Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Cidra									
5L	L	4	848	100	0.005	12.2	0.69	0.0	0.07
2T	T	513	1900	100	0.270	0.7	0.08	0.0	4.78
East: PR-172 Desde Caguas									
6T	T	585	1775	100	0.330	0.7	0.08	0.0	5.45
6R	R	24	73	100	0.329	9.5	0.70	0.0	0.36
North: Farmaceutica GSK									
7L	L	141	156	100	0.904	95.9	1.16	10.0	8.76
4R	R	24	26	100	0.923*	95.9	1.18	10.0	1.50

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra							
5L	L	0.3	0.85	0.001	0.07	0.002	0.7
2T	T	23.8	74.99	0.077	1.35	0.115	59.5
		24.1	75.84	0.079	1.41	0.117	60.3
East: PR-172 Desde Caguas							
6T	T	27.2	85.58	0.088	1.54	0.132	68.0
6R	R	1.7	4.86	0.008	0.37	0.011	4.3
		28.9	90.44	0.096	1.91	0.143	72.3
North: Farmaceutica GSK							
7L	L	15.4	68.14	0.075	2.55	0.077	38.5
4R	R	2.6	11.60	0.013	0.43	0.013	6.6
		18.0	79.75	0.088	2.98	0.091	45.0
INTERSECTION:		71.0	246.03	0.263	6.30	0.351	177.7

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay [sec]	Eff. Stop Rate	Queue 95% Back (vehs)	Queue 95% Back (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 L	4	848	0.005	12.2	0.69	0.0	0.0	45.0T
2 T	513	1900	0.270	0.7	0.08	0.0	0.0	500.0
East: PR-172 Desde Caguas								
1 TR	609	1848	0.330	1.1	0.10	0.0	0.0	500.0
North: Farmaceutica GSK								
1 LR	165	182	0.906	95.9	1.16	10.0	5.0	500.0

T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 L	4	0	0	4	4	848	0.005	100
2 T	0	513	0	513	513	1900	0.270	100
East: PR-172 Desde Caguas								
1 TR	0	585	24	609	609	1848	0.330	100
North: Farmaceutica GSK								
1 LR	141	0	24	165	120	182	0.906	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

	141	0	24	165	0		0.906	95.9	5

ALL VEHICLES	Total Flow	% HV	Max X	Aver. Delay	Max Queue
	1291	2	0.923	13.1	5

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Nota: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
5L	L	4	848	0.005	12.2	B	0.0	0
2T	T	513	1900	0.270	0.7	A	0.0	0
East: PR-172 Desde Caguas								
6T	T	585	1775	0.330	0.7	A	0.0	0
6R	R	24	73	0.329	9.5	A	0.0	0
North: Farmaceutica GSK								
7L	L	141	156	0.904	95.9	F	10.0	5
4R	R	24	26	0.923*	95.9	F	10.0	5
ALL VEHICLES:		1291		0.923	13.1	NA	10.0	5

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
5L L	12.1	0.34	0.543	26.75	0.797	303.1
2T T	7.4	0.23	0.241	4.20	0.360	185.6
	7.5	0.23	0.244	4.37	0.363	186.5
East: PR-172 Desde Caguas						
6T T	7.4	0.23	0.241	4.20	0.360	185.9
6R R	11.5	0.33	0.512	25.09	0.764	291.2
	7.6	0.24	0.252	5.02	0.376	190.0
North: Farmaceutica GSK						
7L L	17.6	0.78	0.865	29.21	0.887	441.1
4R R	17.6	0.78	0.862	29.10	0.886	440.4
	17.6	0.78	0.864	29.19	0.887	441.0
INTERSECTION:	8.8	0.31	0.326	7.82	0.435	220.4

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra												
1 L	4			4	0				0.005	12.2	0	45
2 T		513		513	2				0.270	0.7	0	500
	4	513	0	517	2				0.270	0.8	0	
East: PR-172 Desde Caguas												
1 TR		585	24	609	2				0.330	1.1	0	500
	0	585	24	609	2				0.330	1.1		
North: Farmaceutica GSK												
1 LR	141		24	165	0				0.906	95.9	5	500

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Desde Cidra								
	East	Thru	S	65.0	11.1	500	127	No
	North	Left	7.4	18.0	11.7	500	117	No
East: PR-172 Desde Caguas								
	West	Thru	S	65.0	11.1	500	128	No
	North	Right	10.0	20.2	15.7	500	120	No
North: Farmaceutica GSK								
	West	Right	10.0	20.2	15.7	500	120	No
	East	Left	9.0	19.4	14.2	500	119	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	Stop-line Delay 2nd d2	Stop-line Delay Total dSL	Acc. Dec. dn	Queuing Total dq	Queuing MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
		Delay (seconds/veh)								
West: PR-172 Desde Cidra										
1 L	0.005	2.6	0.0	2.6	2.0	0.6	0.0	0.6	9.6	12.2
2 T	0.270	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
East: PR-172 Desde Caguas										
1 TR	0.330	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
North: Farmaceutica GSK										
1 LR	0.905	19.8	71.1	90.9	2.0	88.9	3.7	85.3	5.0	95.9

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

	Deg.	-- Effective Stop Rate --			Prop.	Queue Move-up

Lane No.	Satn x	he1	he2	Geom. hig	Overall h	Queued pq	Rate hqm
West: PR-172 Desde Cidra							
1 L	0.005	0.35	0.00	0.34	0.69	0.525	0.00
2 T	0.270	0.00	0.00	0.08	0.08	0.000	0.00
East: PR-172 Desde Caguas							
1 TR	0.330	0.00	0.00	0.10	0.10	0.000	0.00
North: Farmaceutica GSK							
1 LR	0.906	0.97	0.16	0.03	1.16	0.973	2.31

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
2 T	0.270	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											
1 TR	0.330	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	0.906	2.2	1.4	2.0	3.4	5.6	7.0	8.0	10.0	11.7	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
2 T	0.270	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											

1 TR	0.330	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	0.906	1.1	0.7	1.0	1.7	2.8	3.5	4.0	5.0	5.9	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
5L L	72.0	18.0	18.0	65.0			51.7	51.0	9.6
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
East: PR-172 Desde Caguas									
6T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
6R R	72.0	20.2	20.2	65.0			54.3	54.3	9.5
North: Farmaceutica GSK									
7L L	72.0	0.0	19.4	65.0	3.1		47.8	16.9	5.0
4R R	72.0	0.0	20.2	65.0	3.8		47.1	16.9	5.0

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
5L L	Normal	609	4.10	2.20	2.0
East: PR-172 Desde Caguas					
No opposed movements on this approach					
North: Farmaceutica GSK					
7L L	Normal	1114+	7.50	3.50	2.0
4R R	Normal	597+	6.90	3.30	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
+ Percentage of exiting flow included in total opposing flow

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:59:32PM

SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2006 AM * 200303~1

Interseccion PR-172 @ Camino San Jose

Performance Measure	Vehicles	Persons
Demand Flows - Total	1452 veh/h	1742 pers/h
Percent Heavy Vehicles	2.4 %	
Degree of Saturation	0.484	
Effective Intersection Capacity	3003 veh/h	
95% Back of Queue (m)	5 m	
95% Back of Queue (veh)	6.8 veh	
Control Delay (Total)	2.51 veh-h/h	3.01 pers-h/h
Control Delay (Average)	6.2 s/veh	6.2 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS F	
Total Effective Stops	154 veh/h	185 pers/h
Effective Stop Rate	0.11 per veh	0.11 per pers
Proportion Queued	0.43	0.43
Travel Distance (Total)	907.4 veh-km/h	1088.9 pers-km/h
Travel Distance (Average)	625 m	625 m
Travel Time (Total)	15.7 veh-h/h	18.8 pers-h/h
Travel Time (Average)	38.9 secs	38.9 secs
Travel Speed	57.9 km/h	57.9 km/h
Operating Cost (Total)	269 $/h	269 $/h
Fuel Consumption (Total)	91.8 L/h	
Carbon Dioxide (Total)	229.8 kg/h	
Hydrocarbons (Total)	0.357 kg/h	
Carbon Monoxide (Total)	14.19 kg/h	
NOX (Total)	0.543 kg/h	

SIDRA SOLUTIONS

A1587, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 02:17:33PM

SIDRA INTERSECTION

Movement Summary

Bosques de Cidra Escenario 2006 AM * 200303~1

Interseccion PR-172 @ Camino San Jose

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Camino San Jose										
3L	L	44	0.0	0.484	50.1	LOS F	1	0.91	1.05	25.8
8R	R	28	0.0	0.483	50.1	LOS F	1	0.91	1.07	25.8
Approach		**72**	**0.0**	**0.485**	**50.1**	**LOS F**	**1**	**0.91**	**1.06**	**25.8**
PR-172 Desde Caguas										
1L	L	4	0.0	0.364	16.0	LOS C	5	0.86	0.99	46.9
6T	T	653	3.5	0.361	7.1	LOS A	5	0.86	0.01	55.9
Approach		**657**	**3.5**	**0.361**	**7.2**	**LOS A**	**5**	**0.86**	**0.02**	**55.8**
PR-172 Desde Cidra										
2T	T	704	1.7	0.389	0.7	LOS A	0	0.00	0.08	69.1
2R	R	20	0.0	0.392	9.5	LOS A	0	0.00	0.70	54.3
Approach		**723**	**1.7**	**0.389**	**1.0**	**LOS A**		**0.00**	**0.09**	**68.6**
All Vehicles		**1452**	**2.4**	**0.484**	**6.2**	**Not Applicable**	**5**	**0.43**	**0.11**	**57.9**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 02:17:33PM

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left		Through		Right	
	LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
2T T	0	0	691	12	0	0
2R R	0	0	0	0	20	0
South: Camino San Jose						
3L L	44	0	0	0	0	0
8R R	0	0	0	0	28	0
East: PR-172 Desde Caguas						
1L L	4	0	0	0	0	0
6T T	0	0	630	23	0	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left		Through		Right	
	Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
2T T	0	0.0	703	1.7	0	0.0
2R R	0	0.0	0	0.0	20	0.0
South: Camino San Jose						
3L L	44	0.0	0	0.0	0	0.0
8R R	0	0.0	0	0.0	28	0.0
East: PR-172 Desde Caguas						
1L L	4	0.0	0	0.0	0	0.0
6T T	0	0.0	653	3.5	0	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2006 AM * 200303~1

Interseccion PR-172 @ Camino San Jose

Run Information

* Basic Parameters:
Intersection Type: Unsignalised - Two-Way Stop Control
Driving on the right-hand side of the road
Input data specified in Metric units
Model Defaults: US HCM (Metric)
Peak Flow Period (for performance): 15 minutes
Unit time (for volumes): 60 minutes.
Delay definition: Control delay
Geometric delay included
HCM Delay Model option selected
HCM Queue Model option selected
Level of Service based on: Delay (HCM method)
Queue definition: Back of queue, 95th Percentile

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-272 Desde Cidra							
	South	2R	Right	20	0	1.00	0.45
	East	2T	Thru	691	12	1.00	0.82
South: Camino San Jose							
	West	3L	Left	44	0	1.00	0.43
	East	8R	Right	28	0	1.00	0.64
East: PR-172 Desde Caguas							
	West	6T	Thru	630	23	1.00	0.90
	South	1L	Left	4	0	1.00	0.90

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
2T T	0.15	0.17	0.7	0.00	0.08	0.0	0	6.55	69.1
2R R	0.05	0.06	9.5	0.00	0.70	0.0	0	0.30	54.3
South: Camino San Jose									
3L L	0.61	0.74	50.1	0.91	1.05	2.8	1	1.79	25.8
8R R	0.39	0.47	50.1	0.91	1.07	2.8	1	1.14	25.8
East: PR-172 Desde Caguas									
1L L	0.02	0.02	16.0	0.86	0.99	6.8	5	0.09	46.9
6T T	1.29	1.55	7.1	0.86	0.01	6.8	5	9.23	55.9

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
723	0.392	0.20	0.24	1.0	0.00	0.09	0	6.85	68.6
South: Camino San Jose									
72	0.484	1.00	1.20	50.1	0.91	1.06	1	2.93	25.8
East: PR-172 Desde Caguas									
657	0.364	1.31	1.57	7.2	0.86	0.02	5	9.32	55.8
ALL VEHICLES:									
1452	0.484	2.51	3.01	6.2	0.43	0.11	5	19.10	57.9
INTERSECTION (persons):									
1742	0.484		3.01	6.2	0.43	0.11		19.10	57.9

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
2T T	703	1.7	0			1809	0.80	106	100	0.389
2R R	20	0.0	0			51	0.80	104	100	0.392
South: Camino San Jose										
3L L	44	0.0	1370+	2.6	1378	91	0.80	65	100	0.484*
8R R	28	0.0	713+	1.7	713	58	0.80	66	100	0.483
East: PR-172 Desde Caguas										
1L L	4	0.0	703	1.7	703	11	0.80	120	100	0.364
6T T	653	3.5	0			1808	0.80	122	100	0.361

\+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	F
Average intersection delay (s)	=	6.2
Largest average movement delay (s)	=	50.1
Largest back of queue, 95% (m)	=	5
Performance Index	=	19.10
Degree of saturation (highest)	=	0.484
Practical Spare Capacity (lowest)	=	65 %
Effective intersection capacity, (veh/h)	=	3003
Total vehicle flow (veh/h)	=	1452
Total person flow (pers/h)	=	1742
Total vehicle delay (veh-h/h)	=	2.51
Total person delay (pers-h/h)	=	3.01
Total effective vehicle stops (veh/h)	=	154
Total effective person stops (pers/h)	=	185
Total vehicle travel (veh-km/h)	=	907.4
Total cost ($/h)	=	269.20
Total fuel (L/h)	=	91.8
Total CO2 (kg/h)	=	229.82

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table 8.15 or Movement Displays for individual movement LOS values.

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 TR	723	1860	0.389	1.0	0.09	0.0	0.0	500.0
South: Camino San Jose								
1 LR	72	149	0.485	50.1	1.05	2.8	1.4	500.0
East: PR-172 Desde Caguas								
1 LT	657	1819	0.361	7.2	0.02	6.8	4.7	500.0

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 TR	0	703	20	723	723	1860	0.389	100
South: Camino San Jose								
1 LR	44	0	28	72	72	149	0.485	100
East: PR-172 Desde Caguas								
1 LT	4	653	0	657	657	1819	0.361	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Dem Flow (veh	Total Cap. (veh	Lane Util	Deg. Satn	Aver. Delay	Eff. Stop Rate	95% Back of Queue	Perf. Index

	/h)	/h]	(%)	x	(sec)		(veh)	
West: PR-172 Desde Cidra								
2T T	703	1809	100	0.389	0.7	0.08	0.0	6.55
2R R	20	51	100	0.392	9.5	0.70	0.0	0.30
South: Camino San Jose								
3L L	44	91	100	0.484*	50.1	1.05	2.8	1.79
8R R	28	58	100	0.483	50.1	1.07	2.8	1.14
East: PR-172 Desde Caguas								
1L L	4	11	100	0.364	16.0	0.99	6.8	0.09
6T T	653	1808	100	0.361	7.1	0.01	6.8	9.23

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra						
2T T	32.3	102.33	0.106	1.84	0.158	80.9
2R R	1.4	4.05	0.006	0.31	0.009	3.6
	33.8	106.38	0.112	2.16	0.168	84.5
South: Camino San Jose						
3L L	4.1	15.14	0.019	0.77	0.023	10.1
8R R	2.6	9.64	0.011	0.49	0.015	6.4
	6.6	24.78	0.031	1.26	0.038	16.6
East: PR-172 Desde Caguas						
1L L	0.3	0.90	0.001	0.07	0.002	0.8
6T T	51.1	137.16	0.212	10.71	0.335	128.0
	51.4	138.04	0.213	10.78	0.337	128.8
INTERSECTION:	91.8	269.20	0.357	14.19	0.543	229.8

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

```
Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-
      controlled intersections and apply only to continuous lanes.
```

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2006 AM * 200303-1
Intersecion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest 95% Back (vehs)	Queue (m)
West: PR-172 Desde Cidra								
2T	T	703	1809	0.389	0.7	A	0.0	0
2R	R	20	51	0.392	9.5	A	0.0	0
South: Camino San Jose								
3L	L	44	91	0.484*	50.1	F	2.8	1
8R	R	28	58	0.483	50.1	F	2.8	1
East: PR-172 Desde Caguas								
1L	L	4	11	0.364	16.0	C	6.8	5
6T	T	653	1808	0.361	7.1	A	6.8	5
ALL VEHICLES:		1452		0.484	6.2	NA	6.8	5

Level of Service calculations are based on
average control delay including geometric delay (HCM criteria),
independant of the current delay definition used.
For the criteria, refer to the 'Level of Service' topic in the
SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods
\# Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2006 AM * 200303-1
Intersecion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream Distance (m)	User Spec?

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2006 AM * 200303-1
Intersecion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
2T T	7.4	0.23	0.341	4.20	0.360	183.9
2R R	11.6	0.33	0.512	25.09	0.764	291.2
	7.5	0.24	0.349	4.77	0.371	186.8
South: Camino San Jose						
3L L	14.9	0.56	0.706	28.45	0.849	373.3
8R R	14.8	0.56	0.697	27.98	0.843	371.0
	14.9	0.56	0.703	28.27	0.847	372.4
East: PR-172 Desde Caguas						
1L L	12.5	0.36	0.564	27.39	0.812	311.8
6T T	12.5	0.34	0.518	26.23	0.822	313.5
	12.5	0.34	0.519	26.23	0.821	313.5
INTERSECTION:	10.1	0.30	0.393	15.68	0.598	253.3

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2006 AM * 200303-1
Intersecion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra												
1 TR	703	20	723	2					0.389	1.0	0	500
	0 703	20	723	2					0.389	1.0		
South: Camino San Jose												
1 LR	44	28	72	0					0.485	50.1	1	500
	44 0	28	72	0					0.485	50.1	1	
East: PR-172 Desde Caguas												
1 LT	4 653		657	4					0.361	7.2	5	500
	4 653	0	657	4					0.361	7.2	5	

ALL VEHICLES	Total Flow	% HV	Max. X	Aver. Delay	Max Queue
	1452	2	0.484	6.2	5

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 TR	0.389	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
South: Camino San Jose											
1 LR	0.485	0.5	0.6	0.3	0.9	1.6	2.0	2.2	2.8	3.2	0.00
East: PR-172 Desde Caguas											
1 LT	0.361	0.2	1.9	0.4	2.2	3.9	4.8	5.4	6.8	7.9	0.01

Values printed in this table are back of queue (vehicles).

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 TR	0.389	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
South: Camino San Jose											
1 LR	0.485	0.3	0.3	0.1	0.4	0.8	1.0	1.1	1.4	1.6	0.00
East: PR-172 Desde Caguas											
1 LT	0.361	0.2	1.3	0.3	1.6	2.7	3.3	3.8	4.7	5.5	0.01

Values printed in this table are back of queue (metres).

Table D.3B - Lane Queues (metres)

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Cidra										
1 TR	0.389	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
South: Camino San Jose										
1 LR	0.485	24.2	20.9	45.1	1.8	43.3	1.4	42.0	5.0	50.1
East: PR-172 Desde Caguas										
1 LT	0.361	5.9	0.5	6.4	7.7	0.0	0.0	0.0	0.8	7.2

dn is average stop-start delay for all vehicles queued and unqueued

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hgm
West: PR-172 Desde Cidra							
1 TR	0.389	0.00	0.00	0.09	0.09	0.000	0.00

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Effective Stop Rate he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hgm
South: Camino San Jose							
1 LR	0.485	0.91	0.06	0.09	1.06	0.905	0.90
East: PR-172 Desde Caguas							
1 LT	0.361	0.01	0.00	0.01	0.02	0.860	0.26

hig is the average value for all movements in a shared lane
hgm is average queue move-up rate for all vehicles queued and unqueued

Lane No.	Deg. Satn x	Lane Use	Prob. Block	Average Delay	Level of Service	95% Back of Queue Veh	95% Back of Queue Metres	Lane Config
West: PR-172 Desde Cidra								
South		Right	10.0	10.2	15.7	500	120	No
East		Thru	S	65.0	10.8	500	127	No
South: Camino San Jose								
West		Left	7.2	17.8	11.3	500	117	No
East		Right	10.0	20.2	15.7	500	120	No
East: PR-172 Desde Caguas								
West		Thru	S	65.0	10.8	500	129	No
South		Left	7.2	17.8	11.3	500	117	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 02:17:33PM

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
2R R	72.0	20.2	20.2	65.0			54.3	54.3	9.5
South: Camino San Jose									
3L L	72.0	0.0	17.8	65.0	2.8		50.4	25.8	5.0
8R R	72.0	0.0	20.2	65.0	3.5		50.0	25.8	5.0
East: PR-172 Desde Caguas									
1L L	72.0	17.8	17.8	65.0	4.8		49.6	46.9	9.6
6T T	72.0	65.0	65.0	65.0	0.0		55.9	55.9	0.7

'Running Speed' is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
No opposed movements on this approach					
South: Camino San Jose					
3L L	Normal	1370+	7.50	3.50	2.0
8R R	Normal	713+	6.90	3.30	2.0
East: PR-172 Desde Caguas					
1L L	Normal	703	4.10	2.20	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
+ Percentage of exiting flow included in total opposing flow

SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2006 PM * 200F33~1

Interseccion PR-172 @ Camino San Jose

Performance Measure	Vehicles	Persons
Demand Flows - Total	1445 veh/h	1734 pers/h
Percent Heavy Vehicles	1.5 %	
Degree of Saturation	0.390	
Effective Intersection Capacity	3705 veh/h	
95% Back of Queue (m)	5 m	
95% Back of Queue (veh)	8.1 veh	
Control Delay (Total)	2.15 veh-h/h	2.58 pers-h/h
Control Delay (Average)	5.4 s/veh	5.4 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS E	
Total Effective Stops	132 veh/h	159 pers/h
Effective Stop Rate	0.09 per veh	0.09 per pers
Proportion Queued	0.46	0.46
Travel Distance (Total)	903.1 veh-km/h	1083.8 pers-km/h
Travel Distance (Average)	625 m	625 m
Travel Time (Total)	15.2 veh-h/h	18.2 pers-h/h
Travel Time (Average)	37.8 secs	37.8 secs
Travel Speed	59.5 km/h	59.5 km/h
Operating Cost (Total)	261 $/h	261 $/h
Fuel Consumption (Total)	89.5 L/h	
Carbon Dioxide (Total)	223.9 kg/h	
Hydrocarbons (Total)	0.354 kg/h	
Carbon Monoxide (Total)	14.28 kg/h	
NOX (Total)	0.537 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 02:17:28PM

SIDRA INTERSECTION

Movement Summary

Bosques de Cidra Escenario 2006 PM * 200F33~1

Interseccion PR-172 @ Camino San Jose

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Camino San Jose										
3L	L	22	0.0	0.256	35.8	LOS E	1	0.86	1.02	30.9
8R	R	18	0.0	0.257	35.8	LOS E	1	0.86	1.02	30.9
Approach		**40**	**0.0**	**0.256**	**35.8**	**LOS E**	**1**	**0.86**	**1.02**	**30.9**
PR-172 Desde Caguas										
1L	L	11	10.0	0.385	17.0	LOS C	5	0.88	0.99	46.4
6T	T	704	1.6	0.390	7.5	LOS A	5	0.88	0.01	55.7
Approach		**714**	**1.7**	**0.390**	**7.7**	**LOS A**	**5**	**0.88**	**0.02**	**55.5**
PR-172 Desde Cidra										
2T	T	655	1.2	0.372	0.7	LOS A	0	0.00	0.08	69.1
2R	R	37	2.8	0.371	9.7	LOS A	0	0.00	0.70	54.3
Approach		**691**	**1.3**	**0.372**	**1.2**	**LOS A**		**0.00**	**0.11**	**68.1**
All Vehicles		**1445**	**1.5**	**0.390**	**5.4**	**Not Applicable**	**5**	**0.46**	**0.09**	**59.5**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 02:17:28PM

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left		Through		Right	
	LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
2T T	0	0	647	8	0	0
2R R	0	0	0	0	35	1
South: Camino San Jose						
3L L	22	0	0	0	0	0
8R R	0	0	0	0	18	0
East: PR-172 Desde Caguas						
1L L	9	1	0	0	0	0
6T T	0	0	693	11	0	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left		Through		Right	
	Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
2T T	0	0.0	655	1.2	0	0.0
2R R	0	0.0	0	0.0	36	2.8
South: Camino San Jose						
3L L	22	0.0	0	0.0	0	0.0
8R R	0	0.0	0	0.0	18	0.0
East: PR-172 Desde Caguas						
1L L	10	10.0	0	0.0	0	0.0
6T T	0	0.0	704	1.6	0	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2006 PM * 200F33~1

Interseccion PR-172 @ Camino San Jose

Run Information

* Basic Parameters:
Intersection Type: Unsignalised - Two-Way Stop Control
Driving on the right-hand side of the road
Input data specified in Metric units
Model Defaults: US HCM (Metric)
Peak Flow Period (for performance): 15 minutes
Unit time (for volumes): 60 minutes.
Delay definition: Control delay
Geometric delay included
HCM Delay Model option selected
HCM Queue Model option selected
Level of Service based on: Delay (HCM method)
Queue definition: Back of queue, 95th Percentile

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Cidra							
	South	2R	Right	35	1	1.00	0.71
	East	2T	Thru	647	8	1.00	0.73
South: Camino San Jose							
	West	3L	Left	22	0	1.00	0.63
	East	8R	Right	18	0	1.00	0.45
East: PR-172 Desde Caguas							
	West	6T	Thru	693	11	1.00	0.85
	South	1L	Left	9	1	1.00	0.85

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
2T T	0.14	0.16	9.7	0.00	0.08	0.0	0	6.10	69.1
2R R	0.10	0.12	9.7	0.00	0.70	0.0	0	0.55	54.3
South: Camino San Jose									
3L L	0.22	0.26	35.8	0.86	1.02	1.1	1	0.73	30.9
8R R	0.18	0.21	35.8	0.86	1.02	1.1	1	0.60	30.9
East: PR-172 Desde Caguas									
1L L	0.05	0.06	17.0	0.88	0.99	0.1	5	0.23	46.4
6T T	1.48	1.77	7.5	0.88	0.01	0.1	5	10.29	55.7

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
591	0.372	0.23	0.28	1.2	0.00	0.11	0	6.65	68.1
South: Camino San Jose									
40	0.257	0.40	0.48	35.8	0.86	1.02	1	1.32	30.9
East: PR-172 Desde Caguas									
714	0.390	1.52	1.83	7.7	0.88	0.02	5	10.51	55.5
ALL VEHICLES:									
1445	0.390	2.15	2.58	5.4	0.46	0.09	5	18.48	59.5
INTERSECTION (persons):									
1734	0.390		2.58	5.4	0.46	0.09		18.48	59.5

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
2T T	655	1.2	0			1762	0.80	115	100	0.372
2R R	36	2.8	0			97	0.80	116	100	0.371
South: Camino San Jose										
3L L	22	0.0	1387+	1.5	1387	86	0.80	213	100	0.256
8R R	18	0.0	673+	1.3	673	70	0.80	211	100	0.257
East: PR-172 Desde Caguas										
1L L	10	10.0	655	1.2	655	26	0.80	108	100	0.385
6T T	704	1.6	0			1805	0.80	105	100	0.390*

\+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst Movement Level of Service	=	E
Average intersection delay (s)	=	5.4
Largest average movement delay (s)	=	35.8
Largest back of queue, 95% (m)	=	5
Performance Index	=	18.48
Degree of saturation (highest)	=	0.390
Practical Spare Capacity (lowest)	=	105 %
Effective intersection capacity, (veh/h)	=	3705
Total vehicle flow (veh/h)	=	1445
Total person flow (pers/h)	=	1734
Total vehicle delay (veh-h/h)	=	2.15
Total person delay (pers-h/h)	=	2.58
Total effective vehicle stops (veh/h)	=	132
Total effective person stops (pers/h)	=	159
Total vehicle travel (veh-km/h)	=	903.1
Total cost ($/h)	=	261.11
Total fuel (L/h)	=	89.5
Total CO2 (kg/h)	=	223.89

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

	/h)	/h)	(%)	x	(sec)		(veh)	
West: PR-172 Desde Cidra								
2T T	655	1782	100	0.372	0.7	0.08	0.0	6.10
2R R	36	97	100	0.371	9.7	0.70	0.0	0.55
South: Camino San Jose								
3L L	22	86	100	0.256	35.8	1.02	1.1	0.73
8R R	18	70	100	0.257	35.8	1.02	1.1	0.60
East: PR-172 Desde Caguas								
1L L	10	26	100	0.385	17.0	0.99	8.1	0.23
6T T	704	1805	100	0.390*	7.5	0.01	8.1	10.29

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra						
2T T	29.8	94.83	0.099	1.72	0.147	74.5
2R R	2.9	7.75	0.012	0.63	0.019	7.3
	32.7	102.58	0.111	2.35	0.167	81.7
South: Camino San Jose						
3L L	1.9	5.61	0.009	0.38	0.011	4.8
8R R	1.6	5.42	0.007	0.31	0.009	3.9
	3.5	12.03	0.016	0.69	0.021	8.7
East: PR-172 Desde Caguas						
1L L	1.0	2.65	0.004	0.23	0.007	2.6
6T T	52.3	143.85	0.223	11.08	0.342	130.9
	53.4	146.50	0.227	11.24	0.349	133.5
INTERSECTION:	89.5	261.11	0.354	14.28	0.537	223.9

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	0.650
Fuel resource cost factor	0.70
Ratio of running cost to fuel cost	3.0
Average income ($/h)	19.00
Time value factor	0.40
Light vehicle mass (1000 kg)	1.4
Heavy vehicle mass (1000 kg)	11.0
Light vehicle idle fuel rate (L/h)	1.350
Heavy vehicle idle fuel rate (L/h)	2.000

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 TR	691	1859	0.372	1.2	0.11	0.0	0.0	500.0
South: Camino San Jose								
1 LR	40	156	0.256	35.8	1.02	1.1	0.6	500.0
East: PR-172 Desde Caguas								
1 LT	714	1830	0.390	7.7	0.02	8.1	4.8	500.0

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 TR	0	655	36	691	691	1859	0.372	100
South: Camino San Jose								
1 LR	22	0	18	40	40	156	0.256	100
East: PR-172 Desde Caguas								
1 LT	10	704	0	714	714	1830	0.390	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Dem Flow (veh	Total Cap. (veh	Lane Util	Deg. Satn	Aver. Delay	Eff. Stop Rate	95% Back of Queue	Perf. Index

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Intersection PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
2T T	7.3	0.23	0.241	4.19	0.360	181.8
2R R	13.0	0.35	0.544	28.35	0.868	326.0
	7.6	0.24	0.257	5.44	0.386	189.2
South: Camino San Jose						
3L L	14.1	0.49	0.654	28.11	0.836	351.5
8R R	14.0	0.49	0.646	27.62	0.830	349.4
	14.0	0.49	0.651	27.89	0.833	350.5
East: PR-172 Desde Caguas						
1L L	16.7	0.43	0.658	37.73	1.140	420.0
6T T	11.9	0.33	0.507	24.99	0.778	297.3
	12.0	0.33	0.509	25.17	0.783	299.0
INTERSECTION:	9.9	0.29	0.392	15.81	0.594	247.9

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2006 PM * 200F33-1
Intersection PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra												
1 TR	655	36		691	1				0.372	1.2	0	500
	0 655	36		691	1				0.372	1.2		
South: Camino San Jose												
1 LR	22		18	40	0				0.256	35.8	1	500
	22	0	18	40	0				0.256	35.8	1	
East: PR-172 Desde Caguas												
1 LT	10	704		714	2				0.390	7.7	5	500
	10	704	0	714	2				0.390	7.7	5	

ALL VEHICLES	Total Flow	% HV	Max X	Aver. Delay	Max Queue
	1445	1	0.390	5.4	5

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2006 PM * 200F33-1
Intersection PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
2T T		655	1762	0.372	0.7	A	0.0	0
2R R		36	97	0.371	9.7	A	0.0	0
South: Camino San Jose								
3L L		22	86	0.256	35.8	E	1.1	1
8R R		18	70	0.257	35.8	E	1.1	1
East: PR-172 Desde Caguas								
1L L		10	26	0.385	17.0	C	8.1	5
6T T		704	1805	0.390*	7.5	A	8.1	5
ALL VEHICLES:		1445		0.390	5.4	NA	8.1	5

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2006 PM * 200F33-1
Intersection PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?

West: PR-172 Desde Cidra									
	South	Right	10.0	20.2	15.7	500	124		No
	East	Thru	S	65.0	10.8	500	127		No
South: Camino San Jose									
	West	Left	7.2	17.8	11.3	500	117		No
	East	Right	10.0	20.2	15.7	500	120		No
East: PR-172 Desde Caguas									
	West	Thru	S	65.0	10.8	500	127		No
	South	Left	7.2	17.8	11.3	500	128		No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd Total d2	dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
		Delay (seconds/veh)								
West: PR-172 Desde Cidra										
1 TR	0.372	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
South: Camino San Jose										
1 LR	0.256	23.0	7.7	30.8	1.7	29.1	0.4	28.7	5.0	35.8
East: PR-172 Desde Caguas										
1 LT	0.390	6.2	0.6	6.8	7.8	0.0	0.0	0.0	0.9	7.7

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Effective Stop Rate Geom. he1	he2	Overall hig	h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Cidra							
1 TR	0.372	0.00	0.00	0.11	0.11	0.000	0.00

South: Camino San Jose									
1 LR	0.256	0.06	0.02	0.14	1.02	0.863	0.28		
East: PR-172 Desde Caguas									
1 LT	0.390	0.01	0.00	0.01	0.02	0.877	0.31		

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 TR	0.372	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
South: Camino San Jose											
1 LR	0.256	0.1	0.3	0.1	0.4	0.7	0.8	0.9	1.1	1.3	0.00
East: PR-172 Desde Caguas											
1 LT	0.390	0.3	2.1	0.5	2.7	4.6	5.7	6.5	8.1	9.4	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 TR	0.372	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
South: Camino San Jose											
1 LR	0.256	0.1	0.2	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.00
East: PR-172 Desde Caguas											
1 LT	0.390	0.2	1.3	0.3	1.5	2.7	3.4	3.8	4.8	5.6	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
2R R	72.0	20.2	20.2	65.0			54.3	54.3	9.7
South: Camino San Jose									
3L L	72.0	0.0	17.8	65.0	2.8		51.4	30.9	5.0
8R R	72.0	0.0	20.2	65.0	3.6		51.1	30.9	5.0
East: PR-172 Desde Caguas									
1L L	72.0	17.8	17.8	65.0	4.5		49.5	46.4	10.2
6T T	72.0	65.0	65.0	65.0	0.0		55.7	55.7	0.7

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
No opposed movements on this approach					
South: Camino San Jose					
3L L	Normal	1387+	7.50	3.50	2.0
8R R	Normal	673+	6.90	3.30	2.0
East: PR-172 Desde Caguas					
1L L	Normal	655	4.31	2.31	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
\+ Percentage of exiting flow included in total opposing flow

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 02:17:28PM

SIDRA INTERSECTION

Intersection Summary

Estudio de Transito Bosques de Cidra * 2006IN~1

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows - Total	1373 veh/h	1 ped/h	1649 pers/h
Percent Heavy Vehicles	3.0 %		
Degree of Saturation	0.797	0.000	
Effective Intersection Capacity	1722 veh/h		
95% Back of Queue (m)	13 m	0 m	
95% Back of Queue (veh)	21.5 veh	0.0 ped	
Control Delay (Total)	9.27 veh-h/h	0.00 ped-h/h	11.12 pers-h/h
Control Delay (Average)	24.3 s/veh	2.1 s/ped	24.3 s/pers
Level of Service	LOS C	LOS A	
Level of Service (Worst Movement)	LOS D	LOS A	
Total Effective Stops	1167 veh/h	0 ped/h	1400 pers/h
Effective Stop Rate	0.85 per veh	0.27 per ped	0.85 per pers
Proportion Queued	0.83	0.27	0.83
Travel Distance (Total)	854.1 veh-km/h	0.0 ped-km/h	1024.9 pers-km/h
Travel Distance (Average)	622 m	31 m	622 m
Travel Time (Total)	24.1 veh-h/h	0.0 ped-h/h	28.9 pers-h/h
Travel Time (Average)	63.2 secs	25.8 secs	63.2 secs
Travel Speed	35.4 km/h	4.3 km/h	35.4 km/h
Operating Cost (Total)	388 $/h	0 $/h	388 $/h
Fuel Consumption (Total)	122.1 L/h		
Carbon Dioxide (Total)	305.7 kg/h		
Hydrocarbons (Total)	0.528 kg/h		
Carbon Monoxide (Total)	26.94 kg/h		
NOX (Total)	0.809 kg/h		

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:59:33PM

SIDRA INTERSECTION

Movement Summary

Estudio de Transito Bosques de Cidra * 2006IN~1

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM

Signalised - Pretimed **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-787 Desde Guavate										
6T	T	381	1.6	0.766	30.4	LOS C	8	0.98	0.87	32.4
6R	R	1	0.0	0.638	38.6	LOS D	8	0.98	0.89	28.8
Approach		**382**	**1.6**	**0.767**	**30.4**	**LOS C**	**8**	**0.98**	**0.87**	**32.4**
PR-172 Desde Caguas										
7L	L	9	0.0	0.050	33.3	LOS C	0	0.93	0.67	30.8
4R	R	267	9.0	0.255	11.4	LOS B	4	0.39	0.74	44.6
Approach		**276**	**8.7**	**0.255**	**12.1**	**LOS B**	**4**	**0.41**	**0.73**	**43.9**
PR-172 Desde Pueblo Cidra										
5L	L	457	1.3	0.797	28.6	LOS C	13	0.90	0.90	33.0
2T	T	248	2.0	0.797	20.3	LOS C	13	0.90	0.84	37.9
Approach		**715**	**1.5**	**0.797**	**25.8**	**LOS C**	**13**	**0.90**	**0.88**	**34.6**
All Vehicles		**1373**	**3.0**	**0.797**	**24.3**	**LOS C**	**13**	**0.83**	**0.85**	**35.4**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	1	2.1	LOS A	0	0.27	0.27
All Peds	**1**	**2.1**	**LOS A**	**0**	**0.27**	**0.27**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:59:33PM

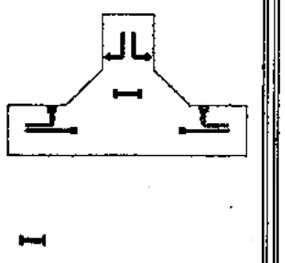
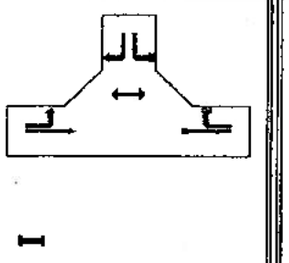
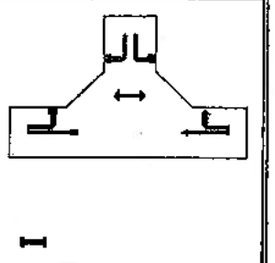
SIDRA INTERSECTION

Phasing Summary

Estudio de Transito Bosques de Cidra * 2006IN~1

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM

C = **60** seconds
Cycle Time Option: **Program calculated cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase D
		
Green Time = **6** seconds Phase Time = **9** seconds Phase Split = **15 %**	Green Time = **29** seconds Phase Time = **32** seconds Phase Split = **53 %**	Green Time = **16** seconds Phase Time = **19** seconds Phase Split = **32 %**

Normal Movement Permitted/Opposed Stopped Movement
Slip-Lane Opposed Slip-Lane Continuous
Turn On Red

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:59:33PM

Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Pueblo Cidra							
	East	2T	Thru	243	5	1.00	0.95
	North	5L	Left	461	6	1.00	0.95
East: PR-787 Desde Guavate							
	West	6T	Thru	375	6	1.00	0.95
	North	6R	Right	1	0	1.00	0.95
North: PR-172 Desde Caguas							
	West	4R	Right	243	24	1.00	0.95
	East	7L	Left	9	0	1.00	0.95

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Estudio de Transito Bosques de Cidra * 2006IN~1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Left LV	Left HV	Through LV	Through HV	Right LV	Right HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	461	6	0	0	0	0
2T T	0	0	243	5	0	0
East: PR-787 Desde Guavate						
6T T	0	0	375	6	0	0
6R R	0	0	0	0	1	0
North: PR-172 Desde Caguas						
7L L	9	0	0	0	0	0
4R R	0	0	0	0	243	24

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Estudio de Transito Bosques de Cidra * 2006IN~1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3

SIDRA INTERSECTION

Output Tables

Estudio de Transito Bosques de Cidra * 2006IN~1

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM

Unsettled Results

Solution for this case has some uncertainty. Review the iteration data in the RUN INFORMATION section to assess the acceptability of the solution.

Run Information

Cycle Time = 60 (Practical Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Pretimed
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
  Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations = 5 (Max)
  The differences between main iterations indicate that this may be an unstable solution (see the information given below).
  Use of the optimum cycle time facility (LT 21) to check results for various cycle times can give a further idea about the stability of this case.
  Comparison of last two iterations:
  Difference in intersection degree of satn = 3.4 %
  Largest difference in eff. green times = 10 secs
  (max. value for stopping = 0 secs)
  Information on Previous Iteration:
  Cycle Time = 70
  Phase Times: 0, 9, 47
  Critical Movements: 7L, 5L, 6R(2nd)

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Estudio de Transito Bosques de Cidra * 2006IN~1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM

2T	T		B	D					3		28.7		29	
East: PR-787 Desde Guavate														
6T	T		D	A					3		16.6		16	
6R	R		A	D		Y	*D	A	15	3	32.7	16.6	26	16
North: PR-172 Desde Caguas														
7L	L		*A	B					3		9.0Min		6	
4R	R		A	D			D	A	Y 3	14	18.0Min	9.0Min	38	5
Pedestrian Movements														
P5	(Ped)	B	A						7		18.0Min		44	

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

* Critical Movement/Green Period

Movement Types:
Slp Slip Lane Movement
Ped Pedestrian
Dum Dummy

Under heading 'Op':
Y If opposed turn

Table S.2 - Movement Capacity Parameters

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Pueblo Cidra											
5L L	467	1.3	1212		0.385		586	0.90	13	100	0.797*
2T T	248	2.0	644		0.385		311	0.90	13	100	0.797*
East: PR-787 Desde Guavate											
6T T	381	1.6	1864		0.204		497	0.90	17	100	0.766
6R R	1	0.0	3	0	0.265	0.204	2	0.90	41	100	0.638
North: PR-172 Desde Caguas											
7L L	9	0.0	1796		0.005		180	0.90	1696	100	0.050
4R R	267	9.0	1512	1052	0.177	0.000	1045	0.90	252	100	0.255
Pedestrian Movements											
P5	1		12000		0.000		8800	0.90		0	0.000

Table S.3 - Intersection Parameters

Estudio de Transito Bosques de Cidra * 2006IN-1

Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Left Total	Left %HV	Through Total	Through %HV	Right Total	Right %HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	467	1.3	0	0.0	0	0.0
2T T	0	0.0	248	2.0	0	0.0
East: PR-787 Desde Guavate						
6T T	0	0.0	381	1.6	0	0.0
6R R	0	0.0	0	0.0	1	0.0
North: PR-172 Desde Caguas						
7L L	9	0.0	0	0.0	0	0.0
4R R	0	0.0	0	0.0	267	9.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.3 - Pedestrian Flow Rates

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Stage	Flow Rate (ped/h)	Flow Scale	Peak Flow Factor
Across North Approach				
P5	1		1.00	0.95

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.1 - Movement Phase and Timing Parameters

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	To	Op Pr	Second Green Fr	To	Op Pr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Desde Pueblo Cidra													
5L L		*B	D					3		28.7		29	

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% (vehs)	Back (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
5L L	3.71	4.46	28.6	0.90	0.90	21.5	13	19.58	33.0
2T T	1.40	1.68	20.3	0.90	0.84	21.5	13	9.77	37.9
East: PR-787 Desde Guavate									
6T T	3.21	3.86	30.4	0.98	0.87	13.4	8	16.61	32.4
6R R	0.01	0.01	38.6	0.98	0.89	13.4	8	0.05	28.8
North: PR-172 Desde Caguas									
7L L	0.08	0.10	33.3	0.93	0.67	0.4	0	0.37	30.8
4R R	0.85	1.02	11.4	0.39	0.74	3.9	4	6.59	44.6
Pedestrian Movements									
P5	0.00	0.00	2.1	0.27	0.27	0.0	0	0.01	4.3

Table S.6 - Intersection Performance

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
715	0.797	5.11	6.14	25.8	0.90	0.88	13	29.35	34.6
East: PR-787 Desde Guavate									
382	0.766	3.23	3.87	30.4	0.98	0.87	8	16.65	32.4
North: PR-172 Desde Caguas									
276	0.255	0.93	1.12	12.1	0.41	0.73	4	6.95	43.9
Pedestrians:									
1	0.000	0.00	0.00	2.1	0.27	0.27	0	0.01	4.3
ALL VEHICLES:									
1373	0.797	9.27	11.12	24.3	0.83	0.85	13	52.96	35.4
INTERSECTION (persons):									
1649	0.797		11.12	24.3	0.83	0.85		52.97	35.4

Queue values in this table are 95% back of queue (metres).

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
7L N_L			A	B	3	-	-	9.0Min
5L W_L			B	D	3	0.385	0.428	28.7
6R E_R	2nd		D	A	3	0.204	0.227	16.6
				Total:	15	0.590	0.655	54.3

- Flow ratio not used for cycle time calculations and the adjusted lost time equals the required movement time (=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
27	150	44	60

Intersection Level of Service	=	C
Worst movement Level of Service	=	D
Average intersection delay (s)	=	24.3
Largest average movement delay (s)	=	38.6
Largest back of queue, 95% (m)	=	13
Performance Index	=	52.97
Degree of saturation (highest)	=	0.797
Practical Spare Capacity (lowest)	=	13 %
Effective intersection capacity, (veh/h)	=	1722
Total vehicle flow (veh/h)	=	1373
Total pedestrian flow (ped/h)	=	1
Total person flow (pers/h)	=	1649
Total vehicle delay (veh-h/h)	=	9.27
Total pedestrian delay (ped-h/h)	=	0.00
Total person delay (pers-h/h)	=	11.12
Total effective vehicle stops (veh/h)	=	1167
Total effective pedestrian stops (ped/h)	=	0
Total effective person stops (pers/h)	=	1400
Total vehicle travel (veh-km/h)	=	854.1
Total cost ($/h)	=	387.92
Total fuel (L/h)	=	122.1
Total CO2 (kg/h)	=	305.65

Table S.4 - Phase Information

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	3	3	6	9	3	9	15%
B	9	3	12	29	41	3	32	53%
D	41	3	44	16	60	3	19	32%

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

Table S.7 - Lane Performance

Estudio de Transito Bosques de Cidra * 2006IN-1
Intersection Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Effective Green Times (sec) R1	G1	R2	G2	Red and	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	(m)	Lane Length (m)
West: PR-172 Desde Pueblo Cidra													
1 LT	31	29	0	0		715	897	0.797	25.8	0.88	21.5	12.6	500.0
East: PR-787 Desde Guavate													
1 TR	15	1	28	16		382	498	0.767	30.4	0.87	13.4	7.8	500.0
North: PR-172 Desde Caguas													
1 L	54	6	0	0		9	180	0.050	33.3	0.67	0.4	0.2	500.0
2 R	3	38	14	5		267	1045	0.255	11.4	0.74	3.9	3.9	500.0

Table S.8 - Lane Flow and Capacity Information

Estudio de Transito Bosques de Cidra * 2006IN-1
Intersection Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Lane Width (m)	Saturation Flow Adj. Basic (tcu)	Aver 1st (veh)	Aver 2nd (veh)	End Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Pueblo Cidra												
1 LT	467	248	0	715	3.60	1947	1856	0	0	897	0.797	100
East: PR-787 Desde Guavate												
1 TR	0	381	1	382	3.60	1871	428	1842	60	498	0.767	100
North: PR-172 Desde Caguas												
1 L	9	0	0	9	3.60	1890	1796	0	0	180	0.050	100
2 R	0	0	267	267	3.60	1890	1512	1052	58	1045	0.255	100

Basic Saturation Flow in this table is adjusted for lane width, approach grade, parking manoeuvres and number of buses stopping. Saturation flow scale applies if specified.

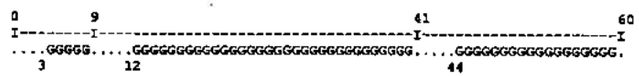
Table S.9 - Signal Timing Diagram

Estudio de Transito Bosques de Cidra * 2006IN-1

Intersection Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Displayed (Phase) Green Times

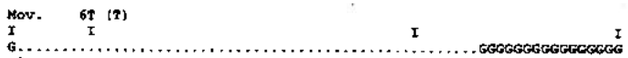
Phase A Phase B Phase D

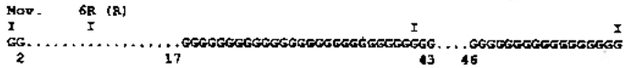


Effective (Movement) Green Times

West: PR-172 Desde Pueblo Cidra

East: PR-787 Desde Guavate





North: PR-172 Desde Caguas

Pedestrian Movements

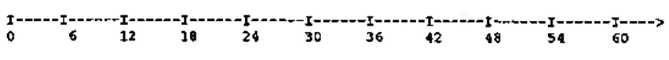


Table S.10 - Movement Capacity and Performance Summary

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Eff. Grn 1st Grn	Eff. Grn 2nd Grn	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Pueblo Cidra											
5L	L	467	586	100	0.797*	29*		28.6	0.90	21.5	19.58
2T	T	249	311	100	0.797*	29		20.3	0.84	21.5	9.77
East: PR-787 Desde Guavate											
6T	T	381	497	100	0.766	16		30.4	0.87	13.4	16.61
6R	R	1	2	100	0.638	26	16*	38.6	0.89	13.4	0.05
North: PR-172 Desde Caguas											
7L	L	9	180	100	0.050	6*		33.3	0.67	0.4	0.37
4R	R	267	1045	100	0.255	38	5	11.4	0.74	3.9	6.59
Pedestrian Movements											
P5	(Ped)	1	8800	100	0.000	44		2.1	0.27	0.0	0.01

* Maximum degree of saturation, or critical green periods

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID		Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Pueblo Cidra							
5L	L	31.1	122.43	0.182	7.58	0.177	77.7
2T	T	14.6	57.50	0.090	3.65	0.080	36.6
		45.7	179.93	0.272	11.23	0.257	114.3
East: PR-787 Desde Guavate							
6T	T	43.5	126.70	0.150	8.66	0.308	108.9
6R	R	0.1	0.33	0.000	0.02	0.001	0.3
		43.6	127.04	0.150	8.68	0.308	109.2
North: PR-172 Desde Caguas							
7L	L	0.8	2.70	0.004	0.16	0.004	1.9
4R	R	32.0	78.20	0.102	6.87	0.239	80.2
		32.8	80.90	0.106	7.03	0.244	82.2
Pedestrian Movements							
P5			0.05				
			0.05				
ALL VEHICLES:		122.1	387.87	0.528	26.94	0.809	305.7

INTERSECTION:	122.1	387.92	0.528	26.94	0.809	305.7

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID		Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Pueblo Cidra							
5L	L	10.7	0.42	0.629	26.23	0.611	268.8
2T	T	9.4	0.37	0.581	23.53	0.517	236.1
		10.3	0.41	0.612	25.29	0.578	257.4
East: PR-787 Desde Guavate							
6T	T	18.3	0.53	0.630	36.35	1.291	457.1
6R	R	16.2	0.50	0.653	32.39	1.035	405.1
		18.3	0.53	0.630	36.34	1.291	457.0
North: PR-172 Desde Caguas							
7L	L	13.9	0.49	0.641	29.23	0.805	348.1
4R	R	19.3	0.47	0.616	41.50	1.446	484.9
		19.2	0.47	0.617	41.10	1.426	480.5
Pedestrian Movements							
P5			1.77				
			1.77				
ALL VEHICLES:		14.3	0.45	0.618	31.55	0.947	357.9
INTERSECTION:		14.3	0.45	0.616	31.55	0.947	357.9

Table S.14 - Summary of Input and Output Data

P5	(Ped) 0.733	1	8800	0.000	2.1	A	0.0	0
ALL VEHICLES:		1373		0.797	24.3	C	21.5	13
INTERSECTION (persons):		1649			24.3		21.5	13

Level of Service calculations are based on
average control delay including geometric delay (HCM criteria),
independant of the current delay definition used.
For the criteria, refer to the "Level of Service" topic in the
SIDRA Output Guide or the Output section of the on-line help.
Intersection capacity is calculated considering vehicle movements only.
* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane
v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table S.16 - SCATS MF Parameter

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Stopline Flow (veh/h)	Capacity (veh/h)	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Desde Pueblo Cidra						
1 LT	715	897	1893	1706	0.797	100
East: PR-787 Desde Guavate						
1 TR	382	498	1871	NA	0.767	100
North: PR-172 Desde Caguas						
1 L	9	180	1796	1197	0.050	100
2 R	267	1045	1607	1489	0.255	100

NA Not Applicable - SCATS MF was not calculated for this lane due to one
of the following reasons:
- the lane is not controlled by signals (slip or continuous lane)
- two movements share this lane and do not run in the same phases

STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line.
This cannot exceed capacity.

SCATS SATURATION FLOW: This allows for lane width, approach grade and
turning vehicles. Saturation flow scale applies if specified.
The effects of heavy vehicles, parking manoeuvres, number of buses
stopping and conflicting pedestrian volume are not included.

SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS
control system. It is calculated from the SCATS SATURATION FLOW parameter.

DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow
Rate, therefore x > 1 is possible.

Table D.0 - Geometric Delay Data

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Pueblo Cidra												
1 LT	467	248		715	2	1947	29		0.797	25.8	13	500
	467	248	0	715	2				0.797	25.8	13	
East: PR-787 Desde Guavate												
1 TR		381	1	382	2	1871	1	16	0.767	30.4	8	500
	0	381	1	382	2				0.767	30.4	8	
North: PR-172 Desde Caguas												
1 L	9			9	0	1890	6		0.050	33.3	0	500
2 R			267	267	9	1890	38	5	0.255	11.4	4	500
	9	0	267	276	9				0.255	12.1	4	
Pedestrians												
Across N approach			1				44		0.000	2.1	0.0	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	1373	3	60	0.797	24.3	13

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for
grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Mov Typ	Green Time Ratio [g/C] 1st grn	2nd grn	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest 95% Back (vehs)	Queue (m)
West: PR-172 Desde Pueblo Cidra										
5L	L	0.483*		467	586	0.797*	28.6	C	21.5	13
2T	T	0.483		248	311	0.797*	20.3	C	21.5	13
East: PR-787 Desde Guavate										
6T	T	0.267		381	497	0.766	30.4	C	13.4	8
6R	R	0.433	0.267*	1	2	0.638	38.6	D	13.4	8
North: PR-172 Desde Caguas										
7L	L	0.100^		9	180	0.050	33.3	C	0.4	0
4R	R	0.633	0.083	267	1045	0.255	11.4	B	3.9	4
Pedestrian Movements										

Lane No.	Deg. Satn x	-- Effective Stop Rate -- Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Pueblo Cidra					
1 LT	0.797	0.03	0.04	0.88	0.904	0.11
East: PR-787 Desde Guavate					
1 TR	0.767	0.04	0.00	0.87	0.978	0.40
North: PR-172 Desde Caguas					
1 L	0.050	0.00	0.05	0.67	0.929	0.00
2 R	0.255	0.00	0.40	0.74	0.395	0.00

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 LT	0.797	2.8	10.0	2.8	12.8	15.5	18.2	19.7	21.5	23.2	0.03
East: PR-787 Desde Guavate											
1 TR	0.767	1.6	5.7	1.6	7.3	8.9	10.7	11.8	13.4	15.0	0.02
North: PR-172 Desde Caguas											
1 L	0.050	0.0	0.1	0.0	0.1	0.2	0.3	0.3	0.4	0.5	0.00
2 R	0.255	0.3	1.4	0.3	1.7	2.2	2.7	3.1	3.9	4.7	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Desde Pueblo Cidra								
	East	Thru	S	65.0	14.4	500	127	No
	North	Left	9.2	19.5	14.4	500	120	No
East: PR-787 Desde Guavate								
	West	Thru	S	65.0	14.4	500	127	No
	North	Right	10.0	20.2	15.7	500	120	No
North: PR-172 Desde Caguas								
	West	Right	10.0	20.2	15.7	500	130	No
	East	Left	7.2	17.8	11.3	500	117	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Deg. Satn x	Stop-line Delay (seconds/veh) 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Pueblo Cidra										
1 LT	0.797	13.0	7.3	20.3	5.1	15.3	0.5	14.8	5.4	25.8
East: PR-787 Desde Guavate										
1 TR	0.767	19.6	10.8	30.4	8.4	22.0	0.7	21.3	0.0	30.4
North: PR-172 Desde Caguas										
1 L	0.050	24.4	0.5	25.0	3.4	21.5	0.0	21.5	8.4	33.3
2 R	0.255	2.3	0.6	2.9	1.6	1.3	0.0	1.3	8.5	11.4

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

1 LT	0.797	1.6	5.9	1.6	7.5	9.0	10.7	11.5	12.6	13.6	0.03
East: PR-787 Desde Guavate											
1 TR	0.767	0.9	3.4	0.9	4.3	5.2	6.3	6.9	7.8	8.8	0.02
North: PR-172 Desde Caguas											
1 L	0.050	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.00
2 R	0.255	0.3	1.4	0.3	1.7	2.1	2.7	3.1	3.9	4.7	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Pueblo Cidra									
5L L	56.0	19.5	19.5	65.0	11.5		43.5	33.0	8.3
2T T	56.0	0.0	65.0	65.0	11.5		47.5	37.9	0.0
East: PR-787 Desde Guavate									
6T T	56.0	0.0	65.0	65.0	1.0	0.0	33.4	32.4	0.0
6R R	56.0	20.2	20.2	65.0	1.0	8.5	43.1	28.8	8.2
North: PR-172 Desde Caguas									
7L L	56.0	17.8	17.8	65.0			43.9	30.8	8.4
4R R	56.0	20.2	20.2	65.0			45.8	44.6	8.5

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Disp. Grn. Settings 1st Grn Gmin	1st Grn Gmax	2nd Grn Gmin	2nd Grn Gmax
West: PR-172 Desde Pueblo Cidra									
5L L	PT	No	3	1.000	1.000	6	NA		
2T T	PT	No	3	1.000	1.000	6	NA		
East: PR-787 Desde Guavate									
6T T	PT	No	3	1.000	1.000	6	NA		
6R R	PT	No	3	1.000	1.000	6	NA	6	NA

North: PR-172 Desde Caguas										
7L L	PT	No	3	1.000	1.000	6	NA			
4R R	PT	No	3	1.000	1.000	6	NA	6	NA	
Pedestrians										
P5	PT	No	3	1.000	1.000					

Table D.6 - Gap Acceptance Parameters

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Pueblo Cidra					
5L L	Normal	0	6.50	2.50	2.0
East: PR-787 Desde Guavate					
6R R	Normal	467	6.00	3.00	2.0
North: PR-172 Desde Caguas					
4R R	Normal	381	6.24	3.12	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:59:33PM

SIDRA INTERSECTION

Intersection Summary

Estudio de Transito Bosques de Cidra * 2006IN~2

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows - Total	1184 veh/h	1 ped/h	1422 pers/h
Percent Heavy Vehicles	2.6 %		
Degree of Saturation	0.645	0.000	
Effective Intersection Capacity	1837 veh/h		
95% Back of Queue (m)	10 m	0 m	
95% Back of Queue (veh)	15.8 veh	0.0 ped	
Control Delay (Total)	6.04 veh-h/h	0.00 ped-h/h	7.25 pers-h/h
Control Delay (Average)	18.4 s/veh	2.1 s/ped	18.4 s/pers
Level of Service	LOS B	LOS A	
Level of Service (Worst Movement)	LOS C	LOS A	
Total Effective Stops	908 veh/h	0 ped/h	1089 pers/h
Effective Stop Rate	0.77 per veh	0.27 per ped	0.77 per pers
Proportion Queued	0.70	0.27	0.70
Travel Distance (Total)	736.4 veh-km/h	0.0 ped-km/h	883.7 pers-km/h
Travel Distance (Average)	622 m	31 m	622 m
Travel Time (Total)	18.8 veh-h/h	0.0 ped-h/h	22.6 pers-h/h
Travel Time (Average)	57.3 secs	25.8 secs	57.3 secs
Travel Speed	39.1 km/h	4.3 km/h	39.1 km/h
Operating Cost (Total)	306 $/h	0 $/h	306 $/h
Fuel Consumption (Total)	97.5 L/h		
Carbon Dioxide (Total)	244.0 kg/h		
Hydrocarbons (Total)	0.428 kg/h		
Carbon Monoxide (Total)	21.75 kg/h		
NOX (Total)	0.644 kg/h		

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 02:52:52PM

SIDRA INTERSECTION

Movement Summary

Estudio de Transito Bosques de Cidra * 2006IN~2

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM

Signalised - Pretimed **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-787 Desde Guavate										
6T	T	255	1.6	0.608	25.2	LOS C	5	0.94	0.79	35.0
6R	R	11	10.0	0.600	33.7	LOS C	5	0.94	0.83	30.8
Approach		**265**	**1.9**	**0.608**	**25.6**	**LOS C**	**5**	**0.94**	**0.79**	**34.8**
PR-172 Desde Caguas										
7L	L	20	0.0	0.111	34.2	LOS C	0	0.94	0.70	30.4
4R	R	281	4.6	0.241	10.1	LOS B	2	0.30	0.72	45.6
Approach		**301**	**4.3**	**0.241**	**11.7**	**LOS B**	**2**	**0.34**	**0.72**	**44.2**
PR-172 Desde Pueblo Cidra										
5L	L	347	3.2	0.645	22.2	LOS C	10	0.78	0.84	36.5
2T	T	271	0.7	0.644	13.8	LOS B	10	0.78	0.69	42.5
Approach		**618**	**2.1**	**0.645**	**18.6**	**LOS B**	**10**	**0.78**	**0.78**	**38.9**
All Vehicles		**1184**	**2.6**	**0.645**	**18.4**	**LOS B**	**10**	**0.70**	**0.77**	**39.1**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	1	2.1	LOS A	0	0.27	0.27
All Peds	**1**	**2.1**	**LOS A**	**0**	**0.27**	**0.27**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 02:52:52PM

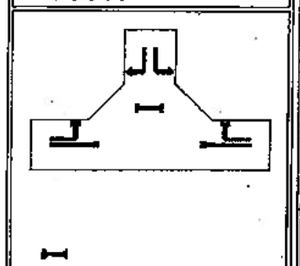
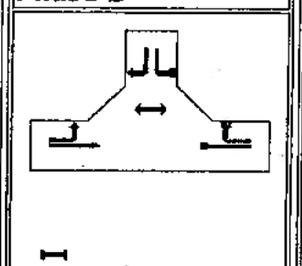
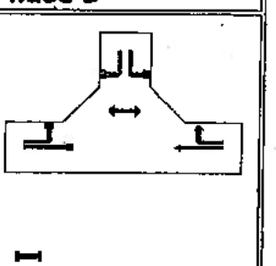
SIDRA INTERSECTION

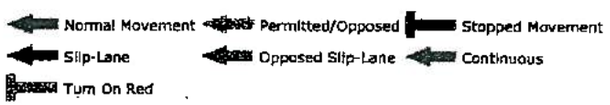
Phasing Summary

Estudio de Transito Bosques de Cidra * 2006IN~2

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM

C = 60 seconds
Cycle Time Option: **User-specified cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase D
		
Green Time = 6 seconds Phase Time = 9 seconds Phase Split = 15 %	Green Time = 31 seconds Phase Time = 34 seconds Phase Split = 57 %	Green Time = 14 seconds Phase Time = 17 seconds Phase Split = 28 %



SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 02:52:52PM

	West	6T	Thru	251	4	1.00	0.95
	North	6R	Right	9	1	1.00	0.95
North: PR-172 Desde Caguas							
	West	4R	Right	268	13	1.00	0.95
	East	7L	Left	20	0	1.00	0.95

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	337	11	0	0	0	0
2T T	0	0	268	2	0	0
East: PR-787 Desde Guavate						
6T T	0	0	251	4	0	0
6R R	0	0	0	0	9	1
North: PR-172 Desde Caguas						
7L L	20	0	0	0	0	0
4R R	0	0	0	0	268	13

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	348	3.2	0	0.0	0	0.0
2T T	0	0.0	270	0.7	0	0.0

SIDRA INTERSECTION

Output Tables

Estudio de Transito Bosques de Cidra * 2006IN~2

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM

Run Information

Cycle Time = 60 (User-given Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Pretimed
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
  Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations = 2
  Comparison of last two iterations:
  Difference in intersection degree of satn = 1.4 %
  Largest difference in eff. green times = 1 secs
  (max. value for stopping = 2 secs)
  Information on Previous Iteration:
  Cycle Time = 60
  Phase Times: 0, 9, 44
  Critical Movements: 7L, 5L, 6R(2nd)

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Pueblo Cidra							
	East	2T	Thru	268	2	1.00	0.95
	North	5L	Left	337	11	1.00	0.95
East: PR-787 Desde Guavate							

```
Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D
```

* Critical Movement/Green Period

Movement Types:
Slip Slip Lane Movement
Ped Pedestrian
Dum Dummy

Under heading 'Op':
Y If opposed turn

Table S.2 - Movement Capacity Parameters

Estudio de Transito Bosques de Cidra — * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Pueblo Cidra											
5L L	348	3.2	1045		0.333		540	0.90	40	100	0.645*
2T T	270	0.7	811		0.333		419	0.90	40	100	0.644
East: PR-787 Desde Guavate											
6T T	255	1.6	1798		0.142		420	0.90	48	100	0.608
6R R	10	10.0	12	44	0.313	0.142	17	0.90	50	100	0.600
North: PR-172 Desde Caguas											
7L L	20	0.0	1796		0.011		180	0.90	708	100	0.111
4R R	281	4.6	1557	1102	0.180	0.000	1167	0.90	274	100	0.241
Pedestrian Movements											
P5	1		12000		0.000		8800	0.90		0	0.000

Table S.3 - Intersection Parameters

Estudio de Transito Bosques de Cidra — * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
7L	N_L		A	B	9	-	-	9.0Min
5L	W_L		B	D	3	0.333	0.370	25.2
6R	E_R	2nd	D	A	3	0.142	0.158	12.5

East: PR-787 Desde Guavate							
6T T	0	9.0	255	1.6	0	0.0	
6R R	0	0.0	0	0.0	10	10.0	
North: PR-172 Desde Caguas							
7L L	20	0.0	0	0.0	0	0.0	
4R R	0	0.0	0	0.0	281	4.6	

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.3 - Pedestrian Flow Rates

Estudio de Transito Bosques de Cidra — * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Stage	Flow Rate (ped/h)	Flow Scale	Peak Flow Factor
Across North Approach				
P5	1		1.00	0.95

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.1 - Movement Phase and Timing Parameters

Estudio de Transito Bosques de Cidra — * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	First Green To	First Green Op	First Green Pr	Second Green Fr	Second Green To	Second Green Op	Second Green Pr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Desde Pueblo Cidra															
5L L	*B	D								3		25.2		31	
2T T	B	D								3		25.2		31	
East: PR-787 Desde Guavate															
6T T	D	A								3		12.5		14	
6R R	A	D	Y	*D	A					11	3	31.9	12.5	32	14
North: PR-172 Desde Caguas															
7L L	*A	B								3		9.0Min		6	
4R R	A	D				D	A	Y		3	10	18.0Min	9.0Min	40	7
Pedestrian Movements															
P5	(Ped) B	A								7		18.0Min		44	

	(veh-h/h)	(pers-h/h)	(sec)		Rate	(vehs)	(m)		(km/h)
West: PR-172 Desde Pueblo Cidra									
5L L	2.15	2.68	22.2	0.78	0.84	15.8	10	12.65	36.5
2T T	1.04	1.25	13.8	0.78	0.69	15.8	10	9.00	42.5
East: PR-787 Desde Guavate									
6T T	1.79	2.14	25.2	0.94	0.79	9.0	5	10.08	35.0
6R R	0.09	0.11	33.7	0.94	0.83	9.0	5	0.42	30.8
North: PR-172 Desde Caguas									
7L L	0.19	0.23	34.2	0.94	0.70	0.9	0	0.82	30.4
4R R	0.79	0.94	10.1	0.30	0.72	3.2	2	6.37	45.6
Pedestrian Movements									
P5	0.00	0.00	2.1	0.27	0.27	0.0	0	0.01	4.3

Table S.6 - Intersection Performance

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
618	0.645	3.19	3.83	18.6	0.78	0.78	10	21.65	38.9
East: PR-787 Desde Guavate									
265	0.608	1.88	2.26	25.6	0.94	0.79	5	10.50	34.8
North: PR-172 Desde Caguas									
301	0.241	0.98	1.17	11.7	0.34	0.72	2	7.20	44.2
Pedestrians:									
1	0.000	0.00	0.00	2.1	0.27	0.27	0	0.01	4.3
ALL VEHICLES:									
1184	0.645	6.04	7.25	18.4	0.70	0.77	10	39.34	39.1
INTERSECTION (persons):									
1422	0.645		7.25	18.4	0.70	0.77		39.35	39.1

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

	Effective Red and	Dem	Queue

Total:	25	0.475	0.528	46.7

- Flow ratio not used for cycle time calculations and the adjusted lost time equals the required movement time (=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
27	150	32	60

(Cycle time specified by the user)

Intersection Level of Service	=	B
Worst movement Level of Service	=	C
Average intersection delay (s)	=	18.4
Largest average movement delay (s)	=	34.2
Largest back of queue, 95% (m)	=	10
Performance Index	=	39.35
Degree of saturation (highest)	=	0.645
Practical Spare Capacity (lowest)	=	40 %
Effective intersection capacity, (veh/h)	=	1837
Total vehicle flow (veh/h)	=	1184
Total pedestrian flow (ped/h)	=	1
Total person flow (pers/h)	=	1422
Total vehicle delay (veh-h/h)	=	6.04
Total pedestrian delay (ped-h/h)	=	0.00
Total person delay (pers-h/h)	=	7.25
Total effective vehicle stops (veh/h)	=	908
Total effective pedestrian stops (ped/h)	=	0
Total effective person stops (pers/h)	=	1089
Total vehicle travel (veh-km/h)	=	736.4
Total cost ($/h)	=	385.88
Total fuel (L/h)	=	97.5
Total CO2 (kg/h)	=	243.95

Table S.4 - Phase Information

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	3	3	6	9	3	9	15%
B	9	3	12	31	43	3	34	57%
D	43	3	46	14	60	3	17	28%

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

Table S.5 - Movement Performance

Mov ID	Total Delay	Total Delay	Aver. Delay	Prop. Queued	Eff. Stop	Longest Queue 95% Back	Perf. Index	Aver. Speed

Lane No.	Green Times (sec) R1	G1	R2	G2	Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back (vehs)	(m)	Lane Length (m)
West: PR-172 Desde Pueblo Cidra												
1 LT	29	31	0	0	618	959	0.645	18.6	0.78	15.8	9.7	500.0
East: PR-787 Desde Guavate												
1 TR	11	1	34	14	265	436	0.608	25.6	0.79	9.0	5.4	500.0
North: PR-172 Desde Caguas												
1 L	54	6	0	0	20	180	0.111	34.2	0.70	0.9	0.4	500.0
2 R	3	40	10	7	281	1166	0.241	10.1	0.72	3.2	2.4	500.0

Table S.8 - Lane Flow and Capacity Information

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Lane Width (m)	Saturation Flow Adj. Basic (tcu)	Aver 1st (veh)	Aver 2nd (veh)	End Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Pueblo Cidra												
1 LT	348	270	0	618	3.60	1947	1855	0	0	959	0.645	100
East: PR-787 Desde Guavate												
1 TR	0	255	10	265	3.60	1871	595	1826	57	436	0.608	100
North: PR-172 Desde Caguas												
1 L	20	0	0	20	3.60	1890	1796	0	0	180	0.111	100
2 R	0	0	281	281	3.60	1890	1557	1102	60	1166	0.241	100

Basic Saturation Flow in this table is adjusted for lane width, approach grade, parking manoeuvres and number of buses stopping. Saturation flow scale applies if specified.

Table S.9 - Signal Timing Diagram

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Displayed (Phase) Green Times

```
 Phase A                  Phase B                          Phase D

0        9                                         43                 60
I--------I-----------------------------------------I------------------I
....GGGGG....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG....GGGGGGGGGGGGGGG.
   3        12                                        46
```


Effective (Movement) Green Times

West: PR-172 Desde Pueblo Cidra

```
Mov.   5L (L)
I      I                                      I                    I
...............GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG....................
              14                                45

Mov.   2T (T)
I      I                                      I                    I
...............GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG....................
              14                                45
```

East: PR-787 Desde Guavate

```
Mov.   6T (T)
I      I                                      I                    I
G...................................................GGGGGGGGGGGGGGG
 2                                                  48

Mov.   6R (R)
I      I                                      I                    I
GG..........GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG...GGGGGGGGGGGGGGG
 2          13                                45  48
```

North: PR-172 Desde Caguas

```
Mov.   7L (L)
I      I                                      I                    I
.....GGGGGG........................................................
     5    11

Mov.   4R (R)
I      I                                      I                    I
GG...GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG..........GGGGGGG
 2   5                                        45          55
```

Pedestrian Movements

```
Mov.   P5
I      I                                      I                    I
..............GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG...
              14                                              58

I-----I-----I-----I-----I-----I-----I-----I-----I-----I-----I---->
0     6     12    18    24    30    36    42    48    54    60

                         T I M E  (s)
```

Table S.10 - Movement Capacity and Performance Summary

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Dem Flow (veh	Total Cap. (veh	Lane Util	Deg. Satn	Eff. Grn 1st	2nd	Aver. Delay	Eff. Stop Rate	95% Back of Queue	Perf. Index

Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio de Transito Bosques de Cidra * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Pueblo Cidra						
5L L	10.7	0.40	0.617	27.24	0.642	268.9
2T T	8.3	0.33	0.517	20.00	0.441	206.7
	9.7	0.37	0.573	24.05	0.554	241.6
East: PR-787 Desde Guavate						
6T T	17.8	0.50	0.603	35.51	1.274	446.0
6R R	21.0	0.59	0.727	43.84	1.476	526.9
	17.9	0.51	0.607	35.82	1.282	449.0
North: PR-172 Desde Caguas						
7L L	14.0	0.49	0.644	29.27	0.807	349.5
4R R	16.6	0.43	0.571	35.66	1.199	415.9
	16.4	0.43	0.576	35.24	1.173	411.5
Pedestrian Movements						
P5		1.77				
		1.77				
ALL VEHICLES:	13.2	0.42	0.582	29.53	0.874	331.3
INTERSECTION:	13.2	0.42	0.582	29.53	0.874	331.3

Table S.14 - Summary of Input and Output Data

Estudio de Transito Bosques de Cidra * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Pueblo Cidra												

	/h)	/h)	(%)	x	Grn	Grn	(sec)		(veh)	
West: PR-172 Desde Pueblo Cidra										
5L L	348	540	100	0.645*	31*		22.2	0.84	15.8	12.65
2T T	270	419	100	0.644	31		13.8	0.69	15.8	9.00
East: PR-787 Desde Guavate										
6T T	255	420	100	0.608	14		25.2	0.79	9.0	10.08
6R R	10	17	100	0.600	32	14*	33.7	0.83	9.0	0.42
North: PR-172 Desde Caguas										
7L L	20	180	100	0.111	5*		34.2	0.70	0.9	0.82
4R R	281	1167	100	0.241	40	7	10.1	0.72	3.2	6.37
Pedestrian Movements										
P5 (Ped)	1	8800	100	0.000	44		2.1	0.27	0.0	0.01

* Maximum degree of saturation, or critical green periods

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio de Transito Bosques de Cidra * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Pueblo Cidra						
5L L	23.1	85.67	0.133	5.87	0.138	57.9
2T T	14.0	55.35	0.087	3.38	0.075	34.9
	37.1	141.01	0.220	9.24	0.213	92.8
East: PR-787 Desde Guavate						
6T T	28.4	80.50	0.096	5.66	0.203	71.1
6R R	1.3	3.63	0.005	0.27	0.009	3.3
	29.7	84.14	0.101	5.93	0.212	74.4
North: PR-172 Desde Caguas						
7L L	1.7	6.05	0.008	0.36	0.010	4.3
4R R	28.9	74.63	0.099	6.21	0.209	72.4
	30.6	80.68	0.107	6.57	0.219	76.7
Pedestrian Movements						
P5		0.05				
		0.05				
ALL VEHICLES:	97.5	305.83	0.428	21.75	0.644	244.0
INTERSECTION:	97.5	305.88	0.428	21.75	0.644	244.0

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00

```
   Intersection capacity is calculated considering vehicle movements only.
*  Maximum v/c ratio, or critical green periods
"  Movement Level of service has been determined using adjacent lane
   v/c ratio rather than short lane v/c ratio (v/c>1.0)
```

Table S.16 - SCATS MF Parameter

```
 Estudio de Transito Bosques de Cidra                                  * 2006IN-2
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------
Lane   Stopline Capacity  SCATS   SCATS   Deg.  Lane
No.      Flow   (veh/h)   Satn     MF    Satn  Util.
       (veh/h)           Flow           x     %
-------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
1 LT      618      959    1891   1725  0.645   100
-------------------------------------------------------------------
East: PR-787 Desde Guavate
1 TR      265      436    1859     NA  0.608   100
-------------------------------------------------------------------
North: PR-172 Desde Caguas
1 L        20      180    1796   1197  0.111   100
2 R       281     1166    1607   1495  0.241   100
-------------------------------------------------------------------
  NA Not Applicable - SCATS MF was not calculated for this lane due to one
     of the following reasons:
       - the lane is not controlled by signals (slip or continuous lane)
       - two movements share this lane and do not run in the same phases

  STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line.
  This cannot exceed capacity.

  SCATS SATURATION FLOW: This allows for lane width, approach grade and
  turning vehicles.  Saturation flow scale applies if specified.
  The effects of heavy vehicles, parking manoeuvres, number of buses
  stopping and conflicting pedestrian volume are not included.

  SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS
  control system. It is calculated from the SCATS SATURATION FLOW parameter.

  DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow
  Rate, therefore x > 1 is possible.
```

Table D.0 - Geometric Delay Data

```
 Estudio de Transito Bosques de Cidra                                  * 2006IN-2
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

                                      Negn   Negn   Negn   Appr.   Downstream  Distance
From          To                      Radius Speed  Dist.  Dist.  ------------------
Approach      Approach      Turn      (m)    (km/h) (m)    (m)       (m)      User Spec?
-------------------------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
```



```
1 LT    348  270          618    2  1947   31       0.645  18.6   10   500
        ---------------------------------------------------------------------
        348  270    0     618    2                  0.645  18.6   10
---------------------------------------------------------------------------
East: PR-787 Desde Guavate
1 TR          255   10    265    2  1871    1  14   0.608  25.6    5   500
        ---------------------------------------------------------------------
          0  255   10    265    2                  0.608  25.6    5
---------------------------------------------------------------------------
North: PR-172 Desde Caguas
1 L     20                 20    0  1890    6       0.111  34.2    0   500
2 R           281  281     281    5  1890   40   7   0.241  10.1    2   500
        ---------------------------------------------------------------------
        20    0  281     301    4                  0.241  11.7    2
---------------------------------------------------------------------------
Pedestrians
 Across N approach        1                 44      0.000   2.1  0.0
===========================================================================
ALL VEHICLES              Total   %      Cycle      Max    Aver.   Max
                          Flow    HV     Time       X      Delay   Queue
                          1184    3        60     0.645   18.4    10

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for
      grade, lane widths, parking manoeuvres and bus stops.
```

Table S.15 - Capacity and Level of Service

```
 Estudio de Transito Bosques de Cidra                                  * 2006IN-2
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------------------
Mov  Mov  Green Time Ratio (g/C)  Total  Total  Deg.  Aver.  LOS  Longest Queue
ID   Typ  ------------------------ Flow   Cap.   of    Delay       95% Back
          1st grn   2nd grn      (veh/h) (veh/h) Satn  (sec)       (vehs)  (m)
-------------------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
 5L  L    0.517*                  348     540   0.645* 22.2   C    15.8    10
 2T  T    0.517                   270     419   0.644  13.8   B    15.8    10
-------------------------------------------------------------------------------
East: PR-787 Desde Guavate
 6T  T    0.233                   255     420   0.608  25.2   C     9.0     5
 6R  R    0.533   0.233*          10      17    0.600  33.7   C     9.0     5
-------------------------------------------------------------------------------
North: PR-172 Desde Caguas
 7L  L    0.100*                  20      180   0.111  34.2   C     0.9     0
 4R  R    0.667   0.117           281     1167  0.241  10.1   B     3.2     2
-------------------------------------------------------------------------------
Pedestrian Movements
 P5  (Ped) 0.733                  1       8800  0.000   2.1   A     0.0     0
-------------------------------------------------------------------------------
 ALL VEHICLES:                    1184          0.645  18.4   B    15.8    10
-------------------------------------------------------------------------------
 INTERSECTION (persons):          1422                 18.4         15.8    10
-------------------------------------------------------------------------------
    Level of Service calculations are based on
    average control delay including geometric delay (HCM criteria),
    independent of the current delay definition used.
    For the criteria, refer to the "Level of Service" topic in the
    SIDRA Output Guide or the Output section of the on-line help.
```

	East	Thru	S	65.0	14.4	500	126	No
	North	Left	9.2	19.5	14.4	500	122	No
East: PR-787 Desde Guavate								
	West	Thru	S	65.0	14.4	500	127	No
	North	Right	10.0	20.2	15.7	500	130	No
North: PR-172 Desde Caguas								
	West	Right	10.0	20.2	15.7	500	125	No
	East	Left	7.2	17.8	11.3	500	117	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Pueblo Cidra										
1 LT	0.645	10.5	3.3	13.8	4.7	9.2	0.0	9.2	4.7	18.6
East: PR-787 Desde Guavate										
1 TR	0.608	19.1	6.2	25.2	7.9	17.3	0.1	17.1	0.3	25.6
North: PR-172 Desde Caguas										
1 L	0.111	24.6	1.3	25.8	3.5	22.4	0.0	22.4	8.4	34.2
2 R	0.241	1.2	0.5	1.7	1.2	0.5	0.0	0.5	8.4	10.1

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Effective Stop Rate he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Pueblo Cidra							
1 LT	0.645	0.69	0.00	0.08	0.78	0.778	0.00
East: PR-787 Desde Guavate							

1 TR	0.608	0.78	0.01	0.00	0.79	0.542	0.17
North: PR-172 Desde Caguas							
1 L	0.111	0.66	0.00	0.04	0.70	0.939	0.00
2 R	0.241	0.26	0.00	0.47	0.72	0.302	0.00

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 LT	0.645	1.5	7.5	1.5	8.9	10.9	13.0	14.1	15.8	17.4	0.02
East: PR-787 Desde Guavate											
1 TR	0.608	0.7	3.8	0.7	4.5	5.6	6.8	7.6	9.0	10.4	0.01
North: PR-172 Desde Caguas											
1 L	0.111	0.0	0.3	0.0	0.3	0.4	0.6	0.7	0.9	1.0	0.00
2 R	0.241	0.3	1.0	0.3	1.4	1.7	2.2	2.5	3.2	3.8	0.00

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 LT	0.645	0.9	4.6	0.9	5.5	6.7	8.0	8.7	9.7	10.7	0.02
East: PR-787 Desde Guavate											
1 TR	0.608	0.4	2.3	0.4	2.7	3.4	4.1	4.6	5.4	6.3	0.01
North: PR-172 Desde Caguas											
1 L	0.111	0.0	0.2	0.0	0.2	0.2	0.3	0.3	0.4	0.5	0.00
2 R	0.241	0.2	0.8	0.2	1.0	1.3	1.7	1.9	2.4	2.9	0.00

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Pueblo Cidra									
5L L	56.0	19.5	19.5	65.0			44.4	36.5	8.4
2T T	56.0	0.0	65.0	65.0			49.1	42.5	0.0
East: PR-787 Desde Guavate									
6T T	56.0	0.0	65.0	65.0	1.2	0.0	35.5	35.0	0.0
6R R	56.0	20.2	20.2	65.0	1.2	0.0	43.7	30.8	8.5
North: PR-172 Desde Caguas									
7L L	56.0	17.8	17.8	65.0			43.9	30.4	8.4
4R R	56.0	20.2	20.2	65.0			46.1	45.6	8.4

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Disp. Grn. Settings 1st Grn Gmin	1st Grn Gmax	2nd Grn Gmin	2nd Grn Gmax
West: PR-172 Desde Pueblo Cidra									
5L L	PT	No	3	1.000	1.000	6	NA		
2T T	PT	No	3	1.000	1.000	6	NA		
East: PR-787 Desde Guavate									
6T T	PT	No	3	1.000	1.000	6	NA		
6R R	PT	No	3	1.000	1.000	6	NA	6	NA
North: PR-172 Desde Caguas									
7L L	PT	No	3	1.000	1.000	6	NA		
4R R	PT	No	3	1.000	1.000	6	NA	6	NA
Pedestrians									
P5	PT	No	3	1.000	1.000				

Table D.6 - Gap Acceptance Parameters

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Pueblo Cidra					
5L L	Normal	0	4.50	2.50	2.0
East: PR-787 Desde Guavate					
6R R	Normal	348	6.30	3.15	2.0
North: PR-172 Desde Caguas					
4R R	Normal	255	6.01	3.01	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 02:52:52PM

SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2014 AM

Interseccion PR-172 @ Farmeceutica GSK

Performance Measure	Vehicles	Persons
Demand Flows - Total	2230 veh/h	2676 pers/h
Percent Heavy Vehicles	1.9 %	
Degree of Saturation	1.000	
Effective Intersection Capacity	2230 veh/h	
95% Back of Queue (m)	6 m	
95% Back of Queue (veh)	12.1 veh	
Control Delay (Total)	8.07 veh-h/h	9.68 pers-h/h
Control Delay (Average)	13.0 s/veh	13.0 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS F	
Total Effective Stops	679 veh/h	815 pers/h
Effective Stop Rate	0.30 per veh	0.30 per pers
Proportion Queued	0.16	0.16
Travel Distance (Total)	1390.5 veh-km/h	1668.6 pers-km/h
Travel Distance (Average)	624 m	624 m
Travel Time (Total)	27.8 veh-h/h	33.4 pers-h/h
Travel Time (Average)	44.9 secs	44.9 secs
Travel Speed	50.0 km/h	50.0 km/h
Operating Cost (Total)	430 $/h	430 $/h
Fuel Consumption (Total)	128.7 L/h	
Carbon Dioxide (Total)	321.9 kg/h	
Hydrocarbons (Total)	0.490 kg/h	
Carbon Monoxide (Total)	14.17 kg/h	
NOX (Total)	0.669 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 04:32:29PM

SIDRA INTERSECTION

Movement Summary

Bosques de Cidra Escenario 2014 AM

Interseccion PR-172 @ Farmeceutica GSK

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-172 Desde Caguas										
6T	T	879	3.1	0.599	0.7	LOS A	0	0.00	0.08	69.1
6R	R	197	0.5	0.599	9.6	LOS A	0	0.00	0.70	54.3
Approach		**1076**	**2.6**	**0.599**	**2.4**	**LOS A**		**0.00**	**0.19**	**65.8**
Farmaceutica GSK										
7L	L	44	0.0	1.000*	189.5	LOS F	6	1.00	1.15	9.9
4R	R	38	0.0	1.000*	189.5	LOS F	6	1.00	1.17	9.9
Approach		**82**	**0.0**	**1.000**	**189.5**	**LOS F**	**6**	**1.00**	**1.16**	**9.9**
PR-172 Desde Cidra										
5L	L	296	0.0	0.831	35.1	LOS E	3	0.95	1.09	33.4
2T	T	776	1.8	0.408	0.7	LOS A	0	0.00	0.08	69.1
Approach		**1072**	**1.3**	**0.830**	**10.2**	**LOS B**	**3**	**0.26**	**0.35**	**53.5**
All Vehicles		**2230**	**1.9**	**1.000**	**13.0**	**Not Applicable**	**6**	**0.16**	**0.30**	**50.0**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 04:32:29PM

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Left		Through		Right	
		LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program							
West: PR-172 Desde Cidra							
5L	L	296	0	0	0	0	0
2T	T	0	0	762	14	0	0
East: PR-172 Desde Caguas							
6T	T	0	0	852	27	0	0
6R	R	0	0	0	0	196	1
North: Farmaceutica GSK							
7L	L	44	0	0	0	0	0
4R	R	0	0	0	0	38	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Left		Through		Right	
		Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program							
West: PR-172 Desde Cidra							
5L	L	296	0.0	0	0.0	0	0.0
2T	T	0	0.0	776	1.8	0	0.0
East: PR-172 Desde Caguas							
6T	T	0	0.0	879	3.1	0	0.0
6R	R	0	0.0	0	0.0	197	0.5
North: Farmaceutica GSK							
7L	L	44	0.0	0	0.0	0	0.0
4R	R	0	0.0	0	0.0	38	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2014 AM

Interseccion PR-172 @ Farmeceutica GSK

Run Information

* Basic Parameters:
  Intersection Type: Unsignalised - Two-Way Stop Control
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
  Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Mov ID		Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Cidra							
	East	2T	Thru	762	14	1.00	0.92
	North	5L	Left	296	0	1.00	0.25
East: PR-172 Desde Caguas							
	West	6T	Thru	852	27	1.00	0.86
	North	6R	Right	196	1	1.00	0.75
North: Farmaceutica GSK							
	West	4R	Right	38	0	1.00	0.58
	East	7L	Left	44	0	1.00	0.63

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
5L L	2.89	3.47	35.1	0.95	1.09	6.9	3	9.51	33.4
2T T	0.16	0.19	0.7	0.00	0.08	0.0	0	7.23	69.1
East: PR-172 Desde Caguas									
6T T	0.18	0.22	0.7	0.00	0.08	0.0	0	8.19	69.1
6R R	0.52	0.63	9.6	0.00	0.70	0.0	0	2.99	54.3
North: Farmaceutica GSK									
7L L	2.32	2.78	189.5	1.00	1.15	12.1	6	5.20	9.9
4R R	2.00	2.40	189.5	1.00	1.17	12.1	6	4.50	9.9

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
1072	0.831	3.85	3.65	10.2	0.26	0.35	3	16.73	53.5
East: PR-172 Desde Caguas									
1076	0.599	0.71	0.85	2.4	0.00	0.19	0	11.17	65.8
North: Farmaceutica GSK									
82	1.000	4.32	5.18	189.5	1.00	1.16	6	9.70	9.9
ALL VEHICLES:									
2230	1.000	8.07	9.68	13.0	0.16	0.30	6	37.60	50.0
INTERSECTION (persons):									
2676	1.000		9.68	13.0	0.16	0.30		37.60	50.0

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn Xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
5L L	296	0.0	1076	2.6	1076	356	0.80	-4	100	0.831
2T T	776	1.8	0			1900	0.80	96	100	0.408
East: PR-172 Desde Caguas										
6T T	879	3.1	0			1467	0.80	34	100	0.599
6R R	197	0.5	0			329	0.80	34	100	0.599
North: Farmaceutica GSK										
7L L	44	0.0	2050+	2.0	2050	44	0.80	-20	100	1.000*
4R R	38	0.0	977+	2.8	978	38	0.80	-20	100	1.000*

\+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	F
Average intersection delay (s)	=	13.0
Largest average movement delay (s)	=	189.5
Largest back of queue, 95% (m)	=	6
Performance Index	=	37.60
Degree of saturation (highest)	=	1.000
Practical Spare Capacity (lowest)	=	-20 %
Effective intersection capacity, (veh/h)	=	2230
Total vehicle flow (veh/h)	=	2230
Total person flow (pers/h)	=	2676
Total vehicle delay (veh-h/h)	=	8.07
Total person delay (pers-h/h)	=	9.68
Total effective vehicle stops (veh/h)	=	679
Total effective person stops (pers/h)	=	815
Total vehicle travel (veh-km/h)	=	1390.5
Total cost ($/h)	=	430.14
Total fuel (L/h)	=	128.7
Total CO2 (kg/h)	=	321.95

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Cidra									
5L	L	296	356	100	0.831	35.1	1.09	6.9	9.51
2T	T	776	1900	100	0.408	0.7	0.08	0.0	7.23
East: PR-172 Desde Caguas									
6T	T	879	1467	100	0.599	0.7	0.08	0.0	8.19
6R	R	197	329	100	0.599	9.6	0.70	0.0	2.99
North: farmaceutica GSK									
7L	L	44	44	100	1.000*	189.5	1.15	12.1	5.20
4R	R	38	38	100	1.000*	189.5	1.17	12.1	4.50

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2014 AM
Intersección PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra							
5L	L	24.9	83.92	0.116	5.10	0.152	62.4
2T	T	35.7	113.06	0.117	2.04	0.175	89.4
		60.7	196.98	0.233	7.14	0.327	151.8
East: PR-172 Desde Caguas							
6T	T	41.7	129.81	0.133	2.31	0.198	104.3
6R	R	14.5	40.35	0.063	3.13	0.096	36.3
		56.2	170.17	0.196	5.45	0.293	140.6
North: Farmaceutica GSK							
7L	L	6.3	33.79	0.033	0.85	0.026	15.9
4R	R	5.5	29.19	0.028	0.73	0.023	13.7
		11.8	62.99	0.061	1.59	0.049	29.6
INTERSECTION:		128.7	430.14	0.490	14.17	0.669	321.9

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income [$/h]	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Bosques de Cidra Escenario 2014 AM
Intersección PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue 95% Back (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 L	296	356	0.830	35.1	1.09	6.9	3.5	45.0T
2 T	776	1900	0.408	0.7	0.08	0.0	0.0	500.0
East: PR-172 Desde Caguas								
1 TR	1076	1796	0.599	2.4	0.19	0.0	0.0	500.0
North: Farmaceutica GSK								
1 LR	82	82	1.000	189.5	1.16	12.1	6.1	500.0

T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2014 AM
Intersección PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 L	296	0	0	296	120	356	0.830	100
2 T	0	776	0	776	776	1900	0.408	100
East: PR-172 Desde Caguas								
1 TR	0	879	197	1076	1076	1796	0.599	100
North: Farmaceutica GSK								
1 LR	44	0	38	82	82	82	1.000	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2014 AM
Intersección PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

	44	0	38	82	0		1.000	189.5	6

ALL VEHICLES	Total Flow	% HV	Max X	Aver. Delay	Max Queue
	2230	2	1.000	13.0	6

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	[m]
West: PR-172 Desde Cidra								
5L	L	296	356	0.831	35.1	E	6.9	3
2T	T	776	1900	0.408	0.7	A	0.0	0
East: PR-172 Desde Caguas								
6T	T	879	1467	0.599	0.7	A	0.0	0
6R	R	197	329	0.599	9.6	A	0.0	0
North: Farmaceutica GSK								
7L	L	44	44	1.000*	189.5	F	12.1	6
4R	R	38	38	1.000*	189.5	F	12.1	6
ALL VEHICLES:		2230		1.000	13.0	NA	12.1	6

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used.
For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods
n Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
5L L	13.7	0.46	0.634	27.95	0.832	341.6
2T T	7.4	0.23	0.241	4.20	0.360	184.3
	9.1	0.29	0.349	10.69	0.489	227.3
East: PR-172 Desde Caguas						
6T T	7.6	0.24	0.242	4.21	0.360	189.7
6R R	11.9	0.33	0.518	25.66	0.783	297.3
	8.4	0.25	0.292	8.11	0.437	209.2
North: Farmaceutica GSK						
7L L	23.3	1.24	1.200	31.29	0.971	582.7
4R R	23.3	1.24	1.197	31.15	0.969	581.7
	23.3	1.24	1.199	31.22	0.970	582.3
INTERSECTION:	9.3	0.31	0.352	10.19	0.481	231.5

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra												
1 L	296			296	0				0.830	35.1	3	45
2 T		776		776	2				0.408	0.7	0	500
	296	776	0	1072	1				0.830	10.2	3	
East: PR-172 Desde Caguas												
1 TR		879	197	1076	3				0.599	2.4	0	500
	0	879	197	1076	3				0.599	2.4		
North: Farmaceutica GSK												
1 LR	44		38	82	0				1.000	189.5	6	500

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Desde Cidra								
	East	Thru	S	65.0	11.1	500	127	No
	North	Left	7.4	10.0	11.7	500	117	No
East: PR-172 Desde Caguas								
	West	Thru	S	65.0	11.1	500	128	No
	North	Right	10.0	20.2	15.7	500	121	No
North: Farmaceutica GSK								
	West	Right	10.0	20.2	15.7	500	120	No
	East	Left	9.0	19.4	14.2	500	119	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Delay (seconds/veh) Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Cidra										
1 L	0.830	12.0	13.5	25.5	3.6	22.0	2.3	19.7	9.6	35.1
2 T	0.408	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
East: PR-172 Desde Caguas										
1 TR	0.599	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.4
North: Farmaceutica GSK										
1 LR	1.000	43.9	140.6	184.5	2.0	182.4	3.6	178.8	5.0	189.5

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

	Deg.	-- Effective Stop Rate --		Prop.	Queue Move-up

Lane No.	Satn x	hal	ha2	Geom. hig	Overall h	Queued pq	Rate hqm
West: PR-172 Desde Cidra							
1 L	0.830	0.95	0.10	0.83	1.09	0.955	1.45
2 T	0.408	0.00	0.00	0.08	0.08	0.000	0.00
East: PR-172 Desde Caguas							
1 TR	0.599	0.00	0.00	0.19	0.19	0.000	0.00
North: Farmaceutica GSK							
1 LR	1.000	1.00	0.16	0.00	1.16	1.000	2.60

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.830	1.1	1.3	1.0	2.3	4.0	4.9	5.6	6.9	8.1	0.08
2 T	0.408	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											
1 TR	0.599	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.000	3.5	1.6	2.5	4.1	6.7	8.4	9.6	12.1	14.2	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.830	0.6	0.6	0.5	1.1	2.0	2.4	2.8	3.5	4.0	0.08
2 T	0.408	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											

1 TR	0.599	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.000	1.7	0.8	1.3	2.1	3.4	4.2	4.8	6.1	7.1	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
5L L	72.0	18.0	18.0	65.0	3.2		47.4	33.4	9.6
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
East: PR-172 Desde Caguas									
6T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
6R R	72.0	20.2	20.2	65.0			54.3	54.3	9.6
North: Farmaceutica GSK									
7L L	72.0	0.0	19.4	65.0	2.6		48.0	9.9	5.0
4R R	72.0	0.0	20.2	65.0	3.0		47.5	9.9	5.0

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
5L L	Normal	1076	4.10	2.20	2.0
East: PR-172 Desde Caguas					
No opposed movements on this approach					
North: Farmaceutica GSK					
7L L	Normal	2050+	7.50	3.50	2.0
4R R	Normal	978+	6.90	3.30	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
+ Percentage of exiting flow included in total opposing flow

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 04:32:29PM

SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2014 PM

INterseccion PR-172 @ Farmeceutica GSK

Performance Measure	Vehicles	Persons
Demand Flows - Total	1809 veh/h	2171 pers/h
Percent Heavy Vehicles	1.5 %	
Degree of Saturation	1.647	
Effective Intersection Capacity	1098 veh/h	
95% Back of Queue (m)	18 m	
95% Back of Queue (veh)	35.6 veh	
Control Delay (Total)	20.48 veh-h/h	24.57 pers-h/h
Control Delay (Average)	40.8 s/veh	40.8 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS F	
Total Effective Stops	406 veh/h	487 pers/h
Effective Stop Rate	0.22 per veh	0.22 per pers
Proportion Queued	0.11	0.11
Travel Distance (Total)	1129.8 veh-km/h	1355.7 pers-km/h
Travel Distance (Average)	625 m	625 m
Travel Time (Total)	36.7 veh-h/h	44.0 pers-h/h
Travel Time (Average)	73.0 secs	73.0 secs
Travel Speed	30.8 km/h	30.8 km/h
Operating Cost (Total)	495 $/h	495 $/h
Fuel Consumption (Total)	116.9 L/h	
Carbon Dioxide (Total)	292.3 kg/h	
Hydrocarbons (Total)	0.474 kg/h	
Carbon Monoxide (Total)	9.12 kg/h	
NOX (Total)	0.512 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP; Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 04:44:06PM

SIDRA INTERSECTION

Movement Summary

Bosques de Cidra Escenario 2014 PM * 2013IN~1

INterseccion PR-172 @ Farmeceutica GSK

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-172 Desde Caguas										
6T	T	843	1.8	0.469	0.7	LOS A	0	0.00	0.08	69.1
6R	R	28	0.0	0.467	9.5	LOS A	0	0.00	0.70	54.3
Approach		**871**	**1.7**	**0.469**	**1.0**	**LOS A**		**0.00**	**0.10**	**68.5**
Farmaceutica GSK										
7L	L	165	0.0	1.602	373.0	LOS F	18	1.00	1.29	5.4
4R	R	28	0.0	1.647	373.0	LOS F	18	1.00	1.33	5.5
Approach		**193**	**0.0**	**1.608**	**373.0**	**LOS F**	**18**	**1.00**	**1.29**	**5.4**
PR-172 Desde Cidra										
5L	L	20	0.0	0.036	14.9	LOS B	0	0.67	0.88	48.0
2T	T	725	1.8	0.382	0.7	LOS A	0	0.00	0.08	69.1
Approach		**745**	**1.7**	**0.382**	**1.1**	**LOS A**	**0**	**0.02**	**0.10**	**68.3**
All Vehicles		**1809**	**1.5**	**1.647**	**40.8**	**Not Applicable**	**18**	**0.11**	**0.22**	**30.8**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 04:44:06PM

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Left		Through		Right	
		LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program							
West: PR-172 Desde Cidra							
5L	L	20	0	0	0	0	0
2T	T	0	0	712	13	0	0
East: PR-172 Desde Caguas							
6T	T	0	0	828	15	0	0
6R	R	0	0	0	0	28	0
North: Farmaceutica GSK							
7L	L	165	0	0	0	0	0
4R	R	0	0	0	0	28	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Left		Through		Right	
		Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program							
West: PR-172 Desde Cidra							
5L	L	20	0.0	0	0.0	0	0.0
2T	T	0	0.0	725	1.8	0	0.0
East: PR-172 Desde Caguas							
6T	T	0	0.0	843	1.8	0	0.0
6R	R	0	0.0	0	0.0	28	0.0
North: Farmaceutica GSK							
7L	L	165	0.0	0	0.0	0	0.0
4R	R	0	0.0	0	0.0	28	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2014 PM * 2013IN~1

INterseccion PR-172 @ Farmeceutica GSK

Run Information

* Basic Parameters:
  Intersection Type: Unsignalised - Two-Way Stop Control
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
  Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Bosques de Cidra Escenario 2014 PM * 2013IN~1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Cidra							
	East	2T	Thru	712	13	1.00	0.92
	North	5L	Left	20	0	1.00	0.25
East: PR-172 Desde Caguas							
	West	6T	Thru	828	15	1.00	0.86
	North	6R	Right	28	0	1.00	0.75
North: Farmaceutica GSK							
	West	4R	Right	28	0	1.00	0.58
	East	7L	Left	165	0	1.00	0.63

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
5L L	0.08	0.10	14.9	0.67	0.88	0.2	0	0.40	48.0
2T T	0.15	0.18	0.7	0.00	0.08	0.0	0	6.75	69.1
East: PR-172 Desde Caguas									
6T T	0.17	0.21	0.7	0.00	0.08	0.0	0	7.85	69.1
6R R	0.07	0.09	9.5	0.00	0.70	0.0	0	0.42	54.3
North: Farmaceutica GSK									
7L L	17.10	20.51	373.0	1.00	1.28	35.6	18	31.28	5.4
4R R	2.90	3.48	373.0	1.00	1.33	35.6	18	5.31	5.5

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
745	0.382	0.23	0.28	1.1	0.02	0.10	0	7.15	68.3
East: PR-172 Desde Caguas									
871	0.469	0.25	0.30	1.0	0.00	0.10	0	8.28	68.5
North: Farmaceutica GSK									
193	1.647	20.00	24.00	373.0	1.00	1.29	18	36.60	5.4
ALL VEHICLES:									
1809	1.647	20.48	24.57	40.8	0.11	0.22	18	52.03	30.8
INTERSECTION (persons):									
2171	1.647		24.57	40.8	0.11	0.22		52.03	30.8

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
5L L	20	0.0	871	1.7	871	554	0.80	2116	100	0.036
2T T	725	1.8	0			1900	0.80	110	100	0.382
East: PR-172 Desde Caguas										
6T T	943	1.8	0			1798	0.80	71	100	0.469
6R R	28	0.0	0			60	0.80	71	100	0.467
North: Farmaceutica GSK										
7L L	165	0.0	1602+	1.7	1602	103	0.80	-50	100	1.602
4R R	28	0.0	857+	1.8	857	17	0.80	-51	100	1.647*

\+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	F
Average intersection delay (s)	=	40.8
Largest average movement delay (s)	=	373.0
Largest back of queue, 95% (m)	=	18
Performance Index	=	52.03
Degree of saturation (highest)	=	1.647
Practical Spare Capacity (lowest)	=	-51 %
Effective intersection capacity, (veh/h)	=	1096
Total vehicle flow (veh/h)	=	1809
Total person flow (pers/h)	=	2171
Total vehicle delay (veh-h/h)	=	20.48
Total person delay (pers-h/h)	=	24.57
Total effective vehicle stops (veh/h)	=	406
Total effective person stops (pers/h)	=	487
Total vehicle travel (veh-km/h)	=	1129.8
Total cost ($/h)	=	494.62
Total fuel (L/h)	=	116.9
Total CO2 (kg/h)	=	292.31

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 L	20	554	0.036	14.9	0.88	0.2	0.1	45.0T
2 T	725	1900	0.382	0.7	0.08	0.0	0.0	500.0
East: PR-172 Desde Caguas								
1 TR	871	1857	0.469	1.0	0.10	0.0	0.0	500.0
North: Farmaceutica GSK								
1 LR	193	120	1.608	373.0	1.29	35.6	17.8	500.0

T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 L	20	0	0	20	20	554	0.036	100
2 T	0	725	0	725	725	1900	0.382	100
East: PR-172 Desde Caguas								
1 TR	0	843	28	871	871	1857	0.469	100
North: Farmaceutica GSK								
1 LR	165	0	28	193	120	120	1.608	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Cidra									
5L	L	20	554	100	0.036	14.9	0.88	0.2	0.40
2T	T	725	1900	100	0.382	0.7	0.08	0.0	6.75
East: PR-172 Desde Caguas									
6T	T	843	1798	100	0.469	0.7	0.08	0.0	7.85
6R	R	28	60	100	0.467	9.5	0.70	0.0	0.42
North: Farmaceutica GSK									
7L	L	165	103	100	1.602	373.0	1.29	35.6	31.28
4R	R	28	17	100	1.647*	373.0	1.33	35.6	5.31

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra							
5L	L	1.5	4.42	0.007	0.33	0.010	3.8
2T	T	33.4	105.61	0.109	1.90	0.163	83.5
		34.9	110.03	0.116	2.24	0.173	87.3
East: PR-172 Desde Caguas							
6T	T	38.8	122.79	0.127	2.21	0.190	97.1
6R	R	2.0	5.67	0.009	0.44	0.013	5.1
		40.8	128.46	0.136	2.65	0.203	102.1
North: Farmaceutica GSK							
7L	L	35.2	218.97	0.190	3.62	0.116	87.9
4R	R	5.0	37.16	0.032	0.61	0.020	14.9
		41.1	256.13	0.222	4.24	0.136	102.8
INTERSECTION:		116.9	494.62	0.474	9.12	0.512	292.3

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

	165	0	28	193	0		1.608	373.0	18

ALL VEHICLES	Total Flow	% HV	Max X	Aver. Delay	Max Queue
	1809	2	1.647	40.8	18

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow [veh /h]	Total Cap. [veh /h]	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
5L	L	20	554	0.036	14.9	B	0.2	0
2T	T	725	1900	0.382	0.7	A	0.0	0
East: PR-172 Desde Caguas								
6T	T	843	1798	0.469	0.7	A	0.0	0
6R	R	28	60	0.467	9.5	A	0.0	0
North: Farmaceutica GSK								
7L	L	165	103	1.602	373.0	F	35.6	18
4R	R	28	17	1.647*	373.0	F	35.6	18
ALL VEHICLES:		1809		1.647	40.8	NA	35.6	18

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods
\^ Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
5L L	12.3	0.36	0.555	27.02	0.804	308.4
2T T	7.4	0.23	0.241	4.20	0.360	184.2
	7.5	0.24	0.250	4.80	0.372	187.5
East: PR-172 Desde Caguas						
6T T	7.4	0.23	0.241	4.20	0.360	184.2
6R R	11.6	0.33	0.512	25.09	0.764	291.2
	7.5	0.24	0.250	4.86	0.373	187.6
North: Farmaceutica GSK						
7L L	34.4	2.14	1.860	35.49	1.137	861.2
4R R	34.4	2.14	1.856	35.37	1.135	859.8
	34.4	2.14	1.860	35.48	1.137	861.0
INTERSECTION:	10.3	0.44	0.420	8.07	0.453	258.7

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st 2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue [m]	Shrt Lane [m]
West: PR-172 Desde Cidra											
1 L	20			20	0			0.036	14.9	0	45
2 T		725		725	2			0.382	0.7	0	500
	20	725	0	745	2			0.382	1.1	0	
East: PR-172 Desde Caguas											
1 TR		843	28	871	2			0.469	1.0	0	500
	0	843	28	871	2			0.469	1.0		
North: Farmaceutica GSK											
1 LR	165		28	193	0			1.608	373.0	18	500

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream Dist. (m)	Distance User Spec?
West: PR-172 Desde Cidra								
	East	Thru	S	65.0	11.1	500	127	No
	North	Left	7.4	18.0	11.7	500	117	No
East: PR-172 Desde Caguas								
	West	Thru	S	65.0	11.1	500	127	No
	North	Right	10.0	20.2	15.7	500	120	No
North: Farmaceutica GSK								
	West	Right	10.0	20.2	15.7	500	120	No
	East	Left	9.0	19.4	14.2	500	119	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvOp dqm	Stopd (Idle) di	Geom dig	Control dic
		Delay (seconds/veh)								
West: PR-172 Desde Cidra										
1 L	0.036	5.3	0.0	5.3	2.5	2.8	0.0	2.8	9.6	14.9
2 T	0.382	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
East: PR-172 Desde Caguas										
1 TR	0.469	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
North: Farmaceutica GSK										
1 LR	1.608	30.0	338.0	368.0	2.0	366.0	6.7	359.2	5.0	373.0

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

	Deg.	-- Effective Stop Rate --	Prop.	Queue Move-up

Lane No.	Satn x	hel	he2	Geom. hig	Overall h	Queued pq	Rate hqm
West: PR-172 Desde Cidra							
1 L	0.036	0.64	0.00	0.24	0.86	0.670	0.00
2 T	0.382	0.00	0.00	0.08	0.08	0.000	0.00
East: PR-172 Desde Caguas							
1 TR	0.469	0.00	0.00	0.10	0.10	0.000	0.00
North: Farmaceutica GSK							
1 LR	1.608	1.00	0.29	0.00	1.29	1.000	4.80

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.036	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.00
2 T	0.382	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											
1 TR	0.469	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.608	11.0	2.9	10.6	13.6	18.0	23.4	27.5	35.6	42.4	0.04

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.036	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.00
2 T	0.382	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											

1 TR	0.469	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.608	5.6	1.5	5.3	6.8	9.0	11.7	13.7	17.8	21.2	0.04

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
5L L	72.0	18.0	18.0	65.0			51.1	48.0	9.6
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
East: PR-172 Desde Caguas									
6T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
6R R	72.0	20.2	20.2	65.0			54.3	54.3	9.5
North: Farmaceutica GSK									
7L L	72.0	0.0	19.4	65.0	2.8		44.9	5.4	5.0
4R R	72.0	0.0	20.2	65.0	3.2		44.1	5.5	5.0

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
5L L	Normal	871	4.10	2.20	2.0
East: PR-172 Desde Caguas					
No opposed movements on this approach					
North: Farmaceutica GSK					
7L L	Normal	1602+	7.50	3.50	2.0
4R R	Normal	857+	6.90	3.30	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
+ Percentage of exiting flow included in total opposing flow

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 04:44:06PM

SIDRA INTERSECTION

Intersection Summary

Estudio Operacional de Transito Bosques de Cidra 2014

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM

Performance Measure	Vehicles	Persons
Demand Flows - Total	1837 veh/h	2204 pers/h
Percent Heavy Vehicles	2.1 %	
Degree of Saturation	0.603	
Effective Intersection Capacity	3046 veh/h	
95% Back of Queue (m)	5 m	
95% Back of Queue (veh)	8.3 veh	
Control Delay (Total)	2.82 veh-h/h	3.38 pers-h/h
Control Delay (Average)	5.5 s/veh	5.5 s/pers
Level of Service	LOS A	
Level of Service (Worst Movement)	LOS D	
Total Effective Stops	575 veh/h	690 pers/h
Effective Stop Rate	0.31 per veh	0.31 per pers
Proportion Queued	0.19	0.19
Travel Distance (Total)	1155.2 veh-km/h	1386.3 pers-km/h
Travel Distance (Average)	629 m	629 m
Travel Time (Total)	19.1 veh-h/h	23.0 pers-h/h
Travel Time (Average)	37.5 secs	37.5 secs
Travel Speed	60.4 km/h	60.4 km/h
Operating Cost (Total)	321 $/h	321 $/h
Fuel Consumption (Total)	106.9 L/h	
Carbon Dioxide (Total)	267.4 kg/h	
Hydrocarbons (Total)	0.402 kg/h	
Carbon Monoxide (Total)	14.00 kg/h	
NOX (Total)	0.600 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:07:10PM

SIDRA INTERSECTION

Movement Summary

Estudio Operacional de Transito Bosques de Cidra 2014

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM

Signalised - Actuated coordinated **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Bosque de Cidra San Jose										
3L	L	57	0.0	0.314	39.7	LOS D	1	0.94	0.74	31.4
8R	R	205	0.0	0.126	9.7	LOS A#	3#	0.00	0.66	55.5
Approach		**262**	**0.0**	**0.314**	**16.3**	**LOS B**	**1**	**0.20**	**0.68**	**47.8**
PR_172 Caguas										
1L	L	29	0.0	0.160	38.8	LOS D	1	0.92	0.71	31.8
6T	T	720	3.5	0.488	1.6	LOS A	3	0.10	0.16	67.3
Approach		**749**	**3.3**	**0.487**	**3.0**	**LOS A**	**3**	**0.13**	**0.18**	**64.5**
PR-172 Cidra										
2T	T	754	1.7	0.603	3.9	LOS A	5	0.25	0.29	63.0
2R	R	71	0.0	0.049	9.3	LOS A	0	0.11	0.66	54.3
Approach		**826**	**1.6**	**0.603**	**4.4**	**LOS A**	**5**	**0.24**	**0.32**	**62.1**
All Vehicles		**1837**	**2.1**	**0.603**	**5.5**	**LOS A**	**5**	**0.19**	**0.31**	**60.4**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:07:10PM

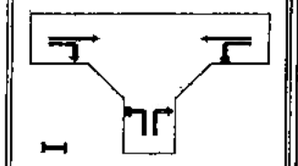
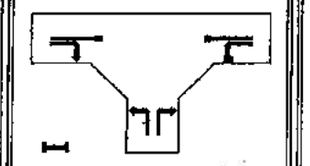
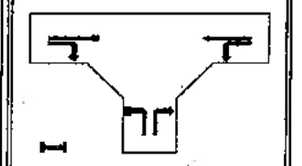
SIDRA INTERSECTION

Phasing Summary

Estudio Operacional de Transito Bosques de Cidra 2014

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM

C = 60 seconds
Cycle Time Option: **User-specified cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase C
		
Green Time = **40** seconds Phase Time = **44** seconds Phase Split = **73 %**	Green Time = **6** seconds Phase Time = **8** seconds Phase Split = **13 %**	Green Time = **6** seconds Phase Time = **8** seconds Phase Split = **13 %**

Normal Movement Permitted/Opposed Stopped Movement
Slip-Lane Opposed Slip-Lane Continuous
Turn On Red

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:07:10PM

	East	8R	Right	205	0	1.00	0.96
East: PR_172 Caguas							
	West	6T	Thru	695	25	1.00	0.96
	South	1L	Left	29	0	1.00	0.96

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left LV	Left HV	Through LV	Through HV	Right LV	Right HV
Demand flows in veh/hour as used by the program						
West: PR-172 Cidra						
2T T	0	0	742	13	0	0
2R R	0	0	0	0	71	0
South: Bosque de Cidra San Jose						
3L L	57	0	0	0	0	0
8R R	0	0	0	0	205	0
East: PR_172 Caguas						
1L L	29	0	0	0	0	0
6T T	0	0	695	25	0	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left Total	Left %HV	Through Total	Through %HV	Right Total	Right %HV
Demand flows in veh/hour as used by the program						
West: PR-172 Cidra						
2T T	0	0.0	755	1.7	0	0.0
2R R	0	0.0	0	0.0	71	0.0
South: Bosque de Cidra San Jose						

SIDRA INTERSECTION

Output Tables

Estudio Operacional de Transito Bosques de Cidra 2014

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM

Run Information

Cycle Time = 60 (User-given Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Actuated Coordinated
  For fully-actuated signal timings, the following specifications will be ignored:
    Any maximum cycle time specification
  For actuated signal timings, cycle increment is set to 1 second
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
                    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations = 2
  Comparison of last two iterations:
    Difference in intersection degree of satn = 0.0 %
    Largest difference in eff. green times = 0 secs
    (max. value for stopping = 0 secs)

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Cidra							
	South	2R	Right	71	0	1.00	0.96
	East	2T	Thru	742	13	1.00	0.96
South: Bosque de Cidra San Jose							
	West	3L	Left	57	0	1.00	0.96

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Cidra											
2T T	755	1.7	1878		0.402		1252	0.90	49	100	0.603*
2R R	71	0.0	1624	1624	0.014	0.030	1462	0.90	1753	100	0.049
South: Bosque de Cidra San Jose											
3L L	57	0.0	1815		0.031		181	0.90	187	100	0.314
8R R	205	0.0	1624		0.126		1624	0.90	613	100	0.126
East: PR_172 Caguas											
1L L	29	0.0	1815		0.016		182	0.90	463	100	0.160
6T T	720	3.5	1846		0.390		1477	0.90	85	100	0.488

Table S.3 - Intersection Parameters

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
2T	W_T		A	B	2	0.402	0.523	33.4
3L	S_L		B	C	10	-	-	10.0Min
1L	E_L		C	A	8	-	-	8.0Min
				Total:	20	0.402	0.523	51.4

\- Flow ratio not used for cycle time calculations and the adjusted lost time equals the required movement time (=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
26	NA	42	60

(Cycle time specified by the user)

NA Cmax does not apply at actuated signals

Intersection Level of Service	=	A
Worst movement Level of Service	=	D
Average intersection delay (s)	=	5.5
Largest average movement delay (s)	=	39.7
Largest back of queue, 95% (m)	=	5
Performance Index	=	29.88
Degree of saturation (highest)	=	0.603
Practical Spare Capacity (lowest)	=	49 %
Effective intersection capacity, (veh/h)	=	3046
Total vehicle flow (veh/h)	=	1837
Total person flow (pers/h)	=	2204
Total vehicle delay (veh-h/h)	=	2.82
Total person delay (pers-h/h)	=	3.38
Total effective vehicle stops (veh/h)	=	575
Total effective person stops (pers/h)	=	690
Total vehicle travel (veh-km/h)	=	1155.2
Total cost ($/h)	=	321.06
Total fuel (L/h)	=	106.9
Total CO2 (kg/h)	=	267.38

3L L	57	0.0	0	0.0	0	0.0
8R R	0	0.0	0	0.0	205	0.0
East: PR_172 Caguas						
1L L	29	0.0	0	0.0	0	0.0
6T T	0	0.0	720	3.5	0	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.1 - Movement Phase and Timing Parameters

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	First Green To	First Green Op Fr	Second Green Fr	Second Green To	Second Green Op Fr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Cidra													
2T T		*A	B					2		33.4		40	
2R R	(Slp)	A	B		B	A		2	4	8.0Min	18.0Min	40	14
South: Bosque de Cidra San Jose													
3L L		*B	C					4		10.0Min		6	
East: PR_172 Caguas													
1L L		*C	A					2		8.0Min		6	
6T T		C	B					2		35.9		48	

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

* Critical Movement/Green Period

Movement Types:
Slp Slip Lane Movement
Ped Pedestrian
Dum Dummy

Under heading 'Op':
Y If opposed turn

Table S.2 - Movement Capacity Parameters

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

West: PR-172 Cidra									
826	0.603	1.00	1.21	4.4	0.24	0.32	5	13.96	62.1
South: Bosque de Cidra San Jose									
262	0.314	1.18	1.42	16.3	0.20	0.68	1	5.65	47.8
East: PR_172 Caguas									
749	0.488	0.63	0.76	3.0	0.13	0.18	3	10.27	64.5
ALL VEHICLES:									
1837	0.603	2.82	3.38	5.5	0.19	0.31	5	29.88	60.4
INTERSECTION (persons):									
2204	0.603		3.38	5.5	0.19	0.31		29.88	60.4

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Effective Green Times (sec) R1	G1	R2	G2	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue 95% Back (m)	Lane Length (m)
West: PR-172 Cidra												
1 T	20	40	0	0	755	1252	0.603	1.9	0.29	8.3	4.9	500.0
2 R	2	40	4	14	71	1462	0.049	9.3	0.66	0.3	0.1	500.0
South: Bosque de Cidra San Jose												
1 L	54	6	0	0	57	182	0.314	39.7	0.74	2.3	1.2	500.0
2 R	0	60	0	0	205	1624	0.126	9.7	0.66	2.0#		500.0
East: PR_172 Caguas												
1 L	54	6	0	0	29	182	0.160	38.8	0.71	1.1	0.6	70.0T
2 T	12	48	0	0	720	1477	0.487	1.6	0.16	3.8	2.6	500.0

Density (passenger cars per km or mile)
T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Lane Width (m)	Saturation Flow Adj. Basic (tou)	Aver 1st (veh)	Aver 2nd (veh)	End Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %

Table S.4 - Phase Information

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	2	2	40	42	4	44	73%
B	42	4	46	6	52	2	8	13%
C	52	2	54	6	60	2	8	13%

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	Longest Queue 95% Back (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Cidra									
2T T	0.82	0.98	3.9	0.25	0.29	8.3	5	12.77	63.0
2R R	0.18	0.22	9.3	0.11	0.66	0.3	0	1.19	54.3
South: Bosque de Cidra San Jose									
3L L	0.63	0.76	39.7	0.94	0.74	2.3	1	2.47	31.4
8R R	0.55	0.67	9.7		0.66	2.0#		3.17	55.5
East: PR_172 Caguas									
1L L	0.31	0.37	38.8	0.92	0.71	1.1	1	1.22	31.8
6T T	0.32	0.38	1.6	0.10	0.16	3.8	3	9.05	67.3

Largest density (passenger cars per km or mile) for any lane

Table S.6 - Intersection Performance

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)

```
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG...............GGGGG
                                          44           56

I-----I-----I-----I-----I-----I-----I-----I-----I-----I-----I---->
0     6    12    18    24    30    36    42    48    54    60

                        T I M E  (s)
```

Table S.10 - Movement Capacity and Performance Summary

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Eff. Grn 1st Grn	Eff. Grn 2nd Grn	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Cidra											
2T T		755	1252	100	0.603*	40*		3.9	0.29	8.3	12.77
2R R	(Slp)	71	1462	100	0.049	40	14	9.3	0.66	0.3	1.19
South: Bosque de Cidra San Jose											
3L L		57	181	100	0.314	6*		39.7	0.74	2.3	2.47
8R R	(Con)	205	1624	100	0.126	60		9.7	0.66	2.8 #	3.17
East: PR_172 Caguas											
1L L		29	182	100	0.160	6*		38.8	0.71	1.1	1.22
6T T		720	1477	100	0.488	48		1.6	0.16	3.8	9.05

* Maximum degree of saturation, or critical green periods
\# Largest density (passenger cars per km or mile) for any lane

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Cidra						
2T T	41.2	124.86	0.152	4.85	0.228	103.1
2R R	5.0	14.37	0.022	1.02	0.032	12.5
	46.2	139.23	0.173	5.88	0.260	115.6
South: Bosque de Cidra San Jose						
3L L	4.9	17.00	0.022	0.95	0.029	12.2
8R R	16.3	44.37	0.072	3.65	0.109	40.9

West: PR-172 Cidra												
1 T	0	755	0	755	3.65	1911	1878	0	0	1252	0.603	100
2 R	0	0	71	71	3.65	1911	1624	1624	0	1462	0.049	100
South: Bosque de Cidra San Jose												
1 L	57	0	0	57	3.65	1911	1815	0	0	182	0.314	100
2 R	0	0	205	205	3.65	1911	1624	0	0	1624	0.126	100
East: PR_172 Caguas												
1 L	29	0	0	29	3.65	1911	1815	0	0	182	0.160	100
2 T	0	720	0	720	3.65	1911	1846	0	0	1477	0.487	100

Basic Saturation Flow in this table is adjusted for lane width, approach grade, parking manoeuvres and number of buses stopping. Saturation flow scale applies if specified.

Table S.9 - Signal Timing Diagram

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

```
Displayed (Phase) Green Times

                 Phase A                            Phase B   Phase C

0                                          42        52        60
I------------------------------------------I---------I---------I
..GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....GGGGG...GGGGGG.
 2                                             46       54


Effective (Movement) Green Times


 West: PR-172 Cidra

Mov.    2T (T)
I                                          I         I         I
.....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG...................
    4                                        44

Mov.    2R (R)
I                                          I         I         I
GG...GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG....GGGGGGGGGGGGGG
 2  4                                      44    48


 South: Bosque de Cidra San Jose

Mov.    3L (L)
I                                          I         I         I
.................................................GGGGGG........
                                                48     54


 East: PR_172 Caguas

Mov.    1L (L)
I                                          I         I         I
G...........................................................GGGGG
 2                                                          56

Mov.    6T (T)
I                                          I         I         I
```

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Cidra												
1 T		755		755	2	1910	40		0.603	3.9	5	500
2 R			71	71	0	1910	40	14	0.049	9.3	0	500
	0	755	71	826	2				0.603	4.4	5	
South: Bosque de Cidra San Jose												
1 L	57			57	0	1910	6		0.314	39.7	1	500
2 R			205	205	0	1910	60		0.126	9.7		500
	57	0	205	262	0				0.314	16.3	1	
East: PR_172 Caguas												
1 L	29			29	0	1910	6		0.160	38.8	1	70
2 T		720		720	3	1910	48		0.487	1.6	3	500
	29	720	0	749	3				0.487	3.0	3	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	1837	2	60	0.603	5.5	5

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio Operacional de Transito Bosques de Cidra 2014
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Green Time Ratio (g/C) 1st grn	2nd grn	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Cidra										
2T T		0.667*		755	1252	0.603*	3.9	A	8.3	5
2R R	(Slp)	0.667	0.233	71	1462	0.049	9.3	A	0.3	0
South: Bosque de Cidra San Jose										
3L L		0.100*		57	181	0.314	39.7	D	2.3	1
8R R	(Con)	1.000		205	1624	0.126	9.7	A#	2.8#	
East: PR_172 Caguas										
1L L		0.100*		29	182	0.160	38.8	D	1.1	1
6T T		0.800		720	1477	0.488	1.6	A	3.8	3
ALL VEHICLES:				1837		0.603	5.5	A	8.3	5

	21.2	61.37	0.094	4.61	0.139	53.1
East: PR_172 Caguas						
1L L	2.5	8.56	0.011	0.49	0.015	6.2
6T T	37.0	111.90	0.123	3.03	0.186	92.5
	39.4	120.46	0.135	3.52	0.201	98.7
INTERSECTION:	106.9	321.86	0.402	14.00	0.600	267.4

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	1.0
Average income ($/h)	=	18.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio Operacional de Transito Bosques de Cidra 2014
Intersecion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Cidra						
2T T	8.7	0.26	0.322	10.28	0.483	218.3
2R R	11.2	0.32	0.480	22.84	0.723	280.0
	8.9	0.27	0.335	11.37	0.504	223.6
South: Bosque de Cidra San Jose						
3L L	13.7	0.48	0.628	26.79	0.817	342.5
8R R	12.2	0.33	0.534	27.22	0.816	304.3
	12.5	0.36	0.554	27.13	0.816	312.3
East: PR_172 Caguas						
1L L	13.7	0.47	0.629	26.91	0.819	341.8
6T T	8.2	0.25	0.274	6.73	0.413	205.5
	8.4	0.26	0.287	7.51	0.428	210.7
INTERSECTION:	9.3	0.28	0.348	12.12	0.519	231.5

Table S.14 - Summary of Input and Output Data

SIDRA INTERSECTION

Intersection Summary

Estudio Operacional de Transito Bosques de Cidra 2014 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

Performance Measure	Vehicles	Persons
Demand Flows - Total	1609 veh/h	1931 pers/h
Percent Heavy Vehicles	1.0 %	
Degree of Saturation	0.586	
Effective Intersection Capacity	2745 veh/h	
95% Back of Queue (m)	7 m	
95% Back of Queue (veh)	12.1 veh	
Control Delay (Total)	5.12 veh-h/h	6.15 pers-h/h
Control Delay (Average)	11.5 s/veh	11.5 s/pers
Level of Service	LOS B	
Level of Service (Worst Movement)	LOS D	
Total Effective Stops	745 veh/h	894 pers/h
Effective Stop Rate	0.46 per veh	0.46 per pers
Proportion Queued	0.39	0.39
Travel Distance (Total)	1009.7 veh-km/h	1211.7 pers-km/h
Travel Distance (Average)	628 m	628 m
Travel Time (Total)	19.4 veh-h/h	23.3 pers-h/h
Travel Time (Average)	43.4 secs	43.4 secs
Travel Speed	52.1 km/h	52.1 km/h
Operating Cost (Total)	319 $/h	319 $/h
Fuel Consumption (Total)	103.6 L/h	
Carbon Dioxide (Total)	259.0 kg/h	
Hydrocarbons (Total)	0.421 kg/h	
Carbon Monoxide (Total)	16.59 kg/h	
NOX (Total)	0.611 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:37:45PM

SIDRA INTERSECTION

Movement Summary

Estudio Operacional de Transito Bosques de Cidra 2014 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

Signalised - Actuated coordinated **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Bosque de Cidra San Jose										
3L	L	78	0.0	0.322	37.5	LOS D	1	0.92	0.76	32.5
8R	R	109	0.0	0.067	9.7	LOS A	2	0.00	0.66	55.5
Approach		**187**	**0.0**	**0.322**	**21.3**	**LOS C**	**1**	**0.38**	**0.70**	**43.1**
PR_172 Caguas										
1L	L	196	0.0	0.381	29.5	LOS C	3	0.83	0.80	36.6
6T	T	623	1.4	0.432	1.6	LOS A	2	0.09	0.15	67.3
Approach		**819**	**1.1**	**0.431**	**8.3**	**LOS A**	**3**	**0.27**	**0.38**	**56.1**
PR-172 Cidra										
2T	T	498	1.2	0.586	13.4	LOS B	7	0.65	0.59	49.7
2R	R	105	1.0	0.072	9.4	LOS A	0	0.11	0.66	54.3
Approach		**603**	**1.2**	**0.586**	**12.7**	**LOS B**	**7**	**0.55**	**0.60**	**50.5**
All Vehicles		**1609**	**1.0**	**0.586**	**11.5**	**LOS B**	**7**	**0.39**	**0.46**	**52.1**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:37:45PM

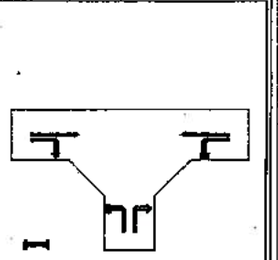
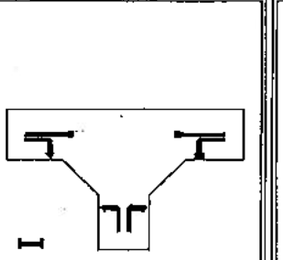
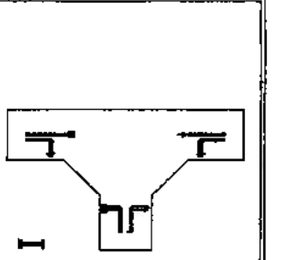
SIDRA INTERSECTION

Phasing Summary

Estudio Operacional de Transito Bosques de Cidra 2014 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

C = 60 seconds
Cycle Time Option: **User-specified cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase C
		
Green Time = **27** seconds Phase Time = **31** seconds Phase Split = **52 %**	Green Time = **8** seconds Phase Time = **10** seconds Phase Split = **17 %**	Green Time = **17** seconds Phase Time = **19** seconds Phase Split = **32 %**

Normal Movement Permitted/Opposed Stopped Movement
Slip-Lane Opposed Slip-Lane Continuous
Turn On Red

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:37:45PM

	East	8R	Right	109	0	1.00	0.96
East: PR_172 Caguas							
	West	6T	Thru	614	9	1.00	0.96
	South	1L	Left	196	0	1.00	0.96

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left LV	Left HV	Through LV	Through HV	Right LV	Right HV
Demand flows in veh/hour as used by the program						
West: PR-172 Cidra						
2T T	0	0	492	6	0	0
2R R	0	0	0	0	104	1
South: Bosque de Cidra San Jose						
3L L	78	0	0	0	0	0
8R R	0	0	0	0	109	0
East: PR_172 Caguas						
1L L	196	0	0	0	0	0
6T T	0	0	614	9	0	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left Total	Left %HV	Through Total	Through %HV	Right Total	Right %HV
Demand flows in veh/hour as used by the program						
West: PR-172 Cidra						
2T T	0	0.0	498	1.2	0	0.0
2R R	0	0.0	0	0.0	105	1.0
South: Bosque de Cidra San Jose						

SIDRA INTERSECTION

Output Tables

Estudio Operacional de Transito Bosques de Cidra 2014 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

Run Information

Cycle Time = 60 (User-given Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Actuated Coordinated
  For fully-actuated signal timings, the following specifications will be ignored:
    Any maximum cycle time specification
  For actuated signal timings, cycle increment is set to 1 second
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations = 1
  Comparison of last two iterations:
    Difference in intersection degree of satn = 0.0 %
    Largest difference in eff. green times = 0 secs
    (max. value for stopping = 0 secs)

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Cidra							
	South	2R	Right	104	1	1.00	0.96
	East	2T	Thru	492	6	1.00	0.96
South: Bosque de Cidra San Jose							
	West	3L	Left	78	0	1.00	0.96

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Cidra											
2T T	498	1.2	1888		0.264		850	0.90	54	100	0.586*
2R R	105	1.0	1613	1613	0.022	0.043	1452	0.90	1144	100	0.072
South: Bosque de Cidra San Jose											
3L L	78	0.0	1815		0.043		242	0.90	179	100	0.322
8R R	109	0.0	1624		0.067		1624	0.90	1241	100	0.067
East: PR_172 Caguas											
1L L	196	0.0	1815		0.108		514	0.90	136	100	0.381
6T T	623	1.4	1883		0.331		1444	0.90	109	100	0.432

Table S.3 - Intersection Parameters

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
2T	W_T		A	B	2	0.264	0.387	25.2
3L	S_L		B	C	4	0.043	0.107	10.4
1L	E_L		C	A	2	0.108	0.231	15.9
		Total:			8	0.415	0.725	51.5

Cycle Time:

Minimum	Maximum	Practical	Chosen
26	NA	30	60

(Cycle time specified by the user)

NA Cmax does not apply at actuated signals

Intersection Level of Service	=	B
Worst movement Level of Service	=	D
Average intersection delay (s)	=	11.5
Largest average movement delay (s)	=	37.5
Largest back of queue, 95% (m)	=	7
Performance Index	=	35.80
Degree of saturation (highest)	=	0.586
Practical Spare Capacity (lowest)	=	54 %
Effective intersection capacity, (veh/h)	=	2745
Total vehicle flow (veh/h)	=	1609
Total person flow (pers/h)	=	1931
Total vehicle delay (veh-h/h)	=	5.12
Total person delay (pers-h/h)	=	6.15
Total effective vehicle stops (veh/h)	=	745
Total effective person stops (pers/h)	=	894
Total vehicle travel (veh-km/h)	=	1009.7
Total cost ($/h)	=	318.58
Total fuel (L/h)	=	103.6
Total CO2 (kg/h)	=	258.99

3L L	78	0.0	0	0.0	0	0.0
8R R	0	0.0	0	0.0	109	0.0
East: PR_172 Caguas						
1L L	196	0.0	0	0.0	0	0.0
6T T	0	0.0	623	1.4	0	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.1 - Movement Phase and Timing Parameters

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	First Green To	First Green Op Pr	Second Green Fr	Second Green To	Second Green Op Pr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Cidra													
2T T		*A	B					2		25.2		27	
2R R	(Slp)	A	B		B	A		2	4	8.0Min	18.0Min	27	27
South: Bosque de Cidra San Jose													
3L L		*B	C					4		10.4		8	
East: PR_172 Caguas													
1L L		*C	A					2		15.9		17	
6T T		C	B					2		32.3		46	

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

* Critical Movement/Green Period

Movement Types:
Slp Slip Lane Movement
Ped Pedestrian
Dum Dummy

Under heading 'Op':
Y If opposed turn

Table S.2 - Movement Capacity Parameters

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

South: Bosque de Cidra San Jose									
167	0.322	1.11	1.33	21.3	0.38	0.70	1	4.96	43.1
East: PR 172 Caguas									
819	0.432	1.88	2.26	8.3	0.27	0.30	3	14.96	56.1
ALL VEHICLES:									
1609	0.586	5.12	6.15	11.5	0.39	0.46	7	35.80	52.1
INTERSECTION (persons):									
1931	0.586		6.15	11.5	0.39	0.46		35.80	52.1

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Effective Green Times (sec) R1	G1	R2	G2	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	(m)	Lane Length (m)
West: PR-172 Cidra												
1 T	33	27	0	0	498	850	0.586	13.4	0.59	12.1	6.8	500.0
2 R	2	27	4	27	105	1452	0.072	9.4	0.66	0.4	0.2	500.0
South: Bosque de Cidra San Jose												
1 L	52	8	0	0	78	242	0.322	37.5	0.76	3.0	1.5	500.0
2 R	0	60	0	0	109	1624	0.067	9.7	0.66	1.5#		500.0
East: PR 172 Caguas												
1 L	43	17	0	0	196	514	0.381	29.5	0.80	6.3	3.1	70.0T
2 T	14	46	0	0	623	1444	0.431	1.6	0.15	3.0	1.7	500.0

\# Density (passenger cars per km or mile)
T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Dem Flow (veh/h) Laf	Thru	Rig	Tot	Lane Width (m)	Saturation Flow Adj. Basic (tcu)	Aver 1st (veh)	Aver 2nd (veh)	End Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Cidra												
1 T	0	498	0	498	3.65	1911	1888	0	0	850	0.586	100
2 R	0	0	105	105	3.65	1911	1613	1613	0	1452	0.072	100

Table S.4 - Phase Information

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	2	2	27	29	4	31	52%
B	29	4	33	8	41	2	10	17%
C	41	2	43	17	60	2	19	32%

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Cidra									
2T T	1.86	2.23	13.4	0.65	0.59	12.1	7	14.11	49.7
2R R	0.27	0.33	9.4	0.11	0.66	0.4	0	1.77	54.3
South: Bosque de Cidra San Jose									
3L L	0.81	0.97	37.5	0.92	0.76	3.0	1	3.28	32.5
8R R	0.29	0.35	9.7		0.66	1.5#		1.69	55.5
East: PR 172 Caguas									
1L L	1.61	1.93	29.5	0.83	0.80	6.3	3	7.31	36.6
6T T	0.27	0.33	1.6	0.09	0.15	3.0	2	7.66	67.3

\# Largest density (passenger cars per km or mile) for any lane

Table S.6 - Intersection Performance

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Cidra									
603	0.586	2.13	2.56	12.7	0.55	0.60	7	15.88	50.5

```
I-----I------I------I------I------I------I------I------I------I------I------I---->
0     6     12     18     24     30     36     42     48     54     60

                        T I M E  (s)
```

Table S.10 - Movement Capacity and Performance Summary

```
Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------------------
Mov      Mov  Dem   Total  Lane  Deg.  Eff. Grn  Aver.  Eff.   95%    Perf.
ID       Typ  Flow   Cap.  Util  Satn  -------- Delay  Stop  Back of  Index
              (veh   (veh                 1st 2nd        Rate  Queue
               /h)    /h)   (%)    x    Grn Grn  (sec)        (veh)
-------------------------------------------------------------------------------
West: PR-172 Cidra
  2T T          498    850   100 0.586* 27*      13.4  0.59   12.1   14.11
  2R R  (Slp)   105   1452   100 0.072  27   27   9.4  0.66    0.4    1.77
-------------------------------------------------------------------------------
South: Bosque de Cidra San Jose
  3L L           78    242   100 0.322   8*      37.5  0.76    3.0    3.28
  8R R  (Con)   109   1624   100 0.067  60       9.7  0.66    1.5 #  1.69
-------------------------------------------------------------------------------
East: PR_172 Caguas
  1L L          196    514   100 0.381  17*      29.5  0.80    6.3    7.31
  6T T          623   1444   100 0.432  46       1.6  0.15    3.0    7.66
-------------------------------------------------------------------------------
  *  Maximum degree of saturation, or critical green periods
  #  Largest density (passenger cars per km or mile) for any lane
```

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

```
Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------------------
  Mov            Fuel    Cost     HC      CO      NOX     CO2
  ID             Total   Total   Total   Total   Total   Total
                  L/h     $/h    kg/h    kg/h    kg/h    kg/h
-------------------------------------------------------------------------------
West: PR-172 Cidra
   2T T          34.3   104.15   0.143    6.08   0.208   85.8
   2R R           7.6    21.59   0.032    1.57   0.050   19.1
                 ------  ------  ------  ------  ------  ------
                 42.0   125.73   0.176    7.64   0.258  105.0
-------------------------------------------------------------------------------
South: Bosque de Cidra San Jose
   3L L           5.6    22.72   0.030    1.30   0.040   16.5
   8R R           8.7    23.59   0.038    1.94   0.058   21.7
                 ------  ------  ------  ------  ------  ------
                 15.3    46.32   0.068    3.24   0.098   38.3
-------------------------------------------------------------------------------
East: PR_172 Caguas
   1L L          15.0    52.24   0.072    3.24   0.098   39.9
```



```
South: Bosque de Cidra San Jose
 1 L      78    0    0   78  3.65  1911 1815     0     0  242 0.322  100
 2 R       0    0  109  109  3.65  1911 1624     0     0 1624 0.067  100
-------------------------------------------------------------------------------
East: PR_172 Caguas
 1 L     196    0    0  196  3.65  1911 1815     0     0  514 0.381  100
 2 T       0  623    0  623  3.65  1911 1883     0     0 1444 0.431  100
-------------------------------------------------------------------------------

 Basic Saturation Flow in this table is adjusted for lane width, approach
 grade, parking manoeuvres and number of buses stopping.  Saturation flow
 scale applies if specified.
```

Table S.9 - Signal Timing Diagram

```
Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time =  60 (User-given Cycle Time)

Displayed (Phase) Green Times

          Phase A                 Phase B             Phase C

0                                29                  41                    60
I-----------------------------------I-------------------I--------------------I
..GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.......GGGGGGG....GGGGGGGGGGGGGGGGGGG.
 2                                    33          43

Effective (Movement) Green Times


 West: PR-172 Cidra

Mov.    2T (T)
I                                    I           I                        I
.....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....................................
    4                                31

Mov.    2R (R)
I                                    I           I                        I
GG...GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
 2  4                                 31    35

 South: Bosque de Cidra San Jose

Mov.    3L (L)
I                                    I           I                        I
.....................................GGGGGGGG.....................
                                     35        43


 East: PR_172 Caguas

Mov.    1L (L)
I                                    I           I                        I
G.....................................................GGGGGGGGGGGGGGGGG
 2                                                    45

Mov.    6T (T)
I                                    I           I                        I
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....................GGGGGGGGGGGGGGGG
                                     31                    45
```

Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Cidra												
1 T		498		498	1	1910	27		0.586	13.4	7	500
2 R			105	105	1	1910	27	27	0.072	9.4	0	500
	0	498	105	603	1				0.586	12.7	7	
South: Bosque de Cidra San Jose												
1 L	78			78	0	1910	8		0.322	37.5	1	500
2 R			109	109	0	1910	60		0.067	9.7		500
	78	0	109	187	0				0.322	21.3	1	
East: PR_172 Caguas												
1 L	196			196	0	1910	17		0.381	29.5	3	70
2 T		623		623	1	1910	46		0.431	1.6	2	500
	196	623	0	819	1				0.431	8.3	3	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	1609	1	60	0.586	11.5	7

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Green Time Ratio (g/C) 1st grn	2nd grn	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Cidra										
2T T		0.450*		498	850	0.586*	13.4	B	12.1	7
2R R	(Slp)	0.450	0.450	105	1452	0.072	9.4	A	0.4	0
South: Bosque de Cidra San Jose										
3L L		0.133*		78	242	0.322	37.5	D	3.0	1
8R R	(Con)	1.000		109	1624	0.067	9.7	A*	1.5*	
East: PR_172 Caguas										
1L L		0.283*		196	514	0.381	29.5	C	6.3	3
6T T		0.767		623	1444	0.432	1.6	A	3.0	2
ALL VEHICLES:				1609		0.586	11.5	B	12.1	7
INTERSECTION (persons):				1931			11.5		12.1	7

Level of Service calculations are based on

6T T	30.3	94.29	0.105	2.46	0.157	75.8
	46.3	146.53	0.177	5.70	0.255	115.8
INTERSECTION:	103.6	318.58	0.421	16.59	0.611	259.0

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Cidra						
2T T	11.0	0.33	0.460	19.51	0.669	275.6
2R R	11.5	0.33	0.488	23.64	0.748	288.6
	11.1	0.33	0.465	20.24	0.683	277.9
South: Bosque de Cidra San Jose						
3L L	13.6	0.47	0.621	26.68	0.814	338.8
8R R	12.2	0.33	0.534	27.23	0.816	304.4
	12.7	0.39	0.569	27.01	0.815	318.4
East: PR_172 Caguas						
1L L	13.1	0.43	0.593	26.48	0.806	326.8
6T T	7.8	0.24	0.268	6.31	0.402	194.6
	9.0	0.29	0.346	11.13	0.499	226.2
INTERSECTION:	10.3	0.32	0.417	16.43	0.605	256.5

Table S.14 - Summary of Input and Output Data

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1

average control delay including geometric delay (HCM criteria), independent of the current delay definition used.
For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.
ǂ Continuous movements: Level Of Service based on density, Density (passenger cars per km or mile) instead of queue.
* Maximum v/c ratio, or critical green periods
^ Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table S.16 - SCATS MF Parameter

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Stopline Flow (veh/h)	Capacity (veh/h)	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Cidra						
1 T	498	850	1911	1779	0.586	100
2 R	105	1452	1624	NA	0.072	100
South: Bosque de Cidra San Jose						
1 L	78	242	1815	1210	0.322	100
2 R	109	1624	1624	NA	0.067	100
East: PR_172 Caguas						
1 L	196	514	1815	1624	0.381	100
2 T	623	1444	1911	1831	0.431	100

NA Not Applicable - SCATS MF was not calculated for this lane due to one of the following reasons:
- the lane is not controlled by signals (slip or continuous lane)
- two movements share this lane and do not run in the same phases

STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line. This cannot exceed capacity.

SCATS SATURATION FLOW: This allows for lane width, approach grade and turning vehicles. Saturation flow scale applies if specified. The effects of heavy vehicles, parking manoeuvres, number of buses stopping and conflicting pedestrian volume are not included.

SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS control system. It is calculated from the SCATS SATURATION FLOW parameter.

DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow Rate, therefore x > 1 is possible.

Table D.0 - Geometric Delay Data

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream Distance (m)	User Spec?
West: PR-172 Cidra								
	South	Right	20.0	26.2	31.4	500	132	No
	East	Thru	S	65.0	22.1	500	127	No
South: Bosque de Cidra San Jose								
	West	Left	14.9	23.4	23.3	500	125	No
	East	Right	20.0	26.2	31.4	500	155	No
East: PR_172 Caguas								
	West	Thru	S	65.0	22.1	500	127	No
	South	Left	13.4	22.6	21.1	500	124	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Delay (seconds/veh) Stop-line 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqu	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Cidra										
1 T	0.586	11.7	1.0	12.7	5.8	6.9	0.0	6.9	0.7	13.4
2 R	0.072	0.2	0.0	0.2	0.5	0.0	0.0	0.0	9.2	9.4
South: Bosque de Cidra San Jose										
1 L	0.322	27.8	0.4	28.1	4.2	23.9	0.0	23.9	9.4	37.5
2 R	0.067			0.0					9.7	9.7
East: PR_172 Caguas										
1 L	0.381	19.9	0.2	20.1	3.7	16.4	0.0	16.4	9.4	29.5
2 T	0.431	0.7	0.2	0.8	0.8	0.0	0.0	0.0	0.7	1.6

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	-- Effective Stop Rate -- be1	be2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Cidra							
1 T	0.586	0.57	0.00	0.03	0.59	0.646	0.00
2 R	0.072	0.09	0.00	0.58	0.66	0.109	0.00
South: Bosque de Cidra San Jose							
1 L	0.322	0.71	0.00	0.05	0.76	0.921	0.00
2 R	0.067			0.66	0.66		
East: PR_172 Caguas							
1 L	0.381	0.68	0.00	0.12	0.80	0.826	0.00
2 T	0.431	0.08	0.00	0.07	0.15	0.089	0.00

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Cidra											
1 T	0.586	0.7	5.6	0.7	6.3	7.4	9.7	10.6	12.1	14.6	0.01
2 R	0.072	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.00
South: Bosque de Cidra San Jose											
1 L	0.322	0.1	1.3	0.1	1.5	1.7	2.3	2.5	3.0	3.8	0.00
East: PR_172 Caguas											
1 L	0.381	0.2	2.9	0.2	3.1	3.7	4.9	5.5	6.3	7.8	0.04
2 T	0.431	0.5	0.9	0.5	1.5	1.7	2.3	2.6	3.0	3.8	0.00

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio

Lane No.	Deg. Satn x	-- Effective Stop Rate -- be1	be2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Cidra							
1 T	0.586	0.4	3.2	0.4	3.5	4.2	5.5	6.0	6.6	8.2	0.01
2 R	0.072	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.00
South: Bosque de Cidra San Jose											
1 L	0.322	0.1	0.7	0.1	0.7	0.9	1.2	1.3	1.5	1.9	0.00
East: PR_172 Caguas											
1 L	0.381	0.1	1.5	0.1	1.6	1.9	2.5	2.7	3.1	3.9	0.04
2 T	0.431	0.3	0.5	0.3	0.8	1.0	1.3	1.5	1.7	2.2	0.00

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	App. Speeds Cruise	Negn	Exit Speeds Negn	Cruise	Queue Move-up 1st Grn	2nd Grn	Av. Section Spd Running	Overall	Geom Delay (sec)
West: PR-172 Cidra									
2† T	72.0	65.0	65.0	65.0			58.7	49.7	0.7
2R R	72.0	26.2	26.2	65.0			54.3	54.3	9.2
South: Bosque de Cidra San Jose									
3L L	72.0	23.4	23.4	65.0			49.6	32.5	9.4
8R R	72.0	26.2	26.2	65.0			55.5	55.5	9.7
East: PR_172 Caguas									
1L L	72.0	22.6	22.6	65.0			50.0	36.6	9.4
6T T	72.0	65.0	65.0	65.0			67.4	67.3	0.7

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Gap Settings es	eh	Disp. Grn. Settings 1st Grn Gmin	Gmax	2nd Grn Gmin	Gmax
West: PR-172 Cidra											
2† T	VA	Yes	4	0.837	0.826	2.5	2.7	6	50		
2R R	VA	No	3	1.000	1.000	2.5	2.7	6	50	6	50
South: Bosque de Cidra San Jose											

3L	L	VA	No	3	1.000	1.000	2.0	2.2	6	20
8R	R	VA	No	3	1.000	1.000	2.5	2.7	6	50
East: PR_172 Caguas										
1L	L	VA	No	3	1.000	1.000	2.0	2.2	6	20
5T	T	VA	Yes	4	0.246	0.243	2.5	2.7	6	50

Table D.6 - Gap Acceptance Parameters

```
Estudio Operacional de Transito Bosques de Cidra 2014 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time =  60 (User-given Cycle Time)


  No opposed movements at this intersection
```

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com
C:\acad386\work\06152 - Estudio de Transito Finca Campo Alegre, Cidra\SidraREV\2014int2PM.aap
Processed Dec 06, 2006 01:37:45PM

SIDRA INTERSECTION

Intersection Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows - Total	1846 veh/h	1 ped/h	2216 pers/h
Percent Heavy Vehicles	2.7 %		
Degree of Saturation	0.811	0.000	
Effective Intersection Capacity	2276 veh/h		
95% Back of Queue (m)	11 m	0 m	
95% Back of Queue (veh)	20.5 veh	0.0 ped	
Control Delay (Total)	11.74 veh-h/h	0.00 ped-h/h	14.10 pers-h/h
Control Delay (Average)	22.9 s/veh	16.9 s/ped	22.9 s/pers
Level of Service	LOS C	LOS B	
Level of Service (Worst Movement)	LOS D	LOS B	
Total Effective Stops	1406 veh/h	1 ped/h	1687 pers/h
Effective Stop Rate	0.76 per veh	0.75 per ped	0.76 per pers
Proportion Queued	0.75	0.75	0.75
Travel Distance (Total)	1148.8 veh-km/h	0.0 ped-km/h	1378.6 pers-km/h
Travel Distance (Average)	622 m	31 m	622 m
Travel Time (Total)	31.4 veh-h/h	0.0 ped-h/h	37.7 pers-h/h
Travel Time (Average)	61.2 secs	40.6 secs	61.2 secs
Travel Speed	36.6 km/h	2.7 km/h	36.6 km/h
Operating Cost (Total)	499 $/h	0 $/h	499 $/h
Fuel Consumption (Total)	154.9 L/h		
Carbon Dioxide (Total)	387.8 kg/h		
Hydrocarbons (Total)	0.666 kg/h		
Carbon Monoxide (Total)	32.85 kg/h		
NOX (Total)	1.008 kg/h		

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:19:53PM

SIDRA INTERSECTION

Movement Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM

Signalised - Pretimed Cycle Time = 60 seconds

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
NR-787 Desde Guavate										
6T	T	449	1.8	0.803	29.3	LOS C	10	0.98	0.90	32.9
6R	R	23	0.0	0.797	37.4	LOS D	10	0.98	0.91	29.2
Approach		**472**	**1.7**	**0.803**	**29.7**	**LOS C**	**10**	**0.98**	**0.90**	**32.7**
PR-172 Desde Caguas										
7L	L	38	0.0	0.330	27.3	LOS C	3	0.88	0.80	33.6
4R	R	400	7.0	0.330	15.6	LOS B	5	0.55	0.77	41.2
Approach		**438**	**6.4**	**0.330**	**16.6**	**LOS B**	**5**	**0.58**	**0.77**	**40.4**
PR-172 Desde Pueblo Cidra										
5L	L	644	1.1	0.811	31.9	LOS C	11	0.94	0.91	31.6
2T	T	293	2.1	0.191	1.7	LOS A	2	0.25	0.19	61.0
Approach		**936**	**1.4**	**0.811**	**22.5**	**LOS C**	**11**	**0.72**	**0.69**	**37.2**
All Vehicles		**1846**	**2.7**	**0.811**	**22.9**	**LOS C**	**11**	**0.75**	**0.76**	**36.6**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	1	16.9	LOS B	0	0.75	0.75
All Peds	**1**	**16.9**	**LOS B**	**0**	**0.75**	**0.75**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:19:53PM

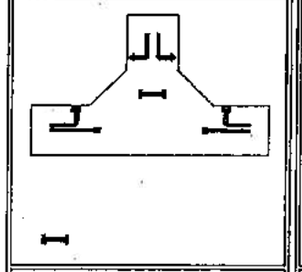
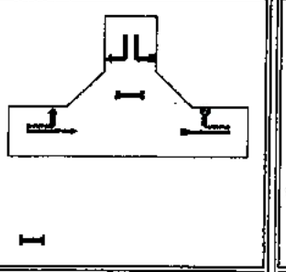
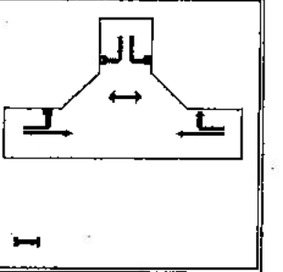
SIDRA INTERSECTION

Phasing Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM

C = **60** seconds
Cycle Time Option: **Program calculated cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase D
		
Green Time = **6** seconds Phase Time = **9** seconds Phase Split = **15 %**	Green Time = **26** seconds Phase Time = **29** seconds Phase Split = **48 %**	Green Time = **19** seconds Phase Time = **22** seconds Phase Split = **37 %**

Normal Movement Permitted/Opposed Stopped Movement
Slip-Lane Opposed Slip-Lane Continuous
Turn On Red

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:19:53PM

```
          West        4R   Right   372    28    1.00     0.95
          East        7L   Left     38     0    1.00     0.95
-----------------------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

-----------------------------------------------------
  Mov          Left        Through       Right
  ID         ---------    ---------    ---------
              LV    HV     LV    HV     LV    HV
-----------------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Pueblo Cidra
   5L L      637     7      0     0      0     0
   2T T        0     0    286     6      0     0
-----------------------------------------------------
East: NR-787 Desde Guavate
   6T T        0     0    441     8      0     0
   6R R        0     0      0     0     23     0
-----------------------------------------------------
North: PR-172 Desde Caguas
   7L L       38     0      0     0      0     0
   4R R        0     0      0     0    372    28
-----------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

-----------------------------------------------------
  Mov          Left        Through       Right
  ID         ---------    ---------    ---------
             Total  %HV   Total  %HV   Total  %HV
-----------------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Pueblo Cidra
   5L L      644   1.1      0   0.0      0   0.0
   2T T        0   0.0    292   2.1      0   0.0
-----------------------------------------------------
East: NR-787 Desde Guavate
   6T T        0   0.0    449   1.8      0   0.0
   6R R        0   0.0      0   0.0     23   0.0
-----------------------------------------------------
```


SIDRA INTERSECTION

Output Tables

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM

Run Information

```
Cycle Time =   60  (Practical Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Pretimed
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
                    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations =  2
  Comparison of last two iterations:
    Difference in intersection degree of satn =  0.0 %
    Largest difference in eff. green times =  0 secs
    (max. value for stopping = 0 secs)
```

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

-----------------------------------------------------------------
 From      To          Mov          Flow Rate   Flow   Peak Flow
 Approach  Approach    ID    Turn    LV    HV   Scale    Factor
-----------------------------------------------------------------
 West: PR-172 Desde Pueblo Cidra
           East        2T    Thru    286     6    1.00     0.95
           North       5L    Left    637     7    1.00     0.95
-----------------------------------------------------------------
 East: NR-787 Desde Guavate
           West        6T    Thru    441     8    1.00     0.95
           North       6R    Right    23     0    1.00     0.95
-----------------------------------------------------------------
 North: PR-172 Desde Caguas
```

```
  *  Critical Movement/Green Period

Movement Types:                          Under heading 'Op':
  Slp  Slip Lane Movement                  Y   If opposed turn
  Ped  Pedestrian
  Dum  Dummy
```

Table S.2 - Movement Capacity Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Pueblo Cidra											
5L L	644	1.1	1832		0.352		794	0.90	11	100	0.811*
2T T	292	2.1	1908		0.153		1526	0.90	370	100	0.191
East: NR-787 Desde Guavate											
6T T	449	1.8	1766		0.254		559	0.90	12	100	0.803
6R R	23	0.0	27	67	0.217	0.256	29	0.90	13	100	0.797
North: PR-172 Desde Caguas											
7L L	38	0.0	1152		0.033		115	0.90	173	100	0.330
4R R	400	7.0	1831	1449	0.218	0.000	1213	0.90	173	100	0.330
Pedestrian Movements											
P5	1		12000		0.000		3000	0.90		0	0.000

Table S.3 - Intersection Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
7L	N_L		A	B	9	-	-	9.0Min
5L	W_L		B	D	3	0.352	0.391	26.4
6R	E_R	2nd	D	A	3	0.256	0.284	20.1
				Total:	15	0.608	0.675	55.5

- Flow ratio not used for cycle time calculations and


```
North: PR-172 Desde Caguas
   7L L       38   0.0       0   0.0       0   0.0
   4R R        0   0.0       0   0.0     400   7.0
-------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.3 - Pedestrian Flow Rates

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Stage	Flow Rate (ped/h)	Flow Scale	Peak Flow Factor
Across North Approach				
P5	1		1.00	0.95

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.1 - Movement Phase and Timing Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	First Green To	First Green Op	First Green Pr	Second Green Fr	Second Green To	Second Green Op	Second Green Pr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Desde Pueblo Cidra															
5L L		*B	D							3		26.4		26	
2T T		B	A							3		25.0Min		48	
East: NR-787 Desde Guavate															
6T T		D	A							3		19.9		19	
6R R		A	D	Y		*D	A			21	3	35.4	20.1	17	19
North: PR-172 Desde Caguas															
7L L		*A	B							3		9.0Min		6	
4R R		A	D			D	A		Y	3	16	18.0Min	16.0Min	35	6
Pedestrian Movements															
P5	(Ped)	D	A							7		16.0Min		15	

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

2T T	0.14	0.17	1.7	0.25	0.19	3.3	2	4.68	61.0
East: NR-787 Desde Guavate									
6T T	3.65	4.38	29.3	0.98	0.90	16.1	10	19.59	32.9
6R R	0.24	0.29	37.4	0.98	0.91	16.1	10	1.06	29.2
North: PR-172 Desde Caguas									
7L L	0.29	0.35	27.3	0.88	0.80	3.6	3	1.41	33.6
4R R	1.73	2.08	15.6	0.55	0.77	5.4	5	11.31	41.2
Pedestrian Movements									
P5	0.00	0.00	16.9	0.75	0.75	0.0	0	0.02	2.7

Table S.6 - Intersection Performance

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
936	0.811	5.84	7.00	22.5	0.72	0.69	11	32.90	37.2
East: NR-787 Desde Guavate									
472	0.803	3.89	4.67	29.7	0.98	0.90	10	20.65	32.7
North: PR-172 Desde Caguas									
438	0.330	2.02	2.42	16.6	0.58	0.77	5	12.72	40.4
Pedestrians:									
1	0.000	0.00	0.00	16.9	0.75	0.75	0	0.02	2.7
ALL VEHICLES:									
1846	0.811	11.74	14.09	22.9	0.75	0.76	11	66.26	36.6
INTERSECTION (persons):									
2216	0.811		14.10	22.9	0.75	0.76		66.28	36.6

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Effective Red and Green Times (sec) R1	G1	R2	G2	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	(m)	Lane Length (m)

the adjusted lost time equals the required movement time
(=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
34	150	46	60

Intersection Level of Service	=	C
Worst movement Level of Service	=	D
Average intersection delay (s)	=	22.9
Largest average movement delay (s)	=	37.4
Largest back of queue, 95% (m)	=	11
Performance Index	=	66.28
Degree of saturation (highest)	=	0.811
Practical Spare Capacity (lowest)	=	11 %
Effective intersection capacity, (veh/h)	=	2276
Total vehicle flow (veh/h)	=	1846
Total pedestrian flow (ped/h)	=	1
Total person flow (pers/h)	=	2216
Total vehicle delay (veh-h/h)	=	11.74
Total pedestrian delay (ped-h/h)	=	0.00
Total person delay (pers-h/h)	=	14.10
Total effective vehicle stops (veh/h)	=	1406
Total effective pedestrian stops (ped/h)	=	1
Total effective person stops (pers/h)	=	1687
Total vehicle travel (veh-km/h)	=	1148.8
Total cost ($/h)	=	499.37
Total fuel (L/h)	=	154.9
Total CO2 (kg/h)	=	387.78

Table S.4 - Phase Information

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	3	3	6	9	3	9	15%
B	9	3	12	26	38	3	29	48%
D	38	3	41	19	60	3	22	37%

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
5L L	5.70	6.84	31.9	0.94	0.91	20.5	11	28.22	31.6

```
Effective (Movement) Green Times

 West: PR-172 Desde Pueblo Cidra

Mov.    5L (L)
I        I                                   I                          I
................GGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.......................
              14                                40

Mov.    2T (T)
I        I                                   I                          I
G...............GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
 2             14

 East: NR-787 Desde Guavate

Mov.    6T (T)
I        I                                   I                          I
G.................................................GGGGGGGGGGGGGGGGGGGG
 2                                                43

Mov.    6R (R)
I        I                                   I                          I
GG.........................GGGGGGGGGGGGGGGGGGGG...GGGGGGGGGGGGGGGGGGGGG
 2                       23                  40  43

 North: PR-172 Desde Caguas

Mov.    7L (L)
I        I                                   I                          I
......GGGGGG...............................................................
     5       11

Mov.    4R (R)
I        I                                   I                          I
GG....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.................GGGGGG
 2   5                                         40                56

 Pedestrian Movements

Mov.    PS
I        I                                   I                          I
.................................................GGGGGGGGGGGGGGGGGG...
                                                  43                58

I-----I------I------I------I------I------I------I------I------I------I---->
0      6     12     18     24     30     36     42     48     54     60

                              T I M E  (s)
```

Table S.10 - Movement Capacity and Performance Summary

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

-----------------------------------------------------------------------------
 Mov     Mov  Dem   Total  Lane  Deg.  Eff. Grn  Aver.  Eff.    95%    Perf.
 ID      Typ  Flow   Cap.  Util  Satn  --------  Delay  Stop  Back of  Index
              (veh  (veh                1st  2nd         Rate   Queue
               /h)   /h)   (%)     x    Grn  Grn  (sec)          (veh)
```



```
 West: PR-172 Desde Pueblo Cidra
 1 L     34  26    0   0    644  794 0.811   31.9  0.91  20.5   11.5   100.0T
 2 T     12  48    0   0    292 1527 0.191    1.7  0.19   3.3    2.1   500.0
-----------------------------------------------------------------------------
 East: NR-787 Desde Guavate
 1 TR    21   1   19  19    472  588 0.803   29.7  0.90  16.1    9.5   500.0
-----------------------------------------------------------------------------
 North: PR-172 Desde Caguas
 1 LR     5  11   40   4    111  338 0.330   27.4  0.80   3.6    2.7   500.0
 2 R      3  35   16   6    327  990 0.330   12.9  0.77   5.4    4.7   500.0
-----------------------------------------------------------------------------
  T  Short lane due to specification of Turn Slot
```

Table S.8 - Lane Flow and Capacity Information

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

-----------------------------------------------------------------------------
                                        Saturation Flow  End  Tot
 Lane     Dem Flow (veh/h)    Lane    Adj. Aver Aver  Cap  Cap  Deg.  Lane
 No.    -------------------   Width  Basic 1st  2nd  (veh (veh  Satn  Util
         Lef Thru  Rig  Tot    (m)   (tcu) (veh)(veh)  /h)  /h)   x     %
-----------------------------------------------------------------------------
 West: PR-172 Desde Pueblo Cidra
 1 L     644    0    0  644  3.60  1947 1832     0    0  794 0.811  100
 2 T       0  292    0  292  3.60  1947 1908     0    0 1527 0.191  100
-----------------------------------------------------------------------------
 East: NR-787 Desde Guavate
 1 TR      0  449   23  472  3.60  1871  603  1825   60  588 0.803  100
-----------------------------------------------------------------------------
 North: PR-172 Desde Caguas
 1 LR     38    0   73  111  3.60  1890 1508   918   59  338 0.330  100
 2 R       0    0  327  327  3.60  1890 1532   968   59  990 0.330  100
-----------------------------------------------------------------------------

  Basic Saturation Flow in this table is adjusted for lane width, approach
  grade, parking manoeuvres and number of buses stopping.  Saturation flow
  scale applies if specified.
```

Table S.9 - Signal Timing Diagram

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

Displayed (Phase) Green Times

 Phase A              Phase B                        Phase D

0        9                                  38                        60
I--------I-----------------------------------I-------------------------I
....GGGGG.....GGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....GGGGGGGGGGGGGGGGGGGGG.
   3         12                                  41
```

Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID		Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Pueblo Cidra							
5L	L	10.9	0.44	0.635	25.92	0.606	271.5
2T	T	4.7	0.21	0.321	6.87	0.163	116.7
		8.9	0.37	0.536	19.95	0.467	223.0
East: NR-787 Desde Guavate							
6T	T	18.3	0.53	0.627	36.60	1.304	459.0
6R	R	16.1	0.53	0.649	32.38	1.034	403.5
		18.2	0.53	0.628	36.40	1.291	456.4
North: PR-172 Desde Caguas							
7L	L	13.5	0.45	0.618	29.04	0.799	338.7
4R	R	18.6	0.48	0.619	39.57	1.356	465.2
		18.1	0.48	0.619	38.66	1.308	454.2
Pedestrian Movements							
P5			2.78				
			2.78				
ALL VEHICLES:		13.5	0.43	0.580	28.59	0.877	337.6
INTERSECTION:		13.5	0.43	0.580	28.59	0.877	337.6

Table S.14 - Summary of Input and Output Data

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Pueblo Cidra												
1 L	644			644	1	1947	26		0.811	31.9	11	100

West: PR-172 Desde Pueblo Cidra										
5L	L	644	794	100	0.811*	26*	31.9	0.91	20.5	28.22
2T	T	292	1526	100	0.191	48	1.7	0.19	3.3	4.68
East: NR-787 Desde Guavate										
6T	T	449	559	100	0.803	19	29.3	0.90	16.1	19.59
6R	R	23	29	100	0.797	17	19* 37.4	0.91	16.1	1.06
North: PR-172 Desde Caguas										
7L	L	38	115	100	0.330	6*	27.3	0.80	3.6	1.41
4R	R	400	1213	100	0.330	35	6 15.6	0.77	5.4	11.31
Pedestrian Movements										
P5	(Ped)	1	3000	100	0.000	15	16.9	0.75	0.0	0.02

* Maximum degree of saturation, or critical green periods

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID		Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Pueblo Cidra							
5L	L	43.4	175.03	0.254	10.36	0.242	108.6
2T	T	8.5	39.03	0.059	1.26	0.030	21.3
		51.9	214.06	0.312	11.62	0.272	129.9
East: NR-787 Desde Guavate							
6T	T	51.5	148.38	0.176	10.28	0.366	128.9
6R	R	2.3	7.59	0.009	0.46	0.015	5.8
		53.8	155.98	0.185	10.74	0.381	134.7
North: PR-172 Desde Caguas							
7L	L	3.2	10.69	0.014	0.68	0.019	7.9
4R	R	46.0	118.55	0.154	9.81	0.336	115.3
		49.2	129.24	0.168	10.49	0.355	123.3
Pedestrian Movements							
P5			0.09				
			0.09				
ALL VEHICLES:		154.9	499.28	0.666	32.85	1.008	387.8
INTERSECTION:		154.9	499.37	0.666	32.85	1.008	387.8

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40

```
   Intersection capacity is calculated considering vehicle movements only.
*  Maximum v/c ratio, or critical green periods
"  Movement Level of service has been determined using adjacent lane
   v/c ratio rather than short lane v/c ratio (v/c=1.0)
```

Table S.16 - SCATS MF Parameter

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)
```

Lane No.	Stopline Flow (veh/h)	Capacity (veh/h)	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Desde Pueblo Cidra						
1 L	644	794	1850	1659	0.811	100
2 T	292	1527	1947	1833	0.191	100
East: NR-787 Desde Guavate						
1 TR	472	588	1856	NA	0.803	100
North: PR-172 Desde Caguas						
1 LR	111	338	1667	NA	0.330	100
2 R	327	990	1607	1480	0.330	100

```
 NA Not Applicable - SCATS MF was not calculated for this lane due to one
    of the following reasons:
      - the lane is not controlled by signals (slip or continuous lane)
      - two movements share this lane and do not run in the same phases

 STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line.
 This cannot exceed capacity.

 SCATS SATURATION FLOW: This allows for lane width, approach grade and
 turning vehicles.  Saturation flow scale applies if specified.
 The effects of heavy vehicles, parking manoeuvres, number of buses
 stopping and conflicting pedestrian volume are not included.

 SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS
 control system. It is calculated from the SCATS SATURATION FLOW parameter.

 DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow
 Rate, therefore x > 1 is possible.
```

Table D.0 - Geometric Delay Data

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)
```

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream Distance	User Spec?

2 T	292		292	2	1947	48		0.191	1.7	2	500
	644	292	0	936	1				0.811	22.5	11	
East: NR-787 Desde Guavate												
1 TR	449	23	472	2	1871	1	19	0.803	29.7	10	500
	0	449	23	472	2				0.803	29.7	10	
North: PR-172 Desde Caguas												
1 LR	38	73	111	5	1890	11	4	0.330	27.4	3	500
2 R		327	327	7	1890	35	6	0.330	12.9	5	500
	38	0	400	438	6				0.330	16.6	5	
Pedestrians												
Across N approach		1			15			0.000	16.9	0.0		
ALL VEHICLES			Total Flow 1846	% HV 3		Cycle Time 60		Max X 0.811	Aver. Delay 22.9	Max Queue 11		

```
Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for
      grade, lane widths, parking manoeuvres and bus stops.
```

Table S.15 - Capacity and Level of Service

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)
```

Mov ID	Mov Typ	Green Time Ratio (g/C) 1st grn	2nd grn	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Pueblo Cidra										
5L	L	0.433*		644	794	0.811*	31.9	C	20.5	11
2T	T	0.800		292	1526	0.191	1.7	A	3.3	2
East: NR-787 Desde Guavate										
6T	T	0.317		449	558	0.803	29.3	C	16.1	10
6R	R	0.283	0.317*	23	29	0.797	37.4	D	16.1	10
North: PR-172 Desde Caguas										
7L	L	0.100*		38	115	0.330	27.3	C	3.6	3
4R	R	0.583	0.100	400	1213	0.330	15.6	B	5.4	5
Pedestrian Movements										
P5	(Ped)	0.250		1	3000	0.000	16.9	B	0.0	0
ALL VEHICLES:				1846		0.811	22.9	C	20.5	11
INTERSECTION (persons):				2216			22.9		20.5	11

```
    Level of Service calculations are based on
    average control delay including geometric delay (HCM criteria),
    independent of the current delay definition used.
    For the criteria, refer to the "Level of Service" topic in the
    SIDRA Output Guide or the Output section of the on-line help.
```

2 T	0.191	0.19	0.00	0.00	0.19	0.252	0.00
East: NR-787 Desde Guavate							
1 TR	0.803	0.85	0.05	0.00	0.90	0.975	0.53
North: PR-172 Desde Caguas							
1 LR	0.330	0.70	0.02	0.08	0.80	0.877	0.18
2 R	0.330	0.41	0.01	0.35	0.77	0.477	0.07

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 L	0.811	2.7	9.4	2.7	12.1	14.7	17.3	18.7	20.5	22.2	0.11
2 T	0.191	0.3	1.1	0.3	1.4	1.8	2.3	2.7	3.3	4.0	0.00
East: NR-787 Desde Guavate											
1 TR	0.803	2.1	7.0	2.1	9.1	11.1	13.2	14.4	16.1	17.7	0.02
North: PR-172 Desde Caguas											
1 LR	0.330	0.2	1.4	0.2	1.6	2.0	2.5	2.9	3.6	4.4	0.01
2 R	0.330	0.4	2.0	0.4	2.4	3.0	3.8	4.4	5.4	6.3	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 L	0.811	1.5	5.3	1.5	6.8	8.2	9.7	10.5	11.5	12.4	0.11
2 T	0.191	0.2	0.7	0.2	0.9	1.1	1.4	1.6	2.1	2.5	0.00
East: NR-787 Desde Guavate											
1 TR	0.803	1.3	4.2	1.3	5.4	6.6	7.8	8.6	9.5	10.5	0.02
North: PR-172 Desde Caguas											

West: PR-172 Desde Pueblo Cidra							
East	Thru	S	65.0	14.4	500	127	No
North	Left	10.8	20.8	17.0	500	122	No
East: NR-787 Desde Guavate							
West	Thru	S	65.0	14.4	500	127	No
North	Right	10.0	20.2	15.7	500	120	No
North: PR-172 Desde Caguas							
West	Right	10.0	20.2	15.7	500	128	No
East	Left	7.2	17.8	11.3	500	117	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd d2	Total dSL	Delay (seconds/veh) Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Pueblo Cidra										
1 L	0.811	14.9	8.8	23.7	3.9	19.8	0.6	19.1	8.2	31.9
2 T	0.191	1.4	0.3	1.7	2.2	0.0	0.0	0.0	0.0	1.7
East: NR-787 Desde Guavate										
1 TR	0.803	18.2	11.1	29.3	8.2	21.1	0.9	20.2	0.4	29.7
North: PR-172 Desde Caguas										
1 LR	0.330	16.3	2.6	18.9	3.5	15.5	0.3	15.2	8.4	27.4
2 R	0.330	3.5	0.9	4.4	1.9	2.5	0.2	2.3	8.5	12.9

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Deg. Satn x	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Pueblo Cidra							
1 L	0.811	0.83	0.04	0.04	0.91	0.938	0.15

1	LR	0.330	0.1	1.0	0.1	1.2	1.5	1.9	2.2	2.7	3.3	0.01
2	R	0.330	0.4	1.8	0.4	2.1	2.7	3.4	3.9	4.7	5.6	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Pueblo Cidra									
5L L	56.0	20.8	20.8	65.0	10.6		43.3	31.6	8.2
2T T	65.0	65.0	65.0	65.0			61.0	61.0	0.0
East: NR-787 Desde Guavate									
6T T	56.0	0.0	65.0	65.0	1.2	0.0	34.9	32.9	0.0
6R R	56.0	20.2	20.2	65.0	1.2	9.3	42.9	29.2	8.2
North: PR-172 Desde Caguas									
7L L	56.0	17.8	17.8	65.0		0.0	34.1	33.6	8.4
4R R	56.0	20.2	20.2	65.0		4.4	45.0	41.2	8.5

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Disp. Grn. Settings 1st Grn Gmin	1st Grn Gmax	2nd Grn Gmin	2nd Grn Gmax
West: PR-172 Desde Pueblo Cidra									
5L L	PT	No	3	1.000	1.000	6	NA		
2T T	PT	No	3	1.000	1.000	6	NA		
East: NR-787 Desde Guavate									
6T T	PT	No	3	1.000	1.000	6	NA		
6R R	PT	No	3	1.000	1.000	6	NA	6	NA
North: PR-172 Desde Caguas									
7L L	PT	No	3	1.000	1.000	6	NA		
4R R	PT	No	3	1.000	1.000	6	NA	6	NA
Pedestrians									

P5	PT	No	3	1.000	1.000

Table D.6 - Gap Acceptance Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Pueblo Cidra					
5L L	Normal	0	4.50	2.50	2.0
East: NR-787 Desde Guavate					
6R R	Normal	644	6.00	3.00	2.0
North: PR-172 Desde Caguas					
4R R	Normal	449	6.13	3.06	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:19:53PM

SIDRA INTERSECTION

Intersection Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows - Total	1749 veh/h	1 ped/h	2100 pers/h
Percent Heavy Vehicles	2.8 %		
Degree of Saturation	0.751	0.000	
Effective Intersection Capacity	2330 veh/h		
95% Back of Queue (m)	9 m	0 m	
95% Back of Queue (veh)	14.2 veh	0.0 ped	
Control Delay (Total)	8.09 veh-h/h	0.00 ped-h/h	9.72 pers-h/h
Control Delay (Average)	16.7 s/veh	14.4 s/ped	16.7 s/pers
Level of Service	LOS B	LOS B	
Level of Service (Worst Movement)	LOS C	LOS B	
Total Effective Stops	1198 veh/h	1 ped/h	1439 pers/h
Effective Stop Rate	0.69 per veh	0.76 per ped	0.69 per pers
Proportion Queued	0.67	0.76	0.67
Travel Distance (Total)	1088.3 veh-km/h	0.0 ped-km/h	1306.0 pers-km/h
Travel Distance (Average)	622 m	31 m	622 m
Travel Time (Total)	26.6 veh-h/h	0.0 ped-h/h	31.9 pers-h/h
Travel Time (Average)	54.7 secs	38.1 secs	54.7 secs
Travel Speed	40.9 km/h	2.9 km/h	40.9 km/h
Operating Cost (Total)	426 $/h	0 $/h	426 $/h
Fuel Consumption (Total)	133.4 L/h		
Carbon Dioxide (Total)	333.9 kg/h		
Hydrocarbons (Total)	0.589 kg/h		
Carbon Monoxide (Total)	28.64 kg/h		
NOX (Total)	0.860 kg/h		

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:35:14PM

SIDRA INTERSECTION

Movement Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM

Signalised - Pretimed **Cycle Time = 50 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
NR-787 Desde Guavate										
6T	T	301	2.0	0.616	17.5	LOS B	6	0.89	0.77	39.8
6R	R	66	0.0	0.616	25.7	LOS C	6	0.89	0.84	34.5
Approach		**367**	**1.6**	**0.616**	**19.0**	**LOS B**	**6**	**0.89**	**0.78**	**38.7**
PR-172 Desde Caguas										
7L	L	62	0.0	0.339	23.4	LOS C	2	0.90	0.79	35.7
4R	R	402	3.7	0.339	11.9	LOS B	3	0.44	0.75	44.0
Approach		**464**	**3.2**	**0.339**	**13.4**	**LOS B**	**3**	**0.50**	**0.75**	**42.7**
PR-172 Desde Pueblo Cidra										
5L	L	516	2.5	0.751	29.1	LOS C	9	0.93	0.88	32.9
2T	T	402	3.7	0.282	2.3	LOS A	3	0.33	0.26	60.0
Approach		**918**	**3.1**	**0.751**	**17.4**	**LOS B**	**9**	**0.66**	**0.61**	**41.0**
All Vehicles		**1749**	**2.8**	**0.751**	**16.7**	**LOS B**	**9**	**0.67**	**0.69**	**40.9**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	1	14.4	LOS B	0	0.76	0.76
All Peds	**1**	**14.4**	**LOS B**	**0**	**0.76**	**0.76**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:35:14PM

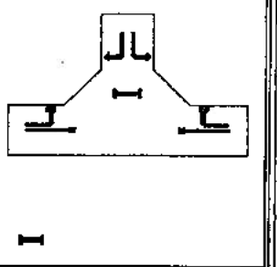
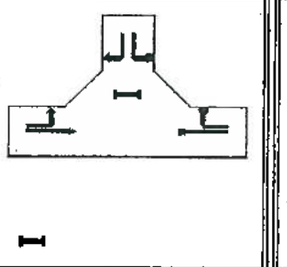
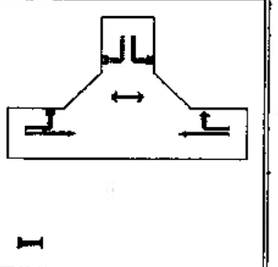
SIDRA INTERSECTION

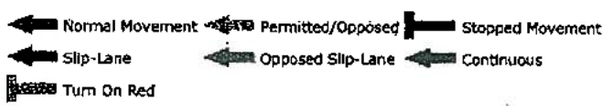
Phasing Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM

C = 50 seconds
Cycle Time Option: Program calculated cycle time
Phase times determined by the program.

Phase A	Phase B	Phase D
		
Green Time = 6 seconds Phase Time = 9 seconds Phase Split = 18 %	Green Time = 19 seconds Phase Time = 22 seconds Phase Split = 44 %	Green Time = 16 seconds Phase Time = 19 seconds Phase Split = 38 %



SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:35:14PM

West	4R	Right	387	15	1.00	0.95
East	7L	Left	62	0	1.00	0.95

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	Left		Through		Right	
	LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	503	13	0	0	0	0
2T T	0	0	387	15	0	0
East: NR-787 Desde Guavate						
6T T	0	0	295	6	0	0
6R R	0	0	0	0	66	0
North: PR-172 Desde Caguas						
7L L	62	0	0	0	0	0
4R R	0	0	0	0	387	15

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	Left		Through		Right	
	Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	516	2.5	0	0.0	0	0.0
2T T	0	0.0	402	3.7	0	0.0
East: NR-787 Desde Guavate						
6T T	0	0.0	301	2.0	0	0.0
6R R	0	0.0	0	0.0	66	0.0

SIDRA INTERSECTION

Output Tables

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM

Run Information

Cycle Time = 50 (Practical Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Pretimed
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
  Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations = 2
  Comparison of last two iterations:
  Difference in intersection degree of satn = 0.0 %
  Largest difference in eff. green times = 0 secs
  (max. value for stopping = 0 secs)

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Pueblo Cidra							
	East	2T	Thru	387	15	1.00	0.95
	North	5L	Left	503	13	1.00	0.95
East: NR-787 Desde Guavate							
	West	6T	Thru	295	6	1.00	0.95
	North	6R	Right	66	0	1.00	0.95
North: PR-172 Desde Caguas							

```
  *  Critical Movement/Green Period

Movement Types:                          Under heading 'Op':
  Slp  Slip Lane Movement                  Y   If opposed turn
  Ped  Pedestrian
  Dum  Dummy
```

Table S.2 - Movement Capacity Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Pueblo Cidra											
5L L	516	2.5	1809		0.285		687	0.90	20	100	0.751*
2T T	402	3.7	1877		0.214		1427	0.90	219	100	0.282
East: NR-787 Desde Guavate											
6T T	301	2.0	1526		0.197		488	0.90	46	100	0.616
6R R	66	0.0	64	271	0.000	0.244	107	0.90	46	100	0.616
North: PR-172 Desde Caguas											
7L L	62	0.0	1526		0.041		183	0.90	166	100	0.339
4R R	402	3.7	1717	1130	0.234	0.000	1188	0.90	166	180	0.339
Pedestrian Movements											
P5	1		12000		0.000		2880	0.90		0	0.000

Table S.3 - Intersection Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
7L	N_L		A	B	9	-	-	9.0Min
5L	W_L		B	D	3	0.285	0.317	18.8
6R	E_R	2nd	D	A	16	-	-	16.0Min
				Total:	28	0.285	0.317	43.8

- Flow ratio not used for cycle time calculations and

North: PR-172 Desde Caguas							
7L L	62	0.0	0	0.0	0	0.0	
4R R	0	0.0	0	0.0	402	3.7	

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.3 - Pedestrian Flow Rates

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	Stage	Flow Rate (ped/h)	Flow Scale	Peak Flow Factor
Across North Approach				
P5	1		1.00	0.95

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.1 - Movement Phase and Timing Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	To	Op	Pr	Second Green Fr	To	Op	Pr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Desde Pueblo Cidra															
5L L		*B	D							3		18.8		19	
2T T		B	A							3		25.0Min		38	
East: NR-787 Desde Guavate															
6T T		D	A							3		16.0Min		15	
6R R		A	D	Y	*D	A				15	3	18.0Min	16.0Min	16	16
North: PR-172 Desde Caguas															
7L L		*A	B							3		9.0Min		6	
4R R		A	D			D	A		Y	3	9	18.0Min	16.0Min	28	10
Pedestrian Movements															
P5	(Ped)	D	A							7		16.0Min		12	

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

2T	T	0.26	0.31	2.3	0.33	0.26	4.7	3	6.79	60.0
East: NR-787 Desde Guavate										
6T	T	1.46	1.76	17.5	0.89	0.77	9.5	6	10.02	39.8
6R	R	0.47	0.57	25.7	0.89	0.84	9.5	6	2.37	34.5
North: PR-172 Desde Caguas										
7L	L	0.40	0.48	23.4	0.90	0.79	2.6	2	2.01	35.7
4R	R	1.33	1.59	11.9	0.44	0.75	4.3	3	9.73	44.0
Pedestrian Movements										
P5		0.00	0.00	14.4	0.76	0.76	0.0	0	0.01	2.9

Table S.6 - Intersection Performance

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
918	0.751	4.43	5.31	17.4	0.66	0.61	9	27.06	41.0
East: NR-787 Desde Guavate									
367	0.616	1.93	2.32	19.0	0.89	0.78	6	12.39	38.7
North: PR-172 Desde Caguas									
464	0.339	1.73	2.08	13.4	0.50	0.75	3	11.74	42.7
Pedestrians:									
1	0.000	0.00	0.00	14.4	0.76	0.76	0	0.01	2.9
ALL VEHICLES:									
1749	0.751	8.09	9.71	16.7	0.67	0.69	9	51.19	40.9
INTERSECTION (persons):									
2100	0.751		9.72	16.7	0.67	0.69		51.20	40.9

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Lane No.	Effective Red and Green Times (sec) R1	G1	R2	G2	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	(m)	Lane Length (m)

the adjusted lost time equals the required movement time
(=Min or Max as shown in Table 8.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
34	150	41	50

Intersection Level of Service	=	B
Worst movement Level of Service	=	C
Average intersection delay (s)	=	16.7
Largest average movement delay (s)	=	29.1
Largest back of queue, 95% (m)	=	9
Performance Index	=	51.20
Degree of saturation (highest)	=	0.751
Practical Spare Capacity (lowest)	=	20 %
Effective intersection capacity, (veh/h)	=	2330
Total vehicle flow (veh/h)	=	1749
Total pedestrian flow (ped/h)	=	1
Total person flow (pers/h)	=	2100
Total vehicle delay (veh-h/h)	=	8.09
Total pedestrian delay (ped-h/h)	=	0.00
Total person delay (pers-h/h)	=	9.72
Total effective vehicle stops (veh/h)	=	1198
Total effective pedestrian stops (ped/h)	=	1
Total effective person stops (pars/h)	=	1439
Total vehicle travel (veh-km/h)	=	1088.3
Total cost ($/h)	=	425.98
Total fuel (L/h)	=	133.4
Total CO2 (kg/h)	=	333.85

Table S.4 - Phase Information

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	3	3	6	9	3	9	18%
B	9	3	12	19	31	3	22	44%
D	31	3	34	16	50	3	19	38%

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
5L	L 4.17	5.00	29.1	0.93	0.88	14.2	9	20.27	32.9

```
Effective (Movement) Green Times

 West: PR-172 Desde Pueblo Cidra

Mov.    5L (L)
I          I                                I                          I
....................GGGGGGGGGGGGGGGGGGGGGGGGGG.........................
                  14                          33

Mov.    2T (T)
I          I                                I                          I
GG.................GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
  2                14

 East: NR-787 Desde Guavate

Mov.    6T (T)
I          I                                I                          I
GG.............................................GGGGGGGGGGGGGGGGGGGG
  2                                                36

Mov.    6R (R)
I          I                                I                          I
GGG.....................GGGGGGGGGGGGGGGGGGGGGG....GGGGGGGGGGGGGGGGGGGGG
  2                   17                   33   36

 North: PR-172 Desde Caguas

Mov.    7L (L)
I          I                                I                          I
.......GGGGGGG.............................................................
      5        11

Mov.    4R (R)
I          I                                I                          I
GGG....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.............GGGGGGGGGGGG
  2   5                                       33           42

 Pedestrian Movements

Mov.    P5
I          I                                I                          I
.............................................GGGGGGGGGGGGGGGG....
                                                36               48

I-----I------I------I------I------I------I------I------I------I------I---->
0     5     10     15     20     25     30     35     40     45     50

                              T I M E  (s)
```

Table S.10 - Movement Capacity and Performance Summary

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  50 (Practical Cycle Time)

-----------------------------------------------------------------------------
 Mov     Mov  Dem   Total  Lane  Deg.  Eff. Grn  Aver.  Eff.    95%    Perf.
 ID      Typ  Flow   Cap.  Util  Satn  --------  Delay  Stop  Back of  Index
              (veh  (veh                1st  2nd         Rate   Queue
               /h)   /h)   (%)     x   Grn  Grn  (sec)         (veh)
```



```
 West: PR-172 Desde Pueblo Cidra
 1 L     31  19    0   0    516  687 0.751   29.1  0.88  14.2    9.1   100.0T
 2 T     12  38    0   0    402 1427 0.282    2.3  0.26   4.7    3.3   500.0
-----------------------------------------------------------------------------
 East: NR-787 Desde Guavate
 1 TR    15   1   18  16    367  596 0.616   19.0  0.78   9.5    5.6   500.0
-----------------------------------------------------------------------------
 North: PR-172 Desde Caguas
 1 LR    10   8   29   3    102  302 0.339   23.4  0.78   2.6    1.5   500.0
 2 R      3  28    9  10    362 1068 0.339   10.6  0.75   4.3    3.0   500.0
-----------------------------------------------------------------------------
  T  Short lane due to specification of Turn Slot
```

Table S.8 - Lane Flow and Capacity Information

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  50 (Practical Cycle Time)

-----------------------------------------------------------------------------
                                          Saturation Flow  End  Tot
 Lane     Dem Flow (veh/h)    Lane    Adj. Aver Aver  Cap  Cap  Deg.  Lane
 No.    -------------------   Width  Basic 1st  2nd  (veh  (veh  Satn  Util
         Lef Thru  Rig  Tot    (m)   (tcu) (veh) (veh)  /h)  /h)   x     %
-----------------------------------------------------------------------------
 West: PR-172 Desde Pueblo Cidra
 1 L     516    0    0  516  3.60  1947 1809     0    0  687 0.751  100
 2 T       0  402    0  402  3.60  1947 1877     0    0 1427 0.282  100
-----------------------------------------------------------------------------
 East: NR-787 Desde Guavate
 1 TR      0  301   66  367  3.60  1871 1208  1786   72  596 0.616  100
-----------------------------------------------------------------------------
 North: PR-172 Desde Caguas
 1 LR     62    0   40  102  3.60  1890 1566   862   72  302 0.339  100
 2 R       0    0  362  362  3.60  1890 1566   958   72 1068 0.339  100
-----------------------------------------------------------------------------

  Basic Saturation Flow in this table is adjusted for lane width, approach
  grade, parking manoeuvres and number of buses stopping.  Saturation flow
  scale applies if specified.
```

Table S.9 - Signal Timing Diagram

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  50 (Practical Cycle Time)

Displayed (Phase) Green Times

  Phase A              Phase B                      Phase D

0          9                                31                          50
I----------I-------------------------------I---------------------------I
....GGGGGGG......GGGGGGGGGGGGGGGGGGGGGGGG......GGGGGGGGGGGGGGGGGGGGG.
  3            12                              34
```

Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Pueblo Cidra						
5L L	11.0	0.43	0.636	26.96	0.637	276.2
2T T	5.2	0.22	0.350	9.07	0.210	130.4
	8.5	0.34	0.510	19.09	0.449	212.1
East: NR-787 Desde Guavate						
6T T	17.5	0.47	0.567	35.03	1.280	437.7
6R R	15.4	0.47	0.604	31.90	1.019	384.7
	17.1	0.47	0.574	34.47	1.234	428.3
North: PR-172 Desde Caguas						
7L L	13.3	0.44	0.605	28.98	0.796	332.9
4R R	16.3	0.43	0.574	34.98	1.164	408.3
	15.9	0.43	0.579	34.19	1.115	398.3
Pedestrian Movements						
P5		2.61				
		2.61				
ALL VEHICLES:	12.3	0.39	0.542	26.32	0.790	306.8
INTERSECTION:	12.3	0.39	0.542	26.32	0.790	306.8

Table S.14 - Summary of Input and Output Data

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Pueblo Cidra												
1 L	516			516	3	1947	19		0.751	29.1	9	100

West: PR-172 Desde Pueblo Cidra										
5L L	516	687	100	0.751*	19*		29.1	0.88	14.2	28.27
2T T	402	1427	100	0.282	38		2.3	0.26	4.7	6.79
East: NR-787 Desde Guavate										
6T T	301	488	100	0.616	16		17.5	0.77	9.5	10.02
6R R	66	107	100	0.616	16	16*	25.7	0.84	9.5	2.37
North: PR-172 Desde Caguas										
7L L	62	183	100	0.339	6*		23.4	0.79	2.6	2.01
4R R	402	1188	100	0.339	28	10	11.9	0.75	4.3	9.73
Pedestrian Movements										
P5 (Ped)	1	2880	100	0.000	12		14.4	0.76	0.0	0.01

* Maximum degree of saturation, or critical green periods

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Pueblo Cidra						
5L L	35.4	137.52	0.204	8.63	0.204	88.5
2T T	13.1	56.41	0.088	2.28	0.053	32.8
	48.4	193.93	0.292	10.92	0.257	121.2
East: NR-787 Desde Guavate						
6T T	32.9	88.32	0.107	6.59	0.241	82.4
6R R	6.3	19.40	0.025	1.31	0.042	15.7
	39.2	107.72	0.132	7.90	0.283	98.1
North: PR-172 Desde Caguas						
7L L	5.1	16.72	0.023	1.11	0.030	12.7
4R R	40.6	107.53	0.143	8.72	0.290	101.7
	45.7	124.25	0.166	9.83	0.320	114.5
Pedestrian Movements						
P5		0.08				
		0.08				
ALL VEHICLES:	133.4	425.90	0.589	28.64	0.860	333.9
INTERSECTION:	133.4	425.98	0.589	28.64	0.860	333.9

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40

2 T		402		402	4	1947	38		0.282	2.3	3	500
	516	402	0	918	3				0.751	17.4	9	
East: NR-787 Desde Guavate												
1 TR		301	66	367	2	1871	1	16	0.616	19.0	6	500
	0	301	66	367	2				0.616	19.0	6	
North: PR-172 Desde Caguas												
1 LR	62		40	102	1	1890	8	3	0.339	23.4	2	500
2 R			362	362	4	1890	28	10	0.339	10.5	3	500
	62	0	402	464	3				0.339	13.4	3	
Pedestrians												
Across N approach			1			12			0.000	14.4	0.0	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	1749	3	50	0.751	16.7	9

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	Mov Typ	Green Time Ratio (g/C) 1st grn	2nd grn	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Pueblo Cidra										
5L	L	0.380*		516	687	0.751*	29.1	C	14.2	9
2T	T	0.760		402	1427	0.282	2.3	A	4.7	3
East: NR-787 Desde Guavate										
6T	T	0.320		301	488	0.616	17.5	B	9.5	6
6R	R	0.320	0.320*	66	107	0.616	25.7	C	9.5	6
North: PR-172 Desde Caguas										
7L	L	0.120*		62	183	0.339	23.4	C	2.6	2
4R	R	0.560	0.200	402	1188	0.339	11.9	B	4.3	3
Pedestrian Movements										
P5	(Ped)	0.240		1	2880	0.000	14.4	B	0.0	0
ALL VEHICLES:				1749		0.751	16.7	B	14.2	9
INTERSECTION (persons):				2100			16.7		14.2	9

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

Intersection capacity is calculated considering vehicle movements only.
* Maximum v/c ratio, or critical green periods
* Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table S.16 - SCATS MF Parameter

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Lane No.	Stopline Flow (veh/h)	Capacity (veh/h)	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Desde Pueblo Cidra						
1 L	516	687	1850	1598	0.751	100
2 T	402	1427	1947	1805	0.282	100
East: NR-787 Desde Guavate						
1 TR	367	596	1814	NA	0.616	100
North: PR-172 Desde Caguas						
1 LR	102	302	1716	NA	0.339	100
2 R	362	1068	1607	1451	0.339	100

NA Not Applicable - SCATS MF was not calculated for this lane due to one of the following reasons:
- the lane is not controlled by signals (slip or continuous lane)
- two movements share this lane and do not run in the same phases

STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line. This cannot exceed capacity.

SCATS SATURATION FLOW: This allows for lane width, approach grade and turning vehicles. Saturation flow scale applies if specified. The effects of heavy vehicles, parking manoeuvres, number of buses stopping and conflicting pedestrian volume are not included.

SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS control system. It is calculated from the SCATS SATURATION FLOW parameter.

DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow Rate, therefore x > 1 is possible.

Table D.0 - Geometric Delay Data

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appx. Dist. (m)	Downstream Distance User Spec?

2 T	0.282	0.26	0.00	0.00	0.26	0.327	0.00	
East: NR-787 Desde Guavate								
1 TR	0.616	0.76	0.01	0.01	0.78	0.891	0.26	
North: PR-172 Desde Caguas								
1 LR	0.339	0.71	0.01	0.07	0.78	0.902	0.13	
2 R	0.339	0.34	0.00	0.41	0.75	0.391	0.00	

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile [veh] 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 L	0.751	1.6	6.2	1.6	7.8	9.6	11.5	12.6	14.2	15.8	0.09
2 T	0.282	0.4	1.7	0.4	2.1	2.6	3.3	3.8	4.7	5.6	0.01
East: NR-787 Desde Guavate											
1 TR	0.616	0.8	3.9	0.8	4.8	5.9	7.2	8.1	9.5	10.9	0.01
North: PR-172 Desde Caguas											
1 LR	0.339	0.2	0.9	0.2	1.1	1.4	1.8	2.0	2.6	3.1	0.00
2 R	0.339	0.4	1.5	0.4	1.9	2.4	3.0	3.4	4.3	5.1	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 L	0.751	1.0	4.0	1.0	5.0	6.1	7.3	8.0	9.1	10.1	0.09
2 T	0.282	0.3	1.2	0.3	1.5	1.9	2.3	2.7	3.3	4.0	0.01
East: NR-787 Desde Guavate											
1 TR	0.616	0.5	2.3	0.5	2.8	3.5	4.3	4.8	5.6	6.4	0.01
North: PR-172 Desde Caguas											

West: PR-172 Desde Pueblo Cidra								
East	Thru	S	65.0	14.4	500	129	No	
North	Left	10.8	20.8	17.0	500	123	No	
East: NR-787 Desde Guavate								
West	Thru	S	65.0	14.4	500	128	No	
North	Right	10.0	20.2	15.7	500	120	No	
North: PR-172 Desde Caguas								
West	Right	10.0	20.2	15.7	500	124	No	
East	Left	7.2	17.8	11.3	500	117	No	

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Lane No.	Deg. Satn x	Delay (seconds/veh) Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Pueblo Cidra										
1 L	0.751	13.4	7.4	20.8	3.9	17.0	0.5	16.5	8.2	29.1
2 T	0.282	1.8	0.5	2.3	2.9	0.0	0.0	0.0	0.0	2.3
East: NR-787 Desde Guavate										
1 TR	0.616	12.8	4.7	17.5	6.9	10.6	0.2	10.3	1.5	19.0
North: PR-172 Desde Caguas										
1 LR	0.339	12.0	3.0	15.0	3.5	11.6	0.2	11.4	8.4	23.4
2 R	0.339	1.4	0.9	2.3	1.6	0.7	0.0	0.7	8.3	10.6

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Lane No.	Deg. Satn x	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Pueblo Cidra							
1 L	0.751	0.81	0.03	0.05	0.88	0.927	0.12

1	LR	0.339	0.1	0.5	0.1	0.6	0.8	1.0	1.2	1.5	1.8	0.00
2	R	0.339	0.3	1.0	0.3	1.3	1.7	2.1	2.4	3.0	3.6	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Pueblo Cidra									
5L L	56.0	20.8	20.8	65.0	9.6		43.4	32.9	8.2
2T T	65.0	65.0	65.0	65.0			60.0	60.0	0.0
East: NR-787 Desde Guavate									
6T T	56.0	0.0	65.0	65.0	1.7	0.0	41.3	39.8	0.0
6R R	56.0	20.2	20.2	65.0	1.7	8.4	43.8	34.5	8.2
North: PR-172 Desde Caguas									
7L L	56.0	17.8	17.8	65.0		0.0	37.1	35.7	8.4
4R R	56.0	20.2	20.2	65.0		5.0	45.6	44.0	8.3

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Disp. Grn. Settings 1st Grn Gmin	1st Grn Gmax	2nd Grn Gmin	2nd Grn Gmax
West: PR-172 Desde Pueblo Cidra									
5L L	PT	No	3	1.000	1.000	6	NA		
2T T	PT	No	3	1.000	1.000	6	NA		
East: NR-787 Desde Guavate									
6T T	PT	No	3	1.000	1.000	6	NA		
6R R	PT	No	3	1.000	1.000	6	NA	6	NA
North: PR-172 Desde Caguas									
7L L	PT	No	3	1.000	1.000	6	NA		
4R R	PT	No	3	1.000	1.000	6	NA	6	NA
Pedestrians									

PS	PT	No	3	1.000	1.000

Table D.6 - Gap Acceptance Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2014 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 50 (Practical Cycle Time)

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Pueblo Cidra					
5L L	Normal	0	4.50	2.50	2.0
East: NR-787 Desde Guavate					
6R R	Normal	516	6.00	3.00	2.0
North: PR-172 Desde Caguas					
4R R	Normal	301	6.00	3.00	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:35:14PM

SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2019 AM

INterseccion PR-172 @ Farmeceutica GSK

Performance Measure	Vehicles	Persons
Demand Flows - Total	2542 veh/h	3050 pers/h
Percent Heavy Vehicles	1.9 %	
Degree of Saturation	1.457	
Effective Intersection Capacity	1744 veh/h	
95% Back of Queue (m)	22 m	
95% Back of Queue (veh)	43.6 veh	
Control Delay (Total)	30.21 veh-h/h	36.25 pers-h/h
Control Delay (Average)	42.8 s/veh	42.8 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS F	
Total Effective Stops	986 veh/h	1183 pers/h
Effective Stop Rate	0.39 per veh	0.39 per pers
Proportion Queued	0.18	0.18
Travel Distance (Total)	1584.8 veh-km/h	1901.8 pers-km/h
Travel Distance (Average)	623 m	623 m
Travel Time (Total)	52.7 veh-h/h	63.3 pers-h/h
Travel Time (Average)	74.7 secs	74.7 secs
Travel Speed	30.0 km/h	30.0 km/h
Operating Cost (Total)	723 $/h	723 $/h
Fuel Consumption (Total)	176.4 L/h	
Carbon Dioxide (Total)	441.3 kg/h	
Hydrocarbons (Total)	0.734 kg/h	
Carbon Monoxide (Total)	17.86 kg/h	
NOX (Total)	0.818 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:02:28PM

SIDRA INTERSECTION

Movement Summary

Bosques de Cidra Escenario 2019 AM

INterseccion PR-172 @ Farmeceutica GSK

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-172 Desde Caguas										
6T	T	983	3.0	0.674	0.7	LOS A	0	0.00	0.08	69.1
6R	R	229	0.4	0.674	9.6	LOS A	0	0.00	0.70	54.3
Approach		**1211**	**2.5**	**0.674**	**2.4**	**LOS A**		**0.00**	**0.19**	**65.7**
Farmaceutica GSK										
7L	L	54	3.7	1.000*	166.3	LOS F	13	1.00	1.16	11.0
4R	R	48	0.0	1.000*	166.3	LOS F	13	1.00	1.18	11.0
Approach		**102**	**2.0**	**1.000**	**166.3**	**LOS F**	**13**	**1.00**	**1.17**	**11.0**
PR-172 Desde Cidra										
5L	L	360	0.0	1.457	245.1	LOS F	22	1.00	1.57	8.0
2T	T	870	1.8	0.457	0.7	LOS A	0	0.00	0.08	69.1
Approach		**1229**	**1.3**	**1.457**	**72.3**	**LOS F**	**22**	**0.29**	**0.51**	**21.6**
All Vehicles		**2542**	**1.9**	**1.457**	**42.8**	**Not Applicable**	**22**	**0.18**	**0.39**	**30.0**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:02:28PM

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Left		Through		Right	
		LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program							
West: PR-172 Desde Cidra							
5L	L	360	0	0	0	0	0
2T	T	0	0	853	16	0	0
East: PR-172 Desde Caguas							
6T	T	0	0	953	29	0	0
6R	R	0	0	0	0	228	1
North: Farmaceutica GSK							
7L	L	52	2	0	0	0	0
4R	R	0	0	0	0	48	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Left		Through		Right	
		Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program							
West: PR-172 Desde Cidra							
5L	L	360	0.0	0	0.0	0	0.0
2T	T	0	0.0	869	1.8	0	0.0
East: PR-172 Desde Caguas							
6T	T	0	0.0	982	3.0	0	0.0
6R	R	0	0.0	0	0.0	229	0.4
North: Farmaceutica GSK							
7L	L	54	3.7	0	0.0	0	0.0
4R	R	0	0.0	0	0.0	48	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2019 AM

INterseccion PR-172 @ Farmeceutica GSK

Run Information

* Basic Parameters:
Intersection Type: Unsignalised - Two-Way Stop Control
Driving on the right-hand side of the road
Input data specified in Metric units
Model Defaults: US HCM (Metric)
Peak Flow Period (for performance): 15 minutes
Unit time (for volumes): 60 minutes.
Delay definition: Control delay
Geometric delay included
HCM Delay Model option selected
HCM Queue Model option selected
Level of Service based on: Delay (HCM method)
Queue definition: Back of queue, 95th Percentile

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Cidra							
	East	2T	Thru	853	16	1.00	0.92
	North	5L	Left	360	0	1.00	0.25
East: PR-172 Desde Caguas							
	West	6T	Thru	953	29	1.00	0.86
	North	6R	Right	228	1	1.00	0.75
North: Farmaceutica GSK							
	West	4R	Right	48	0	1.00	0.58
	East	7L	Left	52	2	1.00	0.63

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
5L L	360	0.0	1211	2.5	1211	247	0.80	-45	100	1.457*
2T T	869	1.8	0			1900	0.80	75	100	0.457
East: PR-172 Desde Caguas										
6T T	982	3.0	0			1456	0.80	19	100	0.674
6R R	229	0.4	0			340	0.80	19	100	0.674
North: Farmaceutica GSK										
7L L	54	3.7	2326+	2.0	2326	54	0.80	-20	100	1.000
4R R	48	0.0	1097+	2.7	1097	48	0.80	-20	100	1.000

+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	F
Average intersection delay (s)	=	42.8
Largest average movement delay (s)	=	245.1
Largest back of queue, 95% (m)	=	22
Performance Index	=	82.16
Degree of saturation (highest)	=	1.457
Practical Spare Capacity (lowest)	=	-45 %
Effective intersection capacity, (veh/h)	=	1744
Total vehicle flow (veh/h)	=	2542
Total person flow (pers/h)	=	3050
Total vehicle delay (veh-h/h)	=	30.21
Total person delay (pers-h/h)	=	36.25
Total effective vehicle stops (veh/h)	=	986
Total effective person stops (pers/h)	=	1183
Total vehicle travel (veh-km/h)	=	1584.8
Total cost ($/h)	=	722.61
Total fuel (L/h)	=	176.4
Total CO2 (kg/h)	=	441.33

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	Longest Queue 95% Back (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
5L L	24.51	29.41	245.1	1.00	1.57	43.6	22	47.62	8.0
2T T	0.18	0.22	0.7	0.00	0.08	0.0	0	8.09	69.1
East: PR-172 Desde Caguas									
6T T	0.20	0.24	0.7	0.00	0.08	0.0	0	9.14	69.1
6R R	0.61	0.73	9.6	0.00	0.70	0.0	0	3.47	54.3
North: Farmaceutica GSK									
7L L	2.49	2.99	166.3	1.00	1.16	21.0	13	7.32	11.0
4R R	2.22	2.66	166.3	1.00	1.18	21.0	13	6.51	11.0

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
1229	1.457	24.69	29.62	72.3	0.29	0.51	22	55.71	21.6
East: PR-172 Desde Caguas									
1211	0.674	0.81	0.97	2.4	0.00	0.19	0	12.61	65.7
North: Farmaceutica GSK									
102	1.000	4.71	5.65	166.3	1.00	1.17	13	13.84	11.0
ALL VEHICLES:									
2542	1.457	30.21	36.25	42.8	0.18	0.39	22	82.16	30.0
INTERSECTION (persons):									
3050	1.457		36.25	42.8	0.18	0.39		82.16	30.0

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue 95% Back (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 L	360	247	1.457	245.1	1.57	43.6	21.8	45.0T
2 T	869	1900	0.457	0.7	0.08	0.0	0.0	500.0
East: PR-172 Desde Caguas								
1 TR	1211	1796	0.674	2.4	0.19	0.0	0.0	500.0
North: Farmaceutica GSK								
1 LR	102	102	1.000	166.3	1.17	21.0	12.8	500.0

T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 L	360	0	0	360	120	247	1.457	100
2 T	0	869	0	869	869	1900	0.457	100
East: PR-172 Desde Caguas								
1 TR	0	982	229	1211	1211	1796	0.674	100
North: Farmaceutica GSK								
1 LR	54	0	48	102	102	102	1.000	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Cidra									
5L	L	360	247	100	1.457*	245.1	1.57	43.6	47.62
2T	T	869	1900	100	0.457	0.7	0.08	0.0	8.09
East: PR-172 Desde Caguas									
6T	T	982	1456	100	0.674	0.7	0.08	0.0	9.14
6R	R	229	340	100	0.674	9.6	0.70	0.0	3.47
North: Farmaceutica GSK									
7L	L	54	54	100	1.000	166.3	1.16	21.0	7.32
4R	R	48	48	100	1.000	166.3	1.18	21.0	6.51

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra							
5L	L	58.8	332.39	0.309	7.34	0.228	147.0
2T	T	40.1	126.69	0.131	2.28	0.196	100.3
		98.9	459.08	0.441	9.62	0.424	247.3
East: PR-172 Desde Caguas							
6T	T	46.5	144.89	0.149	2.58	0.221	116.3
6R	R	16.8	46.83	0.073	3.63	0.111	42.1
		63.3	191.73	0.222	6.22	0.332	158.3
North: Farmaceutica GSK							
7L	L	7.7	38.31	0.038	1.12	0.035	19.4
4R	R	6.5	33.49	0.033	0.91	0.028	16.3
		14.3	71.80	0.071	2.03	0.063	35.7
INTERSECTION:		176.4	722.61	0.734	17.86	0.818	441.3

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

	54	0	48	102	2		1.000	166.3	13

ALL VEHICLES	Total Flow	% HV	Max X	Aver. Delay	Max Queue
	2542	2	1.457	42.8	22

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
5L	L	360	247	1.457*	245.1	F	43.6	22
2T	T	869	1900	0.457	0.7	A	0.0	0
East: PR-172 Desde Caguas								
6T	T	982	1456	0.674	0.7	A	0.0	0
6R	R	229	340	0.674	9.6	A	0.0	0
North: Farmaceutica GSK								
7L	L	54	54	1.000	166.3	F	21.0	13
4R	R	48	48	1.000	166.3	F	21.0	13
ALL VEHICLES:		2542		1.457	42.8	NA	43.6	22

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used.
For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods
* Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
5L L	26.5	1.50	1.394	33.03	1.027	662.1
2T T	7.4	0.23	0.241	4.20	0.360	184.5
	12.9	0.60	0.576	12.56	0.553	323.1
East: PR-172 Desde Caguas						
6T T	7.6	0.24	0.242	4.21	0.360	189.3
6R R	11.9	0.33	0.517	25.58	0.780	296.5
	8.4	0.25	0.293	8.22	0.439	209.4
North: Farmaceutica GSK						
7L L	23.2	1.15	1.145	33.54	1.038	580.5
4R R	21.9	1.13	1.114	30.65	0.948	546.8
	22.6	1.14	1.130	32.18	0.996	564.6
INTERSECTION:	11.1	0.46	0.463	11.27	0.516	278.5

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra												
1 L	360			360	0				1.457	245.1	22	45
2 T		869		869	2				0.457	0.7	0	500
	360	869	0	1229	1				1.457	72.3	22	
East: PR-172 Desde Caguas												
1 TR		982	229	1211	2				0.674	2.4	0	500
	0	982	229	1211	2				0.674	2.4		
North: Farmaceutica GSK												
1 LR	54		48	102	2				1.000	166.3	13	500

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Desde Cidra								
	East	Thru	S	65.0	11.1	500	127	No
	North	Left	7.4	18.0	11.7	500	117	No
East: PR-172 Desde Caguas								
	West	Thru	S	65.0	11.1	500	128	No
	North	Right	10.0	20.2	15.7	500	120	No
North: Farmaceutica GSK								
	West	Right	10.0	20.2	15.7	500	120	No
	East	Left	9.0	19.4	14.2	500	122	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Stop-line 1st d1	Stop-line 2nd d2	Stop-line Total dSL	Delay (seconds/veh) Acc. Dec. dn	Queuing Total dq	Queuing MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Cidra										
1 L	1.457	17.2	218.2	235.4	3.7	231.7	13.1	218.6	9.6	245.1
2 T	0.457	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
East: PR-172 Desde Caguas										
1 TR	0.674	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.4
North: Farmaceutica GSK										
1 LR	1.000	35.3	126.0	161.3	2.0	159.3	4.0	155.3	5.0	166.3

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	-- Effective Stop Rate --	Queue Prop.	Move-up

Lane No.	Satn x	he1	he2	Geom. hig	Overall h	Queued pq	Rate hqm
West: PR-172 Desde Cidra							
1 L	1.457	1.00	0.57	0.00	1.57	1.000	8.85
2 T	0.457	0.00	0.00	0.08	0.08	0.000	0.00
East: PR-172 Desde Caguas							
1 TR	0.674	0.00	0.00	0.19	0.19	0.000	0.00
North: Farmaceutica GSK							
1 LR	1.000	1.00	0.17	0.00	1.17	1.000	2.77

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	1.457	14.9	2.0	14.8	16.9	21.7	28.4	33.5	43.6	52.1	0.48
2 T	0.457	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											
1 TR	0.674	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.000	6.3	2.9	4.7	7.6	11.2	14.2	16.5	21.0	24.8	0.03

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2019 AM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	1.457	7.5	1.0	7.4	8.4	10.8	14.2	16.8	21.8	26.0	0.48
2 T	0.457	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											

Values in this table are adjusted for heavy vehicles in the entry stream.
+ Percentage of exiting flow included in total opposing flow

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:02:28PM

1 TR	0.674	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.000	3.8	1.8	2.9	4.6	6.8	8.6	10.0	12.8	15.1	0.03

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2019 AM
INteraeccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
5L L	72.0	18.0	18.0	65.0	3.0		38.4	8.0	9.6
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
East: PR-172 Desde Caguas									
6T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
6R R	72.0	20.2	20.2	65.0			54.3	54.3	9.6
North: Farmaceutica GSK									
7L L	72.0	0.0	19.4	65.0	2.7		47.6	11.0	5.0
4R R	72.0	0.0	20.2	65.0	3.1		47.1	11.0	5.0

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2019 AM
INteraeccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
5L L	Normal	1211	4.10	2.20	2.0
East: PR-172 Desde Caguas					
No opposed movements on this approach					
North: Farmaceutica GSK					
7L L	Normal	2326+	7.51	3.50	2.0
4R R	Normal	1097+	6.90	3.30	2.0

SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2019 PM

INterseccion PR-172 @ Farmeceutica GSK

Performance Measure	Vehicles	Persons
Demand Flows - Total	2024 veh/h	2429 pers/h
Percent Heavy Vehicles	1.6 %	
Degree of Saturation	1.833	
Effective Intersection Capacity	1104 veh/h	
95% Back of Queue (m)	24 m	
95% Back of Queue (veh)	47.0 veh	
Control Delay (Total)	28.06 veh-h/h	33.68 pers-h/h
Control Delay (Average)	49.9 s/veh	49.9 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS F	
Total Effective Stops	448 veh/h	537 pers/h
Effective Stop Rate	0.22 per veh	0.22 per pers
Proportion Queued	0.11	0.11
Travel Distance (Total)	1264.1 veh-km/h	1516.9 pers-km/h
Travel Distance (Average)	625 m	625 m
Travel Time (Total)	46.2 veh-h/h	55.5 pers-h/h
Travel Time (Average)	82.2 secs	82.2 secs
Travel Speed	27.4 km/h	27.4 km/h
Operating Cost (Total)	610 $/h	610 $/h
Fuel Consumption (Total)	137.8 L/h	
Carbon Dioxide (Total)	344.6 kg/h	
Hydrocarbons (Total)	0.572 kg/h	
Carbon Monoxide (Total)	10.44 kg/h	
NOX (Total)	0.583 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:07:07PM

SIDRA INTERSECTION

Movement Summary

Bosques de Cidra Escenario 2019 PM

INterseccion PR-172 @ Farmeceutica GSK

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-172 Desde Caguas										
6T	T	944	1.8	0.525	0.7	LOS A	0	0.00	0.08	69.1
6R	R	31	0.0	0.525	9.5	LOS A	0	0.00	0.70	54.3
Approach		**975**	**1.7**	**0.525**	**1.0**	**LOS A**		**0.00**	**0.10**	**68.5**
Farmaceutica GSK										
7L	L	184	0.0	1.804	456.6	LOS F	24	1.00	1.26	4.5
4R	R	33	0.0	1.833	456.6	LOS F	24	1.00	1.29	4.5
Approach		**217**	**0.0**	**1.808**	**456.6**	**LOS F**	**24**	**1.00**	**1.26**	**4.5**
PR-172 Desde Cidra										
5L	L	20	0.0	0.045	16.6	LOS C	0	0.73	0.93	46.3
2T	T	812	1.8	0.427	0.7	LOS A	0	0.00	0.08	69.1
Approach		**832**	**1.8**	**0.427**	**1.1**	**LOS A**	**0**	**0.02**	**0.10**	**68.3**
All Vehicles		**2024**	**1.6**	**1.833**	**49.9**	**Not Applicable**	**24**	**0.11**	**0.22**	**27.4**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:07:07PM

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left		Through		Right	
	LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
5L L	20	0	0	0	0	0
2T T	0	0	797	15	0	0
East: PR-172 Desde Caguas						
6T T	0	0	927	17	0	0
6R R	0	0	0	0	31	0
North: Farmaceutica GSK						
7L L	184	0	0	0	0	0
4R R	0	0	0	0	33	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left		Through		Right	
	Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
5L L	20	0.0	0	0.0	0	0.0
2T T	0	0.0	812	1.8	0	0.0
East: PR-172 Desde Caguas						
6T T	0	0.0	944	1.8	0	0.0
6R R	0	0.0	0	0.0	31	0.0
North: Farmaceutica GSK						
7L L	184	0.0	0	0.0	0	0.0
4R R	0	0.0	0	0.0	33	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2019 PM

INterseccion PR-172 @ Farmaceutica GSK

Run Information

* Basic Parameters:
Intersection Type: Unsignalised - Two-Way Stop Control
Driving on the right-hand side of the road
Input data specified in Metric units
Model Defaults: US HCM (Metric)
Peak Flow Period (for performance): 15 minutes
Unit time (for volumes): 60 minutes.
Delay definition: Control delay
Geometric delay included
HCM Delay Model option selected
HCM Queue Model option selected
Level of Service based on: Delay (HCM method)
Queue definition: Back of queue, 95th Percentile

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Cidra							
	East	2T	Thru	797	15	1.00	0.92
	North	5L	Left	20	0	1.00	0.25
East: PR-172 Desde Caguas							
	West	6T	Thru	927	17	1.00	0.86
	North	6R	Right	31	0	1.00	0.75
North: Farmaceutica GSK							
	West	4R	Right	33	0	1.00	0.58
	East	7L	Left	184	0	1.00	0.63

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest 95% Back (vehs)	Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
5L L	0.09	0.11	16.6	0.73	0.93	0.2	0	0.48	46.3
2T T	0.17	0.20	0.7	0.00	0.08	0.0	0	7.56	69.1
East: PR-172 Desde Caguas									
6T T	0.20	0.23	0.7	0.00	0.08	0.0	0	8.79	69.1
6R R	0.08	0.10	9.5	0.00	0.70	0.0	0	0.47	54.3
North: Farmaceutica GSK									
7L L	23.34	28.01	456.6	1.00	1.26	47.0	24	41.71	4.5
4R R	4.19	5.02	456.6	1.00	1.29	47.0	24	7.49	4.5

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
832	0.427	0.26	0.31	1.1	0.02	0.10	0	7.99	68.3
East: PR-172 Desde Caguas									
975	0.525	0.28	0.33	1.0	0.00	0.10	0	9.26	68.5
North: Farmaceutica GSK									
217	1.833	27.53	33.03	456.6	1.00	1.26	24	49.20	4.5
ALL VEHICLES:									
2024	1.833	28.06	33.68	49.9	0.11	0.22	24	66.45	27.4
INTERSECTION (persons):									
2429	1.833		33.68	49.9	0.11	0.22		66.45	27.4

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	RV (%)	Opposing Movement Flow (veh/h)	RV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn Xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
5L L	20	0.0	975	1.7	975	449	0.80	1696	100	0.045
2T T	812	1.8	0			1900	0.80	87	100	0.427
East: PR-172 Desde Caguas										
6T T	944	1.8	0			1798	0.80	52	100	0.525
6R R	31	0.0	0			59	0.80	52	100	0.525
North: Farmaceutica GSK										
7L L	184	0.0	1792+	1.8	1792	102	0.80	-56	100	1.804
4R R	33	0.0	960+	1.8	960	18	0.80	-56	100	1.833*

\+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	F
Average intersection delay (s)	=	49.9
Largest average movement delay (s)	=	456.6
Largest back of queue, 95% (m)	=	24
Performance Index	=	66.45
Degree of saturation (highest)	=	1.833
Practical Spare Capacity (lowest)	=	-56 %
Effective intersection capacity, (veh/h)	=	1104
Total vehicle flow (veh/h)	=	2024
Total person flow (pers/h)	=	2429
Total vehicle delay (veh-h/h)	=	28.06
Total person delay (pers-h/h)	=	33.68
Total affective vehicle stops (veh/h)	=	448
Total effective person stops (pers/h)	=	537
Total vehicle travel (veh-km/h)	=	1264.1
Total cost ($/h)	=	610.02
Total fuel (L/h)	=	137.8
Total CO2 (kg/h)	=	344.64

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Cidra									
5L	L	20	449	100	0.045	16.6	0.93	0.2	0.43
2T	T	812	1900	100	0.427	0.7	0.08	0.0	7.56
East: PR-172 Desde Caguas									
6T	T	944	1798	100	0.525	0.7	0.08	0.0	8.79
6R	R	31	59	100	0.525	9.5	0.70	0.0	0.47
North: Farmaceutica GSK									
7L	L	184	102	100	1.804	456.6	1.26	47.0	41.71
4R	R	33	18	100	1.833*	456.6	1.29	47.0	7.49

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID		Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra							
5L	L	1.5	4.53	0.007	0.33	0.010	3.8
2T	T	37.5	118.38	0.123	2.13	0.183	93.7
		39.0	122.91	0.129	2.47	0.193	97.5
East: PR-172 Desde Caguas							
6T	T	43.5	137.58	0.142	2.48	0.212	108.9
6R	R	2.2	6.28	0.010	0.48	0.015	5.6
		45.8	143.86	0.152	2.96	0.227	114.5
North: Farmaceutica GSK							
7L	L	45.0	291.05	0.246	4.25	0.138	112.5
4R	R	8.1	52.20	0.044	0.76	0.025	20.2
		53.1	343.25	0.290	5.01	0.163	132.6
INTERSECTION:		137.8	610.02	0.572	10.44	0.583	344.6

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue 95% Back (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 L	20	449	0.044	16.6	0.93	0.2	0.1	45.0T
2 T	812	1900	0.427	0.7	0.08	0.0	0.0	500.0
East: PR-172 Desde Caguas								
1 TR	975	1857	0.525	1.0	0.10	0.0	0.0	500.0
North: Farmaceutica GSK								
1 LR	217	120	1.808	456.6	1.26	47.0	23.5	500.0

T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 L	20	0	0	20	20	449	0.044	100
2 T	0	812	0	812	812	1900	0.427	100
East: PR-172 Desde Caguas								
1 TR	0	944	31	975	975	1857	0.525	100
North: Farmaceutica GSK								
1 LR	184	0	33	217	120	120	1.808	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

184	0	33	217	0		1.808	456.6	24

ALL VEHICLES	Total Flow	% HV	Max X	Aver. Delay	Max Queue
	2024	2	1.833	49.9	24

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh/h)	Total Cap. (veh/h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
5L	L	20	449	0.045	16.6	C	0.2	0
2T	T	812	1900	0.427	0.7	A	0.0	0
East: PR-172 Desde Caguas								
6T	T	944	1798	0.525	0.7	A	0.0	0
6R	R	31	59	0.525	9.5	A	0.0	0
North: Farmaceutica GSK								
7L	L	184	102	1.804	456.6	F	47.0	24
4R	R	33	18	1.833*	456.6	F	47.0	24
ALL VEHICLES:		2024		1.833	49.9	NA	47.0	24

Level of Service calculations are based on
average control delay including geometric delay (HCM criteria),
independent of the current delay definition used.
For the criteria, refer to the "Level of Service" topic in the
SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
5L L	12.5	0.37	0.562	27.15	0.807	311.4
2T T	7.4	0.23	0.241	4.20	0.360	184.5
	7.5	0.24	0.249	4.74	0.370	187.5
East: PR-172 Desde Caguas						
6T T	7.4	0.23	0.241	4.20	0.360	184.4
6R R	11.6	0.33	0.512	25.09	0.764	291.2
	7.5	0.24	0.250	4.85	0.373	187.8
North: Farmaceutica GSK						
7L L	39.5	2.56	2.161	37.35	1.212	987.9
4R R	39.4	2.55	2.155	37.21	1.210	986.2
	39.5	2.56	2.160	37.33	1.211	987.6
INTERSECTION:	10.9	0.48	0.452	8.26	0.461	272.6

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra												
1 L	20			20	0				0.044	16.6	0	45
2 T		812		812	2				0.427	0.7	0	500
	20	812	0	832	2				0.427	1.1	0	
East: PR-172 Desde Caguas												
1 TR		944	31	975	2				0.525	1.0	0	500
	0	944	31	975	2				0.525	1.0		
North: Farmaceutica GSK												
1 LR	184		33	217	0				1.808	456.6	24	500

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Desde Cidra								
	East	Thru	S	65.0	11.1	500	127	No
	North	Left	7.4	18.0	11.7	500	117	No
East: PR-172 Desde Caguas								
	West	Thru	S	65.0	11.1	500	127	No
	North	Right	10.0	20.2	15.7	500	120	No
North: Farmaceutica GSK								
	West	Right	10.0	20.2	15.7	500	120	No
	East	Left	9.0	19.4	14.2	500	119	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	Stop-line Delay 2nd d2	Total dSL	Delay (seconds/veh) Acc. Dec. dn	Queuing Total dq	Queuing MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Cidra										
1 L	0.044	7.0	0.0	7.0	2.7	4.2	0.0	4.2	9.6	16.6
2 T	0.427	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
East: PR-172 Desde Caguas										
1 TR	0.525	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
North: Farmaceutica GSK										
1 LR	1.808	30.0	421.6	451.6	2.0	449.6	6.1	443.5	5.0	456.6

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Deg.	-- Effective Stop Rate --	Queue Prop. Move-up

Lane No.	Satn x	hel	he2	Geom. Overall hig	h	Queued pq	Rate hqm
West: PR-172 Desde Cidra							
1 L	0.044	0.73	0.00	0.19	0.93	0.734	0.00
2 T	0.427	0.00	0.00	0.08	0.08	0.000	0.00
East: PR-172 Desde Caguas							
1 TR	0.525	0.00	0.00	0.10	0.10	0.000	0.00
North: Farmaceutica GSK							
1 LR	1.808	1.00	0.26	0.00	1.26	1.000	4.48

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.044	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.00
2 T	0.427	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											
1 TR	0.525	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.808	14.5	4.2	14.1	18.3	23.2	30.6	36.0	47.0	56.1	0.05

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.044	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.00
2 T	0.427	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											

1 TR	0.525	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.808	7.3	2.1	7.0	9.1	11.6	15.3	18.0	23.5	28.1	0.05

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
5L L	72.0	18.0	18.0	65.0			50.8	46.3	9.6
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
East: PR-172 Desde Caguas									
6T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
6R R	72.0	20.2	20.2	65.0			54.3	54.3	9.5
North: Farmaceutica GSK									
7L L	72.0	0.0	19.4	65.0	2.7		45.4	4.5	5.0
4R R	72.0	0.0	20.2	65.0	3.0		44.8	4.5	5.0

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2019 PM
INterseccion PR-172 @ Farmaceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
5L L	Normal	975	4.10	2.20	2.0
East: PR-172 Desde Caguas					
No opposed movements on this approach					
North: Farmaceutica GSK					
7L L	Normal	1792+	7.50	3.50	2.0
4R R	Normal	960+	6.90	3.30	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
+ Percentage of exiting flow included in total opposing flow

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:07:07PM

SIDRA INTERSECTION

Movement Summary

Estudio Operacional de Transito Bosques de Cidra 2019 AM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM

Signalised - Actuated coordinated **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Bosque de Cidra San Jose										
3L	L	57	0.0	0.314	39.7	LOS D	1	0.94	0.74	31.4
8R	R	205	0.0	0.126	9.7	LOS A#	3#	0.00	0.66	55.5
Approach		**262**	**0.0**	**0.314**	**16.3**	**LOS B**	**1**	**0.20**	**0.68**	**47.8**
PR_172 Caguas										
1L	L	29	0.0	0.160	38.8	LOS D	1	0.92	0.71	31.8
6T	T	853	3.3	0.576	2.0	LOS A	4	0.12	0.17	66.6
Approach		**882**	**3.2**	**0.576**	**3.2**	**LOS A**	**4**	**0.14**	**0.19**	**64.3**
PR-172 Cidra										
2T	T	845	1.8	0.675	4.8	LOS A	6	0.30	0.32	61.5
2R	R	71	0.0	0.049	9.3	LOS A	0	0.11	0.66	54.3
Approach		**916**	**1.6**	**0.675**	**5.1**	**LOS A**	**6**	**0.28**	**0.35**	**60.9**
All Vehicles		**2060**	**2.1**	**0.675**	**5.7**	**LOS A**	**6**	**0.21**	**0.32**	**60.1**

SIDRA SOLUTIONS

AI687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:49:11PM

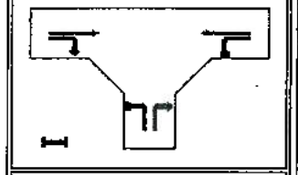
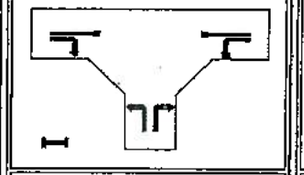
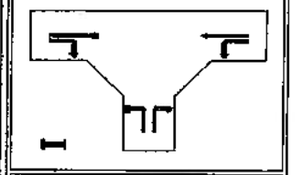
SIDRA INTERSECTION

Phasing Summary

Estudio Operacional de Transito Bosques de Cidra 2019 AM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM

C = 60 seconds
Cycle Time Option: **User-specified cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase C
		
Green Time = **40** seconds Phase Time = **44** seconds Phase Split = **73 %**	Green Time = **6** seconds Phase Time = **8** seconds Phase Split = **13 %**	Green Time = **6** seconds Phase Time = **8** seconds Phase Split = **13 %**

Normal Movement | Permitted/Opposed | Stopped Movement
Slip-Lane | Opposed Slip-Lane | Continuous
Turn On Red

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:49:11PM

	East	8R	Right	205	0	1.00	0.96
East: PR_172 Caguas							
	West	6T	Thru	825	28	1.00	0.96
	South	1L	Left	29	0	1.00	0.96

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program						
West: PR-172 Cidra						
2T T	0	0	830	15	0	0
2R R	0	0	0	0	71	0
South: Bosque de Cidra San Jose						
3L L	57	0	0	0	0	0
8R R	0	0	0	0	205	0
East: PR_172 Caguas						
1L L	29	0	0	0	0	0
6T T	0	0	825	28	0	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program						
West: PR-172 Cidra						
2T T	0	0.0	845	1.8	0	0.0
2R R	0	0.0	0	0.0	71	0.0
South: Bosque de Cidra San Jose						

SIDRA INTERSECTION

Output Tables

Estudio Operacional de Transito Bosques de Cidra 2019 AM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM

Run Information

Cycle Time = 60 (User-given Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Actuated Coordinated
  For fully-actuated signal timings, the following specifications will be ignored:
    Any maximum cycle time specification
  For actuated signal timings, cycle increment is set to 1 second
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes
  Delay definition: Control delay
    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations = 1
  Comparison of last two iterations:
    Difference in intersection degree of satn = 0.0 %
    Largest difference in eff. green times = 0 secs
    (max. value for stopping = 0 secs)

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Cidra							
	South	2R	Right	71	0	1.00	0.96
	East	2T	Thru	830	15	1.00	0.96
South: Bosque de Cidra San Jose							
	West	3L	Left	57	0	1.00	0.96

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
3L L	57	0.0							0	0.0	
8R R	0	0.0							205	0.0	
East: PR_172 Caguas											
1L L	29	0.0			0	0.0			0	0.0	
6T T	0	0.0			853	3.3			0	0.0	

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.1 - Movement Phase and Timing Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	First Green Fr	First Green To	First Green Op	First Green Pr	Second Green Fr	Second Green To	Second Green Op	Second Green Pr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Cidra															
2T T		*A	B							2		35.2		40	
2R R	(Slp)	A	B			B	A			2	4	8.0Min	18.0Min	40	14
South: Bosque de Cidra San Jose															
3L L		*B	C							4		10.0Min		6	
East: PR_172 Caguas															
1L L		*C	A							2		8.0Min		6	
6T T		C	B							2		38.8		48	

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

* Critical Movement/Green Period

Movement Types:
Slp Slip Lane Movement
Ped Pedestrian
Dum Dummy

Under heading 'Op':
Y If opposed turn

Table S.2 - Movement Capacity Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Cidra											
2T T	845	1.8	1877		0.450		1251	0.90	33	100	0.675*
2R R	71	0.0	1624	1624	0.044	0.030	1462	0.90	1753	100	0.049
South: Bosque de Cidra San Jose											
3L L	57	0.0	1815		0.031		181	0.90	187	100	0.314
8R R	205	0.0	1624		0.126		1624	0.90	613	100	0.126
East: PR_172 Caguas											
1L L	29	0.0	1815		0.016		182	0.90	463	100	0.160
6T T	853	3.3	1850		0.461		1480	0.90	56	100	0.576

Table S.3 - Intersection Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
2T	W_T		A	B	2	0.450	0.553	35.2
3L	S_L		B	C	10	-	-	10.0Min
1L	E_L		C	A	8	-	-	8.0Min
				Total:	20	0.450	0.553	53.2

\- Flow ratio not used for cycle time calculations and the adjusted lost time equals the required movement time (=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
26	NA	45	60

(Cycle time specified by the user)

NA Cmax does not apply at actuated signals

Intersection Level of Service	=	A
Worst movement Level of Service	=	D
Average intersection delay (s)	=	5.7
Largest average movement delay (s)	=	39.7
Largest back of queue, 95% [m]	=	6
Performance Index	=	34.84
Degree of saturation (highest)	=	0.675
Practical Spare Capacity (lowest)	=	33 %
Effective intersection capacity, (veh/h)	=	3051
Total vehicle flow (veh/h)	=	2060
Total person flow (pers/h)	=	2472
Total vehicle delay (veh-h/h)	=	3.26
Total person delay (pers-h/h)	=	3.91
Total effective vehicle stops (veh/h)	=	667
Total effective person stops (pers/h)	=	801
Total vehicle travel (veh-km/h)	=	1294.7
Total cost [$/h]	=	361.66
Total fuel [L/h]	=	120.4
Total CO2 (kg/h)	=	301.34

West: PR-172 Cidra									
916	0.675	1.30	1.56	5.1	0.28	0.35	6	16.66	60.9
South: Bosque de Cidra San Jose									
262	0.31¢	1.18	1.42	16.3	0.20	0.68	1	5.65	47.8
East: PR_172 Caguas									
882	0.57¢	0.78	0.93	3.2	0.14	0.19	4	12.53	64.3
ALL VEHICLES:									
2060	0.675	3.26	3.91	5.7	0.21	0.32	6	34.84	60.1
INTERSECTION (persons):									
2472	0.67¢		3.91	5.7	0.21	0.32		34.84	60.1

Queue values in this table are 95¢ back of queue (metres).

Table S.7 - Lane Performance

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Effective Red and Green Times (sec) R1	G1	R2	G2	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95¢ Back (vehs)	(m)	Lane Length (m)
West: PR-172 Cidra												
1 T	20	40	0	0	845	1251	0.675	4.8	0.32	10.7	6.4	500.0
2 R	2	40	4	14	71	1462	0.049	9.3	0.66	0.3	0.1	500.0
South: Bosque de Cidra San Jose												
1 L	5¢	6	0	0	57	182	0.314	39.7	0.74	2.3	1.2	500.0
2 R	0	60	0	0	205	1624	0.126	9.7	0.66	2.8#		500.0
East: PR_172 Caguas												
1 L	54	6	0	0	29	182	0.160	38.8	0.71	1.1	0.6	70.0T
2 T	12	48	0	0	853	1480	0.576	2.0	0.17	5.3	3.6	500.0

Density (passenger cars per km or mile)
T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Lane Width (m)	Saturation Flow Adj. Basic (tcu)	Aver 1st (veh)	Aver 2nd (veh)	End Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util ¢

Table S.4 - Phase Information

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	2	2	40	42	4	44	73¢
B	42	4	46	6	52	2	8	13¢
C	52	2	54	6	60	2	8	13¢

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95¢ Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Cidra									
2T T	1.12	1.34	4.8	0.30	0.32	10.7	6	15.47	61.5
2R R	0.18	0.22	9.3	0.11	0.66	0.3	0	1.19	54.3
South: Bosque de Cidra San Jose									
3L L	0.63	0.76	39.7	0.94	0.74	2.3	1	2.47	31.4
8R R	0.55	0.67	9.7		0.66	2.8#		3.17	55.5
East: PR_172 Caguas									
1L L	0.31	0.37	38.8	0.92	0.72	1.1	1	1.22	31.8
6T T	0.47	0.56	2.0	0.12	0.17	5.3	4	11.31	66.6

Largest density (passenger cars per km or mile) for any lane

Table S.6 - Intersection Performance

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)

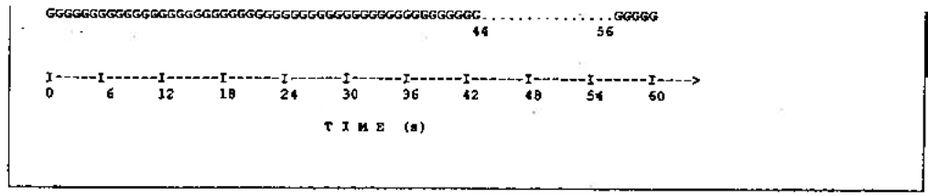


Table S.10 - Movement Capacity and Performance Summary

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Eff. Grn 1st Grn	Eff. Grn 2nd Grn	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Cidra											
2T	T	845	1251	100	0.675*	40*		4.8	0.32	10.7	15.47
2R	R (Slp)	71	1462	100	0.049	40	14	9.3	0.66	0.3	1.19
South: Bosque de Cidra San Jose											
3L	L	57	182	100	0.314	6*		39.7	0.74	2.3	2.47
8R	R (Con)	205	1624	100	0.126	60		9.7	0.66	2.8 #	3.17
East: PR_172 Caguas											
1L	L	29	182	100	0.160	6*		38.8	0.71	1.1	1.22
6T	T	853	1480	100	0.576	48		2.0	0.17	5.3	11.31

* Maximum degree of saturation, or critical green periods
\# Largest density (passenger cars per km or mile) for any lane

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Cidra						
2T T	47.5	143.47	0.178	5.97	0.266	118.8
2R R	5.0	14.37	0.022	1.02	0.032	12.5
	52.5	157.84	0.199	7.00	0.299	131.4
South: Bosque de Cidra San Jose						
3L L	4.9	17.00	0.022	0.95	0.029	12.2
8R R	16.3	44.37	0.072	3.65	0.109	40.9

West: PR-172 Cidra													
1 T	0	845	0	845	3.65	1911	1877	0	0	1251	0.675	100	
2 R	0	0	71	71	3.65	1911	1624	1624	0	1462	0.049	100	
South: Bosque de Cidra San Jose													
1 L	57	0	0	57	3.68	1911	1815	0	0	182	0.314	100	
2 R	0	0	205	205	3.65	1911	1624	0	0	1624	0.126	100	
East: PR_172 Caguas													
1 L	29	0	0	29	3.65	1911	1815	0	0	182	0.160	100	
2 T	0	853	0	853	3.65	1911	1850	0	0	1480	0.576	100	

Basic Saturation Flow in this table is adjusted for lane width, approach grade, parking manoeuvres and number of buses stopping. Saturation flow scale applies if specified.

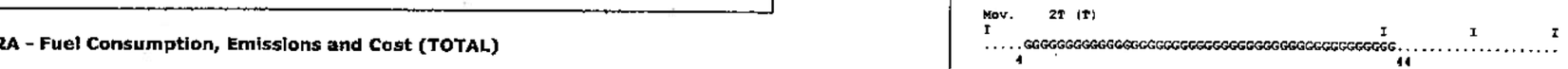
Table S.9 - Signal Timing Diagram

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Displayed (Phase) Green Times

Effective (Movement) Green Times

West: PR-172 Cidra



South: Bosque de Cidra San Jose

East: PR_172 Caguas

	21.2	61.37	0.094	4.61	0.139	53.1
East: PR_172 Caguas						
1L L	2.5	8.56	0.011	0.49	0.015	6.2
6T T	44.2	133.89	0.149	3.84	0.225	110.7
	46.7	142.45	0.161	4.33	0.240	116.9
INTERSECTION:	120.4	361.66	0.454	15.93	0.677	301.3

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Cidra						
2T T	9.0	0.27	0.336	11.30	0.504	224.9
2R R	11.2	0.32	0.480	22.84	0.723	280.0
	9.2	0.28	0.348	12.21	0.521	229.2
South: Bosque de Cidra San Jose						
3L L	13.7	0.48	0.629	26.78	0.817	342.5
8R R	12.2	0.33	0.534	27.22	0.816	304.3
	12.5	0.36	0.554	27.13	0.816	312.3
East: PR_172 Caguas						
1L L	13.7	0.47	0.629	26.91	0.819	341.8
6T T	8.3	0.25	0.280	7.20	0.422	207.5
	8.5	0.26	0.292	7.85	0.435	211.9
INTERSECTION:	9.3	0.28	0.351	12.31	0.523	232.7

Table S.14 - Summary of Input and Output Data

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Cidra												
1 T		845		845	2	1910	40		0.675	4.8	6	500
2 R			71	71	0	1910	40	14	0.049	9.3	0	500
	0	845	71	916	2				0.675	5.1	6	
South: Bosque de Cidra San Jose												
1 L	57			57	0	1910	6		0.314	39.7	1	500
2 R			205	205	0	1910	60		0.126	9.7		500
	57	0	205	262	0				0.314	16.3	1	
East: PR_172 Caguas												
1 L	29			29	0	1910	6		0.160	38.8	1	70
2 T		853		853	3	1910	48		0.576	2.0	4	500
	29	853	0	882	3				0.576	3.2	4	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	2060	2	60	0.675	5.7	6

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Green Time Ratio (g/C) 1st grn	2nd grn	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Cidra										
2T T		0.667*		845	1251	0.675*	4.8	A	10.7	6
2R R	(Slp)	0.667	0.233	71	1462	0.049	9.3	A	0.3	0
South: Bosque de Cidra San Jose										
3L L		0.100*		57	181	0.314	39.7	D	2.3	1
8R R	(Con)	1.000		205	1624	0.126	9.7	A#	2.8#	
East: PR_172 Caguas										
1L L		0.100*		29	182	0.160	38.8	D	1.1	1
6T T		0.800		853	1480	0.576	2.0	A	5.3	4
ALL VEHICLES:				2060		0.675	5.7	A	10.7	6

Intersection PR-172, Comunidad San Josa y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Cidra								
	South	Right	20.0	26.2	31.4	500	131	No
	East	Thru	S	65.0	22.1	500	127	No
South: Bosque de Cidra San Jose								
	West	Left	14.9	23.4	23.3	500	125	No
	East	Right	20.0	26.2	31.4	500	155	No
East: PR_172 Caguas								
	West	Thru	S	65.0	22.1	500	129	No
	South	Left	13.4	22.6	21.1	500	124	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Delay (seconds/veh) Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Cidra										
1 T	0.675	2.6	1.4	4.0	2.6	1.4	0.0	1.4	0.7	4.8
2 R	0.049	0.2	0.0	0.2	0.5	0.0	0.0	0.0	9.1	9.3
South: Bosque de Cidra San Jose										
1 L	0.314	29.9	0.5	30.4	4.3	26.1	0.0	26.1	9.4	39.7
2 R	0.126			0.0					9.7	9.7
East: PR_172 Caguas										
1 L	0.160	29.1	0.2	29.3	4.1	25.2	0.0	25.2	9.4	38.8
2 T	0.576	0.7	0.5	1.2	1.1	0.2	0.0	0.2	0.7	2.0

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1

INTERSECTION (persons):	2472	5.7	10.7	6

Level of Service calculations are based on
average control delay including geometric delay (HCM criteria),
independent of the current delay definition used.
For the criteria, refer to the "Level of Service" topic in the
SIDRA Output Guide or the Output section of the on-line help.
¶ Continuous movements: Level Of Service based on density,
Density (passenger cars per km or mile) instead of queue.
* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table S.16 - SCATS MF Parameter

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Stopline Flow (veh/h)	Capacity (veh/h)	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Cidra						
1 T	845	1251	1911	1820	0.675	100
2 R	71	1462	1624	NA	0.049	100
South: Bosque de Cidra San Jose						
1 L	57	182	1815	1089	0.314	100
2 R	205	1624	1624	NA	0.126	100
East: PR_172 Caguas						
1 L	29	182	1815	1361	0.160	100
2 T	853	1480	1911	1834	0.576	100

NA Not Applicable - SCATS MF was not calculated for this lane due to one of the following reasons:
- the lane is not controlled by signals (slip or continuous lane)
- two movements share this lane and do not run in the same phases

STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line. This cannot exceed capacity.

SCATS SATURATION FLOW: This allows for lane width, approach grade and turning vehicles. Saturation flow scale applies if specified. The effects of heavy vehicles, parking manoeuvres, number of buses stopping and conflicting pedestrian volume are not included.

SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS control system. It is calculated from the SCATS SATURATION FLOW parameter.

DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow Rate, therefore x > 1 is possible.

Table D.0 - Geometric Delay Data

Estudio Operacional de Transito Bosques de Cidra 2019 AM

Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Cidra							
1 T	0.675	0.27	0.00	0.05	0.32	0.296	0.00
2 R	0.049	0.08	0.00	0.58	0.66	0.106	0.00
South: Bosque de Cidra San Jose							
1 L	0.314	0.70	0.00	0.04	0.74	0.942	0.00
2 R	0.125			0.66	0.66		
East: PR_172 Caguas							
1 L	0.160	0.66	0.00	0.05	0.71	0.924	0.00
2 T	0.576	0.11	0.00	0.07	0.17	0.118	0.00

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Cidra											
1 T	0.675	1.3	4.2	1.3	5.5	6.5	8.5	9.4	10.7	12.9	0.01
2 R	0.049	0.0	0.1	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.00
South: Bosque de Cidra San Jose											
1 L	0.314	0.1	1.0	0.1	1.1	1.3	1.8	2.0	2.3	2.9	0.00
East: PR_172 Caguas											
1 L	0.160	0.0	0.5	0.0	0.5	0.7	0.9	1.0	1.1	1.5	0.01
2 T	0.576	0.9	1.7	0.9	2.6	3.1	4.1	4.6	5.3	6.6	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane	Deg.	Ovrfl.	Average (metres)			Percentile (metres)					Queue

Lane No.	Satn x	Queue No	Nb1	Nb2	Nb	70%	85%	90%	95%	98%	Stor. Ratio
West: PR-172 Cidra											
1 T	0.675	0.8	2.5	0.8	3.3	3.9	5.1	5.6	6.4	7.7	0.01
2 R	0.049	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.00
South: Bosque de Cidra San Jose											
1 L	0.314	0.0	0.5	0.0	0.6	0.7	0.9	1.0	1.2	1.5	0.00
East: PR_172 Caguas											
1 L	0.160	0.0	0.3	0.0	0.3	0.3	0.4	0.5	0.6	0.7	0.01
2 T	0.576	0.6	1.1	0.6	1.8	2.1	2.8	3.1	3.6	4.5	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	App. Speeds Cruise	Negn	Exit Speeds Negn	Cruise	Queue Move-up 1st Grn	2nd Grn	Av. Section Spd Running	Overall	Geom Delay (sec)
West: PR-172 Cidra									
2T T	72.0	65.0	65.0	65.0			63.9	61.5	0.7
2R R	72.0	26.2	26.2	65.0			54.3	54.3	9.1
South: Bosque de Cidra San Jose									
3L L	72.0	23.4	23.4	65.0			49.5	31.4	9.4
8R R	72.0	26.2	26.2	65.0			55.5	55.5	9.7
East: PR_172 Caguas									
1L L	72.0	22.6	22.6	65.0			49.6	31.8	9.4
6T T	72.0	65.0	65.0	65.0			66.9	66.6	0.7

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Gap Settings as	ah	Disp. Grn. Settings 1st Grn Gmin	Gmax	2nd Grn Gmin	Gmax
West: PR-172 Cidra											
2T T	VA	Yes	4	0.384	0.459	2.5	2.7	6	50		

2R	R	VA	No	3	1.000	1.000	2.5	2.7	6	50	6 50
South: Bosque de Cidra San Jose											
3L	L	VA	No	3	1.000	1.000	2.0	2.2	6	20	
8R	R	VA	No	3	1.000	1.000	2.5	2.7	6	50	
East: PR_172 Caguas											
1L	L	VA	No	3	1.000	1.000	2.0	2.2	6	20	
6T	T	VA	Yes	4	0.288	0.298	2.5	2.7	6	50	

Table D.6 - Gap Acceptance Parameters

```
Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time =  60 (User-given Cycle Time)

 No opposed movements at this intersection
```

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com
C:\acad386\work\06152 - Estudio de Transito Finca Campo Alegre, Cidra\SidraREV\2019int2AM.aap
Processed Dec 06, 2006 01:49:11PM

SIDRA INTERSECTION

Intersection Summary

Estudio Operacional de Transito Bosques de Cidra 2019 AM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM

Performance Measure	Vehicles	Persons
Demand Flows - Total	2060 veh/h	2472 pers/h
Percent Heavy Vehicles	2.1 %	
Degree of Saturation	0.675	
Effective Intersection Capacity	3051 veh/h	
95% Back of Queue (m)	6 m	
95% Back of Queue (veh)	10.7 veh	
Control Delay (Total)	3.26 veh-h/h	3.91 pers-h/h
Control Delay (Average)	5.7 s/veh	5.7 s/pers
Level of Service	LOS A	
Level of Service (Worst Movement)	LOS D	
Total Effective Stops	667 veh/h	801 pers/h
Effective Stop Rate	0.32 per veh	0.32 per pers
Proportion Queued	0.21	0.21
Travel Distance (Total)	1294.7 veh-km/h	1553.6 pers-km/h
Travel Distance (Average)	628 m	628 m
Travel Time (Total)	21.5 veh-h/h	25.9 pers-h/h
Travel Time (Average)	37.7 secs	37.7 secs
Travel Speed	60.1 km/h	60.1 km/h
Operating Cost (Total)	362 $/h	362 $/h
Fuel Consumption (Total)	120.4 L/h	
Carbon Dioxide (Total)	301.3 kg/h	
Hydrocarbons (Total)	0.454 kg/h	
Carbon Monoxide (Total)	15.93 kg/h	
NOX (Total)	0.677 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:49:11PM

SIDRA INTERSECTION

Intersection Summary

Estudio Operacional de Transito Bosques de Cidra 2019 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

Performance Measure	Vehicles	Persons
Demand Flows - Total	2056 veh/h	2467 pers/h
Percent Heavy Vehicles	1.1 %	
Degree of Saturation	0.713	
Effective Intersection Capacity	2884 veh/h	
95% Back of Queue (m)	10 m	
95% Back of Queue (veh)	16.8 veh	
Control Delay (Total)	6.25 veh-h/h	7.50 pers-h/h
Control Delay (Average)	10.9 s/veh	10.9 s/pers
Level of Service	LOS B	
Level of Service (Worst Movement)	LOS D	
Total Effective Stops	950 veh/h	1140 pers/h
Effective Stop Rate	0.46 per veh	0.46 per pers
Proportion Queued	0.40	0.40
Travel Distance (Total)	1289.6 veh-km/h	1547.5 pers-km/h
Travel Distance (Average)	627 m	627 m
Travel Time (Total)	24.5 veh-h/h	29.4 pers-h/h
Travel Time (Average)	42.9 secs	42.9 secs
Travel Speed	52.7 km/h	52.7 km/h
Operating Cost (Total)	403 $/h	403 $/h
Fuel Consumption (Total)	131.3 L/h	
Carbon Dioxide (Total)	328.3 kg/h	
Hydrocarbons (Total)	0.531 kg/h	
Carbon Monoxide (Total)	20.78 kg/h	
NOX (Total)	0.773 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:44:33PM

SIDRA INTERSECTION

Movement Summary

Estudio Operacional de Transito Bosques de Cidra 2019 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

Signalised - Actuated coordinated **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Bosque de Cidra San Jose										
3L	L	83	0.0	0.392	39.1	LOS D	2	0.94	0.76	31.7
8R	R	117	0.0	0.072	9.7	LOS A#	2#	0.00	0.66	55.5
Approach		**200**	**0.0**	**0.392**	**21.9**	**LOS C**	**2**	**0.39**	**0.70**	**42.6**
PR_172 Caguas										
1L	L	196	0.0	0.432	31.6	LOS C	3	0.86	0.80	35.4
6T	T	869	1.6	0.590	2.1	LOS A	3	0.12	0.18	66.3
Approach		**1065**	**1.3**	**0.590**	**7.5**	**LOS A**	**3**	**0.26**	**0.29**	**57.2**
PR-172 Cidra										
2T	T	673	1.2	0.713	13.4	LOS B	10	0.67	0.62	49.8
2R	R	118	0.8	0.081	9.4	LOS A	0	0.11	0.66	54.3
Approach		**791**	**1.1**	**0.713**	**12.8**	**LOS B**	**10**	**0.59**	**0.63**	**50.4**
All Vehicles		**2056**	**1.1**	**0.713**	**10.9**	**LOS B**	**10**	**0.40**	**0.46**	**52.7**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:44:33PM

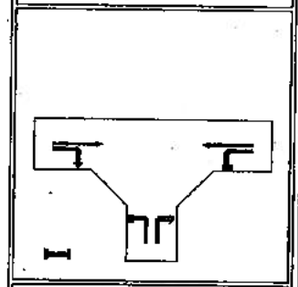
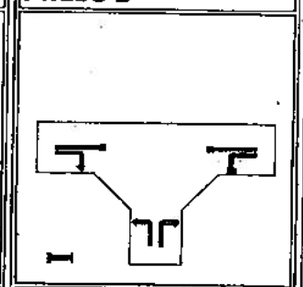
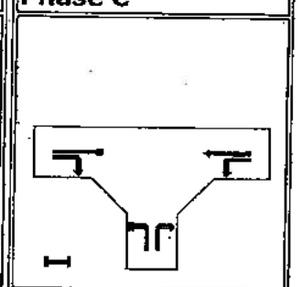
SIDRA INTERSECTION

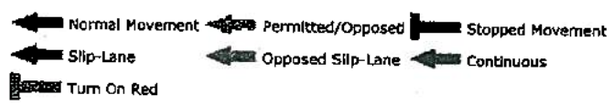
Phasing Summary

Estudio Operacional de Transito Bosques de Cidra 2019 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

C = 60 seconds
Cycle Time Option: User-specified cycle time
Phase times determined by the program.

Phase A	Phase B	Phase C
		
Green Time = 30 seconds Phase Time = 34 seconds Phase Split = 57 %	Green Time = 7 seconds Phase Time = 9 seconds Phase Split = 15 %	Green Time = 15 seconds Phase Time = 17 seconds Phase Split = 28 %



SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 05, 2006 01:44:33PM

	East	8R	Right	117	0	1.00	0.96
East: PR_172 Caguas							
	West	6T	Thru	855	14	1.00	0.96
	South	1L	Left	196	0	1.00	0.96

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program						
West: PR-172 Cidra						
2T T	0	0	665	8	0	0
2R R	0	0	0	0	117	1
South: Bosque de Cidra San Jose						
3L L	83	0	0	0	0	0
8R R	0	0	0	0	117	0
East: PR_172 Caguas						
1L L	196	0	0	0	0	0
6T T	0	0	855	14	0	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program						
West: PR-172 Cidra						
2T T	0	0.0	673	1.2	0	0.0
2R R	0	0.0	0	0.0	118	0.8
South: Bosque de Cidra San Jose						

SIDRA INTERSECTION

Output Tables

Estudio Operacional de Transito Bosques de Cidra 2019 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

Run Information

Cycle Time = 60 (User-given Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Actuated Coordinated
  For fully-actuated signal timings, the following specifications will be ignored:
    Any maximum cycle time specification
  For actuated signal timings, cycle increment is set to 1 second
  Driving on the right-hand side of the road
  Input data specified in Metric Units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
                    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations = 2
  Comparison of last two iterations:
    Difference in intersection degree of satn = 0.0 %
    Largest difference in eff. green times = 0 secs
    (max. value for stopping = 0 secs)

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Cidra							
	South	2R	Right	117	1	1.00	0.96
	East	2T	Thru	665	8	1.00	0.96
South: Bosque de Cidra San Jose							
	West	3L	Left	83	0	1.00	0.96

Mov ID		Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
3L	L	83	0.0							0	0.0	
8R	R	0	0.0							117	0.0	
East: PR_172 Caguas												
1L	L	196	0.0			0	0.0			0	0.0	
6T	T	0	0.0			869	1.6			0	0.0	

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.1 - Movement Phase and Timing Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	To	Op Pr	Second Green Fr	To	Op Pr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Cidra													
2T	T	*A	B					2		29.5		30	
2R	R (Slp)	A	B		B	A		2	4	8.0Min	18.0Min	30	24
South: Bosque de Cidra San Jose													
3L	L	*B	C					4		10.9		7	
East: PR_172 Caguas													
1L	L	*C	A					2		15.8		15	
6T	T	C	B					2		38.3		47	

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

* Critical Movement/Green Period

Movement Types:
Slp Slip Lane Movement
Ped Pedestrian
Dum Dummy

Under heading 'Op':
Y If opposed turn

Table S.2 - Movement Capacity Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID		Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Cidra												
2T	T	673	1.2	1888		0.356		944	0.90	26	100	0.713*
2R	R	118	0.8	1614	1614	0.024	0.049	1453	0.90	1008	100	0.081
South: Bosque de Cidra San Jose												
3L	L	83	0.0	1815		0.046		212	0.90	130	100	0.392
8R	R	117	0.0	1624		0.072		1624	0.90	1149	100	0.072
East: PR_172 Caguas												
1L	L	196	0.0	1815		0.108		454	0.90	188	100	0.432
6T	T	869	1.6	1880		0.462		1473	0.90	53	100	0.590

Table S.3 - Intersection Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
2T	W_T		A	B	2	0.356	0.458	29.5
3L	S_L		B	C	4	0.046	0.114	10.9
1L	E_L		C	A	2	0.108	0.229	15.8
		Total:			8	0.510	0.801	56.1

Cycle Time:

Minimum	Maximum	Practical	Chosen
26	NA	41	60

(Cycle time specified by the user)

NA Cmax does not apply at actuated signals

Intersection Level of Service	=	B
Worst movement Level of Service	=	D
Average intersection delay (s)	=	10.9
Largest average movement delay (s)	=	39.1
Largest back of queue, 95% (m)	=	10
Performance Index	=	46.36
Degree of saturation (highest)	=	0.713
Practical Spare Capacity (lowest)	=	26 %
Effective intersection capacity, (veh/h)	=	2884
Total vehicle flow (veh/h)	=	2056
Total person flow (pers/h)	=	2467
Total vehicle delay (veh-h/h)	=	6.25
Total person delay (pers-h/h)	=	7.50
Total effective vehicle stops (veh/h)	=	950
Total effective person stops (pers/h)	=	1140
Total vehicle travel (veh-km/h)	=	1289.6
Total cost ($/h)	=	402.95
Total fuel (L/h)	=	131.3
Total CO2 (kg/h)	=	328.30

Mov ID	and Turn	Period	Fr	To	Lost Time	Flow Ratio	Grn Time Ratio	Movement Time
7L	N_L		A	B	9	-	-	9.0Min
5L	W_L		B	D	3	0.394	0.437	29.2
6R	E_R	2nd	D	A	3	0.285	0.317	22.0
				Total:	15	0.679	0.754	60.2

- Flow ratio not used for cycle time calculations and the adjusted lost time equals the required movement time (=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
34	150	61	60

(Cycle time specified by the user)

Intersection Level of Service	=	C
Worst Movement Level of Service	=	D
Average intersection delay (s)	=	28.5
Largest average movement delay (s)	=	46.6
Largest back of queue, 95% (m)	=	15
Performance Index	=	82.18
Degree of saturation (highest)	=	0.908
Practical Spare Capacity (lowest)	=	-1 %
Effective intersection capacity, (veh/h)	=	2277
Total vehicle flow (veh/h)	=	2068
Total pedestrian flow (ped/h)	=	1
Total person flow (pers/h)	=	2483
Total vehicle delay (veh-h/h)	=	16.40
Total pedestrian delay (ped-h/h)	=	0.00
Total person delay (pers-h/h)	=	19.68
Total effective vehicle stops (veh/h)	=	1674
Total effective pedestrian stops (ped/h)	=	1
Total effective person stops (pers/h)	=	2010
Total vehicle travel (veh-km/h)	=	1287.0
Total cost ($/h)	=	595.98
Total fuel (L/h)	=	178.6
Total CO2 (kg/h)	=	447.06

Table S.4 - Phase Information

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	3	3	6	9	3	9	15%
B	9	3	12	26	38	3	29	48%
D	38	3	41	19	60	3	22	37%

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
5L L	8.05	9.67	40.2	1.00	0.98	26.2	15	35.97	28.2
2T T	0.16	0.19	1.8	0.26	0.20	3.8	2	5.32	60.9
East: NR-787 Desde Guavate									
6T T	5.36	6.44	38.4	1.00	0.97	20.0	12	24.94	29.1
6R R	0.34	0.40	46.6	1.00	0.97	20.0	12	1.35	26.1
North: PR-172 Desde Caguas									
7L L	0.35	0.42	29.9	0.89	0.81	4.1	3	1.61	32.3
4R R	2.13	2.56	17.1	0.59	0.79	6.0	5	12.99	40.0
Pedestrian Movements									
P5	0.00	0.00	16.9	0.75	0.75	0.0	0	0.02	2.7

Table S.6 - Intersection Performance

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
1049	0.908	8.22	9.86	28.2	0.77	0.74	15	41.28	34.0
East: NR-787 Desde Guavate									
529	0.903	5.70	6.84	38.8	1.00	0.97	12	26.29	28.9
North: PR-172 Desde Caguas									
490	0.379	2.48	2.98	18.2	0.61	0.79	5	14.59	39.2
Pedestrians:									
1	0.000	0.00	0.00	16.9	0.75	0.75	0	0.02	2.7
ALL VEHICLES:									
2068	0.908	16.40	19.68	28.5	0.79	0.81	15	82.17	33.5
INTERSECTION (persons):									
2483	0.908		19.68	28.5	0.79	0.81		82.18	33.5

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

```
  P5    (Ped) D     A                                  7        16.0Min          15
-------------------------------------------------------------------------------------
  Current Phase Sequence: Sequence 1
  Input phase sequence: A B D
  Output phase sequence: A B D
-------------------------------------------------------------------------------------
  *  Critical Movement/Green Period

Movement Types:                                Under heading 'Op':
  Slp  Slip Lane Movement                        Y   If opposed turn
  Ped  Pedestrian
  Dum  Dummy
```

Table S.2 - Movement Capacity Parameters

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------------------------
 Mov       Dem            Satn Flow    Flow Ratio   Total Prac. Prac. Lane    Deg.
 ID        Flow          ----------   ---------    Cap. Deg.  Spare Util    Satn
           (veh     HV    1st   2nd    1st   2nd   (veh  Satn  Cap.
            /h)     (%)   Grn   Grn    Grn   Grn    /h)   xp    (%)   (%)     x
-------------------------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
  5L L     721     1.1  1832          0.394          794  0.90    -1   100  0.908*
  2T T     328     2.1  1907          0.172         1526  0.90   319   100  0.215
-------------------------------------------------------------------------------------
East: NR-787 Desde Guavate
  6T T     503     1.8  1765          0.285          559  0.90     0   100  0.900
  6R R      26     0.0    35     67   0.197 0.285     29  0.90     0   100  0.903
-------------------------------------------------------------------------------------
North: PR-172 Desde Caguas
  7L L      42     0.0  1109          0.038          111  0.90   138   100  0.379
  4R R     448     7.1  1834   1693   0.244 0.000   1183  0.90   138   100  0.379
-------------------------------------------------------------------------------------
Pedestrian Movements
  P5         1          12000          0.000         3000  0.90           0  0.000
-------------------------------------------------------------------------------------

  Opposed turn in movement   6R has high x.
  Its capacity is mainly due to end departures. Consider increasing
  the number of end departures, and/or specifying this as an undetected
  movement, since it may be affecting the timing results adversely.
```

Table S.3 - Intersection Parameters

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------------------
   Crit App.  Green   Phases   Adjusted    Adjusted   Required   Required
```



```
-------------------------------------------------------------------------------
East: NR-787 Desde Guavate
   6T T        0   0.0      503   1.8        0   0.0
   6R R        0   0.0        0   0.0       26   0.0
-------------------------------------------------------------------------------
North: PR-172 Desde Caguas
   7L L       42   0.0        0   0.0        0   0.0
   4R R        0   0.0        0   0.0      448   7.1
-------------------------------------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.3 - Pedestrian Flow Rates

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------------------
 Mov         Flow Rate    Flow    Peak Flow
 ID   Stage   (ped/h)     Scale    Factor
-------------------------------------------------------------------------------
Across North Approach
  P5              1        1.00     0.95
-------------------------------------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table S.1 - Movement Phase and Timing Parameters

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------------------------
 Mov     Mov          P H A S E   M A T R I X          Lost Tim  Req.Mov.Time     Eff. Grn
 ID      Typ      First Green          Second Green    --------  -----------     --------
                ------------------  ------------------  1st  2nd  1st      2nd     1st  2nd
                Fr    To   Op Pr    Fr    To   Op Pr   Grn  Grn  Grn      Grn     Grn  Grn
-------------------------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
  5L L        *B     D                                  3        29.2              26
  2T T         B     A                                  3        25.0Min           48
-------------------------------------------------------------------------------------
East: NR-787 Desde Guavate
  6T T         D     A                                  3        22.0              19
  6R R         A     D      Y     *D     A              25    3   38.2     22.0     13   19
-------------------------------------------------------------------------------------
North: PR-172 Desde Caguas
  7L L        *A     B                                  3         9.0Min            6
  4R R         A     D             D     A      Y       3   18   19.3     16.0Min  35    4
-------------------------------------------------------------------------------------
Pedestrian Movements
```

	3L L	57	0.0	0	0.0	0	0.0				
	8R R	0	0.0	0	0.0	205	0.0				
East: PR_172 Caguas											
	1L L	29	0.0	0	0.0	0	0.0				
	6T T	0	0.0	853	3.3	0	0.0				

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.1 - Movement Phase and Timing Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	To	Op Pr	Second Green Fr	To	Op Pr	Lost Tim 1st Grn	2nd Grn	Req.Mov.Time 1st Grn	2nd Grn	Eff. Grn 1st Grn	2nd Grn
West: PR-172 Cidra													
2T T		*A	B					2		35.2		40	
2R R	(Slp)	A	B		B	A		2	4	8.0Min	18.0Min	40	14
South: Bosque de Cidra San Jose													
3L L		*B	C					4		10.0Min		6	
East: PR_172 Caguas													
1L L		*C	A					2		8.0Min		6	
6T T		C	B					2		38.8		48	

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

* Critical Movement/Green Period

Movement Types:
Slp Slip Lane Movement
Ped Pedestrian
Dum Dummy

Under heading 'Op':
Y If opposed turn

Table S.2 - Movement Capacity Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID		Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Cidra												
2T	T	845	1.8	1877		0.450		1251	0.90	33	100	0.675*
2R	R	71	0.0	1624	1624	0.044	0.030	1462	0.90	1753	100	0.049
South: Bosque de Cidra San Jose												
3L	L	57	0.0	1815		0.031		181	0.90	187	100	0.314
8R	R	205	0.0	1624		0.126		1624	0.90	613	100	0.126
East: PR_172 Caguas												
1L	L	29	0.0	1815		0.016		182	0.90	463	100	0.160
6T	T	853	3.3	1850		0.461		1480	0.90	56	100	0.576

Table S.3 - Intersection Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
2T	W_T		A	B	2	0.450	0.553	35.2
3L	S_L		B	C	10	-	-	10.0Min
1L	E_L		C	A	8	-	-	8.0Min
				Total:	20	0.450	0.553	53.2

\- Flow ratio not used for cycle time calculations and the adjusted lost time equals the required movement time (=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
26	NA	45	60

(Cycle time specified by the user)

NA Cmax does not apply at actuated signals

Intersection Level of Service	=	A
Worst movement Level of Service	=	D
Average intersection delay (s)	=	5.7
Largest average movement delay (s)	=	39.7
Largest back of queue, 95% (m)	=	6
Performance Index	=	34.84
Degree of saturation (highest)	=	0.675
Practical Spare Capacity (lowest)	=	33 %
Effective intersection capacity, (veh/h)	=	3051
Total vehicle flow (veh/h)	=	2060
Total person flow (pers/h)	=	2472
Total vehicle delay (veh-h/h)	=	3.26
Total person delay (pers-h/h)	=	3.91
Total effective vehicle stops (veh/h)	=	667
Total effective person stops (pers/h)	=	801
Total vehicle travel (veh-km/h)	=	1284.7
Total cost ($/h)	=	361.66
Total fuel (L/h)	=	120.4
Total CO2 (kg/h)	=	301.34

West: PR-172 Cidra										
916	0.675	1.30	1.56	5.1	0.28	0.35	6	16.66	60.9
South: Bosque de Cidra San Jose										
262	0.314	1.18	1.42	16.3	0.20	0.68	1	5.65	47.8
East: PR_172 Caguas										
882	0.576	0.78	0.93	3.2	0.14	0.19	4	12.53	64.3
ALL VEHICLES:										
2060	0.675	3.26	3.91	5.7	0.21	0.32	6	34.84	60.1
INTERSECTION (persons):										
2472	0.675		3.91	5.7	0.21	0.32		34.84	60.1

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Effective Green Times (sec) R1	G1	R2	G2	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	(m)	Lane Length (m)
West: PR-172 Cidra												
1 T	20	40	0	0	845	1251	0.675	4.8	0.32	10.7	6.4	500.0
2 R	2	40	4	14	71	1462	0.049	9.3	0.66	0.3	0.1	500.0
South: Bosque de Cidra San Jose												
1 L	54	6	0	0	57	182	0.314	39.7	0.74	2.3	1.2	500.0
2 R	0	60	0	0	205	1624	0.126	9.7	0.66	2.0#		500.0
East: PR_172 Caguas												
1 L	54	6	0	0	29	182	0.160	38.8	0.71	1.1	0.6	70.0T
2 T	12	48	0	0	853	1480	0.576	2.0	0.17	5.3	3.6	500.0

\# Density (passenger cars per km or mile)
T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Lane Width (m)	Saturation Flow Adj. Basic (tcu)	Aver 1st (veh)	Aver 2nd (veh)	End Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %

Table S.4 - Phase Information

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	2	2	40	42	4	44	73%
B	42	4	46	6	52	2	8	13%
C	52	2	54	6	60	2	8	13%

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Cidra									
2T T	1.12	1.36	4.8	0.30	0.32	10.7	6	15.47	61.5
2R R	0.18	0.22	9.3	0.11	0.66	0.3	0	1.19	54.3
South: Bosque de Cidra San Jose									
3L L	0.63	0.76	39.7	0.94	0.74	2.3	1	2.47	31.4
8R R	0.55	0.67	9.7		0.66	2.0#		3.17	55.5
East: PR_172 Caguas									
1L L	0.31	0.37	38.8	0.92	0.71	1.1	1	1.22	31.8
6T T	0.47	0.56	2.0	0.12	0.17	5.3	4	11.31	66.6

\# Largest density (passenger cars per km or mile) for any lane

Table S.6 - Intersection Performance

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)

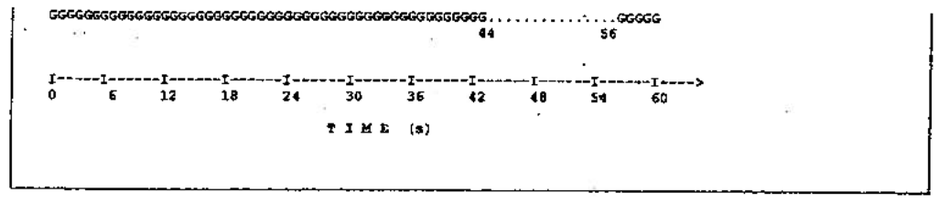


Table S.10 - Movement Capacity and Performance Summary

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Eff. Grn 1st Grn	Eff. Grn 2nd Grn	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Cidra											
2T	T	845	1251	100	0.675*	40*		4.8	0.32	10.7	15.47
2R	R (Slp)	71	1462	100	0.049	40	14	9.3	0.66	0.3	1.19
South: Bosque de Cidra San Jose											
3L	L	57	181	100	0.314	6*		39.7	0.74	2.3	2.47
8R	R (Con)	205	1624	100	0.126	60		9.7	0.66	2.8 #	3.17
East: PR_172 Caguas											
1L	L	29	182	100	0.160	6*		38.8	0.71	1.1	1.22
6T	T	853	1480	100	0.576	48		2.0	0.17	5.3	11.31

* Maximum degree of saturation, or critical green periods
\# Largest density (passenger cars per km or mile) for any lane

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Cidra						
2T T	47.5	143.47	0.178	5.97	0.266	118.8
2R R	5.0	14.37	0.022	1.02	0.032	12.5
	52.5	157.84	0.199	7.00	0.299	131.4
South: Bosque de Cidra San Jose						
3L L	4.9	17.00	0.022	0.95	0.029	12.2
8R R	16.3	44.37	0.072	3.65	0.109	40.9

West: PR-172 Cidra													
1 T	0	845	0	845	3.65	1911	1877	0	0	1251	0.675	100	
2 R	0	0	71	71	3.65	1911	1624	1624	0	1462	0.049	100	
South: Bosque de Cidra San Jose													
1 L	57	0	0	57	3.65	1911	1815	0	0	182	0.314	100	
2 R	0	0	205	205	3.65	1911	1624	0	0	1624	0.126	100	
East: PR_172 Caguas													
1 L	29	0	0	29	3.65	1911	1815	0	0	182	0.160	100	
2 T	0	853	0	853	3.65	1911	1850	0	0	1480	0.576	100	

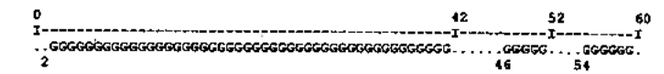
Basic Saturation Flow in this table is adjusted for lane width, approach grade, parking manoeuvres and number of buses stopping. Saturation flow scale applies if specified.

Table S.9 - Signal Timing Diagram

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Displayed (Phase) Green Times

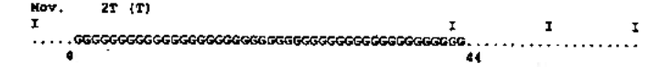
Phase A | Phase B | Phase C



Effective (Movement) Green Times

West: PR-172 Cidra

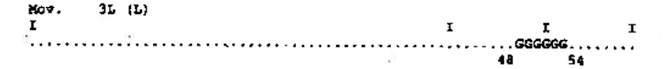
Mov. 2T (T)



Mov. 2R (R)

South: Bosque de Cidra San Jose

Mov. 3L (L)



East: PR_172 Caguas

Mov. 1L (L)

Mov. 6T (T)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Cidra												
1 T		845		845	2	1910	40		0.675	4.8	6	500
2 R			71	71	0	1910	40	14	0.049	9.3	0	500
	0	845	71	916	2				0.675	5.1	6	
South: Bosque de Cidra San Jose												
1 L	57			57	0	1910	6		0.314	39.7	1	500
2 R			205	205	0	1910	60		0.126	9.7		500
	57	0	205	262	0				0.314	16.3	1	
East: PR_172 Caguas												
1 L	29			29	0	1910	6		0.160	38.8	1	70
2 T		853		853	3	1910	48		0.576	2.0	4	500
	29	853	0	882	3				0.576	3.2	4	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	2060	2	60	0.675	5.7	6

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Green Ratio 1st grn	Green Ratio 2nd grn	Time (g/C)	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Cidra											
2T	T	0.667*			845	1251	0.675*	4.8	A	10.7	6
2R	R (Slp)	0.667	0.233		71	1462	0.049	9.3	A	0.3	0
South: Bosque de Cidra San Jose											
3L	L	0.100*			57	181	0.314	39.7	D	2.3	1
8R	R (Con)	1.000			205	1624	0.126	9.7	A	2.8	
East: PR_172 Caguas											
1L	L	0.100*			29	182	0.160	38.8	D	1.1	1
6T	T	0.800			853	1480	0.576	2.0	A	5.3	4
ALL VEHICLES:					2060		0.675	5.7	A	10.7	6

	21.2	61.37	0.094	4.61	0.138	53.1
East: PR_172 Caguas						
1L L	2.5	8.56	0.011	0.49	0.015	6.2
6T T	44.2	133.89	0.149	3.84	0.225	110.7
	46.7	142.45	0.161	4.33	0.240	116.9
INTERSECTION:	120.4	361.66	0.454	15.93	0.677	301.3

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Cidra						
2T T	9.0	0.27	0.336	11.30	0.504	224.9
2R R	11.2	0.32	0.480	22.84	0.723	280.0
	9.2	0.28	0.348	12.21	0.521	229.2
South: Bosque de Cidra San Jose						
3L L	13.7	0.48	0.629	26.79	0.817	342.5
8R R	12.2	0.33	0.534	27.22	0.816	304.3
	12.5	0.36	0.554	27.13	0.816	312.3
East: PR_172 Caguas						
1L L	13.7	0.47	0.629	26.91	0.819	341.8
6T T	8.3	0.25	0.280	7.20	0.422	207.5
	8.5	0.26	0.292	7.85	0.435	211.9
INTERSECTION:	9.3	0.28	0.351	12.31	0.523	232.7

Table S.14 - Summary of Input and Output Data

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream Dist. (m)	Distance User Spec?
West: PR-172 Cidra								
	South	Right	20.0	26.2	31.4	500	131	No
	East	Thru	S	65.0	22.1	500	127	No
South: Bosque de Cidra San Jose								
	West	Left	14.9	23.4	23.3	500	125	No
	East	Right	20.0	26.2	31.4	500	155	No
East: PR_172 Caguas								
	West	Thru	S	65.0	22.1	500	129	No
	South	Left	13.4	22.6	21.1	500	124	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Cidra										
1 T	0.675	2.6	1.4	4.0	2.6	1.4	0.0	1.4	0.7	4.8
2 R	0.049	0.2	0.0	0.2	0.5	0.0	0.0	0.0	9.1	9.3
South: Bosque de Cidra San Jose										
1 L	0.314	29.9	0.5	30.4	4.3	26.1	0.0	26.1	9.4	39.7
2 R	0.126			0.0					9.7	9.7
East: PR_172 Caguas										
1 L	0.160	29.1	0.2	29.3	4.1	25.2	0.0	25.2	9.4	38.8
2 T	0.576	0.7	0.5	1.2	1.1	0.2	0.0	0.2	0.7	2.0

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1

INTERSECTION (persons):	2472	5.7	10.7	6

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.
Continuous movements: Level Of Service based on density, Density (passenger cars per km or mile) instead of queue.
* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table S.16 - SCATS MF Parameter

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Stopline Flow (veh/h)	Capacity [veh/h]	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Cidra						
1 T	845	1251	1911	1820	0.675	100
2 R	71	1462	1624	NA	0.049	100
South: Bosque de Cidra San Jose						
1 L	57	182	1815	1089	0.314	100
2 R	205	1624	1624	NA	0.126	100
East: PR_172 Caguas						
1 L	29	182	1815	1361	0.160	100
2 T	853	1480	1911	1834	0.576	100

NA Not Applicable - SCATS MF was not calculated for this lane due to one of the following reasons:
- the lane is not controlled by signals (slip or continuous lane)
- two movements share this lane and do not run in the same phases

STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line. This cannot exceed capacity.

SCATS SATURATION FLOW: This allows for lane width, approach grade and turning vehicles. Saturation flow scale applies if specified. The effects of heavy vehicles, parking manoeuvres, number of buses stopping and conflicting pedestrian volume are not included.

SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS control system. It is calculated from the SCATS SATURATION FLOW parameter.

DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow Rate, therefore x > 1 is possible.

Table D.0 - Geometric Delay Data

Estudio Operacional de Transito Bosques de Cidra 2019 AM

Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Cidra							
1 T	0.675	0.27	0.00	0.05	0.32	0.296	0.00
2 R	0.049	0.08	0.00	0.58	0.66	0.106	0.00
South: Bosque de Cidra San Jose							
1 L	0.314	0.70	0.00	0.04	0.74	0.942	0.00
2 R	0.126			0.66	0.66		
East: PR_172 Caguas							
1 L	0.160	0.66	0.00	0.05	0.71	0.924	0.00
2 T	0.576	0.11	0.00	0.07	0.17	0.118	0.00

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Cidra											
1 T	0.675	1.3	4.2	1.3	5.5	6.5	8.5	9.4	10.7	12.9	0.01
2 R	0.049	0.0	0.1	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.00
South: Bosque de Cidra San Jose											
1 L	0.314	0.1	1.0	0.1	1.1	1.3	1.8	2.0	2.3	2.9	0.00
East: PR_172 Caguas											
1 L	0.160	0.0	0.5	0.0	0.5	0.7	0.9	1.0	1.1	1.5	0.01
2 T	0.576	0.9	1.7	0.9	2.6	3.1	4.1	4.6	5.3	6.6	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane	Deg.	Ovrfl.	Average (metres)	Percentile (metres)	Queue

Lane No.	Satn x	Queue No	Nb1	Nb2	Nb	70%	85%	90%	95%	98%	Stor. Ratio
West: PR-172 Cidra											
1 T	0.675	0.8	2.5	0.8	3.3	3.9	5.1	5.6	6.4	7.7	0.01
2 R	0.049	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.00
South: Bosque de Cidra San Jose											
1 L	0.314	0.0	0.5	0.0	0.6	0.7	0.9	1.0	1.2	1.5	0.00
East: PR_172 Caguas											
1 L	0.160	0.0	0.3	0.0	0.3	0.3	0.4	0.5	0.6	0.7	0.01
2 T	0.576	0.6	1.1	0.6	1.8	2.1	2.8	3.1	3.6	4.5	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	App. Speeds Cruise	Negn	Exit Speeds Negn	Cruise	Queue Move-up 1st Grn	2nd Grn	Av. Section Spd Running	Overall	Geom Delay (sec)
West: PR-172 Cidra									
2T T	72.0	65.0	65.0	65.0			63.9	61.5	0.7
2R R	72.0	26.2	26.2	65.0			54.3	54.3	9.1
South: Bosque de Cidra San Jose									
3L L	72.0	23.4	23.4	65.0			49.5	31.4	9.4
8R R	72.0	26.2	26.2	65.0			55.5	55.5	9.7
East: PR_172 Caguas									
1L L	72.0	22.6	22.6	65.0			49.6	31.8	9.4
6T T	72.0	65.0	65.0	65.0			66.9	66.6	0.7

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Gap Settings es	eh	Disp. Grn. Settings 1st Grn Gmin	Gmax	2nd Grn Gmin	Gmax
West: PR-172 Cidra											
2T T	VA	Yes	4	0.384	0.459	2.5	2.7	6	50		

2R	R	VA	No	3	1.000	1.000	2.5	2.7	6	50	6 50
South: Bosque de Cidra San Jose											
3L	L	VA	No	3	1.000	1.000	2.0	2.2	6	20	
8R	R	VA	No	3	1.000	1.000	2.5	2.7	6	50	
East: PR_172 Caguas											
1L	L	VA	No	3	1.000	1.000	2.0	2.2	6	20	
6T	T	VA	Yes	4	0.288	0.298	2.5	2.7	6	50	

Table D.6 - Gap Acceptance Parameters

```
Estudio Operacional de Transito Bosques de Cidra 2019 AM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time =  60 (User-given Cycle Time)

  No opposed movements at this intersection
```

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com
C:\acad386\work\06152 - Estudio de Transito Finca Campo Alegre, Cidra\SidraREV\2019int2AM.sap
Processed Dec 06, 2006 01:49:11PM

SIDRA INTERSECTION

Intersection Summary

Estudio Operacional de Transito Bosques de Cidra 2019 AM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra AM

Performance Measure	Vehicles	Persons
Demand Flows - Total	2060 veh/h	2472 pers/h
Percent Heavy Vehicles	2.1 %	
Degree of Saturation	0.675	
Effective Intersection Capacity	3051 veh/h	
95% Back of Queue (m)	6 m	
95% Back of Queue (veh)	10.7 veh	
Control Delay (Total)	3.26 veh-h/h	3.91 pers-h/h
Control Delay (Average)	5.7 s/veh	5.7 s/pers
Level of Service	LOS A	
Level of Service (Worst Movement)	LOS D	
Total Effective Stops	667 veh/h	801 pers/h
Effective Stop Rate	0.32 per veh	0.32 per pers
Proportion Queued	0.21	0.21
Travel Distance (Total)	1294.7 veh-km/h	1553.6 pers-km/h
Travel Distance (Average)	628 m	628 m
Travel Time (Total)	21.5 veh-h/h	25.9 pers-h/h
Travel Time (Average)	37.7 secs	37.7 secs
Travel Speed	60.1 km/h	60.1 km/h
Operating Cost (Total)	362 $/h	362 $/h
Fuel Consumption (Total)	120.4 L/h	
Carbon Dioxide (Total)	301.3 kg/h	
Hydrocarbons (Total)	0.454 kg/h	
Carbon Monoxide (Total)	15.93 kg/h	
NOX (Total)	0.677 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:49:11PM

SIDRA INTERSECTION

Intersection Summary

Estudio Operacional de Transito Bosques de Cidra 2019 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

Performance Measure	Vehicles	Persons
Demand Flows - Total	2056 veh/h	2467 pers/h
Percent Heavy Vehicles	1.1 %	
Degree of Saturation	0.713	
Effective Intersection Capacity	2884 veh/h	
95% Back of Queue (m)	10 m	
95% Back of Queue (veh)	16.8 veh	
Control Delay (Total)	6.25 veh-h/h	7.50 pers-h/h
Control Delay (Average)	10.9 s/veh	10.9 s/pers
Level of Service	LOS B	
Level of Service (Worst Movement)	LOS D	
Total Effective Stops	950 veh/h	1140 pers/h
Effective Stop Rate	0.46 per veh	0.46 per pers
Proportion Queued	0.40	0.40
Travel Distance (Total)	1289.6 veh-km/h	1547.5 pers-km/h
Travel Distance (Average)	627 m	627 m
Travel Time (Total)	24.5 veh-h/h	29.4 pers-h/h
Travel Time (Average)	42.9 secs	42.9 secs
Travel Speed	52.7 km/h	52.7 km/h
Operating Cost (Total)	403 $/h	403 $/h
Fuel Consumption (Total)	131.3 L/h	
Carbon Dioxide (Total)	328.3 kg/h	
Hydrocarbons (Total)	0.531 kg/h	
Carbon Monoxide (Total)	20.78 kg/h	
NOX (Total)	0.773 kg/h	

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:44:33PM

SIDRA INTERSECTION

Movement Summary

Estudio Operacional de Transito Bosques de Cidra 2019 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

Signalised - Actuated coordinated **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Bosque de Cidra San Jose										
3L	L	83	0.0	0.392	39.1	LOS D	2	0.94	0.76	31.7
8R	R	117	0.0	0.072	9.7	LOS A	2	0.00	0.66	55.5
Approach		**200**	**0.0**	**0.392**	**21.9**	**LOS C**	**2**	**0.39**	**0.70**	**42.6**
PR_172 Caguas										
1L	L	196	0.0	0.432	31.6	LOS C	3	0.86	0.80	35.4
6T	T	869	1.6	0.590	2.1	LOS A	3	0.12	0.18	66.3
Approach		**1065**	**1.3**	**0.590**	**7.5**	**LOS A**	**3**	**0.26**	**0.29**	**57.2**
PR-172 Cidra										
2T	T	673	1.2	0.713	13.4	LOS B	10	0.67	0.62	49.8
2R	R	118	0.8	0.081	9.4	LOS A	0	0.11	0.66	54.3
Approach		**791**	**1.1**	**0.713**	**12.8**	**LOS B**	**10**	**0.59**	**0.63**	**50.4**
All Vehicles		**2056**	**1.1**	**0.713**	**10.9**	**LOS B**	**10**	**0.40**	**0.46**	**52.7**

SIDRA SOLUTIONS

AI687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:44:33PM

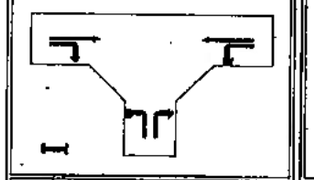
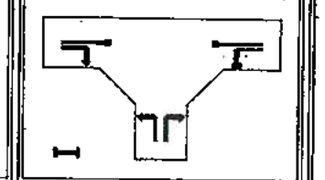
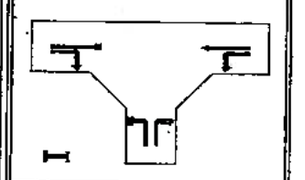
SIDRA INTERSECTION

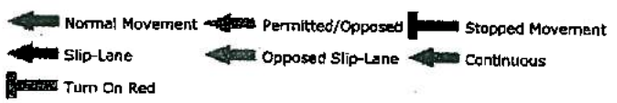
Phasing Summary

Estudio Operacional de Transito Bosques de Cidra 2019 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

C = 60 seconds
Cycle Time Option: **User-specified cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase C
		
Green Time = **30** seconds Phase Time = **34** seconds Phase Split = **57 %**	Green Time = **7** seconds Phase Time = **9** seconds Phase Split = **15 %**	Green Time = **15** seconds Phase Time = **17** seconds Phase Split = **28 %**



SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 01:44:33PM

	East	8R	Right	117	0	1.00	0.96
East: PR_172 Caguas							
	West	6T	Thru	855	14	1.00	0.96
	South	1L	Left	196	0	1.00	0.96

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program						
West: PR-172 Cidra						
2T T	0	0	665	8	0	0
2R R	0	0	0	0	117	1
South: Bosque de Cidra San Jose						
3L L	83	0	0	0	0	0
8R R	0	0	0	0	117	0
East: PR_172 Caguas						
1L L	196	0	0	0	0	0
6T T	0	0	855	14	0	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program						
West: PR-172 Cidra						
2T T	0	0.0	673	1.2	0	0.0
2R R	0	0.0	0	0.0	118	0.8
South: Bosque de Cidra San Jose						

SIDRA INTERSECTION

Output Tables

Estudio Operacional de Transito Bosques de Cidra 2019 PM

Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM

Run Information

Cycle Time = 60 (User-given Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Actuated Coordinated
  For fully-actuated signal timings, the following specifications will be ignored:
    Any maximum cycle time specification
  For actuated signal timings, cycle increment is set to 1 second
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
                    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations = 2
  Comparison of last two iterations:
    Difference in intersection degree of satn = 0.0 %
    Largest difference in eff. green times = 0 secs
    (max. value for stopping = 0 secs)

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Cidra							
	South	2R	Right	117	1	1.00	0.96
	East	2T	Thru	665	8	1.00	0.96
South: Bosque de Cidra San Jose							
	West	3L	Left	83	0	1.00	0.96

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Cidra											
2T T	673	1.2	1888		0.356		944	0.90	26	100	0.713*
2R R	118	0.8	1614	1614	0.024	0.049	1453	0.90	1008	100	0.081
South: Bosque de Cidra San Jose											
3L L	83	0.0	1815		0.046		212	0.90	130	100	0.392
8R R	117	0.0	1624		0.072		1624	0.90	1149	100	0.072
East: PR_172 Caguas											
1L L	196	0.0	1815		0.108		454	0.90	108	100	0.432
6T T	869	1.6	1880		0.462		1473	0.90	53	100	0.590

Table S.3 - Intersection Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
2T	W_T		A	B	2	0.356	0.458	29.5
3L	S_L		B	C	4	0.046	0.114	10.9
1L	E_L		C	A	2	0.108	0.229	15.8
				Total:	8	0.510	0.801	56.1

Cycle Time:

Minimum	Maximum	Practical	Chosen
26	NA	41	60

(Cycle time specified by the user).

NA Cmax does not apply at actuated signals

Intersection Level of Service	=	B
Worst Movement Level of Service	=	D
Average intersection delay (s)	=	10.9
Largest average movement delay (s)	=	39.1
Largest back of queue, 95% (m)	=	10
Performance Index	=	46.35
Degree of saturation (highest)	=	0.713
Practical Spare Capacity (lowest)	=	26 %
Effective intersection capacity, (veh/h)	=	2884
Total vehicle flow (veh/h)	=	2056
Total person flow (pers/h)	=	2467
Total vehicle delay (veh-h/h)	=	6.25
Total person delay (pers-h/h)	=	7.50
Total effective vehicle stops (veh/h)	=	950
Total effective person stops (pers/h)	=	1140
Total vehicle travel (veh-km/h)	=	1289.6
Total cost ($/h)	=	402.95
Total fuel (L/h)	=	131.3
Total CO2 (kg/h)	=	328.30

3L L	83	0.0	0	0.0	0	0.0
8R R	0	0.0	0	0.0	117	0.0
East: PR_172 Caguas						
1L L	196	0.0	0	0.0	0	0.0
6T T	0	0.0	869	1.6	0	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.1 - Movement Phase and Timing Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	First Green To	First Green Op	First Green Pr	PHASE MATRIX Second Green Fr	Second Green To	Second Green Op	Second Green Pr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Cidra															
2T T		*A	B							2		29.5		30	
2R R	(Slp)	A	B			B	A			2	4	8.0Min	18.0Min	30	24
South: Bosque de Cidra San Jose															
3L L		*B	C							4		10.9		7	
East: PR_172 Caguas															
1L L		*C	A							2		15.8		15	
6T T		C	B							2		38.3		47	

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

* Critical Movement/Green Period

Movement Types:
Slp Slip Lane Movement
Ped Pedestrian
Dum Dummy

Under heading 'Op':
Y If opposed turn

Table S.2 - Movement Capacity Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	and Turn	Period	Fr	To	Lost Time	Flow Ratio	Grn Time Ratio	Movement Time
7L	N_L		A	B	9	-	-	9.0Min
5L	W_L		B	D	3	0.394	0.437	29.2
6R	E_R	2nd	D	A	3	0.285	0.317	22.0
			Total:		15	0.679	0.754	60.2

- Flow ratio not used for cycle time calculations and the adjusted lost time equals the required movement time (=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
34	150	61	60

(Cycle time specified by the user)

Intersection Level of Service	=	C
Worst movement Level of Service	=	D
Average intersection delay (s)	=	28.5
Largest average movement delay (s)	=	46.6
Largest back of queue, 95% (m)	=	15
Performance Index	=	82.18
Degree of saturation (highest)	=	0.908
Practical Spare Capacity (lowest)	=	-1
Effective intersection capacity, (veh/h)	=	2277
Total vehicle flow (veh/h)	=	2068
Total pedestrian flow (ped/h)	=	1
Total person flow (pers/h)	=	2483
Total vehicle delay (veh-h/h)	=	16.40
Total pedestrian delay (ped-h/h)	=	0.00
Total person delay (pers-h/h)	=	19.68
Total effective vehicle stops (veh/h)	=	1674
Total effective pedestrian stops (ped/h)	=	1
Total effective person stops (pers/h)	=	2010
Total vehicle travel (veh-km/h)	=	1287.0
Total cost ($/h)	=	595.98
Total fuel (L/h)	=	178.6
Total CO2 (kg/h)	=	447.06

Table S.4 - Phase Information

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	3	3	6	9	3	9	15%
B	9	3	12	26	38	3	29	48%
D	38	3	41	19	60	3	22	37%

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

Table S.5 - Movement Performance

Mov ID		Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra										
5L	L	8.05	9.67	40.2	1.00	0.98	26.2	15	35.97	28.2
2T	T	0.16	0.19	1.8	0.26	0.20	3.8	2	5.32	60.9
East: NR-787 Desde Guavate										
6T	T	5.36	6.44	38.4	1.00	0.97	20.0	12	24.94	29.1
6R	R	0.34	0.40	46.6	1.00	0.97	20.0	12	1.35	26.1
North: PR-172 Desde Caguas										
7L	L	0.35	0.42	29.9	0.89	0.81	4.1	3	1.61	32.3
4R	R	2.13	2.56	17.1	0.59	0.79	6.0	5	12.99	40.0
Pedestrian Movements										
P5		0.00	0.00	16.9	0.75	0.75	0.0	0	0.02	2.7

Table S.6 - Intersection Performance

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
1049	0.908	8.22	9.86	28.2	0.77	0.74	15	41.28	34.0
East: NR-787 Desde Guavate									
529	0.903	5.70	6.84	38.8	1.00	0.97	12	26.29	28.9
North: PR-172 Desde Caguas									
490	0.379	2.48	2.98	18.2	0.61	0.79	5	14.59	39.2
Pedestrians:									
1	0.000	0.00	0.00	16.9	0.75	0.75	0	0.02	2.7
ALL VEHICLES:									
2068	0.908	16.40	19.68	28.5	0.79	0.81	15	82.17	33.5
INTERSECTION (persons):									
2483	0.908		19.68	28.5	0.79	0.81		82.18	33.5

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

```
  P5    (Ped) D     A                                  7        16.0Min          15
-----------------------------------------------------------------------------------
  Current Phase Sequence: Sequence 1
  Input phase sequence: A B D
  Output phase sequence: A B D
-----------------------------------------------------------------------------------
  *  Critical Movement/Green Period

Movement Types:                          Under heading 'Op':
  Slp  Slip Lane Movement                  Y   If opposed turn
  Ped  Pedestrian
  Dum  Dummy
```

Table S.2 - Movement Capacity Parameters

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-----------------------------------------------------------------------------------
 Mov       Dem          Satn Flow   Flow Ratio  Total Prac. Prac. Lane   Deg.
 ID        Flow         ----------  ---------   Cap. Deg.  Spare Util   Satn
           (veh    HV    1st   2nd   1st   2nd  (veh  Satn  Cap.
            /h)    (%)   Grn   Grn   Grn   Grn   /h)   xp    (%)   (%)     x
-----------------------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
  5L L     721    1.1  1832         0.394         794  0.90    -1   100  0.908*
  2T T     328    2.1  1907         0.172        1526  0.90   319   100  0.215
-----------------------------------------------------------------------------------
East: NR-787 Desde Guavate
  6T T     503    1.8  1765         0.285         559  0.90     0   100  0.900
  6R R      26    0.0    35    67   0.197 0.285    29  0.90     0   100  0.903
-----------------------------------------------------------------------------------
North: PR-172 Desde Caguas
  7L L      42    0.0  1109         0.038         111  0.90   138   100  0.379
  4R R     448    7.1  1834  1693   0.244 0.000  1183  0.90   138   100  0.379
-----------------------------------------------------------------------------------
Pedestrian Movements
  P5         1         12000         0.000        3000  0.90           0  0.000
-----------------------------------------------------------------------------------

  Opposed turn in movement   6R has high x.
  Its capacity is mainly due to end departures. Consider increasing
  the number of end departures, and/or specifying this as an undetected
  movement, since it may be affecting the timing results adversely.
```

Table S.3 - Intersection Parameters

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-----------------------------------------------------------------------------
   Crit App.  Green   Phases   Adjusted    Adjusted   Required   Required
```



```
-----------------------------------------------------------------------------
East: NR-787 Desde Guavate
   6T T        0   0.0     503   1.8       0   0.0
   6R R        0   0.0       0   0.0      26   0.0
-----------------------------------------------------------------------------
North: PR-172 Desde Caguas
   7L L       42   0.0       0   0.0       0   0.0
   4R R        0   0.0       0   0.0     448   7.1
-----------------------------------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.3 - Pedestrian Flow Rates

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-----------------------------------------------
 Mov        Flow Rate   Flow   Peak Flow
 ID   Stage  (ped/h)    Scale   Factor
-----------------------------------------------
Across North Approach
  P5            1        1.00    0.95
-----------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table S.1 - Movement Phase and Timing Parameters

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-----------------------------------------------------------------------------------
 Mov     Mov          P H A S E   M A T R I X          Lost Tim  Req.Mov.Time     Eff. Grn
 ID      Typ     First Green          Second Green     --------  ------------     --------
               ------------------  ------------------  1st  2nd  1st      2nd     1st  2nd
               Fr    To   Op Pr    Fr    To   Op Pr   Grn  Grn  Grn      Grn     Grn  Grn
-----------------------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
  5L L        *B    D                                  3        29.2              26
  2T T         B    A                                  3        25.0Min           48
-----------------------------------------------------------------------------------
East: NR-787 Desde Guavate
  6T T         D    A                                  3        22.0              19
  6R R         A    D      Y     *D    A              25    3   38.2     22.0     13   19
-----------------------------------------------------------------------------------
North: PR-172 Desde Caguas
  7L L        *A    B                                  3         9.0Min            6
  4R R         A    D            D     A      Y        3   18   19.3     16.0Min  35    4
-----------------------------------------------------------------------------------
Pedestrian Movements
```

East: NR-787 Desde Guavate							
	West	6T	Thru	494	9	1.00	0.95
	North	6R	Right	26	0	1.00	0.95
North: PR-172 Desde Caguas							
	West	4R	Right	416	32	1.00	0.95
	East	7L	Left	42	0	1.00	0.95

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	713	8	0	0	0	0
2T T	0	0	321	7	0	0
East: NR-787 Desde Guavate						
6T T	0	0	494	9	0	0
6R R	0	0	0	0	26	0
North: PR-172 Desde Caguas						
7L L	42	0	0	0	0	0
4R R	0	0	0	0	416	32

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	721	1.1	0	0.0	0	0.0
2T T	0	0.0	328	2.1	0	0.0

SIDRA INTERSECTION

Output Tables

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM

Run Information

Cycle Time = 60 (User-given Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Pretimed
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
  Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile .

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations = 2
  Comparison of last two iterations:
  Difference in intersection degree of satn = 0.0 %
  Largest difference in eff. green times = 0 secs
  (max. value for stopping = 0 secs)

* Opposed turn in movement 6R has high x.
  Its capacity is mainly due to end departures. Consider increasing the number of end departures, and/or specifying this as an undetected movement, since it may be affecting the timing results adversely.

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Pueblo Cidra							
	East	2T	Thru	321	7	1.00	0.95
	North	5L	Left	713	8	1.00	0.95

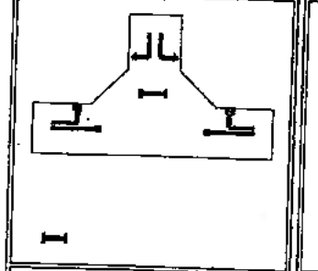
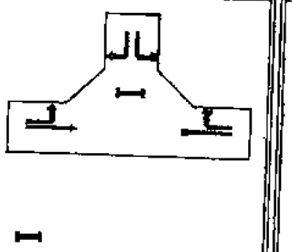
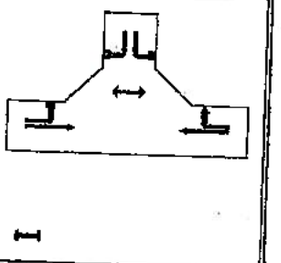
SIDRA INTERSECTION

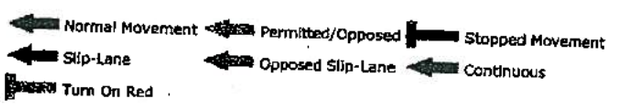
Phasing Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM

C = 60 seconds
Cycle Time Option: **User-specified cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase D
		
Green Time = 6 seconds Phase Time = 9 seconds Phase Split = 15 %	Green Time = 26 seconds Phase Time = 29 seconds Phase Split = 48 %	Green Time = 19 seconds Phase Time = 22 seconds Phase Split = 37 %



SIDRA SOLUTIONS

A1687, CNA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:37:15PM

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:37:15PM

SIDRA INTERSECTION

Movement Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM

Signalised - Pretimed **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
NR-787 Desde Guavate										
6T	T	503	1.8	0.900	38.4	LOS D	12	1.00	0.97	29.1
6R	R	26	0.0	0.903	46.6	LOS D	12	1.00	0.97	26.1
Approach		**529**	**1.7**	**0.900**	**38.8**	**LOS D**	**12**	**1.00**	**0.97**	**28.9**
PR-172 Desde Caguas										
7L	L	42	0.0	0.379	29.9	LOS C	3	0.89	0.81	32.3
4R	R	447	7.1	0.379	17.1	LOS B	5	0.59	0.79	40.0
Approach		**490**	**6.5**	**0.379**	**18.2**	**LOS B**	**5**	**0.61**	**0.79**	**39.2**
PR-172 Desde Pueblo Cidra										
5L	L	721	1.1	0.908	40.2	LOS D	15	1.00	0.98	28.2
2T	T	328	2.1	0.215	1.8	LOS A	2	0.26	0.20	60.9
Approach		**1049**	**1.4**	**0.908**	**28.2**	**LOS C**	**15**	**0.77**	**0.74**	**34.0**
All Vehicles		**2068**	**2.7**	**0.908**	**28.5**	**LOS C**	**15**	**0.79**	**0.81**	**33.5**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	1	16.9	LOS B	0	0.75	0.75
All Peds	**1**	**16.9**	**LOS B**	**0**	**0.75**	**0.75**

SIDRA SOLUTIONS

SIDRA INTERSECTION

Intersection Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows - Total	2068 veh/h	1 ped/h	2483 pers/h
Percent Heavy Vehicles	2.7 %		
Degree of Saturation	0.908	0.000	
Effective Intersection Capacity	2277 veh/h		
95% Back of Queue (m)	15 m	0 m	
95% Back of Queue (veh)	26.2 veh	0.0 ped	
Control Delay (Total)	16.40 veh-h/h	0.00 ped-h/h	19.68 pers-h/h
Control Delay (Average)	28.5 s/veh	16.9 s/ped	28.5 s/pers
Level of Service	LOS C	LOS B	
Level of Service (Worst Movement)	LOS D	LOS B	
Total Effective Stops	1674 veh/h	1 ped/h	2010 pers/h
Effective Stop Rate	0.81 per veh	0.75 per ped	0.81 per pers
Proportion Queued	0.79	0.75	0.79
Travel Distance (Total)	1287.0 veh-km/h	0.0 ped-km/h	1544.4 pers-km/h
Travel Distance (Average)	622 m	31 m	622 m
Travel Time (Total)	38.4 veh-h/h	0.0 ped-h/h	46.1 pers-h/h
Travel Time (Average)	66.9 secs	40.6 secs	66.8 secs
Travel Speed	33.5 km/h	2.7 km/h	33.5 km/h
Operating Cost (Total)	596 $/h	0 $/h	596 $/h
Fuel Consumption (Total)	178.6 L/h		
Carbon Dioxide (Total)	447.1 kg/h		
Hydrocarbons (Total)	0.776 kg/h		
Carbon Monoxide (Total)	37.29 kg/h		
NOX (Total)	1.142 kg/h		

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:37:15PM

3L	L	VA	No	3	1.000	1.000	2.0	2.2	6	20
8R	R	VA	No	3	1.000	1.000	2.5	2.7	6	50
East: PR_172 Caguas										
1L	L	VA	No	3	1.000	1.000	2.0	2.2	6	20
6T	T	VA	Yes	4	0.265	0.282	2.5	2.7	6	50

Table D.6 - Gap Acceptance Parameters

```
Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time =  60 (User-given Cycle Time)

  No opposed movements at this intersection
```

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com
C:\acad386\work\06152 - Estudio de Transito Finca Campo Alegre, Cidra\SidraREV\2019int2PM.sap
Processed Dec 06, 2006 01:44:33PM

Lane No.	Deg. Satn x	Effective Stop Rate hel	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Cidra							
1 T	0.713	0.60	0.00	0.03	0.62	0.670	0.00
2 R	0.081	0.09	0.00	0.58	0.66	0.110	0.00
South: Bosque de Cidra San Jose							
1 L	0.392	0.72	0.00	0.04	0.76	0.941	0.00
2 R	0.072			0.66	0.66		
East: PR_172 Caguas							
1 L	0.432	0.71	0.00	0.09	0.80	0.864	0.00
2 T	0.590	0.11	0.00	0.07	0.18	0.121	0.00

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Cidra											
1 T	0.713	1.3	7.8	1.3	9.0	10.6	13.7	14.9	16.8	19.9	0.02
2 R	0.081	0.1	0.2	0.1	0.2	0.3	0.3	0.4	0.4	0.6	0.00
South: Bosque de Cidra San Jose											
1 L	0.392	0.1	1.5	0.1	1.6	1.9	2.6	2.9	3.3	4.2	0.00
East: PR_172 Caguas											
1 L	0.432	0.3	3.1	0.3	3.3	4.0	5.2	5.8	6.6	8.2	0.05
2 T	0.590	1.0	1.8	1.0	2.7	3.3	4.3	4.8	5.5	6.9	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio

Lane No.	Deg. Satn x	Effective Stop Rate hel	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Cidra							
1 T	0.713	0.7	4.4	0.7	5.1	6.0	7.8	8.4	9.5	11.2	0.02
2 R	0.081	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.00
South: Bosque de Cidra San Jose											
1 L	0.392	0.1	0.7	0.1	0.8	1.0	1.3	1.4	1.7	2.1	0.00
East: PR_172 Caguas											
1 L	0.432	0.1	1.5	0.1	1.7	2.0	2.6	2.9	3.3	4.1	0.05
2 T	0.590	0.6	1.0	0.6	1.6	1.9	2.5	2.8	3.3	4.0	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	App. Speeds Cruise	Negn	Exit Speeds Negn	Cruise	Queue Move-up 1st Grn	2nd Grn	Av. Section Spd Running	Overall	Geom Delay (sec)
West: PR-172 Cidra									
2T T	72.0	65.0	65.0	65.0			58.4	49.8	0.7
2R R	72.0	26.2	26.2	65.0			54.3	54.3	9.2
South: Bosque de Cidra San Jose									
3L L	72.0	23.4	23.4	65.0			49.5	31.7	9.4
8R R	72.0	26.2	26.2	65.0			55.5	55.5	9.7
East: PR_172 Caguas									
1L L	72.0	22.6	22.6	65.0			49.9	35.4	9.4
6T T	72.0	65.0	65.0	65.0			66.9	66.3	0.7

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Gap Settings as	eh	Disp. Grn. Settings 1st Grn Gmin	Gmax	2nd Grn Gmin	Gmax
West: PR-172 Cidra											
2T T	VA	Yes	4	0.767	0.818	2.5	2.7	6	50		
2R R	VA	No	3	1.000	1.000	2.5	2.7	6	50	6	50
South: Bosque de Cidra San Jose											

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream Dist. (m)	Distance User Spec?
West: PR-172 Cidra								
	South	Right	20.0	26.2	31.4	500	132	No
	East	Thru	S	65.0	22.1	500	127	No
South: Bosque de Cidra San Jose								
	West	Left	14.9	23.4	23.3	500	125	No
	East	Right	20.0	26.2	31.4	500	155	No
East: PR_172 Caguas								
	West	Thru	S	65.0	22.1	500	127	No
	South	Left	13.4	22.6	21.1	500	124	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Delay (seconds/veh) Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Cidra										
1 T	0.713	10.2	2.5	12.6	6.0	6.6	0.0	6.6	0.7	13.4
2 R	0.081	0.2	0.0	0.2	0.6	0.0	0.0	0.0	9.2	9.4
South: Bosque de Cidra San Jose										
1 L	0.392	29.2	0.5	29.7	4.3	25.4	0.0	25.4	9.4	39.1
2 R	0.072			0.0					9.7	9.7
East: PR_172 Caguas										
1 L	0.432	21.9	0.3	22.2	3.8	18.4	0.0	18.4	9.4	31.6
2 T	0.590	0.8	0.6	1.4	1.1	0.3	0.0	0.3	0.7	2.1

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

average control delay including geometric delay (HCM criteria), independent of the current delay definition used.
For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.
Continuous movements: Level Of Service based on density, Density (passenger cars per km or mile) instead of queue.
* Maximum v/c ratio, or critical green periods
@ Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table S.16 - SCATS MF Parameter

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Stopline Flow (veh/h)	Capacity (veh/h)	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Cidra						
1 T	673	944	1911	1791	0.713	100
2 R	118	1453	1624	NA	0.081	100
South: Bosque de Cidra San Jose						
1 L	83	212	1815	1155	0.392	100
2 R	117	1624	1624	NA	0.072	100
East: PR_172 Caguas						
1 L	196	454	1815	1601	0.432	100
2 T	869	1473	1911	1833	0.590	100

NA Not Applicable - SCATS MF was not calculated for this lane due to one of the following reasons:
- the lane is not controlled by signals (slip or continuous lane)
- two movements share this lane and do not run in the same phases

STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line. This cannot exceed capacity.

SCATS SATURATION FLOW: This allows for lane width, approach grade and turning vehicles. Saturation flow scale applies if specified. The effects of heavy vehicles, parking manoeuvres, number of buses stopping and conflicting pedestrian volume are not included.

SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS control system. It is calculated from the SCATS SATURATION FLOW parameter.

DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow Rate, therefore x > 1 is possible.

Table D.0 - Geometric Delay Data

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Cidra												
1 T		673		673	1	1910	30		0.713	13.4	10	500
2 R			118	118	1	1910	30	24	0.081	9.4	0	500
	0	673	118	791	1				0.713	12.8	10	
South: Bosque de Cidra San Jose												
1 L	83			83	0	1910	7		0.392	39.1	2	500
2 R			117	117	0	1910	60		0.072	9.7		500
	83	0	117	200	0				0.392	21.9	2	
East: PR_172 Caguas												
1 L	196			196	0	1910	15		0.432	31.6	3	70
2 T		869		869	2	1910	47		0.590	2.1	3	500
	196	869	0	1065	1				0.590	7.5	3	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	2056	1	60	0.713	10.9	10

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Green Time Ratio (g/C) 1st grn	2nd grn	Total Flow [veh /h]	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Cidra										
2T T		0.500*		673	944	0.713*	13.4	B	16.8	10
2R R	(Slp)	0.500	0.400	118	1453	0.081	9.4	A	0.4	0
South: Bosque de Cidra San Jose										
3L L		0.117*		83	212	0.392	39.1	D	3.3	2
8R R	(Con)	1.000		117	1624	0.072	9.7	A	1.6	
East: PR_172 Caguas										
1L L		0.250*		196	454	0.432	31.6	C	6.6	3
6T T		0.763		869	1473	0.590	2.1	A	5.5	3
ALL VEHICLES:				2056		0.713	10.9	B	16.8	10
INTERSECTION (persons):				2467			10.9		16.8	10

Level of Service calculations are based on

6T T	43.3	134.07	0.152	3.85	0.227	108.4
	59.5	187.60	0.225	7.10	0.326	148.7
INTERSECTION:	131.3	402.95	0.531	20.78	0.773	328.3

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Cidra						
2T T	11.1	0.34	0.466	20.07	0.680	278.2
2R R	11.5	0.33	0.487	23.56	0.746	287.7
	11.2	0.33	0.469	20.59	0.690	279.6
South: Bosque de Cidra San Jose						
3L L	13.7	0.47	0.627	26.77	0.817	341.5
8R R	12.2	0.33	0.534	27.23	0.816	304.4
	12.8	0.39	0.571	27.04	0.816	319.4
East: PR_172 Caguas						
1L L	13.2	0.44	0.602	26.62	0.809	330.4
6T T	8.0	0.25	0.279	7.08	0.418	199.4
	8.9	0.28	0.338	10.67	0.490	223.4
INTERSECTION:	10.2	0.31	0.412	16.11	0.599	254.6

Table S.14 - Summary of Input and Output Data

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1

```
I------I------I------I------I------I------I------I------I------I------I------I---->
0      6     12     18     24     30     36     42     48     54     60

                          T I M E  (s)
```

Table S.10 - Movement Capacity and Performance Summary

```
Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time =  60 (User-given Cycle Time)
```

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Eff. Grn 1st Grn	Eff. Grn 2nd Grn	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Cidra											
2T T		673	944	100	0.713*	30*		13.4	0.62	16.8	19.71
2R R	(Slp)	118	1453	100	0.081	30	24	9.4	0.66	0.4	1.99
South: Bosque de Cidra San Jose											
3L L		83	212	100	0.392	7*		39.1	0.76	3.3	3.59
8R R	(Con)	117	1624	100	0.072	60		9.7	0.66	1.6 #	1.81
East: PR_172 Caguas											
1L L		196	454	100	0.432	15*		31.6	0.80	6.6	7.61
6T T		869	1473	100	0.590	47		2.1	0.18	5.5	11.65

* Maximum degree of saturation, or critical green periods
\# Largest density (passenger cars per km or mile) for any lane

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

```
Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time =  60 (User-given Cycle Time)
```

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Cidra						
2T T	46.8	141.21	0.196	8.45	0.286	117.1
2R R	8.6	24.22	0.036	1.75	0.056	21.4
	55.4	165.43	0.232	10.20	0.342	138.5
South: Bosque de Cidra San Jose						
3L L	7.1	24.59	0.033	1.39	0.042	17.7
8R R	9.3	25.33	0.041	2.09	0.063	23.3
	16.4	49.92	0.073	3.48	0.105	41.0
East: PR_172 Caguas						
1L L	16.2	53.53	0.074	3.25	0.099	40.4

South: Bosque de Cidra San Jose													
1 L	83	0	0	83	3.65	1911	1815	0	0	212	0.392	100	
2 R	0	0	117	117	3.65	1911	1624	0	0	1624	0.072	100	
East: PR_172 Caguas													
1 L	196	0	0	196	3.65	1911	1815	0	0	454	0.432	100	
2 T	0	869	0	869	3.65	1911	1880	0	0	1473	0.590	100	

Basic Saturation Flow in this table is adjusted for lane width, approach grade, parking manoeuvres and number of buses stopping. Saturation flow scale applies if specified.

Table S.9 - Signal Timing Diagram

```
Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time =  60 (User-given Cycle Time)

Displayed (Phase) Green Times

            Phase A                  Phase B          Phase C

0                                   32           43                  60
I-----------------------------------I------------I-------------------I
..GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....GGGGGGG....GGGGGGGGGGGGGGGG.
 2                                  36          45


Effective (Movement) Green Times


 West: PR-172 Cidra

Mov.    2T (T)
I                                   I           I                   I
.....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.............................
    4                               34

Mov.    2R (R)
I                                   I           I                   I
GG...GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG....GGGGGGGGGGGGGGGGGGGGGGGG
 2  4                               34   38


 South: Bosque de Cidra San Jose

Mov.    3L (L)
I                                   I           I                   I
.....................................GGGGGGGG.....................
                                    38          45


 East: PR_172 Caguas

Mov.    1L (L)
I                                   I           I                   I
G.....................................................GGGGGGGGGGGGGGG
 2                                                  47.

Mov.    6T (T)
I                                   I           I                   I
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.............GGGGGGGGGGGGGG
                                    34              47
```

Table S.4 - Phase Information

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	2	2	30	32	4	34	57%
B	32	4	36	7	43	2	9	15%
C	43	2	45	15	60	2	17	28%

Current Phase Sequence: Sequence 1
Input phase sequence: A B C
Output phase sequence: A B C

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest 95% Back (vehs)	Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Cidra									
2T T	2.50	3.00	13.4	0.67	0.62	16.8	10	19.71	49.8
2R R	0.31	0.37	9.4	0.11	0.66	0.4	0	1.99	54.3
South: Bosque de Cidra San Jose									
3L L	0.90	1.08	39.1	0.94	0.76	3.3	2	3.59	31.7
8R R	0.32	0.38	9.7		0.66	1.6#		1.81	55.5
East: PR_172 Caguas									
1L L	1.92	2.07	31.6	0.86	0.80	6.6	3	7.61	35.4
6T T	0.51	0.61	2.1	0.12	0.18	5.5	3	11.65	66.3

Largest density (passenger cars per km or mile) for any lane

Table S.6 - Intersection Performance

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Cidra									
791	0.713	2.81	3.37	12.8	0.59	0.63	10	21.70	50.4

South: Bosque de Cidra San Jose									
200	0.392	1.22	1.46	21.9	0.39	0.70	2	5.40	42.6
East: PR_172 Caguas									
1065	0.590	2.23	2.67	7.5	0.26	0.29	3	19.27	57.2
ALL VEHICLES:									
2056	0.713	6.25	7.50	10.9	0.40	0.46	10	46.36	52.7
INTERSECTION (persons):									
2467	0.713		7.50	10.9	0.40	0.46		46.36	52.7

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Effective Red and Green Times (sec) R1	G1	R2	G2	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue (m)	Lane Length (m)
West: PR-172 Cidra												
1 T	30	30	0	0	673	944	0.713	13.4	0.62	16.8	9.5	500.0
2 R	2	30	4	24	118	1453	0.081	9.4	0.66	0.4	0.2	500.0
South: Bosque de Cidra San Jose												
1 L	53	7	0	0	83	212	0.392	39.1	0.76	3.3	1.7	500.0
2 R	0	60	0	0	117	1624	0.072	9.7	0.66	1.6#		500.0
East: PR_172 Caguas												
1 L	45	15	0	0	196	454	0.432	31.6	0.80	6.6	3.3	70.0T
2 T	13	47	0	0	869	1473	0.590	2.1	0.18	5.5	3.3	500.0

Density (passenger cars per km or mile)
T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Estudio Operacional de Transito Bosques de Cidra 2019 PM
Interseccion PR-172, Comunidad San Jose y Bosques de Cidra PM
Intersection ID: 1
Actuated Coordinated Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Lane Width (m)	Saturation Flow Adj. Basic (tcu)	Aver 1st (veh)	Aver 2nd (veh)	End Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Cidra												
1 T	0	673	0	673	3.65	1911	1868	0	0	944	0.713	100
2 R	0	0	118	118	3.65	1911	1614	1614	0	1453	0.081	100

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream Dist. (m)	Distance User Spec?
West: PR-172 Desde Pueblo Cidra								
	East	Thru	S	65.0	14.4	500	127	No
	North	Left	10.8	20.8	17.0	500	122	No
East: NR-787 Desde Guavate								
	West	Thru	S	65.0	14.4	500	127	No
	North	Right	10.0	20.2	15.7	500	120	No
North: PR-172 Desde Caguas								
	West	Right	10.0	20.2	15.7	500	128	No
	East	Left	7.2	17.8	11.3	500	117	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	Stop-line Delay 2nd d2	Stop-line Delay Total dSL	Acc. Dec. dn	Queuing Total dq	Queuing MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Pueblo Cidra										
1 L	0.908	15.9	16.1	32.0	4.2	27.9	1.5	26.4	8.2	40.2
2 T	0.215	1.4	0.3	1.8	2.3	0.0	0.0	0.0	0.0	1.8
East: NR-787 Desde Guavate										
1 TR	0.900	19.1	19.3	38.4	8.4	30.0	1.7	28.3	0.4	38.8
North: PR-172 Desde Caguas										
1 LR	0.379	18.2	3.3	21.5	3.5	18.0	0.5	17.5	8.4	30.0
2 R	0.379	4.7	1.1	5.8	2.1	3.7	0.3	3.4	8.5	14.3

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3

Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Effective Stop Rate Geom. he1	Effective Stop Rate Overall he2	Effective Stop Rate hig	Effective Stop Rate h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Pueblo Cidra							
1 L	0.908	0.90	0.09	0.00	0.98	1.000	0.35
2 T	0.215	0.20	0.00	0.00	0.20	0.258	0.00
East: NR-787 Desde Guavate							
1 TR	0.900	0.87	0.10	0.00	0.97	1.000	0.80
North: PR-172 Desde Caguas							
1 LR	0.379	0.71	0.03	0.07	0.81	0.894	0.35
2 R	0.379	0.44	0.02	0.32	0.79	0.516	0.17

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Average (veh) Nb2	Average (veh) Nb	Percentile (veh) 70%	Percentile (veh) 85%	Percentile (veh) 90%	Percentile (veh) 95%	Percentile (veh) 98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 L	0.908	4.8	11.2	4.8	16.0	19.3	22.6	24.3	26.2	28.2	0.15
2 T	0.215	0.3	1.3	0.3	1.6	2.1	2.6	3.0	3.8	4.6	0.00
East: NR-787 Desde Guavate											
1 TR	0.900	3.6	8.2	3.6	11.8	14.3	16.9	18.3	20.0	21.8	0.02
North: PR-172 Desde Caguas											
1 LR	0.379	0.2	1.6	0.2	1.8	2.3	2.9	3.3	4.1	4.9	0.01
2 R	0.379	0.5	2.2	0.5	2.7	3.5	4.3	4.9	6.0	7.0	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane	Deg. Satn	Ovrfl. Queue	Average (metres)	Percentile (metres)	Queue Stor.

Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Pueblo Cidra												
1 L	721			721	1	1947	26		0.908	40.2	15	100
2 T		328		328	2	1947	48		0.215	1.8	2	500
	721	328	0	1049	1				0.908	28.2	15	
East: NR-787 Desde Guavate												
1 TR		503	26	529	2	1871	1	19	0.900	38.8	12	500
	0	503	26	529	2				0.900	38.8	12	
North: PR-172 Desde Caguas												
1 LR	42		82	124	5	1890	11	3	0.379	30.0	3	500
2 R		366		366	7	1890	35	4	0.379	14.3	5	500
	42	0	448	490	7				0.379	18.2	5	
Pedestrians												
Across N approach		1				15			0.000	16.9	0.0	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	2068	3	60	0.908	28.5	15

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Green Time Ratio [g/C] 1st grn	2nd grn	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Pueblo Cidra										
5L L		0.433*		721	794	0.908*	40.2	D	26.2	15
2T T		0.800		328	1526	0.215	1.8	A	3.8	2
East: NR-787 Desde Guavate										
6T T		0.317		503	559	0.900	38.4	D	20.0	12
6R R		0.217	0.317*	26	29	0.903	46.6	D	20.0	12
North: PR-172 Desde Caguas										
7L L		0.100*		42	111	0.379	29.9	C	4.1	3
4R R		0.583	0.067	448	1183	0.379	17.1	B	6.0	5
Pedestrian Movements										
P5	(Ped)	0.250		1	3000	0.000	16.9	B	0.0	0

ALL VEHICLES:	2068	0.908	28.5	C	26.2	15
INTERSECTION (persons):	2483		28.5		26.2	15

Level of Service calculations are based on
average control delay including geometric delay (HCM criteria),
independant of the current delay definition used.
For the criteria, refer to the "Level of Service" topic in the
SIDRA Output Guide or the Output section of the on-line help.
Intersection capacity is calculated considering vehicle movements only.
* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane
v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table S.16 - SCATS MF Parameter

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Stopline Flow (veh/h)	Capacity (veh/h)	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Desde Pueblo Cidra						
1 L	721	794	1850	1659	0.908	100
2 T	328	1525	1947	1833	0.215	100
East: NR-787 Desde Guavate						
1 TR	529	588	1855	NA	0.900	100
North: PR-172 Desde Caguas						
1 LR	124	328	1666	NA	0.379	100
2 R	366	966	1607	1480	0.379	100

NA Not Applicable - SCATS MF was not calculated for this lane due to one
of the following reasons:
- the lane is not controlled by signals (slip or continuous lane)
- two movements share this lane and do not run in the same phases

STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line.
This cannot exceed capacity.

SCATS SATURATION FLOW: This allows for lane width, approach grade and
turning vehicles. Saturation flow scale applies if specified.
The effects of heavy vehicles, parking manoeuvres, number of buses
stopping and conflicting pedestrian volume are not included.

SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS
control system. It is calculated from the SCATS SATURATION FLOW parameter.

DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow
Rate, therefore x > 1 is possible.

Table D.0 - Geometric Delay Data

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Eff. Grn 1st Grn	Eff. Grn 2nd Grn	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Pueblo Cidra											
5L	L	721	794	100	0.908*	26*		40.2	0.98	26.2	35.97
2T	T	328	1526	100	0.215	48		1.8	0.20	3.8	5.32
East: NR-787 Desde Guavate											
6T	T	503	559	100	0.900	19		38.4	0.97	20.0	24.94
6R	R	26	29	100	0.903	13	19*	46.6	0.97	20.0	1.35
North: PR-172 Desde Caguas											
7L	L	42	111	100	0.379	6*		29.9	0.81	4.1	1.61
4R	R	448	1183	100	0.379	35	4	17.1	0.79	6.0	12.99
Pedestrian Movements											
P5	(Ped)	1	3000	100	0.000	15		16.9	0.75	0.0	0.02

* Maximum degree of saturation, or critical green periods

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Pueblo Cidra						
5L L	51.1	214.78	0.299	11.80	0.277	127.9
2T T	9.7	44.01	0.066	1.44	0.034	24.2
	60.8	258.79	0.365	13.25	0.311	152.1
East: NR-787 Desde Guavate						
6T T	59.8	180.71	0.210	11.75	0.416	149.6
6R R	2.7	9.31	0.011	0.53	0.017	6.7
	62.5	190.03	0.221	12.28	0.433	156.3
North: PR-172 Desde Caguas						
7L L	3.6	12.16	0.016	0.75	0.021	8.9
4R R	51.8	134.92	0.174	11.01	0.377	129.8
	55.3	147.08	0.190	11.76	0.397	138.7
Pedestrian Movements						
P5		0.09				
		0.09				
ALL VEHICLES:	178.6	595.89	0.776	37.29	1.142	447.1
INTERSECTION:	178.6	595.98	0.776	37.29	1.142	447.1

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Pueblo Cidra						
5L L	11.4	0.48	0.668	26.37	0.619	285.8
2T T	4.7	0.21	0.323	7.04	0.167	117.7
	9.3	0.40	0.559	20.30	0.477	233.0
East: NR-787 Desde Guavate						
6T T	19.0	0.57	0.666	37.36	1.322	475.5
6R R	16.7	0.58	0.583	32.71	1.044	417.9
	18.9	0.57	0.667	37.13	1.309	472.7
North: PR-172 Desde Caguas						
7L L	13.7	0.47	0.628	29.13	0.802	342.8
4R R	18.6	0.49	0.626	39.64	1.357	467.5
	18.2	0.48	0.626	38.74	1.309	456.8
Pedestrian Movements						
P5		2.78				
		2.78				
ALL VEHICLES:	13.9	0.46	0.603	28.97	0.887	347.4
INTERSECTION:	13.9	0.46	0.603	28.97	0.887	347.4

Table S.14 - Summary of Input and Output Data

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM

```
Displayed (Phase) Green Times

 Phase A              Phase B                        Phase D

0        9                                  38                        60
I--------I-----------------------------------I-------------------------I
....GGGGG.....GGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....GGGGGGGGGGGGGGGGGGGGG.
   3         12                                  41

Effective (Movement) Green Times

 West: PR-172 Desde Pueblo Cidra

Mov.    5L (L)
I        I                                  I                         I
................GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.........................
              14                                40

Mov.    2T (T)
I        I                                  I                         I
G...............GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
 2             14

 East: NR-787 Desde Guavate

Mov.    6T (T)
I        I                                  I                         I
G.............................................GGGGGGGGGGGGGGGGGGGG
 2                                                43

Mov.    6R (R)
I        I                                  I                         I
GG..............................GGGGGGGGGGGGGG...GGGGGGGGGGGGGGGGGGGGG
 2                            27            40  43

 North: PR-172 Desde Caguas

Mov.    7L (L)
I        I                                  I                         I
......GGGGGG...............................................................
     5        11

Mov.    4R (R)
I        I                                  I                         I
GG....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....................GGG
 2   5                                        40                  58

 Pedestrian Movements

Mov.    P5
I        I                                  I                         I
.............................................GGGGGGGGGGGGGGGGG...
                                                43                 58

I-----I------I------I------I------I------I------I------I------I------I---->
0     6     12     18     24     30     36     42     48     54     60

                              T I M E  (s)
```

Table S.10 - Movement Capacity and Performance Summary

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Effective Red and Green Times (sec) R1	G1	R2	G2	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	(m)	Lane Length (m)
West: PR-172 Desde Pueblo Cidra												
1 L	34	26	0	0	721	794	0.908	40.2	0.98	26.2	14.7	100.0T
2 T	12	48	0	0	328	1525	0.215	1.8	0.20	3.8	2.3	500.0
East: NR-787 Desde Guavate												
1 TR	25	1	15	19	529	588	0.900	38.8	0.97	20.0	11.9	500.0
North: PR-172 Desde Caguas												
1 LR	4	11	42	3	124	328	0.379	30.0	0.81	4.1	3.1	500.0
2 R	3	35	18	4	366	966	0.379	14.3	0.79	6.0	5.3	500.0

T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Lane Width (m)	Saturation Flow Adj. Basic (tcu)	Aver 1st (veh)	Aver 2nd (veh)	End Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Pueblo Cidra												
1 L	721	0	0	721	3.60	1947	1832	0	0	794	0.908	100
2 T	0	328	0	328	3.60	1947	1907	0	0	1525	0.215	100
East: NR-787 Desde Guavate												
1 TR	0	503	26	529	3.60	1871	605	1825	60	588	0.900	100
North: PR-172 Desde Caguas												
1 LR	42	0	82	124	3.60	1890	1516	1004	59	328	0.379	100
2 R	0	0	366	366	3.60	1890	1530	1095	59	966	0.379	100

Basic Saturation Flow in this table is adjusted for lane width, approach grade, parking manoeuvres and number of buses stopping. Saturation flow scale applies if specified.

Table S.9 - Signal Timing Diagram

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

No.	x	No	Nb1	Nb2	Nb	70%	85%	90%	95%	98%	Ratio
West: PR-172 Desde Pueblo Cidra											
1 L	0.908	2.7	6.3	2.7	9.0	10.8	12.7	13.6	14.7	15.8	0.15
2 T	0.215	0.2	0.8	0.2	1.0	1.3	1.6	1.9	2.3	2.8	0.00
East: NR-787 Desde Guavate											
1 TR	0.908	2.1	4.9	2.1	7.0	8.5	10.0	10.9	11.9	12.9	0.02
North: PR-172 Desde Caguas											
1 LR	0.379	0.2	1.2	0.2	1.4	1.7	2.2	2.5	3.1	3.7	0.01
2 R	0.379	0.5	2.0	0.5	2.4	3.1	3.9	4.4	5.3	6.3	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Pueblo Cidra									
5L L	56.0	20.8	20.8	65.0	10.6		42.3	28.2	8.2
2T T	65.0	65.0	65.0	65.0			60.9	60.9	0.0
East: NR-787 Desde Guavate									
6T T	56.0	0.0	65.0	65.0	1.2	0.0	31.3	29.1	0.0
6R R	56.0	20.2	20.2	65.0	1.2	9.3	42.2	26.1	8.2
North: PR-172 Desde Caguas									
7L L	56.0	17.8	17.8	65.0		0.0	33.3	32.3	8.4
4R R	56.0	20.2	20.2	65.0		3.9	44.7	40.0	8.5

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Disp. Grn. Settings 1st Grn Gmin	1st Grn Gmax	2nd Grn Gmin	2nd Grn Gmax
West: PR-172 Desde Pueblo Cidra									
5L L	PT	No	3	1.000	1.000	6	NA		
2T T	PT	No	3	1.000	1.000	6	NA		

East: NR-787 Desde Guavate									
6T T	PT	No	3	1.000	1.000	6	NA		
6R R	PT	No	3	1.000	1.000	6	NA	6	NA
North: PR-172 Desde Caguas									
7L L	PT	No	3	1.000	1.000	6	NA		
4R R	PT	No	3	1.000	1.000	6	NA	6	NA
Pedestrians									
P5	PT	No	3	1.000	1.000				

Table D.6 - Gap Acceptance Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry AV Equiv
West: PR-172 Desde Pueblo Cidra					
5L L	Normal	0	4.50	2.50	2.0
East: NR-787 Desde Guavate					
6R R	Normal	721	6.00	3.00	2.0
North: PR-172 Desde Caguas					
4R R	Normal	503	6.13	3.07	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:37:15PM

SIDRA INTERSECTION

Intersection Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows - Total	1868 veh/h	1 ped/h	2243 pers/h
Percent Heavy Vehicles	2.4 %		
Degree of Saturation	0.738	0.000	
Effective Intersection Capacity	2532 veh/h		
95% Back of Queue (m)	11 m	0 m	
95% Back of Queue (veh)	17.2 veh	0.0 ped	
Control Delay (Total)	9.88 veh-h/h	0.00 ped-h/h	11.86 pers-h/h
Control Delay (Average)	19.0 s/veh	16.9 s/ped	19.0 s/pers
Level of Service	LOS B	LOS B	
Level of Service (Worst Movement)	LOS C	LOS B	
Total Effective Stops	1323 veh/h	1 ped/h	1588 pers/h
Effective Stop Rate	0.71 per veh	0.75 per ped	0.71 per pers
Proportion Queued	0.68	0.75	0.68
Travel Distance (Total)	1162.0 veh-km/h	0.0 ped-km/h	1394.5 pers-km/h
Travel Distance (Average)	622 m	31 m	622 m
Travel Time (Total)	29.7 veh-h/h	0.0 ped-h/h	35.6 pers-h/h
Travel Time (Average)	57.2 secs	40.6 secs	57.2 secs
Travel Speed	39.1 km/h	2.7 km/h	39.1 km/h
Operating Cost (Total)	474 $/h	0 $/h	474 $/h
Fuel Consumption (Total)	147.6 L/h		
Carbon Dioxide (Total)	369.4 kg/h		
Hydrocarbons (Total)	0.645 kg/h		
Carbon Monoxide (Total)	31.48 kg/h		
NOX (Total)	0.954 kg/h		

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:38:35PM

SIDRA INTERSECTION

Movement Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM

Signalised - Pretimed

Cycle Time = 60 seconds

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
NR-787 Desde Guavate										
6T	T	338	2.4	0.704	23.5	LOS C	8	0.93	0.83	36.0
6R	R	74	0.0	0.704	31.7	LOS C	8	0.93	0.87	31.6
Approach		**411**	**1.9**	**0.704**	**25.0**	**LOS C**	**8**	**0.93**	**0.83**	**35.1**
PR-172 Desde Caguas										
7L	L	69	0.0	0.406	34.9	LOS C	2	0.96	0.78	30.1
4R	R	451	3.8	0.406	12.7	LOS B	5	0.49	0.77	43.3
Approach		**520**	**3.3**	**0.406**	**15.6**	**LOS B**	**5**	**0.55**	**0.77**	**41.0**
PR-172 Desde Pueblo Cidra										
5L	L	578	2.6	0.738	28.6	LOS C	11	0.89	0.88	33.1
2T	T	359	1.4	0.234	1.8	LOS A	2	0.26	0.21	60.9
Approach		**937**	**2.1**	**0.738**	**18.3**	**LOS B**	**11**	**0.65**	**0.62**	**40.2**
All Vehicles		**1868**	**2.4**	**0.738**	**19.0**	**LOS B**	**11**	**0.68**	**0.71**	**39.1**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	1	16.9	LOS B	0	0.75	0.75
All Peds	**1**	**16.9**	**LOS B**	**0**	**0.75**	**0.75**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:38:35PM

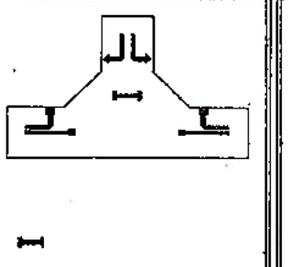
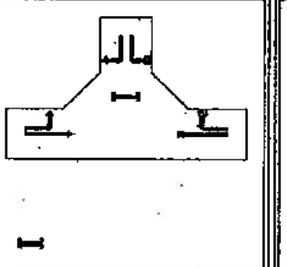
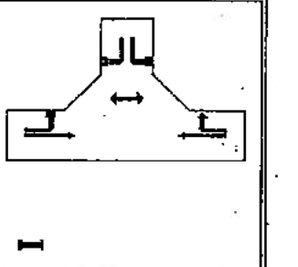
SIDRA INTERSECTION

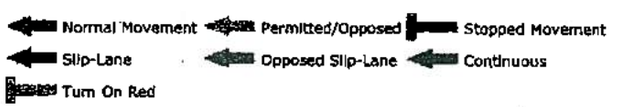
Phasing Summary

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM

C = 60 seconds
Cycle Time Option: **User-specified cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase D
		
Green Time = 6 seconds Phase Time = 9 seconds Phase Split = 15 %	Green Time = 26 seconds Phase Time = 29 seconds Phase Split = 48 %	Green Time = 19 seconds Phase Time = 22 seconds Phase Split = 37 %



SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.12
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:38:35PM

	West	4R	Right	434	17	1.00	0.95
	East	7L	Left	69	0	1.00	0.95

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	LV	HV	LV	HV	LV	HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	563	15	0	0	0	0
2T T	0	0	354	5	0	0
East: NR-787 Desde Guavate						
6T T	0	0	329	8	0	0
6R R	0	0	0	0	74	0
North: PR-172 Desde Caguas						
7L L	69	0	0	0	0	0
4R R	0	0	0	0	434	17

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Left		Through		Right	
	Total	%HV	Total	%HV	Total	%HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	578	2.6	0	0.0	0	0.0
2T T	0	0.0	359	1.4	0	0.0
East: NR-787 Desde Guavate						
6T T	0	0.0	337	2.4	0	0.0
6R R	0	0.0	0	0.0	74	0.0

SIDRA INTERSECTION

Output Tables

Estudio de Transito Bosques de Cidra

Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM

Run Information

Cycle Time = 60 (User-given Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Pretimed
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
  Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations = 2
  Comparison of last two iterations:
  Difference in intersection degree of satn = 0.0 %
  Largest difference in eff. green times = 0 secs
  (max. value for stopping = 0 secs)

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Pueblo Cidra							
	East	2T	Thru	354	5	1.00	0.95
	North	5L	Left	563	15	1.00	0.95
East: NR-787 Dasde Guavate							
	West	6T	Thru	329	8	1.00	0.95
	North	6R	Right	74	0	1.00	0.95
North: PR-172 Desde Caguas							

```
  *  Critical Movement/Green Period

Movement Types:                          Under heading 'Op':
  Slp  Slip Lane Movement                  Y   If opposed turn
  Ped  Pedestrian
  Dum  Dummy
```

Table S.2 - Movement Capacity Parameters

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)
```

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Pueblo Cidra											
5L L	578	2.6	1808		0.320		783	0.90	22	100	0.738*
2T T	359	1.4	1921		0.187		1537	0.90	285	100	0.234
East: NR-787 Desde Guavate											
6T T	337	2.4	1512		0.223		479	0.90	28	100	0.704
6R R	74	0.0	52	277	0.230	0.224	105	0.90	28	100	0.704
North: PR-172 Desde Caguas											
7L L	69	0.0	1700		0.041		170	0.90	122	100	0.406
4R R	451	3.8	1614	1016	0.279	0.000	1111	0.90	122	100	0.406
Pedestrian Movements											
P5	1		12000		0.000		3000	0.90		0	0.000

Table S.3 - Intersection Parameters

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)
```

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
7L	N_L		A	B	9	-	-	9.0Min
5L	W_L		B	D	3	0.320	0.355	24.3
6R	E_R	2nd	D	A	3	0.224	0.249	17.9
				Total:	15	0.544	0.604	51.2

- Flow ratio not used for cycle time calculations and


```
North: PR-172 Desde Caguas
   7L L        69   0.0        0   0.0        0   0.0
   4R R         0   0.0        0   0.0      451   3.8
-------------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.3 - Pedestrian Flow Rates

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)
```

Mov ID	Stage	Flow Rate (ped/h)	Flow Scale	Peak Flow Factor
Across North Approach				
P5	1		1.00	0.95

```
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table S.1 - Movement Phase and Timing Parameters

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)
```

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	To	Op	Pr	Second Green Fr	To	Op	Pr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Desde Pueblo Cidra															
5L L		*B	D							3		24.3		26	
2T T		B	A							3		25.0Min		48	
East: NR-787 Desde Guavate															
6T T		D	A							3		17.9		19	
6R R		A	D	Y		*D	A			10	3	33.3	17.9	20	19
North: PR-172 Desde Caguas															
7L L		*A	B							3		9.0Min		6	
4R R		A	D			D	A	Y		3	12	18.1	16.0Min	35	10
Pedestrian Movements															
P5	(Ped)	D	A							7		16.0Min		15	

```
  Current Phase Sequence: Sequence 1
  Input phase sequence: A B D
  Output phase sequence: A B D
```

2T	T	0.18	0.22	1.8	0.26	0.21	4.2	2	5.87	60.9
East: NR-787 Desde Guavate										
6T	T	2.20	2.64	23.5	0.93	0.83	12.9	8	13.22	36.0
6R	R	0.65	0.78	31.7	0.93	0.87	12.9	8	3.08	31.6
North: PR-172 Desde Caguas										
7L	L	0.67	0.80	34.9	0.96	0.78	2.8	2	2.67	30.1
4R	R	1.59	1.91	12.7	0.49	0.77	6.9	5	12.00	43.3
Pedestrian Movements										
P5		0.00	0.00	16.9	0.75	0.75	0.0	0	0.02	2.7

Table S.6 - Intersection Performance

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
937	0.738	4.77	5.72	18.3	0.65	0.62	11	29.60	40.2
East: NR-787 Desde Guavate									
411	0.704	2.85	3.42	25.0	0.93	0.83	8	16.31	35.1
North: PR-172 Desde Caguas									
520	0.406	2.26	2.71	15.6	0.55	0.77	5	14.67	41.0
Pedestrians:									
1	0.000	0.00	0.00	16.9	0.75	0.75	0	0.02	2.7
ALL VEHICLES:									
1868	0.738	9.88	11.85	19.0	0.68	0.71	11	60.58	39.1
INTERSECTION (persons):									
2243	0.738		11.86	19.0	0.68	0.71		60.60	39.1

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Effective Red and Green Times (sec) R1	G1	R2	G2	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	(m)	Lane Length (m)

the adjusted lost time equals the required movement time
(=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
34	150	38	60

(Cycle time specified by the user)

Intersection Level of Service	=	B
Worst movement Level of Service	=	C
Average intersection delay (s)	=	19.0
Largest average movement delay (s)	=	34.9
Largest back of queue, 95% (m)	=	11
Performance Index	=	60.60
Degree of saturation (highest)	=	0.738
Practical Spare Capacity (lowest)	=	22 %
Effective intersection capacity, (veh/h)	=	2532
Total vehicle flow (veh/h)	=	1868
Total pedestrian flow (ped/h)	=	1
Total person flow (pers/h)	=	2243
Total vehicle delay (veh-h/h)	=	9.88
Total pedestrian delay (ped-h/h)	=	0.00
Total person delay (pers-h/h)	=	11.86
Total effective vehicle stops (veh/h)	=	1323
Total effective pedestrian stops (ped/h)	=	1
Total effective person stops (pers/h)	=	1588
Total vehicle travel (veh-km/h)	=	1162.0
Total cost ($/h)	=	473.68
Total fuel (L/h)	=	147.5
Total CO2 (kg/h)	=	369.43

Table S.4 - Phase Information

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	3	3	6	9	3	9	15%
B	9	3	12	26	38	3	29	48%
D	38	3	41	19	60	3	22	37%

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
5L L	4.59	5.50	28.6	0.89	0.88	17.2	11	23.73	33.1

```
 West: PR-172 Desde Pueblo Cidra
1 L     34  26    0    0     578  783 0.738    28.6  0.88  17.2   11.1   100.0T
2 T     12  48    0    0     359 1537 0.234     1.8  0.21   4.2    2.4   500.0
-------------------------------------------------------------------------------
East: NR-787 Desde Guavate
1 TR    18   1   22   19     411  584 0.704    25.0  0.83  12.9    7.8   500.0
-------------------------------------------------------------------------------
North: PR-172 Desde Caguas
1 LR    12   7   40    1      86  211 0.406    34.9  0.78   2.8    1.5   500.0
2 R      3  35   12   10     434 1070 0.406    11.8  0.77   6.9    4.9   500.0
-------------------------------------------------------------------------------
  T  Short lane due to specification of Turn Slot
```

Table S.8 - Lane Flow and Capacity Information

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------------------
Lane      Dem Flow (veh/h)      Lane   Saturation Flow  Aver  End  Tot
No.   ------------------------  Width  Adj. Aver Aver  Cap  Cap  Deg.  Lane
      Lef Thru  Rig  Tot  (m)  Basic 1st  2nd (veh) (veh  Satn  Util
                                (tcu) (veh)(veh) /h)  /h)   x     %
-------------------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
1 L   578    0    0  578  3.60  1947 1808    0    0  783 0.738  100
2 T     0  359    0  359  3.60  1947 1921    0    0 1537 0.234  100
-------------------------------------------------------------------------------
East: NR-787 Desde Guavate
1 TR    0  337   74  411  3.60  1871 1209 1780   60  584 0.704  100
-------------------------------------------------------------------------------
North: PR-172 Desde Caguas
1 LR   69    0   17   86  3.60  1890 1621 1324   60  211 0.406  100
2 R     0    0  434  434  3.60  1890 1566  939   60 1070 0.406  100
-------------------------------------------------------------------------------

 Basic Saturation Flow in this table is adjusted for lane width, approach
 grade, parking manoeuvres and number of buses stopping.  Saturation flow
 scale applies if specified.
```

Table S.9 - Signal Timing Diagram

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

Displayed (Phase) Green Times

 Phase A                Phase B                          Phase D

0       9                                38                          60
I--------I--------------------------------I--------------------------I
....GGGGG.....GGGGGGGGGGGGGGGGGGGGGGGGGGG.....GGGGGGGGGGGGGGGGGGGGG.
   3         12                                41
```



```
Effective (Movement) Green Times

 West: PR-172 Desde Pueblo Cidra

Mov.    5L (L)
I       I                                I                          I
.............GGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....................
            14                               40

Mov.    2T (T)
I       I                                I                          I
G............GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
 2          14

 East: NR-787 Desde Guavate

Mov.    6T (T)
I       I                                I                          I
G.....................................I.............GGGGGGGGGGGGGGGGGGG
 2                                         43

Mov.    6R (R)
I       I                                I                          I
GG...................GGGGGGGGGGGGGGGGGGGGG...GGGGGGGGGGGGGGGGGGGG
 2                  20                    40  43

 North: PR-172 Desde Caguas

Mov.    7L (L)
I       I                                I                          I
......GGGGGG.....................................................
      5       11

Mov.    4R (R)
I       I                                I                          I
GG....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.............GGGGGGGGGG
 2   5                                    40            52

 Pedestrian Movements

Mov.    P5
I       I                                I                          I
.................................................GGGGGGGGGGGGGGGGG...
                                                43                 58


I-----I-----I-----I-----I-----I-----I-----I-----I-----I-----I-----I---->
0     6     12    18    24    30    36    42    48    54    60

                          T I M E  (s)
```

Table S.10 - Movement Capacity and Performance Summary

```
 Estudio de Transito Bosques de Cidra
 Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------------------
 Mov     Mov  Dem   Total  Lane  Deg.  Eff. Grn  Aver.  Eff.    95%     Perf.
 ID      Typ  Flow   Cap.  Util  Satn  --------  Delay  Stop  Back of  Index
              (veh  (veh                1st  2nd         Rate  Queue
               /h)   /h)   (%)     x   Grn  Grn  (sec)        (veh)
```

Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Pueblo Cidra						
5L L	11.0	0.43	0.634	26.94	0.637	275.6
2T T	4.7	0.21	0.323	7.00	0.165	117.3
	8.6	0.35	0.514	19.27	0.456	214.6
East: NR-787 Desde Guavate						
6T T	18.3	0.50	0.601	36.47	1.324	457.0
6R R	15.8	0.50	0.627	32.13	1.026	394.2
	17.8	0.50	0.606	35.70	1.271	445.8
North: PR-172 Desde Caguas						
7L L	14.0	0.49	0.647	29.31	0.808	350.8
4R R	16.4	0.44	0.579	35.19	1.171	411.1
	16.1	0.44	0.588	34.41	1.123	403.1
Pedestrian Movements						
P5		2.78				
		2.78				
ALL VEHICLES:	12.7	0.41	0.555	27.09	0.821	317.9
INTERSECTION:	12.7	0.41	0.555	27.09	0.821	317.9

Table S.14 - Summary of Input and Output Data

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Pueblo Cidra												
1 L	578			578	3	1947	26		0.738	28.6	11	100

West: PR-172 Desde Pueblo Cidra											
5L L	578	783	100	0.738*	26*		28.6	0.88	17.2	23.73
2T T	359	1537	100	0.234	48		1.8	0.21	4.2	5.87
East: NR-787 Desde Guavate											
6T T	337	479	100	0.704	19		23.5	0.83	12.9	13.22
6R R	74	105	100	0.704	20	19*	31.7	0.87	12.9	3.08
North: PR-172 Desde Caguas											
7L L	69	170	100	0.406	6*		34.9	0.78	2.8	2.67
4R R	451	1111	100	0.406	35	10	12.7	0.77	6.9	12.00
Pedestrian Movements											
P5 (Ped)	1	3000.	100	0.000	15		16.9	0.75	0.0	0.02

* Maximum degree of saturation, or critical green periods

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Pueblo Cidra						
5L L	39.5	153.15	0.228	9.67	0.229	98.9
2T T	10.5	48.11	0.072	1.57	0.037	26.3
	50.0	201.25	0.300	11.24	0.266	125.2
East: NR-787 Desde Guavate						
6T T	38.5	106.25	0.127	7.69	0.279	96.3
6R R	7.2	23.11	0.029	1.47	0.047	18.1
	45.7	129.36	0.155	9.16	0.326	114.4
North: PR-172 Desde Caguas						
7L L	6.0	21.03	0.028	1.25	0.034	14.9
4R R	45.9	121.95	0.162	9.84	0.327	114.9
	51.9	142.98	0.189	11.08	0.362	129.8
Pedestrian Movements						
P5		0.09				
		0.09				
ALL VEHICLES:	147.6	473.60	0.645	31.48	0.954	369.4
INTERSECTION:	147.6	473.68	0.645	31.48	0.954	369.4

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40

2 T		359		359	1	1947	48		0.234	1.8	2	500
	578	359	0	937	2				0.738	18.3	11	
East: NR-787 Desde Guavate												
1 TR		337	74	411	2	1871	1	19	0.704	25.0	8	500
	0	337	74	411	2				0.704	25.0	8	
North: PR-172 Desde Caguas												
1 LR	69		17	86	1	1890	7	1	0.406	34.9	2	500
2 R	.		434	434	4	1890	35	10	0.406	11.8	5	500
	69	0	451	520	3				0.406	15.6	5	
Pedestrians												
Across N approach			1			15			0.000	16.9	0.0	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	1868	2	60	0.738	19.0	11

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Green Time Ratio (g/C) 1st grn	2nd grn	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest 95% Back (veh)	Queue (m)
West: PR-172 Desde Pueblo Cidra										
5L	L	0.433*		578	783	0.738*	28.6	C	17.2	11
2T	T	0.800		359	1537	0.234	1.8	A	4.2	2
East: NR-787 Desde Guavate										
6T	T	0.317		337	479	0.704	23.5	C	12.9	8
6R	R	0.333	0.317*	74	105	0.704	31.7	C	12.9	8
North: PR-172 Desde Caguas										
7L	L	0.100*		69	170	0.406	34.9	C	2.8	2
4R	R	0.583	0.167	451	1111	0.406	12.7	B	6.9	5
Pedestrian Movements										
P5	(Ped)	0.250		1	3000	0.000	16.9	B	0.0	0
ALL VEHICLES:				1868		0.738	19.0	B	17.2	11
INTERSECTION (persons):				2243			19.0		17.2	11

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

Intersection capacity is calculated considering vehicle movements only.
* Maximum v/c ratio, or critical green periods
^ Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c-1.0)

Table S.16 - SCATS MF Parameter

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Stopline Flow (veh/h)	Capacity (veh/h)	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Desde Pueblo Cidra						
1 L	578	783	1850	1659	0.738	100
2 T	359	1537	1947	1833	0.234	100
East: NR-787 Desde Guavate						
1 TR	411	584	1814	NA	0.704	100
North: PR-172 Desde Caguas						
1 LR	86	211	1756	NA	0.406	100
2 R	434	1070	1607	1480	0.406	100

NA Not Applicable - SCATS MF was not calculated for this lane due to one of the following reasons:
- the lane is not controlled by signals (slip or continuous lane)
- two movements share this lane and do not run in the same phases

STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line. This cannot exceed capacity.

SCATS SATURATION FLOW: This allows for lane width, approach grade and turning vehicles. Saturation flow scale applies if specified. The effects of heavy vehicles, parking manoeuvres, number of buses stopping and conflicting pedestrian volume are not included.

SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS control system. It is calculated from the SCATS SATURATION FLOW parameter.

DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow Rate, therefore x > 1 is possible.

Table D.0 - Geometric Delay Data

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream Dist. (m)	Distance User Spec?

West: PR-172 Desde Pueblo Cidra											
	East	Thru		S	65.0	14.4	500	127		No	
	North	Left	10.8	20.8	17.0	500	123			No	
East: NR-787 Desde Guavate											
	West	Thru		S	65.0	14.4	500	128		No	
	North	Right	10.0	20.2	15.7	500	120			No	
North: PR-172 Desde Caguas											
	West	Right	10.0	20.2	15.7	500	124			No	
	East	Left	7.2	17.8	11.3	500	117			No	

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
		Delay (seconds/veh)								
West: PR-172 Desde Pueblo Cidra										
1 L	0.738	14.2	6.1	20.3	3.7	16.6	0.3	16.3	8.3	28.6
2 T	0.234	1.5	0.4	1.8	2.3	0.0	0.0	0.0	0.0	1.8
East: NR-787 Desde Guavate										
1 TR	0.704	16.5	7.0	23.5	7.3	16.2	0.5	15.8	1.5	25.0
North: PR-172 Desde Caguas										
1 LR	0.406	20.8	5.7	26.5	3.6	22.9	0.4	22.6	8.4	34.9
2 R	0.406	2.4	1.1	3.5	1.9	1.6	0.0	1.6	8.3	11.8

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Pueblo Cidra							
1 L	0.738	0.79	0.02	0.07	0.88	0.893	0.06

2 T	0.234	0.21	0.00	0.00	0.21	0.263	0.00	
East: NR-787 Desde Guavate								
1 TR	0.704	0.80	0.03	0.01	0.83	0.930	0.33	
North: PR-172 Desde Caguas								
1 LR	0.406	0.73	0.02	0.03	0.78	0.957	0.43	
2 R	0.406	0.41	0.00	0.36	0.77	0.468	0.01	

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 L	0.738	1.9	8.0	1.9	9.9	12.0	14.3	15.6	17.2	18.9	0.11
2 T	0.234	0.4	1.5	0.4	1.8	2.3	2.9	3.4	4.2	5.0	0.00
East: NR-787 Desde Guavate											
1 TR	0.704	1.3	5.6	1.3	7.0	8.5	10.3	11.3	12.9	14.4	0.02
North: PR-172 Desde Caguas											
1 LR	0.406	0.2	1.0	0.2	1.2	1.5	1.9	2.2	2.8	3.4	0.00
2 R	0.406	0.6	2.7	0.6	3.3	4.1	5.1	5.7	6.9	8.1	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue Nb	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 L	0.738	1.2	5.2	1.2	6.4	7.7	9.2	10.0	11.1	12.2	0.11
2 T	0.234	0.2	0.8	0.2	1.1	1.3	1.7	1.9	2.4	2.9	0.00
East: NR-787 Desde Guavate											
1 TR	0.704	0.8	3.4	0.8	4.2	5.2	6.2	6.9	7.8	8.8	0.02
North: PR-172 Desde Caguas											

1 LR	0.406	0.1	0.5	0.1	0.6	0.8	1.0	1.2	1.5	1.8	0.00
2 R	0.406	0.4	1.9	0.4	2.3	2.9	3.6	4.1	4.9	5.7	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Pueblo Cidra									
5L L	56.0	20.8	20.8	65.0	11.2		43.7	33.1	8.3
2T T	65.0	65.0	65.0	65.0			60.9	60.9	0.0
East: NR-787 Desde Guavate									
6T T	56.0	0.0	65.0	65.0	1.8	0.0	37.6	36.0	0.0
6R R	56.0	20.2	20.2	65.0	1.8	9.3	43.4	31.6	8.2
North: PR-172 Desde Caguas									
7L L	56.0	17.8	17.8	65.0		0.0	34.1	30.1	8.4
4R R	56.0	20.2	20.2	65.0		5.1	45.4	43.3	8.3

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Disp. Grn. Settings 1st Grn Gmin	1st Grn Gmax	2nd Grn Gmin	2nd Grn Gmax
West: PR-172 Desde Pueblo Cidra									
5L L	PT	No	3	1.000	1.000	6	NA		
2T T	PT	No	3	1.000	1.000	6	NA		
East: NR-787 Desde Guavate									
6T T	PT	No	3	1.000	1.000	6	NA		
6R R	PT	No	3	1.000	1.000	6	NA	6	NA
North: PR-172 Desde Caguas									
7L L	PT	No	3	1.000	1.000	6	NA		
4R R	PT	No	3	1.000	1.000	6	NA	6	NA
Pedestrians									

P5	PT	No	3	1.000	1.000

Table D.6 - Gap Acceptance Parameters

Estudio de Transito Bosques de Cidra
Interseccion Num.3 PR-172 @ PR-787 Ao 2019 PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Pueblo Cidra					
5L L	Normal	0	4.50	2.50	2.0
East: NR-787 Desde Guavate					
6R R	Normal	578	6.00	3.00	2.0
North: PR-172 Desde Caguas					
4R R	Normal	337	6.00	3.00	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
Produced by SIDRA Intersection 3.0.060813.1Z
Copyright 2000-2006 Akcelik and Associates Pty Ltd
www.sidrasolutions.com

Processed Dec 06, 2006 05:38:35PM

ANEJO C.

Fotos de las Intersecciones analizadas

Intersección Núm. 1 - PR-172 Km. 17.5 y Farmacéutica Glaxo Smith Kline, Cidra

Foto 1: Entrada a Farmacéutica GSK, se aprecia el control de acceso y caseta de seguridad

Foto 2: PR-172, dirección oeste, antes de entrada a GSK (izq.)

Foto 3: PR-172, dirección este, antes de entrada a GSK (der.)

Intersección Núm. 2 - PR-172 Km. 16.35 y camino Comunidad San José, Cidra

Foto 4: PR-172, dirección oeste, antes de entrada a San José (izq.)

Foto 5: Camino Comunidad San José hacia la PR-172

Foto 6: PR-172, dirección este, antes de entrada a Comunidad San José (der.)

Intersección Núm. 3- PR-172 y PR-787, Cidra

Foto 7: PR-172, dirección oeste, antes de intersección con la PR-787

Foto 8: PR-172, dirección este, antes de intersección con la PR-787

Foto 9: PR-787, dirección oeste, antes de intersección con la PR-172

Apéndice XIII. Plan de Mantenimiento de Transito ("MOT")

Desarrollo Residencial Bosques de Cidra

Intersección carretera estatal y camino municipal Comunidad San José, Barrio Bayamón, Municipio de Cidra

Plan de Mantenimiento de Tránsito (MOT)

El acceso principal por carretera al proyecto, será por la carretera PR-172 que conecta a la ciudad de Caguas con el pueblo de Cidra. Esta consta de una vía en cada dirección con un ancho promedio de 28 metros sin dividir y en algunas áreas con carriles para rebasar. Hay accesos secundarios por la carretera PR-787 desde Guavate y la PR-171 desde Cayey. Además hay otros accesos por la PR-173 de Aguas Buenas y la PR-173 de Aibonito. En el caso del proyecto, los accesos principales serían por la PR-172 desde Cidra y Caguas, y la PR-787 desde Guavate.

El Departamento de Transportación y Obras Públicas y la Autoridad de Carreteras y Transportación están en el proceso de ofrecer talleres informativos sobre el proyecto conector de Cidra, desde la carretera PR-7733 hasta la carretera PR-52 en el Municipio de Cidra. El proyecto consiste en la construcción de una nueva vía que proveerá al municipio de Cidra y barrios limítrofes un conector desde la carretera PR-733, desvío de Cidra, hasta la carretera PR-52, Autopista Luís A. Ferré. El proyecto tendrá una sección típica de dos (2) carriles en cada dirección de 3.65 metros de ancho cada uno, con paseo pavimentado de 3.0 metros de ancho a cada lado, e isleta central con ancho variable de 0.6 a 6.0 metros. La servidumbre tendrá un ancho variable de 50 a 100 metros. El acceso se controlara a través de intersecciones.

Para evitar interrupciones al tránsito durante la construcción del proyecto, se someterá a la Oficina de Ingeniería de Tránsito de la Autoridad de Carreteras y Transportación un Plan de Mantenimiento de Tránsito ("MOT") que cumpla con la Parte V del Manual de Dispositivos Uniformes para el Control del Tránsito en las Vías Públicas. (Véase Apéndice(s) XII y XIII y la Tabla I)

Como parte del proyecto, se prevé que se requerirán mejoras geométricas a la carretera estatal PR-172 y el camino San José. Las obras en las vías existentes requerirán trabajos de ensanche para acomodar los carriles necesarios para la operación aceptable de la intersección. El diseño de planos y los trabajos de construcción se coordinarán con la Autoridad de Carreteras y Transportación (ACT). El flujo vehicular en ambas vías se mantendrá con un mínimo de interrupciones para los usuarios de la PR-172 y los vecinos de San José durante los trabajos de construcción utilizando los desvíos necesarios y dispositivos de control requeridos por la ACT en su publicación "Dibujos Estándares" Capitulo MPT - Mantenimiento y Protección de Trafico – Abril 1996. Las obras en las vías existentes requerirán trabajos de ensanche para acomodar los carriles necesarios para la operación aceptable de la intersección. El diseño de planos y los trabajos de construcción se coordinarán con la Autoridad de Carreteras y Transportación (ACT)

El mantenimiento y protección del tránsito en la zona de trabajo del proyecto en la intersección de la PR-172 y San José será enfatizado utilizando barreras de hormigón, drones, abanderados, rotulación y marcado de pavimento temporero así como la construcción de desvíos paralelos a las carreteras existentes. Estas medidas mitigaran el impacto de los trabajos propuestos y permitirá la continuidad del tránsito en las vías. En las noches se instalará alumbrado y dispositivos especiales que permitan la identificación de las zonas de construcción y provean seguridad a los motoristas en las vías inmediatas. Los desvíos temporeros construidos durante las fases de construcción y para el mantenimiento de tránsito se realizarán en coordinación con el proyecto final para que sean parte de la obra final.

Apéndice XIV. Estudio de Mercado e Impacto Económico para el Proyecto Bosques de Cidra

Estudios Técnicos Inc.

Estudio de Mercado e Impacto Económico para el Proyecto Residencial Bosques de Cidra

Informe Final
Revisado

Sometido a:
Bosques de Cidra, Inc.

9 de febrero de 2007

Ave. Domenech 113, Hato Rey, Puerto Rico, 00918-3501
Apartado 12144, San Juan, Puerto Rico, 00914-0144

Tel. (787) 781-1675 • Fax (787) 767-2117
estudiostecnicos@estudios-tecnicos.com

CONTENIDO

RESUMEN EJECUTIVO 1
DESCRIPCIÓN DEL ÁREA 1
Localización y Accesos 1
Descripción del Área Inmediata al Terreno del Desarrollo 1
DELIMITACIÓN DEL ÁREA DE MERCADO PARA EL PROYECTO 4
PERFIL SOCIO-ECONÓMICO DEL ÁREA DE MERCADO 6
Perfil Demográfico de las Áreas de Mercado Primaria, Secundaria y Terciaria 6
Población 6
Hogares 10
Permisos de Vivienda 11
Empleos 11
Ingreso 12
Perfil Demográfico de las Áreas Alrededor del Proyecto 13
DEMANDA Y OFERTA DE VIVIENDA EN EL ÁREA DE MERCADO 16
Tendencias en Puerto Rico 16
Oferta y Demanda en el Área de Mercado 19
Proyectos de Vivienda Activos en el Área de Mercado 19
Evaluación de Ventas Comparables en el Área de Mercado Primaria 21
Demanda en el Área de Mercado 23
EVALUACIÓN DE LAS TENDENCIAS LABORALES DE LA REGIÓN E IMPACTO ECONÓMICO DEL PROYECTO 28
Evaluación de las Tendencias Laborales en la Región de Caguas 28
Impacto Económico del Proyecto 29
Empleo e Ingreso – Fase de Construcción 34
Impacto Fiscal 34
Empleo e Ingreso – Fase de Ocupación 34
Aportación del Proyecto a las Condiciones de Empleo Existentes en la Región de Caguas 34

RESUMEN EJECUTIVO

Bosques de Cidra Inc. se encuentra en el proceso de preparación de la Declaración de Impacto Ambiental (DIA) para el proyecto residencial Bosque de Cidra propuesto en el Municipio de Cidra, en la Carretera PR-72, Km. 10.3 en el Barrio Bayamón.

En este documento se establece la necesidad de vivienda y empleo en la región que impactará su desarrollo. Se presentan las tendencias de población y empleo, y las condiciones actuales y esperadas del mercado de vivienda. También, se estima la aportación económica del proyecto en el contexto del mercado laboral de la región.

La evaluación se enmarca en el contexto del proyecto propuesto, el cual consiste de un proyecto residencial de aproximadamente 540 unidades de vivienda de las cuales 300 serán unidades de tipo "walkup" y 240 serán unidades unifamiliares. El proyecto incluirá entre sus amenidades una Casa Club. Habrá unas 82 cuerdas a ser reservadas para conservación.

La necesidad de vivienda se establece mediante la evaluación del mercado de vivienda, a través de proyecciones de oferta y demanda. Los impactos económicos, se estiman con los costos de construcción del proyecto y los multiplicadores de insumo producto de la Junta de Planificación.

El área de mercado del proyecto la componen 22 municipios, que fueron seleccionados considerando el acceso y la cercanía a la localización del proyecto propuesto y la movilidad laboral. Estos municipios fueron divididos en tres sub-mercados, entiéndase área de mercado primaria, secundaria y terciaria. El área de mercado primaria representa el área de donde provendría el 50% de la clientela potencial del proyecto, el área secundaria de donde provendría el 30% de la clientela potencial y el área terciaria de donde provendría el 10% de la clientela. El 10% restante representa a la clientela potencial proveniente de otros municipios de la Isla no incluidos en el área primaria, secundaria ni terciaria, y del exterior de Puerto Rico. La tabla a continuación presenta el área de mercado.

Área Primaria	
Cidra	
Caguas	
Cayey	
Área Secundaria	
San Juan	
Guaynabo	
Bayamón	
Carolina	
Cataño	
Trujillo Alto	
Área Terciaria	
Guaynabo	
Gurabo	
Corozal	
Las Piedras	
Aguas Buenas	
Humacao	
Aibonito	
Arroyo	
Patillas	
San Lorenzo	
Yabucoa	
Juncos	
Naguabo	

HALLAZGOS SOBRESALIENTES

El proyecto propuesto suplirá las necesidades de vivienda proyectadas para la región.

La región de estudio es de alto crecimiento poblacional y de hogares. Los indicadores muestran que la población y los hogares en la región durante el periodo 1990-2000 aumentaron mucho más aceleradamente que el promedio en Puerto Rico.

Cidra es el municipio de mayor crecimiento poblacional en el área de mercado primaria. También es uno de los cuatro de mayor crecimiento en todas las sub-áreas de mercado acompañado por Juncos, Gurabo y Trujillo Alto. El municipio de Cidra tuvo un aumento de 3,439 hogares entre el 1990 y el 2000.

Esta tendencia continuará, según anticipan los permisos de vivienda. En el área de mercado, la cantidad de permisos de vivienda expedidos entre el 2000 y 2005 (8,319) fue mayor que la cantidad expedida durante el periodo de 1995 al 2000 (6,702).

El empleo y las condiciones económicas de las familias mejoraron aceleradamente en el periodo. Entre el 1990 y 2004, el crecimiento anual de empleos en el área de

mercado primaria fue de 2.6%. Esto es muy por encima del crecimiento en el área de mercado total, 1.6% y todo Puerto Rico, 1.4%.

El mercado de vivienda en la región de estudio, en particular en el mercado primario y el terciario, muestra un comportamiento relativamente más fuerte en las zonas metropolitanas (Bayamón, Carolina, San Juan, Guaynabo, Cataño y Trujillo Alto).

En el 2006, los datos sobre construcción y venta de vivienda de Puerto Rico y de la región bajo estudio muestran que los proyectos de vivienda son demandados por el mercado. Se destacan las siguientes tendencias:

- En el área de mercado delimitada para el proyecto había 259 proyectos activos en el tercer trimestre del 2006. Éstos tenían 28,375 unidades, de las cuales se habían vendido 10,516, y se opcionaron 8,283. Esto implica que cerca de dos terceras partes del inventario de vivienda se absorbieron por el mercado o están en vías de cierre.
- Las ventas de unidades de vivienda se han acelerado desde el primer trimestre del 2002. De 1,836 unidades trimestrales que se vendían en dicha fecha, crecieron hasta 2,741 unidades en el tercer trimestre del 2006.
- En el Municipio de Cidra todas las ventas fueron de unidades unifamiliares. Este patrón es cónsono con el comportamiento de la región de Caguas.
- En el mercado de unidades de vivienda de $300,000 o más había un total de 102 proyectos con 8,929 unidades con precios mayores a $300,000. De este total, 5,227 unidades se vendieron u opcionaron. El 47% de las unidades fueron vendidas y el 23% opcionadas.
- En el mercado primario, los proyectos activos de unidades unifamiliares de $300,000 o más solamente tienen disponible un 25% de su inventario inicial, lo que implica que habrá necesidad de nueva construcción en este segmento del mercado. En el segmento, había un total de 11 proyectos, con un total de 1,596 unidades. La mayoría de los proyectos fueron desarrollados en el municipio de Caguas.
- El área terciaria tenía un total de 1,857 unidades de vivienda unifamiliar en el renglón de $300,000 o más. De éste total, 1,618 unidades o el 87% habían sido vendidas u opcionadas. La mayoría de los proyectos se encontraban

concentrados en los municipios de Humacao o Gurabo. Tres de los proyectos de Humacao se encontraban dentro de la comunidad de Palmas del Mar.

Se estimó que habrá una necesidad de vivienda de 35,658 unidades en el 2009 en el área de mercado, de la cual sólo un 50% será suplida por el mercado formal, considerando el ingreso de la población del área de mercado. Esto sugiere que en realidad habrá una necesidad de 17,829 unidades en el 2009, o de 1,486 unidades de vivienda mensuales para toda el área de mercado. El proyecto propuesto suplirá 540 unidades, o un 36% de la necesidad estimada.

El proyecto propuesto aportará al mejoramiento de las condiciones de empleo e ingreso en la región.

- Con una inversión estimada de $187.6 millones y un período de cinco años, se estima que el proyecto tiene el potencial de generar un promedio de 206 empleos directos y 252 empleos indirectos e inducidos al año durante la fase de construcción. Esto resulta en un total de 458 empleos directos, indirectos e inducidos promedio al año.
- En cuanto al ingreso generado por la construcción, el proyecto tiene el potencial de generar un promedio anual de $4.7 millones en ingreso directo y $8.2 millones en ingreso indirecto e inducido durante la fase de construcción. Esto resulta en un ingreso directo, indirecto e inducido total promedio al año de $12.8 millones.
- Los ingresos fiscales durante esta fase se estiman en $9.3 millones. De este total, $5.6 millones corresponden al municipio y $3.7 millones al gobierno central. En promedio, esto resulta en ingresos fiscales de $1.8 millones al año, de los cuales $1.1 millones irían al municipio y $737,236 al gobierno central.
- En la fase de ocupación, se estimó un promedio anual de 154 empleos directos y 479 empleos indirectos e inducidos. Esto resulta en un total de 633 empleos directos, indirectos e inducidos en promedio al año. Los empleos directos incluyen los que generará el proyecto luego de construido y la demanda por servicios de los residentes en el proyecto.

- Ya luego de terminado, también se estima que el proyecto tiene el potencial de generar un promedio de $2.1 millones en ingreso directo y $7.8 millones en ingreso indirecto e inducido al año durante la fase de ocupación. Esto resulta en un total promedio de $9.9 millones al año de ingreso directo, indirecto e inducido.

- La región de Caguas, según definida por el *Bureau of Labor Statistics (BLS)* incluye a los municipios de Caguas, Cayey, Cidra, Gurabo y San Lorenzo. Esta región tenía un total de 105,200 personas empleadas en el 2005. En la región se reportó un total de 13,600 personas desempleadas en el 2005, y una tasa de desempleo de 11.4%, similar a la de Puerto Rico que era de 11.3% durante el periodo.

- En la región de Caguas, según definida por el BLS ha ocurrido un deterioro en las tendencias de empleo, según se evidencia por lo siguiente:

  - El total de empleos en la región disminuyó de 115,000 empleos a 105,200 durante el periodo 2004-2005, o en 9,800 empleos, una reducción de 9%. En contraste, el número de empleos de todo Puerto Rico, disminuyó a un ritmo mucho menor de 1% durante el mismo periodo.

  - El desempleo de la región aumentó 4%, ó en 510 personas desempleadas durante el periodo 2004-2005. Se reportaron reducciones sustanciales en la fuerza laboral.

  - Aumentó la tasa de desempleo en 1.2 puntos porcentuales en el 2005.

- El desarrollo propuesto contribuye a una reducción de 3% en el número de personas desempleadas actualmente durante el periodo de construcción.

- La contribución del proyecto durante en su fase de ocupación, será de 498 empleos al año. Esto significa una reducción adicional en el número de personas desempleadas de la región de 6%.

- En total, el desarrollo propuesto contribuiría a reducir el desempleo de la región a razón de 9% durante sus fases de construcción y ocupación en conjunto.

DESCRIPCIÓN DEL ÁREA

Localización y Accesos

El terreno a utilizarse para el desarrollo propuesto tiene una cabida de 250 cuerdas. El mismo está ubicado en la Carretera PR-172, Km. 10.3 en el Barrio Bayamón en el Municipio de Cidra.

La Carretera PR-172 es una bien transitada y tiene sus horas pico durante la mañana, en ambas direcciones; a eso de las 2:00 p.m. y cerca de la urbanización Sabanera, en donde hay una escuela pública y es la hora del recogido de los niños, y en la tarde, también en ambas direcciones. Esta carretera consta de sólo dos carriles. En los Apéndice I, 73 y 99, se puede apreciar el tráfico vehicular de la zona. La foto 73 fue como a eso de las 2:00 p.m. cerca de la escuela, mientras que la foto #99 fue como a las 4:45 p.m. al salir de la urbanización Sabanera.

El flujo vehicular de la PR-172 era de 17,600 vehículos diarios en el 2002, según información obtenida a través del Departamento de Transportación y Obras Públicas.

En el futuro se contempla el desarrollo de una carretera o corredor que conectará entre el municipio de Cayey y Cidra. Esto contribuirá a mejorar el tráfico vehicular de la zona.

Otras carreteras que conectan con la PR-172 son: la PR-52 que conecta con el municipio de Caguas, y la PR-1 en dirección hacia Cayey.

Descripción del Área Inmediata al Terreno del Desarrollo

Estudios Técnicos, Inc. realizó una visita al área del desarrollo propuesto, en donde se pudieron apreciar las siguientes observaciones a lo largo de la PR-172:

- El centro comercial Plaza Cidra queda en la esquina casi al final de la PR-172. Este centro comercial cuenta con un amplio estacionamiento y tiene varias tiendas (Refiérase al Apéndice I, fotos 1 y 2). Su ubicación es beneficiosa para los residentes del área quienes desearían hacer sus compras en esa misma área.

- En el área del proyecto, también se encuentra el puente del Lago de Cidra, el cual consta de dos carriles. (Ver Apéndice I, 3). Luego de cruzar el puente se

pueden observar varias casas, algunas de las cuales son en cemento y otras en madera.

- La Urbanización Campo Lago se encuentra a mano izquierda de la PR-172. Ésta es una urbanización con acceso controlado y su entrada es amplia. (Ver Apéndice I, 11-15)
- Existen varios caminos vecinales en los cuales hay casas y varios comercios de servicio, tales como cuido diurno para niños, entre otros.
- También, en la PR-172 están localizadas las farmacéuticas: Glaxo Smith Kline y Creative Medical Corporation. (Ver Apéndice I, 33 y 34)
- A través de toda la carretera existen variedad de establecimientos comerciales tales como "pubs", colmaditos, y restaurantes, entre otros. (Ver Apéndice I, 32, 65-70)
- En el área se encuentra el centro comunal Hacienda Margarita. (Ver Apéndice I, 72) Este centro es utilizado para la celebración de actividades.
- Otras urbanizaciones ubicadas en el área son Sabanera y Hacienda Primavera. (Ver Apéndice I, 77-78)
- Antes de llegar a las urbanizaciones Sabanera y Hacienda Primavera, hay una escuela pública conocida como "Segunda Unidad/Cervezejas II". (Ver Apéndice I, 73-76)
- Se pudo apreciar que la entrada de la urbanización Sabanera se usa como redondel para las personas que van a recoger a sus hijos en la escuela pública antes mencionada.
- Algunas características específicas de la urbanización Sabanera son: cuenta con una gran cantidad de áreas verdes, las residencias tienen amplios terrenos, las casas están abiertas (no tienen verjas), y la vista con la que cuentan las residencias es impresionante. (Ver Apéndice I, 78-96)
- En el área se encuentra el motel Flor del Valle. (Ver Apéndice I, 97 y 98)

El mapa a continuación presenta la localización del proyecto.

Delimitación del Área de Desarrollo para el Proyecto Bosques de Cidra

DELIMITACIÓN DEL ÁREA DE MERCADO PARA EL PROYECTO

El área de mercado es la región geográfica donde reside el 90% de la clientela potencial del proyecto. La misma se subdivide en tres segmentos, la primaria, la secundaria y la terciaria. El área de mercado primaria representa el área de donde provendría el 30% de la clientela potencial del proyecto, el área secundaria de donde provendría el 30% de la clientela potencial y el área terciaria de donde provendría el 10% de la clientela. El 10% restante representa a la clientela potencial proveniente de otros municipios de la Isla no incluidos en el área primaria, secundaria ni terciaria, y del exterior de Puerto Rico.

El área de mercado del proyecto la componen los siguientes municipios:

Área Primaria
Cidra
Caguas
Cayey
Área Secundaria
San Juan
Guaynabo
Bayamón
Carolina
Canóvanas
Trujillo Alto
Área Terciaria
Gurabo
Juncos
Las Piedras
Aguas Buenas
Humacao
Aibonito
Arroyo
Patillas
San Lorenzo
Yabucoa
Aguas
Maunabo

Estos municipios fueron seleccionados luego de llevar a cabo un análisis sobre la movilidad laboral y las tendencias sobre movilidad residencial en Puerto Rico en el 1995 y 2000. También se tomó en consideración que proyectos como en propuesto, por su concepto, escala y ubicación, atraen compradores de un área de mercado extensa. Los proyectos residenciales atraen su clientela de una forma directamente proporcional a su magnitud, diseño, precio y localización.

Según la información del Censo, el 50% de las personas que se mudaron de casa entre el año 1995 y el año 2000 lo hicieron a otra casa en el mismo municipio. Un 38% provino de otro municipio y un 12% desde fuera de Puerto Rico. El hecho de que un 50% se hayan mudado dentro del propio municipio sugiere que la movilidad de las residencias tiene un radio pequeño, es decir que una gran mayoría se mudó desde un lugar relativamente cercano. Por eso, para determinar el mercado primario desde donde procederán los clientes potenciales de este proyecto, se han escogido los municipios de Cidra, Caguas y Cayey. Sin embargo, se debe considerar que hay municipios que en los últimos años han atraído una población significativa de otros municipios de fuera de la periferia. Un ejemplo es Caguas, que atrajo una población considerable del área metropolitana de San Juan, tendencia que ha sido influenciada por la escasez de terrenos para desarrollos en esta área, y lo alto de los precios de las viviendas, debido a lo limitada que es la nueva oferta.

PERFIL SOCIO-ECONÓMICO DEL ÁREA DE MERCADO

Este capítulo presenta un análisis de la situación demográfica y económica del área de mercado, según descrita en la sección anterior, además de un análisis radial a 3 millas del terreno del desarrollo.

Perfil Demográfico de las Áreas de Mercado Primaria, Secundaria y Terciaria.

Para llevar a cabo un perfil demográfico del área de mercado se evaluaron diferentes variables socioeconómicas para la población de los 22 municipios con mejor acceso a la localización del proyecto en cuestión, según desglosados en la sección anterior. Estos municipios fueron divididos en tres áreas de mercado. Entiéndase área de mercado primaria, secundaria y terciaria (que también se definen en la sección anterior). Para estos propósitos se compararon los datos reportados en los Censos de Población y Vivienda de 1990 y 2000, y se hicieron unas proyecciones para el año 2010. Dichos resultados se presentan a continuación.

Población

- Según el censo 2000, la población en el área de mercado, es de 1,699,767 habitantes. Se proyecta que la misma aumentará a 1,763,671 en el 2010. Dicho aumento constituye un crecimiento de 0.4%.
- Cidra es el municipio de mayor crecimiento poblacional en el área de mercado primaria con 1.2%. También es uno de los cuatro de mayor crecimiento en todas las sub-áreas de mercado acompañado por Juncos, Gurabo y Trujillo Alto.

Población

	1990	1999	2000	2010
Cidra	25,365	35,001	42,753	48,342
Caguas	117,959	133,447	140,602	145,833
Cayey	41,099	48,533	47,370	48,580
San Juan	434,849	437,745	434,374	427,769
Guaynabo	90,742	92,886	100,053	103,537
Bayamón	196,208	220,252	224,044	227,457
Carolina	168,834	177,808	186,076	184,001
Celaño	28,243	34,587	30,071	28,484
Trujillo Alto	51,348	61,110	75,726	80,057
Guayama	40,183	41,882	44,301	46,678
Gurabo	23,674	29,727	36,743	42,984
Comerío	18,212	20,365	20,002	20,274
Las Piedras	23,412	27,898	34,486	39,502
Aguas Buenas	22,420	25,434	28,032	31,748
Humacao	44,334	55,283	58,036	63,184
Albonito	22,187	24,971	28,493	27,538
Arroyo	17,014	18,910	19,117	19,580
Patillas	17,774	19,633	20,152	20,629
San Lorenzo	32,428	35,153	40,087	43,443
Yabucoa	31,435	36,463	39,246	41,808
Juncos	25,467	30,612	36,452	41,086
Maunabo	11,813	12,347	12,741	13,234
Área Primaria	197,423	218,891	230,630	242,919
Área Secundaria	988,360	1,036,486	1,080,346	1,067,416
Área Terciaria	331,172	377,332	418,794	463,441
Área de Mercado	1,473,875	1,617,228	1,699,767	1,763,671
Puerto Rico	3,196,720	3,522,037	3,808,610	4,028,446

Fuente: Censo 2000 y Proyecciones de Junta de Planificación

- Según se desprende de la tabla a continuación, el área de mercado terciaria es la de mayor crecimiento poblacional en términos porcentuales. Esto, porque incorpora municipios que están acogiendo el crecimiento de la zona urbana de San Juan, como por ejemplo Gurabo, Las Piedras y San Lorenzo. Lo mismo ocurre en Cidra.

Crecimiento Poblacional

	1980-90	1990-00	2000-10
Cidra	2.3%	1.8%	1.2%
Caguas	1.2%	0.8%	0.4%
Cayey	1.3%	0.2%	0.3%
San Juan	0.1%	-0.1%	-0.2%
Guaynabo	1.4%	0.7%	0.3%
Bayamón	1.2%	0.2%	0.2%
Carolina	0.7%	0.5%	0.4%
Cataño	2.6%	-1.4%	-0.5%
Trujillo Alto	1.7%	2.2%	1.3%
Guaynama	0.3%	0.8%	0.5%
Gurabo	2.0%	2.5%	1.5%
Comerío	1.1%	-0.1%	0.1%
Las Piedras	2.2%	2.1%	1.4%
Aguas Buenas	1.3%	1.3%	0.9%
Humacao	1.6%	0.7%	0.7%
Aibonito	1.2%	0.6%	0.4%
Arroyo	1.1%	0.1%	0.2%
Patillas	1.0%	0.3%	0.2%
San Lorenzo	0.8%	1.6%	1.0%
Yabucoa	1.6%	0.7%	0.6%
Juncos	1.8%	1.6%	1.2%
Maunabo	0.4%	0.3%	0.4%
Área Primaria	1.4%	0.7%	0.6%
Área Secundaria	0.7%	0.9%	0.2%
Área Terciaria	1.3%	1.1%	0.8%
Área de Mercado	0.8%	0.8%	0.4%
Puerto Rico	1.6%	0.8%	0.8%

- En el área de mercado la mayor parte, o un 53% de la población, se encuentra en el cohorte de edades de entre 20 y 59 años. De este total, un 32% se encuentra entre las edades de 35 y 59 años, lo cual es positivo para el desarrollo propuesto, ya que es en este rango de edades es en donde caería el perfil del cliente potencial para un proyecto residencial como el propuesto.

Población por Edades

	0-19 años	20-59 años	> 60 años
Cidra	34.2%	53.7%	12.1%
Caguas	31.0%	53.0%	16.0%
Cayey	32.0%	52.5%	15.5%
San Juan	27.0%	53.0%	19.1%
Guaynabo	29.2%	54.1%	16.7%
Bayamón	30.0%	52.8%	17.2%
Carolina	29.5%	54.3%	16.3%
Cataño	35.7%	50.8%	13.5%
Trujillo Alto	32.6%	54.5%	12.9%
Guaynama	33.8%	52.8%	13.4%
Gurabo	32.7%	54.8%	12.5%
Comerío	34.3%	51.6%	13.1%
Las Piedras	32.5%	54.6%	12.8%
Aguas Buenas	32.8%	53.1%	14.0%
Humacao	33.2%	53.1%	14.8%
Aibonito	34.1%	51.2%	14.8%
Arroyo	35.0%	50.8%	14.2%
Patillas	33.7%	51.1%	15.2%
San Lorenzo	33.4%	52.6%	14.0%
Yabucoa	33.5%	53.4%	13.1%
Juncos	32.8%	53.7%	13.5%
Maunabo	33.7%	51.1%	15.3%
Área Primaria	31.8%	53.0%	15.2%
Área Secundaria	28.3%	53.3%	17.4%
Área Terciaria	33.3%	52.9%	13.8%
Área de Mercado	30.6%	53.2%	16.2%
Puerto Rico	32.0%	52.6%	15.4%

Fuente: Censo 2000 y Pr Fuente. Censo 2009

- El por ciento de personas mayor de 60 años es significativamente más alto en el área de mercado secundaria, 17.4%. Le sigue el área de mercado primaria con 15.2%, y el área de mercado terciaria con 13.8%. En términos generales, el área de mercado tiene un 16% de personas mayores de 60 años. Esto es algo mayor que el 15.4% para todo Puerto Rico. Entre las edades de 0 a 19 años, el área de mercado tiene un 30.6% de personas.

Hogares

Hogares

	1990	2000	Diferencia
Cidra	9,765	13,204	3,439
Caguas	40,104	46,937	6,833
Cayey	13,742	15,634	1,892
San Juan	150,592	163,462	12,870
Gueynabo	28,856	34,068	5,212
Bayamón	65,785	73,693	7,908
Carolina	54,466	63,546	9,080
Cataño	10,139	9,638	(501)
Trujillo Alto	17,829	24,160	6,331
Guayama	11,922	14,225	2,303
Gurabo	8,421	11,741	3,320
Comerío	5,720	6,311	591
Las Piedras	8,108	11,145	3,037
Aguas Buenas	7,096	9,240	2,144
Humacao	16,021	19,293	3,272
Albonito	7,096	8,408	1,313
Arroyo	5,418	6,166	750
Patillas	5,615	6,576	961
San Lorenzo	10,216	13,138	2,922
Yabucoa	9,980	12,242	2,282
Juncos	9,104	11,933	2,829
Maunabo	3,425	3,994	569
Área Primaria	63,611	75,776	12,164
Área Secundaria	327,667	365,667	40,801
Área Terciaria	108,119	134,412	26,293
Área de Mercado	499,397	575,754	76,357
Puerto Rico	1,054,924	1,261,325	206,401

Fuente: Censo 2000

- El número de hogares en el municipio Cidra aumentó en 3,439 hogares entre el 1990 y el 2000, mientras que en Caguas, hubo un aumento de 6,833 durante el mismo período.
- El área primaria representó el 15% de la formación de hogares en el área de mercado, esto a pesar de contar con sólo 3 de los 22 municipios (13%) del área de mercado.

Permisos de Vivienda

- En el área de mercado, la cantidad de permisos de vivienda expedidos entre el 2000 y 2005 (8,319) fue mayor que la cantidad expedida durante el periodo de 1995 al 2000 (6,702).

Permisos Vivienda, por año

	1990-1995	1996-2000	2000-05
Cidra	114	186	203
Caguas	420	518	942
Cayey	157	168	354
San Juan	1,157	1,324	1,318
Gueynabo	538	520	629
Bayamón	625	668	593
Carolina	580	617	768
Cataño	17	14	41
Trujillo Alto	418	869	466
Guayama	118	296	356
Gurabo	144	203	460
Comerío	10	54	31
Las Piedras	92	182	344
Aguas Buenas	80	52	81
Humacao	198	297	836
Albonito	73	117	103
Arroyo	39	90	187
Patillas	58	80	114
San Lorenzo	77	107	180
Yabucoa	49	148	138
Juncos	157	168	416
Maunabo	20	37	161
Área Primaria	692	879	1,[illegible]
Área Secundaria	3,316	4,011	3,713
Área Terciaria	1,088	1,821	3,169
Área de Mercado	5,094	6,702	8,319
Puerto Rico	10,123	14,[illegible]	18,397

Fuente: Junta de Planificación

- Sin embargo, en el área de mercado secundaria (San Juan) la cantidad de permisos disminuyó durante el periodo del 2000 al 2005. Esto es reflejo de que en San Juan hay escasez de terreno para desarrollar, y de que la población se está mudando hacia otros municipios en la periferia.

Empleos

- Entre el 1990 y 2004, el crecimiento anual de empleos en el área de mercado primaria fue de 2.6%. Esto es muy por encima del crecimiento en el área de mercado total, 1.6% y todo Puerto Rico, 1.4%. Este crecimiento coincide con

las iniciativas de desarrollo económico fomentadas por INTECO y el desarrollo significativo de la industria biotecnológica en la región.

Empleos

	1990	2000	Cre. Anual
Cidra	5,027	7,497	2.9%
Caguas	32,034	45,893	2.8%
Cayey	6,301	12,195	2.8%
San Juan	286,797	321,881	0.8%
Guaynabo	28,672	46,427	3.5%
Bayamón	46,230	61,281	2.2%
Carolina	40,925	57,985	2.5%
Cataño	6,482	13,124	3.2%
Trujillo Alto	6,317	11,436	4.3%
Guayama	10,371	12,923	1.6%
Gurabo	3,500	4,160	1.2%
Comerío	1,644	2,089	2.1%
Las Piedras	5,916	7,328	1.5%
Aguas Buenas	2,562	2,149	-1.2%
Humacao	17,148	21,778	1.7%
Aibonito	4,424	5,605	1.7%
Arroyo	1,961	2,257	1.5%
Patillas	1,920	2,081	0.8%
San Lorenzo	4,509	4,714	0.3%
Yabucoa	5,162	3,430	-2.9%
Juncos	2,873	5,562	5.4%
Maunabo	1,065	1,718	3.3%
Área Primaria	45,362	64,364	2.9%
Área Secundaria	418,833	512,134	1.5%
Área Terciaria	82,763	76,762	1.4%
Área de Mercado	536,763	653,270	1.6%
Puerto Rico	980,817	1,042,883	1.4%

Fuente: DTRH, Composición Industrial

Ingreso

- Durante el año 2000, el ingreso por hogar en el área de mercado primaria, $30,964 fue similar al de Puerto Rico, $30,806.

Ingreso por Hogar

	1990	2000	Cre. Anual
Cidra	$19,886	$31,790	5.3%
Caguas	$21,704	$32,207	4.0%
Cayey	$16,794	$26,538	4.7%
San Juan	$26,816	$41,193	4.5%
Guaynabo	$38,422	$59,620	4.5%
Bayamón	$24,681	$34,991	3.6%
Carolina	$25,868	$38,363	4.0%
Cataño	$22,725	$32,648	3.7%
Trujillo Alto	$23,939	$42,725	6.0%
Guayama	$16,048	$26,438	5.9%
Gurabo	$18,922	$34,400	6.2%
Comerío	$12,731	$19,841	4.4%
Las Piedras	$18,969	$34,787	2.4%
Aguas Buenas	$17,721	$27,547	4.5%
Humacao	$19,548	$29,280	4.1%
Aibonito	$17,853	$25,838	3.7%
Arroyo	$14,885	$22,402	4.2%
Patillas	$13,138	$22,727	5.8%
San Lorenzo	$4,143	$8,545	7.5%
Yabucoa	$4,368	$7,634	5.7%
Juncos	$4,600	$7,938	5.0%
Maunabo	$3,626	$6,731	6.4%
Área Primaria	$20,211	$30,964	4.4%
Área Secundaria	$26,677	$41,643	4.3%
Área Terciaria	$18,863	$28,471	4.7%
Área de Mercado	$23,814	$36,339	4.3%
Puerto Rico	$20,806	$30,806	4.4%

Fuente: DTRH, Comp. Puerto Cruzas y Cuentas Nacionales

Perfil Demográfico de las Áreas Alrededor del Proyecto

Para llevar a cabo un perfil demográfico de las áreas inmediatas al proyecto, se evaluaron 7 variables socioeconómicas para la población que reside en un radio de tres millas del terreno. Para estos propósitos se compararon los datos reportados en los Censos de Población y Vivienda de 1990 y 2000, cuyos resultados se presentan a continuación:

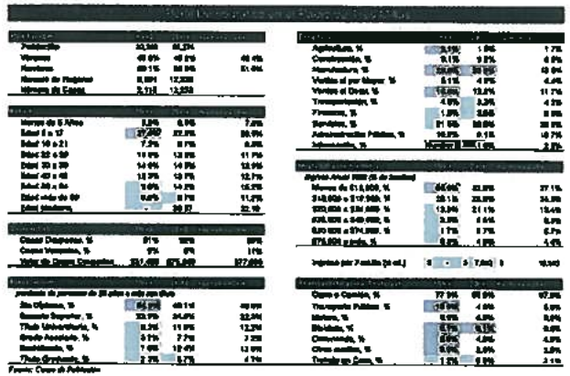
- El sector donde ubica el proyecto, es uno de alto crecimiento. A tres millas radiales del proyecto propuesto, la población reportada fue de 32,356 habitantes en 1990 y 39,274 en 2000. Lo que representa un cambio porcentual anual de 2 puntos. Esto es un crecimiento mayor que el cambio de 0.8% anual para toda la población de Puerto Rico.

- El perfil de edad y sexo es similar al de Puerto Rico, con una mediana de edad de casi 31 años en el 2000.

- Proporcionalmente, la población de las personas en el segmento de 5 a 17 años ha disminuido, mientras que el segmento de 50 a 64 años ha aumentado. Esto es similar a la tendencia existente en todo Puerto Rico.

- Al menos 92 de cada 100 viviendas en las áreas examinadas, se encontraban ocupadas en el año 2000, lo que es superior a 89 de cada 100 viviendas ocupadas en todo Puerto Rico. Este patrón es reflejo de un área donde la mayoría de las viviendas se utiliza como vivienda principal.

- El valor de la vivienda es similar al promedio de Puerto Rico. El promedio de las viviendas ocupadas dentro de las tres millas radiales evaluadas, fue menor en el año 2000, $75,949, que en el correspondiente año para todo Puerto Rico, donde se reportó un promedio de $77,000.



- Igual que para todo Puerto Rico, un 40% de la población mayor o con 25 años de edad en el área evaluada, reportó no tener diploma de escuela superior.

- La mayoría de las personas en el área evaluada, estaban empleadas en el sector de servicios, seguido por el sector de manufactura y ventas al detal.

- En el radio de tres millas, existe una proporción levemente mayor a la de Puerto Rico de familias con ingresos superiores a $50,000 .

- La mayoría de las personas en el área evaluada, un 88%, reportaron contar con un vehículo propio. Esto es cónsono con el comportamiento de todo Puerto Rico.

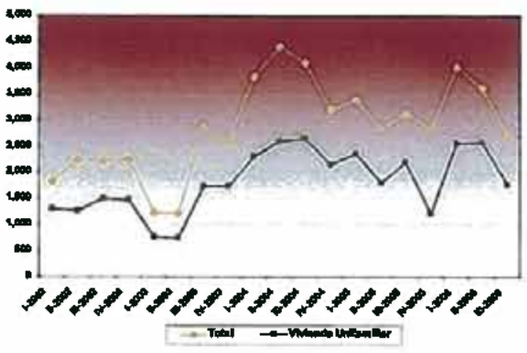
DEMANDA Y OFERTA DE VIVIENDA EN EL ÁREA DE MERCADO

Tendencias en Puerto Rico

El análisis de las tendencias en Puerto Rico a continuación incluye únicamente proyectos de vivienda en proyectos residenciales. La fuente de información es el *Construction and Sales Activity Report*, que prepara trimestralmente Estudios Técnicos, Inc.

Las ventas de unidades de vivienda se han acelerado desde el primer trimestre del 2002 (ver siguiente gráfica). De 1,836 unidades trimestrales que se vendían en dicha fecha, crecieron hasta 2,741 unidades en el tercer trimestre del 2006. Esto, aunque durante el último trimestre del 2006 las ventas se debilitaron, según se puede apreciar en la tabla a continuación.

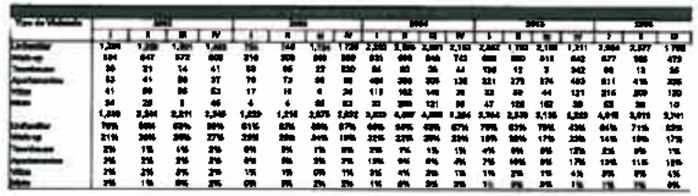
Ventas de Viviendas Total y Unifamiliar en Puerto Rico 2002-2006



Fuente: *Construction and Sales Activity Report, Estudios Técnicos, Inc.*

Por su parte, las unidades de vivienda de tipo unifamiliar (que son las evaluadas para propósitos de este análisis), también han mostrado una tendencia de aumento en sus ventas desde el primer trimestre del 2002, aunque en menor escala que las ventas dentro de todos los segmentos para Puerto Rico. De 1,294 unidades que se vendieron en el primer trimestre del 2002, las ventas aumentaron hasta 1,768 unidades en el tercer trimestre del 2006.

Las ventas de proyectos de vivienda tipo unifamiliar se encuentran en primer lugar como las de mayor venta en Puerto Rico (ver siguiente tabla), estando en segundo lugar la venta de "walkups", y en tercer lugar la venta de apartamentos.



Fuente: *Construction and Sales Activity Report, Estudios Técnicos, Inc.*

Durante el primer trimestre del 2002 al tercer trimestre del 2006 se vendieron en Puerto Rico un promedio de 2,870 unidades al año, de las que en promedio 1,822 unidades, o un 63% fueron unidades unifamiliares.

En términos de ventas por región destaca que en casi toda la Isla las ventas de unidades tipo unifamiliar se encuentran en primer lugar, excepto en la región de San Juan, donde la venta de apartamentos se encuentra en primer lugar. Esto se debe en parte, a que todas las demás regiones (excluyendo a San Juan) cuentan con terrenos amplios en donde se pueden construir tipos de proyectos de vivienda más espaciosos, y a la preferencia de las personas de fuera de la zona metropolitana por unidades de vivienda

unifamiliares. Las regiones con mayor venta de unidades unifamiliares fueron: Aguadilla, Arecibo, Caguas y Guayama.

En el Municipio de Cidra todas las ventas fueron de unidades unifamiliares. Este patrón es cónsono con el comportamiento de la región a la cual pertenece el municipio, que es la región de Caguas.

El sector de vivienda unifamiliar es el que más distribuido tiene los precios. La mayoría, o un 24% de las unidades unifamiliares, se encuentran en el renglón de $200,000 a $299,000. A diferencia, el sector de "walkups" tiene el 63% de las unidades en los renglones de entre $125,000 y $199,000 (ver siguiente tabla), y el de villas con 91% de las unidades en el renglón de $300,000 o más.

Ventas por Renglón de Precio, 1er Trimestre 2006						
K$	Unifamiliar	Walk-up	Townhouse	Apartamentos	Villas	Mixto
40-69	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
70-89	23.4%	8.0%	40.0%	0.0%	0.0%	0.0%
90-104	5.3%	8.0%	37.1%	0.0%	0.0%	0.0%
105-124	11.1%	0.8%	0.0%	0.0%	0.0%	0.0%
125-149	12.8%	32.3%	0.0%	0.0%	2.5%	0.0%
150-199	16.7%	29.8%	2.9%	12.5%	6.7%	80.0%
200-299	24.0%	16.9%	20.0%	60.3%	0.0%	40.0%
300 -	6.6%	4.0%	0.0%	27.2%	90.8%	0.0%

Fuente: *Construction and Sales Activity Report, Estudios Técnicos, Inc.*

Oferta y Demanda en el Área de Mercado

Proyectos de Vivienda Activos en el Área de Mercado

El mercado de vivienda en el área de mercado refleja buena actividad sin indicios de saturación o burbujas especulativas. De un total de 259 proyectos activos en el tercer trimestre del 2006 con 28,375 unidades, se habían vendido 10,516 y se opcionado 8,283. Esto implica que cerca de dos terceras partes del inventario de vivienda se absorbieron por el mercado o están en vías de cierre.

En el mercado de unidades de vivienda de $300,000 o más el desempeño fue mejor. En un total de 102 proyectos con 8,929 unidades con precios mayores a $300,000, un total de 6,227 unidades se vendieron u opcionaron. El 47% de las unidades fueron vendidas y el 23% opcionadas. Refiérase al Apéndice #2 para el detalle de estos proyectos.

En el área primaria de mercado había un total de 31 proyectos activos durante el mismo periodo, con un total de 3,348 unidades de las cuales 2,102 o el 63% habían sido vendidas u opcionadas. (Refiérase al Apéndice II, página 1)

En el mercado primario, los proyectos activos de unidades unifamiliares de $300,000 o más solamente tienen disponible un 25% de su inventario inicial, lo que implica que habrá necesidad de nueva construcción en este segmento del mercado. En el segmento, había un total de 11 proyectos, con un total de 1,596 unidades. De este total, 1,007 unidades habían sido vendidas y 173 opcionadas, para un total de 1,180 unidades o 74% de las unidades que habían sido vendidas u opcionadas. La mayoría de los proyectos fueron desarrollados en el municipio de Caguas. (Refiérase al Apéndice II, página 2)

El proyecto de mayor costo en el área de mercado primaria es Las Nubes, ubicado en la comunidad Hacienda San José de Caguas. Este proyecto ofrece un total de 120 unidades con unidades con un espacio habitable promedio de 5,000 pies cuadrados. La unidad típica tiene 4 habitaciones y 3.5 baños. Los precios fluctúan entre $750,000 y $1.5 millones.

Por su parte, el área secundaria y terciaria, tenían un total de 22 y 12 proyectos en la categoría unifamiliar de $300,000 o más respectivamente. En el área secundaria, los 22 proyectos ofrecieron un total de 1,693 unidades, de las cuales un 42% o 716 unidades se encontraban vendidas u opcionadas. La mayoría de los proyectos se encontraban en el municipio de Guaynabo (Refiérase al Apéndice II, página 3). El por ciento de inventario es alto porque se incluye el proyecto Monticiello de 800 unidades, para el cual no se tienen datos de ventas.

El área terciaria tenía un total de 1,857 unidades de vivienda unifamiliar en el renglón de $300,000 o más. De éste total, 1,618 unidades o el 87% habían sido vendidas u opcionadas. La mayoría de los proyectos se encontraban concentrados en los municipios de Humacao o Gurabo. Tres de los proyectos de Humacao se encontraban dentro de la comunidad de Palmas del Mar. (Refiérase al Apéndice II, página 4)

Algunos de los principales hallazgos sobre los proyectos en toda el área de mercado son:

- En términos de unidades por proyecto, van desde 2 hasta 800 unidades.
- Todos estos proyectos se venden a un precio promedio por pie cuadrado de más de $188.
- Sus tamaños incluyen desde 2,000 p.c. hasta 7,000 p.c., con un tamaño promedio de 1,959 pies cuadrados.
- El tamaño de los solares fluctúa entre los 300 m.c. hasta 2,000 m.c.
- En promedio, los proyectos tienen 3 habitaciones y 2 baños.

Sin embargo, la evaluación específica de los proyectos unifamiliares de $300,000 o más para las tres sub-áreas de mercado en conjunto arrojó lo siguiente:

- Se vendieron a precios promedio de entre $225 y $300 por pie cuadrado.
- El tamaño promedio es de 2,800 pies cuadrados.
- El tamaño promedio de los solares es de 455 metros.
- Las unidades tienen un promedio de 4 habitaciones y 2.5 baños.

Evaluación de Ventas Comparables en el Área de Mercado Primaria

Además de evaluar los proyectos residenciales en el área de mercado, según el *Construction & Sales Activity Report* publicado por Estudios Técnicos, Inc. trimestralmente, se evaluaron ventas comparables del año 2005 del banco de datos de Luis Abreu y Asociados de viviendas unifamiliares de $300,000 o más en el área de mercado primaria. Como se menciona anteriormente, esta área se compone de los municipios de Cidra, Caguas y Cayey. Además, se hizo una evaluación individual de las ventas comparables de Sabanera, que aunque es un proyecto viejo, se entiende sería el más similar al proyecto propuesto en el área de mercado, considerando su localización, composición y tipo de amenidades ofrecidas.

Los datos que se presentan a continuación son un indicador del mercado. No obstante, por tratarse del mercado de re-venta, los precios por pie cuadrado tienden a ser más bajos que los precios de los proyectos nuevos.

Según la evaluación de ventas comparables del 2005 para los municipios antes mencionados, se encontró lo siguiente:

- En Cidra las unidades de vivienda se vendieron a un promedio de $143 por pie cuadrado, tenían 3 habitaciones y 2 baños, y tenían un tamaño promedio de 2,400 pies cuadrados. Estos precios son bajos porque incluyen unidades de vivienda en proyectos que no son nuevos y que tienen viviendas con diferentes condiciones físicas. El dato refleja mayormente el mercado de reventa en Sabanera, donde hay grandes diferencias de precio, o entre $112 a $165 por pie cuadrado.

- En Cayey las unidades de vivienda se vendieron a un promedio de $147 por pie cuadrado, tenían 4 habitaciones y 2 baños, y también tenían un tamaño promedio de 2,400 pies cuadrados.

Sin embargo, en Caguas se pudo apreciar una diferencia significativa en las características de las unidades vendidas, las cuales tuvieron un precio de venta promedio por pie cuadrado de $150, un promedio de 4 habitaciones y 3 baños, y un tamaño promedio de 2,600 pies cuadrados. Los precios de vivienda en los proyectos de nueva construcción son en promedio más alto.

Para más detalles de estos proyectos, refiérase el Apéndice #3.

En cuanto a la urbanización Sabanera, la tabla a continuación presenta un resumen de las unidades vendidas durante el 2005.

Nombre	Municipio	Precio de venta	Fecha de Venta	Cuartos	Baños	Área de terreno m.c	Área de Casa p.c	Precio por p.c
SABANERA	CIDRA	315,000	2005	4	3	1,547	2,382	132
SABANERA	CIDRA	290,000	2005	3	2	1,463	2,150	121
SABANERA	CIDRA	295,000	2005	3	2	1,345	2,294	128
SABANERA	CIDRA	340,000	2005	3	2	1,255	2,238	152
SABANERA	CIDRA	400,000	2005	3	3	1,299	3,241	123
SABANERA	CIDRA	370,000	2005	3	2	1,368	3,140	118
SABANERA	CIDRA	372,000	2005	4	3	1,473	2,794	133
SABANERA	CIDRA	310,000	2005	4	2	1,117	2,772	112
SABANERA	CIDRA	295,000	2005	3	2	1,211	1,762	167
SABANERA	CIDRA	360,000	2005	4	2	1,297	2,278	158
Promedio/Promedio Ponderado		$329,700		3	2	1,332	2,502	$132

Fuente: *Banco de Datos Luis Abreu y Asociados*

Según la tabla anterior, se puede observar que las unidades vendidas en Sabanera tuvieron un precio promedio de $329,700. El precio por pie cuadrado promedio de estas unidades fue de $132, mientras que el tamaño promedio de las unidades es de 2,500 pies cuadrados. La unidad típica tiene 3 habitaciones y 2 baños. También se pudo apreciar en la tabla anterior, que mientras más grande la unidad de vivienda, más bajo el precio de venta promedio por pie cuadrado. Un ejemplo sería la unidad más pequeña vendida (1,762 p.c.) que tenían un precio por pie cuadrado promedio de $167, mientras que la unidad más grande vendida (3,241 p.c.) tenía un precio promedio de

$123 por pie cuadrado. Esto puede reflejar expansiones a unidades de vivienda que no añadieron valor a la unidad proporcional a su expansión.

Demanda en el Área de Mercado

Todos los componentes del análisis al igual que las conclusiones están expresados de acuerdo a los municipios que componen el área de mercado residencial, según descrita anteriormente en la sección de delimitación del área de mercado.

Metodología

El modelo de evaluación del mercado de vivienda utilizado en el informe proyecta la demanda y la oferta de vivienda generada por hogares y otras fuentes.

La necesidad de vivienda está determinada por el incremento en el número de hogares, que se estima con los siguientes factores: el aumento en la población, y la disminución en el número de personas por hogar.

Estimado de Demanda

El crecimiento proyectado en la población de cada municipio se calculó utilizando la población reportada por el Censo de Población para el 2000 y las proyecciones de población de la Junta de Planificación. Para determinar la población que habría durante el periodo del 2006-2015 se interpoló entre ambos valores.

Población Proyectada

Interpolando las proyecciones de la Junta de Planificación para el 2013

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2020
Cidra	42,353	43,214	44,737	45,736	46,801	48,343	48,179	49,229	49,646	52,152
Caguas	129,302	130,231	131,660	133,079	134,481	135,913	136,179	136,467	136,764	142,952
Gurabo	45,170	45,233	45,154	45,410	45,658	45,580	45,645	45,711	45,791	48,956
San Juan	436,394	433,291	430,726	429,945	428,765	427,569	426,814	425,940	426,868	416,361
Guaynabo	100,053	100,818	102,720	103,825	105,281	103,537	103,686	103,583	105,916	104,065
Bayamón	224,044	224,923	227,264	227,100	227,536	227,453	227,719	227,972	228,320	228,859
Carolina	186,076	187,784	192,300	192,555	195,212	196,987	196,684	194,298	195,152	198,683
Canóvanas	30,071	30,163	30,991	30,821	30,652	30,484	30,319	30,151	30,325	30,479
Trujillo Alto	75,720	82,248	83,723	84,669	85,867	86,877	88,869	87,630	89,620	92,669
Gurabo	42,301	45,824	46,945	46,275	46,446	46,678	46,858	47,040	47,232	48,237
Gurabo	36,185	40,315	40,366	41,435	41,991	43,564	42,879	43,497	43,998	47,158
Canovanas	30,902	30,214	30,229	30,264	30,299	30,334	30,367	30,398	30,513	30,661
Las Piedras	34,485	37,185	38,055	38,531	39,017	39,502	39,983	40,356	40,856	43,166
Aguas Buenas	29,932	30,734	31,800	31,348	31,498	31,745	31,994	32,141	32,540	33,560
Aguas Buenas	59,835	62,584	62,900	62,896	63,089	63,284	63,397	63,391	63,624	64,259
Aibonito	26,493	27,290	27,389	27,379	27,469	27,559	27,648	27,721	27,863	28,184
Arroyo	19,317	19,643	19,488	19,315	19,346	19,380	19,409	19,437	19,466	19,738
Patillas	20,152	20,477	20,513	20,549	20,585	20,620	20,648	20,674	20,734	20,753
San Lorenzo	40,997	43,764	44,183	44,399	45,629	45,445	45,799	46,135	46,486	48,720
Yabucoa	39,246	40,943	41,124	41,486	41,835	41,266	42,089	42,771	42,479	43,679
Juncos	36,852	39,348	39,266	40,281	40,641	41,082	41,647	41,813	42,181	44,636
Maunabo	13,741	13,842	13,881	13,873	13,882	13,918	13,919	13,931	13,966	13,976
Área Primaria	230,835	238,718	238,791	240,782	241,790	242,818	243,894	244,530	246,106	249,434
Área Secundaria	1,003,546	1,004,391	1,006,004	1,006,000	1,009,691	1,007,418	1,007,005	1,006,004	1,008,317	1,007,404
Área Terciaria	410,700	401,648	406,998	407,305	406,405	403,644	406,035	402,340	404,520	420,057
Área de Mercado	1,644,707	1,704,419	1,748,184	1,753,041	1,757,791	1,753,670	1,757,206	1,771,162	1,774,643	1,751,205

Fuente: Censo de Población 2000 y Junta de Planificación.

Según la tabla anterior, en el 2006 el área de mercado tenía una base poblacional de 1.74 millones de personas, que debe aumentar a 1.79 millones en el 2020.

Para conocer el número de personas por hogar (también conocido como el "*headship rate*") durante el periodo de 2006 al 2020, se proyectó linealmente para cada municipio de acuerdo a la tendencia en dicha variable entre el 1990 y el 2000. Es importante conocer este parámetro pues la demanda de vivienda está vinculada, al menos parcialmente, a la generación de hogares. Por consiguiente, se estimó el número de hogares que había en cada municipio dividiendo la población entre la proyección de este "*rate*". Durante el periodo del 2006 al 2020, se estimó que el "rate" va a fluctuar entre 2.9 y 2.3 personas por hogar en el área de mercado.

Número de Personas por Hogar

Número de personas por hogar, proyectado a base de la tendencia de los años 1990 a 2000

	2005	2006	2007	2008	2010	2011	2012	2013	2020
Cidra	3.0	3.0	2.9	2.9	2.8	2.8	2.7	2.7	2.5
Caguas	2.8	2.7	2.7	2.7	2.6	2.6	2.6	2.5	2.3
Gurabo	2.8	2.8	2.7	2.7	2.7	2.6	2.6	2.5	2.3
San Juan	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.3
Guaynabo	2.7	2.7	2.7	2.6	2.6	2.6	2.5	2.5	2.3
Bayamón	2.8	2.8	2.7	2.7	2.7	2.6	2.6	2.6	2.3
Carolina	2.7	2.7	2.7	2.6	2.6	2.6	2.5	2.5	2.3
Canóvanas	2.9	2.9	2.9	2.8	2.8	2.8	2.7	2.7	2.5
Trujillo Alto	3.0	3.0	2.9	2.9	2.9	2.9	2.9	2.8	2.7
Gurabo	2.9	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.3
Gurabo	2.9	2.9	2.9	2.8	2.8	2.8	2.8	2.7	2.5
Canovanas	2.9	2.9	2.9	2.8	2.8	2.7	2.7	2.7	2.6
Las Piedras	2.9	2.9	2.9	2.8	2.8	2.8	2.7	2.7	2.5
Aguas Buenas	2.9	2.9	2.8	2.8	2.8	2.7	2.7	2.6	2.3
Aguas Buenas	2.9	2.8	2.8	2.8	2.8	2.7	2.7	2.6	2.4
Aibonito	2.9	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.3
Arroyo	2.8	2.8	2.8	2.7	2.7	2.6	2.6	2.5	2.2
Patillas	2.8	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.1
San Lorenzo	2.9	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.4
Yabucoa	2.9	2.9	2.9	2.8	2.8	2.7	2.7	2.6	2.3
Juncos	2.9	2.8	2.8	2.8	2.7	2.7	2.7	2.7	2.4
Maunabo	2.9	2.9	2.9	2.8	2.7	2.7	2.6	2.6	2.3
Área Primaria	2.8	2.8	2.8	2.7	2.7	2.6	2.6	2.6	2.3
Área Secundaria	2.7	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.3
Área Terciaria	2.8	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.4
Área de Mercado	2.7	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.3

Fuente: Censo de Población 2000.

Proyección del Número de Hogares

Dividiendo la población proyectada entre el headship rate proyectado

	2005	2006	2007	2008	2010	2011	2012	2013	2020
Cidra	15,209	15,495	15,841	16,236	16,864	17,209	17,766	17,927	18,264	21,154
Caguas	46,547	47,842	49,010	50,198	51,549	52,749	53,763	54,829	55,862	64,455
Gurabo	16,036	16,266	16,466	16,715	16,889	16,999	17,179	17,384	17,594	20,611
San Juan	163,458	165,753	167,753	169,189	170,854	172,526	173,556	174,671	176,622	180,219
Guaynabo	36,888	37,468	37,986	38,354	38,881	39,486	40,207	40,966	41,941	45,189
Bayamón	79,680	80,884	81,778	82,686	83,966	85,198	86,279	87,620	88,942	98,761
Carolina	68,966	70,486	71,838	73,631	75,389	76,967	78,122	79,283	80,683	87,155
Canóvanas	10,638	10,760	10,880	10,999	11,117	11,234	11,352	11,468	11,583	12,883
Trujillo Alto	25,198	27,091	27,871	28,394	29,072	29,698	30,772	29,764	31,284	33,784
Gurabo	14,355	15,997	16,185	16,179	16,715	17,096	17,464	17,923	18,411	20,720
Gurabo	12,741	13,717	14,007	14,745	15,213	15,448	15,719	16,138	16,562
Canovanas	6,343	6,251	6,991	7,081	7,195	7,305	7,512	7,675	8,067
Las Piedras	11,144	12,845	13,196	13,511	13,848	14,182	14,496	14,771	15,287
Aguas Buenas	9,849	10,262	10,798	11,016	11,257	11,539	11,791	12,034	12,393
Aguas Buenas	19,391	21,896	22,227	22,589	23,139	23,681	24,045	24,115	25,267
Aibonito	8,486	9,216	9,491	9,760	9,961	10,209	10,414	10,586	10,906	12,222
Arroyo	6,160	6,910	6,900	7,001	7,208	7,314	7,442	7,557	7,715	8,574
Patillas	6,378	7,317	7,381	7,494	7,684	7,895	8,112	8,270	8,441	9,349
San Lorenzo	12,188	15,182	15,515	15,884	16,744	16,976	16,998	17,154	17,315	20,128
Yabucoa	13,541	14,749	14,757	14,989	15,193	15,373	15,553	15,744	16,045	18,166
Juncos	12,953	13,717	14,012	14,231	14,639	14,965	15,296	15,581	15,901	18,320
Maunabo	4,904	4,976	5,045	4,949	4,998	5,023	5,070	5,098	5,148	5,769
Área Primaria	79,778	84,213	84,986	87,616	90,923	94,041	97,149	99,239	96,281	107,986
Área Secundaria	388,887	398,988	408,888	417,825	418,881	427,888	433,891	437,882	443,977	471,888
Área Terciaria	184,413	188,778	190,889	188,903	189,188	188,888	188,788	179,888	178,888	204,888
Área de Mercado	578,766	588,887	588,768	588,888	588,988	588,887	588,888	588,811	588,788	588,778

Fuente: Censo de Población 2000 y Junta de Planificación.

La proyección resultó en un total de 635,447 hogares en el 2006 y 780,374 hogares en el 2020. Esto supone un aumento absoluto de aproximadamente 35% durante dicho periodo.

Estimado de Oferta

La estimación de la oferta de vivienda toma como base el número de unidades de vivienda ocupadas, según reportadas por el Censo en el 2000. A esta base se le suman el número de unidades de vivienda en proyectos aprobados por la Administración de Reglamentos y Permisos durante el periodo del 2000 al segundo trimestre de 2006. La tabla a continuación presenta el estimado de oferta para el área de mercado del proyecto.

Vivienda Ocupada

Proyección y la vivienda ocupada en el 2000 según censo. Las proyecciones de crecimiento de cada año

	2000	2001	2002	2003	2004	2005	2006
Cidra	13,204	13,436	13,640	13,924	14,098	14,333	14,458
Caguas	46,931	47,906	48,725	50,078	51,070	51,901	52,803
Cayey	15,634	15,882	16,400	16,735	17,095	17,296	17,413
San Juan	163,482	165,345	166,699	167,936	168,781	170,359	171,415
Guaynabo	34,068	33,005	35,342	35,709	36,284	36,721	36,895
Bayamón	73,693	74,502	75,194	75,662	76,285	76,880	77,300
Carolina	62,546	63,252	65,132	66,252	66,865	67,392	67,968
Cataño	9,838	9,784	8,990	8,393	9,908	9,841	9,924
Toa Alta	26,160	24,773	25,399	25,759	26,056	26,478	26,685
Gubernam	14,225	14,442	14,725	15,231	15,422	15,753	16,122
Gurabo	11,741	12,258	12,606	13,221	13,758	14,452	15,093
Comerío	6,311	6,348	6,357	6,421	6,465	6,471	6,506
Las Piedras	11,165	11,621	11,926	12,185	12,404	12,611	12,948
Aguas Buenas	9,240	9,258	9,396	9,504	9,593	9,642	9,725
Humacao	19,281	19,566	20,719	21,113	21,808	22,092	22,640
Aibonito	8,426	8,581	8,615	8,681	8,823	8,918	9,024
Arroyo	6,166	6,263	6,447	6,668	7,054	7,268	7,482
Patillas	6,576	6,718	6,757	6,801	7,004	7,224	7,435
San Lorenzo	13,138	13,254	13,508	13,579	13,974	14,352	14,300
Yabucoa	12,342	12,379	12,431	12,732	12,801	12,871	13,076
Juncos	11,935	12,173	12,436	12,697	13,467	13,736	14,271
Maunabo	3,994	4,293	4,316	4,626	4,637	4,634	4,673
Área Primaria	78,575	77,884	79,786	80,777	82,266	83,432	84,487
Área Secundaria	369,887	373,631	377,688	385,784	394,169	397,571	398,387
Área Terciaria	134,412	137,218	140,037	143,988	148,882	148,818	152,526
Área de Mercado	578,784	587,674	596,923	608,858	619,468	630,823	635,000

Fuentes: Censo de Población 2000

Según el estimado anterior, en el 2006 hubo una oferta de 628,098 viviendas, en contraste con 578,754 unidades que había en el 2000. Esto refleja un aumento de 9% en la oferta durante el periodo 2000-2006.

Evaluación del Mercado General

Para calcular la demanda neta se restan las proyecciones de demanda y oferta de vivienda. Los datos indican que en el área de mercado habrá necesidad de vivienda que el proyecto propuesto podrá suplir. La necesidad de vivienda será de 35,658 unidades en el 2009, de la cual sólo un 50% será suplida por el mercado formal, considerando el ingreso de la población del área de mercado. Esto sugiere que en realidad habrá una necesidad de 17,829 unidades en el 2009, o de 1,486 unidades de vivienda mensuales para toda el área de mercado. El proyecto propuesto suplirá 540 unidades, o un 36% de la necesidad estimada.

Exceso Demanda - Oferta

Se restan los hogares ya ocupados a la demanda por nuevos hogares

	2006	2007	2008	2009	2010	2011	2012	2013	2020
Cidra	996	1,388	1,785	2,211	2,664	3,053	3,374	3,811	9,265
Caguas	(329)	77	893	1,748	2,634	3,482	4,328	5,231	14,681
Cayey	(227)	15	300	570	856	1,140	1,431	1,732	3,778
San Juan	937	2,581	3,890	5,114	6,361	8,004	9,536	11,183	22,184
Guaynabo	566	1,180	1,629	2,106	2,760	3,312	3,888	4,466	8,701
Bayamón	3,101	4,295	5,500	6,660	7,905	8,939	10,125	11,642	22,241
Carolina	2,436	3,503	4,669	5,830	7,019	8,154	9,317	10,514	19,787
Cataño	39	79	126	177	227	289	362	438	1,078
Toa Alta	736	1,249	1,831	2,397	2,981	3,591	4,249	4,959	8,621
Guaynabo	(325)	63	252	661	922	1,282	1,688	1,929	4,468
Gurabo	(1,378)	(1,030)	(696)	(345)	25	553	695	1,041	5,619
Comerío	358	392	586	890	795	909	1,026	1,144	2,041
Las Piedras	(59)	245	662	881	1,214	1,511	1,772	2,134	4,496
Aguas Buenas	818	1,065	1,311	1,596	1,814	2,056	2,309	2,568	4,557
Humacao	(742)	(407)	(49)	314	691	1,061	1,465	1,776	4,627
Aibonito	382	569	756	919	1,101	1,300	1,482	1,643	3,199
Arroyo	(352)	(436)	(537)	(194)	(68)	61	193	331	1,374
Patillas	(66)	38	319	569	720	677	836	1,006	2,314
San Lorenzo	882	1,256	1,384	1,955	2,328	2,867	3,834	3,935	6,328
Yabucoa	836	1,141	1,413	1,721	2,041	2,359	2,649	3,029	5,664
Juncos	(965)	(764)	44	342	642	895	1,364	1,624	4,843
Maunabo	(199)	(112)	(46)	65	152	251	765	453	1,339
Área Primaria	38	1,601	2,956	4,658	8,114	7,684	9,236	10,934	25,313
Área Secundaria	7,798	12,380	17,296	23,104	27,688	32,284	37,216	43,004	94,152
Área Terciaria	(464)	2,082	4,730	8,026	12,370	15,676	18,788	22,186	49,888
Área de Mercado	7,372	16,013	24,982	35,788	48,172	55,644	65,240	76,124	169,379

EVALUACIÓN DE LAS TENDENCIAS LABORALES DE LA REGIÓN E IMPACTO ECONÓMICO DEL PROYECTO

A continuación se lleva a cabo un estimado de la aportación económica del proyecto en el contexto del mercado laboral de la región de Caguas, según descrita por el *Bureau of Labor Statistics (BLS)*. La región de Caguas, según descrita por el BLS la componen los municipios de: Caguas, Cayey, Cidra, Gurabo y San Lorenzo. Además, se evalúa el impacto económico que tendrá el desarrollo propuesto en la fase de construcción y de la actividad generada por los residentes del proyecto.

Evaluación de las Tendencias Laborales en la Región de Caguas

En la región de Caguas ha ocurrido un deterioro en las tendencias de empleo, según se evidencia por lo siguiente:

- El total de empleos en la región disminuyó de 115,000 empleos a 105,200 durante el periodo 2004-2005, o en 9,800 empleos, una reducción de 9%. En contraste, el número de empleos de todo Puerto Rico, disminuyó a un ritmo mucho menor de 1% durante el mismo periodo.
- El desempleo de la región aumentó 4%, ó en 510 personas desempleadas durante el periodo 2004-2005. Se reportaron reducciones sustanciales en la fuerza laboral.
- Aumentó la tasa de desempleo en 1.2 puntos porcentuales en el 2005.

La tabla a continuación resume los detalles de empleo y desempleo de la región.

	[illegible]							
	Empleo							
	1998	1999	2000	2001	2002	2003	2004	2005
Caguas	82,800	84,200	85,300	84,200	83,800	83,900	89,200	80,800
Cayey	15,100	15,200	15,700	15,300	14,300	14,900	15,400	14,800
Cidra	15,000	15,200	15,700	15,400	13,200	13,800	14,600	13,700
Gurabo	10,700	10,000	11,200	11,000	11,900	12,400	13,400	13,800
San Lorenzo	10,700	11,200	11,800	11,300	12,100	12,800	13,400	12,800
Total	134,300	107,800	110,800	108,200	105,100	108,800	116,000	105,200
Puerto Rico	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

	Desempleo							
	1998	1999	2000	2001	2002	2003	2004	2005
Caguas	6,900	6,100	5,300	5,700	6,800	5,700	6,800	6,100
Cayey	2,300	2,200	2,080	1,900	2,300	2,300	2,200	2,200
Cidra	1,700	1,500	1,320	1,480	1,710	1,540	1,780	1,900
Gurabo	1,500	1,340	1,180	1,380	1,840	1,610	1,470	1,800
San Lorenzo	2,300	1,900	1,520	1,480	1,830	1,680	1,600	1,800
Total	14,400	13,200	11,500	13,130	13,780	14,100	13,000	13,800
Puerto Rico	[illegible]	[illegible]	132,800	147,[illegible]	[illegible]	147,000	[illegible]	[illegible]

	Tasa de Desempleo							
	1998	1999	2000	2001	2002	2003	2004	2005
Caguas	11.11%	10.07%	8.90%	8.30%	10.88%	10.70%	8.36%	10.78%
Cayey	13.22%	12.94%	11.38%	11.38%	13.06%	13.17%	12.82%	13.17%
Cidra	10.16%	9.62%	8.83%	8.62%	11.47%	11.76%	10.78%	12.19%
Gurabo	12.30%	10.90%	9.38%	13.38%	11.48%	11.49%	9.82%	10.80%
San Lorenzo	17.66%	15.08%	11.66%	11.86%	11.87%	11.88%	11.02%	12.84%
Total	13.19%	11.88%	9.46%	10.13%	11.89%	11.40%	10.33%	11.46%
Puerto Rico	13.36%	11.76%	10.11%	11.33%	12.34%	11.88%	[illegible]	11.84%

Fuente: Department of Labor and Human Resources, Bureau of Labor Statistics

A continuación se realiza una evaluación del impacto económico del proyecto y en que proporción el mismo contribuye a la disminución del desempleo existente en la región.

Impacto Económico del Proyecto

Para estimar el impacto económico del proyecto se tomaron en consideración los siguientes supuestos:

- Que se desarrollarán un total de 540 unidades de vivienda. De este total, 300 son unidades tipo "walkup" y 240 son unidades unifamiliares. Tienen un tamaño

promedio de 1,800 pies cuadrados y 2,500 pies cuadrados respectivamente. Se desarrollarán a razón de 100 unidades al año comenzando en el 2009 hasta el 2012, y en el 2013 serán 140 unidades. En los primeros 3 años se construirán los "walkups", y en los últimos 2 años las unidades unifamiliares.

- Los costos de construcción utilizados para el componente residencial son de $120 para los "walkups" y de $130 por pie cuadrado para la unidades unifamiliares.

- Se considera un costo adicional de infraestructura de $5 millones para todo el proyecto.

Los costos de construcción se calcularon teniendo en cuenta el aumento de los precios para cada uno de los años en los que se planifica la construcción, utilizando una tasa de inflación de 5.5%. Además, los estimados de costo se basan en una definición preliminar del proyecto, según provista por el proponente. Esta información cambiará según se vaya conceptualizando el diseño final del proyecto.

El impacto económico del proyecto propuesto tiene dos componentes principales: (1) los efectos de la inversión en la construcción y (2) el impacto del proyecto una vez que este se encuentre ocupado por sus habitantes. El primero de estos efectos es temporero, pero tendrá un efecto significativo en el empleo y el ingreso durante la fase de construcción. El segundo es un efecto recurrente.

Ambos impactos, tanto el de la construcción y el de ocupación, se pueden dividir en dos partes. La primera es el impacto directo en empleos y salarios. La segunda consiste de los efectos indirectos e inducidos del proyecto en el empleo y los salarios. Ambos se sumaron para llegar a un estimado del impacto agregado durante las fases de construcción y de ocupación.

Los parámetros del modelo de estimación de impacto económico durante las fases de construcción y ocupación se encuentran en las próximas dos tablas. Los multiplicadores

desarrollados por la Junta de Planificación se aplicaron a los datos primarios para a su vez determinar los efectos indirectos en términos de empleos e inversión. El análisis también utiliza los multiplicadores de impacto inducido de la Junta de Planificación. Estos multiplicadores son ampliamente utilizados para determinar relaciones entre varios sectores industriales de la economía, calculando el impacto que el crecimiento de un sector tendrá en otros sectores.

Supuestos	
Inflación Proyectada	4.5%
Inflación para Construcción	5.5%
Supuestos sobre Empleos Directos	
Empleos Directos por Operaciones	
Residencial - Empleos Operación por $ millón inversión	0.86
Salario promedio por empleado para primer año de operación	
Operación de residencias	$13,457
Supuestos sobre Tasas Contributivas	
Tasas Contributivas para Construcción	
Permisos (sellos) de Construcción ($5.00 por $1,000 invertidos)	0.50%
Patentes de Construcción ($5.00 por $1,000 invertidos)	0.50%
Arbitrio Municipal de Construcción	2.90%
Ganancia Neta antes de Contribución por cada dólar de ingresos	5.00%
Tasa contributiva promedio de ingresos de Corporaciones	9.43%
Tasas Contributivas en la Fase de Ocupación	
Impuesto Patente Municipal	0.50%
Tasa contributiva sobre la propiedad (con valor de 1964)	8.1%
Tasas Contributiva sobre ingreso de individuos	8.0%
Supuestos sobre Multiplicadores Económicos	
Multiplicadores de la Construcción	
Multiplicadores de Empleo (empleos por millón de construcción, dólares del 1987)	
Coeficiente de Empleo Directo	20.31
Coeficiente de Empleo Directo e Indirecto	31.32
Coeficiente de Empleo Directo, Indirecto e Inducido	45.23
Multiplicadores de Ingreso para la Construcción	
Multiplicador de Ingreso Tipo I (Directo + Indirecto)	1.780
Multiplicador de Ingreso Tipo II (Directo, Indirecto en Inducido)	2.780
Multiplicadores para la Fase de Ocupación	
Multiplicadores de Empleo	
Directo e Indirecto (Tipo I)	
Operación Residencial	2.90
Directo, Indirecto e Inducido (Tipo II)	
Operación Residencial	4.10
Multiplicadores de Ingreso	
Directo e Indirecto	
Residencial (Sierra Ruinas)	3.08
Directo, Indirecto e Inducido	
Residencial	4.73

Empleo e Ingreso – Fase de Construcción

El costo de construcción del proyecto se estimó en $187.6 millones. Su construcción tendrá una duración de cinco años. Se estima que el proyecto comenzará su fase de construcción en el 2009 y estará completado en el 2013. La inversión promedio es de $37.5 millones al año durante el periodo de cinco años.

Inversión Total en la Construcción

En Millones	2009	2010	2011	2012	2013	Total	Promedio
Residencial	$25.2	$28.5	$28.0	$43.8	$64.1	$187.6	$37.5
Inversión total en la construcción	$25.2	$28.5	$28.0	$43.8	$64.1	$187.6	$37.5

El impacto directo, indirecto e inducido del proyecto durante la fase de construcción se presenta en la tabla siguiente. De acuerdo a los estimados, el proyecto tiene el potencial de generar un promedio de 206 empleos directos y 252 empleos indirectos e inducidos al año durante la fase de construcción. Esto resulta en un total de 458 empleos directos, indirectos e inducidos promedio al año.

Empleos Generados por Construcción

Número de Empleos Anuales	2009	2010	2011	2012	2013	Total	Promedio
Residencial	260	260	260	519	721	2,281	458
Empleos Generados por Construcción	260	260	260	519	721	2,281	458
Empleos directos de construcción (d)	167	167	167	233	324	1 029	206
Empleos indirectos e inducidos (i)	193	193	193	286	397	1,252	252

En cuanto al ingreso generado por la construcción, el proyecto tiene el potencial de generar un promedio anual de $4.7 millones en ingreso directo y $8.2 millones en ingreso indirecto e inducido durante la fase de construcción. Esto resulta en un ingreso directo, indirecto e inducido total promedio al año de $12.8 millones.

Ingreso Generado por la Construcción

En Millones	2009	2010	2011	2012	2013	Total	Promedio
Ingresos directo	$3.2	$3.3	$3.5	$5.4	$7.8	$23.3	$4.7
Ingreso indirecto e inducido	$5.6	$5.8	$6.1	$9.5	$13.7	$40.8	$8.2
Ingreso generado por la construcción	$8.8	$9.2	$9.6	$14.9	$21.6	$64.1	$12.8

Impacto Fiscal

Durante la fase de construcción, el proyecto generará ingresos fiscales por un total de $9.3 millones. De este total, $5.6 millones corresponden al municipio y $3.7 millones al gobierno central. En promedio, esto resulta en ingresos fiscales de $1.8 millones al año, de los cuales $1.1 millones irían al municipio y $737,236 al gobierno central.

Ingresos Fiscales al Gobierno Generados por la Construcción del Proyecto

En Dólares	2009	2010	2011	2012	2013	Total	Promedio
Patente de Construcción (estatal)	$125,772	$133,868	$138,987	$218,516	$320,691	$937,945	$187,589
Patente de Construcción Municipal	$125,772	$133,868	$138,987	$218,516	$320,691	$937,945	$187,589
Arbitrio Municipal de Construcción	$828,868	$883,440	$886,935	$1,084,879	$1,403,606	$4,888,725	$977,945
Contribución s/ Ingresos Empleos Constrc.	$259,982	$267,396	$278,429	$432,837	$627,840	$1,865,363	$372,677
Impuestos Corporativos de Corredores	$118,883	$126,178	$132,283	$206,534	$302,426	$886,864	$176,971
Total de Ingresos Recaba	$1,364,697	$1,381,460	$1,881,403	$2,171,773	$3,175,241	$9,313,893	$1,862,779
Ingreso al Fisco Municipal	$784,831	$798,136	$839,923	$1,313,485	$1,921,446	$5,627,870	$1,125,534
Ingreso al Fisco Estatal	$606,306	$626,264	$661,480	$858,277	$1,253,695	$3,686,183	$737,236

Empleo e Ingreso – Fase de Ocupación

Los impactos directos en empleo e ingreso se estimaron utilizando varias fuentes de información, como el Censo Económico y data de empleo del Departamento de Trabajo y Recursos Humanos. Además, se utilizaron estimados de Estudios Técnicos, Inc.

Los impactos indirectos e inducidos se estimaron con los multiplicadores provistos por los estimados realizados por la Junta de Planificación en el 1987. Estos varían de acuerdo a los diferentes tipos de desarrollo. Los multiplicadores tipo I y II fueron utilizados para estimar los impactos indirectos e inducidos basados en un estimado de impacto directo.

La tabla siguiente presenta los impactos del empleo y el ingreso durante la fase de ocupación. El primero resultó en un promedio anual de 154 empleos directos y 479 empleos indirectos e inducidos. Esto resulta en un total de 633 empleos directos, indirectos e inducidos en promedio al año. Los empleos directos incluyen los que generará la operación del proyecto y la demanda por servicios de los residentes en el proyecto.

Empleos Generados por la Fase de Ocupación del Proyecto Bosques de Cidra

Número de Empleos Anuales	2013	2014	2015	2016	2017	2018	2019	2020	Promedio
Empleo en residencias (directos)	108	161	161	161	161	161	161	161	154
Empleo residencias indirecto e inducido	328	500	500	500	500	500	500	500	479
Empleo en residencias (dir, ind, inducidos)	**436**	**661**	**661**	**661**	**661**	**661**	**661**	**661**	**633**
Total de empleos de operación	**436**	**661**	**661**	**661**	**661**	**661**	**661**	**661**	**633**
Directos en operaciones	108	161	161	161	161	161	161	161	154
Indirectos e inducidos por operaciones	328	500	500	500	500	500	500	500	479

De acuerdo a los estimados, el proyecto tiene el potencial de generar un promedio de $2.1 millones en ingreso directo y $7.8 millones en ingreso indirecto e inducido al año durante la fase de ocupación. Esto resulta en un total promedio de $9.9 millones al año de ingreso directo, indirecto e inducido.

Ingreso Personal Generado por la Fase de Ocupación

En Millones	2013	2009	2007	2008	2058	2010	2011	2012	Promedio
Residencias - Ingreso directo	$1.4	$2.2	$2.2	$2.2	$2.2	$2.2	$2.2	$2.2	$2.1
Residencias - Ingreso indirecto e inducido	$6.3	$8.1	$8.1	$8.1	$8.1	$8.1	$8.1	$8.1	$7.8
Ingreso personal generado por residencias	**$8.8**	**$10.3**	**$10.3**	**$10.3**	**$10.3**	**$10.3**	**$10.3**	**$10.3**	**$9.9**
Operación total -Ingresos directo	$1.4	$2.2	$2.2	$2.2	$2.2	$2.2	$2.2	$2.2	$2.1
Operación total - Ingresos indirecto e inducido	$6.3	$8.1	$8.1	$8.1	$8.1	$8.1	$8.1	$8.1	$7.8
Ingreso total generado por la operación	**$8.8**	**$10.3**	**$10.3**	**$10.3**	**$10.3**	**$10.3**	**$10.3**	**$10.3**	**$9.9**

Aportación del Proyecto a las Condiciones de Empleo Existentes en la Región de Caguas

Según las evaluaciones llevadas a cabo anteriormente, el desarrollo propuesto contribuye a una reducción de 3% en el número de personas desempleadas anualmente durante el periodo de construcción.

Por otro lado, la contribución del proyecto durante en su fase de ocupación, será de un promedio de 633 empleos al año. Esto significa una reducción adicional en el número de personas desempleadas de la región de 6%.

Lo anterior es muy positivo para el desarrollo económico de la región, especialmente para el municipio de Cidra, que es el que mayor crecimiento ha reflejado en el desempleo durante los últimos 7 años. En total, el desarrollo propuesto contribuiría a reducir el desempleo de la región a razón de 9% durante sus fases de construcción y ocupación.

APÉNDICE I:
REGISTRO FOTOGRÁFICO DE VISITA DE CAMPO AL ÁREA DEL PROYECTO

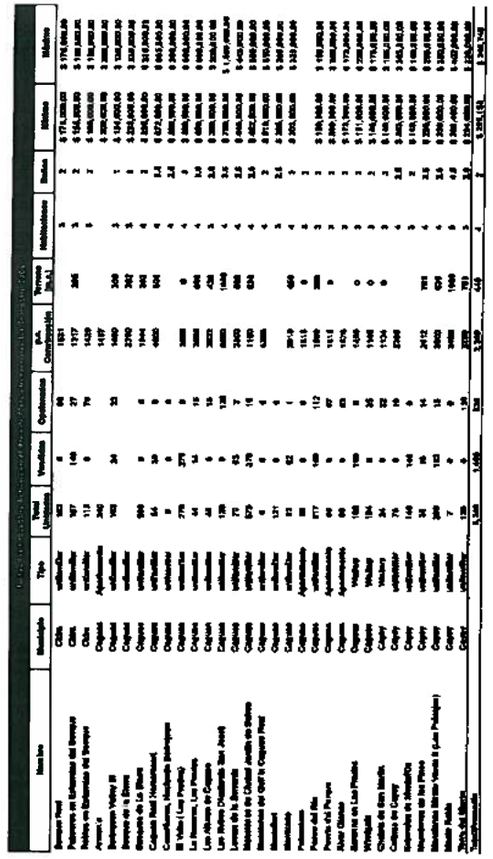
Apéndice I: Registro Fotográfico de Visita de Campo al Área del Proyecto

Noviembre de 2006 (las fotos comienzan desde el centro comercial Plaza Cidra, por la carr. 172 en direccion hacia Caguas)

23
24
25
26
27
28
29
30
31
32
33
34

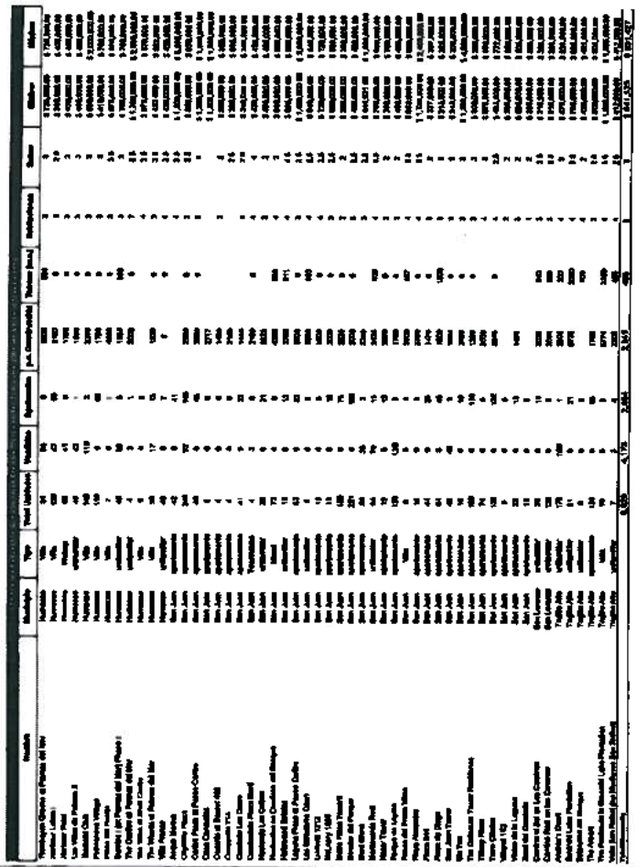
65
66
67
68
69
70
71
72
73
74
75
76

APÉNDICE II:
TABLAS DEL CONSTRUCTION & SALES ACTIVITY REPORT



Nombre	Municipio	Tipo	Total Unidades	Vendidas	Opcionadas	p.c. Construcción	Terreno (m.c.)	Habitaciones	Baños	Mínimo	Máximo
Caguas Real Homestead	Caguas	unifamiliar	54	30	0	4800	800	4	3.5	$ 572,000.00	$ [illegible]
El Valle (Las Prados)	Caguas	unifamiliar	276	276	0	[illegible]	0	4	3	$ [illegible]	$ [illegible]
La Ramera, Las Prados	Caguas	unifamiliar	44	14	15	3800	800	4	3.5	$ [illegible]	$ [illegible]
Los Robles (Hacienda San José)	Caguas	unifamiliar	120	0	120	[illegible]	1000	4	3.5	$ 700,000.00	$ 1,[illegible]
Lomas de la Barranca	Caguas	unifamiliar	70	65	2	[illegible]	800	4	3.5	$ 445,000.00	$ 440,[illegible]
Mansiones de Ciudad Jardín de Bairoa	Caguas	unifamiliar	675	575	19	1100	500	4	3.0	$ [illegible]	$ [illegible]
Mansiones del Golf in Caguas Real	Caguas	unifamiliar	6	0	0	4200		4	3	$ 610,000.00	$ 610,000.00
[illegible]	Caguas	unifamiliar	83	82	1	2016	440	4	3	$ [illegible]	$ [illegible]
Colinas de Cayey	Cayey	unifamiliar	78	0	10	2300		4	2.5	$ [illegible]	$ [illegible]
Mansiones Monte Verde II (Los Pabellones)	Cayey	unifamiliar	210	153	15	3000	[illegible]	4	3.5	$ 150,000.00	$ [illegible]
Monte Rubio	Cayey	unifamiliar	7	0	0	3400	1000	5	4.5	$ 388,480.00	$ 402,000.00
Total/Promedio			1,536	1,097	173	3,340	793	4	3	$ 463,175	$ 570,000

Nombre	Municipio	Tipo	Total Unidades	Vendidas	Opcionadas	p.c. Construcción	Terreno (m.c.)	Habitaciones	Baños	Mínimo	Máximo
Hacienda Los Collins	San Juan	unifamiliar	30	6	21	[illegible]		3	2	$ 400,000.00	$ [illegible]
Hollywood Estates	San Juan	unifamiliar	30	5	10	[illegible]	611	4	4.5	$ [illegible]	$ [illegible]
Los Miradores Court	San Juan	unifamiliar	6	6	0	[illegible]	400	4	2.5	$ [illegible]	$ [illegible]
Montecarlo Real	San Juan	unifamiliar	94	79	15	[illegible]	400	4	3.5	$ 700,000.00	$ [illegible]
Sabanera Estates	Guaynabo	unifamiliar	14	0	11	[illegible]	[illegible]	5	5	$ [illegible]	$ [illegible]
Garden Estates	Guaynabo	unifamiliar	16	0	0	[illegible]	1000	4	3.5	$ [illegible]	$ [illegible]
Laderas de Monte Verde	Guaynabo	unifamiliar	22	0	12			4	3.5	$ 372,000.00	$ 475,000.00
L'Hermitage	Guaynabo	unifamiliar	4	0	3	7000	1800	5	7	$ 3,700,000.00	$ 3,700,000.00
Puerto de Mieva	Guaynabo	unifamiliar	15	0	0	[illegible]	1200	5	6	$ 2,000,000.00	$ 4,[illegible]
Thistle Hills	Guaynabo	unifamiliar	4	0	0	5000	0	4	4	$ 1,[illegible]	$ 1,[illegible]
Vallata Lodge	Guaynabo	unifamiliar	3	0	0	4800	3000	4	3.5	$ 1,300,000.00	$ 1,[illegible]
Villa Marcelina (phase 2)	Guaynabo	unifamiliar	14	13	1	3120	[illegible]	4	3.5	$ [illegible]	$ [illegible]
Villas de Montecasino	Guaynabo	unifamiliar	400	0	0	0	0	4	2.5	$ [illegible]	$ [illegible]
Mirabella Village & Club	Bayamón	unifamiliar	194	0	61	2700	800	4	3.5	$ [illegible]	$ [illegible]
Hacienda Mi Sueño	Carolina	unifamiliar	37	0	38	3000	[illegible]	3	2.5	$ 671,700.00	$ 700,000.00
Hacienda Rios	Carolina	unifamiliar	189	154	31	2200	475	4	2	$ 400,000.00	$ 475,000.00
Los Mimosas	Carolina	unifamiliar	30	30	0	3000	600	4	2.5	$ [illegible]	$ [illegible]
Mansiones de Villamar Ibanez III	Carolina	unifamiliar	30	0	1	2700	400	4	2.5	$ [illegible]	$ [illegible]
Andrea's Court	Trujillo Alto	unifamiliar	175	160	1	2200	300	4	3	$ 475,000.00	$ [illegible]
Emerald Lake Plantation	Trujillo Alto	unifamiliar	21	5	21	3700	1000	4	3.5	$ 700,000.00	$ [illegible]
Estancias del Bosque	Trujillo Alto	unifamiliar	4	0	0		400	4	2	$ 425,000.00	$ 425,000.00
Valle San Rafael (ex Mansiones San Rafael)	Trujillo Alto	unifamiliar	7	3	4	2300	400	4	2.5	$ 412,000.00	$ 412,000.00
Total/Promedio			1,803	462	274	3,640	760	4	3	$ 894,443	$ 991,833



APÉNDICE III:
VENTAS COMPARABLES DE $300,000 O MÁS EN EL ÁREA PRIMARIA DE MERCADO, ABREU & ASOCIADOS

Nombre	Municipio	Precio de venta	Fecha de venta	Cuartos	Baños	Area de casa p.c	Precio por p.c
SABANERA DEL RIO	CIDRA	415,000	2005	3	2	2,997	138
SABANERA DEL RIO	CIDRA	390,000	2005	3	2	2,456	159
SABANERA	CIDRA	350,000	2005	4	2	2,378	154
SABANERA	CIDRA	318,000	2005	4	2	2,772	112
SABANERA	CIDRA	372,000	2005	4	3	2,794	133
SABANERA	CIDRA	370,000	2005	3	2	3,140	118
SABANERA	CIDRA	400,000	2005	3	3	3,241	123
SABANERA	CIDRA	340,000	2005	3	2	2,238	152
SABANERA	CIDRA	315,000	2005	4	2.5	2,362	133
HACIENDA SABANERA	CIDRA	310,000	2005	3	2	2,297	135
HACIENDA SABANERA	CIDRA	330,000	2005	3	2	2,094	158
HACIENDA SABANERA	CIDRA	370,000	2005	3	2	2,236	165
HACIENDA SABANERA	CIDRA	335,000	2005	3	2	2,072	162
HACIENDA SABANERA	CIDRA	340,000	2005	3	2	2,062	165
HACIENDA SABANERA	CIDRA	325,000	2005	3	2	2,278	143
FREIRE	CIDRA	300,000	2005	3	3	1,892	159
Promedio/Promedio Ponderado		$348,280		3	2	2,427	$143

Nombre	Municipio	Precio de venta	Fecha de venta	Cuartos	Baños	Area de casa p.c	Precio por p.c
TERRA DEL VALLE	CAYEY	338,900	2005	3	2	1,581	214
MANSIONES DE MONTE VERDE	CAYEY	325,000	2005	3	2.5	1,982	164
MANSIONES DE MONTE VERDE	CAYEY	335,000	2005	4	2.5	2,463	136
MANSIONES DE MONTE VERDE	CAYEY	334,900	2005	4	2.5	2,463	136
MANSIONES DE MONTE VERDE	CAYEY	420,000	2005	4	2.5	2,463	171
MANSIONES DE MONTE VERDE	CAYEY	345,000	2005	4	2.5	2,463	140
MANSIONES DE MONTE VERDE	CAYEY	310,000	2005	3	2.5	2,051	151
MANSIONES DE MONTE VERDE	CAYEY	488,000	2005	4	2.5	2,885	147
MANSIONES DE MONTE VERDE	CAYEY	332,000	2005	4	2.5	2,463	135
MANSIONES DE MONTE VERDE	CAYEY	329,250	2005	4	2.5	2,463	134
MANSIONES DE MONTE VERDE	CAYEY	325,000	2005	4	2.5	2,473	131
MANSIONES DE MONTE VERDE	CAYEY	368,997	2005	4	2.5	2,463	150
MANSIONES DE MONTE VERDE	CAYEY	318,000	2005	4	2.5	2,463	129
MANSIONES DE MONTE VERDE	CAYEY	308,000	2005	4	2.5	2,463	125
MANSIONES DE MONTE VERDE	CAYEY	494,880	2005	4	2.5	3,230	153
MANSIONES DE MONTE VERDE	CAYEY	329,000	2005	4	2.5	2,463	134
Promedio/Promedio Ponderado		$338,438		4	2	2,431	$147

Nombre	Municipio	Precio de venta	Fecha de venta	Cuartos	Baños	Área de casa p.c	Precio por p.c
ABOMANTE	CAGUAS	495,000	2006	4	3.5	2,862	173
ABOMANTE	CAGUAS	393,000	2005	4	3.5	2,715	145
ABOMANTE	CAGUAS	386,000	2005	4	3.5	2,770	139
ABOMANTE	CAGUAS	412,990	2004	4	3.5	2,515	164
CAGUAS REAL HOME RESORT	CAGUAS	555,700	2006	4	3.5	3,795	172
CAGUAS REAL HOME RESORT	CAGUAS	595,000	2005	4	3.5	3,732	159
CAGUAS REAL HOME RESORT	CAGUAS	560,000	2005	4	3.5	3,732	172
CAGUAS REAL HOME RESORT	CAGUAS	726,000	2005	4	3.5	3,732	194
CAGUAS REAL HOME RESORT	CAGUAS	479,250	2005	4	3.5	3,752	127
CAGUAS REAL HOME RESORT	CAGUAS	456,000	2005	4	3.5	3,752	121
CAMINO REAL	CAGUAS	325,000	2005	3	3	2,053	158
CAMINO REAL	CAGUAS	323,000	2005	3	3	2,447	132
CAUTIVA	CAGUAS	459,041	2006	4	4.5	3,453	133
CAUTIVA	CAGUAS	462,067	2006	4	4.5	3,696	125
CAUTIVA	CAGUAS	442,000	2006	4	3.5	3,199	138
CAUTIVA	CAGUAS	555,000	2006	4	4.5	3,611	154
CAUTIVA	CAGUAS	530,700	2006	4	4.5	3,496	151
CAUTIVA	CAGUAS	515,493	2006	4	4.5	3,456	150
CAUTIVA	CAGUAS	514,990	2006	4	4	3,443	149
CAUTIVA	CAGUAS	510,000	2005	4	4.5	3,496	146
CAUTIVA	CAGUAS	509,999	2006	4	3.5	3,491	146
CAUTIVA	CAGUAS	467,250	2006	4	3.5	3,123	150
CAUTIVA	CAGUAS	480,543	2006	4	4.5	3,499	137
CAUTIVA	CAGUAS	444,724	2006	4	4.5	3,495	127
CAUTIVA	CAGUAS	436,963	2006	4	4.5	3,691	125
CAUTIVA	CAGUAS	656,000	2006	4	4.5	3,498	187
CAUTIVA	CAGUAS	496,000	2006	4	4.5	3,436	144
CAUTIVA	CAGUAS	475,000	2005	4	4.5	3,488	136
CAUTIVA	CAGUAS	434,199	2005	4	4.5	3,499	122
CAUTIVA	CAGUAS	643,334	2005	4	3.5	3,497	184
CAUTIVA	CAGUAS	496,347	2005	4	4.5	3,493	142
CAUTIVA	CAGUAS	486,844	2005	4	4.5	3,483	133
CAUTIVA	CAGUAS	457,482	2005	4	4.5	3,497	129
CAUTIVA	CAGUAS	535,000	2005	4	4.5	3,351	160
CAUTIVA	CAGUAS	533,129	2005	4	4.5	3,483	153
CAUTIVA	CAGUAS	510,028	2005	4	4.5	3,496	146
CAUTIVA	CAGUAS	490,000	2005	4	4.5	3,496	137
CAUTIVA	CAGUAS	497,500	2005	4	4.5	3,496	139
CAUTIVA	CAGUAS	579,999	2005	4	4.5	3,294	159
CAUTIVA	CAGUAS	499,979	2005	4	4.5	3,496	140
CAUTIVA	CAGUAS	482,152	2005	4	4.5	3,496	138
CAUTIVA	CAGUAS	451,500	2005	4	4.5	3,425	141
CAUTIVA	CAGUAS	444,526	2005	4	4.5	3,496	127
CAUTIVA	CAGUAS	441,701	2005	4	4.5	3,439	128
CAUTIVA	CAGUAS	495,527	2005	4	3.5	3,139	158
CAUTIVA	CAGUAS	433,188	2005	4	3.5	3,201	135
CAUTIVA	CAGUAS	568,183	2005	4	4.5	3,499	162
CAUTIVA	CAGUAS	526,000	2005	4	4.5	3,495	150
CAUTIVA	CAGUAS	499,900	2005	4	4.5	3,496	143
CAUTIVA	CAGUAS	483,901	2005	4	4.5	3,356	144
CAUTIVA	CAGUAS	444,479	2005	4	4.5	3,496	127
CAUTIVA	CAGUAS	447,525	2005	4	4.5	3,496	128
CAUTIVA	CAGUAS	447,271	2005	4	4.5	3,496	128
CAUTIVA	CAGUAS	443,847	2005	4	4.5	3,496	126
CAUTIVA	CAGUAS	436,884	2005	4	3.5	3,199	134
CAUTIVA	CAGUAS	545,000	2005	4	4.5	3,499	157
CAUTIVA	CAGUAS	516,704	2005	4	3.5	3,139	165
CAUTIVA	CAGUAS	502,971	2005	4	3.5	3,139	161
CAUTIVA	CAGUAS	490,394	2005	4	4.5	3,496	140
CAUTIVA	CAGUAS	469,523	2005	4	4.5	3,496	134
CAUTIVA	CAGUAS	459,398	2005	4	3.5	3,496	131
CAUTIVA	CAGUAS	439,930	2005	4	3.5	3,496	126
CAUTIVA	CAGUAS	555,259	2005	4	4.5	3,496	159
CAUTIVA	CAGUAS	472,499	2005	4	4.5	3,496	135
CAUTIVA	CAGUAS	462,993	2005	4	4.5	3,430	135
CAUTIVA	CAGUAS	443,980	2005	4	4.5	3,496	127
CAUTIVA	CAGUAS	516,000	2005	4	4.5	3,496	154
CAUTIVA	CAGUAS	496,998	2005	4	3.5	3,139	158

Nombre	Municipio	Precio de venta	Fecha de venta	Cuartos	Baños	Área de casa p.c	Precio por p.c
CHALETS DE BARDA	CAGUAS	300,000	2006	4	2.5	1,835	161
CHALETS DE BARDA	CAGUAS	320,000	2006	4	2.5	1,860	165
CHALETS DE BARDA	CAGUAS	372,000	2006	4	2.5	2,275	164
CHALETS DE BARDA	CAGUAS	350,000	2006	4	2.5	1,658	211
CHALETS DE BARDA	CAGUAS	326,088	2005	4	2.5	1,646	197
CHALETS DE BARDA	CAGUAS	300,000	2006	4	2.5	1,671	180
CIUDAD JARDIN	CAGUAS	305,000	2005	4	2.5	1,649	185
CIUDAD JARDIN	CAGUAS	376,000	2005	4	2.5	2,134	176
CIUDAD JARDIN	CAGUAS	365,000	2005	4	2.5	2,116	169
CIUDAD JARDIN	CAGUAS	317,000	2006	4	2.5	1,829	166
CIUDAD JARDIN DE BARDA	CAGUAS	362,000	2006	4	2.5	2,132	164
CIUDAD JARDIN DE BARDA	CAGUAS	310,000	2005	3	2.5	1,738	179
CIUDAD JARDIN DE BARDA	CAGUAS	490,000	2005	4	2.5	2,380	201
CIUDAD JARDIN DE BARDA	CAGUAS	312,000	2006	4	2.5	1,691	191
CIUDAD JARDIN DE BARDA	CAGUAS	308,000	2005	4	2.5	1,673	184
CIUDAD JARDIN DE BARDA	CAGUAS	305,000	2005	4	2.5	1,664	191
EL RETIRO	CAGUAS	378,000	2006	4	2.5	2,196	171
EL RETIRO	CAGUAS	378,000	2006	4	2.5	2,196	171
EL VALLE	CAGUAS	332,000	2006	4	3	2,432	137
EL VALLE	CAGUAS	338,500	2005	4	2.5	2,534	143
EL VALLE	CAGUAS	327,500	2005	4	2.5	2,345	137
EL VALLE	CAGUAS	348,190	2005	4	3	2,432	143
EL VALLE	CAGUAS	345,369	2005	4	2.5	2,452	141
EL VALLE	CAGUAS	340,000	2005	4	2.5	2,379	143
EL VALLE	CAGUAS	335,500	2005	4	3	2,472	136
EL VALLE II	CAGUAS	388,987	2005	4	3	2,462	180
EL VERDE	CAGUAS	378,000	2006	5	4	3,131	120
EL VERDE	CAGUAS	300,000	2006	7	2	2,061	145
ESTANCIAS DE BARDA	CAGUAS	338,000	2005	4	2.5	2,430	139
ESTANCIAS DEL LAGO	CAGUAS	225,000	2005	3	2	1,791	126
ESTANCIAS DEL LAGO	CAGUAS	301,000	2005	4	3	2,080	144
HACIENDA SAN JOSE	CAGUAS	301,807	2006	4	2.5	2,364	128
HACIENDA SAN JOSE	CAGUAS	452,122	2005	4	4.5	3,495	130
HACIENDA SAN JOSE	CAGUAS	498,000	2005	4	4.5	3,514	142
HACIENDA SAN JOSE	CAGUAS	510,585	2005	4	4.5	3,496	146
HACIENDA SAN JOSE	CAGUAS	468,075	2005	4	3.5	2,737	171
HACIENDA SAN JOSE	CAGUAS	414,016	2005	4	3.5	2,732	152
HACIENDA SAN JOSE	CAGUAS	405,076	2005	4	3.5	2,748	147
HACIENDA SAN JOSE	CAGUAS	300,000	2005	4	2.5	2,230	135
HACIENDA SAN JOSE	CAGUAS	410,000	2005	4	3.5	2,760	148
HACIENDA SAN JOSE	CAGUAS	330,000	2005	4	2.5	1,913	167
HACIENDA SAN JOSE	CAGUAS	485,185	2005	4	4.5	3,485	143
HACIENDA SAN JOSE	CAGUAS	348,000	2005	4	2.5	2,374	162
HACIENDA SAN JOSE	CAGUAS	333,000	2005	4	2.5	2,353	142
HACIENDA SAN JOSE	CAGUAS	570,120	2005	4	4.5	3,388	172
HACIENDA SAN JOSE	CAGUAS	338,000	2005	4	2.5	2,303	151
HACIENDA SAN JOSE	CAGUAS	331,000	2005	4	2.5	2,300	136
HACIENDA SAN JOSE	CAGUAS	413,000	2005	4	3.5	2,732	149
HACIENDA SAN JOSE	CAGUAS	319,000	2005	4	2.5	2,190	144
HACIENDA SAN JOSE	CAGUAS	553,800	2005	4	4.5	3,373	173
HACIENDA SAN JOSE	CAGUAS	665,000	2005	4	4.5	3,488	190
HACIENDA SAN JOSE	CAGUAS	540,000	2005	4	4.5	3,432	157
HACIENDA SAN JOSE	CAGUAS	336,000	2005	4	2.5	2,363	142
HACIENDA SAN JOSE	CAGUAS	315,000	2005	4	2.5	2,206	143
LA ESTANCIA	CAGUAS	324,944	2005	4	2.5	2,301	141
LA ESTANCIA	CAGUAS	302,213	2005	4	2.5	2,271	133
LA ESTANCIA	CAGUAS	332,947	2005	4	2.5	2,327	143
LA ESTANCIA	CAGUAS	329,213	2005	4	2.5	2,347	140
LA ESTANCIA	CAGUAS	341,000	2005	4	2.5	2,371	144
LA SERRANIA	CAGUAS	325,000	2005	4	2.5	1,862	187
LA SERRANIA	CAGUAS	333,000	2005	4	2.5	1,971	170
LA SERRANIA	CAGUAS	415,000	2005	4	3.5	2,218	187
LA SERRANIA	CAGUAS	340,000	2005	4	2.5	1,886	179
LA SERRANIA	CAGUAS	370,000	2005	4	2.5	2,168	170
LA SERRANIA	CAGUAS	366,000	2005	4	2.5	1,859	196
LA SERRANIA	CAGUAS	368,000	2005	4	2.5	1,992	185

Nombre	Municipio	Precio de venta	Fecha de venta	Cuartos	Baños	Área de const. m²	Precio por m²
LA SERRANIA	CAGUAS	258,000	2009	4	2.5	1,550	171
LA SERRANIA	CAGUAS	320,000	2005	4	2.5	1,968	165
LA SERRANIA	CAGUAS	460,000	2008	4	2.5	2,022	227
LA SERRANIA	CAGUAS	350,000	2005	4	2.5	2,162	164
LAGEVIEN	CAGUAS	290,000	2005	3	3	2,366	123
LOMAS DE LA SERRANIA	CAGUAS	426,000	2004	4	2.5	2,561	166
LOMAS DE LA SERRANIA	CAGUAS	418,000	2008	4	2.5	2,307	186
LOMAS DE LA SERRANIA	CAGUAS	408,000	2009	4	2.5	2,281	180
LOMAS DE LA SERRANIA	CAGUAS	430,000	2006	4	2.5	2,604	173
LOMAS DE LA SERRANIA	CAGUAS	495,100	2006	4	2.5	2,604	190
LOMAS DE LA SERRANIA	CAGUAS	439,199	2006	4	2.5	2,604	168
LOMAS DE LA SERRANIA	CAGUAS	497,300	2006	4	2.5	2,604	164
LOS PRADOS	CAGUAS	411,114	2005	4	2.5	2,439	168
LOS PRADOS	CAGUAS	351,158	2005	4	3	2,482	142
LOS PRADOS	CAGUAS	318,000	2006	4	2.5	2,373	134
LOS PRADOS	CAGUAS	345,107	2008	4	3	2,478	140
LOS PRADOS	CAGUAS	332,900	2005	4	3	2,482	136
LOS PRADOS	CAGUAS	320,000	2003	4	2.5	2,326	138
LOS PRADOS	CAGUAS	329,000	2001	4	3	2,366	139
LOS PRADOS	CAGUAS	378,915	2004	4	2.5	2,452	157
LOS PRADOS	CAGUAS	365,000	2005	4	1	2,330	163
LOS PRADOS	CAGUAS	333,911	2008	4	2.5	2,373	141
LOS PRADOS	CAGUAS	333,000	2005	4	3	2,475	134
LOS PRADOS	CAGUAS	333,900	2006	4	3	2,475	134
LOS PRADOS	CAGUAS	334,700	2006	4	3	2,481	133
LOS PRADOS	CAGUAS	316,700	2005	4	2.5	2,452	130
LOS PRADOS	CAGUAS	425,891	2003	4	3	2,452	174
LOS PRADOS	CAGUAS	370,677	2006	4	3	2,453	151
LOS PRADOS	CAGUAS	368,210	2006	4	3	2,452	150
LOS PRADOS	CAGUAS	338,100	2006	4	2.5	2,373	141
LOS PRADOS	CAGUAS	330,000	2006	4	3	2,442	135
LOS PRADOS	CAGUAS	330,000	2006	4	2.5	2,373	139
LOS PRADOS	CAGUAS	419,000	2006	4	2.5	2,396	175
LOS PRADOS	CAGUAS	354,230	2005	4	2.5	2,452	144
LOS PRADOS	CAGUAS	341,953	2006	4	2.5	2,373	144
LOS PRADOS	CAGUAS	339,950	2006	4	2.5	2,452	139
LOS PRADOS	CAGUAS	339,979	2006	4	2.5	2,474	137
LOS PRADOS	CAGUAS	338,500	2006	4	3	2,462	138
LOS PRADOS	CAGUAS	338,000	2006	4	3	2,462	138
LOS PRADOS	CAGUAS	336,000	2006	4	2.5	2,452	137
LOS PRADOS	CAGUAS	330,637	2005	4	2.5	2,452	135
LOS PRADOS	CAGUAS	339,367	2006	4	2.5	2,373	139
LOS PRADOS	CAGUAS	426,000	2005	4	2.5	2,452	174
LOS PRADOS	CAGUAS	365,473	2001	4	2.5	2,373	154
LOS PRADOS	CAGUAS	349,000	2005	4	3	2,471	145
LOS PRADOS	CAGUAS	356,000	2005	4	3	2,492	144
LOS PRADOS	CAGUAS	348,778	2005	4	3	2,452	142
LOS PRADOS	CAGUAS	343,394	2005	4	3	2,492	140
LOS PRADOS	CAGUAS	339,998	2005	4	2.5	2,452	139
LOS PRADOS	CAGUAS	329,484	2006	4	2.5	2,373	139
LOS PRADOS	CAGUAS	323,461	2006	4	2.5	2,373	136
LOS PRADOS	CAGUAS	330,513	2005	4	2.5	2,379	139
LOS PRADOS	CAGUAS	346,661	2005	4	2.5	2,452	142
LOS PRADOS	CAGUAS	343,446	2006	4	2.5	2,373	145
LOS PRADOS	CAGUAS	336,894	2006	4	3	2,452	138
LOS PRADOS	CAGUAS	332,341	2006	4	2.5	2,373	140
LOS PRADOS	CAGUAS	320,000	2006	4	2.5	2,379	135
LOS PRADOS	CAGUAS	349,731	2003	4	3	2,492	140
LOS PRADOS	CAGUAS	345,900	2006	4	3	2,377	146
LOS PRADOS	CAGUAS	364,442	2004	4	2.5	2,452	149
LOS PRADOS	CAGUAS	358,221	2006	4	3	2,492	144
LOS PRADOS	CAGUAS	354,367	2005	4	2.5	2,452	145
LOS PRADOS	CAGUAS	363,513	2004	4	3	2,410	145
LOS PRADOS	CAGUAS	335,500	2003	4	3	2,452	137
LOS PRADOS	CAGUAS	334,230	2004	4	2.5	2,373	137
LOS PRADOS	CAGUAS	332,230	2006	4	2.5	2,373	135
LOS PRADOS	CAGUAS	340,013	2006	4	2.5	2,373	143
LOS PRADOS	CAGUAS	340,013	2006	4	2.5	2,373	143

Nombre	Municipio	Precio de venta	Fecha de venta	Cuartos	Baños	Área de const. m²	Precio por m²
LOS PRADOS	CAGUAS	330,000	2006	4	2.5	2,362	140
LOS PRADOS	CAGUAS	326,413	2006	4	2.5	2,373	138
LOS PRADOS	CAGUAS	334,579	2005	4	2.5	2,373	137
LOS PRADOS	CAGUAS	334,330	2005	4	2.5	2,373	137
LOS PRADOS	CAGUAS	345,025	2002	4	3	2,470	144
LOS PRADOS	CAGUAS	323,000	2002	4	2.5	2,373	138
LOS PRADOS	CAGUAS	324,241	2006	4	2.5	2,466	131
LOS PRADOS	CAGUAS	343,733	2006	4	2.5	2,516	137
LOS PRADOS	CAGUAS	345,000	2006	4	2.5	2,373	145
LOS PRADOS	CAGUAS	356,000	2006	4	2.5	2,466	144
LOS PRADOS	CAGUAS	342,000	2006	4	3	2,461	141
LOS PRADOS	CAGUAS	326,000	2006	4	2.5	2,373	137
MANSIONES CIUDAD JARDIN	CAGUAS	468,000	2006	4	2.5	2,454	190
MANSIONES CIUDAD JARDIN	CAGUAS	470,000	2005	4	2.5	2,044	230
MANSIONES CIUDAD JARDIN	CAGUAS	447,000	2005	4	2.5	2,282	196
MANSIONES CIUDAD JARDIN	CAGUAS	357,000	2005	4	2.5	2,193	167
MANSIONES CIUDAD JARDIN	CAGUAS	459,000	2005	4	2.5	2,044	220
MANSIONES CIUDAD JARDIN	CAGUAS	465,000	2004	4	2.5	2,120	188
MANSIONES CIUDAD JARDIN	CAGUAS	389,000	2004	4	2.5	2,118	197
MANSIONES CIUDAD JARDIN	CAGUAS	445,000	2005	4	2.5	2,250	198
MANSIONES CIUDAD JARDIN	CAGUAS	384,000	2004	4	2.5	2,145	184
MANSIONES CIUDAD JARDIN	CAGUAS	510,000	2006	4	2.5	2,411	213
MANSIONES CIUDAD JARDIN	CAGUAS	380,000	2006	4	2.5	2,207	179
MANSIONES CIUDAD JARDIN	CAGUAS	495,000	2006	4	2.5	2,173	198
MANSIONES CIUDAD JARDIN	CAGUAS	430,000	2006	4	2.5	2,250	193
MANSIONES CIUDAD JARDIN	CAGUAS	504,000	2006	4	2.5	2,396	211
MANSIONES CIUDAD JARDIN	CAGUAS	427,000	2005	4	2.5	2,148	199
MANSIONES CIUDAD JARDIN	CAGUAS	477,000	2006	4	2.5	2,098	208
PALMAS DEL TURABO	CAGUAS	368,000	2006	4	2.5	2,253	163
QUINTAS DE SAN LUIS	CAGUAS	378,000	2006	3	2.5	2,087	181
RINCON DE SERRANIA	CAGUAS	399,000	2005	4	2.5	1,914	167
RINCON DE SERRANIA	CAGUAS	315,000	2005	4	2	1,810	152
RINCON DE SERRANIA	CAGUAS	330,000	2005	4	2.5	1,968	168
RINCON DE SERRANIA	CAGUAS	360,000	2005	4	2.5	1,810	157
SAN PEDRO ESTATES	CAGUAS	366,000	2005	4	2.5	2,043	151
SAN PEDRO ESTATES	CAGUAS	368,000	2004	4	2.5	2,498	172
SAN RAMERA	CAGUAS	360,000	2003	4	2.5	2,027	136
SAN RAMERA	CAGUAS	335,000	2005	4	2.5	2,457	126
SANJUANERA	CAGUAS	312,000	2005	4	2.5	2,379	151
SANJUANERA	CAGUAS	340,000	2006	4	2.5	2,442	139
SANJUANERA	CAGUAS	336,000	2006	4	2.5	2,066	163
SANJUANERA	CAGUAS	370,000	2004	4	2.5	2,435	153
SANJUANERA	CAGUAS	350,000	2005	4	2.5	2,150	163
SANJUANERA	CAGUAS	360,000	2006	4	2.5	2,300	156
SANJUANERA	CAGUAS	341,000	2006	4	2.5	2,372	144
SANJUANERA	CAGUAS	336,000	2005	4	2.5	1,958	172
SANJUANERA	CAGUAS	330,000	2006	4	2.5	1,936	170
SANJUANERA	CAGUAS	316,000	2006	4	2.5	2,191	144
SURERA	CAGUAS	331,331	2003	4	3.5	2,732	121
SURERA	CAGUAS	386,500	2006	4	3.5	2,143	180
SURERA	CAGUAS	407,735	2006	4	3.5	2,732	149
SURERA	CAGUAS	373,700	2006	4	3.5	2,667	140
SURERA	CAGUAS	377,000	2006	4	3.5	2,473	152
SURERA	CAGUAS	407,735	2006	4	3.5	2,732	149
VALLE DEL LAGO	CAGUAS	380,000	2005	4	3	2,956	129
VALLE DEL LAGO	CAGUAS	380,000	2004	4	3	2,956	129
VALLE DEL LAGO	CAGUAS	440,000	2006	3	2	2,822	156
VALLE DEL LAGO	CAGUAS	458,000	2006	4	2.5	2,663	177
VILLA CARIBE	CAGUAS	368,000	2006	4	2.5	2,168	137
VILLA CARIBE	CAGUAS	317,000	2005	4	2.5	2,220	143
VILLA CARIBE	CAGUAS	340,000	2005	4	2.5	2,220	157
VILLA CARIBE	CAGUAS	349,000	2005	4	2.5	2,179	156
VILLA CARIBE	CAGUAS	329,000	2006	4	2.5	2,221	148
VILLA CARIBE	CAGUAS	318,000	2006	4	2.5	2,236	141
VILLA CARIBE	CAGUAS	303,000	2005	4	2.5	2,240	135
VILLA CARIBE	CAGUAS	368,000	2005	4	2.5	2,168	169
VILLA CARIBE	CAGUAS	340,000	2003	4	2.5	2,236	152
VILLA DE ORO	CAGUAS	329,000	2005	5	3.5	2,130	112
VILLA MINERA	CAGUAS	350,000	2006	4	3	2,666	131
Promedio/Promedio Ponderado		$355,870		4	3	2,654	$148

Apéndice XV. Datos Poblacionales

	Parámetro	Censo 1990	Censo 2000	Censo de Puerto Rico 2000
Población	Habitantes	35,601	42,753	3,808,610
Densidad poblacional	Habitantes por metro cuadrado	971	166	114
	Habitantes por milla cuadrada	986	1,184.51	1,112
Densidad residencial	Residencia por milla cuadrada		395.28	
Población residencial	Habitantes		52,744	
Unidades de vivienda	Unidades		14,267	1,418,476
Extensión territorial	Millas cuadradas		36.66 (36.51)	
Área de terreno	Millas cuadradas		36.09	
Área de agua	Millas cuadradas		0.42	
Población menor de 18 años	Por ciento	36.2	30.7	28.7
Población entre 18 y 65 años	Por ciento	55.9	60.7	60.1
Ingreso per Capita	Dólares	3,611	7,877	8,185
Población debajo del nivel de pobreza	Individuos de 18 años o mas en por ciento	61.0	46.9	48.2
Población de 25 años o mas graduada de Escuela superior o mas	Por ciento	48.6	60.7	60.0
Población urbana	Por ciento	66.0	94.6	94.4
Población rural	Por ciento	34.0	5.4	5.6
		Año 2003	**Año 2004**	**Cambio porcentual**
Grupo trabajador	Miles	16,100	15,200	-5.6
Empleo total	Miles	7,467	7,511	4.9
Desempleo	Miles	1,850	1,700	-8.1
Tasa de desempleo	Por ciento	11.5	11.0	-4.3
Empleos Gerenciales y Profesionales	Por ciento		22.4	
Empleos de Servicios	Por ciento		17.4	
Empleos de Venta y Oficinas	Por ciento		26.1	
Empleos Agricultura, Pesca y Bosques	Por ciento		1.0	
Empleos Construcción, Mantenimiento y Canteras	Por ciento		12.5	
Empleos Producción, Transportación y Acarreo	Por ciento		20.5	
Total Agricultura, Pesca, Caza y Bosques	Por ciento		1.0	

Total Manufactura	Por ciento		20.8	
Total Gobierno	Por ciento		29.0	
	Por ciento			
		Año Fiscal 2002-2003	**Año Fiscal 2003-2004**	**Año Fiscal 2004-2005**
Ingresos municipales	Dólares	16.818,631	16,563,031	17,166,246
Patentes municipales	Dólares	8,800,000	8,500,000	8,850,000
Contribución sobre la propiedad	Dólares	3,878,154	3,692,247	3,746,696
Otros ingresos	Dólares	4,140,477	4,370,784	4,569,550

Fuentes: ***Municipio de Cidra, Oficina del Contralor, Informe de Auditoria M-06-60, Censo de Puerto Rico***

Apéndice XVI. Maquinaria y Equipo de Construcción-Niveles de Ruido

Equipo normalmente utilizado en este tipo de proyecto. Los valores están en dBA medido a 15 metros de distancia.

Tipo de Equipo	Niveles de Ruido	Tipo de Equipo	Niveles de Ruido	Tipo de Equipo	Niveles de Ruido
Raspador	89 a 95	Camión	81 a 96	Bomba de agua	79
Raspador elevado	88	Camión de asfalto	69 a 82	Bomba de hormigón	93
Niveladora	22 a 87	Camión de hormigón	71 a 82	Hincadora de pilotes	90
Arrasadora	87 a 89	Camión de cemento	91	Generador	69 a 75
Arrasadora con banda ruidosa	90 a 93	Camión 14 ruedas	88	Excavadora convencional	79 a 85
Rolo pata de cabra	72 a 80	Tractor con bomba de agua	73 a 80	Excavadora grande	91
Rolo vibrador	90 a 95	Pavimentadora	82 a 92	Gradall	87 a 88
Cargadora con cuchara	80 a 81	Autonivelaadora	81	Grúa	80 a 85
Cargadora terex	96	Compresor	71 a 87	Sierra de hormigón	87
Barrenadora de roca neumática	88	Barrenadora de roca convencional	91	Sierra de hormigón de cadena	88 a 93

Fuente: Autoridad de Carreteras

Apéndice XVII. Actividad de Construcción

Medidas de Control del plan CES a ser Implantadas

Descripción	Provisional o Permanente	Costo de implantación	Costo de mantenimiento ($/semana)	Comentarios
Movimiento de tierra	*Permanente*	*$240,000*		
Obras de infraestructura	*Permanente*	*$ 25,000*		
Revegetación de superficie	*Permanente*	*$ 52,000*	*$200*	
Mantenimiento plan CES	*Provisional*	*$59,000*	*$500*	
Limpieza de la parcela	*Permanente*	*$ 25,000*	*$250*	
Suelo de relleno (top soil)	*Permanente*	*$ 25,500*		
Camión de riego	*Provisional*	*$ 25,000*	*$250*	
Pacas de heno y mallas	*Provisional*	*$ 50,000*	*$400*	
Totales				

Itinerario Plan CES

Actividad	Itinerario Tentativo	Comentarios
Radicación de Plan CES y PFE	*10 de octubre de 2009*	
Informe inicial	*5 días luego de aprobado el Plan CES*	
Preparación del área de trabajo bajo el Plan CES	*5 días luego de recibir orden de proceder*	
Preparación de accesos y verjas	*en proceso*	
Instalación de mallas y pacas de heno	*30 de octubre de 2009 (5 días)*	

Activación camión de riego	*30 de octubre de 2009 (continuo)*	
Construcción de sistema de drenajes en la colindancia	*30 de octubre de 2009(5 días)*	
Construcción estación de inspección y lavado de gomas	*30 de octubre de 2009 (5 días)*	
Remoción y acopio de terreno de superficie (top soil)	*1 día laborable luego de completar fase anterior*	
Transportación de material removido y excavaciones según aplique	*5 días laborables luego de completar fase anterior*	
Disposición externa de material contaminado	*15 días laborables luego de recibir informes de laboratorio*	
Relleno de excavaciones a rasante original	*Simultaneo con fase anterior*	
Aplicación de capa superficial de terreno (top-soil) y capa vegetal	*Simultaneo con fase anterior*	

Apéndice XVIII. Medidas de Control de Erosión y Sedimentación

Las medidas de control de erosión y sedimentación a ser aplicadas, consisten de la toma de varias acciones para controlar las aguas de escorrentía del lugar durante la construcción. Como parte de las obras de construcción, se construirá un sistema de drenaje pluvial y revegetación del área afectada. En esta etapa no se requiere como parte del proyecto sistemas de agua, energía eléctrica o alcantarillado sanitario.

El plan consiste de mantener como parte integral del proyecto, los árboles útiles existentes en el predio, la siembra de árboles adicionales, y la revegetación con yerbas nativas, con drenajes de tubería flexible, protecciones o diques de piedra triturada (Rip-rap) y otras facilidades ansilares, tales como, sistema de accesos, cunetas de asfalto y otras. El movimiento de tierra que se efectuará en el área del proyecto, se limita a la aplicación de la capa vegetal y la aplicación de unos 25,000 metros cúbicos de relleno y a lo estrictamente necesario para efectuar la construcción ordenada del área antes indicada la construcción de las obras. Al concluirse la construcción, se incluye en el mismo un proyecto de revegetación de las áreas expuestas.

La topografía del lugar es ondulada, con pendientes en su colindancia con el lago y las quebradas, desde el 0.5% hasta 50%, con inclinación hacia los cuerpos de agua. La parte norte del proyecto se encuentra a nivel con la carretera de acceso al proyecto (Véase Figura Núm. II). Debido a este tipo de topografía, el movimiento de tierras es limitado a un relleno adicional de unos 25,000 metros cúbicos de relleno" en el área de construcción.

Control de Desperdicios Sólidos
El contratista del proyecto solicitará un permiso DS-3 y un Plan CES para realizar una actividad generante de desperdicios sólidos no peligrosos, a ser emitido por la Junta de Calidad Ambiental de Puerto Rico.

Las fuentes principales de desperdicios sólidos no peligrosos durante la construcción constará de aquellos suelos no utilizables en el proyecto, desperdicios de empaque generados como parte del proyecto, escoria de construcción, madera, cartón, hormigón, papeles, acero de refuerzo y otros. Las pacas de heno utilizadas como filtros de sedimentos, y el material recogido en las mismas serán integradas como parte de los materiales de suelo vegetal (top soil).

Siempre que sea factible, se recogerán y almacenarán los desperdicios generados durante la construcción al terminar la faena diaria. Se colocarán contenedores de acero en áreas estratégicas del proyecto, para la disposición ordenada de los desperdicios sólidos generados. En áreas tales como el taller y almacén de la

construcción, se colocarán envases de desperdicios los cuales serán vaciados en el vertedero designado según sean llenados. Se establecerá una estación para inspección de los vehículos que entran o abandonan el proyecto, para asegurar que estos cumplan con las leyes y reglamentos vigentes sobre la emisión de polvo por vehículos pesados, tales como la limpieza de gomas y la cubierta del material con toldos adecuados.

El proyecto no generará ni dispondrá de desperdicios sólidos peligrosos o tóxicos como resultado de las obras de movimiento de tierra o construcción.

Protección de Suelos Expuestos
Todos los suelos expuestos durante la construcción, serán protegidos por medio de un tratamiento continuo para minimizar las partículas sueltas que podrían convertirse en polvo y ser transportadas fuera del área del proyecto por el viento o la escorrentía. Este tratamiento consistirá de compactar y humedecer la superficie del terreno al punto de obtener la más alta consistencia posible, y así una resistencia a la fuerza erosiva del viento y del agua. Se evitará el movimiento innecesario de vehículos en el área del proyecto durante el movimiento de tierra y la construcción. Hasta donde sea posible, se limitará a rutas predeterminadas dentro del proyecto. Se someterá al Departamento de Recursos Naturales y Ambientales un informe sobre la vegetación en el predio y el plan de siembra.

Todos los suelos, a excepción del suelo para replanteo o "top soil", serán compactados a un mínimo de 85%, de acuerdo a las especificaciones del proyecto.

Cualquier terreno o talud expuesto, será mantenido húmedo o cubierto por vegetación o algún material protector igual o similar a las esteras de fibras de material natural o artificial, entretejidas. Inmediatamente de terminadas las obras, los mismos serán revestidos por vegetación de rápido crecimiento, y mantenidos húmedos, hasta tanto la capa vegetal cubra la superficie de los mismos.

Escorrentía
Un sistema de drenaje diseñado especialmente para tormentas, reducirá la acción erosiva del agua. Durante la construcción, se tratará en lo posible de colocar las primeras capas de vegetación, iniciando así el proceso de protección. Las áreas adyacentes a cualquier construcción en proceso, serán cubiertas con grava, y bordeadas con pacas de heno, previniendo así la erosión de la superficie, y el acarreo de sólidos por las aguas de escorrentía.

Con el propósito primario de proveer un filtro o área de decantación a sedimentos suspendidos, se colocarán pacas de heno en las canales de drenaje del proyecto, al igual que en la salida de los pluviales que sirven al área en construcción. Las pacas de heno serán reemplazadas cada semana, o cuando se noten tupidas.

Como parte del sistema de control de accesos a la propiedad, durante la construcción, el guardián de entrada inspeccionará los vehículos de servicio que entran o abandonan la facilidad para asegurar que estos cumplan con las leyes y reglamentos vigentes sobre la emisión de polvo por vehículos pesados, tales como la limpieza de gomas y la cubierta del material con toldos adecuados, rotulación y otros.

Como parte del diseño de la facilidad, se tendrá un programa intensivo de arquitectura paisajista, el cual incluirá la vegetación paisajista en todo terreno expuesto de la facilidad. Inmediatamente de terminadas las obras, dichos terrenos serán revestidos con vegetación de rápido crecimiento, y mantenidos húmedos, hasta tanto la nueva capa vegetal cubra la superficie de los mismos.

Las aguas de escorrentía serán dispuestas al sistema pluvial de la carretera PR-172. No se contempla al presente la construcción de facilidades para el tratamiento o disposición de dichas aguas. Siempre que sea factible, se dispondrá de los desperdicios sólidos no-peligrosos generados en la propiedad semanalmente.

Como parte de las facilidades del proyecto durante la construcción, se establecerá una estación, donde aquellos vehículos saliendo del área de trabajo, serán inspeccionados, y de ser necesario, se removerá aquel material que pueda estar adherido al mismo. Se tratará en todo lo posible de remover el material en seco. Luego de removido el material en seco, se pasará el vehículo a un segundo paso en un área pavimentada, donde se lavarán las llantas de los mismos.

Apéndice XIX. Control de Polvo Fugitivo

Durante la Construcción

El contratista seleccionado solicitará un permiso (PFE) para construir una fuente de emisión (polvo fugitivo) de la Junta de Calidad Ambiental de Puerto Rico. Como resultado del impacto del viento, o de actividades mecánicas sobre los suelos expuestos, residuos de construcción o de los propios materiales de construcción, se suspenden en la atmósfera partículas finas de polvo, las cuales se conocen como polvo fugitivo. Estas partículas, dado su tamaño y peso, son respirables en su mayoría, y susceptibles a movimiento a grandes distancias.

Toda superficie de terreno expuesta en el área del proyecto, incluyendo carreteras de acceso, se mantendrá húmeda constantemente, por medio de mangueras de agua, un vehículo tanque de riego, asperjadores móviles, manuales o automáticos. El grado de humedad a ser mantenido, será aquel necesario para evitar que el material particulado sea transportado y dispersado en o fuera del proyecto.

Aquellas barreras naturales en el área del proyecto, tales como árboles y arbustos, que minimizan la posibilidad de que como resultado del impacto del viento, o de actividades mecánicas sobre los suelos expuestos, residuos de construcción o de los propios materiales de construcción, se suspendan en la atmósfera partículas finas de polvo, deberán ser preservadas y protegidas durante la construcción. Cualquier terreno o talud expuesto, será mantenido húmedo o cubierto por vegetación, mallas o semilla hidráulica o algún material protector igual o similar a las esteras de material natural o artificial entretejidas. Inmediatamente de terminadas las obras, los mismos serán revestidos por vegetación de rápido crecimiento, y mantenidos húmedos, hasta tanto la capa vegetal cubra la superficie de los mismos.

Se establecerá una estación para inspección de los vehículos que entran o abandonan el proyecto, para asegurar que estos cumplan con las leyes y reglamentos vigentes sobre la emisión de polvo por vehículos pesados, tales como la limpieza de gomas y la cubierta del material con toldos adecuados. Todo camión que salga del proyecto transportando desperdicios sólidos, suelos o escombros será verificado para que no exceda la carga legal permitida en vías públicas. Además todos los camiones cubrirán la carga con lonas o mantas para evitar el derrame de los desperdicios durante la travesía. Durante el movimiento de tierra, se establecerá una estación de limpieza de camiones a la salida del proyecto, donde el conductor deberá remover todo el material adherido a las gomas del camión antes de abandonar el área.

Todo material de construcción desechado, o desperdicios de demolición que sean acumulados en el proyecto serán recogidos regularmente y depositados en el vertedero municipal. En el caso de arena, cemento, cal o materiales similares, los mismos se mantendrán cubiertos por encerados, tela o sacos, para minimizar la emisión de material particulado.

Durante la Operación

Como parte del diseño y operación de la facilidad, se establecerá y mantendrá un programa intensivo de re-vegetación por medio de mallas o semilla hidráulica en todo terreno expuesto del proyecto. Inmediatamente de terminadas las obras, dichos terrenos serán revestidos por vegetación de rápido crecimiento, y mantenidos húmedos, hasta tanto la nueva capa vegetal cubra la superficie de los mismos.

Apéndice XX. Colindantes

Laberinto Cidra

1.__
2. William Vélez Ortiz Bo. Bayamón Sect. San José, Buzón 13 Cidra, PR 00739
3. Idelfonso Vélez Ortiz Bo. Bayamón Sect. San José, Buzón 13 Cidra, PR 00739
4. Clemencia Ortiz SantiagoBo. Bayamón Sect. San José, Buzón 13 Cidra, PR 00739
5. Benigno Reyes Santos Bo. Bayamón Sect. San José, Buzón 13 Cidra, PR 00739
6. Pablo Rivera Torres Po. Box 9890 Bo. Bayamón, Cidra, PR 00739
7. Gabriel Rolón Flores Apartado 787 Cidra, PR 00739
8. Wanda Rolón Apartado 787 Cidra, PR 00739
9. Expedito Velásquez Bo.Bayamón Sect. San José, PO. Box 3 Cidra, PR 00739
10. María L. Nieves González26 Sect. San José Cidra, PR 00739
11. David Hernández Ortiz 27 Sect. San José Cidra, PR 00739
12. Hipólito Hernández Rivera 35 Sect. San José, Cidra PR 00739
13. Luis Hernández Ortiz 35 Sect. San José, Cidra PR 00739
14. Ignacio Hernández Rivera 36 Sect. San José, Cidra PR 00739
15. Norberto Ortiz Santiago 2-34 Sect. San José, Cidra PR 00739

Calle Cruz Ortega

1. José Rodríguez Rodríguez	PO Box 1264 Cidra, PR 00739
2. Juan J. Rivera Hernández	RR-02 Box 6547, Cidra, PR 00739
3. Crispín Centeno Rodríguez	Ste. 1131 Po. Box 1600 Cidra, PR 00739 - 1600
4. Julio Ortiz Martínez 00725	Hac. Borinquen 725 Calle Majagua Caguas, PR
5. Ramón Ramos	Apt. 1600 Ste. 363, Cidra PR 00739
6. William Rivera Ortiz	Bo Bayamón Certenejas I, Apt. 196 Bayamón
7. Luciano Rivera Ortiz	Apt. 196 Cidra, PR 00739
8. Rocabel Chamorro	RR-02 Box 6528 Cidra, PR 00739
9. Irisbel Chamorro	RR-02 Box 6528 Cidra, PR 00739
10. Wanda Rivera Ortiz	Apt. 196 Cidra, PR 00739
11. Manuel López Ortiz	Apt. 196 Cidra, PR 00739
12. Ariel Martínez Arroyo	# 7 Calle Geranio, Cidra, PR 00739
13. Emilia Ortiz Centeno	RR-03 Box 6515, Cidra, PR 00739
14. Aida L. Ortiz Centeno	RR-03 Box 6515, Cidra, PR 00739
15. Isabel González Oyola	PO Box 1039 Cidra, PR 00739
16. Cristino Ortiz Santos	PO Box RR-3 6515, Cidra, PR 00739
17. Tony Ortiz Centeno	PO Box RR-3 6515, Cidra, PR 00739
18. Don Hipólito Ortiz Ortega	Apt 196, Cidra, PR. 00739
19.Asociación Ortiz Figueroa	RR-02 Box 627, Cidra, PR 00739
20. Restaurante Lucios	Apt. 196 Cidra, PR 00739

Hacienda La Paloma

1. Walter Ramírez González	Po. Box 1572 Cidra, PR 00739
2. Armengol Hernández Nieves	Po. Box 821 Cidra, PR 00739
3. Roberto Núñez Figueroa	RR-03 Box 7120 Cidra, PR 00739
4. Antonio Gutiérrez Jiménez	Muñoz Rivera # 7 Cidra, PR 00739
5. Rafael Rivera Cordero	Río Piedras, PR
6. Irma M. Olique Pedraza	RR-02 Box 6544 Cidra, PR 00739
7. Gilberto Rivera Torres	RR-02 Box 6544 Cidra, PR 00739

Apéndice XXI. Referencias

1. Calvesbert, R. J.; Climate of Puerto Rico and the Virgin Islands, U. S. Department of Commerce. No. 60-52-1970.
2. US Geological Survey Maps I-320 and I-1152, Comerío and Caguas Quadrangles, Maurice H. Pease and Reginald P. Briggs (1960) and Cleaves I. Rogers (1979)
3. Topographic Map of the Caguas and Aguas Buenas Quadrangle, (Map xxxx, USGS)
4. Soil Survey Map, Soil Conservation Service 1937
5. Soils Conservation Service Manual of the San Juan Area, Rafael A. Boccheciamp and others
6. Mapa Metalogenético de Puerto Rico (USGS, Mapa 1-721)
7. Mc Cann y Asociados, Mapa de Peligrosidad Sísmica para Puerto Rico. 1993.
8. National Register of Historic Places. Listado disponible en la Oficina de Preservación Histórica de Puerto Rico, La Fortaleza, San Juan, PR. 1994.
9. Hydrologic Investigations Atlas, Floods in the Area of Cidra, Puerto Rico, U. S. Geological Survey.
10. Mapa de Zonificación (Hoja Número xx), Junta de Planificación, con vigencia del 28 de noviembre de 2000.
11. Mapa de Zonas Susceptibles a Inundaciones, Junta de Planificación, Hoja XX, vigente desde el 26 de febrero de 1988.
12. Mapa de Zonas Susceptibles a Inundaciones, FEMA, Hojas 174, 175, 176 y 178, vigente desde el 26 de febrero de 2005.
13. Especies en Peligro de Extinción, Departamento de Recursos Naturales, Estado Libre Asociado, 1987
14. Raros y en Peligro de Extinción, Departamento de Recursos Naturales, Estado Libre Asociado, 1987
15. Mapa de Suelos (Hoja XX del Área de Cidra) del Servicio de Conservación de Suelos (SCS) del Departamento de Agricultura Federal
16. Puerto Rico and Virgin Islands Precipitation Frequency Data, (Tech. Papers 42 and 53) U.S. National Weather Service, NOAA, Update 2004

17. Plan Integral del Desarrollo, Conservación y Uso de los Recursos de Agua de Puerto Rico, Departamento de Recursos Naturales, Mayo 2005

18. Virginia Department of Game and Fisheries; Building Boat Ramps

19. U.S. Corps of Engineers, Eng. Manual EM-1110-2-410

20. U.S. Department of Commerce Technical Paper No. 42, (USDC, 1961) Generalized Estimate of Probable Maximum Precipitation and rainfall Frequency data for Puerto Rico and Virgin Islands

21. Calidad Ambiental, Junta de; Archivos, biblioteca e informes anuales (1971-2000)

22. Climate of Puerto Rico and E. U. A. Virgin Islands, E. U. A. Department of Comerce, 1937-2000.

23. Collazo, Lydia Esther; Rol del Servicio de Conservación de Recursos Naturales (NRCS) y de la Agencia Consolidada de Servicios Agrícolas (CFSA) con el Renglón Agrícola de Puerto Rico, Universidad Politécnica de Puerto Rico, San Juan, Puerto Rico

24. Cruz Pérez, Rafael, PE; Notas, archivos y diarios.

25. Descripción del Muestrario de Maderas del País, presentado por la Real Maestranza de Artillería, a la Primera Exposición Pública de la Industria, Agricultura y Bellas Artes de la Isla de Puerto Rico en junio de 1854. Revista del Instituto de Cultura, Año IV, Núm. 12, Julio a Septiembre 1961.

26. Fiddler, González & Rodríguez; Puerto Rico Environmental Law Handbook; Government Institutes, Inc.,Rockville, Maryland.

27. Latimer Torres, Eugenio; Historia de la Autoridad de Energia Electrica, 1997, San Juan.

28. Little, Elbert L., Jr., Wadworth, Frank H. y Marrero, José; Arboles Comunes de Puerto Rico y las Islas Vírgenes; Editorial Universitaria, Universidad de Puerto Rico. Río Piedras, Puerto Rico. 1977.

29. Recursos Naturales y Ambientales, Departamento de; Archivos, biblioteca e informes legislativos (1974-2000)

30. Scarano, Francisco A.; Puerto Rico, Cinco Siglos de Historia. McGraw Hill. New York. 1993.

31. Tesauro de Datos Históricos de Puerto Rico. Volúmenes I, II, III y IV. Editorial de la Universidad de Puerto Rico. Río Piedras, Puerto Rico. 1994-2000.

32. USEPA; April 1996 CERCLA Information System, "Special Report List".

33. USEPA; April 1996 RCRA Information System, "Special Report List".