Access Study

Solar Farm

Salinas, Puerto Rico

Prepared for PMG and Associates

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605 Condado Avenue | Suite 814 | San Juan, PR 00907-3814
(787) 724-2494 | (787) 587-9928 | (787) 566-0266
vanessa@vagtecpr.com | gustavo@vagtecpr.com
www.vagtecpr.com

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LIST OF ACRONYMS

AADT – Annual Average Daily Traffic
ADT – Average Daily Traffic
ATC – Automatic Traffic Counts
CBD – Central Business District
CPD – Cyclists per Day
EB - Eastbound
FHWA – Federal Highway Administration
HCM – Highway Capacity Manual
LOS – Level(s) of Service
LRTP – Long Range Transportation Plan
MOE – Measures of Effectiveness
NB - Northbound
NHS – National Highway System
PPD – Pedestrians per Day
PPH – Pedestrians per Hour
PHF – Peak Hour Factor
PHV – Peak Hour Volume
PRHTA – Puerto Rico Highway and Transportation Authority
PRPB – Puerto Rico Planning Board
SB – Southbound
TMC – Turning Movement Counts
TSS – Traffic Signal System
TWSC – Two-Way Stop Controlled
WB - Westbound

PROJECT DESCRIPTION

Clean Flexible Energy, LLC proposes to build a 240 MV photovoltaics solar system to provide power to PREPA's distribution network. The property consists of twelve (12) parcels with a combined area of 1,844.03 cuerdas, located between PR-53 (to the north), PR-3 (to the south), PR-706 (to the west), and PR-713 (to the east) in the Municipalities of Guayama and Salinas. The proposed project will occupy eight (8) of the twelve (12) parcels in an area of 1,029.63 cuerdas. This operation is not expected to impact the transportation network nearby. The solar farm's construction will generate temporary heavy vehicle traffic during construction.

There are two existing accesses, one through PR-706, with acceleration and deceleration lanes, and one through PR-3.

The project's influence area includes two (2) intersections:

Intersection 1 – PR-3 with PR-706 – unsignalized four-leg intersection with a stop condition on its southbound approach.

Northbound – local street with one shared lane.
Southbound – PR-706 with one shared lane (left and thru movements) and an exclusive right-turn ramp.
Eastbound – PR-3 with one shared lane (right-, thru, and left-turn movements).
Westbound – PR-3 with one shared lane (left and thru movements) and an exclusive right-turn ramp.

Intersection 2 – PR-706 with PR-53 EB Ramps – unsignalized four-leg intersection with regulatory stop signs on the eastbound approach.

Northbound – PR-706 with two thru lanes and one exclusive right-turn ramp.
Southbound – one thru lane and one shared lane (thru and left-turn movements).
Eastbound – one shared lane (left and thru movements) and one exclusive right turn ramp.
Westbound – N/A

The Average Daily Traffic (ADT) on each roadway segment under evaluation was estimated from the data gathered:

Roadway	Estimated ADT
PR-3	10,880 vpd
PR-706	5,376 vpd

PR-706 has 4% and PR-3 has 3% heavy vehicle traffic during peak hours.

Figure 1 illustrates the project's location and the surrounding roadway network.

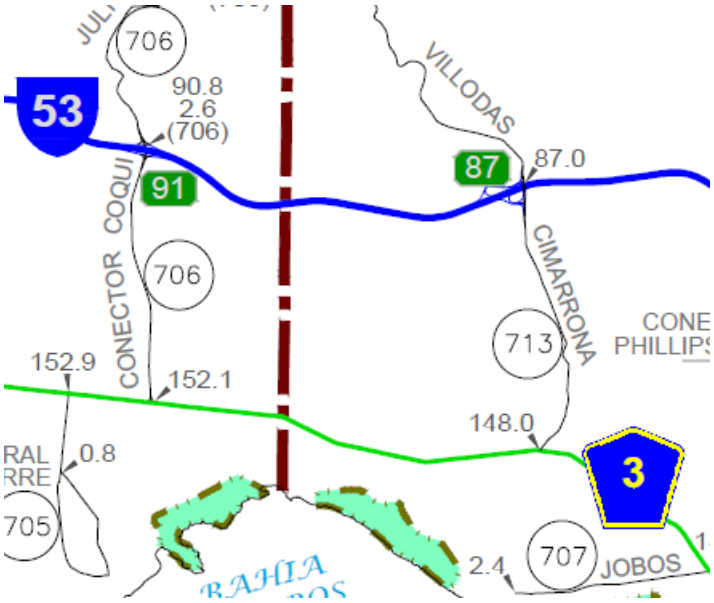


Figure 1 Roadway Network (source: Official Transportation Network Map, 2022)

Figure 2 illustrates the influence area, project's location, existing accesses, and intersections analyzed.

Figure 2 Influence Area, Project's Location, Existing Accesses, and Intersections Analyzed

Figure 3 presents the two existing site accesses.

Figure 3 Existing Accesses (through PR-706 and PR-3)

The proposed project is small per the PRHTA's guidelines, with minimum impact on the surrounding roadway network. An access study was prepared to analyze said impact. The analysis included two (2) intersections and the roadway network described previously (Figures 1 and 2). A list of recommendations to mitigate the impact is included as part of this study, following the requirements of Tables III and IV of the "*Guías para la Preparación de Estudios Operacionales de Accesos y de Tránsito para Puerto Rico*" (PRHTA 2004).

The following tasks were completed to attain the study's objectives:

- Traffic counts were collected during 12-hour periods on a typical weekday during the year of the study (2023);
- Peak Hour Factors (PHF) were calculated for each movement of the intersections analyzed;
- Maximum queues were calculated for each approach of each intersection analyzed;

- Traffic signal system timings were calculated for the signalized intersections analyzed;
- results were analyzed; and
- conclusions and recommendations were discussed.

The following tools were used in the completion of this study:

- Trafficware Synchro version 10,
- "*Guías para la Preparación de Estudios Operacionales de Accesos y Tránsito para Puerto Rico*," Puerto Rico Highway and Transportation Authority (PRHTA), December 2004
- Highway Capacity Manual 2010, Transportation Research Board, 2010
- Highway Performance Monitoring System (HPMS) Functional Classification and Federal Aid Logs
- Puerto Rico Highway Transportation Official Map, 2021
- Manual of Transportation Engineering Studies, Institute of Transportation Engineers, 2nd edition

The document was organized following the outline proposed by the PRHTA in its "*Guías para la Preparación de Estudios Operacionales de Accesos y Tránsito para Puerto Rico*."

ANALYSIS PARAMETERS

Study Area
An access study was prepared for the proposed project according to the characteristics of the proposed land uses and the trips to be generated. The project is small according to the PRHTA's *Guías para la Preparación de Estudios Operacionales de Accesos y de Tránsito para Puerto Rico*.

Scenarios Analyzed
The study includes the analysis of the existing condition in 2023 and the opening year in 2024.

Typical Days
The turning movement counts were collected on Wednesday, April 19, 2023, from 6:00 AM to 6:00 PM.

Peak Hours (AM and PM)
From the traffic counts collected, morning and afternoon peak hours were determined to be:

Intersection 1 – from 7:15 AM to 8:15 AM and from 3:15 PM to 4:15 PM
Intersection 2 – from 6:45 AM to 7:45 PM and from 3:45 PM to 4:45 PM

The tabulation of the raw data, 15-minute vehicle totals, and hourly totals is included in Appendix A.

STUDY MATRIX

The name of the electronic files for each analysis performed through HCS2010 is included in Table 1.

Table 1 Study Matrix

Name of Electronic Files
Int. 1 Existing 2023 am.xtw
Int. 1 Existing 2023 pm.xtw
Int. 2 Existing 2023 am.xtw
Int. 2 Existing 2023 pm.xtw
Intersection 1 – Construction AM 2024.xtw
Intersection 1 – Construction PM 2024.xtw
Intersection 2 – Construction AM 2024.xtw
Intersection 2 – Construction PM 2024.xtw
Intersection 3 – Construction AM 2024.xhu
Intersection 3 – Construction PM 2024.xhu

ANALYSIS OF EXISTING CONDITIONS (2023)

Volumes

The existing conditions were evaluated in HCS2010, an industry-standard application. Tables 2 to 5 show the input.

Geometry of Intersections

The existing geometry of the two (2) intersections analyzed is presented in Figures 4 and 5. This illustration complements the previous description. Appendix B includes photos of each intersection's approach.

Figure 4 Existing Geometry - Intersection 1

Figure 5 Existing Geometry - Intersection 2

Control of Intersections
Both intersections are two-way stop-controlled (TWSC).

Capacity Analysis of Intersections
The traffic capacity analysis summary of results includes the following performance measures: flow rate, capacity, v/c ratio, 95% queue length, control delay per approach, LOS per approach, control delay per intersection, and LOS per intersection. Tables 2 to 5 present the summary of results for the AM and PM peak hours in 2023.

Table 2 Summary of Results (2023) – Intersection 1 AM

Intersection 1 - AM

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	1
Configuration			LTR			LT		R			LTR			LT		R
Volume, V (veh/h)		231	341	1		1	250	41		2	1	0		43	0	225
Percent Heavy Vehicles (%)		3				2				0	0	0		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No				Yes				No				Yes			
Median Type/Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		436				2					6			81		425
Capacity, c (veh/h)		1084				940					74			131		1041
v/c Ratio		0.40				0.00					0.08			0.62		0.41
95% Queue Length, Q_{95} (veh)		2.0				0.0					0.3			3.2		2.0
Control Delay (s/veh)		10.5				8.8					57.7			69.6		10.8
Level of Service, LOS		B				A					F			F		B
Approach Delay (s/veh)	8.2				0.1				57.7				20.2			
Approach LOS	A				A				F				C			

Intersection Control Delay and LOS = 11.32 sec/veh LOS B

Table 3 Summary of Results (2023) – Intersection 1 PM

Intersection 1 - PM

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	1
Configuration			LTR			LT		R			LTR			LT		R
Volume, V (veh/h)		234	421	5		8	323	57		5	1	4		52	0	138
Percent Heavy Vehicles (%)		3				0				3	3	3		4	4	4
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				Yes				No				Yes		
Median Type/Storage		Undivided														
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				4.2	4.2	4.2		4.2	4.2	4.2
Critical Headway (sec)		4.13				4.10				4.23	4.23	4.23		4.24	4.24	4.24
Base Follow-Up Headway (sec)		2.2				2.2				2.3	2.3	2.3		2.3	2.3	2.3
Follow-Up Headway (sec)		2.23				2.20				2.30	2.30	2.30		2.30	2.30	2.30
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		390				13					17			87		230
Capacity, c (veh/h)		1024				899					137			119		982
v/c Ratio		0.38				0.01					0.12			0.73		0.23
95% Queue Length, Q_{95} (veh)		1.8				0.0					0.4			4.0		0.9
Control Delay (s/veh)		10.7				9.1					35.0			90.6		9.8
Level of Service, LOS		B				A					E			F		A
Approach Delay (s/veh)		8.1				0.4				35.0				32.0		
Approach LOS		A				A				E				D		

Intersection Control Delay and LOS = 10.88 sec/veh LOS B

Table 4 Summary of Results (2023) – Intersection 2 AM

Intersection 2 - AM

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	0	0		0	1	1		0	2	0
Configuration		LT		R							T	R		LT	T	
Volume, V (veh/h)		6	0	161							159	141		14	133	
Percent Heavy Vehicles (%)		1									1	1		5	5	
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		Yes				No				Yes				No		
Median Type/Storage		Undivided														
Critical and Follow-up Headways																
Base Critical Headway (sec)		0.0									6.5	6.2		7.1	6.5	
Critical Headway (sec)		0.00									6.51	6.21		7.15	6.55	
Base Follow-Up Headway (sec)		0.0									4.0	3.3		0.0	4.0	
Follow-Up Headway (sec)		0.00									4.01	3.31		0.00	4.04	
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		10									274	243		139	115	
Capacity, c (veh/h)		0									876	1088			869	
v/c Ratio											0.31	0.22			0.13	
95% Queue Length, Q_{95} (veh)											1.3	0.9			1.1	
Control Delay (s/veh)											11.0	9.3			10.6	
Level of Service, LOS											B	A			B	
Approach Delay (s/veh)										10.2						
Approach LOS		A								B						

Intersection Control Delay and LOS = 7.52 sec/veh LOS A

Table 5 Summary of Results (2023) – Intersection 2 PM

Intersection 2 - PM

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	0	0		0	1	1		0	2	0
Configuration		LT		R							T	R		LT	T	
Volume, V (veh/h)		7	0	107							175	98		10	101	
Percent Heavy Vehicles (%)		7									3	3		0	0	
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	Yes				No				Yes				No			
Median Type/Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)		0.0									6.5	6.2		7.1	6.5	
Critical Headway (sec)		0.00									6.53	6.23		7.10	6.50	
Base Follow-Up Headway (sec)		0.0									4.0	3.3		0.0	4.0	
Follow-Up Headway (sec)		0.00									4.03	3.33		0.00	4.00	
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		10									246	138		85	71	
Capacity, c (veh/h)		0									871	1081			878	
v/c Ratio											0.28	0.13			0.08	
95% Queue Length, Q_{95} (veh)											1.2	0.4			0.6	
Control Delay (s/veh)											10.7	8.8			9.9	
Level of Service, LOS											B	A			A	
Approach Delay (s/veh)									10.1							
Approach LOS	A								B				A			

Intersection Control Delay and LOS = 7.50 sec/veh LOS A

The results show that both intersections operate well with LOS B or better. Intersection 1's minor crossroad, a local street on the northbound approach, operates at capacity (LOS E) or with recurring congestion (LOS F). This street has such low volumes (3 vph and 10 vph during the morning and afternoon peak hours) that mitigation is unwarranted. Once the project is completed, it will not generate much traffic. The evaluation presented in this study considers the temporary traffic generated during construction. The other intersection approaches operate acceptably with LOS D or better.

The output is included in Appendix C.

CONSTRUCTION YEAR CONDITION (2024)

Volumes

The project's access traffic capacity analysis includes the trips generated by its construction and traffic growth on the local roadway network by 2024, the year the project should be built. A 20-year traffic growth factor of 1.30 was obtained from the PRHTA's Highway Performance Monitoring System's Log (2022) for PR-706 and PR-3. Even though this factor is high, given Puerto Rico's demographic tendencies, it was used as a conservative measure. This results in a traffic growth factor of 1.01 for the opening year (2024). The analysis of trips generated by the project's construction and the projection of traffic growth is described below.

Trip Generation

The analysis of the future condition (2024) includes the trips generated by the project's construction. The client provided a trip generation estimate of 600 daily trips (300 arriving and 300 leaving), all by heavy vehicles.

Figure 6 presents the existing trip distribution along PR-706. The same distribution was considered for the trips generated by the project's construction. Since the analysis is performed for the day's peak hours, it was assumed that 50% of the trips occur during the morning and 50% during the afternoon.

Figure 6 Existing Trip Distribution along PR-706

Projections

Equation 1 (F/P, i%, n) was used to calculate the traffic growth rate.

Equation 1 $F = P(1 + i)^n$

where: F = Future AADT
P = Present AADT

i = traffic growth rate
n = number of years in the analysis

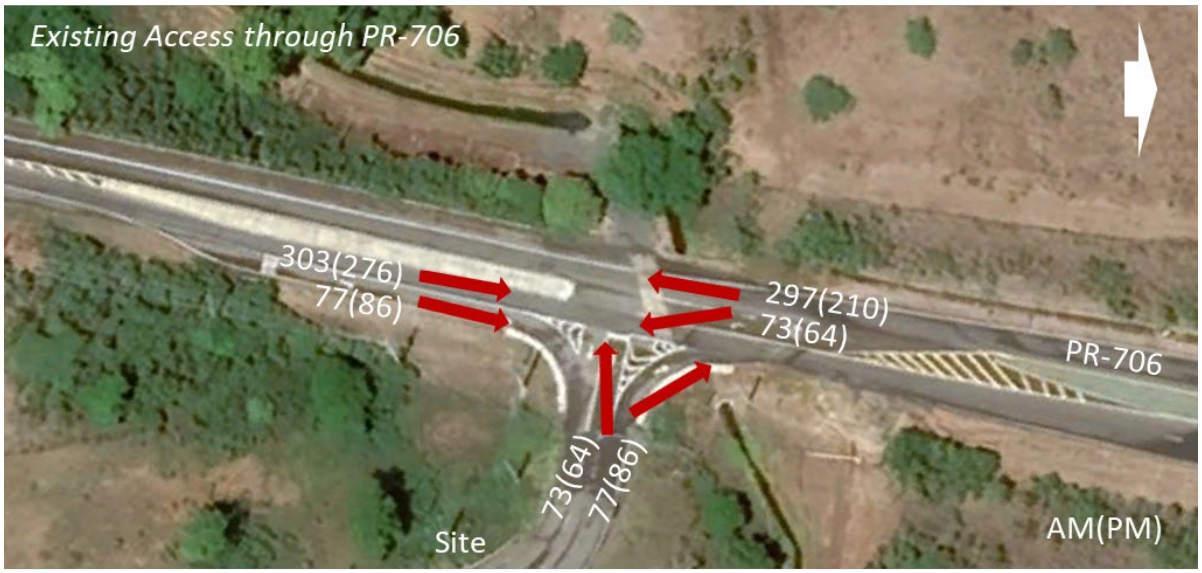


Figure 7 Trip Generation and Traffic Projections for Access to the Site (Intersection 3)

Geometry of Intersections

The geometry of intersections 1 through 3 (the existing access to the site through PR-706) will remain unchanged. The geometry of both existing accesses will stay the same.

Control of Intersections

The traffic control of intersections 1 and 2 will remain unaltered. Intersection 3 will continue to be controlled by regulatory stop signs, as shown in Figure 8. This is the access through PR-706 that will be used during construction.

Figure 8 Traffic Control of the Access through PR-706 (Intersection 3)

Capacity Analysis of Intersections

The traffic capacity analysis summary of results includes the following performance measures: flow rate, capacity, v/c ratio, 95% queue length, control delay per approach, LOS per approach, control delay per intersection, and LOS per intersection. Tables 6 to 11 present the summary of results for the AM and PM peak hours in 2024.

Table 6 Summary of Results (2024) – Intersection 1 AM

Intersection 1 – Construction Year AM

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	1
Configuration			LTR			LT		R			LTR			LT		R
Volume, V (veh/h)		298	344	1		1	253	54		2	1	0		56	0	288
Percent Heavy Vehicles (%)		4				2				0	0	0		3	3	5
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				Yes				No				Yes		
Median Type/Storage		Undivided														
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				4.2	4.2	4.2		4.2	4.2	4.2
Critical Headway (sec)		4.15				4.13				4.23	4.23	4.23		4.24	4.23	4.25
Base Follow-Up Headway (sec)		2.2				2.2				2.3	2.3	2.3		2.3	2.3	2.3
Follow-Up Headway (sec)		2.24				2.23				2.30	2.30	2.30		2.34	2.30	2.34
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		562				2					6			106		543
Capacity, c (veh/h)		1073				935					28			63		1019
v/c Ratio		0.52				0.00					0.22			1.68		0.53
95% Queue Length, Q_{95} (veh)		3.1				0.0					0.7			9.5		3.2
Control Delay (s/veh)		12.0				8.9					168.5			474.0		12.5
Level of Service, LOS		B				A					F			F		B
Approach Delay (s/veh)		10.8				0.1				168.5				87.9		
Approach LOS		B				A				F				F		

Intersection Control Delay and LOS = 28.98 sec/veh LOS D

Table 7 Summary of Results (2024) – Intersection 1 PM

Intersection 1 – Construction Year PM

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	1
Configuration			LTR			LT		R			LTR			LT		R
Volume, V (veh/h)		305	425	5		8	326	75		5	1	4		71	0	185
Percent Heavy Vehicles (%)		3				2				0	0	0		4	4	4
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				Yes				No				Yes		
Median Type/Storage		Undivided														
Critical and Follow-up Headways																
Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		508				13					17			118		308
Capacity, c (veh/h)		1020				884					60			57		977
v/c Ratio		0.50				0.01					0.28			2.06		0.32
95% Queue Length, Q_{95} (veh)		2.9				0.0					1.0			11.5		1.4
Control Delay (s/veh)		12.0				9.1					87.7			645.1		10.4
Level of Service, LOS		B				A					F			F		B
Approach Delay (s/veh)		10.8				0.3				87.7				186.2		
Approach LOS		B				A				F				F		

Intersection Control Delay and LOS = 40.19 sec/veh LOS E

Table 8 Summary of Results (2024) – Intersection 2 AM

Intersection 2 – Construction Year AM

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	0	0		0	1	1		0	2	0
Configuration		LT		R							T	R		LT	T	
Volume, V (veh/h)		6	0	200							199	181		14	170	
Percent Heavy Vehicles (%)		1									2	2		5	5	
Proportion Time Blocked																
Percent Grade (%)											0				0	
Right Turn Channelized		Yes				No					Yes				No	
Median Type/Storage				Undivided												
Critical and Follow-up Headways																
Base Critical Headway (sec)		0.0									6.5	6.2		7.1	6.5	
Critical Headway (sec)		0.00									6.51	6.21		7.15	6.55	
Base Follow-Up Headway (sec)		0.0									4.0	3.3		0.0	4.0	
Follow-Up Headway (sec)		0.00									4.01	3.31		0.00	4.04	
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		10									343	312		171	147	
Capacity, c (veh/h)		0									873	1084			869	
v/c Ratio											0.39	0.29			0.17	
95% Queue Length, Q_{95} (veh)											1.9	1.2			1.5	
Control Delay (s/veh)											11.8	9.7			11.2	
Level of Service, LOS											B	A			B	
Approach Delay (s/veh)											10.8					
Approach LOS		A									B					

Intersection Control Delay and LOS = 8.0 sec/veh LOS A

Table 9 Summary of Results (2024) – Intersection 2 PM

Intersection 2 – Construction Year PM

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	0	0		0	1	1		0	2	0
Configuration		LT		R							T	R		LT	T	
Volume, V (veh/h)		7	0	140							232	130		10	134	
Percent Heavy Vehicles (%)		7									4	4		0	0	
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		Yes				No				Yes				No		
Median Type/Storage		Undivided														
Critical and Follow-up Headways																
Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		10									327	183		109	95	
Capacity, c (veh/h)		0									869	1078			878	
v/c Ratio											0.38	0.17			0.11	
95% Queue Length, Q_{95} (veh)											1.8	0.6			0.8	
Control Delay (s/veh)											11.6	9.0			10.2	
Level of Service, LOS											B	A			B	
Approach Delay (s/veh)										10.7						
Approach LOS		A								B						

Intersection Control Delay and LOS = 8.16 sec/veh LOS A

Table 10 Summary of Results (2024) – Intersection 3 AM

Intersection 3 – Construction Year AM

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		303	77	73	297	
Peak-Hour Factor, PHF	1.00	0.92	0.92	0.92	0.92	1.00
Hourly Flow Rate, HFR (veh/h)	0	329	83	79	322	0
Percent Heavy Vehicles	0	--	--	100	--	--
Median Type	Raised curb					
RT Channelized			0			0
Lanes	0	1	1	1	1	0
Configuration		T	R	L	T	
Upstream Signal		0			0	
Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				73		77
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.92	1.00	0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0	79	0	83
Percent Heavy Vehicles	0	0	0	100	0	100
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (veh/h)		79	79		83			
C (m) (veh/h)		770	312		535			
v/c		0.10	0.25		0.16			
95% queue length		0.34	0.98		0.55			
Control Delay (s/veh)		10.2	20.4		13.0			
LOS		B	C		B			
Approach Delay (s/veh)	--	--	16.6					
Approach LOS	--	--	C					

Table 11 Summary of Results (2024) – Intersection 3 PM

Intersection 3 – Construction Year PM

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		276	86	64	210	
Peak-Hour Factor, PHF	1.00	0.92	0.92	0.92	0.92	1.00
Hourly Flow Rate, HFR (veh/h)	0	299	93	69	228	0
Percent Heavy Vehicles	0	--	--	100	--	--
Median Type	Raised curb					
RT Channelized			0			0
Lanes	0	1	1	1	1	0
Configuration		T	R	L	T	
Upstream Signal		0			0	
Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				64		86
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.92	1.00	0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0	69	0	93
Percent Heavy Vehicles	0	0	0	100	0	100
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (veh/h)		69	69		93			
C (m) (veh/h)		785	364		558			
v/c		0.09	0.19		0.17			
95% queue length		0.29	0.69		0.59			
Control Delay (s/veh)		10.0	17.2		12.7			
LOS		B	C		B			
Approach Delay (s/veh)	--	--	14.6					
Approach LOS	--	--	B					

The results of the construction year analysis reveal that Intersection 1 will operate at capacity (LOS E) during the afternoon peak hour due to the traffic increment. The other intersections will operate acceptably (LOS C or better). Since the project's construction traffic will be temporary, we do not recommend mitigation. However, the project owner could request the contractor only to use PR-

53 when traveling to the site. All construction vehicles would arrive through PR-53 to the north, not PR-3 to the south. This would alleviate traffic on Intersection 1 in the afternoon.

RESULTS

An access study was conducted for the construction of the proposed solar farm. The influence area includes two (2) intersections: PR-3 with PR-706 and PR-706 with PR-53 EB Ramps. The development will sit on a parcel that currently has two accesses: one through PR-706 and one through PR-3. No other accesses are proposed. During construction, the intersection along PR-706, which includes auxiliary lanes, will be used.

The study's primary goal was to determine the impact that the project's construction will have on the traffic capacity of the surrounding roadway network.

According to the PRHTA's guidelines, two scenarios were analyzed: existing condition (2023) and construction year (2024).

The analyses conducted show that Intersection 2 has ample capacity to carry the expected construction traffic. If the construction traffic is distributed through PR-53 and PR-3, there will be some impact to Intersection 1, especially in the afternoon. However, this condition will be temporary. Once completed, the development will have minimum effect. The land use proposed (solar farm) does not generate enough traffic to cause an impact.

CONCLUSIONS AND RECOMMENDATIONS

After evaluating the roadways within the influence area, the construction vehicles will have minimum impact. Intersection 1 will experience longer delays in the afternoon. However, since Intersection 2 has ample capacity, most construction vehicles should access the site through PR-53. Once completed, the development will have minimum effect. The land use proposed (solar farm) does not generate enough traffic to cause an impact.

The following recommendations should be implemented:

⇒ Include proper temporary control signing to alert drivers of the construction vehicles expected in and out of the site's access through PR-706.

⇒ Include retroreflective pavement markings at Intersection 3 (site's access through PR-706) as a safety measure for all users.

⇒ Contractor shall use PR-53 (to the north) to access the site while avoiding accessing the site through the south using PR-3 to connect PR-706.

CERTIFICATION OF WORK

I certify that the information presented herein is true, accurate, and complete, and that it was obtained and analyzed using the criteria of the best practice accepted by the Puerto Rico Highway and Transportation Authority and its Traffic Engineering and Operations Area.

_____

Vanessa Amado, PhD, PE
License Number 20887

APPENDIXES

Appendix A – Raw Traffic Count Data (every 15 minutes) for a 12-Hour Period Tabulated in a Spreadsheet

File Name: Int 1 - PR-3 with PR-706
Start Date: Wednesday, April 19, 2023
Start Time: 6:00 AM
Finish Time: 6:00 PM

	SB				WB				NB 1				NB 2				EB					
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	15-Min	Hourly
6:00 AM	16	0	6	0	9	49	0	0	0	0	0	0	0	0	0	0	0	37	28	0	145	145
6:15 AM	34	0	10	0	14	50	0	0	0	0	0	0	0	0	0	0	0	39	45	0	192	337
6:30 AM	41	0	4	0	12	47	1	0	0	0	0	0	1	0	1	0	4	61	50	0	222	559
6:45 AM	52	0	11	0	12	47	0	0	0	0	0	0	0	1	0	0	2	56	45	0	226	785
7:00 AM	55	0	8	0	16	43	0	0	0	0	0	0	0	0	1	0	0	55	51	0	229	869
7:15 AM	99	0	6	0	11	72	0	0	0	0	1	0	0	0	0	0	1	94	77	0	361	1038
7:30 AM	51	0	9	0	14	61	0	0	0	0	0	0	0	0	0	0	0	81	69	0	285	1101
7:45 AM	47	0	14	0	7	67	1	0	0	0	0	0	0	1	1	0	0	75	39	0	252	1127
8:00 AM	28	0	14	0	9	50	0	0	0	0	0	0	0	0	0	0	0	91	46	0	238	1136
8:15 AM	21	0	4	0	4	47	1	0	0	0	0	0	0	0	0	0	2	92	48	0	219	994
8:30 AM	34	0	11	0	9	44	0	0	0	0	1	0	1	0	0	0	0	71	33	1	205	914
8:45 AM	23	0	12	0	8	46	1	0	0	0	0	0	0	0	2	0	1	56	28	0	177	839
9:00 AM	17	0	11	0	14	62	2	0	0	0	0	0	0	0	1	0	0	60	34	1	202	803
9:15 AM	20	0	13	0	20	48	0	0	0	0	1	0	1	0	3	0	2	82	37	0	227	811
9:30 AM	20	0	11	0	16	53	2	0	1	0	0	0	0	0	0	0	0	68	24	0	195	801
9:45 AM	26	0	6	0	5	61	0	0	0	0	0	0	2	0	2	0	0	59	22	0	183	807
10:00 AM	23	0	9	0	15	66	0	0	0	0	0	0	0	0	0	0	1	79	23	0	216	821
10:15 AM	17	0	7	0	9	58	0	0	0	0	0	0	0	0	1	0	1	69	20	0	182	776
10:30 AM	23	0	4	0	17	51	1	0	0	0	0	0	1	0	1	0	0	59	25	0	182	763
10:45 AM	21	1	2	0	14	70	2	0	0	0	1	0	0	0	0	0	2	56	24	0	193	773
11:00 AM	24	1	7	0	11	62	1	0	2	0	1	0	0	0	0	0	1	73	19	0	202	759
11:15 AM	20	0	9	0	12	69	1	0	0	0	0	0	0	0	0	0	2	71	25	0	209	786
11:30 AM	22	0	8	0	12	71	2	0	1	0	0	0	0	0	0	0	2	76	38	0	232	836
11:45 AM	14	1	8	0	12	67	0	0	2	2	2	0	1	0	1	0	2	69	26	0	207	850
12:00 PM	31	0	7	0	7	66	2	0	0	1	1	0	1	0	1	0	3	83	27	0	230	878
12:15 PM	28	0	7	0	10	78	2	0	1	0	0	0	1	1	3	0	2	78	36	0	247	916
12:30 PM	21	0	4	0	9	68	1	0	0	0	1	0	0	0	0	0	1	71	32	0	208	892
12:45 PM	29	0	10	0	9	74	0	0	0	0	1	0	1	0	0	0	1	74	31	0	230	915
1:00 PM	19	0	7	0	5	59	2	0	0	1	0	0	1	0	0	0	0	79	37	0	210	895
1:15 PM	19	0	5	0	14	74	0	1	0	0	1	0	0	0	0	0	1	78	28	0	221	869
1:30 PM	17	0	14	0	10	75	1	0	0	0	1	0	0	0	2	0	0	86	27	0	233	894
1:45 PM	16	0	8	0	10	69	0	0	0	0	0	0	2	0	0	0	0	80	28	0	213	877
2:00 PM	35	0	6	0	17	68	0	0	0	1	1	0	0	0	0	0	2	91	45	0	266	933
2:15 PM	30	0	6	0	12	71	1	0	1	0	2	0	0	0	1	0	2	74	34	0	234	946
2:30 PM	34	0	11	0	9	84	1	0	0	0	0	0	1	0	3	0	1	78	37	0	259	972
2:45 PM	42	0	19	0	18	96	1	0	0	0	1	0	0	0	0	0	1	71	44	0	293	1052
3:00 PM	33	0	14	0	14	79	2	0	0	0	0	0	1	0	0	0	2	75	64	0	284	1070
3:15 PM	33	0	9	0	12	83	4	0	0	0	2	0	1	0	1	0	0	88	50	0	283	1119
3:30 PM	32	0	11	0	15	66	2	0	1	0	0	0	1	0	0	0	3	125	64	0	320	1180
3:45 PM	42	0	15	0	13	89	2	0	0	1	1	0	1	0	0	0	0	79	45	0	288	1175
4:00 PM	31	0	17	0	17	85	0	0	0	0	1	0	0	0	0	0	2	129	75	0	357	1248
4:15 PM	31	0	11	0	13	77	1	0	0	0	1	0	0	0	0	0	3	80	52	0	269	1234
4:30 PM	45	0	13	0	11	75	1	0	1	0	0	0	1	0	0	0	1	73	41	0	262	1176
4:45 PM	42	0	13	0	12	69	1	0	1	0	0	0	1	0	0	0	0	87	41	0	267	1155
5:00 PM	49	0	9	0	9	77	3	0	0	0	0	0	1	0	0	0	0	61	37	0	246	1044
5:15 PM	33	0	7	0	8	73	0	0	0	1	1	0	1	0	1	0	3	59	37	0	224	999
5:30 PM	38	0	19	0	5	62	1	0	0	0	2	0	0	0	0	0	0	62	34	0	223	960
5:45 PM	38	0	8	0	7	56	0	0	1	0	0	0	1	0	1	0	2	60	35	0	209	902

File Name: Int 2 - PR-706 with PR-53 EB Ramps
Start Date: Wednesday, April 19, 2023
Start Time: 6:00 AM
Finish Time: 6:00 PM

	SB				WB				NB				EB					
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	15-Min	Hourly
6:00 AM	0	14	1	0	0	0	0	0	5	29	0	0	13	0	1	0	63	63
6:15 AM	0	16	1	0	0	0	0	0	14	46	0	0	25	0	1	0	103	166
6:30 AM	0	23	2	0	0	0	0	0	16	44	0	0	28	0	0	0	113	279
6:45 AM	0	23	6	1	0	0	0	0	25	33	0	0	40	0	0	0	128	407
7:00 AM	0	34	3	0	0	0	0	0	23	35	0	0	35	0	2	0	132	476
7:15 AM	0	43	2	0	0	0	0	0	53	36	0	0	54	0	0	0	188	561
7:30 AM	0	33	2	0	0	0	0	0	40	55	0	0	32	0	4	0	166	614
7:45 AM	0	23	3	1	0	0	0	0	24	27	0	0	30	0	0	0	108	594
8:00 AM	0	21	3	0	0	0	0	0	15	32	0	0	13	0	5	0	89	551
8:15 AM	0	11	2	0	0	0	0	0	28	30	0	0	22	0	3	0	96	459
8:30 AM	0	23	2	0	0	0	0	0	17	24	0	0	18	0	4	0	88	381
8:45 AM	0	18	2	0	0	0	0	0	15	25	0	0	23	0	0	0	83	356
9:00 AM	0	15	1	0	0	0	0	0	20	25	0	0	11	0	2	0	74	341
9:15 AM	0	16	3	0	0	0	0	0	25	40	0	0	20	0	4	0	108	353
9:30 AM	0	18	2	0	0	0	0	0	8	25	0	0	12	0	1	0	66	331
9:45 AM	0	20	2	0	0	0	0	0	11	23	0	0	16	0	2	0	74	322
10:00 AM	0	12	3	0	0	0	0	0	9	23	0	0	11	0	4	0	62	310
10:15 AM	0	8	1	0	0	0	0	0	14	23	0	0	14	0	3	0	63	265
10:30 AM	0	15	3	0	0	0	0	0	12	23	0	0	13	0	3	0	69	268
10:45 AM	0	14	1	0	0	0	0	0	13	26	0	0	7	0	1	0	62	256
11:00 AM	0	21	0	0	0	0	0	0	10	19	0	0	12	0	0	0	62	256
11:15 AM	0	12	0	0	0	0	0	0	14	19	0	0	17	0	1	0	63	256
11:30 AM	0	13	0	0	0	0	0	0	18	34	0	0	14	0	3	0	82	269
11:45 AM	0	18	0	0	0	0	0	0	18	18	0	0	10	1	2	0	67	274
12:00 PM	0	20	0	0	0	0	0	0	19	24	0	0	10	0	2	0	75	287
12:15 PM	0	17	1	0	0	0	0	0	17	27	0	0	16	0	3	0	81	305
12:30 PM	0	15	3	0	0	0	0	0	10	28	0	0	14	0	3	0	73	296
12:45 PM	0	17	1	0	0	0	0	0	16	26	0	0	17	1	0	0	78	307
1:00 PM	0	19	5	0	0	0	0	0	15	21	0	0	11	0	5	0	76	308
1:15 PM	0	10	2	0	0	0	0	0	15	30	0	0	10	1	2	0	70	297
1:30 PM	0	15	0	0	0	0	0	0	13	22	0	0	17	0	6	0	73	297
1:45 PM	0	14	3	0	0	0	0	0	19	24	0	0	11	0	6	0	77	296
2:00 PM	0	25	1	0	0	0	0	0	19	37	0	0	15	0	5	0	102	322
2:15 PM	0	22	3	0	0	0	0	0	24	25	0	0	13	0	0	0	87	339
2:30 PM	0	27	4	0	0	0	0	0	21	32	0	0	23	0	10	0	117	383
2:45 PM	0	29	0	0	0	0	0	0	26	30	0	0	26	0	4	0	115	421
3:00 PM	0	30	3	0	0	0	0	0	22	55	0	0	19	0	1	0	130	449
3:15 PM	0	31	2	0	0	0	0	0	23	36	0	0	13	0	2	0	107	469
3:30 PM	0	15	0	0	0	0	0	0	33	46	0	0	21	0	3	0	118	470
3:45 PM	0	26	3	0	0	0	0	0	20	38	0	0	32	0	1	0	120	475
4:00 PM	0	22	1	0	0	0	0	0	34	56	0	0	26	0	2	0	141	486
4:15 PM	0	17	4	0	0	0	0	0	25	49	0	0	17	0	1	0	113	492
4:30 PM	0	36	2	0	0	0	0	0	19	32	0	0	32	0	3	0	124	498
4:45 PM	0	24	4	0	0	0	0	0	18	34	0	0	29	0	3	0	112	490
5:00 PM	0	38	2	0	0	0	0	0	16	33	0	0	17	0	3	0	109	458
5:15 PM	0	22	0	0	0	0	0	0	21	27	0	0	18	1	4	0	93	438
5:30 PM	0	24	2	0	0	0	0	0	16	25	0	0	26	0	6	0	99	413
5:45 PM	0	28	0	0	0	0	0	0	11	29	0	0	26	0	3	0	97	398

Appendix B – Pictures of Intersections

Photo 1 Eastbound Approach - Intersection 1

Photo 2 Northbound Approach - Intersection 1

Photo 3 Westbound Approach - Intersection 1

Photo 4 Southbound Approach - Intersection 1

Photo 5 Southbound Approach - Intersection 2

Photo 6 Eastbound Approach - Intersection 2

Photo 7 Northbound Approach - Intersection 2

Appendix C – Results (HCS2010)

HCS 2010 Two-Way Stop-Control Report

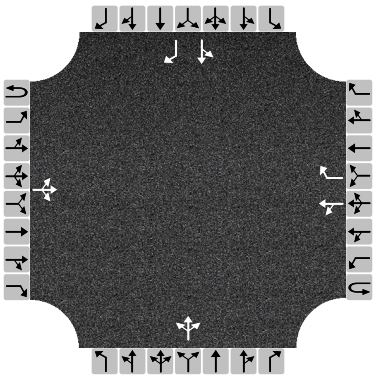
General Information

Analyst	A Torres
Agency/Co.	VAGtec
Date Performed	5/3/2023
Analysis Year	2023
Time Analyzed	7:15 a.m.
Intersection Orientation	East-West
Project Description	Int. 1 - Existing 2023 am

Site Information

Intersection	PR-3 & PR-706
Jurisdiction	Salinas
East/West Street	PR-3
North/South Street	PR-706
Peak Hour Factor	0.53
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	1
Configuration			LTR			LT		R			LTR			LT		R
Volume, V (veh/h)		231	341	1		1	250	41		2	1	0		43	0	225
Percent Heavy Vehicles (%)		3				2				0	0	0		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				Yes				No				Yes		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		436				2					6			81		425
Capacity, c (veh/h)		1084				940					74			131		1041
v/c Ratio		0.40				0.00					0.08			0.62		0.41
95% Queue Length, Q_{95} (veh)		2.0				0.0					0.3			3.2		2.0
Control Delay (s/veh)		10.5				8.8					57.7			69.6		10.8
Level of Service, LOS		B				A					F			F		B
Approach Delay (s/veh)		8.2				0.1				57.7				20.2		
Approach LOS										F				C		

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HCS 2010 Two-Way Stop-Control Report

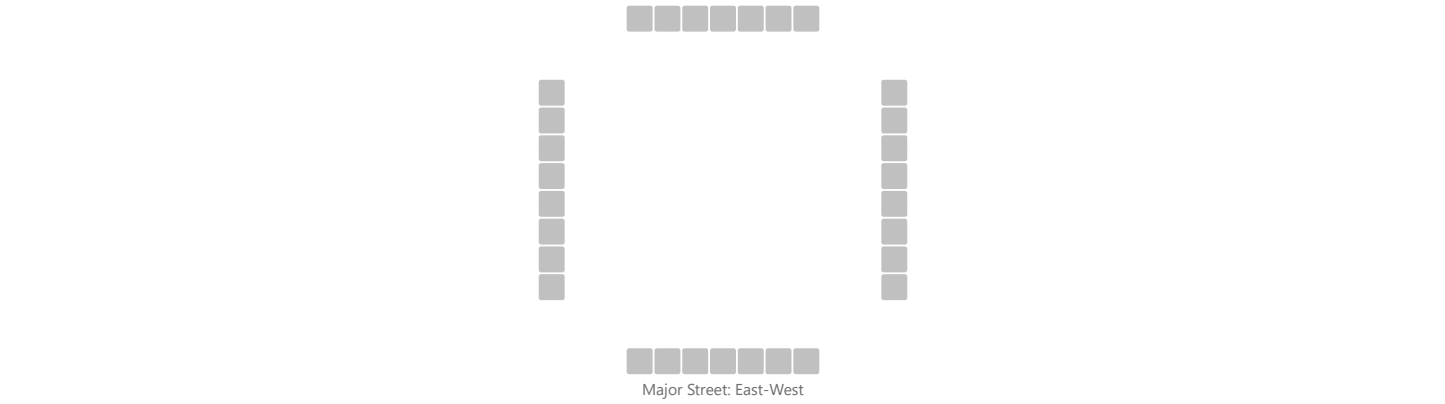
General Information

Analyst	A Torres
Agency/Co.	VAGtec
Date Performed	5/3/2023
Analysis Year	2023
Time Analyzed	3:15 p.m.
Intersection Orientation	East-West
Project Description	Int. 1 - Existing 2023 pm

Site Information

Intersection	PR-3 & PR-706
Jurisdiction	Salinas
East/West Street	PR-3
North/South Street	PR-706
Peak Hour Factor	0.60
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	1
Configuration			LTR			LT		R			LTR			LT		R
Volume, V (veh/h)		234	421	5		8	323	57		5	1	4		52	0	138
Percent Heavy Vehicles (%)		3				0				3	3	3		4	4	4
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				Yes				No				Yes		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				4.2	4.2	4.2		4.2	4.2	4.2
Critical Headway (sec)		4.13				4.10				4.23	4.23	4.23		4.24	4.24	4.24
Base Follow-Up Headway (sec)		2.2				2.2				2.3	2.3	2.3		2.3	2.3	2.3
Follow-Up Headway (sec)		2.23				2.20				2.30	2.30	2.30		2.30	2.30	2.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		390				13					17			87		230
Capacity, c (veh/h)		1024				899					137			119		982
v/c Ratio		0.38				0.01					0.12			0.73		0.23
95% Queue Length, Q_{95} (veh)		1.8				0.0					0.4			4.0		0.9
Control Delay (s/veh)		10.7				9.1					35.0			90.6		9.8
Level of Service, LOS		B				A					E			F		A
Approach Delay (s/veh)		8.1				0.4				35.0				32.0		
Approach LOS										E				D		

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HCS 2010 Two-Way Stop-Control Report

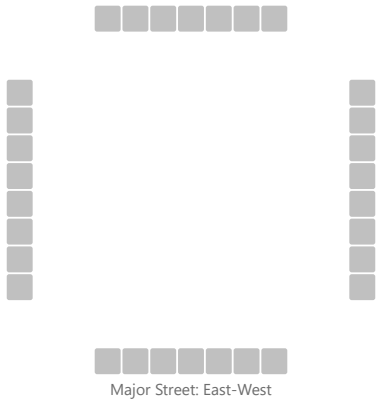
General Information

Analyst	A Torres
Agency/Co.	VAGtec
Date Performed	5/3/2023
Analysis Year	2023
Time Analyzed	6:45 a.m.
Intersection Orientation	East-West
Project Description	Int. 2 - Existing 2023 am

Site Information

Intersection	PR-53 & PR-706
Jurisdiction	Salinas
East/West Street	PR-53
North/South Street	PR-706
Peak Hour Factor	0.58
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	0	0		0	1	1		0	2	0
Configuration		LT		R							T	R		LT	T	
Volume, V (veh/h)		6	0	161							159	141		14	133	
Percent Heavy Vehicles (%)		1									1	1		5	5	
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		Yes				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		0.0									6.5	6.2		7.1	6.5	
Critical Headway (sec)		0.00									6.51	6.21		7.15	6.55	
Base Follow-Up Headway (sec)		0.0									4.0	3.3		0.0	4.0	
Follow-Up Headway (sec)		0.00									4.01	3.31		0.00	4.04	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10									274	243		139	115	
Capacity, c (veh/h)		0									876	1088			869	
v/c Ratio											0.31	0.22			0.13	
95% Queue Length, Q_{95} (veh)											1.3	0.9			1.1	
Control Delay (s/veh)											11.0	9.3			10.6	
Level of Service, LOS											B	A			B	
Approach Delay (s/veh)										10.2						
Approach LOS										B						

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HCS 2010 Two-Way Stop-Control Report

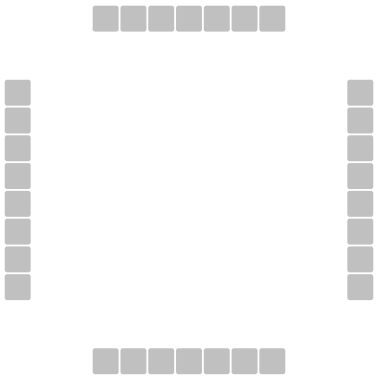
General Information

Analyst	A Torres
Agency/Co.	VAGtec
Date Performed	5/3/2023
Analysis Year	2023
Time Analyzed	3:45 p.m.
Intersection Orientation	East-West
Project Description	Int. 2 - Existing 2023 pm

Site Information

Intersection	PR-53 & PR-706
Jurisdiction	Salinas
East/West Street	PR-53
North/South Street	PR-706
Peak Hour Factor	0.71
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	0	0		0	1	1		0	2	0
Configuration		LT		R							T	R		LT	T	
Volume, V (veh/h)		7	0	107							175	98		10	101	
Percent Heavy Vehicles (%)		7									3	3		0	0	
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		Yes				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		0.0									6.5	6.2		7.1	6.5	
Critical Headway (sec)		0.00									6.53	6.23		7.10	6.50	
Base Follow-Up Headway (sec)		0.0									4.0	3.3		0.0	4.0	
Follow-Up Headway (sec)		0.00									4.03	3.33		0.00	4.00	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10									246	138		85	71	
Capacity, c (veh/h)		0									871	1081			878	
v/c Ratio											0.28	0.13			0.08	
95% Queue Length, Q_{95} (veh)											1.2	0.4			0.6	
Control Delay (s/veh)											10.7	8.8			9.9	
Level of Service, LOS											B	A			A	
Approach Delay (s/veh)										10.1						
Approach LOS										B						

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HCS 2010 Two-Way Stop-Control Report

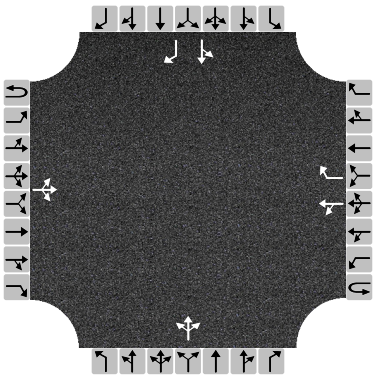
General Information

Analyst	A Torres
Agency/Co.	VAGtec
Date Performed	5/3/2023
Analysis Year	2023
Time Analyzed	7:15 a.m.
Intersection Orientation	East-West
Project Description	Int. 1 - Construction 2024 am

Site Information

Intersection	PR-3 & PR-706
Jurisdiction	Salinas
East/West Street	PR-3
North/South Street	PR-706
Peak Hour Factor	0.53
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	1
Configuration			LTR			LT		R			LTR			LT		R
Volume, V (veh/h)		298	344	1		1	253	54		2	1	0		56	0	288
Percent Heavy Vehicles (%)		4				2				0	0	0		3	3	5
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				Yes				No				Yes		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				4.2	4.2	4.2		4.2	4.2	4.2
Critical Headway (sec)		4.15				4.13				4.23	4.23	4.23		4.24	4.23	4.25
Base Follow-Up Headway (sec)		2.2				2.2				2.3	2.3	2.3		2.3	2.3	2.3
Follow-Up Headway (sec)		2.24				2.23				2.30	2.30	2.30		2.34	2.30	2.34

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		562				2					6			106		543
Capacity, c (veh/h)		1073				935					28			63		1019
v/c Ratio		0.52				0.00					0.22			1.68		0.53
95% Queue Length, Q_{95} (veh)		3.1				0.0					0.7			9.5		3.2
Control Delay (s/veh)		12.0				8.9					168.5			474.0		12.5
Level of Service, LOS		B				A					F			F		B
Approach Delay (s/veh)		10.8				0.1					168.5			87.9		
Approach LOS											F			F		

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HCS 2010 Two-Way Stop-Control Report

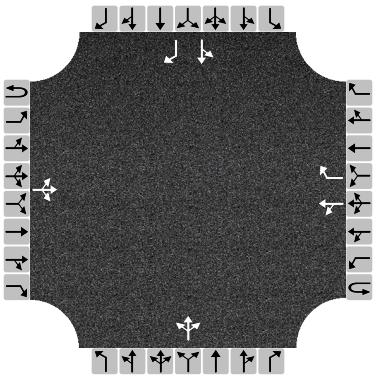
General Information

Analyst	A Torres
Agency/Co.	VAGtec
Date Performed	5/3/2023
Analysis Year	2023
Time Analyzed	3:15 p.m.
Intersection Orientation	East-West
Project Description	Int. 1 - Construction 2024 pm

Site Information

Intersection	PR-3 & PR-706
Jurisdiction	Salinas
East/West Street	PR-3
North/South Street	PR-706
Peak Hour Factor	0.60
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	1
Configuration			LTR			LT		R			LTR			LT		R
Volume, V (veh/h)		305	425	5		8	326	75		5	1	4		71	0	185
Percent Heavy Vehicles (%)		3				2				0	0	0		4	4	4
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				Yes				No				Yes		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		508				13					17			118		308
Capacity, c (veh/h)		1020				884					60			57		977
v/c Ratio		0.50				0.01					0.28			2.06		0.32
95% Queue Length, Q_{95} (veh)		2.9				0.0					1.0			11.5		1.4
Control Delay (s/veh)		12.0				9.1					87.7			645.1		10.4
Level of Service, LOS		B				A					F			F		B
Approach Delay (s/veh)		10.8				0.3					87.7			186.2		
Approach LOS											F			F		

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HCS 2010 Two-Way Stop-Control Report

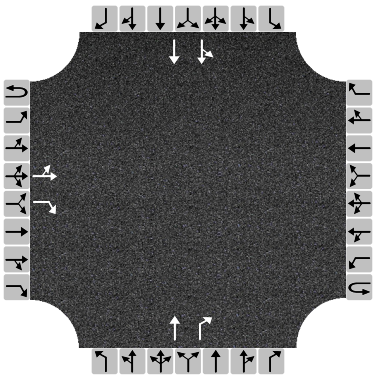
General Information

Analyst	A Torres
Agency/Co.	VAGtec
Date Performed	5/3/2023
Analysis Year	2023
Time Analyzed	6:45 a.m.
Intersection Orientation	East-West
Project Description	Int. 2 - Construction 2024 am

Site Information

Intersection	PR-53 & PR-706
Jurisdiction	Salinas
East/West Street	PR-53
North/South Street	PR-706
Peak Hour Factor	0.58
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	0	0		0	1	1		0	2	0
Configuration		LT		R							T	R		LT	T	
Volume, V (veh/h)		6	0	200							199	181		14	170	
Percent Heavy Vehicles (%)		1									2	2		5	5	
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		Yes				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		0.0									6.5	6.2		7.1	6.5	
Critical Headway (sec)		0.00									6.51	6.21		7.15	6.55	
Base Follow-Up Headway (sec)		0.0									4.0	3.3		0.0	4.0	
Follow-Up Headway (sec)		0.00									4.01	3.31		0.00	4.04	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10									343	312		171	147	
Capacity, c (veh/h)		0									873	1084			869	
v/c Ratio											0.39	0.29			0.17	
95% Queue Length, Q_{95} (veh)											1.9	1.2			1.5	
Control Delay (s/veh)											11.8	9.7			11.2	
Level of Service, LOS											B	A			B	
Approach Delay (s/veh)										10.8						
Approach LOS										B						

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HCS 2010 Two-Way Stop-Control Report

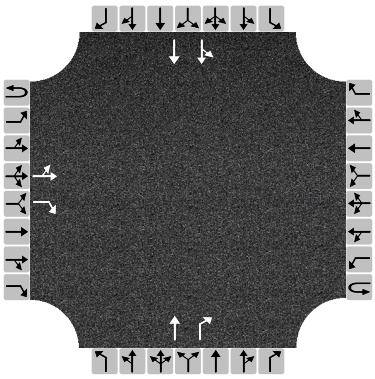
General Information

Analyst	A Torres
Agency/Co.	VAGtec
Date Performed	5/3/2023
Analysis Year	2023
Time Analyzed	3:45 p.m.
Intersection Orientation	East-West
Project Description	Int. 2 - Construction 2024 pm

Site Information

Intersection	PR-53 & PR-706
Jurisdiction	Salinas
East/West Street	PR-53
North/South Street	PR-706
Peak Hour Factor	0.71
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	0	0		0	1	1		0	2	0
Configuration		LT		R							T	R		LT	T	
Volume, V (veh/h)		7	0	140							232	130		10	134	
Percent Heavy Vehicles (%)		7									4	4		0	0	
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		Yes				No				Yes				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10									327	183		109	95	
Capacity, c (veh/h)		0									869	1078			878	
v/c Ratio											0.38	0.17			0.11	
95% Queue Length, Q_{95} (veh)											1.8	0.6			0.8	
Control Delay (s/veh)											11.6	9.0			10.2	
Level of Service, LOS											B	A			B	
Approach Delay (s/veh)										10.7						
Approach LOS										B						

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*VAMADO*
Agency/Co.	*PMG*
Date Performed	*5/31/2023*
Analysis Time Period	*AM*

Site Information

Intersection	*Intersection 3*
Jurisdiction	*Salinas*
Analysis Year	*2024*

Project Description *Intersection 3 - Construction Year AM*

East/West Street: *Site Access* | North/South Street: *PR-706*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*303*	*77*	*73*	*297*	
Peak-Hour Factor, PHF	*1.00*	*0.92*	*0.92*	*0.92*	*0.92*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*329*	*83*	*79*	*322*	*0*
Percent Heavy Vehicles	*0*	--	--	*100*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*1*	*1*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*73*		*77*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.92*	*1.00*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*79*	*0*	*83*
Percent Heavy Vehicles	*0*	*0*	*0*	*100*	*0*	*100*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*79*	*79*		*83*			
C (m) (veh/h)		*770*	*312*		*535*			
v/c		*0.10*	*0.25*		*0.16*			
95% queue length		*0.34*	*0.98*		*0.55*			
Control Delay (s/veh)		*10.2*	*20.4*		*13.0*			
LOS		*B*	*C*		*B*			
Approach Delay (s/veh)	--	--	*16.6*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*VAMADO*
Agency/Co.	*PMG*
Date Performed	*5/31/2023*
Analysis Time Period	*PM*

Site Information

Intersection	*Intersection 3*
Jurisdiction	*Salinas*
Analysis Year	*2024*

Project Description *Intersection 3 - Construction Year PM*

East/West Street: *Site Access* | North/South Street: *PR-706*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*276*	*86*	*64*	*210*	
Peak-Hour Factor, PHF	*1.00*	*0.92*	*0.92*	*0.92*	*0.92*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*299*	*93*	*69*	*228*	*0*
Percent Heavy Vehicles	*0*	--	--	*100*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*1*	*1*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*64*		*86*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.92*	*1.00*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*69*	*0*	*93*
Percent Heavy Vehicles	*0*	*0*	*0*	*100*	*0*	*100*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*69*	*69*		*93*			
C (m) (veh/h)		*785*	*364*		*558*			
v/c		*0.09*	*0.19*		*0.17*			
95% queue length		*0.29*	*0.69*		*0.59*			
Control Delay (s/veh)		*10.0*	*17.2*		*12.7*			
LOS		*B*	*C*		*B*			
Approach Delay (s/veh)	--	--	*14.6*					
Approach LOS	--	--	*B*					

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