SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y Proyecto*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/19/2008*	Jurisdiction	*Caguas*
Time Period	*7:15 - 8:15 AM*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	1	1	1	1	1	2	3	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	67	0	92	33	1	22	543	1171	29	40	1592	739
% Heavy Vehicles	0	0	0	0	0	0	0	3	0	0	3	0
PHF	0.89	0.91	0.92	0.92	0.91	0.89	0.89	0.89	0.89	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	4	4	3	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	92	0	0	22	0	0	29	0	0	739
Lane Width	4.8	3.7	3.7	4.6	3.7	3.7	4.8	4.8	3.7	4.6	4.8	3.7
Parking/Grade/Parking	N	0	N	N	3	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 5.0	G = 4.0	G =	G =	G = 19.0	G = 51.0	G =	G =
	Y = 4	Y = 6	Y =	Y =	Y = 4	Y = 6	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 99.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	75	0	0	36	1	0	610	1316	0	43	1730	0
Lane Group Capacity	201	78	66	100	76	65	762	2934	841	748	2934	841
v/c Ratio	0.37	0.00	0.00	0.36	0.01	0.00	0.80	0.45	0.00	0.06	0.59	0.00
Green Ratio	0.05	0.04	0.04	0.05	0.04	0.04	0.19	0.52	0.52	0.19	0.52	0.52
Uniform Delay d_1	45.5	45.6	45.6	45.5	45.6	45.6	38.2	15.1	11.6	32.7	16.7	11.6
Delay Factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.34	0.11	0.11	0.11	0.18	0.11
Incremental Delay d_2	1.2	0.0	0.0	2.2	0.1	0.0	6.1	0.1	0.0	0.0	0.3	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.743	1.000	1.000	0.743	1.000
Control Delay	46.7	45.6	45.6	47.7	45.7	45.6	44.3	11.3	11.6	32.7	12.7	11.6
Lane Group LOS	D	D	D	D	D	D	D	B	B	C	B	B
Approach Delay	46.7			47.6			21.8			13.2		
Approach LOS	D			D			C			B		
Intersection Delay	18.5			Intersection LOS						B		

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SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y C. Colón*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/18/2008*	Jurisdiction	*Caguas*
Time Period	*7:15 - 8:15 AM*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		1				2	3			3	1
Lane Group	L		R				L	T			T	R
Volume (vph)	77		103				156	1104			2268	35
% Heavy Vehicles	4		2				0	3			3	3
PHF	0.83		0.88				0.89	0.89			0.92	0.25
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	4			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	103	0	0		0	0		0	0	35
Lane Width	2.7		3.7				3.7	3.7			3.7	3.7
Parking/Grade/Parking	N	-2	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	02	03	04	NB Only	Thru & RT	07	08
Timing	G = 5.0	G =	G =	G =	G = 6.0	G = 69.0	G =	G =
	Y = 6	Y =	Y =	Y =	Y = 4	Y = 6	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 96.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	93		0				175	1240			2465	0
Lane Group Capacity	160		84				222	3652			3652	1139
v/c Ratio	0.58		0.00				0.79	0.34			0.67	0.00
Green Ratio	0.05		0.05				0.06	0.72			0.72	0.72
Uniform Delay d_1	44.5		43.1				44.4	5.0			7.4	3.8
Delay Factor k	0.17		0.11				0.33	0.11			0.25	0.11
Incremental Delay d_2	5.3		0.0				17.1	0.1			0.5	0.0
PF Factor	1.000		1.000				1.000	0.204			1.000	1.000
Control Delay	49.7		43.1				61.5	1.1			7.9	3.8
Lane Group LOS	D		D				E	A			A	A
Approach Delay	49.7						8.6			7.9		
Approach LOS	D						A			A		
Intersection Delay	9.1			Intersection LOS						A		

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HCS+: Urban Streets Release 5.3

José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst: José L. Pérez Berenguer
Agency/Co.: Pérez Berenguer y Asociados
Date Performed: 10/19/2008
Analysis Time Period: 7:15 - 8:15 AM
Urban Street: PR-32
Direction of Travel: North-bound
Jurisdiction: Caguas
Analysis Year: 2012
Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	PR-34					
1	Proyecto/Terrassa	0.30	4	40	33.2	1
2	Cristóbal Colón	0.20	4	40	25.0	2
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I factor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	99.0	0.520	0.450	2934		4	0.334*	3.0	0	11.0	0.0	B
2	96.0	0.720	0.340	3652		4	0.893	3.0	0	0.9	0.0	A
3		0*	0*	0*								
4		0*	0*	0*								
5		0*	0*	0*								

6	0*	0*	0*
7	0*	0*	0*
8	0*	0*	0*
9	0*	0*	0*
10	0*	0*	0*
11	0*	0*	0*
12	0*	0*	0*
13	0*	0*	0*
14	0*	0*	0*
15	0*	0*	0*

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	1	33.2	11.0	0.0	44.1	0.30	24.5	C
2	2	25.0	0.9	0.0	25.9	0.20	27.8	C
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x)	=	70.0	sec
Total length Length (y)	=	0.50	km
Total travel speed, Sa = 3600 x (y)/(x)	=	25.7	km/h
Total urban street LOS (Exhibit 15-2)	=	C	

Intersection Files in the Analysis

1: ProyAM12
2: ColoAM12
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

HCS+: Urban Streets Release 5.3

José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst:	José L. Pérez Berenguer
Agency/Co.:	Pérez Berenguer y Asociados
Date Performed:	10/19/2008
Analysis Time Period:	7:15 - 8:15 AM
Urban Street:	PR-32
Direction of Travel:	South-bound
Jurisdiction:	Caguas
Analysis Year:	2012

Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	Cristóbal Colón					
1	Proyecto/Terrassa	0.20	4	40	25.0	2
2	PR-34	0.30	4	40	33.2	1
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I factor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	99.0	0.520	0.590	2934		4	0.689*	3.0	0	12.3	0.0	B
2	100.0	0.410	0.510	2062		4	0.779	3.0	0	19.6	0.0	B
3												
4												
5												

6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	2	25.0	12.3	0.0	37.3	0.20	19.3	D
2	1	33.2	19.6	0.0	52.8	0.30	20.5	D
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x)	=	90.1	sec
Total length Length (y)	=	0.50	km
Total travel speed, Sa = 3600 x (y)/(x)	=	20.0	km/h
Total urban street LOS (Exhibit 15-2)	=	D	

Intersection Files in the Analysis

1: ProyAM12
2: HIMAAM12
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y PR-34*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/16/2008*	Jurisdiction	*Caguas*
Time Period	*1:00 - 2:00 PM*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	2	1	2	2	1	1	2	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	393	310	110	171	164	511	41	1208	89	221	970	474
% Heavy Vehicles	3	5	4	10	17	2	0	2	4	4	2	2
PHF	0.88	0.87	0.74	0.51	0.83	0.58	0.84	0.95	0.84	0.81	0.87	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	3	3	4	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	110	0	0	511	0	0	89	0	0	474
Lane Width	4.0	3.7	3.7	4.0	3.7	3.7	3.7	3.7	3.7	4.0	3.7	3.7
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	2	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	WB Only	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 14.0	G = 10.0	G =	G =	G = 9.0	G = 41.0	G =	G =
	Y = 4	Y = 6	Y =	Y =	Y = 4	Y = 6	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 94.0		

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate	447	356	0	335	198	0	49	1272	0	273	1115	0
Lane Group Capacity	537	527	237	354	333	170	175	1564	685	334	2215	691
v/c Ratio	0.83	0.68	0.00	0.95	0.59	0.00	0.28	0.81	0.00	0.82	0.50	0.00
Green Ratio	0.15	0.15	0.15	0.11	0.11	0.11	0.10	0.44	0.44	0.10	0.44	0.44
Uniform Delay d_1	38.9	37.9	34.0	41.7	40.1	37.5	39.5	23.2	14.9	41.7	19.1	14.9
Delay Factor k	0.37	0.25	0.11	0.46	0.18	0.11	0.11	0.35	0.11	0.36	0.11	0.11
Incremental Delay d_2	10.8	3.4	0.0	34.1	2.9	0.0	0.9	3.4	0.0	14.6	0.2	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.853	1.000
Control Delay	49.6	41.3	34.0	75.8	42.9	37.5	40.4	26.6	14.9	56.3	16.5	14.9
Lane Group LOS	D	D	C	E	D	D	D	C	B	E	B	B
Approach Delay	45.9			63.6			27.1			24.4		
Approach LOS	D			E			C			C		
Intersection Delay	34.7			Intersection LOS						C		

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SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y Proyecto*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/19/2008*	Jurisdiction	*Caguas*
Time Period	*1:00 - 2:00 PM*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	1	1	1	1	1	2	3	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	289	1	309	136	5	136	842	1143	131	138	1218	897
% Heavy Vehicles	0	0	0	0	0	0	0	3	0	0	3	0
PHF	0.84	0.94	0.92	0.92	0.94	0.84	0.84	0.84	0.84	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	4	4	3	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	309	0	0	136	0	0	131	0	0	897
Lane Width	4.8	3.7	3.7	4.6	3.7	3.7	4.8	4.8	3.7	4.6	4.8	3.7
Parking/Grade/Parking	N	0	N	N	3	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 12.0	G = 4.0	G =	G =	G = 31.0	G = 35.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 98.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	344	1	0	148	5	0	1002	1361	0	150	1324	0
Lane Group Capacity	486	78	67	242	77	66	1257	2034	583	1232	2034	583
v/c Ratio	0.71	0.01	0.00	0.61	0.06	0.00	0.80	0.67	0.00	0.12	0.65	0.00
Green Ratio	0.12	0.04	0.04	0.12	0.04	0.04	0.32	0.36	0.36	0.32	0.36	0.36
Uniform Delay d_1	41.3	45.1	45.1	40.8	45.2	45.1	30.6	26.6	20.3	23.8	26.4	20.3
Delay Factor k	0.27	0.11	0.11	0.20	0.11	0.11	0.34	0.24	0.11	0.11	0.23	0.11
Incremental Delay d_2	4.7	0.1	0.0	4.5	0.4	0.0	3.7	0.9	0.0	0.0	0.7	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.937	1.000	1.000	0.937	1.000
Control Delay	46.0	45.2	45.1	45.3	45.6	45.1	34.3	25.8	20.3	23.9	25.5	20.3
Lane Group LOS	D	D	D	D	D	D	C	C	C	C	C	C
Approach Delay	46.0			45.3			29.4			25.3		
Approach LOS	D			D			C			C		
Intersection Delay	29.9			Intersection LOS						C		

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SHORT REPORT

General Information		Site Information	
Analyst	José L. Pérez Berenguer	Intersection	PR-32 y C. Colón
Agency or Co.	Pérez Berenguer y Asociados	Area Type	All other areas
Date Performed	10/18/2008	Jurisdiction	Caguas
Time Period	1:00 - 2:00 PM	Analysis Year	2012

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		1				2	3			3	1
Lane Group	L		R				L	T			T	R
Volume (vph)	164		283				194	1367			1969	636
% Heavy Vehicles	8		6				0	2			2	2
PHF	0.83		0.84				0.84	0.84			0.87	0.71
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	4			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	283	0	0		0	0		0	0	636
Lane Width	2.7		3.7				3.7	3.7			3.7	3.7
Parking/Grade/Parking	N	-2	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	02	03	04	NB Only	Thru & RT	07	08
Timing	G = 9.0	G =	G =	G =	G = 14.0	G = 58.0	G =	G =
	Y = 6	Y =	Y =	Y =	Y = 4	Y = 6	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 97.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	198		0				231	1627			2263	0
Lane Group Capacity	274		144				512	3067			3067	957
v/c Ratio	0.72		0.00				0.45	0.53			0.74	0.00
Green Ratio	0.09		0.09				0.14	0.60			0.60	0.60
Uniform Delay d_1	42.8		39.9				38.0	11.5			14.0	7.8
Delay Factor k	0.28		0.11				0.11	0.13			0.30	0.11
Incremental Delay d_2	9.1		0.0				0.6	0.2			1.0	0.0
PF Factor	1.000		1.000				1.000	0.580			1.000	1.000
Control Delay	51.8		39.9				38.6	6.8			15.0	7.8
Lane Group LOS	D		D				D	A			B	A
Approach Delay	51.8						10.8			15.0		
Approach LOS	D						B			B		
Intersection Delay	14.9			Intersection LOS						B		

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José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst:	José L. Pérez Berenguer
Agency/Co.:	Pérez Berenguer y Asociados
Date Performed:	10/19/2008
Analysis Time Period:	1:00 - 2:00 PM
Urban Street:	PR-32
Direction of Travel:	North-bound
Jurisdiction:	Caguas
Analysis Year:	2012

Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	PR-34					
1	Proyecto/Terrassa	0.30	4	40	33.2	1
2	Cristóbal Colón	0.20	4	40	25.0	2
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I factor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	98.0	0.360	0.670	2034		4	0.483*	3.0	0	25.1	0.0	C
2	97.0	0.600	0.530	3067		4	0.689	3.0	0	6.7	0.0	A
3												
4												
5												

6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	1	33.2	25.1	0.0	58.3	0.30	18.5	D
2	2	25.0	6.7	0.0	31.7	0.20	22.7	D
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x) = 90.0 sec
Total length Length (y) = 0.50 km
Total travel speed, Sa = 3600 x (y)/(x) = 20.0 km/h
Total urban street LOS (Exhibit 15-2) = D

Intersection Files in the Analysis

1: Proy1212
2: Colo1212
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

HCS+: Urban Streets Release 5.3

José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst:	José L. Pérez Berenguer
Agency/Co.:	Pérez Berenguer y Asociados
Date Performed:	10/19/2008
Analysis Time Period:	1:00 - 2:00 PM
Urban Street:	PR-32
Direction of Travel:	South-bound
Jurisdiction:	Caguas
Analysis Year:	2012

Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	Cristóbal Colón					
1	Proyecto/Terrassa	0.20	4	40	25.0	2
2	PR-34	0.30	4	40	33.2	1
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I factor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	98.0	0.360	0.650	2034		4	0.594*	3.0	0	24.9	0.0	C
2	94.0	0.440	0.500	2215		4	0.713	3.0	0	16.2	0.0	B
3												
4												
5												

6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	2	25.0	24.9	0.0	49.9	0.20	14.4	E
2	1	33.2	16.2	0.0	49.3	0.30	21.9	D
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x) = 99.3 sec
Total length Length (y) = 0.50 km
Total travel speed, Sa = 3600 x (y)/(x) = 18.1 km/h
Total urban street LOS (Exhibit 15-2) = D

Intersection Files in the Analysis

1: Proy1212
2: HIMA1212
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

SHORT REPORT

General Information		Site Information	
Analyst	José L. Pérez Berenguer	Intersection	PR-32 y PR-34
Agency or Co.	Pérez Berenguer y Asociados	Area Type	All other areas
Date Performed	10/16/2008	Jurisdiction	Caguas
Time Period	3:15 - 4:15 PM	Analysis Year	2012

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	2	1	2	2	1	1	2	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	327	203	76	116	256	932	42	931	51	211	1064	525
% Heavy Vehicles	3	2	6	6	18	3	0	3	0	4	6	2
PHF	0.86	0.91	0.86	0.59	0.80	0.69	0.59	0.83	0.64	0.84	0.91	0.88
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	3	3	3	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	76	0	0	932	0	0	51	0	0	525
Lane Width	4.0	3.7	3.7	4.0	3.7	3.7	3.7	3.7	3.7	4.0	3.7	3.7
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	2	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	WB Only	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 13.0	G = 17.0	G =	G =	G = 8.0	G = 38.0	G =	G =
	Y = 4	Y = 6	Y =	Y =	Y = 4	Y = 6	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 96.0		

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate	380	223	0	197	320	0	71	1122	0	251	1169	0
Lane Group Capacity	489	493	212	612	549	281	152	1406	646	290	1935	627
v/c Ratio	0.78	0.45	0.00	0.32	0.58	0.00	0.47	0.80	0.00	0.87	0.60	0.00
Green Ratio	0.14	0.14	0.14	0.18	0.18	0.18	0.08	0.40	0.40	0.08	0.40	0.40
Uniform Delay d_1	40.1	38.2	35.9	34.5	36.2	32.5	42.0	25.6	17.5	43.5	23.0	17.5
Delay Factor k	0.33	0.11	0.11	0.11	0.17	0.11	0.11	0.34	0.11	0.40	0.19	0.11
Incremental Delay d_2	7.8	0.7	0.0	0.3	1.6	0.0	2.3	3.3	0.0	22.9	0.5	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.899	1.000
Control Delay	47.9	38.9	35.9	34.8	37.8	32.5	44.2	29.0	17.5	66.4	21.2	17.5
Lane Group LOS	D	D	D	C	D	C	D	C	B	E	C	B
Approach Delay	44.5			36.7			29.9			29.2		
Approach LOS	D			D			C			C		
Intersection Delay	32.9			Intersection LOS						C		

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SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y Proyecto*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/19/2008*	Jurisdiction	*Caguas*
Time Period	*3:15 - 4:15 PM*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	1	1	1	1	1	2	3	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	760	0	523	93	1	134	341	1718	132	92	1184	236
% Heavy Vehicles	0	0	0	0	0	0	0	3	0	0	5	0
PHF	0.82	0.88	0.94	0.94	0.88	0.82	0.82	0.82	0.82	0.94	0.94	0.94
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	4	4	3	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	523	0	0	134	0	0	132	0	0	236
Lane Width	4.8	3.7	3.7	4.6	3.7	3.7	4.8	4.8	3.7	4.6	4.8	3.7
Parking/Grade/Parking	N	0	N	N	3	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 32.0	G = 4.0	G =	G =	G = 16.0	G = 53.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 121.0			

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate	927	0	0	99	1	0	416	2095	0	98	1260	0
Lane Group Capacity	1051	64	54	522	63	53	525	2495	715	515	2447	715
v/c Ratio	0.88	0.00	0.00	0.19	0.02	0.00	0.79	0.84	0.00	0.19	0.51	0.00
Green Ratio	0.26	0.03	0.03	0.26	0.03	0.03	0.13	0.44	0.44	0.13	0.44	0.44
Uniform Delay d_1	42.7	56.6	56.6	34.5	56.6	56.6	50.9	30.2	19.1	46.7	24.7	19.1
Delay Factor k	0.41	0.11	0.11	0.11	0.11	0.11	0.34	0.37	0.11	0.11	0.12	0.11
Incremental Delay d_2	8.9	0.0	0.0	0.2	0.1	0.0	8.1	2.7	0.0	0.2	0.2	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.851	1.000	1.000	0.851	1.000
Control Delay	51.6	56.6	56.6	34.6	56.7	56.6	59.0	28.5	19.1	46.9	21.2	19.1
Lane Group LOS	D	E	E	C	E	E	E	C	B	D	C	B
Approach Delay	51.6			34.9			33.5			23.0		
Approach LOS	D			C			C			C		
Intersection Delay	34.1			Intersection LOS						C		

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SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y C. Colón*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/18/2008*	Jurisdiction	*Caguas*
Time Period	*3:15 - 4:15 PM*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		1				2	3			3	1
Lane Group	L		R				L	T			T	R
Volume (vph)	234		268				326	2287			1243	505
% Heavy Vehicles	3		11				0	3			4	3
PHF	0.69		0.88				0.81	0.82			0.96	0.78
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	4			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	268	0	0		0	0		0	0	505
Lane Width	2.7		3.7				3.7	3.7			3.7	3.7
Parking/Grade/Parking	N	-2	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	02	03	04	NB Only	NS Perm	07	08
Timing	G = 14.0	G =	G =	G =	G = 7.0	G = 62.0	G =	G =
	Y = 6	Y =	Y =	Y =	Y = 4	Y = 6	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 99.0		

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate	339		0				402	2789			1295	0
Lane Group Capacity	438		210				738	3747			3151	993
v/c Ratio	0.77		0.00				0.54	0.74			0.41	0.00
Green Ratio	0.14		0.14				0.76	0.74			0.63	0.63
Uniform Delay d_1	41.0		36.5				4.9	7.6			9.3	6.9
Delay Factor k	0.32		0.11				0.14	0.30			0.11	0.11
Incremental Delay d_2	8.4		0.0				0.8	0.8			0.1	0.0
PF Factor	1.000		1.000				1.000	0.219			1.000	1.000
Control Delay	49.4		36.5				5.8	2.5			9.4	6.9
Lane Group LOS	D		D				A	A			A	A
Approach Delay	49.4						2.9			9.4		
Approach LOS	D						A			A		
Intersection Delay	7.9			Intersection LOS						A		

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José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst:	José L. Pérez Berenguer
Agency/Co.:	Pérez Berenguer y Asociados
Date Performed:	10/19/2008
Analysis Time Period:	3:15 - 4:15 PM
Urban Street:	PR-32
Direction of Travel:	North-bound
Jurisdiction:	Caguas
Analysis Year:	2012

Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	PR-34					
1	Proyecto/Terrassa	0.30	4	40	33.2	1
2	Cristóbal Colón	0.20	4	40	25.0	2
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I factor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	121.0	0.440	0.840	2495		4	0.500*	3.0	0	27.0	0.0	C
2	99.0	0.740	0.740	3747		4	0.430	3.0	0	0.8	0.0	A
3												
4												
5												

6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	1	33.2	27.0	0.0	60.1	0.30	18.0	E
2	2	25.0	0.8	0.0	25.8	0.20	27.9	C
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x)	=	85.9	sec
Total length Length (y)	=	0.50	km
Total travel speed, Sa = 3600 x (y)/(x)	=	21.0	km/h
Total urban street LOS (Exhibit 15-2)	=	D	

Intersection Files in the Analysis

1: ProyPM12
2: ColoPM12
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

HCS+: Urban Streets Release 5.3

José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst: José L. Pérez Berenguer
Agency/Co.: Pérez Berenguer y Asociados
Date Performed: 10/19/2008
Analysis Time Period: 3:15 - 4:15 PM
Urban Street: PR-32
Direction of Travel: South-bound
Jurisdiction: Caguas
Analysis Year: 2012
Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	Cristóbal Colón					
1	Proyecto/Terrassa	0.20	4	40	25.0	2
2	PR-34	0.30	4	40	33.2	1
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I fac-tor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	121.0	0.440	0.510	2447		4	0.917*	3.0	0	20.9	0.0	C
2	96.0	0.400	0.600	1935		4	0.850	3.0	0	20.8	0.0	C
3												
4												
5												

6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	2	25.0	20.9	0.0	45.9	0.20	15.7	E
2	1	33.2	20.8	0.0	53.9	0.30	20.0	D
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x)	=	99.9	sec
Total length Length (y)	=	0.50	km
Total travel speed, Sa = 3600 x (y)/(x)	=	18.0	km/h
Total urban street LOS (Exhibit 15-2)	=	D	

Intersection Files in the Analysis

1: ProyPM12
2: HIMAPM12
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y PR-34*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/16/2008*	Jurisdiction	*Caguas*
Time Period	*7:15 - 8:15 AM*	Analysis Year	*2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	2	1	2	2	1	1	2	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	503	315	76	64	125	281	46	1418	155	493	1144	533
% Heavy Vehicles	1	9	2	0	6	3	0	3	4	3	3	3
PHF	0.88	0.90	0.76	0.64	0.94	0.81	0.83	0.87	0.80	0.78	0.86	0.86
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	3	3	4	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	76	0	0	281	0	0	155	0	0	533
Lane Width	4.0	3.7	3.7	4.0	3.7	3.7	3.7	3.7	3.7	4.0	3.7	3.7
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	2	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	WB Only	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 20.5	G = 7.0	G =	G =	G = 23.5	G = 59.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 126.0		

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate	572	350	0	100	133	0	55	1630	0	632	1330	0
Lane Group Capacity	599	554	264	203	192	88	340	1663	735	656	2355	735
v/c Ratio	0.95	0.63	0.00	0.49	0.69	0.00	0.16	0.98	0.00	0.96	0.56	0.00
Green Ratio	0.16	0.16	0.16	0.06	0.06	0.06	0.19	0.47	0.47	0.19	0.47	0.47
Uniform Delay d_1	52.3	49.2	44.2	57.8	58.4	56.2	43.0	32.9	17.8	50.8	24.2	17.8
Delay Factor k	0.46	0.21	0.11	0.11	0.26	0.11	0.11	0.48	0.11	0.47	0.16	0.11
Incremental Delay d_2	26.0	2.3	0.0	1.9	10.2	0.0	0.2	17.5	0.0	26.3	0.3	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.812	1.000
Control Delay	78.3	51.6	44.2	59.7	68.7	56.2	43.2	50.4	17.8	77.1	20.0	17.8
Lane Group LOS	E	D	D	E	E	E	D	D	B	E	B	B
Approach Delay	68.1			64.8			50.2			38.4		
Approach LOS	E			E			D			D		
Intersection Delay	49.5			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y Proyecto*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/19/2008*	Jurisdiction	*Caguas*
Time Period	*7:15 - 8:15 AM*	Analysis Year	*2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	1	1	1	1	1	2	3	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	85	0	116	42	1	28	686	1480	37	51	2012	934
% Heavy Vehicles	0	0	0	0	0	0	0	3	0	0	3	0
PHF	0.89	0.91	0.92	0.92	0.91	0.89	0.89	0.89	0.89	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	4	4	3	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	116	0	0	28	0	0	37	0	0	934
Lane Width	4.8	3.7	3.7	4.6	3.7	3.7	4.8	4.8	3.7	4.6	4.8	3.7
Parking/Grade/Parking	N	0	N	N	3	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 5.0	G = 4.0	G =	G =	G = 27.0	G = 66.0	G =	G =
	Y = 4	Y = 6	Y =	Y =	Y = 4	Y = 6	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 122.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	96	0	0	46	1	0	771	1663	0	55	2187	0
Lane Group Capacity	163	63	54	81	62	53	879	3081	883	862	3081	883
v/c Ratio	0.59	0.00	0.00	0.57	0.02	0.00	0.88	0.54	0.00	0.06	0.71	0.00
Green Ratio	0.04	0.03	0.03	0.04	0.03	0.03	0.22	0.54	0.54	0.22	0.54	0.54
Uniform Delay d_1	57.5	57.1	57.1	57.4	57.1	57.1	45.9	18.2	12.9	37.5	20.9	12.9
Delay Factor k	0.18	0.11	0.11	0.16	0.11	0.11	0.40	0.14	0.11	0.11	0.27	0.11
Incremental Delay d_2	5.5	0.0	0.0	9.1	0.1	0.0	10.0	0.2	0.0	0.0	0.8	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.698	1.000	1.000	0.698	1.000
Control Delay	63.0	57.1	57.1	66.5	57.2	57.1	55.9	12.9	12.9	37.5	15.3	12.9
Lane Group LOS	E	E	E	E	E	E	E	B	B	D	B	B
Approach Delay	63.0			66.3			26.5			15.9		
Approach LOS	E			E			C			B		
Intersection Delay	22.7			Intersection LOS						C		

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SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y C. Colón*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/18/2008*	Jurisdiction	*Caguas*
Time Period	*7:15 - 8:15 AM*	Analysis Year	*2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		1				2	3			3	1
Lane Group	L		R				L	T			T	R
Volume (vph)	97		130				197	1395			2867	44
% Heavy Vehicles	4		2				0	3			3	3
PHF	0.83		0.88				0.89	0.89			0.92	0.25
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	4			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	130	0	0		0	0		0	0	44
Lane Width	2.7		3.7				3.7	3.7			3.7	3.7
Parking/Grade/Parking	N	-2	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	02	03	04	NB Only	Thru & RT	07	08
Timing	G = 6.0	G =	G =	G =	G = 9.0	G = 87.0	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 114.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	117		0				221	1567			3116	0
Lane Group Capacity	161		85				280	3878			3878	1210
v/c Ratio	0.73		0.00				0.79	0.40			0.80	0.00
Green Ratio	0.05		0.05				0.08	0.76			0.76	0.76
Uniform Delay d_1	53.2		51.2				51.6	4.6			8.3	3.2
Delay Factor k	0.29		0.11				0.34	0.11			0.35	0.11
Incremental Delay d_2	15.2		0.0				14.1	0.1			1.3	0.0
PF Factor	1.000		1.000				1.000	0.243			1.000	1.000
Control Delay	68.4		51.2				65.6	1.2			9.6	3.2
Lane Group LOS	E		D				E	A			A	A
Approach Delay	68.4						9.2			9.6		
Approach LOS	E						A			A		
Intersection Delay	10.8			Intersection LOS						B		

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HCS+: Urban Streets Release 5.3

José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst:	José L. Pérez Berenguer
Agency/Co.:	Pérez Berenguer y Asociados
Date Performed:	10/19/2008
Analysis Time Period:	7:15 - 8:15 AM
Urban Street:	PR-32
Direction of Travel:	North-bound
Jurisdiction:	Caguas
Analysis Year:	2022

Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	PR-34					
1	Proyecto/Terrassa	0.30	4	40	33.2	1
2	Cristóbal Colón	0.20	4	40	25.0	2
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I factor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	122.0	0.540	0.540	3081		4	0.138*	3.0	0	12.8	0.0	B
2	114.0	0.760	0.400	3878		4	0.825	3.0	0	0.1	0.0	A
3												
4												
5												

6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	1	33.2	12.8	0.0	45.9	0.30	23.5	C
2	2	25.0	0.1	0.0	25.1	0.20	28.7	C
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x) = 71.0 sec
Total length Length (y) = 0.50 km
Total travel speed, Sa = 3600 x (y)/(x) = 25.4 km/h
Total urban street LOS (Exhibit 15-2) = C

Intersection Files in the Analysis

1: ProyAM22
2: ColoAM22
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

HCS+: Urban Streets Release 5.3

José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst:	José L. Pérez Berenguer
Agency/Co.:	Pérez Berenguer y Asociados
Date Performed:	10/19/2008
Analysis Time Period:	7:15 - 8:15 AM
Urban Street:	PR-32
Direction of Travel:	South-bound
Jurisdiction:	Caguas
Analysis Year:	2022

Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	Cristóbal Colón					
1	Proyecto/Terrassa	0.20	4	40	25.0	2
2	PR-34	0.30	4	40	33.2	1
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I fac-tor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	122.0	0.540	0.710	3081		4	0.500*	3.0	0	15.1	0.0	B
2	126.0	0.470	0.560	2355		4	0.637	3.0	0	19.7	0.0	B
3												
4												
5												

6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	2	25.0	15.1	0.0	40.1	0.20	18.0	E
2	1	33.2	19.7	0.0	52.8	0.30	20.5	D
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x) = 92.9 sec
Total length Length (y) = 0.50 km
Total travel speed, Sa = 3600 x (y)/(x) = 19.4 km/h
Total urban street LOS (Exhibit 15-2) = D

Intersection Files in the Analysis

1: ProyAM22
2: HIMAAM22
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y PR-34*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/16/2008*	Jurisdiction	*Caguas*
Time Period	*1:00 - 2:00 PM*	Analysis Year	*2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	2	1	2	2	1	1	2	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	497	392	139	216	207	646	52	1527	112	279	1226	599
% Heavy Vehicles	3	5	4	10	17	2	0	2	4	4	2	2
PHF	0.88	0.87	0.74	0.51	0.83	0.58	0.84	0.95	0.84	0.81	0.87	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	3	3	4	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	139	0	0	646	0	0	112	0	0	474
Lane Width	4.0	3.7	3.7	4.0	3.7	3.7	3.7	3.7	3.7	4.0	3.7	3.7
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	2	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	WB Only	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 16.0	G = 14.0	G =	G =	G = 11.0	G = 44.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 101.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	565	451	0	424	249	0	62	1607	0	344	1409	132
Lane Group Capacity	572	560	253	461	433	222	199	1562	684	380	2213	690
v/c Ratio	0.99	0.81	0.00	0.92	0.58	0.00	0.31	1.03	0.00	0.91	0.64	0.19
Green Ratio	0.16	0.16	0.16	0.14	0.14	0.14	0.11	0.44	0.44	0.11	0.44	0.44
Uniform Delay d_1	42.4	41.0	35.8	42.9	40.7	37.5	41.5	28.5	16.1	44.5	22.3	17.5
Delay Factor k	0.49	0.35	0.11	0.44	0.17	0.11	0.11	0.50	0.11	0.43	0.22	0.11
Incremental Delay d_2	34.4	8.4	0.0	23.7	1.9	0.0	0.9	30.5	0.0	24.5	0.6	0.1
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.854	0.854
Control Delay	76.8	49.4	35.8	66.6	42.6	37.5	42.4	59.0	16.1	69.0	19.6	15.1
Lane Group LOS	E	D	D	E	D	D	D	E	B	E	B	B
Approach Delay	64.7			57.7			58.4			28.3		
Approach LOS	E			E			E			C		
Intersection Delay	48.7			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y Proyecto*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/19/2008*	Jurisdiction	*Caguas*
Time Period	*1:00 - 2:00 PM*	Analysis Year	*2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	1	1	1	1	1	2	3	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	365	1	391	172	6	162	1064	1445	166	174	1539	1134
% Heavy Vehicles	0	0	0	0	0	0	0	3	0	0	3	0
PHF	0.84	0.94	0.92	0.92	0.94	0.84	0.84	0.84	0.84	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	4	4	3	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	391	0	0	162	0	0	166	0	0	1134
Lane Width	4.8	3.7	3.7	4.6	3.7	3.7	4.8	4.8	3.7	4.6	4.8	3.7
Parking/Grade/Parking	N	0	N	N	3	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 16.0	G =	G =	G =	G = 27.5	G = 35.0	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 90.5		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	435	1	0	187	6	0	1267	1720	0	189	1673	0
Lane Group Capacity	449	340	289	278	334	284	1207	2202	632	1184	2202	632
v/c Ratio	0.97	0.00	0.00	0.67	0.02	0.00	1.05	0.78	0.00	0.16	0.76	0.00
Green Ratio	0.18	0.18	0.18	0.18	0.18	0.18	0.30	0.39	0.39	0.30	0.39	0.39
Uniform Delay d_1	37.0	30.7	30.7	34.8	30.8	30.7	31.5	24.4	17.0	23.0	24.1	17.0
Delay Factor k	0.48	0.11	0.11	0.24	0.11	0.11	0.50	0.33	0.11	0.11	0.31	0.11
Incremental Delay d_2	34.4	0.0	0.0	6.2	0.0	0.0	40.0	1.9	0.0	0.1	1.6	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.908	1.000	1.000	0.908	1.000
Control Delay	71.4	30.7	30.7	41.0	30.8	30.7	71.5	24.0	17.0	23.1	23.5	17.0
Lane Group LOS	E	C	C	D	C	C	E	C	B	C	C	B
Approach Delay	71.3			40.7			44.2			23.4		
Approach LOS	E			D			D			C		
Intersection Delay	39.2			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y C. Colón*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/18/2008*	Jurisdiction	*Caguas*
Time Period	*1:00 - 2:00 PM*	Analysis Year	*2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		1				2	3			3	1
Lane Group	L		R				L	T			T	R
Volume (vph)	207		358				245	1728			2489	804
% Heavy Vehicles	8		6				0	2			2	2
PHF	0.83		0.84				0.84	0.84			0.87	0.71
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	4			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	358	0	0		0	0		0	0	804
Lane Width	2.7		3.7				3.7	3.7			3.7	3.7
Parking/Grade/Parking	N	-2	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	02	03	04	NB Only	Thru & RT	07	08
Timing	G = 10.0	G =	G =	G =	G = 15.0	G = 66.0	G =	G =
	Y = 6	Y =	Y =	Y =	Y = 4	Y = 6	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 107.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	249		0				292	2057			2861	0
Lane Group Capacity	276		145				497	3164			3164	988
v/c Ratio	0.90		0.00				0.59	0.65			0.90	0.00
Green Ratio	0.09		0.09				0.14	0.62			0.62	0.62
Uniform Delay d_1	48.0		44.0				43.1	13.1			17.8	7.9
Delay Factor k	0.42		0.11				0.18	0.23			0.43	0.11
Incremental Delay d_2	30.2		0.0				1.8	0.5			4.2	0.0
PF Factor	1.000		1.000				1.000	0.533			1.000	1.000
Control Delay	78.2		44.0				44.9	7.5			21.9	7.9
Lane Group LOS	E		D				D	A			C	A
Approach Delay	78.2						12.1			21.9		
Approach LOS	E						B			C		
Intersection Delay	20.3			Intersection LOS						C		

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José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst:	José L. Pérez Berenguer
Agency/Co.:	Pérez Berenguer y Asociados
Date Performed:	10/19/2008
Analysis Time Period:	1:00 - 2:00 PM
Urban Street:	PR-32
Direction of Travel:	North-bound
Jurisdiction:	Caguas
Analysis Year:	2022

Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	PR-34					
1	Proyecto/Terrassa	0.30	4	40	33.2	1
2	Cristóbal Colón	0.20	4	40	25.0	2
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I fac-tor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	90.5	0.390	0.780	2202		4	0.090*	3.0	0	22.1	0.0	C
2	107.0	0.620	0.650	3164		4	0.532	3.0	0	7.1	0.0	A
3												
4												
5												

6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	1	33.2	22.1	0.0	55.2	0.30	19.6	D
2	2	25.0	7.1	0.0	32.1	0.20	22.5	D
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x)	=	87.3	sec
Total length Length (y)	=	0.50	km
Total travel speed, Sa = 3600 x (y)/(x)	=	20.6	km/h
Total urban street LOS (Exhibit 15-2)	=	D	

Intersection Files in the Analysis

1: Proy1222
2: Colo1222
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

HCS+: Urban Streets Release 5.3

José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst:	José L. Pérez Berenguer
Agency/Co.:	Pérez Berenguer y Asociados
Date Performed:	10/19/2008
Analysis Time Period:	1:00 - 2:00 PM
Urban Street:	PR-32
Direction of Travel:	South-bound
Jurisdiction:	Caguas
Analysis Year:	2022

Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	Cristóbal Colón					
1	Proyecto/Terrassa	0.20	4	40	25.0	2
2	PR-34	0.30	4	40	33.2	1
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I factor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	90.5	0.390	0.760	2202		4	0.314*	3.0	0	22.2	0.0	C
2	101.0	0.440	0.640	2213		4	0.564	3.0	0	19.1	0.0	B
3												
4												
5												

6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	2	25.0	22.2	0.0	47.2	0.20	15.3	E
2	1	33.2	19.1	0.0	52.2	0.30	20.7	D
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x) = 99.4 sec
Total length Length (y) = 0.50 km
Total travel speed, Sa = 3600 x (y)/(x) = 18.1 km/h
Total urban street LOS (Exhibit 15-2) = D

Intersection Files in the Analysis

1: Proy1222
2: HIMA1222
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y PR-34*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/16/2008*	Jurisdiction	*Caguas*
Time Period	*3:15 - 4:15 PM*	Analysis Year	*2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	2	1	2	2	1	1	2	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	413	257	96	147	324	1178	53	1177	64	267	1345	664
% Heavy Vehicles	3	2	6	6	18	3	0	3	0	4	6	2
PHF	0.86	0.91	0.86	0.59	0.80	0.69	0.59	0.83	0.64	0.84	0.91	0.88
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	3	3	3	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	96	0	0	1178	0	0	64	0	0	664
Lane Width	4.0	3.7	3.7	4.0	3.7	3.7	3.7	3.7	3.7	4.0	3.7	3.7
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	2	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	WB Only	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 14.0	G = 17.0	G =	G =	G = 10.0	G = 38.0	G =	G =
	Y = 4	Y = 6	Y =	Y =	Y = 4	Y = 6	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 99.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	480	282	0	249	405	0	90	1418	0	318	1478	0
Lane Group Capacity	510	515	221	593	532	272	184	1363	627	352	1876	608
v/c Ratio	0.94	0.55	0.00	0.42	0.76	0.00	0.49	1.04	0.00	0.90	0.79	0.00
Green Ratio	0.14	0.14	0.14	0.17	0.17	0.17	0.10	0.38	0.38	0.10	0.38	0.38
Uniform Delay d_1	42.1	39.6	36.5	36.6	39.1	34.0	42.1	30.5	18.8	44.0	26.9	18.8
Delay Factor k	0.45	0.15	0.11	0.11	0.31	0.11	0.11	0.50	0.11	0.42	0.33	0.11
Incremental Delay d_2	25.9	1.2	0.0	0.5	6.4	0.0	2.0	35.5	0.0	25.6	2.3	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.911	1.000
Control Delay	68.0	40.8	36.5	37.1	45.5	34.0	44.1	66.0	18.8	69.6	26.9	18.8
Lane Group LOS	E	D	D	D	D	C	D	E	B	E	C	B
Approach Delay	57.9			42.3			64.7			34.4		
Approach LOS	E			D			E			C		
Intersection Delay	49.0			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y Proyecto*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/19/2008*	Jurisdiction	*Caguas*
Time Period	*3:15 - 4:15 PM*	Analysis Year	*2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	1	1	1	1	1	2	3	1	2	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	961	0	661	118	1	169	431	2171	167	116	1497	298
% Heavy Vehicles	0	0	0	0	0	0	0	3	0	0	5	0
PHF	0.82	0.88	0.94	0.94	0.88	0.82	0.82	0.82	0.82	0.94	0.94	0.94
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	4	4	3	4	4
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	661	0	0	169	0	0	167	0	0	298
Lane Width	4.8	3.7	3.7	4.6	3.7	3.7	4.8	4.8	3.7	4.6	4.8	3.7
Parking/Grade/Parking	N	0	N	N	3	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	NB Only	Thru & RT	08
Timing	G = 31.0	G = 4.0	G =	G =	G = 4.5	G = 6.5	G = 44.0	G =
	Y = 4	Y = 4	Y =	Y =	Y = 4	Y = 4	Y = 4	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 110.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	1172	0	0	126	1	0	526	2648	0	123	1593	0
Lane Group Capacity	1120	70	59	557	69	58	542	2822	653	159	2234	653
v/c Ratio	1.05	0.00	0.00	0.23	0.01	0.00	0.97	0.94	0.00	0.77	0.71	0.00
Green Ratio	0.28	0.04	0.04	0.28	0.04	0.04	0.14	0.50	0.40	0.04	0.40	0.40
Uniform Delay d_1	39.5	51.1	51.1	30.3	51.1	51.1	47.3	26.2	19.8	52.2	27.7	19.8
Delay Factor k	0.50	0.11	0.11	0.11	0.11	0.11	0.48	0.45	0.11	0.32	0.28	0.11
Incremental Delay d_2	39.9	0.0	0.0	0.2	0.1	0.0	31.1	7.0	0.0	20.8	1.1	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.774	1.000	1.000	0.894	1.000
Control Delay	79.4	51.1	51.1	30.5	51.2	51.1	78.4	27.2	19.8	73.0	25.9	19.8
Lane Group LOS	E	D	D	C	D	D	E	C	B	E	C	B
Approach Delay	79.4			30.7			35.7			29.3		
Approach LOS	E			C			D			C		
Intersection Delay	42.1			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	*José L. Pérez Berenguer*	Intersection	*PR-32 y C. Colón*
Agency or Co.	*Pérez Berenguer y Asociados*	Area Type	*All other areas*
Date Performed	*10/18/2008*	Jurisdiction	*Caguas*
Time Period	*3:15 - 4:15 PM*	Analysis Year	*2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		1				2	3			3	1
Lane Group	L		R				L	T			T	R
Volume (vph)	296		339				412	2891			1571	638
% Heavy Vehicles	3		11				0	3			4	3
PHF	0.69		0.88				0.81	0.82			0.96	0.78
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	4			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	339	0	0		0	0		0	0	638
Lane Width	2.7		3.7				3.7	3.7			3.7	3.7
Parking/Grade/Parking	N	-2	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	02	03	04	NB Only	NS Perm	07	08
Timing	G = 18.0	G =	G =	G =	G = 7.0	G = 77.0	G =	G =
	Y = 6	Y =	Y =	Y =	Y = 4	Y = 6	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 118.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	429		0				509	3526			1636	0
Lane Group Capacity	472		227				741	3789			3284	1034
v/c Ratio	0.91		0.00				0.69	0.93			0.50	0.00
Green Ratio	0.15		0.15				0.76	0.75			0.65	0.65
Uniform Delay d_1	49.2		42.4				7.5	12.5			10.6	7.1
Delay Factor k	0.43		0.11				0.26	0.45			0.11	0.11
Incremental Delay d_2	21.4		0.0				2.7	4.9			0.1	0.0
PF Factor	1.000		1.000				1.000	0.226			1.000	1.000
Control Delay	70.6		42.4				10.2	7.7			10.7	7.1
Lane Group LOS	E		D				B	A			B	A
Approach Delay	70.6						8.0			10.7		
Approach LOS	E						A			B		
Intersection Delay	13.1			Intersection LOS						B		

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José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst:	José L. Pérez Berenguer
Agency/Co.:	Pérez Berenguer y Asociados
Date Performed:	10/19/2008
Analysis Time Period:	3:15 - 4:15 PM
Urban Street:	PR-32
Direction of Travel:	North-bound
Jurisdiction:	Caguas
Analysis Year:	2022

Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	PR-34					
1	Proyecto/Terrassa	0.30	4	40	33.2	1
2	Cristóbal Colón	0.20	4	40	25.0	2
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I factor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	110.0	0.500	0.940	2822		4	0.090*	3.0	0	20.7	0.0	C
2	118.0	0.750	0.930	3789		4	0.229	3.0	0	1.3	0.0	A
3												
4												

5
6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	1	33.2	20.7	0.0	53.9	0.30	20.1	D
2	2	25.0	1.3	0.0	26.3	0.20	27.4	C
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

Total travel time (x) = 80.1 sec
Total length Length (y) = 0.50 km
Total travel speed, Sa = 3600 x (y)/(x) = 22.5 km/h
Total urban street LOS (Exhibit 15-2) = D

Intersection Files in the Analysis

1: ProyPM22
2: ColoPM22
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

HCS+: Urban Streets Release 5.3

José L. Pérez Berenguer
Pérez Berenguer y Asociados
Apartado 6512, Marina Station
Mayagüez, Puerto Rico, 00681-6512

Phone: (787) 254-8321 Fax: (787) 254-8321
E-Mail: PBAsoc@choicecable.net

OPERATIONAL ANALYSIS

Analyst:	José L. Pérez Berenguer
Agency/Co.:	Pérez Berenguer y Asociados
Date Performed:	10/19/2008
Analysis Time Period:	3:15 - 4:15 PM
Urban Street:	PR-32
Direction of Travel:	South-bound
Jurisdiction:	Caguas
Analysis Year:	2022

Project ID: Estudio de Tránsito Centro Judicial de Caguas

Description of Arterial

Analysis period length 1.00 hr

Seg.	Cross street name	Length of segment (km)	Urban street class	Free-flow speed (km/h)	Running time (sec)	Section
0	Cristóbal Colón					
1	Proyecto/Terrassa	0.20	4	40	25.0	2
2	PR-34	0.30	4	40	33.2	1
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Intersection Inputs and Delay Computation

Seg	Cycle length C	Green ratio g/C	v/c ratio X	Lane cap. c	PVG if input	Arr. type AT	I factor	Unit ext. (sec)	Init. queue (veh)	Cntrl. delay (sec)	Other delay (sec)	Inter. LOS
1	110.0	0.400	0.710	2234		4	0.858*	3.0	0	25.7	0.0	C
2	99.0	0.380	0.790	1876		4	0.637	3.0	0	26.4	0.0	C
3												
4												
5												

6
7
8
9
10
11
12
13
14
15

Arterial Level of Service

Seg.	Sect.	Running time (sec)	Inter. control. delay (sec)	Other delay (sec)	Sum of time by section (sec)	Sum of length by section (km)	Travel speed (km/h)	Arterial LOS by section
1	2	25.0	25.7	0.0	50.7	0.20	14.2	E
2	1	33.2	26.4	0.0	59.6	0.30	18.1	D
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Urban Street LOS Determination

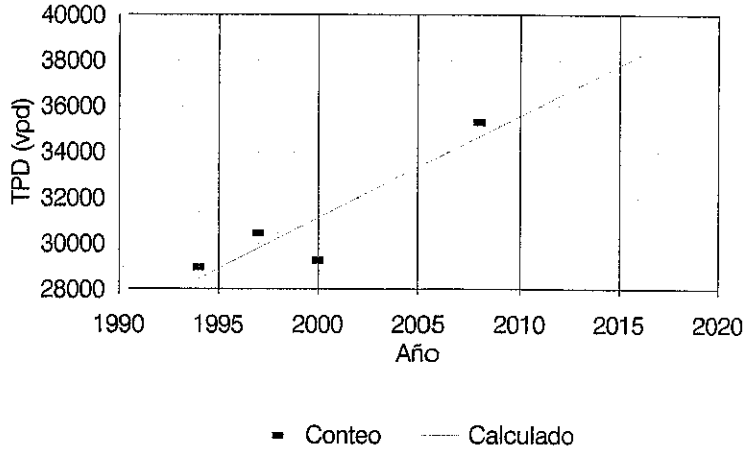
Total travel time (x)	=	110.2	sec
Total length Length (y)	=	0.50	km
Total travel speed, Sa = 3600 x (y)/(x)	=	16.3	km/h
Total urban street LOS (Exhibit 15-2)	=	E	

Intersection Files in the Analysis

1: ProyPM22
2: HIMAPM22
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

Apéndice 6. Determinación del Factor de Crecimiento del Tránsito Promedio Diario
Carretera PR-32, al norte de Carretera PR-34

Año	Conteo	Calculado	Regression Output:	
1994	29000	28488	Constant	-852515.965519573
1997	30500	29814	Std Err of Y Est	1504.4360267624
2000	29300	31139	R Squared	0.824247950105011
2008	35315	34674	No. of Observations	4
2012		36441	Degrees of Freedom	2
2017		38650		
			X Coefficient(s)	441827586208062
			Std Err of Coef.	144264372853205



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

$$(1+i)^n = \frac{F}{P}$$

$$1+i = \sqrt[n]{\frac{F}{P}}$$

$$i = \sqrt[n]{\frac{F}{P}} - 1$$

$$i = \sqrt[13]{\frac{38650}{28488}} - 1$$

$$i = 2.37\%\ anual$$

Apéndice 7. Generación, Asignación y Proyección de Viajes

Generación de Viajes

Con el propósito de determinar el flujo vehicular que generará el Centro Judicial de Caguas y una institución bancaria propuesta para el sector se utilizó la referencia *Trip Generation* (**ITE, 2003**). Esta referencia define una serie de usos de terreno e indica el flujo vehicular que se espera que cada uno genere, basado en estudios realizados previamente.

El Centro Judicial de Caguas consistirá en la construcción de un edificio que albergará oficinas destinadas a ofrecer servicios relacionados con la judicatura estatal y un edificio de estacionamiento multipisos, totalizando un área de piso de 652556 pies cuadrados. El proyecto estará ubicado en la esquina suroeste de la intersección de la carretera PR-32 (avenida Luis Muñoz Marín) y el boulevard Cristóbal Colón, barrio Pueblo, Caguas y tendrá acceso directo a la primer vía. Actualmente, la Junta de Planificación de Puerto Rico evalúa la Consulta de Ubicación del proyecto bajo el número de caso 2008-46-0201-JPU-MA. Para estimar el flujo vehicular que generará este proyecto se utilizó el uso de terreno 733 (*Government Office Complex*) según definido por *Trip Generation* (**ITE, 2003**). También se consideró la construcción y ocupación de una sucursal bancaria propuesta para el predio de terreno que ubica al lado este de la carretera PR-32, frente al predio destinado para el Centro Judicial de Caguas. Este proyecto

constara de un edificio de tres plantas destinado para una sucursal bancaria y oficina, con un área de piso de 9793.0668 pies cuadrados. El acceso a este proyecto será por la carretera PR-32, utilizando la calle que actualmente le brinda acceso a una iglesia que ubica frente al predio donde se propone el Centro Judicial de Caguas. Actualmente, la Junta de Planificación de Puerto Rico evalúa la Consulta de Ubicación de este proyecto bajo el número de caso 2007-46-0278-JPU-MA. Utilizando la información que ofrece la referencia relacionada al flujo vehicular que generará el proyecto propuesto durante la hora pico de la calle adyacente para las horas críticas de la mañana y de la tarde y la hora pico de la tarde del generador para la hora entre 1:00 y 2:00 PM se obtuvo que los proyectos propuestos generarán los viajes que aparecen en la tabla A7-1. Cuando se utilizó la hora pico de la calle adyacente se hizo porque se desea conocer el impacto de los proyectos en la operación de las facilidades analizadas durante sus horas más críticas. Cuando se utilizó la hora pico del generador se hizo para analizar el efecto más crítico del proyecto en el entorno. Se supuso que las horas pico de la facilidad analizada no cambiarán una vez se ocupe el proyecto propuesto debido a que el uso de terreno propuesto (institucional) existe en el área.

Proyección del Tránsito

Para proyectar los conteos de flujo vehicular actuales hacia el futuro, se obtuvieron datos históricos recopilados por la

Autoridad de Carreteras y Transportación (ACT) en una estación de conteo ubicada en la carretera PR-32, al norte de su intersección con la carretera PR-34. Con estos datos, los cuales aparecen en el Apéndice 6, y los tomados para este estudio, se desarrolló una ecuación de regresión lineal para determinar la curva que mejor se les ajustara. Los resultados se ilustran en las páginas 26 y 27 de este informe y se detallan en el Apéndice 6. Utilizando la ley de interés compuesto y el crecimiento anual obtenido, se proyectaron los viajes que actualmente utilizan las intersecciones aquí analizadas al año 2012. Estos viajes proyectados se detallan en la figura A7-1. Estos viajes, junto con los que generarán los proyectos propuestos para el área, fueron proyectados al año 2022 de igual forma.

Tabla A7-1. Viajes que Generarán los Proyectos Propuestos para el Área Analizada en este Estudio

Hora Pico	Entrando	Saliendo	Total
Proyecto: Centro Judicial de Caguas			
7:15 - 8:15 AM	1283	159	1442
1:00 - 2:00 PM	1744	599	2343
3:15 - 4:15 PM	577	1283	1860
Proyecto: Institución Bancaria			
7:15 - 8:15 AM	68	53	121
1:00 - 2:00 PM	267 (142)	257 (136)	524 (278)
3:15 - 4:15 PM	224 (119)	224 (119)	448 (238)

Nota: Los viajes, luego del ajuste por "pass-by", aparecen entre paréntesis.

Ajuste por Viajes "Pass-by"

Se reconoce que los viajes generados por centros comerciales y otros establecimientos, tales como bancos, farmacias, restaurantes de comida rápida, etc., poseen características diferentes a los viajes generados por otros tipos de facilidades. Una proporción significativa de los viajes generados por instituciones bancarias son simplemente viajes desviados del tránsito actual en el sistema de carreteras adyacente. Estos viajes se conocen como "pass-by".

Debido a que un proyecto propuesto para el área analizada es una institución bancaria, los viajes generados por esta deben ser ajustados por viajes "pass-by". *Trip Generation Handbook* (**ITE, 2001**) incluye estadísticas para estimar los porcientos de viajes "pass-by" en función del uso del terreno. De esta referencia, el porciento promedio de viajes "pass-by" para una institución bancaria es 47%. Por lo tanto, se supuso que un 47% de los viajes generados por la institución bancaria propuesta serán viajes "pass-by". Los viajes ajustados se resumen en la tabla A7-1.

Distribución de Viajes

Una vez determinado el flujo vehicular que generará el proyecto propuesto, durante las horas pico, se procedió a distribuir la nueva demanda. Esta distribución se realizó basada en la proporción direccional obtenida durante las horas pico en los conteos realizados recientemente en las intersecciones analizadas.

En la figura A7-2 se ilustran los viajes que generará el proyecto propuesto, distribuidos por la red de carreteras analizada. Se sumó la información que aparece en esta figura con la de la figura A7-1 para hacer los análisis operacionales para el momento en el que se espera que se concluya y recién se ocupe el Centro Judicial de Caguas. Estos resultados resumen en la figura 15. Los viajes ya proyectados al año 2022 se resumen en la figura 16 y los resultados correspondientes se ilustran en la figura 17.

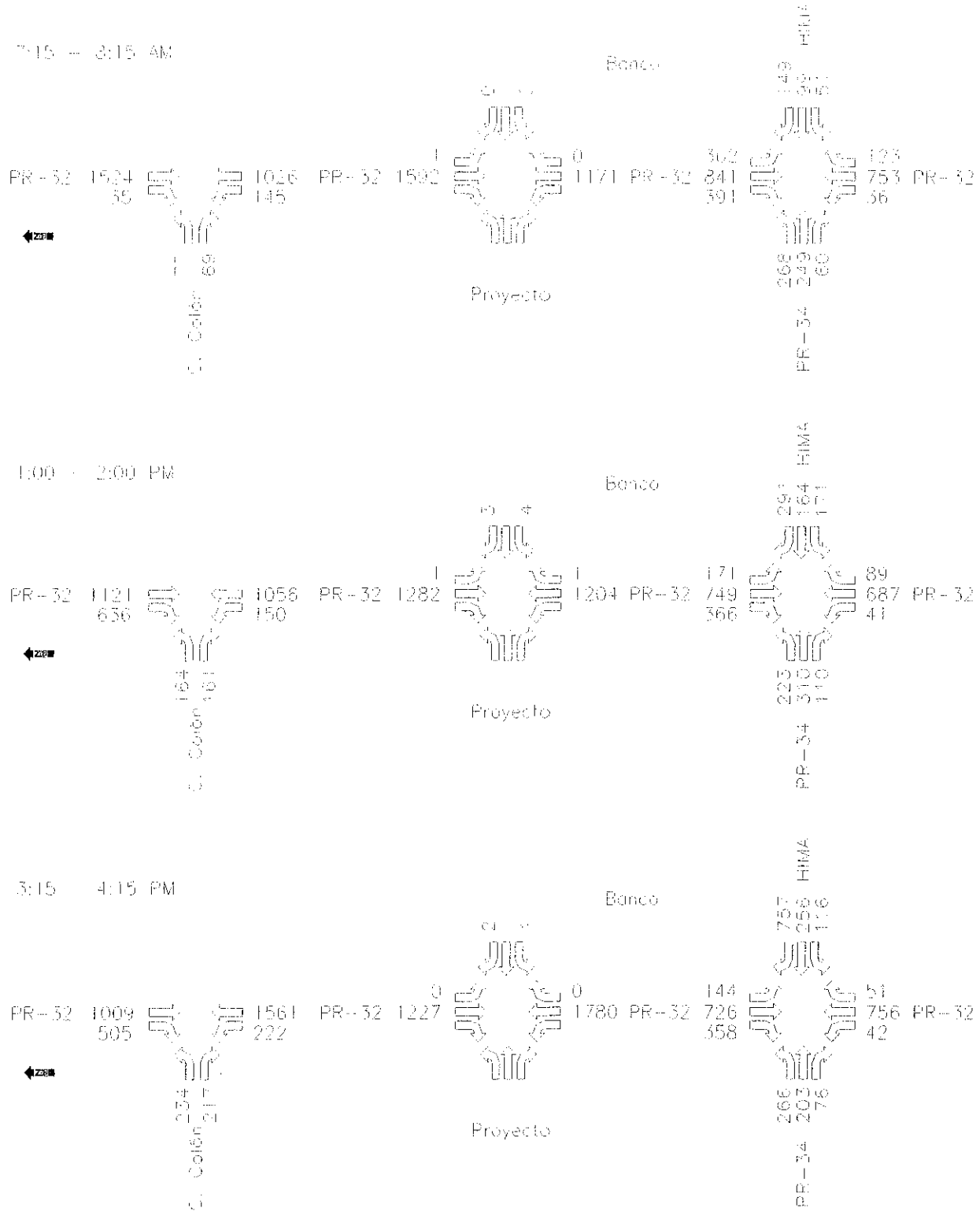


Figura A7-1. Viajes que actualmente utilizan las intersecciones analizadas en este estudio, durante las horas pico de un día laborable típico, proyectados al año 2012. Los viajes se expresan en vehículos por hora

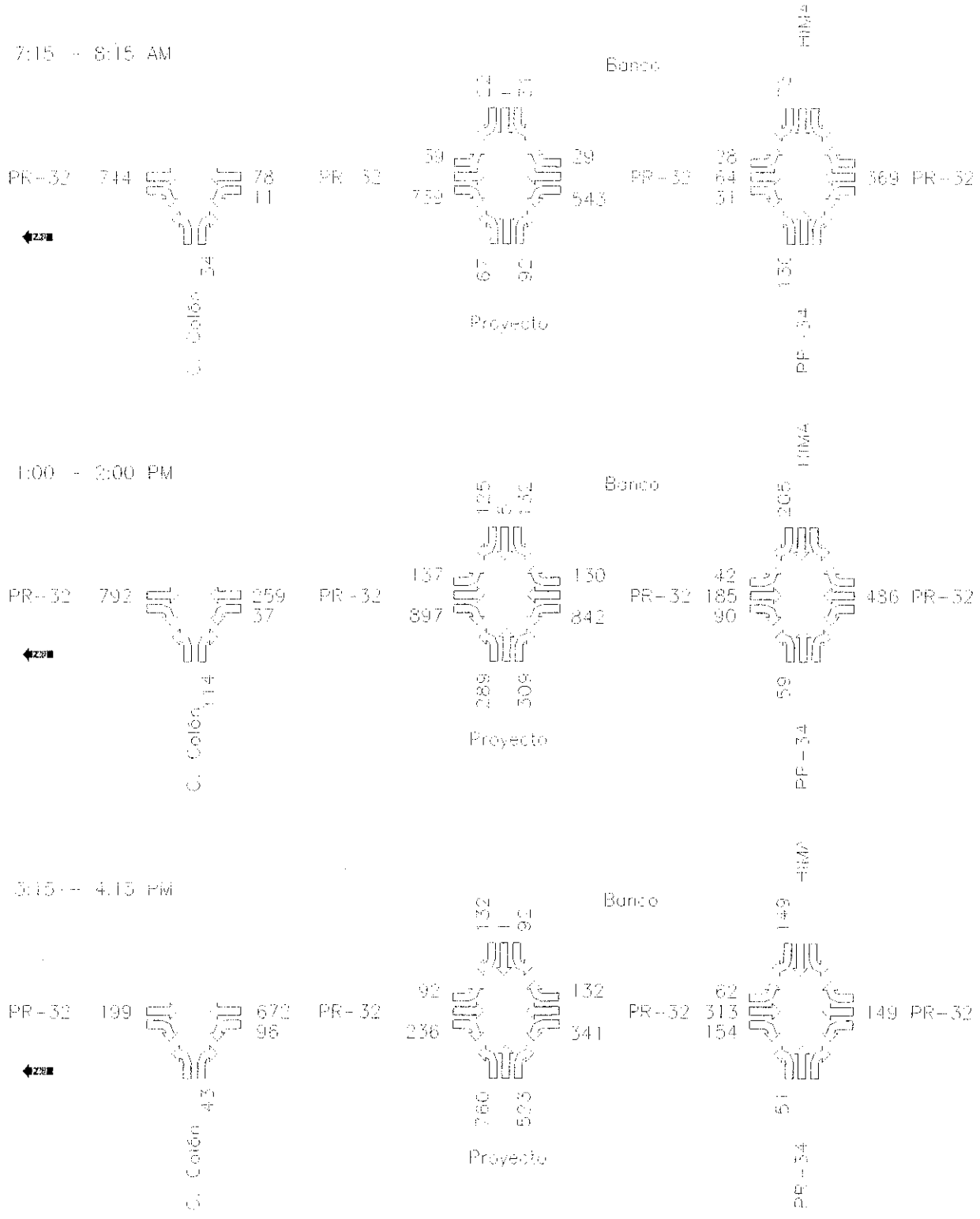


Figura A7-2. Viajes que generarán los proyectos propuestos en el área analizada, durante las horas pico de un día laborable típico, distribuídos por las intersecciones evaluadas en este estudio. Los viajes generados se expresan en vehículos por hora

Apéndice 8. Justificaciones para la Evaluación de la Instalación de Sistemas de Semáforos (ATSSA/ITE/AASHTO, 2003)

CHAPTER 4C. TRAFFIC CONTROL SIGNAL NEEDS STUDIES

Section 4C.01 Studies and Factors for Justifying Traffic Control Signals

Standard:

An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location.

The investigation of the need for a traffic control signal shall include an analysis of the applicable factors contained in the following traffic signal warrants and other factors related to existing operation and safety at the study location:

Warrant 1, Eight-Hour Vehicular Volume.
Warrant 2, Four-Hour Vehicular Volume.
Warrant 3, Peak Hour.
Warrant 4, Pedestrian Volume.
Warrant 5, School Crossing.
Warrant 6, Coordinated Signal System.
Warrant 7, Crash Experience.
Warrant 8, Roadway Network.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Support:

Sections 8D.07 and 10D.05 contain information regarding the use of traffic control signals instead of gates and/or flashing light signals at highway-railroad grade crossings and highway-light rail transit grade crossings, respectively.

Guidance:

A traffic control signal should not be installed unless one or more of the factors described in this Chapter are met.

A traffic control signal should not be installed unless an engineering study indicates that installing a traffic control signal will improve the overall safety and/or operation of the intersection.

A traffic control signal should not be installed if it will seriously disrupt progressive traffic flow.

The study should consider the effects of the right-turn vehicles from the minor-street approaches. Engineering judgment should be used to determine what, if any, portion of the right-turn traffic is subtracted from the minor-street traffic count when evaluating the count against the above signal warrants.

Engineering judgment should also be used in applying various traffic signal warrants to cases where approaches consist of one lane plus one left-turn or right-turn lane. The site-specific traffic characteristics dictate whether an approach should be considered as one lane or two lanes. For example, for an approach with one lane for through and right-turning traffic plus a left-turn lane, engineering judgment could indicate that it should be considered a one-lane approach if the traffic using the left-turn lane is minor. In such a case, the total traffic volume approaching the intersection should be applied against the signal warrants as a one-lane approach. The approach should be considered two lanes if approximately half of the traffic on the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn vehicles.

Similar engineering judgment and rationale should be applied to a street approach with one lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered.

At a location that is under development or construction and where it is not possible to obtain a traffic count that would represent future traffic conditions, hourly volumes should be estimated as part of an engineering study for comparison with traffic signal warrants. Except for locations where the engineering study uses the satisfaction of Warrant 8 to justify a signal, a traffic control signal installed under projected conditions should have an engineering study done within 1 year of putting the signal into stop-and-go operation to determine if the signal is justified. If not justified, the signal should be taken out of stop-and-go operation or removed.

For signal warrant analysis, a location with a wide median, even if the median width is greater than 9 m (30 ft), should be considered as one intersection.

Option:

At an intersection with a high volume of left-turn traffic from the major street, the signal warrant analysis may be performed in a manner that considers the higher of the major-street left-turn volumes as the "minor-street" volume and the corresponding single direction of opposing traffic on the major street as the "major-street" volume.

For signal warrant analysis, bicyclists may be counted as either vehicles or pedestrians.

Support:

When performing a signal warrant analysis, bicyclists riding in the street with other vehicular traffic are usually counted as vehicles and bicyclists who are clearly using pedestrian facilities are usually counted as pedestrians.

Option:

Engineering study data may include the following:

A. The number of vehicles entering the intersection in each hour from each approach during 12 hours of an average day. It is desirable that the hours selected contain the greatest percentage of the 24-hour traffic volume.
B. Vehicular volumes for each traffic movement from each approach, classified by vehicle type (heavy trucks, passenger cars and light trucks, public-transit vehicles, and, in some locations, bicycles), during each 15-minute period of the 2 hours in the morning and 2 hours in the afternoon during which total traffic entering the intersection is greatest.
C. Pedestrian volume counts on each crosswalk during the same periods as the vehicular counts in Item B above and during hours of highest pedestrian volume. Where young, elderly, and/or persons with physical or visual disabilities need special consideration, the pedestrians and their crossing times may be classified by general observation.
D. Information about nearby facilities and activity centers that serve the young, elderly, and/or persons with disabilities, including requests from persons with disabilities for accessible crossing improvements at the location under study. These persons might not be adequately reflected in the pedestrian volume count if the absence of a signal restrains their mobility.
E. The posted or statutory speed limit or the 85th-percentile speed on the uncontrolled approaches to the location.
F. A condition diagram showing details of the physical layout, including such features as intersection geometrics, channelization, grades, sight-distance restrictions, transit stops and routes, parking conditions, pavement markings, roadway lighting, driveways, nearby railroad crossings, distance to nearest traffic control signals, utility poles and fixtures, and adjacent land use.
G. A collision diagram showing crash experience by type, location, direction of movement, severity, weather, time of day, date, and day of week for at least 1 year.

The following data, which are desirable for a more precise understanding of the operation of the intersection, may be obtained during the periods specified in Item B of the preceding paragraph:

A. Vehicle-hours of stopped time delay determined separately for each approach.
B. The number and distribution of acceptable gaps in vehicular traffic on the major street for entrance from the minor street.
C. The posted or statutory speed limit or the 85th-percentile speed on controlled approaches at a point near to the intersection but unaffected by the control.
D. Pedestrian delay time for at least two 30-minute peak pedestrian delay periods of an average weekday or like periods of a Saturday or Sunday.
E. Queue length on stop-controlled approaches.

Section 4C.02 Warrant 1, Eight-Hour Vehicular Volume

Support:

The Minimum Vehicular Volume, Condition A, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

The Interruption of Continuous Traffic, Condition B, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

It is intended that Warrant 1 be treated as a single warrant. If Condition A is satisfied, then the criteria for Warrant 1 is satisfied and Condition B and the combination of Conditions A and B are not needed. Similarly, if Condition B is satisfied, then the criteria for Warrant 1 is satisfied and the combination of Conditions A and B is not needed.

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1.....	1.....	500	400	350	280	150	120	105	84
2 or more...	1.....	600	480	420	336	150	120	105	84
2 or more...	2 or more...	600	480	420	336	200	160	140	112
1.....	2 or more....	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1.....	1.....	750	600	525	420	75	60	53	42
2 or more...	1.....	900	720	630	504	75	60	53	42
2 or more...	2 or more...	900	720	630	504	100	80	70	56
1.....	2 or more....	750	600	525	420	100	80	70	56

[a] Basic minimum hourly volume.
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.
[c] May be used when the major-street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.
[d] May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.

Standard:

The need for a traffic control signal shall be considered if an engineering study finds that one of the following conditions exist for each of any 8 hours of an average day:

A. The vehicles per hour given in both of the 100 percent columns of Condition A in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; or

B. The vehicles per hour given in both of the 100 percent columns of Condition B in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.

In applying each condition the major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of these 8 hours.

Option:

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 70 km/h or exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 70 percent columns in Table 4C-1 may be used in place of the 100 percent columns.

Guidance:

The combination of Conditions A and B is intended for application at locations where Condition A is not satisfied and Condition B is not satisfied and should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Standard:

The need for a traffic control signal shall be considered if an engineering study finds that both of the following conditions exist for each of any 8 hours of an average day:

A. The vehicles per hour given in both of the 80 percent columns of Condition A in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; and

B. The vehicles per hour given in both of the 80 percent columns of Condition B in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.

These major-street and minor-street volumes shall be for the same 8 hours for each condition; however, the 8 hours satisfied in Condition A shall not be required to be the same 8 hours satisfied in Condition B. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.

Option:

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 70 km/h or exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 56 percent columns in Table 4C-1 may be used in place of the 80 percent columns.

Section 4C.03 Warrant 2, Four-Hour Vehicular Volume

Support:

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Standard:

The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in Figure 4C-1 for the existing combination of approach lanes. On the minor street, the higher volume shall not be required to be on the same approach during each of these 4 hours.

Option:

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 70 km/h or exceeds 40 mph or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-2 may be used in place of Figure 4C-1.

Section 4C.04 Warrant 3, Peak Hour

Support:

The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street.

Standard:

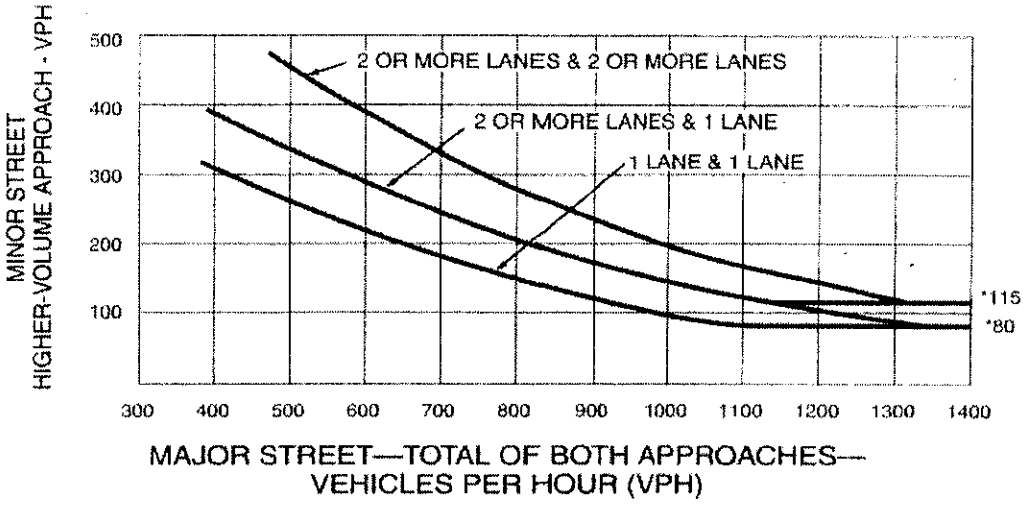
This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

A. If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:

1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and

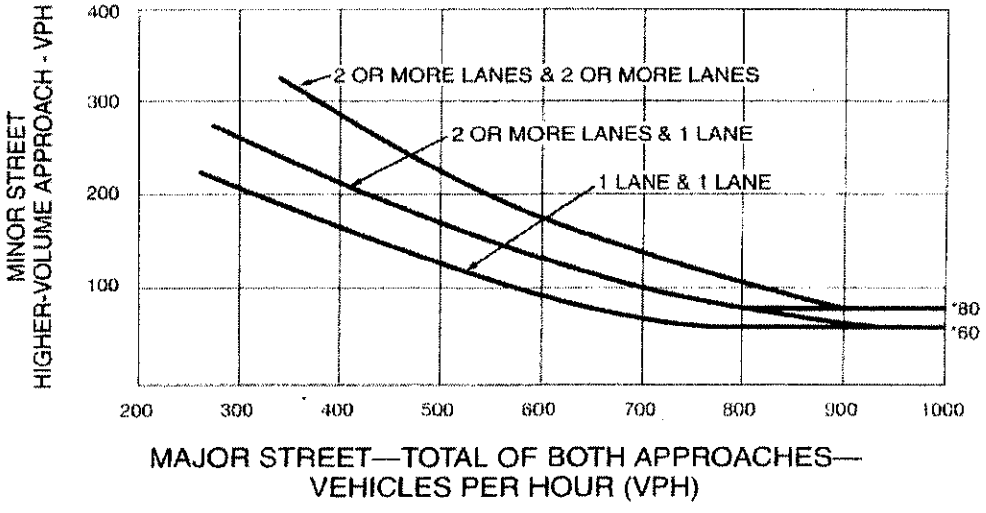
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



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

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



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

2. **The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and**
3. **The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.**

B. **The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.**

Option:

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 70 km/h or exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-4 may be used in place of Figure 4C-3 to satisfy the criteria in the second category of the Standard.

Section 4C.05 Warrant 4, Pedestrian Volume

Support:

The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

Standard:

The need for a traffic control signal at an intersection or midblock crossing shall be considered if an engineering study finds that both of the following criteria are met:

A. **The pedestrian volume crossing the major street at an intersection or midblock location during an average day is 100 or more for each of any 4 hours or 190 or more during any 1 hour; and**
B. **There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic.**

The Pedestrian Volume signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 90 m (300 ft), unless the proposed traffic control signal will not restrict the progressive movement of traffic.

If this warrant is met and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads conforming to requirements set forth in Chapter 4E.

Guidance:

If this warrant is met and a traffic control signal is justified by an engineering study, then:

A. If at an intersection, the traffic control signal should be traffic-actuated and should include pedestrian detectors.
B. If at a nonintersection crossing, the traffic control signal should be pedestrian-actuated, parking and other sight obstructions should be prohibited for at least 30 m (100 ft) in advance of and at least 6.1 m (20 ft) beyond the crosswalk, and the installation should include suitable standard signs and pavement markings.
C. Furthermore, if installed within a signal system, the traffic control signal should be coordinated.

Option:

The criterion for the pedestrian volume crossing the major roadway may be reduced as much as 50 percent if the average crossing speed of pedestrians is less than 1.2 m/sec (4 ft/sec).

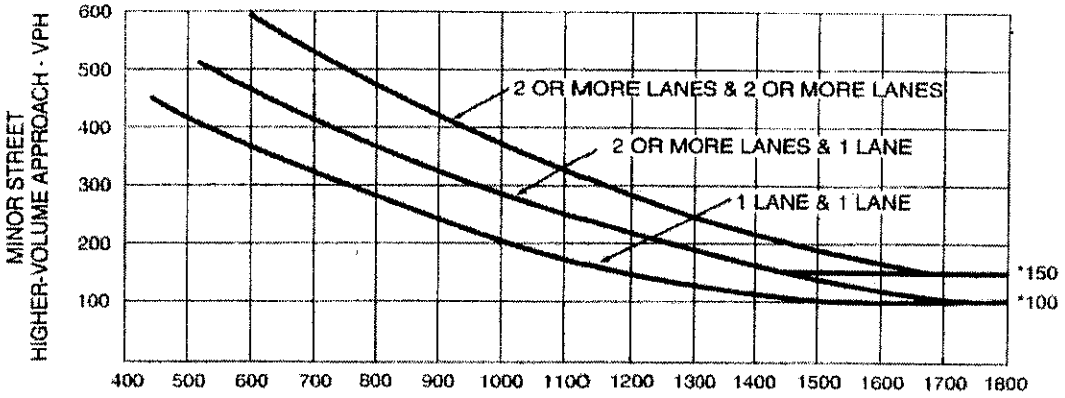
A traffic control signal may not be needed at the study location if adjacent coordinated traffic control signals consistently provide gaps of adequate length for pedestrians to cross the street, even if the rate of gap occurrence is less than one per minute.

Section 4C.06 Warrant 5, School Crossing

Support:

The School Crossing signal warrant is intended for application where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal.

Figure 4C-3. Warrant 3, Peak Hour

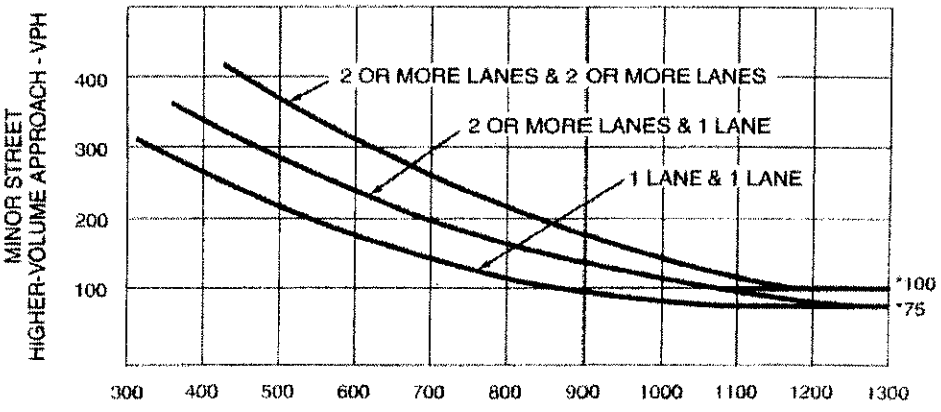


MAJOR STREET—TOTAL OF BOTH APPROACHES—
VEHICLES PER HOUR (VPH)

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

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



MAJOR STREET—TOTAL OF BOTH APPROACHES—
VEHICLES PER HOUR (VPH)

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

Standard:

The need for a traffic control signal shall be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of school children at an established school crossing across the major street shows that the number of adequate gaps in the traffic stream during the period when the children are using the crossing is less than the number of minutes in the same period (see Section 7A.03) and there are a minimum of 20 students during the highest crossing hour.

Before a decision is made to install a traffic control signal, consideration shall be given to the implementation of other remedial measures, such as warning signs and flashers, school speed zones, school crossing guards, or a grade-separated crossing.

The School Crossing signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 90 m (300 ft), unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Guidance:

If this warrant is met and a traffic control signal is justified by an engineering study, then:

A. If at an intersection, the traffic control signal should be traffic-actuated and should include pedestrian detectors.
B. If at a nonintersection crossing, the traffic control signal should be pedestrian-actuated, parking and other sight obstructions should be prohibited for at least 30 m (100 ft) in advance of and at least 6.1 m (20 ft) beyond the crosswalk, and the installation should include suitable standard signs and pavement markings.
C. Furthermore, if installed within a signal system, the traffic control signal should be coordinated.

Section 4C.07 Warrant 6, Coordinated Signal System

Support:

Progressive movement in a coordinated signal system sometimes necessitates installing traffic control signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles.

Standard:

The need for a traffic control signal shall be considered if an engineering study finds that one of the following criteria is met:

A. On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.
B. On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.

Guidance:

The Coordinated Signal System signal warrant should not be applied where the resultant spacing of traffic control signals would be less than 300 m (1,000 ft).

Section 4C.08 Warrant 7, Crash Experience

Support:

The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.

Standard:

The need for a traffic control signal shall be considered if an engineering study finds that all of the following criteria are met:

A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and
B. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and
C. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Condition A in Table 4C-1 (see Section 4C.02), or the vph in both of the 80 percent columns of Condition B in Table 4C-1 exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection, or the volume of pedestrian traffic is not

less than 80 percent of the requirements specified in the Pedestrian Volume warrant. These major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.

Option:

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 70 km/h or exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 56 percent columns in Table 4C-1 may be used in place of the 80 percent columns.

Section 4C.09 Warrant 8, Roadway Network

Support:

Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network.

Standard:

The need for a traffic control signal shall be considered if an engineering study finds that the common intersection of two or more major routes meets one or both of the following criteria:

A. The intersection has a total existing, or immediately projected, entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday and has 5-year projected traffic volumes, based on an engineering study, that meet one or more of Warrants 1, 2, and 3 during an average weekday; or

B. The intersection has a total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a nonnormal business day (Saturday or Sunday).

A major route as used in this signal warrant shall have one or more of the following characteristics:

A. It is part of the street or highway system that serves as the principal roadway network for through traffic flow; or

B. It includes rural or suburban highways outside, entering, or traversing a City; or

C. It appears as a major route on an official plan, such as a major street plan in an urban area traffic and transportation study.

Apéndice 9. Curriculum Vitæ del consultor

José Luis Pérez Berenguer, M.S.C.E., P.E., P.T.O.E., S.I.T.
P.O. Box 6512, Marina Station
Mayagüez, Puerto Rico 00681-6512
Phone & Fax (787) 254-8321
PBAsoc@choicecable.net

CURRICULUM VITÆ

EDUCATION:

JANUARY 1992 TO MAY 1994
Master of Science in Civil Engineering (Pavement Design and Transportation). University of Puerto Rico - Mayagüez Campus, Mayagüez, Puerto Rico. GPA: 3.70

AUGUST 1986 TO DECEMBER 1991
Bachelor of Science in Civil Engineering. University of Puerto Rico - Mayagüez Campus, Mayagüez, Puerto Rico. Cum Laude

JANUARY 2000 TO DECEMBER 2005
Bachelor of Science in Surveying and Topography. University of Puerto Rico - Mayagüez Campus, Mayagüez, Puerto Rico. Cum Laude

PROFESSIONAL LICENSES AND CERTIFICATIONS:

Professional Engineer - License 12673 P.E.

Surveyor in Training - Certification 22117 S.I.T.

Principles and Practice of Land Surveying Examination - Approved

Professional Transportation Operations Engineer - Certificate Number 840

Certified Worksite Traffic Supervisor - Certification 54159

RESEARCH PROJECTS:

JULY 1998 TO FEBRUARY 1999

Análisis del Diseño de los Accesos, Facilidades de Transferencia Intermodal, Estacionamientos y "Kiss and Ride" en las Estaciones del Tren Urbano. Research supervisor of the undergraduate student Joel A. Martínez Vega for the UPR/MIT Tren Urbano Internship Program - coordinated by the Civil Infrastructure Research Center. Poster and presentation

JULY 1997 TO MAY 1998

Analisis de los Planes de Mantenimiento de Tránsito a Implementarse Durante la Construcción del Tren Urbano. Research supervisor of the undergraduate student Jorge L. Ramos Ortiz for the UPR/MIT Tren Urbano Internship Program - coordinated by the Civil Infrastructure Research Center. Written and oral report, poster

SEPTEMBER 1996 TO MAY 1998

El Impacto Futuro en el Patrón de Flujo Vehicular en las Intersecciones Adyacentes al Corredor del Tren Urbano. Research supervisor of the undergraduate student Diego Torres for the UPR/MIT Tren Urbano Internship Program - coordinated by the Civil Infrastructure Research Center. Written and oral report, poster

MARCH 1996 TO FEBRUARY 1998

Measurement and Analysis of Pavement Condition and Improvement of Existing Roughness Mathematical Models Applied to the Puerto Rico Highway Network. Principal Investigator, supported by the Puerto Rico Department of Transportation and Public Works - coordinated by the Civil Infrastructure Research Center. Written and oral report, poster

JUNE 1996 TO AUGUST 1996

Medidas y Análisis de Rugosidad en el Pavimento en la Red de Carreteras de Puerto Rico. Research supervisor of the undergraduate student Jorge L. Ramos Ortiz, sponsored by the Puerto Rico Alliance for Minority Participation. Written and oral report, poster

AUGUST 1995 TO MAY 1996

Análisis Operacional de un Sistema de Transportación sobre Rieles; Plan de Servicio Propuesto para el Tren Urbano. Research supervisor of the graduate student Ginger M. Rossy Robles for the UPR/MIT Tren Urbano Internship Program - coordinated by the Civil Infrastructure Research Center. Written and oral report

MAY 1992 TO MAY 1994

Develop of the thesis ***Análisis de datos de Rugosidad y Desarrollo de Modelos para Estimar la Tendencia del Deterioro de Pavimentos.*** Requirement to obtain a Master Degree in Pavement Design and Transportation Engineering Area. University of Puerto Rico - Mayagüez Campus, Mayagüez, Puerto Rico. Written report and oral exam

PAPERS:

SEPTEMBER 1996

Replicabilidad de Medidas de Rugosidad del Pavimento Utilizando el equipo ARAN. Published. IX Congreso Panamericano de Ingeniería de Tránsito y Transportes, La Habana, Cuba

JULY 1996

Analysis of Roughness Measurements for Delineating Homogeneous Units for Pavement Management Application. Co-author, submitted for consideration to the Transportation Research Board 76th Annual Meeting

JUNE 1994

Un Nuevo Enfoque en el Análisis de Datos de Rugosidad para un Sistema de Gerencia de Pavimentos. Published. VIII Congreso Panamericano de Ingenería de Tránsito y Transportes, Ciudad de Mexico, Mexico

PRESENTATIONS:

DECEMBER 2, 1996 TO DECEMBER 6, 1996

Replicabilidad de Medidas de Rugosidad del Pavimento Utilizando el equipo ARAN. IX Congreso Panamericano de Ingeniería de Tránsito y Transportes, Capitolio Nacional, La Habana, Cuba

OCTOBER 24, 1996
Measurement and Analysis of Pavement Condition and Improvement of Existing Roughness Mathematical Models Applied to the Puerto Rico Highway Network. Civil Engineering Department, University of Puerto Rico - Mayagüez Campus. Sponsored by the Civil Infrastructure Research Center

APRIL 1994
Análisis de datos de Rugosidad y Desarrollo de Modelos para Estimar la Tendencia del Deterioro de Pavimentos. 29th ACS Junior Technical Meeting, University of Puerto Rico - Mayagüez Campus. Sponsored by Puerto Rico Alliance for Minority Participation.

WORK EXPERIENCE:

JULY 1994 TO PRESENT
Pérez Berenguer y Asociados; Principal, Transportation and Civil Engineer

AUGUST 1994 TO DECEMBER 1998
University of Puerto Rico - Mayagüez Campus, Department of Civil Engineering; Professor of the following courses in the Transportation and Civil Engineering Department:

- Highway Location and Curve Design
- Highway Engineering
- Undergraduate Research
- Seminar of Civil Engineering

OCTOBER 1992
Traffic Study in Lomas Verdes Ave. and Ramírez de Arellano Ave. at Guaynabo, Puerto Rico. Dr. Sergio L. González Quevedo - Consultant; Technical support

JANUARY 1992 TO MAY 1992
University of Puerto Rico - Mayagüez Campus; Teacher Assistant of Dr. José F. Lluch García, Construction Management Course

MARCH 1991 TO JANUARY 1992
Office for the Improvement of the Public Schools, Department of Education, Commonwealth of Puerto Rico; Engineer's Assistant, Field Inspector

DECEMBER 1990 TO JANUARY 1991
Office for the Improvement of the Public Schools, Department of Education, Commonwealth of Puerto Rico; Engineer's Assistant, Field Inspector

AUGUST 1990 TO DECEMBER 1990
University of Puerto Rico - Mayagüez Campus; Assistant of Dr. Milton R. Martínez Delgado (R.I.P.) in the development of Structural Analysis Computer Programs

GRADUATE COURSES TAKEN:

Analysis and Design of Public Transportation Systems
Urban Transportation Planning
Traffic Engineering I
Pavement Design
Advanced Engineering Economics
Bituminous Mix Design and Construction Techniques I
Bituminous Mix Design and Construction Techniques II
Pavement Management
Applied Soil Mechanics
Operations Research
Geosynthetics in Civil Engineering
Design of Intelligent Traffic-Control Systems

CONTINUING EDUCATION COURSES TAKEN

NOVEMBER 16, 2007
Cumbre de Infraestructura y Seguridad del Oeste, Institute of Engineers and Surveyors of Puerto Rico (CIAPR), Mayagüez Chapter, Mayagüez, Puerto Rico

NOVEMBER 1st, 2007
Reconstrucción de Accidentes - Iluminación - Manuel Rodríguez Perazza, Ph.D., Institute of Engineers and Surveyors of Puerto Rico (CIAPR), Mayagüez Chapter, Mayagüez, Puerto Rico

JUNE 1st, 2006
Foro: Urbanismo y Soluciones Innovadoras de Transportación - Institute of Engineers and Surveyors of Puerto Rico (CIAPR). Polytechnic University of Puerto Rico, San Juan, Puerto Rico

SEPTEMBER 24, 2004
The Process of Forced Expropriation: Important Aspects for Engineers and Land Surveyors - Johnny Colón Díaz, P.E., Polytechnic University of Puerto Rico, San Juan, Puerto Rico

OCTOBER 13, 2001
Professional Traffic Operations Engineer Certification Exam Refresher Course - Benjamín Colucci Ríos, Ph.D., Institute of Engineers and Surveyors of Puerto Rico, San Juan, Puerto Rico

JULY 31, 2001
Addressing Lead-Based Paint Hazards During Renovation, Remodeling and Rehabilitation in Federally Owned and Assisted Housing -Benjamín Cintrón, Quantech - Fort Buchanan, Guaynabo, Puerto Rico. Sponsored by HUD

JULY 14-16, 1998
Worksite Traffic Supervisor Training Course - James A. Brandon, Jr., P.E., American Traffic Safety Services Association. PGA Mariott Hotel, Palm Beach Gardens, Florida

JULY 1998
Public Transportation in Boston - Nigel Wilson, Ph.D. and Kenneth Kruckemeyer, Ph.D., MIT. Massachussetts Institute of Technology, Cambridge, Massachussetts

JULY 1997
Reglamentación y Procedimientos para el Desarrollo de Terreno y Permisos de Construcción en Puerto Rico - José F. Lluch García, Ph.D., P.E., Institute of Engineers and Surveyors of Puerto Rico (CIAPR). University of Puerto Rico-Mayagüez Campus, Mayagüez, Puerto Rico

JULY 1997
Public Transportation in Boston - Nigel Wilson, Ph.D. and Kenneth Kruckemeyer, Ph.D., MIT. Massachussetts Institute of Technology, Cambridge, Massachussetts

FEBRUARY 8, 1996
Standard Drawings of the Puerto Rico Highway and Transportation Authority - Isabel Cristina Victoria Jaramillo, M.S.C.E., PRHTA - Institute of Engineers and Surveyors of Puerto Rico (CIAPR), Hato Rey, Puerto Rico

SEPTEMBER 1995 TO DECEMBER 1995
Autocad I - Surveyor José Vigo, University of Puerto Rico - Mayagüez Campus, Mayagüez, Puerto Rico

JULY 1995
Public Transportation in Boston - Nigel Wilson, Ph.D. and Kenneth Kruckemeyer, Ph.D., MIT. Massachussetts Institute of Technology, Cambridge, Massachussetts

MEMBERSHIP IN PROFESSIONAL AND COMMUNITY ORGANIZATIONS:

Institute of Engineers and Surveyors of Puerto Rico (CIAPR) - License 12673 P.E.

Institute of Civil Engineers of Puerto Rico

Member - Institute of Transportation Engineers

Associate Member - American Society of Civil Engineers

Miembro - Centro Cultural Salvador Brau, Cabo Rojo

NOVEMBER 2007 TO PRESENT
Alternate Administrator – Piratas de Cabo Rojo baseball team, superior league, Amateur Baseball Federation of Puerto Rico

SEPTEMBER 2006 TO PRESENT
Member, Board of Directors - Equipo Piratas Doble A, Inc. Baseball Club, Cabo Rojo, Puerto Rico

NOVEMBER 1998 TO NOVEMBER 2000
President - Asociación de Residentes de Urbanización y Extensión La Concepción, Inc., Cabo Rojo, Puerto Rico

NOVEMBER 1994 TO DECEMBER 1998
Tren Urbano Internship Program - coordinated by the Civil Infrastructure Research Center, University of Puerto Rico - Mayagüez Campus, Mayagüez, Puerto Rico

1995 TO 1998
Member of the University of Puerto Rico evaluating committee for grant the Dwight D. Eisenhower Scholarship for Transportation Engineering studies

NOVEMBER 1994 TO OCTOBER 1997
Faculty Advisor - Institute of Transportation Engineers, Student Chapter, University of Puerto Rico - Mayagüez Campus, Mayagüez, Puerto Rico

NOVEMBER 1995 TO AUGUST 1996
Member of the Academic Affairs Committee of the Civil Engineering Department, University of Puerto Rico - Mayagüez Campus, Mayagüez, Puerto Rico

WORK DONE BY THE OFFICE IN RELATED FIELDS:

OCTOBER 2008
Traffic Study to analyze the impact of Caguas Judicial Center in the adjacent area, to be located at the junction of the State Highway PR-32 and the Cristóbal Colón boulvard, Pueblo ward, Caguas, Puerto Rico, for Osvaldo Rivera 7 Associates

OCTOBER 2008
Traffic Study to analyze the impact of Monte Sierra housing development in the adjacent area, to be located at the State Highway PR-349, Km. 1.1, Quebrada Grande ward, Mayagüez, Puerto Rico, for Urbanización Monte Sierra, Inc.

SEPTEMBER 2008
Traffic Study to analyze the impact of D'Hau Village housing development a in the adjacent area, to be located at the State Highway PR-466, Km. 8.0, Bajura ward, Isabela, Puerto Rico, for Mrs. Delimar Rivera Hau

AUGUST 2008
Study to determine the waiting area needed for the location of the checkpoint of Quintas del Rey housing development, State Highway PR-114, Km. 13.9, Sabana Grande Abajo ward, San Germán, Puerto Rico, for Foursome Development

JULY 2008
Traffic Study to analyze the impact of a 220 unit housing development a in the adjacent area, to be located at the State Highway PR-466, interior, Francisco Camacho Street, Guayabos ward, Isabela, Puerto Rico, for Mr. Hauger Martín Hau

JULY 2008
Traffic Study to analyze the impact of a 412 unit housing development a in the adjacent area, to be located at the State Highway PR-466, interior, Francisco Camacho Street, Guayabos ward, Isabela, Puerto Rico, for Mr. Hauger Martín Hau

JUNE 2008
Traffic Study to analyze the impact of a 145 unit housing development a in the adjacent area, to be located at the State Highway PR-9939, interior, 1 Street, Las Piedras Industrial Park, Montones ward, Las Piedras, Puerto Rico, for EFA Investment Corp.

JUNE 2008
Traffic Study to analyze the impact of Rancho Santa Catalina de Los Llanos housing, touristic and agricultural development a in the adjacent area, to be located at the State Highway PR-545, Km. 1.8, interior, Carlos Ruiz road, Santa Catalina and Los Llanos ward, Coamo, Puerto Rico, for Arquitectura RD Olabarrieta, A.I.A.

MAY 2008
Traffic Study to analyze the impact of the improvements of the facilities of Technical Distributors in the adjacent area, located at the State Highway PR-177, Km. 5.0, Monacillo Urbano ward, San Juan, Puerto Rico, for Julio E. Rodríguez Frau, A.I.A.

MARCH 2008
Traffic Study to analyze the impact of the Égida de la Asociación de Miembros de la Policía housing development in the adjacent area, to be located at the State Highway PR-1, Km. 20.9, Río ward, Guaynabo, Puerto Rico, for Erwin Rodríguez, P.E.

MARCH 2008
Traffic Study to analyze the impact of Horizonte housing development in the adjacent area, to be located at the State Highway PR-504, Km. 1.0, interior, Portugués ward, Ponce, Puerto Rico, for Mr. Juan A. San Miguel

JANUARY 2008
Maintenance of Traffic Plans for Ponce en Marcha Urban Cores Improvements Project, Ponce, Puerto Rico, for the Belmec Construction Corp.

NOVEMBER 2007
Traffic Study to analyze the impact of Praderas del Río Culebrinas housing development in the adjacent area, to be located at the State Highway PR-125, Km. 21.8, Culebrinas ward, San Sebastián, Puerto Rico, for Mr. Carlos M. Cruz

OCTOBER 2007
Traffic Study to analyze the impact of the expansion of Villas del Mar Hau resort in the adjacent area, located at the State Highway PR-466, Km. 8.9, Bajura ward, Isabela, Puerto Rico, for Mrs. Myrna Hau

OCTOBER 2007
Traffic Study to analyze the impact of Milenia housing development in the adjacent area, to be located at the State Highway PR-681, Km. 4.3, Islote ward, Arecibo, Puerto Rico, for Preferred Management Corp.

OCTOBER 2007
Study to determine the waiting area needed for the location of the checkpoint of La Rambla housing development, State Highway PR-14 (Tito Castro avenue), Km. 3.0, Machuelo Arriba and Machuelo Abajo wards, Ponce, Puerto Rico, for Asociación de Residentes de la Urbanización La Rambla

SEPTEMBER 2007
Traffic Study to analyze the impact of Gersant Shopping Center in the adjacent area, to be located at the State Highway PR-3, Km. 134.4, Algarrobo ward, Guayama, Puerto Rico, for Germán Torres Berríos & Asoc.

SEPTEMBER 2007
Expert witness report based on the results of an evaluation about the possible access for a land lot located at the State Highway PR-2, Km. 165.2, Lavadero ward, Hormigueros, Puerto Rico, for Mr. José A. Lugo

SEPTEMBER 2007
Expert witness report based on the results of an evaluation about the possible access for a land lot located at the State Highway PR-2, Km. 165.2, Lavadero ward, Hormigueros, Puerto Rico, for Desarrollos Industriales, S.E.

AUGUST 2007
Traffic Study to analyze the impact of a commercial project in the adjacent area, to be located at the State Highway PR-3, Km. 139.7, Pueblo ward, Guayama, Puerto Rico, for Best Properties, Corp.

AUGUST 2007
Access, Maintenance of Traffic Plan, Pavement Markings and Permanent Signing Design for Best Western Hotel & Casino Cofresí to be located at State Highway PR-102, Km. 18.9, Miradero ward, Cabo Rojo, Puerto Rico, for Eng. Jorge Medina Ramírez

JULY 2007
Traffic Study to analyze the impact of Brisas de La Parguera walk-ups in the adjacent area, to be located at the State Highway PR-304, Km. 3.3, interior, Camino Real road, Palmarejo ward, Lajas, Puerto Rico, for N & R Developer Inc.

JULY 2007
Evaluation of the impact in the traffic of the adjacent area of Flamboyanes de Dorado Housing Development, to be located at the State Highway PR-695, Km. 4.2, interior, Higuillar ward, Dorado, Puerto Rico, for Arch. Luis Cela

JULY 2007
Expert witness report of an accident occurred on March 10, 2004 in the junction of the State Highway PR-37 (Isla Verde Avenue) and Díaz Way Street, Cangrejo Arriba ward, Carolina, Puerto Rico, for Mr. Gilberto Collazo Semprit

JUNE 2007
Traffic Study to analyze the impact of Serenity Breeze walk-ups in the adjacent area, to be located at the State Highway PR-686, Km. 10.6, Yeguada ward, Vega Baja, Puerto Rico, for EFA Investment Corp.

APRIL 2007
Study to determine the waiting area needed for the location of the main checkpoint of Vista del Bosque housing project, State Highway PR-167, Km. 13.3, Buena Vista ward, Bayamón, Puerto Rico, for Foursome Development

APRIL 2007
Gravel Surface Pavement Design for a road located inside a farm, Naguabo, Puerto Rico, for A.S. Consulting Engineers

MARCH 2007
Traffic Study to analyze the impact of Puerta del Combate housing project in the adjacent area, to be located at the State Highway PR-301, Km. 0.6, interior, State Highway PR-3301, Llanos Tuna ward, Cabo Rojo, Puerto Rico, for Puerta del Combate, Corp.

FEBRUARY 2007
Analysis for the determination of wetland conditions of a dirt road located at Hiram D. Cabassa avenue, Sábalos ward, Mayagüez, Puerto Rico, for Mr. Lester A. Ortiz

FEBRUARY 2007
Traffic Study to analyze the impact of Monte Verde housing project in the adjacent area, to be located at the State Highway PR-108, Km. 6.5, Río Cañas and Leguísamo wards, Mayagüez, Puerto Rico, for José N. Vélez Matías, P.E.

JANUARY 2007
Traffic Study to analyze the impact of Jardines de Eureka housing project in the adjacent area, to be located at the State Highway PR-345, Km. 2.6, Lavadero ward, Hormigueros, Puerto Rico, for Hernán Jr. Machado Torres, P.E.

NOVEMBER 2006
Traffic Study to analyze the impact of Costa del Este housing project in the adjacent area, to be located at the State Highway PR-3, Km. 52.5, interior, Machos ward, Ceiba, Puerto Rico, for Costa del Este, Corp.

NOVEMBER 2006
Traffic Study (written report and comparison to public hearings) to analyze the impact of Best Western Hotel & Casino Cofresí project in the adjacent area, to be located at the State Highway PR-102, Km. 18.9, Miradero ward, Cabo Rojo, Puerto Rico, for Eng. Jorge Medina Ramírez

OCTOBER 2006
Evaluation of the impact in the traffic of the adjacent area of Park Place Housing Development, to be located at the State Highway PR-833, Km. 12.5, Santa Rosa II ward, Guaynabo, Puerto Rico, for Mr. Esteban Galva

OCTOBER 2006
Traffic Study to analyze the impact of "Supermercado Econo y otras facilidades comerciales" project in the adjacent area, to be located at the State Highway PR-2, Km. 68.0, Santana ward, Arecibo, Puerto Rico, for Mr. Manuel Leizán

SEPTEMBER 16 AND 30, 2006
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

SEPTEMBER 2006
Traffic Study to analyze the impact of La Aventura housing and commercial development in the adjacent area, to be located at the junction of the State Highways PR-941 and PR-942, Celada and Jaguas wards, Gurabo, Puerto Rico, for Integral Development Strategists

JUNE 2006
Traffic Study to analyze the impact of Plaza Río Canas shopping center in the adjacent area, to be located at the junction of the State Highways Ramal PR-2, PR-585 and Eduardo Ruberté avenue, Canas Urbano ward, Ponce, Puerto Rico, for VVK Arquitectura C.S.P.

MAY 2006
Traffic Study to analyze the impact of Parque Catalina apartments in the adjacent area, to be located at the State Highway PR-196 (José Garrido avenue), Km. 1.3, Cañabón ward, Caguas, Puerto Rico, for ADI, Inc.

MARCH 11 AND 18, 2006
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

DECEMBER 2005
Traffic Count to determine the Average Daily Traffic at the State Highway PR-28, Km. 0.9, Juan Sánchez ward, Bayamón, Puerto Rico, for Borcon Puerto Rico, Inc.

NOVEMBER 2005
Traffic Study to analyze the impact of Colinas de la Fuente housing development in the adjacent area, to be located at Cuba road, Sabanetas ward, Mayagüez, Puerto Rico, for Mr. Javier López

NOVEMBER 2005
Maintenance of Traffic Plan for the Construction of Garage Isla Verde New Sanitary Pumping Station and Off-Site Force Line, located at Los Ángeles Frontage Road, Cangrejo Arriba ward, Carolina, Puerto Rico, for Paredes Luciano Architects

NOVEMBER 2005
Traffic Study to analyze the impact of Plaza Pla shopping center in the adjacent area, to be located at the State Highway PR-445, Km. 0.2, Guatemala ward, San Sebastián, Puerto Rico, for Mr. Raul Pla

OCTOBER 2005
Traffic Count to determine the Average Daily Traffic and the Traffic during a Typical Saturday at the Frontage Road of the State Highway PR-2, Km. 149.5, Sabanetas ward, Mayagüez, Puerto Rico, for Mr. Santos Vélez

OCTOBER 2005
Traffic Study to analyze the impact of Mansiones de la Sultana housing development in the adjacent area, to be located at the José Bechara road, interior, Guanajibo ward, Mayagüez, Puerto Rico, for ADI, Inc.

SEPTEMBER 17 AND OCTOBER 1st, 2005
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

AUGUST 2005
Maintenance of Traffic Plan, Pavement Markings and Permanent Signing Design for Plaza Río Canas Shopping Center, to be located at Intersection of the State Highways Ramal PR-2 and PR-585/A Street, Canas Urbano ward, Ponce, Puerto Rico, for VVK Arquitectura, C.S.P.

AUGUST 2005
Evaluation of the impact in the traffic of the adjacent area (including public hearing) of Mansiones del Club Housing Development, to be located at the State Highway PR-308, Km. 6.1, Miradero ward, Cabo Rojo, Puerto Rico, for BEFA Holding

JULY 2005
Traffic Study to analyze the impact of Mansiones de Barceloneta housing development in the adjacent area, to be located at the State Highway PR-684, Km. 17.5, Palmas Altas ward, Barceloneta, Puerto Rico, for ADI, Inc.

MAY 2003 TO JUNE 2005
Maintenance of Traffic Plans for projects to be constructed in 27 municipalities as part of the Urban Cores Improvements Program, for the Directorate of Urbanism, Department of Transportation and Public Works

MAY 2005
Access, Maintenance of Traffic Plan, Pavement Markings and Permanent Signing Design for Villas de Porta Coeli housing development, State Highway PR-2, Km. 178.0, Minillas ward, San Germán, Puerto Rico, for Urbanización Villas de Porta Coeli, Inc.

MAY 2005
Traffic Study to analyze the impact of Baldwin's View residential complex in the adjacent area, to be located at the State Highway PR-833, Km. 13.0, interior, End of Emiliano Chinea Street, Frailes ward, Guaynabo, Puerto Rico, for Baldwin Investment Corp.

APRIL 2005
Traffic Study to analyze the impact of Villas de Porta Coeli housing development in the adjacent area, to be located at the State Highway PR-2, Km. 178.0, Minillas ward, San Germán, Puerto Rico, for Urbanización Villas de Porta Coeli, Inc.

MARCH 5 AND 12, 2005
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

DECEMBER 2004
Report with the results of an evaluation of the proposed street network of the future Multeado Estrella urban development, Playa ward, Ponce, Puerto Rico, for Administración de Terrenos de Puerto Rico

DECEMBER 2004
Traffic Study to analyze the impact of Monte Sierra housing development in the adjacent area, to be located at the State Highway PR-349, Km. 1.1, Quebrada Grande ward, Mayagüez, Puerto Rico, for Urbanización Monte Sierra, Inc.

OCTOBER 2004
Traffic Study (written report and comparison to public hearings) to analyze the impact of Frailes Centro shopping center in the adjacent area, to be located at the State Highway PR-873, Km. 0.8, Tortugo ward, San Juan, Puerto Rico, for Best Properties

OCTOBER 2004
Evaluation of the Traffic Impact Study (written report and comparison to public hearings) submitted by the proponents of the Expansion of the Actual Facilities of SER de Puerto Rico, located at 500 Báez street, Pérez Moris Housing Development, Universidad ward, San Juan, Puerto Rico, for Asociación de Residentes y Propietarios de la Urbanización Pérez Moris, Inc.

MAY 2003 TO OCTOBER 2004
Maintenance of Traffic Plan for the Reconstruction of Intersection number 5 (Junction of the State Highways PR-1, PR-25, PR-26 and PR-35), Santurce ward, San Juan, Puerto Rico for Orval E. Sifontes, A.I.A.

OCTOBER 2 AND 10, 2004
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

AUGUST 2004
Evaluation of the impact in the traffic of the adjacent area of Caribbean Medical Testing Center, located at 300 Clemson street, University Gardens Housing Development, Hato Rey Sur ward, San Juan, Puerto Rico, for Farmacias El Amal

AUGUST 2004
Evaluation of the impact in the traffic of the adjacent area of Terrazas del Turabo Housing Development, to be located at Reina de las Flores road, Rincón ward, Gurabo, Puerto Rico, for Terrazas del Turabo

MAY 2004
Traffic Count to determine the Average Daily Traffic at McKinley and Méndez Vigo streets, immediately at west of the State Highway PR-2, Marina Meridional ward, Mayagüez, Puerto Rico, for Mr. Eduardo Ruiz Valentín

MAY 2004
Traffic Count to determine the Average Daily Traffic at the intersection of the State Highway PR-2 and Carlos Chardón street, Río ward, Mayagüez, Puerto Rico, for Mr. Eduardo Ruiz Valentín

MAY 2004
Consultant hired by the opposite part in the procedures for a Necessity and Convenience Certificate for a Walgreens Drug Store proposed at Boulevard street, Pueblo ward, Bayamón, Puerto Rico, for Farmacias El Amal

MAY 2004
Traffic Study to analyze the impact of Laurel Sur Housing Development in the adjacent area, to be located at the State Highway PR-506, Km. 1.7, Coto Laurel ward, Ponce, Puerto Rico, for D.I.S., Inc.

MARCH 2004
Feasibility Study to Evaluate the Public Transportation System of the Municipality of Dorado, Puerto Rico - Project FTA - P.R. 80-X011 - Task 22-01, for the Municipality of Dorado

MARCH 6 AND 20, 2004
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

DECEMBER 2003
Traffic Study to analyze the impact of Plaza La Cumbre project in the adjacent area, to be located at the State Highway PR-199, Km. 4.0, Cupey ward, San Juan, Puerto Rico, for Álvarez-Díaz Group, P.S.C.

OCTOBER 2003
Report with the results of an evaluation of the future street network of Multeado Estrella urban development, Playa ward, Ponce, Puerto Rico, for Administración de Terrenos

SEPTEMBER 2003
Expert witness report of an accident occurred on September 27, 1997 in 435 Street, Villa Carolina Housing Development, Carolina, Puerto Rico, for Mrs. Sonia Carballo Fernandez

SEPTEMBER 13 AND 27, 2003
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

MARCH 29 AND APRIL 5, 2003
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

MARCH 2003
Expert witness report analyzing the Maintenance of Traffic Plan approved for the projects AC-014206 and AC-14207 (State Highway PR-142 Quebrada Arenas ward, Toa Alta, Puerto Rico), for American International Insurance Company

OCTOBER 5 AND 19, 2002
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

SEPTEMBER 2002
Composed Pavement Design for a frontage road of the State Highway PR-199, Río Piedras, Puerto Rico, for A.S. Consulting Engineers

SEPTEMBER 2002
Traffic Study to analyze the impact of the operation of Antonio S. Paoli Fine Arts Center in the adjacent area, to be located at Los Caobos Avenue, Bucaná Ward, Ponce, Puerto Rico, for Urban Venture Group, P.S.C.

JUNE 2002
Traffic Study to analyze the impact of Haudimar housing development in the adjacent area, to be located at State Highway PR-4466, Km. 0.8, Bajura Ward, Isabela, Puerto Rico, for Mr. Hauger Martín Hau

APRIL 2002
Traffic Study to analyze the impact of the expansion of the Panamerican Terminal in the adjacent area, located at Lindbergh Street interior, Isla Grande sector, Santurce Ward, San Juan, Puerto Rico, for Royal Caribbean and RAY Architects Engineers

APRIL 6 AND 13, 2002
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

MARCH 2002
Traffic Study to determine the Average Daily Traffic at the State Highway PR-54, Km. 3.0, Guayama, Puerto Rico, for Mr. Oscar Rodríguez Crespo

JANUARY 2002
Traffic Study to analyze the impact of the expansion of the Winnie's Active Learning Kids School in the adjacent area (including depositions at public audiences), located in the State Highway PR-104, Km. 1.9, Algarrobos Ward, Mayagüez, Puerto Rico, for WALKS

NOVEMBER 2001
Traffic Study to analyze the impact of Apartamentos Marazul housing and commercial development in the State Highway PR-187, Km. 9.7, Medianía Baja Ward, Loíza, Puerto Rico, for Ossam Construction

NOVEMBER 2001
Traffic Study to analyze the impact of Paraíso de Mayagüez housing development in the adjacent roads, Sábalos ward, Mayagüez, Puerto Rico, for Pulte Homes Caribbean

SEPTEMBER 29 AND OCTOBER 6, 2001
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

FEBRUARY 2001 TO JULY 2001
Inspector of the Project "Widening of the Bridge over Maricao River", located at the State Highway PR-120, Km. 11.30, Maricao, Puerto Rico, for Ingeniar Engineering Solutions, P.S.C.

JULY 2001
Traffic Study to analyze the impact of Garden State Commercial Center project in the State Highway PR-100, Kms. 3.3 to 4.6, Guanajibo and Miradero wards, Cabo Rojo, Puerto Rico, for Mr. Guisseppe Marino Damiani

JUNE 2001
Traffic Study to determine the Average Daily Traffic at the State Highway PR-980, Km. 1.1, Florida ward, San Lorenzo, Puerto Rico, for Mr. Rafael Martínez Santana

MARCH 28 AND APRIL 2, 2001
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

FEBRUARY 3, 2001
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Interamerican University of Puerto Rico at Arecibo

JANUARY 2001
Traffic Study to determine the Average Daily Traffic at the junction of the State Highways PR-3 and PR-901, Juan Martín ward, Yabucoa, Puerto Rico, for Farmacias El Amal

DECEMBER 2000
Traffic Study to determine the Average Daily Traffic at the junction of the State Highways PR-14 and PR-721 (including depositions at public audiences), Pueblo Norte and Pueblo Sur wards, Aibonito, Puerto Rico, for Farmacias El Amal

OCTOBER 2000
Traffic Study to determine the Average Daily Traffic at the State Highway PR-1, Km. 88.1, Lapa ward, Salinas, Puerto Rico, for Mr. Bernardo Olmeda Morales

SEPTEMBER 30, 2000
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

SEPTEMBER 2000
Traffic Study to analyze the impact of Haciendas El Monte project in the State Highway PR-2, Kms. 173.2 to 174.7, Cain Alto ward, San Germán, Puerto Rico, for Paseos de San Antonio Development Corporation

AUGUST 2000
Expert witness report with the results of a traffic study to analyze the impact of Percon Industrial park at the junctions of the State Highway PR-14 with the future Caribe Principal Street, State Highway PR-52, Puerto Viejo road and the future Contreras Avenue, Playa ward, Ponce, Puerto Rico, for Percon Development Corporation

MAY 2000
Traffic Count to determine the Average Daily Traffic at Ave. Del Pescador, La Parguera ward, Lajas, Puerto Rico, for Carlyle Benavent, M.D.

MAY 2000
Expert witness report, related to construction faults in the roof slab of the building occupied by Parada Los Flamboyanes restaurant, located at the State Highway PR-102, Km. 15.9, Miradero ward, Cabo Rojo, Puerto Rico, for Mr. Luis A. Matías Meléndez

APRIL 1st, 2000
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

MARCH 2000
Expert witness report based on the results of an evaluation about the possible access for the project Percon Industrial Park, Playa ward, Ponce, Puerto Rico, for Percon Development Corporation

FEBRUARY 2000
Traffic Study to determine the Average Daily Traffic at the State Highway PR-348, Km. 8.8, Rosario Bajo ward, San Germán, Puerto Rico, for Félix J. Rodríguez Arroyo

DECEMBER 1999
Traffic Study to determine the impact of an extension of the PRTC facilities at the junctions of the State Highway PR-5 with the access of the Puerto Nuevo Distribution Center and the 11th street of Las Vegas Housing Development, Palmas ward, Cataño, Puerto Rico, for Puerto Rico Telephone Company

NOVEMBER 1999
Traffic Study to determine the Average Daily Traffic at the junction of the State Highways PR-921 and PR-9922, Collores ward, Las Piedras, Puerto Rico, for Mr. Carlos Beltrán Rodríguez

OCTOBER 16, 1999
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

OCTOBER 1999
Traffic Study to determine the Average Daily Traffic at the junction of the State Highways PR-189, PR-9919 and Hormazábal street, Pueblo Norte ward, Juncos, Puerto Rico, for Mr. Carlos L. Beltrán Rodríguez

JULY 1997 TO JULY 1999
Maintenance of Traffic Plan for the Bayamón Alignment Section Contract-Tren Urbano (project AC-500007), for ICA-Miramar Metro San Juan, Corp.

MAY 1999
Expert witness report of an accident occurred on June 21, 1998 in the junction of the State Highway PR-823 and the access to the construction project of the future PR-142, Quebrada Arenas ward, Toa Alta, Puerto Rico, for Mr. Ismael Díaz Santos

MAY 1999
Expert witness report of an accident occurred on May 27, 1996 in the State Highways PR-335, Km. 11.0, Indios ward, Guayanilla, Puerto Rico, for Mr. Frank A. Quiñones Martínez

MAY 1999
Pavement design for projects AC-000136, AC-100202 and AC-100203 (Mejoras a la PR-1 desde PR-735 a PR-170), Cayey, Puerto Rico, for A.S. Consulting Engineers

MARCH 13, 1999
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

FEBRUARY 1999
Traffic Count to determine the Average Daily Traffic at the State Highway PR-111, Km. 0.4 at Aguadilla, Puerto Rico, for Fidel De Frías, M.D.

NOVEMBER 1998
Expert witness report of an accident occurred on June 19, 1994 in the junction of the State Highways PR-2 and PR-114, Sábalos ward, Mayagüez, Puerto Rico, for Eng. Pablo Crespo Pérez

OCTOBER 1998
Expert witness report of an accident occurred on December 6, 1997 in the State Highway PR-307, Km. 8.9, Boquerón ward, Cabo Rojo, Puerto Rico, for Mrs. Anabelle Rodríguez Sepúlveda

OCTOBER 1998
Report with the results of an evaluation about the proposed alternatives for the project AC-030108 (Conector PR-100 Intersección PR-101 a PR-301), Boquerón ward, Cabo Rojo, Puerto Rico, for Dr. Ricardo Ramírez Ramírez

OCTOBER 17, 1998
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

MAY 1998
Traffic Study to analize the impact of Isla Azul housing development, proposed at the State Highway PR-472, km. 2.7, Bejucos ward, Isabela, Puerto Rico, for Mr. Luis A. Pérez Villanueva

MAY 1998
Traffic Impact Study and preliminar design of access for the Parque de Diversiones de Luquillo (including depositions at public audiences), proposed at the State Highway PR-3, kms. 33.0 to 35.0, Mata de Plátano ward, Luquillo, Puerto Rico, for Fernando L. Rodríguez, P.E. & Associates

MARCH 1998
Evaluation of the Haul Route used by Betteroads Asphalt Corp. when operates the extraction area at Cercado and Cidra wards, Añasco, Puerto Rico, for Betteroads Asphalt Corp.

FEBRUARY 28, 1998
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

JANUARY 1998
Traffic Study to determine the impact of Garden State Commercial Center at the junction of the State Highways PR-100 and PR-311, Miradero and Guanajibo wards, Cabo Rojo, Puerto Rico, for Mr. Guisseppe Marino Damiani

DECEMBER 1997
Traffic Study to determine the impact of an extension of S.E.S.O. school at the junction of their access and the Cuba road, Miradero ward, Mayagüez, Puerto Rico, for Southwestern Educational Society

NOVEMBER 1997
Rigid Pavement Design for Project AC-006608 (State Highway PR-66, Carolina - Canóvanas, Puerto Rico), for Behar-Ybarra Associates

OCTOBER 4, 1997
Instructor - Review for the Professional Civil Engineer Exam, sponsored by the Institute of Engineers and Surveyors of Puerto Rico

AUGUST 1997
Traffic Count to determine the Average Daily Traffic at the State Highway PR-128, Km. 2.0, Yauco, Puerto Rico, for PCO Associates

APRIL 1997
Traffic Study to determine the Average Daily Traffic at the junction of the State Highways PR-102 and PR-308, La Garita Sector, Miradero ward, Cabo Rojo, Puerto Rico, for Chaibén J. Fas Alzamora, Esq.

AUGUST 1996
Quality tests of the asphalt concrete used on the parking of the Municipal Drop-Off Center, for the Municipality of Las Marías

JULY 1996
Traffic Study (written report and comparison to public hearings) to determine the Average Daily Traffic at the State Highway PR-3, Km. 16.3, Canóvanas, Puerto Rico, for Moravarcy Engineering Group

JULY 1996
Traffic Study to determine the Average Daily Traffic at the State Highway PR-128, Km. 2.0, Yauco, Puerto Rico, for Moravarcy Engineering Group

MAY 1996
Pavement Design for the project AC-053603, Rehabilitation of the State Highway PR-536, Santa Isabel, Puerto Rico, for A.S. Consulting Engineers

MARCH 1996
Origin and Destiny Study for the preliminary design of the future interchange of the State Highways PR-148 and PR-828, Bayamón and Toa Alta, Puerto Rico, for CSA Architects and Engineers

FEBRUARY 1996
Traffic Study to determine the Average Daily Traffic at the State Highway PR-110, Km. 9.7, Moca, Puerto Rico, for Moravarcy Engineering Group

NOVEMBER 1995
Traffic Study to determine the Average Daily Traffic at the junction of the State Highways PR-2 and PR-402, Añasco, Puerto Rico, for Moravarcy Engineering Group

AUGUST 1995
Pavement Design for preliminary design of the State Highway PR-66 (Río Piedras-Loiza), for Lebrón Associates

JULY 1995
Pavement design for project AC-001732 (Mejoras inmediatas a carretera PR-17), Jesús T. Piñero Avenue, Hato Rey, Puerto Rico, for Lebrón Associates

JULY 1995
Pavement design for Piers N 1/2 & O. San Juan, San Juan, Puerto Rico, for EBP Design Group Consulting Engineers

MARCH 1995
Traffic Study to determine the Average Daily Traffic at the State Highway PR-111, Km. 4.0, Moca, Puerto Rico, for Moravar Engineering Group

MARCH 1995
Traffic Study to determine the Average Daily Traffic at the State Highway PR-420, Km. 5.2, Moca, Puerto Rico, for Moravar Engineering Group

FEBRUARY 1995
Traffic Study to determine the Average Daily Traffic at the State Highway PR-115, Km. 26.6, Aguada, Puerto Rico, for Moravar Engineering Group

SEPTEMBER 1994
Structural evaluation of the streets of Montesol Housing Development for the Municipal Legislature of Cabo Rojo

APENDICE 3

CARTAS DE AGENCIAS

ESTADO LIBRE ASOCIADO DE PUERTO RICO
DEPARTAMENTO DE RECURSOS NATURALES Y AMBIENTALES

27 MAY 2008

SRA CARMEN TORRES
SECRETARIA
JUNTA DE PLANIFICACIÓN
PO BOX 41119
SAN JUAN, PR 0940-1119

Estimada señora Torres:

Nuevo Centro Judicial de Caguas
Ave. Luis Muñoz Marín
Bo. Turabo, Caguas

O-CE-EJP01-SJ-00733-19052008
2008-46-0201-JPU-MA

Hemos evaluado los documentos sometidos en relación con el asunto descrito en epígrafe. Se propone la construcción de un edificio de siete (7) plantas y un (1) sótano para un área total de 416,830 pies cuadrados. Para servir al proyecto se construirá un anexo para 1,097 estacionamientos. En adición se proveen 45 espacios de estacionamientos en el sótano y 191 espacios sobre el terreno para un total de 1,333 espacios.

El Departamento de Recursos Naturales y Ambientales (DRNA) no tiene objeción a que la Junta de Planificación apruebe la consulta de ubicación para este proyecto, sujeto a que la parte proponente cumpla con los requerimientos que se presentan a continuación:

- Deberá obtener de la Junta de Calidad Ambiental, el Permiso para el Control de Erosión y Sedimentación para minimizar la erosión hacia los cuerpos de agua. Además, se deberá obtener cualquier permiso requerido por esa entidad para realizar el proyecto o actividad.

- Deberá cumplir con las disposiciones del Reglamento de Planificación Núm. 25 (Reglamento de Siembra, Corte y Forestación para Puerto Rico). Se le apercibe que la Ley Núm. 133 de 1 de julio de 1975, según enmendada prohíbe el corte y poda de árboles sin el permiso correspondiente del Departamento.

- En las cercanías del proyecto se ha encontrado la **Paloma Sabanera** (*Patagioenas inornata wetmorei),* sub-especie endémica designada en peligro de extinción bajo leyes estatales y federales. Por tal razón, se le requiere que utilice

en el Plan de Siembra, que presente en cumplimiento con el Reglamento Núm. 25, los siguientes árboles nativos: Palma real, Corcho bobo, Dama de Día, Camasey, Péndula, Jagüey blanco, Caba blanco y Cerezo. Estas especies, además de ayudar a evitar la erosión del terreno, le proveerán frutos naturales a las especies de aves silvestres.

- Debido a que el predio ubica en Zona AE según la hoja C1210H del Mapa de Tasas de Seguro Contra Inundaciones deberá cumplir con las disposiciones de la Sección 7.03 del Reglamento sobre Áreas Especiales de Riesgo a Inundación (Reglamento de Planificación Núm. 13).

- Deberá cumplir con las disposiciones del Reglamento de Planificación Núm. 3 (Reglamento de Lotificación y Urbanización), Sección 14 (Manejo de Aguas Pluviales). Se le apercibe que del sistema pluvial ser conectado a uno existente, no será necesario presentarlo en el DRNA.

- Deberá cumplir con las disposiciones del Reglamento Núm. 6916 (Reglamento para Regir la Extracción, Excavación, Remoción y Dragado de los Componentes de la Corteza Terrestre). Se le apercibe que la Ley Núm. 132 de 25 de junio de 1968, según enmendada y su Reglamento, prohíben la extracción, excavación, remoción y dragado de material de la corteza terrestre sin el permiso correspondiente del Departamento.

- De descubrirse en el predio objeto de desarrollo algún cuerpo de agua superficial o subterráneo, sea perenne o intermitente, deberá informarlo inmediatamente al DRNA y demás agencias concernidas. No informar hallazgos de este tipo así como las medidas de mitigación que se implantarán para proteger estos recursos naturales conllevará una revocación automática de la presente comunicación de no objeción y podrá ser base para acciones legales por parte del DRNA en los foros disponibles.

Este endoso es solamente aplicable a la situación de hechos y los datos según presentados y evaluados en el caso y el Secretario se reserva el derecho de reevaluar, variar o modificar el mismo en cualquier momento anterior a la emisión del permiso o la acción administrativa correspondiente por parte de la agencia solicitante o proponente cuando surja nueva información oficial específica estableciendo que el derecho aplicable o las condiciones ambientales en el predio han cambiado sustancialmente, o cuando el endoso original se emitió bajo premisas falsas o fraudulentas.

Cordialmente,

Javier J. Rúa
Subsecretario

JJR/AGV/GF/ACH/ach

ESTADO LIBRE ASOCIADO DE PUERTO RICO
AUTORIDAD DE CARRETERAS Y TRANSPORTACION

C# 08-0001-4170

2 de junio de 2008

Sra. Carmen Torres Meléndez
Secretaria
Junta de Planificación
Apartado 41119
San Juan, Puerto Rico 00940-1119

CONSULTA NÚM: 2008-46-0201-JPU-MA
CENTRO JUDICIAL DE CAGUAS
(652,556 PIES CUADRADOS
DE ÁREA DE CONSTRUCCIÓN)
CARRETERA PR-32 (AVE. LUIS MUÑOZ MARÍN
BO. TURABO, CAGUAS

Estimada señora Torres Meléndez:

Hacemos referencia a la consulta de ubicación de la Junta de Planificación, recibida a través de correo electrónico el 15 de mayo de 2008, relacionada con este asunto.

El personal del Centro Expreso de Trámite de la Oficina de Control de Accesos del Área de Ingeniería de Tránsito y Operaciones de esta Autoridad revisó los planos sometidos a través de la Junta de Planificación e informó que al presente, el proyecto mencionado en el asunto no se encuentra afectado por proyectos de carretera en planes de esta Autoridad. No obstante, se deberá cumplir con los siguientes comentarios, recomendaciones y requisitos:

1. La media sección futura para la Carretera PR-32 será de 7.50 metros, medidos desde su eje central y consiste de un pavimento de rodaje de 6.00 metros y acera de 1.50 metros, más los taludes necesarios.

2. Se construirán las obras de ensanche para la carretera de acuerdo a su media sección de 7.50 metros.

3. Se deberá dedicar a uso público, a favor del Departamento de Transportación y Obras Públicas, la franja de terreno necesaria para completar la media sección de 7.50 metros, para la Carretera PR-32, mediante la escritura correspondiente. En donde la servidumbre de paso existente sea mayor que la requerida, la misma permanecerá inalterada.

4. Si dicha servidumbre de paso de la carretera es mayor que la sección requerida, deberá obtener una Certificación de Conformidad de Colindancia de la Oficina de Derecho de Vía del Area de Adquisición de Propiedades de esta Autoridad en lo relacionado al límite de colindancia con la Carretera PR-32. Puede comunicarse con dicha oficina al 787-721-8787, extensión 1224.

Autoridad de Carreteras y Transportación • Departamento de Transportación y Obras Públicas
PO Box 42007 • San Juan, Puerto Rico 00940-2007 Tel. (787) 721-8787 Fax (787) 727-5456

5. El acceso al proyecto propuesto deberá ser tipo calle con dos carriles de entrada de 3.65 metros de ancho y uno de salida de 4.00 metros de ancho, con radios de 6.00 metros mínimo en su enlace con la Carretera PR-32. Deberá ilustrar en el plano los detalles del acceso al proyecto propuesto (diámetro, radios de curvatura, etc.).

6. Deberá ilustrar en todas las hojas del plano del proyecto propuesto el norte magnético y deberá identificar la Avenida Luis Muñoz Marín como la Carretera PR-32.

7 Deberá incluir en las aceras las rampas de impedidos necesarias para eliminar barreras arquitectónicas que interfieran con el libre flujo de tránsito peatonal de personas con impedimentos (Ley ADA).

8. Se deberá localizar el área de depósito de basura dentro de los predios del proyecto, de forma tal que la operación de recogido no afecte el flujo de tránsito en la vía pública y en el acceso.

9. Deberá instalar una verja sobre un muro de 8 pulgadas de alto en el límite de la media sección futura para la Carretera PR-32 en todo el frente del proyecto propuesto, excepto en el acceso.

10. Para el establecimiento de cualquier sistema o dispositivo para el control de tránsito en la calle de acceso al proyecto (entiéndase portones, brazos mecánicos, sistemas de comunicación, etc.), se deberá solicitar el endoso del Departamento de Transportación y Obras Públicas, de acuerdo al *Reglamento de Planificación Número 20*. Dicha solicitud deberá hacerse a la División de Estudios de Tránsito de esta Área, una vez recibido el endoso final de la Oficina de Control de Accesos, en donde se deberá someter un diseño de estas facilidades (caseta de guardia de seguridad, barreras permanentes, barreras de control de tránsito y portón de acceso de peatón) para la evaluación y recomendación correspondiente. Para más información puede comunicarse con el Sr. Erick Centeno Navarro o con el Sr. Ansoel Agosto Quiñones al 787-721-8787, extensión 2858.

11. El Reglamento Núm. 11-001, conocido como *Normas para la Imposición de la Aportación por Concepto de Exacción por Impacto*, faculta a la Autoridad de Carreteras y Transportación a establecer un programa de Exacción por Impacto. Este conlleva que nuevos desarrollos deberán tener participación equitativa de los costos de infraestructura y los usos comunales diseñados para prestar servicio al nuevo crecimiento y desarrollo y así evitar efectos acumulativos negativos sobre la calidad de vida de los desarrollos existentes. Por lo tanto, el desarrollo de referencia estará sujeto al pago de la exacción por impacto, la cual será calculada cuando se sometan los planos corregidos y se tengan detalles adicionales de la magnitud del proyecto y su impacto a la infraestructura de carretera. Para más detalles relacionados con la exacción por impacto, deberá comunicarse con el Sr. Renny Parrilla Navarro al 787-721-8787, extensión 2805.

La Oficina de Planificación Estratégica de esta Autoridad se encuentra evaluando el proyecto propuesto con relación a proyectos viales a largo plazo, por lo que posteriormente le informaremos los comentarios de la misma, si alguno.

Estos son comentarios preliminares para propósitos de consulta de ubicación. Para comentarios o requerimientos finales se deberán someter a la Oficina de Control de Accesos de esta Área cuatro copias de los planos corregidos, de acuerdo a nuestras recomendaciones, para la evaluación final o endoso

correspondiente. En los mismos se deberán incluir los detalles del ensanche, accesos, obras de desagüe y cualquier otra obra que pueda impactar la vía estatal. Le recordamos que los planos a someterse para poderlos procesar deberán estar firmados y sellados por el profesional que los prepare y estén en cumplimiento con las Normas y Reglamentos vigentes de esta Autoridad.

Esta comunicación tiene un año de vigencia y no constituye un endoso ni una autorización para comenzar obra de construcción alguna en el proyecto, por lo que se deberán cumplir con los requisitos indicados en la misma, previo a obtener los permisos reglamentarios, según establecido en el Tópico 4, Incisos 11.02 y 11.03 del *Reglamento para la Certificación de Planos de Construcción* del Departamento de Transportación y Obras Públicas y aplica al proyecto "Centro Judicial de Caguas", a construirse en el predio de terreno de referencia. Cualquier otro proyecto a ser desarrollado en este predio de terreno, deberá ser sometido a esta Autoridad para la evaluación y los comentarios que apliquen.

Para cualquier aclaración o información adicional, favor de comunicarse con la División de Asesoramiento al Proponente de la Oficina de Control de Accesos de esta Área al 787-721-8787, extensión 2805.

Cordialmente,

Samuel Forestier Castillo
Director
Área de Ingeniería de Tránsito y Operaciones

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Rev. 1/01

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AUTORIDAD DE ENERGÍA ELÉCTRICA DE PUERTO RICO

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20 de mayo de 2008

Sra. Carmen Torres Meléndez
Secretaria
Junta de Planificación
San Juan, Puerto Rico

Estimada señora Torres:

NUEVO CENTRO JUDICIAL DE CAGUAS
CAGUAS

AEE NO: **08-0-070** CARGA (KVA): **1500**

JPU NO: **2008-46-0201-JPUMA** CET NO:

En respuesta a su solicitud de información sobre el proyecto de referencia, le informamos que la Autoridad de Energía Eléctrica (AEE) no tiene objeción a que la Junta apruebe el desarrollo o consulta de ubicación del proyecto siempre que se cumpla con las siguientes condiciones:

1 El dueño del proyecto o su representante tiene que solicitar una evaluación de campo del proyecto a la AEE. En su carta de solicitud tiene explicar claramente el alcance del proyecto, incluidos la carga total en kVA a instalarse y un programa de trabajo que indique las fechas propuestas a conectar esta carga al sistema eléctrico de la AEE. Junto con la carta de solicitud, se tienen que presentar los planos de ubicación (*location*) y situación (*site*) del proyecto. El dueño del proyecto es responsable de cumplir con todos los requisitos que establezca la AEE para la conexión del proyecto como resultado de la evaluación de campo.

2. El diseñador del proyecto tiene que ser un ingeniero licenciado y colegiado, autorizado para ejercer su profesión en Puerto Rico. Los planos de diseño elaborados por este profesional tienen que cumplir con los códigos, reglamentos, manuales, estándares y normas aplicables y vigentes para los sistemas eléctricos en Puerto Rico.

3. El dueño del proyecto es responsable de cumplir con los requisitos establecidos en el Reglamento de Servidumbres para la Autoridad de Energía Eléctrica, en relación con:

   a. Las nuevas servidumbres a establecerse o constituirse como parte del desarrollo del proyecto.

   b. Las servidumbres existentes cuando existan instalaciones eléctricas en el área del proyecto.

4. En caso de que la AEE esté realizando una obra en el área del proyecto, el dueño deberá cumplir con las adquisiciones de nuevas servidumbres por parte de la AEE en el proyecto de referencia.

5. En caso de que el proyecto afecte un sistema de riego, el dueño del proyecto o su representante tiene que solicitar el endoso de la División de Servicios de Riego, Represas y Embalses de la AEE.

Esta carta no es una evaluación final del proyecto.

Sinceramente,

Reinaldo Baretty Huertas
Ingeniero Supervisor Principal
Oficina de Ingeniería de Distribución

"Somos un patrono con igualdad de oportunidades de empleo y no discriminamos por razón de raza, color, sexo, religión, nacionalidad, edad, ideas políticas, condición física o mental y condición de veterano de la Era de Vietnam o veterano con impedimentos"