DRAFT

TECHNICAL MEMORANDUM #1

DATE: May 16, 2019

Kittelson #: 20783
MDT #: 110591

TO: Wade Salyards, PE Montana Department of Transportation

FROM: Andy Daleiden, PE and Mark Heisinger, EIT – Kittelson & Associates, Inc.

PROJECT: Exposition Dr & 1st Ave N - Billings - NH 16-1(53)0, UPN 7908000

SUBJECT: Existing and Future Year 2040 Transportation Conditions and Analysis

Introduction

This memorandum addresses the existing and future conditions at the Exposition Drive / 1st Avenue North intersection. This project could potentially include lane modifications, traffic signal modifications, and minor realignment of routes and approaches near and at the intersection of Exposition Drive / 1st Avenue North in Billings, MT. This report discusses traffic related issues that will be used to identify and implement intersection improvements.

PROJECT AREA

Located in Yellowstone County, within the Billings city limits, the Exposition Drive / 1st Avenue North intersection is located 1.3 miles northeast of downtown Billings and just southwest of MetraPark. This intersection resides on the Camino Real International Trade Corridor that connects Canada, United States, and Mexico, and is a critical junction that provides local and regional connectivity to downtown Billings, US 87, Highway 3, and Interstate 90. Figure 1 illustrates the project location within Billings and Yellowstone County. Figure 2 illustrates the project study area, including study intersections. The eastern project limits end at the Dick Johnston Bridge which crosses the Yellowstone River and provides access to Interstate 90. A Montana Rail Link (MRL) railroad facility is located to the south of the study area and runs parallel to 1st Avenue North and US 87 over the Yellowstone River.

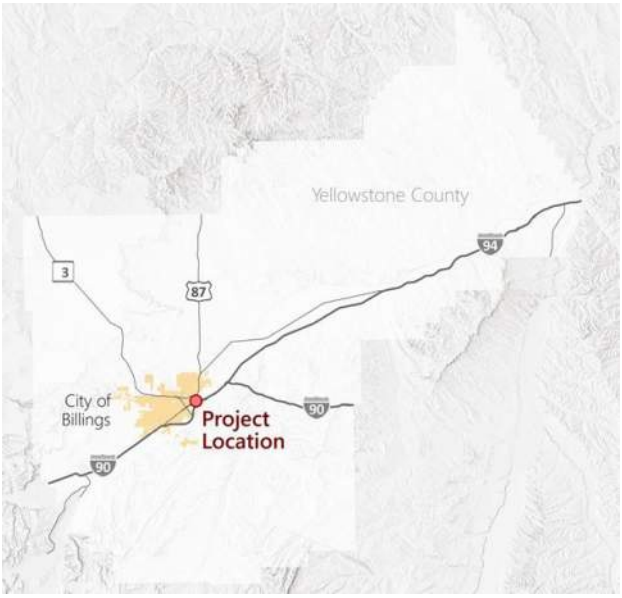


Figure 1 Project Vicinity Map

Roadway Characteristics

Figure 3 displays existing traffic control and roadway posted speed limits. Exposition Drive, 1st Avenue North, and 4th Avenue North are all owned by the Montana Department of Transportation (MDT) and are classified as Principal Arterials (Reference 1). Exposition Drive is a six-lane roadway with a raised median. 1st Avenue North is a four-lane roadway with a two-way-left turn lane to the west of Exposition Drive and a raised median to the east of Exposition Drive. 4th Avenue North is a three-lane, one-way road.

Figure 2

Project Study Area

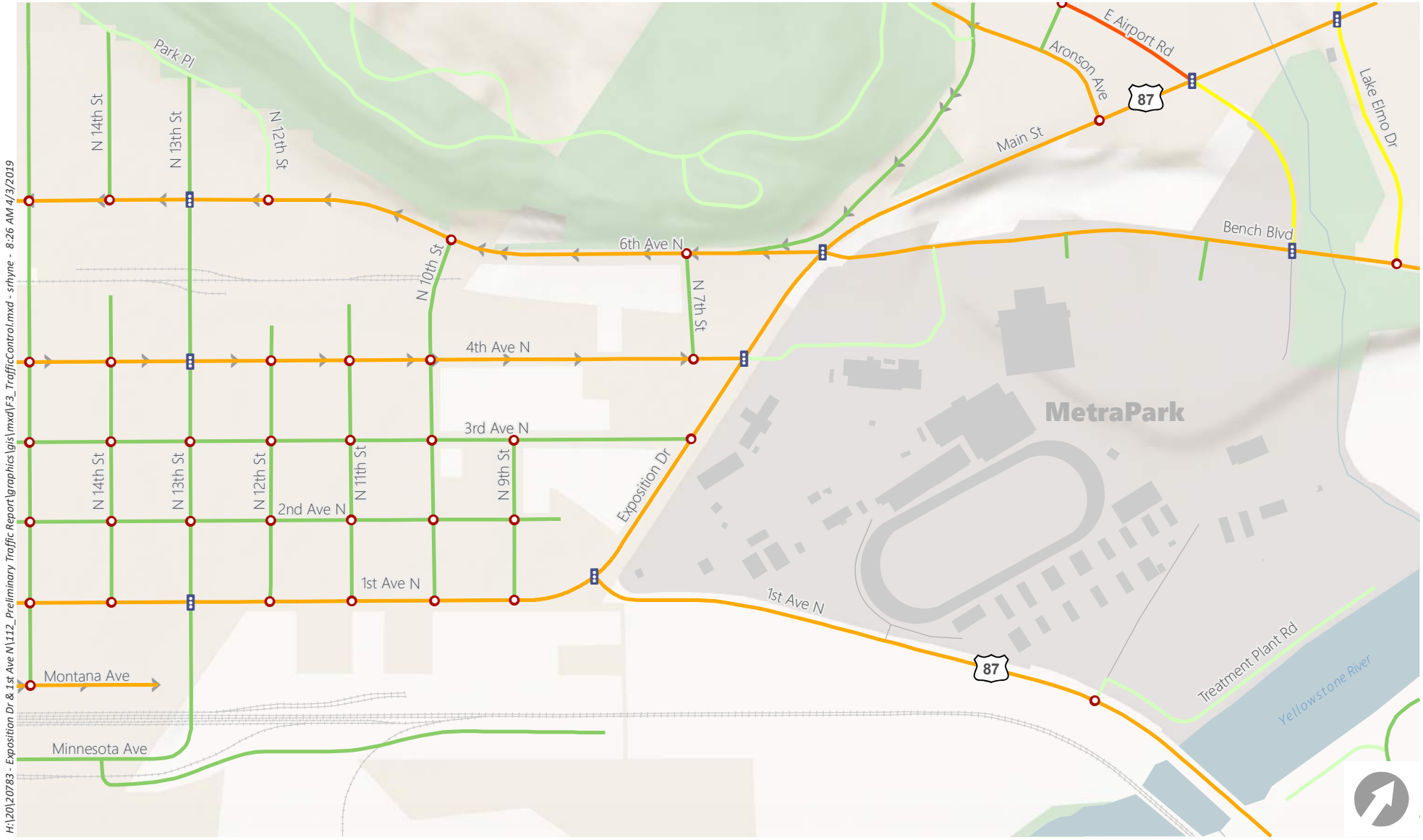


Figure 3

Posted Speed Limit and Traffic Control

EXPO&1ST

ACCESS LOCATIONS AND SPACING

MDT standards for access management are in the Right of Way and Utilities Operations Manual (Reference 2). The manual gives access density and spacing recommendations based on the highway classifications. All roadways within the study area fall within the "Developed" classification, where access densities may be greater than 25 access points per mile and there is little vacant land left for development. The access points should have minimum spacing distances of 300 and 250 feet on undivided and divided roadways, respectively. A minimum spacing of one-quarter miles between traffic signals is also recommended.

The roadways have a varying number of access points, which are typically driveways or curb cuts that allow access to neighboring properties and are not classified as local streets. The roadways have the following number of access points:

- 1st Avenue North (Exposition Drive to North 13th Street) - approximately 12 access points
- 1st Avenue North (Exposition Drive to Dick Johnston Bridge) - approximately 8 access points
- Exposition Drive (1st Avenue North to 6th Avenue North) - no access points

The existing access point and signalized intersection spacing on 1st Avenue North and Exposition Drive do not meet MDT standards. Further guidance from the Transportation Research Board's (TRB) Access Management Manual states that lowering the spacing between access points and traffic signals can increase the amount of crashes on the roadway (Reference 3). For example, the manual estimates that roadways with 10 unsignalized access points per mile and roadways with 70 unsignalized access points per mile have an expected relative crash rate of 1.0 and 3.5, respectively.

BICYCLE, PEDESTRIAN, AND TRANSIT CONSIDERATIONS

Pedestrian and bicycle routes were identified to analyze existing connections and identify potential areas for improvement. Figure 4 displays existing pedestrian and bicycling facilities and transit routes. Also shown in Figure 4 are the total pedestrian and bicycle counts at the signalized study intersections for the three peak traffic count periods (7:00 a.m. to 9:00 a.m., 11:00 a.m. to 1:00 p.m., and 4:00 p.m. to 6:00 p.m.). The existing level of activity for bicyclists and pedestrians is low but increases during events at the MetraPark. Deficiencies in bicycle and pedestrian infrastructure are as follows:

- No marked pedestrian crossings between 4th Avenue North and North 13th Street on Exposition Drive / 1st Avenue North (approximately 3,100 feet), including no crosswalks at the signalized intersection at Exposition Drive / 1st Avenue North
- Gaps in the sidewalks on the south side of 1st Avenue North between North 13th Street and Exposition Drive
- Limited connectivity for bicyclists or pedestrians to the Jim Dutcher shared-use path along the Yellowstone River

As shown in Figure 4, there are five transit routes that go through the 1st Avenue North / Exposition Drive intersection and four transit routes that go through the 4th Avenue North / Exposition Drive intersection. These routes are operated by the City of Billings Metropolitan Transit System (MET Transit). Average ridership on these routes ranged from 19 to 87 persons per day in the 2018 fiscal year (Reference 4). Headway between transit routes is one or more hours, with most transit routes only operating for four to eight hours per day. The transit routes have no permanent stops within the study area and utilize a flag down system.

This project should look for opportunities to improve connectivity for bicyclists and pedestrians by creating crossing locations, filling in sidewalk gaps, and connecting existing facilities to the Jim Dutcher shared-use path. Improvements to bicycle and pedestrian facilities should take into consideration the travel patterns of MetraPark event attendees and access to transit routes.

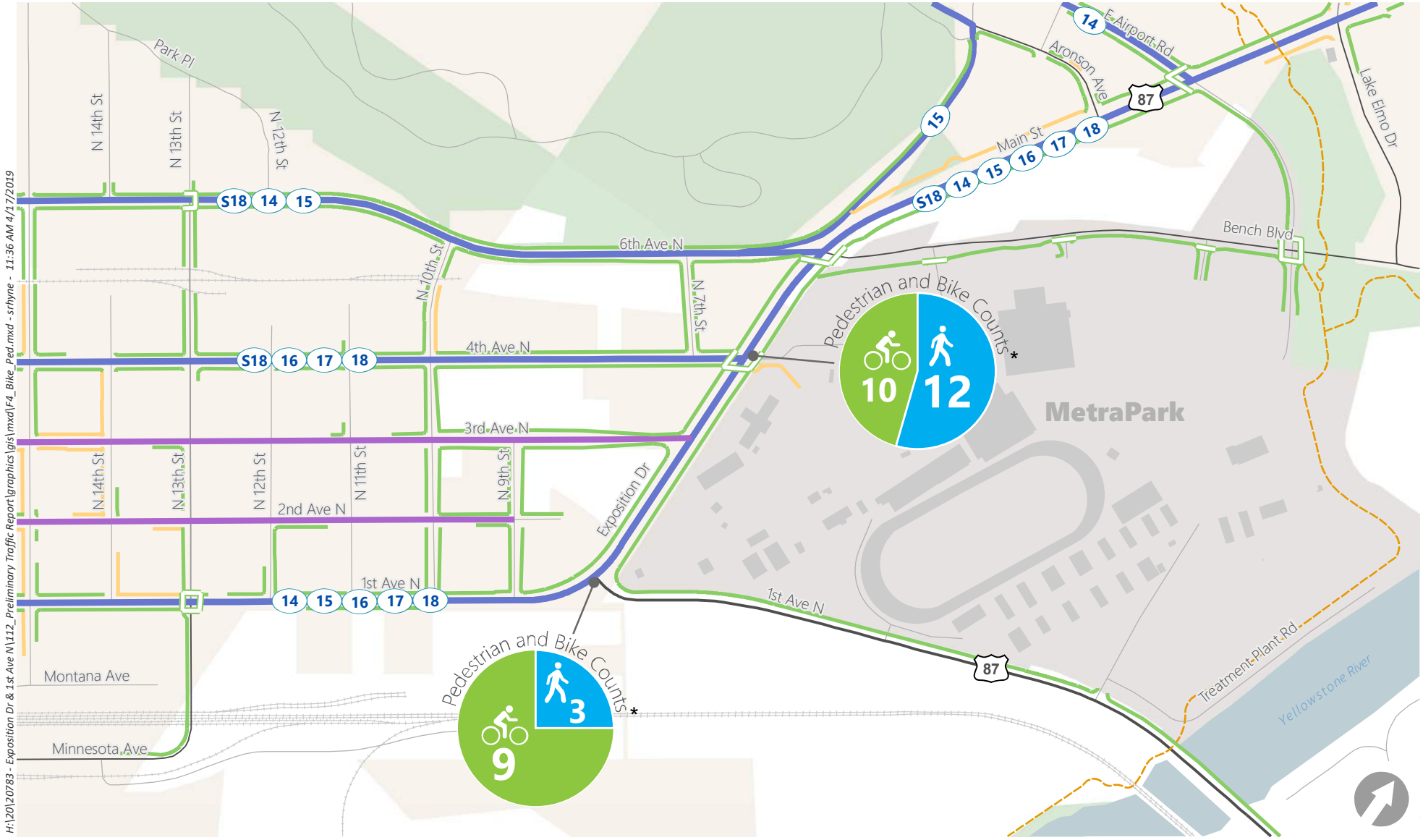


Figure 4

Existing Bicycle and Pedestrian Facilities

EXPO&1ST

Operational Analysis

An operational analysis was performed on the roadway system under existing (year 2019) and future (year 2040) conditions during the weekday AM and PM peak hours. The purpose of the operational analysis was to identify existing and projected operational deficiencies in the roadway system. Level of service (LOS), delay, volume-to-capacity (v/c) ratios, and 95th percentile queue results are reported for the study intersections.

The existing signal timing and coordination was used for the existing conditions analysis. The cycle lengths for the signalized intersections on Exposition Drive are 130 seconds and 150 seconds for the AM and PM peak hours, respectively. Signal timing and coordination was optimized for the future conditions analysis and the cycle lengths during the future AM conditions were adjusted to 150 seconds for the signalized intersections on Exposition Drive.

TRAFFIC VOLUMES

Traffic volumes for all scenarios were collected on weekdays in June 2018 for the signalized intersections and in February 2019 for the unsignalized intersections for the AM (7:00 to 9:00 a.m.) and PM (4:00 to 6:00 p.m.). Traffic volumes for the signalized intersections were also collected during the weekday and Saturday midday periods (11:00 a.m. to 1:00 p.m.). The turning movements were balanced between intersections to account for inconsistencies between data collected on different dates. Raw count data for the study intersections and driveways can be found in Appendix A.

Existing Volumes

Exhibit 1 summarizes a mid-weekday, 24-hour profile of the Average Daily Traffic (ADT) volumes collected in 2016 on Exposition Drive, just north of 6th Avenue. As shown in Exhibit 1, there is a distinct morning peak between 7:00 to 8:00 a.m. and a distinct evening peak between 4:30 to 5:30 p.m. Exhibit 1 also shows the directional distributions of the traffic. Southbound traffic peaks in the AM (approximately 72% of the total traffic) and northbound traffic peaks in the PM (approximately 65% of the total traffic).

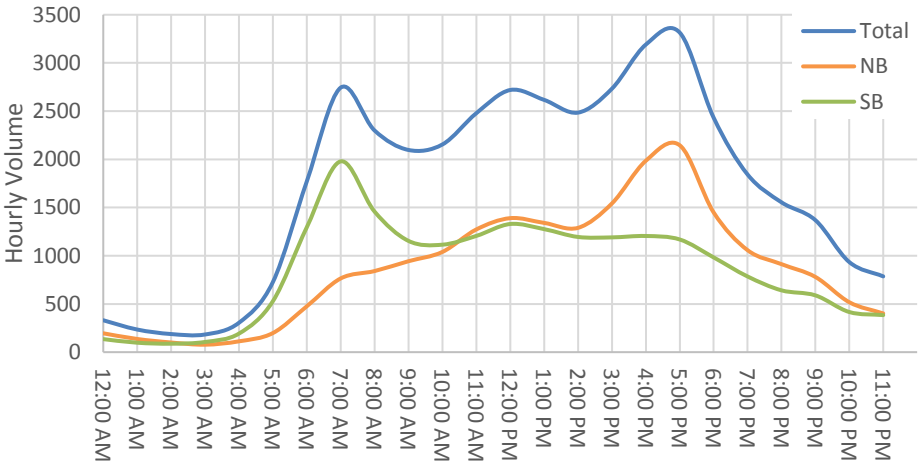


Exhibit 1 Hourly Traffic Volume Profile at Exposition Drive, North of 6th Avenue N

Figure 5 shows the roadway Annual Average Daily Traffic (AADT) volumes from the Regional Travel Demand Model (Reference 5), AADT estimates from MDT (Reference 6), and existing traffic volumes for the signalized intersections during the AM, midday, and PM peak hours. Heavy vehicles comprised approximately 7.3 percent, 6.5 percent, and 4.4 percent of total traffic volumes during the AM, midday, and PM peak hours, respectively. The driveways and unsignalized intersections typically experienced total entering and exiting volumes of 5 to 30 vehicles per hour (vph). The 10th Street / 1st Avenue North intersection experienced the highest volume of the unsignalized intersections and driveways with 56 vehicles entering and exiting the south leg in the AM peak hour.

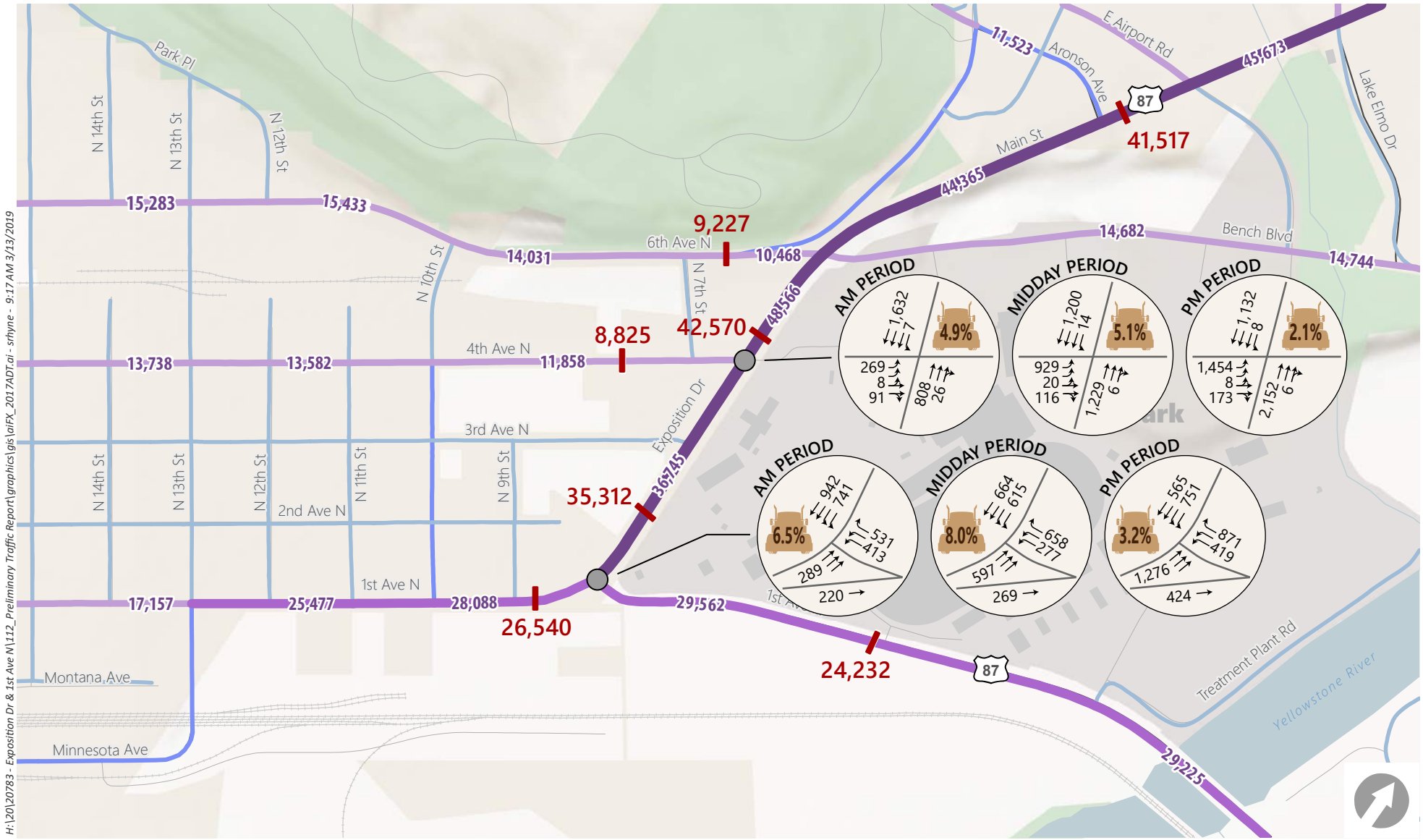


Figure 5

Existing Daily Traffic Volumes (Model and Count Data)

EXPO&1ST

Future Volumes

The regional travel demand model was used to compare year 2017 (the baseline model year) and year 2040 traffic volumes and develop an overall growth rate. Table 1 displays the growth rates developed from the travel demand model, as well as growth rates used in past studies. Year 2017 and year 2040 traffic volumes and their corresponding growth rates from the regional travel demand model are shown in Appendix B.

Table 1: Growth Rate Summary

Reference	Roadway	Average Annual Growth Rate
Regional Travel Demand Model	1st Ave N (E of Exposition Dr)	<0.5%
	1st Ave N (W of Exposition Dr)	0.5%
	Exposition Dr (N of 1st Ave N)	<0.5%
	4th Ave (W of Exposition Dr)	0.5%
Airport Road and Main Street – PTR[1]	*All study roadways*	1.6%
Billings Downtown Traffic Flow Study[2]	Main St/Exposition Dr	1.0%
27th Street Railroad Crossing Study[3]	Main St/Exposition Dr	1.0%

[1]Reference 7 [2]Reference 8 [3]Reference 9

As shown in Table 1, the average annual growth rate used in other studies ranges from 1% to 1.6%, while the average annual growth rate calculated from the travel demand model ranges between 0% and 0.5%. For background, the updated regional travel demand model was completed in 2018 as part of the Billings Urban Area Long Range Transportation Plan. This latest model was not available for use in the Airport Road and Main Street PTR, which factors into the different growth rates between the model and three studies presented in Table 1. Based on these values and historical growth rates in the region, an average annual growth rate of 1.0% was applied to all existing traffic volumes to develop the projected future year 2040 traffic volumes. Figure 6 shows the projected year 2040 traffic volumes for the signalized intersections and the year 2040 AADT volumes from the regional travel demand model.

OPERATIONS RESULTS

Figures 7 through 11 present a summary of LOS, v/c, and queue lengths at the study intersections under existing and future year 2040 traffic conditions. LOS, queue lengths, and v/c ratios for individual movements were calculated in Synchro using the Highway Capacity Manual (HCM) 6th Edition methodology (Reference 10). The v/c ratios for overall intersection operations were calculated using the HCM 2000 methodology. The traffic analysis summaries for the intersections under the different conditions can be found in Appendices C through F. The following sections contain summaries of the traffic analysis during each analysis year and time period and identify intersections and movements that exceed capacity. For signalized intersections, the reported LOS and v/c ratios indicate how the overall intersection operates. For unsignalized intersections, LOS and v/c ratios indicate how the critical movement, the movement with the highest delays, operates.

Guidance for operations standards in the MDT Road Design Manual (Reference 11) identifies a target LOS “C” for all Principal Arterials. In urban conditions, a LOS “E” and a volume-to-capacity ratio of less than 1.0 are often acceptable. Additionally, LOS F does not indicate that an intersection operates above capacity, but that an intersection experiences average vehicle delays of longer than 50 or 80 seconds for unsignalized or signalized intersections, respectively.

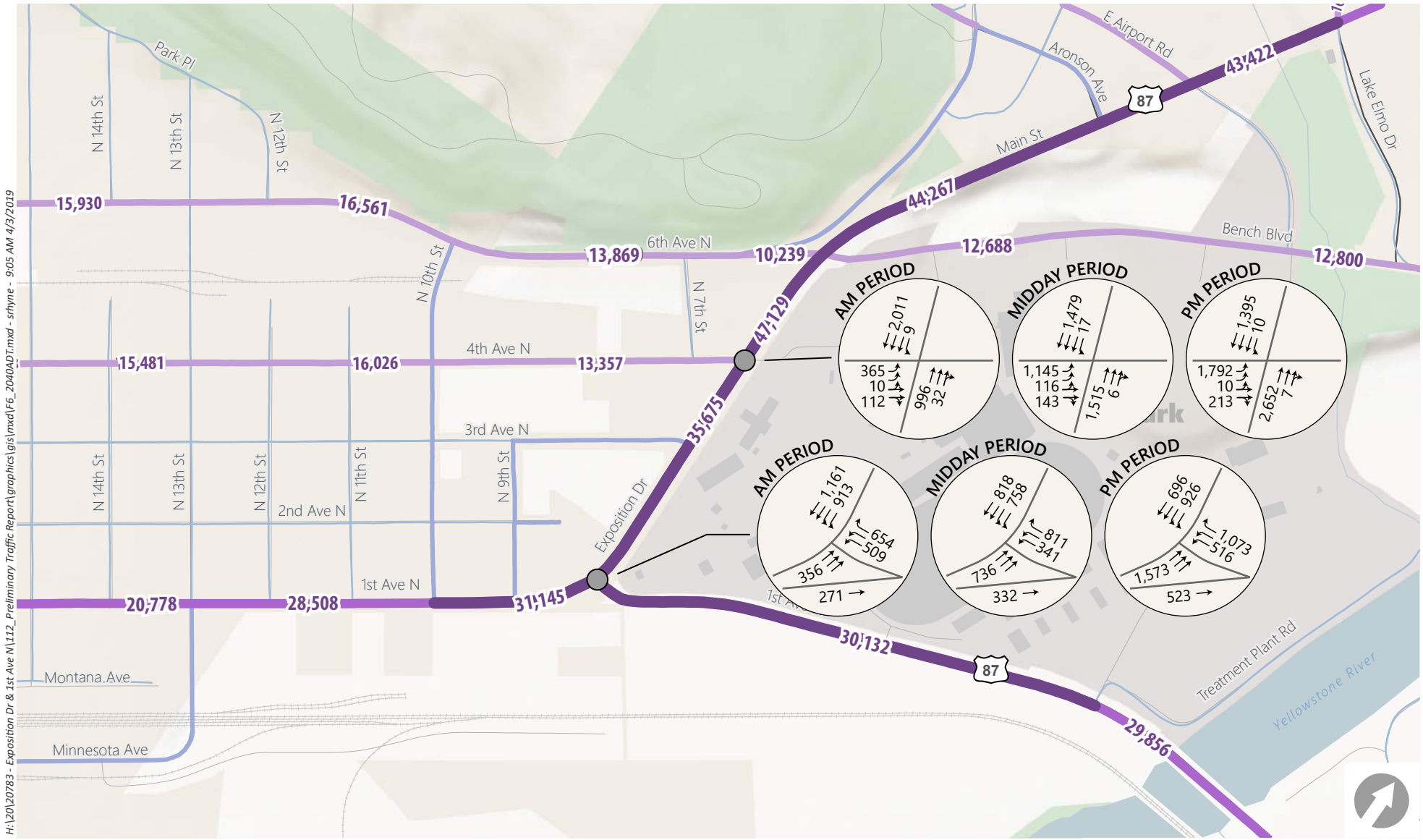


Figure 6

Year 2040 Daily Traffic Volumes (Model and Count Data)

Existing Conditions

Figure 8 shows the year 2019 operations during the AM and PM peak hours. All intersections operate at under capacity (v/c < 1.0) during the AM and PM peak hours, with the exception of the 1st Avenue North / Exposition Drive intersection, which has a v/c ratio of 1.03 during the PM peak hour. The Treatment Plant Road / 1st Avenue North intersection operates at LOS F during the AM peak hour, but is under capacity. The critical movement for this intersection is the southbound left, which serves 7 vehicles in the AM peak hour.

Figure 9 shows the v/c ratios and 95th percentile queue lengths for the individual vehicle movements at the 4th Avenue North / Exposition Drive and 1st Avenue North / Exposition Drive intersections under year 2019 conditions during the AM and PM peak hours. The 1st Avenue North / Exposition Drive westbound right-turn movement is the only movement to operate above capacity, with a v/c ratio of 1.42 and a 95th percentile queue length of 2,100 feet during the PM peak hour. The 6th Avenue North / Exposition Drive northbound movement has a calculated 95th percentile queue length of 378 feet during the PM peak hour, but field observations show that it often extends to the 4th Avenue North / Exposition Drive intersection (approximately 450 feet) due to the near-constant flow of northbound traffic from the eastbound-left turn and northbound-through movements at the 4th Avenue North / Exposition Drive intersection. Figure 7 displays drone footage of the study area during a weekday, PM peak hour with typical queue lengths.

Figure 7 Queue Lengths During PM Peak Hour

Traffic patterns can change significantly as people enter or exit events at MetraPark. At the beginning of events, volumes increase at the 4th Avenue North / Exposition Drive intersection's northbound-left turn and eastbound-through movements and the 1st Avenue North / Exposition Drive intersection's westbound-right turn movement. At the end of events, volumes increase at the 4th Avenue North / Exposition Drive intersection's southbound-through movement and the 1st Avenue North / Exposition Drive intersection's southbound-left turn movement.

Future Year 2040 Conditions

Figure 10 shows the year 2040 operations during the AM and PM peak hours. All intersections are projected to operate under capacity during the AM and PM peak hours except the 4th Avenue North / Exposition Drive and 1st Avenue North /

Exposition Drive intersections, which have v/c ratios of 1.07 and 1.20 during the PM peak hour, respectively. It is worth noting that, although the v/c ratio calculated using HCM 2000 methodology of the 4th Avenue North / Exposition Drive intersection is greater than 1.0 during the PM peak hour, the calculated LOS ("D"), average intersection delay (35.6 seconds), and v/c movements for individual movements calculated using HCM 6th Edition methodology indicate that the intersection will operate below capacity. There are limited opportunities to improve capacity on the 4th Avenue North / Exposition Drive intersection as part of this project, but improvements should be considered as the intersection will be close to capacity in the year 2040.

The following unsignalized intersections operate at LOS F but are under capacity and experience delays of less than 80 seconds:

- 12th Street / 1st Avenue North – PM peak hour
- Treatment Plant Road / 1st Avenue North – AM and PM peak hours

Both unsignalized intersections have low traffic volumes (less than 40 vehicles) and are projected to operate under capacity, so no improvements are planned at these locations.

Figure 11 shows the v/c ratios and 95th percentile queue lengths for the individual vehicle movements at the 4th Avenue North / Exposition Drive and 1st Avenue North / Exposition Drive intersections under year 2040 conditions during the AM and PM peak hours. The 1st Avenue North / Exposition Drive westbound right-turn movement is the only movement to operate above capacity, with a v/c ratio of 1.33 and a 95th percentile queue length of 2190 feet during the PM peak hour. The 1st Avenue North / Exposition Drive northbound through and southbound left movements are also close to capacity with v/c ratios of 0.97 and 0.96, respectively. The 95th percentile queue for the northbound movement at the 6th Avenue North / Exposition Drive intersection is projected to be 630 feet in the year 2040 peak hour, spilling into the 4th Avenue North / Exposition Drive intersection.

Safety Analysis

Crash data from a four-year period was provided by MDT for the 1st Avenue North / Exposition Drive intersection between the dates of January 1, 2015 and December 31st, 2018. The crash data presented information related to crash type, crash severity, time of day, weather condition, and other factors. Table 2 presents crash type and severity summaries for the data, as well as observed and predicted crash frequencies. The predicted crash frequencies were calculated in accordance with Highway Safety Manual (HSM) Chapter 12 (Urban and Suburban Arterials) methodology (Reference 12). It should be noted that the AADT on 1st Avenue North exceeds the maximum AADT recommended by HSM in calculating the predicted crash frequency.

Table 2: Study Area Crash Types and Severity

Intersection	Crash Types				Crash Severity			Total	Obs. Crash Freq.[1]	Pred. Crash Freq.[2]	
	Rear-End	Side-Swipe	Angle/ Turning	Other	PDO	Injury	Fatal			2019	2040
1st Ave N / Exposition Dr	41	24	12	10	61	25	1	87	21.8	11.2	14.9

[1] Observed crashes per year

[2] Predicted crashes per year

A summary of the crash data and analysis is as follows:

- Rear-end and side-swipe related crashes were the most common crash types and comprised approximately 47 percent and 28 percent of the total crashes, respectively.
- There were no reported bicycle or pedestrian-related crashes (no bicycle facilities or pedestrian crossings are present at the intersection).
- Approximately 70 percent of the crashes were Property Damage Only (PDO) and approximately 29 percent of the crashes involved personal injury. There was one reported fatality.
- The majority of crashes (approximately 53 percent) occurred between 12:00 PM and 6:00 PM.

In general, signalized intersections that operate above capacity can be prone to higher amounts of crashes. Improving traffic flow can mitigate the amount of crashes that happen at an intersection by decreasing the amount of slowing and stopping on intersection approaches and movements.

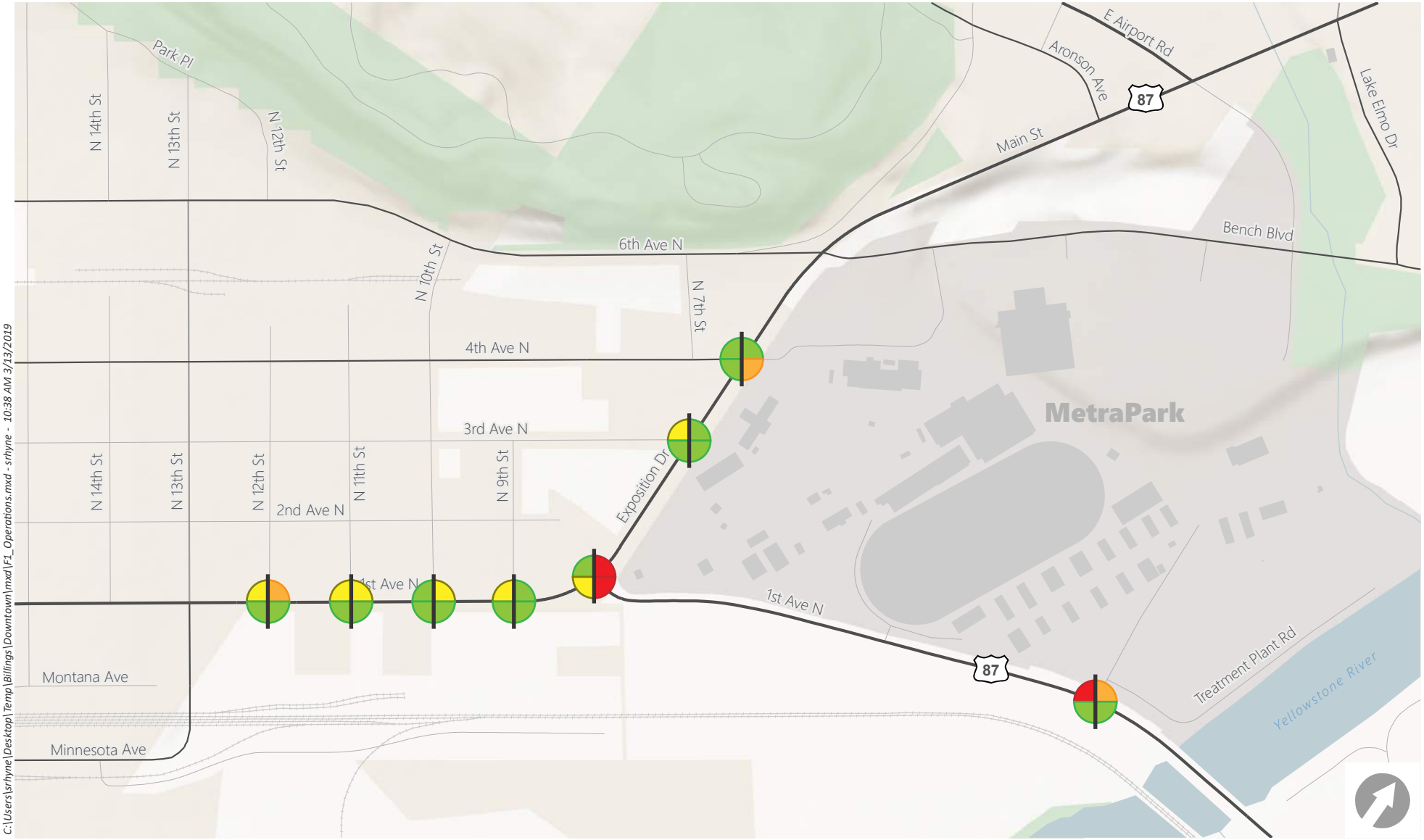
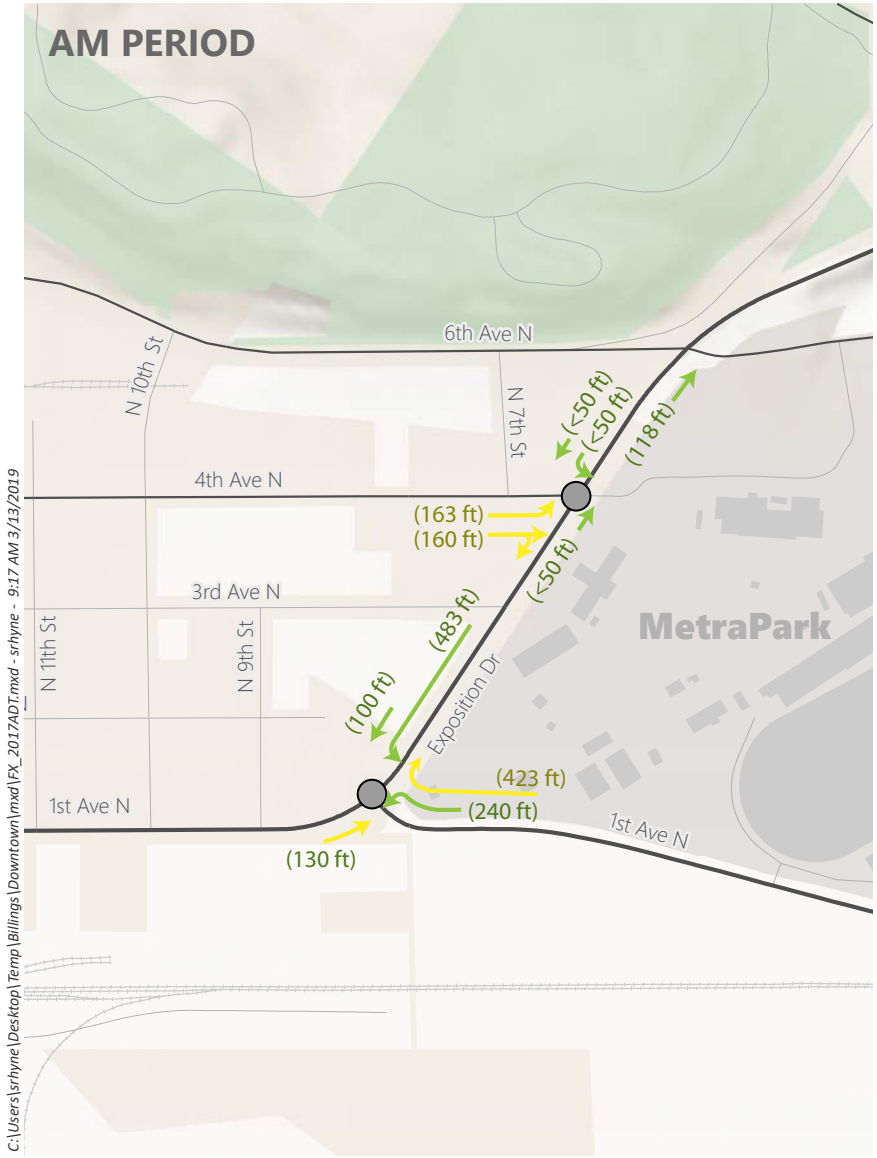
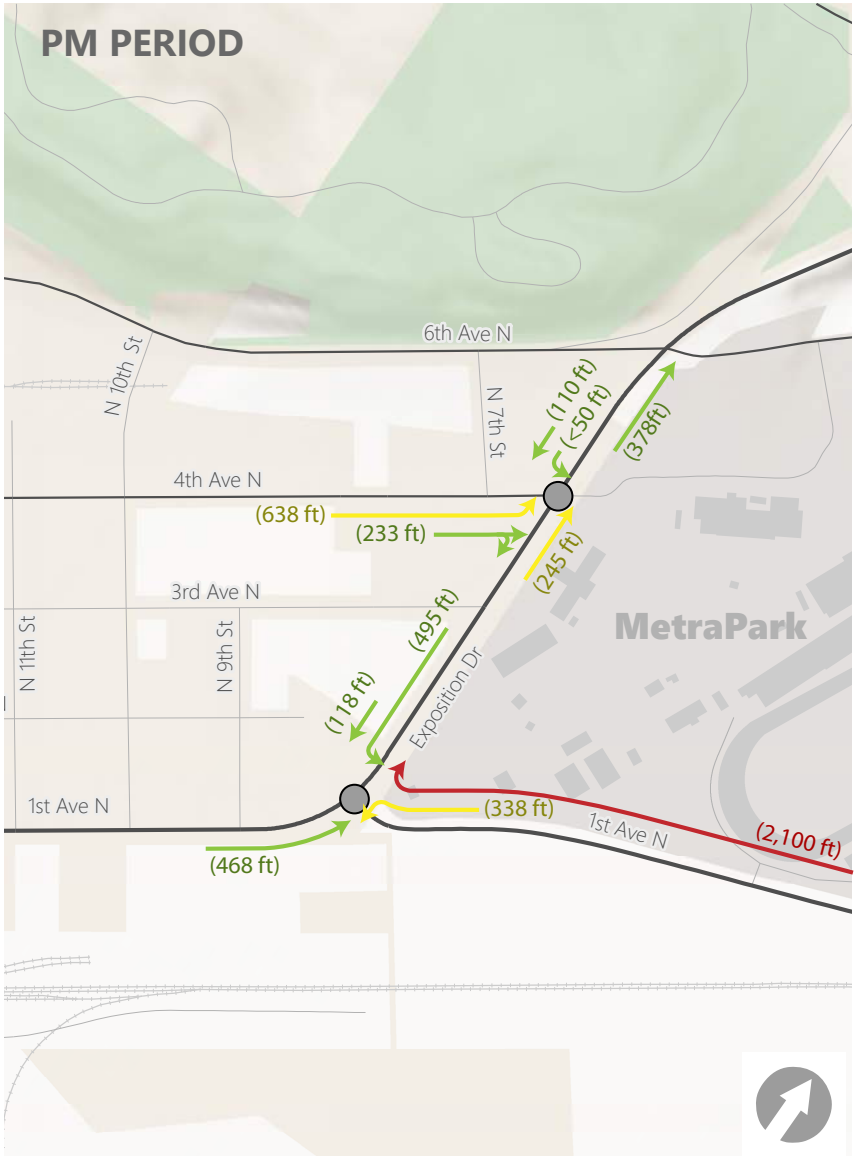


Figure 8

Existing Intersection Operations





C:\Users\srhyne\Desktop\Temp\Billings\Downtown\mxd\FX_2017ADT.mxd - srhyne - 9:17 AM 3/13/2019

Volume to Capacity

- <0.7
- 0.7 - 0.89
- 0.9 - 0.99
- >1.00

Park/Open Space

City of Billings

Figure 9

Existing Movement Volume to Capacity Ratio and 95th Percentile Vehicle Queue Lengths

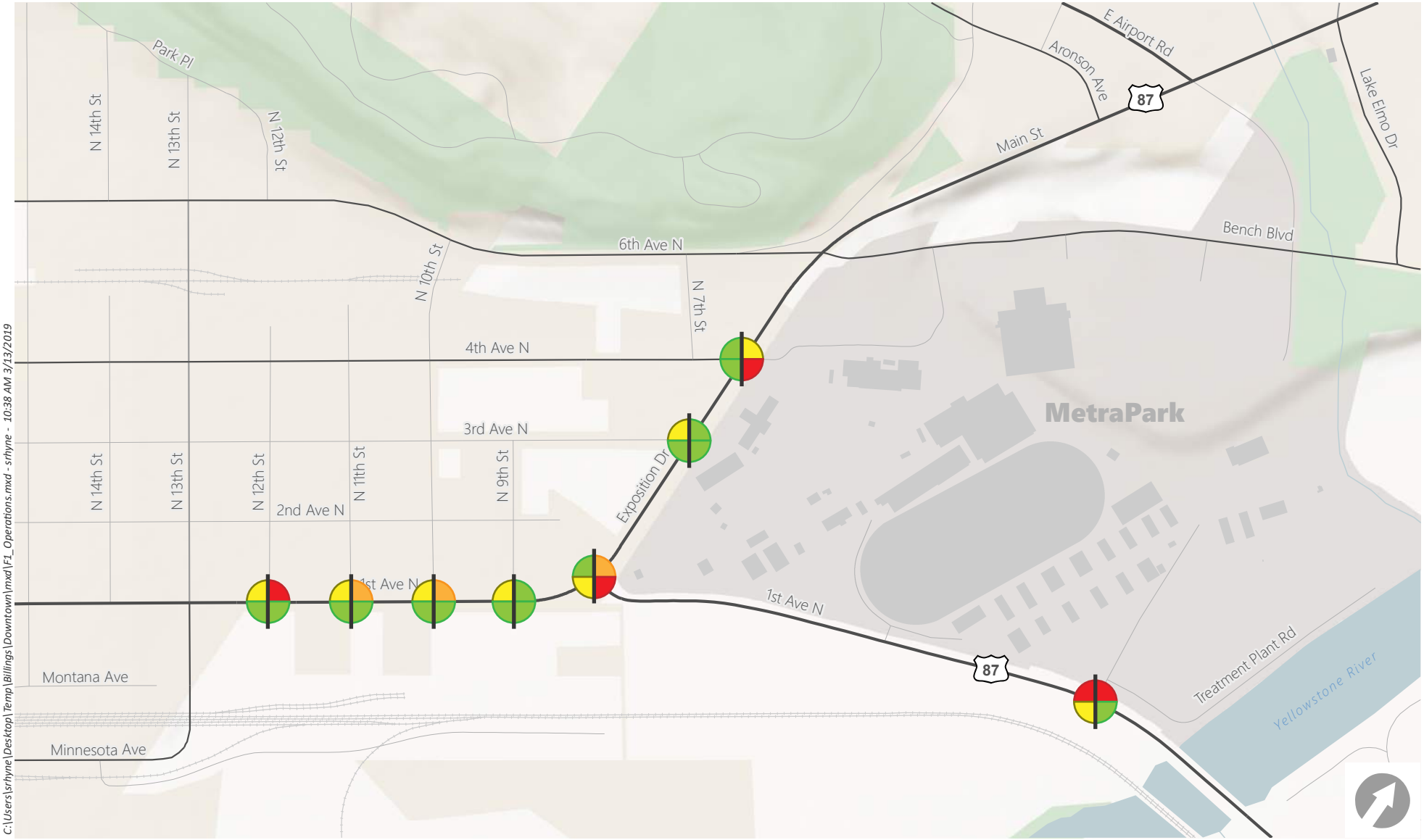
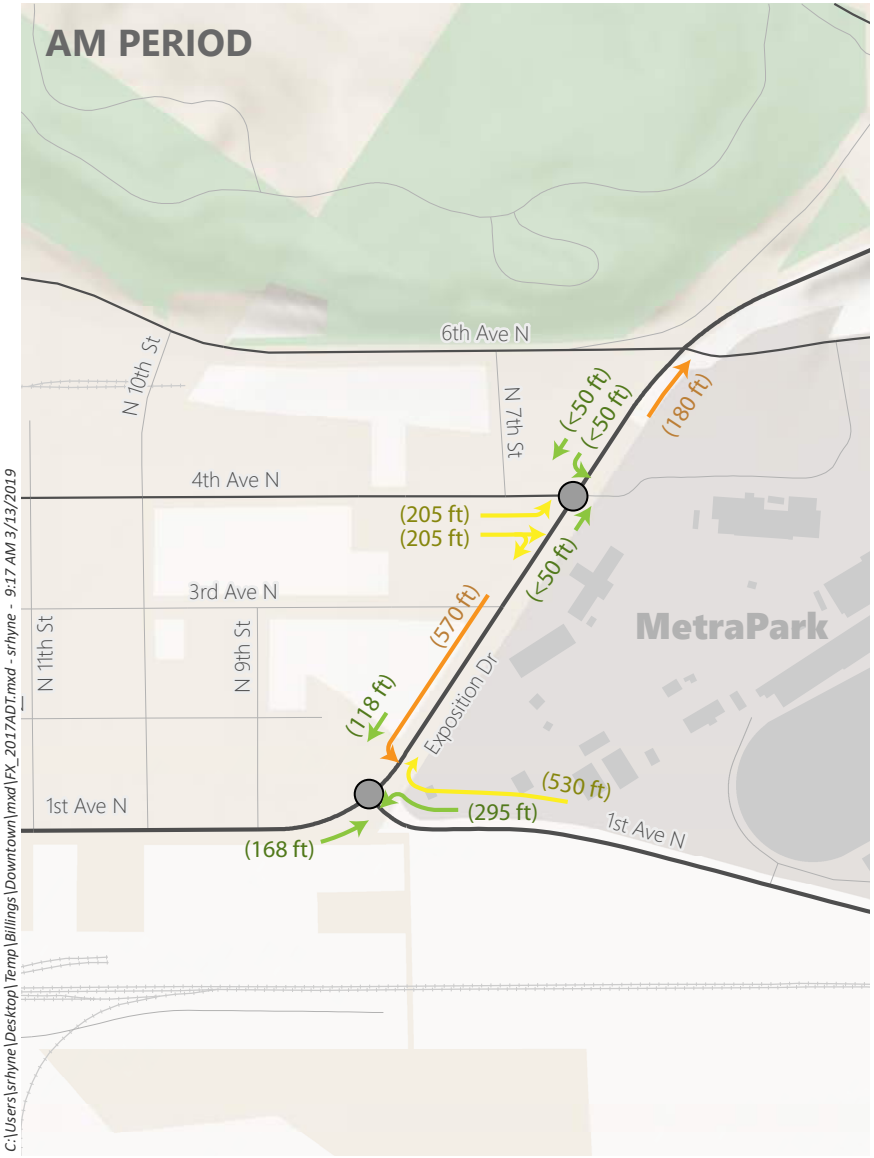
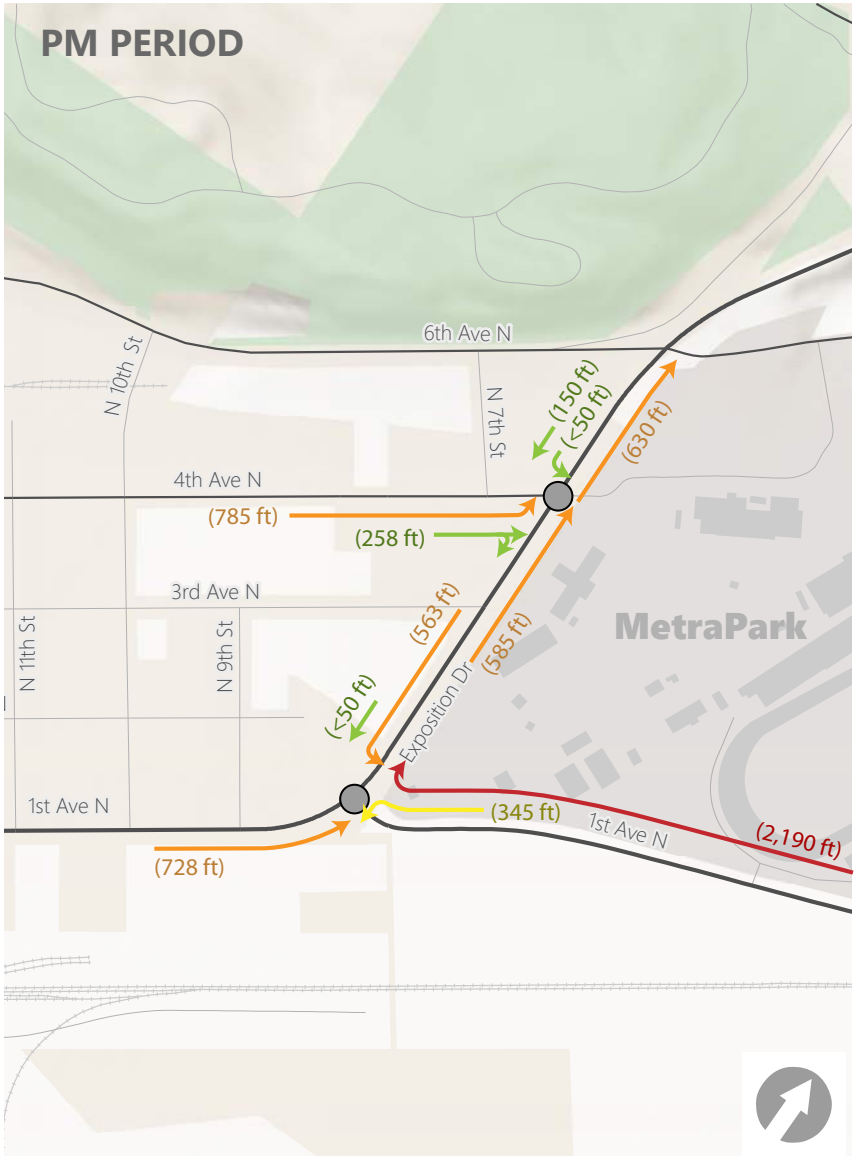


Figure 10

Future Year 2040 Intersection Operations

EXPO&1ST





C:\Users\srhyne\Desktop\Temp\Billings\Downtown\mxd\FX_2017ADT.mxd - srhyne - 9:17 AM 3/13/2019

Volume to Capacity

- <0.7
- 0.7 - 0.89
- 0.9 - 0.99
- >1.00

Park/Open Space

City of Billings

Figure 11

Future Year 2040
Movement Volume to Capacity Ratio and 95th Percentile Vehicle Queue Lengths

Summary of Deficiencies and Opportunities for Improvement

The following section summarizes the deficiencies identified in the memorandum during existing and future conditions and discusses opportunities to mitigate the deficiencies in the project.

EXISTING DEFICIENCIES

- Access Locations and Spacing
    - The existing access point and signalized intersection spacing on 1st Avenue North and Exposition Drive does not meet MDT standards.
- Bicycle and Pedestrian Considerations
    - Deficiencies in bicycle and pedestrian infrastructure are as follows:
        - No marked pedestrian crossings between 4th Avenue North and North 13th Street on Exposition Drive / 1st Avenue North (approximately 3,100 feet), including no crosswalks at the signalized intersection at Exposition Drive / 1st Avenue North
        - Gaps in the sidewalks on the south side of 1st Avenue North between North 13th Street and Exposition Drive
        - Limited connectivity for bicyclists or pedestrians to the Jim Dutcher shared-use path along the Yellowstone River
- Traffic Operations
    - The 1st Avenue North / Exposition Drive intersection has a v/c ratio of 1.03 and operates at LOS F during the PM peak hour.
        - The westbound right-turn movement is the only movement to operate above capacity, with a v/c ratio of 1.42 and a 95th percentile queue length of 2,100 feet.
    - The Treatment Plant Road / 1st Avenue North intersection operates at LOS F during the AM peak hour but is under capacity. The critical movement for this intersection is the southbound-left, which serves 7 vehicles in the AM peak hour.
    - The calculated 95th percentile queue for the northbound through movement at the 6th Avenue North / Exposition Drive intersection is 378 feet during the PM peak hour. Field observations show that it often extends to the 4th Avenue / Exposition Drive intersection (approximately 450 feet) due to the near-constant flow of northbound traffic from the eastbound-left turn and northbound-through movements at the 4th Avenue North / Exposition Drive intersection.
- Safety
    - There are approximately 22 crashes per year at the 1st Avenue North / Exposition Drive intersection. They are predominantly rear-end related.

FUTURE DEFICIENCIES

- Year 2040 Future Operations
    - The 1st Avenue North / Exposition Drive intersection is projected to operate with a v/c ratio of 1.20 and LOS F during the PM peak hour.

        - The westbound right-turn movement (1073 vph) has a v/c ratio of 1.33 and a 95th percentile queue length of 2,190 feet during the PM peak hour.
        - The northbound through (1573 vph) and southbound left-turn (926 vph) movements are close to capacity with v/c ratios of 0.97 and 0.96, respectively.
    - The 4th Avenue North / Exposition Drive intersection has a v/c ratio of 1.07 during the PM peak hour.
        - The northbound-through (2652 vph) and eastbound-left movements (1792 vph) have v/c ratios of 0.99 and 0.96, respectively.
    - The following unsignalized intersections operate at LOS F but are projected to have low traffic volumes, operate under capacity (less than 40 vehicles), and experience delays of less than 80 seconds. Therefore, no mitigation is recommended at these locations.
        - 12th Street / 1st Avenue North – PM peak hour
        - Treatment Plant Road / 1st Avenue North – AM and PM peak hours
    - The 95th percentile queue for the northbound movement at the 6th Avenue North / Exposition Drive intersection is projected to be 630 feet in the year 2040 peak hour, spilling into the 4th Avenue North / Exposition Drive intersection.

OPPORTUNITIES FOR IMPROVEMENT

Based on the deficiencies identified in the existing and future conditions analysis, the following opportunities for mitigation have been identified for the project team to consider when developing the alternatives.

- Fill in sidewalk gaps on 1st Avenue North between North 13th Street and Exposition Drive
- Provide pedestrian/bicycle connections to the Jim Dutcher Trail
- Provide bicycle connection on 1st Avenue North (US 87) between Exposition Drive and Yellowstone River
- Add pedestrian crossings in the following locations:
    - 1st Avenue North / Exposition Drive intersection
    - Exposition Drive between 4th Avenue North and 1st Avenue North
    - 1st Avenue North between Exposition Drive and North 13th Street
- Consolidate access points to target MDT standards for access spacing, if possible.
- Accommodate transit and heavy vehicle movements with any capacity and geometric design improvements.
- Enhance the operations of the following intersections and critical movements via capacity improvements:
    - 1st Avenue North / Exposition Drive
        - Westbound right-turn, northbound left-turn, and southbound left-turn movements
    - 4th Avenue North / Exposition Drive
        - Northbound-through and eastbound-left turn movements
- Mitigate queue spillback between traffic signals from 1st Avenue North to 6th Avenue North through capacity improvements, signal timing adjustments, and signal coordination.
- Mitigate the high number of crashes at the intersection by improving intersection capacity and traffic flow through the intersection. Improving intersection operations can reduce queue lengths, decrease the amount of slowing and stopping on intersection approaches, and reduce speed differentials between roadways. These factors are often associated with rear-end crash types.

References

1. Montana Department of Transportation. *Functional Classification Map*. September, 2018.
2. Montana Department of Transportation. *Right of Way and Utilities Operations Manual*. 2007.
3. Transportation Research Board. *Access Management Manual*. 2003.
4. City of Billings. *Metropolitan Transit System Annual Report FY13 – FY18*. 2018.
5. City of Billings. *Regional Travel Demand Model*. 2018.
6. Montana Department of Transportation. *Traffic Count Database System*. 2019.
7. Kittelson and Associates, Inc. *Billings Airport Road and Main Street Preliminary Traffic Report*. October, 2018.
8. Kittelson and Associates, Inc. *Billings Downtown Traffic Flow Study – Draft*. March, 2019.
9. Kittelson and Associates, Inc. *27th Street Railroad Crossing Feasibility Study – Existing and Future No-Build Conditions Memorandum*. December, 2018.
10. Transportation Research Board. *Highway Capacity Manual*. 2016
11. Montana Department of Transportation. *Road Design Manual*. September, 2016.
12. American Association of State Highway and Transportation Officials. *Highway Safety Manual*. 2010.

Appendix A Traffic Count Data

Type of peak hour being reported: Intersection Peak

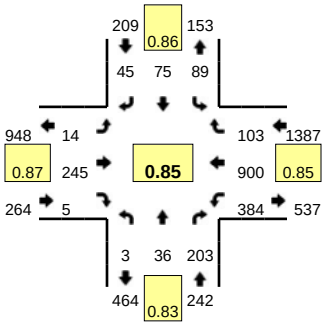
Method for determining peak hour: Total Entering Volume

LOCATION: 33. N 13th St -- 1st Ave N

CITY/STATE: Billings, MT

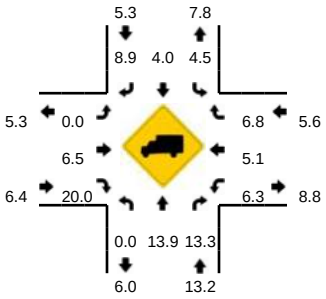
QC JOB #: 14600569

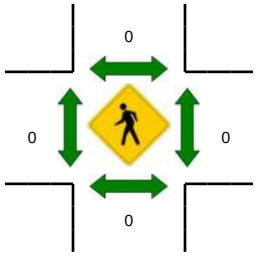
DATE: Wed, Jun 13 2018

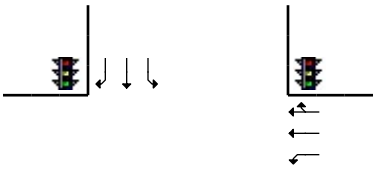


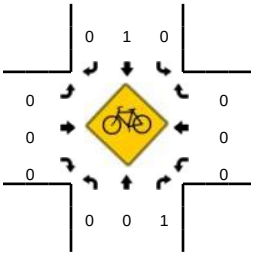
Peak-Hour: 7:15 AM -- 8:15 AM

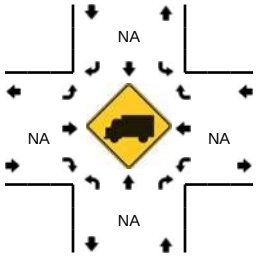
Peak 15-Min: 7:45 AM -- 8:00 AM

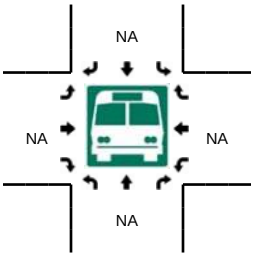












15-Min Count Period Beginning At	33. N 13th St (Northbound)				33. N 13th St (Southbound)				1st Ave N (Eastbound)				1st Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	5	28	0	24	15	4	0	1	39	1	0	83	139	15	0	354	
7:15 AM	1	5	49	0	24	17	6	0	3	40	2	0	89	212	20	0	468	
7:30 AM	1	14	47	0	31	14	16	0	3	77	1	0	101	258	35	0	598	
7:45 AM	1	10	60	0	19	29	14	0	4	71	1	0	123	252	34	0	618	2038
8:00 AM	0	7	47	0	15	15	9	0	4	57	1	0	71	178	14	0	418	2102
8:15 AM	0	6	54	0	13	12	8	0	3	56	4	0	79	153	21	0	409	2043
8:30 AM	2	9	50	0	27	6	3	0	0	53	1	0	67	144	9	0	371	1816
8:45 AM	1	7	68	0	22	10	8	0	2	56	0	0	67	137	14	0	392	1590

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	40	240	0	76	116	56	0	16	284	4	0	492	1008	136	0	2472
Heavy Trucks	0	8	32		8	4	8		0	16	4		28	36	8		152
Pedestrians		0				0				0				0			0
Bicycles	0	0	1		0	1	0		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/10/2018 6:02 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

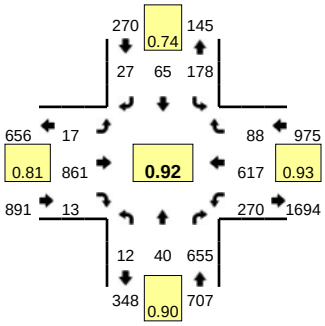
Method for determining peak hour: Total Entering Volume

LOCATION: 33. N 13th St -- 1st Ave N

QC JOB #: 14600570

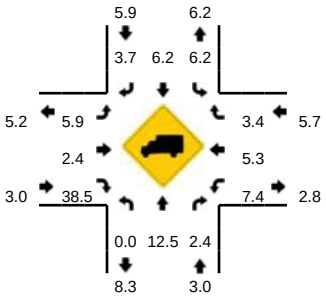
CITY/STATE: Billings, MT

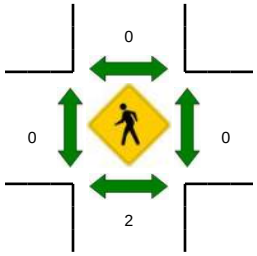
DATE: Wed, Jun 13 2018

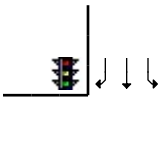


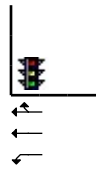
Peak-Hour: 4:45 PM -- 5:45 PM

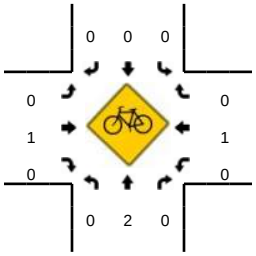
Peak 15-Min: 5:00 PM -- 5:15 PM

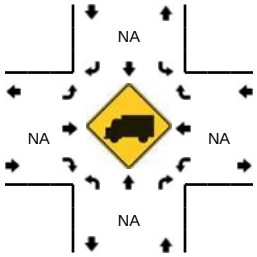


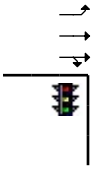


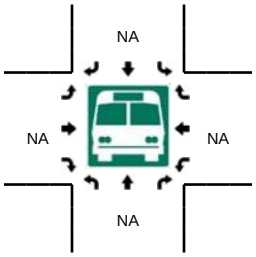












15-Min Count Period Beginning At	33. N 13th St (Northbound)				33. N 13th St (Southbound)				1st Ave N (Eastbound)				1st Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	13	146	0	39	12	11	0	3	157	3	0	71	146	12	0	618	
4:15 PM	6	18	122	0	34	20	2	0	5	199	2	0	61	140	8	0	617	
4:30 PM	5	18	133	0	46	11	5	0	7	159	4	0	80	154	15	0	637	
4:45 PM	5	13	127	0	37	15	11	0	7	203	3	0	58	160	15	0	654	2526
5:00 PM	6	8	183	0	56	28	9	0	4	207	5	0	78	154	32	0	770	2678
5:15 PM	1	9	173	0	40	11	4	0	2	269	5	0	63	150	19	0	746	2807
5:30 PM	0	10	172	0	45	11	3	0	4	182	0	0	71	153	22	0	673	2843
5:45 PM	3	6	99	0	33	10	1	0	1	152	3	0	62	159	20	0	549	2738

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	32	732	0	224	112	36	0	16	828	20	0	312	616	128	0	3080
Heavy Trucks	0	4	20		12	4	0		0	16	12		32	28	8		136
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/10/2018 6:02 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

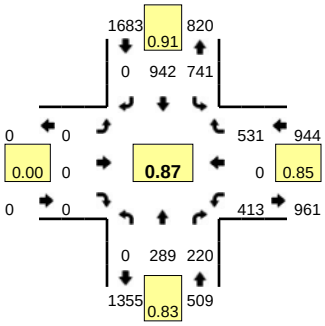
Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 1st Ave N

QC JOB #: 14667501

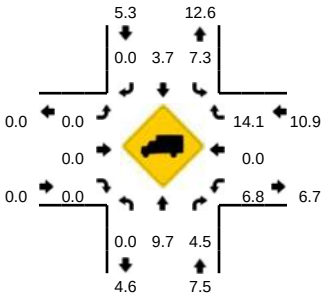
CITY/STATE: Billings, MT

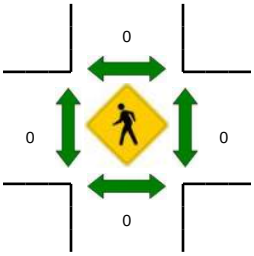
DATE: Wed, Jun 20 2018

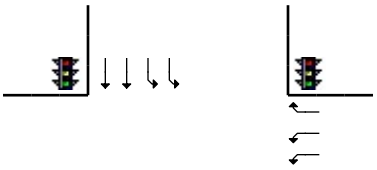


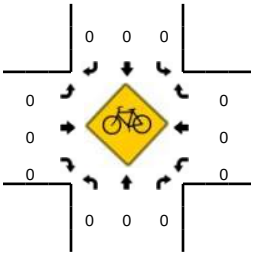
Peak-Hour: 7:15 AM -- 8:15 AM

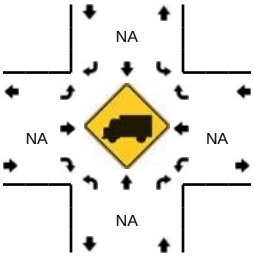
Peak 15-Min: 7:45 AM -- 8:00 AM

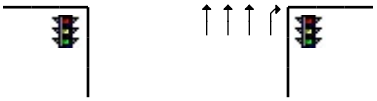


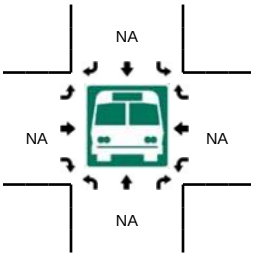












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				1st Ave N (Eastbound)				1st Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	0	39	66	0	185	196	0	0	0	0	0	0	48	0	100	0	634	
6:45 AM	0	51	50	0	184	248	0	0	0	0	0	0	71	0	123	0	727	
7:00 AM	0	52	45	0	125	218	0	0	0	0	0	0	69	0	111	0	620	
7:15 AM	0	62	55	0	191	235	0	0	0	0	0	0	85	0	122	0	750	2731
7:30 AM	0	62	49	0	190	281	0	0	0	0	0	0	116	0	143	0	841	2938
7:45 AM	0	93	63	0	203	263	0	0	0	0	0	0	138	0	142	0	902	3113
8:00 AM	0	72	53	0	157	163	0	0	0	0	0	0	74	0	124	0	643	3136
8:15 AM	0	77	51	0	142	184	0	0	0	0	0	0	72	0	144	0	670	3056

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	372	252	0	812	1052	0	0	0	0	0	0	552	0	568	0	3608
Heavy Trucks	0	28	20		64	36	0		0	0	0		32	0	56		236
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:15 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

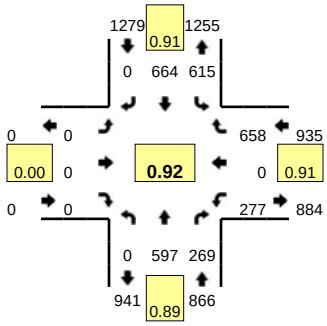
Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 1st Ave N

QC JOB #: 14667502

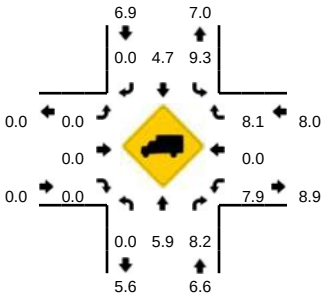
CITY/STATE: Billings, MT

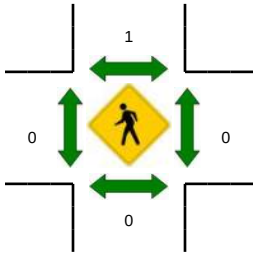
DATE: Wed, Jun 20 2018

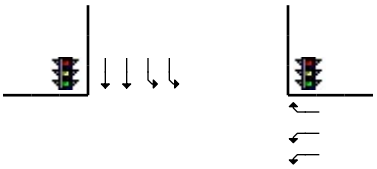


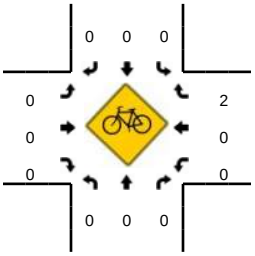
Peak-Hour: 12:00 PM -- 1:00 PM

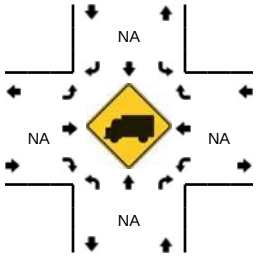
Peak 15-Min: 12:30 PM -- 12:45 PM

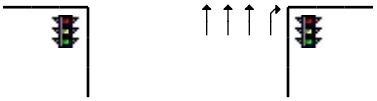


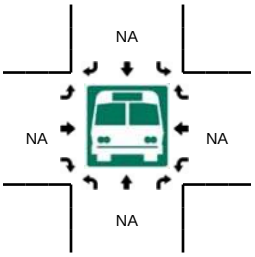












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				1st Ave N (Eastbound)				1st Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	119	51	0	128	147	0	0	0	0	0	0	54	0	143	0	642	
11:15 AM	0	106	62	0	135	141	0	1	0	0	0	0	61	0	148	0	654	
11:30 AM	0	131	59	0	128	160	0	0	0	0	0	0	47	0	139	0	664	
11:45 AM	0	148	52	0	145	147	0	0	0	0	0	0	81	0	188	0	761	2721
12:00 PM	0	151	66	0	162	143	0	0	0	0	0	0	66	0	161	0	749	2828
12:15 PM	0	123	68	0	140	145	0	0	0	0	0	0	71	0	174	0	721	2895
12:30 PM	0	172	71	0	166	185	0	0	0	0	0	0	72	0	170	0	836	3067
12:45 PM	0	151	64	0	147	191	0	0	0	0	0	0	68	0	153	0	774	3080

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	688	284	0	664	740	0	0	0	0	0	0	288	0	680	0	3344
Heavy Trucks	0	56	36		64	20	0		0	0	0		12	0	80		268
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:15 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

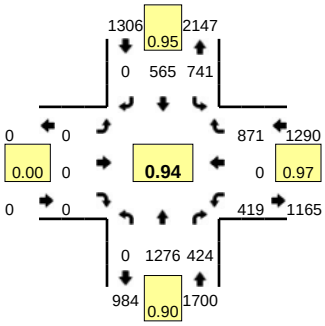
Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 1st Ave N

QC JOB #: 14667503

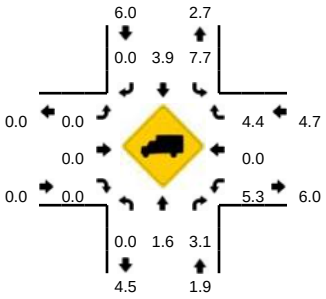
CITY/STATE: Billings, MT

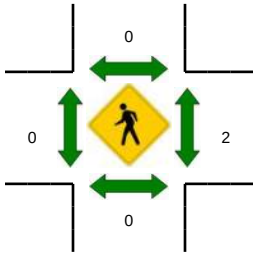
DATE: Wed, Jun 20 2018

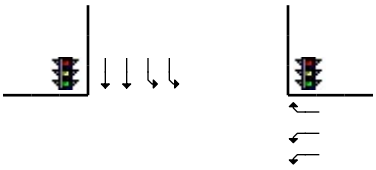


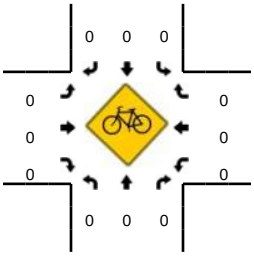
Peak-Hour: 4:45 PM -- 5:45 PM

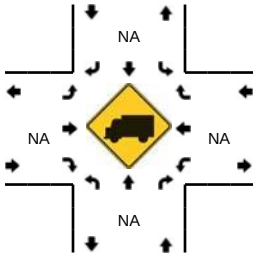
Peak 15-Min: 5:15 PM -- 5:30 PM

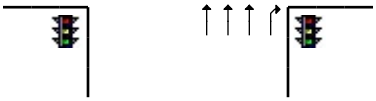


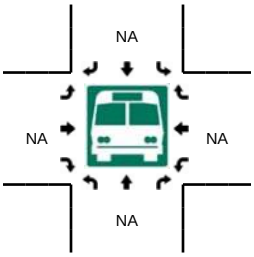












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				1st Ave N (Eastbound)				1st Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	218	95	0	161	145	0	0	0	0	0	0	78	0	201	0	898	
4:15 PM	0	258	101	0	168	143	0	0	0	0	0	0	88	0	201	0	959	
4:30 PM	0	238	80	0	196	155	0	1	0	0	0	0	84	0	222	0	976	
4:45 PM	0	282	104	0	165	163	0	0	0	0	0	0	78	0	211	0	1003	3836
5:00 PM	0	310	107	0	205	111	0	0	0	0	0	0	121	0	220	0	1074	4012
5:15 PM	0	360	110	0	202	140	0	0	0	0	0	0	107	0	221	0	1140	4193
5:30 PM	0	324	103	0	169	151	0	0	0	0	0	0	113	0	219	0	1079	4296
5:45 PM	0	236	66	0	146	108	0	0	0	0	0	0	104	0	219	0	879	4172

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1440	440	0	808	560	0	0	0	0	0	0	428	0	884	0	4560
Heavy Trucks	0	16	20		68	12	0		0	0	0		16	0	16		148
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:15 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 1st Ave N

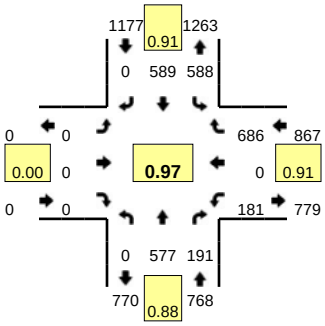
CITY/STATE: Billings, MT

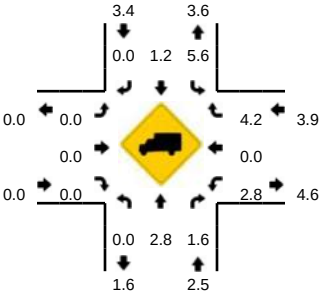
QC JOB #: 14667504

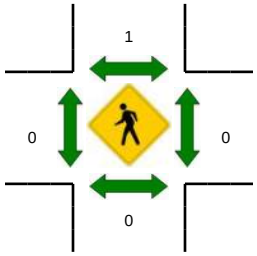
DATE: Sat, Jun 16 2018

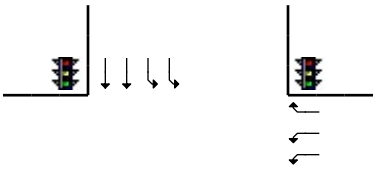
Peak-Hour: 12:00 PM -- 1:00 PM

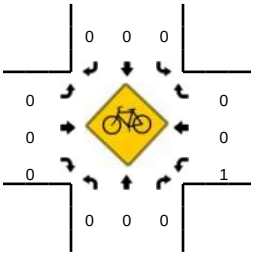
Peak 15-Min: 12:45 PM -- 1:00 PM

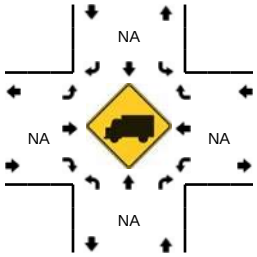


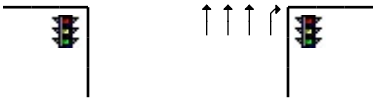


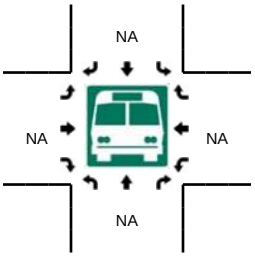












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				1st Ave N (Eastbound)				1st Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:30 AM	0	107	28	0	125	134	0	0	0	0	0	0	33	0	143	0	570	
11:45 AM	0	122	30	0	143	156	0	0	0	0	0	0	44	0	175	0	670	
12:00 PM	0	145	47	0	152	149	0	0	0	0	0	0	47	0	160	0	700	
12:15 PM	0	157	61	0	152	143	0	0	0	0	0	0	43	0	140	0	696	2636
12:30 PM	0	117	46	0	146	138	0	0	0	0	0	0	51	0	191	0	689	2755
12:45 PM	0	158	37	0	138	159	0	0	0	0	0	0	40	0	195	0	727	2812
1:00 PM	0	131	41	0	147	147	0	0	0	0	0	0	38	0	154	0	658	2770
1:15 PM	0	116	46	0	166	164	0	1	0	0	0	0	32	0	176	0	701	2775

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	632	148	0	552	636	0	0	0	0	0	0	160	0	780	0	2908
Heavy Trucks	0	8	4		28	12	0		0	0	0		4	0	28		84
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:15 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

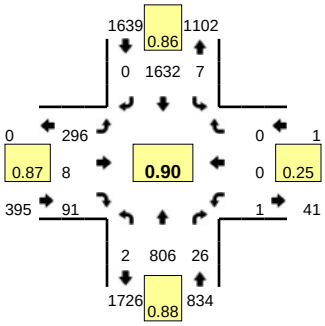
Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 4th Ave N

QC JOB #: 14667505

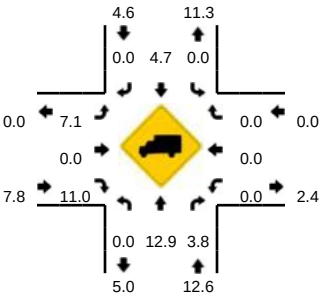
CITY/STATE: Billings, MT

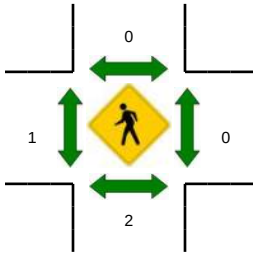
DATE: Wed, Jun 20 2018

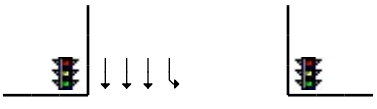


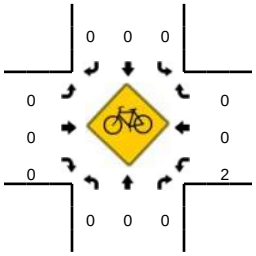
Peak-Hour: 7:15 AM -- 8:15 AM

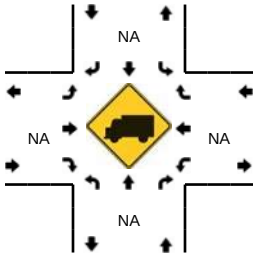
Peak 15-Min: 7:30 AM -- 7:45 AM

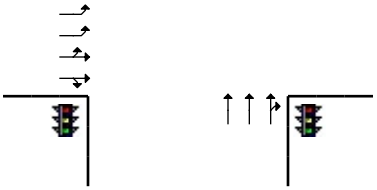


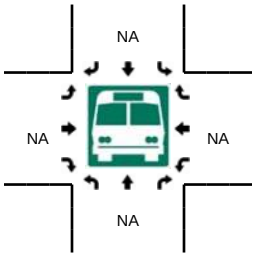












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				4th Ave N (Eastbound)				4th Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	0	136	1	0	0	355	0	0	53	0	19	0	0	0	0	0	564	
6:45 AM	0	162	14	0	3	416	0	0	60	3	18	0	0	0	0	0	676	
7:00 AM	0	150	1	0	0	329	0	0	55	1	13	0	0	0	0	0	549	
7:15 AM	0	188	4	1	2	428	0	0	51	0	19	0	1	0	0	0	694	2483
7:30 AM	0	197	9	0	3	482	0	0	81	3	22	0	0	0	0	0	797	2716
7:45 AM	0	231	7	1	0	414	0	0	77	3	25	0	0	0	0	0	758	2798
8:00 AM	0	190	6	0	2	308	0	0	87	2	25	0	0	0	0	0	620	2869
8:15 AM	0	193	7	0	1	318	0	1	104	3	24	0	0	0	1	0	652	2827

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	788	36	0	12	1928	0	0	324	12	88	0	0	0	0	0	3188
Heavy Trucks	0	68	4		0	68	0		8	0	8		0	0	0		156
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		2	0	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:15 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

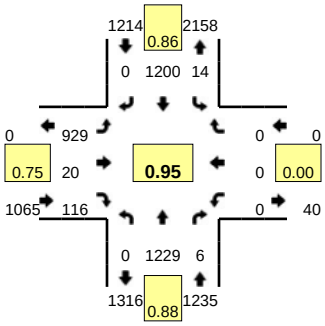
Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 4th Ave N

QC JOB #: 14667506

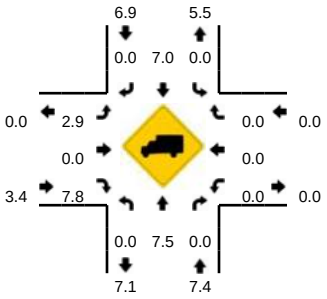
CITY/STATE: Billings, MT

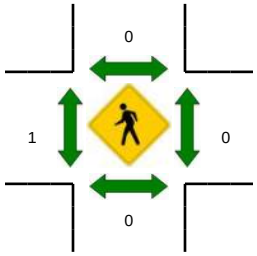
DATE: Wed, Jun 20 2018

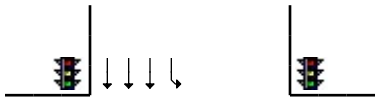


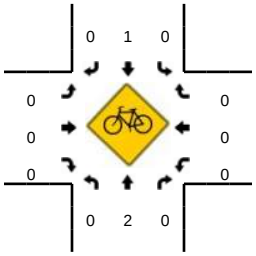
Peak-Hour: 12:00 PM -- 1:00 PM

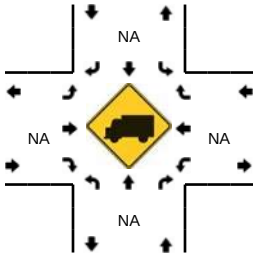
Peak 15-Min: 12:00 PM -- 12:15 PM

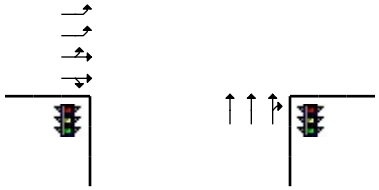


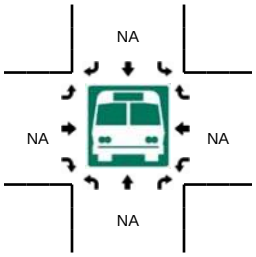












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				4th Ave N (Eastbound)				4th Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	258	6	0	1	246	0	0	189	4	31	0	0	0	0	0	735	
11:15 AM	0	256	4	0	1	273	0	2	167	2	22	0	0	0	0	0	727	
11:30 AM	0	243	3	0	0	267	0	0	213	0	28	0	0	0	0	0	754	
11:45 AM	0	364	1	0	1	271	0	1	141	1	17	0	0	0	0	0	797	3013
12:00 PM	0	294	1	0	2	276	0	0	312	4	38	0	0	0	0	0	927	3205
12:15 PM	0	304	1	0	2	280	0	0	224	4	38	0	0	0	0	0	853	3331
12:30 PM	0	323	1	0	6	297	0	0	228	9	24	0	0	0	0	0	888	3465
12:45 PM	0	308	3	0	4	347	0	0	165	3	16	0	0	0	0	0	846	3514

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1176	4	0	8	1104	0	0	1248	16	152	0	0	0	0	0	3708
Heavy Trucks	0	56	0		0	84	0		32	0	16		0	0	0		188
Pedestrians		0				0				0				0			0
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:15 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

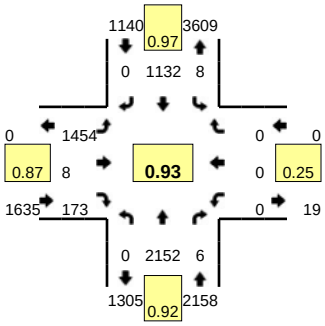
Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 4th Ave N

QC JOB #: 14667507

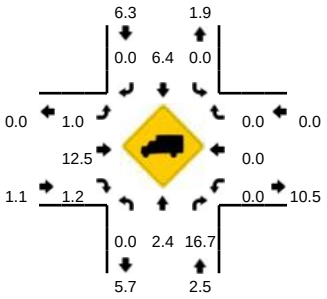
CITY/STATE: Billings, MT

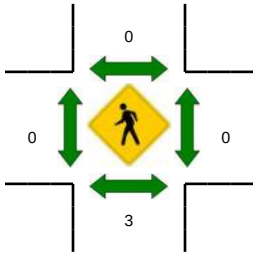
DATE: Wed, Jun 20 2018

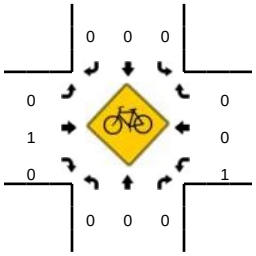


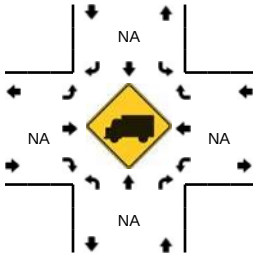
Peak-Hour: 4:45 PM -- 5:45 PM

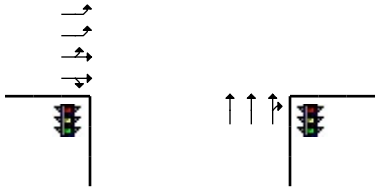
Peak 15-Min: 5:15 PM -- 5:30 PM

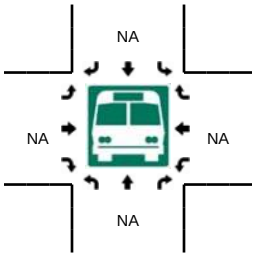












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				4th Ave N (Eastbound)				4th Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	416	4	0	2	273	0	1	288	1	35	0	0	0	0	0	1020	
4:15 PM	0	444	3	0	0	298	0	0	279	0	44	0	0	0	0	0	1068	
4:30 PM	0	449	0	0	1	288	0	0	308	1	51	0	0	0	0	0	1098	
4:45 PM	0	501	1	0	0	279	0	1	319	2	33	0	0	0	0	0	1136	4322
5:00 PM	0	517	3	0	0	300	0	1	419	3	49	0	0	0	0	0	1292	4594
5:15 PM	0	584	1	0	2	284	0	0	409	1	49	0	0	0	0	0	1330	4856
5:30 PM	0	550	1	0	3	269	0	1	307	2	42	0	0	0	0	0	1175	4933
5:45 PM	0	460	0	0	1	212	0	0	281	1	26	0	0	0	1	0	982	4779

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	2336	4	0	8	1136	0	0	1636	4	196	0	0	0	0	0	5320
Heavy Trucks	0	28	0		0	68	0		16	0	0		0	0	0		112
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:15 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 4th Ave N

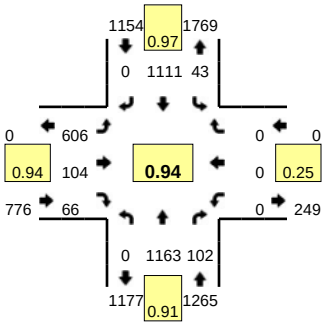
CITY/STATE: Billings, MT

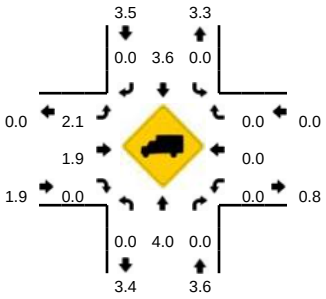
QC JOB #: 14667508

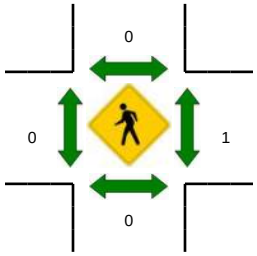
DATE: Sat, Jun 16 2018

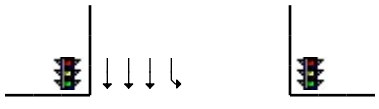
Peak-Hour: 12:00 PM -- 1:00 PM

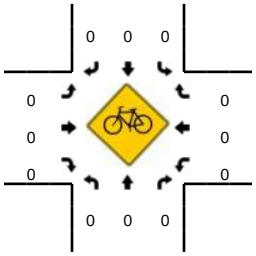
Peak 15-Min: 12:45 PM -- 1:00 PM

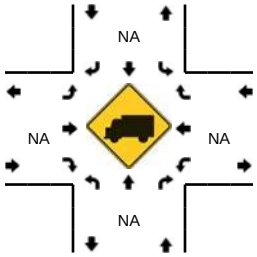


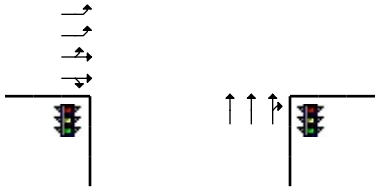


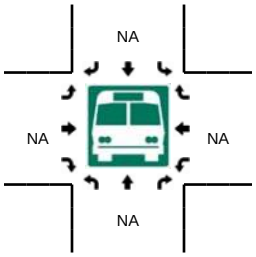












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				4th Ave N (Eastbound)				4th Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:30 AM	0	240	21	0	6	267	0	0	127	16	12	0	0	0	1	0	690	
11:45 AM	0	264	24	0	5	278	0	0	127	16	11	0	0	0	0	0	725	
12:00 PM	0	283	21	0	12	298	0	0	131	25	17	0	0	0	0	0	787	
12:15 PM	0	279	22	0	7	259	0	0	157	26	22	0	0	0	0	0	772	2974
12:30 PM	0	284	29	0	10	271	0	0	151	26	14	0	0	0	0	0	785	3069
12:45 PM	0	317	30	0	14	283	0	0	167	27	13	0	0	0	0	0	851	3195
1:00 PM	0	266	26	0	9	292	0	0	136	27	12	0	0	0	0	0	768	3176
1:15 PM	0	251	30	0	6	300	0	0	141	13	14	0	0	0	0	0	755	3159

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1268	120	0	56	1132	0	0	668	108	52	0	0	0	0	0	3404
Heavy Trucks	0	36	0		0	36	0		16	4	0		0	0	0		92
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:15 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

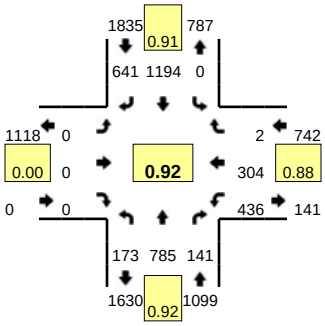
Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 6th Ave N/Bench Blvd

QC JOB #: 14667509

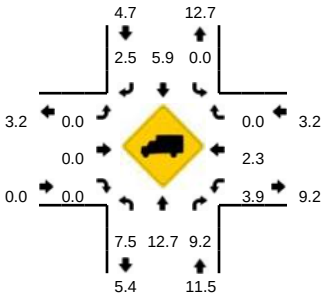
CITY/STATE: Billings, MT

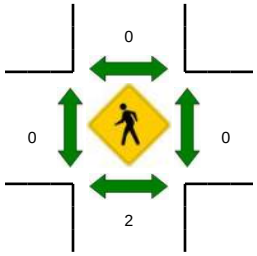
DATE: Wed, Jun 20 2018

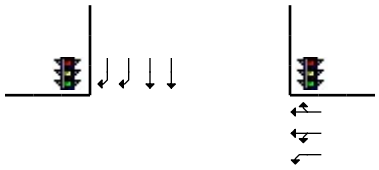


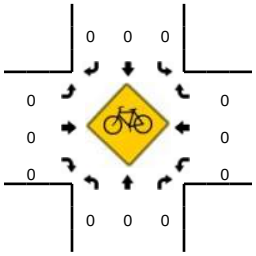
Peak-Hour: 7:15 AM -- 8:15 AM

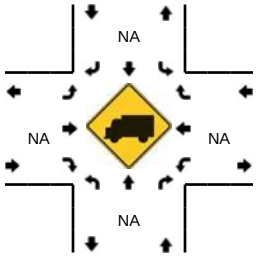
Peak 15-Min: 7:45 AM -- 8:00 AM

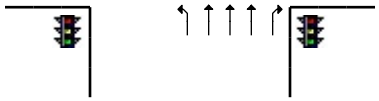


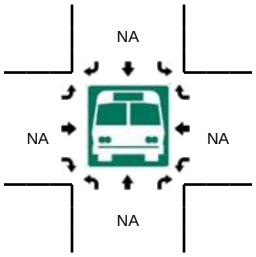












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				6th Ave N/Bench Blvd (Eastbound)				6th Ave N/Bench Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	31	125	21	0	0	262	111	0	0	0	0	0	108	55	1	0	714	
6:45 AM	39	144	37	0	0	316	123	0	0	0	0	0	88	64	0	0	811	
7:00 AM	26	148	27	0	0	277	126	0	0	0	0	0	76	45	1	0	726	
7:15 AM	43	166	29	0	0	303	166	0	0	0	0	0	127	80	1	0	915	3166
7:30 AM	45	191	35	0	0	353	161	0	0	0	0	0	129	81	0	0	995	3447
7:45 AM	44	234	38	0	0	315	172	0	0	0	0	0	108	88	0	0	999	3635
8:00 AM	41	194	39	0	0	223	142	0	0	0	0	0	72	55	1	0	767	3676
8:15 AM	38	211	53	0	0	259	219	0	0	0	0	0	65	61	0	0	906	3667

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	176	936	152	0	0	1260	688	0	0	0	0	0	432	352	0	0	3996
Heavy Trucks	12	92	4		0	96	8		0	0	0		12	16	0		240
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:15 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

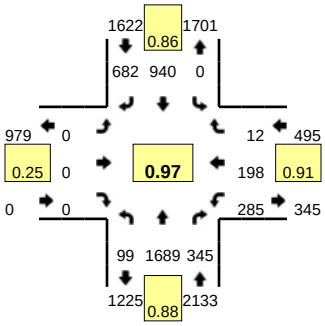
Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 6th Ave N/Bench Blvd

QC JOB #: 14667510

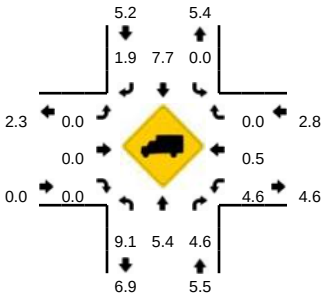
CITY/STATE: Billings, MT

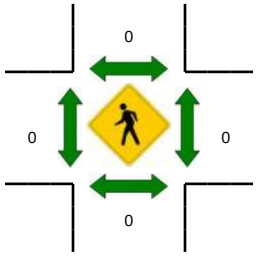
DATE: Wed, Jun 20 2018

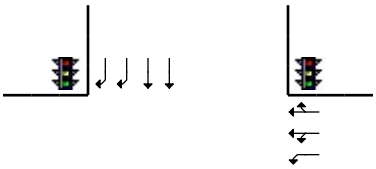


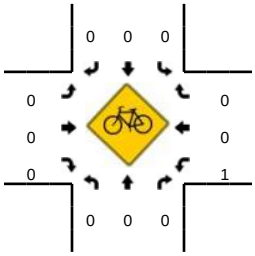
Peak-Hour: 12:00 PM -- 1:00 PM

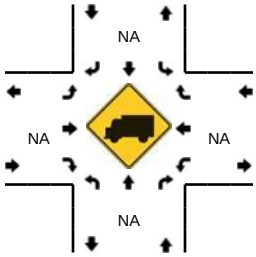
Peak 15-Min: 12:00 PM -- 12:15 PM

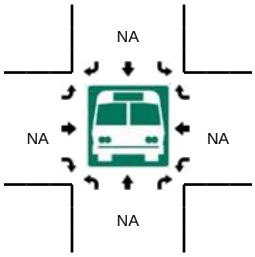












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				6th Ave N/Bench Blvd (Eastbound)				6th Ave N/Bench Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	30	325	81	0	0	190	123	0	0	0	0	0	53	38	3	0	843	
11:15 AM	28	330	71	0	0	230	149	0	0	0	0	0	56	39	2	0	905	
11:30 AM	28	345	76	0	0	206	154	0	1	0	0	0	63	41	5	0	919	
11:45 AM	39	372	85	0	0	215	152	0	0	0	0	0	54	58	6	0	981	3648
12:00 PM	26	489	97	0	0	210	142	0	0	0	0	0	73	48	8	0	1093	3898
12:15 PM	16	415	84	0	0	220	161	0	0	0	0	0	64	50	0	0	1010	4003
12:30 PM	34	421	82	0	0	247	171	0	0	0	0	0	72	40	4	0	1071	4155
12:45 PM	23	364	82	0	0	263	208	0	0	0	0	0	76	60	0	0	1076	4250

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	104	1956	388	0	0	840	568	0	0	0	0	0	292	192	32	0	4372
Heavy Trucks	0	64	20		0	60	8		0	0	0		20	0	0		172
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:16 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

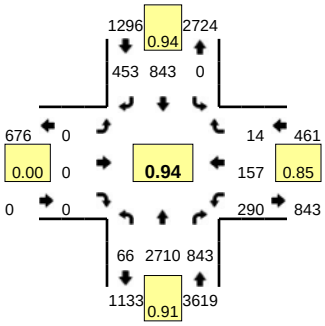
Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 6th Ave N/Bench Blvd

QC JOB #: 14667511

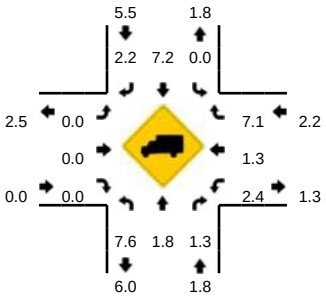
CITY/STATE: Billings, MT

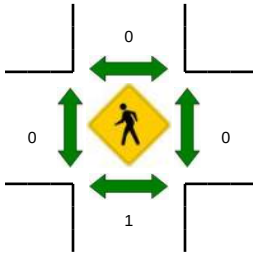
DATE: Wed, Jun 20 2018

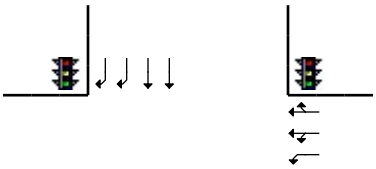


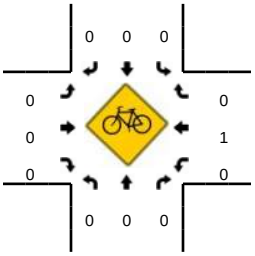
Peak-Hour: 4:45 PM -- 5:45 PM

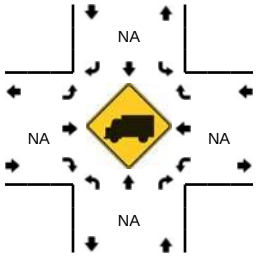
Peak 15-Min: 5:15 PM -- 5:30 PM

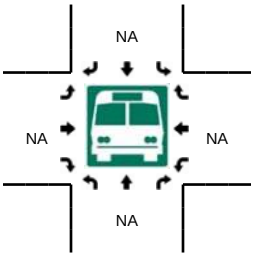












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				6th Ave N/Bench Blvd (Eastbound)				6th Ave N/Bench Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	28	532	129	0	0	218	116	0	0	0	0	0	70	34	0	0	1127	
4:15 PM	21	570	148	0	0	232	128	0	0	0	0	0	68	42	0	0	1209	
4:30 PM	25	562	170	0	0	221	152	0	0	0	0	0	74	57	1	0	1262	
4:45 PM	21	605	195	0	0	221	108	0	0	0	0	0	57	39	0	0	1246	4844
5:00 PM	23	671	218	0	0	220	106	0	0	0	0	0	82	56	4	0	1380	5097
5:15 PM	12	744	240	0	0	203	124	0	0	0	0	0	81	30	1	0	1435	5323
5:30 PM	10	690	190	0	0	199	115	0	0	0	0	0	70	32	9	0	1315	5376
5:45 PM	20	540	164	0	0	158	94	0	0	0	0	0	58	41	1	0	1076	5206

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	48	2976	960	0	0	812	496	0	0	0	0	0	324	120	4	0	5740
Heavy Trucks	4	40	4		0	40	4		0	0	0		8	0	0		100
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:16 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

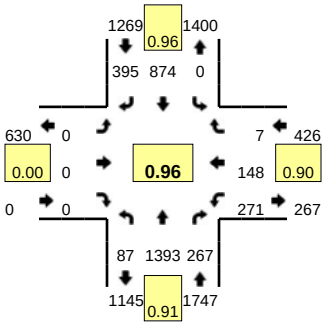
Method for determining peak hour: Total Entering Volume

LOCATION: Main St (Hwy 312) -- 6th Ave N/Bench Blvd

QC JOB #: 14667512

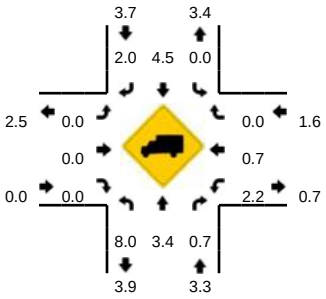
CITY/STATE: Billings, MT

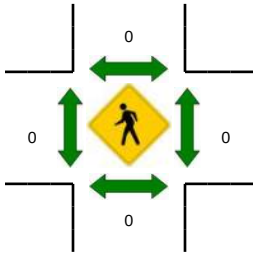
DATE: Sat, Jun 16 2018

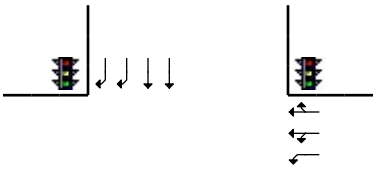


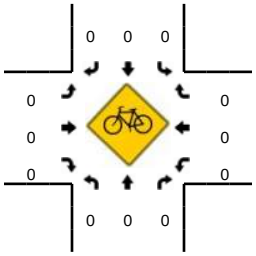
Peak-Hour: 12:00 PM -- 1:00 PM

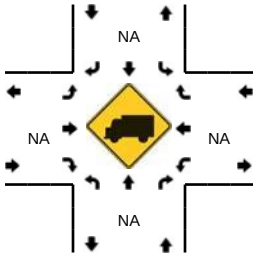
Peak 15-Min: 12:45 PM -- 1:00 PM

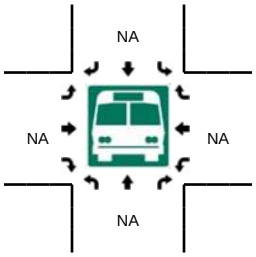












15-Min Count Period Beginning At	Main St (Hwy 312) (Northbound)				Main St (Hwy 312) (Southbound)				6th Ave N/Bench Blvd (Eastbound)				6th Ave N/Bench Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:30 AM	13	292	51	0	0	226	110	0	0	0	0	0	55	29	2	0	778	
11:45 AM	22	310	62	0	0	216	104	0	0	0	0	0	60	39	4	0	817	
12:00 PM	25	322	57	0	0	239	103	0	0	0	0	0	66	29	1	0	842	
12:15 PM	19	341	66	0	0	199	117	0	0	0	0	0	70	42	0	0	854	3291
12:30 PM	19	349	69	0	0	227	97	0	0	0	0	0	60	27	4	0	852	3365
12:45 PM	24	381	75	0	0	209	78	0	0	0	0	0	75	50	2	0	894	3442
1:00 PM	19	291	82	0	0	216	94	0	0	0	0	0	79	29	6	0	816	3416
1:15 PM	19	299	70	0	0	222	105	0	0	0	0	0	79	46	1	0	841	3403

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	96	1524	300	0	0	836	312	0	0	0	0	0	300	200	8	0	3576
Heavy Trucks	4	44	0		0	36	8		0	0	0		4	0	0		96
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 7/13/2018 3:16 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

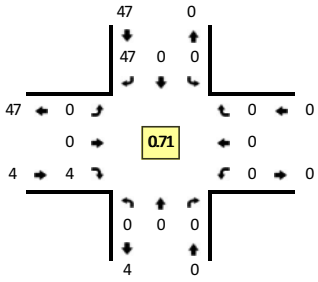
Type of peak hour being reported: Intersection Peak

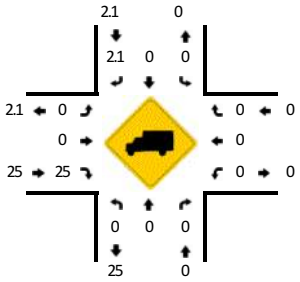
Method for determining peak hour: Total Entering Volume

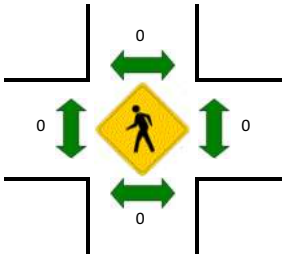
LOCATION: US Hwy 87 -- 3rd Ave N
CITY/STATE: Billings, MT

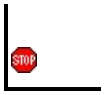
QC JOB #: 14752801
DATE: Wed, Feb 27 2019

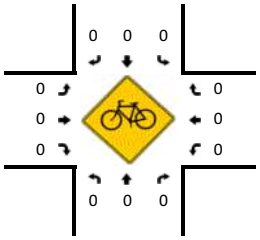
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 8:00 AM -- 8:15 AM

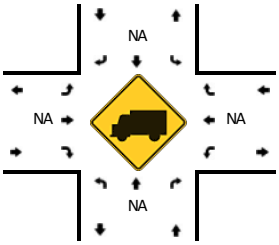


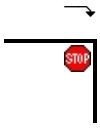


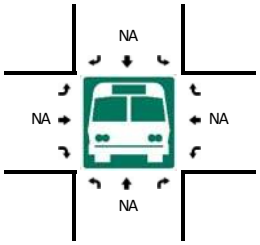












5-Min Count Period Beginning At	US Hwy 87 (Northbound)				US Hwy 87 (Southbound)				3rd Ave N (Eastbound)				3rd Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	
7:10 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
7:15 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
7:20 AM	0	0	0	0	0	0	5	0	0	0	1	0	0	0	0	0	6	
7:25 AM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	
7:30 AM	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6	
7:35 AM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	
7:40 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
7:45 AM	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	4	
7:50 AM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	
7:55 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	38
8:00 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	40
8:05 AM	0	0	0	0	0	0	11	0	0	0	1	0	0	0	0	0	12	49
8:10 AM	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	4	51
8:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	50
8:20 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	46
8:25 AM	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3	45
8:30 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	41
8:35 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	40
8:40 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	40
8:45 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	38
8:50 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	37
8:55 AM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2	38

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	64	0	0	0	8	0	0	0	0	0	72
Heavy Trucks	0	0	0		0	0	4		0	0	4		0	0	0		8
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

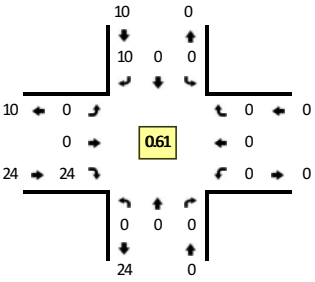
Report generated on 3/6/2019 12:07 PM

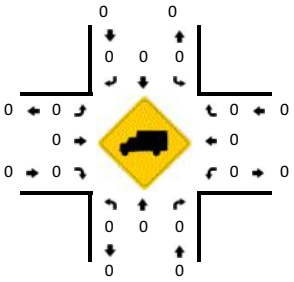
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

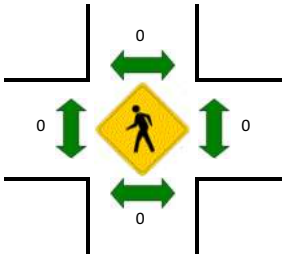
LOCATION: US Hwy 87 -- 3rd Ave N | **QC JOB #:** 14752802
CITY/STATE: Billings, MT | **DATE:** Tue, Feb 26 2019

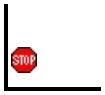
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:25 PM -- 5:40 PM

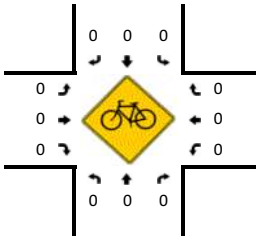


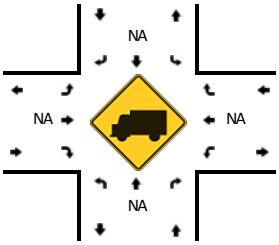


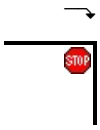
Quality Counts
DATA THAT DRIVES COMMUNITIES

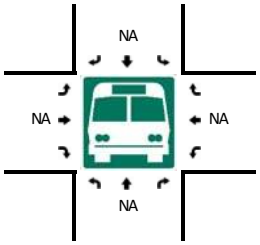












5-Min Count Period Beginning At	US Hwy 87 (Northbound)				US Hwy 87 (Southbound)				3rd Ave N (Eastbound)				3rd Ave N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	4	
4:05 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
4:10 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2	
4:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
4:20 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2	
4:35 PM	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3	
4:50 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	20
5:05 PM	0	0	0	0	0	0	4	0	0	0	1	0	0	0	0	0	5	23
5:10 PM	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	4	25
5:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	25
5:20 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	22
5:25 PM	0	0	0	0	0	0	2	0	0	0	6	0	0	0	0	0	8	30
5:30 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	31
5:35 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	31
5:40 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	34
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	32
5:50 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	33
5:55 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	34

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	8	0	0	0	48	0	0	0	0	0	56
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

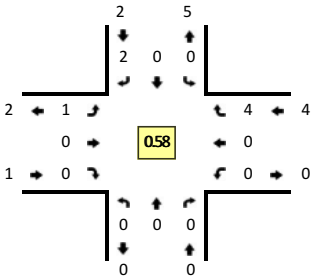
Comments:

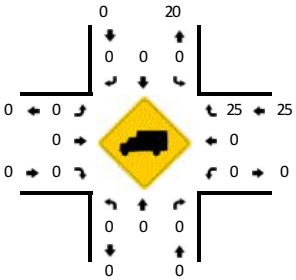
Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

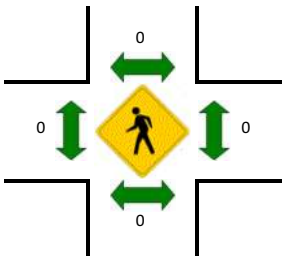
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

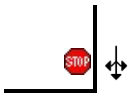
LOCATION: N 12th St -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752803
CITY/STATE: Billings, MT | **DATE:** Wed, Feb 27 2019

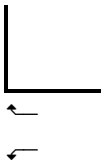
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:00 AM -- 7:15 AM

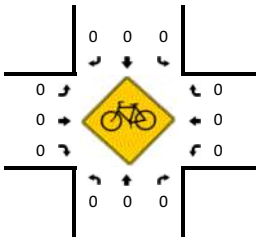


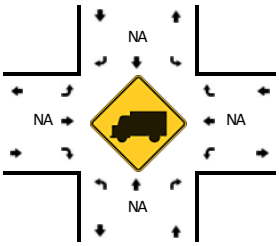


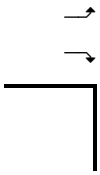


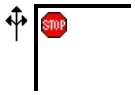


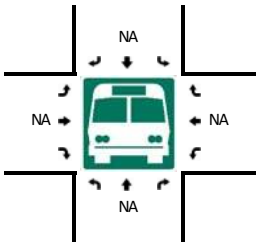












5-Min Count Period Beginning At	N 12th St (Northbound)				N 12th St (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
7:05 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	7
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	7
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
8:10 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	6
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	5
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:55 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	5

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	8	0	0	0	0	0	0	0	4	0	12
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	4		4
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

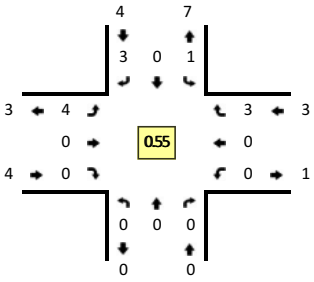
Comments:

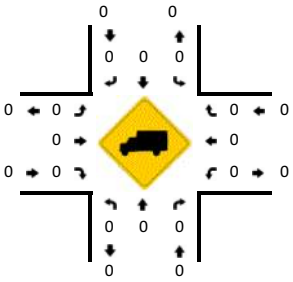
Report generated on 3/6/2019 12:07 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

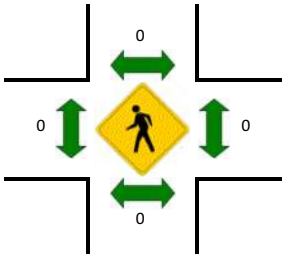
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

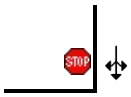
LOCATION: N 12th St -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752804
CITY/STATE: Billings, MT | **DATE:** Tue, Feb 26 2019

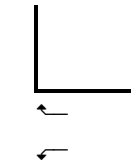
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

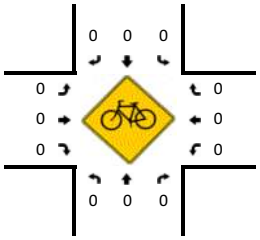


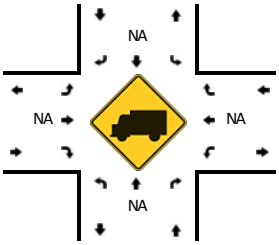


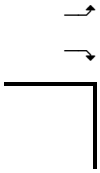


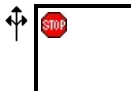


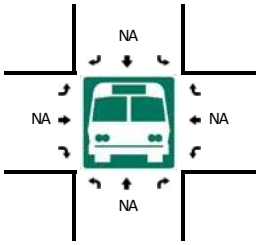












5-Min Count Period Beginning At	N 12th St (Northbound)				N 12th St (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
4:05 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
4:20 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
4:25 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
4:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	
4:35 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
4:40 PM	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	11
5:05 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	11
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
5:25 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	9
5:30 PM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	9
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	7
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	4	0	4	0	8	0	0	0	0	0	4	0	20
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

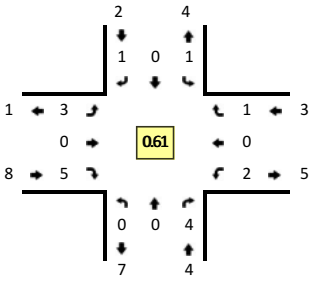
Comments:

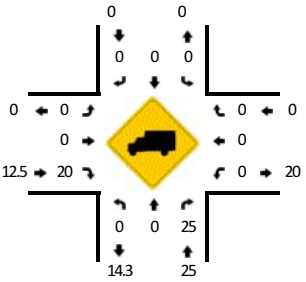
Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

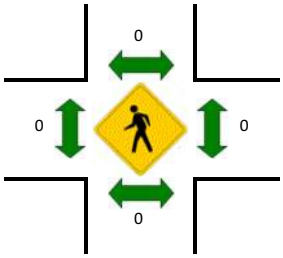
LOCATION: N 11th St -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752805
CITY/STATE: Billings, MT | **DATE:** Wed, Feb 27 2019

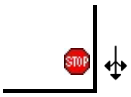
Peak-Hour: 7:50 AM -- 8:50 AM
Peak 15-Min: 8:20 AM -- 8:35 AM

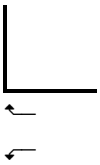


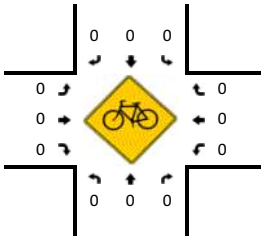


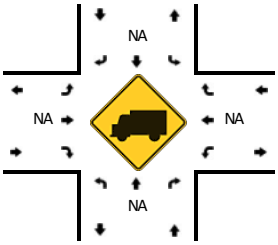
Quality Counts
DATA THAT DRIVES COMMUNITIES

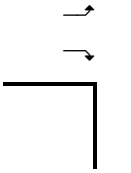


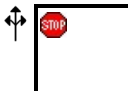


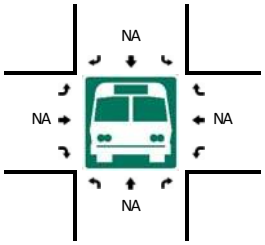












5-Min Count Period Beginning At	N 11th St (Northbound)				N 11th St (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
7:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:35 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:50 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	12
8:00 AM	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2	13
8:05 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	14
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
8:20 AM	0	0	1	0	0	0	1	0	1	0	2	0	0	0	0	0	5	16
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
8:30 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	16
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
8:40 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	16
8:45 AM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	17
8:50 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	16
8:55 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	16

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	8	0	0	0	4	0	4	0	12	0	0	0	0	0	28
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

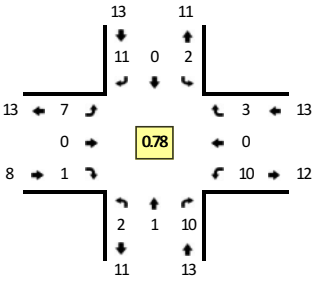
Comments:

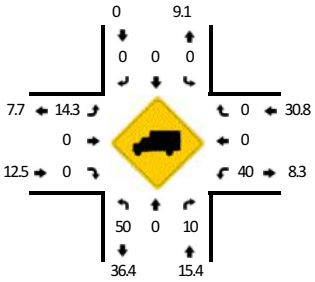
Report generated on 3/6/2019 12:07 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

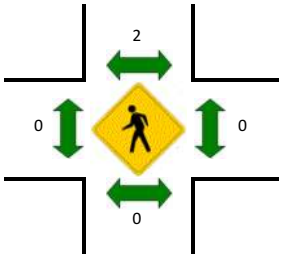
LOCATION: N 11th St -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752806
CITY/STATE: Billings, MT | **DATE:** Tue, Feb 26 2019

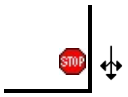
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

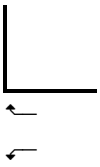


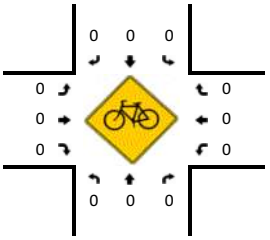


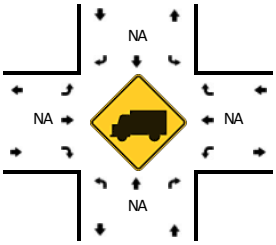
Quality Counts
DATA THAT DRIVES COMMUNITIES

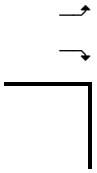


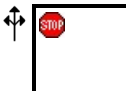


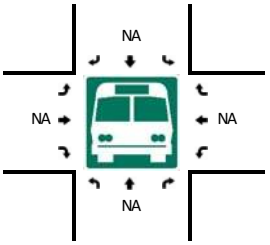












5-Min Count Period Beginning At	N 11th St (Northbound)				N 11th St (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	
4:05 PM	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	3	
4:10 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	4	
4:15 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	
4:20 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	
4:25 PM	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	
4:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
4:35 PM	0	0	1	0	0	0	2	0	1	0	0	0	1	0	1	0	6	
4:40 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	3	
4:45 PM	0	0	1	0	0	0	3	0	1	0	0	0	0	0	0	0	5	
4:50 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:55 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	3	35
5:00 PM	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	4	37
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
5:10 PM	0	0	2	0	1	0	1	0	0	0	0	0	3	0	0	0	7	37
5:15 PM	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	3	38
5:20 PM	0	1	1	0	0	0	0	0	1	0	0	0	2	0	0	0	5	40
5:25 PM	0	0	1	0	0	0	2	0	0	0	1	0	1	0	0	0	5	43
5:30 PM	0	0	1	0	1	0	0	0	2	0	0	0	1	0	0	0	5	47
5:35 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	43
5:40 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	41
5:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	37
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	37
5:55 PM	0	0	1	0	1	0	0	0	1	0	0	0	0	0	2	0	5	39

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	4	16	0	4	0	4	0	4	0	0	0	24	0	0	0	60
Heavy Trucks	0	0	4		0	0	0		0	0	0		8	0	0		12
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

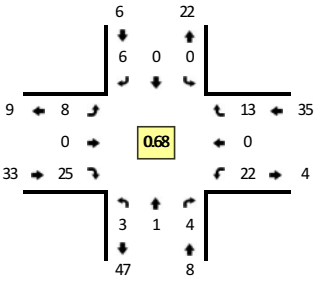
Comments:

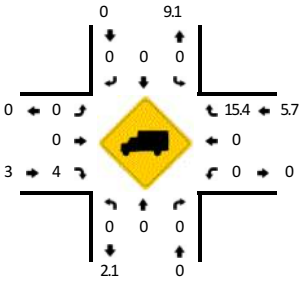
Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

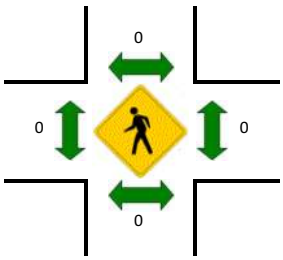
LOCATION: N 10th St -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752807
CITY/STATE: Billings, MT | **DATE:** Wed, Feb 27 2019

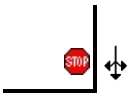
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:35 AM -- 7:50 AM

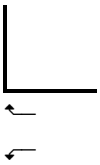


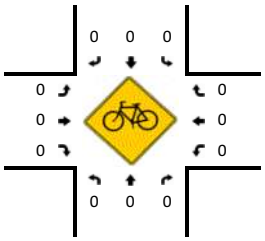


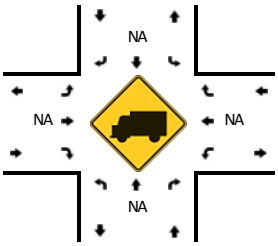
Quality Counts
DATA THAT DRIVES COMMUNITIES

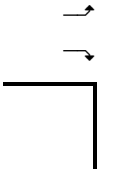


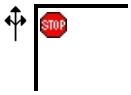


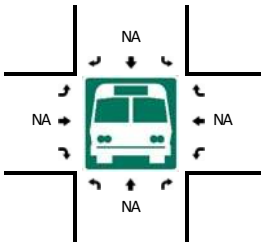












5-Min Count Period Beginning At	N 10th St (Northbound)				N 10th St (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	
7:10 AM	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	3	
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:20 AM	0	0	0	0	0	0	0	0	1	0	1	0	1	0	2	0	5	
7:25 AM	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	3	
7:30 AM	0	0	0	0	0	0	0	0	2	0	2	0	3	0	1	0	8	
7:35 AM	0	0	0	0	0	0	1	0	0	0	2	0	3	0	3	0	9	
7:40 AM	0	0	1	0	0	0	0	0	0	0	4	0	4	0	1	0	10	
7:45 AM	2	0	0	0	0	0	0	0	2	0	2	0	1	0	4	0	11	
7:50 AM	0	0	1	0	0	0	0	0	0	0	4	0	3	0	1	0	9	
7:55 AM	1	0	0	0	0	0	0	0	2	0	3	0	4	0	0	0	10	71
8:00 AM	0	0	1	0	0	0	1	0	1	0	4	0	2	0	1	0	10	81
8:05 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	81
8:10 AM	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3	81
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	81
8:20 AM	0	1	1	0	0	0	1	0	1	0	1	0	0	0	0	0	5	81
8:25 AM	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	0	4	82
8:30 AM	0	0	0	0	0	0	2	0	1	0	1	0	0	0	0	0	4	78
8:35 AM	1	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	5	74
8:40 AM	1	0	1	0	1	0	2	0	0	0	0	0	0	0	1	0	6	70
8:45 AM	0	0	0	0	0	0	2	0	1	0	0	0	1	0	0	0	4	63
8:50 AM	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	3	57
8:55 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	3	50

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	0	4	0	0	0	4	0	8	0	32	0	32	0	32	0	120
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	4		4
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 3/6/2019 12:07 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

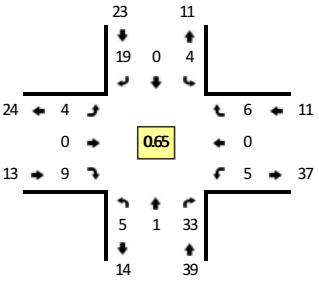
Type of peak hour being reported: Intersection Peak

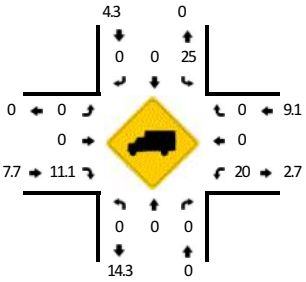
Method for determining peak hour: Total Entering Volume

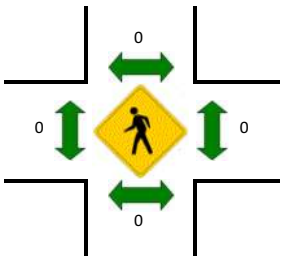
LOCATION: N 10th St -- 1st Ave N (I-90 Bus)
CITY/STATE: Billings, MT

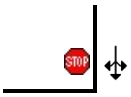
QC JOB #: 14752808
DATE: Tue, Feb 26 2019

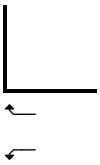
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:55 PM -- 5:10 PM

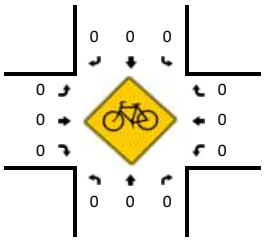


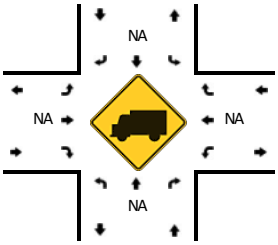


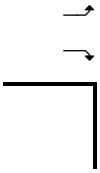


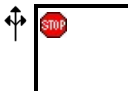


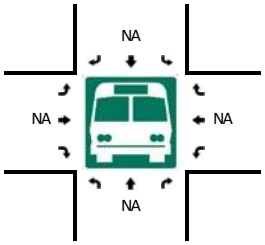












5-Min Count Period Beginning At	N 10th St (Northbound)				N 10th St (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	1	0	0	0	2	0	3	0	0	0	6	
4:05 PM	0	1	0	0	0	0	2	0	0	0	4	0	1	0	0	0	8	
4:10 PM	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3	
4:15 PM	1	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	5	
4:20 PM	0	0	0	0	2	0	1	0	1	0	0	0	0	0	0	0	4	
4:25 PM	0	0	2	0	0	0	2	0	0	0	1	0	1	0	1	0	7	
4:30 PM	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3	
4:35 PM	1	1	1	0	0	0	1	0	0	0	2	0	1	0	2	0	9	
4:40 PM	0	0	2	0	1	0	0	0	2	0	0	0	0	0	1	0	6	
4:45 PM	0	0	0	0	1	0	2	0	0	0	0	0	2	0	0	0	5	
4:50 PM	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	4	
4:55 PM	0	0	6	0	0	0	3	0	0	0	1	0	1	0	1	0	12	72
5:00 PM	2	0	4	0	0	0	2	0	0	0	2	0	0	0	0	0	10	76
5:05 PM	0	0	8	0	0	0	2	0	0	0	1	0	0	0	0	0	11	79
5:10 PM	0	0	9	0	0	0	1	0	0	0	0	0	0	0	0	0	10	86
5:15 PM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	4	85
5:20 PM	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1	0	4	85
5:25 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	4	82
5:30 PM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	2	0	5	84
5:35 PM	0	0	2	0	1	0	3	0	0	0	0	0	0	0	1	0	7	82
5:40 PM	1	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	4	80
5:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	76
5:50 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	74
5:55 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3	65

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	0	72	0	0	0	28	0	0	0	16	0	4	0	4	0	132
Heavy Trucks	0	0	0		0	0	0		0	0	4		0	0	0		4
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

Comments:

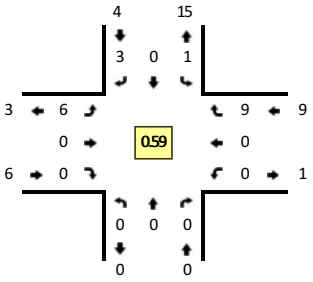
Report generated on 3/6/2019 12:08 PM

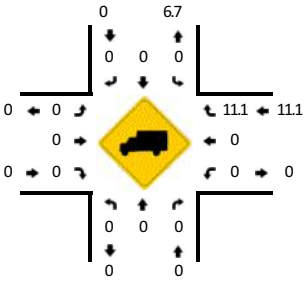
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

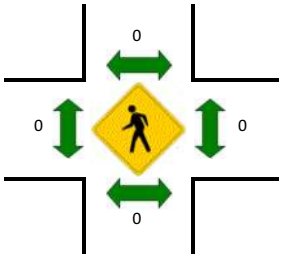
LOCATION: N 9th St -- & 1st Ave N (I-90 Bus) | **QC JOB #:** 14752809
CITY/STATE: Billings, MT | **DATE:** Wed, Feb 27 2019

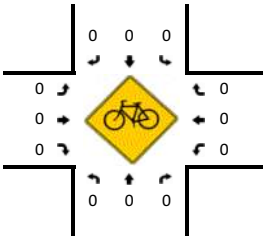
Peak-Hour: 7:35 AM -- 8:35 AM
Peak 15-Min: 7:35 AM -- 7:50 AM

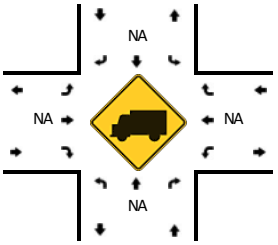


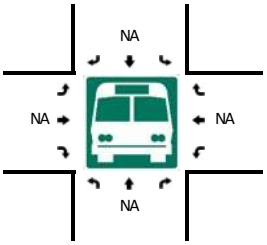


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	N 9th St (Northbound)				N 9th St (Southbound)				& 1st Ave N (I-90 Bus) (Eastbound)				& 1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:10 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:25 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	
7:40 AM	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	3	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	
7:50 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	3	
7:55 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	16
8:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	17
8:05 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	18
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
8:25 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	17
8:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	19
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
8:40 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	3	16
8:45 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	3	17
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
8:55 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	13

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	4	0	8	0	0	0	0	0	20	0	32
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

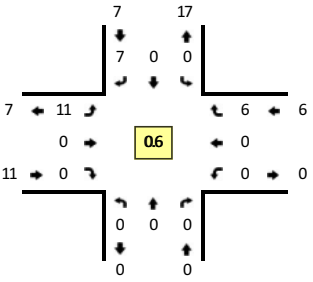
Comments:

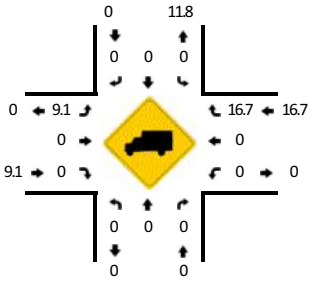
Report generated on 3/6/2019 12:07 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

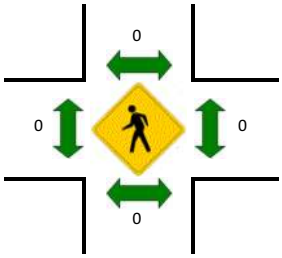
LOCATION: N 9th St -- & 1st Ave N (I-90 Bus) | **QC JOB #:** 14752810
CITY/STATE: Billings, MT | **DATE:** Tue, Feb 26 2019

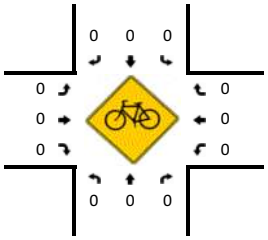
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 4:55 PM -- 5:10 PM

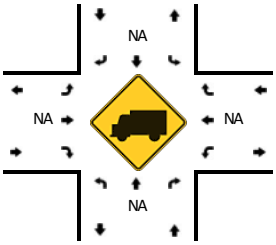


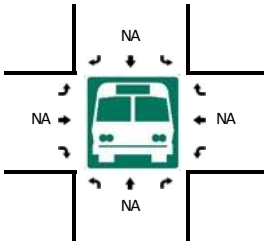


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	N 9th St (Northbound)				N 9th St (Southbound)				& 1st Ave N (I-90 Bus) (Eastbound)				& 1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	
4:05 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	
4:10 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
4:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	
4:35 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	3	
4:40 PM	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	3	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:50 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
4:55 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	3	19
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	19
5:05 PM	0	0	0	0	0	0	3	0	2	0	0	0	0	0	0	0	5	22
5:10 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	22
5:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	22
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
5:25 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	23
5:30 PM	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	3	24
5:35 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	23
5:40 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	21
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	22
5:50 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	22
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	12	0	16	0	0	0	0	0	12	0	40
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	4		4
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

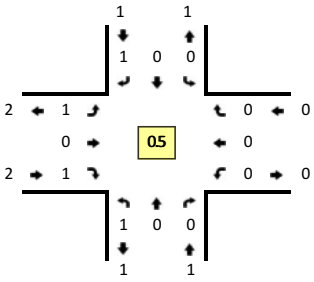
Comments:

Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

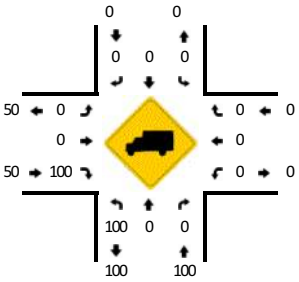
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

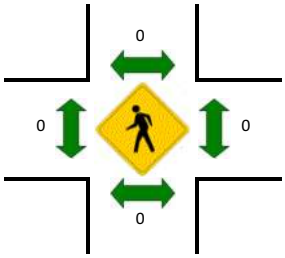
LOCATION: Gate 2/Materials Dwy -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752813
CITY/STATE: Billings, MT | **DATE:** Wed, Feb 27 2019

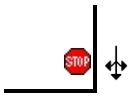
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

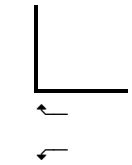


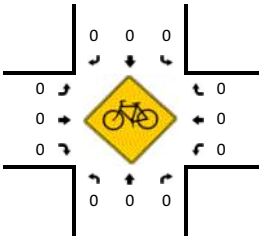
Quality Counts
DATA THAT DRIVES COMMUNITIES

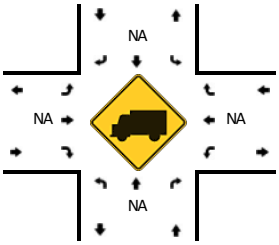


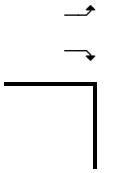


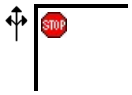


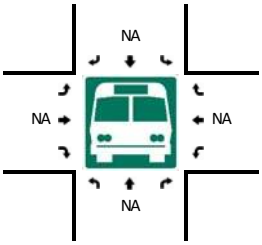












5-Min Count Period Beginning At	Gate 2/Materials Dwy (Northbound)				Gate 2/Materials Dwy (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:55 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:10 AM	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	4
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	8
Heavy Trucks	0	0	0		0	0	0		0	0	4		0	0	0		4
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

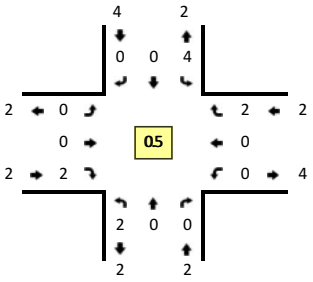
Comments:

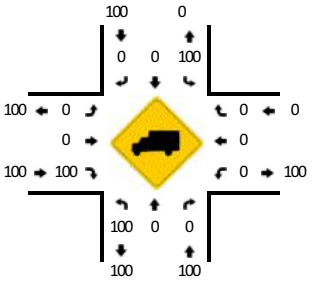
Report generated on 3/6/2019 12:07 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

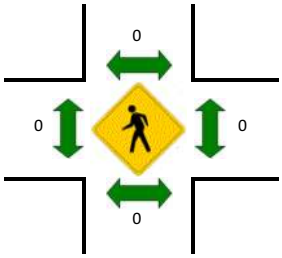
LOCATION: Gate 2/Materials Dwy -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752814
CITY/STATE: Billings, MT | **DATE:** Tue, Feb 26 2019

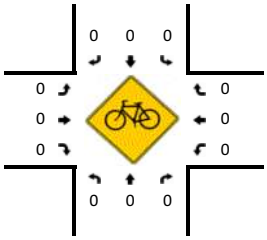
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

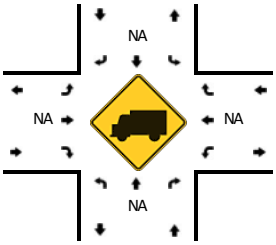


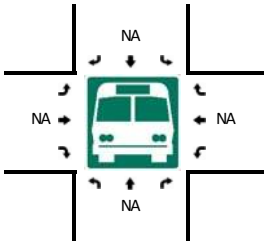


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	Gate 2/Materials Dwy (Northbound)				Gate 2/Materials Dwy (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	
4:20 PM	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2	
4:25 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:55 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	4
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5
5:50 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	8	0	0	0	0	0	4	0	0	0	8	0	20
Heavy Trucks	0	0	0		8	0	0		0	0	4		0	0	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

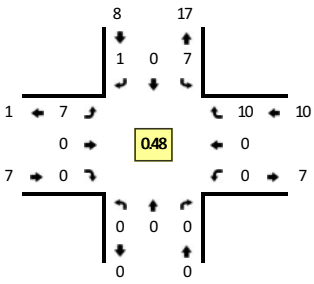
Comments:

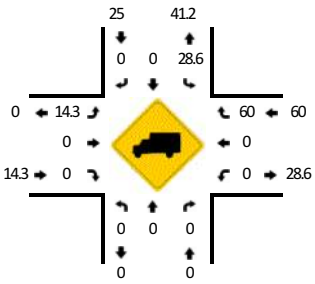
Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

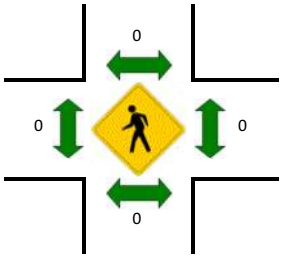
LOCATION: City Wastewater Access Rd -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752815
CITY/STATE: Billings, MT | **DATE:** Wed, Feb 27 2019

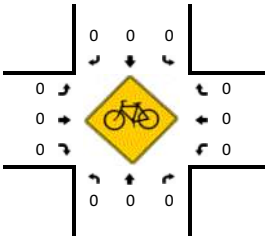
Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:45 AM -- 9:00 AM

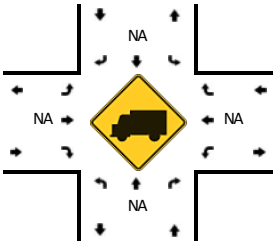


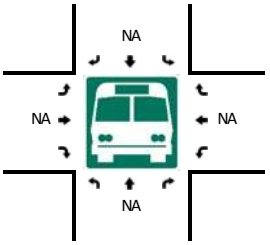


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	City Wastewater Access Rd (Northbound)				City Wastewater Access Rd (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	3	
7:05 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	
7:20 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
7:25 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:35 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	
7:40 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:50 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	
7:55 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	18
8:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	16
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
8:10 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	14
8:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	13
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	13
8:25 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	13
8:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14
8:35 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2	14
8:40 AM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	3	15
8:45 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	0	5	20
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	19
8:55 AM	0	0	0	0	2	0	0	0	2	0	0	0	0	0	3	0	7	25

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	8	0	0	0	16	0	0	0	0	0	28	0	52
Heavy Trucks	0	0	0		4	0	0		4	0	0		0	0	16		24
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

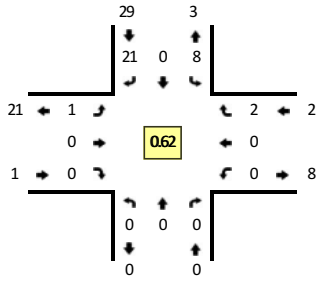
Comments:

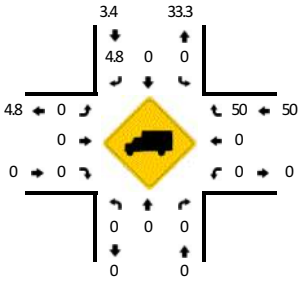
Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

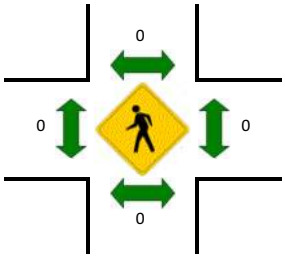
LOCATION: City Wastewater Access Rd -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752816
CITY/STATE: Billings, MT | **DATE:** Tue, Feb 26 2019

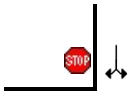
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:00 PM -- 4:15 PM

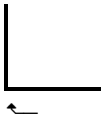


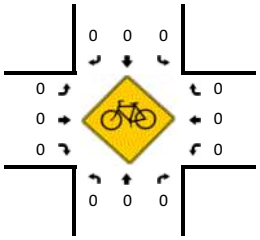


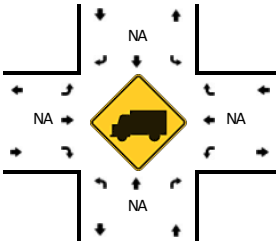
Quality Counts
DATA THAT DRIVES COMMUNITIES

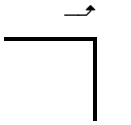


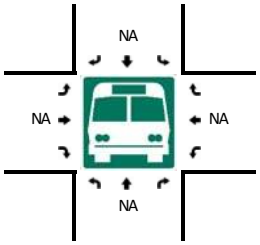












5-Min Count Period Beginning At	City Wastewater Access Rd (Northbound)				City Wastewater Access Rd (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0	5	
4:05 PM	0	0	0	0	1	0	4	0	0	0	0	0	0	0	0	0	5	
4:10 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	3	
4:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
4:20 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	0	0	3	0	1	0	1	0	0	0	0	0	0	0	5	
4:35 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
4:45 PM	0	0	0	0	1	0	4	0	0	0	0	0	0	0	0	0	5	
4:50 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
5:15 PM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	3	20
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
5:35 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	11
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
5:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	6
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:55 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	6

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	12	0	36	0	0	0	0	0	0	0	4	0	52
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	4		4
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

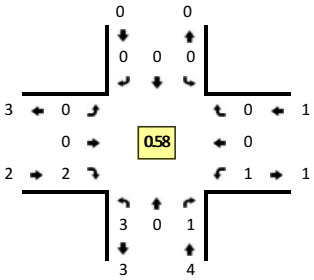
Comments:

Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

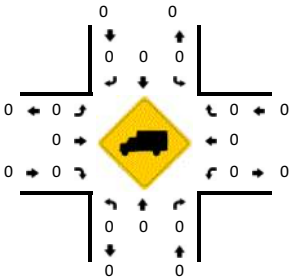
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

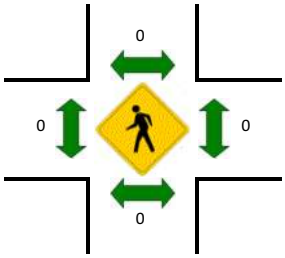
LOCATION: Auto Magic Dwy -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752817
CITY/STATE: Billings, MT | **DATE:** Wed, Feb 27 2019

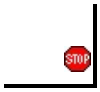
Peak-Hour: 7:10 AM -- 8:10 AM
Peak 15-Min: 7:35 AM -- 7:50 AM

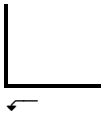


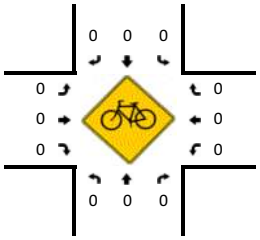
Quality Counts
DATA THAT DRIVES COMMUNITIES

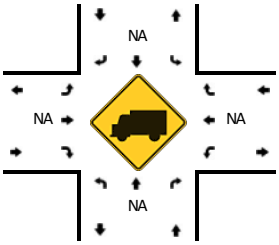


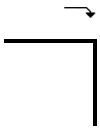


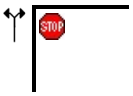


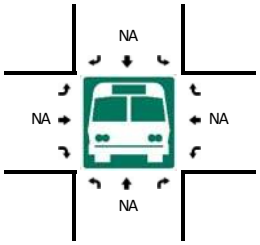












5-Min Count Period Beginning At	Auto Magic Dwy (Northbound)				Auto Magic Dwy (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:10 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:40 AM	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6
8:05 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	6
8:35 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7
8:40 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	6
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	12
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

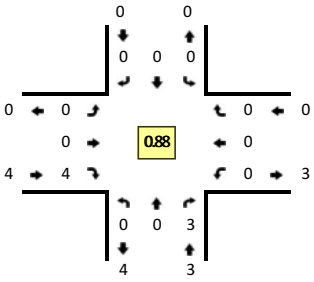
Comments:

Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

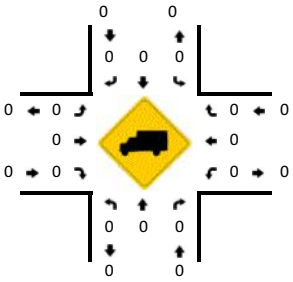
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

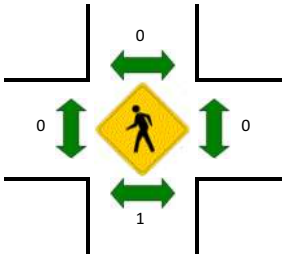
LOCATION: Auto Magic Dwy -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752818
CITY/STATE: Billings, MT | **DATE:** Tue, Feb 26 2019

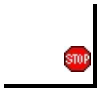
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

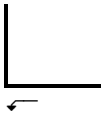


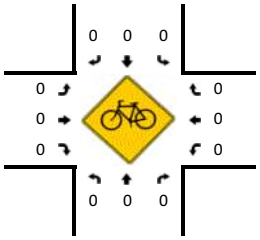
Quality Counts
DATA THAT DRIVES COMMUNITIES

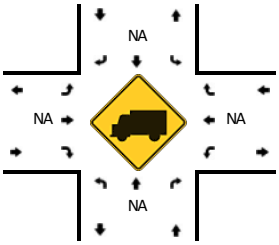


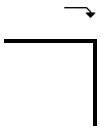


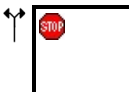


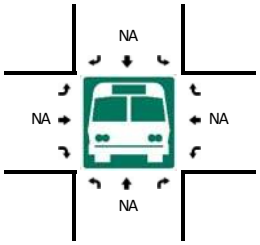












5-Min Count Period Beginning At	Auto Magic Dwy (Northbound)				Auto Magic Dwy (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:20 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:35 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:50 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:55 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:10 PM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	7
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
5:50 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	4	0	0	0	0	0	0	0	4	0	0	0	0	0	8
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

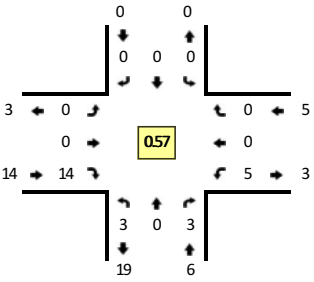
Comments:

Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

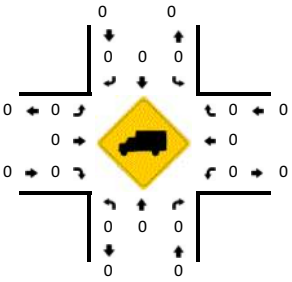
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

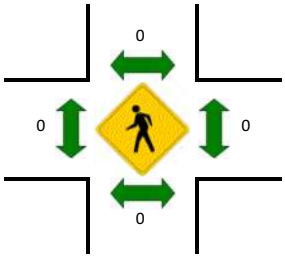
LOCATION: Northern AgNetwork Dwy -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752819
CITY/STATE: Billings, MT | **DATE:** Wed, Feb 27 2019

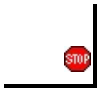
Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

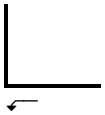


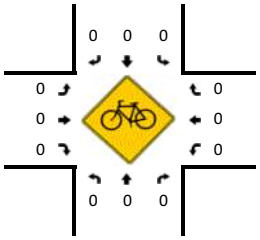
Quality Counts
DATA THAT DRIVES COMMUNITIES

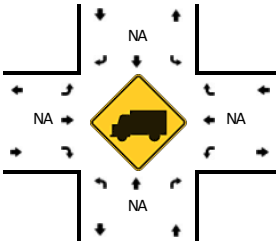


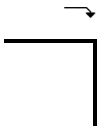


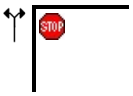


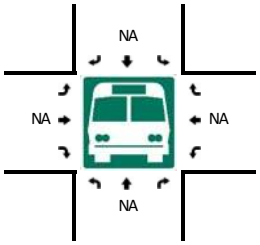












5-Min Count Period Beginning At	Northern AgNetwork Dwy (Northbound)				Northern AgNetwork Dwy (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:05 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:10 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:20 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:25 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:35 AM	0	0	1	0	0	0	0	0	0	0	3	0	1	0	0	0	5	
7:40 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:45 AM	0	0	1	0	0	0	0	0	0	0	2	0	1	0	0	0	4	
7:50 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	
7:55 AM	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	5	24
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	24
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	24
8:10 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	24
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	24
8:20 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	25
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	25
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	15
8:50 AM	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	4	17
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	4	0	0	0	0	0	0	0	28	0	8	0	0	0	44
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

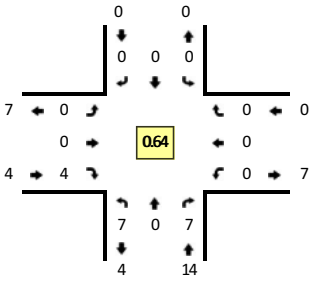
Comments:

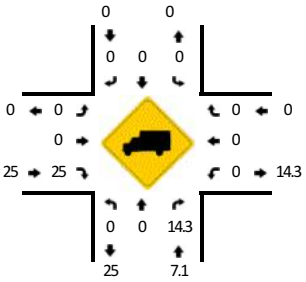
Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

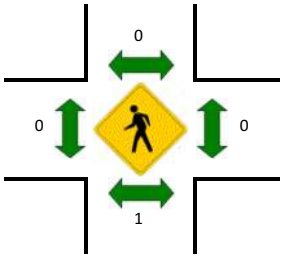
LOCATION: Northern AgNetwork Dwy -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752820
CITY/STATE: Billings, MT | **DATE:** Tue, Feb 26 2019

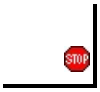
Peak-Hour: 4:05 PM -- 5:05 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

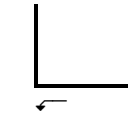


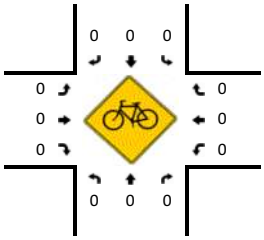


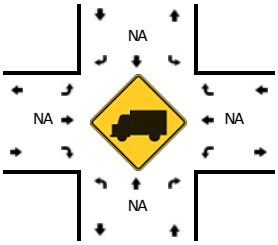
Quality Counts
DATA THAT DRIVES COMMUNITIES

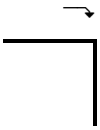


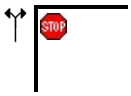


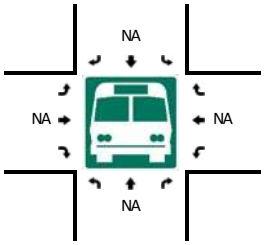












5-Min Count Period Beginning At	Northern AgNetwork Dwy (Northbound)				Northern AgNetwork Dwy (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:05 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	
4:10 PM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	
4:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:35 PM	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4	
4:40 PM	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:50 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
5:00 PM	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4	18
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
5:10 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	16
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	12
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	10
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	11
5:50 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10
5:55 PM	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	15

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	0	8	0	0	0	0	0	0	0	4	0	0	0	0	0	28
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

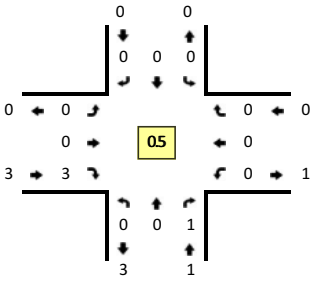
Comments:

Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

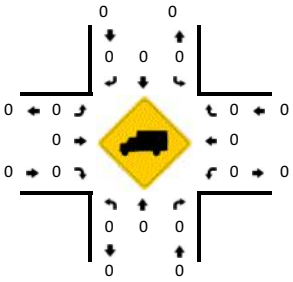
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

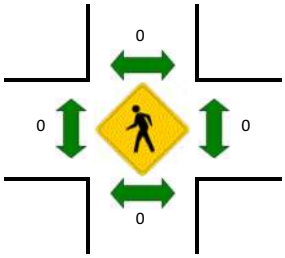
LOCATION: Yellowstone Pipeline Dwy -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752821
CITY/STATE: Billings, MT | **DATE:** Wed, Feb 27 2019

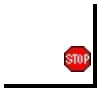
Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:10 AM -- 7:25 AM

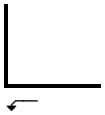


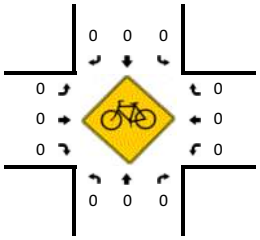
Quality Counts
DATA THAT DRIVES COMMUNITIES

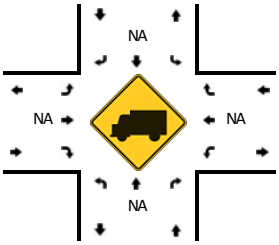


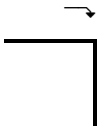


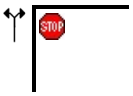


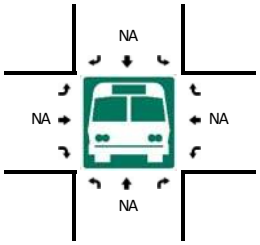












5-Min Count Period Beginning At	Yellowstone Pipeline Dwy (Northbound)				Yellowstone Pipeline Dwy (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:20 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:40 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

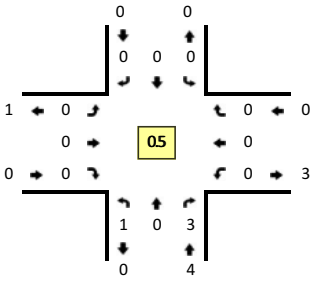
Comments:

Report generated on 3/6/2019 12:08 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

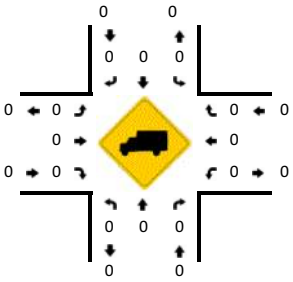
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

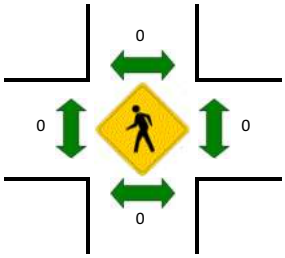
LOCATION: Yellowstone Pipeline Dwy -- 1st Ave N (I-90 Bus) | **QC JOB #:** 14752822
CITY/STATE: Billings, MT | **DATE:** Tue, Feb 26 2019

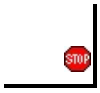
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:10 PM -- 4:25 PM

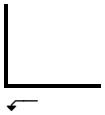


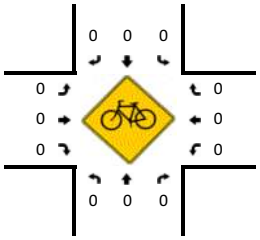
Quality Counts
DATA THAT DRIVES COMMUNITIES

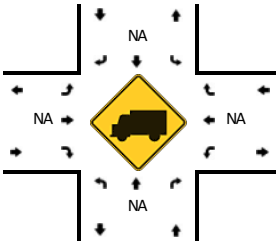


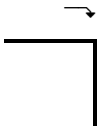


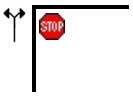


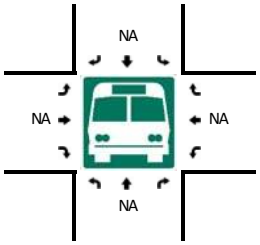












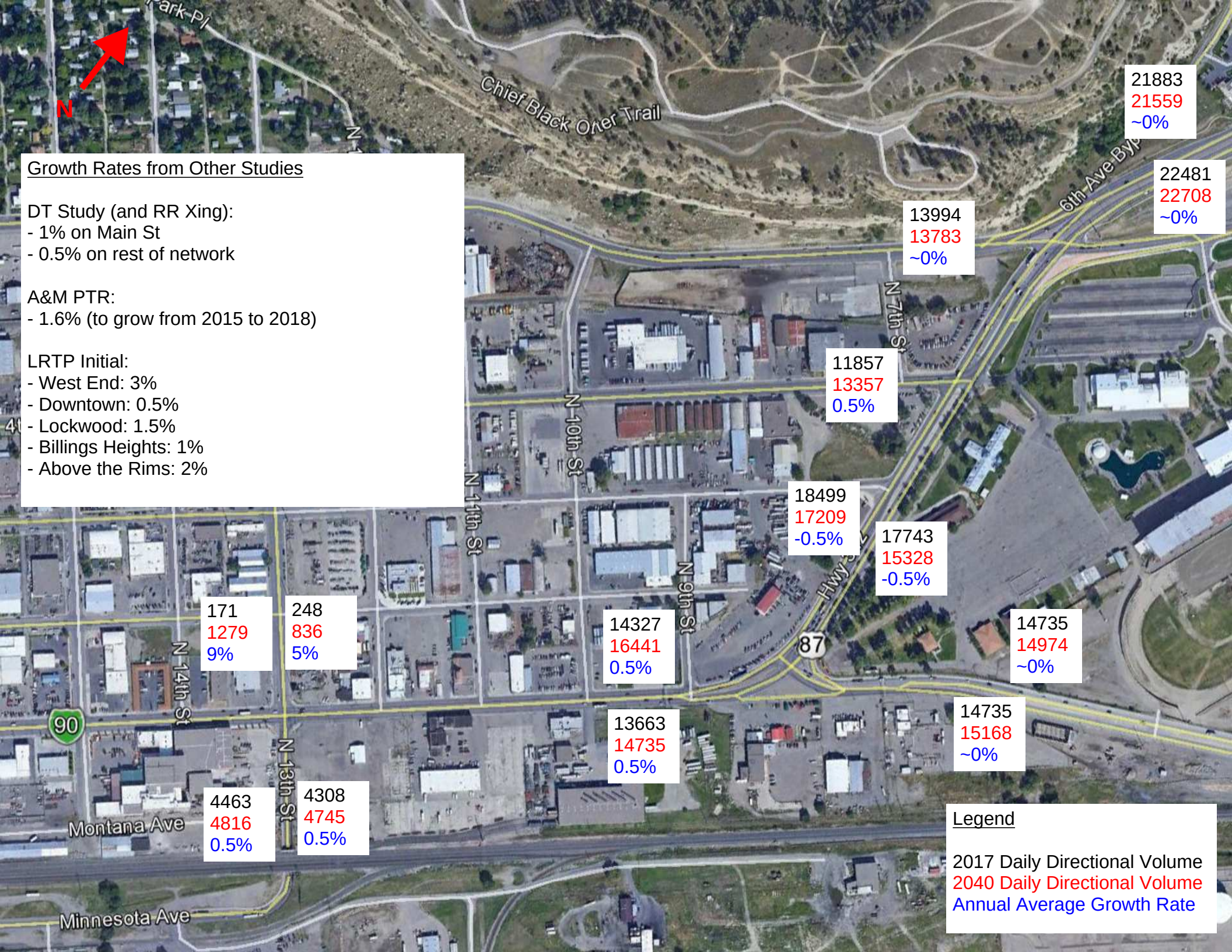
5-Min Count Period Beginning At	Yellowstone Pipeline Dwy (Northbound)				Yellowstone Pipeline Dwy (Southbound)				1st Ave N (I-90 Bus) (Eastbound)				1st Ave N (I-90 Bus) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:20 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:35 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

Comments:

Report generated on 3/6/2019 12:09 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix B Regional Travel Demand Model Data


Growth Rates from Other Studies
DT Study (and RR Xing):
- 1% on Main St
- 0.5% on rest of network
A&M PTR:
- 1.6% (to grow from 2015 to 2018)
LRTP Initial:
- West End: 3%
- Downtown: 0.5%
- Lockwood: 1.5%
- Billings Heights: 1%
- Above the Rims: 2%
N
Chief Black Otter Trail
6th Ave Byp
N 7th St
N 10th St
N 11th St
N 9th St
N 14th St
N 13th St
Hwy 87
90
Montana Ave
Minnesota Ave
21883
21559
~0%
22481
22708
~0%
13994
13783
~0%
11857
13357
0.5%
18499
17209
-0.5%
17743
15328
-0.5%
14735
14974
~0%
14735
15168
~0%
14327
16441
0.5%
13663
14735
0.5%
171
1279
9%
248
836
5%
4463
4816
0.5%
4308
4745
0.5%
Legend
2017 Daily Directional Volume
2040 Daily Directional Volume
Annual Average Growth Rate

Appendix C Existing AM Traffic Operation Worksheets

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	523	1	1	1371	4	1	1	1	1	1	2
Future Vol, veh/h	1	523	1	1	1371	4	1	1	1	1	1	2
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	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	8	0	0	5	25	0	0	0	0	0	0
Mvmt Flow	1	608	1	1	1594	5	1	1	1	1	1	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1599	0	0	609	0	0	1411	2212	305	1906	2210	800
Stage 1	-	-	-	-	-	-	611	611	-	1599	1599	-
Stage 2	-	-	-	-	-	-	800	1601	-	307	611	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	415	-	-	979	-	-	100	45	697	43	45	332
Stage 1	-	-	-	-	-	-	453	487	-	113	167	-
Stage 2	-	-	-	-	-	-	349	167	-	683	487	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	415	-	-	979	-	-	99	45	697	43	45	332
Mov Cap-2 Maneuver	-	-	-	-	-	-	275	151	-	107	152	-
Stage 1	-	-	-	-	-	-	452	486	-	113	167	-
Stage 2	-	-	-	-	-	-	344	167	-	679	486	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	19.2	25.3
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	257	415	-	-	979	-	-	182
HCM Lane V/C Ratio	0.014	0.003	-	-	0.001	-	-	0.026
HCM Control Delay (s)	19.2	13.7	-	-	8.7	-	-	25.3
HCM Lane LOS	C	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	523	1	2	1371	1	1	1	4	1	1	1
Future Vol, veh/h	1	523	1	2	1371	1	1	1	4	1	1	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	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	8	20	0	5	0	0	0	25	0	0	0
Mvmt Flow	1	608	1	2	1594	1	1	1	5	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1595	0	0	609	0	0	1413	2210	305	1906	2210	798
Stage 1	-	-	-	-	-	-	611	611	-	1599	1599	-
Stage 2	-	-	-	-	-	-	802	1599	-	307	611	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	7.4	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.55	3.5	4	3.3
Pot Cap-1 Maneuver	416	-	-	979	-	-	100	45	627	43	45	333
Stage 1	-	-	-	-	-	-	453	487	-	113	167	-
Stage 2	-	-	-	-	-	-	348	167	-	683	487	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	416	-	-	979	-	-	99	45	627	42	45	333
Mov Cap-2 Maneuver	-	-	-	-	-	-	275	151	-	106	152	-
Stage 1	-	-	-	-	-	-	452	486	-	113	167	-
Stage 2	-	-	-	-	-	-	344	167	-	675	486	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	15.2	28.3
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	361	416	-	-	979	-	-	158
HCM Lane V/C Ratio	0.019	0.003	-	-	0.002	-	-	0.022
HCM Control Delay (s)	15.2	13.7	-	-	8.7	-	-	28.3
HCM Lane LOS	C	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

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	8	523	25	22	1371	13	3	1	4	1	1	6
Future Vol, veh/h	8	523	25	22	1371	13	3	1	4	1	1	6
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	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	8	4	0	5	15	0	0	0	0	0	0
Mvmt Flow	9	608	29	26	1594	15	3	1	5	1	1	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1609	0	0	637	0	0	1491	2302	319	1977	2309	805
Stage 1	-	-	-	-	-	-	641	641	-	1654	1654	-
Stage 2	-	-	-	-	-	-	850	1661	-	323	655	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	411	-	-	956	-	-	87	39	683	38	39	330
Stage 1	-	-	-	-	-	-	434	473	-	104	157	-
Stage 2	-	-	-	-	-	-	326	156	-	669	466	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	411	-	-	956	-	-	82	37	683	36	37	330
Mov Cap-2 Maneuver	-	-	-	-	-	-	243	131	-	96	138	-
Stage 1	-	-	-	-	-	-	424	463	-	102	153	-
Stage 2	-	-	-	-	-	-	308	152	-	648	456	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	17	21.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	310	411	-	-	956	-	-	223
HCM Lane V/C Ratio	0.03	0.023	-	-	0.027	-	-	0.042
HCM Control Delay (s)	17	14	-	-	8.9	-	-	21.8
HCM Lane LOS	C	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	523	1371	9	1	3
Future Vol, veh/h	6	523	1371	9	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	8	5	11	0	0
Mvmt Flow	7	608	1594	10	1	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1604	0	-	0	1917	802
Stage 1	-	-	-	-	1599	-
Stage 2	-	-	-	-	318	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	413	-	-	-	61	331
Stage 1	-	-	-	-	154	-
Stage 2	-	-	-	-	716	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	413	-	-	-	60	331
Mov Cap-2 Maneuver	-	-	-	-	60	-
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	716	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	28.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	413	-	-	-	155
HCM Lane V/C Ratio	0.017	-	-	-	0.03
HCM Control Delay (s)	13.9	-	-	-	28.9
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	413	531	289	220	741	942
Future Volume (vph)	413	531	289	220	741	942
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.8	4.0	4.5	4.5
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3014	1305	4343	1417	3014	3197
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3014	1305	4343	1417	3014	3197
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	475	610	332	253	852	1083
RTOR Reduction (vph)	0	28	0	0	0	0
Lane Group Flow (vph)	475	582	332	253	852	1083
Heavy Vehicles (%)	7%	14%	10%	5%	7%	4%
Turn Type	Prot	pt+ov	NA	Free	Prot	NA
Protected Phases	3	1 3	2		1	6
Permitted Phases				Free		
Actuated Green, G (s)	44.5	89.9	30.8	130.0	40.9	76.5
Effective Green, g (s)	44.5	89.9	30.8	130.0	40.9	76.5
Actuated g/C Ratio	0.34	0.69	0.24	1.00	0.31	0.59
Clearance Time (s)	4.5		4.8		4.5	4.5
Vehicle Extension (s)	3.0		0.2		2.0	2.0
Lane Grp Cap (vph)	1031	902	1028	1417	948	1881
v/s Ratio Prot	0.16	c0.45	0.08		c0.28	c0.34
v/s Ratio Perm				0.18		
v/c Ratio	0.46	0.64	0.32	0.18	0.90	0.58
Uniform Delay, d1	33.4	11.2	41.0	0.0	42.6	16.6
Progression Factor	1.00	1.00	1.00	1.00	0.84	0.58
Incremental Delay, d2	0.3	1.2	0.8	0.3	9.9	0.2
Delay (s)	33.7	12.4	41.8	0.3	45.6	9.9
Level of Service	C	B	D	A	D	A
Approach Delay (s)	21.7		23.9			25.6
Approach LOS	C		C			C

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	413	531	289	220	741	942
Future Volume (veh/h)	413	531	289	220	741	942
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	1654	1559	1614	1682	1654	1695
Adj Flow Rate, veh/h	475	610	332	0	852	1083
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	7	14	10	5	7	4
Cap, veh/h	1056	844	1123		896	1878
Arrive On Green	0.35	0.35	0.26	0.00	0.44	0.87
Sat Flow, veh/h	3057	1321	4550	1425	3057	3306
Grp Volume(v), veh/h	475	610	332	0	852	1083
Grp Sat Flow(s),veh/h/ln	1528	1321	1468	1425	1528	1611
Q Serve(g_s), s	15.7	40.3	7.9	0.0	34.9	11.1
Cycle Q Clear(g_c), s	15.7	40.3	7.9	0.0	34.9	11.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	1056	844	1123		896	1878
V/C Ratio(X)	0.45	0.72	0.30		0.95	0.58
Avail Cap(c_a), veh/h	1164	890	1123		1023	1878
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.50	1.50
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	15.8	39.0	0.0	35.5	4.1
Incr Delay (d2), s/veh	0.3	2.8	0.7	0.0	15.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.6	16.9	5.2	0.0	19.3	4.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	33.3	18.5	39.7	0.0	51.2	4.4
LnGrp LOS	C	B	D		D	A
Approach Vol, veh/h	1085		332	A		1935
Approach Delay, s/veh	25.0		39.7			25.0
Approach LOS	C		D			C

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	42.6	38.0			80.6	49.4
Change Period (Y+Rc), s	4.5	* 4.8			* 4.8	4.5
Max Green Setting (Gmax), s	43.5	* 23			* 72	49.5
Max Q Clear Time (g_c+I1), s	36.9	9.9			13.1	42.3
Green Ext Time (p_c), s	1.2	0.4			6.0	2.7

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

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	0	820	1676	47
Future Vol, veh/h	0	4	0	820	1676	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	25	0	0	0	2
Mvmt Flow	0	5	0	932	1905	53

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	979	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.6	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	4.15	-	-	-	-
Pot Cap-1 Maneuver	0	183	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	183	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.2	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	183	-	-
HCM Lane V/C Ratio	-	0.025	-	-
HCM Control Delay (s)	-	25.2	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	8	91	0	0	0	0	808	26	7	1632	0
Future Volume (vph)	296	8	91	0	0	0	0	808	26	7	1632	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0						5.6		5.6	5.6	
Lane Util. Factor	0.86	0.86						0.91		1.00	0.91	
Frt	1.00	0.93						1.00		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	2672	2513						4219		1662	4550	
Flt Permitted	0.95	0.98						1.00		0.29	1.00	
Satd. Flow (perm)	2672	2513						4219		511	4550	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	329	9	101	0	0	0	0	898	29	8	1813	0
RTOR Reduction (vph)	0	9	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	227	203	0	0	0	0	0	926	0	8	1813	0
Heavy Vehicles (%)	7%	0%	11%	0%	0%	0%	0%	13%	4%	0%	5%	0%
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)	19.4	19.4						100.0		100.0	100.0	
Effective Green, g (s)	19.4	19.4						100.0		100.0	100.0	
Actuated g/C Ratio	0.15	0.15						0.77		0.77	0.77	
Clearance Time (s)	5.0	5.0						5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0						0.2		0.2	0.2	
Lane Grp Cap (vph)	398	375						3245		393	3500	
v/s Ratio Prot								0.22			c0.40	
v/s Ratio Perm	c0.08	0.08								0.02		
v/c Ratio	0.57	0.54						0.29		0.02	0.52	
Uniform Delay, d1	51.4	51.2						4.4		3.5	5.8	
Progression Factor	1.00	1.00						1.45		0.85	0.69	
Incremental Delay, d2	2.0	1.6						0.2		0.1	0.4	
Delay (s)	53.4	52.8						6.6		3.1	4.4	
Level of Service	D	D						A		A	A	
Approach Delay (s)		53.1			0.0			6.6			4.4	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	296	8	91	0	0	0	0	808	26	7	1632	0
Future Volume (veh/h)	296	8	91	0	0	0	0	808	26	7	1632	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1654	1750	1654				0	1573	1573	1750	1682	0
Adj Flow Rate, veh/h	332	4	101				0	898	29	8	1813	0
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	7	0	7				0	13	13	0	5	0
Cap, veh/h	467	6	142				0	3501	113	558	3763	0
Arrive On Green	0.10	0.10	0.10				0.00	1.00	1.00	1.00	1.00	0.00
Sat Flow, veh/h	4727	57	1435				0	4414	138	613	4743	0
Grp Volume(v), veh/h	332	0	105				0	601	326	8	1813	0
Grp Sat Flow(s),veh/h/ln	1576	0	1492				0	1431	1548	613	1530	0
Q Serve(g_s), s	8.8	0.0	8.9				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.8	0.0	8.9				0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.96				0.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	467	0	147				0	2346	1269	558	3763	0
V/C Ratio(X)	0.71	0.00	0.71				0.00	0.26	0.26	0.01	0.48	0.00
Avail Cap(c_a), veh/h	1854	0	585				0	2346	1269	558	3763	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.50	1.50	1.50	1.50	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	56.8	0.0	56.8				0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	6.2				0.0	0.3	0.5	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.5	0.0	6.4				0.0	0.2	0.3	0.0	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.8	0.0	63.0				0.0	0.3	0.5	0.0	0.3	0.0
LnGrp LOS	E	A	E				A	A	A	A	A	A
Approach Vol, veh/h		437						927			1821	
Approach Delay, s/veh		59.8						0.3			0.3	
Approach LOS		E						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		112.1		17.9		112.1						
Change Period (Y+Rc), s		5.6		5.0		5.6						
Max Green Setting (Gmax), s		68.4		51.0		68.4						
Max Q Clear Time (g_c+I1), s		2.0		10.9		2.0						
Green Ext Time (p_c), s		1.1		2.0		3.3						

Intersection Summary	
HCM 6th Ctrl Delay	8.5
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	954	943	10	7	1
Future Vol, veh/h	7	954	943	10	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	14	0	0	60	29	0
Mvmt Flow	8	1097	1084	11	8	1

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	1095	0	-	0	1649	542			
Stage 1	-	-	-	-	1084	-			
Stage 2	-	-	-	-	565	-			
Critical Hdwy	4.38	-	-	-	7.38	6.9			
Critical Hdwy Stg 1	-	-	-	-	6.38	-			
Critical Hdwy Stg 2	-	-	-	-	6.38	-			
Follow-up Hdwy	2.34	-	-	-	3.79	3.3			
Pot Cap-1 Maneuver	567	-	-	-	68	490			
Stage 1	-	-	-	-	233	-			
Stage 2	-	-	-	-	463	-			
Platoon blocked, %		-	-	-					
Mov Cap-1 Maneuver	567	-	-	-	67	490			
Mov Cap-2 Maneuver	-	-	-	-	67	-			
Stage 1	-	-	-	-	230	-			
Stage 2	-	-	-	-	463	-			

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	59.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	567	-	-	-	75
HCM Lane V/C Ratio	0.014	-	-	-	0.123
HCM Control Delay (s)	11.4	-	-	-	59.6
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	436	304	2	173	785	141	0	1194	641
Future Volume (vph)	0	0	0	436	304	2	173	785	141	0	1194	641
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)				4.5	4.5		4.5	4.8	4.0		4.8	4.0
Lane Util. Factor				0.91	0.91		1.00	0.91	1.00		0.95	0.88
Frt				1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected				0.95	0.98		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)				1455	3039		1509	4143	1337		3200	2593
Flt Permitted				0.95	0.98		0.13	1.00	1.00		1.00	1.00
Satd. Flow (perm)				1455	3039		200	4143	1337		3200	2593
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	474	330	2	188	853	153	0	1298	697
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	265	541	0	188	853	153	0	1298	697
Heavy Vehicles (%)	0%	0%	0%	4%	2%	0%	8%	13%	9%	0%	6%	3%
Turn Type				Split	NA		pm+pt	NA	Free		NA	Free
Protected Phases				4	4		5	2			6	
Permitted Phases							2		Free			Free
Actuated Green, G (s)				29.1	29.1		91.6	91.6	130.0		75.9	130.0
Effective Green, g (s)				29.1	29.1		91.6	91.6	130.0		75.9	130.0
Actuated g/C Ratio				0.22	0.22		0.70	0.70	1.00		0.58	1.00
Clearance Time (s)				4.5	4.5		4.5	4.8			4.8	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				325	680		253	2919	1337		1868	2593
v/s Ratio Prot				c0.18	0.18		c0.06	0.21			0.41	
v/s Ratio Perm							c0.46		0.11			0.27
v/c Ratio				0.82	0.80		0.74	0.29	0.11		0.69	0.27
Uniform Delay, d1				47.9	47.6		15.8	7.1	0.0		18.9	0.0
Progression Factor				1.00	1.00		1.45	0.55	1.00		1.00	1.00
Incremental Delay, d2				14.5	6.4		11.0	0.2	0.2		2.2	0.3
Delay (s)				62.4	54.1		33.9	4.2	0.2		21.1	0.3
Level of Service				E	D		C	A	A		C	A
Approach Delay (s)		0.0			56.8			8.4			13.8	
Approach LOS		A			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	436	304	2	173	785	141	0	1194	641
Future Volume (veh/h)	0	0	0	436	304	2	173	785	141	0	1194	641
Initial Q (Qb), veh				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
Parking Bus, Adj				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	
Adj Sat Flow, veh/h/ln				1695	1723	1695	1554	1486	1540	0	1812	1853
Adj Flow Rate, veh/h				269	617	2	188	853	0	0	1298	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				4	2	4	8	13	9	0	6	3
Cap, veh/h				340	722	2	296	2913		0	2144	
Arrive On Green				0.21	0.21	0.21	0.06	0.72	0.00	0.00	0.62	0.00
Sat Flow, veh/h				1615	3432	11	1480	4056	1305	0	3533	2764
Grp Volume(v), veh/h				269	310	309	188	853	0	0	1298	0
Grp Sat Flow(s),veh/h/ln				1615	1723	1721	1480	1352	1305	0	1721	1382
Q Serve(g_s), s				20.5	22.5	22.5	5.7	9.8	0.0	0.0	29.7	0.0
Cycle Q Clear(g_c), s				20.5	22.5	22.5	5.7	9.8	0.0	0.0	29.7	0.0
Prop In Lane				1.00		0.01	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				340	362	362	296	2913		0	2144	
V/C Ratio(X)				0.79	0.85	0.85	0.63	0.29		0.00	0.61	
Avail Cap(c_a), veh/h				404	431	430	349	2913		0	2144	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.95	0.95	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				48.6	49.4	49.4	14.3	6.5	0.0	0.0	14.8	0.0
Incr Delay (d2), s/veh				8.8	13.5	13.6	2.7	0.2	0.0	0.0	1.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				14.0	16.4	16.4	4.2	4.7	0.0	0.0	16.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				57.4	62.9	63.0	17.1	6.8	0.0	0.0	16.1	0.0
LnGrp LOS				E	E	E	B	A		A	B	
Approach Vol, veh/h					888			1041	A		1298	A
Approach Delay, s/veh					61.3			8.6			16.1	
Approach LOS					E			A			B	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	98.2	31.8	12.4	85.8
Change Period (Y+Rc), s	* 4.8	4.5	4.5	* 4.8
Max Green Setting (Gmax), s	* 88	32.5	12.5	* 71
Max Q Clear Time (g_c+I1), s	11.8	24.5	7.7	31.7
Green Ext Time (p_c), s	7.3	2.8	0.2	12.7

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	245	5	384	900	103	3	36	203	89	65	45
Future Volume (vph)	14	245	5	384	900	103	3	36	203	89	65	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.8		4.0	4.8			4.8	4.0	4.8	4.8	4.8
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	3090		1568	3112			1545	1316	1583	1683	1365
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1662	3090		1568	3112			1509	1316	1212	1683	1365
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	16	288	6	452	1059	121	4	42	239	105	76	53
RTOR Reduction (vph)	0	1	0	0	6	0	0	0	109	0	0	46
Lane Group Flow (vph)	16	293	0	452	1174	0	0	46	130	105	76	7
Heavy Vehicles (%)	0%	7%	20%	6%	5%	7%	0%	14%	13%	5%	4%	9%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pm+ov	Perm	NA	Perm
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	1.2	17.0		26.9	42.7			9.3	36.2	9.3	9.3	9.3
Effective Green, g (s)	1.2	17.0		26.9	42.7			9.3	36.2	9.3	9.3	9.3
Actuated g/C Ratio	0.02	0.25		0.40	0.64			0.14	0.54	0.14	0.14	0.14
Clearance Time (s)	4.0	4.8		4.0	4.8			4.8	4.0	4.8	4.8	4.8
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	29	786		631	1989			210	713	168	234	190
v/s Ratio Prot	0.01	0.09		c0.29	c0.38				0.07		0.05	
v/s Ratio Perm								0.03	0.03	c0.09		0.01
v/c Ratio	0.55	0.37		0.72	0.59			0.22	0.18	0.62	0.32	0.04
Uniform Delay, d1	32.5	20.5		16.7	7.0			25.5	7.8	27.1	25.9	24.9
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.8	0.4		3.9	0.6			0.5	0.1	7.1	0.8	0.1
Delay (s)	53.3	20.9		20.6	7.5			26.1	7.9	34.2	26.7	25.0
Level of Service	D	C		C	A			C	A	C	C	C
Approach Delay (s)		22.6			11.2			10.8			29.7	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	13.6
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	245	5	384	900	103	3	36	203	89	65	45
Future Volume (veh/h)	14	245	5	384	900	103	3	36	203	89	65	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1654	1654	1668	1682	1682	1559	1559	1573	1682	1695	1627
Adj Flow Rate, veh/h	16	288	6	452	1059	121	4	42	239	105	76	53
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, %	0	7	7	6	5	5	14	14	13	5	4	9
Cap, veh/h	20	715	15	522	1571	179	85	263	671	304	297	242
Arrive On Green	0.01	0.23	0.23	0.33	0.54	0.54	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1667	3149	65	1589	2890	330	44	1499	1333	1072	1695	1379
Grp Volume(v), veh/h	16	144	150	452	585	595	46	0	239	105	76	53
Grp Sat Flow(s),veh/h/ln	1667	1572	1643	1589	1598	1622	1543	0	1333	1072	1695	1379
Q Serve(g_s), s	0.5	3.9	3.9	13.5	13.3	13.3	0.0	0.0	5.5	4.7	2.0	1.7
Cycle Q Clear(g_c), s	0.5	3.9	3.9	13.5	13.3	13.3	1.3	0.0	5.5	5.9	2.0	1.7
Prop In Lane	1.00		0.04	1.00		0.20	0.09		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	20	357	373	522	868	882	348	0	671	304	297	242
V/C Ratio(X)	0.80	0.40	0.40	0.87	0.67	0.67	0.13	0.00	0.36	0.35	0.26	0.22
Avail Cap(c_a), veh/h	528	940	983	818	1272	1292	837	0	1103	651	846	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	16.6	16.6	15.9	8.3	8.3	17.7	0.0	7.6	20.2	18.0	17.9
Incr Delay (d2), s/veh	50.8	1.0	1.0	6.1	1.3	1.3	0.2	0.0	0.3	0.7	0.4	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(95%),veh/ln	0.8	2.4	2.5	8.5	6.0	6.1	0.8	0.0	2.3	2.0	1.3	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.7	17.6	17.6	22.0	9.6	9.6	17.9	0.0	7.9	20.9	18.4	18.3
LnGrp LOS	E	B	B	C	A	A	B	A	A	C	B	B
Approach Vol, veh/h		310			1632			285			234	
Approach Delay, s/veh		20.6			13.0			9.5			19.5	
Approach LOS		C			B			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.6	16.3		13.6	4.6	32.2		13.6				
Change Period (Y+Rc), s	4.0	* 4.8		* 4.8	4.0	* 4.8		* 4.8				
Max Green Setting (Gmax), s	26.0	* 30		* 25	16.0	* 40		* 25				
Max Q Clear Time (g_c+I1), s	15.5	5.9		7.9	2.5	15.3		7.5				
Green Ext Time (p_c), s	1.1	2.3		0.9	0.0	12.1		1.0				

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

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix D Existing PM Traffic Operation Worksheets

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	1697	1	1	980	3	1	1	1	1	1	3
Future Vol, veh/h	4	1697	1	1	980	3	1	1	1	1	1	3
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	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	0	0	5	0	0	0	0	0	0	0
Mvmt Flow	4	1825	1	1	1054	3	1	1	1	1	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1057	0	0	1826	0	0	2364	2893	913	1979	2892	529
Stage 1	-	-	-	-	-	-	1834	1834	-	1058	1058	-
Stage 2	-	-	-	-	-	-	530	1059	-	921	1834	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	667	-	-	339	-	-	19	16	280	38	16	499
Stage 1	-	-	-	-	-	-	80	128	-	244	304	-
Stage 2	-	-	-	-	-	-	506	304	-	295	128	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	667	-	-	339	-	-	19	16	280	37	16	499
Mov Cap-2 Maneuver	-	-	-	-	-	-	75	110	-	178	110	-
Stage 1	-	-	-	-	-	-	80	127	-	243	303	-
Stage 2	-	-	-	-	-	-	499	303	-	290	127	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	37.2	20.3
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	115	667	-	-	339	-	-	241
HCM Lane V/C Ratio	0.028	0.006	-	-	0.003	-	-	0.022
HCM Control Delay (s)	37.2	10.4	-	-	15.7	-	-	20.3
HCM Lane LOS	E	B	-	-	C	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

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	7	1697	1	10	980	3	2	1	10	2	1	11
Future Vol, veh/h	7	1697	1	10	980	3	2	1	10	2	1	11
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	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	14	3	0	40	5	0	50	0	10	0	0	0
Mvmt Flow	8	1825	1	11	1054	3	2	1	11	2	1	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1057	0	0	1826	0	0	2392	2921	913	2007	2920	529
Stage 1	-	-	-	-	-	-	1842	1842	-	1078	1078	-
Stage 2	-	-	-	-	-	-	550	1079	-	929	1842	-
Critical Hdwy	4.38	-	-	4.9	-	-	8.5	6.5	7.1	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	7.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.34	-	-	2.6	-	-	4	4	3.4	3.5	4	3.3
Pot Cap-1 Maneuver	588	-	-	208	-	-	9	16	261	36	16	499
Stage 1	-	-	-	-	-	-	46	127	-	237	297	-
Stage 2	-	-	-	-	-	-	382	297	-	292	127	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	588	-	-	208	-	-	8	15	261	33	15	499
Mov Cap-2 Maneuver	-	-	-	-	-	-	42	107	-	167	100	-
Stage 1	-	-	-	-	-	-	45	125	-	234	281	-
Stage 2	-	-	-	-	-	-	352	281	-	274	125	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	34.5	16.9
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	136	588	-	-	208	-	-	318
HCM Lane V/C Ratio	0.103	0.013	-	-	0.052	-	-	0.047
HCM Control Delay (s)	34.5	11.2	-	-	23.2	-	-	16.9
HCM Lane LOS	D	B	-	-	C	-	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.1

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	4	1697	9	5	980	6	5	1	33	4	1	19
Future Vol, veh/h	4	1697	9	5	980	6	5	1	33	4	1	19
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	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	11	20	5	0	0	0	0	25	0	0
Mvmt Flow	4	1825	10	5	1054	6	5	1	35	4	1	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1060	0	0	1835	0	0	2376	2908	918	1988	2910	530
Stage 1	-	-	-	-	-	-	1838	1838	-	1067	1067	-
Stage 2	-	-	-	-	-	-	538	1070	-	921	1843	-
Critical Hdwy	4.1	-	-	4.5	-	-	7.5	6.5	6.9	8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	7	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	7	5.5	-
Follow-up Hdwy	2.2	-	-	2.4	-	-	3.5	4	3.3	3.75	4	3.3
Pot Cap-1 Maneuver	665	-	-	262	-	-	19	16	278	27	16	499
Stage 1	-	-	-	-	-	-	80	127	-	200	301	-
Stage 2	-	-	-	-	-	-	500	300	-	249	127	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	665	-	-	262	-	-	18	16	278	23	16	499
Mov Cap-2 Maneuver	-	-	-	-	-	-	75	109	-	136	106	-
Stage 1	-	-	-	-	-	-	80	126	-	199	295	-
Stage 2	-	-	-	-	-	-	469	294	-	214	126	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	27.7	17.6
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	200	665	-	-	262	-	-	312
HCM Lane V/C Ratio	0.21	0.006	-	-	0.021	-	-	0.083
HCM Control Delay (s)	27.7	10.4	-	-	19	-	-	17.6
HCM Lane LOS	D	B	-	-	C	-	-	C
HCM 95th %tile Q(veh)	0.8	0	-	-	0.1	-	-	0.3

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	1697	980	6	1	7
Future Vol, veh/h	11	1697	980	6	1	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	9	3	5	17	0	0
Mvmt Flow	12	1825	1054	6	1	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1060	0	-	0	1994	530
Stage 1	-	-	-	-	1057	-
Stage 2	-	-	-	-	937	-
Critical Hdwy	4.28	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.29	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	613	-	-	-	54	499
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	346	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	613	-	-	-	53	499
Mov Cap-2 Maneuver	-	-	-	-	53	-
Stage 1	-	-	-	-	294	-
Stage 2	-	-	-	-	346	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	20.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	613	-	-	-	243
HCM Lane V/C Ratio	0.019	-	-	-	0.035
HCM Control Delay (s)	11	-	-	-	20.4
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	419	871	1276	424	751	565
Future Volume (vph)	419	871	1276	424	751	565
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.8	4.0	4.5	4.5
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	1430	4684	1444	2986	3197
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	1430	4684	1444	2986	3197
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	446	927	1357	451	799	601
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	446	927	1357	451	799	601
Heavy Vehicles (%)	5%	4%	2%	3%	8%	4%
Turn Type	Prot	pt+ov	NA	Free	Prot	NA
Protected Phases	3	1 3	2		1	6
Permitted Phases				Free		
Actuated Green, G (s)	26.5	99.5	41.2	150.0	68.5	114.5
Effective Green, g (s)	26.5	99.5	41.2	150.0	68.5	114.5
Actuated g/C Ratio	0.18	0.66	0.27	1.00	0.46	0.76
Clearance Time (s)	4.5		4.8		4.5	4.5
Vehicle Extension (s)	3.0		0.2		2.0	2.0
Lane Grp Cap (vph)	542	948	1286	1444	1363	2440
v/s Ratio Prot	0.15	c0.65	c0.29		0.27	0.19
v/s Ratio Perm				0.31		
v/c Ratio	0.82	0.98	1.06	0.31	0.59	0.25
Uniform Delay, d1	59.5	24.2	54.4	0.0	30.2	5.2
Progression Factor	1.00	1.00	1.00	1.00	1.77	1.02
Incremental Delay, d2	9.8	23.5	41.0	0.6	0.4	0.0
Delay (s)	69.3	47.7	95.4	0.6	53.9	5.3
Level of Service	E	D	F	A	D	A
Approach Delay (s)	54.7		71.8			33.0
Approach LOS	D		E			C

Intersection Summary			
HCM 2000 Control Delay	54.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	419	871	1276	424	751	565
Future Volume (veh/h)	419	871	1276	424	751	565
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	1682	1695	1723	1709	1641	1695
Adj Flow Rate, veh/h	446	927	1357	0	799	601
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	4	2	3	8	4
Cap, veh/h	549	654	2131		844	2452
Arrive On Green	0.18	0.18	0.45	0.00	0.42	1.00
Sat Flow, veh/h	3107	1437	4858	1448	3032	3306
Grp Volume(v), veh/h	446	927	1357	0	799	601
Grp Sat Flow(s),veh/h/ln	1554	1437	1568	1448	1516	1611
Q Serve(g_s), s	20.7	26.5	33.3	0.0	38.1	0.0
Cycle Q Clear(g_c), s	20.7	26.5	33.3	0.0	38.1	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	549	654	2131		844	2452
V/C Ratio(X)	0.81	1.42	0.64		0.95	0.25
Avail Cap(c_a), veh/h	549	654	2131		1384	2459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.50	1.50
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	59.4	40.9	31.5	0.0	42.6	0.0
Incr Delay (d2), s/veh	9.1	197.1	1.5	0.0	6.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	13.5	84.0	18.7	0.0	19.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	68.4	238.0	33.0	0.0	49.3	0.0
LnGrp LOS	E	F	C		D	A
Approach Vol, veh/h	1373		1357	A		1400
Approach Delay, s/veh	182.9		33.0			28.1
Approach LOS	F		C			C

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	46.2	72.8			119.0	31.0
Change Period (Y+Rc), s	4.5	* 4.8			* 4.8	4.5
Max Green Setting (Gmax), s	68.5	* 41			* 1.1E2	26.5
Max Q Clear Time (g_c+I1), s	40.1	35.3			2.0	28.5
Green Ext Time (p_c), s	1.7	1.5			2.8	0.0

Intersection Summary	
HCM 6th Ctrl Delay	81.2
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.1

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations		↑↑↑	↑↑↑			↱
Traffic Vol, veh/h	0	2153	1295	10	0	24
Future Vol, veh/h	0	2153	1295	10	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	96	96
Heavy Vehicles, %	0	0	0	0	2	2
Mvmt Flow	0	2290	1378	11	0	25

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	695
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	-	0	330
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	330
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NBT	SBT	SBR
Capacity (veh/h)	330	-	-	-
HCM Lane V/C Ratio	0.076	-	-	-
HCM Control Delay (s)	16.8	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1454	8	173	0	0	0	0	2152	6	8	1132	0
Future Volume (vph)	1454	8	173	0	0	0	0	2152	6	8	1132	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0						5.6		5.6	5.6	
Lane Util. Factor	0.86	0.86						0.91		1.00	0.91	
Frt	1.00	0.96						1.00		1.00	1.00	
Flt Protected	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (prot)	2831	2759						4680		1662	4507	
Flt Permitted	0.95	0.96						1.00		0.05	1.00	
Satd. Flow (perm)	2831	2759						4680		92	4507	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1563	9	186	0	0	0	0	2314	6	9	1217	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1047	691	0	0	0	0	0	2320	0	9	1217	0
Heavy Vehicles (%)	1%	13%	1%	0%	0%	0%	0%	2%	17%	0%	6%	0%
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)	63.2	63.2						76.2		76.2	76.2	
Effective Green, g (s)	63.2	63.2						76.2		76.2	76.2	
Actuated g/C Ratio	0.42	0.42						0.51		0.51	0.51	
Clearance Time (s)	5.0	5.0						5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0						0.2		0.2	0.2	
Lane Grp Cap (vph)	1192	1162						2377		46	2289	
v/s Ratio Prot								c0.50			0.27	
v/s Ratio Perm	c0.37	0.25								0.10		
v/c Ratio	0.88	0.59						0.98		0.20	0.53	
Uniform Delay, d1	39.9	33.5						36.0		20.2	24.9	
Progression Factor	1.00	1.00						0.61		0.98	1.04	
Incremental Delay, d2	7.6	0.8						2.3		8.5	0.8	
Delay (s)	47.5	34.3						24.3		28.2	26.7	
Level of Service	D	C						C		C	C	
Approach Delay (s)		42.1			0.0			24.3			26.7	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.6
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1454	8	173	0	0	0	0	2152	6	8	1132	0
Future Volume (veh/h)	1454	8	173	0	0	0	0	2152	6	8	1132	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1736	1573	1736				0	1723	1723	1750	1668	0
Adj Flow Rate, veh/h	1563	9	186				0	2314	6	9	1217	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	13	1				0	2	2	0	6	0
Cap, veh/h	1794	22	463				0	2750	7	98	2586	0
Arrive On Green	0.36	0.36	0.36				0.00	0.85	0.57	0.85	0.85	0.00
Sat Flow, veh/h	4961	62	1280				0	4998	13	160	4704	0
Grp Volume(v), veh/h	1563	0	195				0	1498	822	9	1217	0
Grp Sat Flow(s),veh/h/ln	1654	0	1342				0	1568	1720	160	1518	0
Q Serve(g_s), s	44.0	0.0	16.3				0.0	37.5	37.9	4.9	9.9	0.0
Cycle Q Clear(g_c), s	44.0	0.0	16.3				0.0	37.5	37.9	42.7	9.9	0.0
Prop In Lane	1.00		0.95				0.00		0.01	1.00		0.00
Lane Grp Cap(c), veh/h	1794	0	485				0	1780	977	98	2586	0
V/C Ratio(X)	0.87	0.00	0.40				0.00	0.84	0.84	0.09	0.47	0.00
Avail Cap(c_a), veh/h	2150	0	582				0	1780	977	98	2586	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.50	1.00	1.50	1.50	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.90	0.90	0.00
Uniform Delay (d), s/veh	44.6	0.0	35.8				0.0	7.6	7.7	18.9	5.5	0.0
Incr Delay (d2), s/veh	3.7	0.0	0.5				0.0	5.0	8.7	1.7	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	25.5	0.0	9.3				0.0	9.8	12.0	0.4	4.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.3	0.0	36.3				0.0	12.6	16.5	20.5	6.1	0.0
LnGrp LOS	D	A	D				A	B	B	C	A	A
Approach Vol, veh/h		1758						2320			1226	
Approach Delay, s/veh		47.0						14.0			6.2	
Approach LOS		D						B			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		90.8		59.2		90.8						
Change Period (Y+Rc), s		5.6		5.0		5.6						
Max Green Setting (Gmax), s		74.4		65.0		74.4						
Max Q Clear Time (g_c+I1), s		39.9		46.0		44.7						
Green Ext Time (p_c), s		3.6		8.2		2.2						

Intersection Summary	
HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1174	1269	2	8	21
Future Vol, veh/h	1	1174	1269	2	8	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	6	4	50	0	5
Mvmt Flow	1	1249	1350	2	9	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1352	0	-	0	1977	675
Stage 1	-	-	-	-	1350	-
Stage 2	-	-	-	-	627	-
Critical Hdwy	4.1	-	-	-	6.8	7
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.35
Pot Cap-1 Maneuver	516	-	-	-	55	390
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	500	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	516	-	-	-	55	390
Mov Cap-2 Maneuver	-	-	-	-	55	-
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	500	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	36.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	516	-	-	-	146
HCM Lane V/C Ratio	0.002	-	-	-	0.211
HCM Control Delay (s)	12	-	-	-	36.1
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	290	157	14	66	2710	843	0	843	453
Future Volume (vph)	0	0	0	290	157	14	66	2710	843	0	843	453
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)				4.5	4.5		4.5	4.8	4.0		4.8	4.0
Lane Util. Factor				0.91	0.91		1.00	0.91	1.00		0.95	0.88
Frt				1.00	0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected				0.95	0.98		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)				1483	3042		1509	4590	1443		3170	2618
Flt Permitted				0.95	0.98		0.28	1.00	1.00		1.00	1.00
Satd. Flow (perm)				1483	3042		442	4590	1443		3170	2618
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	309	167	15	70	2883	897	0	897	482
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	161	327	0	70	2883	897	0	897	482
Heavy Vehicles (%)	0%	0%	0%	2%	1%	7%	8%	2%	1%	0%	7%	2%
Turn Type				Split	NA		pm+pt	NA	Free		NA	Free
Protected Phases				4	4		5	2			6	
Permitted Phases							2		Free			Free
Actuated Green, G (s)				21.5	21.5		119.2	119.2	150.0		109.8	150.0
Effective Green, g (s)				21.5	21.5		119.2	119.2	150.0		109.8	150.0
Actuated g/C Ratio				0.14	0.14		0.79	0.79	1.00		0.73	1.00
Clearance Time (s)				4.5	4.5		4.5	4.8			4.8	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				212	436		386	3647	1443		2320	2618
v/s Ratio Prot				c0.11	0.11		0.01	c0.63			0.28	
v/s Ratio Perm							0.14		c0.62			0.18
v/c Ratio				0.76	0.75		0.18	0.79	0.62		0.39	0.18
Uniform Delay, d1				61.8	61.7		4.1	8.5	0.0		7.5	0.0
Progression Factor				1.00	1.00		1.06	0.96	1.00		1.00	1.00
Incremental Delay, d2				14.4	7.1		0.1	0.8	0.9		0.5	0.2
Delay (s)				76.2	68.8		4.4	8.9	0.9		8.0	0.2
Level of Service				E	E		A	A	A		A	A
Approach Delay (s)		0.0			71.2			7.0			5.3	
Approach LOS		A			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	290	157	14	66	2710	843	0	843	453
Future Volume (veh/h)	0	0	0	290	157	14	66	2710	843	0	843	453
Initial Q (Qb), veh				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
Parking Bus, Adj				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	
Adj Sat Flow, veh/h/ln				1723	1736	1723	1554	1636	1650	0	1798	1867
Adj Flow Rate, veh/h				330	138	15	70	2883	0	0	897	0
Peak Hour Factor				0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %				2	1	2	8	2	1	0	7	2
Cap, veh/h				397	186	20	464	3649		0	2603	
Arrive On Green				0.12	0.12	0.12	0.03	0.82	0.00	0.00	0.76	0.00
Sat Flow, veh/h				3281	1539	167	1480	4466	1398	0	3506	2785
Grp Volume(v), veh/h				330	0	153	70	2883	0	0	897	0
Grp Sat Flow(s),veh/h/ln				1641	0	1706	1480	1489	1398	0	1708	1393
Q Serve(g_s), s				14.7	0.0	13.0	1.5	49.9	0.0	0.0	12.7	0.0
Cycle Q Clear(g_c), s				14.7	0.0	13.0	1.5	49.9	0.0	0.0	12.7	0.0
Prop In Lane				1.00		0.10	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				397	0	206	464	3649		0	2603	
V/C Ratio(X)				0.83	0.00	0.74	0.15	0.79		0.00	0.34	
Avail Cap(c_a), veh/h				558	0	290	481	3649		0	2603	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.22	0.22	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				64.5	0.0	63.7	4.0	7.1	0.0	0.0	5.8	0.0
Incr Delay (d2), s/veh				7.4	0.0	6.2	0.0	0.4	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				10.8	0.0	10.0	0.7	15.1	0.0	0.0	7.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				71.8	0.0	69.9	4.0	7.5	0.0	0.0	6.1	0.0
LnGrp LOS				E	A	E	A	A		A	A	
Approach Vol, veh/h					483			2953	A		897	A
Approach Delay, s/veh					71.2			7.4			6.1	
Approach LOS					E			A			A	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	127.4	22.6	8.3	119.1
Change Period (Y+Rc), s	* 4.8	4.5	4.5	* 4.8
Max Green Setting (Gmax), s	* 1.2E2	25.5	5.5	* 1.1E2
Max Q Clear Time (g_c+I1), s	51.9	16.7	3.5	14.7
Green Ext Time (p_c), s	51.0	1.4	0.0	7.8

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

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	861	13	270	617	88	12	40	655	178	65	27
Future Volume (vph)	17	861	13	270	617	88	12	40	655	178	65	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.8		4.0	4.8			4.8	4.0	4.8	4.8	4.8
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1568	3235		1554	3115			1573	1458	1568	1651	1430
Flt Permitted	0.95	1.00		0.95	1.00			0.94	1.00	0.72	1.00	1.00
Satd. Flow (perm)	1568	3235		1554	3115			1494	1458	1189	1651	1430
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	936	14	293	671	96	13	43	712	193	71	29
RTOR Reduction (vph)	0	1	0	0	8	0	0	0	11	0	0	23
Lane Group Flow (vph)	18	949	0	293	759	0	0	56	701	193	71	6
Heavy Vehicles (%)	6%	2%	39%	7%	5%	3%	0%	13%	2%	6%	6%	4%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pm+ov	Perm	NA	Perm
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	2.9	31.6		24.1	52.8			18.1	42.2	18.1	18.1	18.1
Effective Green, g (s)	2.9	31.6		24.1	52.8			18.1	42.2	18.1	18.1	18.1
Actuated g/C Ratio	0.03	0.36		0.28	0.60			0.21	0.48	0.21	0.21	0.21
Clearance Time (s)	4.0	4.8		4.0	4.8			4.8	4.0	4.8	4.8	4.8
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	52	1169		428	1881			309	703	246	341	296
v/s Ratio Prot	0.01	c0.29		0.19	0.24				c0.27		0.04	
v/s Ratio Perm								0.04	0.21	0.16		0.00
v/c Ratio	0.35	0.81		0.68	0.40			0.18	1.00	0.78	0.21	0.02
Uniform Delay, d1	41.3	25.2		28.3	9.1			28.5	22.5	32.8	28.7	27.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.0	4.6		4.5	0.2			0.3	33.0	15.0	0.3	0.0
Delay (s)	45.3	29.8		32.8	9.3			28.8	55.6	47.8	29.0	27.6
Level of Service	D	C		C	A			C	E	D	C	C
Approach Delay (s)		30.1			15.7			53.6			41.3	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	13.6
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	861	13	270	617	88	12	40	655	178	65	27
Future Volume (veh/h)	17	861	13	270	617	88	12	40	655	178	65	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1668	1723	1723	1654	1682	1682	1573	1573	1723	1668	1668	1695
Adj Flow Rate, veh/h	18	936	14	293	671	96	13	43	712	193	71	29
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, %	6	2	2	7	5	5	13	13	2	6	6	4
Cap, veh/h	19	1089	16	332	1483	212	128	369	743	272	498	429
Arrive On Green	0.01	0.33	0.33	0.21	0.53	0.53	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1589	3301	49	1576	2806	401	253	1236	1460	686	1668	1437
Grp Volume(v), veh/h	18	464	486	293	382	385	56	0	712	193	71	29
Grp Sat Flow(s),veh/h/ln	1589	1637	1714	1576	1598	1610	1489	0	1460	686	1668	1437
Q Serve(g_s), s	1.0	22.4	22.4	15.2	12.5	12.5	0.0	0.0	25.2	23.0	2.6	1.2
Cycle Q Clear(g_c), s	1.0	22.4	22.4	15.2	12.5	12.5	2.2	0.0	25.2	25.2	2.6	1.2
Prop In Lane	1.00		0.03	1.00		0.25	0.23		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	19	540	565	332	844	850	497	0	743	272	498	429
V/C Ratio(X)	0.93	0.86	0.86	0.88	0.45	0.45	0.11	0.00	0.96	0.71	0.14	0.07
Avail Cap(c_a), veh/h	301	585	613	485	844	850	497	0	743	272	498	429
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.7	26.5	26.5	32.3	12.3	12.3	21.6	0.0	19.9	31.1	21.7	21.2
Incr Delay (d2), s/veh	76.2	12.2	11.7	12.5	0.5	0.5	0.1	0.0	23.2	8.2	0.1	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(95%),veh/ln	1.4	15.2	15.7	10.9	7.4	7.5	1.5	0.0	23.9	8.0	1.9	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	117.8	38.7	38.2	44.8	12.9	12.9	21.7	0.0	43.1	39.3	21.8	21.3
LnGrp LOS	F	D	D	D	B	B	C	A	D	D	C	C
Approach Vol, veh/h		968			1060			768			293	
Approach Delay, s/veh		39.9			21.7			41.5			33.3	
Approach LOS		D			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.8	32.7		30.0	5.0	49.4		30.0				
Change Period (Y+Rc), s	4.0	* 4.8		* 4.8	4.0	* 4.8		* 4.8				
Max Green Setting (Gmax), s	26.0	* 30		* 25	16.0	* 40		* 25				
Max Q Clear Time (g_c+I1), s	17.2	24.4		27.2	3.0	14.5		27.2				
Green Ext Time (p_c), s	0.6	3.5		0.0	0.0	7.2		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix E Future AM Traffic Operation Worksheets

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	645	1	1	1690	5	1	1	1	1	1	2
Future Vol, veh/h	1	645	1	1	1690	5	1	1	1	1	1	2
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	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	8	0	0	5	25	0	0	0	0	0	0
Mvmt Flow	1	645	1	1	1690	5	1	1	1	1	1	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1695	0	0	646	0	0	1496	2345	323	2020	2343	848
Stage 1	-	-	-	-	-	-	648	648	-	1695	1695	-
Stage 2	-	-	-	-	-	-	848	1697	-	325	648	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	381	-	-	949	-	-	86	37	679	35	37	309
Stage 1	-	-	-	-	-	-	430	469	-	98	150	-
Stage 2	-	-	-	-	-	-	327	150	-	667	469	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	381	-	-	949	-	-	85	37	679	35	37	309
Mov Cap-2 Maneuver	-	-	-	-	-	-	256	136	-	92	137	-
Stage 1	-	-	-	-	-	-	429	468	-	98	150	-
Stage 2	-	-	-	-	-	-	322	150	-	663	468	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	20.5	27.8
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	236	381	-	-	949	-	-	162
HCM Lane V/C Ratio	0.013	0.003	-	-	0.001	-	-	0.025
HCM Control Delay (s)	20.5	14.5	-	-	8.8	-	-	27.8
HCM Lane LOS	C	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	645	1	2	1690	1	1	1	5	1	1	1
Future Vol, veh/h	1	645	1	2	1690	1	1	1	5	1	1	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	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	8	20	0	5	0	0	0	25	0	0	0
Mvmt Flow	1	645	1	2	1690	1	1	1	5	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1691	0	0	646	0	0	1498	2343	323	2020	2343	846
Stage 1	-	-	-	-	-	-	648	648	-	1695	1695	-
Stage 2	-	-	-	-	-	-	850	1695	-	325	648	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	7.4	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.55	3.5	4	3.3
Pot Cap-1 Maneuver	383	-	-	949	-	-	86	37	610	35	37	310
Stage 1	-	-	-	-	-	-	430	469	-	98	150	-
Stage 2	-	-	-	-	-	-	326	150	-	667	469	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	383	-	-	949	-	-	85	37	610	34	37	310
Mov Cap-2 Maneuver	-	-	-	-	-	-	256	136	-	92	137	-
Stage 1	-	-	-	-	-	-	429	468	-	98	150	-
Stage 2	-	-	-	-	-	-	322	150	-	658	468	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	15.2	31.3
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	360	383	-	-	949	-	-	140
HCM Lane V/C Ratio	0.019	0.003	-	-	0.002	-	-	0.021
HCM Control Delay (s)	15.2	14.4	-	-	8.8	-	-	31.3
HCM Lane LOS	C	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

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	10	645	31	27	1690	16	4	1	5	1	1	7
Future Vol, veh/h	10	645	31	27	1690	16	4	1	5	1	1	7
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	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	8	4	0	5	15	0	0	0	0	0	0
Mvmt Flow	10	645	31	27	1690	16	4	1	5	1	1	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1706	0	0	676	0	0	1581	2441	338	2095	2448	853
Stage 1	-	-	-	-	-	-	681	681	-	1752	1752	-
Stage 2	-	-	-	-	-	-	900	1760	-	343	696	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	378	-	-	925	-	-	75	32	664	31	32	307
Stage 1	-	-	-	-	-	-	411	453	-	91	141	-
Stage 2	-	-	-	-	-	-	304	139	-	651	446	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	378	-	-	925	-	-	70	30	664	29	30	307
Mov Cap-2 Maneuver	-	-	-	-	-	-	224	115	-	84	124	-
Stage 1	-	-	-	-	-	-	400	441	-	89	137	-
Stage 2	-	-	-	-	-	-	286	135	-	628	434	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	17.7	22.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	293	378	-	-	925	-	-	210
HCM Lane V/C Ratio	0.034	0.026	-	-	0.029	-	-	0.043
HCM Control Delay (s)	17.7	14.8	-	-	9	-	-	22.9
HCM Lane LOS	C	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	645	1690	11	1	4
Future Vol, veh/h	7	645	1690	11	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	8	5	11	0	0
Mvmt Flow	7	645	1690	11	1	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1701	0	-	0	2033	851
Stage 1	-	-	-	-	1696	-
Stage 2	-	-	-	-	337	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	379	-	-	-	51	308
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	701	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	379	-	-	-	50	308
Mov Cap-2 Maneuver	-	-	-	-	50	-
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	701	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	29.5
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	379	-	-	-	152
HCM Lane V/C Ratio	0.018	-	-	-	0.033
HCM Control Delay (s)	14.7	-	-	-	29.5
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	509	654	356	271	913	1161
Future Volume (vph)	509	654	356	271	913	1161
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.8	4.0	4.5	4.5
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3014	1305	4343	1417	3014	3197
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3014	1305	4343	1417	3014	3197
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	509	654	356	271	913	1161
RTOR Reduction (vph)	0	18	0	0	0	0
Lane Group Flow (vph)	509	636	356	271	913	1161
Heavy Vehicles (%)	7%	14%	10%	5%	7%	4%
Turn Type	Prot	pt+ov	NA	Free	Prot	NA
Protected Phases	3	1 3	2		1	6
Permitted Phases				Free		
Actuated Green, G (s)	51.5	107.6	33.1	150.0	51.6	89.5
Effective Green, g (s)	51.5	107.6	33.1	150.0	51.6	89.5
Actuated g/C Ratio	0.34	0.72	0.22	1.00	0.34	0.60
Clearance Time (s)	4.5		4.8		4.5	4.5
Vehicle Extension (s)	3.0		0.2		2.0	2.0
Lane Grp Cap (vph)	1034	936	958	1417	1036	1907
v/s Ratio Prot	0.17	c0.49	0.08		c0.30	c0.36
v/s Ratio Perm				0.19		
v/c Ratio	0.49	0.68	0.37	0.19	0.88	0.61
Uniform Delay, d1	38.9	11.7	49.6	0.0	46.3	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.22	0.89
Incremental Delay, d2	0.4	1.6	1.1	0.3	7.5	0.3
Delay (s)	39.3	13.2	50.7	0.3	64.0	17.5
Level of Service	D	B	D	A	E	B
Approach Delay (s)	24.6		28.9			37.9
Approach LOS	C		C			D

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	509	654	356	271	913	1161
Future Volume (veh/h)	509	654	356	271	913	1161
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	1654	1559	1614	1682	1654	1695
Adj Flow Rate, veh/h	509	654	356	0	913	1161
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	14	10	5	7	4
Cap, veh/h	1049	867	1110		956	1916
Arrive On Green	0.34	0.34	0.25	0.00	0.47	0.89
Sat Flow, veh/h	3057	1321	4550	1425	3057	3306
Grp Volume(v), veh/h	509	654	356	0	913	1161
Grp Sat Flow(s),veh/h/ln	1528	1321	1468	1425	1528	1611
Q Serve(g_s), s	19.7	50.6	9.9	0.0	43.1	12.7
Cycle Q Clear(g_c), s	19.7	50.6	9.9	0.0	43.1	12.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	1049	867	1110		956	1916
V/C Ratio(X)	0.48	0.75	0.32		0.96	0.61
Avail Cap(c_a), veh/h	1049	867	1110		1213	1922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.50	1.50
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	38.8	17.6	45.6	0.0	38.8	4.0
Incr Delay (d2), s/veh	0.3	3.8	0.8	0.0	13.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.8	21.2	6.7	0.0	22.8	4.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.2	21.4	46.4	0.0	52.1	4.4
LnGrp LOS	D	C	D		D	A
Approach Vol, veh/h	1163		356	A		2074
Approach Delay, s/veh	29.2		46.4			25.4
Approach LOS	C		D			C

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	51.4	42.6			94.0	56.0
Change Period (Y+Rc), s	4.5	* 4.8			* 4.8	4.5
Max Green Setting (Gmax), s	59.5	* 25			* 90	51.5
Max Q Clear Time (g_c+I1), s	45.1	11.9			14.7	52.6
Green Ext Time (p_c), s	1.8	0.4			6.7	0.0

Intersection Summary	
HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	0	1011	2065	58
Future Vol, veh/h	0	5	0	1011	2065	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	25	0	0	0	2
Mvmt Flow	0	5	0	1011	2065	58

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1062	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.6	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	4.15	-	-	-	-
Pot Cap-1 Maneuver	0	160	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	160	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	160	-	-
HCM Lane V/C Ratio	-	0.031	-	-
HCM Control Delay (s)	-	28.2	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	365	10	112	0	0	0	0	996	32	9	2011	0
Future Volume (vph)	365	10	112	0	0	0	0	996	32	9	2011	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0						5.6		5.6	5.6	
Lane Util. Factor	0.86	0.86						0.91		1.00	0.91	
Frt	1.00	0.93						1.00		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	2672	2516						4219		1662	4550	
Flt Permitted	0.95	0.98						1.00		0.26	1.00	
Satd. Flow (perm)	2672	2516						4219		455	4550	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	365	10	112	0	0	0	0	996	32	9	2011	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	248	235	0	0	0	0	0	1027	0	9	2011	0
Heavy Vehicles (%)	7%	0%	11%	0%	0%	0%	0%	13%	4%	0%	5%	0%
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)	21.7	21.7						117.7		117.7	117.7	
Effective Green, g (s)	21.7	21.7						117.7		117.7	117.7	
Actuated g/C Ratio	0.14	0.14						0.78		0.78	0.78	
Clearance Time (s)	5.0	5.0						5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0						0.2		0.2	0.2	
Lane Grp Cap (vph)	386	363						3310		357	3570	
v/s Ratio Prot								0.24			c0.44	
v/s Ratio Perm	0.09	0.09								0.02		
v/c Ratio	0.64	0.65						0.31		0.03	0.56	
Uniform Delay, d1	60.5	60.5						4.6		3.5	6.2	
Progression Factor	1.00	1.00						0.97		0.96	0.75	
Incremental Delay, d2	3.6	3.9						0.2		0.1	0.5	
Delay (s)	64.1	64.5						4.6		3.5	5.2	
Level of Service	E	E						A		A	A	
Approach Delay (s)		64.3			0.0			4.6			5.2	
Approach LOS		E			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.6
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	365	10	112	0	0	0	0	996	32	9	2011	0
Future Volume (veh/h)	365	10	112	0	0	0	0	996	32	9	2011	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1654	1750	1654				0	1573	1573	1750	1682	0
Adj Flow Rate, veh/h	369	5	112				0	996	32	9	2011	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	0	7				0	13	13	0	5	0
Cap, veh/h	493	7	149				0	3525	113	508	3787	0
Arrive On Green	0.10	0.10	0.10				0.00	1.00	1.00	1.00	1.00	0.00
Sat Flow, veh/h	4727	64	1429				0	4414	137	557	4743	0
Grp Volume(v), veh/h	369	0	117				0	667	361	9	2011	0
Grp Sat Flow(s),veh/h/ln	1576	0	1493				0	1431	1548	557	1530	0
Q Serve(g_s), s	11.4	0.0	11.4				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.4	0.0	11.4				0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.96				0.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	493	0	156				0	2361	1277	508	3787	0
V/C Ratio(X)	0.75	0.00	0.75				0.00	0.28	0.28	0.02	0.53	0.00
Avail Cap(c_a), veh/h	1922	0	607				0	2361	1277	508	3787	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.50	1.50	1.50	1.50	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.74	0.74	0.00
Uniform Delay (d), s/veh	65.3	0.0	65.3				0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	2.3	0.0	7.1				0.0	0.3	0.6	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.2	0.0	8.2				0.0	0.2	0.4	0.0	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.5	0.0	72.4				0.0	0.3	0.6	0.0	0.4	0.0
LnGrp LOS	E	A	E				A	A	A	A	A	A
Approach Vol, veh/h		486						1028			2020	
Approach Delay, s/veh		68.7						0.4			0.4	
Approach LOS		E						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		129.3		20.7		129.3						
Change Period (Y+Rc), s		5.6		5.0		5.6						
Max Green Setting (Gmax), s		78.4		61.0		78.4						
Max Q Clear Time (g_c+I1), s		2.0		13.4		2.0						
Green Ext Time (p_c), s		1.3		2.2		3.9						

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	1176	1162	12	9	1
Future Vol, veh/h	9	1176	1162	12	9	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	14	0	0	60	29	0
Mvmt Flow	9	1176	1162	12	9	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1174	0	-	0	1768	581
Stage 1	-	-	-	-	1162	-
Stage 2	-	-	-	-	606	-
Critical Hdwy	4.38	-	-	-	7.38	6.9
Critical Hdwy Stg 1	-	-	-	-	6.38	-
Critical Hdwy Stg 2	-	-	-	-	6.38	-
Follow-up Hdwy	2.34	-	-	-	3.79	3.3
Pot Cap-1 Maneuver	527	-	-	-	56	462
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	439	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	527	-	-	-	55	462
Mov Cap-2 Maneuver	-	-	-	-	55	-
Stage 1	-	-	-	-	206	-
Stage 2	-	-	-	-	439	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	76.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	527	-	-	-	60
HCM Lane V/C Ratio	0.017	-	-	-	0.167
HCM Control Delay (s)	11.9	-	-	-	76.6
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	537	375	2	213	967	174	0	1471	790
Future Volume (vph)	0	0	0	537	375	2	213	967	174	0	1471	790
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)				4.5	4.5		4.5	4.8	4.0		4.8	4.0
Lane Util. Factor				0.91	0.91		1.00	0.91	1.00		0.91	1.00
Frt				1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected				0.95	0.98		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)				1455	3039		1509	4143	1337		4597	1473
Flt Permitted				0.95	0.98		0.11	1.00	1.00		1.00	1.00
Satd. Flow (perm)				1455	3039		177	4143	1337		4597	1473
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	537	375	2	213	967	174	0	1471	790
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	301	613	0	213	967	174	0	1471	790
Heavy Vehicles (%)	0%	0%	0%	4%	2%	0%	8%	13%	9%	0%	6%	3%
Turn Type				Split	NA		pm+pt	NA	Free		NA	Free
Protected Phases				4	4		5	2			6	
Permitted Phases							2		Free			Free
Actuated Green, G (s)				37.7	37.7		103.0	103.0	150.0		81.8	150.0
Effective Green, g (s)				37.7	37.7		103.0	103.0	150.0		81.8	150.0
Actuated g/C Ratio				0.25	0.25		0.69	0.69	1.00		0.55	1.00
Clearance Time (s)				4.5	4.5		4.5	4.8			4.8	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				365	763		269	2844	1337		2506	1473
v/s Ratio Prot				c0.21	0.20		c0.09	0.23			0.32	
v/s Ratio Perm							c0.45		0.13			0.54
v/c Ratio				0.82	0.80		0.79	0.34	0.13		0.59	0.54
Uniform Delay, d1				53.0	52.7		25.1	9.6	0.0		22.8	0.0
Progression Factor				1.00	1.00		1.33	1.71	1.00		1.00	1.00
Incremental Delay, d2				14.0	6.1		14.3	0.3	0.2		1.0	1.4
Delay (s)				67.1	58.8		47.8	16.8	0.2		23.8	1.4
Level of Service				E	E		D	B	A		C	A
Approach Delay (s)		0.0			61.5			19.5			16.0	
Approach LOS		A			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	537	375	2	213	967	174	0	1471	790
Future Volume (veh/h)	0	0	0	537	375	2	213	967	174	0	1471	790
Initial Q (Qb), veh				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
Parking Bus, Adj				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	
Adj Sat Flow, veh/h/ln				1695	1723	1695	1554	1486	1540	0	1812	1853
Adj Flow Rate, veh/h				305	700	2	213	967	0	0	1471	0
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				4	2	4	8	13	9	0	6	3
Cap, veh/h				382	812	2	291	2845		0	2979	
Arrive On Green				0.24	0.24	0.24	0.07	0.70	0.00	0.00	0.60	0.00
Sat Flow, veh/h				1615	3434	10	1480	4056	1305	0	5110	1571
Grp Volume(v), veh/h				305	351	351	213	967	0	0	1471	0
Grp Sat Flow(s),veh/h/ln				1615	1723	1721	1480	1352	1305	0	1649	1571
Q Serve(g_s), s				26.7	29.3	29.3	7.9	14.0	0.0	0.0	25.3	0.0
Cycle Q Clear(g_c), s				26.7	29.3	29.3	7.9	14.0	0.0	0.0	25.3	0.0
Prop In Lane				1.00		0.01	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				382	407	407	291	2845		0	2979	
V/C Ratio(X)				0.80	0.86	0.86	0.73	0.34		0.00	0.49	
Avail Cap(c_a), veh/h				468	500	499	401	2845		0	2979	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.93	0.93	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				53.9	54.9	54.9	15.9	8.8	0.0	0.0	16.9	0.0
Incr Delay (d2), s/veh				7.8	12.3	12.3	4.0	0.3	0.0	0.0	0.6	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				17.2	20.2	20.2	5.6	7.2	0.0	0.0	14.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				61.7	67.2	67.2	19.9	9.1	0.0	0.0	17.5	0.0
LnGrp LOS				E	E	E	B	A		A	B	
Approach Vol, veh/h					1007			1180	A		1471	A
Approach Delay, s/veh					65.5			11.0			17.5	
Approach LOS					E			B			B	

Timer - Assigned Phs	2		4	5	6							
Phs Duration (G+Y+Rc), s	110.0		40.0	14.9	95.1							
Change Period (Y+Rc), s	* 4.8		4.5	4.5	* 4.8							
Max Green Setting (Gmax), s	* 97		43.5	21.5	* 71							
Max Q Clear Time (g_c+I1), s	16.0		31.3	9.9	27.3							
Green Ext Time (p_c), s	8.6		4.2	0.4	15.1							

Intersection Summary		
HCM 6th Ctrl Delay		28.6
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	302	6	473	1109	127	4	44	250	110	80	55
Future Volume (vph)	17	302	6	473	1109	127	4	44	250	110	80	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.8		4.0	4.8			4.8	4.0	4.8	4.8	4.8
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.88	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	3091		1568	3112			1545	2317	1583	1683	1365
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1662	3091		1568	3112			1510	2317	1210	1683	1365
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	302	6	473	1109	127	4	44	250	110	80	55
RTOR Reduction (vph)	0	1	0	0	6	0	0	0	114	0	0	47
Lane Group Flow (vph)	17	307	0	473	1230	0	0	48	136	110	80	8
Heavy Vehicles (%)	0%	7%	20%	6%	5%	7%	0%	14%	13%	5%	4%	9%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pm+ov	Perm	NA	Perm
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	1.2	17.2		27.0	43.0			9.5	36.5	9.5	9.5	9.5
Effective Green, g (s)	1.2	17.2		27.0	43.0			9.5	36.5	9.5	9.5	9.5
Actuated g/C Ratio	0.02	0.26		0.40	0.64			0.14	0.54	0.14	0.14	0.14
Clearance Time (s)	4.0	4.8		4.0	4.8			4.8	4.0	4.8	4.8	4.8
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	29	789		629	1988			213	1256	170	237	192
v/s Ratio Prot	0.01	0.10		c0.30	c0.40				0.04		0.05	
v/s Ratio Perm								0.03	0.02	c0.09		0.01
v/c Ratio	0.59	0.39		0.75	0.62			0.23	0.11	0.65	0.34	0.04
Uniform Delay, d1	32.8	20.7		17.3	7.3			25.6	7.5	27.3	26.1	25.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.8	0.4		5.1	0.7			0.5	0.0	8.2	0.8	0.1
Delay (s)	59.6	21.1		22.3	7.9			26.2	7.5	35.5	26.9	25.0
Level of Service	E	C		C	A			C	A	D	C	C
Approach Delay (s)		23.1			11.9			10.5			30.4	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	67.3	Sum of lost time (s)	13.6
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	302	6	473	1109	127	4	44	250	110	80	55
Future Volume (veh/h)	17	302	6	473	1109	127	4	44	250	110	80	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1654	1654	1668	1682	1682	1559	1559	1573	1682	1695	1627
Adj Flow Rate, veh/h	17	302	6	473	1109	127	4	44	250	110	80	55
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	7	7	6	5	5	14	14	13	5	4	9
Cap, veh/h	21	708	14	538	1592	182	81	271	1217	299	305	248
Arrive On Green	0.01	0.22	0.22	0.34	0.55	0.55	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1667	3152	63	1589	2890	330	40	1504	2345	1059	1695	1379
Grp Volume(v), veh/h	17	150	158	473	612	624	48	0	250	110	80	55
Grp Sat Flow(s),veh/h/ln	1667	1572	1643	1589	1598	1622	1544	0	1173	1059	1695	1379
Q Serve(g_s), s	0.5	4.3	4.4	14.9	14.8	14.9	0.0	0.0	3.0	5.2	2.2	1.8
Cycle Q Clear(g_c), s	0.5	4.3	4.4	14.9	14.8	14.9	1.4	0.0	3.0	6.6	2.2	1.8
Prop In Lane	1.00		0.04	1.00		0.20	0.08		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	21	353	369	538	880	894	352	0	1217	299	305	248
V/C Ratio(X)	0.81	0.43	0.43	0.88	0.70	0.70	0.14	0.00	0.21	0.37	0.26	0.22
Avail Cap(c_a), veh/h	503	895	936	779	1211	1230	798	0	1909	612	806	655
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	17.6	17.6	16.5	8.7	8.7	18.4	0.0	6.9	21.2	18.7	18.6
Incr Delay (d2), s/veh	50.7	1.2	1.1	8.1	1.5	1.5	0.2	0.0	0.1	0.8	0.5	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(95%),veh/ln	0.9	2.7	2.8	9.6	6.9	7.1	0.9	0.0	1.1	2.3	1.5	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.8	18.8	18.7	24.6	10.1	10.1	18.6	0.0	7.0	21.9	19.2	19.0
LnGrp LOS	E	B	B	C	B	B	B	A	A	C	B	B
Approach Vol, veh/h		325			1709			298			245	
Approach Delay, s/veh		21.8			14.2			8.8			20.4	
Approach LOS		C			B			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.0	16.7		14.3	4.7	34.0		14.3				
Change Period (Y+Rc), s	4.0	* 4.8		* 4.8	4.0	* 4.8		* 4.8				
Max Green Setting (Gmax), s	26.0	* 30		* 25	16.0	* 40		* 25				
Max Q Clear Time (g_c+I1), s	16.9	6.4		8.6	2.5	16.9		5.0				
Green Ext Time (p_c), s	1.1	2.4		1.0	0.0	12.3		1.2				

Intersection Summary	
HCM 6th Ctrl Delay	15.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix F Future PM Traffic Operations Worksheet

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	2091	1	1	1207	4	1	1	1	1	1	4
Future Vol, veh/h	5	2091	1	1	1207	4	1	1	1	1	1	4
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	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	3	0	0	5	0	0	0	0	0	0	0
Mvmt Flow	5	2091	1	1	1207	4	1	1	1	1	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1211	0	0	2092	0	0	2708	3315	1046	2267	3313	606
Stage 1	-	-	-	-	-	-	2102	2102	-	1211	1211	-
Stage 2	-	-	-	-	-	-	606	1213	-	1056	2102	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	583	-	-	268	-	-	10	9	228	23	9	445
Stage 1	-	-	-	-	-	-	54	94	-	197	257	-
Stage 2	-	-	-	-	-	-	456	257	-	244	94	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	583	-	-	268	-	-	10	9	228	22	9	445
Mov Cap-2 Maneuver	-	-	-	-	-	-	51	82	-	142	81	-
Stage 1	-	-	-	-	-	-	54	93	-	195	256	-
Stage 2	-	-	-	-	-	-	448	256	-	238	93	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	50	22.6
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	83	583	-	-	268	-	-	211
HCM Lane V/C Ratio	0.036	0.009	-	-	0.004	-	-	0.028
HCM Control Delay (s)	50	11.2	-	-	18.5	-	-	22.6
HCM Lane LOS	F	B	-	-	C	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

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	9	2091	1	12	1207	4	2	1	12	2	1	14
Future Vol, veh/h	9	2091	1	12	1207	4	2	1	12	2	1	14
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	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	14	3	0	40	5	0	50	0	10	0	0	0
Mvmt Flow	9	2091	1	12	1207	4	2	1	12	2	1	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1211	0	0	2092	0	0	2738	3345	1046	2297	3343	606
Stage 1	-	-	-	-	-	-	2110	2110	-	1233	1233	-
Stage 2	-	-	-	-	-	-	628	1235	-	1064	2110	-
Critical Hdwy	4.38	-	-	4.9	-	-	8.5	6.5	7.1	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	7.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.34	-	-	2.6	-	-	4	4	3.4	3.5	4	3.3
Pot Cap-1 Maneuver	509	-	-	156	-	-	4	8	212	21	8	445
Stage 1	-	-	-	-	-	-	29	93	-	191	251	-
Stage 2	-	-	-	-	-	-	338	251	-	242	93	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	509	-	-	156	-	-	4	7	212	18	7	445
Mov Cap-2 Maneuver	-	-	-	-	-	-	26	79	-	131	70	-
Stage 1	-	-	-	-	-	-	28	91	-	188	232	-
Stage 2	-	-	-	-	-	-	301	232	-	222	91	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	45.8	18.7
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	103	509	-	-	156	-	-	279
HCM Lane V/C Ratio	0.146	0.018	-	-	0.077	-	-	0.061
HCM Control Delay (s)	45.8	12.2	-	-	30	-	-	18.7
HCM Lane LOS	E	B	-	-	D	-	-	C
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.2	-	-	0.2

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	2091	11	6	1207	7	6	1	41	5	1	23
Future Vol, veh/h	5	2091	11	6	1207	7	6	1	41	5	1	23
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	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	3	11	20	5	0	0	0	0	25	0	0
Mvmt Flow	5	2091	11	6	1207	7	6	1	41	5	1	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1214	0	0	2102	0	0	2723	3333	1051	2279	3335	607
Stage 1	-	-	-	-	-	-	2107	2107	-	1223	1223	-
Stage 2	-	-	-	-	-	-	616	1226	-	1056	2112	-
Critical Hdwy	4.1	-	-	4.5	-	-	7.5	6.5	6.9	8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	7	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	7	5.5	-
Follow-up Hdwy	2.2	-	-	2.4	-	-	3.5	4	3.3	3.75	4	3.3
Pot Cap-1 Maneuver	582	-	-	202	-	-	10	8	227	16	8	444
Stage 1	-	-	-	-	-	-	54	93	-	157	254	-
Stage 2	-	-	-	-	-	-	450	253	-	203	93	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	582	-	-	202	-	-	9	8	227	13	8	444
Mov Cap-2 Maneuver	-	-	-	-	-	-	51	80	-	103	76	-
Stage 1	-	-	-	-	-	-	54	92	-	156	246	-
Stage 2	-	-	-	-	-	-	412	245	-	163	92	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	38.6	20.9
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	154	582	-	-	202	-	-	255
HCM Lane V/C Ratio	0.312	0.009	-	-	0.03	-	-	0.114
HCM Control Delay (s)	38.6	11.2	-	-	23.4	-	-	20.9
HCM Lane LOS	E	B	-	-	C	-	-	C
HCM 95th %tile Q(veh)	1.2	0	-	-	0.1	-	-	0.4

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	2091	1207	7	1	9
Future Vol, veh/h	14	2091	1207	7	1	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	9	3	5	17	0	0
Mvmt Flow	14	2091	1207	7	1	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1214	0	-	0	2285	607
Stage 1	-	-	-	-	1211	-
Stage 2	-	-	-	-	1074	-
Critical Hdwy	4.28	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.29	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	533	-	-	-	34	444
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	294	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	533	-	-	-	33	444
Mov Cap-2 Maneuver	-	-	-	-	33	-
Stage 1	-	-	-	-	243	-
Stage 2	-	-	-	-	294	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	533	-	-	-	198
HCM Lane V/C Ratio	0.026	-	-	-	0.051
HCM Control Delay (s)	11.9	-	-	-	24.1
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	516	1073	1573	523	926	696
Future Volume (vph)	516	1073	1573	523	926	696
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.8	4.0	4.5	4.5
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	1430	4684	1444	2986	3197
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	1430	4684	1444	2986	3197
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	516	1073	1573	523	926	696
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	516	1073	1573	523	926	696
Heavy Vehicles (%)	5%	4%	2%	3%	8%	4%
Turn Type	Prot	pt+ov	NA	Free	Prot	NA
Protected Phases	3	1 3	2		1	6
Permitted Phases				Free		
Actuated Green, G (s)	36.5	109.5	31.2	150.0	68.5	104.5
Effective Green, g (s)	36.5	109.5	31.2	150.0	68.5	104.5
Actuated g/C Ratio	0.24	0.73	0.21	1.00	0.46	0.70
Clearance Time (s)	4.5		4.8		4.5	4.5
Vehicle Extension (s)	3.0		0.2		2.0	2.0
Lane Grp Cap (vph)	747	1043	974	1444	1363	2227
v/s Ratio Prot	0.17	c0.75	c0.34		0.31	0.22
v/s Ratio Perm				0.36		
v/c Ratio	0.69	1.03	1.61	0.36	0.68	0.31
Uniform Delay, d1	51.6	20.2	59.4	0.0	32.1	8.8
Progression Factor	1.00	1.00	1.00	1.00	1.62	1.83
Incremental Delay, d2	2.8	35.5	281.5	0.7	0.9	0.0
Delay (s)	54.4	55.7	340.9	0.7	52.9	16.1
Level of Service	D	E	F	A	D	B
Approach Delay (s)	55.3		256.0			37.1
Approach LOS	E		F			D

Intersection Summary			
HCM 2000 Control Delay	129.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	112.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	516	1073	1573	523	926	696
Future Volume (veh/h)	516	1073	1573	523	926	696
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	1682	1695	1723	1709	1641	1695
Adj Flow Rate, veh/h	516	1073	1573	0	926	696
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	5	4	2	3	8	4
Cap, veh/h	756	809	1622		969	2238
Arrive On Green	0.24	0.24	0.34	0.00	0.48	1.00
Sat Flow, veh/h	3107	1437	4858	1448	3032	3306
Grp Volume(v), veh/h	516	1073	1573	0	926	696
Grp Sat Flow(s),veh/h/ln	1554	1437	1568	1448	1516	1611
Q Serve(g_s), s	22.6	36.5	49.4	0.0	44.0	0.0
Cycle Q Clear(g_c), s	22.6	36.5	49.4	0.0	44.0	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	756	809	1622		969	2238
V/C Ratio(X)	0.68	1.33	0.97		0.96	0.31
Avail Cap(c_a), veh/h	756	809	1622		1384	2244
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.50	1.50
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	32.8	48.4	0.0	38.0	0.0
Incr Delay (d2), s/veh	2.5	155.4	16.2	0.0	10.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	13.8	87.6	29.1	0.0	22.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.0	188.2	64.6	0.0	48.3	0.0
LnGrp LOS	D	F	E		D	A
Approach Vol, veh/h	1589		1573	A		1622
Approach Delay, s/veh	144.6		64.6			27.6
Approach LOS	F		E			C

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	52.5	56.5			109.0	41.0
Change Period (Y+Rc), s	4.5	* 4.8			* 4.8	4.5
Max Green Setting (Gmax), s	68.5	* 31			* 1E2	36.5
Max Q Clear Time (g_c+I1), s	46.0	51.4			2.0	38.5
Green Ext Time (p_c), s	1.9	0.0			3.4	0.0

Intersection Summary	
HCM 6th Ctrl Delay	78.6
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.1

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations		↑↑↑	↑↑↑			↱
Traffic Vol, veh/h	0	2653	1596	12	0	30
Future Vol, veh/h	0	2653	1596	12	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	2	2
Mvmt Flow	0	2653	1596	12	0	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	804
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	-	0	280
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	280
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	19.4
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NBT	SBT	SBR
Capacity (veh/h)	280	-	-	-
HCM Lane V/C Ratio	0.107	-	-	-
HCM Control Delay (s)	19.4	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.4	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1792	10	213	0	0	0	0	2652	7	10	1395	0
Future Volume (vph)	1792	10	213	0	0	0	0	2652	7	10	1395	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0						5.6		5.6	5.6	
Lane Util. Factor	0.86	0.86						0.91		1.00	0.91	
Frt	1.00	0.96						1.00		1.00	1.00	
Flt Protected	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (prot)	2831	2759						4680		1662	4507	
Flt Permitted	0.95	0.96						1.00		0.05	1.00	
Satd. Flow (perm)	2831	2759						4680		85	4507	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1792	10	213	0	0	0	0	2652	7	10	1395	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1201	794	0	0	0	0	0	2659	0	10	1395	0
Heavy Vehicles (%)	1%	13%	1%	0%	0%	0%	0%	2%	17%	0%	6%	0%
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)	57.0	57.0						82.4		82.4	82.4	
Effective Green, g (s)	57.0	57.0						82.4		82.4	82.4	
Actuated g/C Ratio	0.38	0.38						0.55		0.55	0.55	
Clearance Time (s)	5.0	5.0						5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0						0.2		0.2	0.2	
Lane Grp Cap (vph)	1075	1048						2570		46	2475	
v/s Ratio Prot								c0.57			0.31	
v/s Ratio Perm	c0.42	0.29								0.12		
v/c Ratio	1.12	1.00dl						1.03		0.22	0.56	
Uniform Delay, d1	46.5	40.5						33.8		17.3	22.1	
Progression Factor	1.00	1.00						0.75		1.08	1.10	
Incremental Delay, d2	65.6	3.2						17.3		9.8	0.9	
Delay (s)	112.1	43.7						42.5		28.4	25.2	
Level of Service	F	D						D		C	C	
Approach Delay (s)		84.4			0.0			42.5			25.3	
Approach LOS		F			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	52.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.6
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1792	10	213	0	0	0	0	2652	7	10	1395	0
Future Volume (veh/h)	1792	10	213	0	0	0	0	2652	7	10	1395	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1736	1573	1736				0	1723	1723	1750	1668	0
Adj Flow Rate, veh/h	1792	10	213				0	2652	7	10	1395	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	13	1				0	2	2	0	6	0
Cap, veh/h	1871	23	483				0	2674	7	51	2515	0
Arrive On Green	0.38	0.38	0.38				0.00	0.83	0.55	0.83	0.83	0.00
Sat Flow, veh/h	4961	60	1282				0	4998	13	114	4704	0
Grp Volume(v), veh/h	1792	0	223				0	1716	943	10	1395	0
Grp Sat Flow(s),veh/h/ln	1654	0	1342				0	1568	1720	114	1518	0
Q Serve(g_s), s	52.8	0.0	18.6				0.0	78.8	79.2	3.6	14.6	0.0
Cycle Q Clear(g_c), s	52.8	0.0	18.6				0.0	78.8	79.2	82.8	14.6	0.0
Prop In Lane	1.00		0.96				0.00		0.01	1.00		0.00
Lane Grp Cap(c), veh/h	1871	0	506				0	1731	950	51	2515	0
V/C Ratio(X)	0.96	0.00	0.44				0.00	0.99	0.99	0.20	0.55	0.00
Avail Cap(c_a), veh/h	1885	0	510				0	1731	950	51	2515	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.50	1.00	1.50	1.50	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.92	0.92	0.00
Uniform Delay (d), s/veh	45.6	0.0	34.9				0.0	12.5	12.7	53.8	7.0	0.0
Incr Delay (d2), s/veh	12.3	0.0	0.6				0.0	19.7	27.4	7.8	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	31.4	0.0	10.3				0.0	23.4	28.2	0.9	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	0.0	35.5				0.0	32.2	40.1	61.6	7.8	0.0
LnGrp LOS	E	A	D				A	C	D	E	A	A
Approach Vol, veh/h		2015						2659			1405	
Approach Delay, s/veh		55.3						35.0			8.2	
Approach LOS		E						C			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		88.4		61.6		88.4						
Change Period (Y+Rc), s		5.6		5.0		5.6						
Max Green Setting (Gmax), s		82.4		57.0		82.4						
Max Q Clear Time (g_c+I1), s		81.2		54.8		84.8						
Green Ext Time (p_c), s		0.8		1.7		0.0						

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

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1447	1564	2	10	26
Future Vol, veh/h	1	1447	1564	2	10	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	6	4	50	0	5
Mvmt Flow	1	1447	1564	2	10	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1566	0	-	0	2290	782
Stage 1	-	-	-	-	1564	-
Stage 2	-	-	-	-	726	-
Critical Hdwy	4.1	-	-	-	6.8	7
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.35
Pot Cap-1 Maneuver	427	-	-	-	34	331
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	445	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	427	-	-	-	34	331
Mov Cap-2 Maneuver	-	-	-	-	34	-
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	445	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	62.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	427	-	-	-	97
HCM Lane V/C Ratio	0.002	-	-	-	0.371
HCM Control Delay (s)	13.5	-	-	-	62.5
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	357	193	17	81	3340	1039	0	1039	558
Future Volume (vph)	0	0	0	357	193	17	81	3340	1039	0	1039	558
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)				4.5	4.5		4.5	4.8	4.0		4.8	4.0
Lane Util. Factor				0.91	0.91		1.00	0.91	1.00		0.91	1.00
Frt				1.00	0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected				0.95	0.98		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)				1483	3042		1509	4590	1443		4554	1487
Flt Permitted				0.95	0.98		0.24	1.00	1.00		1.00	1.00
Satd. Flow (perm)				1483	3042		376	4590	1443		4554	1487
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	357	193	17	81	3340	1039	0	1039	558
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	186	379	0	81	3340	1039	0	1039	558
Heavy Vehicles (%)	0%	0%	0%	2%	1%	7%	8%	2%	1%	0%	7%	2%
Turn Type				Split	NA		pm+pt	NA	Free		NA	Free
Protected Phases				4	4		5	2			6	
Permitted Phases							2		Free			Free
Actuated Green, G (s)				23.1	23.1		117.6	117.6	150.0		107.2	150.0
Effective Green, g (s)				23.1	23.1		117.6	117.6	150.0		107.2	150.0
Actuated g/C Ratio				0.15	0.15		0.78	0.78	1.00		0.71	1.00
Clearance Time (s)				4.5	4.5		4.5	4.8			4.8	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				228	468		339	3598	1443		3254	1487
v/s Ratio Prot				0.13	0.12		0.01	c0.73			0.23	
v/s Ratio Perm							0.18		c0.72			0.38
v/c Ratio				0.82	0.81		0.24	0.93	0.72		0.32	0.38
Uniform Delay, d1				61.4	61.3		4.2	12.9	0.0		7.9	0.0
Progression Factor				1.00	1.00		0.83	0.85	1.00		1.00	1.00
Incremental Delay, d2				19.7	10.2		0.0	0.6	0.3		0.3	0.7
Delay (s)				81.1	71.6		3.5	11.5	0.3		8.2	0.7
Level of Service				F	E		A	B	A		A	A
Approach Delay (s)		0.0			74.7			8.8			5.6	
Approach LOS		A			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	357	193	17	81	3340	1039	0	1039	558
Future Volume (veh/h)	0	0	0	357	193	17	81	3340	1039	0	1039	558
Initial Q (Qb), veh				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
Parking Bus, Adj				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	
Adj Sat Flow, veh/h/ln				1723	1736	1723	1554	1636	1650	0	1798	1867
Adj Flow Rate, veh/h				381	160	17	81	3340	0	0	1039	0
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				2	1	2	8	2	1	0	7	2
Cap, veh/h				446	210	22	418	3582		0	3664	
Arrive On Green				0.14	0.14	0.14	0.03	0.80	0.00	0.00	0.75	0.00
Sat Flow, veh/h				3281	1543	164	1480	4466	1398	0	5071	1582
Grp Volume(v), veh/h				381	0	177	81	3340	0	0	1039	0
Grp Sat Flow(s),veh/h/ln				1641	0	1707	1480	1489	1398	0	1636	1582
Q Serve(g_s), s				17.0	0.0	15.0	1.9	88.0	0.0	0.0	10.2	0.0
Cycle Q Clear(g_c), s				17.0	0.0	15.0	1.9	88.0	0.0	0.0	10.2	0.0
Prop In Lane				1.00		0.10	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				446	0	232	418	3582		0	3664	
V/C Ratio(X)				0.85	0.00	0.76	0.19	0.93		0.00	0.28	
Avail Cap(c_a), veh/h				558	0	290	434	3582		0	3664	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				63.4	0.0	62.5	4.2	11.6	0.0	0.0	6.1	0.0
Incr Delay (d2), s/veh				10.3	0.0	9.0	0.0	0.6	0.0	0.0	0.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				12.3	0.0	11.4	0.8	25.2	0.0	0.0	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				73.7	0.0	71.4	4.3	12.3	0.0	0.0	6.3	0.0
LnGrp LOS				E	A	E	A	B		A	A	
Approach Vol, veh/h					558			3421	A		1039	A
Approach Delay, s/veh					73.0			12.1			6.3	
Approach LOS					E			B			A	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	125.1	24.9	8.4	116.8
Change Period (Y+Rc), s	* 4.8	4.5	4.5	* 4.8
Max Green Setting (Gmax), s	* 1.2E2	25.5	5.5	* 1.1E2
Max Q Clear Time (g_c+I1), s	90.0	19.0	3.9	12.2
Green Ext Time (p_c), s	24.2	1.4	0.0	9.5

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1061	16	333	760	108	15	49	807	219	80	33
Future Volume (vph)	21	1061	16	333	760	108	15	49	807	219	80	33
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.8		4.0	4.8			4.8	4.0	4.8	4.8	4.8
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.88	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1568	3235		1554	3115			1573	2567	1568	1651	1430
Flt Permitted	0.95	1.00		0.95	1.00			0.94	1.00	0.72	1.00	1.00
Satd. Flow (perm)	1568	3235		1554	3115			1490	2567	1181	1651	1430
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	21	1061	16	333	760	108	15	49	807	219	80	33
RTOR Reduction (vph)	0	1	0	0	8	0	0	0	11	0	0	26
Lane Group Flow (vph)	21	1076	0	333	860	0	0	64	796	219	80	7
Heavy Vehicles (%)	6%	2%	39%	7%	5%	3%	0%	13%	2%	6%	6%	4%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pm+ov	Perm	NA	Perm
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	3.0	33.2		22.9	53.1			20.2	43.1	20.2	20.2	20.2
Effective Green, g (s)	3.0	33.2		22.9	53.1			20.2	43.1	20.2	20.2	20.2
Actuated g/C Ratio	0.03	0.37		0.25	0.59			0.22	0.48	0.22	0.22	0.22
Clearance Time (s)	4.0	4.8		4.0	4.8			4.8	4.0	4.8	4.8	4.8
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	52	1194		395	1839			334	1230	265	370	321
v/s Ratio Prot	0.01	c0.33		c0.21	0.28				0.16		0.05	
v/s Ratio Perm								0.04	0.15	c0.19		0.01
v/c Ratio	0.40	0.90		0.84	0.47			0.19	0.65	0.83	0.22	0.02
Uniform Delay, d1	42.6	26.8		31.8	10.4			28.2	17.7	33.2	28.4	27.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	9.7		15.0	0.3			0.3	1.2	18.6	0.3	0.0
Delay (s)	47.6	36.5		46.8	10.7			28.5	18.8	51.8	28.7	27.2
Level of Service	D	D		D	B			C	B	D	C	C
Approach Delay (s)		36.7			20.7			19.6			43.8	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	13.6
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	1061	16	333	760	108	15	49	807	219	80	33
Future Volume (veh/h)	21	1061	16	333	760	108	15	49	807	219	80	33
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	1668	1723	1723	1654	1682	1682	1573	1573	1723	1668	1668	1695
Adj Flow Rate, veh/h	21	1061	16	333	760	108	15	49	807	219	80	33
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	2	7	5	5	13	13	2	6	6	4
Cap, veh/h	23	1108	17	368	1557	221	121	344	1319	236	467	402
Arrive On Green	0.01	0.34	0.34	0.23	0.55	0.55	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1589	3301	50	1576	2809	399	256	1229	2569	625	1668	1437
Grp Volume(v), veh/h	21	526	551	333	432	436	64	0	807	219	80	33
Grp Sat Flow(s),veh/h/ln	1589	1637	1714	1576	1598	1610	1484	0	1285	625	1668	1437
Q Serve(g_s), s	1.2	28.3	28.3	18.5	14.9	14.9	0.0	0.0	20.1	22.5	3.3	1.5
Cycle Q Clear(g_c), s	1.2	28.3	28.3	18.5	14.9	14.9	2.7	0.0	20.1	25.2	3.3	1.5
Prop In Lane	1.00		0.03	1.00		0.25	0.23		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	23	549	575	368	886	892	465	0	1319	236	467	402
V/C Ratio(X)	0.91	0.96	0.96	0.91	0.49	0.49	0.14	0.00	0.61	0.93	0.17	0.08
Avail Cap(c_a), veh/h	282	549	575	455	886	892	465	0	1319	236	467	402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.3	29.3	29.3	33.5	12.3	12.3	24.3	0.0	15.5	37.0	24.5	23.9
Incr Delay (d2), s/veh	65.1	28.2	27.4	18.9	0.6	0.6	0.1	0.0	0.8	39.6	0.2	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(95%),veh/ln	1.6	21.1	21.8	13.5	8.5	8.6	1.9	0.0	9.7	12.0	2.4	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.3	57.5	56.7	52.4	12.8	12.8	24.5	0.0	16.4	76.6	24.7	24.0
LnGrp LOS	F	E	E	D	B	B	C	A	B	E	C	C
Approach Vol, veh/h		1098			1201			871			332	
Approach Delay, s/veh		58.1			23.8			17.0			58.8	
Approach LOS		E			C			B			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	35.0		30.0	5.3	54.7		30.0				
Change Period (Y+Rc), s	4.0	* 4.8		* 4.8	4.0	* 4.8		* 4.8				
Max Green Setting (Gmax), s	26.0	* 30		* 25	16.0	* 40		* 25				
Max Q Clear Time (g_c+I1), s	20.5	30.3		27.2	3.2	16.9		22.1				
Green Ext Time (p_c), s	0.5	0.0		0.0	0.0	8.1		1.3				

Intersection Summary	
HCM 6th Ctrl Delay	36.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.