37					0	13	0	36	510		0	0		0
5:30 PM	0	30	182	0	0	0	169	27					0	14	0	21	443		0	0		0
5:45 PM	0	41	124	0	0	0	141	20					0	13	0	27	366		0	0		0
Count Total	0	275	1,482	0	0	0	1,312	214					0	130	0	228	3,641		0	0		0
Peak Hour	0	141	793	0	0	0	677	112					0	62	0	116	1,901		0	0		0

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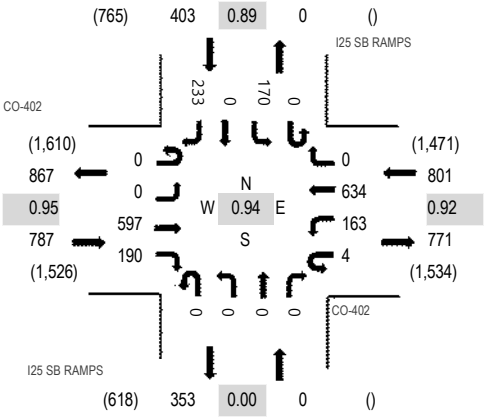
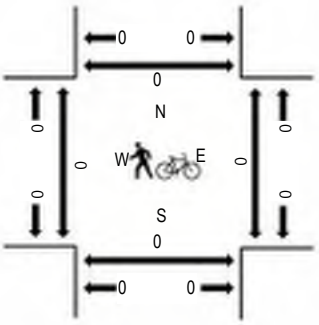
Location: 3 I25 SB RAMPS & CO-402 PM
Date: Thursday, October 20, 2022
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	CO-402 Eastbound				CO-402 Westbound				I25 SB RAMPS Northbound				I25 SB RAMPS Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	0	135	46	3	35	178	0	0	0	0	0	0	44	0	61	502	1,991	0	0	0	0
4:15 PM	0	0	151	53	1	36	175	0	0	0	0	0	0	50	0	63	529	1,959	0	0	0	0
4:30 PM	0	0	167	46	0	45	173	0	0	0	0	0	0	41	0	51	523	1,894	0	0	0	0
4:45 PM	0	0	144	45	0	47	108	0	0	0	0	0	0	35	0	58	437	1,781	0	0	0	0
5:00 PM	0	0	167	39	1	41	127	0	0	0	0	0	0	40	1	54	470	1,771	0	0	0	0
5:15 PM	1	0	168	28	2	41	131	0	0	0	0	0	0	40	1	52	464		0	0	0	0
5:30 PM	0	0	136	29	1	30	134	0	0	0	0	0	0	34	0	46	410		0	0	0	0
5:45 PM	0	0	139	32	1	22	139	0	0	0	0	0	0	34	1	59	427		0	0	0	0
Count Total	1	0	1,207	318	9	297	1,165	0	0	0	0	0	0	318	3	444	3,762		0	0	0	0
Peak Hour	0	0	597	190	4	163	634	0	0	0	0	0	0	170	0	233	1,991		0	0	0	0

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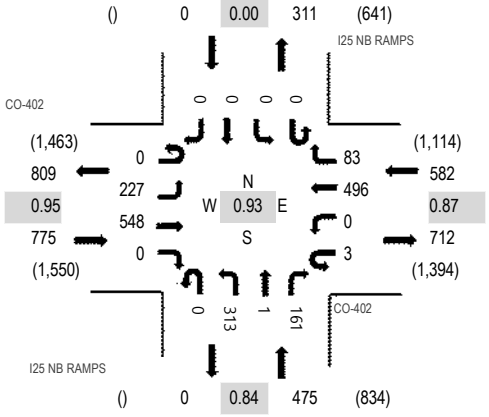
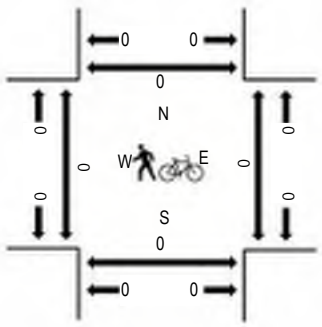
Location: 4 I25 NB RAMPS & CO-402 PM
Date: Thursday, October 20, 2022
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:30 PM - 04:45 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	CO-402 Eastbound				CO-402 Westbound				I25 NB RAMPS Northbound				I25 NB RAMPS Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	49	130	0	0	0	136	31	0	93	0	34	0	0	0	0	473	1,832	0	0	0	0
4:15 PM	0	70	140	0	2	0	118	17	0	93	0	41	0	0	0	0	481	1,793	0	0	0	0
4:30 PM	0	55	153	0	1	0	120	20	0	97	1	43	0	0	0	0	490	1,724	0	0	0	0
4:45 PM	0	53	125	0	0	0	122	15	0	30	0	43	0	0	0	0	388	1,655	0	0	0	0
5:00 PM	0	63	153	0	1	0	117	22	0	48	0	30	0	0	0	0	434	1,666	0	0	0	0
5:15 PM	0	65	150	0	1	0	116	20	0	36	2	22	0	0	0	0	412		0	0	0	0
5:30 PM	0	63	117	0	0	0	124	26	0	46	0	45	0	0	0	0	421		0	0	0	0
5:45 PM	0	55	109	0	1	0	90	14	0	77	0	53	0	0	0	0	399		0	0	0	0
Count Total	0	473	1,077	0	6	0	943	165	0	520	3	311	0	0	0	0	3,498		0	0	0	0
Peak Hour	0	227	548	0	3	0	496	83	0	313	1	161	0	0	0	0	1,832		0	0	0	0

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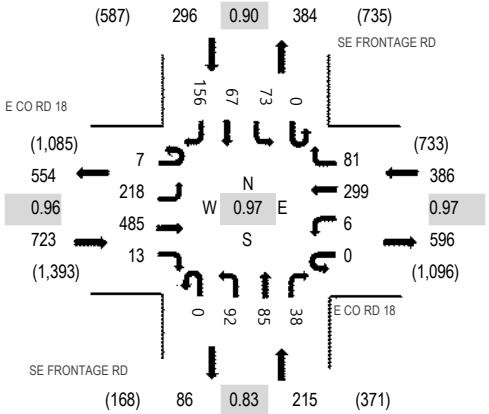
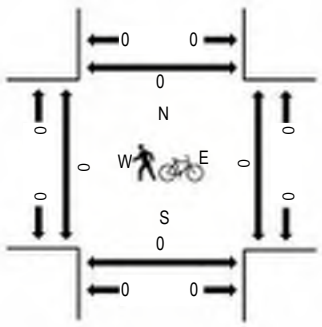
Location: 5 SE FRONTAGE RD & E CO RD 18 PM
Date: Thursday, October 20, 2022
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 04:30 PM - 04:45 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk

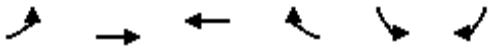


Traffic Counts

Interval Start Time	E CO RD 18 Eastbound				E CO RD 18 Westbound				SE FRONTAGE RD Northbound				SE FRONTAGE RD Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	5	55	107	4	0	0	67	24	0	23	11	6	0	16	14	54	386	1,597	0	0	0	0
4:15 PM	2	53	123	4	0	0	80	19	0	19	16	7	0	17	22	38	400	1,620	0	0	0	0
4:30 PM	0	57	129	3	0	1	78	20	0	22	23	13	0	19	17	37	419	1,589	0	0	0	0
4:45 PM	2	53	116	2	0	2	77	22	0	22	23	5	0	17	14	37	392	1,561	0	0	0	0
5:00 PM	3	55	117	4	0	3	64	20	0	29	23	13	0	20	14	44	409	1,487	0	0	0	0
5:15 PM	2	44	115	5	0	2	79	13	0	21	10	6	0	20	21	31	369		0	0	0	0
5:30 PM	7	67	92	6	0	3	78	13	0	22	17	5	0	27	14	40	391		0	0	0	0
5:45 PM	4	66	87	4	0	0	50	18	0	16	13	6	0	13	9	32	318		0	0	0	0
Count Total	25	450	886	32	0	11	573	149	0	174	136	61	0	149	125	313	3,084		0	0	0	0
Peak Hour	7	218	485	13	0	6	299	81	0	92	85	38	0	73	67	156	1,620		0	0	0	0

APPENDIX C

Existing Conditions Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	234	725	829	87	115	151
Future Volume (veh/h)	234	725	829	87	115	151
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1796	1796
Adj Flow Rate, veh/h	257	797	911	96	126	44
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	4	4	4	4	7	7
Cap, veh/h	328	1469	1130	119	154	228
Arrive On Green	0.06	0.80	0.69	0.69	0.09	0.09
Sat Flow, veh/h	1753	1841	1637	173	1711	1522
Grp Volume(v), veh/h	257	797	0	1007	126	44
Grp Sat Flow(s),veh/h/ln	1753	1841	0	1810	1711	1522
Q Serve(g_s), s	5.0	19.3	0.0	48.6	9.0	3.2
Cycle Q Clear(g_c), s	5.0	19.3	0.0	48.6	9.0	3.2
Prop In Lane	1.00			0.10	1.00	1.00
Lane Grp Cap(c), veh/h	328	1469	0	1249	154	228
V/C Ratio(X)	0.78	0.54	0.00	0.81	0.82	0.19
Avail Cap(c_a), veh/h	434	1469	0	1249	246	310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	4.5	0.0	13.5	55.9	46.5
Incr Delay (d2), s/veh	6.7	1.4	0.0	5.6	10.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	4.8	0.0	17.3	4.3	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.6	5.9	0.0	19.1	66.7	46.9
LnGrp LOS	C	A	A	B	E	D
Approach Vol, veh/h		1054	1007		170	
Approach Delay, s/veh		11.7	19.1		61.6	
Approach LOS		B	B		E	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	13.5	94.3				107.7	17.3
Change Period (Y+Rc), s	6.0	8.0				8.0	6.0
Max Green Setting (Gmax), s	15.0	72.0				93.0	18.0
Max Q Clear Time (g_c+I1), s	7.0	50.6				21.3	11.0
Green Ext Time (p_c), s	0.4	7.3				5.8	0.2

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	159	686	730	118	49	115
Future Vol, veh/h	159	686	730	118	49	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	385	-	-	420	225	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	6	6	10	10
Mvmt Flow	175	754	802	130	54	126

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	932	0	-	0	1906	802
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	1104	-
Critical Hdwy	4.15	-	-	-	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	2.245	-	-	-	3.59	3.39
Pot Cap-1 Maneuver	722	-	-	-	72	372
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	306	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	722	-	-	-	55	372
Mov Cap-2 Maneuver	-	-	-	-	55	-
Stage 1	-	-	-	-	324	-
Stage 2	-	-	-	-	306	-

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	84.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	722	-	-	-	55	372
HCM Lane V/C Ratio	0.242	-	-	-	0.979	0.34
HCM Control Delay (s)	11.6	-	-	-	235.6	19.6
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	0.9	-	-	-	4.4	1.5

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	732	8	11	858	0	3	0	12	0	0	0
Future Vol, veh/h	0	732	8	11	858	0	3	0	12	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	340	225	-	-	0	-	195	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	4	4	4	10	10	10	0	0	0
Mvmt Flow	0	804	9	12	943	0	3	0	13	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	943	0	0	813	0	0	1300	-	804	1782	1780	472
Stage 1	-	-	-	-	-	-	804	-	-	967	967	-
Stage 2	-	-	-	-	-	-	496	-	-	815	813	-
Critical Hdwy	4.13	-	-	4.16	-	-	7.45	-	6.35	7.3	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.25	-	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.65	-	-	6.1	5.5	-
Follow-up Hdwy	2.219	-	-	2.238	-	-	3.595	-	3.395	3.5	4	3.3
Pot Cap-1 Maneuver	725	-	-	801	-	-	121	0	366	58	83	544
Stage 1	-	-	-	-	-	-	361	0	-	277	335	-
Stage 2	-	-	-	-	-	-	508	0	-	374	395	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	725	-	-	801	-	-	120	-	366	55	82	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	120	-	-	55	82	-
Stage 1	-	-	-	-	-	-	361	-	-	277	330	-
Stage 2	-	-	-	-	-	-	500	-	-	361	395	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	19.3	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	120	366	725	-	-	801	-	-	-
HCM Lane V/C Ratio	0.027	0.036	-	-	-	0.015	-	-	-
HCM Control Delay (s)	35.8	15.2	0	-	-	9.6	-	-	0
HCM Lane LOS	E	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	696	34	47	835	0	14	0	44	0	0	0
Future Vol, veh/h	0	696	34	47	835	0	14	0	44	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	6	6	6	0	0	0
Mvmt Flow	0	765	37	52	918	0	15	0	48	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	918	0	0	802	0	0	1806	1806	784	1830	1824	918
Stage 1	-	-	-	-	-	-	784	784	-	1022	1022	-
Stage 2	-	-	-	-	-	-	1022	1022	-	808	802	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.16	6.56	6.26	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.1	5.5	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.554	4.054	3.354	3.5	4	3.3
Pot Cap-1 Maneuver	739	-	-	817	-	-	60	77	387	60	78	332
Stage 1	-	-	-	-	-	-	380	398	-	287	316	-
Stage 2	-	-	-	-	-	-	280	308	-	378	399	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	739	-	-	817	-	-	54	67	387	47	68	332
Mov Cap-2 Maneuver	-	-	-	-	-	-	54	67	-	47	68	-
Stage 1	-	-	-	-	-	-	380	398	-	287	275	-
Stage 2	-	-	-	-	-	-	244	268	-	331	399	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	43.2	0
HCM LOS			E	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	156	739	-	-	817	-	-	-
HCM Lane V/C Ratio	0.409	-	-	-	0.063	-	-	-
HCM Control Delay (s)	43.2	0	-	-	9.7	0	-	0
HCM Lane LOS	E	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	1.8	0	-	-	0.2	-	-	-

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: West Ridge)]

Existing AM Peak Hour
Site Category: Existing Design
Roundabout

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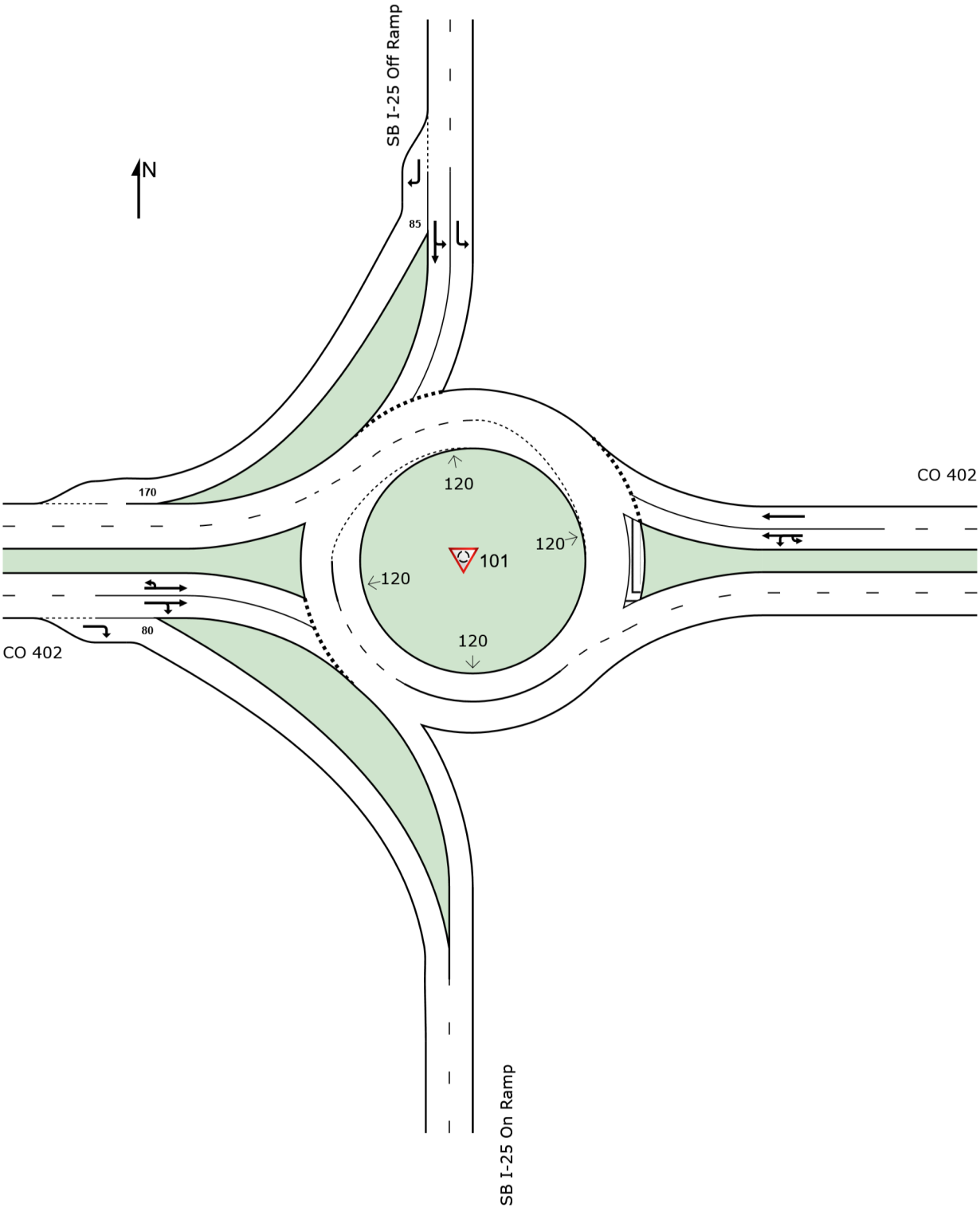

MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: West Ridge)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing AM Peak Hour
Site Category: Existing Design
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: CO 402															
1u	U	All MCs	14	9.0	14	9.0	0.345	4.5	LOS A	1.9	49.9	0.02	0.00	0.02	17.3
1	L2	All MCs	250	9.0	250	9.0	0.345	4.5	LOS A	1.9	49.9	0.02	0.00	0.02	33.1
6	T1	All MCs	635	9.0	635	9.0	0.345	4.5	LOS A	1.9	49.9	0.02	0.00	0.02	23.5
Approach			899	9.0	899	9.0	0.345	4.5	LOS A	1.9	49.9	0.02	0.00	0.02	26.9
North: SB I-25 Off Ramp															
7	L2	All MCs	83	9.0	83	9.0	0.089	8.8	LOS A	0.3	6.8	0.61	0.60	0.61	27.5
4	T1	All MCs	1	9.0	1	9.0	0.089	8.5	LOS A	0.2	6.5	0.60	0.59	0.60	37.4
14	R2	All MCs	315	9.0	315	9.0	0.205	5.4	LOS A	0.0	0.0	0.00	0.00	0.00	42.2
Approach			399	9.0	399	9.0	0.205	6.1	LOS A	0.3	6.8	0.13	0.13	0.13	37.8
West: CO 402															
5u	U	All MCs	1	8.0	1	8.0	0.266	7.0	LOS A	1.1	28.0	0.50	0.36	0.50	19.3
2	T1	All MCs	471	8.0	471	8.0	0.266	6.8	LOS A	1.1	28.0	0.48	0.35	0.48	23.6
12	R2	All MCs	312	8.0	312	8.0	0.200	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.1
Approach			784	8.0	784	8.0	0.266	4.1	LOS A	1.1	28.0	0.29	0.21	0.29	31.4
All Vehicles			2082	8.6	2082	8.6	0.345	4.7	LOS A	1.9	49.9	0.14	0.10	0.14	30.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
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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SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: West Ridge)]

Existing AM Peak Hour
Site Category: Existing Design
Roundabout

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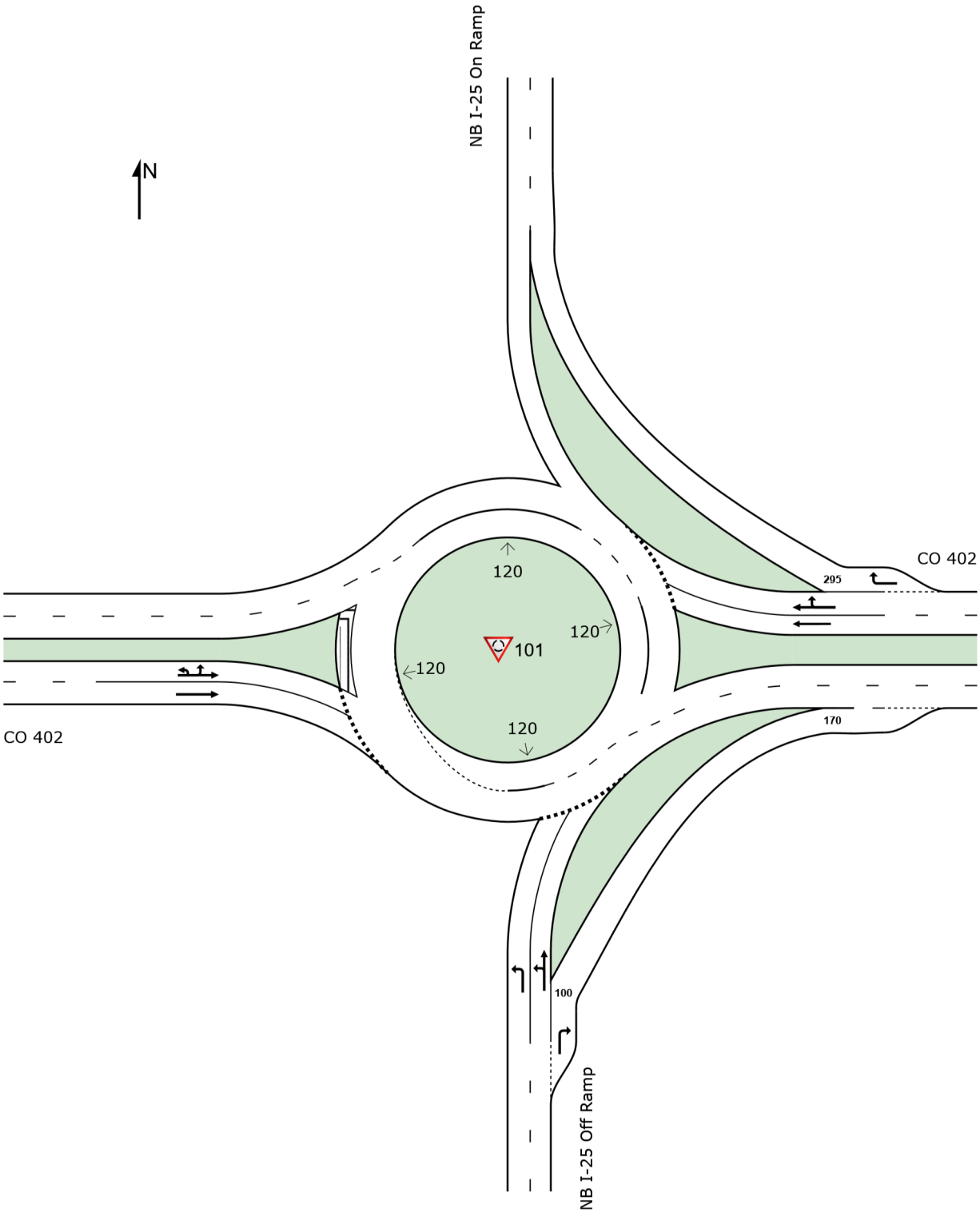

MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: West Ridge)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing AM Peak Hour
Site Category: Existing Design
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: NB I-25 Off Ramp															
3	L2	All MCs	227	10.0	227	10.0	0.176	7.3	LOS A	0.6	15.6	0.55	0.47	0.55	27.3
8	T1	All MCs	11	10.0	11	10.0	0.176	7.1	LOS A	0.6	15.1	0.54	0.46	0.54	36.5
18	R2	All MCs	126	10.0	126	10.0	0.083	3.5	LOS A	0.0	0.0	0.00	0.00	0.00	41.0
Approach			364	10.0	364	10.0	0.176	6.0	LOS A	0.6	15.6	0.36	0.31	0.36	31.2
East: CO 402															
6	T1	All MCs	649	10.0	649	10.0	0.452	11.3	LOS B	2.4	64.1	0.65	0.67	0.89	19.0
16	R2	All MCs	214	10.0	214	10.0	0.140	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.7
Approach			863	10.0	863	10.0	0.452	8.5	LOS A	2.4	64.1	0.49	0.50	0.67	20.9
West: CO 402															
5u	U	All MCs	1	9.0	1	9.0	0.217	3.8	LOS A	0.0	0.0	0.00	0.00	0.00	19.6
5	L2	All MCs	273	9.0	273	9.0	0.217	3.8	LOS A	0.0	0.0	0.00	0.00	0.00	33.4
2	T1	All MCs	293	9.0	293	9.0	0.217	3.8	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach			567	9.0	567	9.0	0.217	3.8	LOS A	0.0	0.0	0.00	0.00	0.00	29.7
All Vehicles			1795	9.7	1795	9.7	0.452	6.5	LOS A	2.4	64.1	0.31	0.30	0.39	25.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
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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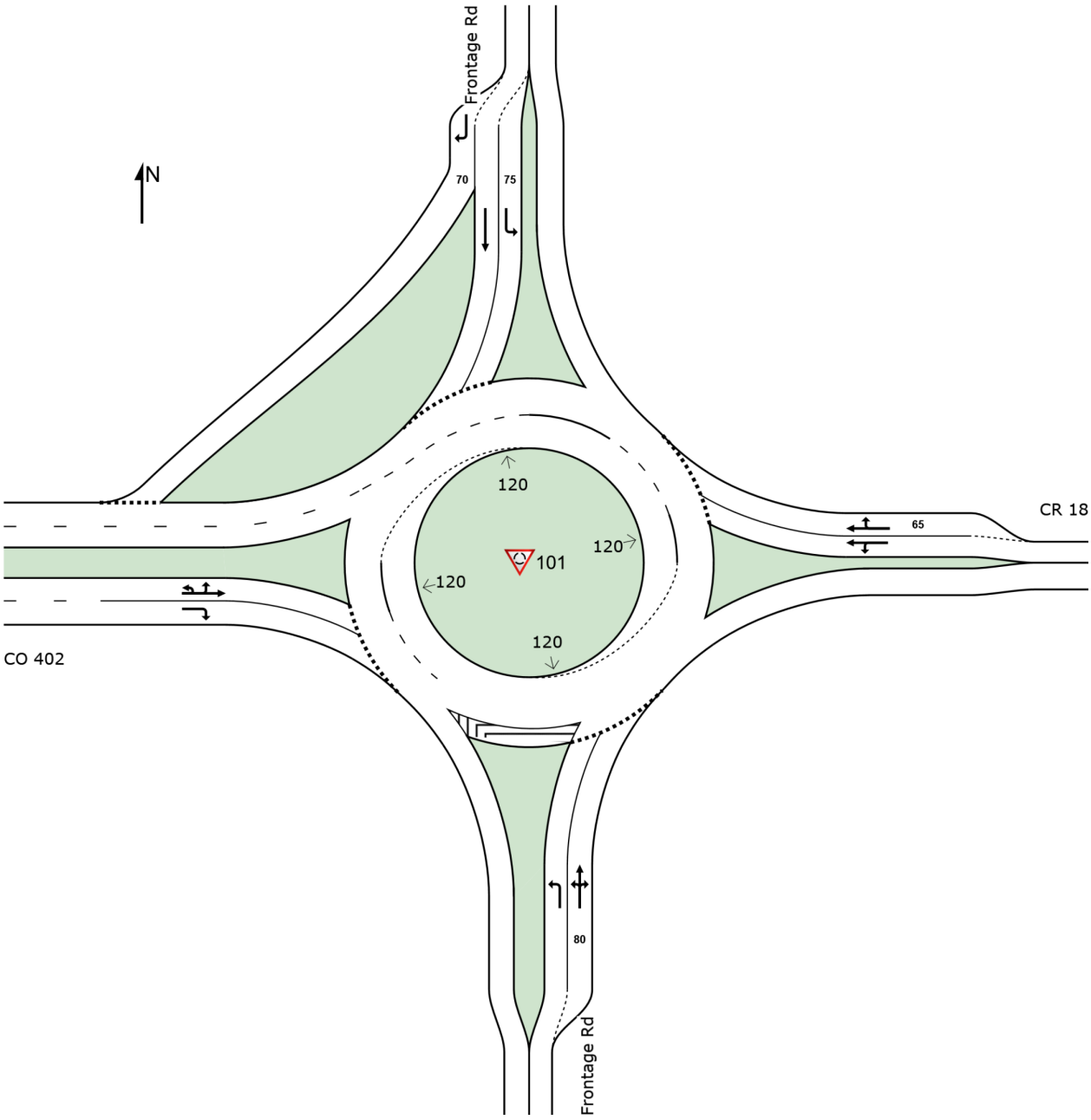
SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: West Ridge)]

Existing AM Peak Hour
Site Category: Existing Design
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: West Ridge)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing AM Peak Hour
Site Category: Existing Design
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: Frontage Rd															
3	L2	All MCs	92	9.0	92	9.0	0.101	5.5	LOS A	0.3	9.2	0.48	0.37	0.48	30.4
8	T1	All MCs	55	9.0	55	9.0	0.101	5.5	LOS A	0.3	9.2	0.48	0.37	0.48	33.2
18	R2	All MCs	15	9.0	15	9.0	0.101	5.5	LOS A	0.3	9.2	0.48	0.37	0.48	38.1
Approach			163	9.0	163	9.0	0.101	5.5	LOS A	0.3	9.2	0.48	0.37	0.48	32.3
East: CR 18															
1	L2	All MCs	16	7.0	16	7.0	0.322	7.0	LOS A	1.4	37.7	0.46	0.30	0.46	37.7
6	T1	All MCs	565	7.0	565	7.0	0.322	6.9	LOS A	1.4	37.7	0.45	0.29	0.45	39.3
16	R2	All MCs	61	7.0	61	7.0	0.322	6.7	LOS A	1.4	36.7	0.44	0.28	0.44	39.0
Approach			642	7.0	642	7.0	0.322	6.9	LOS A	1.4	37.7	0.45	0.29	0.45	39.2
North: Frontage Rd															
7	L2	All MCs	46	4.0	46	4.0	0.065	5.8	LOS A	0.2	5.4	0.53	0.48	0.53	37.4
4	T1	All MCs	45	4.0	45	4.0	0.069	6.4	LOS A	0.2	5.9	0.56	0.51	0.56	33.2
14	R2	All MCs	270	4.0	270	4.0	0.377	9.9	LOS A	1.7	43.3	0.64	0.62	0.78	28.5
Approach			360	4.0	360	4.0	0.377	8.9	LOS A	1.7	43.3	0.62	0.59	0.72	30.8
West: CO 402															
5u	U	All MCs	3	9.0	3	9.0	0.331	6.1	LOS A	1.5	41.1	0.28	0.13	0.28	21.1
5	L2	All MCs	100	9.0	100	9.0	0.331	6.1	LOS A	1.5	41.1	0.28	0.13	0.28	29.2
2	T1	All MCs	285	9.0	285	9.0	0.331	6.1	LOS A	1.5	41.1	0.28	0.13	0.28	39.3
12	R2	All MCs	22	9.0	22	9.0	0.019	3.4	LOS A	0.1	1.8	0.21	0.09	0.21	32.1
Approach			410	9.0	410	9.0	0.331	6.0	LOS A	1.5	41.1	0.28	0.13	0.28	36.0
All Vehicles			1575	7.0	1575	7.0	0.377	7.0	LOS A	1.7	43.3	0.45	0.32	0.47	35.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
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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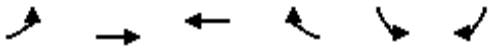


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	215	816	750	126	97	213
Future Volume (veh/h)	215	816	750	126	97	213
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1826	1826	1856	1856	1885	1885
Adj Flow Rate, veh/h	222	841	773	130	100	61
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	3	3	1	1
Cap, veh/h	422	1514	1143	192	127	190
Arrive On Green	0.05	0.83	0.74	0.74	0.07	0.07
Sat Flow, veh/h	1739	1826	1548	260	1795	1598
Grp Volume(v), veh/h	222	841	0	903	100	61
Grp Sat Flow(s),veh/h/ln	1739	1826	0	1809	1795	1598
Q Serve(g_s), s	4.4	20.4	0.0	36.5	7.7	4.9
Cycle Q Clear(g_c), s	4.4	20.4	0.0	36.5	7.7	4.9
Prop In Lane	1.00			0.14	1.00	1.00
Lane Grp Cap(c), veh/h	422	1514	0	1335	127	190
V/C Ratio(X)	0.53	0.56	0.00	0.68	0.79	0.32
Avail Cap(c_a), veh/h	513	1514	0	1335	244	294
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	3.8	0.0	9.6	64.0	56.5
Incr Delay (d2), s/veh	1.0	1.5	0.0	2.8	10.1	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	4.8	0.0	12.2	3.9	2.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.2	5.3	0.0	12.3	74.1	57.5
LnGrp LOS	B	A	A	B	E	E
Approach Vol, veh/h		1063	903		161	
Approach Delay, s/veh		6.7	12.3		67.8	
Approach LOS		A	B		E	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	12.7	111.4				124.1	15.9
Change Period (Y+Rc), s	6.0	8.0				8.0	6.0
Max Green Setting (Gmax), s	14.0	87.0				107.0	19.0
Max Q Clear Time (g_c+I1), s	6.4	38.5				22.4	9.7
Green Ext Time (p_c), s	0.3	7.3				6.4	0.3

Intersection Summary			
HCM 6th Ctrl Delay		13.7	
HCM 6th LOS		B	

Intersection	
Int Delay, s/veh	10.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	141	793	677	112	62	116
Future Vol, veh/h	141	793	677	112	62	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	385	-	-	420	225	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	4	4	5	5
Mvmt Flow	152	853	728	120	67	125

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	848	0	-	0	1885	728			
Stage 1	-	-	-	-	728	-			
Stage 2	-	-	-	-	1157	-			
Critical Hdwy	4.12	-	-	-	6.45	6.25			
Critical Hdwy Stg 1	-	-	-	-	5.45	-			
Critical Hdwy Stg 2	-	-	-	-	5.45	-			
Follow-up Hdwy	2.218	-	-	-	3.545	3.345			
Pot Cap-1 Maneuver	790	-	-	-	76	418			
Stage 1	-	-	-	-	473	-			
Stage 2	-	-	-	-	295	-			
Platoon blocked, %		-	-	-					
Mov Cap-1 Maneuver	790	-	-	-	~ 61	418			
Mov Cap-2 Maneuver	-	-	-	-	~ 61	-			
Stage 1	-	-	-	-	382	-			
Stage 2	-	-	-	-	295	-			

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	100.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	790	-	-	-	61	418
HCM Lane V/C Ratio	0.192	-	-	-	1.093	0.298
HCM Control Delay (s)	10.6	-	-	-	256.6	17.2
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	0.7	-	-	-	5.4	1.2

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

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	756	8	10	838	0	10	0	20	0	0	0
Future Vol, veh/h	0	756	8	10	838	0	10	0	20	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	340	225	-	-	0	-	195	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	4	4	4	4	4	4	0	0	0
Mvmt Flow	0	831	9	11	921	0	11	0	22	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	921	0	0	840	0	0	1314	-	831	1790	1783	461
Stage 1	-	-	-	-	-	-	831	-	-	943	943	-
Stage 2	-	-	-	-	-	-	483	-	-	847	840	-
Critical Hdwy	4.145	-	-	4.16	-	-	7.36	-	6.26	7.3	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	-	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.56	-	-	6.1	5.5	-
Follow-up Hdwy	2.2285	-	-	2.238	-	-	3.538	-	3.338	3.5	4	3.3
Pot Cap-1 Maneuver	734	-	-	782	-	-	123	0	365	58	83	553
Stage 1	-	-	-	-	-	-	359	0	-	286	344	-
Stage 2	-	-	-	-	-	-	530	0	-	359	384	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	734	-	-	782	-	-	122	-	365	54	82	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	122	-	-	54	82	-
Stage 1	-	-	-	-	-	-	359	-	-	286	339	-
Stage 2	-	-	-	-	-	-	523	-	-	337	384	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	22.8	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	122	365	734	-	-	782	-	-	-
HCM Lane V/C Ratio	0.09	0.06	-	-	-	0.014	-	-	-
HCM Control Delay (s)	37.4	15.5	0	-	-	9.7	-	-	0
HCM Lane LOS	E	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.3	0.2	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	766	40	35	774	0	21	0	44	0	0	1
Future Vol, veh/h	2	766	40	35	774	0	21	0	44	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	4	4	4	2	2	2	0	0	0
Mvmt Flow	2	833	43	38	841	0	23	0	48	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	841	0	0	876	0	0	1777	1776	855	1800	1797	841
Stage 1	-	-	-	-	-	-	859	859	-	917	917	-
Stage 2	-	-	-	-	-	-	918	917	-	883	880	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	790	-	-	762	-	-	64	83	358	63	81	368
Stage 1	-	-	-	-	-	-	351	373	-	329	354	-
Stage 2	-	-	-	-	-	-	326	351	-	343	368	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	790	-	-	762	-	-	59	75	358	50	73	368
Mov Cap-2 Maneuver	-	-	-	-	-	-	59	75	-	50	73	-
Stage 1	-	-	-	-	-	-	349	371	-	327	321	-
Stage 2	-	-	-	-	-	-	294	318	-	296	366	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	57.1	14.8
HCM LOS			F	B

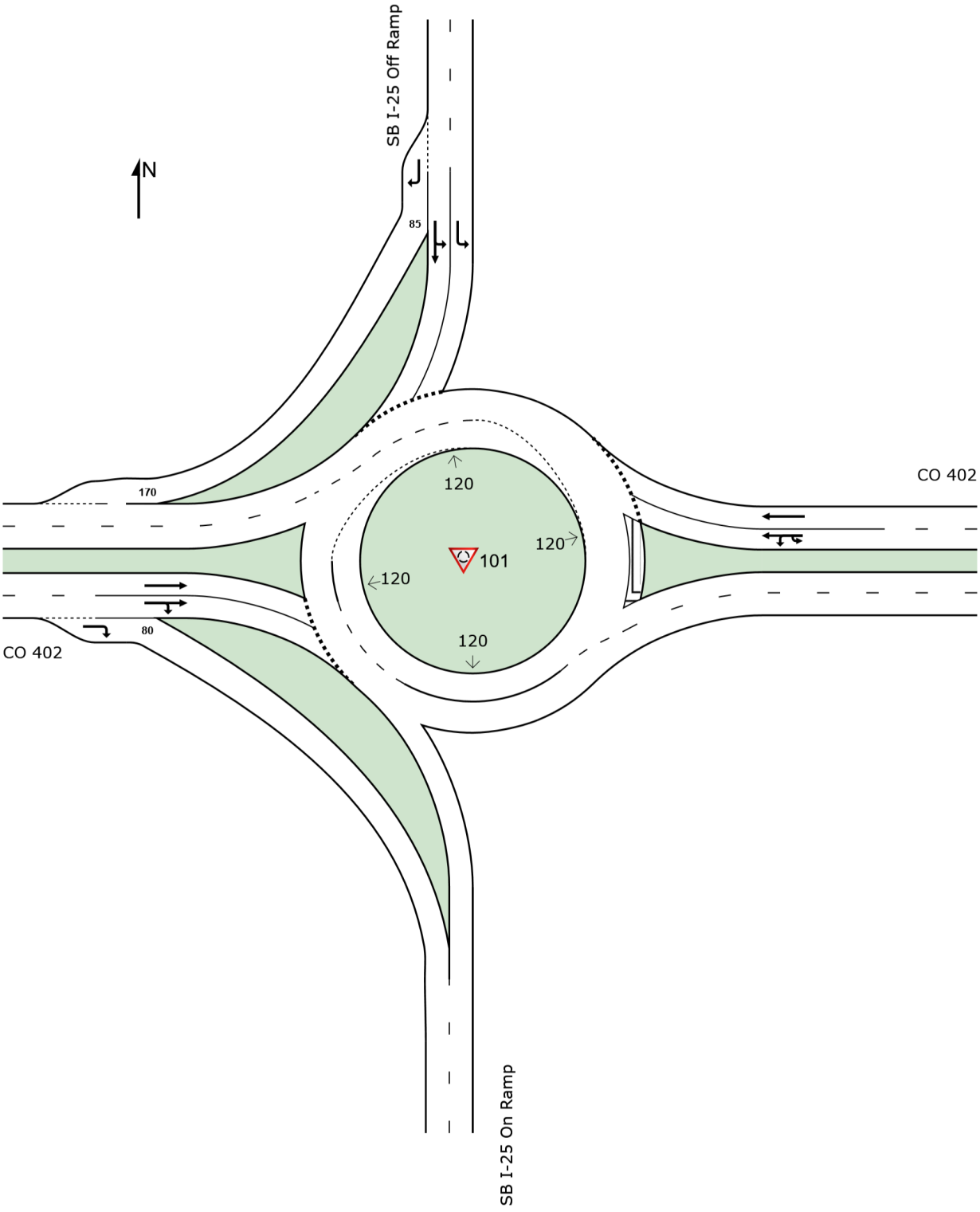
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	136	790	-	-	762	-	-	368
HCM Lane V/C Ratio	0.52	0.003	-	-	0.05	-	-	0.003
HCM Control Delay (s)	57.1	9.6	0	-	10	0	-	14.8
HCM Lane LOS	F	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	2.5	0	-	-	0.2	-	-	0

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

Existing PM Peak Hour
Site Category: Existing Design
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing PM Peak Hour
Site Category: Existing Design
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: CO 402															
1u	U	All MCs	4	5.0	4	5.0	0.321	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	19.5
1	L2	All MCs	177	5.0	177	5.0	0.321	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	37.6
6	T1	All MCs	689	5.0	689	5.0	0.321	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	26.4
Approach			871	5.0	871	5.0	0.321	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	29.5
North: SB I-25 Off Ramp															
7	L2	All MCs	185	6.0	185	6.0	0.173	8.9	LOS A	0.6	14.4	0.62	0.60	0.62	27.6
4	T1	All MCs	1	6.0	1	6.0	0.173	8.6	LOS A	0.5	14.0	0.61	0.59	0.61	37.6
14	R2	All MCs	253	6.0	253	6.0	0.160	4.5	LOS A	0.0	0.0	0.00	0.00	0.00	42.3
Approach			439	6.0	439	6.0	0.173	6.4	LOS A	0.6	14.4	0.26	0.25	0.26	34.4
West: CO 402															
2	T1	All MCs	649	7.0	649	7.0	0.364	8.1	LOS A	1.6	41.9	0.53	0.39	0.53	22.8
12	R2	All MCs	207	7.0	207	7.0	0.131	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.4
Approach			855	7.0	855	7.0	0.364	6.1	LOS A	1.6	41.9	0.41	0.30	0.41	27.9
All Vehicles			2165	6.0	2165	6.0	0.364	5.4	LOS A	1.6	41.9	0.21	0.17	0.21	30.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
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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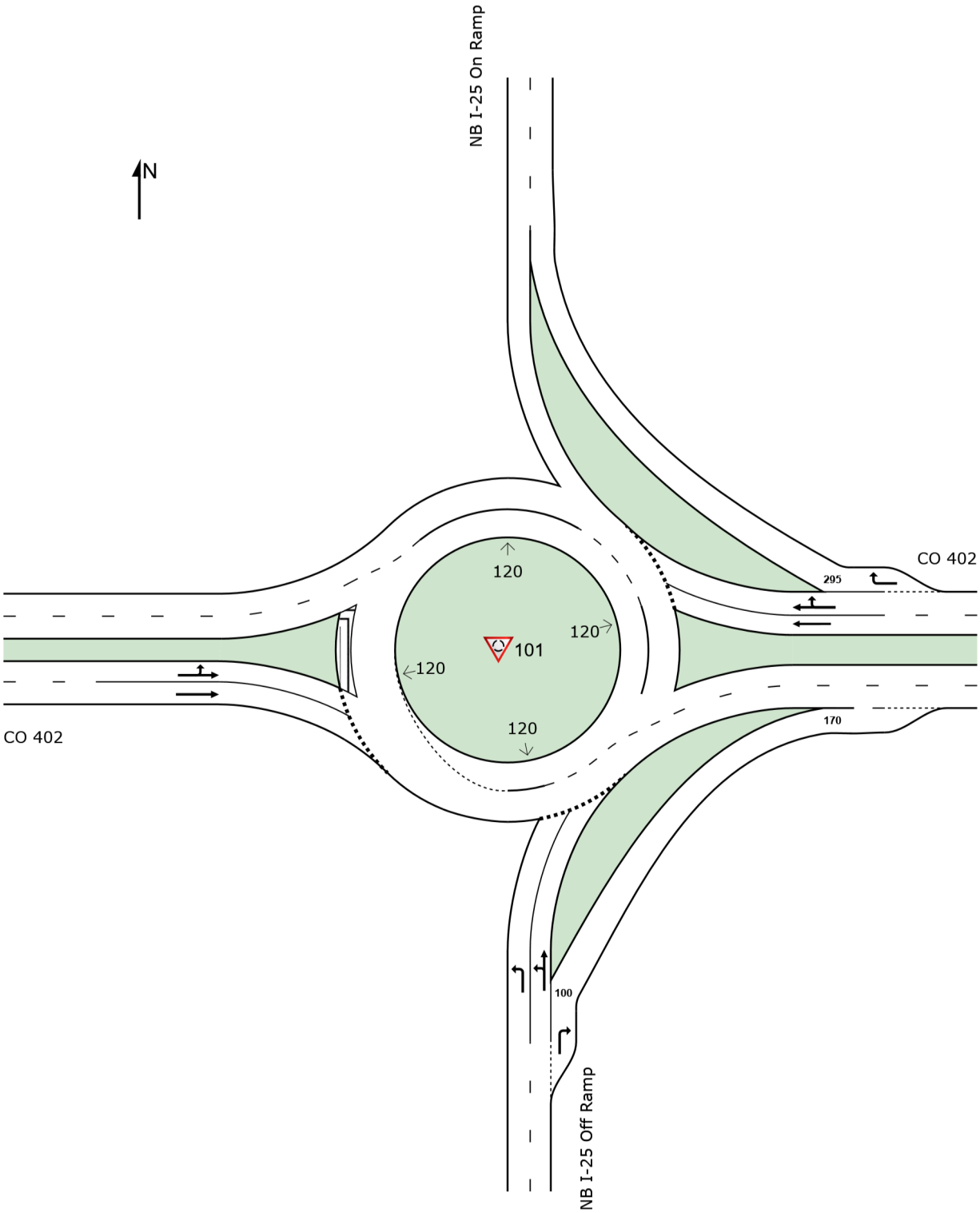
SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

Existing PM Peak Hour
Site Category: Existing Design
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing PM Peak Hour
Site Category: Existing Design
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: NB I-25 Off Ramp															
3	L2	All MCs	340	4.0	340	4.0	0.295	10.2	LOS B	1.1	28.4	0.65	0.64	0.72	25.8
8	T1	All MCs	1	4.0	1	4.0	0.295	9.8	LOS A	1.1	27.8	0.64	0.63	0.71	35.2
18	R2	All MCs	175	4.0	175	4.0	0.108	3.8	LOS A	0.0	0.0	0.00	0.00	0.00	41.3
Approach			516	4.0	516	4.0	0.295	8.1	LOS A	1.1	28.4	0.43	0.42	0.48	29.5
East: CO 402															
6	T1	All MCs	539	7.0	539	7.0	0.379	9.9	LOS A	1.7	44.8	0.63	0.60	0.76	19.6
16	R2	All MCs	90	7.0	90	7.0	0.058	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.7
Approach			629	7.0	629	7.0	0.379	8.5	LOS A	1.7	44.8	0.54	0.52	0.65	20.6
West: CO 402															
5	L2	All MCs	247	5.0	247	5.0	0.311	4.2	LOS A	0.0	0.0	0.00	0.00	0.00	35.6
2	T1	All MCs	596	5.0	596	5.0	0.311	4.2	LOS A	0.0	0.0	0.00	0.00	0.00	24.4
Approach			842	5.0	842	5.0	0.311	4.2	LOS A	0.0	0.0	0.00	0.00	0.00	28.3
All Vehicles			1988	5.4	1988	5.4	0.379	6.6	LOS A	1.7	44.8	0.28	0.27	0.33	26.0

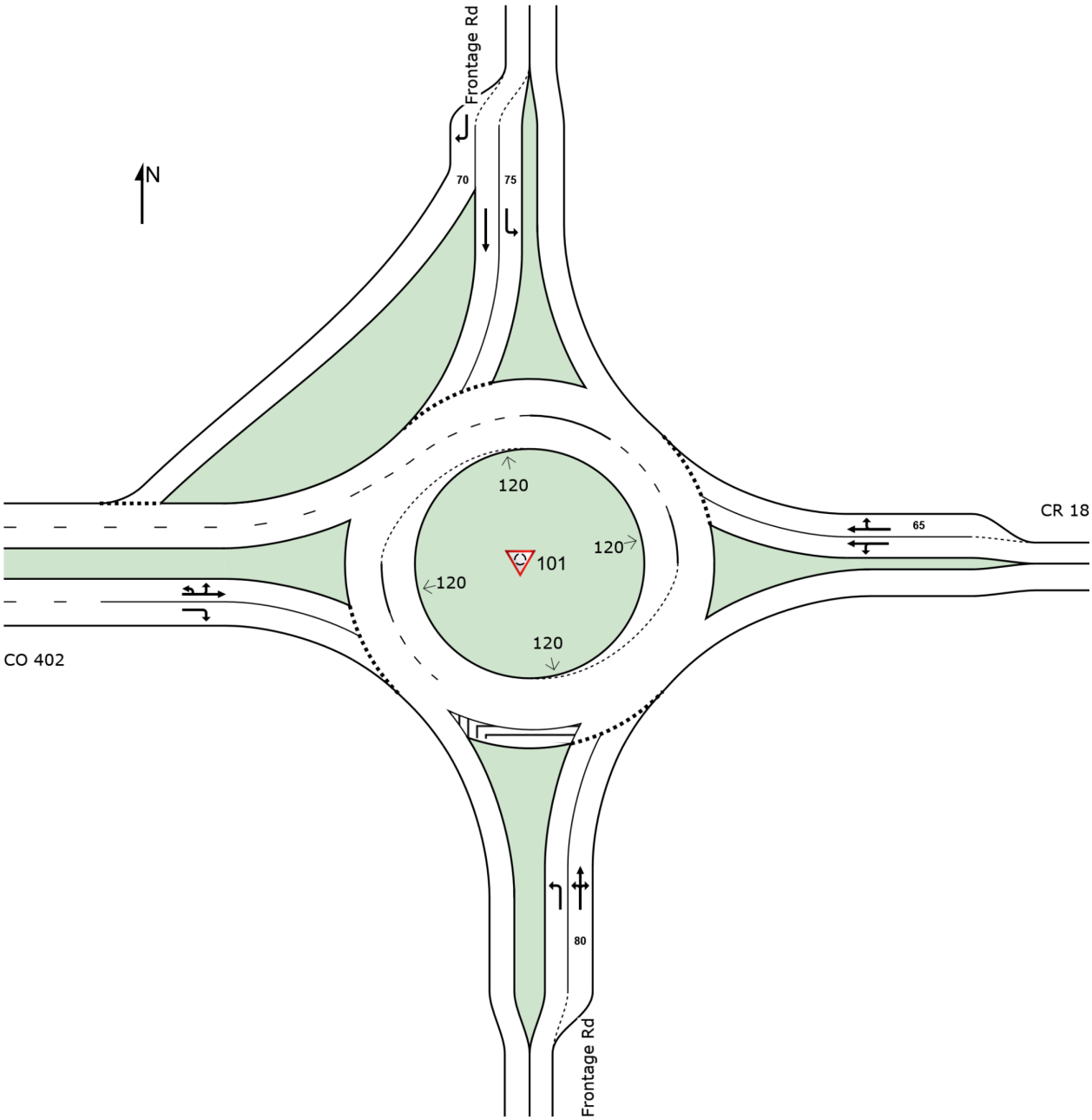
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
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.

SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Existing PM Peak Hour
Site Category: Existing Design
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing PM Peak Hour
Site Category: Existing Design
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: Frontage Rd															
3	L2	All MCs	100	9.0	100	9.0	0.192	9.5	LOS A	0.6	16.1	0.64	0.61	0.64	29.5
8	T1	All MCs	92	9.0	92	9.0	0.257	10.5	LOS B	0.8	22.4	0.66	0.63	0.67	32.5
18	R2	All MCs	41	9.0	41	9.0	0.257	10.5	LOS B	0.8	22.4	0.66	0.63	0.67	37.2
Approach			234	9.0	234	9.0	0.257	10.1	LOS B	0.8	22.4	0.65	0.62	0.66	32.2
East: CR 18															
1	L2	All MCs	7	4.0	7	4.0	0.243	6.9	LOS A	1.0	24.8	0.53	0.41	0.53	37.8
6	T1	All MCs	325	4.0	325	4.0	0.243	6.7	LOS A	1.0	24.8	0.52	0.40	0.52	39.4
16	R2	All MCs	88	4.0	88	4.0	0.243	6.5	LOS A	0.9	24.3	0.51	0.39	0.51	39.1
Approach			420	4.0	420	4.0	0.243	6.7	LOS A	1.0	24.8	0.52	0.40	0.52	39.3
North: Frontage Rd															
7	L2	All MCs	79	6.0	79	6.0	0.091	5.0	LOS A	0.3	8.0	0.45	0.35	0.45	37.5
4	T1	All MCs	73	6.0	73	6.0	0.090	5.3	LOS A	0.3	8.1	0.47	0.37	0.47	33.4
14	R2	All MCs	170	6.0	170	6.0	0.194	6.0	LOS A	0.7	18.4	0.48	0.37	0.48	29.2
Approach			322	6.0	322	6.0	0.194	5.6	LOS A	0.7	18.4	0.47	0.36	0.47	32.8
West: CO 402															
5u	U	All MCs	8	4.0	8	4.0	0.657	11.6	LOS B	5.4	139.5	0.58	0.32	0.59	18.9
5	L2	All MCs	237	4.0	237	4.0	0.657	11.6	LOS B	5.4	139.5	0.58	0.32	0.59	27.6
2	T1	All MCs	527	4.0	527	4.0	0.657	11.6	LOS B	5.4	139.5	0.58	0.32	0.59	37.0
12	R2	All MCs	14	4.0	14	4.0	0.013	3.3	LOS A	0.0	1.2	0.27	0.13	0.27	32.2
Approach			786	4.0	786	4.0	0.657	11.5	LOS B	5.4	139.5	0.57	0.32	0.59	33.7
All Vehicles			1761	5.0	1761	5.0	0.657	9.1	LOS A	5.4	139.5	0.55	0.39	0.56	34.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
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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APPENDIX D

Existing Crash Analysis

Intersection Safety Performance Functions

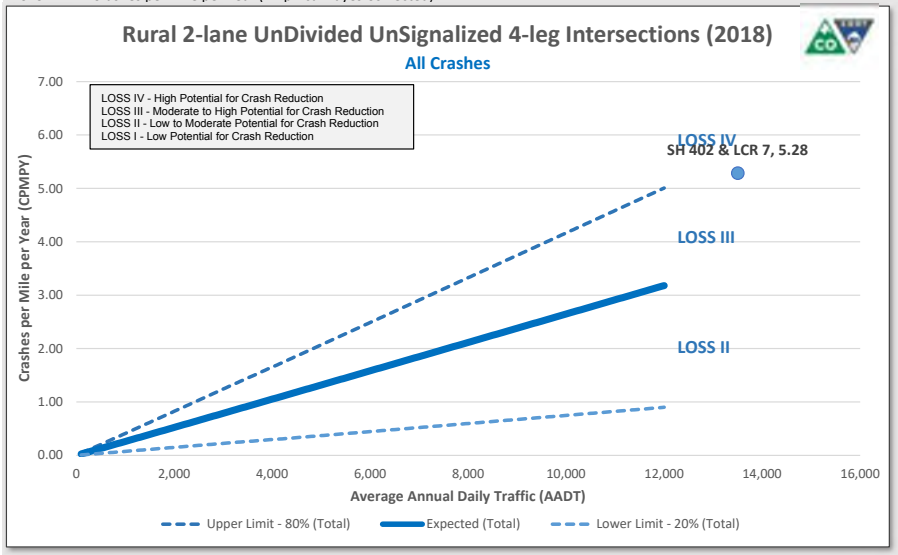
Choose a Model: Rural 2-lane UnDivided UnSignalized 4-leg Intersections (2018)

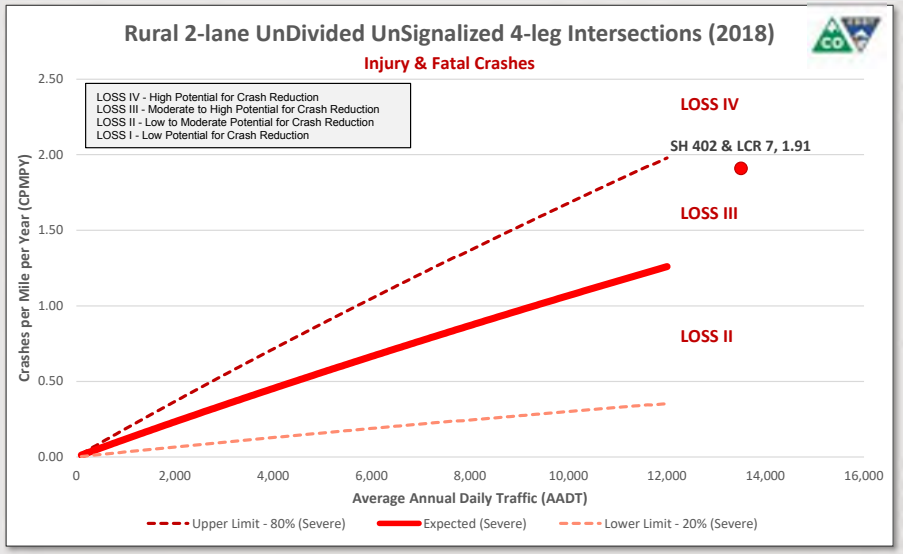
ID or Label	Road A AADT[A]	Road B AADT[A]	Crash History Date Begin	Crash History Date End	Number of Crashes PDO[B] Crash	Number of Crashes Injury Crash	Number of Crashes Fatal Crash	CPMPY[C] Total	CPMPY[C] Injury & Fatal
SH 402 & LCR 7	13,500	1,500	1/1/2018	12/31/2022	17	9	1	5.28	1.91

A. AADT - Average Annual Daily Traffic. If only one AADT is provided, it is assumed as the major AADT and the minor AADT with be calculated at 10% of the major AADT.

B. PDO - Property Damage Only

C. CPMPY - Crashes per Mile per Year (Empirical Bayes Corrected)





Intersection Safety Performance Functions

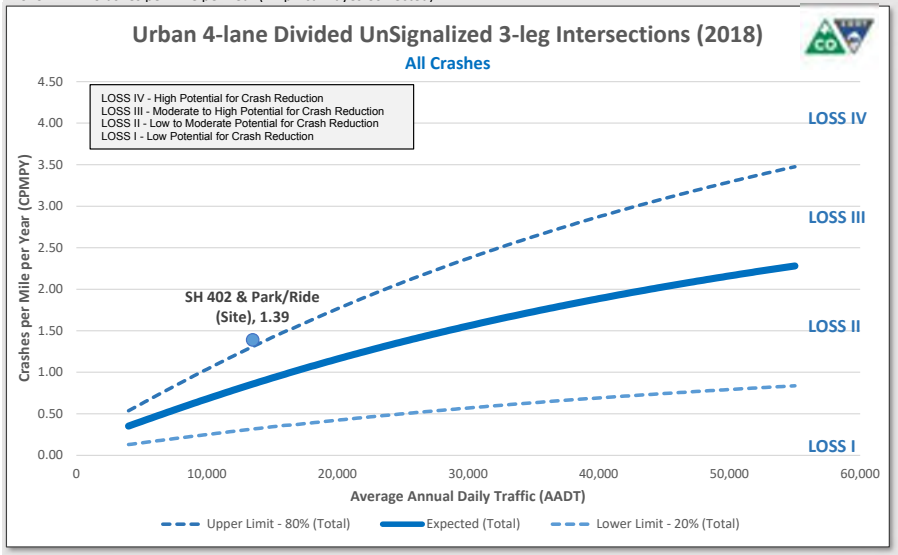
Choose a Model: Urban 4-lane Divided UnSignalized 3-leg Intersections (2018)

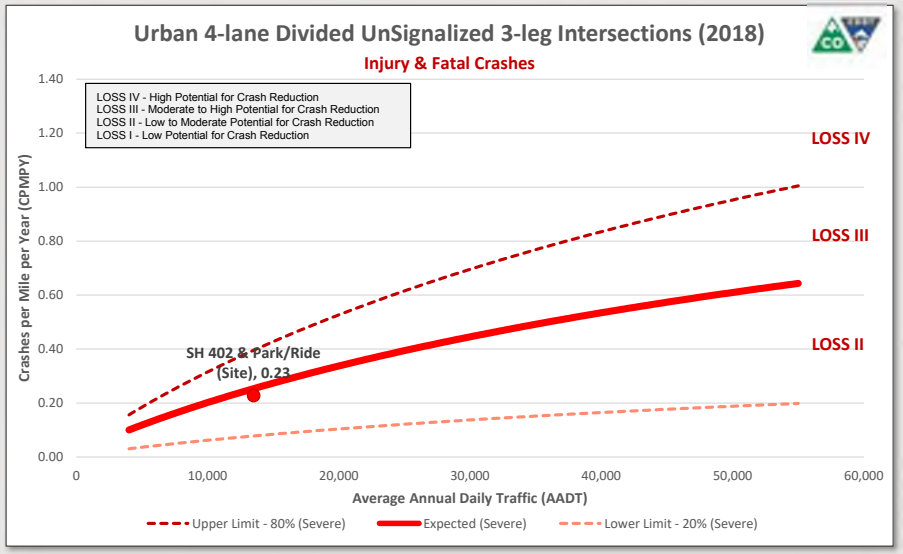
ID or Label	Road A AADT[A]	Road B AADT[A]	Crash History Date Begin	Crash History Date End	Number of Crashes PDO[B] Crash	Number of Crashes Injury Crash	Number of Crashes Fatal Crash	CPMPY[C] Total	CPMPY[C] Injury & Fatal
SH 402 & Park/Ride (Site)	13,500	1,000	1/1/2018	12/31/2022	7	1	0	**1.39**	**0.23**

A. AADT - Average Annual Daily Traffic. If only one AADT is provided, it is assumed as the major AADT and the minor AADT with be calculated at 10% of the major AADT.

B. PDO - Property Damage Only

C. CPMPY - Crashes per Mile per Year (Empirical Bayes Corrected)





Intersection Safety Performance Functions

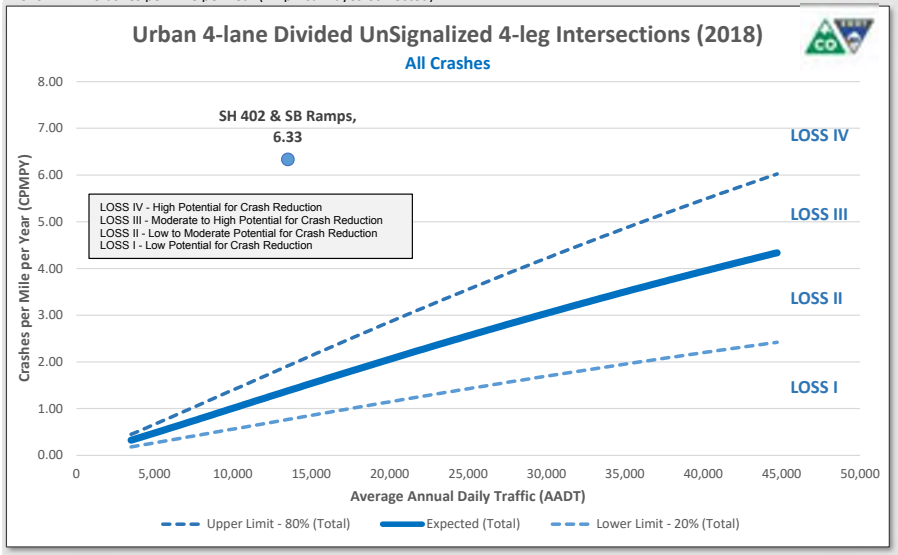
Choose a Model: Urban 4-lane Divided UnSignalized 4-leg Intersections (2018)

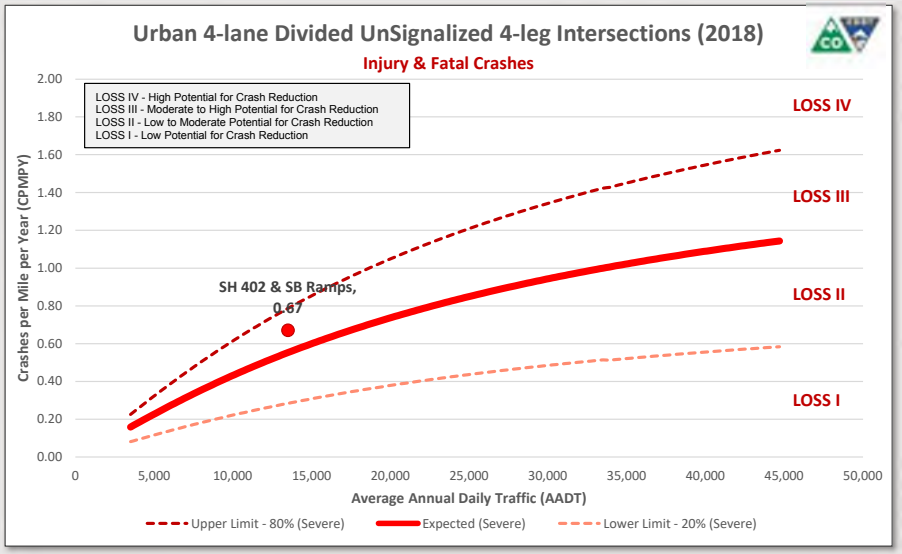
ID or Label	Road A AADT[A]	Road B AADT[A]	Crash History Date Begin	Crash History Date End	Number of Crashes PDO[B] Crash	Number of Crashes Injury Crash	Number of Crashes Fatal Crash	CPMPY[C] Total	CPMPY[C] Injury & Fatal
SH 402 & SB Ramps	13,500	5,000	1/1/2018	12/31/2022	41	4	0	6.33	0.67

A. AADT - Average Annual Daily Traffic. If only one AADT is provided, it is assumed as the major AADT and the minor AADT with be calculated at 10% of the major AADT.

B. PDO - Property Damage Only

C. CPMPY - Crashes per Mile per Year (Empirical Bayes Corrected)





Intersection Safety Performance Functions

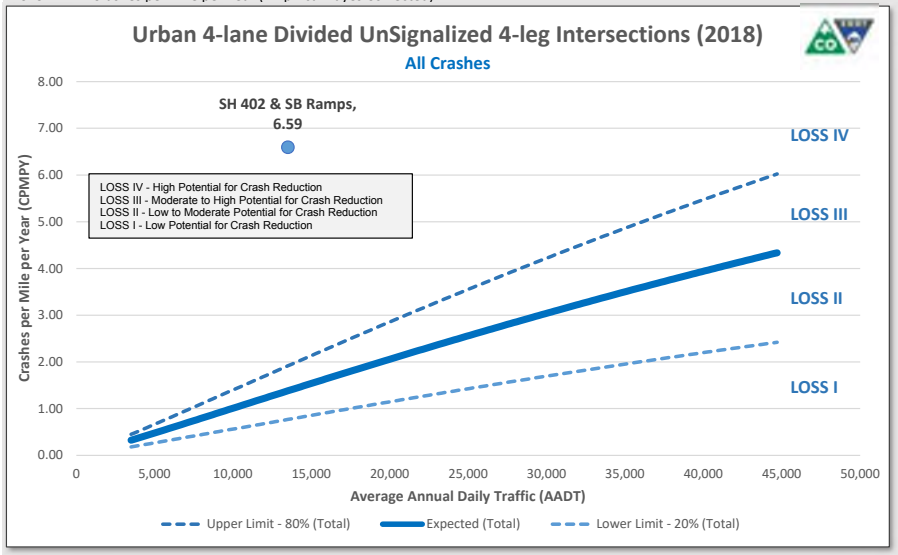
Choose a Model: Urban 4-lane Divided UnSignalized 4-leg Intersections (2018)

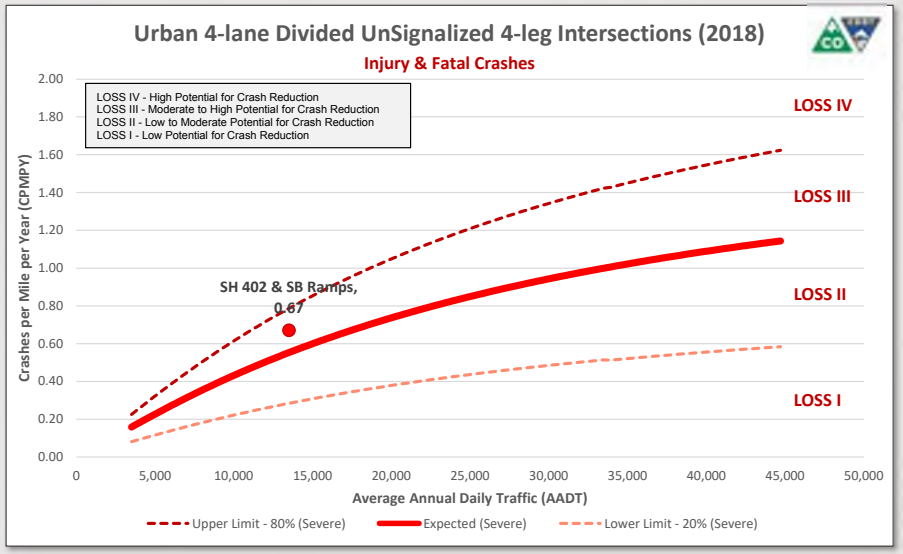
ID or Label	Road A AADT[A]	Road B AADT[A]	Crash History Date Begin	Crash History Date End	Number of Crashes PDO[B] Crash	Number of Crashes Injury Crash	Number of Crashes Fatal Crash	CPMPY[C] Total	CPMPY[C] Injury & Fatal
SH 402 & SB Ramps	13,500	5,000	1/1/2018	12/31/2022	43	4	0	6.59	0.67

A. AADT - Average Annual Daily Traffic. If only one AADT is provided, it is assumed as the major AADT and the minor AADT with be calculated at 10% of the major AADT.

B. PDO - Property Damage Only

C. CPMPY - Crashes per Mile per Year (Empirical Bayes Corrected)





system	rte	sec	mp	date	time	severity	injlevel_1	injlevel_2	injlevel_3	injlevel_4	injlevel_5	location	road_desc	vehicles	contour	condition	lighting	weather	limit1	limit2	ramp	acctype	dir_1	vehicle_1	driver_1
STATE HIGHWAY	402	A	3.5	5/9/2018	1602	INJ	6	0	1	0	0	ON	NON-INTERSECTION	3	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	55	55	N	REAR-END	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	1/17/2020	924	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	55	55	N	SIDESWIPE (SAME DIRECTION)	W	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	12/13/2019	658	PDO	1	0	0	0	0	OFF RIGHT	AT INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE	45	UK	N	SIGN	S	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	6/1/2018	1726	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	55	55	N	APPROACH TURN	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	2/2/2018	1553	PDO	2	0	0	0	0	ON	NON-INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	55	55	N	REAR-END	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	8/29/2018	1809	FAT	0	1	1	0	1	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	55	55	N	APPROACH TURN	E	PICKUP TRUCK/UTILITY VAN	ALCOHOL/DRUGS
STATE HIGHWAY	402	A	3.74	3/2/2020	2153	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	55	55	N	REAR-END	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	1/5/2018	1715	INJ	1	2	1	0	0	ON	INTERSECTION RELATED	4	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE	55	55	N	REAR-END	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	4/18/2018	1810	PDO	4	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	55	55	N	REAR-END	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	4/30/2019	1659	INJ	1	1	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	SNOW/SLEET/HAIL	30	30	N	REAR-END	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	6/28/2020	1049	INJ	2	1	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	55	55	N	REAR-END	W	PASSENGER CAR/VAN	RX/MEDICATION/DRUGS
STATE HIGHWAY	402	A	3.74	3/10/2020	1300	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	40	40	N	SIDESWIPE (SAME DIRECTION)	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	3/16/2018	1352	INJ	0	1	0	2	0	ON	INTERSECTION RELATED	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	55	55	N	APPROACH TURN	W	SUV	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	7/16/2020	1342	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	55	55	N	REAR-END	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	3/10/2020	2047	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	UK	UK	N	REAR-END	E	SUV	ALCOHOL INVOLVED
STATE HIGHWAY	402	A	3.74	10/24/2018	1836	PDO	2	0	0	0	0	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	30	30	N	REAR-END	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.74	2/17/2020	653	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	30	30	N	REAR-END	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.75	10/21/2018	2025	PDO	4	0	0	0	0	ON	NON-INTERSECTION	3	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	30	30	N	REAR-END	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.93	4/19/2018	1605	PDO	2	0	0	0	0	ON	NON-INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	55	55	N	REAR-END	E	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.95	3/14/2018	1734	PDO	2	0	0	0	0	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	REAR-END	E	SUV	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	3.95	3/14/2018	1803	PDO	4	0	0	0	0	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	REAR-END	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4	6/14/2018	1707	PDO	3	0	0	0	0	ON	NON-INTERSECTION	3	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	45	45	N	REAR-END	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.02	5/11/2018	1430	PDO	2	0	0	0	0	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	45	45	N	REAR-END	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.11	11/22/2019	1027	PDO	0	0	0	0	0	OFF RIGHT	ROUNDABOUT	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	UK	UK	N	LIGHT/UTILITY POLE	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.11	6/17/2020	1700	INJ	1	1	0	0	0	ON	ROUNDABOUT	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE	35	35	N	BROADSIDE	S	SUV	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.11	5/13/2020	1451	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	30	30	N	SIDESWIPE (SAME DIRECTION)	S	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.11	1/9/2020	649	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE	35	35	N	BROADSIDE	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.11	11/2/2019	1607	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	30	30	N	BROADSIDE	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.11	11/14/2019	1143	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	SIDESWIPE (SAME DIRECTION)	W	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.11	11/11/2020	1750	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	UNKNOWN	DRY	DARK-LIGHTED	NONE	35	35	N	SIDESWIPE (SAME DIRECTION)	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.11	7/23/2020	1024	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	UNKNOWN	DRY	DAYLIGHT	NONE	30	30	N	SIDESWIPE (SAME DIRECTION)	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.14	8/11/2018	1557	PDO	5	0	0	0	0	ON	RAMP	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	55	55	Y (T)	REAR-END	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.17	4/8/2018	51	INJ	2	1	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	35	35	N	REAR-END	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.18	3/5/2018	1709	PDO	1	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	UK	35	N	REAR-END	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.18	3/24/2019	2101	PDO	1	0	0	0	0	OFF RIGHT	AT INTERSECTION	1	STRAIGHT ON-GRADE	DRY	DARK-UNLIGHTED	NONE	55	UK	N	EMBANKMENT CUT/FILL SLOPE	S	SUV	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.22	11/20/2018	703	INJ	1	1	0	0	0	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	45	45	N	REAR-END	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.22	6/13/2018	1810	PDO	3	0	0	0	0	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	45	45	N	REAR-END	E	PASSENGER CAR/VAN	ALCOHOL INVOLVED
STATE HIGHWAY	402	A	4.23	4/8/2019	849	PDO	0	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	UK	30	N	REAR-END	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.23	3/23/2018	1100	PDO	2	0	0	0	0	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	REAR-END	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.26	5/25/2018	551	INJ	1	0	1	0	0	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	REAR-END	W	MOTORCYCLE	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.27	7/4/2018	1600	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	REAR-END	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.27	9/5/2018	1430	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	APPROACH TURN	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.27	10/1/2018	1828	INJ	0	2	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE	35	35	N	APPROACH TURN	W	PICKUP TRUCK/UTILITY VAN	ALCOHOL INVOLVED
STATE HIGHWAY	402	A	4.3	9/16/2020	916	PDO	1	0	0	0	0	ON	ROUNDABOUT	2	UNKNOWN	DRY	DAYLIGHT	NONE	UK	35	N	SIDESWIPE (SAME DIRECTION)	UK	UNKNOWN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.3	2/10/2020	1331	INJ	0	1	0	0	0	OFF RIGHT	ROUNDABOUT	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	35	UK	N	OVERTURNING	W	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.3	5/4/2019	1106	PDO	6	0	0	0	0	ON	NON-INTERSECTION	3	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	45	45	N	REAR-END	N	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.3	3/30/2019	1532	PDO	3	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	30	30	N	REAR-END	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.3	10/27/2020	1128	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	UNKNOWN	SLUSHY	DAYLIGHT	NONE	35	35	N	SIDESWIPE (SAME DIRECTION)	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.3	5/18/2020	1630	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	SIDESWIPE (SAME DIRECTION)	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.3	12/10/2020	1552	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	UNKNOWN	DRY	DAYLIGHT	NONE	35	35	N	BROADSIDE	N	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.3	11/13/2020	2235	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	UNKNOWN	DRY	DARK-LIGHTED	NONE	35	35	N	SIDESWIPE (SAME DIRECTION)	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.3	11/7/2020	1341	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	UNKNOWN	DRY	DAYLIGHT	NONE	30	30	N	BROADSIDE	N	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.3	8/6/2020	1408	PDO	3	0	0	0	0	ON	ROUNDABOUT	2	UNKNOWN	DRY	DAYLIGHT	NONE	30	30	N	BROADSIDE	N	SUV	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	5/10/2019	0	PDO	2	0	0	0	0	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	VEHICLE CARGO/DEBRIS	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	7/19/2019	1330	PDO	1	0	0	0	0	OFF RIGHT	AT INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	UK	N	SIGN	E	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	3/5/2018	1448	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	REAR-END	E	SUV	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	5/18/2018	1707	PDO	0	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAWN OR DUSK	RAIN	35	35	N	REAR-END	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	6/2/2018	1620	INJ	3	0	1	0	0	ON	AT INTERSECTION	3	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	REAR-END	E	SUV	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	3/2/2018	1530	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	25	25	N	SIDESWIPE (SAME DIRECTION)	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	7/31/2018	722	PDO	3	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	SIDESWIPE (SAME DIRECTION)	E	SUV	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	5/6/2018	1449	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	REAR-END	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	6/19/2018	1355	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	55	35	N	BROADSIDE	S	SUV	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	6/19/2018	1355	PDO	2	0	0	0	0	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	55	35	N	BROADSIDE	S	SUV	NO IMPAIRMENT SUSPECTED
STATE HIGHWAY	402	A	4.31	5/3/2019	1445	PDO	2	0	0	0	0	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	35	35	N	REAR-END	N	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
FRONTAGE ROAD	25	A	255.27	12/12/2019	1110	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	30	30	Y (P)	SIDESWIPE (OPPOSITE DIRECTION)	S	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
FRONTAGE ROAD	25	A	255.27	10/22/2019	1451	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	30	UK	Y (P)	BROADSIDE	S	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED
FRONTAGE ROAD	25	A	255.27	4/29/2020	1541	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	45	UK	Y (P)	BICYCLE	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED
FRONTAGE ROAD	25	A	255.27	7/20/2020	851	PDO	2	0	0	0	0	ON	ROUNDABOUT	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	30	30	Y (P)	SIDESWIPE (SAME DIRECTION)	NW	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED

factor_1	speed_1	veh_move_1	dir_2	vehicle_2	driver_2	factor_2	speed_2	veh_move_2	loc_01	link	loc_02	city	county	latitude	longitude
NO APPARENT CONTRIBUTING FACTOR	17	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	HWY 402	AT	4800 BLK	LOVELAND	LARIMER	40.378132	-105.006997
NO APPARENT CONTRIBUTING FACTOR	40	GOING STRAIGHT	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	DRIVER UNFAMILIAR WITH AREA	10	GOING STRAIGHT	14TH ST SE	AT	CR 7	LOVELAND	LARIMER	40.378091	-105.002427
DRIVER UNFAMILIAR WITH AREA	5	MAKING RIGHT TURN			NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR			CR 7	AT	HWY 402	LOVELAND	LARIMER	40.378091	-105.002446
NO APPARENT CONTRIBUTING FACTOR	15	MAKING LEFT TURN	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	50	GOING STRAIGHT	CR 7 S	AT	HWY 402 E	LOVELAND	LARIMER	40.378091	-105.002444
DRIVER PREOCCUPIED	UK	GOING STRAIGHT	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	HIGHWAY 402 E	AT	CR 7 / CHARLOTTE CT	LOVELAND	LARIMER	40.378091	-105.002444
NO APPARENT CONTRIBUTING FACTOR	UK	MAKING LEFT TURN	W	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	HWY 402	AT	CHARLOTTE CT	LOVELAND	LARIMER	40.378106	-105.002567
UNKNOWN	UK	GOING STRAIGHT	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402	AT	CHARLOTTE CT (NOT IN CORIS)	LOVELAND	LARIMER	40.378091	-105.002427
NO APPARENT CONTRIBUTING FACTOR	40	SLOWING	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	40	SLOWING	HWY 402	AT	CR 7	JOHNSTOWN	WELD	40.378091	-105.002444
NO APPARENT CONTRIBUTING FACTOR	40	SLOWING	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	40	SLOWING	HWY 402	AT	CR 7		LARIMER	40.378091	-105.002444
NO APPARENT CONTRIBUTING FACTOR	35	GOING STRAIGHT	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	20	SLOWING	HWY 402	AT	CR 7		LARIMER	40.378091	-105.002446
UNKNOWN	45	MAKING LEFT TURN	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	UNKNOWN	UK	GOING STRAIGHT	HWY 402	AT	CR 7	JOHNSTOWN	LARIMER	40.378091	-105.002427
NO APPARENT CONTRIBUTING FACTOR	10	OTHER	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	20	GOING STRAIGHT	HWY 402	AT	CR 7	JOHNSTOWN	LARIMER	40.378091	-105.002427
NO APPARENT CONTRIBUTING FACTOR	10	MAKING LEFT TURN	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	HWY 402	AT	CR 7	LOVELAND	LARIMER	40.378091	-105.002444
NO APPARENT CONTRIBUTING FACTOR	55	GOING STRAIGHT	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	20	SLOWING	HWY 402 E	AT	CHARLOTTE CT	LOVELAND	LARIMER	40.378091	-105.002427
UNKNOWN	UK	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	MAKING LEFT TURN	HWY 402 E	AT	CR 7	LOVELAND	LARIMER	40.378091	-105.002427
DRIVER FATIGUE	45	GOING STRAIGHT	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	40	SLOWING	HWY 402 E	AT	CR 7 S	JOHNSTOWN	LARIMER	40.378091	-105.002444
DRIVER INEXPERIENCE	40	GOING STRAIGHT	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	HWY 402 E	AT	CR 7 S	JOHNSTOWN	LARIMER	40.378091	-105.002427
UNKNOWN	30	GOING STRAIGHT	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	30	SLOWING	HWY 402	99999FE	LCR 7 S	JOHNSTOWN	WELD	40.378091	-105.002258
NO APPARENT CONTRIBUTING FACTOR	35	GOING STRAIGHT	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	15	AVOIDING OBJECT/VEHICLE IN ROAD	HWY 402	00393FW	MM 4		LARIMER	40.378097	-104.998894
NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402	AT	5500 E	LOVELAND	LARIMER	40.378097	-104.99852
NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402	AT	5500 E	LOVELAND	LARIMER	40.378097	-104.99852
NO APPARENT CONTRIBUTING FACTOR	30	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	20	SLOWING	HWY 402	AT	MM 4	JOHNSTOWN	WELD	40.378099	-104.997586
NO APPARENT CONTRIBUTING FACTOR	10	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	5	SLOWING	HWY 402	AT	MM 4	JOHNSTOWN	WELD	40.378099	-104.997212
NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT			NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR			HWY 402	AT	5570 E HWY 402	JOHNSTOWN	LARIMER	40.377711	-104.994196
DRIVER UNFAMILIAR WITH AREA	25	MAKING RIGHT TURN	W	SUV	NO IMPAIRMENT SUSPECTED	DRIVER UNFAMILIAR WITH AREA	25	GOING STRAIGHT	HWY 402	AT	I-25 SB OFF RAMP	JOHNSTOWN	LARIMER	40.378001	-104.994124
NO APPARENT CONTRIBUTING FACTOR	20	OTHER	S	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	OTHER	HWY 402	AT	I-25 SB ON RAMP	JOHNSTOWN	LARIMER	40.378001	-104.994124
NO APPARENT CONTRIBUTING FACTOR	10	GOING STRAIGHT	S	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	35	GOING STRAIGHT	HWY 402	AT	I-25 SB ON RAMP (NEW CONFIG)	JOHNSTOWN	LARIMER	40.378001	-104.994124
NO APPARENT CONTRIBUTING FACTOR	15	OTHER	S	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	25	OTHER	HWY 402	AT	I-25 SB RAMPS	JOHNSTOWN	WELD	40.377981	-104.993938
NO APPARENT CONTRIBUTING FACTOR	20	OTHER	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	20	GOING STRAIGHT	HWY 402	AT	I-25 SB RAMPS	JOHNSTOWN	WELD	40.377981	-104.993938
NO APPARENT CONTRIBUTING FACTOR	35	UNKNOWN	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	35	GOING STRAIGHT	HWY 402	AT	I-25 EXIT 255 ROUND ABOUT	JOHNSTOWN	LARIMER	40.378001	-104.994124
DRIVER UNFAMILIAR WITH AREA	25	GOING STRAIGHT	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	25	GOING STRAIGHT	HWY 402	AT	I-25 SB ONRAMP ROUND ABOUT	JOHNSTOWN	LARIMER	40.378001	-104.994124
DRIVER PREOCCUPIED	40	GOING STRAIGHT	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402	AT	LOVELAND PARK AND RIDE (NOT IN CORIS)	LOVELAND	LARIMER	40.378103	-104.99497
DRIVER PREOCCUPIED	40	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	15	GOING STRAIGHT	HWY 402	99999FW	I-25 SB ON RAMP	JOHNSTOWN	WELD	40.378104	-104.994409
NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402 EB	AT	I-25 SB RAMPS	JOHNSTOWN	LARIMER	40.378104	-104.994222
ILLNESS	55	OTHER			NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR			I-25 SB OFF RAMP	AT	HWY 402		LARIMER	40.378104	-104.994182
NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	W	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	20	GOING STRAIGHT	HWY 402	99999FW	I-25	JOHNSTOWN	LARIMER	40.378105	-104.993475
DRIVER PREOCCUPIED	45	GOING STRAIGHT	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402	99999FW	I-25 OVERPASS	LOVELAND	LARIMER	40.378105	-104.993475
NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	HWY 402	AT	I-25	JOHNSTOWN	LARIMER	40.378106	-104.99324
DRIVER PREOCCUPIED	35	GOING STRAIGHT	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402 EB	AT	I-25 UNDERPASS	JOHNSTOWN	WELD	40.378105	-104.993288
DRIVER PREOCCUPIED	10	GOING STRAIGHT	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	5	SLOWING	HWY 402	00030FW	I-25 NB ON RAMP	JOHNSTOWN	WELD	40.378106	-104.992727
NO APPARENT CONTRIBUTING FACTOR	25	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	15	GOING STRAIGHT	HWY 402	AT	I-25 NB ON RAMP	JOHNSTOWN	WELD	40.378107	-104.99254
DRIVER PREOCCUPIED	10	MAKING LEFT TURN	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	35	GOING STRAIGHT	HWY 402	AT	I-25 NB ON RAMP	JOHNSTOWN	LARIMER	40.378107	-104.99254
UNKNOWN	35	MAKING LEFT TURN	E	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	10	GOING STRAIGHT	HWY 402	AT	I-25 SB OFF RAMP	JOHNSTOWN	LARIMER	40.378107	-104.99254
UNKNOWN	UK	UNKNOWN	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	15	GOING STRAIGHT	HWY 402	AT	I-25 NB RAMPS	JOHNSTOWN	LARIMER	40.378229	-104.991721
DRIVER INEXPERIENCE	21	OTHER			NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR			HWY 402	AT	I-25 NB RAMPS (NEW CONFIG)	JOHNSTOWN	LARIMER	40.378229	-104.991721
NO APPARENT CONTRIBUTING FACTOR	30	GOING STRAIGHT	N	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	25	SLOWING	HWY 402	AT	FRONTAGE RD SE	JOHNSTOWN	LARIMER	40.378107	-104.991975
NO APPARENT CONTRIBUTING FACTOR	10	SLOWING	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	SLOWING	HWY 402	99999FW	I-25 NB ON/OFF RAMP	JOHNSTOWN	LARIMER	40.378107	-104.991975
NO APPARENT CONTRIBUTING FACTOR	15	UNKNOWN	W	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	15	UNKNOWN	HWY 402	AT	INTERSTATE 25	JOHNSTOWN	LARIMER	40.378229	-104.991721
NO APPARENT CONTRIBUTING FACTOR	25	GOING STRAIGHT	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	25	GOING STRAIGHT	HWY 402	AT	I-25	JOHNSTOWN	LARIMER	40.378108	-104.991871
DRIVER INEXPERIENCE	10	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	20	CHANGING LANES	HWY 402	AT	I-25 NORTHBOUND OFF RAMP ROUNDABOUT	JOHNSTOWN	LARIMER	40.378108	-104.991871
DRIVER UNFAMILIAR WITH AREA	20	UNKNOWN	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	20	MAKING LEFT TURN	HWY 402 OVERPASS/MIDDLE ROUNDABOUT	AT	I-25	JOHNSTOWN	LARIMER	40.378108	-104.991871
UNKNOWN	15	MAKING RIGHT TURN	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	25	CHANGING LANES	HWY 402 OVERPASS/MIDDLE ROUNDABOUT	AT	I-25	JOHNSTOWN	LARIMER	40.378108	-104.991871
NO APPARENT CONTRIBUTING FACTOR	20	GOING STRAIGHT	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	20	GOING STRAIGHT	HWY 402	AT	I-25 NB OFF RAMP	JOHNSTOWN	LARIMER	40.378108	-104.991871
NO APPARENT CONTRIBUTING FACTOR	20	GOING STRAIGHT	W	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402	AT	FRONTAGE RD SE	JOHNSTOWN	LARIMER	40.378108	-104.991871
DRIVER INEXPERIENCE	10	MAKING RIGHT TURN			NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR			HWY 402	AT	I-25 FRONTAGE RD E	JOHNSTOWN	LARIMER	40.378108	-104.991871
DRIVER PREOCCUPIED	5	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	DRIVER PREOCCUPIED	5	GOING STRAIGHT	HWY 402	AT	I-25 FRONTAGE RD SE	JOHNSTOWN	WELD	40.378108	-104.991871
NO APPARENT CONTRIBUTING FACTOR	20	GOING STRAIGHT	E	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402	AT	I-25 FRONTAGE RD SE	JOHNSTOWN	WELD	40.378108	-104.991871
DISTRACTED BY PASSENGER	45	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402	AT	I-25 FRONTAGE RD SE	JOHNSTOWN	WELD	40.378108	-104.991871
UNKNOWN	5	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	5	GOING STRAIGHT	HWY 402	AT	I-25 FRONTAGE RD SE	JOHNSTOWN	LARIMER	40.378108	-104.991871
NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	E	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	HWY 402	AT	I-25 FRONTAGE RD SE	JOHNSTOWN	LARIMER	40.378108	-104.991871
DRIVER PREOCCUPIED	5	BACKING	W	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	HWY 402 / CR 18	AT	I-25 FRONTAGE RD SE	JOHNSTOWN	LARIMER	40.378108	-104.991871
NO APPARENT CONTRIBUTING FACTOR	55	GOING STRAIGHT	W	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	35	GOING STRAIGHT	I-25 FRONTAGE RD SE	AT	HWY 402	JOHNSTOWN	WELD	40.378108	-104.991871
NO APPARENT CONTRIBUTING FACTOR	55	GOING STRAIGHT	W	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	35	GOING STRAIGHT	I-25 FRONTAGE RD SE	AT	HWY 402	JOHNSTOWN	LARIMER	40.378108	-104.991871
DRIVER PREOCCUPIED	5	GOING STRAIGHT	N	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	0	STOPPED IN TRAFFIC	SE FRONTAGE RD	AT	HWY 402	JOHNSTOWN	LARIMER	40.378108	-104.991871
DRIVER UNFAMILIAR WITH AREA	5	WRONG WAY	N	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	10	MAKING LEFT TURN	HWY 402	AT	I-25 FRONTAGE RD SE	JOHNSTOWN	LARIMER	40.378235	-104.988756
DRIVER UNFAMILIAR WITH AREA	25	GOING STRAIGHT	W	PASSENGER CAR/VAN	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	HWY 402 (NEW CONFIG)	AT	I-25 FRONTAGE RD SE	JOHNSTOWN	LARIMER	40.378235	-104.988756
NO APPARENT CONTRIBUTING FACTOR	10	GOING STRAIGHT	S	BICYCLE	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	UK	GOING STRAIGHT	I-25 FRONTAGE RD SE	AT	HWY 402	JOHNSTOWN	LARIMER	40.378262	-104.988792
NO APPARENT CONTRIBUTING FACTOR	20	MAKING LEFT TURN	NW	SUV	NO IMPAIRMENT SUSPECTED	NO APPARENT CONTRIBUTING FACTOR	20	MAKING LEFT TURN	HWY 402	AT	SE FRONTAGE ROAD	JOHNSTOWN	LARIMER	40.377981	-104.988547

CUID	System Code	Rd_Number	Rd_Section	City_Street	Road Description	City	County	Location 1	Link	Location 2	Location	Crash Type	MHE	First HE
56418		2 402A	3.73		Non-Intersection	LOVELAND	LARIMER	HWY 402	99999FW	CR 7	Ran off left side	Overturning/Rollover	Overturning/Rollover	Overturning/Rollover
99936		2 402A	3.741		At Intersection	LOVELAND	LARIMER	HWY 402	AT	CR 7	On Roadway	Rear-End	Front to Rear	Front to Rear
176108		2 402A	3.741		At Intersection	LOVELAND	LARIMER	HWY 402	AT	CR 7 / CHARLOTTE CT	On Roadway	Rear-End	Front to Rear	Front to Rear
203851		2 402A	3.741		At Intersection	LOVELAND	LARIMER	HWY 402	AT	CR 7	Ran off right side	Light Pole/Utility Pole	Light Pole/Utility Pole	Light Pole/Utility Pole
218518		2 402A	3.741		At Intersection	LOVELAND	LARIMER	HWY 402	AT	CR 7	Ran off left side	Sign	Sign	Sign
221226		2 402A	3.741		At Intersection	JOHNSTOWN	LARIMER	HWY 402	AT	CR 7	On Roadway	Rear-End	Front to Rear	Front to Rear
274216		2 402A	3.741		At Intersection	JOHNSTOWN	LARIMER	HWY 402	AT	CR 7	On Roadway	Rear-End	Front to Rear	Front to Rear
150473		2 402A	3.75		Non-Intersection	LOVELAND	LARIMER	HWY 402	99999FE	CR 7	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
157846		2 402A	3.75		Intersection Related	LOVELAND	LARIMER	HWY 402	99999FE	CR 7 / CHARLOTTE CT	On Roadway	Rear-End	Front to Side	Front to Rear
234433		2 402A	3.92		Non-Intersection	JOHNSTOWN	LARIMER	HWY 402	0.25MW	I-25 SB ON RAMP	On Roadway	Sideswipe Opposite Direct	Side to Side-Opposite Dire	Side to Side-Opposite Dire
236661		2 402A	3.92		Non-Intersection	JOHNSTOWN	LARIMER	HWY 402	0.25MW	I-25 SB ON RAMP	On Roadway	Parked Motor Vehicle	Parked Motor Vehicle	Parked Motor Vehicle
188244		2 402A	4.050		At Intersection	JOHNSTOWN	LARIMER	HWY 402	00300FW	I-25 SB ON RAMP	On Roadway	Rear-End	Front to Rear	Front to Rear
55980		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 OFF RAMP SB	On Roadway	Broadside	Front to Side	Front to Side
120011		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAMPS (W ROUND	On Roadway	Broadside	Front to Side	Front to Side
125185		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RNDABT	Center median/ Island	Sign	Sign	Sign
126461		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB OFF RAMP	Ran off left side	Traffic Signal Pole	Traffic Signal Pole	Traffic Signal Pole
130808		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB ON RAMP	On Roadway	Sideswipe Same Direction	Front to Side	Front to Side
135101		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAMPS	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
140732		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RNDABT	On Roadway	Broadside	Side to Side-Same Directio	Side to Side-Same Directio
162511		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAMPS	On Roadway	Broadside	Front to Front	Front to Front
162551		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAMPS	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
172461		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
177404		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 OFF RAMP	On Roadway	Broadside	Front to Side	Front to Side
186373		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB OFF RAMP	On Roadway	Broadside	Front to Side	Front to Side
192272		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB ON RAMP	Ran off right side	Light Pole/Utility Pole	Light Pole/Utility Pole	Light Pole/Utility Pole
193621		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB ON RAMP	On Roadway	Rear-End	Front to Rear	Front to Rear
194267		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAMPS	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
194546		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAMPS	Center median/ Island	Traffic Signal Pole	Traffic Signal Pole	Traffic Signal Pole
196926		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAMPS	On Roadway	Sideswipe Same Direction	Rear to Side	Rear to Side
212243		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAMPS	On Roadway	Sideswipe Same Direction	Front to Side	Front to Side
215604		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RNDABT	On Roadway	Overturning/Rollover	Overturning/Rollover	Overturning/Rollover
241356		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB OFF RAMP	On Roadway	Broadside	Front to Side	Front to Side
243365		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25	On Roadway	Vehicle Debris or Cargo	Vehicle Debris or Cargo	Vehicle Debris or Cargo
254438		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 OFF RAMP	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
255074		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAMPS	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
256464		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB OFF RAMP	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
258014		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
261231		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB OFF RAMP	On Roadway	Rear-End	Front to Rear	Front to Rear
261766		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB ROUNDABOUT W	On Roadway	Overtaking Turn	Front to Rear	Front to Rear
279319		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAB W	On Roadway	Parked Motor Vehicle	Parked Motor Vehicle	Parked Motor Vehicle
307827		2 402A	4.110		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SB RAMPS	Ran off right side	Sign	Sign	Sign
56277		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I 25 NB ON RAMP	On Roadway	Broadside	Front to Rear	Front to Rear
119800		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB OFF RAMP	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
135152		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I 25 NB RAMPS	On Roadway	Broadside	Side to Side-Same Directio	Side to Side-Same Directio
140205		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB OFF RAMP	On Roadway	Overtaking Turn	Side to Side-Same Directio	Side to Side-Same Directio
151605		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB RAMPS	On Roadway	Sideswipe Same Direction	Front to Side	Front to Side
170706		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB OFF RAMP	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
170733		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB RAMPS	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
179960		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB ON RAMP	Ran off right side	Light Pole/Utility Pole	Light Pole/Utility Pole	Curb
186328		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB RAMPS	On Roadway	Overtaking Turn	Front to Side	Front to Side
186357		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
194583		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	I-25 NB OFF RAMP	AT	HWY 402	Ran off right side	Traffic Signal Pole	Traffic Signal Pole	Traffic Signal Pole
197071		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 OVERPASS	On Roadway	Broadside	Front to Side	Front to Side
210561		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB OVERPASS	On Roadway	Broadside	Front to Side	Front to Side
217297		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	I-25 NB OFF RAMP	AT	HWY 402	On Roadway	Broadside	Front to Side	Front to Side
219258		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	I-25 NB OFF RAMP	AT	HWY 402	On Roadway	Broadside	Front to Side	Front to Side
226010		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB OFF RAMP	On Roadway	Broadside	Front to Side	Front to Side
232429		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB RAMPS	On Roadway	Sideswipe Same Direction	Front to Side	Front to Side
261240		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB RAMPS	Ran off left side	Light Pole/Utility Pole	Light Pole/Utility Pole	Light Pole/Utility Pole
265142		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB RAB E	On Roadway	Broadside	Front to Side	Front to Side
265163		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB RAB E	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
265988		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB RAB	On Roadway	Broadside	Front to Side	Front to Side
269613		2 402A	4.295		Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NB RAMPS	On Roadway	Broadside	Front to Side	Front to Side
136132		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 NE FRONTAGE RD	On Roadway	Broadside	Front to Side	Front to Side
164592		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	I-25 FRONTAGE RD SE	AT	CR 18	On Roadway	Broadside	Front to Side	Front to Side
164996		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 FRONTAGE RD SE	On Roadway	Rear-End	Front to Rear	Front to Rear
176673		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	I-25 SE FRONTAGE RD	AT	HWY 402	On Roadway	Broadside	Front to Side	Front to Side
179630		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	I-25 SE FRONTAGE RD	AT	LCR 18 (NOT CDOT)	On Roadway	Broadside	Front to Side	Front to Side
185661		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	CR 18	AT	I-25 SE FRONTAGE RD	On Roadway	Rear-End	Front to Rear	Front to Rear
186330		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	CR 18	AT	I-25 SE FRONTAGE RD	On Roadway	Overtaking Turn	Side to Side-Same Directio	Side to Side-Same Directio
212745		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SE FRONTAGE RD	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
225513		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	HWY 402 (NOT CDOT)	AT	I-25 FRONTAGE RD SE	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
233156		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 FRONTAGE RD SE	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
243326		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 SE FRONTAGE RD	On Roadway	Broadside	Front to Side	Front to Side
248933		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	CR 18	AT	I-25 SE FRONTAGE RD	On Roadway	Broadside	Front to Side	Front to Side
259753		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	I-25 FRONTAGE RD SE	AT	HWY 402	On Roadway	Rear-End	Front to Rear	Front to Rear
272654		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	HWY 402	AT	I-25 FRONTAGE RD	On Roadway	Sideswipe Same Direction	Side to Side-Same Directio	Side to Side-Same Directio
277530		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	I-25 FRONTAGE RD SE	AT	HWY 402	On Roadway	Rear-End	Front to Rear	Front to Rear
315548		3 025A	255.272	P	Roundabout	JOHNSTOWN	LARIMER	I-25 SE FRONTAGE RD	AT	HWY 402	On Roadway	Broadside	Front to Side	Front to Side

Second HE	Third HE	Fourth HE	Wild Animal	Latitude	Longitude	TU-1 Type	TU-2 Type	TU-3 Type	TU-1 Direction	TU-2 Direction	TU-3 Direction	TU-1 Movement	TU-2 Movement
				40.37808	-105.00252	SUV			East			Other (Describe in Narrati	
				40.37808	-105.00252	Passenger Car/Passenger \	SUV		West	West		Going Straight	Stopped in Traffic
				40.37808	-105.00252	Pickup Truck/Utility Van	Pickup Truck/Utility Van		West	West		Going Straight	Stopped in Traffic
				40.37808	-105.00252	SUV			West			Making U-Turn	
Electical/Utility Box				40.37808	-105.00252	Passenger Car/Passenger \			East			Making Right Turn	
				40.37809	-105.00248	Passenger Car/Passenger \	Passenger Car/Passenger \		West	West		Going Straight	Slowing
Front to Rear				40.37808	-105.00251	SUV	Passenger Car/Passenger \	Pickup Truck/Utility Van	West	West	West	Going Straight	Going Straight
				40.37807	-105.00252	Unknown (Hit and Run Onl	Passenger Car/Passenger \		West	West		Other (Describe in Narrati	Going Straight
Front to Side	Side to Side-Opposite Dire	Ditch		40.37809	-105.00234	Passenger Car/Passenger \	Passenger Car/Passenger \	Medium/Heavy Trucks Cro	West	West	East	Out of Control	Stopped in Traffic
						Motorcycle	SUV		East	West		Other (Describe in Narrati	Other (Describe in Narrati
						Motorcycle	Pickup Truck/Utility Van		West	West		Passing	Parked
				40.37809	-104.99664	Medium/Heavy Trucks Cro	Passenger Car/Passenger \		West	West		Making Left Turn	Stopped in Traffic
						Passenger Car/Passenger \	Pickup Truck/Utility Van		West	North		Going Straight	Going Straight
						Passenger Car/Passenger \	Pickup Truck/Utility Van		West	North		Entering Traffic Way/Merg	Negotiating a Curve
						Passenger Car/Passenger \			East			Entering Traffic Way/Merg	
Embankment	Large Rocks or Boulder					SUV			East			Other (Describe in Narrati	
						SUV	Pickup Truck/Utility Van		East	East		Changing Lanes	Going Straight
Sign						Passenger Car/Passenger \	Passenger Car/Passenger \		South	South		Going Straight	Going Straight
						Medium/Heavy Trucks Cro	Passenger Car/Passenger \		North	East		Making Right Turn	Going Straight
						SUV	Passenger Car/Passenger \		West	Unknown		Going Straight	Going Straight
						Medium/Heavy Trucks sta	SUV		West	West		Other (Describe in Narrati	Going Straight
				40.37803	-104.99393	Pickup Truck/Utility Van	SUV		West	West		Going Straight	Going Straight
						Pickup Truck/Utility Van	Pickup Truck/Utility Van		South	West		Going Straight	Going Straight
						Passenger Car/Passenger \	Motorcycle		South	West		Entering Traffic Way/Merg	Going Straight
				40.37824	-104.99417	SUV			South			Making Right Turn	
				40.378	-104.99422	Medium/Heavy Trucks sta	Passenger Car/Passenger \		West	West		Negotiating a Curve	Negotiating a Curve
						SUV	SUV		West	West		Changing Lanes	Going Straight
						Passenger Car/Passenger \			East			Backing	
				40.37808	-104.99407	Medium/Heavy Trucks Cro	Passenger Car/Passenger \		South	South		Going Straight	Going Straight
				40.37801	-104.99424	Passenger Car/Passenger \	Pickup Truck/Utility Van		West	West		Going Straight	Going Straight
						Medium/Heavy Trucks sta			West			Making Left Turn	
Curb						Passenger Car/Passenger \	Medium/Heavy Trucks Cro		West	South		Going Straight	Going Straight
				40.37768	-104.99422	Medium/Heavy Trucks sta	Passenger Car/Passenger \		East	East		Negotiating a Curve	Negotiating a Curve
				40.37799	-104.9943	Passenger Car/Passenger \	Passenger Car/Passenger \		West	West		Changing Lanes	Going Straight
				40.37803	-104.99416	SUV	SUV		Southwest	Southwest		Changing Lanes	Making Left Turn
				40.37806	-104.99468	SUV	SUV		West	West		Entering Traffic Way/Merg	Going Straight
						Passenger Car/Passenger \	Passenger Car/Passenger \		West	West		Negotiating a Curve	Negotiating a Curve
				40.37791	-104.99368	Passenger Car/Passenger \	Passenger Car/Passenger \		West	West		Going Straight	Stopped in Traffic
						Pickup Truck/Utility Van	Pickup Truck/Utility Van		West	West		Making Left Turn	Going Straight
						Medium/Heavy Trucks Cro	Pickup Truck/Utility Van		East	Southwest		Negotiating a Curve	Parked
				40.37776	-104.9943	SUV			East			Going Straight	
						Passenger Car/Passenger \	Pickup Truck/Utility Van		North	East		Entering Traffic Way/Merg	Entering Traffic Way/Merg
						SUV	Passenger Car/Passenger \		West	West		Going Straight	Negotiating a Curve
						Medium/Heavy Trucks Cro	Pickup Truck/Utility Van		North	East		Entering Traffic Way/Merg	Negotiating a Curve
						SUV	SUV		East	East		Making Left Turn	Going Straight
						Pickup Truck/Utility Van	SUV		East	East		Entering Traffic Way/Merg	Going Straight
						SUV	Passenger Car/Passenger \		East	East		Going Straight	Going Straight
						Passenger Car/Passenger \	Passenger Car/Passenger \		East	East		Entering Traffic Way/Merg	Going Straight
Light Pole/Utility Pole				40.37821	-104.99183	Passenger Car/Passenger \			West			Negotiating a Curve	
				40.37788	-104.99149	Passenger Car/Passenger \	Medium/Heavy Trucks Cro		West	West		Making Right Turn	Going Straight
				40.37818	-104.9915	Pickup Truck/Utility Van	Passenger Car/Passenger \		West	West		Entering Traffic Way/Merg	Going Straight
				40.37799	-104.99141	Passenger Car/Passenger \			North			Entering Traffic Way/Merg	
						Pickup Truck/Utility Van	Pickup Truck/Utility Van		North	Northwest		Going Straight	Entering Traffic Way/Merg
				40.37784	-104.99156	Pickup Truck/Utility Van	Passenger Car/Passenger \		North	East		Making Right Turn	Going Straight
				40.37784	-104.99156	SUV	Passenger Car/Passenger \		North	East		Making Left Turn	Going Straight
				40.37785	-104.99155	Passenger Car/Passenger \	Pickup Truck/Utility Van		North	East		Making Right Turn	Going Straight
Front to Rear				40.37784	-104.99155	SUV	Pickup Truck/Utility Van		East	North		Going Straight	Going Straight
						Pickup Truck/Utility Van	Passenger Car/Passenger \		North	North		Other (Describe in Narrati	Other (Describe in Narrati
				40.37791	-104.99179	Passenger Car/Passenger \			East			Going Straight	
						Passenger Car/Passenger \	SUV		North	East		Going Straight	Going Straight
						Passenger Car/Passenger \	Passenger Car/Passenger \		West	West		Going Straight	Going Straight
						Passenger Car/Passenger \	Passenger Car/Passenger \		North	East		Making Right Turn	Going Straight
				40.37784	-104.99156	Passenger Car/Passenger \	Pickup Truck/Utility Van		North	East		Entering Traffic Way/Merg	Negotiating a Curve
				40.37827	-104.9888	Pickup Truck/Utility Van	SUV		South	West		Going Straight	Going Straight
				40.37816	-104.98841	SUV	Passenger Car/Passenger \		North	West		Entering Traffic Way/Merg	Entering Traffic Way/Merg
				40.37819	-104.98845	Passenger Car/Passenger \	Pickup Truck/Utility Van		West	West		Going Straight	Slowing
				40.37792	-104.98861	Passenger Car/Passenger \	Passenger Car/Passenger \		South	West		Entering Traffic Way/Merg	Negotiating a Curve
				40.37817	-104.98842	Passenger Car/Passenger \	Pickup Truck/Utility Van		West	North		Entering Traffic Way/Merg	Going Straight
				40.37792	-104.98851	Unknown (Hit and Run Onl	Passenger Car/Passenger \		East	East		Entering Traffic Way/Merg	Swerve/Avoidance
				40.37795	-104.98846	Passenger Car/Passenger \	Medium/Heavy Trucks sta		East	East		Passing	Making Left Turn
				40.37807	-104.98842	Medium/Heavy Trucks sta	Passenger Car/Passenger \		North	North		Going Straight	Going Straight
				40.37789	-104.98871	SUV	Pickup Truck/Utility Van		East	East		Weaving	Going Straight
				40.37788	-104.98866	SUV	Passenger Car/Passenger \		West	West		Going Straight	Going Straight
				40.37794	-104.98849	SUV	Pickup Truck/Utility Van		North	East		Entering Traffic Way/Merg	Going Straight
				40.37825	-104.9888	Medium/Heavy Trucks sta	SUV		South	West		Going Straight	Going Straight
Front to Side				40.3781	-104.9884	Passenger Car/Passenger \	Passenger Car/Passenger \	Unknown (Hit and Run Onl	West	West	East	Going Straight	Going Straight
				40.37817	-104.98837	Medium/Heavy Trucks sta	Pickup Truck/Utility Van		West	West		Negotiating a Curve	Negotiating a Curve
Front to Rear				40.37817	-104.98835	Pickup Truck/Utility Van	Passenger Car/Passenger \	Working Vehicle/Equipme	West	West	West	Going Straight	Stopped in Traffic
Light Pole/Utility Pole				40.37826	-104.9888	SUV	Passenger Car/Passenger \		South	West		Going Straight	Going Straight

TU-3 Movement	Approach Overtaking Turn	Record Status	Processing Status	Agency Id	Crash Date	Crash Time	Number Killed	Number Injured	Injury 00	Injury 01	Injury 02	Injury 03	Injury 04	Severity
	Not Applicable	Coded	Completed	LVPD	1/15/2021	07:53:00	0	1	0	0	1	0	0	PDO
	Not Applicable	Coded	Completed	LVPD	2/2/2021	17:12:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	LVPD	10/14/2021	06:28:00	0	1	1	0	1	0	0	PDO
	Not Applicable	Coded	Completed	LVPD	1/25/2022	06:01:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	LVPD	3/26/2022	06:24:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	4/16/2022	16:17:00	0	0	3	0	0	0	0	PDO
Slowing	Not Applicable	Coded	Completed	JPD	11/11/2022	17:30:00	0	1	2	1	0	0	0	PDO
	Not Applicable	Coded	Completed	LVPD	6/24/2021	16:21:00	0	0	1	0	0	0	0	PDO
Going Straight	Not Applicable	Coded	Completed	LVPD	8/6/2021	15:57:00	0	4	2	0	2	2	0	INJ
	Not Applicable	Coded	Completed	JPD	6/17/2022	11:57:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	6/17/2022	11:57:00	0	1	1	0	0	1	0	PDO
	Not Applicable	Coded	Completed	JPD	11/19/2021	10:45:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	1/14/2021	16:00:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	CSP	6/6/2021	17:00:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	3/31/2021	00:20:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	2/17/2021	08:30:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	5/23/2021	10:52:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	6/10/2021	10:16:00	0	1	4	0	1	0	0	PDO
	Not Applicable	Coded	Completed	JPD	4/28/2021	16:40:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/6/2021	12:42:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/1/2021	10:30:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/28/2021	12:02:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	10/21/2021	09:36:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	11/15/2021	17:09:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	12/15/2021	09:47:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	1/21/2022	07:37:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	12/27/2021	06:47:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	12/27/2021	21:17:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	1/27/2022	17:23:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	3/12/2022	23:31:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	3/25/2022	11:55:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	6/28/2022	08:08:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	6/28/2022	11:57:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	8/28/2022	17:55:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	8/25/2022	17:48:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	8/29/2022	18:22:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	8/28/2022	14:26:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/18/2022	10:40:00	0	0	2	0	0	0	0	PDO
	Overtaking Turn	Coded	Completed	JPD	9/15/2022	12:05:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	12/1/2022	08:23:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	2/4/2022	19:37:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	1/16/2021	17:32:00	0	0	0	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	4/29/2021	08:29:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	5/26/2021	11:59:00	0	0	2	0	0	0	0	PDO
	Overtaking Turn	Coded	Completed	JPD	6/17/2021	14:07:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	8/3/2021	17:33:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/25/2021	08:46:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/25/2021	19:14:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	10/30/2021	21:15:00	0	0	0	0	0	0	0	PDO
	Overtaking Turn	Coded	Completed	JPD	11/9/2021	15:25:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	11/17/2021	15:07:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	12/26/2021	17:00:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	1/27/2022	16:56:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	2/15/2022	06:45:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	4/4/2022	11:58:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	4/5/2022	06:46:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	4/20/2022	08:47:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	6/11/2022	15:30:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/13/2022	19:13:00	0	0	1	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	10/1/2022	12:30:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	10/3/2022	14:59:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/30/2022	15:26:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	7/25/2022	15:41:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	5/21/2021	15:11:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/11/2021	07:23:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/16/2021	14:11:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	10/15/2021	14:47:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	10/28/2021	13:48:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	11/13/2021	15:58:00	0	0	1	0	0	0	0	PDO
	Overtaking Turn	Coded	Completed	JPD	11/12/2021	10:40:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	3/18/2022	09:15:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	5/6/2022	16:58:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	6/8/2022	07:39:00	0	0	2	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	7/16/2022	17:35:00	0	0	7	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	8/2/2022	11:51:00	0	0	2	0	0	0	0	PDO
Going Straight	Not Applicable	Coded	Completed	JPD	9/6/2022	15:49:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	11/2/2022	07:50:00	0	0	2	0	0	0	0	PDO
Stopped in Traffic	Not Applicable	Coded	Completed	JPD	11/21/2022	14:55:00	0	0	3	0	0	0	0	PDO
	Not Applicable	Coded	Completed	JPD	9/8/2022	16:44:00	0	0	2	0	0	0	0	PDO

APPENDIX E
Signal Warrant Evaluations

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:	Loveland	Engineer:	JEM
County:		Date:	August 13, 2024
District:			

Major Street:	SH 402 (2030 Base)	Lanes:	2	Major Approach Speed:	55
Minor Street:	LCR 9E	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☐ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

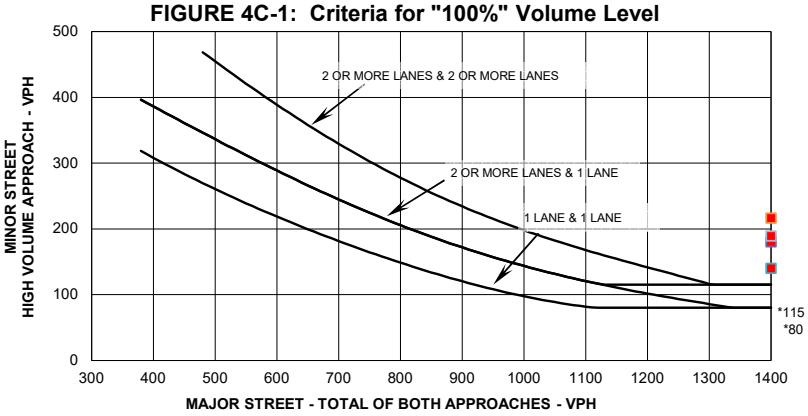
Applicable: ☑ Yes ☐ No
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7-8 AM	1908	180
8-9 AM	1573	140
4-5 PM	1905	216
5-6 PM	1794	189

FIGURE 4C-1: Criteria for "100%" Volume Level



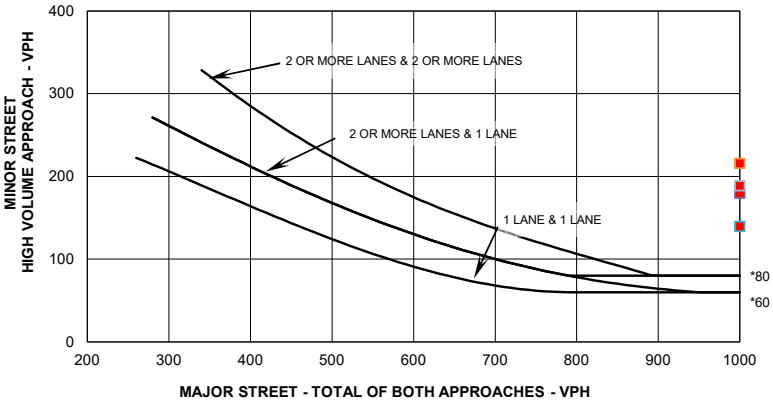
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7-8 AM	1908	180
8-9 AM	1573	140
4-5 PM	1905	216
5-6 PM	1794	189

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:	Loveland	Engineer:	JEM
County:		Date:	August 13, 2024
District:			

Major Street:	SH 402 (2030 Base)	Lanes:	2	Major Approach Speed:	55
Minor Street:	LCR 9E	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No
Satisfied: ☑ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
AM	1953	185

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
AM	1953	185

Criteria

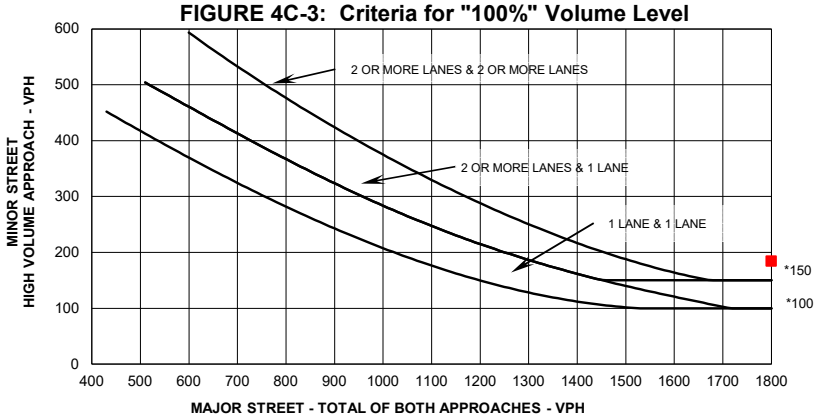
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

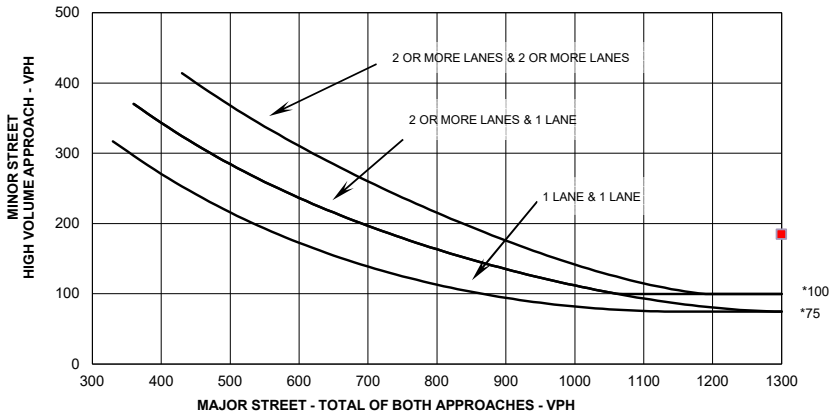
FIGURE 4C-3: Criteria for "100%" Volume Level



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

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



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

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:	Loveland	Engineer:	JEM
County:		Date:	August 13, 2024
District:			

Major Street:	SH 402 (2030 Base)	Lanes:	2	Major Approach Speed:	55
Minor Street:	LCR 9E	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☐ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

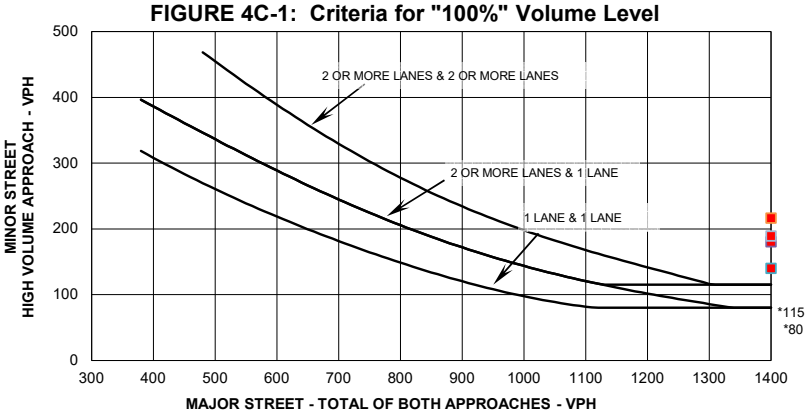
Applicable: ☑ Yes ☐ No
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7-8 AM	1908	180
8-9 AM	1573	140
4-5 PM	1905	216
5-6 PM	1794	189

FIGURE 4C-1: Criteria for "100%" Volume Level



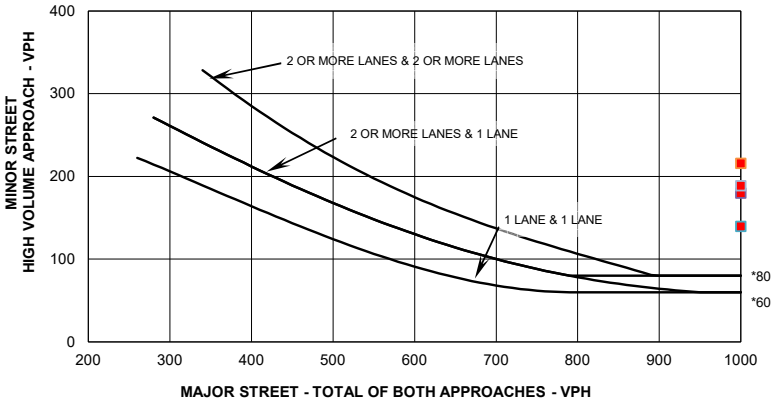
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7-8 AM	1908	180
8-9 AM	1573	140
4-5 PM	1905	216
5-6 PM	1794	189

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:	Loveland	Engineer:	JEM
County:		Date:	August 13, 2024
District:			

Major Street:	SH 402 (2030 Base)	Lanes:	2	Major Approach Speed:	55
Minor Street:	LCR 9E	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No
Satisfied: ☑ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
PM	1941	201

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
PM	1941	201

Criteria

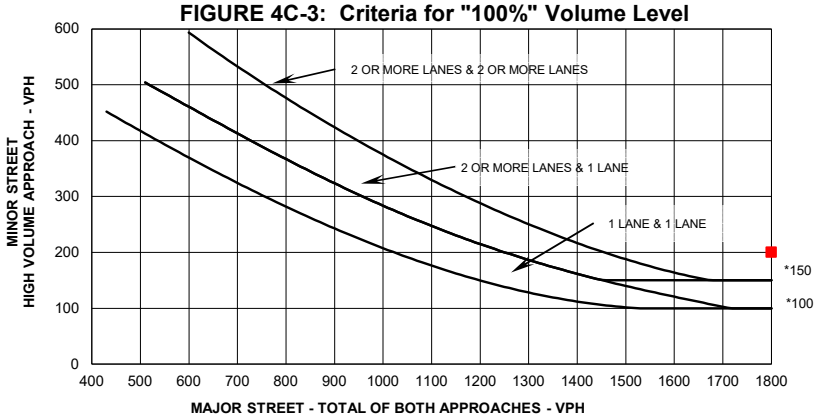
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

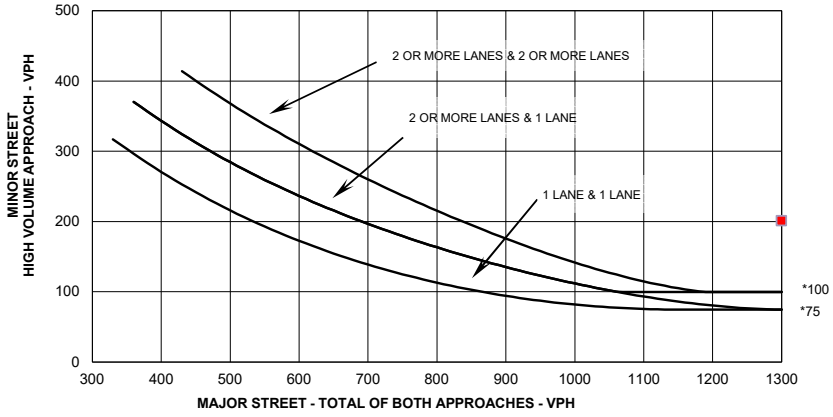
FIGURE 4C-3: Criteria for "100%" Volume Level



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

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



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

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:	Loveland	Engineer:	JEM
County:		Date:	August 13, 2024
District:			

Major Street:	SH 502 (2030 Base)	Lanes:	1	Major Approach Speed:	55
Minor Street:	LCR 7	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☐ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

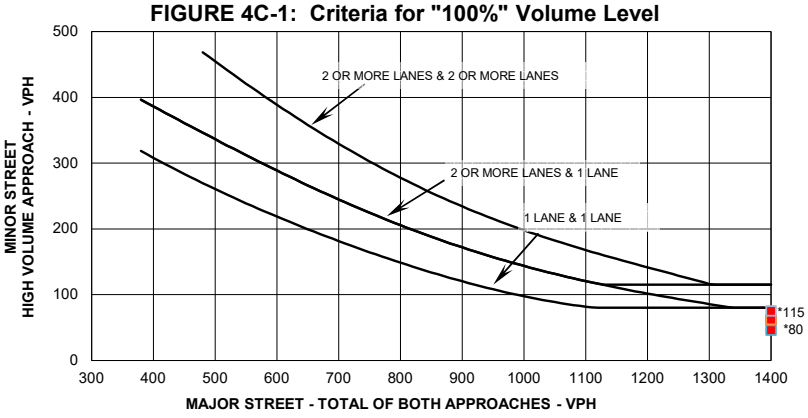
Applicable: ☑ Yes ☐ No
Satisfied: ☐ Yes ☑ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7-8 AM	1784	62
8-9 AM	1476	46
4-5 PM	1776	62
5-6 PM	1682	75

FIGURE 4C-1: Criteria for "100%" Volume Level



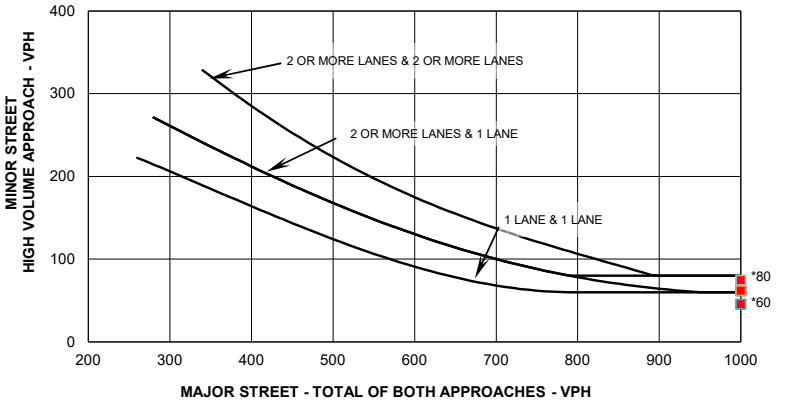
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7-8 AM	1784	62
8-9 AM	1476	46
4-5 PM	1776	62
5-6 PM	1682	75

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:	Loveland	Engineer:	JEM
County:		Date:	August 13, 2024
District:			

Major Street:	SH 502 (2030 Base)	Lanes:	1	Major Approach Speed:	55
Minor Street:	LCR 7	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No
Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
AM	1816	66

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
AM	1816	66

Criteria

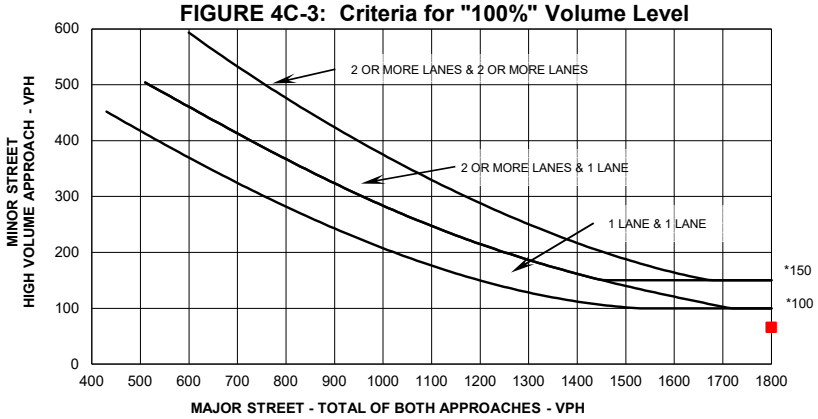
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

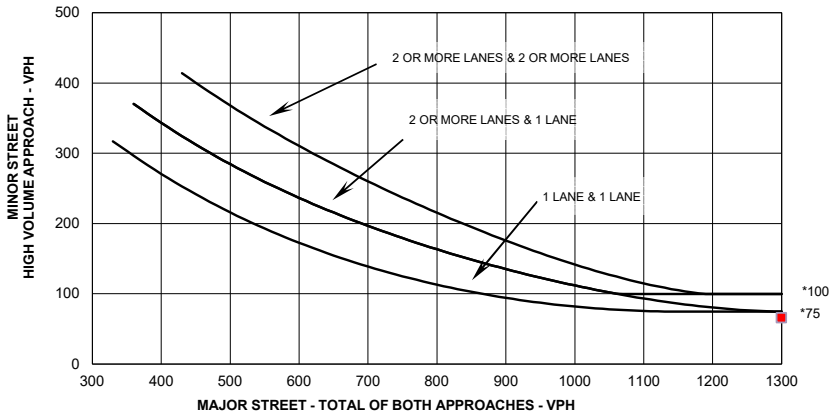
FIGURE 4C-3: Criteria for "100%" Volume Level



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

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



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

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:	Loveland	Engineer:	JEM
County:		Date:	August 13, 2024
District:			

Major Street:	SH 502 (2030 Base)	Lanes:	1	Major Approach Speed:	55
Minor Street:	LCR 7	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☐ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

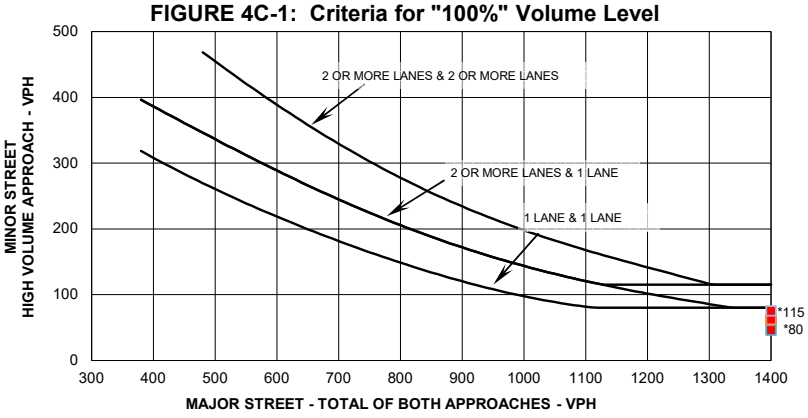
Applicable: ☑ Yes ☐ No
Satisfied: ☐ Yes ☑ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7-8 AM	1784	62
8-9 AM	1476	46
4-5 PM	1776	62
5-6 PM	1682	75

FIGURE 4C-1: Criteria for "100%" Volume Level



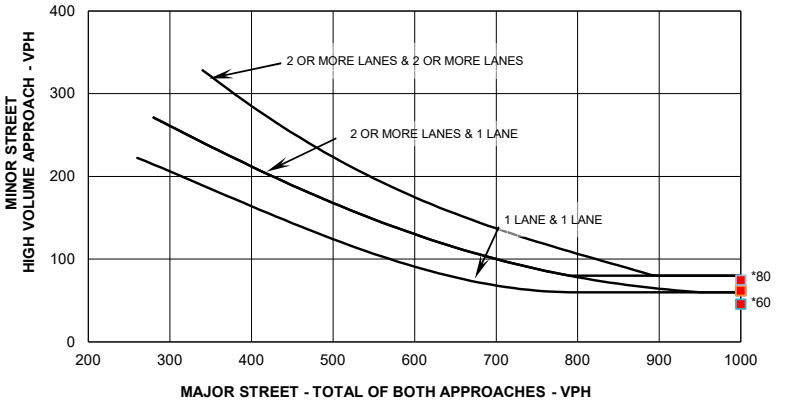
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7-8 AM	1784	62
8-9 AM	1476	46
4-5 PM	1776	62
5-6 PM	1682	75

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

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TRAFFIC SIGNAL WARRANT SUMMARY

City:	Loveland	Engineer:	JEM
County:		Date:	August 13, 2024
District:			

Major Street:	SH 502 (2030 Base)	Lanes:	1	Major Approach Speed:	55
Minor Street:	LCR 7	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No
Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
PM	1822	74

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
PM	1822	74

Criteria

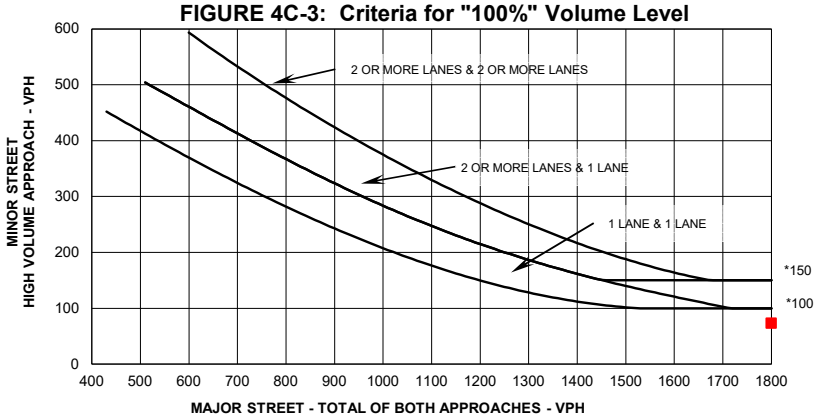
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

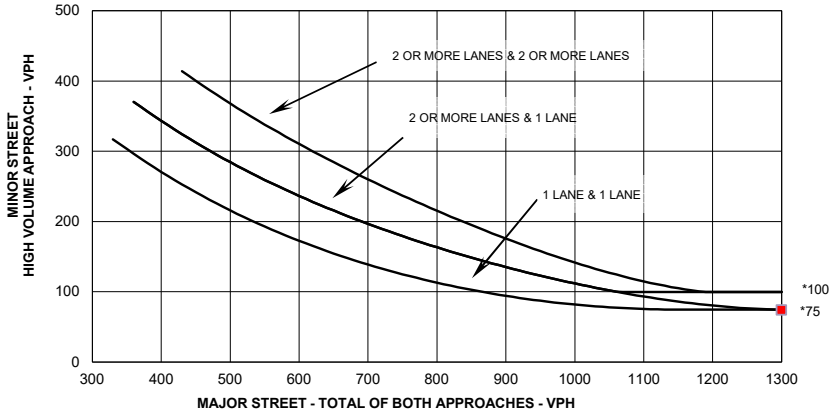
FIGURE 4C-3: Criteria for "100%" Volume Level



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

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



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

APPENDIX F
Trip Generation

Trip Generation - West Ridge

ITE Trip Generation, 11th Edition

Daily Trip Generation

ITE 11th Ed Code	Land Use	Size	Units	Trip Gen. Avg.	Daily Peak Trips	Mixed-Use Reduction	Net Daily Peak Trips	Trip Distribution Enter	Trip Distribution Exit	Total Daily Trips Enter	Total Daily Trips Exit	Pass-By Reduction	Pass-by Trips Enter	Pass-by Trips Exit
110	General Light Industrial	650,000	SF	4.87	3,166	10%	2,850	50%	50%	1,425	1,425	0%	0	0
210	Single-Family Detached Housing	121	Dwelling Units	9.43	1,142	10%	1,028	50%	50%	514	514	0%	0	0
215	Single-Family Attached Housing	201	Dwelling Units	7.20	1,448	10%	1,304	50%	50%	652	652	0%	0	0
821	Shopping Plaza (40k-150k, No Supermarket)	75,000	SF	67.52	5,064	10%	4,558	50%	50%	2,279	2,279	0%	0	0
822	Strip Retail Plaza (<40k)	7,000	SF	54.45	382	10%	344	50%	50%	172	172	0%	0	0
932	High-Turnover (Sit-Down) Restaurant	20,000	SF	107.20	2,144	10%	1,930	50%	50%	965	965	0%	0	0
934	Fast-Food Restaurant with Drive-Through Window	15,000	SF	467.48	7,013	10%	6,312	50%	50%	3,156	3,156	0%	0	0
945	Convenience Store/Gas Station GFA (2-4k)	8	VFP	265.12	2,121	10%	1,909	50%	50%	955	955	0%	0	0
Total					22,480		20,235			10,118	10,118		0	0

AM Peak Hour Trips

ITE 11th Ed Code	Land Use	Size	Units	Trip Gen. Avg.	AM Peak Trips	Mixed-Use Reduction	Net AM Peak Trips	Trip Distribution Enter	Trip Distribution Exit	Total AM Trips Enter	Total AM Trips Exit	Pass-By Reduction	Pass-by Trips Enter	Pass-by Trips Exit	Primary Trips Enter	Primary Trips Exit
110	General Light Industrial	650,000	SF	0.74	481	7%	448	88%	12%	395	53	0%	0	0	395	53
210	Single-Family Detached Housing	121	Dwelling Units	0.70	85	7%	80	25%	75%	20	60	0%	0	0	20	60
215	Single-Family Attached Housing	201	Dwelling Units	0.48	97	7%	91	25%	75%	23	68	0%	0	0	23	68
821	Shopping Plaza (40k-150k, No Supermarket)	75,000	SF	1.73	130	7%	121	62%	38%	76	45	40%	25	25	51	20
822	Strip Retail Plaza (<40k)	7,000	SF	2.36	17	7%	16	60%	40%	10	6	0%	0	0	10	6
932	High-Turnover (Sit-Down) Restaurant	20,000	SF	9.57	192	7%	179	55%	45%	99	80	43%	39	39	60	41
934	Fast-Food Restaurant with Drive-Through Window	15,000	SF	44.61	670	7%	624	51%	49%	319	305	50%	156	156	163	149
945	Convenience Store/Gas Station GFA (2-4k)	8	VFP	16.06	129	7%	120	50%	50%	60	60	76%	46	46	14	14
Total					1,801		1,679			1,002	677		266	266	736	411

PM Peak Hour Trips

ITE 11th Ed Code	Land Use	Size	Units	Trip Gen. Avg.	PM Peak Trips	Mixed-Use Reduction	Net PM Peak Trips	Trip Distribution Enter	Trip Distribution Exit	Total PM Trips Enter	Total PM Trips Exit	Pass-By Reduction	Pass-by Trips Enter	Pass-by Trips Exit	Primary Trips Enter	Primary Trips Exit
110	General Light Industrial	650,000	SF	0.65	423	36%	271	14%	86%	38	233	0%	0	0	38	233
210	Single-Family Detached Housing	121	Dwelling Units	0.94	114	36%	73	63%	37%	46	27	0%	0	0	46	27
215	Single-Family Attached Housing	201	Dwelling Units	0.57	115	36%	74	59%	41%	44	30	0%	0	0	44	30
821	Shopping Plaza (40k-150k, No Supermarket)	75,000	SF	5.19	390	36%	250	49%	51%	123	127	40%	50	50	73	77
822	Strip Retail Plaza (<40k)	7,000	SF	6.59	47	36%	31	50%	50%	16	15	0%	0	0	16	15
932	High-Turnover (Sit-Down) Restaurant	20,000	SF	9.05	181	36%	116	61%	39%	71	45	43%	25	25	46	20
934	Fast-Food Restaurant with Drive-Through Window	15,000	SF	33.03	496	36%	318	52%	48%	166	152	55%	88	88	78	64
945	Convenience Store/Gas Station GFA (2-4k)	8	VFP	18.42	148	36%	95	50%	50%	48	47	75%	36	36	12	11
Total					1,914		1,228			552	676		199	199	353	477

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	West Ridge	**Organization:**	Benesch
Project Location:	Loveland, CO	**Performed By:**	JEM
Scenario Description:	Site	**Date:**	6/25/2024
Analysis Year:	2045	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0	0	0
Retail				276	157	119
Restaurant				862	448	414
Cinema/Entertainment				0	0	0
Residential				182	47	135
Hotel				0	0	0
All Other Land Uses[2]				481	424	57
				1,801	1,076	725

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant	1.00	0%	0%	1.00	0%	0%
Cinema/Entertainment	1.00	0%	0%	1.00	0%	0%
Residential	1.00	0%	0%	1.00	0%	0%
Hotel	1.00	0%	0%	1.00	0%	0%
All Other Land Uses[2]	1.00	0%	0%	1.00	0%	0%

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		15	0	1	0
Restaurant	0	13		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	27	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,801	1,076	725
Internal Capture Percentage	7%	5%	8%
External Vehicle-Trips[5]	1,683	1,017	666
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	9%	13%
Restaurant	9%	4%
Cinema/Entertainment	N/A	N/A
Residential	6%	21%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	West Ridge	**Organization:**	Benesch
Project Location:	Loveland, CO	**Performed By:**	JEM
Scenario Description:	Site	**Date:**	6/25/2024
Analysis Year:	2045	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0	0	0
Retail				585	290	295
Restaurant				677	369	308
Cinema/Entertainment				0	0	0
Residential				229	140	89
Hotel				0	0	0
All Other Land Uses[2]				423	60	363
				1,914	859	1,055

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant	1.00	0%	0%	1.00	0%	0%
Cinema/Entertainment	1.00	0%	0%	1.00	0%	0%
Residential	1.00	0%	0%	1.00	0%	0%
Hotel	1.00	0%	0%	1.00	0%	0%
All Other Land Uses[2]	1.00	0%	0%	1.00	0%	0%

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		86	0	64	0
Restaurant	0	126		0	22	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	29	19	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,914	859	1,055
Internal Capture Percentage	36%	40%	33%
External Vehicle-Trips[5]	1,222	513	709
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	53%	51%
Restaurant	28%	48%
Cinema/Entertainment	N/A	N/A
Residential	61%	54%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Trip Generation - Erlich City

ITE Trip Generation, 11th Edition

Daily Trip Generation

ITE 11th Ed Code	Land Use	Size	Units	Trip Gen. Avg.	Daily Peak Trips	Mixed-Use Reduction	Net Daily Peak Trips	Trip Distribution Enter	Trip Distribution Exit	Total Daily Trips Enter	Total Daily Trips Exit	Pass-By Reduction	Pass-by Trips Enter	Pass-by Trips Exit
230	Low-Rise Residential with Ground Floor Retail	1,000	Dwelling Units	3.44	3,440	10%	3,096	50%	50%	1,548	1,548	0%	0	0
770	Business Park	400,000	SF	12.44	4,976	10%	4,479	50%	50%	2,240	2,240	0%	0	0
820	Shopping Center (>150k)	150,000	SF	37.01	5,552	10%	4,997	50%	50%	2,499	2,499	0%	0	0
821	Shopping Center (40-150k)	50,000	SF	67.52	3,376	10%	3,039	50%	50%	1,520	1,520	0%	0	0
822	Strip Retail Plaza (<40k)	25,000	SF	54.45	1,362	10%	1,226	50%	50%	613	613	0%	0	0
932	High-Turnover (Sit-Down) Restaurant	15,000	SF	107.20	1,608	10%	1,448	50%	50%	724	724	0%	0	0
934	Fast-Food Restaurant with Drive-Through Window	10,000	SF	467.48	4,675	10%	4,208	50%	50%	2,104	2,104	0%	0	0
Total					24,989		22,493			11,248	11,248		0	0

AM Peak Hour Trips

ITE 11th Ed Code	Land Use	Size	Units	Trip Gen. Avg.	AM Peak Trips	Mixed-Use Reduction	Net AM Peak Trips	Trip Distribution Enter	Trip Distribution Exit	Total AM Trips Enter	Total AM Trips Exit	Pass-By Reduction	Pass-by Trips Enter	Pass-by Trips Exit	Primary Trips Enter	Primary Trips Exit
230	Low-Rise Residential with Ground Floor Retail	1,000	Dwelling Units	0.44	440	28%	317	23%	77%	73	244	0%	0	0	73	244
770	Business Park	400,000	SF	1.35	540	28%	389	85%	15%	331	58	0%	0	0	331	58
820	Shopping Center (>150k)	150,000	SF	0.84	126	28%	91	62%	38%	57	34	29%	14	14	43	20
821	Shopping Center (40-150k)	50,000	SF	1.73	87	28%	63	62%	38%	40	23	40%	13	13	27	10
822	Strip Retail Plaza (<40k)	25,000	SF	2.36	59	28%	43	60%	40%	26	17	0%	0	0	26	17
932	High-Turnover (Sit-Down) Restaurant	15,000	SF	9.57	144	28%	104	55%	45%	58	46	43%	23	23	35	23
934	Fast-Food Restaurant with Drive-Through Window	10,000	SF	44.61	447	28%	322	51%	49%	165	157	50%	81	81	84	76
Total					1,843		1,329			750	579		131	131	619	448

PM Peak Hour Trips

ITE 11th Ed Code	Land Use	Size	Units	Trip Gen. Avg.	PM Peak Trips	Mixed-Use Reduction	Net PM Peak Trips	Trip Distribution Enter	Trip Distribution Exit	Total PM Trips Enter	Total PM Trips Exit	Pass-By Reduction	Pass-by Trips Enter	Pass-by Trips Exit	Primary Trips Enter	Primary Trips Exit
230	Low-Rise Residential with Ground Floor Retail	1,000	Dwelling Units	0.36	360	40%	216	71%	29%	154	62	0%	0	0	154	62
770	Business Park	400,000	SF	1.22	488	40%	293	26%	74%	77	216	0%	0	0	77	216
820	Shopping Center (>150k)	150,000	SF	3.4	510	40%	306	48%	52%	147	159	29%	45	45	102	114
821	Shopping Center (40-150k)	50,000	SF	5.19	260	40%	156	49%	51%	77	79	40%	32	32	45	47
822	Strip Retail Plaza (<40k)	25,000	SF	6.59	165	40%	99	50%	50%	50	49	0%	0	0	50	49
932	High-Turnover (Sit-Down) Restaurant	15,000	SF	9.05	136	40%	82	61%	39%	51	31	43%	18	18	33	13
934	Fast-Food Restaurant with Drive-Through Window	10,000	SF	33.03	331	40%	199	52%	48%	104	95	55%	55	55	49	40
Total					2,250	0	1,351			660	691		150	150	510	541

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Erlich City	**Organization:**	Benesch
Project Location:	Loveland, CO	**Performed By:**	JEM
Scenario Description:	Site	**Date:**	7/12/2024
Analysis Year:	2045	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				540	459	81
Retail				275	169	106
Restaurant				593	308	285
Cinema/Entertainment				0	0	0
Residential				441	102	339
Hotel				0	0	0
All Other Land Uses[2]				0	0	0
				1,849	1,038	811

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant	1.00	0%	0%	1.00	0%	0%
Cinema/Entertainment	1.00	0%	0%	1.00	0%	0%
Residential	1.00	0%	0%	1.00	0%	0%
Hotel	1.00	0%	0%	1.00	0%	0%
All Other Land Uses[2]	1.00	0%	0%	1.00	0%	0%

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		23	51	0	0	0
Retail	18		14	0	2	0
Restaurant	64	14		0	5	0
Cinema/Entertainment	0	0	0		0	0
Residential	7	3	62	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,849	1,038	811
Internal Capture Percentage	28%	25%	32%
External Vehicle-Trips[5]	1,323	775	548
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	19%	91%
Retail	24%	32%
Restaurant	41%	29%
Cinema/Entertainment	N/A	N/A
Residential	7%	21%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Erlich City	**Organization:**	Benesch
Project Location:	Loveland, CO	**Performed By:**	JEM
Scenario Description:	Site	**Date:**	7/12/2024
Analysis Year:	2045	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				489	127	362
Retail				938	456	482
Restaurant				469	256	213
Cinema/Entertainment				0	0	0
Residential				361	256	105
Hotel				0	0	0
All Other Land Uses[2]				0	0	0
				2,257	1,095	1,162

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant	1.00	0%	0%	1.00	0%	0%
Cinema/Entertainment	1.00	0%	0%	1.00	0%	0%
Residential	1.00	0%	0%	1.00	0%	0%
Hotel	1.00	0%	0%	1.00	0%	0%
All Other Land Uses[2]	1.00	0%	0%	1.00	0%	0%

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		36	5	0	7	0
Retail	10		74	0	118	0
Restaurant	6	87		0	38	0
Cinema/Entertainment	0	0	0		0	0
Residential	4	44	22	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	2,257	1,095	1,162
Internal Capture Percentage	40%	41%	39%
External Vehicle-Trips[5]	1,355	644	711
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	16%	13%
Retail	37%	42%
Restaurant	39%	62%
Cinema/Entertainment	N/A	N/A
Residential	64%	67%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made

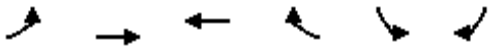
[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

APPENDIX G

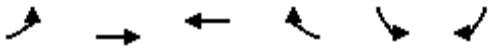
Future Year Background Conditions and Queueing Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	265	819	935	99	131	171
Future Volume (veh/h)	265	819	935	99	131	171
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1796	1796
Adj Flow Rate, veh/h	291	900	1027	88	144	118
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	4	4	4	4	7	7
Cap, veh/h	453	1527	1074	1072	178	482
Arrive On Green	0.21	0.83	0.58	0.58	0.10	0.10
Sat Flow, veh/h	1753	1841	1841	1560	1711	1522
Grp Volume(v), veh/h	291	900	1027	88	144	118
Grp Sat Flow(s),veh/h/ln	1753	1841	1841	1560	1711	1522
Q Serve(g_s), s	12.2	19.6	63.1	2.2	9.9	0.0
Cycle Q Clear(g_c), s	12.2	19.6	63.1	2.2	9.9	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	453	1527	1074	1072	178	482
V/C Ratio(X)	0.64	0.59	0.96	0.08	0.81	0.24
Avail Cap(c_a), veh/h	453	1527	1074	1072	328	616
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.62	0.62	1.00	1.00
Uniform Delay (d), s/veh	40.1	3.4	23.6	6.2	52.6	30.4
Incr Delay (d2), s/veh	3.1	1.7	13.5	0.1	8.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	3.7	27.0	0.9	4.6	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	43.2	5.1	37.1	6.3	61.1	30.6
LnGrp LOS	D	A	D	A	E	C
Approach Vol, veh/h		1191	1115		262	
Approach Delay, s/veh		14.4	34.6		47.4	
Approach LOS		B	C		D	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	29.5	74.0				103.5	16.5
Change Period (Y+Rc), s	4.0	4.0				4.0	4.0
Max Green Setting (Gmax), s	15.0	70.0				89.0	23.0
Max Q Clear Time (g_c+I1), s	14.2	65.1				21.6	11.9
Green Ext Time (p_c), s	0.1	2.9				7.2	0.6

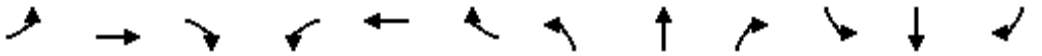
Intersection Summary	
HCM 6th Ctrl Delay	26.6
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	181	819	824	134	57	131
Future Volume (veh/h)	181	819	824	134	57	131
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1752	1752
Adj Flow Rate, veh/h	199	900	905	121	63	34
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	6	6	6	6	10	10
Cap, veh/h	412	1373	1202	1261	264	314
Arrive On Green	0.05	0.76	0.88	0.88	0.16	0.16
Sat Flow, veh/h	1725	1811	1811	1535	1668	1485
Grp Volume(v), veh/h	199	900	905	121	63	34
Grp Sat Flow(s),veh/h/ln	1725	1811	1811	1535	1668	1485
Q Serve(g_s), s	4.2	28.6	21.0	0.7	4.0	2.2
Cycle Q Clear(g_c), s	4.2	28.6	21.0	0.7	4.0	2.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	412	1373	1202	1261	264	314
V/C Ratio(X)	0.48	0.66	0.75	0.10	0.24	0.11
Avail Cap(c_a), veh/h	478	1373	1202	1261	264	314
HCM Platoon Ratio	1.00	1.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.57	0.57	1.00	1.00
Uniform Delay (d), s/veh	8.3	7.0	3.6	0.7	44.2	38.2
Incr Delay (d2), s/veh	0.7	1.8	2.5	0.1	2.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	7.9	3.6	0.3	1.8	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.0	8.8	6.2	0.8	46.3	38.9
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1099	1026		97	
Approach Delay, s/veh		8.8	5.5		43.7	
Approach LOS		A	A		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	96.0	24.0	11.4	84.6
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	91.0	19.0	11.0	75.0
Max Q Clear Time (g_c+I1), s	30.6	6.0	6.2	23.0
Green Ext Time (p_c), s	7.2	0.2	0.2	7.7

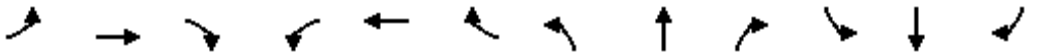
Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	786	40	55	942	5	18	5	51	10	5	5
Future Volume (veh/h)	5	786	40	55	942	5	18	5	51	10	5	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	864	23	60	1035	0	20	5	56	11	5	5
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	248	1247	1057	364	1302	1104	285	22	244	238	142	142
Arrive On Green	0.01	0.67	0.67	0.04	0.70	0.00	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1767	1856	1572	1767	1856	1572	1394	131	1462	1331	851	851
Grp Volume(v), veh/h	5	864	23	60	1035	0	20	0	61	11	0	10
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1856	1572	1394	0	1592	1331	0	1702
Q Serve(g_s), s	0.1	34.3	0.6	1.2	45.1	0.0	1.5	0.0	4.0	0.9	0.0	0.6
Cycle Q Clear(g_c), s	0.1	34.3	0.6	1.2	45.1	0.0	2.1	0.0	4.0	4.8	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.92	1.00		0.50
Lane Grp Cap(c), veh/h	248	1247	1057	364	1302	1104	285	0	265	238	0	284
V/C Ratio(X)	0.02	0.69	0.02	0.16	0.79	0.00	0.07	0.00	0.23	0.05	0.00	0.04
Avail Cap(c_a), veh/h	310	1247	1057	374	1302	1104	285	0	265	238	0	284
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.5	12.1	6.5	10.7	12.1	0.0	42.8	0.0	43.3	45.4	0.0	41.9
Incr Delay (d2), s/veh	0.0	2.5	0.0	0.2	5.1	0.0	0.5	0.0	2.0	0.4	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.1	0.2	0.4	15.7	0.0	0.5	0.0	1.7	0.3	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.5	14.6	6.6	10.9	17.1	0.0	43.2	0.0	45.3	45.8	0.0	42.1
LnGrp LOS	B	B	A	B	B	A	D	A	D	D	A	D
Approach Vol, veh/h		892			1095			81			21	
Approach Delay, s/veh		14.4			16.8			44.8			44.1	
Approach LOS		B			B			D			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		25.0	9.3	85.7		25.0	5.8	89.2				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		20.0	5.0	80.0		20.0	5.0	80.0				
Max Q Clear Time (g_c+I1), s		6.0	3.2	36.3		6.8	2.1	47.1				
Green Ext Time (p_c), s		0.2	0.0	6.6		0.0	0.0	8.8				

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	680	40	10	840	110	5	110	25	115	135	110
Future Volume (veh/h)	110	680	40	10	840	110	5	110	25	115	135	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	739	14	11	913	59	5	120	0	125	147	44
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	277	1192	1020	320	1139	1045	249	312	284	288	393	398
Arrive On Green	0.03	0.43	0.43	0.01	0.61	0.61	0.01	0.17	0.00	0.05	0.21	0.21
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	120	739	14	11	913	59	5	120	0	125	147	44
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.9	37.0	0.6	0.3	44.7	1.6	0.3	6.9	0.0	6.0	8.1	2.6
Cycle Q Clear(g_c), s	2.9	37.0	0.6	0.3	44.7	1.6	0.3	6.9	0.0	6.0	8.1	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	277	1192	1020	320	1139	1045	249	312	284	288	393	398
V/C Ratio(X)	0.43	0.62	0.01	0.03	0.80	0.06	0.02	0.38	0.00	0.43	0.37	0.11
Avail Cap(c_a), veh/h	308	1192	1020	371	1139	1045	312	312	284	288	393	398
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	0.58	0.58	0.58	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	23.1	12.2	13.4	17.9	7.2	41.2	44.5	0.0	39.3	40.6	34.6
Incr Delay (d2), s/veh	0.8	1.8	0.0	0.0	3.6	0.1	0.0	3.6	0.0	1.0	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	17.1	0.2	0.1	17.3	0.5	0.1	3.4	0.0	3.0	3.7	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.5	24.8	12.2	13.4	21.5	7.3	41.2	48.1	0.0	40.4	41.2	34.7
LnGrp LOS	B	C	B	B	C	A	D	D	A	D	D	C
Approach Vol, veh/h		873			983			125			316	
Approach Delay, s/veh		23.9			20.5			47.8			40.0	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	24.0	5.5	80.5	4.8	29.2	8.9	77.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	20.0	5.0	73.0	5.0	21.0	7.0	71.0
Max Q Clear Time (g_c+I1), s	8.0	8.9	2.3	39.0	2.3	10.1	4.9	46.7
Green Ext Time (p_c), s	0.0	0.3	0.0	4.9	0.0	0.6	0.0	6.6

Intersection Summary	
HCM 6th Ctrl Delay	26.0
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	826	10	14	968	0	5	0	14	0	0	0
Future Vol, veh/h	0	826	10	14	968	0	5	0	14	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	-	0	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	908	11	15	1064	0	5	0	15	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1064	0	0	919	0	0	1470	-	908	2015	2013	532
Stage 1	-	-	-	-	-	-	908	-	-	1094	1094	-
Stage 2	-	-	-	-	-	-	562	-	-	921	919	-
Critical Hdwy	4.145	-	-	4.145	-	-	7.345	-	6.245	7.345	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	6.145	-	-	6.545	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.545	-	-	6.145	5.545	-
Follow-up Hdwy	2.2285	-	-	2.2285	-	-	3.5285	-	3.3285	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	648	-	-	735	-	-	96	0	331	38	58	491
Stage 1	-	-	-	-	-	-	327	0	-	228	287	-
Stage 2	-	-	-	-	-	-	478	0	-	322	347	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	648	-	-	735	-	-	94	-	331	36	57	491
Mov Cap-2 Maneuver	-	-	-	-	-	-	94	-	-	36	57	-
Stage 1	-	-	-	-	-	-	327	-	-	228	281	-
Stage 2	-	-	-	-	-	-	468	-	-	307	347	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	24.1	0
HCM LOS			C	A

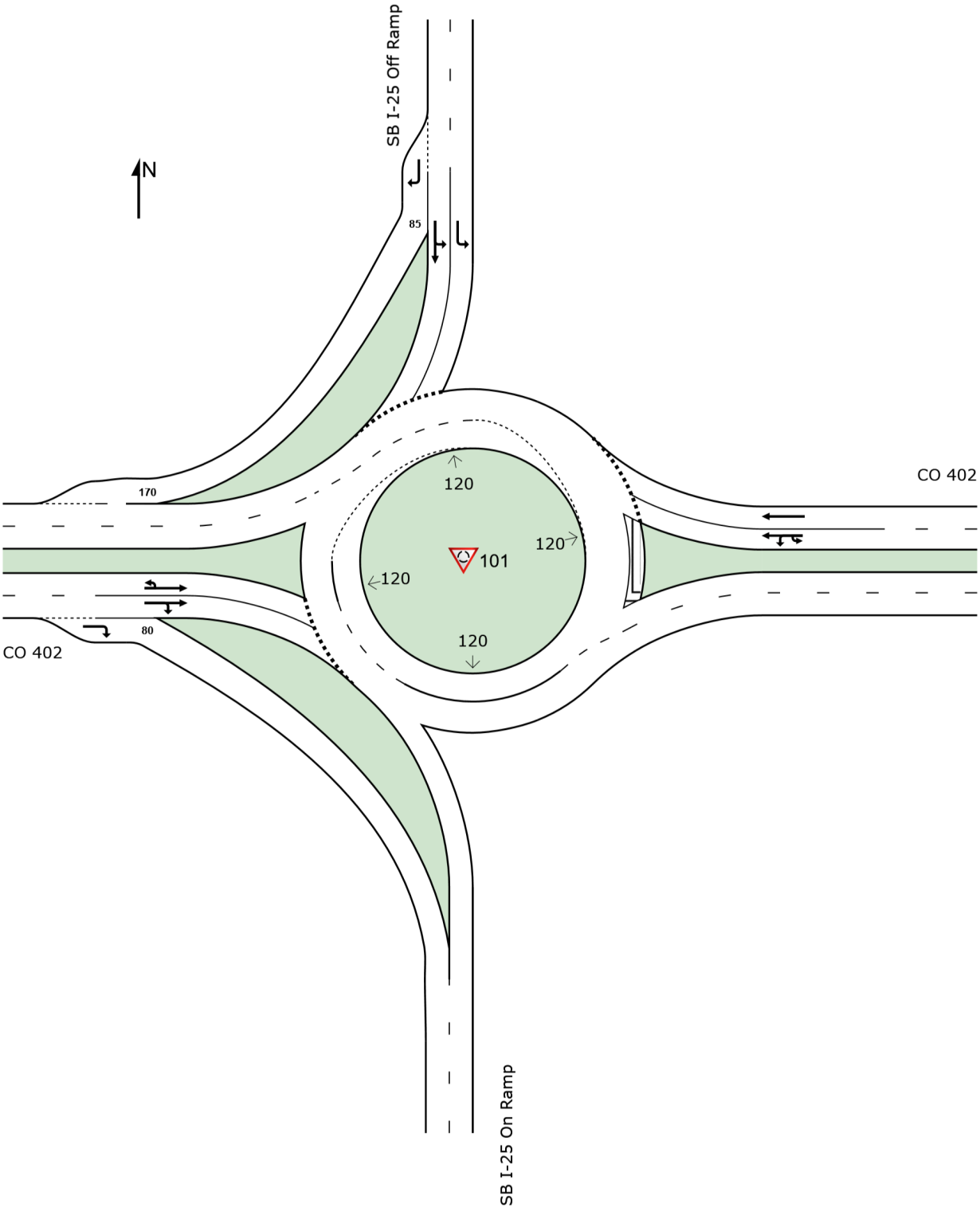
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	94	331	648	-	-	735	-	-	-
HCM Lane V/C Ratio	0.058	0.046	-	-	-	0.021	-	-	-
HCM Control Delay (s)	45.7	16.4	0	-	-	10	-	-	0
HCM Lane LOS	E	C	A	-	-	B	-	-	A
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	0.1	-	-	-

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

AM 2030 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2030 Base
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: CO 402															
1u	U	All MCs	16	9.0	16	9.0	0.378	4.8	LOS A	3.2	86.3	0.05	0.01	0.05	17.2
1	L2	All MCs	284	9.0	284	9.0	0.378	4.8	LOS A	3.2	86.3	0.05	0.01	0.05	32.9
6	T1	All MCs	717	9.0	717	9.0	0.378	4.7	LOS A	3.2	86.5	0.05	0.01	0.05	23.6
Approach			1017	9.0	1017	9.0	0.378	4.7	LOS A	3.2	86.5	0.05	0.01	0.05	26.9
North: SB I-25 Off Ramp															
7	L2	All MCs	95	9.0	95	9.0	0.061	5.1	LOS A	0.2	6.0	0.56	0.50	0.56	29.5
4	T1	All MCs	2	9.0	2	9.0	0.061	4.5	LOS A	0.2	6.0	0.55	0.48	0.55	39.7
14	R2	All MCs	357	9.0	357	9.0	0.231	7.2	LOS A	0.0	0.0	0.00	0.00	0.00	42.2
Approach			453	9.0	453	9.0	0.231	6.7	LOS A	0.2	6.0	0.12	0.11	0.12	38.6
West: CO 402															
5u	U	All MCs	2	8.0	2	8.0	0.264	6.5	LOS A	1.2	32.8	0.51	0.37	0.51	19.5
2	T1	All MCs	532	8.0	532	8.0	0.264	6.1	LOS A	1.3	33.7	0.50	0.36	0.50	24.1
12	R2	All MCs	353	8.0	353	8.0	0.226	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.1
Approach			887	8.0	887	8.0	0.264	3.7	LOS A	1.3	33.7	0.30	0.22	0.30	31.8
All Vehicles			2358	8.6	2358	8.6	0.378	4.7	LOS A	3.2	86.5	0.16	0.10	0.16	30.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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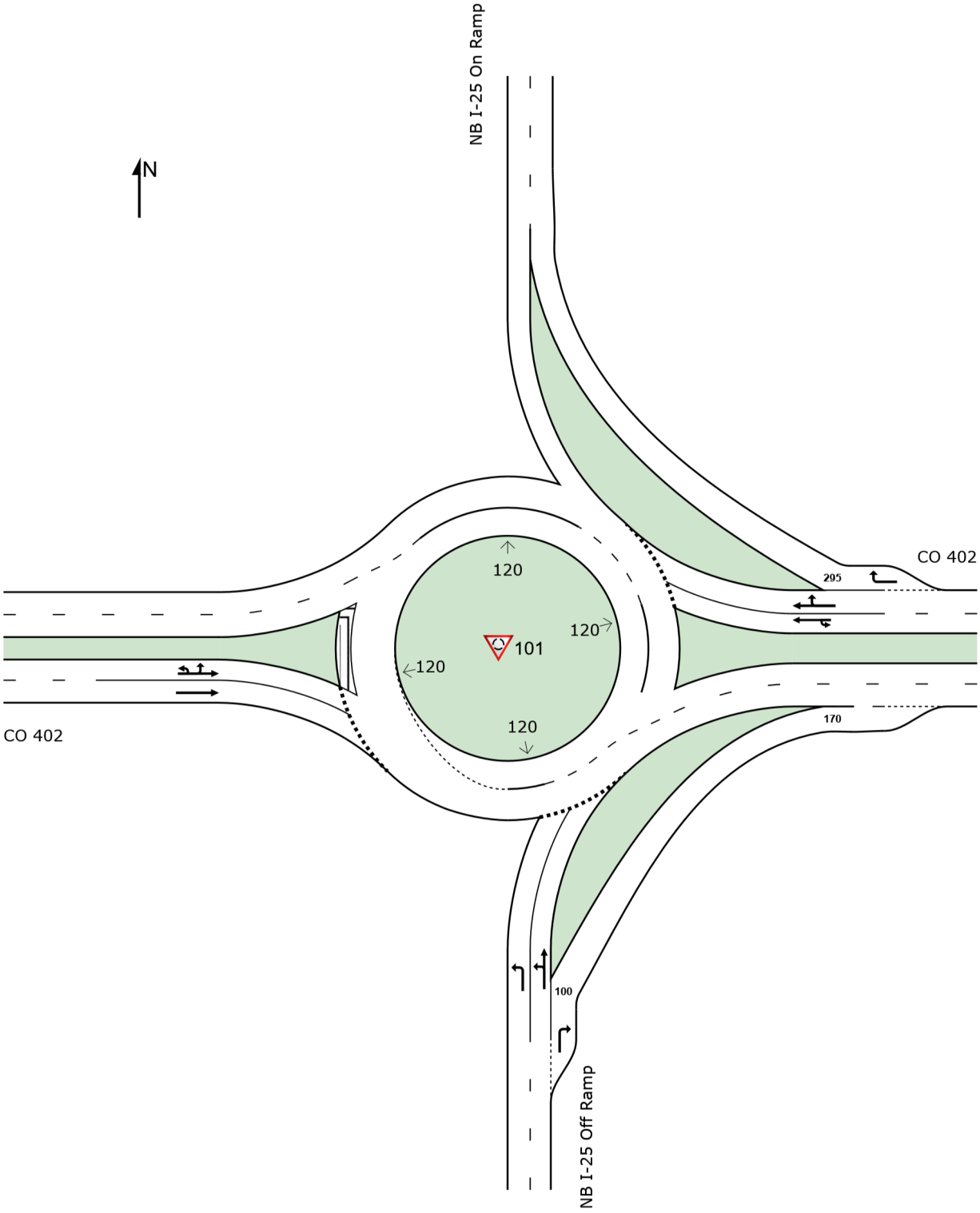
SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

AM 2030 Base

Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2030 Base

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: NB I-25 Off Ramp															
3	L2	All MCs	259	8.0	259	8.0	0.148	5.3	LOS A	0.6	15.2	0.51	0.41	0.51	28.4
8	T1	All MCs	14	8.0	14	8.0	0.148	4.8	LOS A	0.6	15.2	0.50	0.40	0.50	38.0
18	R2	All MCs	143	8.0	143	8.0	0.092	3.7	LOS A	0.0	0.0	0.00	0.00	0.00	41.1
Approach			416	8.0	416	8.0	0.148	4.8	LOS A	0.6	15.2	0.33	0.27	0.33	32.2
East: CO 402															
1u	U	All MCs	2	8.0	2	8.0	0.420	9.8	LOS A	2.4	63.7	0.66	0.60	0.76	20.0
6	T1	All MCs	733	8.0	733	8.0	0.420	9.1	LOS A	2.4	64.1	0.65	0.57	0.73	19.9
16	R2	All MCs	243	8.0	243	8.0	0.157	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.7
Approach			978	8.0	978	8.0	0.420	6.9	LOS A	2.4	64.1	0.49	0.43	0.55	21.6
West: CO 402															
5u	U	All MCs	2	8.0	2	8.0	0.237	4.0	LOS A	1.8	46.9	0.04	0.00	0.04	17.9
5	L2	All MCs	310	8.0	310	8.0	0.237	4.0	LOS A	1.8	46.9	0.04	0.00	0.04	31.1
2	T1	All MCs	332	8.0	332	8.0	0.237	3.8	LOS A	1.8	47.2	0.04	0.00	0.04	22.6
Approach			643	8.0	643	8.0	0.237	3.9	LOS A	1.8	47.2	0.04	0.00	0.04	27.4
All Vehicles			2038	8.0	2038	8.0	0.420	5.5	LOS A	2.4	64.1	0.32	0.26	0.34	25.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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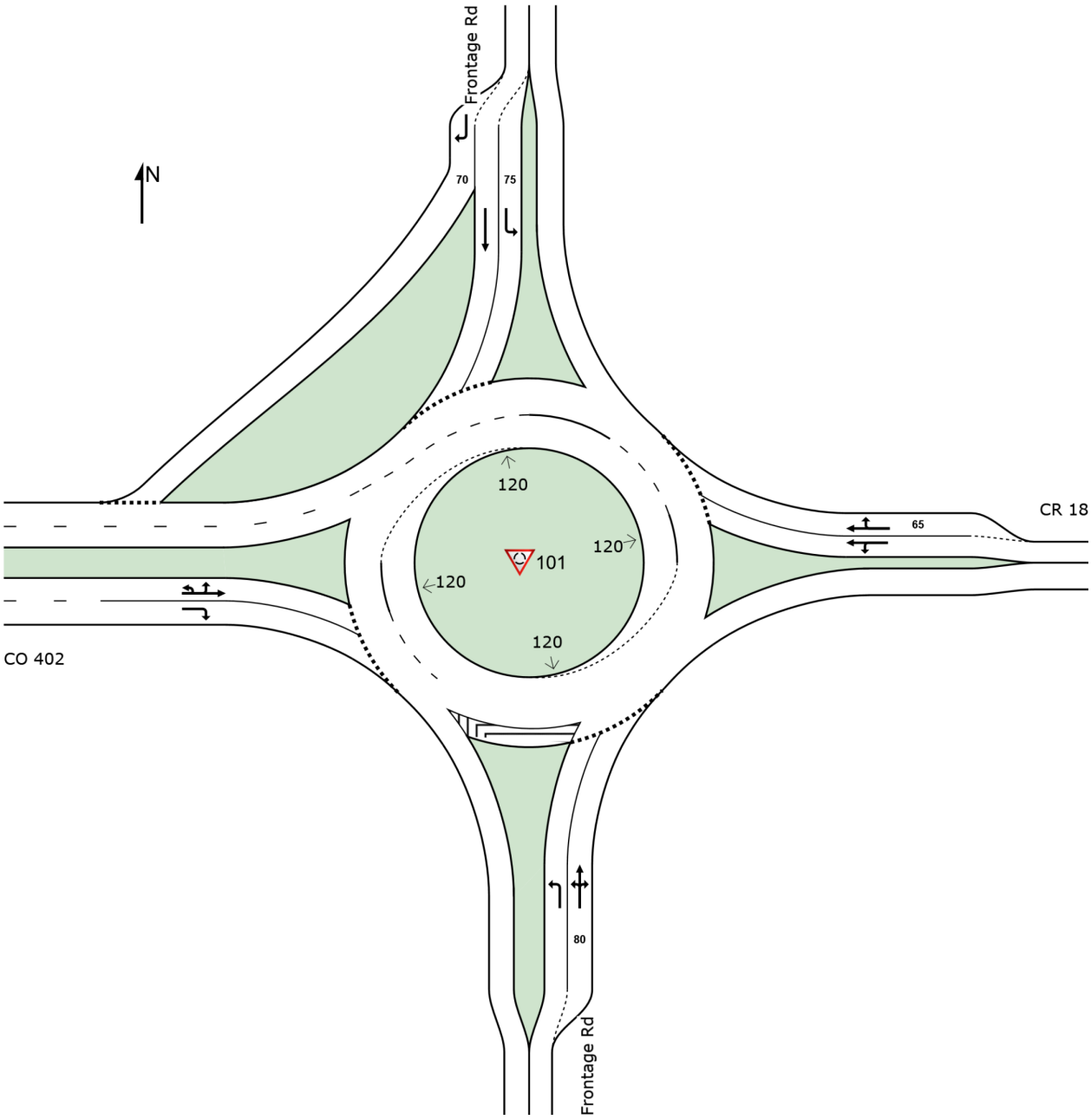
SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

AM 2030 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: Y:\Denver\152300S\00152379.00_West_Ridge_Study\Eng_Docs\Traffic\Models\SIDRA\2030\AM_2030 Base_Roundabouts.sip9

MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2030 Base
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: Frontage Rd															
3	L2	All MCs	107	9.0	107	9.0	0.112	5.7	LOS A	0.6	17.2	0.63	0.46	0.63	30.4
8	T1	All MCs	65	9.0	65	9.0	0.112	5.0	LOS A	0.6	17.2	0.62	0.44	0.62	33.2
18	R2	All MCs	17	9.0	17	9.0	0.112	5.0	LOS A	0.6	17.2	0.62	0.44	0.62	38.1
Approach			189	9.0	189	9.0	0.112	5.4	LOS A	0.6	17.2	0.63	0.45	0.63	32.3
East: CR 18															
1	L2	All MCs	20	7.0	20	7.0	0.081	4.6	LOS A	0.4	9.5	0.44	0.29	0.44	38.0
6	T1	All MCs	63	7.0	63	7.0	0.081	4.6	LOS A	0.4	9.5	0.44	0.29	0.44	39.9
16	R2	All MCs	70	7.0	70	7.0	0.081	4.6	LOS A	0.4	9.5	0.43	0.29	0.43	39.8
Approach			152	7.0	152	7.0	0.081	4.6	LOS A	0.4	9.5	0.43	0.29	0.43	39.4
North: Frontage Rd															
7	L2	All MCs	53	4.0	53	4.0	0.040	3.0	LOS A	0.2	4.4	0.30	0.16	0.30	38.1
4	T1	All MCs	51	4.0	51	4.0	0.043	3.4	LOS A	0.2	4.7	0.32	0.17	0.32	33.8
14	R2	All MCs	305	4.0	305	4.0	0.225	4.5	LOS A	1.1	29.6	0.34	0.18	0.34	30.2
Approach			410	4.0	410	4.0	0.225	4.2	LOS A	1.1	29.6	0.33	0.18	0.33	32.2
West: CO 402															
5u	U	All MCs	5	9.0	5	9.0	0.403	7.4	LOS A	2.4	64.1	0.37	0.20	0.37	20.5
5	L2	All MCs	113	9.0	113	9.0	0.403	7.4	LOS A	2.4	64.1	0.37	0.20	0.37	28.8
2	T1	All MCs	323	9.0	323	9.0	0.403	7.4	LOS A	2.4	64.1	0.37	0.20	0.37	38.7
12	R2	All MCs	26	9.0	26	9.0	0.037	5.4	LOS A	0.2	4.2	0.32	0.18	0.32	31.7
Approach			467	9.0	467	9.0	0.403	7.3	LOS A	2.4	64.1	0.37	0.19	0.37	35.4
All Vehicles			1218	7.1	1218	7.1	0.403	5.6	LOS A	2.4	64.1	0.40	0.24	0.40	34.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

Intersection: 3: SH 402 & S Boise Ave

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	327	285	703	275	179	263
Average Queue (ft)	220	81	325	64	108	114
95th Queue (ft)	323	189	546	240	171	219
Link Distance (ft)		1168	7117			438
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	390			250	155	
Storage Blk Time (%)			11	0	3	4
Queuing Penalty (veh)			11	0	4	5

Intersection: 5: SH 402 & LCR 9E

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	284	317	259	52	159	142
Average Queue (ft)	117	130	105	10	49	66
95th Queue (ft)	227	250	200	33	106	127
Link Distance (ft)		7117	3060			697
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	385			420	225	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 16: Park-n-Ride Access & SH 402

Movement	WB	WB	NB	NB
Directions Served	L	T	L	R
Maximum Queue (ft)	28	178	30	53
Average Queue (ft)	5	38	6	15
95th Queue (ft)	22	123	23	42
Link Distance (ft)		555	373	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150			150
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 18: LCR 7/Charlotte Court & SH 402

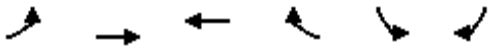
Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	TR
Maximum Queue (ft)	30	347	28	73	296	26	108	67	48	45
Average Queue (ft)	7	211	8	27	140	2	15	24	8	4
95th Queue (ft)	26	313	28	62	233	12	51	54	30	20
Link Distance (ft)		3814			1096			474		634
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250		250	250		250	150		150	
Storage Blk Time (%)		2			0					
Queuing Penalty (veh)		1			0					

Intersection: 22: Boyd Lake & SH 402

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	T	R
Maximum Queue (ft)	131	305	33	424	520	425	27	132	44	178	153	64
Average Queue (ft)	54	225	8	18	365	58	2	71	15	77	77	28
95th Queue (ft)	105	324	24	143	474	259	13	120	39	142	136	58
Link Distance (ft)		3060			3814			517			559	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400		400	400		400	200		200	200		200
Storage Blk Time (%)					3	0						
Queuing Penalty (veh)					4	0						

Zone Summary

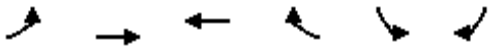
Zone wide Queuing Penalty: 27



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	243	921	847	143	110	241
Future Volume (veh/h)	243	921	847	143	110	241
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1826	1826	1856	1856	1885	1885
Adj Flow Rate, veh/h	251	949	873	117	113	154
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	3	3	1	1
Cap, veh/h	323	1296	1083	1217	341	425
Arrive On Green	0.08	0.71	0.58	0.58	0.19	0.19
Sat Flow, veh/h	1739	1826	1856	1572	1795	1598
Grp Volume(v), veh/h	251	949	873	117	113	154
Grp Sat Flow(s),veh/h/ln	1739	1826	1856	1572	1795	1598
Q Serve(g_s), s	5.4	31.4	37.0	1.8	5.4	7.8
Cycle Q Clear(g_c), s	5.4	31.4	37.0	1.8	5.4	7.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	323	1296	1083	1217	341	425
V/C Ratio(X)	0.78	0.73	0.81	0.10	0.33	0.36
Avail Cap(c_a), veh/h	382	1296	1083	1217	341	425
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.72	0.72	1.00	1.00
Uniform Delay (d), s/veh	19.1	8.8	16.4	2.8	35.0	29.8
Incr Delay (d2), s/veh	8.3	3.7	4.7	0.1	2.6	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	9.3	13.9	1.0	2.6	3.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.4	12.4	21.1	2.9	37.6	32.2
LnGrp LOS	C	B	C	A	D	C
Approach Vol, veh/h		1200	990		267	
Approach Delay, s/veh		15.6	18.9		34.5	
Approach LOS		B	B		C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	12.6	63.4				76.0	24.0
Change Period (Y+Rc), s	5.0	5.0				5.0	5.0
Max Green Setting (Gmax), s	11.0	55.0				71.0	19.0
Max Q Clear Time (g_c+I1), s	7.4	39.0				33.4	9.8
Green Ext Time (p_c), s	0.2	5.4				7.6	0.5

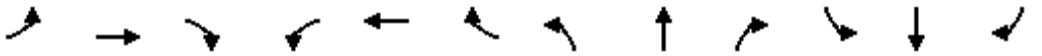
Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	161	895	765	128	72	133
Future Volume (veh/h)	161	895	765	128	72	133
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1826	1826
Adj Flow Rate, veh/h	173	962	823	116	77	34
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	4	4	5	5
Cap, veh/h	375	1403	1217	1291	290	331
Arrive On Green	0.05	0.75	0.66	0.66	0.17	0.17
Sat Flow, veh/h	1781	1870	1841	1560	1739	1547
Grp Volume(v), veh/h	173	962	823	116	77	34
Grp Sat Flow(s),veh/h/ln	1781	1870	1841	1560	1739	1547
Q Serve(g_s), s	3.5	31.8	32.9	1.7	4.6	2.1
Cycle Q Clear(g_c), s	3.5	31.8	32.9	1.7	4.6	2.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	375	1403	1217	1291	290	331
V/C Ratio(X)	0.46	0.69	0.68	0.09	0.27	0.10
Avail Cap(c_a), veh/h	425	1403	1217	1291	290	331
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.59	0.59	1.00	1.00
Uniform Delay (d), s/veh	12.2	7.7	12.5	1.9	43.6	37.9
Incr Delay (d2), s/veh	0.6	1.8	1.8	0.1	2.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	9.3	11.5	0.9	2.1	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.8	9.5	14.3	2.0	45.8	38.5
LnGrp LOS	B	A	B	A	D	D
Approach Vol, veh/h		1135	939		111	
Approach Delay, s/veh		10.0	12.7		43.6	
Approach LOS		B	B		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	95.0	25.0	10.7	84.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	90.0	20.0	9.0	76.0
Max Q Clear Time (g_c+I1), s	33.8	6.6	5.5	34.9
Green Ext Time (p_c), s	8.1	0.2	0.1	6.4

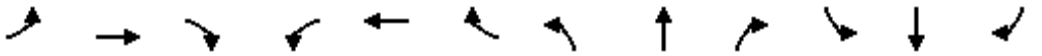
Intersection Summary	
HCM 6th Ctrl Delay	12.9
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	864	47	40	874	5	24	5	50	5	5	5
Future Volume (veh/h)	10	864	47	40	874	5	24	5	50	5	5	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	939	27	43	950	0	26	5	54	5	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	253	1178	998	267	1213	1028	344	28	304	297	177	177
Arrive On Green	0.01	0.63	0.63	0.03	0.65	0.00	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1767	1856	1572	1767	1856	1572	1394	135	1458	1333	851	851
Grp Volume(v), veh/h	11	939	27	43	950	0	26	0	59	5	0	10
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1856	1572	1394	0	1593	1333	0	1702
Q Serve(g_s), s	0.3	44.9	0.8	1.0	43.6	0.0	1.8	0.0	3.7	0.4	0.0	0.6
Cycle Q Clear(g_c), s	0.3	44.9	0.8	1.0	43.6	0.0	2.4	0.0	3.7	4.0	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.92	1.00		0.50
Lane Grp Cap(c), veh/h	253	1178	998	267	1213	1028	344	0	332	297	0	355
V/C Ratio(X)	0.04	0.80	0.03	0.16	0.78	0.00	0.08	0.00	0.18	0.02	0.00	0.03
Avail Cap(c_a), veh/h	304	1178	998	284	1213	1028	344	0	332	297	0	355
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.64	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.7	16.2	8.1	15.9	14.7	0.0	38.8	0.0	39.1	40.7	0.0	37.8
Incr Delay (d2), s/veh	0.0	3.7	0.0	0.3	5.1	0.0	0.4	0.0	1.2	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	16.8	0.2	0.4	16.4	0.0	0.6	0.0	1.5	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	19.9	8.2	16.2	19.8	0.0	39.2	0.0	40.2	40.8	0.0	38.0
LnGrp LOS	B	B	A	B	B	A	D	A	D	D	A	D
Approach Vol, veh/h		977			993			85			15	
Approach Delay, s/veh		19.5			19.7			39.9			38.9	
Approach LOS		B			B			D			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		30.0	8.8	81.2		30.0	6.5	83.5				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		25.0	5.0	75.0		25.0	5.0	75.0				
Max Q Clear Time (g_c+I1), s		5.7	3.0	46.9		6.0	2.3	45.6				
Green Ext Time (p_c), s		0.3	0.0	7.1		0.0	0.0	7.2				

Intersection Summary												
HCM 6th Ctrl Delay			20.6									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	780	55	10	770	120	5	110	15	135	140	120
Future Volume (veh/h)	130	780	55	10	770	120	5	110	15	135	140	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	141	848	37	11	837	83	5	120	0	147	152	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	1114	954	246	1045	1005	251	281	258	310	409	425
Arrive On Green	0.05	0.60	0.60	0.01	0.56	0.56	0.01	0.15	0.00	0.08	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	141	848	37	11	837	83	5	120	0	147	152	31
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	3.9	40.3	1.1	0.3	42.9	2.4	0.3	7.0	0.0	8.2	8.3	1.8
Cycle Q Clear(g_c), s	3.9	40.3	1.1	0.3	42.9	2.4	0.3	7.0	0.0	8.2	8.3	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	1114	954	246	1045	1005	251	281	258	310	409	425
V/C Ratio(X)	0.52	0.76	0.04	0.04	0.80	0.08	0.02	0.43	0.00	0.47	0.37	0.07
Avail Cap(c_a), veh/h	301	1114	954	297	1045	1005	314	281	258	310	409	425
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	0.61	0.61	0.61	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	18.0	9.7	16.5	21.1	8.5	42.8	46.3	0.0	38.0	39.9	32.8
Incr Delay (d2), s/veh	1.1	3.5	0.1	0.0	4.0	0.1	0.0	4.7	0.0	5.1	2.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	15.8	0.4	0.1	17.4	0.7	0.1	3.5	0.0	3.9	4.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.1	21.5	9.8	16.6	25.2	8.6	42.9	51.0	0.0	43.1	42.5	33.1
LnGrp LOS	C	C	A	B	C	A	D	D	A	D	D	C
Approach Vol, veh/h		1026			931			125			330	
Approach Delay, s/veh		21.0			23.6			50.7			41.9	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	23.0	6.5	76.5	5.8	31.2	10.9	72.1
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	9.0	18.0	5.0	68.0	5.0	22.0	8.0	65.0
Max Q Clear Time (g_c+I1), s	10.2	9.0	2.3	42.3	2.3	10.3	5.9	44.9
Green Ext Time (p_c), s	0.0	0.3	0.0	5.9	0.0	0.6	0.1	5.5

Intersection Summary	
HCM 6th Ctrl Delay	26.4
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	853	10	12	946	0	12	0	24	0	0	0
Future Vol, veh/h	0	853	10	12	946	0	12	0	24	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	-	0	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	937	11	13	1040	0	13	0	26	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1040	0	0	948	0	0	1483	-	937	2022	2014	520
Stage 1	-	-	-	-	-	-	937	-	-	1066	1066	-
Stage 2	-	-	-	-	-	-	546	-	-	956	948	-
Critical Hdwy	4.145	-	-	4.145	-	-	7.345	-	6.245	7.345	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	6.145	-	-	6.545	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.545	-	-	6.145	5.545	-
Follow-up Hdwy	2.2285	-	-	2.2285	-	-	3.5285	-	3.3285	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	662	-	-	717	-	-	94	0	318	38	58	500
Stage 1	-	-	-	-	-	-	315	0	-	237	296	-
Stage 2	-	-	-	-	-	-	488	0	-	307	337	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	662	-	-	717	-	-	93	-	318	34	57	500
Mov Cap-2 Maneuver	-	-	-	-	-	-	93	-	-	34	57	-
Stage 1	-	-	-	-	-	-	315	-	-	237	291	-
Stage 2	-	-	-	-	-	-	479	-	-	282	337	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	28.2	0
HCM LOS			D	A

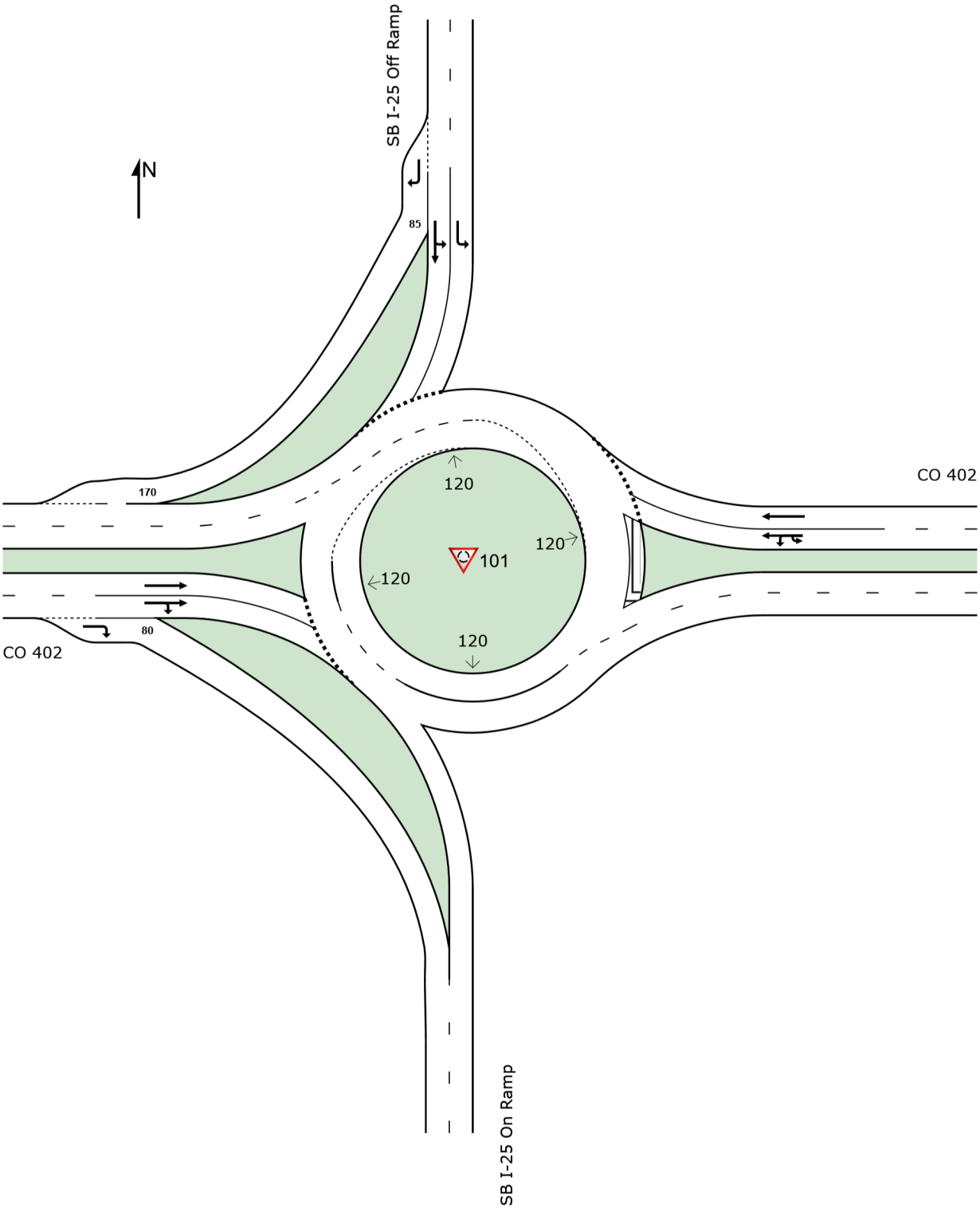
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	93	318	662	-	-	717	-	-	-
HCM Lane V/C Ratio	0.142	0.083	-	-	-	0.018	-	-	-
HCM Control Delay (s)	50	17.3	0	-	-	10.1	-	-	0
HCM Lane LOS	F	C	A	-	-	B	-	-	A
HCM 95th %tile Q(veh)	0.5	0.3	0	-	-	0.1	-	-	-

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

PM 2030 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2030 Base
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: CO 402															
1u	U	All MCs	5	5.0	5	5.0	0.352	4.4	LOS A	0.0	0.0	0.00	0.00	0.00	19.5
1	L2	All MCs	201	5.0	201	5.0	0.352	4.4	LOS A	0.0	0.0	0.00	0.00	0.00	37.5
6	T1	All MCs	779	5.0	779	5.0	0.352	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	26.6
Approach			986	5.0	986	5.0	0.352	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	29.6
North: SB I-25 Off Ramp															
7	L2	All MCs	210	6.0	210	6.0	0.122	5.3	LOS A	0.5	11.9	0.55	0.48	0.55	29.5
4	T1	All MCs	1	6.0	1	6.0	0.122	4.7	LOS A	0.5	11.9	0.54	0.46	0.54	39.8
14	R2	All MCs	287	6.0	287	6.0	0.181	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	42.3
Approach			498	6.0	498	6.0	0.181	5.5	LOS A	0.5	11.9	0.23	0.20	0.23	35.6
West: CO 402															
2	T1	All MCs	734	7.0	734	7.0	0.363	7.4	LOS A	1.9	49.7	0.55	0.40	0.55	23.2
12	R2	All MCs	235	7.0	235	7.0	0.149	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.4
Approach			968	7.0	968	7.0	0.363	5.6	LOS A	1.9	49.7	0.41	0.31	0.41	28.3
All Vehicles			2452	6.0	2452	6.0	0.363	5.1	LOS A	1.9	49.7	0.21	0.16	0.21	30.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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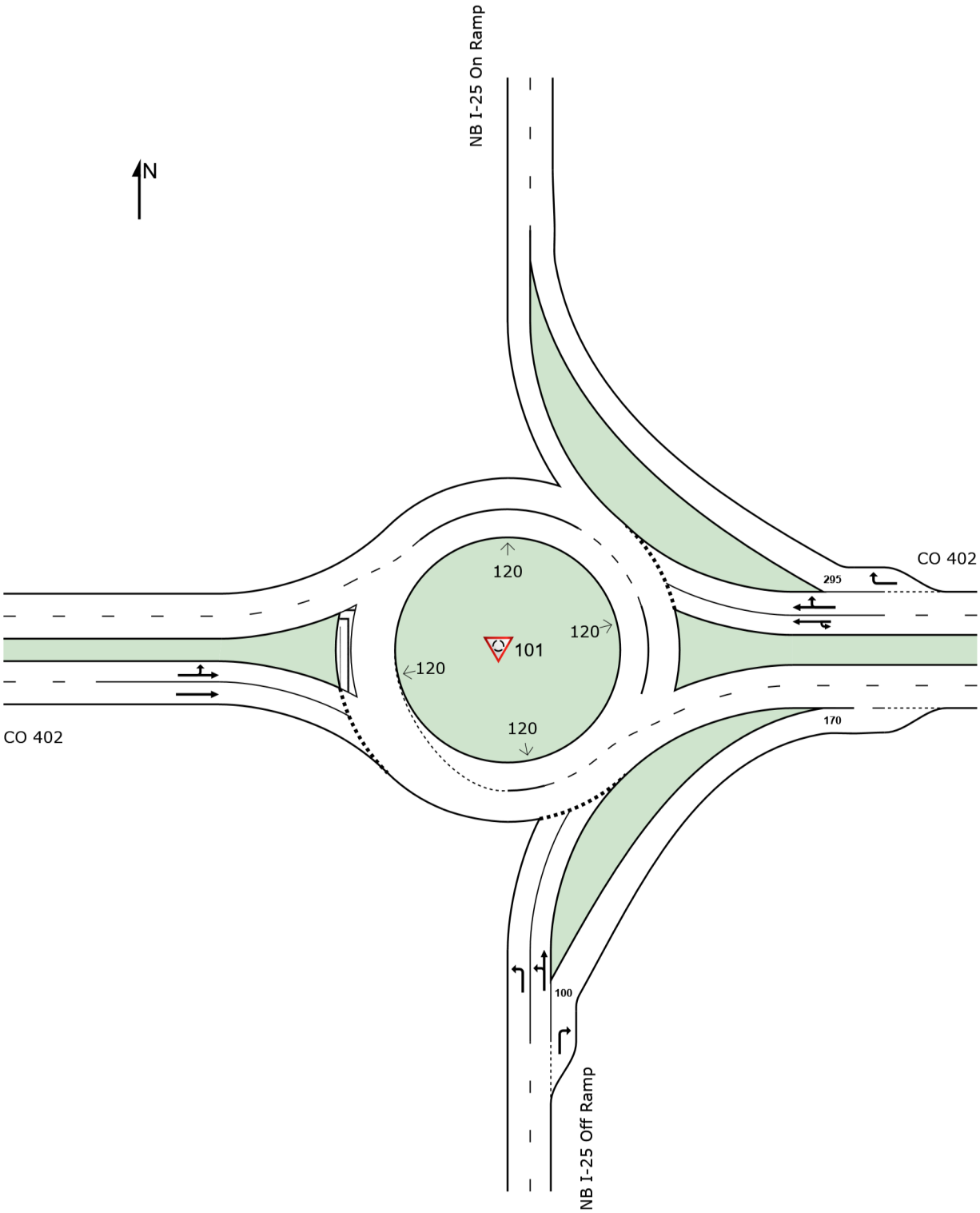
SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

PM 2030 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2030 Base
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: NB I-25 Off Ramp															
3	L2	All MCs	385	4.0	385	4.0	0.219	6.3	LOS A	0.9	23.5	0.59	0.52	0.59	27.8
8	T1	All MCs	2	4.0	2	4.0	0.219	5.7	LOS A	0.9	23.5	0.58	0.50	0.58	37.6
18	R2	All MCs	199	4.0	199	4.0	0.123	4.5	LOS A	0.0	0.0	0.00	0.00	0.00	41.3
Approach			586	4.0	586	4.0	0.219	5.7	LOS A	0.9	23.5	0.39	0.34	0.39	31.3
East: CO 402															
1u	U	All MCs	4	7.0	4	7.0	0.362	9.2	LOS A	1.8	47.8	0.66	0.57	0.68	20.2
6	T1	All MCs	609	7.0	609	7.0	0.362	8.4	LOS A	1.9	49.3	0.65	0.54	0.66	20.2
16	R2	All MCs	102	7.0	102	7.0	0.065	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.7
Approach			715	7.0	715	7.0	0.362	7.2	LOS A	1.9	49.3	0.56	0.47	0.57	21.2
West: CO 402															
5	L2	All MCs	280	5.0	280	5.0	0.343	4.6	LOS A	2.9	75.6	0.07	0.01	0.07	32.4
2	T1	All MCs	673	5.0	673	5.0	0.343	4.5	LOS A	2.9	76.0	0.07	0.01	0.07	21.8
Approach			953	5.0	953	5.0	0.343	4.6	LOS A	2.9	76.0	0.07	0.01	0.07	25.4
All Vehicles			2254	5.4	2254	5.4	0.362	5.7	LOS A	2.9	76.0	0.31	0.24	0.31	25.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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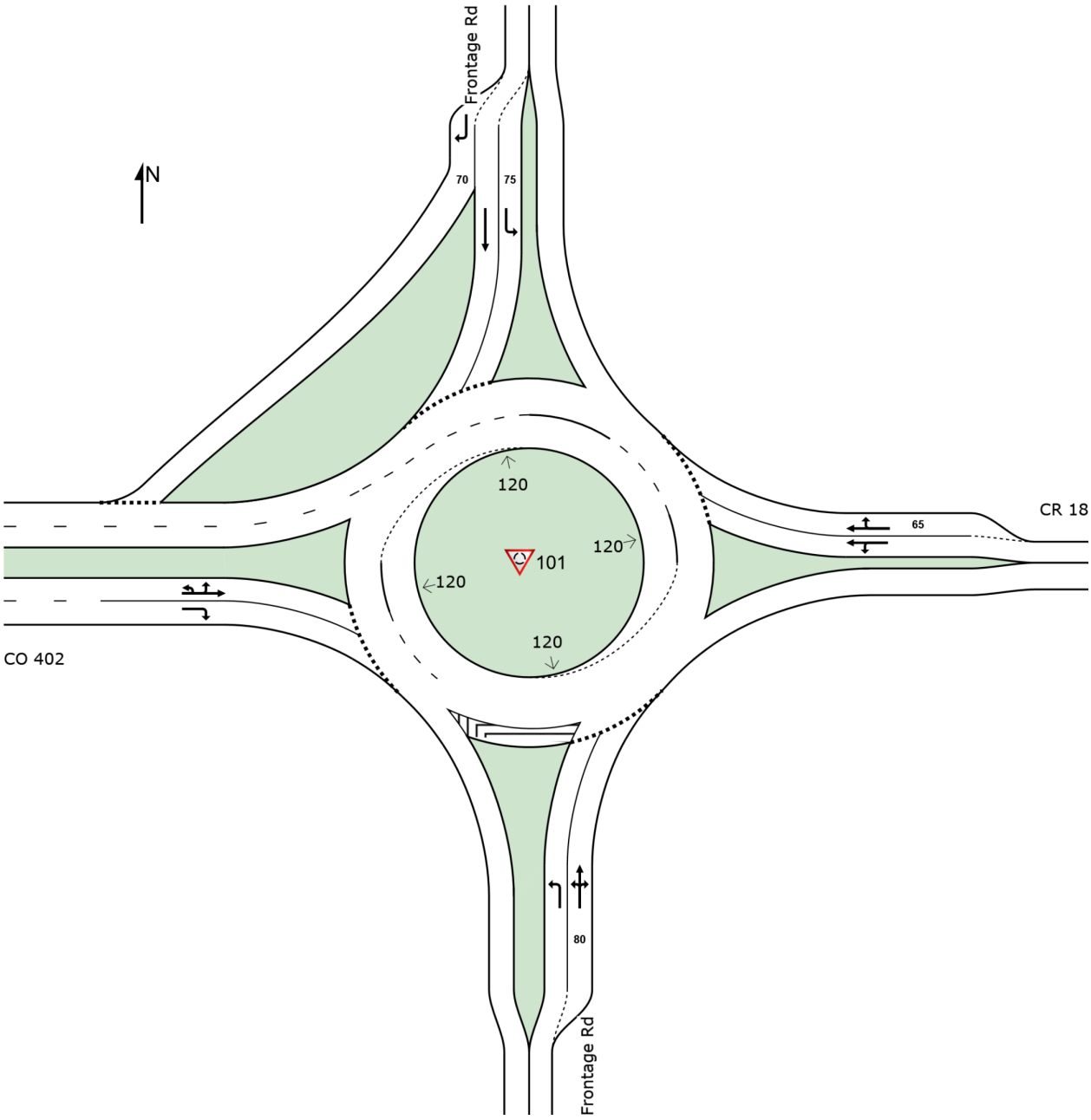
SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

PM 2030 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2030 Base
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: Frontage Rd															
3	L2	All MCs	114	9.0	114	9.0	0.337	17.5	LOS B	2.3	60.4	0.97	0.83	0.98	28.0
8	T1	All MCs	107	9.0	107	9.0	0.338	13.5	LOS B	2.6	69.7	1.00	0.80	1.00	32.0
18	R2	All MCs	48	9.0	48	9.0	0.338	13.5	LOS B	2.6	69.7	1.00	0.80	1.00	36.6
Approach			268	9.0	268	9.0	0.338	15.2	LOS B	2.6	69.7	0.99	0.81	0.99	31.3
East: CR 18															
1	L2	All MCs	10	4.0	10	4.0	0.296	7.8	LOS A	1.5	39.3	0.62	0.49	0.62	37.5
6	T1	All MCs	368	4.0	368	4.0	0.296	7.8	LOS A	1.5	39.4	0.62	0.48	0.62	38.9
16	R2	All MCs	101	4.0	101	4.0	0.296	7.6	LOS A	1.5	39.4	0.62	0.48	0.62	38.8
Approach			479	4.0	479	4.0	0.296	7.7	LOS A	1.5	39.4	0.62	0.48	0.62	38.8
North: Frontage Rd															
7	L2	All MCs	91	6.0	91	6.0	0.084	4.0	LOS A	0.4	9.8	0.49	0.35	0.49	37.8
4	T1	All MCs	84	6.0	84	6.0	0.092	4.8	LOS A	0.4	10.3	0.51	0.38	0.51	33.5
14	R2	All MCs	192	6.0	192	6.0	0.175	4.8	LOS A	0.8	21.6	0.51	0.37	0.51	30.0
Approach			367	6.0	367	6.0	0.175	4.6	LOS A	0.8	21.6	0.50	0.37	0.50	33.3
West: CO 402															
5u	U	All MCs	9	4.0	9	4.0	0.828	20.0	LOS C	20.6	530.5	0.85	0.98	1.39	16.5
5	L2	All MCs	267	4.0	267	4.0	0.828	20.0	LOS C	20.6	530.5	0.85	0.98	1.39	25.5
2	T1	All MCs	616	4.0	616	4.0	0.828	20.0	LOS C	20.6	530.5	0.85	0.98	1.39	33.9
12	R2	All MCs	16	4.0	16	4.0	0.025	5.7	LOS A	0.1	2.6	0.39	0.24	0.39	31.6
Approach			909	4.0	909	4.0	0.828	19.8	LOS B	20.6	530.5	0.84	0.97	1.37	31.0
All Vehicles			2024	5.0	2024	5.0	0.828	13.6	LOS B	20.6	530.5	0.75	0.73	0.99	33.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

Intersection: 3: SH 402 & S Boise Ave

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	286	294	546	275	178	235
Average Queue (ft)	127	141	298	115	63	87
95th Queue (ft)	222	250	501	317	120	161
Link Distance (ft)		1168	7117			438
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	390			250	155	
Storage Blk Time (%)			13	0		1
Queuing Penalty (veh)			19	1		1

Intersection: 5: SH 402 & LCR 9E

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	130	276	226	80	75	110
Average Queue (ft)	72	144	66	14	47	60
95th Queue (ft)	123	253	150	47	87	101
Link Distance (ft)		7117	3060			697
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	385			420	225	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 16: Park-n-Ride Access & SH 402

Movement	WB	WB	WB	NB	NB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	28	178	86	52	79
Average Queue (ft)	5	21	5	13	22
95th Queue (ft)	22	100	35	41	50
Link Distance (ft)		555	555	373	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150				150
Storage Blk Time (%)		0			
Queuing Penalty (veh)		0			

Intersection: 18: LCR 7/Charlotte Court & SH 402

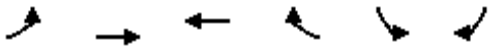
Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	TR
Maximum Queue (ft)	274	412	275	51	307	28	174	206	26	24
Average Queue (ft)	16	258	38	20	160	2	26	32	4	3
95th Queue (ft)	97	388	168	46	260	12	83	103	17	15
Link Distance (ft)		3814			1096			474		634
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250		250	250		250	150		150	
Storage Blk Time (%)		9	0		1			1		
Queuing Penalty (veh)		5	0		0			0		

Intersection: 22: Boyd Lake & SH 402

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	T	R
Maximum Queue (ft)	130	353	18	26	537	425	48	130	44	204	255	127
Average Queue (ft)	55	219	6	5	353	128	7	70	9	112	107	49
95th Queue (ft)	106	310	18	22	507	422	28	118	28	188	178	107
Link Distance (ft)		3060			3814			517			559	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400		400	400		400	200		200	200		200
Storage Blk Time (%)					6	0				1		
Queuing Penalty (veh)					7	0				2		

Zone Summary

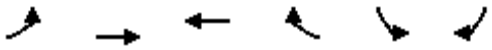
Zone wide Queuing Penalty: 36



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	331	1023	1169	123	163	213
Future Volume (veh/h)	331	1023	1169	123	163	213
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1796	1796
Adj Flow Rate, veh/h	364	1124	1285	91	179	223
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	4	4	4	4	7	7
Cap, veh/h	601	2695	1539	686	221	624
Arrive On Green	0.28	0.77	0.44	0.44	0.13	0.13
Sat Flow, veh/h	1753	3589	3589	1560	1711	1522
Grp Volume(v), veh/h	364	1124	1285	91	179	223
Grp Sat Flow(s),veh/h/ln	1753	1749	1749	1560	1711	1522
Q Serve(g_s), s	11.0	10.9	32.5	3.5	10.2	0.0
Cycle Q Clear(g_c), s	11.0	10.9	32.5	3.5	10.2	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	601	2695	1539	686	221	624
V/C Ratio(X)	0.61	0.42	0.84	0.13	0.81	0.36
Avail Cap(c_a), veh/h	601	2695	1539	686	325	716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.80	0.80	1.00	1.00
Uniform Delay (d), s/veh	27.7	3.9	24.8	16.7	42.3	20.4
Incr Delay (d2), s/veh	1.7	0.5	4.5	0.3	9.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	2.1	12.7	1.2	4.8	3.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.5	4.4	29.3	17.0	51.5	20.7
LnGrp LOS	C	A	C	B	D	C
Approach Vol, veh/h		1488	1376		402	
Approach Delay, s/veh		10.5	28.4		34.4	
Approach LOS		B	C		C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	33.1	49.0				82.1	17.9
Change Period (Y+Rc), s	5.0	5.0				5.0	5.0
Max Green Setting (Gmax), s	22.0	44.0				71.0	19.0
Max Q Clear Time (g_c+I1), s	13.0	34.5				12.9	12.2
Green Ext Time (p_c), s	0.7	5.5				8.9	0.8

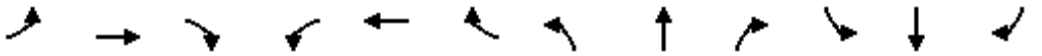
Intersection Summary	
HCM 6th Ctrl Delay	21.0
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	225	1024	1030	167	70	163
Future Volume (veh/h)	225	1024	1030	167	70	163
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1752	1752
Adj Flow Rate, veh/h	247	1125	1132	130	77	148
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	6	6	6	6	10	10
Cap, veh/h	330	2478	2042	1187	300	381
Arrive On Green	0.08	0.72	0.20	0.20	0.18	0.18
Sat Flow, veh/h	1725	3532	3532	1535	1668	1485
Grp Volume(v), veh/h	247	1125	1132	130	77	148
Grp Sat Flow(s),veh/h/ln	1725	1721	1721	1535	1668	1485
Q Serve(g_s), s	5.2	13.6	29.7	3.9	4.0	8.2
Cycle Q Clear(g_c), s	5.2	13.6	29.7	3.9	4.0	8.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	330	2478	2042	1187	300	381
V/C Ratio(X)	0.75	0.45	0.55	0.11	0.26	0.39
Avail Cap(c_a), veh/h	509	2478	2042	1187	300	381
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.74	0.74	1.00	1.00
Uniform Delay (d), s/veh	16.8	5.8	28.3	6.0	35.2	30.7
Incr Delay (d2), s/veh	3.0	0.5	0.8	0.1	2.1	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.3	13.6	2.3	1.7	7.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.8	6.4	29.1	6.1	37.3	33.7
LnGrp LOS	B	A	C	A	D	C
Approach Vol, veh/h		1372	1262		225	
Approach Delay, s/veh		8.8	26.7		34.9	
Approach LOS		A	C		C	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	77.0	23.0	12.7	64.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	72.0	18.0	18.0	49.0
Max Q Clear Time (g_c+I1), s	15.6	10.2	7.2	31.7
Green Ext Time (p_c), s	9.0	0.4	0.5	7.1

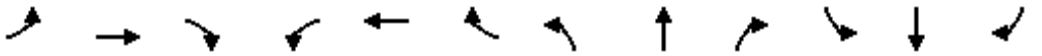
Intersection Summary	
HCM 6th Ctrl Delay	18.8
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	981	50	68	1177	5	22	5	63	10	5	5
Future Volume (veh/h)	5	981	50	68	1177	5	22	5	63	10	5	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	1078	24	75	1293	0	24	5	69	11	5	5
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	282	2208	985	384	2339	1043	316	19	267	256	153	153
Arrive On Green	0.01	0.63	0.63	0.04	0.66	0.00	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1767	3526	1572	1767	3526	1572	1394	107	1482	1315	851	851
Grp Volume(v), veh/h	5	1078	24	75	1293	0	24	0	74	11	0	10
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1572	1394	0	1589	1315	0	1702
Q Serve(g_s), s	0.1	16.5	0.6	1.4	19.5	0.0	1.4	0.0	4.0	0.7	0.0	0.5
Cycle Q Clear(g_c), s	0.1	16.5	0.6	1.4	19.5	0.0	1.9	0.0	4.0	4.7	0.0	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.93	1.00		0.50
Lane Grp Cap(c), veh/h	282	2208	985	384	2339	1043	316	0	286	256	0	306
V/C Ratio(X)	0.02	0.49	0.02	0.20	0.55	0.00	0.08	0.00	0.26	0.04	0.00	0.03
Avail Cap(c_a), veh/h	359	2208	985	448	2339	1043	316	0	286	256	0	306
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.0	10.1	7.1	7.2	8.9	0.0	34.6	0.0	35.3	37.3	0.0	33.8
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.2	0.9	0.0	0.5	0.0	2.2	0.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.2	0.2	0.4	5.8	0.0	0.5	0.0	1.7	0.3	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.0	10.8	7.1	7.4	9.9	0.0	35.1	0.0	37.4	37.6	0.0	34.0
LnGrp LOS	A	B	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h		1107			1368			98			21	
Approach Delay, s/veh		10.7			9.8			36.9			35.9	
Approach LOS		B			A			D			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		23.0	9.4	67.6		23.0	5.6	71.4				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		18.0	8.0	59.0		18.0	5.0	62.0				
Max Q Clear Time (g_c+I1), s		6.0	3.4	18.5		6.7	2.1	21.5				
Green Ext Time (p_c), s		0.3	0.0	8.2		0.0	0.0	10.7				

Intersection Summary												
HCM 6th Ctrl Delay			11.4									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	850	140	10	1045	110	5	160	30	145	250	140
Future Volume (veh/h)	135	850	140	10	1045	110	5	160	30	145	250	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	147	924	84	11	1136	63	5	174	0	158	272	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	328	2276	1015	395	1898	996	200	216	183	270	486	412
Arrive On Green	0.11	1.00	1.00	0.53	0.53	0.53	0.12	0.12	0.00	0.09	0.26	0.26
Sat Flow, veh/h	1781	3554	1585	605	3554	1585	1107	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	147	924	84	11	1136	63	5	174	0	158	272	93
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	605	1777	1585	1107	1870	1585	1781	1870	1585
Q Serve(g_s), s	3.6	0.0	0.0	0.9	21.9	1.5	0.4	9.1	0.0	7.5	12.6	4.6
Cycle Q Clear(g_c), s	3.6	0.0	0.0	0.9	21.9	1.5	0.4	9.1	0.0	7.5	12.6	4.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	328	2276	1015	395	1898	996	200	216	183	270	486	412
V/C Ratio(X)	0.45	0.41	0.08	0.03	0.60	0.06	0.02	0.80	0.00	0.59	0.56	0.23
Avail Cap(c_a), veh/h	388	2276	1015	395	1898	996	293	374	317	280	655	555
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	0.84	0.84	0.84	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	0.0	0.0	11.1	16.0	7.2	39.3	43.1	0.0	33.3	32.1	29.1
Incr Delay (d2), s/veh	0.9	0.5	0.1	0.1	1.2	0.1	0.0	6.9	0.0	2.9	1.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.2	0.0	0.1	7.8	0.4	0.1	4.4	0.0	3.3	5.5	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.5	0.1	11.2	17.1	7.3	39.3	50.0	0.0	36.2	33.1	29.4
LnGrp LOS	B	A	A	B	B	A	D	D	A	D	C	C
Approach Vol, veh/h		1155			1210			179			523	
Approach Delay, s/veh		2.0			16.6			49.7			33.4	
Approach LOS		A			B			D			C	

Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	14.4	16.6		69.0		31.0	10.6	58.4				
Change Period (Y+Rc), s	5.0	5.0		5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s	10.0	20.0		55.0		35.0	9.0	41.0				
Max Q Clear Time (g_c+I1), s	9.5	11.1		2.0		14.6	5.6	23.9				
Green Ext Time (p_c), s	0.0	0.5		7.0		1.6	0.1	7.0				

Intersection Summary												
HCM 6th Ctrl Delay			15.9									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1033	12	16	1210	0	5	0	17	0	0	0
Future Vol, veh/h	0	1033	12	16	1210	0	5	0	17	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	250	250	-	-	0	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	2
Mvmt Flow	0	1135	13	18	1330	0	5	0	19	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1330	0	0	1148	0	0	1836	-	568	1934	2514	665
Stage 1	-	-	-	-	-	-	1135	-	-	1366	1366	-
Stage 2	-	-	-	-	-	-	701	-	-	568	1148	-
Critical Hdwy	4.16	-	-	4.16	-	-	7.56	-	6.96	7.56	6.56	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.56	-	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.56	-	-	6.56	5.56	-
Follow-up Hdwy	2.23	-	-	2.23	-	-	3.53	-	3.33	3.53	4.03	3.32
Pot Cap-1 Maneuver	510	-	-	599	-	-	47	0	464	39	27	403
Stage 1	-	-	-	-	-	-	214	0	-	154	211	-
Stage 2	-	-	-	-	-	-	393	0	-	472	270	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	510	-	-	599	-	-	46	-	464	37	26	403
Mov Cap-2 Maneuver	-	-	-	-	-	-	46	-	-	37	26	-
Stage 1	-	-	-	-	-	-	214	-	-	154	205	-
Stage 2	-	-	-	-	-	-	381	-	-	453	270	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	31.4	0
HCM LOS			D	A

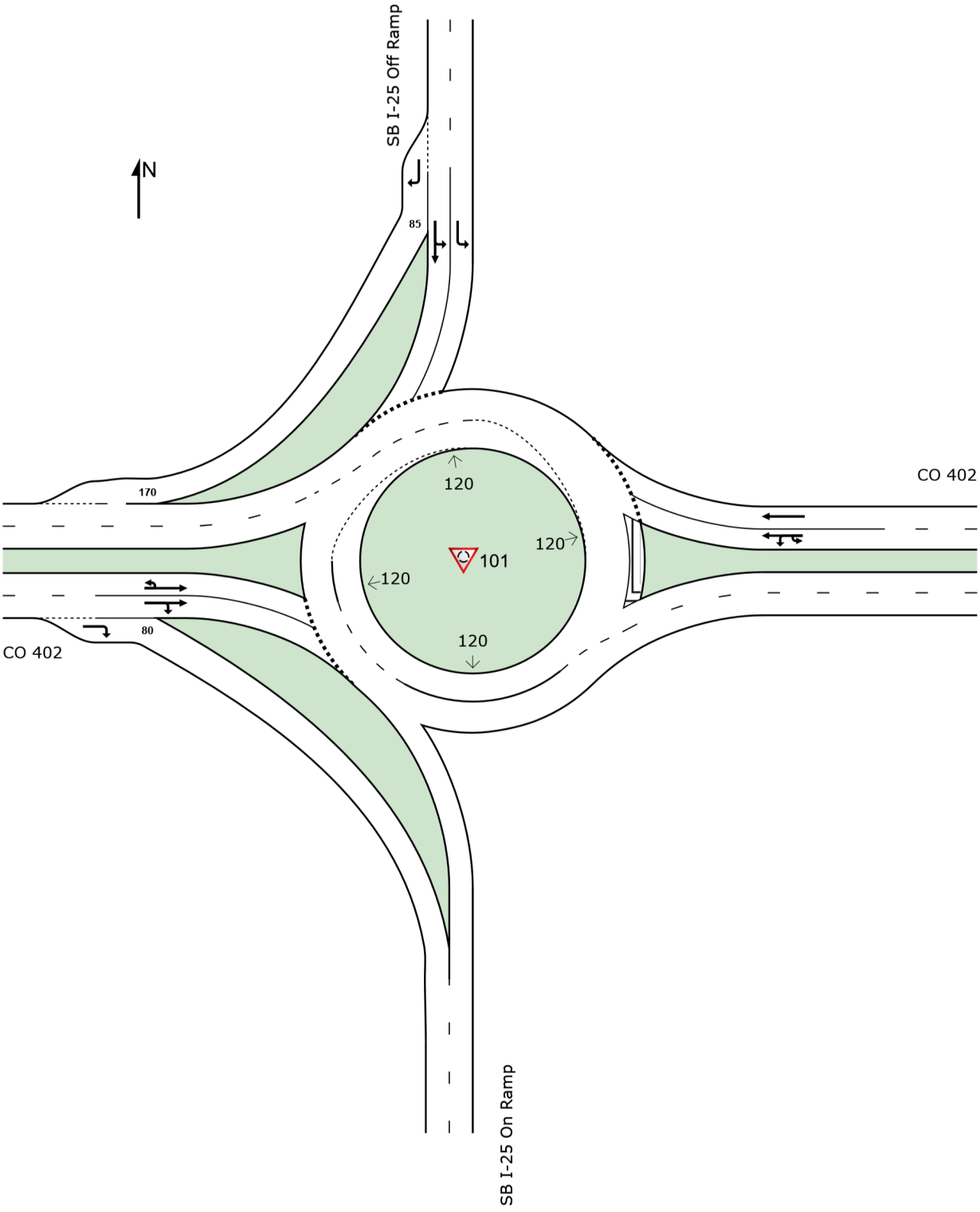
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	46	464	510	-	-	599	-	-	-
HCM Lane V/C Ratio	0.119	0.04	-	-	-	0.029	-	-	-
HCM Control Delay (s)	93.6	13.1	0	-	-	11.2	-	-	0
HCM Lane LOS	F	B	A	-	-	B	-	-	A
HCM 95th %tile Q(veh)	0.4	0.1	0	-	-	0.1	-	-	-

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

AM 2045 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Base
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: CO 402															
1u	U	All MCs	21	9.0	21	9.0	0.472	5.3	LOS A	4.8	127.8	0.06	0.01	0.06	17.0
1	L2	All MCs	353	9.0	353	9.0	0.472	5.3	LOS A	4.8	127.8	0.06	0.01	0.06	32.6
6	T1	All MCs	896	9.0	896	9.0	0.472	5.2	LOS A	4.8	128.0	0.06	0.01	0.06	23.2
Approach			1270	9.0	1270	9.0	0.472	5.2	LOS A	4.8	128.0	0.06	0.01	0.06	26.6
North: SB I-25 Off Ramp															
7	L2	All MCs	117	9.0	117	9.0	0.083	5.9	LOS A	0.3	8.5	0.61	0.57	0.61	29.0
4	T1	All MCs	2	9.0	2	9.0	0.083	5.0	LOS A	0.3	8.5	0.61	0.54	0.61	39.4
14	R2	All MCs	446	9.0	446	9.0	0.289	11.4	LOS B	0.0	0.0	0.00	0.00	0.00	42.2
Approach			565	9.0	565	9.0	0.289	10.2	LOS B	0.3	8.5	0.13	0.12	0.13	38.4
West: CO 402															
5u	U	All MCs	2	8.0	2	8.0	0.353	8.1	LOS A	1.7	46.3	0.59	0.46	0.59	18.9
2	T1	All MCs	664	8.0	664	8.0	0.353	7.6	LOS A	1.8	48.2	0.58	0.45	0.58	23.1
12	R2	All MCs	441	8.0	441	8.0	0.282	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.1
Approach			1108	8.0	1108	8.0	0.353	4.6	LOS A	1.8	48.2	0.35	0.27	0.35	31.0
All Vehicles			2942	8.6	2942	8.6	0.472	5.9	LOS A	4.8	128.0	0.18	0.13	0.18	30.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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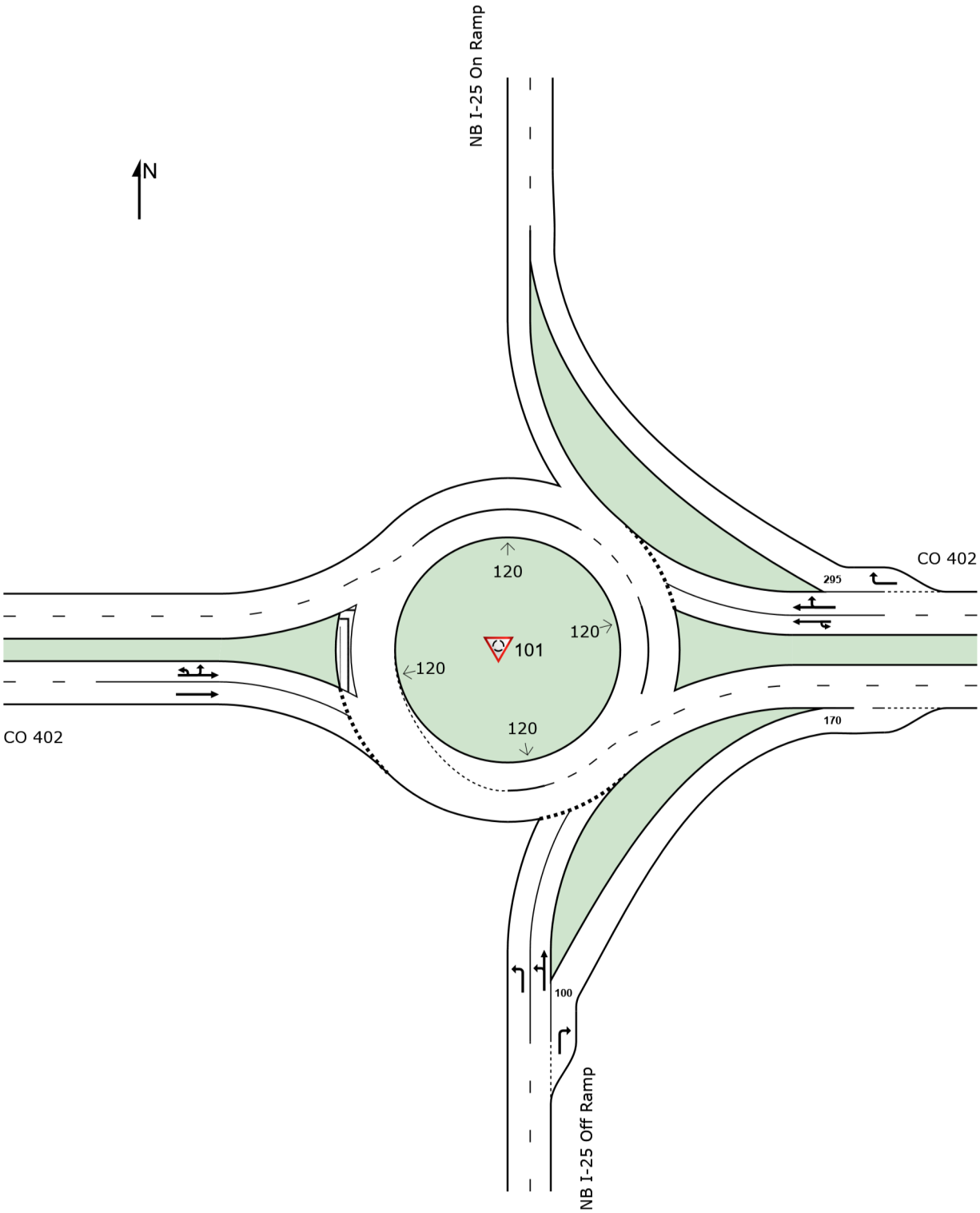
SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

AM 2045 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Base
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: NB I-25 Off Ramp															
3	L2	All MCs	336	8.0	336	8.0	0.208	6.4	LOS A	0.8	22.1	0.57	0.50	0.57	27.8
8	T1	All MCs	17	8.0	17	8.0	0.208	5.7	LOS A	0.8	22.1	0.56	0.47	0.56	37.5
18	R2	All MCs	188	8.0	188	8.0	0.121	4.5	LOS A	0.0	0.0	0.00	0.00	0.00	41.1
Approach			541	8.0	541	8.0	0.208	5.7	LOS A	0.8	22.1	0.37	0.32	0.37	31.7
East: CO 402															
1u	U	All MCs	2	8.0	2	8.0	0.617	16.1	LOS B	5.1	136.0	0.81	0.97	1.28	17.8
6	T1	All MCs	958	8.0	958	8.0	0.617	14.7	LOS B	5.6	147.9	0.80	0.95	1.26	17.7
16	R2	All MCs	317	8.0	317	8.0	0.204	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.7
Approach			1277	8.0	1277	8.0	0.617	11.1	LOS B	5.6	147.9	0.60	0.71	0.94	19.9
West: CO 402															
5u	U	All MCs	2	8.0	2	8.0	0.309	4.4	LOS A	2.6	69.2	0.05	0.01	0.05	17.7
5	L2	All MCs	403	8.0	403	8.0	0.309	4.4	LOS A	2.6	69.2	0.05	0.01	0.05	30.8
2	T1	All MCs	433	8.0	433	8.0	0.309	4.2	LOS A	2.6	69.7	0.05	0.01	0.05	22.4
Approach			839	8.0	839	8.0	0.309	4.3	LOS A	2.6	69.7	0.05	0.01	0.05	27.1
All Vehicles			2657	8.0	2657	8.0	0.617	7.9	LOS A	5.6	147.9	0.38	0.41	0.55	24.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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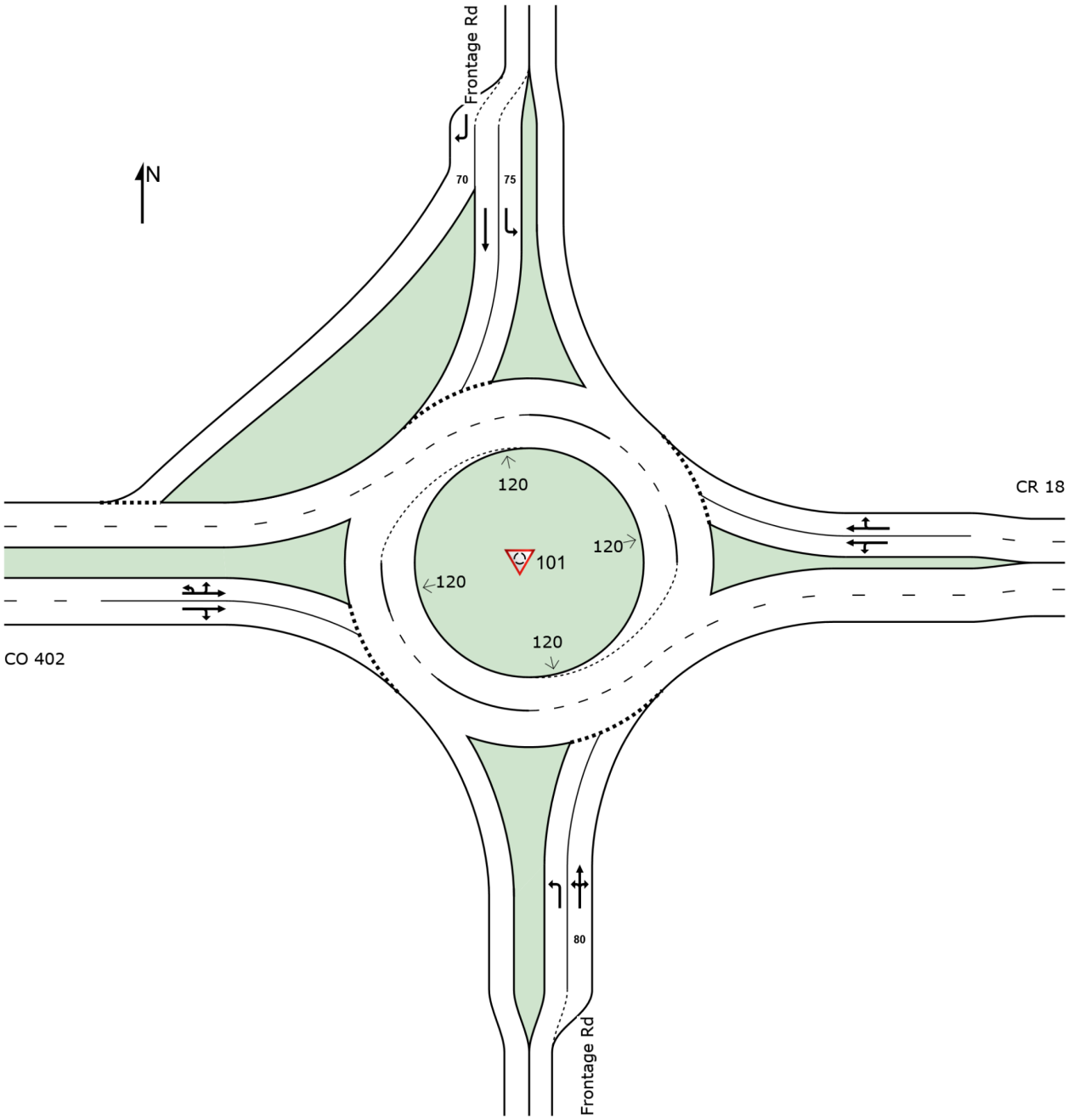
SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

AM 2045 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Base
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: Frontage Rd															
3	L2	All MCs	139	9.0	139	9.0	0.172	7.1	LOS A	0.7	18.6	0.58	0.49	0.58	30.1
8	T1	All MCs	84	9.0	84	9.0	0.172	6.7	LOS A	0.7	18.6	0.57	0.48	0.57	33.0
18	R2	All MCs	23	9.0	23	9.0	0.172	6.7	LOS A	0.7	18.6	0.57	0.48	0.57	37.7
Approach			245	9.0	245	9.0	0.172	6.9	LOS A	0.7	18.6	0.57	0.49	0.57	32.0
East: CR 18															
1	L2	All MCs	25	7.0	25	7.0	0.548	11.7	LOS B	4.6	120.5	0.68	0.59	0.90	36.7
6	T1	All MCs	834	7.0	834	7.0	0.548	11.6	LOS B	4.6	120.5	0.68	0.59	0.89	37.2
16	R2	All MCs	91	7.0	91	7.0	0.548	11.6	LOS B	4.6	120.4	0.68	0.59	0.89	37.6
Approach			950	7.0	950	7.0	0.548	11.6	LOS B	4.6	120.5	0.68	0.59	0.89	37.2
North: Frontage Rd															
7	L2	All MCs	68	4.0	68	4.0	0.079	4.9	LOS A	0.4	9.8	0.66	0.55	0.66	37.6
4	T1	All MCs	66	4.0	66	4.0	0.101	6.7	LOS A	0.4	11.5	0.67	0.60	0.67	33.2
14	R2	All MCs	399	4.0	399	4.0	0.455	9.7	LOS A	2.9	76.1	0.77	0.73	0.93	28.5
Approach			533	4.0	533	4.0	0.455	8.7	LOS A	2.9	76.1	0.74	0.69	0.87	30.9
West: CO 402															
5u	U	All MCs	6	9.0	6	9.0	0.291	6.2	LOS A	1.6	42.8	0.39	0.22	0.39	20.6
5	L2	All MCs	149	9.0	149	9.0	0.291	6.2	LOS A	1.6	42.8	0.39	0.22	0.39	28.8
2	T1	All MCs	422	9.0	422	9.0	0.291	6.2	LOS A	1.6	42.8	0.39	0.22	0.39	39.5
12	R2	All MCs	34	9.0	34	9.0	0.291	6.2	LOS A	1.6	42.8	0.39	0.22	0.39	31.5
Approach			610	9.0	610	9.0	0.291	6.2	LOS A	1.6	42.8	0.39	0.22	0.39	35.8
All Vehicles			2339	7.0	2339	7.0	0.548	9.1	LOS A	4.6	120.5	0.61	0.51	0.72	34.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

Intersection: 3: SH 402 & S Boise Ave

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	376	186	164	226	241	87	179	276
Average Queue (ft)	212	66	49	105	105	27	87	87
95th Queue (ft)	324	152	105	195	191	66	162	172
Link Distance (ft)		1168	1168	7113	7113			426
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	390					250	155	
Storage Blk Time (%)	0				0		4	0
Queuing Penalty (veh)	0				0		8	1

Intersection: 5: SH 402 & LCR 9E

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	219	134	137	202	203	76	135	103
Average Queue (ft)	105	62	73	81	78	20	54	52
95th Queue (ft)	177	122	125	175	177	57	116	93
Link Distance (ft)		7113	7113	3063	3063			685
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	385					420	225	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 16: Park-n-Ride Access & SH 402

Movement	EB	WB	NB	NB
Directions Served	T	L	L	R
Maximum Queue (ft)	22	28	26	43
Average Queue (ft)	1	4	4	11
95th Queue (ft)	10	19	19	30
Link Distance (ft)	1535		362	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		150
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	22	93	112	66	98	143	154	26	70	46	26	46
Average Queue (ft)	1	48	59	9	33	63	78	1	23	17	4	9
95th Queue (ft)	10	88	105	36	67	117	135	9	53	39	19	31
Link Distance (ft)		3813	3813			1535	1535			462	622	622
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250			250	250			250	150			
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 22: Boyd Lake & SH 402

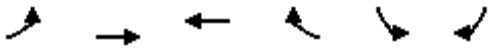
Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	113	113	117	41	47	160	189	40	49	201	44	172
Average Queue (ft)	57	42	44	9	11	68	74	6	10	81	14	88
95th Queue (ft)	98	88	97	28	35	139	145	23	32	141	35	150
Link Distance (ft)		3063	3063			3813	3813			505		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			400	400			400	250		250	250
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 22: Boyd Lake & SH 402

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	203	127
Average Queue (ft)	105	49
95th Queue (ft)	167	101
Link Distance (ft)	547	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		250
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

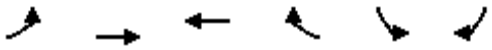
Zone wide Queuing Penalty: 9



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	304	1151	1058	179	137	301
Future Volume (veh/h)	304	1151	1058	179	137	301
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1826	1826	1856	1856	1885	1885
Adj Flow Rate, veh/h	313	1187	1091	136	141	282
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	3	3	1	1
Cap, veh/h	399	2602	2238	1279	321	412
Arrive On Green	0.08	0.75	0.63	0.63	0.18	0.18
Sat Flow, veh/h	1739	3561	3618	1572	1795	1598
Grp Volume(v), veh/h	313	1187	1091	136	141	282
Grp Sat Flow(s),veh/h/ln	1739	1735	1763	1572	1795	1598
Q Serve(g_s), s	8.3	18.2	22.9	2.5	9.8	22.3
Cycle Q Clear(g_c), s	8.3	18.2	22.9	2.5	9.8	22.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	399	2602	2238	1279	321	412
V/C Ratio(X)	0.79	0.46	0.49	0.11	0.44	0.68
Avail Cap(c_a), veh/h	608	2602	2238	1279	385	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.88	0.88	1.00	1.00
Uniform Delay (d), s/veh	13.8	6.7	13.5	2.7	51.3	46.8
Incr Delay (d2), s/veh	3.8	0.6	0.7	0.1	0.9	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	5.4	8.3	1.6	4.5	9.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.6	7.2	14.2	2.8	52.2	50.2
LnGrp LOS	B	A	B	A	D	D
Approach Vol, veh/h		1500	1227		423	
Approach Delay, s/veh		9.4	12.9		50.9	
Approach LOS		A	B		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	16.1	93.9			110.0	30.0
Change Period (Y+Rc), s	5.0	5.0			5.0	5.0
Max Green Setting (Gmax), s	28.0	67.0			100.0	30.0
Max Q Clear Time (g_c+I1), s	10.3	24.9			20.2	24.3
Green Ext Time (p_c), s	0.8	8.9			9.9	0.7

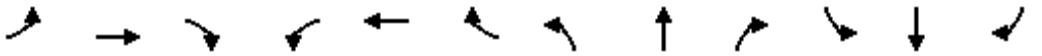
Intersection Summary	
HCM 6th Ctrl Delay	16.3
HCM 6th LOS	B



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	200	1119	955	159	89	165
Future Volume (veh/h)	200	1119	955	159	89	165
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1826	1826
Adj Flow Rate, veh/h	215	1203	1027	127	96	133
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	4	4	5	5
Cap, veh/h	423	2564	2192	1301	360	412
Arrive On Green	0.06	0.72	0.83	0.83	0.21	0.21
Sat Flow, veh/h	1781	3647	3589	1560	1739	1547
Grp Volume(v), veh/h	215	1203	1027	127	96	133
Grp Sat Flow(s),veh/h/ln	1781	1777	1749	1560	1739	1547
Q Serve(g_s), s	5.8	20.0	11.2	0.9	6.5	9.7
Cycle Q Clear(g_c), s	5.8	20.0	11.2	0.9	6.5	9.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	423	2564	2192	1301	360	412
V/C Ratio(X)	0.51	0.47	0.47	0.10	0.27	0.32
Avail Cap(c_a), veh/h	636	2564	2192	1301	360	412
HCM Platoon Ratio	1.00	1.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.81	0.81	1.00	1.00
Uniform Delay (d), s/veh	8.3	8.2	5.3	0.9	46.6	41.2
Incr Delay (d2), s/veh	0.8	0.6	0.6	0.1	1.8	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	6.4	2.9	0.7	3.0	9.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.1	8.8	5.9	1.0	48.4	43.3
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1418	1154		229	
Approach Delay, s/veh		8.8	5.3		45.4	
Approach LOS		A	A		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	106.0	34.0	13.3	92.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	101.0	29.0	25.0	71.0
Max Q Clear Time (g_c+I1), s	22.0	11.7	7.8	13.2
Green Ext Time (p_c), s	10.0	0.6	0.5	8.4

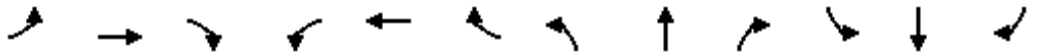
Intersection Summary	
HCM 6th Ctrl Delay	10.4
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1080	57	50	1091	5	30	5	62	5	5	5
Future Volume (veh/h)	10	1080	57	50	1091	5	30	5	62	5	5	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	1174	33	54	1186	0	33	5	67	5	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	342	2458	1096	358	2525	1126	274	18	243	216	140	140
Arrive On Green	0.01	0.70	0.70	0.03	0.72	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1767	3526	1572	1767	3526	1572	1394	110	1479	1318	851	851
Grp Volume(v), veh/h	11	1174	33	54	1186	0	33	0	72	5	0	10
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1572	1394	0	1589	1318	0	1702
Q Serve(g_s), s	0.3	21.2	0.9	1.2	20.1	0.0	2.9	0.0	5.6	0.5	0.0	0.7
Cycle Q Clear(g_c), s	0.3	21.2	0.9	1.2	20.1	0.0	3.5	0.0	5.6	6.0	0.0	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.93	1.00		0.50
Lane Grp Cap(c), veh/h	342	2458	1096	358	2525	1126	274	0	261	216	0	280
V/C Ratio(X)	0.03	0.48	0.03	0.15	0.47	0.00	0.12	0.00	0.28	0.02	0.00	0.04
Avail Cap(c_a), veh/h	408	2458	1096	416	2525	1126	274	0	261	216	0	280
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.1	9.6	6.6	7.1	8.5	0.0	50.7	0.0	51.2	53.8	0.0	49.2
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.2	0.6	0.0	0.9	0.0	2.6	0.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	7.0	0.3	0.4	6.5	0.0	1.1	0.0	2.4	0.2	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.1	10.2	6.6	7.3	9.1	0.0	51.6	0.0	53.8	54.0	0.0	49.4
LnGrp LOS	A	B	A	A	A	A	D	A	D	D	A	D
Approach Vol, veh/h		1218			1240			105			15	
Approach Delay, s/veh		10.1			9.1			53.1			51.0	
Approach LOS		B			A			D			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		28.0	9.4	102.6		28.0	6.7	105.3				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		23.0	9.0	93.0		23.0	7.0	95.0				
Max Q Clear Time (g_c+I1), s		7.6	3.2	23.2		8.0	2.3	22.1				
Green Ext Time (p_c), s		0.3	0.0	9.8		0.0	0.0	9.8				

Intersection Summary												
HCM 6th Ctrl Delay			11.6									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	960	80	15	995	150	5	180	20	155	200	160
Future Volume (veh/h)	160	960	80	15	995	150	5	180	20	155	200	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	174	1043	58	16	1082	96	5	196	0	168	217	149
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	304	1997	891	233	1847	962	260	384	352	341	601	603
Arrive On Green	0.02	0.19	0.19	0.02	0.52	0.52	0.21	0.21	0.00	0.09	0.32	0.32
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1016	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	174	1043	58	16	1082	96	5	196	0	168	217	149
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1016	1870	1585	1781	1870	1585
Q Serve(g_s), s	6.0	37.1	4.2	0.6	29.4	3.5	0.6	13.0	0.0	10.1	12.5	9.0
Cycle Q Clear(g_c), s	6.0	37.1	4.2	0.6	29.4	3.5	0.6	13.0	0.0	10.1	12.5	9.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	304	1997	891	233	1847	962	260	384	352	341	601	603
V/C Ratio(X)	0.57	0.52	0.07	0.07	0.59	0.10	0.02	0.51	0.00	0.49	0.36	0.25
Avail Cap(c_a), veh/h	415	1997	891	293	1847	962	260	384	352	389	601	603
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	0.89	0.89	0.89	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	40.1	26.7	18.8	23.2	11.5	44.4	49.4	0.0	38.0	36.5	29.7
Incr Delay (d2), s/veh	1.5	0.9	0.1	0.1	1.2	0.2	0.1	4.8	0.0	1.1	1.7	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	17.8	1.5	0.2	11.7	1.2	0.1	6.5	0.0	4.4	5.9	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	40.9	26.8	18.9	24.4	11.7	44.5	54.1	0.0	39.1	38.1	30.6
LnGrp LOS	C	D	C	B	C	B	D	D	A	D	D	C
Approach Vol, veh/h		1275			1194			201			534	
Approach Delay, s/veh		37.6			23.3			53.9			36.4	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	16.2	33.8	6.3	83.7		50.0	12.3	77.7				
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0		5.0	4.0	5.0				
Max Green Setting (Gmax), s	16.0	25.0	7.0	74.0		45.0	17.0	64.0				
Max Q Clear Time (g_c+I1), s	12.1	15.0	2.6	39.1		14.5	8.0	31.4				
Green Ext Time (p_c), s	0.1	0.6	0.0	7.8		1.6	0.3	8.2				

Intersection Summary												
HCM 6th Ctrl Delay			33.1									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1066	12	15	1182	0	15	0	29	0	0	0
Future Vol, veh/h	0	1066	12	15	1182	0	15	0	29	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	250	250	-	-	0	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	1171	13	16	1299	0	16	0	32	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1299	0	0	1184	0	0	1853	-	586	1917	2515	650
Stage 1	-	-	-	-	-	-	1171	-	-	1331	1331	-
Stage 2	-	-	-	-	-	-	682	-	-	586	1184	-
Critical Hdwy	4.16	-	-	4.16	-	-	7.56	-	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	6.56	-	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.56	-	-	6.56	5.56	-
Follow-up Hdwy	2.23	-	-	2.23	-	-	3.53	-	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	524	-	-	580	-	-	45	0	451	40	27	409
Stage 1	-	-	-	-	-	-	203	0	-	162	220	-
Stage 2	-	-	-	-	-	-	404	0	-	461	259	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	524	-	-	580	-	-	44	-	451	36	26	409
Mov Cap-2 Maneuver	-	-	-	-	-	-	44	-	-	36	26	-
Stage 1	-	-	-	-	-	-	203	-	-	162	214	-
Stage 2	-	-	-	-	-	-	393	-	-	428	259	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	53.1	0
HCM LOS			F	A

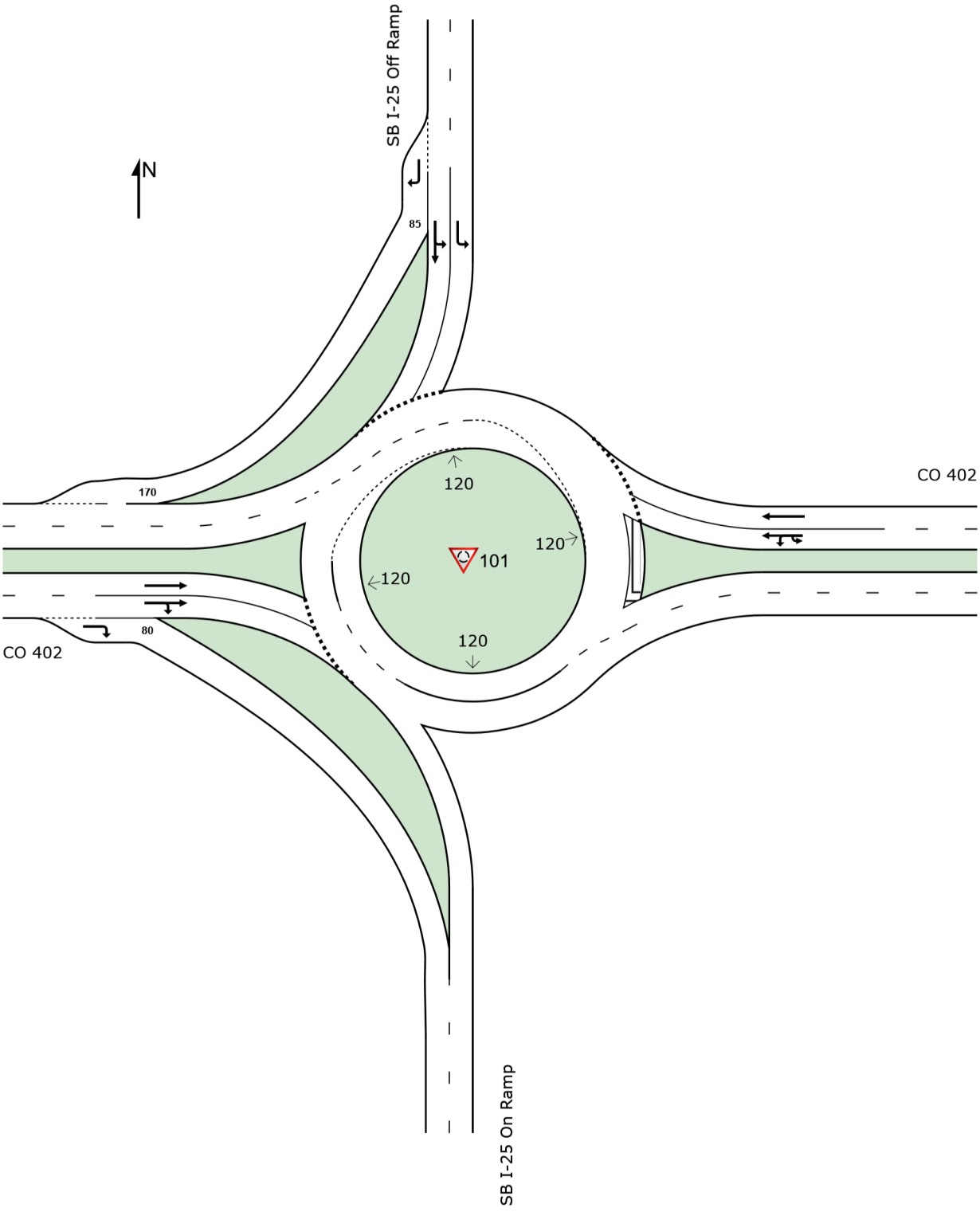
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	44	451	524	-	-	580	-	-	-
HCM Lane V/C Ratio	0.375	0.071	-	-	-	0.028	-	-	-
HCM Control Delay (s)	129.4	13.6	0	-	-	11.4	-	-	0
HCM Lane LOS	F	B	A	-	-	B	-	-	A
HCM 95th %tile Q(veh)	1.3	0.2	0	-	-	0.1	-	-	-

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

PM 2045 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Base
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: CO 402															
1u	U	All MCs	6	5.0	6	5.0	0.430	4.8	LOS A	0.0	0.0	0.00	0.00	0.00	19.5
1	L2	All MCs	247	5.0	247	5.0	0.430	4.8	LOS A	0.0	0.0	0.00	0.00	0.00	37.5
6	T1	All MCs	951	5.0	951	5.0	0.430	4.7	LOS A	0.0	0.0	0.00	0.00	0.00	26.6
Approach			1204	5.0	1204	5.0	0.430	4.7	LOS A	0.0	0.0	0.00	0.00	0.00	29.6
North: SB I-25 Off Ramp															
7	L2	All MCs	256	6.0	256	6.0	0.159	6.1	LOS A	0.6	16.2	0.60	0.55	0.60	29.1
4	T1	All MCs	1	6.0	1	6.0	0.159	5.3	LOS A	0.6	16.2	0.59	0.52	0.59	39.4
14	R2	All MCs	350	6.0	350	6.0	0.221	7.5	LOS A	0.0	0.0	0.00	0.00	0.00	42.3
Approach			607	6.0	607	6.0	0.221	6.9	LOS A	0.6	16.2	0.25	0.23	0.25	35.3
West: CO 402															
2	T1	All MCs	897	7.0	897	7.0	0.474	9.5	LOS A	3.1	81.7	0.64	0.54	0.76	22.0
12	R2	All MCs	247	7.0	247	7.0	0.157	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.4
Approach			1144	7.0	1144	7.0	0.474	7.4	LOS A	3.1	81.7	0.50	0.43	0.60	26.6
All Vehicles			2955	6.0	2955	6.0	0.474	6.2	LOS A	3.1	81.7	0.25	0.21	0.28	29.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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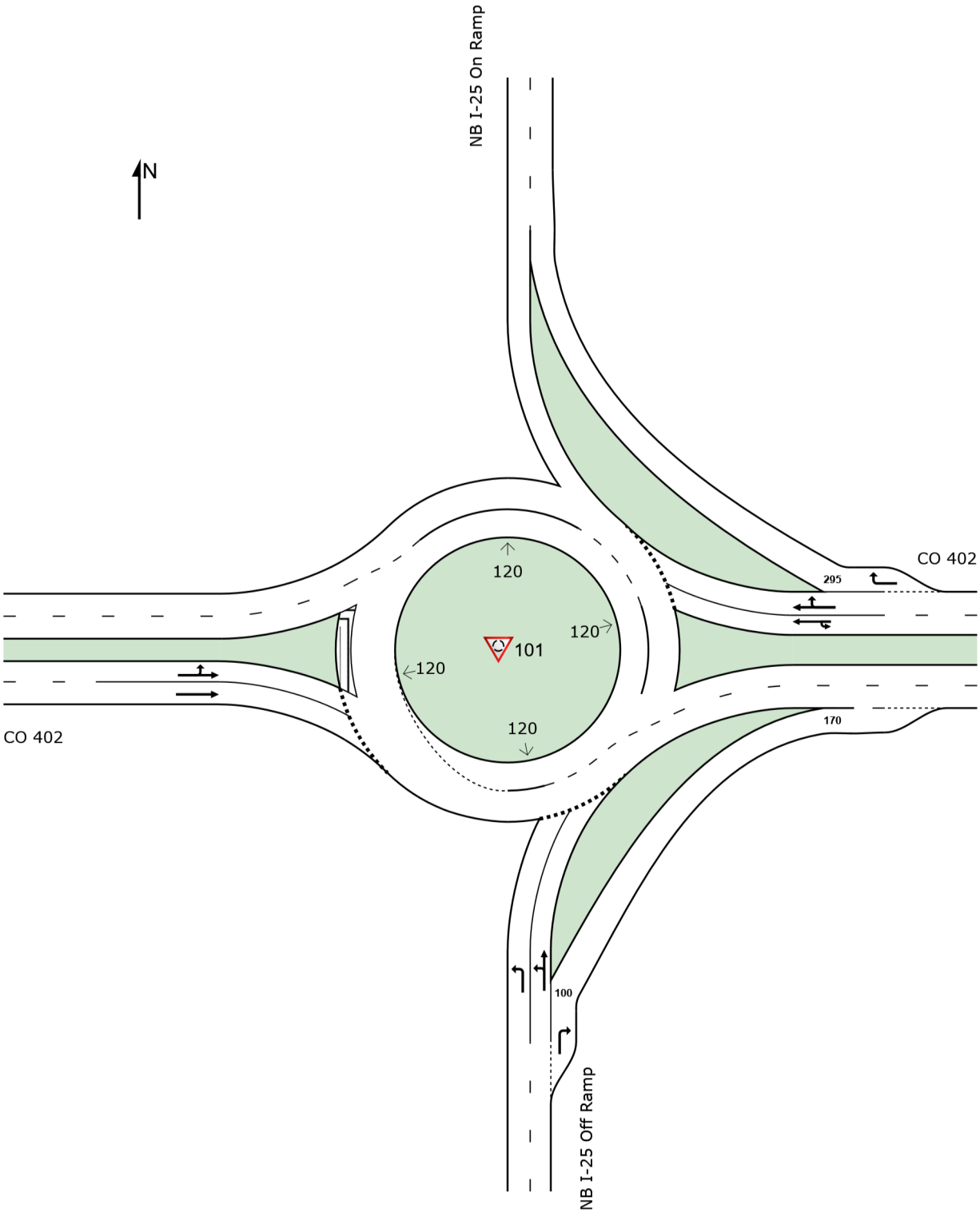
SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

PM 2045 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Base
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: NB I-25 Off Ramp															
3	L2	All MCs	475	4.0	475	4.0	0.294	7.7	LOS A	1.3	33.5	0.66	0.60	0.66	27.0
8	T1	All MCs	2	4.0	2	4.0	0.294	6.9	LOS A	1.3	33.5	0.65	0.58	0.65	36.9
18	R2	All MCs	246	4.0	246	4.0	0.152	5.7	LOS A	0.0	0.0	0.00	0.00	0.00	41.3
Approach			724	4.0	724	4.0	0.294	7.0	LOS A	1.3	33.5	0.43	0.40	0.44	30.6
East: CO 402															
1u	U	All MCs	5	7.0	5	7.0	0.500	13.0	LOS B	3.3	86.1	0.76	0.82	1.04	18.8
6	T1	All MCs	753	7.0	753	7.0	0.500	11.8	LOS B	3.5	92.3	0.76	0.79	1.01	18.8
16	R2	All MCs	127	7.0	127	7.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.7
Approach			885	7.0	885	7.0	0.500	10.1	LOS B	3.5	92.3	0.65	0.68	0.87	20.0
West: CO 402															
5	L2	All MCs	345	5.0	345	5.0	0.424	5.2	LOS A	4.1	107.5	0.09	0.01	0.09	32.0
2	T1	All MCs	832	5.0	832	5.0	0.424	5.1	LOS A	4.2	108.1	0.09	0.01	0.09	21.5
Approach			1177	5.0	1177	5.0	0.424	5.2	LOS A	4.2	108.1	0.09	0.01	0.09	25.1
All Vehicles			2786	5.4	2786	5.4	0.500	7.2	LOS A	4.2	108.1	0.36	0.33	0.43	24.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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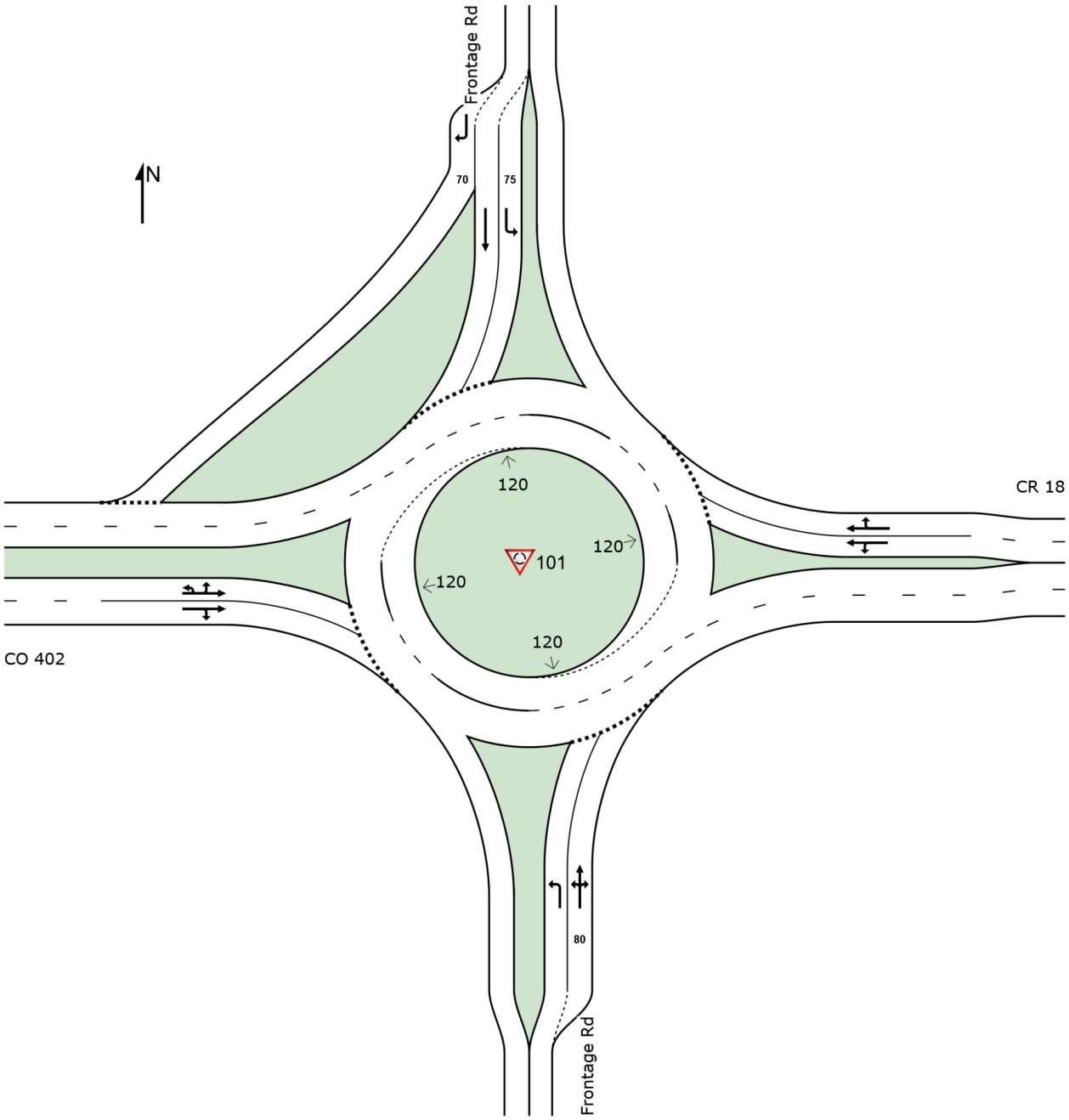
SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

PM 2045 Base
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Base
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: Frontage Rd															
3	L2	All MCs	135	9.0	135	9.0	0.302	13.0	LOS B	1.3	34.0	0.73	0.73	0.79	28.8
8	T1	All MCs	125	9.0	125	9.0	0.328	11.3	LOS B	1.5	40.4	0.74	0.72	0.81	32.3
18	R2	All MCs	56	9.0	56	9.0	0.328	11.3	LOS B	1.5	40.4	0.74	0.72	0.81	37.0
Approach			315	9.0	315	9.0	0.328	12.0	LOS B	1.5	40.4	0.74	0.73	0.80	31.8
East: CR 18															
1	L2	All MCs	10	4.0	10	4.0	0.369	9.4	LOS A	1.9	49.8	0.67	0.55	0.68	37.2
6	T1	All MCs	436	4.0	436	4.0	0.369	9.2	LOS A	1.9	49.8	0.67	0.55	0.67	38.3
16	R2	All MCs	120	4.0	120	4.0	0.369	9.0	LOS A	1.9	49.7	0.67	0.54	0.67	38.4
Approach			566	4.0	566	4.0	0.369	9.2	LOS A	1.9	49.8	0.67	0.55	0.67	38.3
North: Frontage Rd															
7	L2	All MCs	108	6.0	108	6.0	0.105	4.4	LOS A	0.5	12.6	0.54	0.40	0.54	37.7
4	T1	All MCs	98	6.0	98	6.0	0.116	5.4	LOS A	0.5	13.3	0.56	0.44	0.56	33.4
14	R2	All MCs	228	6.0	228	6.0	0.219	5.5	LOS A	1.1	28.2	0.57	0.43	0.57	29.8
Approach			434	6.0	434	6.0	0.219	5.2	LOS A	1.1	28.2	0.56	0.42	0.56	33.2
West: CO 402															
5u	U	All MCs	10	4.0	10	4.0	0.502	9.2	LOS A	3.3	84.3	0.54	0.34	0.54	19.3
5	L2	All MCs	318	4.0	318	4.0	0.502	9.2	LOS A	3.3	84.3	0.54	0.34	0.54	27.8
2	T1	All MCs	705	4.0	705	4.0	0.502	9.2	LOS A	3.3	84.3	0.54	0.34	0.54	38.4
12	R2	All MCs	20	4.0	20	4.0	0.502	9.2	LOS A	3.3	84.3	0.54	0.34	0.54	30.9
Approach			1053	4.0	1053	4.0	0.502	9.2	LOS A	3.3	84.3	0.54	0.34	0.54	34.5
All Vehicles			2368	5.0	2368	5.0	0.502	8.9	LOS A	3.3	84.3	0.60	0.46	0.61	34.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

Intersection: 3: SH 402 & S Boise Ave

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	367	234	170	339	363	275	179	221
Average Queue (ft)	137	94	65	221	224	90	105	116
95th Queue (ft)	235	194	145	341	357	260	175	205
Link Distance (ft)		1168	1168	7113	7113			426
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	390					250	155	
Storage Blk Time (%)					7	0	4	3
Queuing Penalty (veh)					12	0	12	5

Intersection: 5: SH 402 & LCR 9E

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	222	182	190	162	141	51	115	140
Average Queue (ft)	104	99	107	86	95	13	65	55
95th Queue (ft)	179	178	175	148	152	41	112	109
Link Distance (ft)		7113	7113	3063	3063			685
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	385					420	225	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 16: Park-n-Ride Access & SH 402

Movement	EB	EB	WB	NB	NB
Directions Served	T	T	L	L	R
Maximum Queue (ft)	22	20	28	45	63
Average Queue (ft)	1	1	9	7	21
95th Queue (ft)	7	9	30	28	52
Link Distance (ft)	1535	1535		362	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			250		150
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	27	228	237	46	74	138	135	18	68	91	24	109
Average Queue (ft)	4	112	123	8	30	75	90	1	24	30	1	14
95th Queue (ft)	19	196	214	32	59	123	137	6	56	65	9	52
Link Distance (ft)		3813	3813			1535	1535			462	622	622
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250			250	250			250	150			
Storage Blk Time (%)			0									
Queuing Penalty (veh)			0									

Intersection: 22: Boyd Lake & SH 402

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	213	338	341	62	26	365	381	409	27	220	45	174
Average Queue (ft)	89	208	223	14	11	238	253	36	4	132	13	92
95th Queue (ft)	158	301	308	38	29	345	361	156	19	186	32	155
Link Distance (ft)		3063	3063			3813	3813			505		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			400	400			400	250		250	250
Storage Blk Time (%)							0	0				
Queuing Penalty (veh)							0	0				

Intersection: 22: Boyd Lake & SH 402

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	225	107
Average Queue (ft)	123	54
95th Queue (ft)	200	101
Link Distance (ft)	547	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		250
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 29

APPENDIX H

Future Year Alternatives Analysis – Crash Analysis Worksheets

Intersection Safety Performance Functions

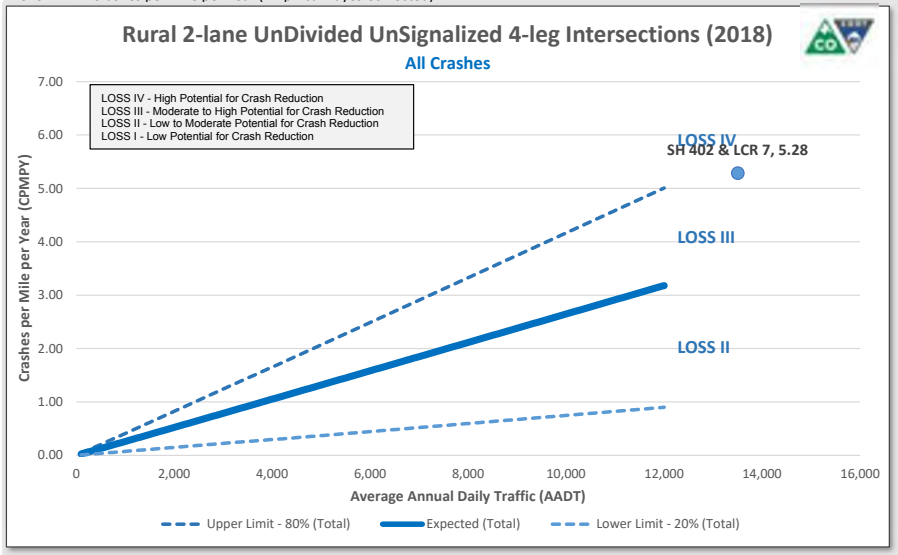
Choose a Model: Rural 2-lane UnDivided UnSignalized 4-leg Intersections (2018)

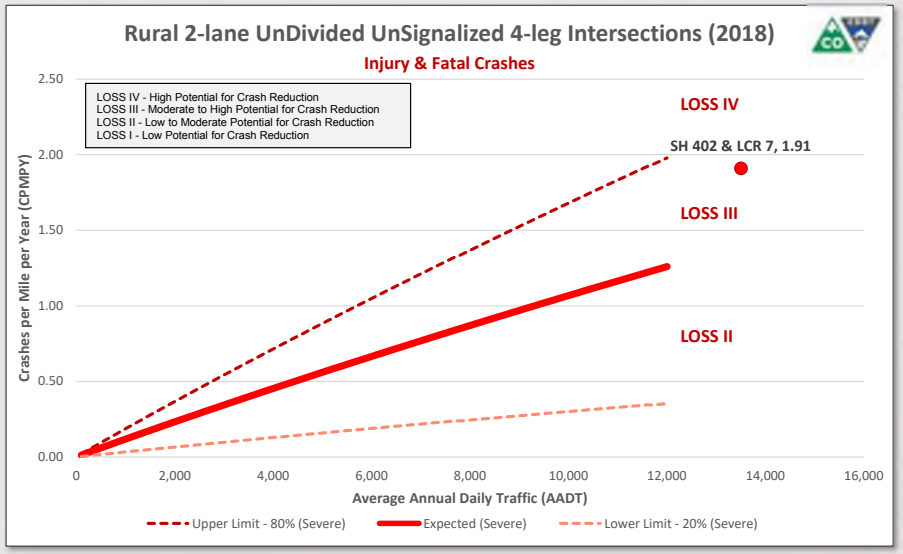
ID or Label	Road A AADT[A]	Road B AADT[A]	Crash History Date Begin	Crash History Date End	Number of Crashes PDO[B] Crash	Number of Crashes Injury Crash	Number of Crashes Fatal Crash	CPMPY[C] Total	CPMPY[C] Injury & Fatal
SH 402 & LCR 7	13,500	1,500	1/1/2018	12/31/2022	17	9	1	5.28	1.91

A. AADT - Average Annual Daily Traffic. If only one AADT is provided, it is assumed as the major AADT and the minor AADT with be calculated at 10% of the major AADT.

B. PDO - Property Damage Only

C. CPMPY - Crashes per Mile per Year (Empirical Bayes Corrected)





Intersection Safety Performance Functions

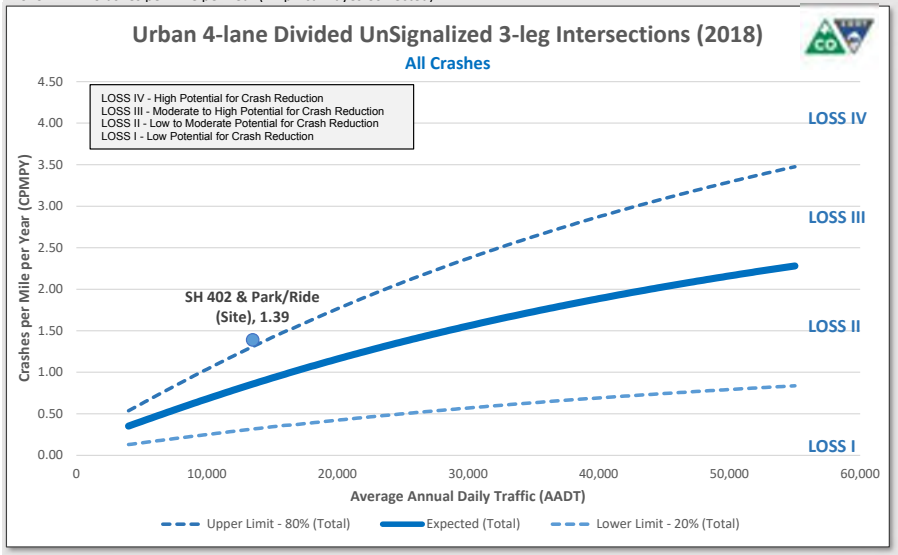
Choose a Model: Urban 4-lane Divided UnSignalized 3-leg Intersections (2018)

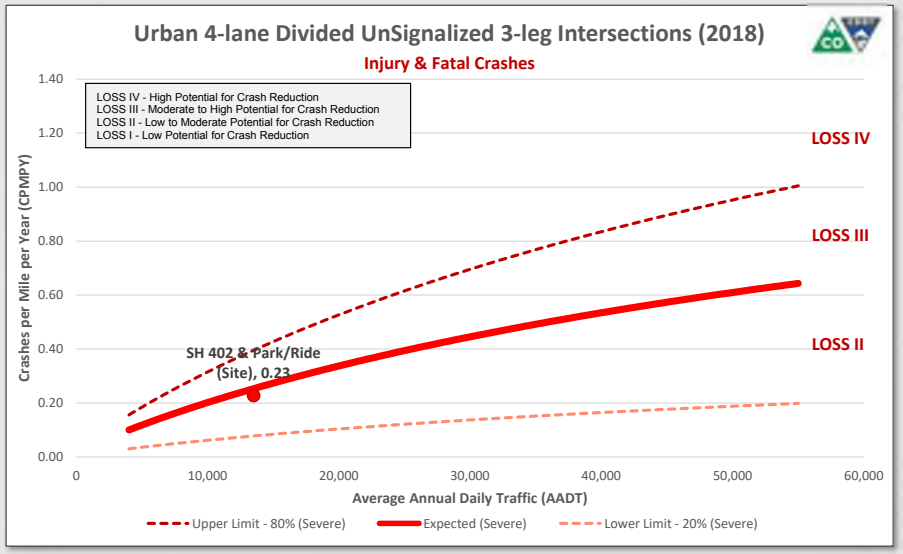
ID or Label	Road A AADT[A]	Road B AADT[A]	Crash History Date Begin	Crash History Date End	Number of Crashes PDO[B] Crash	Number of Crashes Injury Crash	Number of Crashes Fatal Crash	CPMPY[C] Total	CPMPY[C] Injury & Fatal
SH 402 & Park/Ride (Site)	13,500	1,000	1/1/2018	12/31/2022	7	1	0	**1.39**	**0.23**

A. AADT - Average Annual Daily Traffic. If only one AADT is provided, it is assumed as the major AADT and the minor AADT with be calculated at 10% of the major AADT.

B. PDO - Property Damage Only

C. CPMPY - Crashes per Mile per Year (Empirical Bayes Corrected)





Intersection Safety Performance Functions

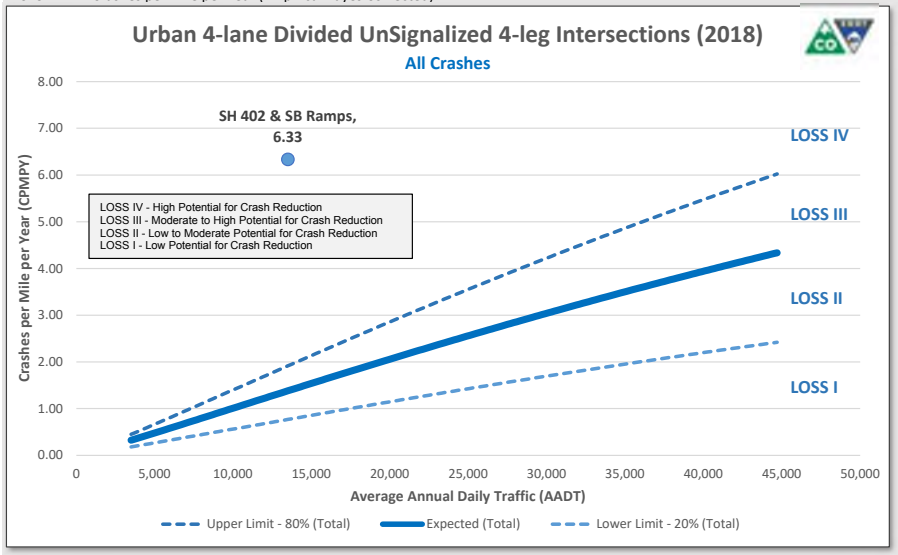
Choose a Model: Urban 4-lane Divided UnSignalized 4-leg Intersections (2018)

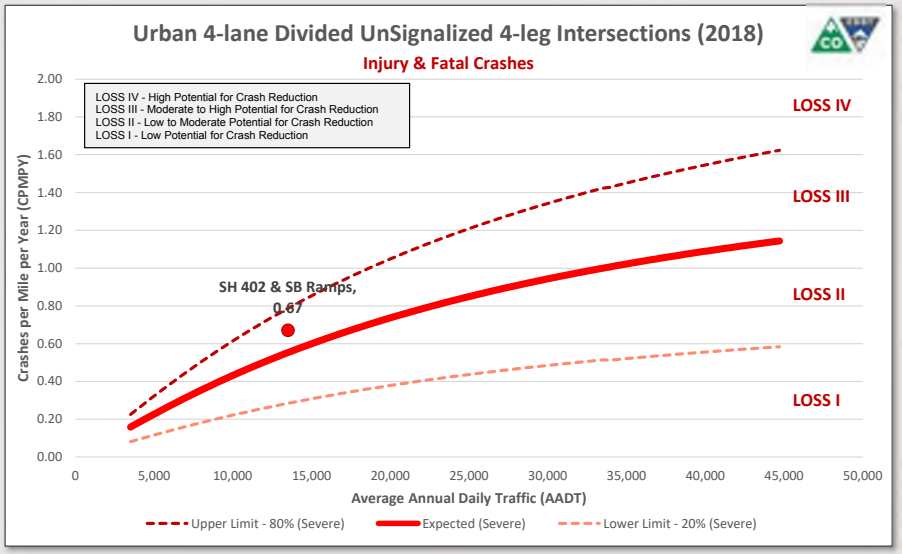
ID or Label	Road A AADT[A]	Road B AADT[A]	Crash History Date Begin	Crash History Date End	Number of Crashes PDO[B] Crash	Number of Crashes Injury Crash	Number of Crashes Fatal Crash	CPMPY[C] Total	CPMPY[C] Injury & Fatal
SH 402 & SB Ramps	13,500	5,000	1/1/2018	12/31/2022	41	4	0	6.33	0.67

A. AADT - Average Annual Daily Traffic. If only one AADT is provided, it is assumed as the major AADT and the minor AADT with be calculated at 10% of the major AADT.

B. PDO - Property Damage Only

C. CPMPY - Crashes per Mile per Year (Empirical Bayes Corrected)





Intersection Safety Performance Functions

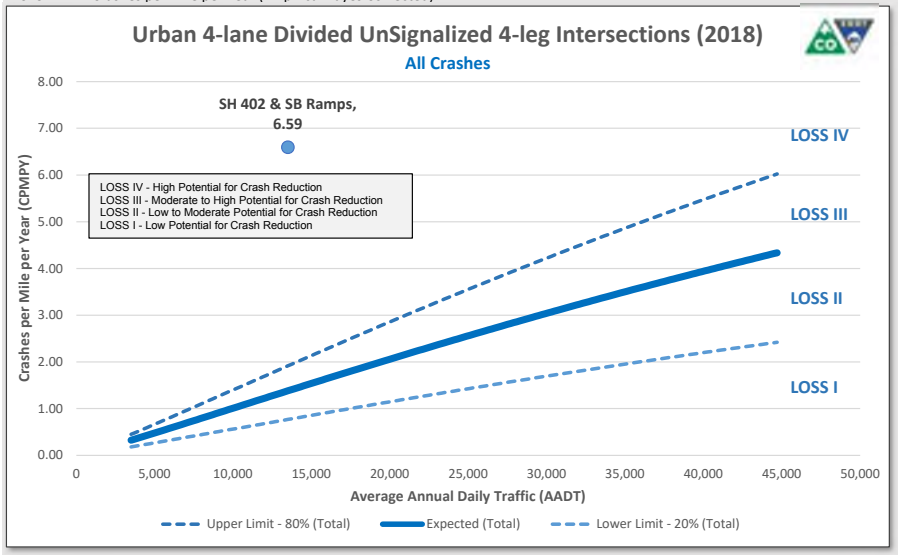
Choose a Model: Urban 4-lane Divided UnSignalized 4-leg Intersections (2018)

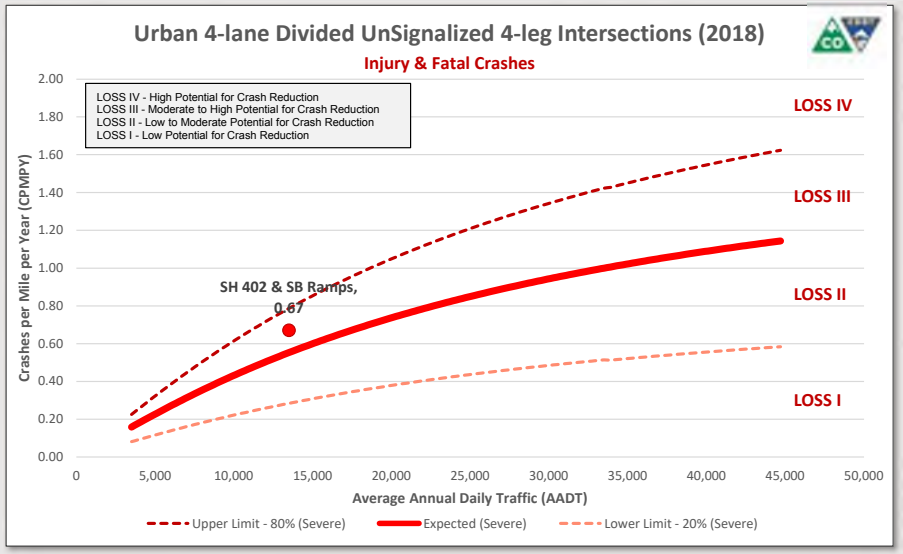
ID or Label	Road A AADT[A]	Road B AADT[A]	Crash History Date Begin	Crash History Date End	Number of Crashes PDO[B] Crash	Number of Crashes Injury Crash	Number of Crashes Fatal Crash	CPMPY[C] Total	CPMPY[C] Injury & Fatal
SH 402 & SB Ramps	13,500	5,000	1/1/2018	12/31/2022	43	4	0	6.59	0.67

A. AADT - Average Annual Daily Traffic. If only one AADT is provided, it is assumed as the major AADT and the minor AADT with be calculated at 10% of the major AADT.

B. PDO - Property Damage Only

C. CPMPY - Crashes per Mile per Year (Empirical Bayes Corrected)





Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	LCR 7 - Signal (Site - RIRO)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	44,500
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	13,000
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	2
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	4
Type of left-turn signal phasing for Leg #1		Permissive	Protected / Permissive
Type of left-turn signal phasing for Leg #2		--	Protected / Permissive
Type of left-turn signal phasing for Leg #3		--	Protected / Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected / Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	6
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.96	0.85	1.00	0.91	1.00	0.49

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	14.030	1.000	14.030	0.49	1.00	6.880
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	4.825	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.355	4.981	0.49	1.00	2.443
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	8.765	$(5)_{TOTAL}-(5)_{FI}$ = 0.645	9.049	0.49	1.00	4.437

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	2.443	1.000	4.437	6.880
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	1.099	0.483	2.143	3.243
Head-on collision	0.049	0.120	0.030	0.133	0.253
Angle collision	0.347	0.848	0.244	1.083	1.930
Sideswipe	0.099	0.242	0.032	0.142	0.384
Other multiple-vehicle collision	0.055	0.134	0.211	0.936	1.071

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.688	1.000	0.688	0.49	1.00	0.337
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.149	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.218	0.150	0.49	1.00	0.074
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.536	$(5)_{TOTAL}-(5)_{FI}$ = 0.782	0.538	0.49	1.00	0.264

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.074	1.000	0.264	0.337
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.001	0.001
Collision with fixed object	0.744	0.055	0.870	0.229	0.284
Collision with other object	0.072	0.005	0.070	0.018	0.024
Other single-vehicle collision	0.040	0.003	0.023	0.006	0.009
Single-vehicle noncollision	0.141	0.010	0.034	0.009	0.019

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.015	1.00	1.00	0.015
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.015

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	6.880	0.337	7.218	0.015	0.108
Fatal and injury (FI)	--	--	--	--	0.108

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	1.099	2.143	3.243
Head-on collisions (from Worksheet 2D)	0.120	0.133	0.253
Angle collisions (from Worksheet 2D)	0.848	1.083	1.930
Sideswipe (from Worksheet 2D)	0.242	0.142	0.384
Other multiple-vehicle collision (from Worksheet 2D)	0.134	0.936	1.071
Subtotal	2.443	4.437	6.880
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.001	0.001
Collision with fixed object (from Worksheet 2F)	0.055	0.229	0.284
Collision with other object (from Worksheet 2F)	0.005	0.018	0.024
Other single-vehicle collision (from Worksheet 2F)	0.003	0.006	0.009
Single-vehicle noncollision (from Worksheet 2F)	0.010	0.009	0.019
Collision with pedestrian (from Worksheet 2G or 2I)	0.015	0.000	0.015
Collision with bicycle (from Worksheet 2J)	0.108	0.000	0.108
Subtotal	0.197	0.264	0.461
Total	2.640	4.701	7.341

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	7.3
Fatal and injury (FI)	2.6
Property damage only (PDO)	4.7

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	LCR 7 - Signal (Site - Signal)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	42,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	10,000
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	2
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	4
Type of left-turn signal phasing for Leg #1		Permissive	Protected / Permissive
Type of left-turn signal phasing for Leg #2		--	Protected / Permissive
Type of left-turn signal phasing for Leg #3		--	Protected / Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected / Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	6
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.96	0.85	1.00	0.91	1.00	0.49

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	12.416	1.000	12.416	0.49	1.00	6.089
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	4.254	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.354	4.397	0.49	1.00	2.156
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	7.759	$(5)_{TOTAL}-(5)_{FI}$ = 0.646	8.019	0.49	1.00	3.933

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	2.156	1.000	3.933	6.089
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.970	0.483	1.899	2.870
Head-on collision	0.049	0.106	0.030	0.118	0.224
Angle collision	0.347	0.748	0.244	0.960	1.708
Sideswipe	0.099	0.213	0.032	0.126	0.339
Other multiple-vehicle collision	0.055	0.119	0.211	0.830	0.948

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.616	1.000	0.616	0.49	1.00	0.302
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.135	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.220	0.135	0.49	1.00	0.066
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.480	$(5)_{TOTAL}-(5)_{FI}$ = 0.780	0.481	0.49	1.00	0.236

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.066	1.000	0.236	0.302
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.001
Collision with fixed object	0.744	0.049	0.870	0.205	0.254
Collision with other object	0.072	0.005	0.070	0.017	0.021
Other single-vehicle collision	0.040	0.003	0.023	0.005	0.008
Single-vehicle noncollision	0.141	0.009	0.034	0.008	0.017

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.014	1.00	1.00	0.014
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.014

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	6.089	0.302	6.391	0.015	0.096
Fatal and injury (FI)	--	--	--	--	0.096

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.970	1.899	2.870
Head-on collisions (from Worksheet 2D)	0.106	0.118	0.224
Angle collisions (from Worksheet 2D)	0.748	0.960	1.708
Sideswipe (from Worksheet 2D)	0.213	0.126	0.339
Other multiple-vehicle collision (from Worksheet 2D)	0.119	0.830	0.948
Subtotal	2.156	3.933	6.089
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.001
Collision with fixed object (from Worksheet 2F)	0.049	0.205	0.254
Collision with other object (from Worksheet 2F)	0.005	0.017	0.021
Other single-vehicle collision (from Worksheet 2F)	0.003	0.005	0.008
Single-vehicle noncollision (from Worksheet 2F)	0.009	0.008	0.017
Collision with pedestrian (from Worksheet 2G or 2I)	0.014	0.000	0.014
Collision with bicycle (from Worksheet 2J)	0.096	0.000	0.096
Subtotal	0.176	0.236	0.412
Total	2.332	4.168	6.501

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	6.5
Fatal and injury (FI)	2.3
Property damage only (PDO)	4.2

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	LCR 7 - Signal (Site - RAB)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	42,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	10,000
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	2
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	4
Type of left-turn signal phasing for Leg #1		Permissive	Protected / Permissive
Type of left-turn signal phasing for Leg #2		--	Protected / Permissive
Type of left-turn signal phasing for Leg #3		--	Protected / Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected / Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	6
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.96	0.85	1.00	0.91	1.00	0.49

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	12.416	1.000	12.416	0.49	1.00	6.089
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	4.254	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.354	4.397	0.49	1.00	2.156
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	7.759	$(5)_{TOTAL}-(5)_{FI}$ = 0.646	8.019	0.49	1.00	3.933

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	2.156	1.000	3.933	6.089
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.970	0.483	1.899	2.870
Head-on collision	0.049	0.106	0.030	0.118	0.224
Angle collision	0.347	0.748	0.244	0.960	1.708
Sideswipe	0.099	0.213	0.032	0.126	0.339
Other multiple-vehicle collision	0.055	0.119	0.211	0.830	0.948

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.616	1.000	0.616	0.49	1.00	0.302
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.135	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.220	0.135	0.49	1.00	0.066
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.480	$(5)_{TOTAL}-(5)_{FI}$ = 0.780	0.481	0.49	1.00	0.236

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.066	1.000	0.236	0.302
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.001
Collision with fixed object	0.744	0.049	0.870	0.205	0.254
Collision with other object	0.072	0.005	0.070	0.017	0.021
Other single-vehicle collision	0.040	0.003	0.023	0.005	0.008
Single-vehicle noncollision	0.141	0.009	0.034	0.008	0.017

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.014	1.00	1.00	0.014
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.014

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	6.089	0.302	6.391	0.015	0.096
Fatal and injury (FI)	--	--	--	--	0.096

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.970	1.899	2.870
Head-on collisions (from Worksheet 2D)	0.106	0.118	0.224
Angle collisions (from Worksheet 2D)	0.748	0.960	1.708
Sideswipe (from Worksheet 2D)	0.213	0.126	0.339
Other multiple-vehicle collision (from Worksheet 2D)	0.119	0.830	0.948
Subtotal	2.156	3.933	6.089
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.001
Collision with fixed object (from Worksheet 2F)	0.049	0.205	0.254
Collision with other object (from Worksheet 2F)	0.005	0.017	0.021
Other single-vehicle collision (from Worksheet 2F)	0.003	0.005	0.008
Single-vehicle noncollision (from Worksheet 2F)	0.009	0.008	0.017
Collision with pedestrian (from Worksheet 2G or 2I)	0.014	0.000	0.014
Collision with bicycle (from Worksheet 2J)	0.096	0.000	0.096
Subtotal	0.176	0.236	0.412
Total	2.332	4.168	6.501

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	6.5
Fatal and injury (FI)	2.3
Property damage only (PDO)	4.2

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	LCR 7 - Signal (Site - 3/4 Mvmt)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	42,500
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	12,500
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	2
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	4
Type of left-turn signal phasing for Leg #1		Permissive	Protected / Permissive
Type of left-turn signal phasing for Leg #2		--	Protected / Permissive
Type of left-turn signal phasing for Leg #3		--	Protected / Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected / Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	6
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.96	0.85	1.00	0.91	1.00	0.49

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	13.236	1.000	13.236	0.49	1.00	6.491
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	4.531	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.354	4.680	0.49	1.00	2.295
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	8.285	$(5)_{TOTAL}-(5)_{FI}$ = 0.646	8.557	0.49	1.00	4.196

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	2.295	1.000	4.196	6.491
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	1.033	0.483	2.027	3.059
Head-on collision	0.049	0.112	0.030	0.126	0.238
Angle collision	0.347	0.796	0.244	1.024	1.820
Sideswipe	0.099	0.227	0.032	0.134	0.361
Other multiple-vehicle collision	0.055	0.126	0.211	0.885	1.012

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.660	1.000	0.660	0.49	1.00	0.323
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.145	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.221	0.145	0.49	1.00	0.071
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.512	$(5)_{TOTAL}-(5)_{FI}$ = 0.779	0.514	0.49	1.00	0.252

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.071	1.000	0.252	0.323
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.001	0.001
Collision with fixed object	0.744	0.053	0.870	0.219	0.272
Collision with other object	0.072	0.005	0.070	0.018	0.023
Other single-vehicle collision	0.040	0.003	0.023	0.006	0.009
Single-vehicle noncollision	0.141	0.010	0.034	0.009	0.019

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.015	1.00	1.00	0.015
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.015

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	6.491	0.323	6.815	0.015	0.102
Fatal and injury (FI)	--	--	--	--	0.102

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	1.033	2.027	3.059
Head-on collisions (from Worksheet 2D)	0.112	0.126	0.238
Angle collisions (from Worksheet 2D)	0.796	1.024	1.820
Sideswipe (from Worksheet 2D)	0.227	0.134	0.361
Other multiple-vehicle collision (from Worksheet 2D)	0.126	0.885	1.012
Subtotal	2.295	4.196	6.491
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.001	0.001
Collision with fixed object (from Worksheet 2F)	0.053	0.219	0.272
Collision with other object (from Worksheet 2F)	0.005	0.018	0.023
Other single-vehicle collision (from Worksheet 2F)	0.003	0.006	0.009
Single-vehicle noncollision (from Worksheet 2F)	0.010	0.009	0.019
Collision with pedestrian (from Worksheet 2G or 2I)	0.015	0.000	0.015
Collision with bicycle (from Worksheet 2J)	0.102	0.000	0.102
Subtotal	0.188	0.252	0.441
Total	2.483	4.448	6.932

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	6.9
Fatal and injury (FI)	2.5
Property damage only (PDO)	4.4

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	LCR 7 - RAB (Site - RAB)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	42,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	10,000
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	2
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	4
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Protected
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.78	0.85	1.00	0.91	1.00	0.40

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	12.416	1.000	12.416	0.40	1.00	4.949
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	4.254	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.354	4.397	0.40	1.00	1.752
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	7.759	$(5)_{TOTAL}-(5)_{FI}$ = 0.646	8.019	0.40	1.00	3.196

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	1.752	1.000	3.196	4.949
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.789	0.483	1.544	2.332
Head-on collision	0.049	0.086	0.030	0.096	0.182
Angle collision	0.347	0.608	0.244	0.780	1.388
Sideswipe	0.099	0.173	0.032	0.102	0.276
Other multiple-vehicle collision	0.055	0.096	0.211	0.674	0.771

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.616	1.000	0.616	0.40	1.00	0.246
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.135	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.220	0.135	0.40	1.00	0.054
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.480	$(5)_{TOTAL}-(5)_{FI}$ = 0.780	0.481	0.40	1.00	0.192

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.054	1.000	0.192	0.246
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.000
Collision with fixed object	0.744	0.040	0.870	0.167	0.207
Collision with other object	0.072	0.004	0.070	0.013	0.017
Other single-vehicle collision	0.040	0.002	0.023	0.004	0.007
Single-vehicle noncollision	0.141	0.008	0.034	0.007	0.014

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.012	1.00	1.00	0.012
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.012

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	4.949	0.246	5.194	0.015	0.078
Fatal and injury (FI)	--	--	--	--	0.078

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.789	1.544	2.332
Head-on collisions (from Worksheet 2D)	0.086	0.096	0.182
Angle collisions (from Worksheet 2D)	0.608	0.780	1.388
Sideswipe (from Worksheet 2D)	0.173	0.102	0.276
Other multiple-vehicle collision (from Worksheet 2D)	0.096	0.674	0.771
Subtotal	1.752	3.196	4.949
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.040	0.167	0.207
Collision with other object (from Worksheet 2F)	0.004	0.013	0.017
Other single-vehicle collision (from Worksheet 2F)	0.002	0.004	0.007
Single-vehicle noncollision (from Worksheet 2F)	0.008	0.007	0.014
Collision with pedestrian (from Worksheet 2G or 2I)	0.012	0.000	0.012
Collision with bicycle (from Worksheet 2J)	0.078	0.000	0.078
Subtotal	0.144	0.192	0.335
Total	1.896	3.388	5.284

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	5.3
Fatal and injury (FI)	1.9
Property damage only (PDO)	3.4

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	LCR 7 - RAB (Site - 3/4 Mvmt)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	42,500
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	12,500
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	2
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	4
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Protected
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.78	0.85	1.00	0.91	1.00	0.40

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	13.236	1.000	13.236	0.40	1.00	5.276
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	4.531	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.354	4.680	0.40	1.00	1.865
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	8.285	$(5)_{TOTAL}-(5)_{FI}$ = 0.646	8.557	0.40	1.00	3.411

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	1.865	1.000	3.411	5.276
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.839	0.483	1.647	2.487
Head-on collision	0.049	0.091	0.030	0.102	0.194
Angle collision	0.347	0.647	0.244	0.832	1.479
Sideswipe	0.099	0.185	0.032	0.109	0.294
Other multiple-vehicle collision	0.055	0.103	0.211	0.720	0.822

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.660	1.000	0.660	0.40	1.00	0.263
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.145	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.221	0.145	0.40	1.00	0.058
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.512	$(5)_{TOTAL}-(5)_{FI}$ = 0.779	0.514	0.40	1.00	0.205

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.058	1.000	0.205	0.263
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.001
Collision with fixed object	0.744	0.043	0.870	0.178	0.221
Collision with other object	0.072	0.004	0.070	0.014	0.019
Other single-vehicle collision	0.040	0.002	0.023	0.005	0.007
Single-vehicle noncollision	0.141	0.008	0.034	0.007	0.015

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.013	1.00	1.00	0.013
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.013

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	5.276	0.263	5.539	0.015	0.083
Fatal and injury (FI)	--	--	--	--	0.083

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.839	1.647	2.487
Head-on collisions (from Worksheet 2D)	0.091	0.102	0.194
Angle collisions (from Worksheet 2D)	0.647	0.832	1.479
Sideswipe (from Worksheet 2D)	0.185	0.109	0.294
Other multiple-vehicle collision (from Worksheet 2D)	0.103	0.720	0.822
Subtotal	1.865	3.411	5.276
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.001
Collision with fixed object (from Worksheet 2F)	0.043	0.178	0.221
Collision with other object (from Worksheet 2F)	0.004	0.014	0.019
Other single-vehicle collision (from Worksheet 2F)	0.002	0.005	0.007
Single-vehicle noncollision (from Worksheet 2F)	0.008	0.007	0.015
Collision with pedestrian (from Worksheet 2G or 2I)	0.013	0.000	0.013
Collision with bicycle (from Worksheet 2J)	0.083	0.000	0.083
Subtotal	0.154	0.205	0.359
Total	2.019	3.616	5.634

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	5.6
Fatal and injury (FI)	2.0
Property damage only (PDO)	3.6

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	Site - North RIRO (LCR 7 - Signal)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 45,700 (veh/day)	--	25,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 9,300 (veh/day)	--	1,700
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	1
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	3
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	5
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	0.86	1.00	0.91	1.00	0.78

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-13.36	1.11	0.41	0.80	2.535	1.000	2.535	0.78	1.00	1.983
Fatal and Injury (FI)	-14.01	1.16	0.30	0.69	0.969	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.355	0.900	0.78	1.00	0.704
Property Damage Only (PDO)	-15.38	1.20	0.51	0.77	1.760	$(5)_{TOTAL}-(5)_{FI}$ 0.645	1.635	0.78	1.00	1.279

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.704	1.000	1.279	1.983
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.421	0.296	0.440	0.563	0.859
Head-on collision	0.045	0.032	0.023	0.029	0.061
Angle collision	0.343	0.241	0.262	0.335	0.577
Sideswipe	0.126	0.089	0.040	0.051	0.140
Other multiple-vehicle collision	0.065	0.046	0.235	0.301	0.346

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-6.81	0.16	0.51	1.14	0.248	1.000	0.248	0.78	1.00	0.194
Fatal and Injury (FI)	--	--	--	--	0.077	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.304	0.075	0.78	1.00	0.059
Property Damage Only (PDO)	-8.36	0.25	0.55	1.29	0.176	$(5)_{TOTAL}-(5)_{FI}$ 0.696	0.172	0.78	1.00	0.135

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.059	1.000	0.135	0.194
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.003	0.000	0.000
Collision with animal	0.003	0.000	0.018	0.002	0.003
Collision with fixed object	0.762	0.045	0.834	0.112	0.157
Collision with other object	0.090	0.005	0.092	0.012	0.018
Other single-vehicle collision	0.039	0.002	0.023	0.003	0.005
Single-vehicle noncollision	0.105	0.006	0.030	0.004	0.010

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	1.983	0.194	2.177	0.021	0.046
Fatal and injury (FI)	--	--	--	--	0.046

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	1.983	0.194	2.177	0.016	0.035
Fatal and injury (FI)	--	--	--	--	0.035

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.296	0.563	0.859
Head-on collisions (from Worksheet 2D)	0.032	0.029	0.061
Angle collisions (from Worksheet 2D)	0.241	0.335	0.577
Sideswipe (from Worksheet 2D)	0.089	0.051	0.140
Other multiple-vehicle collision (from Worksheet 2D)	0.046	0.301	0.346
Subtotal	0.704	1.279	1.983
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.002	0.003
Collision with fixed object (from Worksheet 2F)	0.045	0.112	0.157
Collision with other object (from Worksheet 2F)	0.005	0.012	0.018
Other single-vehicle collision (from Worksheet 2F)	0.002	0.003	0.005
Single-vehicle noncollision (from Worksheet 2F)	0.006	0.004	0.010
Collision with pedestrian (from Worksheet 2G or 2I)	0.046	0.000	0.046
Collision with bicycle (from Worksheet 2J)	0.035	0.000	0.035
Subtotal	0.139	0.135	0.274
Total	0.843	1.414	2.257

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	2.3
Fatal and injury (FI)	0.8
Property damage only (PDO)	1.4

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	Site - South RIRO (LCR 7 - Signal)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 45,700 (veh/day)	--	20,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 9,300 (veh/day)	--	1,800
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	1
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	3
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	5
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	0.86	1.00	0.91	1.00	0.78

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-13.36	1.11	0.41	0.80	2.026	1.000	2.026	0.78	1.00	1.585
Fatal and Injury (FI)	-14.01	1.16	0.30	0.69	0.761	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.354	0.718	0.78	1.00	0.561
Property Damage Only (PDO)	-15.38	1.20	0.51	0.77	1.387	$(5)_{TOTAL}-(5)_{FI}$ = 0.646	1.308	0.78	1.00	1.023

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.561	1.000	1.023	1.585
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.421	0.236	0.440	0.450	0.687
Head-on collision	0.045	0.025	0.023	0.024	0.049
Angle collision	0.343	0.193	0.262	0.268	0.461
Sideswipe	0.126	0.071	0.040	0.041	0.112
Other multiple-vehicle collision	0.065	0.036	0.235	0.240	0.277

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-6.81	0.16	0.51	1.14	0.246	1.000	0.246	0.78	1.00	0.192
Fatal and Injury (FI)	--	--	--	--	0.076	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.307	0.076	0.78	1.00	0.059
Property Damage Only (PDO)	-8.36	0.25	0.55	1.29	0.172	$(5)_{TOTAL}-(5)_{FI}$ = 0.693	0.170	0.78	1.00	0.133

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.059	1.000	0.133	0.192
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.003	0.000	0.000
Collision with animal	0.003	0.000	0.018	0.002	0.003
Collision with fixed object	0.762	0.045	0.834	0.111	0.156
Collision with other object	0.090	0.005	0.092	0.012	0.018
Other single-vehicle collision	0.039	0.002	0.023	0.003	0.005
Single-vehicle noncollision	0.105	0.006	0.030	0.004	0.010

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	1.585	0.192	1.777	0.021	0.037
Fatal and injury (FI)	--	--	--	--	0.037

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	1.585	0.192	1.777	0.016	0.028
Fatal and injury (FI)	--	--	--	--	0.028

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.236	0.450	0.687
Head-on collisions (from Worksheet 2D)	0.025	0.024	0.049
Angle collisions (from Worksheet 2D)	0.193	0.268	0.461
Sideswipe (from Worksheet 2D)	0.071	0.041	0.112
Other multiple-vehicle collision (from Worksheet 2D)	0.036	0.240	0.277
Subtotal	0.561	1.023	1.585
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.002	0.003
Collision with fixed object (from Worksheet 2F)	0.045	0.111	0.156
Collision with other object (from Worksheet 2F)	0.005	0.012	0.018
Other single-vehicle collision (from Worksheet 2F)	0.002	0.003	0.005
Single-vehicle noncollision (from Worksheet 2F)	0.006	0.004	0.010
Collision with pedestrian (from Worksheet 2G or 2I)	0.037	0.000	0.037
Collision with bicycle (from Worksheet 2J)	0.028	0.000	0.028
Subtotal	0.125	0.133	0.258
Total	0.686	1.157	1.843

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	1.8
Fatal and injury (FI)	0.7
Property damage only (PDO)	1.2

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	Site - Signal (LCR 7 - Signal)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	44,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	7,500
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	1
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	3
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	4
Type of left-turn signal phasing for Leg #1		Permissive	Protected / Permissive
Type of left-turn signal phasing for Leg #2		--	Protected / Permissive
Type of left-turn signal phasing for Leg #3		--	Protected / Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected / Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	6
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.96	0.88	1.00	0.91	1.00	0.51

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	12.214	1.000	12.214	0.51	1.00	6.239
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	4.219	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.357	4.362	0.51	1.00	2.228
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	7.593	$(5)_{TOTAL}-(5)_{FI}$ = 0.643	7.852	0.51	1.00	4.011

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	2.228	1.000	4.011	6.239
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	1.003	0.483	1.937	2.940
Head-on collision	0.049	0.109	0.030	0.120	0.230
Angle collision	0.347	0.773	0.244	0.979	1.752
Sideswipe	0.099	0.221	0.032	0.128	0.349
Other multiple-vehicle collision	0.055	0.123	0.211	0.846	0.969

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.588	1.000	0.588	0.51	1.00	0.301
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.127	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.215	0.126	0.51	1.00	0.065
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.463	$(5)_{TOTAL}-(5)_{FI}$ = 0.785	0.462	0.51	1.00	0.236

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.065	1.000	0.236	0.301
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.001
Collision with fixed object	0.744	0.048	0.870	0.205	0.253
Collision with other object	0.072	0.005	0.070	0.017	0.021
Other single-vehicle collision	0.040	0.003	0.023	0.005	0.008
Single-vehicle noncollision	0.141	0.009	0.034	0.008	0.017

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.013	1.00	1.00	0.013
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.013

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	6.239	0.301	6.540	0.015	0.098
Fatal and injury (FI)	--	--	--	--	0.098

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	1.003	1.937	2.940
Head-on collisions (from Worksheet 2D)	0.109	0.120	0.230
Angle collisions (from Worksheet 2D)	0.773	0.979	1.752
Sideswipe (from Worksheet 2D)	0.221	0.128	0.349
Other multiple-vehicle collision (from Worksheet 2D)	0.123	0.846	0.969
Subtotal	2.228	4.011	6.239
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.001
Collision with fixed object (from Worksheet 2F)	0.048	0.205	0.253
Collision with other object (from Worksheet 2F)	0.005	0.017	0.021
Other single-vehicle collision (from Worksheet 2F)	0.003	0.005	0.008
Single-vehicle noncollision (from Worksheet 2F)	0.009	0.008	0.017
Collision with pedestrian (from Worksheet 2G or 2I)	0.013	0.000	0.013
Collision with bicycle (from Worksheet 2J)	0.098	0.000	0.098
Subtotal	0.175	0.236	0.411
Total	2.404	4.247	6.651

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	6.7
Fatal and injury (FI)	2.4
Property damage only (PDO)	4.2

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	Site - 3/4 Mvmt (LCR 7 - RAB)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4ST
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 46,800 (veh/day)	--	46,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 5,900 (veh/day)	--	4,000
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	1
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	2
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	3
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	6
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.53	1.00	0.86	1.00	0.91	1.00	0.42

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-8.90	0.82	0.25	0.40	7.224	1.000	7.224	0.42	1.00	3.006
Fatal and Injury (FI)	-11.13	0.93	0.28	0.48	3.245	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.436	3.149	0.42	1.00	1.311
Property Damage Only (PDO)	-8.74	0.77	0.23	0.40	4.198	$(5)_{TOTAL}-(5)_{FI}$ = 0.564	4.074	0.42	1.00	1.695

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	1.311	1.000	1.695	3.006
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.338	0.443	0.374	0.634	1.077
Head-on collision	0.041	0.054	0.030	0.051	0.105
Angle collision	0.440	0.577	0.335	0.568	1.145
Sideswipe	0.121	0.159	0.044	0.075	0.233
Other multiple-vehicle collision	0.060	0.079	0.217	0.368	0.447

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-5.33	0.33	0.12	0.65	0.453	1.000	0.453	0.42	1.00	0.189
Fatal and Injury (FI)	--	--	--	--	0.127	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.276	0.125	0.42	1.00	0.052
Property Damage Only (PDO)	-7.04	0.36	0.25	0.54	0.332	$(5)_{TOTAL}-(5)_{FI}$ = 0.724	0.328	0.42	1.00	0.136

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.052	1.000	0.136	0.189
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.001	0.000	0.026	0.004	0.004
Collision with fixed object	0.679	0.035	0.847	0.116	0.151
Collision with other object	0.089	0.005	0.070	0.010	0.014
Other single-vehicle collision	0.051	0.003	0.007	0.001	0.004
Single-vehicle noncollision	0.179	0.009	0.049	0.007	0.016

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	3.006	0.189	3.195	0.022	0.070
Fatal and injury (FI)	--	--	--	--	0.070

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	3.006	0.189	3.195	0.018	0.058
Fatal and injury (FI)	--	--	--	--	0.058

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.443	0.634	1.077
Head-on collisions (from Worksheet 2D)	0.054	0.051	0.105
Angle collisions (from Worksheet 2D)	0.577	0.568	1.145
Sideswipe (from Worksheet 2D)	0.159	0.075	0.233
Other multiple-vehicle collision (from Worksheet 2D)	0.079	0.368	0.447
Subtotal	1.311	1.695	3.006
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.004	0.004
Collision with fixed object (from Worksheet 2F)	0.035	0.116	0.151
Collision with other object (from Worksheet 2F)	0.005	0.010	0.014
Other single-vehicle collision (from Worksheet 2F)	0.003	0.001	0.004
Single-vehicle noncollision (from Worksheet 2F)	0.009	0.007	0.016
Collision with pedestrian (from Worksheet 2G or 2I)	0.070	0.000	0.070
Collision with bicycle (from Worksheet 2J)	0.058	0.000	0.058
Subtotal	0.180	0.136	0.316
Total	1.490	1.832	3.322

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	3.3
Fatal and injury (FI)	1.5
Property damage only (PDO)	1.8

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	Site - 3/4 Mvmt (LCR 7 - Signal)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4ST
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 46,800 (veh/day)	--	46,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 5,900 (veh/day)	--	4,000
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	1
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	2
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	3
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Permissive
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	6
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.53	1.00	0.86	1.00	0.91	1.00	0.42

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-8.90	0.82	0.25	0.40	7.224	1.000	7.224	0.42	1.00	3.006
Fatal and Injury (FI)	-11.13	0.93	0.28	0.48	3.245	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.436	3.149	0.42	1.00	1.311
Property Damage Only (PDO)	-8.74	0.77	0.23	0.40	4.198	$(5)_{TOTAL}-(5)_{FI}$ = 0.564	4.074	0.42	1.00	1.695

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	1.311	1.000	1.695	3.006
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.338	0.443	0.374	0.634	1.077
Head-on collision	0.041	0.054	0.030	0.051	0.105
Angle collision	0.440	0.577	0.335	0.568	1.145
Sideswipe	0.121	0.159	0.044	0.075	0.233
Other multiple-vehicle collision	0.060	0.079	0.217	0.368	0.447

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-5.33	0.33	0.12	0.65	0.453	1.000	0.453	0.42	1.00	0.189
Fatal and Injury (FI)	--	--	--	--	0.127	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.276	0.125	0.42	1.00	0.052
Property Damage Only (PDO)	-7.04	0.36	0.25	0.54	0.332	$(5)_{TOTAL}-(5)_{FI}$ = 0.724	0.328	0.42	1.00	0.136

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.052	1.000	0.136	0.189
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.001	0.000	0.026	0.004	0.004
Collision with fixed object	0.679	0.035	0.847	0.116	0.151
Collision with other object	0.089	0.005	0.070	0.010	0.014
Other single-vehicle collision	0.051	0.003	0.007	0.001	0.004
Single-vehicle noncollision	0.179	0.009	0.049	0.007	0.016

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	3.006	0.189	3.195	0.022	0.070
Fatal and injury (FI)	--	--	--	--	0.070

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	3.006	0.189	3.195	0.018	0.058
Fatal and injury (FI)	--	--	--	--	0.058

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.443	0.634	1.077
Head-on collisions (from Worksheet 2D)	0.054	0.051	0.105
Angle collisions (from Worksheet 2D)	0.577	0.568	1.145
Sideswipe (from Worksheet 2D)	0.159	0.075	0.233
Other multiple-vehicle collision (from Worksheet 2D)	0.079	0.368	0.447
Subtotal	1.311	1.695	3.006
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.004	0.004
Collision with fixed object (from Worksheet 2F)	0.035	0.116	0.151
Collision with other object (from Worksheet 2F)	0.005	0.010	0.014
Other single-vehicle collision (from Worksheet 2F)	0.003	0.001	0.004
Single-vehicle noncollision (from Worksheet 2F)	0.009	0.007	0.016
Collision with pedestrian (from Worksheet 2G or 2I)	0.070	0.000	0.070
Collision with bicycle (from Worksheet 2J)	0.058	0.000	0.058
Subtotal	0.180	0.136	0.316
Total	1.490	1.832	3.322

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	3.3
Fatal and injury (FI)	1.5
Property damage only (PDO)	1.8

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	Site - RAB (LCR 7 - RAB)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	44,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	7,500
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	2
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	4
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Protected
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.78	0.85	1.00	0.91	1.00	0.40

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	12.214	1.000	12.214	0.40	1.00	4.868
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	4.219	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.357	4.362	0.40	1.00	1.739
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	7.593	$(5)_{TOTAL}-(5)_{FI}$ = 0.643	7.852	0.40	1.00	3.130

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	1.739	1.000	3.130	4.868
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.782	0.483	1.512	2.294
Head-on collision	0.049	0.085	0.030	0.094	0.179
Angle collision	0.347	0.603	0.244	0.764	1.367
Sideswipe	0.099	0.172	0.032	0.100	0.272
Other multiple-vehicle collision	0.055	0.096	0.211	0.660	0.756

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.588	1.000	0.588	0.40	1.00	0.235
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.127	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.215	0.126	0.40	1.00	0.050
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.463	$(5)_{TOTAL}-(5)_{FI}$ = 0.785	0.462	0.40	1.00	0.184

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.050	1.000	0.184	0.235
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.000
Collision with fixed object	0.744	0.038	0.870	0.160	0.198
Collision with other object	0.072	0.004	0.070	0.013	0.017
Other single-vehicle collision	0.040	0.002	0.023	0.004	0.006
Single-vehicle noncollision	0.141	0.007	0.034	0.006	0.013

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.011	1.00	1.00	0.011
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.011

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	4.868	0.235	5.103	0.015	0.077
Fatal and injury (FI)	--	--	--	--	0.077

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.782	1.512	2.294
Head-on collisions (from Worksheet 2D)	0.085	0.094	0.179
Angle collisions (from Worksheet 2D)	0.603	0.764	1.367
Sideswipe (from Worksheet 2D)	0.172	0.100	0.272
Other multiple-vehicle collision (from Worksheet 2D)	0.096	0.660	0.756
Subtotal	1.739	3.130	4.868
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.038	0.160	0.198
Collision with other object (from Worksheet 2F)	0.004	0.013	0.017
Other single-vehicle collision (from Worksheet 2F)	0.002	0.004	0.006
Single-vehicle noncollision (from Worksheet 2F)	0.007	0.006	0.013
Collision with pedestrian (from Worksheet 2G or 2I)	0.011	0.000	0.011
Collision with bicycle (from Worksheet 2J)	0.077	0.000	0.077
Subtotal	0.138	0.184	0.322
Total	1.876	3.314	5.190

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	5.2
Fatal and injury (FI)	1.9
Property damage only (PDO)	3.3

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	JEM	Roadway	SH 402
Agency or Company	Benesch	Intersection	Site - RAB (LCR 7 - Signal)
Date Performed	08/13/24	Jurisdiction	CDOT/Johnstown/Loveland
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	44,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	7,500
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	2
Number of major-road approaches with right-turn lanes (0,1,2)		0	2
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	4
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Protected
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	2
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.78	0.85	1.00	0.91	1.00	0.40

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	12.214	1.000	12.214	0.40	1.00	4.868
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	4.219	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.357	4.362	0.40	1.00	1.739
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	7.593	$(5)_{TOTAL}-(5)_{FI}$ = 0.643	7.852	0.40	1.00	3.130

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	1.739	1.000	3.130	4.868
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.782	0.483	1.512	2.294
Head-on collision	0.049	0.085	0.030	0.094	0.179
Angle collision	0.347	0.603	0.244	0.764	1.367
Sideswipe	0.099	0.172	0.032	0.100	0.272
Other multiple-vehicle collision	0.055	0.096	0.211	0.660	0.756

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.588	1.000	0.588	0.40	1.00	0.235
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.127	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.215	0.126	0.40	1.00	0.050
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.463	$(5)_{TOTAL}-(5)_{FI}$ = 0.785	0.462	0.40	1.00	0.184

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.050	1.000	0.184	0.235
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.000
Collision with fixed object	0.744	0.038	0.870	0.160	0.198
Collision with other object	0.072	0.004	0.070	0.013	0.017
Other single-vehicle collision	0.040	0.002	0.023	0.004	0.006
Single-vehicle noncollision	0.141	0.007	0.034	0.006	0.013

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16	(4)*(5)
Total	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-30

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.00	1.00

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.011	1.00	1.00	0.011
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.011

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(7)*
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17	(4)*(5)
Total	4.868	0.235	5.103	0.015	0.077
Fatal and injury (FI)	--	--	--	--	0.077

* Column 6 has been removed due to redundant application of calibration factors and inconsistency with HSM Equation 12-31

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.782	1.512	2.294
Head-on collisions (from Worksheet 2D)	0.085	0.094	0.179
Angle collisions (from Worksheet 2D)	0.603	0.764	1.367
Sideswipe (from Worksheet 2D)	0.172	0.100	0.272
Other multiple-vehicle collision (from Worksheet 2D)	0.096	0.660	0.756
Subtotal	1.739	3.130	4.868
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.038	0.160	0.198
Collision with other object (from Worksheet 2F)	0.004	0.013	0.017
Other single-vehicle collision (from Worksheet 2F)	0.002	0.004	0.006
Single-vehicle noncollision (from Worksheet 2F)	0.007	0.006	0.013
Collision with pedestrian (from Worksheet 2G or 2I)	0.011	0.000	0.011
Collision with bicycle (from Worksheet 2J)	0.077	0.000	0.077
Subtotal	0.138	0.184	0.322
Total	1.876	3.314	5.190

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

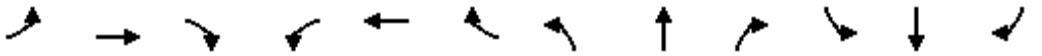
(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	5.2
Fatal and injury (FI)	1.9
Property damage only (PDO)	3.3

APPENDIX I

Future Year Alternatives Analysis – Capacity Analysis and Queuing Anlsysis

HCM 6th Signalized Intersection Summary
18: LCR 7/Charlotte Court & SH 402

08/14/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	373	1021	224	465	1280	42	175	87	229	195	62	108
Future Volume (veh/h)	373	1021	224	465	1280	42	175	87	229	195	62	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	410	1122	131	511	1407	11	192	96	240	214	68	67
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	518	1569	700	662	1635	729	376	334	448	336	353	434
Arrive On Green	0.09	0.45	0.45	0.10	0.46	0.46	0.06	0.18	0.18	0.07	0.19	0.19
Sat Flow, veh/h	3428	3526	1572	3428	3526	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	410	1122	131	511	1407	11	192	96	240	214	68	67
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1763	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	6.4	25.9	5.0	7.9	35.6	0.4	6.0	4.5	12.9	7.0	3.1	3.2
Cycle Q Clear(g_c), s	6.4	25.9	5.0	7.9	35.6	0.4	6.0	4.5	12.9	7.0	3.1	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	518	1569	700	662	1635	729	376	334	448	336	353	434
V/C Ratio(X)	0.79	0.72	0.19	0.77	0.86	0.02	0.51	0.29	0.54	0.64	0.19	0.15
Avail Cap(c_a), veh/h	565	1569	700	748	1635	729	376	334	448	336	353	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	22.6	16.8	18.9	23.9	14.5	33.3	35.5	30.2	33.8	34.1	27.4
Incr Delay (d2), s/veh	5.3	2.1	0.4	4.4	6.2	0.0	1.2	2.2	4.5	4.0	1.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	9.8	1.7	2.9	14.2	0.1	4.1	2.1	5.1	1.8	1.5	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	24.7	17.2	23.3	30.1	14.5	34.5	37.6	34.7	37.8	35.3	28.1
LnGrp LOS	C	C	B	C	C	B	C	D	C	D	D	C
Approach Vol, veh/h		1663			1929			528			349	
Approach Delay, s/veh		24.6			28.2			35.1			35.5	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	23.0	15.5	49.5	11.0	24.0	13.6	51.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	18.0	13.0	42.0	6.0	19.0	10.0	45.0
Max Q Clear Time (g_c+I1), s	9.0	14.9	9.9	27.9	8.0	5.2	8.4	37.6
Green Ext Time (p_c), s	0.0	0.4	0.6	6.3	0.0	0.4	0.3	4.8

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1384	43	0	1616	295	0	0	107	0	0	130
Future Vol, veh/h	0	1384	43	0	1616	295	0	0	107	0	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	200	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	1521	47	0	1776	324	0	0	118	0	0	143

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	784	-	-	888
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	334	0	0	285
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	334	-	-	285
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	21.5	29.7
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	334	-	-	-	-	285
HCM Lane V/C Ratio	0.352	-	-	-	-	0.501
HCM Control Delay (s)	21.5	-	-	-	-	29.7
HCM Lane LOS	C	-	-	-	-	D
HCM 95th %tile Q(veh)	1.5	-	-	-	-	2.6

Intersection: 16: Erlich City Access/Site Access & SH 402

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	141	172
Average Queue (ft)	53	72
95th Queue (ft)	101	127
Link Distance (ft)	486	558
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	T
Maximum Queue (ft)	170	176	424	428	197	140	220	309	299	41	186	129
Average Queue (ft)	87	94	226	251	66	93	100	196	208	14	103	57
95th Queue (ft)	146	139	341	371	128	132	154	281	280	33	160	108
Link Distance (ft)			3802	3802				1079	1079			457
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400	400			400	400	400			400	250	
Storage Blk Time (%)			0	0								
Queuing Penalty (veh)			1	0								

Intersection: 18: LCR 7/Charlotte Court & SH 402

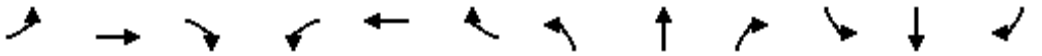
Movement	NB	SB	SB	SB
Directions Served	R	L	T	R
Maximum Queue (ft)	172	254	110	103
Average Queue (ft)	75	126	50	42
95th Queue (ft)	136	212	91	80
Link Distance (ft)			617	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250	250		250
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Zone Summary

Zone wide Queuing Penalty: 1

HCM 6th Signalized Intersection Summary
18: LCR 7/Charlotte Court & SH 402

08/14/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	1106	200	381	1211	23	224	78	263	220	56	125
Future Volume (veh/h)	187	1106	200	381	1211	23	224	78	263	220	56	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	203	1202	91	414	1316	0	243	85	60	239	61	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	319	1481	660	569	1657	739	454	334	283	431	334	283
Arrive On Green	0.05	0.42	0.42	0.10	0.47	0.00	0.10	0.18	0.18	0.10	0.18	0.18
Sat Flow, veh/h	3428	3526	1572	3428	3526	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	203	1202	91	414	1316	0	243	85	60	239	61	32
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1763	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	3.8	30.0	2.3	4.9	31.6	0.0	10.5	3.9	2.5	10.5	2.8	1.7
Cycle Q Clear(g_c), s	3.8	30.0	2.3	4.9	31.6	0.0	10.5	3.9	2.5	10.5	2.8	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	319	1481	660	569	1657	739	454	334	283	431	334	283
V/C Ratio(X)	0.64	0.81	0.14	0.73	0.79	0.00	0.53	0.25	0.21	0.55	0.18	0.11
Avail Cap(c_a), veh/h	319	1481	660	569	1657	739	454	334	283	431	334	283
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	25.5	7.7	40.4	22.4	0.0	29.9	35.2	20.0	29.9	34.8	34.3
Incr Delay (d2), s/veh	2.9	3.5	0.3	4.7	4.0	0.0	1.2	1.8	1.7	1.6	1.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	11.7	1.2	4.7	12.2	0.0	4.7	1.9	1.3	4.9	1.4	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	29.0	8.0	45.0	26.4	0.0	31.1	37.1	21.7	31.4	36.0	35.1
LnGrp LOS	C	C	A	D	C	A	C	D	C	C	D	D
Approach Vol, veh/h		1496			1730			388			332	
Approach Delay, s/veh		27.6			30.9			31.0			32.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	23.0	15.0	47.0	15.0	23.0	10.0	52.0
Change Period (Y+Rc), s	4.5	5.0	5.0	5.0	4.5	5.0	5.0	5.0
Max Green Setting (Gmax), s	10.5	18.0	10.0	42.0	10.5	18.0	5.0	47.0
Max Q Clear Time (g_c+I1), s	12.5	5.9	6.9	32.0	12.5	4.8	5.8	33.6
Green Ext Time (p_c), s	0.0	0.4	0.5	5.3	0.0	0.3	0.0	6.9

Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1482	38	0	1506	142	0	0	138	0	0	145
Future Vol, veh/h	0	1482	38	0	1506	142	0	0	138	0	0	145
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	200	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	1629	42	0	1655	156	0	0	152	0	0	159

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	836	-	-	828
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	308	0	0	312
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	308	-	-	312
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	27.5	28
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	308	-	-	-	-	312
HCM Lane V/C Ratio	0.492	-	-	-	-	0.511
HCM Control Delay (s)	27.5	-	-	-	-	28
HCM Lane LOS	D	-	-	-	-	D
HCM 95th %tile Q(veh)	2.6	-	-	-	-	2.7

Intersection: 16: Erlich City Access/Site Access & SH 402

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	289	164
Average Queue (ft)	140	66
95th Queue (ft)	263	120
Link Distance (ft)	486	558
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	T
Maximum Queue (ft)	136	164	327	307	64	180	300	281	303	21	264	134
Average Queue (ft)	50	74	239	245	35	98	123	206	211	7	119	45
95th Queue (ft)	108	127	302	313	59	156	200	273	274	23	218	94
Link Distance (ft)			3802	3802				1079	1079			457
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400	400			400	400	400			400	250	
Storage Blk Time (%)											0	
Queuing Penalty (veh)											1	

Intersection: 18: LCR 7/Charlotte Court & SH 402

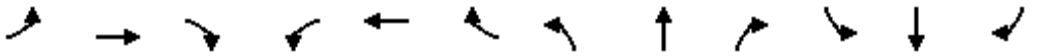
Movement	NB	SB	SB	SB
Directions Served	R	L	T	R
Maximum Queue (ft)	157	216	69	137
Average Queue (ft)	72	124	37	61
95th Queue (ft)	128	202	68	111
Link Distance (ft)			617	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250	250		250
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1

HCM 6th Signalized Intersection Summary
18: LCR 7/Charlotte Court & SH 402

08/14/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	1196	224	324	1280	42	175	51	244	195	62	108
Future Volume (veh/h)	189	1196	224	324	1280	42	175	51	244	195	62	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	208	1314	131	356	1407	11	192	56	256	214	68	67
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	263	1710	763	528	1694	755	363	334	401	342	334	408
Arrive On Green	0.08	0.48	0.48	0.08	0.48	0.48	0.06	0.18	0.18	0.06	0.18	0.18
Sat Flow, veh/h	1767	3526	1572	3428	3526	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	208	1314	131	356	1407	11	192	56	256	214	68	67
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	5.9	30.6	4.7	5.2	34.5	0.4	6.0	2.6	14.5	6.0	3.1	3.3
Cycle Q Clear(g_c), s	5.9	30.6	4.7	5.2	34.5	0.4	6.0	2.6	14.5	6.0	3.1	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	1710	763	528	1694	755	363	334	401	342	334	408
V/C Ratio(X)	0.79	0.77	0.17	0.67	0.83	0.01	0.53	0.17	0.64	0.63	0.20	0.16
Avail Cap(c_a), veh/h	300	1710	763	614	1694	755	363	334	401	342	334	408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	21.1	14.5	19.4	22.5	13.6	33.7	34.7	33.1	34.5	34.9	28.6
Incr Delay (d2), s/veh	9.0	2.5	0.4	2.4	4.9	0.0	1.4	1.1	7.6	3.6	1.4	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	11.4	1.5	1.8	13.3	0.1	4.2	1.2	5.9	2.2	1.5	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.9	23.7	14.8	21.7	27.4	13.6	35.1	35.7	40.7	38.1	36.3	29.5
LnGrp LOS	C	C	B	C	C	B	D	D	D	D	D	C
Approach Vol, veh/h		1653			1774			504			349	
Approach Delay, s/veh		23.8			26.1			38.0			36.1	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	23.0	12.5	53.5	11.0	23.0	13.0	53.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	18.0	10.0	46.0	6.0	18.0	10.0	46.0
Max Q Clear Time (g_c+I1), s	8.0	16.5	7.2	32.6	8.0	5.3	7.9	36.5
Green Ext Time (p_c), s	0.0	0.2	0.4	7.2	0.0	0.4	0.1	5.8

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	199	1384	43	140	1477	295	0	0	107	0	0	130
Future Vol, veh/h	199	1384	43	140	1477	295	0	0	107	0	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	250	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	219	1521	47	154	1623	324	0	0	118	0	0	143

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1947	0	0	1568	0	0	-	-	784	-	-	812
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.16	-	-	4.16	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.23	-	-	2.23	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	293	-	-	412	-	-	0	0	334	0	0	320
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	293	-	-	412	-	-	-	-	334	-	-	320
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.6	1.4	21.5	25
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	334	293	-	-	412	-	-	320
HCM Lane V/C Ratio	0.352	0.746	-	-	0.373	-	-	0.446
HCM Control Delay (s)	21.5	46.1	-	-	18.9	-	-	25
HCM Lane LOS	C	E	-	-	C	-	-	D
HCM 95th %tile Q(veh)	1.5	5.5	-	-	1.7	-	-	2.2

Intersection: 16: Erlich City Access/Site Access & SH 402

Movement	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	T	R	R	R
Maximum Queue (ft)	472	854	862	136	18	17	37	122	82
Average Queue (ft)	296	253	208	62	1	2	8	54	43
95th Queue (ft)	551	744	713	113	6	10	26	103	76
Link Distance (ft)		1079	1079		1010	1010		486	558
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250			250			250		
Storage Blk Time (%)	54	0							
Queuing Penalty (veh)	376	0							

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	T	R
Maximum Queue (ft)	158	447	401	133	115	126	285	258	48	198	67	172
Average Queue (ft)	88	242	263	50	64	67	161	172	4	101	28	77
95th Queue (ft)	135	346	359	97	106	107	246	257	20	164	63	136
Link Distance (ft)		3802	3802				1079	1079			457	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			400	400	400			400	250		250
Storage Blk Time (%)		0	0									
Queuing Penalty (veh)		1	0									

Intersection: 18: LCR 7/Charlotte Court & SH 402

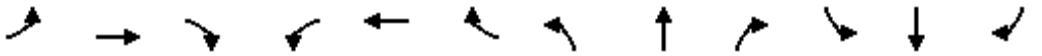
Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	197	91	103
Average Queue (ft)	116	36	45
95th Queue (ft)	189	76	90
Link Distance (ft)		616	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	250		250
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 377

HCM 6th Signalized Intersection Summary
18: LCR 7/Charlotte Court & SH 402

08/14/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	1195	200	264	1211	23	224	44	271	220	56	125
Future Volume (veh/h)	99	1195	200	264	1211	23	224	44	271	220	56	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	108	1299	91	287	1316	0	243	48	69	239	61	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	188	1704	760	472	1760	785	457	309	262	456	291	247
Arrive On Green	0.05	0.48	0.48	0.07	0.50	0.00	0.13	0.17	0.17	0.12	0.16	0.16
Sat Flow, veh/h	1767	3526	1572	3428	3526	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	108	1299	91	287	1316	0	243	48	69	239	61	32
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	4.2	36.2	2.3	0.9	35.8	0.0	13.6	2.7	3.8	13.6	3.4	2.1
Cycle Q Clear(g_c), s	4.2	36.2	2.3	0.9	35.8	0.0	13.6	2.7	3.8	13.6	3.4	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	188	1704	760	472	1760	785	457	309	262	456	291	247
V/C Ratio(X)	0.57	0.76	0.12	0.61	0.75	0.00	0.53	0.16	0.26	0.52	0.21	0.13
Avail Cap(c_a), veh/h	216	1704	760	472	1760	785	467	309	262	456	291	247
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	25.4	6.0	48.0	24.0	0.0	35.4	42.8	29.3	36.2	44.1	43.5
Incr Delay (d2), s/veh	1.9	2.3	0.2	2.2	3.0	0.0	1.1	1.1	2.4	1.1	1.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	14.1	1.3	4.0	14.0	0.0	5.8	1.3	1.9	6.0	1.7	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	27.6	6.2	50.3	27.0	0.0	36.5	43.8	31.7	37.3	45.7	44.6
LnGrp LOS	C	C	A	D	C	A	D	D	C	D	D	D
Approach Vol, veh/h		1498			1603			360			332	
Approach Delay, s/veh		26.4			31.1			36.6			39.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	25.0	13.0	63.0	20.2	23.8	11.1	64.9
Change Period (Y+Rc), s	4.5	5.0	5.0	5.0	4.5	5.0	5.0	5.0
Max Green Setting (Gmax), s	14.5	20.0	8.0	58.0	16.4	18.1	8.0	58.0
Max Q Clear Time (g_c+I1), s	15.6	5.8	2.9	38.2	15.6	5.4	6.2	37.8
Green Ext Time (p_c), s	0.0	0.3	0.4	8.7	0.1	0.3	0.0	8.6

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

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	96	1482	38	117	1389	142	0	0	138	0	0	145
Future Vol, veh/h	96	1482	38	117	1389	142	0	0	138	0	0	145
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	250	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	105	1629	42	129	1526	156	0	0	152	0	0	159

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1682	0	0	1671	0	0	-	-	836	-	-	763
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.16	-	-	4.16	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.23	-	-	2.23	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	372	-	-	376	-	-	0	0	308	0	0	345
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	372	-	-	376	-	-	-	-	308	-	-	345
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	1.4	27.5	24.1
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	308	372	-	-	376	-	-	345
HCM Lane V/C Ratio	0.492	0.284	-	-	0.342	-	-	0.462
HCM Control Delay (s)	27.5	18.5	-	-	19.5	-	-	24.1
HCM Lane LOS	D	C	-	-	C	-	-	C
HCM 95th %tile Q(veh)	2.6	1.1	-	-	1.5	-	-	2.3

Intersection: 16: Erlich City Access/Site Access & SH 402

Movement	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	T	R	R	R
Maximum Queue (ft)	139	156	22	472	1059	1092	472	224	174
Average Queue (ft)	70	14	1	294	347	299	16	141	71
95th Queue (ft)	123	81	7	546	1011	956	156	230	134
Link Distance (ft)		1079	1079		1010	1010		486	558
Upstream Blk Time (%)					6	6			
Queuing Penalty (veh)					48	49			
Storage Bay Dist (ft)	250			250			250		
Storage Blk Time (%)				54	15	0			
Queuing Penalty (veh)				374	17	0			

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	T	R
Maximum Queue (ft)	136	429	418	71	178	174	312	319	15	216	108	270
Average Queue (ft)	66	230	230	31	78	82	209	217	2	140	30	125
95th Queue (ft)	125	372	381	54	159	157	317	323	10	199	75	214
Link Distance (ft)		3802	3802				1079	1079			457	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			400	400	400			400	250		250
Storage Blk Time (%)		1	1									0
Queuing Penalty (veh)		1	1									1

Intersection: 18: LCR 7/Charlotte Court & SH 402

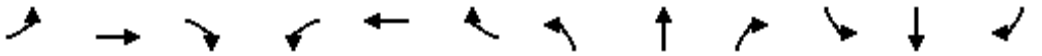
Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	259	133	133
Average Queue (ft)	155	42	74
95th Queue (ft)	226	98	127
Link Distance (ft)		616	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	250		250
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Zone Summary

Zone wide Queuing Penalty: 491

HCM 6th Signalized Intersection Summary
18: LCR 7/Charlotte Court & SH 402

08/14/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	1196	224	307	1280	42	148	51	244	31	49	108
Future Volume (veh/h)	189	1196	224	307	1280	42	148	51	244	31	49	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	208	1314	131	337	1407	11	163	56	256	34	54	67
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	292	2078	927	573	2059	918	331	350	391	278	294	353
Arrive On Green	0.07	0.59	0.59	0.06	0.58	0.58	0.06	0.19	0.19	0.03	0.16	0.16
Sat Flow, veh/h	1767	3526	1572	3428	3526	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	208	1314	131	337	1407	11	163	56	256	34	54	67
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	5.6	29.3	4.5	4.7	33.2	0.4	7.0	3.0	17.5	1.9	3.0	4.1
Cycle Q Clear(g_c), s	5.6	29.3	4.5	4.7	33.2	0.4	7.0	3.0	17.5	1.9	3.0	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	292	2078	927	573	2059	918	331	350	391	278	294	353
V/C Ratio(X)	0.71	0.63	0.14	0.59	0.68	0.01	0.49	0.16	0.65	0.12	0.18	0.19
Avail Cap(c_a), veh/h	411	2078	927	737	2059	918	331	350	391	316	294	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	16.1	11.0	14.9	17.3	10.5	40.4	40.8	40.4	40.5	43.8	37.7
Incr Delay (d2), s/veh	2.5	1.1	0.2	1.0	1.9	0.0	1.1	1.0	8.3	0.2	1.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	10.5	1.4	1.5	12.1	0.1	0.9	1.5	7.3	0.9	1.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	17.2	11.3	15.9	19.1	10.5	41.6	41.7	48.7	40.7	45.2	38.9
LnGrp LOS	C	B	B	B	B	B	D	D	D	D	D	D
Approach Vol, veh/h		1653			1755			475			155	
Approach Delay, s/veh		17.2			18.5			45.4			41.5	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	26.6	11.3	74.7	11.0	23.0	11.9	74.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	20.0	13.0	65.0	7.0	19.0	16.0	62.0
Max Q Clear Time (g_c+I1), s	3.9	19.5	6.7	31.3	9.0	6.1	7.6	35.2
Green Ext Time (p_c), s	0.0	0.1	0.6	11.1	0.0	0.3	0.3	10.7

Intersection Summary	
HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

Intersection: 18: LCR 7/Charlotte Court & SH 402

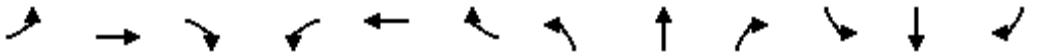
Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	T	R
Maximum Queue (ft)	159	312	332	84	130	130	257	261	35	241	91	380
Average Queue (ft)	90	220	228	34	46	58	173	189	5	105	32	97
95th Queue (ft)	153	311	324	64	87	101	264	264	17	188	75	207
Link Distance (ft)		3802	3802				995	995			457	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			400	400	400			400	250		250
Storage Blk Time (%)										0		1
Queuing Penalty (veh)										0		3

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	88	114	131
Average Queue (ft)	28	42	39
95th Queue (ft)	65	94	83
Link Distance (ft)		616	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	250		250
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

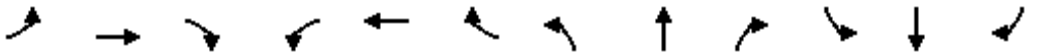
Zone wide Queuing Penalty: 3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	1195	200	249	1211	23	182	44	271	29	46	125
Future Volume (veh/h)	99	1195	200	249	1211	23	182	44	271	29	46	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	108	1299	91	271	1316	0	198	48	69	32	50	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	207	1763	786	491	1791	799	401	409	347	352	334	283
Arrive On Green	0.05	0.50	0.50	0.06	0.51	0.00	0.07	0.22	0.22	0.03	0.18	0.18
Sat Flow, veh/h	1767	3526	1572	3428	3526	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	108	1299	91	271	1316	0	198	48	69	32	50	32
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	3.4	29.2	2.1	0.0	29.3	0.0	7.0	2.1	2.8	1.5	2.3	1.7
Cycle Q Clear(g_c), s	3.4	29.2	2.1	0.0	29.3	0.0	7.0	2.1	2.8	1.5	2.3	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	207	1763	786	491	1791	799	401	409	347	352	334	283
V/C Ratio(X)	0.52	0.74	0.12	0.55	0.73	0.00	0.49	0.12	0.20	0.09	0.15	0.11
Avail Cap(c_a), veh/h	239	1763	786	491	1791	799	401	409	347	406	334	283
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	19.8	6.1	39.3	19.3	0.0	31.1	31.2	20.1	31.8	34.6	34.3
Incr Delay (d2), s/veh	1.5	2.1	0.2	1.3	2.7	0.0	0.9	0.6	1.3	0.1	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	10.6	1.0	3.1	10.8	0.0	4.1	1.0	1.4	0.6	1.1	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	21.9	6.4	40.6	22.0	0.0	32.0	31.8	21.4	31.9	35.5	35.1
LnGrp LOS	C	C	A	D	C	A	C	C	C	C	D	D
Approach Vol, veh/h		1498			1587			315			114	
Approach Delay, s/veh		21.0			25.2			29.6			34.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	27.1	11.0	55.0	11.0	23.0	10.2	55.8
Change Period (Y+Rc), s	4.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	19.0	6.0	50.0	7.0	18.0	7.0	49.0
Max Q Clear Time (g_c+I1), s	3.5	4.8	2.0	31.2	9.0	4.3	5.4	31.3
Green Ext Time (p_c), s	0.0	0.3	0.3	8.5	0.0	0.2	0.0	8.1

Intersection Summary	
HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C



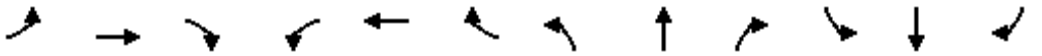
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	1220	43	140	1477	295	28	23	107	165	31	111
Future Volume (veh/h)	199	1220	43	140	1477	295	28	23	107	165	31	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	219	1341	33	154	1623	246	31	25	36	181	34	103
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	248	1972	49	388	1908	851	322	297	252	376	355	425
Arrive On Green	0.16	1.00	1.00	0.06	0.54	0.54	0.03	0.16	0.16	0.06	0.19	0.19
Sat Flow, veh/h	1767	3516	86	1767	3526	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	219	672	702	154	1623	246	31	25	36	181	34	103
Grp Sat Flow(s),veh/h/ln	1767	1763	1840	1767	1763	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	5.7	0.0	0.0	3.8	39.1	8.5	1.4	1.1	2.0	6.0	1.5	5.1
Cycle Q Clear(g_c), s	5.7	0.0	0.0	3.8	39.1	8.5	1.4	1.1	2.0	6.0	1.5	5.1
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	248	989	1032	388	1908	851	322	297	252	376	355	425
V/C Ratio(X)	0.88	0.68	0.68	0.40	0.85	0.29	0.10	0.08	0.14	0.48	0.10	0.24
Avail Cap(c_a), veh/h	303	989	1032	496	1908	851	377	297	252	376	355	425
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	0.0	0.0	8.8	19.5	12.5	33.5	35.8	36.1	33.7	33.3	28.5
Incr Delay (d2), s/veh	15.5	2.4	2.3	0.7	5.0	0.9	0.1	0.6	1.2	1.0	0.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.7	0.7	1.3	14.4	2.7	0.6	0.6	0.8	1.1	0.7	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.2	2.4	2.3	9.4	24.5	13.3	33.6	36.3	37.3	34.7	33.9	29.9
LnGrp LOS	D	A	A	A	C	B	C	D	D	C	C	C
Approach Vol, veh/h		1593			2023			92			318	
Approach Delay, s/veh		6.9			22.0			35.8			33.0	
Approach LOS		A			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	20.0	9.9	60.1	6.9	23.1	11.9	58.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	16.0	12.0	50.0	6.0	16.0	11.0	51.0
Max Q Clear Time (g_c+I1), s	8.0	4.0	5.8	2.0	3.4	7.1	7.7	41.1
Green Ext Time (p_c), s	0.0	0.1	0.2	10.7	0.0	0.3	0.2	7.1

Intersection Summary	
HCM 6th Ctrl Delay	17.2
HCM 6th LOS	B

Notes

User approved ignoring U-Turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	1196	224	307	1280	42	148	51	244	31	49	108
Future Volume (veh/h)	189	1196	224	307	1280	42	148	51	244	31	49	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	208	1314	131	337	1407	11	163	56	256	34	54	67
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	383	1756	783	532	1733	773	356	370	427	311	334	406
Arrive On Green	0.08	0.50	0.50	0.14	0.98	0.98	0.05	0.20	0.20	0.03	0.18	0.18
Sat Flow, veh/h	1767	3526	1572	3428	3526	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	208	1314	131	337	1407	11	163	56	256	34	54	67
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	5.7	29.8	4.6	4.9	3.3	0.0	5.0	2.5	14.2	1.5	2.5	3.3
Cycle Q Clear(g_c), s	5.7	29.8	4.6	4.9	3.3	0.0	5.0	2.5	14.2	1.5	2.5	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	383	1756	783	532	1733	773	356	370	427	311	334	406
V/C Ratio(X)	0.54	0.75	0.17	0.63	0.81	0.01	0.46	0.15	0.60	0.11	0.16	0.16
Avail Cap(c_a), veh/h	421	1756	783	595	1733	773	356	370	427	345	334	406
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	0.43	0.43	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.6	20.1	13.7	16.7	0.4	0.4	33.7	33.0	31.7	31.8	34.6	28.7
Incr Delay (d2), s/veh	0.9	2.2	0.3	0.8	1.9	0.0	0.9	0.9	6.1	0.2	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	10.9	1.5	1.4	0.7	0.0	3.4	1.2	5.7	0.7	1.2	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.5	22.3	14.1	17.5	2.3	0.4	34.6	33.9	37.8	31.9	35.7	29.6
LnGrp LOS	B	C	B	B	A	A	C	C	D	C	D	C
Approach Vol, veh/h		1653			1755			475			155	
Approach Delay, s/veh		20.3			5.2			36.3			32.2	
Approach LOS		C			A			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	24.9	12.2	54.8	10.0	23.0	12.8	54.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	5.0	18.0	9.0	48.0	5.0	18.0	10.0	47.0
Max Q Clear Time (g_c+I1), s	3.5	16.2	6.9	31.8	7.0	5.3	7.7	5.3
Green Ext Time (p_c), s	0.0	0.2	0.3	8.1	0.0	0.3	0.1	12.4

Intersection Summary	
HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

Intersection: 16: Erlich City Access/Site Access & SH 402

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	279	328	328	169	365	367	102	53	89	102	156	46
Average Queue (ft)	119	152	164	49	216	213	30	24	31	47	84	16
95th Queue (ft)	245	260	280	102	323	301	66	54	70	82	134	40
Link Distance (ft)		1064	1064		992	992			485			560
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250			250			250	150		150	150	
Storage Blk Time (%)	2	2			3	2					0	
Queuing Penalty (veh)	11	3			4	6					0	

Intersection: 16: Erlich City Access/Site Access & SH 402

Movement	SB
Directions Served	R
Maximum Queue (ft)	68
Average Queue (ft)	30
95th Queue (ft)	65
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	T	R
Maximum Queue (ft)	270	415	406	172	180	110	236	280	35	191	88	171
Average Queue (ft)	132	229	256	48	59	66	152	163	7	101	27	73
95th Queue (ft)	244	348	375	104	113	106	250	279	20	188	65	133
Link Distance (ft)		3802	3802				1064	1064			457	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			400	400	400			400	250		250
Storage Blk Time (%)		0	0									
Queuing Penalty (veh)		0	0									

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	50	113	67
Average Queue (ft)	15	39	38
95th Queue (ft)	39	87	70
Link Distance (ft)		616	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	250		250
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

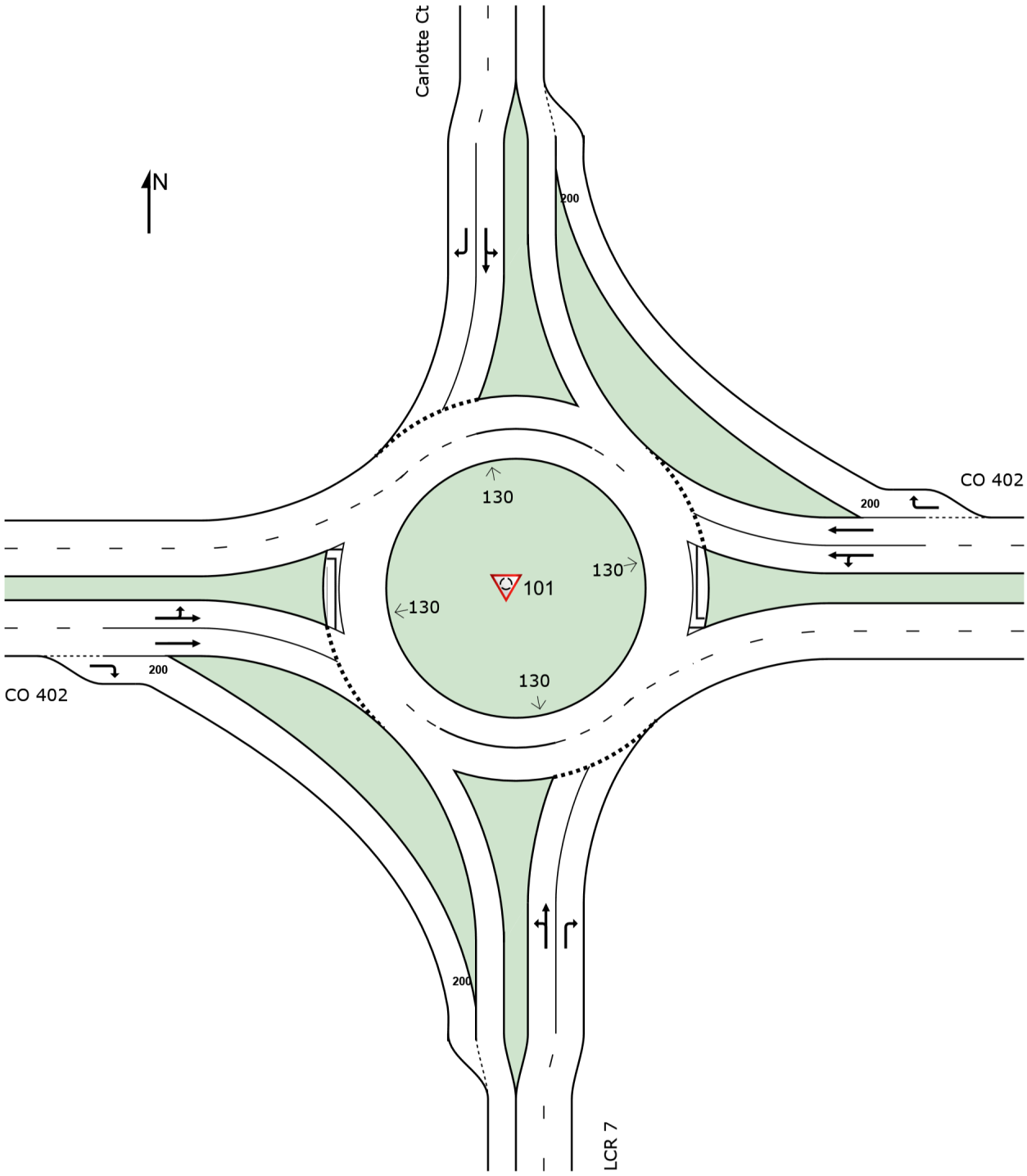
Zone wide Queuing Penalty: 25

SITE LAYOUT

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

PM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site
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: LCR 7															
3	L2	All MCs	198	3.0	198	3.0	0.621	25.7	LOS C	3.7	94.8	0.87	0.98	1.27	28.2
8	T1	All MCs	48	3.0	48	3.0	0.621	25.7	LOS C	3.7	94.8	0.87	0.98	1.27	18.8
18	R2	All MCs	295	3.0	295	3.0	0.621	22.1	LOS C	4.0	102.5	0.87	0.97	1.26	25.3
Approach			540	3.0	540	3.0	0.621	23.7	LOS C	4.0	102.5	0.87	0.97	1.27	26.0
East: CO 402															
1	L2	All MCs	271	3.0	271	3.0	0.793	19.8	LOS B	15.9	406.5	0.94	0.93	1.61	25.6
6	T1	All MCs	1316	3.0	1316	3.0	0.793	18.9	LOS B	16.3	418.3	0.93	0.92	1.57	34.2
16	R2	All MCs	25	3.0	25	3.0	0.015	2.4	LOS A	0.0	0.0	0.00	0.00	0.00	41.6
Approach			1612	3.0	1612	3.0	0.793	18.8	LOS B	16.3	418.3	0.92	0.91	1.55	33.0
North: Carlotte Ct															
7	L2	All MCs	34	3.0	34	3.0	0.306	19.7	LOS B	1.4	35.1	0.85	0.88	0.92	22.2
4	T1	All MCs	53	3.0	53	3.0	0.306	19.7	LOS B	1.4	35.1	0.85	0.88	0.92	21.0
14	R2	All MCs	136	3.0	136	3.0	0.361	16.6	LOS B	1.9	47.6	0.86	0.89	0.96	29.8
Approach			223	3.0	223	3.0	0.361	17.8	LOS B	1.9	47.6	0.86	0.88	0.94	26.8
West: CO 402															
5	L2	All MCs	108	3.0	108	3.0	0.713	15.9	LOS B	11.0	281.1	0.87	0.79	1.30	29.9
2	T1	All MCs	1299	3.0	1299	3.0	0.713	15.3	LOS B	11.2	286.8	0.86	0.77	1.28	36.4
12	R2	All MCs	217	3.0	217	3.0	0.134	3.8	LOS A	0.0	0.0	0.00	0.00	0.00	45.7
Approach			1624	3.0	1624	3.0	0.713	13.8	LOS B	11.2	286.8	0.75	0.67	1.11	36.8
All Vehicles			3999	3.0	3999	3.0	0.793	17.4	LOS B	16.3	418.3	0.84	0.82	1.30	33.2

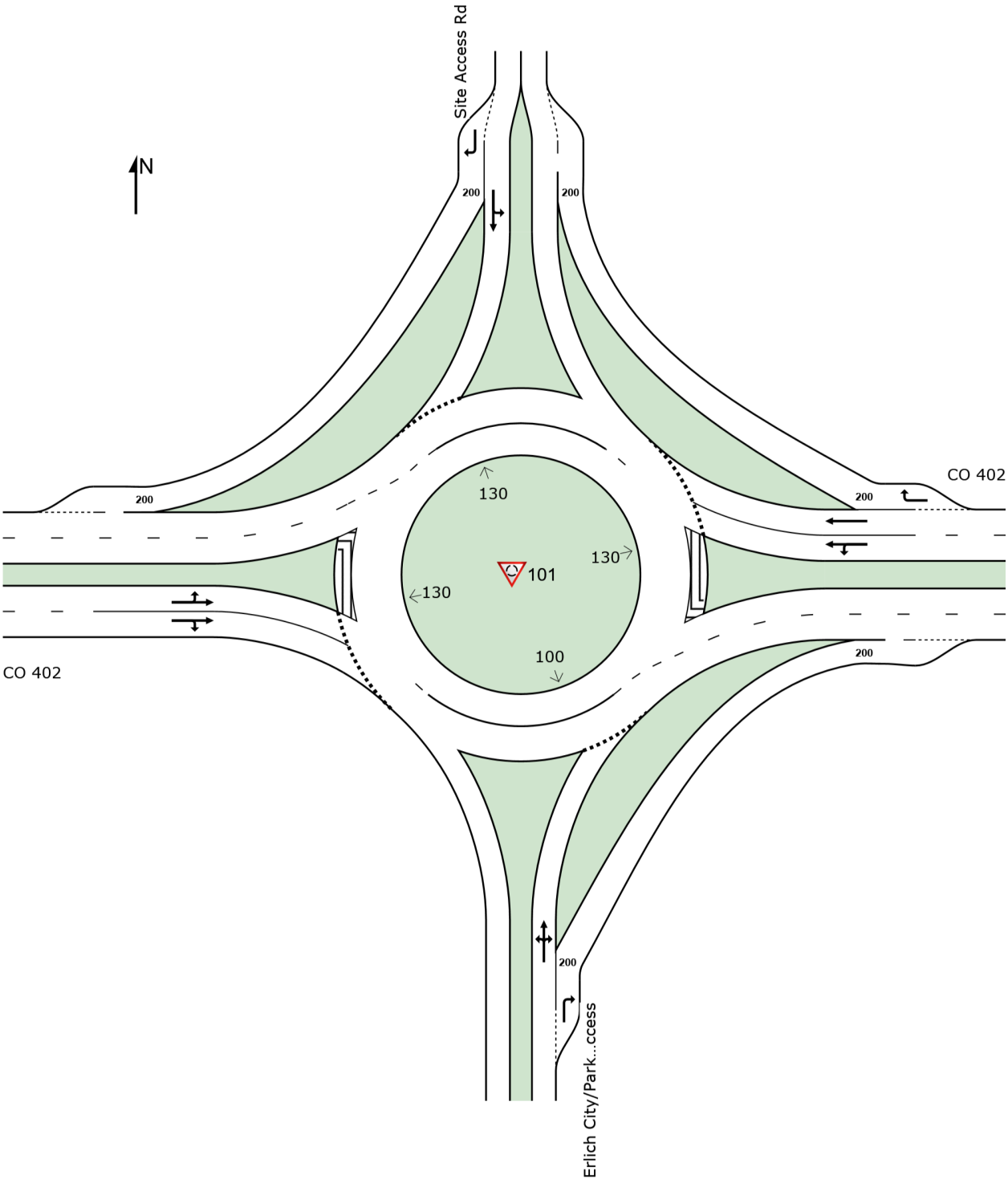
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

PM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site
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: Erlich City/Park-n-Ride Access															
3	L2	All MCs	47	3.0	47	3.0	0.262	17.8	LOS B	1.3	32.6	0.87	0.86	0.87	25.9
8	T1	All MCs	30	3.0	30	3.0	0.262	17.8	LOS B	1.3	32.6	0.87	0.86	0.87	25.8
18	R2	All MCs	150	3.0	150	3.0	0.092	6.4	LOS A	0.0	0.0	0.00	0.00	0.00	36.2
Approach			227	3.0	227	3.0	0.262	10.3	LOS B	1.3	32.6	0.30	0.29	0.30	31.8
East: CO 402															
1	L2	All MCs	127	3.0	127	3.0	0.757	15.5	LOS B	13.5	345.4	0.79	0.60	1.03	29.1
6	T1	All MCs	1634	3.0	1634	3.0	0.757	15.1	LOS B	13.5	345.4	0.78	0.58	0.99	31.0
16	R2	All MCs	167	3.0	167	3.0	0.103	3.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.6
Approach			1928	3.0	1928	3.0	0.757	14.1	LOS B	13.5	345.4	0.72	0.53	0.91	31.5
North: Site Access Rd															
7	L2	All MCs	225	3.0	225	3.0	0.606	23.8	LOS C	3.7	94.9	0.89	1.04	1.25	20.7
4	T1	All MCs	28	3.0	28	3.0	0.606	23.8	LOS C	3.7	94.9	0.89	1.04	1.25	21.7
14	R2	All MCs	152	3.0	152	3.0	0.093	7.3	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach			405	3.0	405	3.0	0.606	17.6	LOS B	3.7	94.9	0.56	0.65	0.78	22.1
West: CO 402															
5	L2	All MCs	113	3.0	113	3.0	0.856	25.1	LOS C	20.7	530.6	1.00	1.12	1.96	21.0
2	T1	All MCs	1519	3.0	1519	3.0	0.856	24.2	LOS C	21.6	552.9	1.00	1.11	1.93	26.6
12	R2	All MCs	41	3.0	41	3.0	0.856	23.4	LOS C	21.6	552.9	1.00	1.10	1.91	26.7
Approach			1673	3.0	1673	3.0	0.856	24.2	LOS C	21.6	552.9	1.00	1.11	1.94	26.1
All Vehicles			4233	3.0	4233	3.0	0.856	18.2	LOS B	21.6	552.9	0.79	0.76	1.27	28.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

PM 2045 Plus Site
Site Category: (None)
Roundabout

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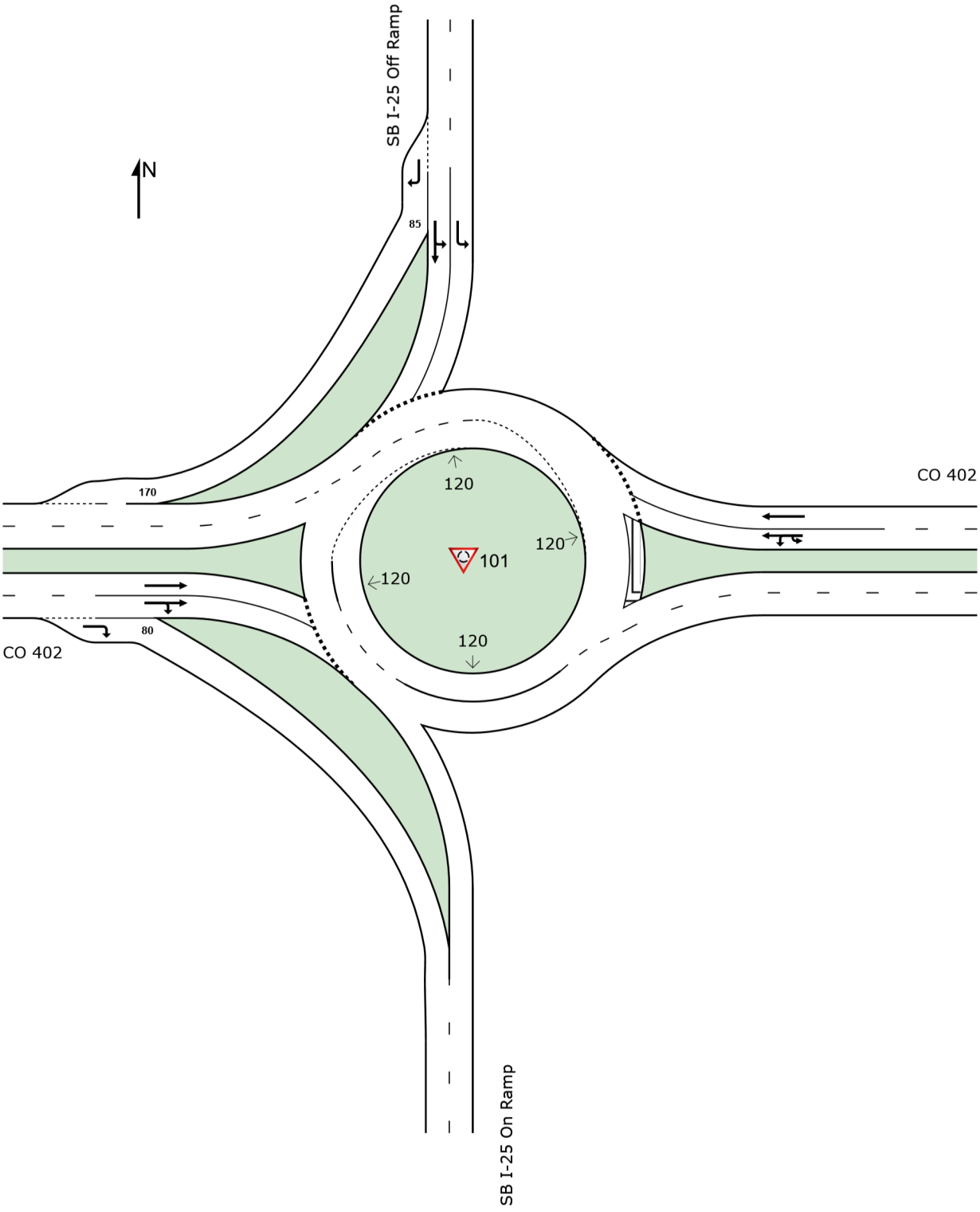

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MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site
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: CO 402															
1u	U	All MCs	6	5.0	6	5.0	0.529	5.3	LOS A	0.0	0.0	0.00	0.00	0.00	19.6
1	L2	All MCs	247	5.0	247	5.0	0.529	5.3	LOS A	0.0	0.0	0.00	0.00	0.00	37.9
6	T1	All MCs	1230	5.0	1230	5.0	0.529	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	26.4
Approach			1483	5.0	1483	5.0	0.529	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	29.0
North: SB I-25 Off Ramp															
7	L2	All MCs	256	6.0	256	6.0	0.174	6.7	LOS A	0.7	18.7	0.65	0.61	0.65	28.7
4	T1	All MCs	1	6.0	1	6.0	0.174	5.8	LOS A	0.7	18.7	0.65	0.59	0.65	39.2
14	R2	All MCs	551	6.0	551	6.0	0.348	16.7	LOS B	0.0	0.0	0.00	0.00	0.00	42.3
Approach			809	6.0	809	6.0	0.348	13.5	LOS B	0.7	18.7	0.21	0.19	0.21	36.6
West: CO 402															
2	T1	All MCs	1293	7.0	1293	7.0	0.685	14.9	LOS B	8.2	216.7	0.78	0.80	1.29	19.3
12	R2	All MCs	411	7.0	411	7.0	0.260	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.4
Approach			1703	7.0	1703	7.0	0.685	11.3	LOS B	8.2	216.7	0.59	0.61	0.98	24.6
All Vehicles			3995	6.1	3995	6.1	0.685	9.5	LOS A	8.2	216.7	0.29	0.30	0.46	28.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

PM 2045 Plus Site
Site Category: (None)
Roundabout

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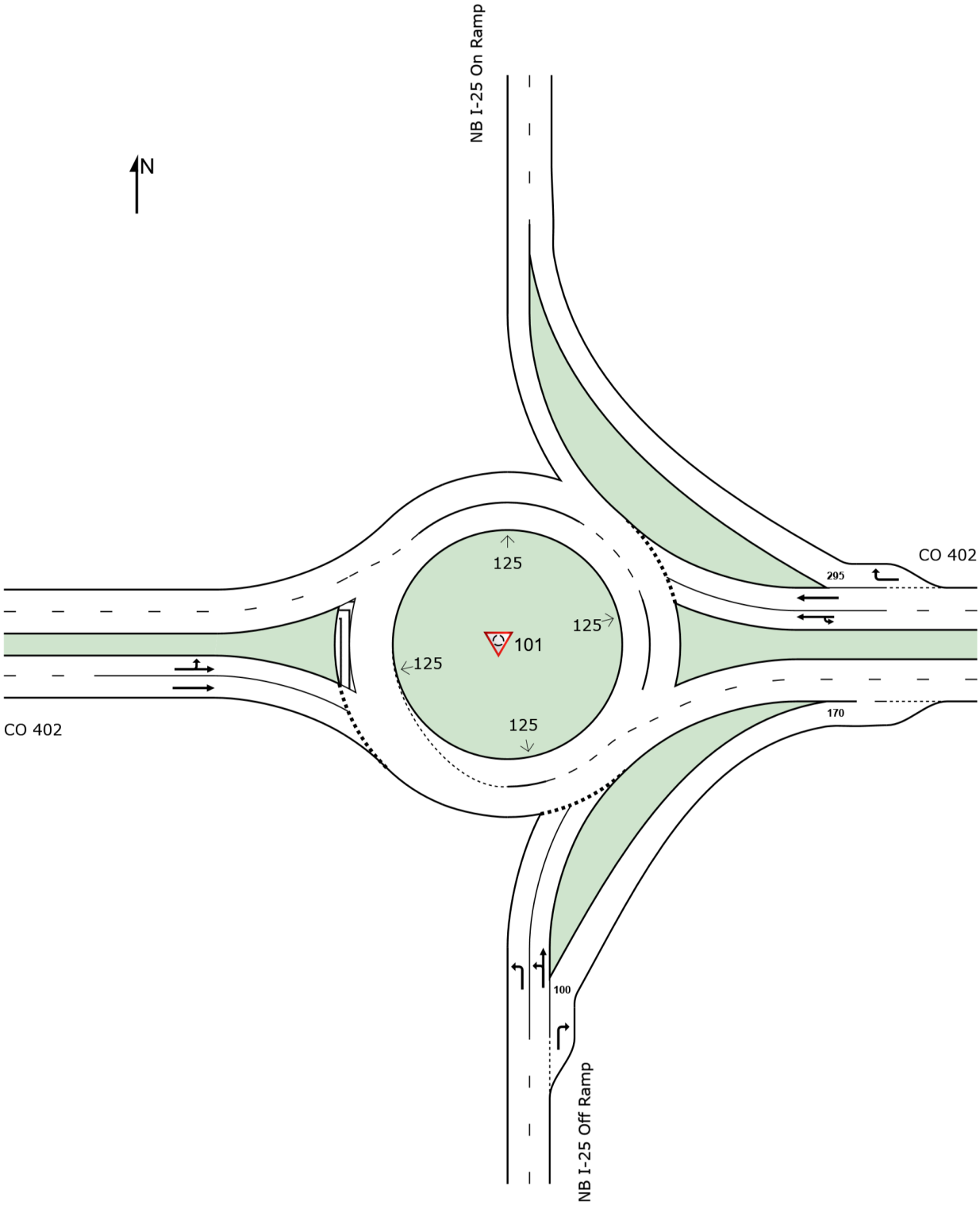

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MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site
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: NB I-25 Off Ramp															
3	L2	All MCs	615	4.0	615	4.0	0.436	11.1	LOS B	2.5	65.4	0.77	0.79	1.01	25.4
8	T1	All MCs	2	4.0	2	4.0	0.436	9.6	LOS A	2.5	65.4	0.77	0.76	0.98	35.4
18	R2	All MCs	243	4.0	243	4.0	0.150	8.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.4
Approach			860	4.0	860	4.0	0.436	10.2	LOS B	2.5	65.4	0.55	0.56	0.72	28.5
East: CO 402															
1u	U	All MCs	5	7.0	5	7.0	0.754	29.0	LOS C	6.7	176.7	0.92	1.26	1.72	14.6
6	T1	All MCs	896	7.0	896	7.0	0.754	25.3	LOS C	7.8	206.7	0.93	1.26	1.71	14.7
16	R2	All MCs	127	7.0	127	7.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.8
Approach			1028	7.0	1028	7.0	0.754	22.2	LOS C	7.8	206.7	0.82	1.10	1.50	16.1
West: CO 402															
5	L2	All MCs	572	5.0	572	5.0	0.565	6.2	LOS A	7.3	190.1	0.12	0.02	0.12	31.0
2	T1	All MCs	1005	5.0	1005	5.0	0.565	6.0	LOS A	7.3	191.0	0.12	0.02	0.12	21.1
Approach			1577	5.0	1577	5.0	0.565	6.1	LOS A	7.3	191.0	0.12	0.02	0.12	25.3
All Vehicles			3466	5.3	3466	5.3	0.754	11.9	LOS B	7.8	206.7	0.43	0.48	0.68	22.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

PM 2045 Plus Site
Site Category: (None)
Roundabout

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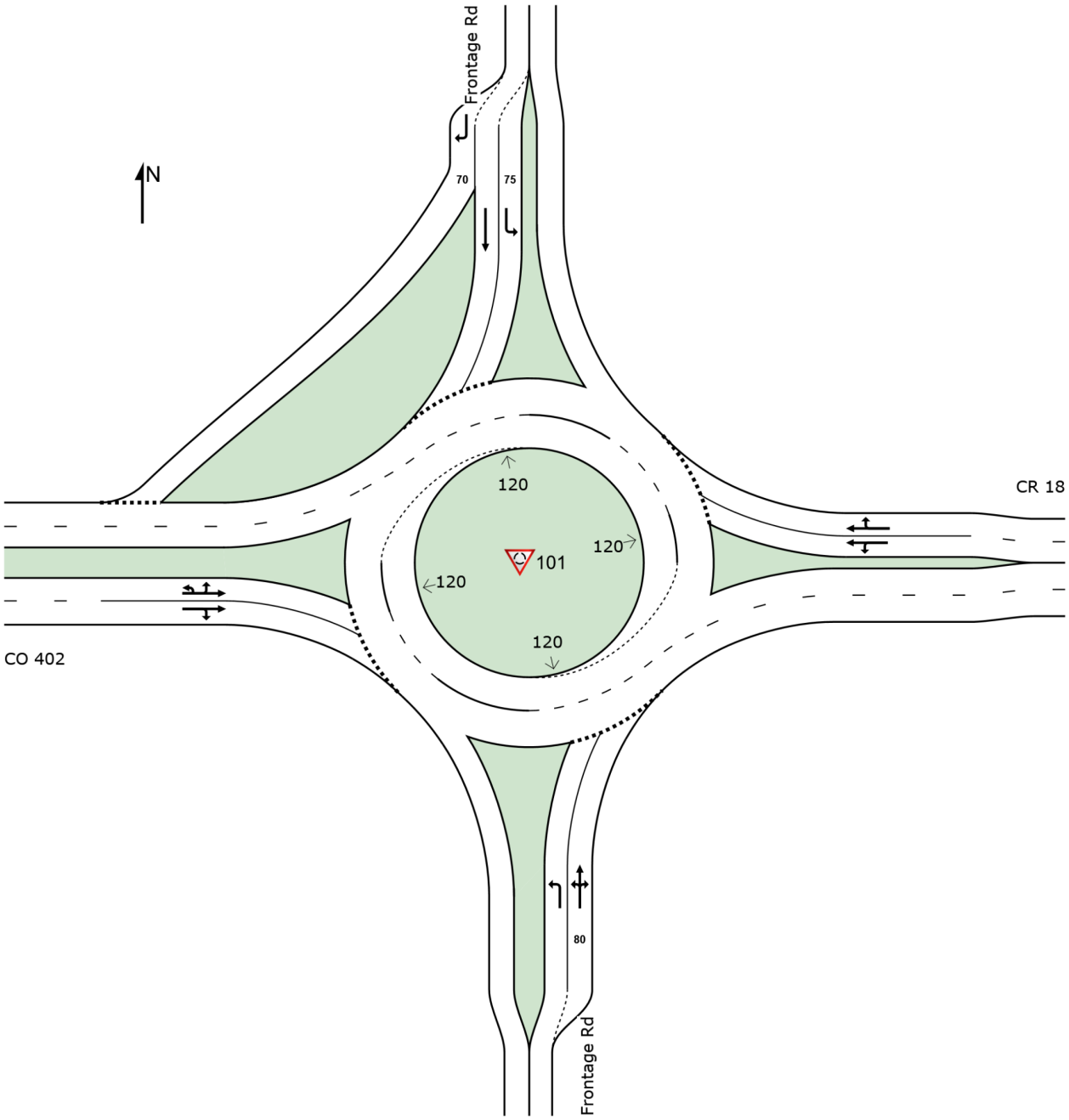

MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site
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: Frontage Rd															
3	L2	All MCs	165	2.0	165	2.0	0.316	12.0	LOS B	1.5	39.3	0.76	0.75	0.81	29.0
8	T1	All MCs	125	2.0	125	2.0	0.316	10.4	LOS B	1.5	39.3	0.76	0.72	0.79	32.5
18	R2	All MCs	56	2.0	56	2.0	0.316	10.4	LOS B	1.5	39.3	0.76	0.72	0.79	37.3
Approach			345	2.0	345	2.0	0.316	11.2	LOS B	1.5	39.3	0.76	0.73	0.80	31.8
East: CR 18															
1	L2	All MCs	10	2.0	10	2.0	0.414	10.2	LOS B	2.4	62.2	0.70	0.62	0.80	37.1
6	T1	All MCs	500	2.0	500	2.0	0.414	10.1	LOS B	2.5	62.4	0.70	0.61	0.80	37.9
16	R2	All MCs	120	2.0	120	2.0	0.414	9.8	LOS A	2.5	62.4	0.70	0.61	0.79	38.2
Approach			630	2.0	630	2.0	0.414	10.0	LOS B	2.5	62.4	0.70	0.61	0.79	38.0
North: Frontage Rd															
7	L2	All MCs	108	2.0	108	2.0	0.101	4.3	LOS A	0.5	12.2	0.56	0.42	0.56	37.9
4	T1	All MCs	98	2.0	98	2.0	0.113	5.3	LOS A	0.5	12.9	0.57	0.46	0.57	33.4
14	R2	All MCs	273	2.0	273	2.0	0.255	5.8	LOS A	1.3	33.3	0.60	0.46	0.60	29.8
Approach			479	2.0	479	2.0	0.255	5.3	LOS A	1.3	33.3	0.59	0.45	0.59	33.0
West: CO 402															
5u	U	All MCs	10	2.0	10	2.0	0.569	10.3	LOS B	4.1	104.7	0.58	0.37	0.58	18.8
5	L2	All MCs	371	2.0	371	2.0	0.569	10.3	LOS B	4.1	104.7	0.58	0.37	0.58	27.4
2	T1	All MCs	784	2.0	784	2.0	0.569	10.3	LOS B	4.1	104.7	0.57	0.36	0.57	38.0
12	R2	All MCs	56	2.0	56	2.0	0.569	10.3	LOS B	4.1	102.5	0.57	0.36	0.57	30.7
Approach			1221	2.0	1221	2.0	0.569	10.3	LOS B	4.1	104.7	0.57	0.37	0.57	33.9
All Vehicles			2675	2.0	2675	2.0	0.569	9.5	LOS A	4.1	104.7	0.63	0.49	0.66	34.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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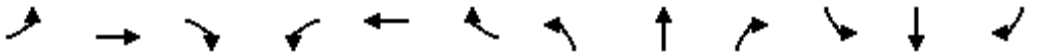


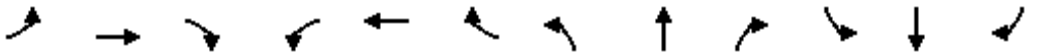
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	1291	38	117	1389	142	43	28	138	191	26	129
Future Volume (veh/h)	96	1291	38	117	1389	142	43	28	138	191	26	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	105	1419	13	129	1526	126	47	31	63	210	29	46
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	198	1813	17	354	1808	901	373	334	367	393	378	394
Arrive On Green	0.09	1.00	1.00	0.05	0.51	0.51	0.04	0.18	0.18	0.06	0.20	0.20
Sat Flow, veh/h	1767	3580	33	1767	3526	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	105	699	733	129	1526	126	47	31	63	210	29	46
Grp Sat Flow(s),veh/h/ln	1767	1763	1850	1767	1763	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	2.9	0.0	0.0	3.5	37.2	3.7	2.1	1.4	3.2	6.0	1.3	2.3
Cycle Q Clear(g_c), s	2.9	0.0	0.0	3.5	37.2	3.7	2.1	1.4	3.2	6.0	1.3	2.3
Prop In Lane	1.00		0.02	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	893	937	354	1808	901	373	334	367	393	378	394
V/C Ratio(X)	0.53	0.78	0.78	0.36	0.84	0.14	0.13	0.09	0.17	0.53	0.08	0.12
Avail Cap(c_a), veh/h	220	893	937	383	1808	901	397	334	367	393	378	394
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.65	0.65	0.65	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	0.0	10.4	20.9	9.9	31.5	34.2	30.6	33.6	32.2	28.9
Incr Delay (d2), s/veh	1.4	4.5	4.3	0.6	5.0	0.3	0.2	0.6	1.0	1.4	0.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.1	1.1	1.4	15.9	1.3	0.9	0.7	1.3	1.8	0.6	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	4.5	4.3	11.1	26.0	10.2	31.7	34.7	31.6	35.0	32.6	29.5
LnGrp LOS	C	A	A	B	C	B	C	C	C	D	C	C
Approach Vol, veh/h		1537			1781			141			285	
Approach Delay, s/veh		5.5			23.8			32.3			33.9	
Approach LOS		A			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	23.0	10.4	55.6	8.6	25.4	9.7	56.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	18.0	7.0	49.0	5.0	19.0	6.0	50.0
Max Q Clear Time (g_c+I1), s	8.0	5.2	5.5	2.0	4.1	4.3	4.9	39.2
Green Ext Time (p_c), s	0.0	0.2	0.0	11.5	0.0	0.2	0.0	8.0

Intersection Summary	
HCM 6th Ctrl Delay	17.4
HCM 6th LOS	B

Notes

User approved ignoring U-Turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	1195	200	249	1211	23	182	44	271	29	46	125
Future Volume (veh/h)	99	1195	200	249	1211	23	182	44	271	29	46	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	108	1299	91	271	1316	0	198	48	69	32	50	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	329	1728	771	479	1790	798	419	428	363	352	334	283
Arrive On Green	0.05	0.49	0.49	0.12	1.00	0.00	0.08	0.23	0.23	0.03	0.18	0.18
Sat Flow, veh/h	1767	3526	1572	3428	3526	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	108	1299	91	271	1316	0	198	48	69	32	50	32
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	3.4	29.8	2.1	0.0	0.0	0.0	8.0	2.0	2.8	1.5	2.3	1.7
Cycle Q Clear(g_c), s	3.4	29.8	2.1	0.0	0.0	0.0	8.0	2.0	2.8	1.5	2.3	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	1728	771	479	1790	798	419	428	363	352	334	283
V/C Ratio(X)	0.33	0.75	0.12	0.57	0.74	0.00	0.47	0.11	0.19	0.09	0.15	0.11
Avail Cap(c_a), veh/h	378	1728	771	513	1790	798	419	428	363	406	334	283
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	0.50	0.50	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.0	20.6	6.1	37.3	0.0	0.0	29.8	30.4	19.4	31.8	34.6	34.3
Incr Delay (d2), s/veh	0.4	2.1	0.2	0.6	1.4	0.0	0.8	0.5	1.2	0.1	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	10.9	1.0	2.8	0.3	0.0	3.8	0.9	1.4	0.6	1.1	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.4	22.7	6.4	37.9	1.4	0.0	30.6	30.9	20.6	31.9	35.5	35.1
LnGrp LOS	B	C	A	D	A	A	C	C	C	C	D	D
Approach Vol, veh/h		1498			1587			315			114	
Approach Delay, s/veh		21.2			7.6			28.4			34.4	
Approach LOS		C			A			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	28.1	11.0	54.0	12.0	23.0	9.2	55.8
Change Period (Y+Rc), s	4.0	5.0	5.0	* 5	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	6.0	20.0	7.0	* 49	8.0	18.0	8.0	48.0
Max Q Clear Time (g_c+I1), s	3.5	4.8	2.0	31.8	10.0	4.3	5.4	2.0
Green Ext Time (p_c), s	0.0	0.3	0.4	8.1	0.0	0.2	0.0	11.2

Intersection Summary	
HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 16: Erlich City Access/Site Access & SH 402

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	120	322	319	154	322	335	59	93	75	122	192	46
Average Queue (ft)	55	183	190	59	208	221	20	38	28	64	109	15
95th Queue (ft)	101	286	304	118	300	318	45	78	67	107	170	39
Link Distance (ft)		1064	1064		992	992			485			560
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250			250			250	150		150	150	
Storage Blk Time (%)		4			2	4					3	
Queuing Penalty (veh)		3			2	6					5	

Intersection: 16: Erlich City Access/Site Access & SH 402

Movement	SB
Directions Served	R
Maximum Queue (ft)	142
Average Queue (ft)	66
95th Queue (ft)	118
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	T	R
Maximum Queue (ft)	116	416	384	50	112	106	233	236	29	193	186	250
Average Queue (ft)	58	242	244	30	48	60	131	137	4	81	33	106
95th Queue (ft)	112	333	314	49	92	99	206	205	14	145	97	191
Link Distance (ft)		3802	3802				1064	1064			457	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			400	400	400			400	250		250
Storage Blk Time (%)		0	0									0
Queuing Penalty (veh)		0	0									0

Intersection: 18: LCR 7/Charlotte Court & SH 402

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	50	91	154
Average Queue (ft)	9	27	51
95th Queue (ft)	32	63	97
Link Distance (ft)		616	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	250		250
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 17

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	199	1384	43	140	1477	295	0	0	107	0	0	130
Future Vol, veh/h	199	1384	43	140	1477	295	0	0	107	0	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	250	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	219	1521	47	154	1623	324	0	0	118	0	0	143

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1947	0	0	1568	0	0	-	-	784	-	-	812
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.16	-	-	4.16	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.23	-	-	2.23	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	293	-	-	412	-	-	0	0	334	0	0	320
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	293	-	-	412	-	-	-	-	334	-	-	320
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.6	1.4	21.5	25
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	334	293	-	-	412	-	-	320
HCM Lane V/C Ratio	0.352	0.746	-	-	0.373	-	-	0.446
HCM Control Delay (s)	21.5	46.1	-	-	18.9	-	-	25
HCM Lane LOS	C	E	-	-	C	-	-	D
HCM 95th %tile Q(veh)	1.5	5.5	-	-	1.7	-	-	2.2

Intersection: 16: Erlich City Access/Site Access & SH 402

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	R	R	R
Maximum Queue (ft)	403	334	97	105	19	55	99	130
Average Queue (ft)	218	42	5	46	1	7	47	48
95th Queue (ft)	397	180	36	82	9	27	86	91
Link Distance (ft)		1012	1012		1011		492	564
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	250			250		250		
Storage Blk Time (%)	29							
Queuing Penalty (veh)	199							

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	96	1482	38	117	1389	142	0	0	138	0	0	145
Future Vol, veh/h	96	1482	38	117	1389	142	0	0	138	0	0	145
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	250	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	105	1629	42	129	1526	156	0	0	152	0	0	159

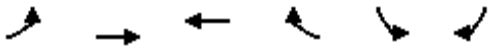
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1682	0	0	1671	0	0	-	-	836	-	-	763
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.16	-	-	4.16	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.23	-	-	2.23	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	372	-	-	376	-	-	0	0	308	0	0	345
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	372	-	-	376	-	-	-	-	308	-	-	345
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	1.4	27.5	24.1
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	308	372	-	-	376	-	-	345
HCM Lane V/C Ratio	0.492	0.284	-	-	0.342	-	-	0.462
HCM Control Delay (s)	27.5	18.5	-	-	19.5	-	-	24.1
HCM Lane LOS	D	C	-	-	C	-	-	C
HCM 95th %tile Q(veh)	2.6	1.1	-	-	1.5	-	-	2.3

Intersection: 16: Erlich City Access/Site Access & SH 402

Movement	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	T	R	R	R
Maximum Queue (ft)	453	476	22	472	1055	1060	472	317	579
Average Queue (ft)	134	40	3	318	293	271	18	145	274
95th Queue (ft)	363	213	15	511	847	848	157	255	620
Link Distance (ft)		1012	1012		1011	1011		492	564
Upstream Blk Time (%)					4	7			3
Queuing Penalty (veh)					32	63			0
Storage Bay Dist (ft)	250			250			250		
Storage Blk Time (%)	17			71	12	7			
Queuing Penalty (veh)	123			491	14	10			



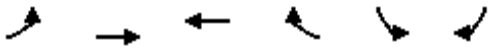
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	331	1264	1320	167	231	213
Future Volume (veh/h)	331	1264	1320	167	231	213
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1796	1796
Adj Flow Rate, veh/h	364	1389	1451	140	254	225
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	4	4	4	4	7	7
Cap, veh/h	512	2576	1539	957	297	639
Arrive On Green	0.25	0.74	0.44	0.44	0.17	0.17
Sat Flow, veh/h	1753	3589	3589	1560	1711	1522
Grp Volume(v), veh/h	364	1389	1451	140	254	225
Grp Sat Flow(s),veh/h/ln	1753	1749	1749	1560	1711	1522
Q Serve(g_s), s	14.0	17.4	39.7	3.8	14.4	0.0
Cycle Q Clear(g_c), s	14.0	17.4	39.7	3.8	14.4	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	512	2576	1539	957	297	639
V/C Ratio(X)	0.71	0.54	0.94	0.15	0.86	0.35
Avail Cap(c_a), veh/h	512	2576	1539	957	393	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.63	0.63	1.00	1.00
Uniform Delay (d), s/veh	32.1	5.8	26.8	8.2	40.1	19.7
Incr Delay (d2), s/veh	4.6	0.8	9.0	0.2	13.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	4.1	16.2	1.8	7.0	3.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	36.7	6.6	35.8	8.4	53.4	20.1
LnGrp LOS	D	A	D	A	D	C
Approach Vol, veh/h		1753	1591		479	
Approach Delay, s/veh		12.8	33.4		37.8	
Approach LOS		B	C		D	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	29.7	49.0				78.7	21.3
Change Period (Y+Rc), s	5.0	* 5				5.0	4.0
Max Green Setting (Gmax), s	20.0	* 44				68.0	23.0
Max Q Clear Time (g_c+I1), s	16.0	41.7				19.4	16.4
Green Ext Time (p_c), s	0.4	1.8				12.4	0.9

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

Notes

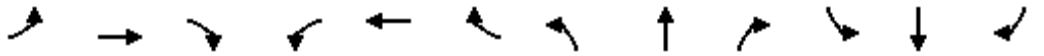
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	225	1332	1223	232	175	163
Future Volume (veh/h)	225	1332	1223	232	175	163
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1752	1752
Adj Flow Rate, veh/h	247	1464	1344	190	192	163
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	6	6	6	6	10	10
Cap, veh/h	396	2409	1964	1183	334	415
Arrive On Green	0.08	0.70	1.00	1.00	0.20	0.20
Sat Flow, veh/h	1725	3532	3532	1535	1668	1485
Grp Volume(v), veh/h	247	1464	1344	190	192	163
Grp Sat Flow(s),veh/h/ln	1725	1721	1721	1535	1668	1485
Q Serve(g_s), s	5.5	22.2	0.0	0.0	10.4	8.9
Cycle Q Clear(g_c), s	5.5	22.2	0.0	0.0	10.4	8.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	396	2409	1964	1183	334	415
V/C Ratio(X)	0.62	0.61	0.68	0.16	0.58	0.39
Avail Cap(c_a), veh/h	535	2409	1964	1183	334	415
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.54	0.54	1.00	1.00
Uniform Delay (d), s/veh	6.4	7.8	0.0	0.0	36.2	29.2
Incr Delay (d2), s/veh	1.3	0.9	1.1	0.2	7.1	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.8	0.3	0.1	4.7	8.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.7	8.7	1.1	0.2	43.2	32.0
LnGrp LOS	A	A	A	A	D	C
Approach Vol, veh/h		1711	1534		355	
Approach Delay, s/veh		8.6	1.0		38.0	
Approach LOS		A	A		D	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			75.0		25.0	12.9	62.1
Change Period (Y+Rc), s			5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s			70.0		20.0	16.0	49.0
Max Q Clear Time (g_c+I1), s			24.2		12.4	7.5	2.0
Green Ext Time (p_c), s			13.5		0.7	0.4	12.9

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A



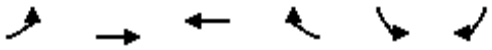
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	1263	140	45	1301	175	5	160	86	250	250	140
Future Volume (veh/h)	135	1263	140	45	1301	175	5	160	86	250	250	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	142	1329	76	47	1369	103	5	168	91	263	263	147
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	2218	989	190	1888	1032	201	217	184	320	516	437
Arrive On Green	0.02	0.21	0.21	0.53	0.53	0.53	0.12	0.12	0.12	0.12	0.28	0.28
Sat Flow, veh/h	1781	3554	1585	412	3554	1585	1116	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	142	1329	76	47	1369	103	5	168	91	263	263	147
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	412	1777	1585	1116	1870	1585	1781	1870	1585
Q Serve(g_s), s	3.4	33.9	3.9	9.2	29.4	2.4	0.4	8.7	5.4	12.0	11.8	7.4
Cycle Q Clear(g_c), s	3.4	33.9	3.9	33.8	29.4	2.4	0.4	8.7	5.4	12.0	11.8	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	2218	989	190	1888	1032	201	217	184	320	516	437
V/C Ratio(X)	0.54	0.60	0.08	0.25	0.73	0.10	0.02	0.78	0.50	0.82	0.51	0.34
Avail Cap(c_a), veh/h	291	2218	989	190	1888	1032	329	430	365	320	729	618
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	28.4	16.5	28.8	17.9	6.5	39.3	42.9	41.5	33.9	30.5	28.9
Incr Delay (d2), s/veh	1.3	0.9	0.1	3.1	2.5	0.2	0.0	5.9	2.1	15.5	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	16.0	1.2	1.0	10.7	0.7	0.1	4.2	2.1	6.6	5.2	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.3	29.3	16.6	31.9	20.3	6.7	39.3	48.8	43.5	49.4	31.3	29.4
LnGrp LOS	B	C	B	C	C	A	D	D	D	D	C	C
Approach Vol, veh/h		1547			1519			264			673	
Approach Delay, s/veh		27.7			19.8			46.8			37.9	
Approach LOS		C			B			D			D	

Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	16.0	16.6		67.4		32.6	9.3	58.1				
Change Period (Y+Rc), s	4.0	5.0		5.0		5.0	4.0	5.0				
Max Green Setting (Gmax), s	12.0	23.0		51.0		39.0	7.0	40.0				
Max Q Clear Time (g_c+I1), s	14.0	10.7		35.9		13.8	5.4	35.8				
Green Ext Time (p_c), s	0.0	0.9		7.7		1.8	0.0	3.1				

Intersection Summary		
HCM 6th Ctrl Delay		27.7
HCM 6th LOS		C

HCM 6th Signalized Intersection Summary
3: SH 402 & S Boise Ave

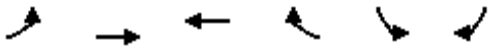
08/14/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	304	1299	1236	231	181	301
Future Volume (veh/h)	304	1299	1236	231	181	301
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1826	1826	1856	1856	1885	1885
Adj Flow Rate, veh/h	313	1339	1274	167	187	294
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	3	3	1	1
Cap, veh/h	357	2484	2010	1186	330	447
Arrive On Green	0.10	0.72	0.57	0.57	0.18	0.18
Sat Flow, veh/h	1739	3561	3618	1572	1795	1598
Grp Volume(v), veh/h	313	1339	1274	167	187	294
Grp Sat Flow(s),veh/h/ln	1739	1735	1763	1572	1795	1598
Q Serve(g_s), s	6.9	17.8	24.3	2.9	9.5	16.2
Cycle Q Clear(g_c), s	6.9	17.8	24.3	2.9	9.5	16.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	357	2484	2010	1186	330	447
V/C Ratio(X)	0.88	0.54	0.63	0.14	0.57	0.66
Avail Cap(c_a), veh/h	555	2484	2010	1186	341	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.75	0.75	1.00	1.00
Uniform Delay (d), s/veh	17.3	6.6	14.5	3.4	37.2	31.8
Incr Delay (d2), s/veh	9.7	0.8	1.2	0.2	2.1	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	4.5	8.2	1.5	4.3	6.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.9	7.4	15.6	3.6	39.2	35.1
LnGrp LOS	C	A	B	A	D	D
Approach Vol, veh/h		1652	1441		481	
Approach Delay, s/veh		11.1	14.2		36.7	
Approach LOS		B	B		D	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	14.6	62.0				76.6	23.4
Change Period (Y+Rc), s	5.0	5.0				5.0	5.0
Max Green Setting (Gmax), s	21.0	45.0				71.0	19.0
Max Q Clear Time (g_c+I1), s	8.9	26.3				19.8	18.2
Green Ext Time (p_c), s	0.7	8.6				11.8	0.2

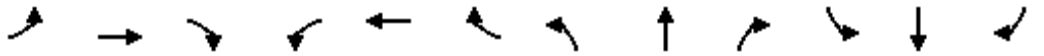
Intersection Summary	
HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	200	1310	1184	235	151	163
Future Volume (veh/h)	200	1310	1184	235	151	163
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1826	1826
Adj Flow Rate, veh/h	215	1409	1273	192	162	66
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	4	4	5	5
Cap, veh/h	408	2559	2114	1224	313	279
Arrive On Green	0.07	0.72	1.00	1.00	0.18	0.18
Sat Flow, veh/h	1781	3647	3589	1560	1739	1547
Grp Volume(v), veh/h	215	1409	1273	192	162	66
Grp Sat Flow(s),veh/h/ln	1781	1777	1749	1560	1739	1547
Q Serve(g_s), s	4.3	18.4	0.0	0.0	8.4	3.7
Cycle Q Clear(g_c), s	4.3	18.4	0.0	0.0	8.4	3.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	408	2559	2114	1224	313	279
V/C Ratio(X)	0.53	0.55	0.60	0.16	0.52	0.24
Avail Cap(c_a), veh/h	540	2559	2114	1224	313	279
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.67	0.67	1.00	1.00
Uniform Delay (d), s/veh	5.5	6.5	0.0	0.0	37.1	35.1
Incr Delay (d2), s/veh	0.9	0.7	0.3	0.0	6.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.6	0.1	0.0	4.0	3.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.4	7.2	0.3	0.0	43.1	37.1
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1624	1465		228	
Approach Delay, s/veh		7.1	0.3		41.4	
Approach LOS		A	A		D	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			77.0		23.0	11.6	65.4
Change Period (Y+Rc), s			5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s			72.0		18.0	14.0	53.0
Max Q Clear Time (g_c+I1), s			20.4		10.4	6.3	2.0
Green Ext Time (p_c), s			12.8		0.4	0.3	12.0

Intersection Summary	
HCM 6th Ctrl Delay	6.4
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1212	80	56	1298	226	5	180	54	217	200	160
Future Volume (veh/h)	160	1212	80	56	1298	226	5	180	54	217	200	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	1276	45	59	1366	129	5	189	1	228	211	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	256	1889	843	225	1807	806	272	539	457	320	539	557
Arrive On Green	0.02	0.18	0.18	0.04	0.51	0.51	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1014	1870	1585	1193	1870	1585
Grp Volume(v), veh/h	168	1276	45	59	1366	129	5	189	1	228	211	157
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1014	1870	1585	1193	1870	1585
Q Serve(g_s), s	4.3	33.6	2.4	1.5	30.7	4.4	0.4	8.0	0.0	18.7	9.1	7.1
Cycle Q Clear(g_c), s	4.3	33.6	2.4	1.5	30.7	4.4	9.5	8.0	0.0	26.7	9.1	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	256	1889	843	225	1807	806	272	539	457	320	539	557
V/C Ratio(X)	0.66	0.68	0.05	0.26	0.76	0.16	0.02	0.35	0.00	0.71	0.39	0.28
Avail Cap(c_a), veh/h	303	1889	843	257	1807	806	274	542	460	323	542	561
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	33.2	20.3	16.2	19.6	13.2	32.4	28.2	25.4	38.8	28.6	23.3
Incr Delay (d2), s/veh	3.2	1.6	0.1	0.6	3.0	0.4	0.0	0.4	0.0	7.1	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	16.1	0.8	0.6	11.5	1.4	0.1	3.5	0.0	5.8	3.9	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	34.8	20.4	16.8	22.6	13.6	32.4	28.6	25.4	45.9	29.0	23.6
LnGrp LOS	C	C	C	B	C	B	C	C	C	D	C	C
Approach Vol, veh/h		1489			1554			195			596	
Approach Delay, s/veh		33.0			21.7			28.7			34.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.8	8.0	58.2		33.8	10.4	55.8				
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0				
Max Green Setting (Gmax), s		29.0	5.8	51.2		29.0	9.0	48.0				
Max Q Clear Time (g_c+I1), s		11.5	3.5	35.6		28.7	6.3	32.7				
Green Ext Time (p_c), s		0.8	0.0	7.4		0.1	0.1	8.1				

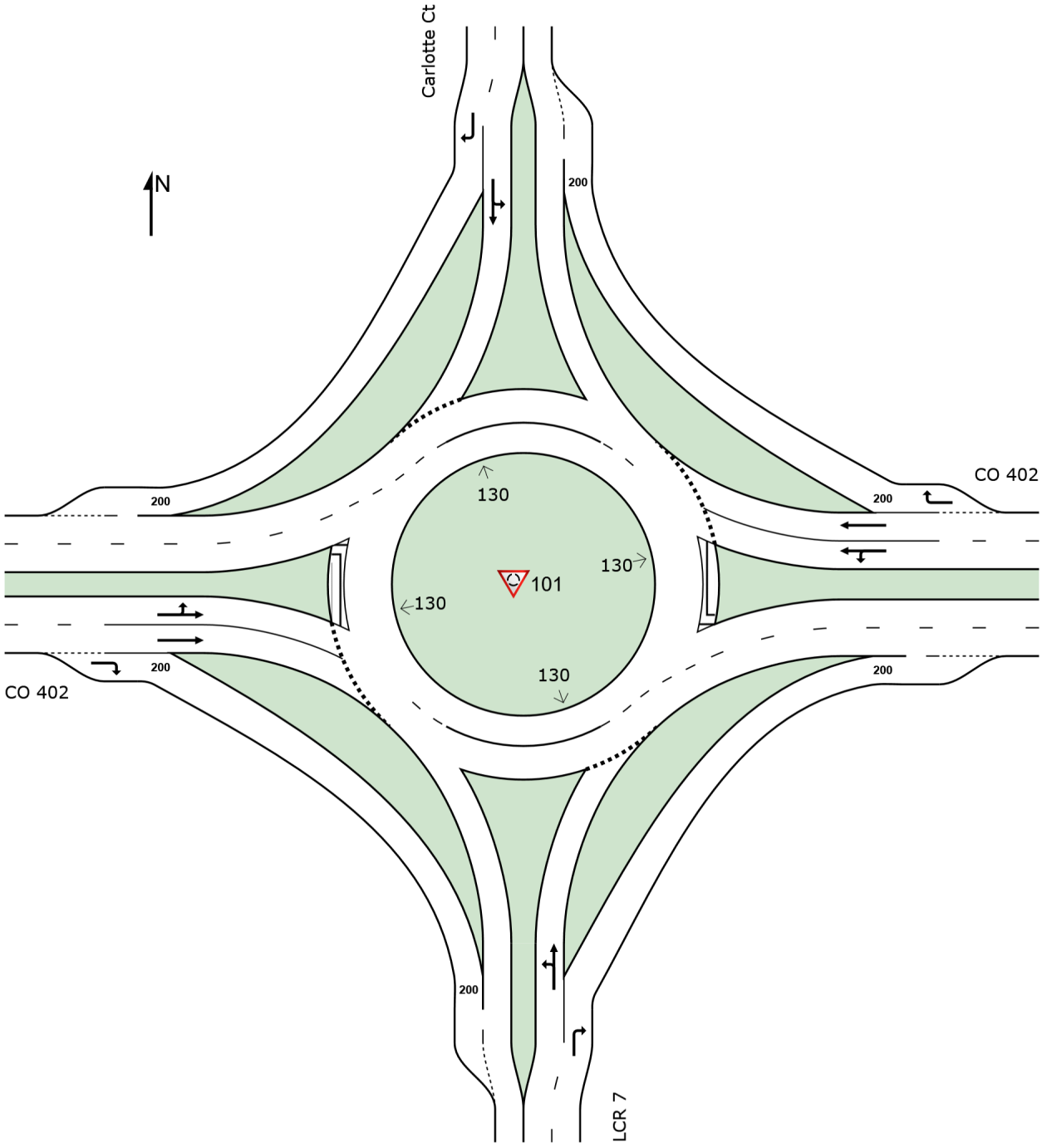
Intersection Summary	
HCM 6th Ctrl Delay	28.4
HCM 6th LOS	C

SITE LAYOUT

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

AM 2045 Plus Site - Site Access 3/4ths Mvmt
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site - Site Access 3/4ths Mvmt
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: LCR 7															
3	L2	All MCs	192	3.0	192	3.0	0.661	29.3	LOS C	4.2	108.7	0.92	1.02	1.32	27.2
8	T1	All MCs	56	3.0	56	3.0	0.661	29.3	LOS C	4.2	108.7	0.92	1.02	1.32	18.0
18	R2	All MCs	268	3.0	268	3.0	0.165	7.9	LOS A	0.0	0.0	0.00	0.00	0.00	38.0
Approach			516	3.0	516	3.0	0.661	18.2	LOS B	4.2	108.7	0.44	0.49	0.64	29.4
East: CO 402															
1	L2	All MCs	356	3.0	356	3.0	0.957	40.5	LOS D	30.8	787.4	1.00	1.52	2.74	19.3
6	T1	All MCs	1407	3.0	1407	3.0	0.957	38.8	LOS D	32.9	841.7	1.00	1.52	2.72	27.2
16	R2	All MCs	46	3.0	46	3.0	0.028	2.7	LOS A	0.0	0.0	0.00	0.00	0.00	41.6
Approach			1809	3.0	1809	3.0	0.957	38.2	LOS D	32.9	841.7	0.97	1.48	2.66	25.9
North: Carlotte Ct															
7	L2	All MCs	214	3.0	214	3.0	0.881	59.0	LOS E	7.4	190.0	0.97	1.39	1.92	14.4
4	T1	All MCs	68	3.0	68	3.0	0.881	59.0	LOS E	7.4	190.0	0.97	1.39	1.92	13.5
14	R2	All MCs	119	3.0	119	3.0	0.073	7.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach			401	3.0	401	3.0	0.881	43.6	LOS D	7.4	190.0	0.69	0.98	1.35	17.0
West: CO 402															
5	L2	All MCs	208	3.0	208	3.0	1.007	57.3	LOS F	30.9	790.6	1.00	1.71	3.30	19.9
2	T1	All MCs	1314	3.0	1314	3.0	1.007	54.8	LOS F	34.3	878.1	1.00	1.73	3.31	23.5
12	R2	All MCs	246	3.0	246	3.0	0.151	4.4	LOS A	0.0	0.0	0.00	0.00	0.00	45.7
Approach			1768	3.0	1768	3.0	1.007	48.1	LOS D	34.3	878.1	0.86	1.48	2.85	24.6
All Vehicles			4495	3.0	4495	3.0	1.007	40.3	LOS D	34.3	878.1	0.84	1.32	2.38	24.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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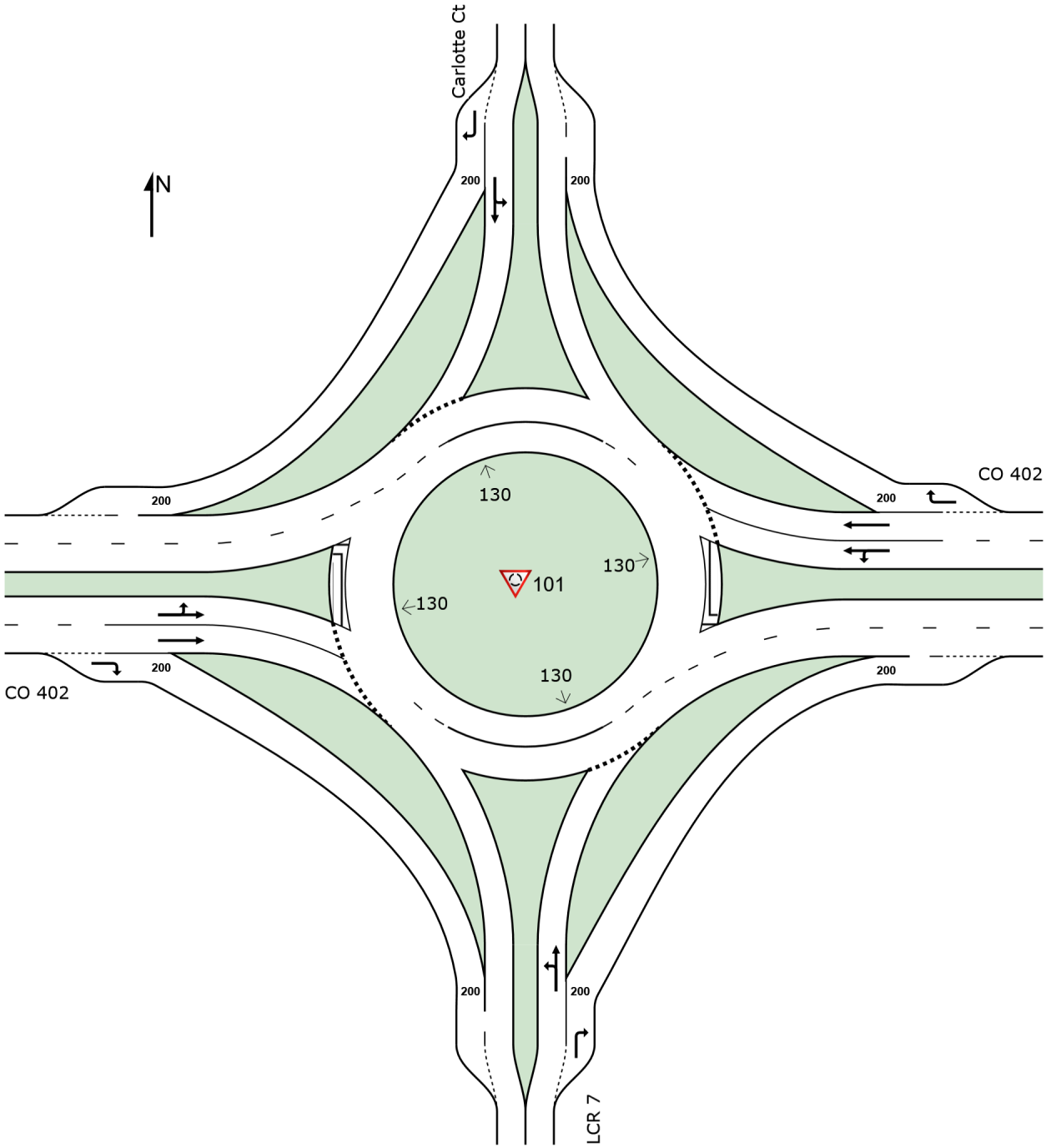
SITE LAYOUT

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

PM 2045 Plus Site - Site Access 3/4ths Mvmt
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site - Site Access 3/4ths Mvmt
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: LCR 7															
3	L2	All MCs	243	3.0	243	3.0	0.733	33.2	LOS C	5.2	133.8	0.93	1.08	1.48	26.0
8	T1	All MCs	48	3.0	48	3.0	0.733	33.2	LOS C	5.2	133.8	0.93	1.08	1.48	17.2
18	R2	All MCs	295	3.0	295	3.0	0.181	7.5	LOS A	0.0	0.0	0.00	0.00	0.00	38.0
Approach			586	3.0	586	3.0	0.733	20.3	LOS C	5.2	133.8	0.46	0.53	0.73	28.6
East: CO 402															
1	L2	All MCs	287	3.0	287	3.0	0.843	24.4	LOS C	19.0	486.8	1.00	1.10	1.91	23.8
6	T1	All MCs	1316	3.0	1316	3.0	0.843	23.3	LOS C	19.9	508.4	1.00	1.08	1.88	32.4
16	R2	All MCs	25	3.0	25	3.0	0.015	2.4	LOS A	0.0	0.0	0.00	0.00	0.00	41.6
Approach			1628	3.0	1628	3.0	0.843	23.2	LOS C	19.9	508.4	0.98	1.07	1.86	31.1
North: Carlotte Ct															
7	L2	All MCs	239	3.0	239	3.0	0.868	53.9	LOS E	7.4	190.2	0.97	1.38	1.90	15.1
4	T1	All MCs	61	3.0	61	3.0	0.868	53.9	LOS E	7.4	190.2	0.97	1.38	1.90	14.1
14	R2	All MCs	136	3.0	136	3.0	0.084	6.2	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach			436	3.0	436	3.0	0.868	39.1	LOS D	7.4	190.2	0.67	0.95	1.31	17.7
West: CO 402															
5	L2	All MCs	108	3.0	108	3.0	0.869	30.7	LOS C	17.5	449.2	1.00	1.23	2.17	25.4
2	T1	All MCs	1299	3.0	1299	3.0	0.869	29.0	LOS C	18.9	484.1	1.00	1.23	2.14	30.6
12	R2	All MCs	217	3.0	217	3.0	0.134	3.9	LOS A	0.0	0.0	0.00	0.00	0.00	45.7
Approach			1624	3.0	1624	3.0	0.869	25.8	LOS C	18.9	484.1	0.87	1.07	1.86	31.5
All Vehicles			4274	3.0	4274	3.0	0.869	25.4	LOS C	19.9	508.4	0.84	0.98	1.65	29.2

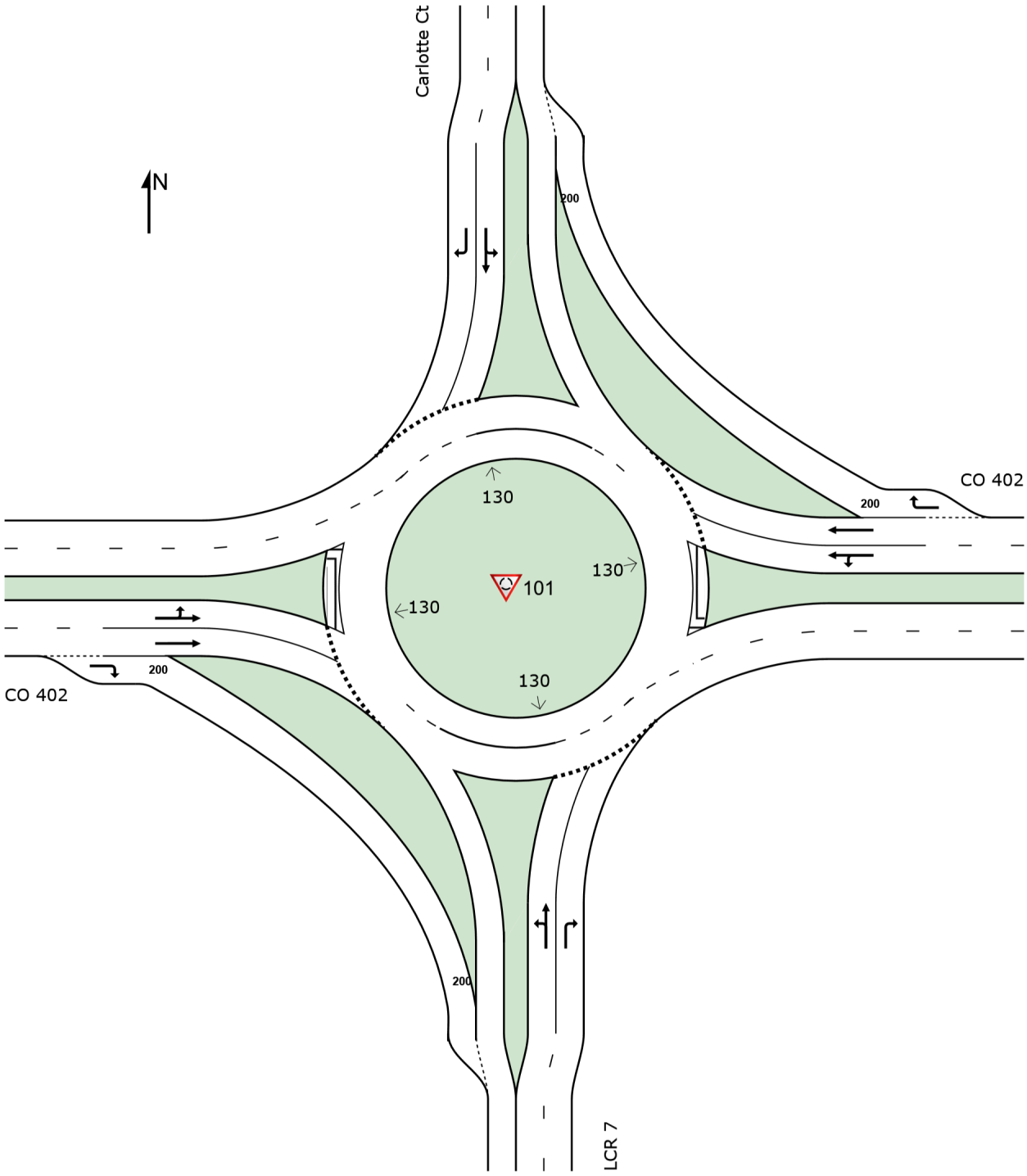
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

AM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: ALFRED BENESCH & COMPANY | Licence: PLUS / 1PC | Created: Wednesday, August 14, 2024 3:41:10 PM
Project: Y:\Denver\152300S\00152379.00_West_Ridge_Study\Eng_Docs\Traffic\Models\SIDRA\RIRO PnR\2045\AM_2045 Plus Site_Roundabouts.sip9

MOVEMENT SUMMARY

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site
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: LCR 7															
3	L2	All MCs	163	3.0	163	3.0	0.673	34.0	LOS C	4.1	103.9	0.91	1.03	1.34	25.9
8	T1	All MCs	56	3.0	56	3.0	0.673	34.0	LOS C	4.1	103.9	0.91	1.03	1.34	17.1
18	R2	All MCs	268	3.0	268	3.0	0.673	28.8	LOS C	4.5	114.1	0.91	1.02	1.33	22.8
Approach			487	3.0	487	3.0	0.673	31.1	LOS C	4.5	114.1	0.91	1.02	1.33	23.4
East: CO 402															
1	L2	All MCs	337	3.0	337	3.0	0.921	33.7	LOS C	26.8	685.3	1.00	1.36	2.42	21.0
6	T1	All MCs	1407	3.0	1407	3.0	0.921	32.2	LOS C	28.3	725.3	1.00	1.36	2.39	29.2
16	R2	All MCs	46	3.0	46	3.0	0.028	2.7	LOS A	0.0	0.0	0.00	0.00	0.00	41.6
Approach			1790	3.0	1790	3.0	0.921	31.7	LOS C	28.3	725.3	0.97	1.32	2.33	27.9
North: Carlotte Ct															
7	L2	All MCs	34	3.0	34	3.0	0.351	23.6	LOS C	1.6	41.4	0.88	0.92	0.98	21.1
4	T1	All MCs	54	3.0	54	3.0	0.351	23.6	LOS C	1.6	41.4	0.88	0.92	0.98	20.0
14	R2	All MCs	119	3.0	119	3.0	0.360	18.7	LOS B	1.9	47.5	0.88	0.91	0.97	29.1
Approach			207	3.0	207	3.0	0.360	20.7	LOS C	1.9	47.5	0.88	0.91	0.98	25.6
West: CO 402															
5	L2	All MCs	208	3.0	208	3.0	0.834	24.4	LOS C	17.6	450.2	1.00	1.09	1.88	26.9
2	T1	All MCs	1314	3.0	1314	3.0	0.834	23.3	LOS C	18.4	472.2	1.00	1.08	1.85	32.7
12	R2	All MCs	246	3.0	246	3.0	0.151	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	45.7
Approach			1768	3.0	1768	3.0	0.834	20.8	LOS C	18.4	472.2	0.86	0.93	1.60	33.1
All Vehicles			4252	3.0	4252	3.0	0.921	26.6	LOS C	28.3	725.3	0.92	1.10	1.85	29.4

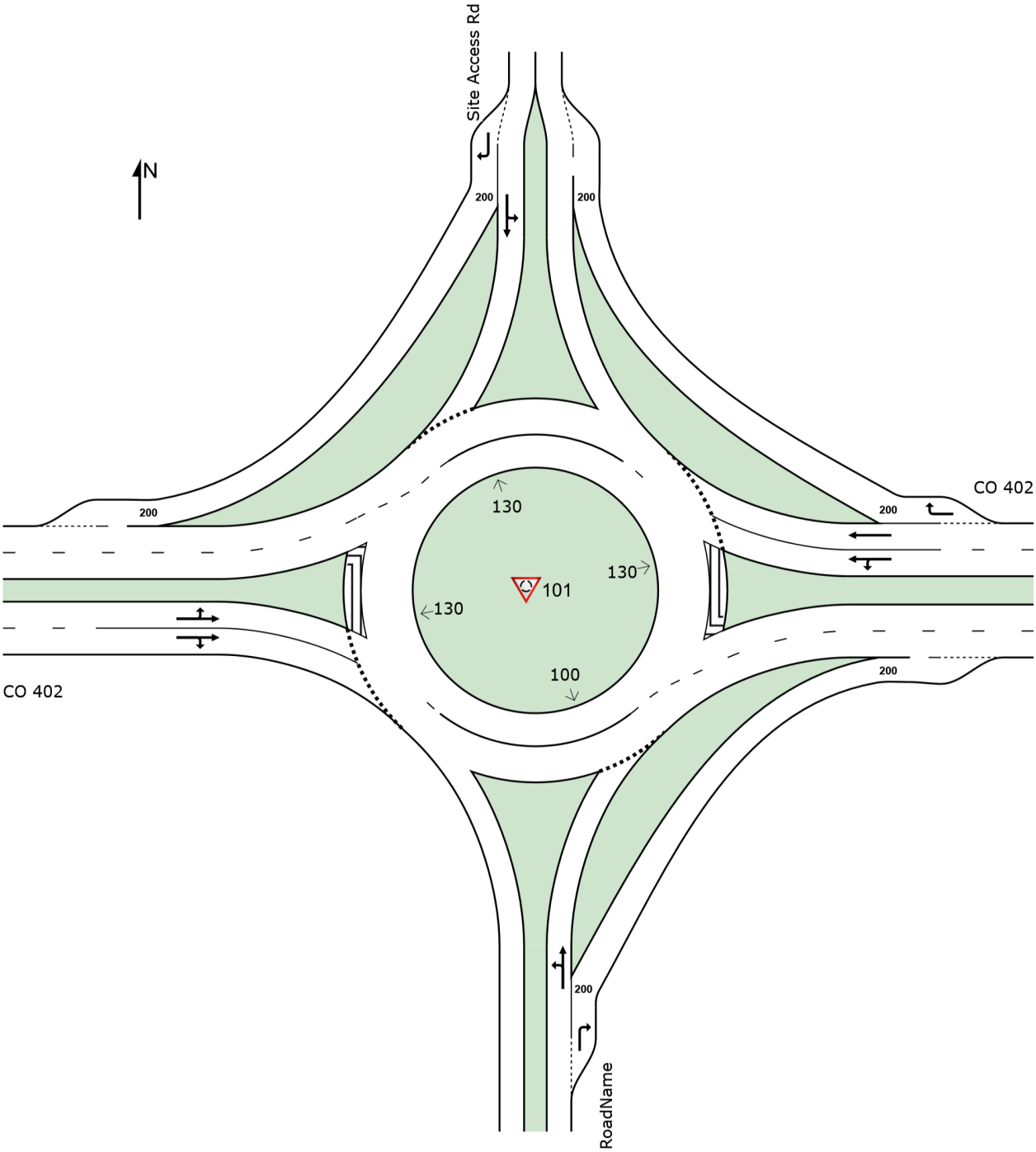
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

AM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site
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: RoadName															
3	L2	All MCs	41	3.0	41	3.0	0.228	17.1	LOS B	1.1	28.1	0.87	0.85	0.87	26.1
8	T1	All MCs	25	3.0	25	3.0	0.228	17.1	LOS B	1.1	28.1	0.87	0.85	0.87	26.0
18	R2	All MCs	116	3.0	116	3.0	0.072	6.1	LOS A	0.0	0.0	0.00	0.00	0.00	36.2
Approach			183	3.0	183	3.0	0.228	10.1	LOS B	1.1	28.1	0.31	0.31	0.31	31.7
East: CO 402															
1	L2	All MCs	152	3.0	152	3.0	0.912	30.1	LOS C	30.1	769.6	1.00	1.28	2.14	24.0
6	T1	All MCs	1738	3.0	1738	3.0	0.912	29.1	LOS C	31.2	797.7	1.00	1.25	2.11	24.8
16	R2	All MCs	347	3.0	347	3.0	0.213	4.4	LOS A	0.0	0.0	0.00	0.00	0.00	41.6
Approach			2237	3.0	2237	3.0	0.912	25.3	LOS C	31.2	797.7	0.84	1.06	1.78	26.2
North: Site Access Rd															
7	L2	All MCs	194	3.0	194	3.0	0.714	37.9	LOS D	4.7	119.8	0.94	1.13	1.38	17.7
4	T1	All MCs	34	3.0	34	3.0	0.714	37.9	LOS D	4.7	119.8	0.94	1.13	1.38	18.9
14	R2	All MCs	131	3.0	131	3.0	0.080	8.1	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach			358	3.0	358	3.0	0.714	27.0	LOS C	4.7	119.8	0.60	0.72	0.88	19.8
West: CO 402															
5	L2	All MCs	234	3.0	234	3.0	0.876	27.0	LOS C	22.8	582.5	1.00	1.18	2.06	20.3
2	T1	All MCs	1435	3.0	1435	3.0	0.876	26.0	LOS C	23.8	608.4	1.00	1.17	2.04	25.8
12	R2	All MCs	47	3.0	47	3.0	0.876	25.2	LOS C	23.8	608.4	1.00	1.17	2.02	26.0
Approach			1716	3.0	1716	3.0	0.876	26.1	LOS C	23.8	608.4	1.00	1.17	2.04	24.9
All Vehicles			4494	3.0	4494	3.0	0.912	25.1	LOS C	31.2	797.7	0.86	1.05	1.75	25.3

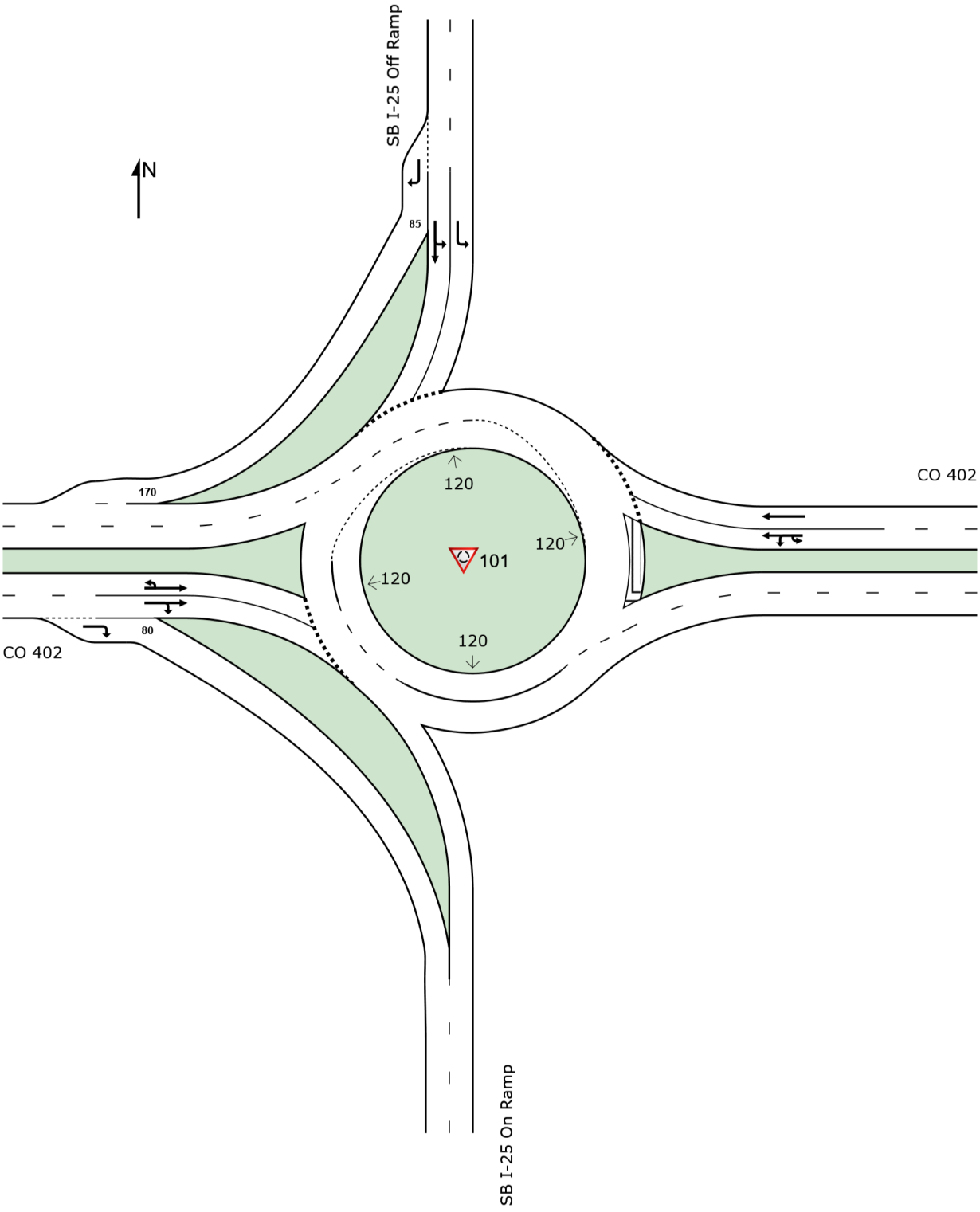
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

AM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site
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: CO 402															
1u	U	All MCs	21	9.0	21	9.0	0.644	6.3	LOS A	9.5	253.5	0.08	0.01	0.08	16.8
1	L2	All MCs	353	9.0	353	9.0	0.644	6.3	LOS A	9.5	253.5	0.08	0.01	0.08	32.5
6	T1	All MCs	1359	9.0	1359	9.0	0.644	23.5	LOS C	9.5	253.5	0.08	0.01	0.08	22.2
Approach			1733	9.0	1733	9.0	0.644	19.8	LOS B	9.5	253.5	0.08	0.01	0.08	25.0
North: SB I-25 Off Ramp															
7	L2	All MCs	117	9.0	117	9.0	0.100	7.2	LOS A	0.4	11.5	0.71	0.68	0.71	28.3
4	T1	All MCs	2	9.0	2	9.0	0.100	6.0	LOS A	0.4	11.5	0.71	0.66	0.71	38.8
14	R2	All MCs	728	9.0	728	9.0	0.473	30.7	LOS C	0.0	0.0	0.00	0.00	0.00	42.2
Approach			848	9.0	848	9.0	0.473	27.4	LOS C	0.4	11.5	0.10	0.10	0.10	39.4
West: CO 402															
5u	U	All MCs	2	8.0	2	8.0	0.537	11.5	LOS B	4.2	110.9	0.69	0.63	0.94	17.7
2	T1	All MCs	1004	8.0	1004	8.0	0.537	10.8	LOS B	4.3	113.3	0.68	0.61	0.90	21.3
12	R2	All MCs	583	8.0	583	8.0	0.373	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.1
Approach			1589	8.0	1589	8.0	0.537	6.8	LOS A	4.3	113.3	0.43	0.38	0.57	29.0
All Vehicles			4170	8.6	4170	8.6	0.644	16.4	LOS B	9.5	253.5	0.22	0.17	0.27	29.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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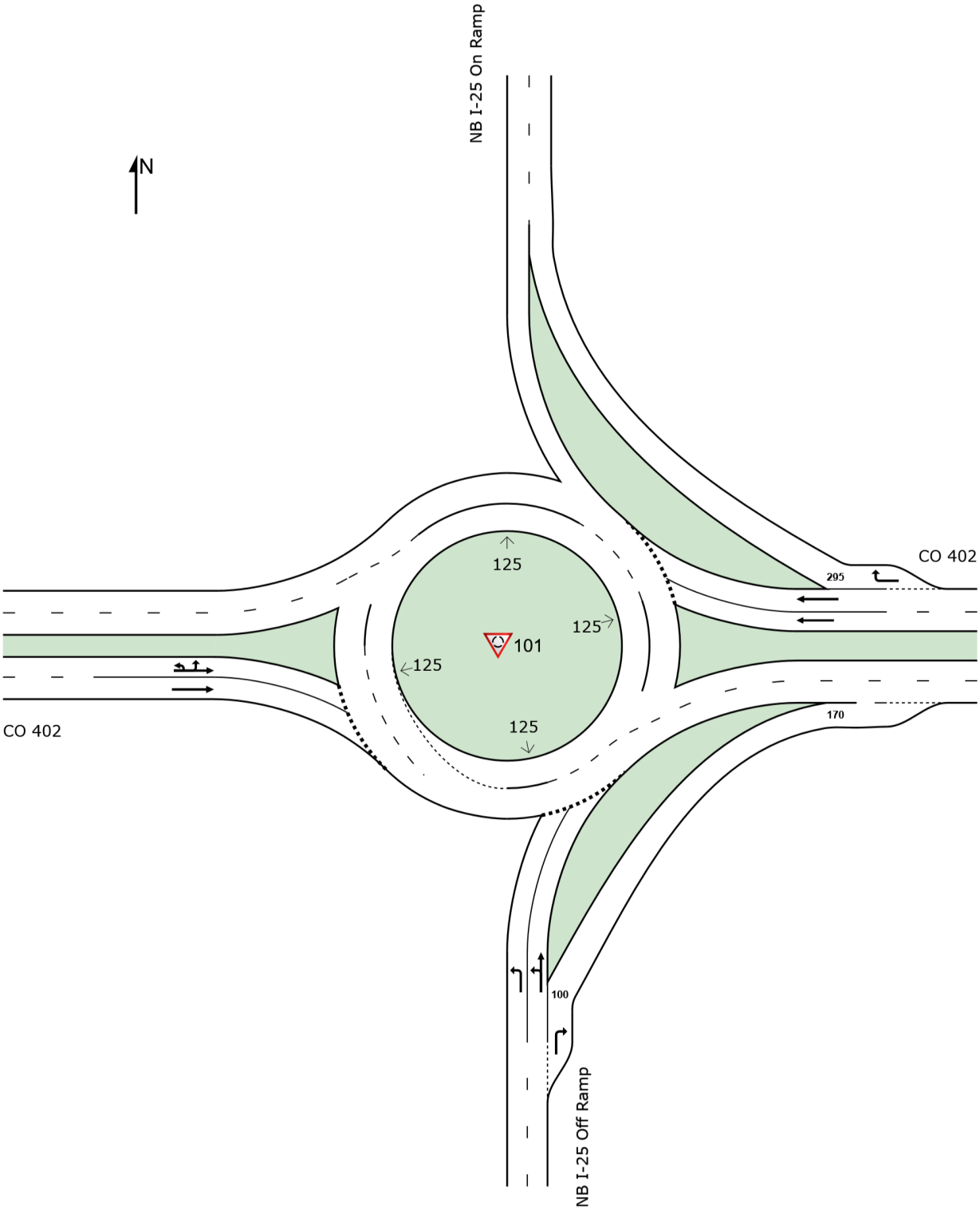
SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

AM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site
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: NB I-25 Off Ramp															
3	L2	All MCs	568	8.0	568	8.0	0.389	9.7	LOS A	1.9	51.6	0.69	0.68	0.86	26.1
8	T1	All MCs	17	8.0	17	8.0	0.389	8.5	LOS A	1.9	51.6	0.68	0.66	0.83	35.8
18	R2	All MCs	188	8.0	188	8.0	0.121	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	41.2
Approach			773	8.0	773	8.0	0.389	8.7	LOS A	1.9	51.6	0.52	0.52	0.65	28.9
East: CO 402															
6	T1	All MCs	1211	8.0	1211	8.0	1.011	63.3	LOS F	25.0	665.3	1.00	2.39	3.77	9.1
16	R2	All MCs	317	8.0	317	8.0	0.204	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.8
Approach			1528	8.0	1528	8.0	1.011	50.2	LOS E	25.0	665.3	0.79	1.90	2.98	11.6
West: CO 402															
5u	U	All MCs	2	8.0	2	8.0	0.492	5.4	LOS A	0.0	0.0	0.00	0.00	0.00	19.6
5	L2	All MCs	605	8.0	605	8.0	0.492	5.4	LOS A	0.0	0.0	0.00	0.00	0.00	33.4
2	T1	All MCs	589	8.0	589	8.0	0.471	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	25.0
Approach			1195	8.0	1195	8.0	0.492	5.3	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
All Vehicles			3497	8.0	3497	8.0	1.011	25.7	LOS C	25.0	665.3	0.46	0.94	1.45	18.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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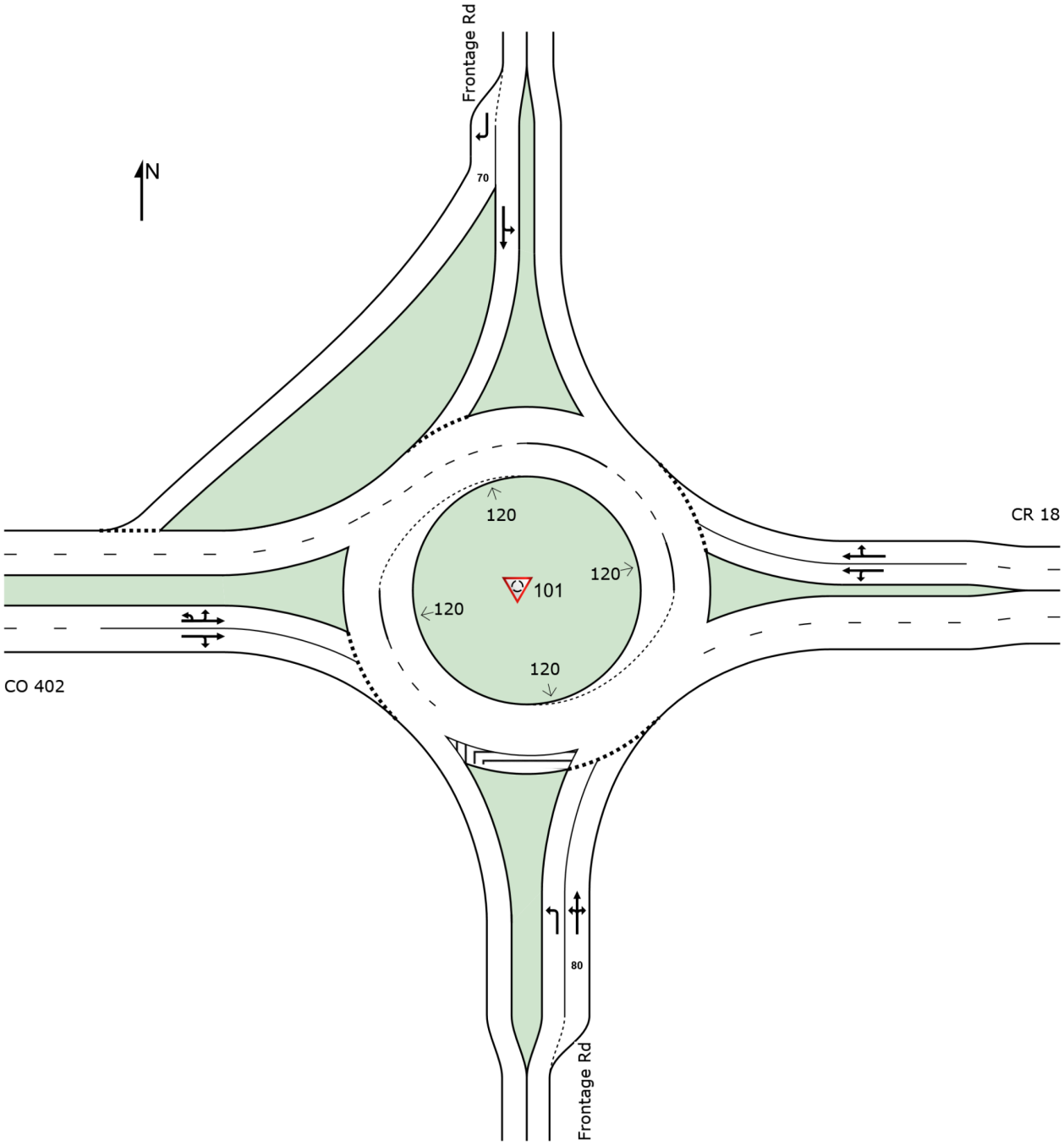
SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

AM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: ALFRED BENESCH & COMPANY | Licence: PLUS / 1PC | Created: Wednesday, August 14, 2024 3:39:25 PM
Project: Y:\Denver\152300S\00152379.00_West_Ridge_Study\Eng_Docs\Traffic\Models\SIDRA\RIRO PnR\2045\AM_2045 Plus Site_Roundabouts.sip9

MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site
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: Frontage Rd															
3	L2	All MCs	195	9.0	195	9.0	0.241	9.2	LOS A	1.6	41.9	0.81	0.65	0.81	29.8
8	T1	All MCs	84	9.0	84	9.0	0.241	7.9	LOS A	1.6	41.9	0.81	0.63	0.81	32.6
18	R2	All MCs	23	9.0	23	9.0	0.241	7.9	LOS A	1.6	41.9	0.81	0.63	0.81	37.2
Approach			302	9.0	302	9.0	0.241	8.7	LOS A	1.6	41.9	0.81	0.64	0.81	31.3
East: CR 18															
1	L2	All MCs	25	7.0	25	7.0	0.690	17.6	LOS B	7.9	208.0	0.83	0.86	1.39	35.6
6	T1	All MCs	953	7.0	953	7.0	0.690	17.4	LOS B	7.9	209.6	0.83	0.86	1.38	34.9
16	R2	All MCs	91	7.0	91	7.0	0.690	17.2	LOS B	7.9	209.6	0.83	0.85	1.38	36.1
Approach			1069	7.0	1069	7.0	0.690	17.4	LOS B	7.9	209.6	0.83	0.86	1.38	35.1
North: Frontage Rd															
7	L2	All MCs	68	4.0	68	4.0	0.245	9.9	LOS A	1.1	29.5	0.76	0.70	0.76	37.1
4	T1	All MCs	66	4.0	66	4.0	0.245	9.9	LOS A	1.1	29.5	0.76	0.70	0.76	32.1
14	R2	All MCs	476	4.0	476	4.0	0.851	36.2	LOS D	9.4	242.3	0.95	1.33	2.07	22.4
Approach			610	4.0	610	4.0	0.851	30.4	LOS C	9.4	242.3	0.91	1.19	1.79	25.7
West: CO 402															
5u	U	All MCs	6	9.0	6	9.0	0.369	7.2	LOS A	2.4	63.1	0.44	0.25	0.44	20.2
5	L2	All MCs	199	9.0	199	9.0	0.369	7.2	LOS A	2.4	63.1	0.44	0.25	0.44	28.4
2	T1	All MCs	495	9.0	495	9.0	0.369	7.2	LOS A	2.4	63.1	0.44	0.25	0.44	39.0
12	R2	All MCs	68	9.0	68	9.0	0.369	7.2	LOS A	2.3	62.9	0.44	0.25	0.44	31.3
Approach			768	9.0	768	9.0	0.369	7.2	LOS A	2.4	63.1	0.44	0.25	0.44	35.0
All Vehicles			2750	7.1	2750	7.1	0.851	16.5	LOS B	9.4	242.3	0.74	0.74	1.15	32.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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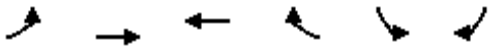
APPENDIX J

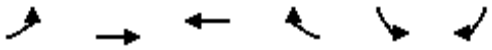
Future Year Total Traffic Conditions Capacity and Queuing Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	265	967	1018	120	168	171
Future Volume (veh/h)	265	967	1018	120	168	171
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1796	1796
Adj Flow Rate, veh/h	291	1063	1119	95	185	165
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	4	4	4	4	7	7
Cap, veh/h	319	1474	1184	1201	217	377
Arrive On Green	0.12	0.80	0.64	0.64	0.13	0.13
Sat Flow, veh/h	1753	1841	1841	1560	1711	1522
Grp Volume(v), veh/h	291	1063	1119	95	185	165
Grp Sat Flow(s),veh/h/ln	1753	1841	1841	1560	1711	1522
Q Serve(g_s), s	11.3	30.0	60.9	1.6	11.6	10.1
Cycle Q Clear(g_c), s	11.3	30.0	60.9	1.6	11.6	10.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	319	1474	1184	1201	217	377
V/C Ratio(X)	0.91	0.72	0.95	0.08	0.85	0.44
Avail Cap(c_a), veh/h	329	1474	1184	1201	249	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.47	0.47	1.00	1.00
Uniform Delay (d), s/veh	36.0	5.2	17.9	3.1	47.0	34.9
Incr Delay (d2), s/veh	28.3	3.1	9.0	0.1	21.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	6.5	22.7	0.7	6.2	3.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	64.3	8.3	26.9	3.2	68.8	35.7
LnGrp LOS	E	A	C	A	E	D
Approach Vol, veh/h		1354	1214		350	
Approach Delay, s/veh		20.3	25.1		53.2	
Approach LOS		C	C		D	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	17.3	74.7				92.1	17.9
Change Period (Y+Rc), s	4.0	4.0				4.0	4.0
Max Green Setting (Gmax), s	14.0	68.0				86.0	16.0
Max Q Clear Time (g_c+I1), s	13.3	62.9				32.0	13.6
Green Ext Time (p_c), s	0.1	3.3				10.1	0.3

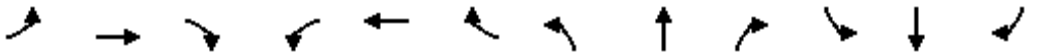
Intersection Summary	
HCM 6th Ctrl Delay	26.2
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	181	1003	927	176	131	131
Future Volume (veh/h)	181	1003	927	176	131	131
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1752	1752
Adj Flow Rate, veh/h	199	1102	1019	167	144	57
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	6	6	6	6	10	10
Cap, veh/h	265	1367	1203	1285	288	336
Arrive On Green	0.05	0.75	0.66	0.66	0.17	0.17
Sat Flow, veh/h	1725	1811	1811	1535	1668	1485
Grp Volume(v), veh/h	199	1102	1019	167	144	57
Grp Sat Flow(s),veh/h/ln	1725	1811	1811	1535	1668	1485
Q Serve(g_s), s	3.8	42.0	47.5	2.2	8.6	3.4
Cycle Q Clear(g_c), s	3.8	42.0	47.5	2.2	8.6	3.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	265	1367	1203	1285	288	336
V/C Ratio(X)	0.75	0.81	0.85	0.13	0.50	0.17
Avail Cap(c_a), veh/h	313	1367	1203	1285	288	336
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.25	0.25	1.00	1.00
Uniform Delay (d), s/veh	23.1	8.5	14.2	1.6	41.2	34.2
Incr Delay (d2), s/veh	5.0	3.1	2.0	0.1	6.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	11.0	15.2	1.2	3.9	3.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.1	11.6	16.2	1.7	47.3	35.3
LnGrp LOS	C	B	B	A	D	D
Approach Vol, veh/h		1301	1186		201	
Approach Delay, s/veh		14.1	14.1		43.9	
Approach LOS		B	B		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	87.0	23.0	9.9	77.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	83.0	19.0	9.0	70.0
Max Q Clear Time (g_c+I1), s	44.0	10.6	5.8	49.5
Green Ext Time (p_c), s	10.5	0.3	0.2	7.9

Intersection Summary	
HCM 6th Ctrl Delay	16.4
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	938	40	31	984	152	5	110	62	189	135	110
Future Volume (veh/h)	110	938	40	31	984	152	5	110	62	189	135	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	129	1104	29	36	1158	107	6	129	24	222	159	63
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	1241	1052	182	1197	1014	165	160	164	261	410	412
Arrive On Green	0.04	0.66	0.66	0.02	0.64	0.64	0.09	0.09	0.09	0.10	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1227	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	129	1104	29	36	1158	107	6	129	24	222	159	63
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1227	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.9	58.2	0.8	0.8	70.3	3.1	0.5	8.1	1.7	12.0	8.7	3.7
Cycle Q Clear(g_c), s	2.9	58.2	0.8	0.8	70.3	3.1	0.5	8.1	1.7	12.0	8.7	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	160	1241	1052	182	1197	1014	165	160	164	261	410	412
V/C Ratio(X)	0.81	0.89	0.03	0.20	0.97	0.11	0.04	0.80	0.15	0.85	0.39	0.15
Avail Cap(c_a), veh/h	175	1241	1052	225	1197	1014	193	203	199	261	452	448
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.53	0.53	0.53	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	16.6	6.9	20.9	20.4	8.3	50.4	53.9	49.0	45.2	40.0	34.2
Incr Delay (d2), s/veh	12.8	5.6	0.0	0.5	19.3	0.2	0.1	16.7	0.4	22.6	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	21.3	0.2	0.5	30.8	1.0	0.2	4.5	0.6	7.5	4.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	22.2	6.9	21.4	39.8	8.6	50.5	70.6	49.4	67.8	40.6	34.4
LnGrp LOS	D	C	A	C	D	A	D	E	D	E	D	C
Approach Vol, veh/h		1262			1301			159			444	
Approach Delay, s/veh		24.0			36.7			66.6			53.3	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	16.0	14.3	6.1	83.6		30.3	8.9	80.8				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s	12.0	13.0	5.0	74.0		29.0	6.0	73.0				
Max Q Clear Time (g_c+I1), s	14.0	10.1	2.8	60.2		10.7	4.9	72.3				
Green Ext Time (p_c), s	0.0	0.2	0.0	6.8		0.9	0.0	0.6				

Intersection Summary												
HCM 6th Ctrl Delay			35.5									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1012	24	0	1319	0	19
Future Vol, veh/h	1012	24	0	1319	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	3	3	3	3
Mvmt Flow	1112	26	0	1449	0	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	556
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.33
Pot Cap-1 Maneuver	-	-	0	-	0	472
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	472
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13
HCM LOS			B

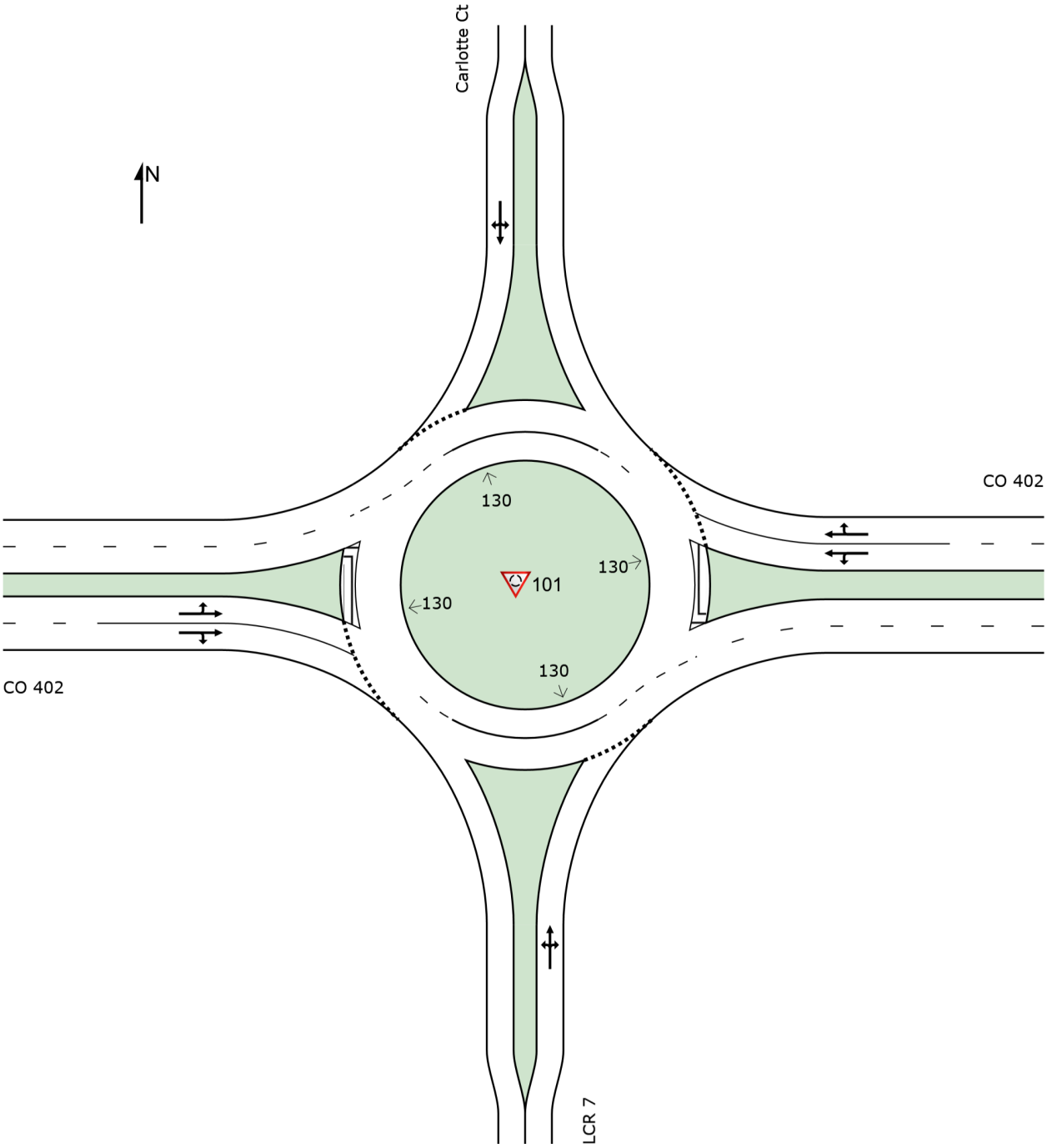
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	472	-	-	-
HCM Lane V/C Ratio	0.044	-	-	-
HCM Control Delay (s)	13	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

SITE LAYOUT

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

AM 2030 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2030 Plus Site
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: LCR 7															
3	L2	All MCs	20	3.0	20	3.0	0.259	11.5	LOS B	1.0	25.5	0.70	0.70	0.70	35.2
8	T1	All MCs	31	3.0	31	3.0	0.259	11.5	LOS B	1.0	25.5	0.70	0.70	0.70	23.6
18	R2	All MCs	73	3.0	73	3.0	0.259	11.5	LOS B	1.0	25.5	0.70	0.70	0.70	30.2
Approach			123	3.0	123	3.0	0.259	11.5	LOS B	1.0	25.5	0.70	0.70	0.70	29.4
East: CO 402															
1	L2	All MCs	70	3.0	70	3.0	0.569	10.4	LOS B	4.6	116.9	0.64	0.42	0.65	30.7
6	T1	All MCs	1148	3.0	1148	3.0	0.569	10.1	LOS B	4.6	116.9	0.63	0.41	0.64	38.9
16	R2	All MCs	46	3.0	46	3.0	0.569	9.8	LOS A	4.5	115.1	0.63	0.40	0.63	26.8
Approach			1265	3.0	1265	3.0	0.569	10.1	LOS B	4.6	116.9	0.63	0.41	0.64	38.2
North: Carlotte Ct															
7	L2	All MCs	34	3.0	34	3.0	0.377	14.4	LOS B	1.7	44.1	0.74	0.81	0.90	24.1
4	T1	All MCs	20	3.0	20	3.0	0.377	14.4	LOS B	1.7	44.1	0.74	0.81	0.90	22.8
14	R2	All MCs	119	3.0	119	3.0	0.377	14.4	LOS B	1.7	44.1	0.74	0.81	0.90	30.4
Approach			173	3.0	173	3.0	0.377	14.4	LOS B	1.7	44.1	0.74	0.81	0.90	28.6
West: CO 402															
5	L2	All MCs	208	3.0	208	3.0	0.528	8.6	LOS A	4.2	107.6	0.45	0.23	0.45	32.3
2	T1	All MCs	1066	3.0	1066	3.0	0.528	8.4	LOS A	4.2	108.4	0.45	0.23	0.45	39.9
12	R2	All MCs	44	3.0	44	3.0	0.528	8.3	LOS A	4.2	108.4	0.44	0.23	0.44	38.4
Approach			1318	3.0	1318	3.0	0.528	8.4	LOS A	4.2	108.4	0.45	0.23	0.45	38.5
All Vehicles			2878	3.0	2878	3.0	0.569	9.7	LOS A	4.6	116.9	0.56	0.36	0.57	37.4

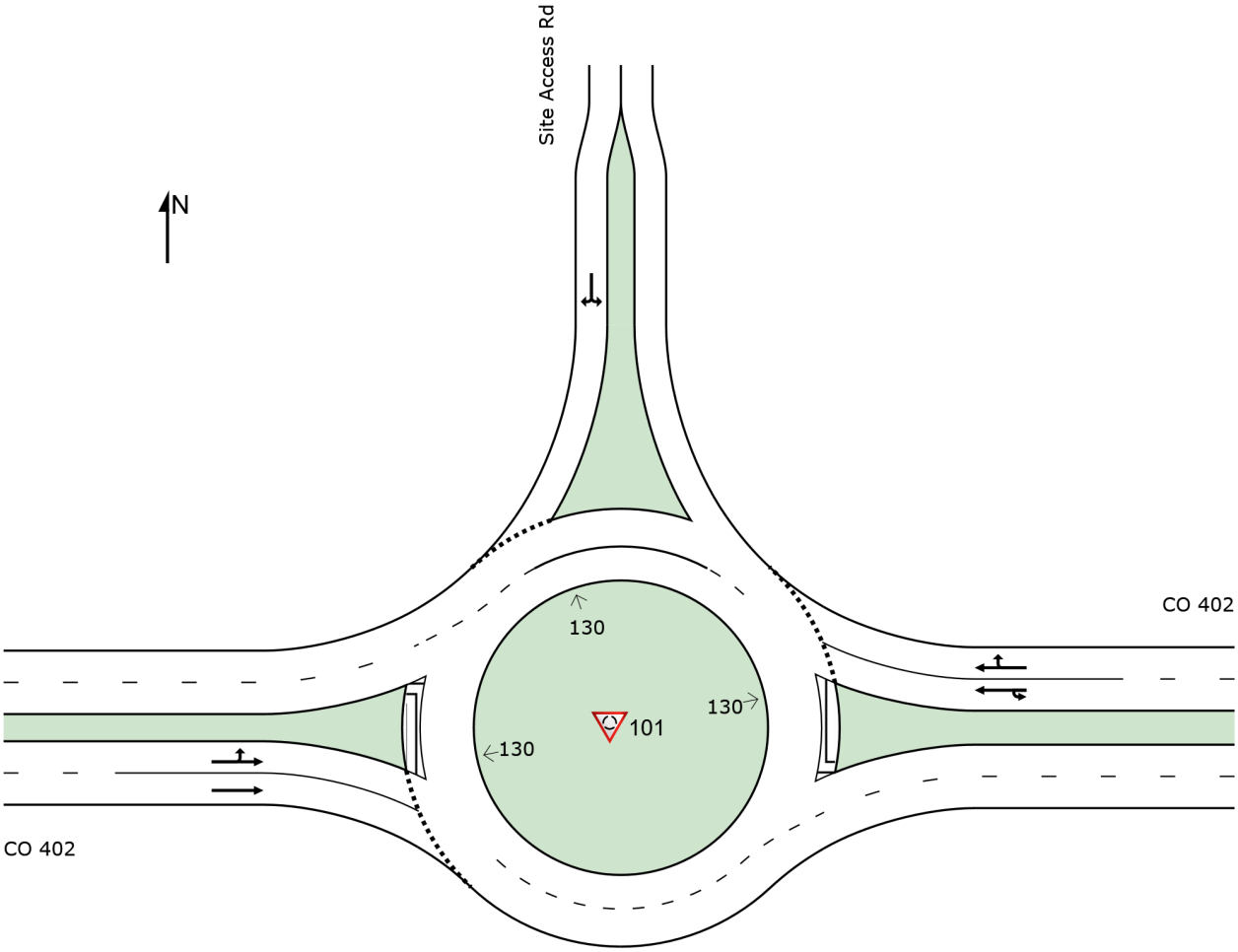
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

AM 2030 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2030 Plus Site
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: CO 402															
1u	U	All MCs	16	3.0	16	3.0	0.664	12.5	LOS B	8.2	209.4	0.72	0.52	0.86	31.7
6	T1	All MCs	1182	3.0	1182	3.0	0.664	12.1	LOS B	8.2	209.4	0.72	0.50	0.82	33.0
16	R2	All MCs	347	3.0	347	3.0	0.664	11.5	LOS B	7.6	193.8	0.70	0.48	0.77	25.8
Approach			1546	3.0	1546	3.0	0.664	12.0	LOS B	8.2	209.4	0.71	0.50	0.81	31.2
North: Site Access Rd															
7	L2	All MCs	194	3.0	194	3.0	0.745	31.9	LOS C	5.7	146.3	0.88	1.20	1.60	18.8
14	R2	All MCs	131	3.0	131	3.0	0.745	31.9	LOS C	5.7	146.3	0.88	1.20	1.60	19.0
Approach			325	3.0	325	3.0	0.745	31.9	LOS C	5.7	146.3	0.88	1.20	1.60	18.9
West: CO 402															
5	L2	All MCs	234	3.0	234	3.0	0.529	9.3	LOS A	4.4	111.8	0.61	0.37	0.61	26.0
2	T1	All MCs	1008	3.0	1008	3.0	0.529	8.8	LOS A	4.5	114.9	0.60	0.36	0.60	34.7
Approach			1242	3.0	1242	3.0	0.529	8.9	LOS A	4.5	114.9	0.60	0.36	0.60	32.7
All Vehicles			3113	3.0	3113	3.0	0.745	12.8	LOS B	8.2	209.4	0.69	0.52	0.81	29.8

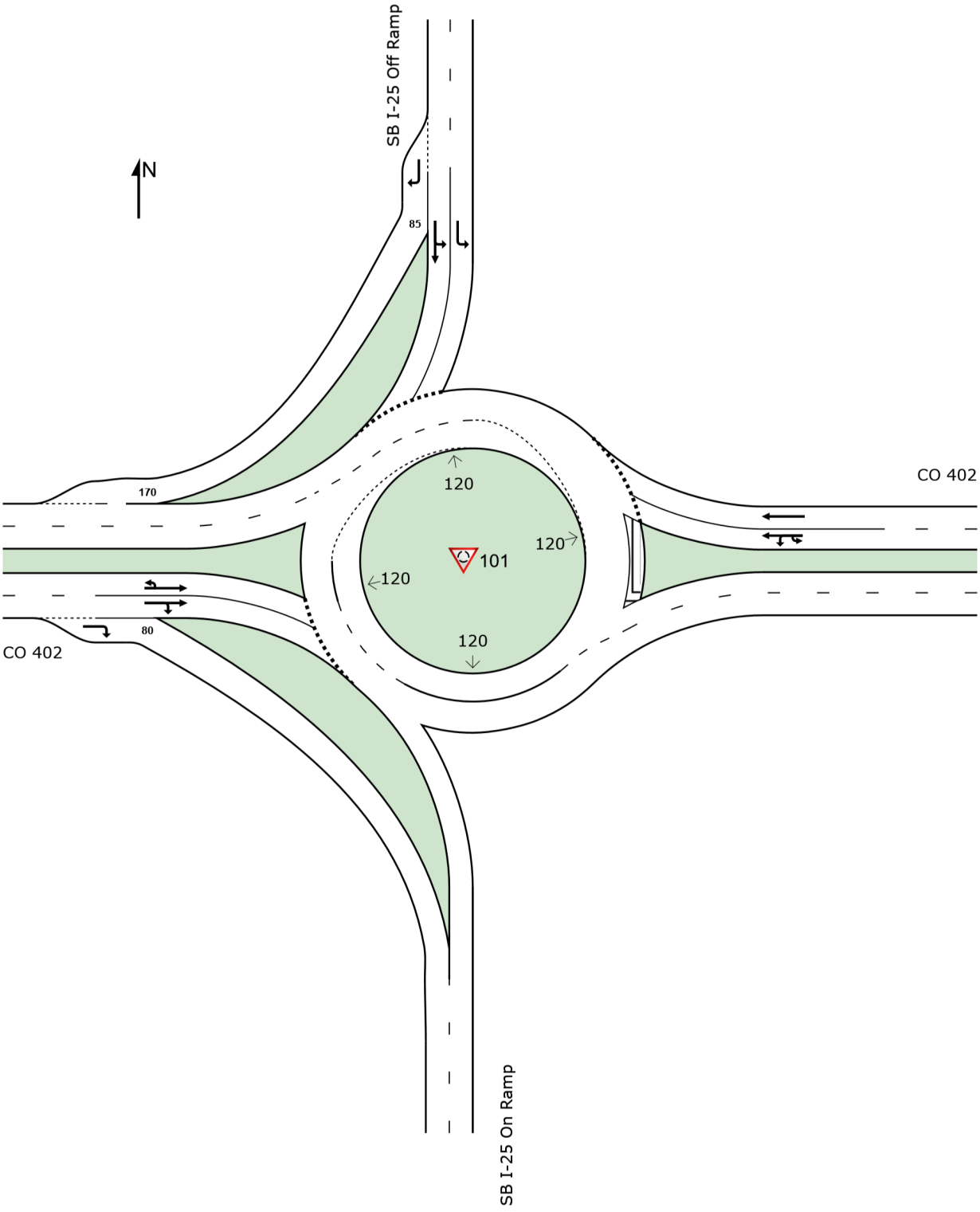
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

AM 2030 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2030 Plus Site
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: CO 402															
1u	U	All MCs	16	9.0	16	9.0	0.486	6.0	LOS A	4.9	131.8	0.12	0.02	0.12	16.9
1	L2	All MCs	284	9.0	284	9.0	0.486	6.0	LOS A	4.9	131.8	0.12	0.02	0.12	32.6
6	T1	All MCs	998	9.0	998	9.0	0.486	5.9	LOS A	4.9	132.0	0.12	0.02	0.12	22.5
Approach			1298	9.0	1298	9.0	0.486	5.9	LOS A	4.9	132.0	0.12	0.02	0.12	25.4
North: SB I-25 Off Ramp															
7	L2	All MCs	95	9.0	95	9.0	0.070	6.0	LOS A	0.3	7.3	0.63	0.58	0.63	29.0
4	T1	All MCs	2	9.0	2	9.0	0.070	5.1	LOS A	0.3	7.3	0.62	0.56	0.62	39.4
14	R2	All MCs	437	9.0	437	9.0	0.284	11.6	LOS B	0.0	0.0	0.00	0.00	0.00	42.2
Approach			534	9.0	534	9.0	0.284	10.6	LOS B	0.3	7.3	0.11	0.11	0.11	38.9
West: CO 402															
5u	U	All MCs	8	8.0	8	8.0	0.336	7.4	LOS A	1.7	44.0	0.54	0.40	0.54	19.1
2	T1	All MCs	666	8.0	666	8.0	0.336	7.0	LOS A	1.7	45.3	0.53	0.38	0.53	23.4
12	R2	All MCs	421	8.0	421	8.0	0.269	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.1
Approach			1095	8.0	1095	8.0	0.336	4.3	LOS A	1.7	45.3	0.33	0.24	0.33	31.0
All Vehicles			2926	8.6	2926	8.6	0.486	6.2	LOS A	4.9	132.0	0.20	0.12	0.20	29.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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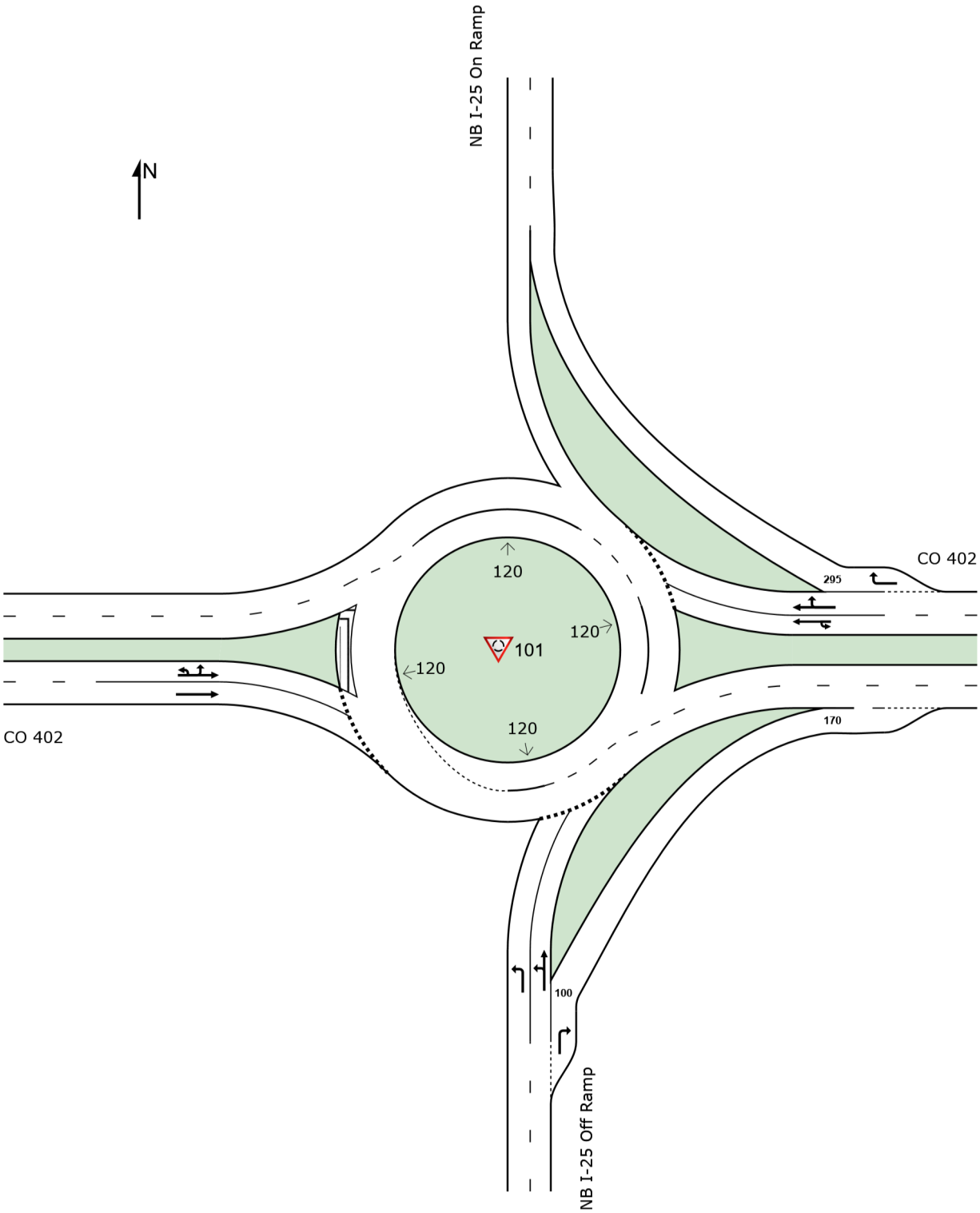
SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

AM 2030 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2030 Plus Site
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: NB I-25 Off Ramp															
3	L2	All MCs	397	8.0	397	8.0	0.240	6.7	LOS A	1.0	25.9	0.58	0.50	0.58	27.6
8	T1	All MCs	15	8.0	15	8.0	0.240	6.1	LOS A	1.0	25.9	0.57	0.48	0.57	37.2
18	R2	All MCs	150	8.0	150	8.0	0.096	4.2	LOS A	0.0	0.0	0.00	0.00	0.00	41.1
Approach			561	8.0	561	8.0	0.240	6.0	LOS A	1.0	25.9	0.42	0.37	0.42	30.6
East: CO 402															
1u	U	All MCs	2	8.0	2	8.0	0.617	16.5	LOS B	5.0	132.3	0.81	0.98	1.29	17.7
6	T1	All MCs	934	8.0	934	8.0	0.617	15.0	LOS B	5.4	144.6	0.81	0.95	1.26	17.7
16	R2	All MCs	255	8.0	255	8.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.7
Approach			1191	8.0	1191	8.0	0.617	11.8	LOS B	5.4	144.6	0.63	0.75	0.99	19.6
West: CO 402															
5u	U	All MCs	2	8.0	2	8.0	0.300	4.3	LOS A	2.5	66.6	0.05	0.01	0.05	17.8
5	L2	All MCs	372	8.0	372	8.0	0.300	4.3	LOS A	2.5	66.6	0.05	0.01	0.05	31.0
2	T1	All MCs	441	8.0	441	8.0	0.300	4.2	LOS A	2.5	67.1	0.05	0.01	0.05	22.3
Approach			815	8.0	815	8.0	0.300	4.3	LOS A	2.5	67.1	0.05	0.01	0.05	27.0
All Vehicles			2567	8.0	2567	8.0	0.617	8.1	LOS A	5.4	144.6	0.40	0.43	0.57	24.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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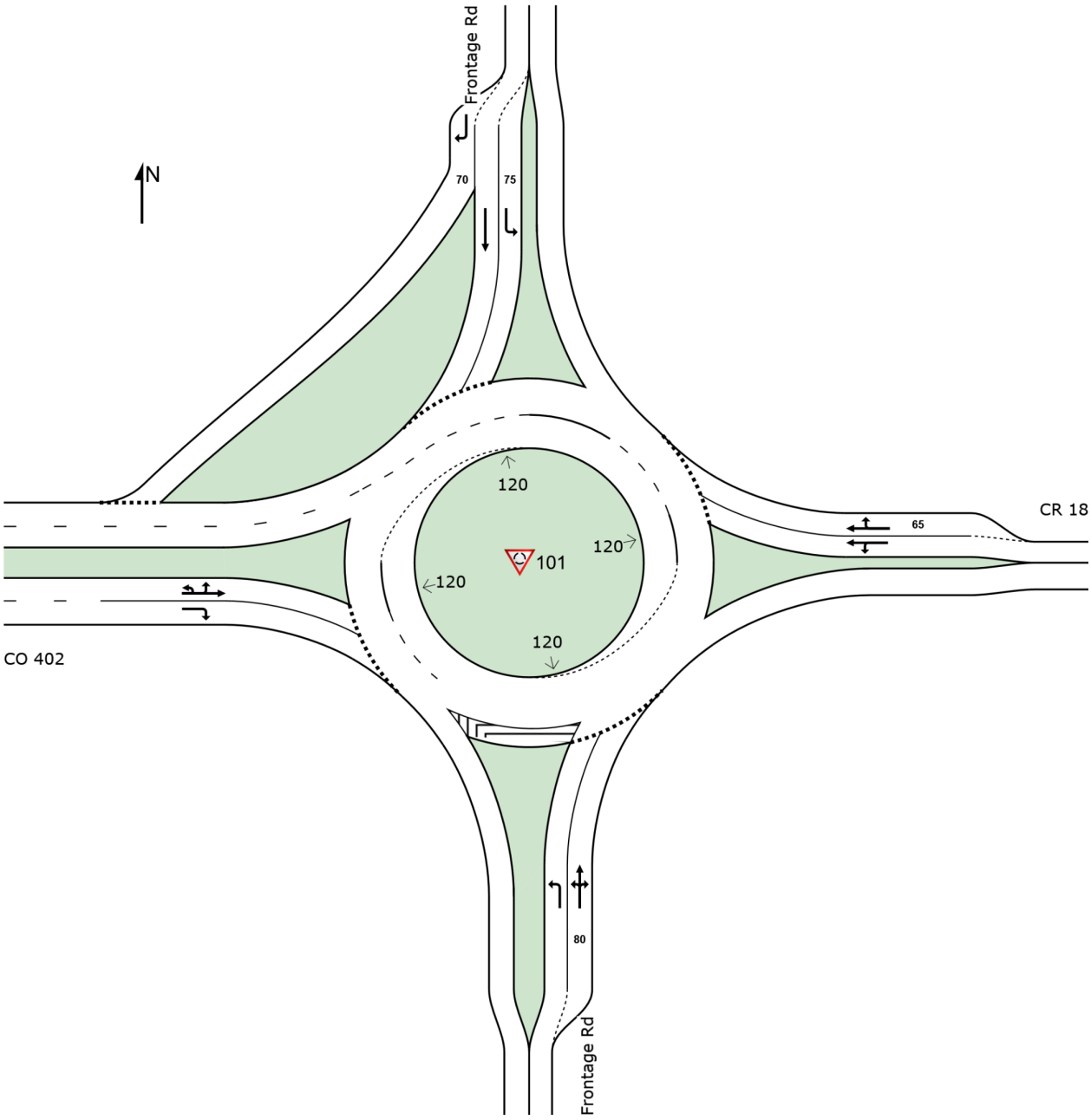
SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

AM 2030 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2030 Plus Site
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: Frontage Rd															
3	L2	All MCs	153	9.0	153	9.0	0.160	6.8	LOS A	1.0	26.2	0.71	0.54	0.71	30.2
8	T1	All MCs	68	9.0	68	9.0	0.160	6.0	LOS A	1.0	26.2	0.70	0.52	0.70	32.9
18	R2	All MCs	18	9.0	18	9.0	0.160	6.0	LOS A	1.0	26.2	0.70	0.52	0.70	37.7
Approach			240	9.0	240	9.0	0.160	6.5	LOS A	1.0	26.2	0.71	0.53	0.71	31.7
East: CR 18															
1	L2	All MCs	20	7.0	20	7.0	0.487	10.4	LOS B	3.4	89.8	0.65	0.53	0.75	37.0
6	T1	All MCs	751	7.0	751	7.0	0.487	10.4	LOS B	3.4	89.8	0.65	0.52	0.75	37.8
16	R2	All MCs	73	7.0	73	7.0	0.487	10.3	LOS B	3.4	89.6	0.65	0.52	0.75	38.0
Approach			844	7.0	844	7.0	0.487	10.4	LOS B	3.4	89.8	0.65	0.52	0.75	37.7
North: Frontage Rd															
7	L2	All MCs	56	4.0	56	4.0	0.061	4.5	LOS A	0.3	7.2	0.62	0.52	0.62	37.7
4	T1	All MCs	53	4.0	53	4.0	0.077	6.0	LOS A	0.3	8.4	0.64	0.56	0.64	33.3
14	R2	All MCs	361	4.0	361	4.0	0.392	8.3	LOS A	2.2	57.3	0.72	0.64	0.79	28.9
Approach			470	4.0	470	4.0	0.392	7.6	LOS A	2.2	57.3	0.70	0.62	0.75	31.1
West: CO 402															
5u	U	All MCs	6	9.0	6	9.0	0.495	8.8	LOS A	3.5	93.4	0.45	0.24	0.45	20.0
5	L2	All MCs	142	9.0	142	9.0	0.495	8.8	LOS A	3.5	93.4	0.45	0.24	0.45	28.4
2	T1	All MCs	385	9.0	385	9.0	0.495	8.8	LOS A	3.5	93.4	0.45	0.24	0.45	38.1
12	R2	All MCs	51	9.0	51	9.0	0.073	5.9	LOS A	0.3	9.0	0.35	0.21	0.35	31.6
Approach			584	9.0	584	9.0	0.495	8.6	LOS A	3.5	93.4	0.44	0.24	0.44	34.6
All Vehicles			2139	7.1	2139	7.1	0.495	8.8	LOS A	3.5	93.4	0.61	0.47	0.66	34.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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: 3: SH 402 & S Boise Ave

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	611	1183	1143	622	237	218
Average Queue (ft)	205	209	650	243	133	104
95th Queue (ft)	430	618	1118	718	207	187
Link Distance (ft)		1168	7285			438
Upstream Blk Time (%)		1				
Queuing Penalty (veh)		0				
Storage Bay Dist (ft)	390			400	155	
Storage Blk Time (%)	3	3	23		12	0
Queuing Penalty (veh)	32	8	28		21	0

Intersection: 5: SH 402 & LCR 9E

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	306	393	456	75	172	179
Average Queue (ft)	124	144	278	19	91	78
95th Queue (ft)	240	282	462	52	155	143
Link Distance (ft)		7285	3069			697
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	385			420	225	
Storage Blk Time (%)		0	1			
Queuing Penalty (veh)		0	1			

Intersection: 22: Boyd Lake & SH 402

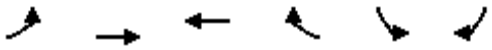
Movement	EB	EB	EB	WB	WB	WB	B17	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	T	T	R	L	T	R
Maximum Queue (ft)	133	378	56	48	597	61	39	135	90	210	212	146
Average Queue (ft)	66	230	6	20	357	20	1	75	31	116	86	53
95th Queue (ft)	133	348	25	50	565	47	13	128	76	188	164	112
Link Distance (ft)		3069			3014		688	628			772	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400		400	400		400			250	250		250
Storage Blk Time (%)					7							
Queuing Penalty (veh)					13							

Intersection: 26: PnR Access & SH 402

Movement	NB
Directions Served	R
Maximum Queue (ft)	46
Average Queue (ft)	11
95th Queue (ft)	33
Link Distance (ft)	340
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

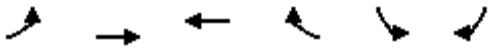
Zone wide Queuing Penalty: 104



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	243	992	943	167	128	241
Future Volume (veh/h)	243	992	943	167	128	241
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1826	1826	1856	1856	1885	1885
Adj Flow Rate, veh/h	251	1023	972	145	132	194
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	3	3	1	1
Cap, veh/h	337	1339	1052	1171	319	479
Arrive On Green	0.12	0.73	0.57	0.57	0.18	0.18
Sat Flow, veh/h	1739	1826	1856	1572	1795	1598
Grp Volume(v), veh/h	251	1023	972	145	132	194
Grp Sat Flow(s),veh/h/ln	1739	1826	1856	1572	1795	1598
Q Serve(g_s), s	5.8	30.6	42.9	2.3	5.9	8.7
Cycle Q Clear(g_c), s	5.8	30.6	42.9	2.3	5.9	8.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	337	1339	1052	1171	319	479
V/C Ratio(X)	0.75	0.76	0.92	0.12	0.41	0.41
Avail Cap(c_a), veh/h	337	1339	1052	1171	319	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.45	0.45	1.00	1.00
Uniform Delay (d), s/veh	22.2	7.3	17.7	3.2	32.8	25.1
Incr Delay (d2), s/veh	8.7	4.2	7.6	0.1	0.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	7.8	16.2	1.1	2.6	3.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	30.9	11.5	25.4	3.3	33.7	25.7
LnGrp LOS	C	B	C	A	C	C
Approach Vol, veh/h		1274	1117		326	
Approach Delay, s/veh		15.3	22.5		28.9	
Approach LOS		B	C		C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	15.0	55.0				70.0	20.0
Change Period (Y+Rc), s	4.0	4.0				4.0	4.0
Max Green Setting (Gmax), s	11.0	51.0				66.0	16.0
Max Q Clear Time (g_c+I1), s	7.8	44.9				32.6	10.7
Green Ext Time (p_c), s	0.2	3.4				8.6	0.5

Intersection Summary	
HCM 6th Ctrl Delay	19.9
HCM 6th LOS	B



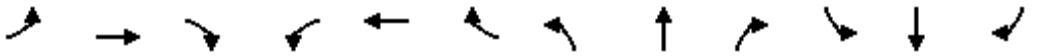
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	161	984	885	176	108	133
Future Volume (veh/h)	161	984	885	176	108	133
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1826	1826
Adj Flow Rate, veh/h	173	1058	952	152	116	61
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	4	4	5	5
Cap, veh/h	323	1347	1051	1187	330	463
Arrive On Green	0.11	0.72	0.57	0.57	0.19	0.19
Sat Flow, veh/h	1781	1870	1841	1560	1739	1547
Grp Volume(v), veh/h	173	1058	952	152	116	61
Grp Sat Flow(s),veh/h/ln	1781	1870	1841	1560	1739	1547
Q Serve(g_s), s	3.2	36.5	46.0	2.6	5.8	2.9
Cycle Q Clear(g_c), s	3.2	36.5	46.0	2.6	5.8	2.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	323	1347	1051	1187	330	463
V/C Ratio(X)	0.54	0.79	0.91	0.13	0.35	0.13
Avail Cap(c_a), veh/h	325	1347	1051	1187	330	463
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.61	0.61	0.41	0.41	1.00	1.00
Uniform Delay (d), s/veh	20.6	9.0	19.1	3.2	35.1	25.6
Incr Delay (d2), s/veh	1.0	2.9	5.9	0.1	2.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	10.3	17.4	1.4	2.6	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.7	11.9	25.0	3.3	38.1	26.2
LnGrp LOS	C	B	C	A	D	C
Approach Vol, veh/h		1231	1104		177	
Approach Delay, s/veh		13.3	22.0		34.0	
Approach LOS		B	C		C	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	77.0	23.0	14.9	62.1
Change Period (Y+Rc), s	5.0	4.0	4.0	5.0
Max Green Setting (Gmax), s	72.0	19.0	11.0	57.0
Max Q Clear Time (g_c+I1), s	38.5	7.8	5.2	48.0
Green Ext Time (p_c), s	9.2	0.3	0.2	4.4

Intersection Summary	
HCM 6th Ctrl Delay	18.6
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	904	55	35	937	168	5	110	33	171	140	120
Future Volume (veh/h)	130	904	55	35	937	168	5	110	33	171	140	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	153	1064	11	41	1102	117	6	129	0	201	165	105
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	210	1232	1044	232	1204	1021	201	374	368	243	374	392
Arrive On Green	0.05	0.66	0.66	0.03	0.64	0.64	0.20	0.20	0.00	0.20	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1109	1870	1585	1261	1870	1585
Grp Volume(v), veh/h	153	1064	11	41	1102	117	6	129	0	201	165	105
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1109	1870	1585	1261	1870	1585
Q Serve(g_s), s	3.2	49.6	0.3	0.8	56.2	3.1	0.5	6.5	0.0	15.5	8.5	5.9
Cycle Q Clear(g_c), s	3.2	49.6	0.3	0.8	56.2	3.1	9.0	6.5	0.0	22.0	8.5	5.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	210	1232	1044	232	1204	1021	201	374	368	243	374	392
V/C Ratio(X)	0.73	0.86	0.01	0.18	0.92	0.11	0.03	0.34	0.00	0.83	0.44	0.27
Avail Cap(c_a), veh/h	224	1232	1044	272	1204	1021	201	374	368	243	374	392
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.58	0.58	0.58	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	14.9	6.5	17.2	17.0	7.5	42.6	37.8	0.0	48.2	38.6	33.4
Incr Delay (d2), s/veh	6.4	5.0	0.0	0.4	12.2	0.2	0.1	0.5	0.0	20.5	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	17.6	0.1	0.4	22.5	0.9	0.1	2.9	0.0	6.8	3.9	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	19.9	6.5	17.6	29.2	7.8	42.6	38.4	0.0	68.6	39.4	33.8
LnGrp LOS	C	B	A	B	C	A	D	D	A	E	D	C
Approach Vol, veh/h		1228			1260			135			471	
Approach Delay, s/veh		21.3			26.8			38.5			50.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		26.0	7.6	76.4		26.0	9.2	74.8				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		22.0	6.0	70.0		22.0	6.0	70.0				
Max Q Clear Time (g_c+I1), s		11.0	2.8	51.6		24.0	5.2	58.2				
Green Ext Time (p_c), s		0.4	0.0	7.4		0.0	0.0	6.3				

Intersection Summary												
HCM 6th Ctrl Delay			28.7									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1068	22	0	1130	0	36
Future Vol, veh/h	1068	22	0	1130	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	140	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1174	24	0	1242	0	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	587
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.33
Pot Cap-1 Maneuver	-	-	0	-	0	450
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	450
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.8
HCM LOS			B

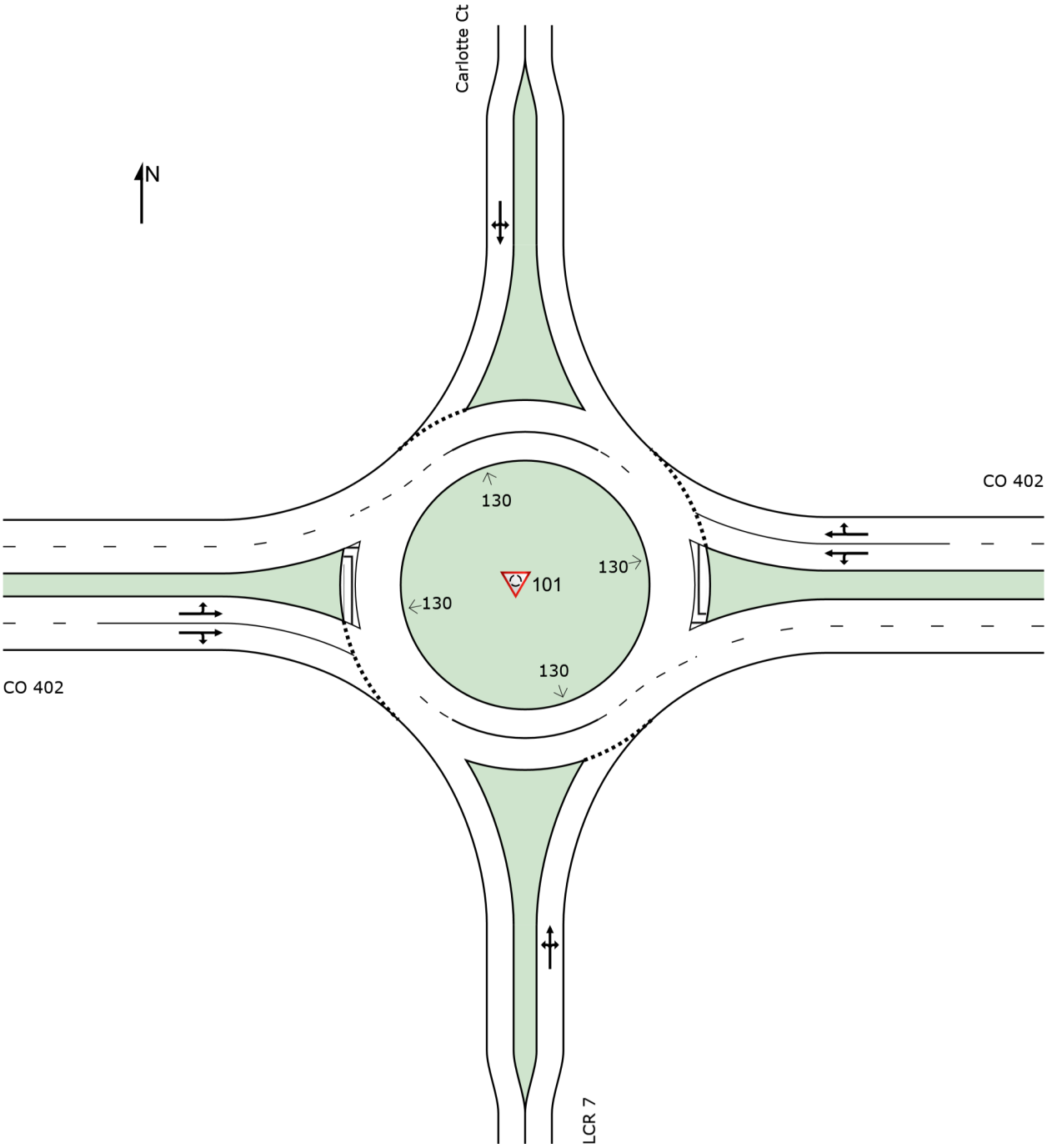
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	450	-	-	-
HCM Lane V/C Ratio	0.088	-	-	-
HCM Control Delay (s)	13.8	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-

SITE LAYOUT

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

PM 2030 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2030 Plus Site
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: LCR 7															
3	L2	All MCs	26	3.0	26	3.0	0.205	9.7	LOS A	0.8	19.4	0.65	0.64	0.65	35.9
8	T1	All MCs	17	3.0	17	3.0	0.205	9.7	LOS A	0.8	19.4	0.65	0.64	0.65	24.2
18	R2	All MCs	63	3.0	63	3.0	0.205	9.7	LOS A	0.8	19.4	0.65	0.64	0.65	31.0
Approach			107	3.0	107	3.0	0.205	9.7	LOS A	0.8	19.4	0.65	0.64	0.65	31.3
East: CO 402															
1	L2	All MCs	54	3.0	54	3.0	0.474	8.0	LOS A	3.4	86.9	0.45	0.25	0.45	32.3
6	T1	All MCs	1080	3.0	1080	3.0	0.474	7.8	LOS A	3.4	87.6	0.45	0.24	0.45	40.3
16	R2	All MCs	25	3.0	25	3.0	0.474	7.6	LOS A	3.4	87.6	0.44	0.24	0.44	27.8
Approach			1160	3.0	1160	3.0	0.474	7.8	LOS A	3.4	87.6	0.45	0.24	0.45	39.8
North: Carlotte Ct															
7	L2	All MCs	32	3.0	32	3.0	0.368	12.8	LOS B	1.6	41.6	0.70	0.76	0.85	24.8
4	T1	All MCs	22	3.0	22	3.0	0.368	12.8	LOS B	1.6	41.6	0.70	0.76	0.85	23.4
14	R2	All MCs	136	3.0	136	3.0	0.368	12.8	LOS B	1.6	41.6	0.70	0.76	0.85	31.0
Approach			189	3.0	189	3.0	0.368	12.8	LOS B	1.6	41.6	0.70	0.76	0.85	29.4
West: CO 402															
5	L2	All MCs	108	3.0	108	3.0	0.471	7.6	LOS A	3.5	89.5	0.39	0.19	0.39	33.1
2	T1	All MCs	1036	3.0	1036	3.0	0.471	7.5	LOS A	3.5	90.0	0.39	0.19	0.39	40.7
12	R2	All MCs	51	3.0	51	3.0	0.471	7.3	LOS A	3.5	90.0	0.38	0.18	0.38	39.0
Approach			1195	3.0	1195	3.0	0.471	7.5	LOS A	3.5	90.0	0.39	0.19	0.39	39.8
All Vehicles			2650	3.0	2650	3.0	0.474	8.1	LOS A	3.5	90.0	0.45	0.27	0.46	38.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

PM 2030 Plus Site
Site Category: (None)
Roundabout

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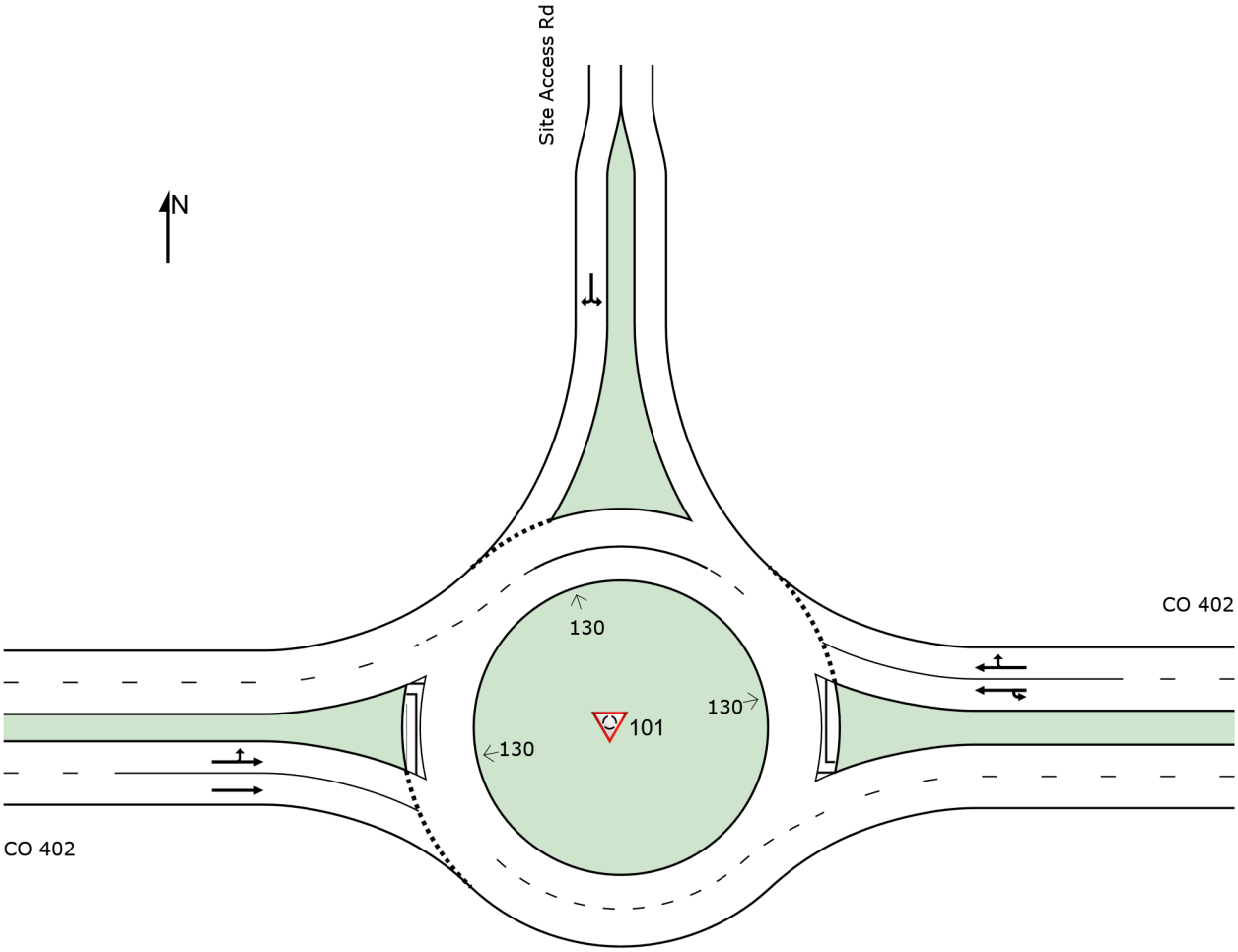

MOVEMENT SUMMARY

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2030 Plus Site
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: CO 402															
1u	U	All MCs	14	3.0	14	3.0	0.532	8.7	LOS A	4.6	117.2	0.47	0.23	0.47	34.2
6	T1	All MCs	1148	3.0	1148	3.0	0.532	8.5	LOS A	4.6	118.4	0.46	0.23	0.46	35.5
16	R2	All MCs	167	3.0	167	3.0	0.532	8.3	LOS A	4.6	118.4	0.46	0.22	0.46	27.4
Approach			1329	3.0	1329	3.0	0.532	8.5	LOS A	4.6	118.4	0.46	0.23	0.46	34.3
North: Site Access Rd															
7	L2	All MCs	225	3.0	225	3.0	0.747	28.6	LOS C	5.9	151.8	0.85	1.22	1.67	19.5
14	R2	All MCs	152	3.0	152	3.0	0.747	28.6	LOS C	5.9	151.8	0.85	1.22	1.67	19.8
Approach			376	3.0	376	3.0	0.747	28.6	LOS C	5.9	151.8	0.85	1.22	1.67	19.6
West: CO 402															
5	L2	All MCs	113	3.0	113	3.0	0.526	9.6	LOS A	4.2	108.4	0.64	0.40	0.64	26.3
2	T1	All MCs	1044	3.0	1044	3.0	0.526	9.3	LOS A	4.3	110.7	0.63	0.40	0.63	34.9
Approach			1156	3.0	1156	3.0	0.526	9.3	LOS A	4.3	110.7	0.63	0.40	0.63	33.9
All Vehicles			2862	3.0	2862	3.0	0.747	11.5	LOS B	5.9	151.8	0.58	0.43	0.69	31.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
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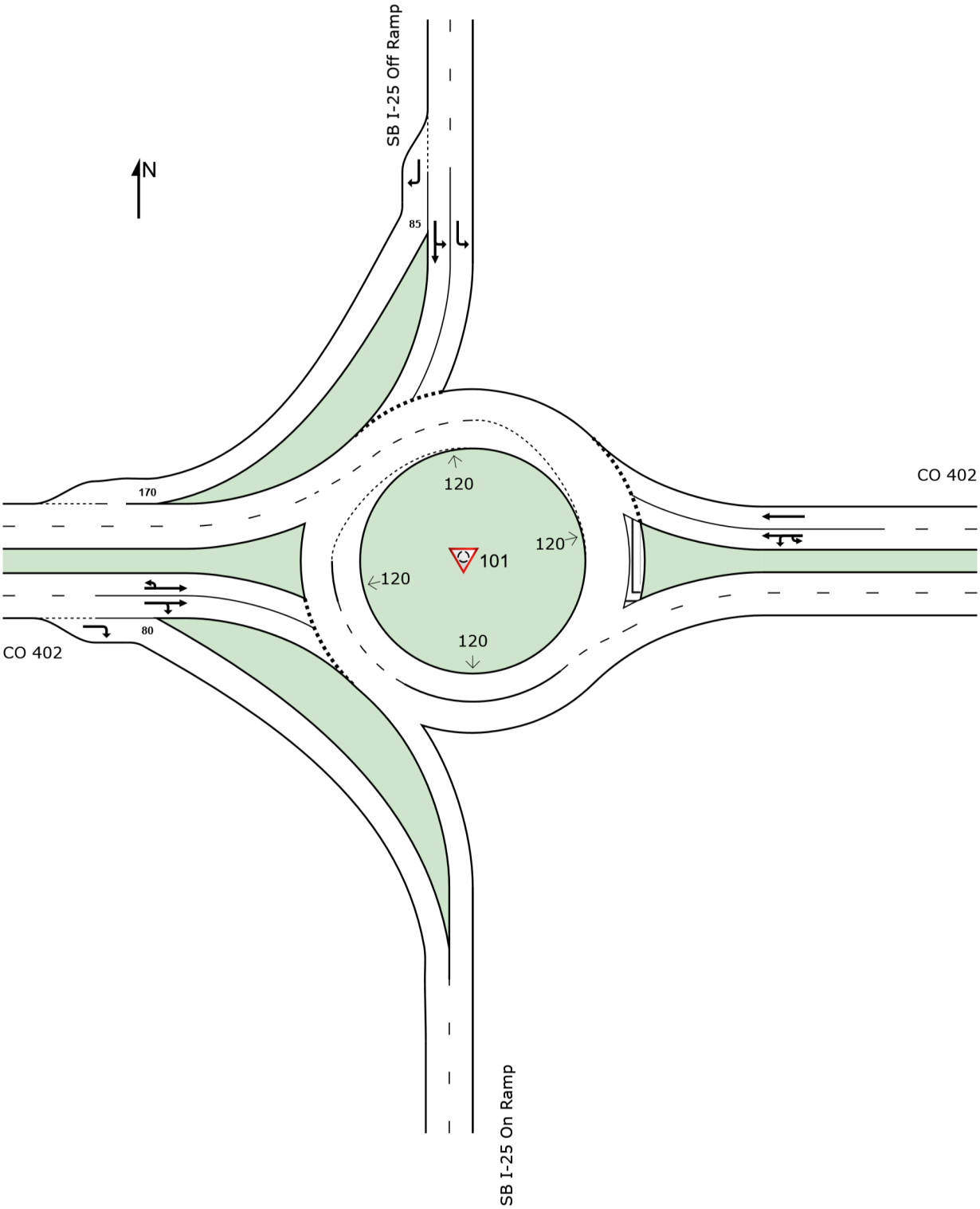
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

PM 2030 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: Y:\Denver\152300S\00152379.00_West_Ridge_Study\Eng_Docs\Traffic\Models\SIDRA\RIRO PnR\2030\PM_2030 Plus Site_Roundabouts.sip9

MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2030 Plus Site
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: CO 402															
1u	U	All MCs	5	5.0	5	5.0	0.398	5.5	LOS A	3.5	92.2	0.15	0.03	0.15	17.2
1	L2	All MCs	197	5.0	197	5.0	0.398	5.5	LOS A	3.5	92.2	0.15	0.03	0.15	33.9
6	T1	All MCs	895	5.0	895	5.0	0.398	5.4	LOS A	3.6	92.6	0.14	0.03	0.14	22.7
Approach			1097	5.0	1097	5.0	0.398	5.4	LOS A	3.6	92.6	0.14	0.03	0.14	25.3
North: SB I-25 Off Ramp															
7	L2	All MCs	205	6.0	205	6.0	0.129	5.8	LOS A	0.5	13.5	0.60	0.54	0.60	29.2
4	T1	All MCs	1	6.0	1	6.0	0.129	5.1	LOS A	0.5	13.5	0.59	0.52	0.59	39.6
14	R2	All MCs	319	6.0	319	6.0	0.202	6.5	LOS A	0.0	0.0	0.00	0.00	0.00	42.3
Approach			526	6.0	526	6.0	0.202	6.2	LOS A	0.5	13.5	0.24	0.21	0.24	35.9
West: CO 402															
5u	U	All MCs	13	7.0	13	7.0	0.438	8.9	LOS A	2.4	64.2	0.59	0.45	0.61	18.5
2	T1	All MCs	871	7.0	871	7.0	0.438	8.4	LOS A	2.4	64.2	0.58	0.43	0.59	22.5
12	R2	All MCs	306	7.0	306	7.0	0.194	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.4
Approach			1191	7.0	1191	7.0	0.438	6.3	LOS A	2.4	64.2	0.43	0.32	0.44	27.9
All Vehicles			2813	6.0	2813	6.0	0.438	5.9	LOS A	3.6	92.6	0.28	0.19	0.29	28.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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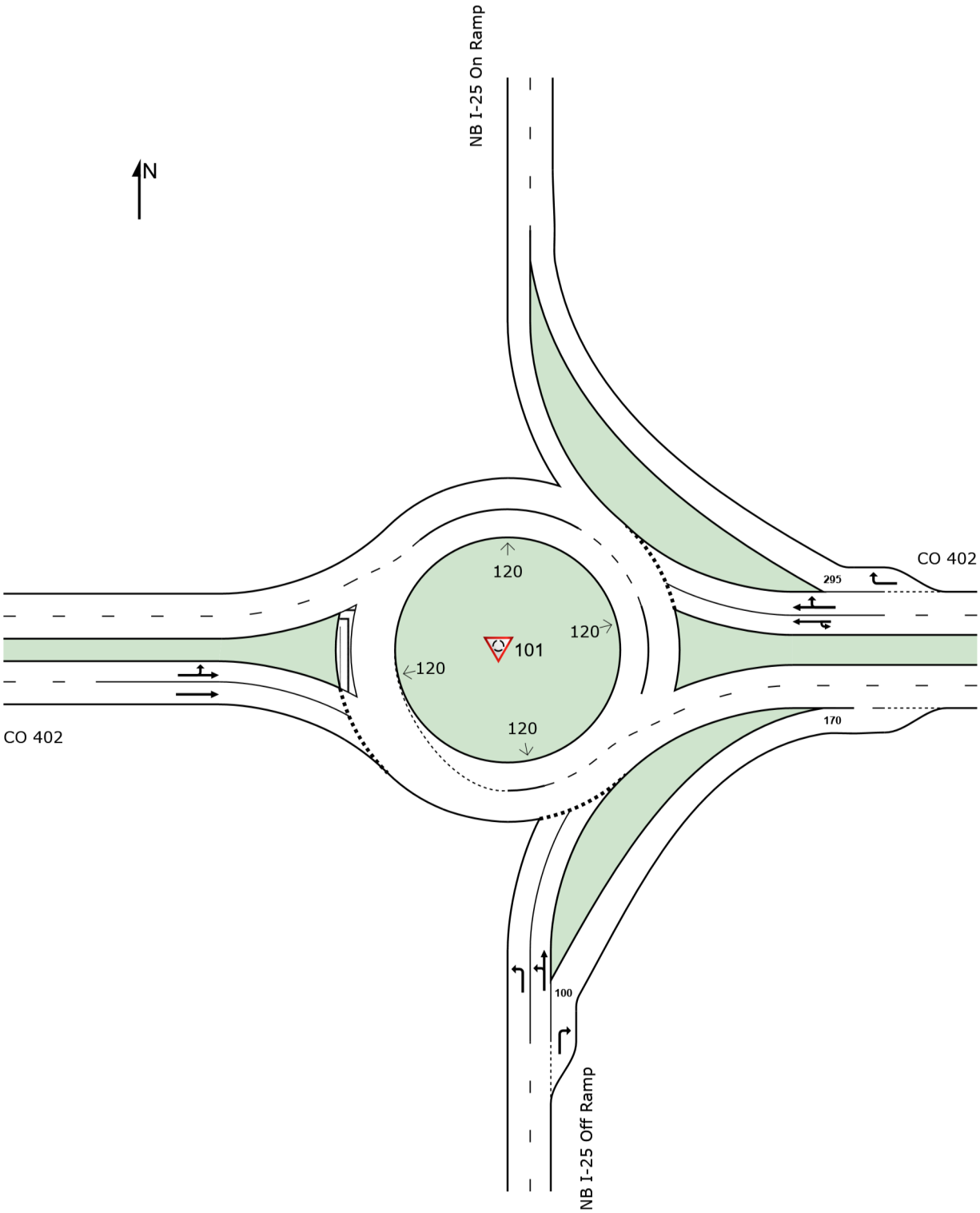
SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

PM 2030 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2030 Plus Site
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: NB I-25 Off Ramp															
3	L2	All MCs	438	4.0	438	4.0	0.262	7.1	LOS A	1.1	29.1	0.63	0.57	0.63	27.3
8	T1	All MCs	2	4.0	2	4.0	0.262	6.3	LOS A	1.1	29.1	0.62	0.55	0.62	37.2
18	R2	All MCs	197	4.0	197	4.0	0.122	4.9	LOS A	0.0	0.0	0.00	0.00	0.00	41.3
Approach			637	4.0	637	4.0	0.262	6.4	LOS A	1.1	29.1	0.44	0.39	0.44	30.6
East: CO 402															
1u	U	All MCs	4	7.0	4	7.0	0.434	11.1	LOS B	2.5	67.0	0.72	0.72	0.89	19.5
6	T1	All MCs	678	7.0	678	7.0	0.434	10.1	LOS B	2.7	70.1	0.71	0.69	0.86	19.5
16	R2	All MCs	101	7.0	101	7.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.7
Approach			784	7.0	784	7.0	0.434	8.8	LOS A	2.7	70.1	0.62	0.60	0.75	20.5
West: CO 402															
5	L2	All MCs	329	5.0	329	5.0	0.395	5.0	LOS A	3.7	95.0	0.08	0.01	0.08	32.1
2	T1	All MCs	769	5.0	769	5.0	0.395	4.8	LOS A	3.7	95.6	0.08	0.01	0.08	21.6
Approach			1098	5.0	1098	5.0	0.395	4.9	LOS A	3.7	95.6	0.08	0.01	0.08	25.3
All Vehicles			2518	5.4	2518	5.4	0.434	6.5	LOS A	3.7	95.6	0.34	0.29	0.38	25.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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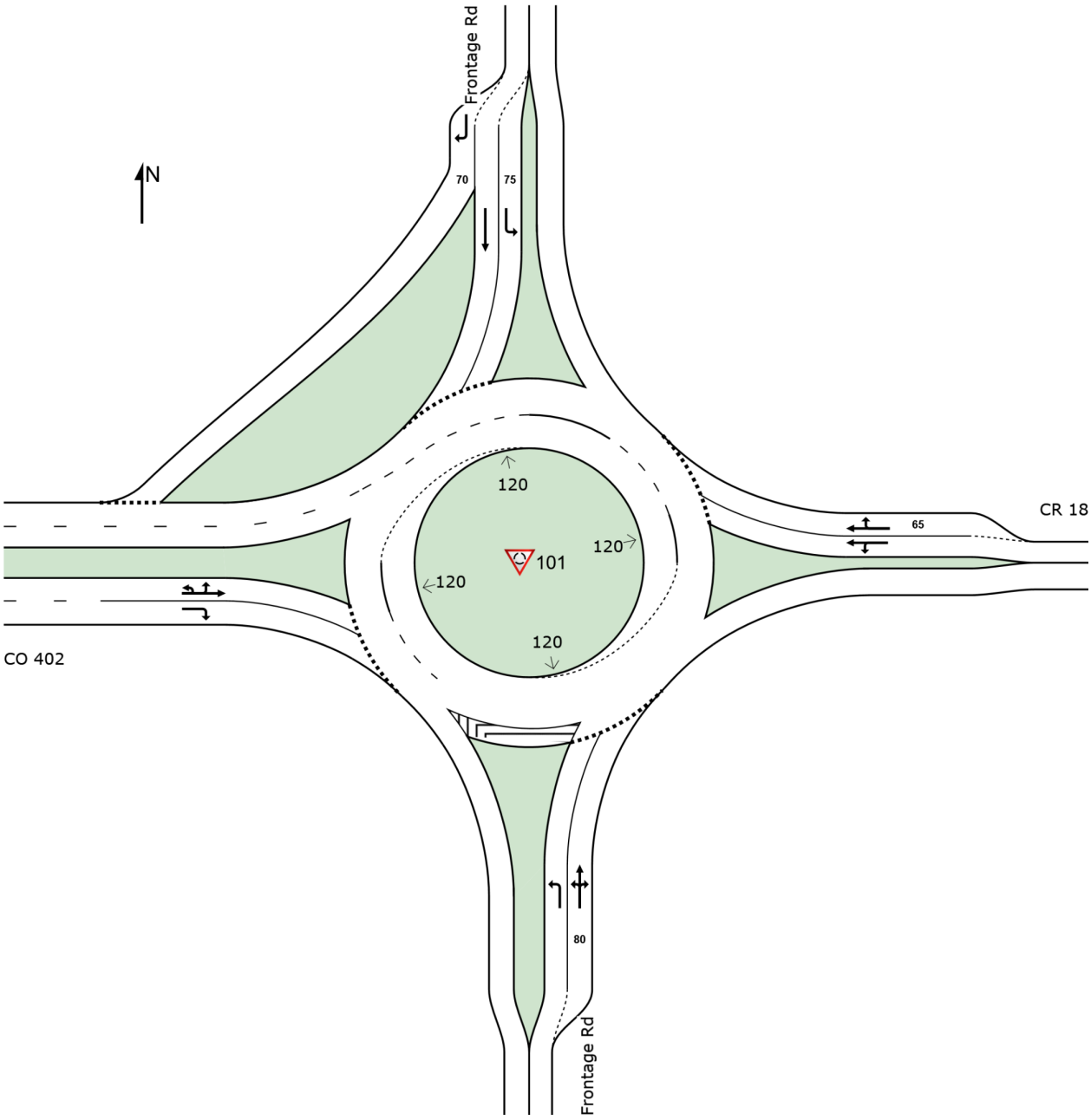
SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

PM 2030 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2030 Plus Site
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: Frontage Rd															
3	L2	All MCs	127	9.0	127	9.0	0.345	17.4	LOS B	2.7	71.3	0.97	0.83	0.99	28.1
8	T1	All MCs	101	9.0	101	9.0	0.345	13.7	LOS B	2.7	71.3	1.00	0.81	1.00	31.9
18	R2	All MCs	45	9.0	45	9.0	0.345	13.7	LOS B	2.7	71.3	1.00	0.81	1.00	36.4
Approach			273	9.0	273	9.0	0.345	15.4	LOS B	2.7	71.3	0.99	0.82	1.00	31.1
East: CR 18															
1	L2	All MCs	9	4.0	9	4.0	0.308	8.1	LOS A	1.6	41.1	0.63	0.50	0.63	37.5
6	T1	All MCs	387	4.0	387	4.0	0.308	8.0	LOS A	1.6	41.3	0.63	0.50	0.63	38.8
16	R2	All MCs	96	4.0	96	4.0	0.308	7.9	LOS A	1.6	41.3	0.63	0.49	0.63	38.7
Approach			492	4.0	492	4.0	0.308	8.0	LOS A	1.6	41.3	0.63	0.50	0.63	38.7
North: Frontage Rd															
7	L2	All MCs	87	6.0	87	6.0	0.080	4.0	LOS A	0.4	9.2	0.49	0.36	0.49	37.8
4	T1	All MCs	79	6.0	79	6.0	0.089	4.9	LOS A	0.4	9.8	0.51	0.39	0.51	33.5
14	R2	All MCs	201	6.0	201	6.0	0.185	5.0	LOS A	0.9	22.7	0.52	0.38	0.52	30.0
Approach			367	6.0	367	6.0	0.185	4.7	LOS A	0.9	22.7	0.51	0.38	0.51	33.2
West: CO 402															
5u	U	All MCs	8	4.0	8	4.0	0.829	19.9	LOS B	20.6	532.0	0.85	0.95	1.35	16.5
5	L2	All MCs	278	4.0	278	4.0	0.829	19.9	LOS B	20.6	532.0	0.85	0.95	1.35	25.6
2	T1	All MCs	613	4.0	613	4.0	0.829	19.9	LOS B	20.6	532.0	0.85	0.95	1.35	33.9
12	R2	All MCs	40	4.0	40	4.0	0.060	6.0	LOS A	0.3	6.6	0.39	0.26	0.39	31.5
Approach			940	4.0	940	4.0	0.829	19.3	LOS B	20.6	532.0	0.83	0.92	1.31	31.0
All Vehicles			2072	5.0	2072	5.0	0.829	13.5	LOS B	20.6	532.0	0.75	0.71	0.97	33.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

Intersection: 3: SH 402 & S Boise Ave

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	273	311	434	97	156	172
Average Queue (ft)	104	130	233	30	76	80
95th Queue (ft)	196	263	385	75	142	148
Link Distance (ft)		1168	7285			438
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	390			400	155	
Storage Blk Time (%)			1		0	1
Queuing Penalty (veh)			1		1	1

Intersection: 5: SH 402 & LCR 9E

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	140	219	511	74	135	95
Average Queue (ft)	71	135	219	16	73	49
95th Queue (ft)	116	217	420	53	123	83
Link Distance (ft)		7285	3069			697
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	385			420	225	
Storage Blk Time (%)			1			
Queuing Penalty (veh)			2			

Intersection: 22: Boyd Lake & SH 402

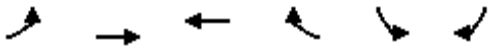
Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	T	R
Maximum Queue (ft)	130	303	39	45	324	41	26	172	69	412	510	110
Average Queue (ft)	59	131	6	17	174	17	5	77	15	189	151	35
95th Queue (ft)	113	239	23	38	281	37	21	146	42	347	355	76
Link Distance (ft)		3069			3014			628			772	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400		400	400		400	250		250	250		250
Storage Blk Time (%)										16	0	
Queuing Penalty (veh)										43	0	

Intersection: 26: PnR Access & SH 402

Movement	EB	NB
Directions Served	T	R
Maximum Queue (ft)	41	43
Average Queue (ft)	1	19
95th Queue (ft)	14	37
Link Distance (ft)	329	340
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 47



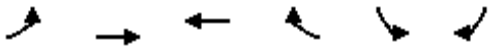
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	331	1264	1320	167	231	213
Future Volume (veh/h)	331	1264	1320	167	231	213
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1796	1796
Adj Flow Rate, veh/h	364	1389	1451	140	254	225
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	4	4	4	4	7	7
Cap, veh/h	512	2576	1539	957	297	639
Arrive On Green	0.25	0.74	0.44	0.44	0.17	0.17
Sat Flow, veh/h	1753	3589	3589	1560	1711	1522
Grp Volume(v), veh/h	364	1389	1451	140	254	225
Grp Sat Flow(s),veh/h/ln	1753	1749	1749	1560	1711	1522
Q Serve(g_s), s	14.0	17.4	39.7	3.8	14.4	0.0
Cycle Q Clear(g_c), s	14.0	17.4	39.7	3.8	14.4	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	512	2576	1539	957	297	639
V/C Ratio(X)	0.71	0.54	0.94	0.15	0.86	0.35
Avail Cap(c_a), veh/h	512	2576	1539	957	393	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.63	0.63	1.00	1.00
Uniform Delay (d), s/veh	32.1	5.8	26.8	8.2	40.1	19.7
Incr Delay (d2), s/veh	4.6	0.8	9.0	0.2	13.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	4.1	16.2	1.8	7.0	3.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	36.7	6.6	35.8	8.4	53.4	20.1
LnGrp LOS	D	A	D	A	D	C
Approach Vol, veh/h		1753	1591		479	
Approach Delay, s/veh		12.8	33.4		37.8	
Approach LOS		B	C		D	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	29.7	49.0				78.7	21.3
Change Period (Y+Rc), s	5.0	* 5				5.0	4.0
Max Green Setting (Gmax), s	20.0	* 44				68.0	23.0
Max Q Clear Time (g_c+I1), s	16.0	41.7				19.4	16.4
Green Ext Time (p_c), s	0.4	1.8				12.4	0.9

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

Notes

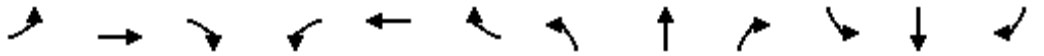
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	225	1332	1223	232	175	163
Future Volume (veh/h)	225	1332	1223	232	175	163
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1752	1752
Adj Flow Rate, veh/h	247	1464	1344	190	192	163
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	6	6	6	6	10	10
Cap, veh/h	396	2409	1964	1183	334	415
Arrive On Green	0.08	0.70	1.00	1.00	0.20	0.20
Sat Flow, veh/h	1725	3532	3532	1535	1668	1485
Grp Volume(v), veh/h	247	1464	1344	190	192	163
Grp Sat Flow(s),veh/h/ln	1725	1721	1721	1535	1668	1485
Q Serve(g_s), s	5.5	22.2	0.0	0.0	10.4	8.9
Cycle Q Clear(g_c), s	5.5	22.2	0.0	0.0	10.4	8.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	396	2409	1964	1183	334	415
V/C Ratio(X)	0.62	0.61	0.68	0.16	0.58	0.39
Avail Cap(c_a), veh/h	535	2409	1964	1183	334	415
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.54	0.54	1.00	1.00
Uniform Delay (d), s/veh	6.4	7.8	0.0	0.0	36.2	29.2
Incr Delay (d2), s/veh	1.3	0.9	1.1	0.2	7.1	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.8	0.3	0.1	4.7	8.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.7	8.7	1.1	0.2	43.2	32.0
LnGrp LOS	A	A	A	A	D	C
Approach Vol, veh/h		1711	1534		355	
Approach Delay, s/veh		8.6	1.0		38.0	
Approach LOS		A	A		D	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			75.0		25.0	12.9	62.1
Change Period (Y+Rc), s			5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s			70.0		20.0	16.0	49.0
Max Q Clear Time (g_c+I1), s			24.2		12.4	7.5	2.0
Green Ext Time (p_c), s			13.5		0.7	0.4	12.9

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	1263	140	45	1301	175	5	160	86	250	250	140
Future Volume (veh/h)	135	1263	140	45	1301	175	5	160	86	250	250	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	142	1329	76	47	1369	103	5	168	91	263	263	147
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	2218	989	190	1888	1032	201	217	184	320	516	437
Arrive On Green	0.02	0.21	0.21	0.53	0.53	0.53	0.12	0.12	0.12	0.12	0.28	0.28
Sat Flow, veh/h	1781	3554	1585	412	3554	1585	1116	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	142	1329	76	47	1369	103	5	168	91	263	263	147
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	412	1777	1585	1116	1870	1585	1781	1870	1585
Q Serve(g_s), s	3.4	33.9	3.9	9.2	29.4	2.4	0.4	8.7	5.4	12.0	11.8	7.4
Cycle Q Clear(g_c), s	3.4	33.9	3.9	33.8	29.4	2.4	0.4	8.7	5.4	12.0	11.8	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	2218	989	190	1888	1032	201	217	184	320	516	437
V/C Ratio(X)	0.54	0.60	0.08	0.25	0.73	0.10	0.02	0.78	0.50	0.82	0.51	0.34
Avail Cap(c_a), veh/h	291	2218	989	190	1888	1032	329	430	365	320	729	618
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	28.4	16.5	28.8	17.9	6.5	39.3	42.9	41.5	33.9	30.5	28.9
Incr Delay (d2), s/veh	1.3	0.9	0.1	3.1	2.5	0.2	0.0	5.9	2.1	15.5	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	16.0	1.2	1.0	10.7	0.7	0.1	4.2	2.1	6.6	5.2	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.3	29.3	16.6	31.9	20.3	6.7	39.3	48.8	43.5	49.4	31.3	29.4
LnGrp LOS	B	C	B	C	C	A	D	D	D	D	C	C
Approach Vol, veh/h		1547			1519			264			673	
Approach Delay, s/veh		27.7			19.8			46.8			37.9	
Approach LOS		C			B			D			D	

Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	16.0	16.6		67.4		32.6	9.3	58.1				
Change Period (Y+Rc), s	4.0	5.0		5.0		5.0	4.0	5.0				
Max Green Setting (Gmax), s	12.0	23.0		51.0		39.0	7.0	40.0				
Max Q Clear Time (g_c+I1), s	14.0	10.7		35.9		13.8	5.4	35.8				
Green Ext Time (p_c), s	0.0	0.9		7.7		1.8	0.0	3.1				

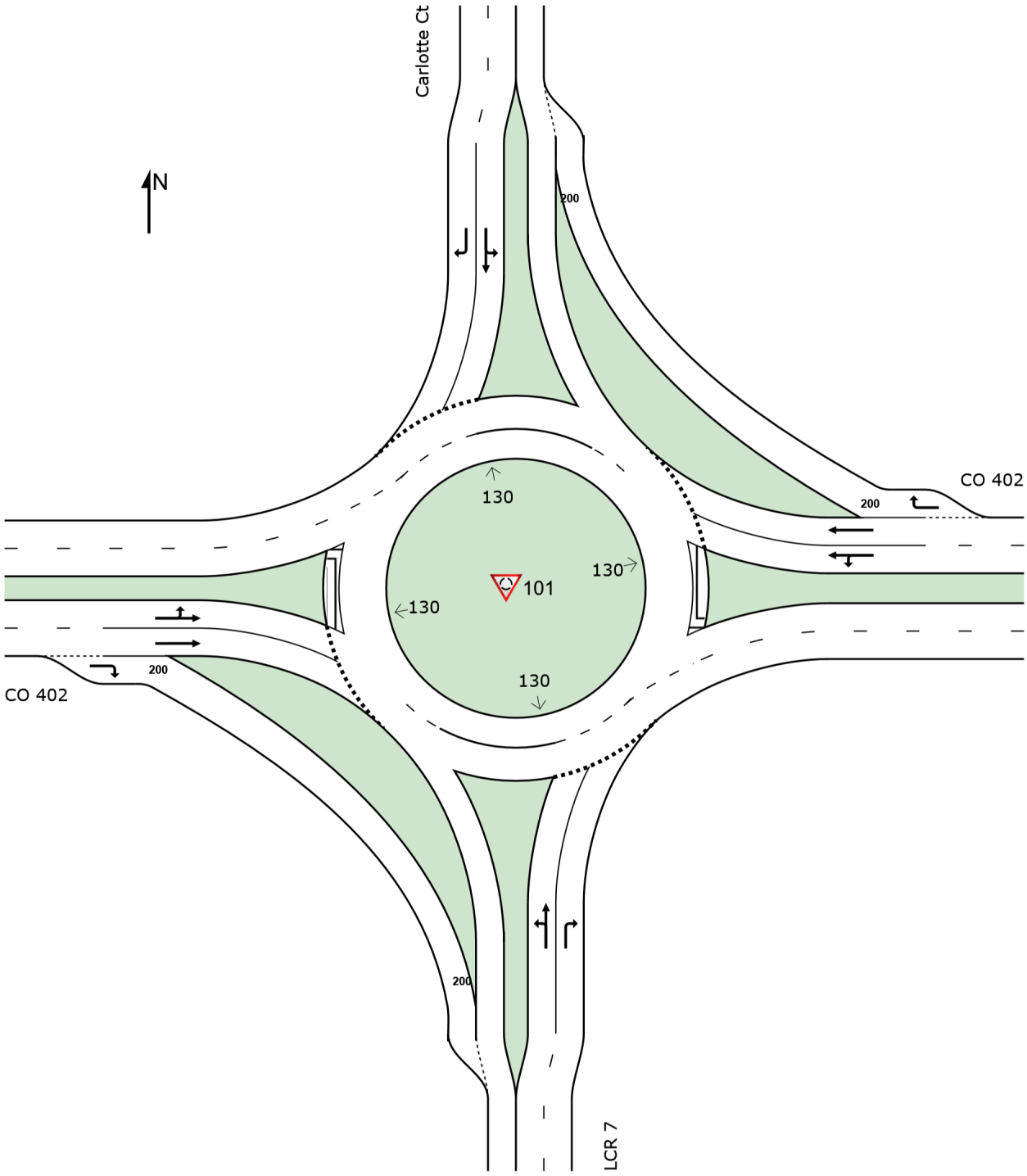
Intersection Summary		
HCM 6th Ctrl Delay		27.7
HCM 6th LOS		C

SITE LAYOUT

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

AM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: ALFRED BENESCH & COMPANY | Licence: PLUS / 1PC | Created: Wednesday, August 14, 2024 3:41:10 PM
Project: Y:\Denver\152300S\00152379.00_West_Ridge_Study\Eng_Docs\Traffic\Models\SIDRA\RIRO PnR\2045\AM_2045 Plus Site_Roundabouts.sip9

MOVEMENT SUMMARY

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site
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: LCR 7															
3	L2	All MCs	163	3.0	163	3.0	0.673	34.0	LOS C	4.1	103.9	0.91	1.03	1.34	25.9
8	T1	All MCs	56	3.0	56	3.0	0.673	34.0	LOS C	4.1	103.9	0.91	1.03	1.34	17.1
18	R2	All MCs	268	3.0	268	3.0	0.673	28.8	LOS C	4.5	114.1	0.91	1.02	1.33	22.8
Approach			487	3.0	487	3.0	0.673	31.1	LOS C	4.5	114.1	0.91	1.02	1.33	23.4
East: CO 402															
1	L2	All MCs	337	3.0	337	3.0	0.921	33.7	LOS C	26.8	685.3	1.00	1.36	2.42	21.0
6	T1	All MCs	1407	3.0	1407	3.0	0.921	32.2	LOS C	28.3	725.3	1.00	1.36	2.39	29.2
16	R2	All MCs	46	3.0	46	3.0	0.028	2.7	LOS A	0.0	0.0	0.00	0.00	0.00	41.6
Approach			1790	3.0	1790	3.0	0.921	31.7	LOS C	28.3	725.3	0.97	1.32	2.33	27.9
North: Carlotte Ct															
7	L2	All MCs	34	3.0	34	3.0	0.351	23.6	LOS C	1.6	41.4	0.88	0.92	0.98	21.1
4	T1	All MCs	54	3.0	54	3.0	0.351	23.6	LOS C	1.6	41.4	0.88	0.92	0.98	20.0
14	R2	All MCs	119	3.0	119	3.0	0.360	18.7	LOS B	1.9	47.5	0.88	0.91	0.97	29.1
Approach			207	3.0	207	3.0	0.360	20.7	LOS C	1.9	47.5	0.88	0.91	0.98	25.6
West: CO 402															
5	L2	All MCs	208	3.0	208	3.0	0.834	24.4	LOS C	17.6	450.2	1.00	1.09	1.88	26.9
2	T1	All MCs	1314	3.0	1314	3.0	0.834	23.3	LOS C	18.4	472.2	1.00	1.08	1.85	32.7
12	R2	All MCs	246	3.0	246	3.0	0.151	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	45.7
Approach			1768	3.0	1768	3.0	0.834	20.8	LOS C	18.4	472.2	0.86	0.93	1.60	33.1
All Vehicles			4252	3.0	4252	3.0	0.921	26.6	LOS C	28.3	725.3	0.92	1.10	1.85	29.4

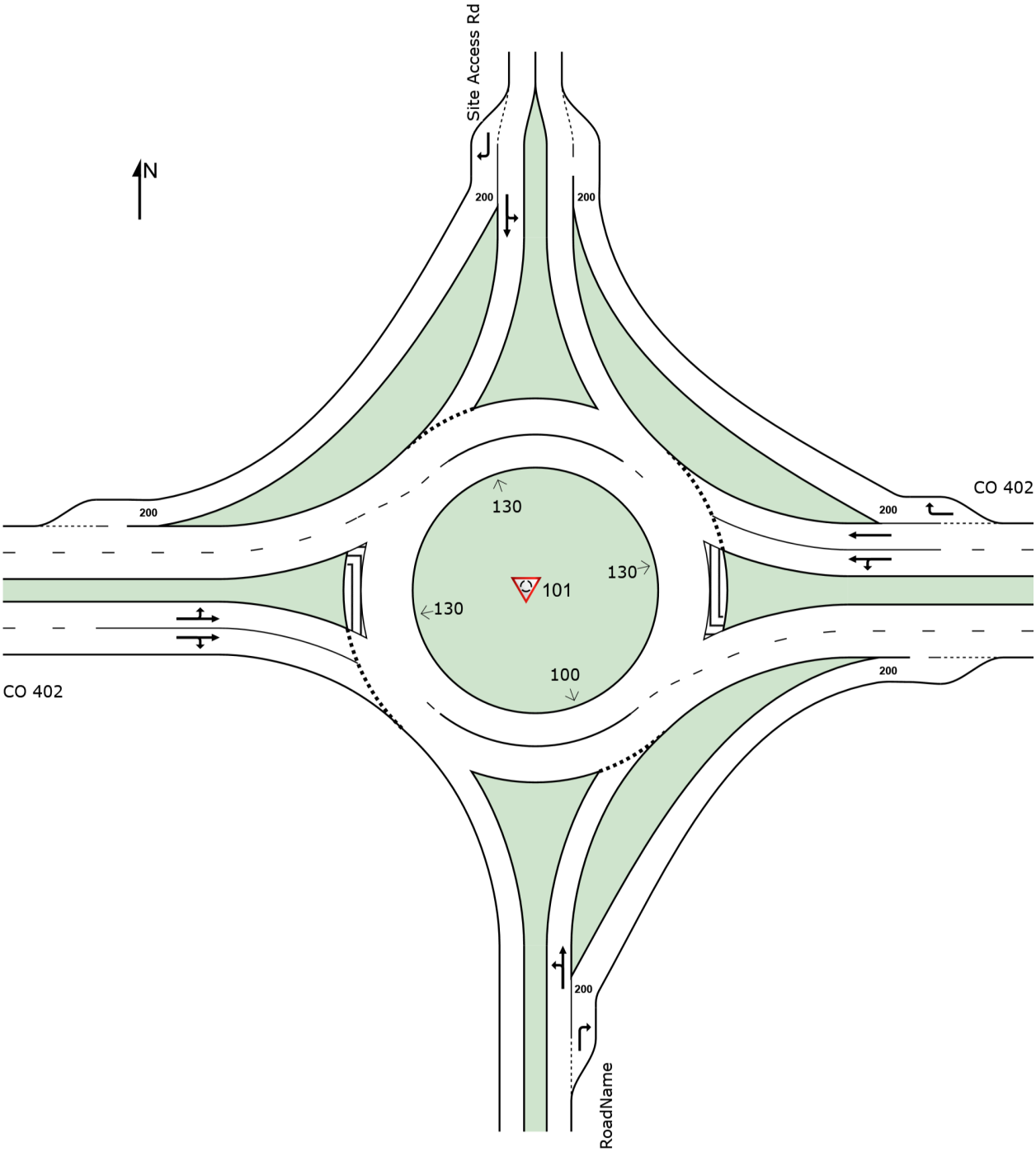
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

AM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site
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: RoadName															
3	L2	All MCs	41	3.0	41	3.0	0.228	17.1	LOS B	1.1	28.1	0.87	0.85	0.87	26.1
8	T1	All MCs	25	3.0	25	3.0	0.228	17.1	LOS B	1.1	28.1	0.87	0.85	0.87	26.0
18	R2	All MCs	116	3.0	116	3.0	0.072	6.1	LOS A	0.0	0.0	0.00	0.00	0.00	36.2
Approach			183	3.0	183	3.0	0.228	10.1	LOS B	1.1	28.1	0.31	0.31	0.31	31.7
East: CO 402															
1	L2	All MCs	152	3.0	152	3.0	0.912	30.1	LOS C	30.1	769.6	1.00	1.28	2.14	24.0
6	T1	All MCs	1738	3.0	1738	3.0	0.912	29.1	LOS C	31.2	797.7	1.00	1.25	2.11	24.8
16	R2	All MCs	347	3.0	347	3.0	0.213	4.4	LOS A	0.0	0.0	0.00	0.00	0.00	41.6
Approach			2237	3.0	2237	3.0	0.912	25.3	LOS C	31.2	797.7	0.84	1.06	1.78	26.2
North: Site Access Rd															
7	L2	All MCs	194	3.0	194	3.0	0.714	37.9	LOS D	4.7	119.8	0.94	1.13	1.38	17.7
4	T1	All MCs	34	3.0	34	3.0	0.714	37.9	LOS D	4.7	119.8	0.94	1.13	1.38	18.9
14	R2	All MCs	131	3.0	131	3.0	0.080	8.1	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach			358	3.0	358	3.0	0.714	27.0	LOS C	4.7	119.8	0.60	0.72	0.88	19.8
West: CO 402															
5	L2	All MCs	234	3.0	234	3.0	0.876	27.0	LOS C	22.8	582.5	1.00	1.18	2.06	20.3
2	T1	All MCs	1435	3.0	1435	3.0	0.876	26.0	LOS C	23.8	608.4	1.00	1.17	2.04	25.8
12	R2	All MCs	47	3.0	47	3.0	0.876	25.2	LOS C	23.8	608.4	1.00	1.17	2.02	26.0
Approach			1716	3.0	1716	3.0	0.876	26.1	LOS C	23.8	608.4	1.00	1.17	2.04	24.9
All Vehicles			4494	3.0	4494	3.0	0.912	25.1	LOS C	31.2	797.7	0.86	1.05	1.75	25.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

AM 2045 Plus Site
Site Category: (None)
Roundabout

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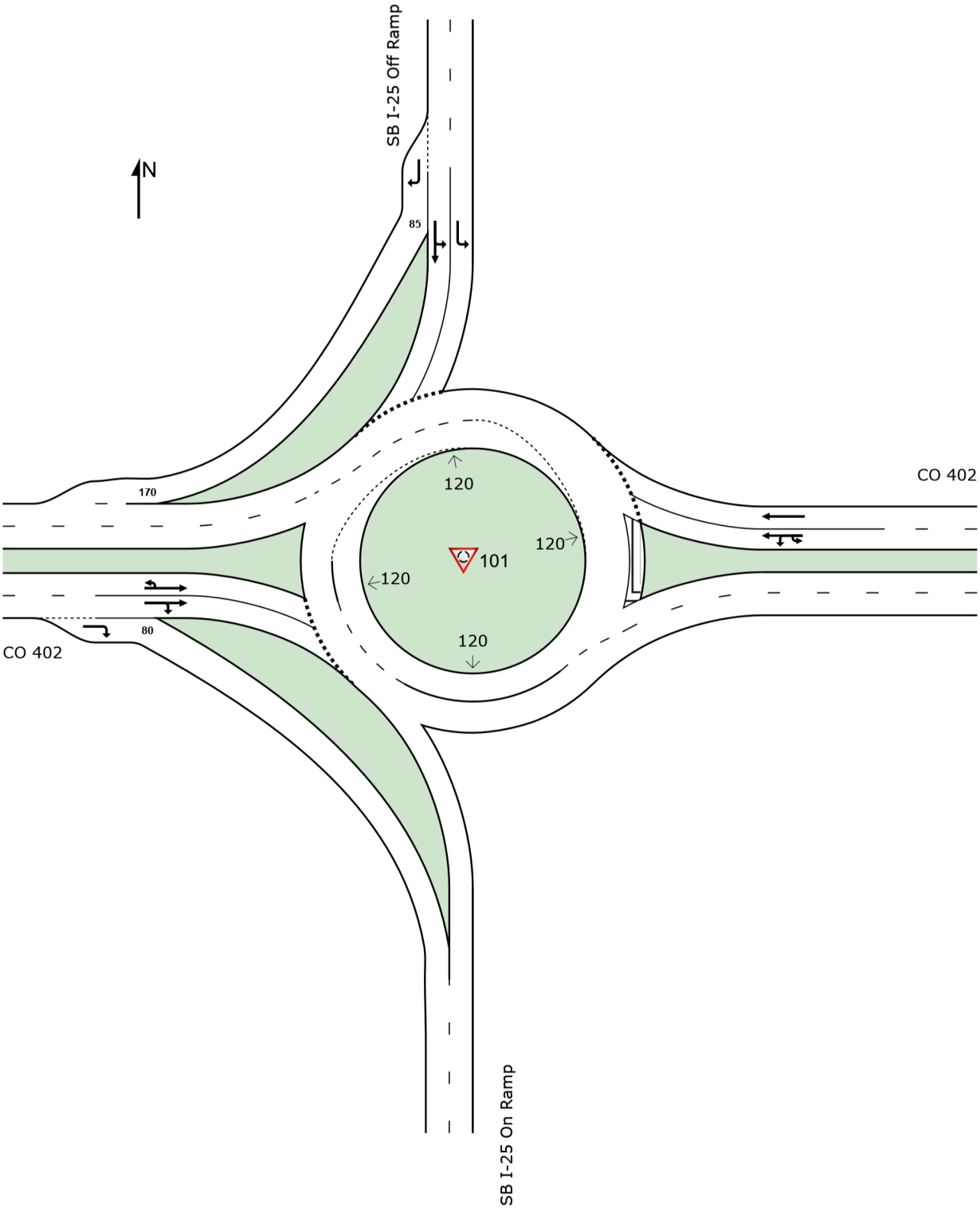

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MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site
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: CO 402															
1u	U	All MCs	21	9.0	21	9.0	0.644	6.3	LOS A	9.5	253.5	0.08	0.01	0.08	16.8
1	L2	All MCs	353	9.0	353	9.0	0.644	6.3	LOS A	9.5	253.5	0.08	0.01	0.08	32.5
6	T1	All MCs	1359	9.0	1359	9.0	0.644	23.5	LOS C	9.5	253.5	0.08	0.01	0.08	22.2
Approach			1733	9.0	1733	9.0	0.644	19.8	LOS B	9.5	253.5	0.08	0.01	0.08	25.0
North: SB I-25 Off Ramp															
7	L2	All MCs	117	9.0	117	9.0	0.100	7.2	LOS A	0.4	11.5	0.71	0.68	0.71	28.3
4	T1	All MCs	2	9.0	2	9.0	0.100	6.0	LOS A	0.4	11.5	0.71	0.66	0.71	38.8
14	R2	All MCs	728	9.0	728	9.0	0.473	30.7	LOS C	0.0	0.0	0.00	0.00	0.00	42.2
Approach			848	9.0	848	9.0	0.473	27.4	LOS C	0.4	11.5	0.10	0.10	0.10	39.4
West: CO 402															
5u	U	All MCs	2	8.0	2	8.0	0.537	11.5	LOS B	4.2	110.9	0.69	0.63	0.94	17.7
2	T1	All MCs	1004	8.0	1004	8.0	0.537	10.8	LOS B	4.3	113.3	0.68	0.61	0.90	21.3
12	R2	All MCs	583	8.0	583	8.0	0.373	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.1
Approach			1589	8.0	1589	8.0	0.537	6.8	LOS A	4.3	113.3	0.43	0.38	0.57	29.0
All Vehicles			4170	8.6	4170	8.6	0.644	16.4	LOS B	9.5	253.5	0.22	0.17	0.27	29.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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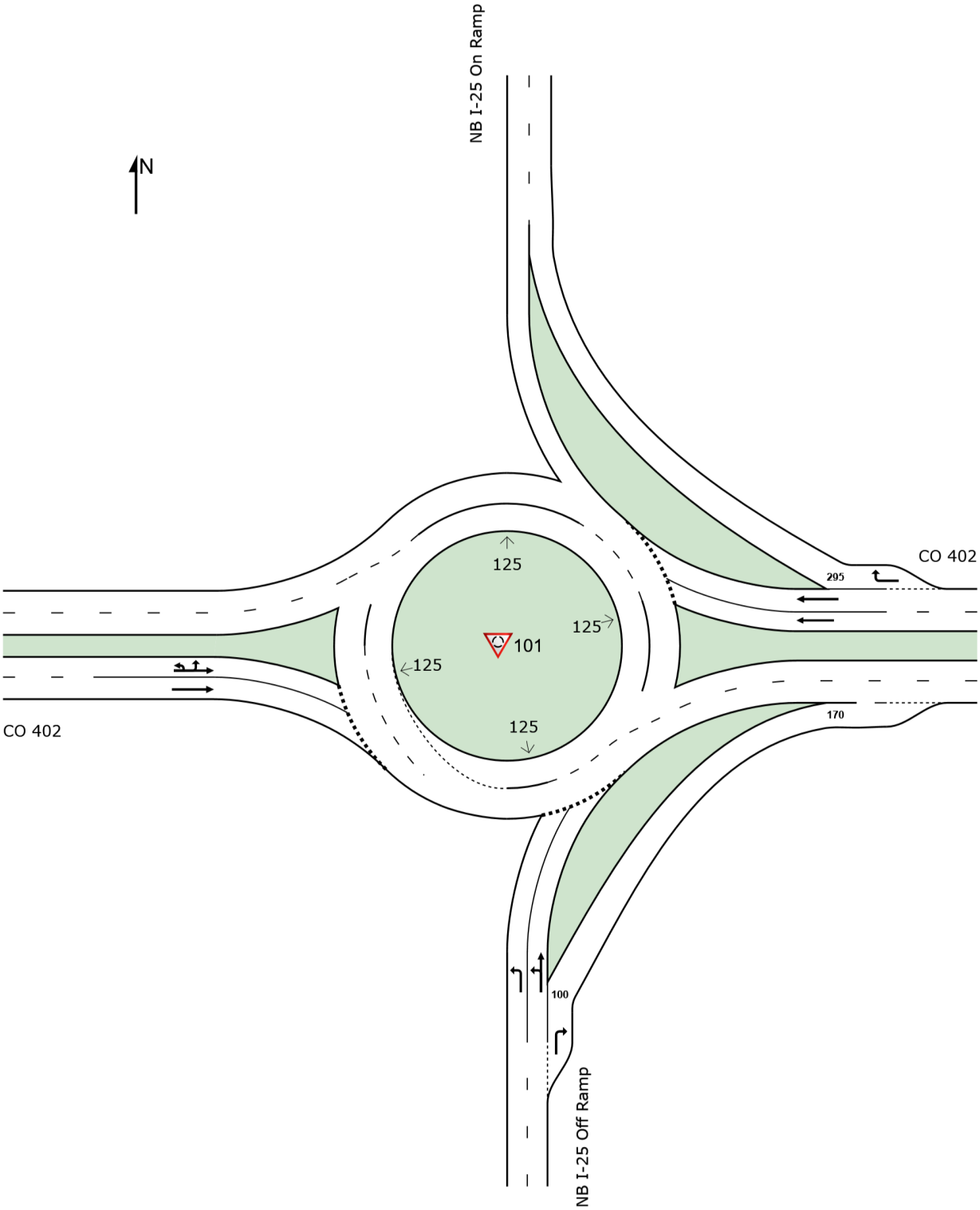
SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

AM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site
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: NB I-25 Off Ramp															
3	L2	All MCs	568	8.0	568	8.0	0.389	9.7	LOS A	1.9	51.6	0.69	0.68	0.86	26.1
8	T1	All MCs	17	8.0	17	8.0	0.389	8.5	LOS A	1.9	51.6	0.68	0.66	0.83	35.8
18	R2	All MCs	188	8.0	188	8.0	0.121	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	41.2
Approach			773	8.0	773	8.0	0.389	8.7	LOS A	1.9	51.6	0.52	0.52	0.65	28.9
East: CO 402															
6	T1	All MCs	1211	8.0	1211	8.0	1.011	63.3	LOS F	25.0	665.3	1.00	2.39	3.77	9.1
16	R2	All MCs	317	8.0	317	8.0	0.204	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.8
Approach			1528	8.0	1528	8.0	1.011	50.2	LOS E	25.0	665.3	0.79	1.90	2.98	11.6
West: CO 402															
5u	U	All MCs	2	8.0	2	8.0	0.492	5.4	LOS A	0.0	0.0	0.00	0.00	0.00	19.6
5	L2	All MCs	605	8.0	605	8.0	0.492	5.4	LOS A	0.0	0.0	0.00	0.00	0.00	33.4
2	T1	All MCs	589	8.0	589	8.0	0.471	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	25.0
Approach			1195	8.0	1195	8.0	0.492	5.3	LOS A	0.0	0.0	0.00	0.00	0.00	30.0
All Vehicles			3497	8.0	3497	8.0	1.011	25.7	LOS C	25.0	665.3	0.46	0.94	1.45	18.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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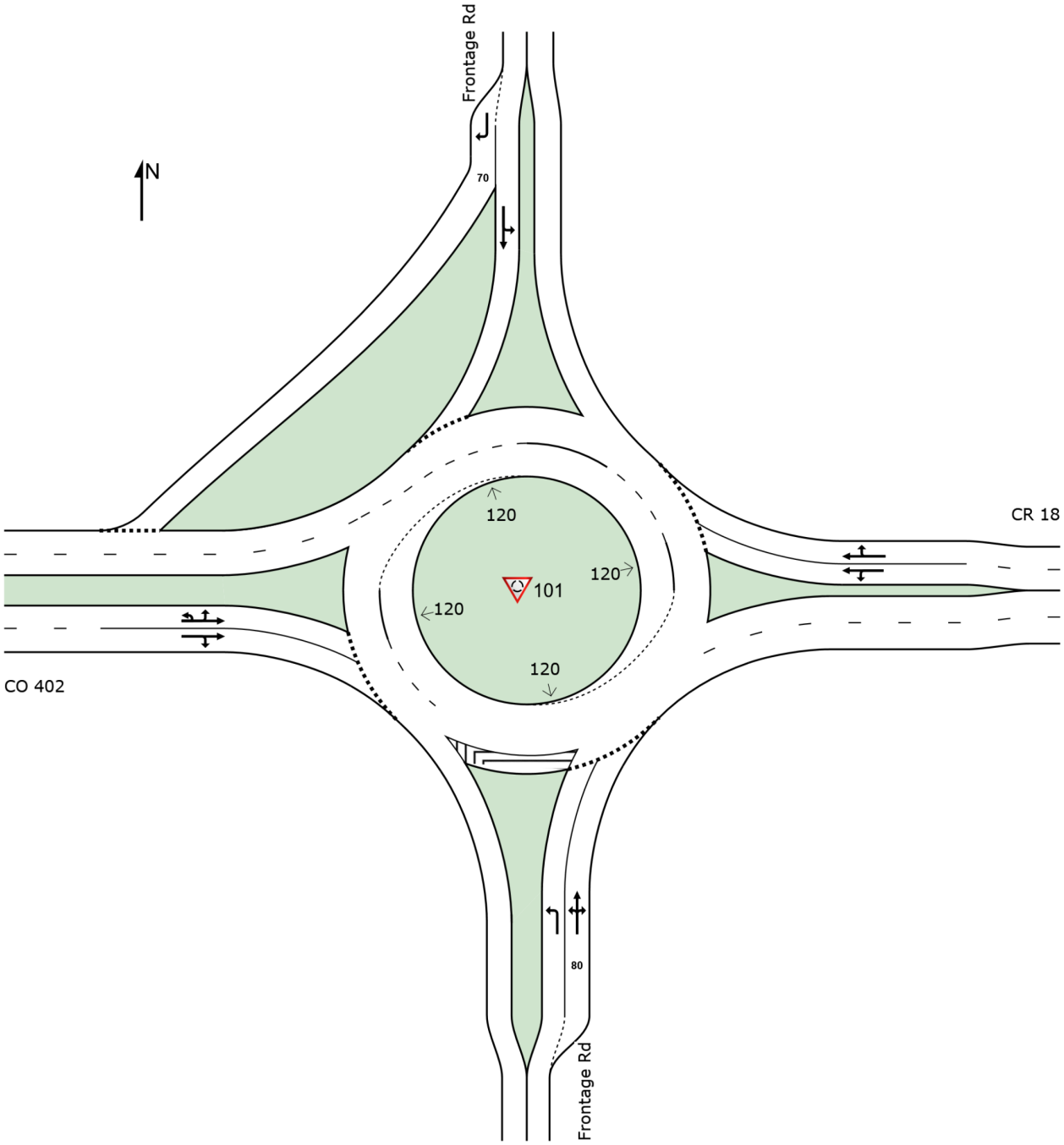
SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

AM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: ALFRED BENESCH & COMPANY | Licence: PLUS / 1PC | Created: Wednesday, August 14, 2024 3:39:25 PM
Project: Y:\Denver\152300S\00152379.00_West_Ridge_Study\Eng_Docs\Traffic\Models\SIDRA\RIRO PnR\2045\AM_2045 Plus Site_Roundabouts.sip9

MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

AM 2045 Plus Site
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: Frontage Rd															
3	L2	All MCs	195	9.0	195	9.0	0.241	9.2	LOS A	1.6	41.9	0.81	0.65	0.81	29.8
8	T1	All MCs	84	9.0	84	9.0	0.241	7.9	LOS A	1.6	41.9	0.81	0.63	0.81	32.6
18	R2	All MCs	23	9.0	23	9.0	0.241	7.9	LOS A	1.6	41.9	0.81	0.63	0.81	37.2
Approach			302	9.0	302	9.0	0.241	8.7	LOS A	1.6	41.9	0.81	0.64	0.81	31.3
East: CR 18															
1	L2	All MCs	25	7.0	25	7.0	0.690	17.6	LOS B	7.9	208.0	0.83	0.86	1.39	35.6
6	T1	All MCs	953	7.0	953	7.0	0.690	17.4	LOS B	7.9	209.6	0.83	0.86	1.38	34.9
16	R2	All MCs	91	7.0	91	7.0	0.690	17.2	LOS B	7.9	209.6	0.83	0.85	1.38	36.1
Approach			1069	7.0	1069	7.0	0.690	17.4	LOS B	7.9	209.6	0.83	0.86	1.38	35.1
North: Frontage Rd															
7	L2	All MCs	68	4.0	68	4.0	0.245	9.9	LOS A	1.1	29.5	0.76	0.70	0.76	37.1
4	T1	All MCs	66	4.0	66	4.0	0.245	9.9	LOS A	1.1	29.5	0.76	0.70	0.76	32.1
14	R2	All MCs	476	4.0	476	4.0	0.851	36.2	LOS D	9.4	242.3	0.95	1.33	2.07	22.4
Approach			610	4.0	610	4.0	0.851	30.4	LOS C	9.4	242.3	0.91	1.19	1.79	25.7
West: CO 402															
5u	U	All MCs	6	9.0	6	9.0	0.369	7.2	LOS A	2.4	63.1	0.44	0.25	0.44	20.2
5	L2	All MCs	199	9.0	199	9.0	0.369	7.2	LOS A	2.4	63.1	0.44	0.25	0.44	28.4
2	T1	All MCs	495	9.0	495	9.0	0.369	7.2	LOS A	2.4	63.1	0.44	0.25	0.44	39.0
12	R2	All MCs	68	9.0	68	9.0	0.369	7.2	LOS A	2.3	62.9	0.44	0.25	0.44	31.3
Approach			768	9.0	768	9.0	0.369	7.2	LOS A	2.4	63.1	0.44	0.25	0.44	35.0
All Vehicles			2750	7.1	2750	7.1	0.851	16.5	LOS B	9.4	242.3	0.74	0.74	1.15	32.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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: 3: SH 402 & S Boise Ave

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	410	226	205	416	430	97	309	247
Average Queue (ft)	191	93	79	290	282	28	138	94
95th Queue (ft)	340	163	169	386	380	63	228	185
Link Distance (ft)		1168	1168	7114	7114			722
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	390					400	155	
Storage Blk Time (%)	0				1		9	0
Queuing Penalty (veh)	2				1		20	1

Intersection: 5: SH 402 & LCR 9E

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	179	192	170	378	347	114	207	151
Average Queue (ft)	88	116	114	226	230	50	119	65
95th Queue (ft)	146	172	165	335	331	93	185	118
Link Distance (ft)		7114	7114	3063	3063			685
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	390					420	225	
Storage Blk Time (%)							0	
Queuing Penalty (veh)							0	

Intersection: 22: Boyd Lake & SH 402

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	157	370	320	163	69	249	293	82	27	197	65	296
Average Queue (ft)	62	182	189	34	27	167	193	18	3	97	30	155
95th Queue (ft)	111	286	274	90	68	241	271	53	17	167	59	261
Link Distance (ft)		3063	3063			3735	3735			615		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			400	400			400	250		250	250
Storage Blk Time (%)												1
Queuing Penalty (veh)												2

Intersection: 22: Boyd Lake & SH 402

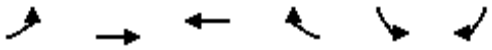
Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	243	110
Average Queue (ft)	113	47
95th Queue (ft)	205	91
Link Distance (ft)	760	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		250
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Zone Summary

Zone wide Queuing Penalty: 26

HCM 6th Signalized Intersection Summary
3: SH 402 & S Boise Ave

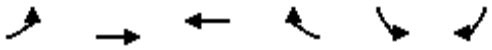
08/14/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	304	1299	1236	231	181	301
Future Volume (veh/h)	304	1299	1236	231	181	301
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1826	1826	1856	1856	1885	1885
Adj Flow Rate, veh/h	313	1339	1274	167	187	294
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	3	3	1	1
Cap, veh/h	357	2484	2010	1186	330	447
Arrive On Green	0.10	0.72	0.57	0.57	0.18	0.18
Sat Flow, veh/h	1739	3561	3618	1572	1795	1598
Grp Volume(v), veh/h	313	1339	1274	167	187	294
Grp Sat Flow(s),veh/h/ln	1739	1735	1763	1572	1795	1598
Q Serve(g_s), s	6.9	17.8	24.3	2.9	9.5	16.2
Cycle Q Clear(g_c), s	6.9	17.8	24.3	2.9	9.5	16.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	357	2484	2010	1186	330	447
V/C Ratio(X)	0.88	0.54	0.63	0.14	0.57	0.66
Avail Cap(c_a), veh/h	555	2484	2010	1186	341	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.75	0.75	1.00	1.00
Uniform Delay (d), s/veh	17.3	6.6	14.5	3.4	37.2	31.8
Incr Delay (d2), s/veh	9.7	0.8	1.2	0.2	2.1	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	4.5	8.2	1.5	4.3	6.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.9	7.4	15.6	3.6	39.2	35.1
LnGrp LOS	C	A	B	A	D	D
Approach Vol, veh/h		1652	1441		481	
Approach Delay, s/veh		11.1	14.2		36.7	
Approach LOS		B	B		D	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	14.6	62.0				76.6	23.4
Change Period (Y+Rc), s	5.0	5.0				5.0	5.0
Max Green Setting (Gmax), s	21.0	45.0				71.0	19.0
Max Q Clear Time (g_c+I1), s	8.9	26.3				19.8	18.2
Green Ext Time (p_c), s	0.7	8.6				11.8	0.2

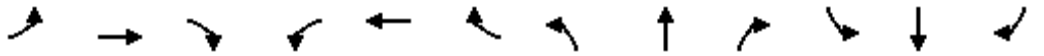
Intersection Summary	
HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	200	1310	1184	235	151	163
Future Volume (veh/h)	200	1310	1184	235	151	163
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1826	1826
Adj Flow Rate, veh/h	215	1409	1273	192	162	66
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	4	4	5	5
Cap, veh/h	408	2559	2114	1224	313	279
Arrive On Green	0.07	0.72	1.00	1.00	0.18	0.18
Sat Flow, veh/h	1781	3647	3589	1560	1739	1547
Grp Volume(v), veh/h	215	1409	1273	192	162	66
Grp Sat Flow(s),veh/h/ln	1781	1777	1749	1560	1739	1547
Q Serve(g_s), s	4.3	18.4	0.0	0.0	8.4	3.7
Cycle Q Clear(g_c), s	4.3	18.4	0.0	0.0	8.4	3.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	408	2559	2114	1224	313	279
V/C Ratio(X)	0.53	0.55	0.60	0.16	0.52	0.24
Avail Cap(c_a), veh/h	540	2559	2114	1224	313	279
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.67	0.67	1.00	1.00
Uniform Delay (d), s/veh	5.5	6.5	0.0	0.0	37.1	35.1
Incr Delay (d2), s/veh	0.9	0.7	0.3	0.0	6.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.6	0.1	0.0	4.0	3.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.4	7.2	0.3	0.0	43.1	37.1
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		1624	1465		228	
Approach Delay, s/veh		7.1	0.3		41.4	
Approach LOS		A	A		D	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			77.0		23.0	11.6	65.4
Change Period (Y+Rc), s			5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s			72.0		18.0	14.0	53.0
Max Q Clear Time (g_c+I1), s			20.4		10.4	6.3	2.0
Green Ext Time (p_c), s			12.8		0.4	0.3	12.0

Intersection Summary	
HCM 6th Ctrl Delay	6.4
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1212	80	56	1298	226	5	180	54	217	200	160
Future Volume (veh/h)	160	1212	80	56	1298	226	5	180	54	217	200	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	1276	45	59	1366	129	5	189	1	228	211	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	256	1889	843	225	1807	806	272	539	457	320	539	557
Arrive On Green	0.02	0.18	0.18	0.04	0.51	0.51	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1014	1870	1585	1193	1870	1585
Grp Volume(v), veh/h	168	1276	45	59	1366	129	5	189	1	228	211	157
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1014	1870	1585	1193	1870	1585
Q Serve(g_s), s	4.3	33.6	2.4	1.5	30.7	4.4	0.4	8.0	0.0	18.7	9.1	7.1
Cycle Q Clear(g_c), s	4.3	33.6	2.4	1.5	30.7	4.4	9.5	8.0	0.0	26.7	9.1	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	256	1889	843	225	1807	806	272	539	457	320	539	557
V/C Ratio(X)	0.66	0.68	0.05	0.26	0.76	0.16	0.02	0.35	0.00	0.71	0.39	0.28
Avail Cap(c_a), veh/h	303	1889	843	257	1807	806	274	542	460	323	542	561
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	33.2	20.3	16.2	19.6	13.2	32.4	28.2	25.4	38.8	28.6	23.3
Incr Delay (d2), s/veh	3.2	1.6	0.1	0.6	3.0	0.4	0.0	0.4	0.0	7.1	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	16.1	0.8	0.6	11.5	1.4	0.1	3.5	0.0	5.8	3.9	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	34.8	20.4	16.8	22.6	13.6	32.4	28.6	25.4	45.9	29.0	23.6
LnGrp LOS	C	C	C	B	C	B	C	C	C	D	C	C
Approach Vol, veh/h		1489			1554			195			596	
Approach Delay, s/veh		33.0			21.7			28.7			34.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.8	8.0	58.2		33.8	10.4	55.8				
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0				
Max Green Setting (Gmax), s		29.0	5.8	51.2		29.0	9.0	48.0				
Max Q Clear Time (g_c+I1), s		11.5	3.5	35.6		28.7	6.3	32.7				
Green Ext Time (p_c), s		0.8	0.0	7.4		0.1	0.1	8.1				

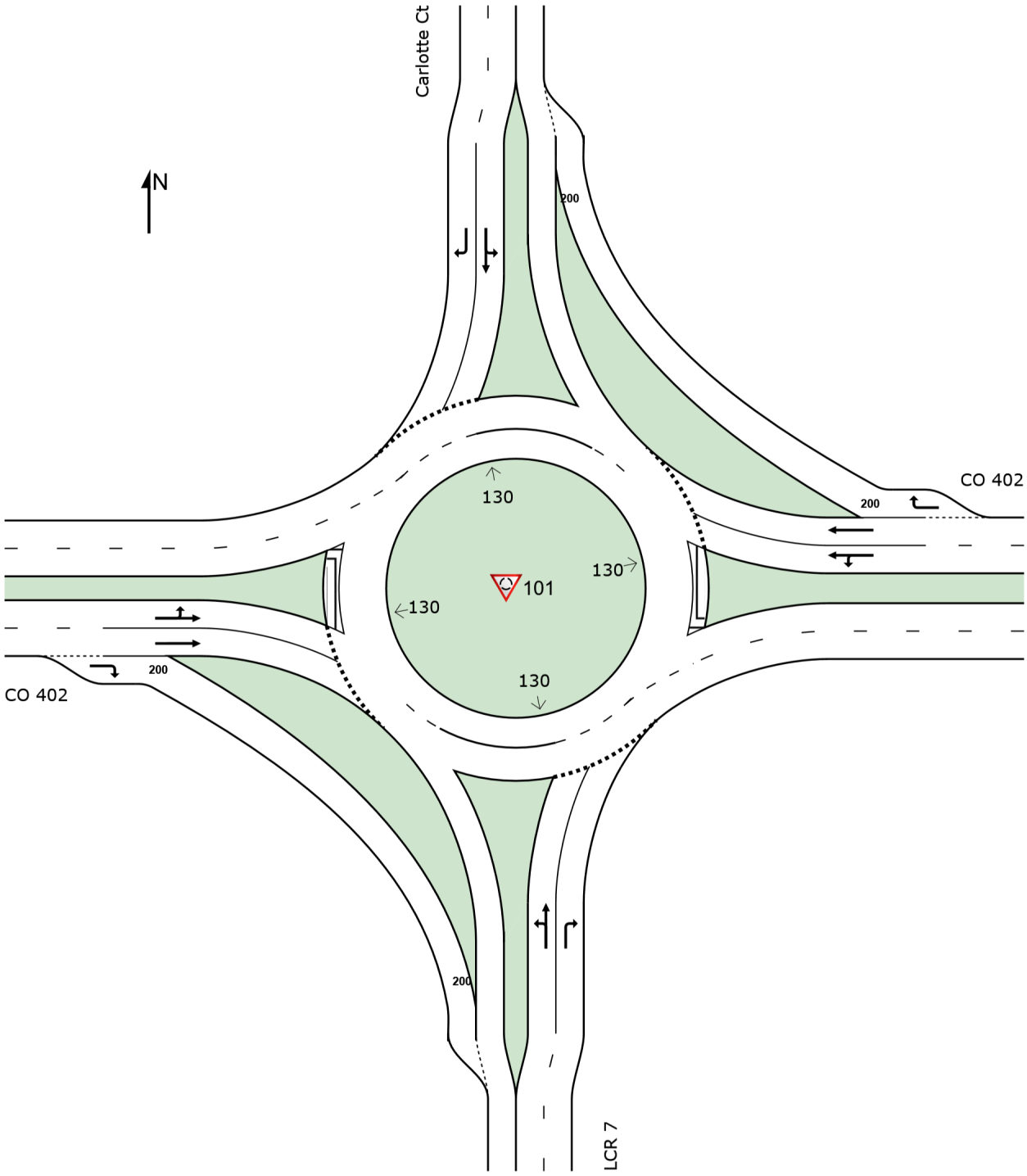
Intersection Summary	
HCM 6th Ctrl Delay	28.4
HCM 6th LOS	C

SITE LAYOUT

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

PM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: Y:\Denver\152300S\00152379.00_West_Ridge_Study\Eng_Docs\Traffic\Models\SIDRA\RIRO PnR\2045\PM_2045 Plus Site_Roundabouts.sip9

MOVEMENT SUMMARY

Site: 101 [402 & Charlotte/LCR7 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site
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: LCR 7															
3	L2	All MCs	198	3.0	198	3.0	0.621	25.7	LOS C	3.7	94.8	0.87	0.98	1.27	28.2
8	T1	All MCs	48	3.0	48	3.0	0.621	25.7	LOS C	3.7	94.8	0.87	0.98	1.27	18.8
18	R2	All MCs	295	3.0	295	3.0	0.621	22.1	LOS C	4.0	102.5	0.87	0.97	1.26	25.3
Approach			540	3.0	540	3.0	0.621	23.7	LOS C	4.0	102.5	0.87	0.97	1.27	26.0
East: CO 402															
1	L2	All MCs	271	3.0	271	3.0	0.793	19.8	LOS B	15.9	406.5	0.94	0.93	1.61	25.6
6	T1	All MCs	1316	3.0	1316	3.0	0.793	18.9	LOS B	16.3	418.3	0.93	0.92	1.57	34.2
16	R2	All MCs	25	3.0	25	3.0	0.015	2.4	LOS A	0.0	0.0	0.00	0.00	0.00	41.6
Approach			1612	3.0	1612	3.0	0.793	18.8	LOS B	16.3	418.3	0.92	0.91	1.55	33.0
North: Carlotte Ct															
7	L2	All MCs	34	3.0	34	3.0	0.306	19.7	LOS B	1.4	35.1	0.85	0.88	0.92	22.2
4	T1	All MCs	53	3.0	53	3.0	0.306	19.7	LOS B	1.4	35.1	0.85	0.88	0.92	21.0
14	R2	All MCs	136	3.0	136	3.0	0.361	16.6	LOS B	1.9	47.6	0.86	0.89	0.96	29.8
Approach			223	3.0	223	3.0	0.361	17.8	LOS B	1.9	47.6	0.86	0.88	0.94	26.8
West: CO 402															
5	L2	All MCs	108	3.0	108	3.0	0.713	15.9	LOS B	11.0	281.1	0.87	0.79	1.30	29.9
2	T1	All MCs	1299	3.0	1299	3.0	0.713	15.3	LOS B	11.2	286.8	0.86	0.77	1.28	36.4
12	R2	All MCs	217	3.0	217	3.0	0.134	3.8	LOS A	0.0	0.0	0.00	0.00	0.00	45.7
Approach			1624	3.0	1624	3.0	0.713	13.8	LOS B	11.2	286.8	0.75	0.67	1.11	36.8
All Vehicles			3999	3.0	3999	3.0	0.793	17.4	LOS B	16.3	418.3	0.84	0.82	1.30	33.2

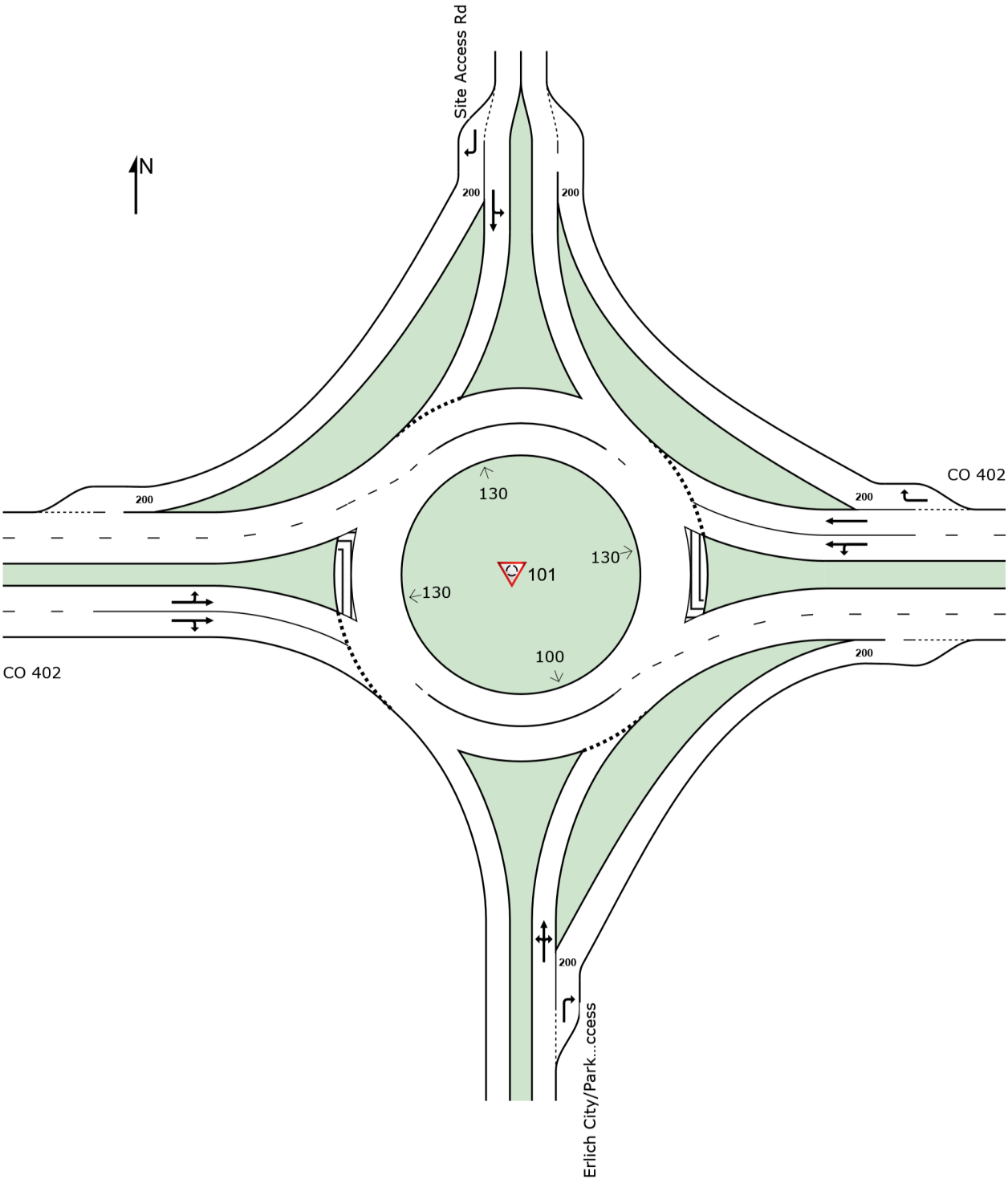
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

PM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [402 & Site Access/PnR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site
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: Erlich City/Park-n-Ride Access															
3	L2	All MCs	47	3.0	47	3.0	0.262	17.8	LOS B	1.3	32.6	0.87	0.86	0.87	25.9
8	T1	All MCs	30	3.0	30	3.0	0.262	17.8	LOS B	1.3	32.6	0.87	0.86	0.87	25.8
18	R2	All MCs	150	3.0	150	3.0	0.092	6.4	LOS A	0.0	0.0	0.00	0.00	0.00	36.2
Approach			227	3.0	227	3.0	0.262	10.3	LOS B	1.3	32.6	0.30	0.29	0.30	31.8
East: CO 402															
1	L2	All MCs	127	3.0	127	3.0	0.757	15.5	LOS B	13.5	345.4	0.79	0.60	1.03	29.1
6	T1	All MCs	1634	3.0	1634	3.0	0.757	15.1	LOS B	13.5	345.4	0.78	0.58	0.99	31.0
16	R2	All MCs	167	3.0	167	3.0	0.103	3.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.6
Approach			1928	3.0	1928	3.0	0.757	14.1	LOS B	13.5	345.4	0.72	0.53	0.91	31.5
North: Site Access Rd															
7	L2	All MCs	225	3.0	225	3.0	0.606	23.8	LOS C	3.7	94.9	0.89	1.04	1.25	20.7
4	T1	All MCs	28	3.0	28	3.0	0.606	23.8	LOS C	3.7	94.9	0.89	1.04	1.25	21.7
14	R2	All MCs	152	3.0	152	3.0	0.093	7.3	LOS A	0.0	0.0	0.00	0.00	0.00	24.9
Approach			405	3.0	405	3.0	0.606	17.6	LOS B	3.7	94.9	0.56	0.65	0.78	22.1
West: CO 402															
5	L2	All MCs	113	3.0	113	3.0	0.856	25.1	LOS C	20.7	530.6	1.00	1.12	1.96	21.0
2	T1	All MCs	1519	3.0	1519	3.0	0.856	24.2	LOS C	21.6	552.9	1.00	1.11	1.93	26.6
12	R2	All MCs	41	3.0	41	3.0	0.856	23.4	LOS C	21.6	552.9	1.00	1.10	1.91	26.7
Approach			1673	3.0	1673	3.0	0.856	24.2	LOS C	21.6	552.9	1.00	1.11	1.94	26.1
All Vehicles			4233	3.0	4233	3.0	0.856	18.2	LOS B	21.6	552.9	0.79	0.76	1.27	28.2

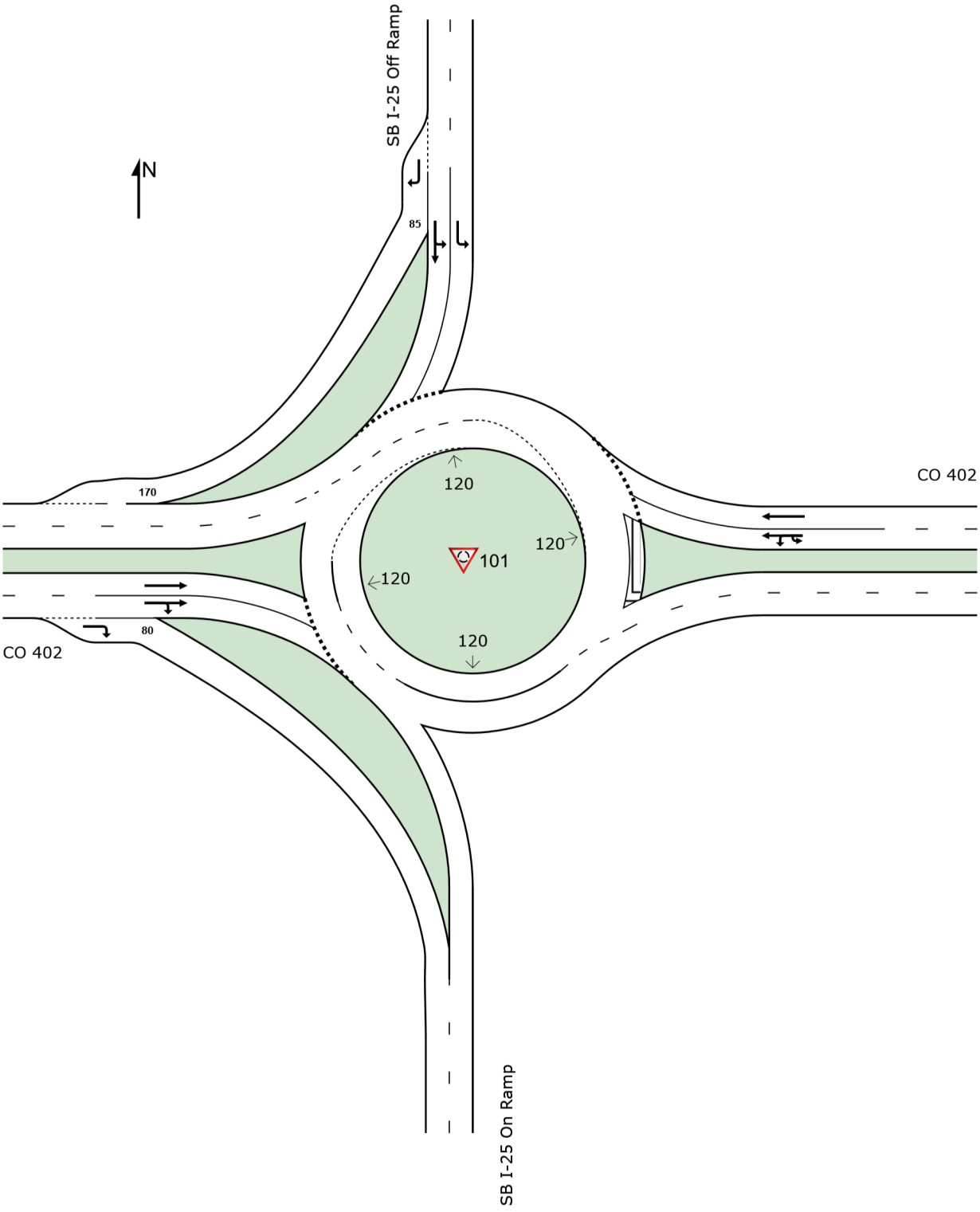
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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.

SITE LAYOUT

Site: 101 [402 & SB I-25 (Site Folder: General)]

PM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [402 & SB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site
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: CO 402															
1u	U	All MCs	6	5.0	6	5.0	0.529	5.3	LOS A	0.0	0.0	0.00	0.00	0.00	19.6
1	L2	All MCs	247	5.0	247	5.0	0.529	5.3	LOS A	0.0	0.0	0.00	0.00	0.00	37.9
6	T1	All MCs	1230	5.0	1230	5.0	0.529	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	26.4
Approach			1483	5.0	1483	5.0	0.529	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	29.0
North: SB I-25 Off Ramp															
7	L2	All MCs	256	6.0	256	6.0	0.174	6.7	LOS A	0.7	18.7	0.65	0.61	0.65	28.7
4	T1	All MCs	1	6.0	1	6.0	0.174	5.8	LOS A	0.7	18.7	0.65	0.59	0.65	39.2
14	R2	All MCs	551	6.0	551	6.0	0.348	16.7	LOS B	0.0	0.0	0.00	0.00	0.00	42.3
Approach			809	6.0	809	6.0	0.348	13.5	LOS B	0.7	18.7	0.21	0.19	0.21	36.6
West: CO 402															
2	T1	All MCs	1293	7.0	1293	7.0	0.685	14.9	LOS B	8.2	216.7	0.78	0.80	1.29	19.3
12	R2	All MCs	411	7.0	411	7.0	0.260	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.4
Approach			1703	7.0	1703	7.0	0.685	11.3	LOS B	8.2	216.7	0.59	0.61	0.98	24.6
All Vehicles			3995	6.1	3995	6.1	0.685	9.5	LOS A	8.2	216.7	0.29	0.30	0.46	28.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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SITE LAYOUT

Site: 101 [402 & NB I-25 (Site Folder: General)]

PM 2045 Plus Site
Site Category: (None)
Roundabout

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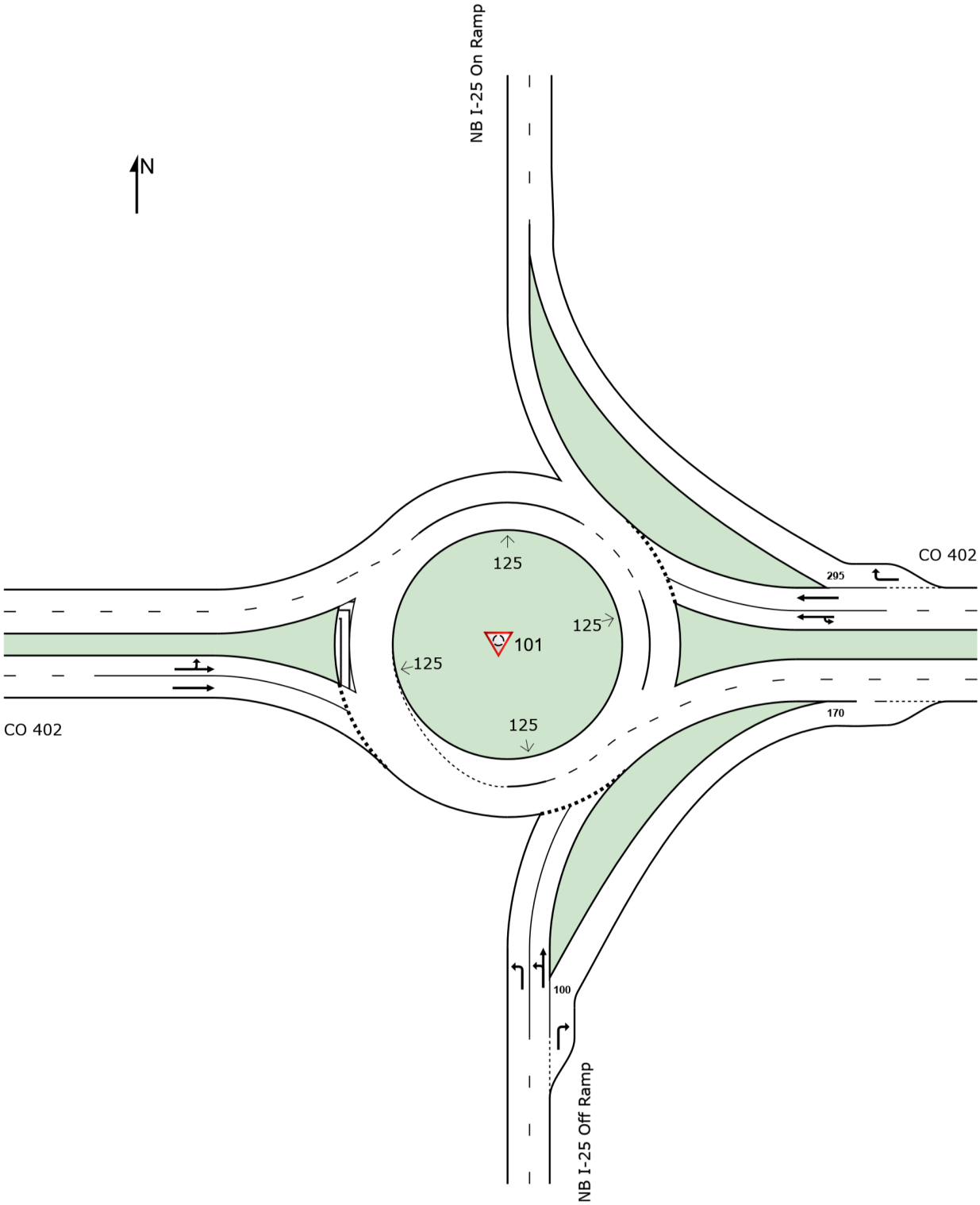

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MOVEMENT SUMMARY

Site: 101 [402 & NB I-25 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site
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: NB I-25 Off Ramp															
3	L2	All MCs	615	4.0	615	4.0	0.436	11.1	LOS B	2.5	65.4	0.77	0.79	1.01	25.4
8	T1	All MCs	2	4.0	2	4.0	0.436	9.6	LOS A	2.5	65.4	0.77	0.76	0.98	35.4
18	R2	All MCs	243	4.0	243	4.0	0.150	8.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.4
Approach			860	4.0	860	4.0	0.436	10.2	LOS B	2.5	65.4	0.55	0.56	0.72	28.5
East: CO 402															
1u	U	All MCs	5	7.0	5	7.0	0.754	29.0	LOS C	6.7	176.7	0.92	1.26	1.72	14.6
6	T1	All MCs	896	7.0	896	7.0	0.754	25.3	LOS C	7.8	206.7	0.93	1.26	1.71	14.7
16	R2	All MCs	127	7.0	127	7.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	24.8
Approach			1028	7.0	1028	7.0	0.754	22.2	LOS C	7.8	206.7	0.82	1.10	1.50	16.1
West: CO 402															
5	L2	All MCs	572	5.0	572	5.0	0.565	6.2	LOS A	7.3	190.1	0.12	0.02	0.12	31.0
2	T1	All MCs	1005	5.0	1005	5.0	0.565	6.0	LOS A	7.3	191.0	0.12	0.02	0.12	21.1
Approach			1577	5.0	1577	5.0	0.565	6.1	LOS A	7.3	191.0	0.12	0.02	0.12	25.3
All Vehicles			3466	5.3	3466	5.3	0.754	11.9	LOS B	7.8	206.7	0.43	0.48	0.68	22.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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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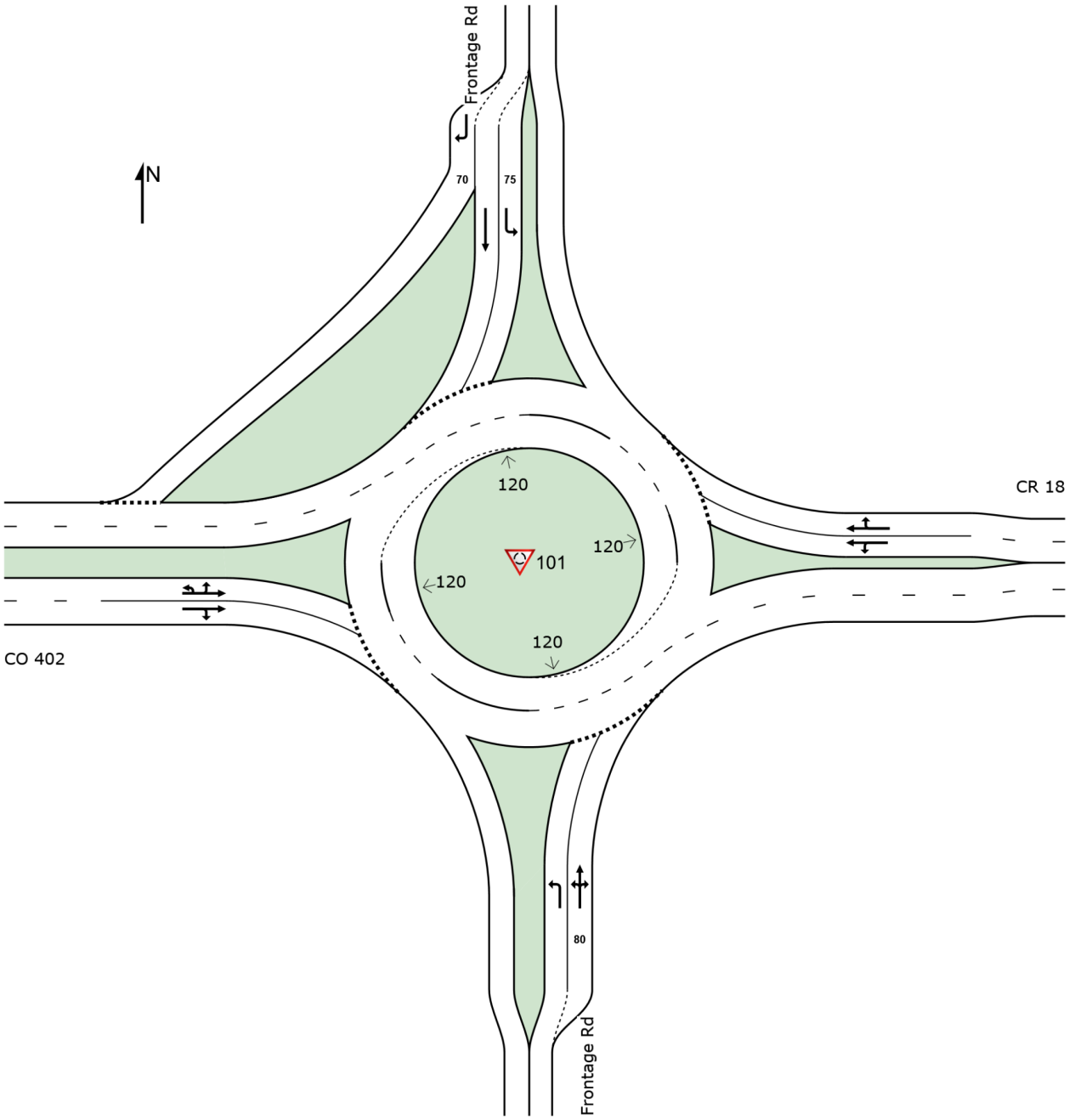
SITE LAYOUT

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

PM 2045 Plus Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [402/CR18 & Frontage Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

PM 2045 Plus Site
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: Frontage Rd															
3	L2	All MCs	165	2.0	165	2.0	0.316	12.0	LOS B	1.5	39.3	0.76	0.75	0.81	29.0
8	T1	All MCs	125	2.0	125	2.0	0.316	10.4	LOS B	1.5	39.3	0.76	0.72	0.79	32.5
18	R2	All MCs	56	2.0	56	2.0	0.316	10.4	LOS B	1.5	39.3	0.76	0.72	0.79	37.3
Approach			345	2.0	345	2.0	0.316	11.2	LOS B	1.5	39.3	0.76	0.73	0.80	31.8
East: CR 18															
1	L2	All MCs	10	2.0	10	2.0	0.414	10.2	LOS B	2.4	62.2	0.70	0.62	0.80	37.1
6	T1	All MCs	500	2.0	500	2.0	0.414	10.1	LOS B	2.5	62.4	0.70	0.61	0.80	37.9
16	R2	All MCs	120	2.0	120	2.0	0.414	9.8	LOS A	2.5	62.4	0.70	0.61	0.79	38.2
Approach			630	2.0	630	2.0	0.414	10.0	LOS B	2.5	62.4	0.70	0.61	0.79	38.0
North: Frontage Rd															
7	L2	All MCs	108	2.0	108	2.0	0.101	4.3	LOS A	0.5	12.2	0.56	0.42	0.56	37.9
4	T1	All MCs	98	2.0	98	2.0	0.113	5.3	LOS A	0.5	12.9	0.57	0.46	0.57	33.4
14	R2	All MCs	273	2.0	273	2.0	0.255	5.8	LOS A	1.3	33.3	0.60	0.46	0.60	29.8
Approach			479	2.0	479	2.0	0.255	5.3	LOS A	1.3	33.3	0.59	0.45	0.59	33.0
West: CO 402															
5u	U	All MCs	10	2.0	10	2.0	0.569	10.3	LOS B	4.1	104.7	0.58	0.37	0.58	18.8
5	L2	All MCs	371	2.0	371	2.0	0.569	10.3	LOS B	4.1	104.7	0.58	0.37	0.58	27.4
2	T1	All MCs	784	2.0	784	2.0	0.569	10.3	LOS B	4.1	104.7	0.57	0.36	0.57	38.0
12	R2	All MCs	56	2.0	56	2.0	0.569	10.3	LOS B	4.1	102.5	0.57	0.36	0.57	30.7
Approach			1221	2.0	1221	2.0	0.569	10.3	LOS B	4.1	104.7	0.57	0.37	0.57	33.9
All Vehicles			2675	2.0	2675	2.0	0.569	9.5	LOS A	4.1	104.7	0.63	0.49	0.66	34.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not 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: 3: SH 402 & S Boise Ave

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	250	161	158	295	321	95	229	210
Average Queue (ft)	138	86	75	162	168	34	109	116
95th Queue (ft)	221	147	144	282	285	77	191	200
Link Distance (ft)		1168	1168	7114	7114			722
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	390					400	155	
Storage Blk Time (%)							6	3
Queuing Penalty (veh)							17	5

Intersection: 5: SH 402 & LCR 9E

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	238	178	172	246	249	112	184	136
Average Queue (ft)	98	78	85	158	166	34	105	64
95th Queue (ft)	175	137	151	256	255	76	181	105
Link Distance (ft)		7114	7114	3063	3063			685
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	390					420	225	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 22: Boyd Lake & SH 402

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	157	339	325	59	68	290	305	144	48	175	62	342
Average Queue (ft)	72	188	196	16	29	177	199	44	9	82	22	196
95th Queue (ft)	128	308	301	42	55	255	266	90	32	138	45	321
Link Distance (ft)		3063	3063			3735	3735			615		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			400	400			400	250		250	250
Storage Blk Time (%)												16
Queuing Penalty (veh)												57

Intersection: 22: Boyd Lake & SH 402

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	336	108
Average Queue (ft)	153	44
95th Queue (ft)	275	90
Link Distance (ft)	760	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		250
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Zone Summary

Zone wide Queuing Penalty: 79

APPENDIX K

Site Access Exhibit

7/12/2023 2:40 PM

REVISIONS

DESCRIPTION	DATE	BY

DRAWN BAMG

CHECKED JFS

DESIGNED BAMG

FILENAME 2023-07-11 0003_ROUNDABOUT

WEST RIDGE

ROUNDABOUT EXHIBIT

TST

TST, INC.
CONSULTING ENGINEERS
748 Whalers Way
Suite 200 Fort Collins
Colorado 80525
Phone: 970.226.0557

JOB NO. 1258.0003.00

SCALE 1" = 150'

DATE JULY 2023

SHEET 1 of 1

7/12/2023 2:40 PM

REVISIONS

DESCRIPTION	DATE	BY

DRAWN BAMG

CHECKED JFS

DESIGNED BAMG

FILENAME 2023-07-11 0003_ROUNDABOUT_ULTIMATE

WEST RIDGE

ROUNDABOUT EXHIBIT

TST

TST, INC.
CONSULTING ENGINEERS
748 Whalers Way
Suite 200 Fort Collins
Colorado 80525
Phone: 970.226.0557

JOB NO. 1258.0003.00

SCALE 1" = 150'

DATE JULY 2023

SHEET 1 of 1