Kimley»Horn

January 22, 2019

Mr. Shawn Knapp
Town of Moraga
329 Rheem Boulevard
Moraga, CA 94556

RE: ***St. Marys Road Roundabout Project, Moraga, CA***
Draft Traffic Letter

Dear Mr. Knapp:

The St. Marys Road Roundabout Project ("Project") is proposing to construct roundabouts at two existing side street stop controlled (SSSC) intersections in the Town of Moraga (Town) in Contra Costa County, CA to improve the physical and operational characteristics of St. Marys Road. After discussions with the Town, this memorandum evaluated the traffic impacts of the proposed roundabouts. The following discusses the methodology, analysis, and results of the comparison.

BACKGROUND

The proposed roundabouts are to be located along St. Marys Road at the intersections of Rheem Boulevard and Bollinger Canyon Road. **Figure 1** illustrates the location of the study intersections in relation to the adjacent roadway network in Moraga. The existing lane geometry configuration lacks acceptable sight distance due to horizontal and vertical constraints. Therefore, roundabouts are proposed to replace the existing SSSC of the two study intersections.

METHODOLOGY

Study Intersections

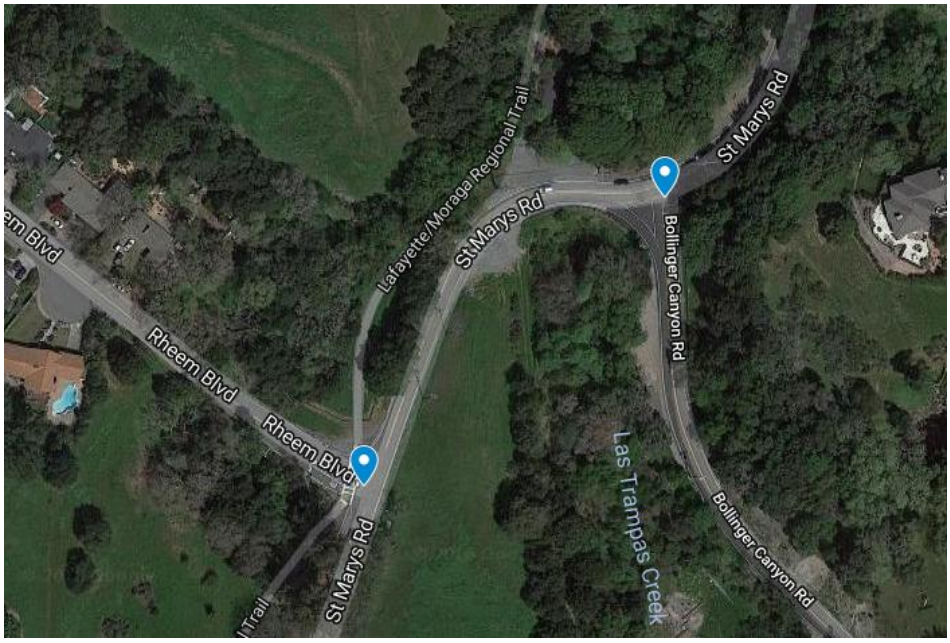
As part of this evaluation, study intersections were reviewed to determine the existing traffic operations at the following study intersections:

1. St. Marys Road / Rheem Boulevard – SSSC
2. St. Marys Road / Bollinger Canyon Road – SSSC

AM and PM peak hour traffic volumes for all study scenarios at the two study intersections were derived from the *Bollinger Valley Project Final EIR*[1] and are provided in the **Attachments**.

[1] *Bollinger Valley Project Final EIR, Appendix B: 2014 Traffic Analysis*, January 2017.

Figure 1 – Study Intersections



Analysis Scenarios

To determine the potential project impacts, multiple scenarios were analyzed in the AM and PM peak hours:

- Existing (2017) Conditions – Based on traffic counts derived from the *Bollinger Valley Project Final EIR* and existing roadway geometry and traffic control.
- Existing (2017) Plus Project Conditions – Based on existing traffic volumes added to the proposed roadway geometry and traffic control assumed for this scenario.
- Cumulative (2040) Conditions – Based on future year traffic projections which are derived from the *Bollinger Valley Project Final EIR*. This scenario assumes roadway geometry and traffic control present in the forecast horizon.
- Cumulative (2040) Plus Project Conditions – Based on future year traffic projections added to the proposed roadway geometry and traffic control assumed for this scenario.

Level of Service Standards

Analysis of significant environmental impacts at intersections were based on the concept of Level of Service (LOS). The LOS of an intersection is a qualitative measure used to describe operational conditions. LOS ranges from A (best), which represents minimal delay, to F (worst), which represents heavy delay and a facility that is operating at or near its functional capacity. **Table 1** provides a definition for each level of service category. Levels of service for this study were determined using methods defined in the Highway Capacity Manual, 2010 (HCM) and appropriate traffic analysis software.

The HCM includes procedures for analyzing side-street stop-controlled (SSSC), all-way stop-controlled (AWSC), roundabouts, and signalized intersections. The SSSC procedure defines LOS as a function of average control delay for the worst minor street movement or major street left-turn. Conversely, the AWSC and signalized intersection procedures define LOS as a function of average control delay for the intersection as a whole. **Table 2** relates the operational characteristics associated with each LOS category for signalized and unsignalized intersections.

Table 1 - Level of Service Definitions

Level of Service	Description
A	Free flow with no delays. Users are virtually unaffected by others in the traffic stream. At signalized intersections, turning movements are easily made and all queues clear in a single signal cycle.
B	Stable traffic. Traffic flows smoothly with few delays. An occasional approach phase is fully utilized. Drivers begin to feel somewhat restricted within platoons of vehicles.
C	Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays. Major approach phases fully utilized. Backups may develop behind turning vehicles.
D	Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak hours. Queues may develop but dissipate rapidly, without excessive delays.
E	Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing.
F	Forced or breakdown flow that causes reduced capacity. Traffic demand exceeds the capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing.

Source: Transportation Research Board, *Highway Capacity Manual 2010,* National Research Council, 2010

Table 2 – Signalized and Unsignalized Intersection Level of Service Definitions

Level of Service	Signalized (Avg. control delay per vehicle sec/veh.)	Unsignalized (Avg. control delay per vehicle sec/veh.)
A	≤ 10.0	≤ 10.0
B	> 10.0 – 20.0	> 10.0 – 15.0
C	> 20.0 – 35.0	> 15.0 – 25.0
D	> 35.0 – 55.0	> 25.0 – 35.0
E	> 55.0 – 80.0	> 35.0 – 50.0
F	> 80.0	> 50.0

The intersection level of service (LOS) standards are outlined in the Moraga General Plan. The LOS standards for the Town of Moraga is LOS C for all intersections.

Based on the *Saint Mary's College Campus Master Plan DEIR*, a significant impact would occur if the proposed project caused the following to unsignalized intersections:

- For unsignalized intersections operating at LOS C or better without the project, a significant impact would occur if the project degrades the intersection from an acceptable LOS to an unacceptable LOS D or worse and if the intersection meets the peak hour signal warrant in plus project conditions.

The Contra Costa Transportation Authority (CCTA) and its subsequent Regional Transportation Planning Committees have also set various standards on specific roadways, called Multi-Modal Transportation Service Objectives (MTSO's). These MTSO's are specific to each region and regulate the routes of regional significance. However, all study intersections are not designated as regionally significant and therefore no MTSO's were evaluated.

Analysis Methodology

The study intersections for Existing and Cumulative conditions were analyzed in Synchro software using Highway Capacity Manual (HCM) 2010 methodology for the AM and PM peak periods.

The study intersections for Existing Plus Project and Cumulative Plus Project were evaluated in Sidra Intersection software using the HCM 2010 methodology with the exception of parameters A and B resulting in a change in the default capacity. Parameters A and B were modified based on the recommended factors in the Caltrans *Roundabout Geometric Design Guidance* to adjust for the driver characteristics in California. **Table 3** presents the comparison between the default HCM 2010 parameters in Sidra and the recommended adjusted factors.

Table 3 – Roundabout Model Parameters for Entry Capacity

Roundabout Type	Default HCM 2010 Parameters		Modified HCM Parameters	
	A	B	A	B
Single-Lane Circulating System				
• Single-Lane Entry	1130	0.00100	1440	0.00100
• Multi-Lane Entry (apply to all lanes)	1130	0.00100	1440	0.00100
Multi-Lane Circulating System				
• Single-Lane Entry	1130	0.00070	–	–
• Multi-Lane Entry				
o Dominate Lane (right lane)	1130	0.00070	1640	0.00090
o Dominate Lane (left lane)	1130	0.00075	1640	0.00100

EXISTING (2017) CONDITIONS

Traffic operations were evaluated at the study intersections under Existing traffic conditions. Results of the analysis are presented in **Table 4**. **Table 4** shows the existing LOS and delay for each of the study intersections. All study intersections operate at an acceptable level of service in the Existing scenario. Analysis sheets are provided in the **Attachments**.

Table 4 – Existing Intersection Level of Service Summary

#	Intersection	LOS Criteria[1]	Jurisdiction	Control	Existing			
					AM Peak		PM Peak	
					LOS	Delay	LOS	Delay
1	St. Mary's Road / Rheem Boulevard	C	Town	SSSC	A	3.6	A	3.9
	Worst Approach				*C*	*18.5*	*C*	*20.4*
2	St. Mary's Road / Bollinger Canyon Road	C	Town	SSSC	A	1.5	A	0.9
	Worst Approach				*C*	*16.5*	*B*	*16.2*

Note: Intersections that are operating below acceptable levels are shown in **BOLD**.
Intersections were analyzed using HCM 2010 methodology within Synchro software
[1]Town = Town of Moraga

Existing Transit Facilities

The County Connection provides transit services within Moraga and nearby cities in Central Contra Costa County. The following County Connection routes operate near the proposed project but do not operate through the study intersections:

Route 6 is a bus service that operates between the Orinda BART station and the Lafayette BART station while serving St. Mary's College along its route. Within the vicinity of the project site, Route 6 travels on St. Marys Road. On weekdays, Route 6 operates between 5:40 AM and 8:45 PM on 40-minute to 120-minute headways. On weekends, Route 6 operates between 9:24 AM to 6:09 PM on 80-minute headways.

Route 250 is a bus route that operates between the Pittsburg/Bay Point BART station and St. Mary's College. Within the vicinity of the project site, Route 250 travels on St. Marys Road. On weekdays, Route 250 operates between 9:20 PM to 1:25 AM (of the following day). On weekends, Route 250 operates between 6:20 PM to 1:25 AM (of the following day).

Existing Pedestrian Facilities

There is a lack of sidewalks and crosswalks provided near the study intersections for pedestrians to walk to and from nearby land uses. A crosswalk is provided on the west side of the intersection of St Marys Road and Rheem Boulevard and provides access to the Lafayette/Moraga Regional Trail.

Existing Bicycle Facilities

The Lafayette/Moraga Regional Trail is a Class I bicycle path that runs near the project area. The Lafayette/Moraga Regional Trail runs adjacent to St Marys Road between the intersection of Moraga Road and St Marys Road and extends beyond the town's limits into the City of Lafayette. A bicycle route is proposed along St Marys Road between Stafford Road to the outside of the Moraga town

limits. Bicycle routes are also proposed along Rheem Boulevard between St Marys Road and Moraga Road and along Bollinger Canyon Road between St Marys Road and north of Valley Hill Drive.

EXISTING (2017) PLUS PROJECT CONDITIONS

Existing Plus Project traffic conditions were evaluated at the study intersections based on the following roadway improvements:

1. St. Marys Road / Rheem Boulevard – Intersection control to be changed from a SSSC to a roundabout
2. St. Marys Road / Bollinger Canyon Road – Intersection control to be changed from a SSSC to a mini-roundabout

The concept layout for the proposed roundabouts are provided in the **Attachments**.

Existing Plus Project volumes were assumed to be the same as Existing volumes since traffic is not expected to be redirected or changed with the addition of the roundabouts at the study intersections. Results of the analysis are presented in **Table 5**. As shown in **Table 5**, all study intersections would operate at acceptable levels of service in the Existing Plus Project scenario. Analysis sheets are provided in the **Attachments**.

Table 5 – Existing Plus Project Intersection Level of Service Summary

#	Intersection	LOS Criteria[1]	Jurisdiction	Control[2]	Existing				Existing + Project					
					AM Peak		PM Peak		AM Peak			PM Peak		
					LOS	Delay	LOS	Delay	LOS	Delay	ΔDelay	LOS	Delay	ΔDelay
1	St. Mary's Road / Rheem Boulevard	C	Town	SSSC / Roundabout	A	3.6	A	3.9	A	5.6	-12.9	A	6.0	-14.4
	Worst Approach				*C*	*18.5*	*C*	*20.4*						
2	St. Mary's Road / Bollinger Canyon Road	C	Town	SSSC / Mini-Roundabout	A	1.5	A	0.9	A	5.6	-10.9	A	5.8	-10.4
	Worst Approach				*C*	*16.5*	*B*	*16.2*						

Note: Intersections that are operating below acceptable levels are shown in **BOLD** and significant impacts are highlighted.
Intersections were analyzed using HCM 2010 methodology within Sidra software

[1] Town = Town of Moraga

[2] With the addition of the project, Intersection #1 becomes a roundabout and Intersection #2 becomes a mini-roundabout

CUMULATIVE (2040) CONDITIONS

Traffic operations were evaluated at the study intersections under Cumulative traffic conditions. Cumulative traffic volumes were derived from the *Bollinger Valley Project Final EIR*. Under Cumulative traffic conditions, there is no new lane geometry improvements to the study intersections, therefore Existing lane geometry was assumed in the Cumulative conditions. Results of the analysis are presented in **Table 6**. As shown in **Table 6**, the following intersections operate at unacceptable levels of service in the Cumulative scenario:

- #1 – St. Marys Road / Rheem Boulevard (AM and PM Peak Hours)
- #2 – St. Marys Road / Bollinger Canyon Road (AM and PM Peak Hours)

Analysis sheets are provided in the **Attachments**.

Table 6 – Cumulative Intersection Level of Service Summary

#	Intersection	LOS Criteria[1]	Jurisdiction	Control	Long-term (2035)			
					AM Peak		PM Peak	
					LOS	Delay	LOS	Delay
1	St. Mary's Road / Rheem Boulevard	C	Town	SSSC	A	5.3	A	9.4
	Worst Approach				**D**	**30.6**	**F**	**57.7**
2	St. Mary's Road / Bollinger Canyon Road	C	Town	SSSC	A	3.8	A	2.4
	Worst Approach				**D**	**26.2**	**D**	**26.4**

Note: Intersections that are operating below acceptable levels are shown in **BOLD**.
Intersections were analyzed using HCM 2010 methodology within Synchro software
[1] Town = Town of Moraga

CUMULATIVE (2040) PLUS PROJECT CONDITIONS

Traffic operations were evaluated at the study intersections under Cumulative Plus project traffic conditions based on the lane geometry proposed by the project. Cumulative Plus Project volumes were assumed to be the same as Cumulative volumes since traffic is not expected to be redirected or changed with the addition of the roundabouts at the study intersections. Results of the analysis are presented in **Table 7**. As shown in **Table 7**, all study intersections would operate at acceptable levels of service in the Cumulative Plus Project scenario. Analysis sheets are provided in the **Attachments**.

Table 7 – Cumulative Plus Project Intersection Level of Service Summary

#	Intersection	LOS Criteria	Jurisdiction[1]	Control[2]	Long-term (2035)				Long-term (2035) + Project					
					AM Peak		PM Peak		AM Peak			PM Peak		
					LOS	Delay	LOS	Delay	LOS	Delay	ΔDelay	LOS	Delay	ΔDelay
1	St. Mary's Road / Rheem Boulevard	C	Town	SSSC / Roundabout	A	5.3	A	9.4	A	7.1	-23.5	A	7.8	-49.9
	Worst Approach				**D**	**30.6**	**F**	**57.7**						
2	St. Mary's Road / Bollinger Canyon Road	C	Town	SSSC / Mini-Roundabout	A	3.8	A	2.4	A	6.8	-19.4	A	7.7	-18.7
	Worst Approach				**D**	**26.2**	**D**	**26.4**						

Note: Intersections that are operating below acceptable levels are shown in **BOLD** and significant impacts are highlighted.
Intersections were analyzed using HCM 2010 methodology within Sidra software
[1] Town = Town of Moraga
[2] With the addition of the project, Intersection #1 becomes a roundabout and Intersection #2 becomes a mini-roundabout

BICYCLE AND PEDESTRIAN FACILITIES

As noted in the Existing condition, there is a lack of sidewalks and crosswalks near the two study intersections. Pedestrians can cross the intersection of St Marys Road and Rheem Boulevard using the west crosswalk to access the Lafayette/Moraga Regional Trail. With the addition of the roundabout at the intersection of St Marys Road and Rheem Boulevard, vehicles approach the intersection at a lower speed and the pedestrian crosswalk is located further from the main roadway, thereby improving the safety of pedestrians. There is also a pedestrian refuge island separating the inbound and outbound vehicles on the Rheem Boulevard leg of the intersection, making it safer for pedestrians to cross one direction of travel at a time. Since the proposed project does not conflict with any adopted policies or plans related to pedestrian activity, the proposed project will have **less than significant impact** on pedestrian circulation.

Bicycles have access to the study intersection of St Marys Road and Rheem Boulevard using the Lafayette/Moraga Regional Trail. The existing trail crosses Rheem Boulevard using the western

crosswalk. The proposed roundabout will relocate this crosswalk to the west and improve the safety of bicyclists by improving the visibility of bicyclists in the crosswalk and reducing vehicle speeds through the roundabout. The proposed project would improve the safety of bicyclists. Since the proposed project does not conflict with any adopted policies or plans related to bicycle activity, the proposed project will have a **less than significant impact** on bicycle circulation.

CONSTRUCTION TRAFFIC

The day-to-day construction operations associated with demolition and construction of the roundabouts will generate traffic related to construction employees and construction equipment. This will also include heavy vehicles hauling construction material to and from the site. In addition, the construction of these roundabouts will result in either a partial or full closure of these two intersections. Since alternative detour paths are limited in this area, appropriate communication to users will need to be planned and implemented. Therefore, a traffic control plan is recommended to be developed and instituted during construction activities as a mitigation.

CONCLUSIONS

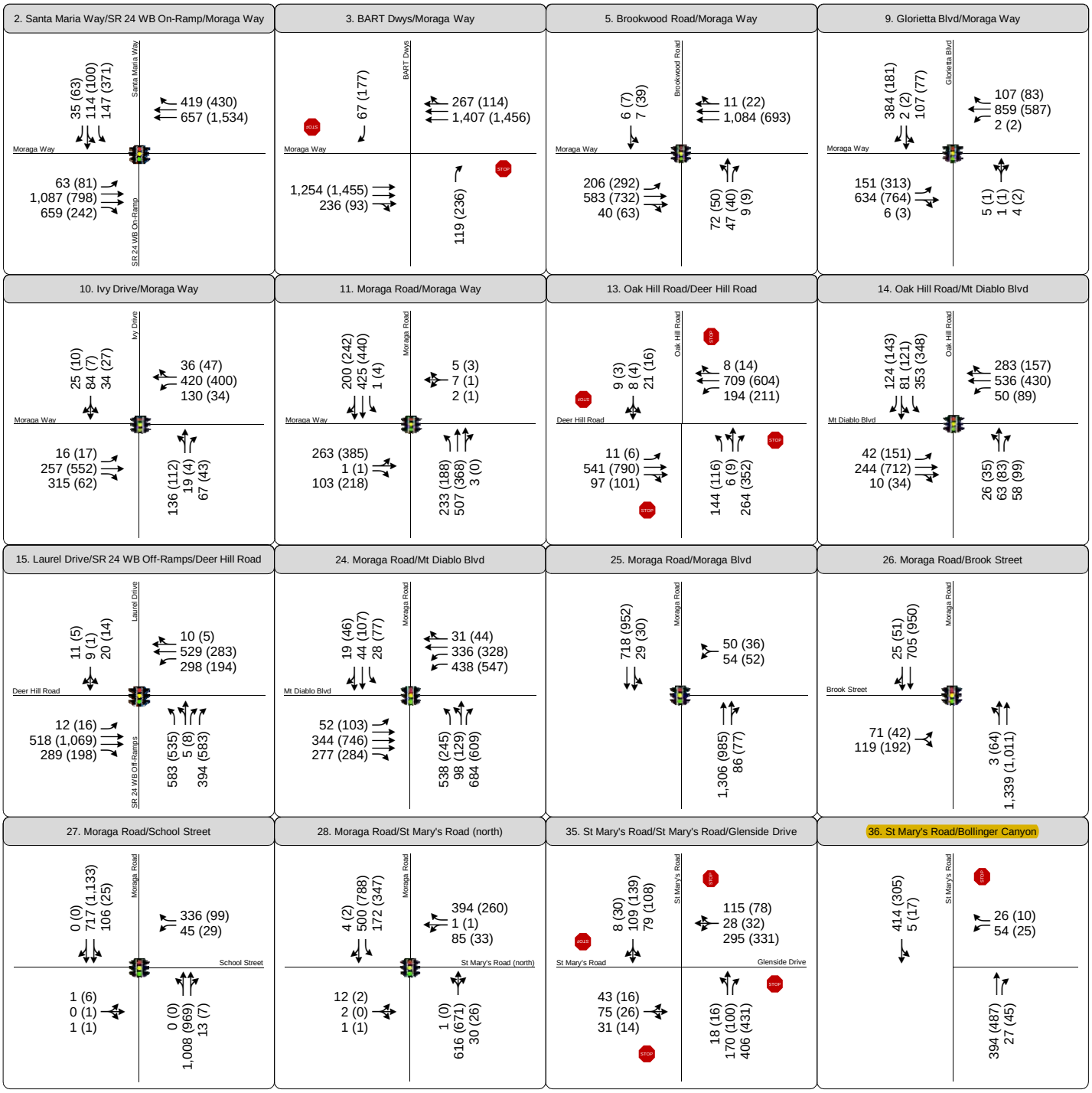
The results of the traffic evaluation demonstrated that the proposed project is not expected to create any significant impacts at the study intersections or on pedestrian and bicycle access and circulation. All study intersections are expected to operate at acceptable levels of service in the Existing Plus Project and Cumulative Plus Project conditions. However, there may be construction impacts related to partial or full closures of the two intersections, and a traffic control plan will be needed for mitigation of this impact.

Sincerely,

Ben Huie, P.E.
California Professional Engineer #C76682

Attachments:

Attachment A – Traffic Counts
Attachment B – Concept Layout
Attachment C – LOS Outputs



LEGEND

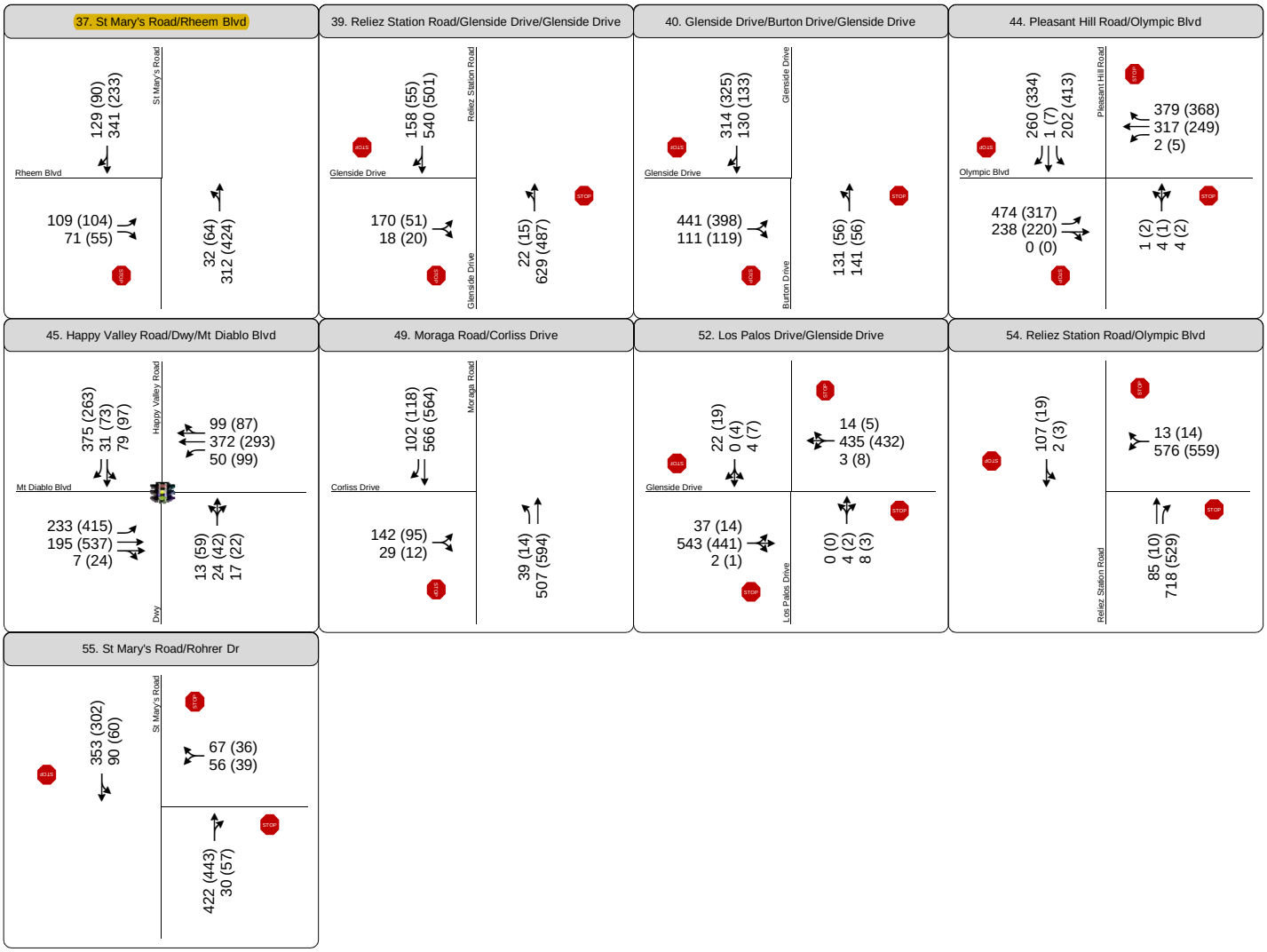
XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Figure 2A

Existing Conditions
Peak Hour Traffic Volumes



LEGEND

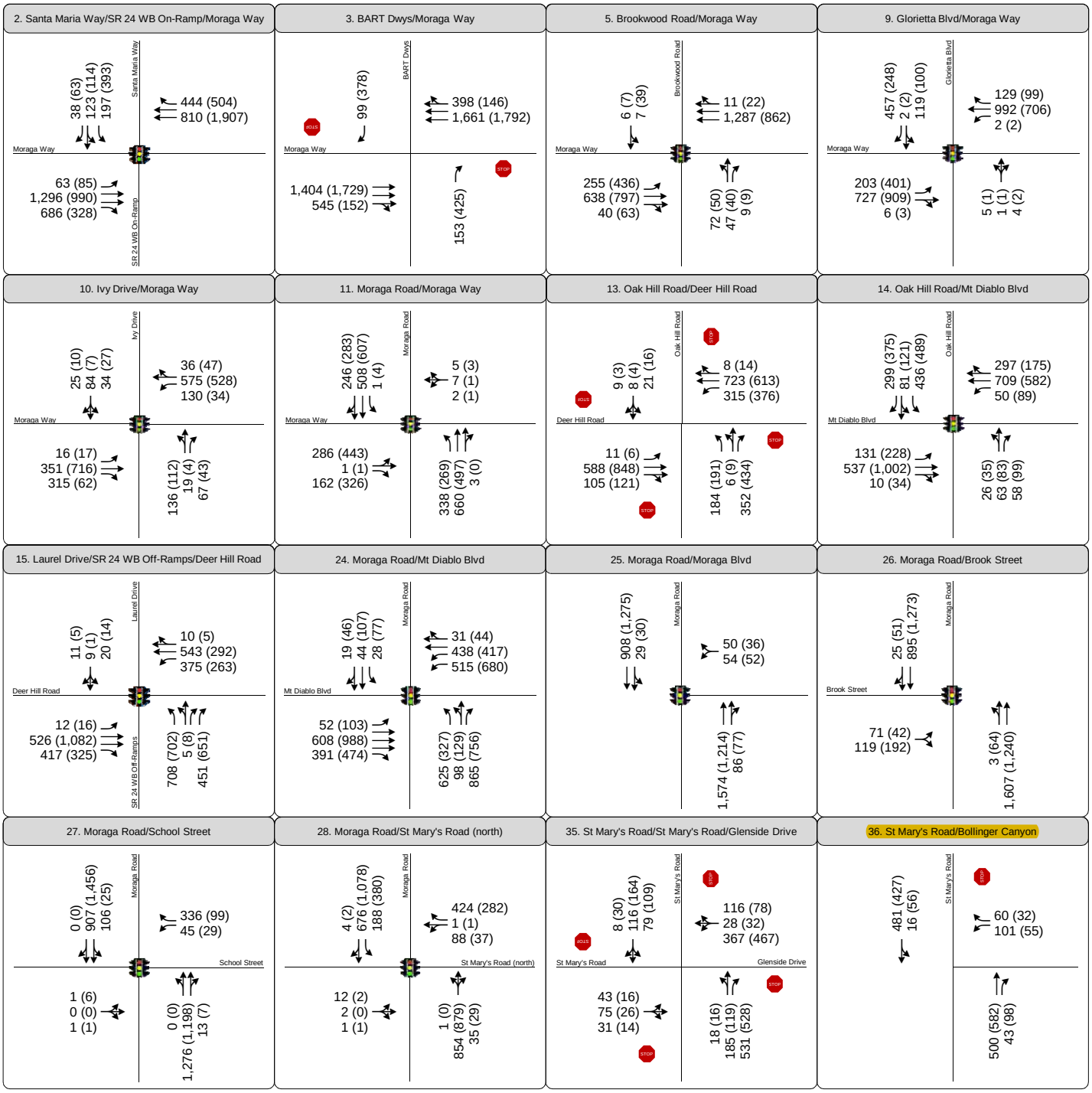
XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Figure 2B

Existing Conditions
Peak Hour Traffic Volumes



LEGEND

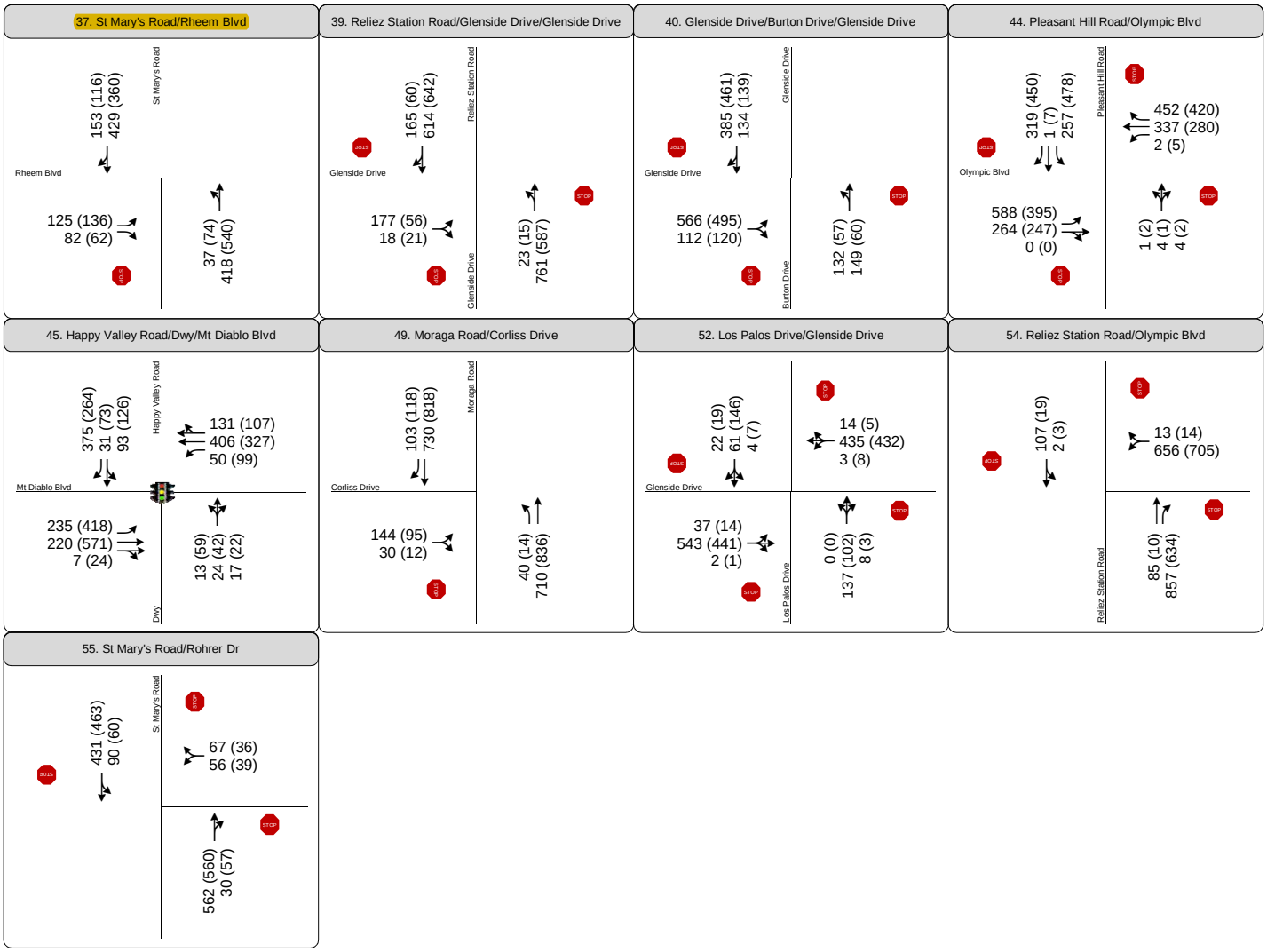
XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Figure 7A

Cumulative Plus Project Conditions Peak Hour Traffic Volumes



LEGEND

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Figure 7B

Cumulative Plus Project Conditions Peak Hour Traffic Volumes

Kimley»Horn

DRAFT CONCEPT NOT FOR CONSTRUCTION

CONCEPT ROUNDABOUT LAYOUT STUDY
ROUNDABOUT AT RHEEM | MINI ROUNDABOUT AT BOLLINGER
St. Marys Road Roundabout

Concept 04
EXHIBIT 4 of 7
3/15/2018

SCALE
1" = 50'

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	312	341	129	109	71
Future Vol, veh/h	32	312	341	129	109	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	339	371	140	118	77

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	511	0	-	0	850	441
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	409	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1054	-	-	-	331	616
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	671	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1054	-	-	-	317	616
Mov Cap-2 Maneuver	-	-	-	-	317	-
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	643	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1054	-	-	-	317	616
HCM Lane V/C Ratio	0.033	-	-	-	0.374	0.125
HCM Control Delay (s)	8.5	0	-	-	23	11.7
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.7	0.4

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	394	27	5	414	54	26
Future Vol, veh/h	394	27	5	414	54	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	None
Storage Length	-	100	-	-	0	20
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	428	29	5	450	59	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	428	0	889	428
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	461	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	0	1131	-	314	627
Stage 1	-	0	-	-	657	-
Stage 2	-	0	-	-	635	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	1131	-	312	627
Mov Cap-2 Maneuver	-	-	-	-	312	-
Stage 1	-	-	-	-	657	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	WBL	WBT
Capacity (veh/h)	312	627	-	1131	-
HCM Lane V/C Ratio	0.188	0.045	-	0.005	-
HCM Control Delay (s)	19.2	11	-	8.2	0
HCM Lane LOS	C	B	-	A	A
HCM 95th %tile Q(veh)	0.7	0.1	-	0	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	64	424	233	90	104	55
Future Vol, veh/h	64	424	233	90	104	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	461	253	98	113	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	351	0	-	0	902	302
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	600	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1208	-	-	-	308	738
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	548	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1208	-	-	-	284	738
Mov Cap-2 Maneuver	-	-	-	-	284	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	505	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	20.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1208	-	-	-	284	738
HCM Lane V/C Ratio	0.058	-	-	-	0.398	0.081
HCM Control Delay (s)	8.2	0	-	-	25.8	10.3
HCM Lane LOS	A	A	-	-	D	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.8	0.3

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	487	45	17	305	25	10
Future Vol, veh/h	487	45	17	305	25	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	None
Storage Length	-	100	-	-	0	20
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	529	49	18	332	27	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	529	0	897	529
Stage 1	-	-	-	-	529	-
Stage 2	-	-	-	-	368	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	0	1038	-	310	550
Stage 1	-	0	-	-	591	-
Stage 2	-	0	-	-	700	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	1038	-	303	550
Mov Cap-2 Maneuver	-	-	-	-	303	-
Stage 1	-	-	-	-	591	-
Stage 2	-	-	-	-	685	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	16.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	WBL	WBT
Capacity (veh/h)	303	550	-	1038	-
HCM Lane V/C Ratio	0.09	0.02	-	0.018	-
HCM Control Delay (s)	18	11.7	-	8.5	0
HCM Lane LOS	C	B	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	0.1	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	37	418	429	153	125	82
Future Vol, veh/h	37	418	429	153	125	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	454	466	166	136	89

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	633	0	-	0	1084	549
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	535	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	950	-	-	-	240	535
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	587	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	950	-	-	-	227	535
Mov Cap-2 Maneuver	-	-	-	-	227	-
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	554	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	30.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	950	-	-	-	227	535
HCM Lane V/C Ratio	0.042	-	-	-	0.599	0.167
HCM Control Delay (s)	9	0	-	-	42	13.1
HCM Lane LOS	A	A	-	-	E	B
HCM 95th %tile Q(veh)	0.1	-	-	-	3.4	0.6

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	500	43	16	481	101	60
Future Vol, veh/h	500	43	16	481	101	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	None
Storage Length	-	100	-	-	0	20
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	543	47	17	523	110	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	543	0	1101	543
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	558	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	0	1026	-	235	540
Stage 1	-	0	-	-	582	-
Stage 2	-	0	-	-	573	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	1026	-	230	540
Mov Cap-2 Maneuver	-	-	-	-	230	-
Stage 1	-	-	-	-	582	-
Stage 2	-	-	-	-	560	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	26.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	WBL	WBT
Capacity (veh/h)	230	540	-	1026	-
HCM Lane V/C Ratio	0.477	0.121	-	0.017	-
HCM Control Delay (s)	34.2	12.6	-	8.6	0
HCM Lane LOS	D	B	-	A	A
HCM 95th %tile Q(veh)	2.4	0.4	-	0.1	-

Intersection	
Int Delay, s/veh	9.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	74	540	360	116	136	62
Future Vol, veh/h	74	540	360	116	136	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	587	391	126	148	67

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	517	0	-	0	1202	454
Stage 1	-	-	-	-	454	-
Stage 2	-	-	-	-	748	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1049	-	-	-	204	606
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	468	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1049	-	-	-	181	606
Mov Cap-2 Maneuver	-	-	-	-	181	-
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	415	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	57.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1049	-	-	-	181	606
HCM Lane V/C Ratio	0.077	-	-	-	0.817	0.111
HCM Control Delay (s)	8.7	0	-	-	78.6	11.7
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	0.2	-	-	-	5.7	0.4

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	582	98	56	427	55	32
Future Vol, veh/h	582	98	56	427	55	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	None
Storage Length	-	100	-	-	0	20
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	633	107	61	464	60	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	633	0	1219	633
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	586	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	0	950	-	199	480
Stage 1	-	0	-	-	529	-
Stage 2	-	0	-	-	556	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	950	-	182	480
Mov Cap-2 Maneuver	-	-	-	-	182	-
Stage 1	-	-	-	-	529	-
Stage 2	-	-	-	-	508	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	26.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	WBL	WBT
Capacity (veh/h)	182	480	-	950	-
HCM Lane V/C Ratio	0.328	0.072	-	0.064	-
HCM Control Delay (s)	34.2	13.1	-	9	0
HCM Lane LOS	D	B	-	A	A
HCM 95th %tile Q(veh)	1.3	0.2	-	0.2	-

LANE SUMMARY

Site: 101 [INT-01_Existing_AM_Rheem at St. Marys]

Rheem at St. Marys
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB St Marys Rd													
Lane 1[d]	374	2.0	1251	0.299	100	5.6	LOS A	1.7	42.4	Full	1600	0.0	0.0
Approach	374	2.0		0.299		5.6	LOS A	1.7	42.4				
North: SB St Marys Rd													
Lane 1[d]	511	2.0	1363	0.375	100	6.1	LOS A	2.4	61.8	Full	500	0.0	0.0
Approach	511	2.0		0.375		6.1	LOS A	2.4	61.8				
West:													
Lane 1[d]	196	2.0	1224	0.160	100	4.3	LOS A	0.8	19.4	Full	750	0.0	0.0
Approach	196	2.0		0.160		4.3	LOS A	0.8	19.4				
Intersection	1080	2.0		0.375		5.6	LOS A	2.4	61.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [INT-01_Existing_PM_Rheem at St. Marys]

Rheem at St. Marys
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB St Marys Rd													
Lane 1[d]	530	2.0	1258	0.422	100	7.0	LOS A	2.8	70.1	Full	1600	0.0	0.0
Approach	530	2.0		0.422		7.0	LOS A	2.8	70.1				
North: SB St Marys Rd													
Lane 1[d]	351	2.0	1315	0.267	100	5.1	LOS A	1.5	37.3	Full	500	0.0	0.0
Approach	351	2.0		0.267		5.1	LOS A	1.5	37.3				
West:													
Lane 1[d]	173	2.0	1090	0.159	100	4.7	LOS A	0.7	18.5	Full	750	0.0	0.0
Approach	173	2.0		0.159		4.7	LOS A	0.7	18.5				
Intersection	1054	2.0		0.422		6.0	LOS A	2.8	70.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [INT-01_CumulativePlus_AM_Rheem at St. Marys]

Rheem at St. Marys
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB St Marys Rd													
Lane 1[d]	495	2.0	1229	0.402	100	6.9	LOS A	2.5	64.2	Full	1600	0.0	0.0
Approach	495	2.0		0.402		6.9	LOS A	2.5	64.2				
North: SB St Marys Rd													
Lane 1[d]	633	2.0	1355	0.467	100	7.3	LOS A	3.5	88.5	Full	500	0.0	0.0
Approach	633	2.0		0.467		7.3	LOS A	3.5	88.5				
West:													
Lane 1[d]	225	2.0	877	0.256	100	6.8	LOS A	1.2	30.1	Full	750	0.0	0.0
Approach	225	2.0		0.256		6.8	LOS A	1.2	30.1				
Intersection	1352	2.0		0.467		7.1	LOS A	3.5	88.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [INT-01_CumulativePlus_PM_Rheem at St. Marys]

Rheem at St. Marys
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB St Marys Rd													
Lane 1[d]	667	2.0	1214	0.550	100	9.3	LOS A	4.2	107.0	Full	1600	0.0	0.0
Approach	667	2.0		0.550		9.3	LOS A	4.2	107.0				
North: SB St Marys Rd													
Lane 1[d]	517	2.0	1301	0.398	100	6.6	LOS A	2.6	65.6	Full	500	0.0	0.0
Approach	517	2.0		0.398		6.6	LOS A	2.6	65.6				
West:													
Lane 1[d]	215	2.0	947	0.227	100	6.1	LOS A	1.1	26.8	Full	750	0.0	0.0
Approach	215	2.0		0.227		6.1	LOS A	1.1	26.8				
Intersection	1400	2.0		0.550		7.8	LOS A	4.2	107.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [INT-02_Existing_AM_Bollinger Canyon at St. Marys]

Bollinger Canyon at St. Marys
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Bollinger Canyon Road													
Lane 1[d]	87	2.0	912	0.095	100	4.8	LOS A	0.4	10.1	Full	1600	0.0	0.0
Approach	87	2.0		0.095		4.8	LOS A	0.4	10.1				
East: SB/WB St Marys Road													
Lane 1[d]	455	2.0	1330	0.343	100	5.8	LOS A	2.1	53.1	Full	1600	0.0	0.0
Approach	455	2.0		0.343		5.8	LOS A	2.1	53.1				
West: NB/EB St Marys Road													
Lane 1[d]	458	2.0	1404	0.326	100	5.4	LOS A	2.0	51.1	Full	450	0.0	0.0
Approach	458	2.0		0.326		5.4	LOS A	2.0	51.1				
Intersection	1000	2.0		0.343		5.6	LOS A	2.1	53.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [INT-02_Existing_PM_Bollinger Canyon at St. Marys]

Bollinger Canyon at St. Marys
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Bollinger Canyon Road													
Lane 1[d]	38	2.0	823	0.046	100	4.8	LOS A	0.2	4.7	Full	1600	0.0	0.0
Approach	38	2.0		0.046		4.8	LOS A	0.2	4.7				
East: SB/WB St Marys Road													
Lane 1[d]	350	2.0	1373	0.255	100	4.8	LOS A	1.4	35.9	Full	1600	0.0	0.0
Approach	350	2.0		0.255		4.8	LOS A	1.4	35.9				
West: NB/EB St Marys Road													
Lane 1[d]	578	2.0	1385	0.417	100	6.5	LOS A	2.9	74.4	Full	450	0.0	0.0
Approach	578	2.0		0.417		6.5	LOS A	2.9	74.4				
Intersection	966	2.0		0.417		5.8	LOS A	2.9	74.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [INT-02_CumulativePlus_AM_Bollinger Canyon at St. Marys]

Bollinger Canyon at St. Marys
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Bollinger Canyon Road													
Lane 1[d]	175	2.0	811	0.216	100	6.7	LOS A	0.9	24.0	Full	1600	0.0	0.0
Approach	175	2.0		0.216		6.7	LOS A	0.9	24.0				
East: SB/WB St Marys Road													
Lane 1[d]	540	2.0	1262	0.428	100	7.1	LOS A	2.8	72.0	Full	1600	0.0	0.0
Approach	540	2.0		0.428		7.1	LOS A	2.8	72.0				
West: NB/EB St Marys Road													
Lane 1[d]	590	2.0	1387	0.426	100	6.6	LOS A	3.0	76.9	Full	450	0.0	0.0
Approach	590	2.0		0.426		6.6	LOS A	3.0	76.9				
Intersection	1305	2.0		0.428		6.8	LOS A	3.0	76.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [INT-02_CumulativePlus_PM_Bollinger Canyon at St. Marys]

Bollinger Canyon at St. Marys
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Bollinger Canyon Road													
Lane 1[d]	95	2.0	741	0.128	100	6.2	LOS A	0.5	13.2	Full	1600	0.0	0.0
Approach	95	2.0		0.128		6.2	LOS A	0.5	13.2				
East: SB/WB St Marys Road													
Lane 1[d]	525	2.0	1328	0.395	100	6.4	LOS A	2.6	65.9	Full	1600	0.0	0.0
Approach	525	2.0		0.395		6.4	LOS A	2.6	65.9				
West: NB/EB St Marys Road													
Lane 1[d]	739	2.0	1327	0.557	100	8.9	LOS A	4.8	121.2	Full	450	0.0	0.0
Approach	739	2.0		0.557		8.9	LOS A	4.8	121.2				
Intersection	1359	2.0		0.557		7.7	LOS A	4.8	121.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach