

RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LTR				
v (veh/h)		12		33				
C (m) (veh/h)		1538		1010				
v/c		0.01		0.03				
95% queue length		0.02		0.10				
Control Delay (s/veh)		7.4		8.7				
LOS		A		A				
Approach Delay (s/veh)	-	-	8.7					
Approach LOS	-	-	A					

TWO-WAY STOP CONTROL SUMMARY						
General Information			Site Information			
Analyst	José L. Pérez Berenguer		Intersection	2		
Agency/Co.	Pérez Berenguer y Asoc.		Jurisdiction	Gurabo		
Date Performed	8/7/2006		Analysis Year	2020		
Analysis Time Period	2:45 - 3:45 PM					
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: PR-9941			North/South Street: PR-941			
Intersection Orientation: North-South			Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		319	21	16	315	
Peak-Hour Factor, PHF	1.00	0.80	0.50	0.45	0.80	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	32	0	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	
Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				8	0	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.25	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	35	393	0	0	398	42
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			-6		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LTR				
v (veh/h)		35		32				
C (m) (veh/h)		1131		310				
v/c		0.03		0.10				
95% queue length		0.10		0.34				
Control Delay (s/veh)		8.3		17.9				
LOS		A		C				
Approach Delay (s/veh)	-	-	17.9					
Approach LOS	-	-	C					

TWO-WAY STOP CONTROL SUMMARY						
General Information			Site Information			
Analyst	José L. Pérez Berenguer		Intersection	2		
Agency/Co.	Pérez Berenguer y Asoc.		Jurisdiction	Gurabo		
Date Performed	8/7/2006		Analysis Year	2020		
Analysis Time Period	2:45 - 3:45 PM					
Project Description: <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: <i>Félix Díaz</i>			North/South Street: <i>PR-941</i>			
Intersection Orientation: <i>North-South</i>			Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	195	400			237	136
Peak-Hour Factor, PHF	0.71	0.71	1.00	1.00	0.83	0.83
Hourly Flow Rate, HFR (veh/h)	78	0	182	0	0	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Raised curb					
RT Channelized			0			0
Lanes	1	1	0	0	1	0
Configuration	L	T				TR
Upstream Signal		0			0	
Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	59		137			
Peak-Hour Factor, PHF	0.75	1.00	0.75	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	285	163	274	563	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	-5			-6		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L					L		R
v (veh/h)	274					78		182
C (m) (veh/h)	1123					224		684
v/c	0.24					0.35		0.27
95% queue length	0.96					1.48		1.07
Control Delay (s/veh)	9.2					29.4		12.2
LOS	A					D		B
Approach Delay (s/veh)	-	-				17.3		
Approach LOS	-	-				C		

HCS+: Multilane Highways Release 5.2

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

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

Fax: (787) 254-8321

 OPERATIONAL ANALYSIS

Analyst: José L. Pérez Berenguer
 Agency/Co: Pérez Berenguer y Asociados
 Date: 8/10/2006
 Analysis Period: 2:45 - 3:45 PM
 Highway: PR-941
 From/To: Gurabo/Jaguas
 Jurisdiction: Gurabo
 Analysis Year: 2020
 Project ID: Estudio de Impacto en el Tránsito La Aventura

 FREE-FLOW SPEED

	Direction	1		2	
Lane width		3.6	m	3.6	m
Lateral clearance:					
Right edge		1.8	m	1.8	m
Left edge		1.8	m	1.8	m
Total lateral clearance		3.6	m	3.6	m
Access points per km		1		1	
Median type		Divided		Divided	
Free-flow speed:		Base		Base	
FFS or BFFS		100.0	km/h	100.0	km/h
Lane width adjustment, FLW		0.0	km/h	0.0	km/h
Lateral clearance adjustment, FLC		0.0	km/h	0.0	km/h
Median type adjustment, FM		0.0	km/h	0.0	km/h
Access points adjustment, FA		0.7	km/h	0.7	km/h
Free-flow speed		99.3	km/h	99.3	km/h

 VOLUME

	Direction	1		2	
Volume, V		1019	vph	743	vph
Peak-hour factor, PHF		0.78		0.77	
Peak 15-minute volume, v15		327		241	
Trucks and buses		2	%	5	%
Recreational vehicles		0	%	0	%
Terrain type		Level		Level	
Grade		0.00	%	0.00	%
Segment length		0.00	km	0.00	km
Number of lanes		2		2	
Driver population adjustment, fP		1.00		1.00	
Trucks and buses PCE, ET		1.5		1.5	
Recreational vehicles PCE, ER		1.2		1.2	
Heavy vehicle adjustment, fHV		0.990		0.976	
Flow rate, vp		659	pcphpl	494	pcphpl

RESULTS

	Direction	1		2	
Flow rate, vp		659	pcphpl	494	pcphpl
Free-flow speed, FFS		99.3	km/h	99.3	km/h
Avg. passenger-car travel speed, S		99.3	km/h	99.3	km/h
Level of service, LOS		A		A	
Density, D		6.6	pc/km/ln	5.0	pc/km/ln

Overall results are not computed when free-flow speed is less than 70 km/h.

SHORT REPORT												
General Information						Site Information						
Analyst	José L. Pérez Berenguer					Intersection	PR-941 y PR-942					
Agency or Co.	Pérez Berenguer y Asociados					Area Type	All other areas					
Date Performed	8/8/2006					Jurisdiction	Gurabo					
Time Period	2:45 - 3:45 PM					Analysis Year	2020					
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		1	1	1	1		1		1			
Lane Group		TR	R	L	LT		L		R			
Volume (vph)		69	305	438	159		436		583			
% Heavy Vehicles		0	4	6	6		2		2			
PHF		0.42	0.82	0.74	0.67		0.71		0.84			
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	4	4		3		3			
Unit Extension		3.0	3.0	3.0	3.0		3.0		3.0			
Ped/Bike/RTOR Volume	0	0	305	0	0		0	0	583			
Lane Width		3.7	3.7	4.3	3.7		4.3		3.7			
Parking/Grade/Parking	N	-1	N	N	-6	N	N	10	N			
Parking/Hour												
Bus Stops/Hour		0	0	0	0		0		0			
Minimum Pedestrian Time		3.2			3.2				3.2			
Phasing	EB Only	WB Only	03	04	NB Only	06	07	08				
Timing	G = 10.0	G = 36.0	G =	G =	G = 38.0	G =	G =	G =				
	Y = 4	Y = 4	Y =	Y =	Y = 4	Y =	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		164	0	592	237		614		0		
Lane Group Capacity		201	164	709	700		717		602		
v/c Ratio		0.82	0.00	0.83	0.34		0.86		0.00		
Green Ratio		0.10	0.10	0.38	0.38		0.40		0.40		
Uniform Delay d_1		42.1	38.5	27.3	21.5		26.5		17.5		
Delay Factor k		0.36	0.11	0.37	0.11		0.39		0.11		
Incremental Delay d_2		22.3	0.0	8.6	0.3		10.0		0.0		
PF Factor		1.000	1.000	0.920	0.920		1.000		1.000		
Control Delay		64.4	38.5	33.7	20.0		36.6		17.5		
Lane Group LOS		E	D	C	C		D		B		
Approach Delay	64.4			29.8			36.6				
Approach LOS	E			C			D				
Intersection Delay	35.9										D

SHORT REPORT			
General Information		Site Information	
Analyst	José L. Pérez Berenguer	Intersection	PR-942 y Acceso a Proyecto
Agency or Co.	Pérez Berenguer y Asociados	Area Type	All other areas
Date Performed	8/8/2006	Jurisdiction	Gurabo
Time Period	2:45 - 3:45 PM	Analysis Year	2020

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1		1				1	1			1	1
Lane Group	L		R				L	T			T	R
Volume (vph)	320		425				455	190			172	603
% Heavy Vehicles	0		0				0	2			0	0
PHF	0.80		0.72				0.80	0.80			0.72	0.72
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				4	4			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	255				0	0		0	0	603
Lane Width	3.7		3.7				3.7	3.7			3.7	3.7
Parking/Grade/Parking	N	0	N				N	6	N	N	6	N
Parking/Hour												
Bus Stops/Hour	0		0				0	2			6	0
Minimum Pedestrian Time		3.2						3.2			3.2	

Phasing	EB Only	02	03	04	NS Perm	06	07	08
Timing	G = 16.0	G =	G =	G =	G = 36.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 60.0			

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate	400		236				569	237			239	0
Lane Group Capacity	487		435				682	1087			1159	1009
v/c Ratio	0.82		0.54				0.83	0.22			0.21	0.00
Green Ratio	0.27		0.27				0.60	0.60			0.60	0.60
Uniform Delay d_1	20.7		18.9				9.6	5.5			5.5	4.8
Delay Factor k	0.36		0.14				0.37	0.11			0.11	0.11
Incremental Delay d_2	10.8		1.4				8.8	0.1			0.1	0.0
PF Factor	1.000		1.000				0.575	0.575			1.000	1.000
Control Delay	31.5		20.3				14.3	3.3			5.6	4.8
Lane Group LOS	C		C				B	A			A	A
Approach Delay	27.3						11.1			5.6		
Approach LOS	C						B			A		
Intersection Delay	16.4			Intersection LOS						B		

HCS+: Two-Lane Highways Release 5.2

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

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

Fax: (787) 254-8321

 Two-Way Two-Lane Highway Segment Analysis

Analyst	José L. Pérez Berenguer
Agency/Co.	Pérez Berenguer y Asociados
Date Performed	8/10/2006
Analysis Time Period	2:45 - 3:45 PM
Highway	PR-942
From/To	PR-941/PR-9942
Jurisdiction	Gurabo
Analysis Year	2020
Description	Estudio de Impacto en el Tránsito La Aventura

 Input Data

Highway class	Class 2				
Shoulder width	0.0	m	Peak-hour factor, PHF	0.70	
Lane width	2.8	m	% Trucks and buses	6	%
Segment length	1.0	km	% Recreational vehicles	0	%
Terrain type	Rolling		% No-passing zones	0	%
Grade: Length		km	Access points/km	1	/km
Up/down		%			
Two-way hourly volume, V	1202	veh/h			
Directional split	62 / 38	%			

 Average Travel Speed

Grade adjustment factor, fG	0.99	
PCE for trucks, ET	1.5	
PCE for RVs, ER	1.1	
Heavy-vehicle adjustment factor,	0.971	
Two-way flow rate, (note-1) vp	1787	pc/h
Highest directional split proportion (note-2)	1108	pc/h
Free-Flow Speed from Field Measurement:		
Field measured speed, SFM	-	km/h
Observed volume, Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, BFFS	100.0	km/h
Adj. for lane and shoulder width, fLS	10.3	km/h
Adj. for access points, fA	0.7	km/h
Free-flow speed, FFS	89.0	km/h
Adjustment for no-passing zones, fnp	0.0	km/h
Average travel speed, ATS	66.7	km/h

 Percent Time-Spent-Following

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.0	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	1.000	
Two-way flow rate, (note-1) vp	1717	pc/h
Highest directional split proportion (note-2)	1065	
Base percent time-spent-following, BPTSF	77.9	%
Adj. for directional distribution and no-passing zones, fd/np	0.0	
Percent time-spent-following, PTSF	77.9	%

 Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.56	
Peak 15-min vehicle-kilometers of travel, VkmT15	429	veh-km
Peak-hour vehicle-kilometers of travel, VkmT60	1202	veh-km
Peak 15-min total travel time, TT15	6.4	veh-h

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

SHORT REPORT			
General Information		Site Information	
Analyst	José L. Pérez Berenguer	Intersection	PR-942 y PR-9942
Agency or Co.	Pérez Berenguer y Asociados	Area Type	All other areas
Date Performed	8/10/2006	Jurisdiction	Gurabo
Time Period	2:45 - 3:45 PM	Analysis Year	2020

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes				1		0		1	1	0	1	
Lane Group				L	LR			T	R		LT	
Volume (vph)				699		17		109	353	52	41	
% Heavy Vehicles				10		8		2	0	0	0	
PHF				0.63		0.81		0.80	0.80	0.70	0.70	
Pretimed/Actuated (P/A)				A		A		A	A	A	A	
Startup Lost Time				2.0	2.0			2.0	2.0		2.0	
Extension of Effective Green				2.0	2.0			2.0	2.0		2.0	
Arrival Type				3	3			3	3		3	
Unit Extension				3.0	3.0			3.0	3.0		3.0	
Ped/Bike/RTOR Volume				0	0	3	0	0	353	0	0	
Lane Width				4.0	3.7			3.7	3.7		4.0	
Parking/Grade/Parking				N	8	N	N	-1	N	N	-6	N
Parking/Hour												
Bus Stops/Hour				0	0			0	0		0	
Minimum Pedestrian Time					3.2			3.2			3.2	

Phasing	WB Only	02	03	04	NS Perm	06	07	08
Timing	G = 79.0	G =	G =	G =	G = 19.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 106.0		

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate				1110	17			136	0		133	
Lane Group Capacity				1226	1082			339	294		168	
v/c Ratio				0.91	0.02			0.40	0.00		0.79	
Green Ratio				0.75	0.75			0.18	0.18		0.18	
Uniform Delay d_1				10.6	3.5			38.5	35.7		41.6	
Delay Factor k				0.43	0.11			0.11	0.11		0.34	
Incremental Delay d_2				9.7	0.0			0.8	0.0		22.2	
PF Factor				1.000	1.000			1.000	1.000		1.000	
Control Delay				20.3	3.5			39.2	35.7		63.8	
Lane Group LOS				C	A			D	D		E	
Approach Delay				20.1			39.2			63.8		
Approach LOS				C			D			E		
Intersection Delay	26.1			Intersection LOS						C		

TWO-WAY STOP CONTROL SUMMARY						
General Information			Site Information			
Analyst	José L. Pérez Berenguer		Intersection	5		
Agency/Co.	Pérez Berenguer y Asoc.		Jurisdiction	Gurabo		
Date Performed	8/7/2006		Analysis Year	2020		
Analysis Time Period	2:45 - 3:45 PM					
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: PR-9943			North/South Street: PR-942			
Intersection Orientation: North-South			Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	99	27			26	0
Peak-Hour Factor, PHF	0.83	0.70	1.00	1.00	0.50	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	77	0	0	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT			TR		
Upstream Signal		0			0	
Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	42			
Peak-Hour Factor, PHF	1.00	1.00	0.54	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	52	0	119	38	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	6			0		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	119						77	
C (m) (veh/h)	1567						1021	
v/c	0.08						0.08	
95% queue length	0.25						0.24	
Control Delay (s/veh)	7.5						8.8	
LOS	A						A	
Approach Delay (s/veh)	-	-				8.8		
Approach LOS	-	-				A		

TWO-WAY STOP CONTROL SUMMARY						
General Information				Site Information		
Analyst	José L. Pérez Berenguer			Intersection	6	
Agency/Co.	Pérez Berenguer y Asoc.			Jurisdiction	Gurabo	
Date Performed	8/7/2006			Analysis Year	2020	
Analysis Time Period	2:45 - 3:45 PM					
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: PR-942				North/South Street: PR-9941		
Intersection Orientation: <i>East-West</i>				Study Period (hrs): 0.25		
Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		22	9	2	25	
Peak-Hour Factor, PHF	1.00	0.44	0.44	0.25	0.65	1.00
Hourly Flow Rate, HFR (veh/h)	0	50	20	8	38	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	
Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	3			
Peak-Hour Factor, PHF	1.00	1.00	0.25	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	12	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	10			0		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LTR				
v (veh/h)		8		12				
C (m) (veh/h)		1544		1011				
v/c		0.01		0.01				
95% queue length		0.02		0.04				
Control Delay (s/veh)		7.3		8.6				
LOS		A		A				
Approach Delay (s/veh)	-	-	8.6					
Approach LOS	-	-	A					

TWO-WAY STOP CONTROL SUMMARY						
General Information			Site Information			
Analyst	José L. Pérez Berenguer		Intersection	2		
Agency/Co.	Pérez Berenguer y Asoc.		Jurisdiction	Gurabo		
Date Performed	8/7/2006		Analysis Year	2030		
Analysis Time Period	7:00 - 8:00 AM					
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: PR-9941			North/South Street: PR-941			
Intersection Orientation: North-South			Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		301	10	0	363	
Peak-Hour Factor, PHF	1.00	0.60	0.25	1.00	0.80	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	28	0	27
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	
Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				7	0	12
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.25	1.00	0.44
Hourly Flow Rate, HFR (veh/h)	0	453	0	0	501	40
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			-6		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LTR				
v (veh/h)		0		55				
C (m) (veh/h)		1038		374				
v/c		0.00		0.15				
95% queue length		0.00		0.51				
Control Delay (s/veh)		8.5		16.3				
LOS		A		C				
Approach Delay (s/veh)	-	-	16.3					
Approach LOS	-	-	C					

HCS+: MUTCD Signal Warrants Release 5.2

Analyst: José L. Pérez Berenguer
 Agency: Pérez Berenguer y Asociados
 Date: 8/10/2006
 Project ID: La Aventura
 EW Street: Félix Díaz

Intersection: 2
 Jurisdiction: Gurabo
 Units: U.S. Metric
 Analysis Year: 2030
 NS Street: PR-941

General Information

Major St. Speed (kph): 65
 Nearest Signal (m): 0
 Crashes per Yr: 0

Population: Not less than 10000
 Coordinated Signal System: N

School Crossing

Students in Highest Hour: 0
 Adequate Gaps in Period: 0
 Minutes in Period: 0

Roadway Network

Two Major Routes: 0
 Weekend Count: 0
 5-yr Growth Factor: 10

Geometry and Traffic

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	0	0	1	1	0	0	1	0
LaneUsage	L		R				L	T			TR	

Results

Warrant 1: Eight-Hour Vehicular Volume []
 1 A. Minimum Vehicular Volumes []
 1 B. Interruption of Continuous Traffic []
 1 80% Vehicular --and-- Interruption Volumes []

Warrant 2: Four-Hour Vehicular Volume []
 2 A. Four-Hour Vehicular Volumes []

Warrant 3: Peak Hour []
 3 A. Peak-Hour Conditions []
 3 B. Peak-Hour Vehicular Volume Hours Met []

Warrant 4: Pedestrian Volume []
 4 A. Pedestrian Volumes []
 4 B. Gaps Same Period []

Warrant 5: School Crossing []
 5 A. Student Volumes []
 5 B. Gaps Same Period []

Warrant 6: Coordinated Signal System []
 6 Degree of Platooning []

TWO-WAY STOP CONTROL SUMMARY						
General Information			Site Information			
Analyst	José L. Pérez Berenguer		Intersection	2		
Agency/Co.	Pérez Berenguer y Asoc.		Jurisdiction	Gurabo		
Date Performed	8/7/2006		Analysis Year	2030		
Analysis Time Period	7:00 - 8:00 AM					
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: <i>Félix Díaz</i>			North/South Street: <i>PR-941</i>			
Intersection Orientation: <i>North-South</i>			Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	33	227			412	84
Peak-Hour Factor, PHF	0.69	0.69	1.00	1.00	0.80	0.80
Hourly Flow Rate, HFR (veh/h)	118	0	311	0	0	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	<i>Raised curb</i>					
RT Channelized			0			0
Lanes	1	1	0	0	1	0
Configuration	<i>L</i>	<i>T</i>				<i>TR</i>
Upstream Signal		0			0	
Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	104		274			
Peak-Hour Factor, PHF	0.88	1.00	0.88	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	514	104	47	328	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	-5			-6		
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	

RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L					L		R
v (veh/h)	47					118		311
C (m) (veh/h)	972					463		528
v/c	0.05					0.25		0.59
95% queue length	0.15					1.00		3.77
Control Delay (s/veh)	8.9					15.4		21.1
LOS	A					C		C
Approach Delay (s/veh)	-	-				19.6		
Approach LOS	-	-				C		

HCS+: Multilane Highways Release 5.2

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

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

Fax: (787) 254-8321

 OPERATIONAL ANALYSIS

Analyst: José L. Pérez Berenguer
 Agency/Co: Pérez Berenguer y Asociados
 Date: 8/10/2006
 Analysis Period: 7:00 - 8:00 AM
 Highway: PR-941
 From/To: Gurabo/Jaguas
 Jurisdiction: Gurabo
 Analysis Year: 2030
 Project ID: Estudio de Impacto en el Tránsito La Aventura

 FREE-FLOW SPEED

	Direction	1		2	
Lane width		3.6	m	3.6	m
Lateral clearance:					
Right edge		1.8	m	1.8	m
Left edge		1.8	m	1.8	m
Total lateral clearance		3.6	m	3.6	m
Access points per km		1		1	
Median type		Divided		Divided	
Free-flow speed:		Base		Base	
FFS or BFFS		100.0	km/h	100.0	km/h
Lane width adjustment, FLW		0.0	km/h	0.0	km/h
Lateral clearance adjustment, FLC		0.0	km/h	0.0	km/h
Median type adjustment, FM		0.0	km/h	0.0	km/h
Access points adjustment, FA		0.7	km/h	0.7	km/h
Free-flow speed		99.3	km/h	99.3	km/h

 VOLUME

	Direction	1		2	
Volume, V		272	vph	1818	vph
Peak-hour factor, PHF		0.77		0.80	
Peak 15-minute volume, v15		88		568	
Trucks and buses		2	%	1	%
Recreational vehicles		0	%	0	%
Terrain type		Level		Level	
Grade		0.00	%	0.00	%
Segment length		0.00	km	0.00	km
Number of lanes		2		2	
Driver population adjustment, fP		1.00		1.00	
Trucks and buses PCE, ET		1.5		1.5	
Recreational vehicles PCE, ER		1.2		1.2	
Heavy vehicle adjustment, fHV		0.990		0.995	
Flow rate, vp		178	pcphpl	1141	pcphpl

RESULTS

	Direction	1		2	
Flow rate, vp		178	pcphpl	1141	pcphpl
Free-flow speed, FFS		99.3	km/h	99.3	km/h
Avg. passenger-car travel speed, S		99.3	km/h	99.3	km/h
Level of service, LOS		A		C	
Density, D		1.8	pc/km/ln	11.5	pc/km/ln

Overall results are not computed when free-flow speed is less than 70 km/h.

SHORT REPORT												
General Information						Site Information						
Analyst	José L. Pérez Berenguer					Intersection	PR-941 y PR-942					
Agency or Co.	Pérez Berenguer y Asociados					Area Type	All other areas					
Date Performed	8/8/2006					Jurisdiction	Gurabo					
Time Period	7:00 - 8:00 AM					Analysis Year	2030					
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		1	1	1	1		1		1			
Lane Group		T	R	L	LT		L		R			
Volume (vph)		7	679	1139	107		151		121			
% Heavy Vehicles		0	1	1	0		3		0			
PHF		0.25	0.81	0.80	0.44		0.70		0.85			
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	4	4		3		3			
Unit Extension		3.0	3.0	3.0	3.0		3.0		3.0			
Ped/Bike/RTOR Volume	0	0	679	0	0		0	0	121			
Lane Width		3.7	3.7	4.3	3.7		4.3		3.7			
Parking/Grade/Parking	N	-1	N	N	-6	N	N	10	N			
Parking/Hour												
Bus Stops/Hour		0	0	0	0		0		0			
Minimum Pedestrian Time		3.2			3.2				3.2			
Phasing	EB Only	WB Only	03	04	NB Only	06	07	08				
Timing	G = 6.0	G = 103.0	G =	G =	G = 22.0	G =	G =	G =				
	Y = 4	Y = 4	Y =	Y =	Y = 4	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 143.0						

Lane Group Capacity, Control Delay, and LOS Determination										
	EB		WB		NB		SB			
Adjusted Flow Rate	28	0	1424	243	216	0				
Lane Group Capacity	81	68	1429	1425	276	239				
v/c Ratio	0.35	0.00	1.00	0.17	0.78	0.00				
Green Ratio	0.04	0.04	0.72	0.72	0.15	0.15				
Uniform Delay d_1	66.6	65.6	19.8	6.4	58.2	51.2				
Delay Factor k	0.11	0.11	0.50	0.11	0.33	0.11				
Incremental Delay d_2	2.6	0.0	22.9	0.1	13.6	0.0				
PF Factor	1.000	1.000	0.206	0.206	1.000	1.000				
Control Delay	69.2	65.6	27.0	1.4	71.8	51.2				
Lane Group LOS	E	E	C	A	E	D				
Approach Delay	69.2		23.3		71.8					
Approach LOS	E		C		E					
Intersection Delay	29.4		Intersection LOS				C			

SHORT REPORT												
General Information						Site Information						
Analyst	José L. Pérez Berenguer					Intersection	PR-942 y Acceso a Proyecto					
Agency or Co.	Pérez Berenguer y Asociados					Area Type	All other areas					
Date Performed	8/8/2006					Jurisdiction	Gurabo					
Time Period	7:00 - 8:00 AM					Analysis Year	2030					
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1		1				1	1			1	1
Lane Group	L		R				L	T			T	R
Volume (vph)	197		919				83	45			327	388
% Heavy Vehicles	0		0				0	0			1	0
PHF	0.82		0.77				0.82	0.82			0.77	0.77
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				4	4			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	219				0	0		0	0	246
Lane Width	3.7		3.7				3.7	3.7			3.7	3.7
Parking/Grade/Parking	N	0	N				N	6	N	N	-6	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2						3.2			3.2	
Phasing	EB Only	02	03	04	NS Perm	06	07	08				
Timing	G = 40.0	G =	G =	G =	G = 15.0	G =	G =	G =				
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 63.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB		WB			NB			SB			
Adjusted Flow Rate	240		909				101	55			425	184
Lane Group Capacity	1159		1037				118	444			466	400
v/c Ratio	0.21		0.88				0.86	0.12			0.91	0.46
Green Ratio	0.63		0.63				0.24	0.24			0.24	0.24
Uniform Delay d_1	4.8		9.5				23.0	18.8			23.4	20.5
Delay Factor k	0.11		0.40				0.39	0.11			0.43	0.11
Incremental Delay d_2	0.1		8.6				42.5	0.1			22.2	0.8
PF Factor	1.000		1.000				1.000	1.000			1.000	1.000
Control Delay	4.9		18.1				65.4	19.0			45.5	21.4
Lane Group LOS	A		B				E	B			D	C
Approach Delay	15.3					49.0			38.2			
Approach LOS	B					D			D			
Intersection Delay	25.4		Intersection LOS						C			

HCS+: Two-Lane Highways Release 5.2

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

Phone: (787) 254-8321

Fax: (787) 254-8321

E-Mail: PBAsoc@choicecable.net

 Two-Way Two-Lane Highway Segment Analysis

Analyst	José L. Pérez Berenguer
Agency/Co.	Pérez Berenguer y Asociados
Date Performed	8/10/2006
Analysis Time Period	7:00 - 8:00 AM
Highway	PR-942
From/To	PR-941/PR-9942
Jurisdiction	Gurabo
Analysis Year	2030
Description	Estudio de Impacto en el Tránsito La Aventura

 Input Data

Highway class	Class 2			
Shoulder width	0.0	m	Peak-hour factor, PHF	0.74
Lane width	2.8	m	% Trucks and buses	0 %
Segment length	1.0	km	% Recreational vehicles	0 %
Terrain type	Rolling		% No-passing zones	0 %
Grade: Length		km	Access points/km	1 /km
Up/down		%		
Two-way hourly volume, V	852	veh/h		
Directional split	68 / 32	%		

 Average Travel Speed

Grade adjustment factor, fG	0.99	
PCE for trucks, ET	1.5	
PCE for RVs, ER	1.1	
Heavy-vehicle adjustment factor,	1.000	
Two-way flow rate, (note-1) vp	1163	pc/h
Highest directional split proportion (note-2)	791	pc/h
Free-Flow Speed from Field Measurement:		
Field measured speed, SFM	-	km/h
Observed volume, Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, BFFS	100.0	km/h
Adj. for lane and shoulder width, fLS	10.3	km/h
Adj. for access points, fA	0.7	km/h
Free-flow speed, FFS	89.0	km/h
Adjustment for no-passing zones, fnp	0.0	km/h
Average travel speed, ATS	74.5	km/h

 Percent Time-Spent-Following

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.0	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	1.000	
Two-way flow rate, (note-1) vp	1151	pc/h
Highest directional split proportion (note-2)	783	
Base percent time-spent-following, BPTSF	63.6	%
Adj. for directional distribution and no-passing zones, fd/np	0.0	
Percent time-spent-following, PTSF	63.6	%

 Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.36	
Peak 15-min vehicle-kilometers of travel, VkmT15	288	veh-km
Peak-hour vehicle-kilometers of travel, VkmT60	852	veh-km
Peak 15-min total travel time, TT15	3.9	veh-h

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

SHORT REPORT												
General Information						Site Information						
Analyst	José L. Pérez Berenguer					Intersection	PR-942 y PR-9942					
Agency or Co.	Pérez Berenguer y Asociados					Area Type	All other areas					
Date Performed	8/10/2006					Jurisdiction	Gurabo					
Time Period	7:00 - 8:00 AM					Analysis Year	2030					
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes				1		0		1	1	0	1	
Lane Group				L	LR			T	R		LT	
Volume (vph)				410		5		37	238	5	167	
% Heavy Vehicles				0		0		0	0	0	1	
PHF				0.63		0.75		0.90	0.90	0.38	0.77	
Pretimed/Actuated (P/A)				A		A		A	A	A	A	
Startup Lost Time				2.0	2.0			2.0	2.0		2.0	
Extension of Effective Green				2.0	2.0			2.0	2.0		2.0	
Arrival Type				3	3			3	3		3	
Unit Extension				3.0	3.0			3.0	3.0		3.0	
Ped/Bike/RTOR Volume				0	0	1	0	0	238	0	0	
Lane Width				4.0	3.7			3.7	3.7		4.0	
Parking/Grade/Parking				N	8	N	N	-1	N	N	-6	N
Parking/Hour												
Bus Stops/Hour				0	0			0	0		0	
Minimum Pedestrian Time					3.2			3.2			3.2	
Phasing	WB Only	02	03	04	NS Perm	06	07	08				
Timing	G = 39.0	G =	G =	G =	G = 14.0	G =	G =	G =				
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 61.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate				651	5			41	0		230	
Lane Group Capacity				1157	1002			443	377		459	
v/c Ratio				0.56	0.00			0.09	0.00		0.50	
Green Ratio				0.64	0.64			0.23	0.23		0.23	
Uniform Delay d_1				6.2	4.0			18.5	18.1		20.5	
Delay Factor k				0.16	0.11			0.11	0.11		0.11	
Incremental Delay d_2				0.6	0.0			0.1	0.0		0.9	
PF Factor				1.000	1.000			1.000	1.000		1.000	
Control Delay				6.8	4.0			18.6	18.1		21.3	
Lane Group LOS				A	A			B	B		C	
Approach Delay				6.8			18.6			21.3		
Approach LOS				A			B			C		
Intersection Delay	10.9			Intersection LOS						B		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	José L. Pérez Berenguer	Intersection	5
Agency/Co.	Pérez Berenguer y Asoc.	Jurisdiction	Gurabo
Date Performed	8/7/2006	Analysis Year	2030
Analysis Time Period	7:00 - 8:00 AM		
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>			
East/West Street: PR-9943		North/South Street: PR-942	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
	1	2	3	4	5	6
Movement	L	T	R	L	T	R
Volume (veh/h)	23	18			65	0
Peak-Hour Factor, PHF	0.50	0.56	1.00	1.00	0.81	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	40	0	0	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT			TR		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
	7	8	9	10	11	12
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	20			
Peak-Hour Factor, PHF	1.00	1.00	0.50	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	80	0	46	32	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	6			0		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	46						40	
C (m) (veh/h)	1531						986	
v/c	0.03						0.04	
95% queue length	0.09						0.13	
Control Delay (s/veh)	7.4						8.8	
LOS	A						A	
Approach Delay (s/veh)	-	-				8.8		
Approach LOS	-	-				A		

TWO-WAY STOP CONTROL SUMMARY						
General Information			Site Information			
Analyst	José L. Pérez Berenguer		Intersection	6		
Agency/Co.	Pérez Berenguer y Asoc.		Jurisdiction	Gurabo		
Date Performed	8/7/2006		Analysis Year	2030		
Analysis Time Period	7:00 - 8:00 AM					
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: PR-942			North/South Street: PR-9941			
Intersection Orientation: East-West			Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		34	10	7	12	
Peak-Hour Factor, PHF	1.00	0.58	0.30	0.50	0.38	1.00
Hourly Flow Rate, HFR (veh/h)	0	58	33	14	31	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	
Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	30			
Peak-Hour Factor, PHF	1.00	1.00	0.75	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	40	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	10			0		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LTR				
v (veh/h)		14		40				
C (m) (veh/h)		1517		993				
v/c		0.01		0.04				
95% queue length		0.03		0.13				
Control Delay (s/veh)		7.4		8.8				
LOS		A		A				
Approach Delay (s/veh)	-	-	8.8					
Approach LOS	-	-	A					

TWO-WAY STOP CONTROL SUMMARY						
General Information			Site Information			
Analyst	José L. Pérez Berenguer		Intersection	2		
Agency/Co.	Pérez Berenguer y Asoc.		Jurisdiction	Gurabo		
Date Performed	8/7/2006		Analysis Year	2030		
Analysis Time Period	2:45 - 3:45 PM					
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: PR-9941			North/South Street: PR-941			
Intersection Orientation: North-South			Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
	1	2	3	4	5	6
Movement	L	T	R	L	T	R
Volume (veh/h)		389	26	20	384	
Peak-Hour Factor, PHF	1.00	0.80	0.50	0.45	0.80	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	40	0	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	
Minor Street	Eastbound			Westbound		
	7	8	9	10	11	12
Movement	L	T	R	L	T	R
Volume (veh/h)				10	0	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.25	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	44	479	0	0	486	52
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			-6		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LTR				
v (veh/h)		44		40				
C (m) (veh/h)		1040		235				
v/c		0.04		0.17				
95% queue length		0.13		0.60				
Control Delay (s/veh)		8.6		23.4				
LOS		A		C				
Approach Delay (s/veh)	-	-	23.4					
Approach LOS	-	-	C					

TWO-WAY STOP CONTROL SUMMARY						
General Information			Site Information			
Analyst	José L. Pérez Berenguer		Intersection	2		
Agency/Co.	Pérez Berenguer y Asoc.		Jurisdiction	Gurabo		
Date Performed	8/7/2006		Analysis Year	2030		
Analysis Time Period	2:45 - 3:45 PM					
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: <i>Félix Díaz</i>			North/South Street: <i>PR-941</i>			
Intersection Orientation: <i>North-South</i>			Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	238	488			289	166
Peak-Hour Factor, PHF	0.71	0.71	1.00	1.00	0.83	0.83
Hourly Flow Rate, HFR (veh/h)	96	0	222	0	0	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Raised curb					
RT Channelized			0			0
Lanes	0	2	0	0	1	0
Configuration	LT	T				TR
Upstream Signal		0			0	
Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	72		167			
Peak-Hour Factor, PHF	0.75	1.00	0.75	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	348	200	335	687	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	-5			-6		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT					L		R
v (veh/h)	335					96		222
C (m) (veh/h)	1032					197		564
v/c	0.32					0.49		0.39
95% queue length	1.42					2.40		1.87
Control Delay (s/veh)	10.2					39.5		15.5
LOS	B					E		C
Approach Delay (s/veh)	—	—				22.7		
Approach LOS	—	—				C		

HCS+: Multilane Highways Release 5.2

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

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

Fax: (787) 254-8321

 OPERATIONAL ANALYSIS

Analyst: José L. Pérez Berenguer
 Agency/Co: Pérez Berenguer y Asociados
 Date: 8/10/2006
 Analysis Period: 2:45 - 3:45 PM
 Highway: PR-941
 From/To: Gurabo/Jaguas
 Jurisdiction: Gurabo
 Analysis Year: 2030
 Project ID: Estudio de Impacto en el Tránsito La Aventura

 FREE-FLOW SPEED

	Direction	1		2	
Lane width		3.6	m	3.6	m
Lateral clearance:					
Right edge		1.8	m	1.8	m
Left edge		1.8	m	1.8	m
Total lateral clearance		3.6	m	3.6	m
Access points per km		1		1	
Median type		Divided		Divided	
Free-flow speed:		Base		Base	
FFS or BFFS		100.0	km/h	100.0	km/h
Lane width adjustment, FLW		0.0	km/h	0.0	km/h
Lateral clearance adjustment, FLC		0.0	km/h	0.0	km/h
Median type adjustment, FM		0.0	km/h	0.0	km/h
Access points adjustment, FA		0.7	km/h	0.7	km/h
Free-flow speed		99.3	km/h	99.3	km/h

 VOLUME

	Direction	1		2	
Volume, V		1242	vph	906	vph
Peak-hour factor, PHF		0.78		0.77	
Peak 15-minute volume, v15		398		294	
Trucks and buses		2	%	5	%
Recreational vehicles		0	%	0	%
Terrain type		Level		Level	
Grade		0.00	%	0.00	%
Segment length		0.00	km	0.00	km
Number of lanes		2		2	
Driver population adjustment, fp		1.00		1.00	
Trucks and buses PCE, ET		1.5		1.5	
Recreational vehicles PCE, ER		1.2		1.2	
Heavy vehicle adjustment, fhv		0.990		0.976	
Flow rate, vp		804	pcphpl	603	pcphpl

RESULTS

	Direction	1		2	
Flow rate, vp		804	pcphpl	603	pcphpl
Free-flow speed, FFS		99.3	km/h	99.3	km/h
Avg. passenger-car travel speed, S		99.3	km/h	99.3	km/h
Level of service, LOS		B		A	
Density, D		8.1	pc/km/ln	6.1	pc/km/ln

Overall results are not computed when free-flow speed is less than 70 km/h.

SHORT REPORT												
General Information						Site Information						
Analyst	José L. Pérez Berenguer					Intersection	PR-941 y PR-942					
Agency or Co.	Pérez Berenguer y Asociados					Area Type	All other areas					
Date Performed	8/8/2006					Jurisdiction	Gurabo					
Time Period	2:45 - 3:45 PM					Analysis Year	2030					
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		1	1	1	1		1		1			
Lane Group		TR	R	L	LT		L		R			
Volume (vph)		84	372	534	194		531		711			
% Heavy Vehicles		0	4	6	6		2		2			
PHF		0.42	0.82	0.74	0.67		0.71		0.84			
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	4	4		3		3			
Unit Extension		3.0	3.0	3.0	3.0		3.0		3.0			
Ped/Bike/RTOR Volume	0	0	372	0	0		0	0	711			
Lane Width		3.7	3.7	4.3	3.7		4.3		3.7			
Parking/Grade/Parking	N	-1	N	N	-6	N	N	10	N			
Parking/Hour												
Bus Stops/Hour		0	0	0	0		0		0			
Minimum Pedestrian Time		3.2			3.2				3.2			
Phasing	EW Perm	02	03	04	NB Only	06	07	08				
Timing	G = 45.0	G =	G =	G =	G = 32.0	G =	G =	G =				
	Y = 3	Y =	Y =	Y =	Y = 3	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 83.0						

Lane Group Capacity, Control Delay, and LOS Determination										
	EB			WB			NB			SB
Adjusted Flow Rate		200	0	722	290		748	0		
Lane Group Capacity		1047	856	655	1012		699	586		
v/c Ratio		0.19	0.00	1.10	0.29		1.07	0.00		
Green Ratio		0.54	0.54	0.54	0.54		0.39	0.39		
Uniform Delay d_1		9.7	8.7	19.0	10.3		25.5	15.7		
Delay Factor k		0.11	0.11	0.50	0.11		0.50	0.11		
Incremental Delay d_2		0.1	0.0	66.5	0.2		54.4	0.0		
PF Factor		1.000	1.000	0.696	0.696		1.000	1.000		
Control Delay		9.8	8.7	79.7	7.3		79.9	15.7		
Lane Group LOS		A	A	E	A		E	B		
Approach Delay	9.8				59.0				79.9	
Approach LOS	A				E				E	
Intersection Delay	61.9			Intersection LOS						E

SHORT REPORT												
General Information						Site Information						
Analyst	José L. Pérez Berenguer					Intersection	PR-942 y Acceso a Proyecto					
Agency or Co.	Pérez Berenguer y Asociados					Area Type	All other areas					
Date Performed	8/8/2006					Jurisdiction	Gurabo					
Time Period	2:45 - 3:45 PM					Analysis Year	2030					
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1		1				1	1			1	1
Lane Group	L		R				L	T			T	R
Volume (vph)	390		518				555	232			210	735
% Heavy Vehicles	0		0				0	2			0	0
PHF	0.80		0.72				0.80	0.80			0.72	0.72
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				4	4			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	324				0	0		0	0	735
Lane Width	3.7		3.7				3.7	3.7			3.7	3.7
Parking/Grade/Parking	N	0	N				N	6	N	N	-6	N
Parking/Hour												
Bus Stops/Hour	0		0				0	2			6	0
Minimum Pedestrian Time		3.2						3.2			3.2	
Phasing	EB Only	02	03	04	NS Perm	06	07	08				
Timing	G = 22.0	G =	G =	G =	G = 50.0	G =	G =	G =				
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate	487		269				694	290			292	0
Lane Group Capacity	502		449				653	1133			1207	1051
v/c Ratio	0.97		0.60				1.06	0.26			0.24	0.00
Green Ratio	0.28		0.28				0.63	0.63			0.63	0.63
Uniform Delay d_1	28.7		25.2				15.0	6.7			6.6	5.6
Delay Factor k	0.48		0.19				0.50	0.11			0.11	0.11
Incremental Delay d_2	32.5		2.2				53.1	0.1			0.1	0.0
PF Factor	1.000		1.000				0.511	0.511			1.000	1.000
Control Delay	61.2		27.4				60.8	3.5			6.7	5.6
Lane Group LOS	E		C				E	A			A	A
Approach Delay	49.1						43.9			6.7		
Approach LOS	D						D			A		
Intersection Delay	40.5			Intersection LOS						D		

HCS+: Two-Lane Highways Release 5.2

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

Phone: (787) 254-8321

Fax: (787) 254-8321

E-Mail: PBAsoc@choicecable.net

 Two-Way Two-Lane Highway Segment Analysis

Analyst	José L. Pérez Berenguer
Agency/Co.	Pérez Berenguer y Asociados
Date Performed	8/10/2006
Analysis Time Period	2:45 - 3:45 PM
Highway	PR-942
From/To	PR-941/PR-9942
Jurisdiction	Gurabo
Analysis Year	2030
Description	Estudio de Impacto en el Tránsito La Aventura

 Input Data

Highway class	Class 2				
Shoulder width	0.0	m	Peak-hour factor, PHF	0.70	
Lane width	2.8	m	% Trucks and buses	6	%
Segment length	1.0	km	% Recreational vehicles	0	%
Terrain type	Rolling		% No-passing zones	0	%
Grade: Length		km	Access points/km	1	/km
Up/down		%			
Two-way hourly volume, V	1465	veh/h			
Directional split	62 / 38	%			

 Average Travel Speed

Grade adjustment factor, fG	0.99	
PCE for trucks, ET	1.5	
PCE for RVs, ER	1.1	
Heavy-vehicle adjustment factor,	0.971	
Two-way flow rate, (note-1) vp	2177	pc/h
Highest directional split proportion (note-2)	1350	pc/h
Free-Flow Speed from Field Measurement:		
Field measured speed, SFM	-	km/h
Observed volume, Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, BFFS	100.0	km/h
Adj. for lane and shoulder width, fLS	10.3	km/h
Adj. for access points, fA	0.7	km/h
Free-flow speed, FFS	89.0	km/h
Adjustment for no-passing zones, fnp	0.0	km/h
Average travel speed, ATS	61.8	km/h

 Percent Time-Spent-Following

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.0	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	1.000	
Two-way flow rate, (note-1) vp	2093	pc/h
Highest directional split proportion (note-2)	1298	
Base percent time-spent-following, BPTSF	84.1	%
Adj. for directional distribution and no-passing zones, fd/np	0.0	
Percent time-spent-following, PTSF	84.1	%

 Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.68	
Peak 15-min vehicle-kilometers of travel, VkmT15	523	veh-km
Peak-hour vehicle-kilometers of travel, VkmT60	1465	veh-km
Peak 15-min total travel time, TT15	8.5	veh-h

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

SHORT REPORT			
General Information		Site Information	
Analyst	José L. Pérez Berenguer	Intersection	PR-942 y PR-9942
Agency or Co.	Pérez Berenguer y Asociados	Area Type	All other areas
Date Performed	8/10/2006	Jurisdiction	Gurabo
Time Period	2:45 - 3:45 PM	Analysis Year	2030

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes				1		0		1	1	0	1	
Lane Group				L	LR			T	R		LT	
Volume (vph)				852		21		133	430	63	50	
% Heavy Vehicles				10		8		2	0	0	0	
PHF				0.63		0.81		0.80	0.80	0.70	0.70	
Pretimed/Actuated (P/A)				A		A		A	A	A	A	
Startup Lost Time				2.0	2.0			2.0	2.0		2.0	
Extension of Effective Green				2.0	2.0			2.0	2.0		2.0	
Arrival Type				3	3			3	3		3	
Unit Extension				3.0	3.0			3.0	3.0		3.0	
Ped/Bike/RTOR Volume				0	0	3	0	0	430	0	0	
Lane Width				4.0	3.7			3.7	3.7		4.0	
Parking/Grade/Parking				N	8	N	N	-1	N	N	-6	N
Parking/Hour												
Bus Stops/Hour				0	0			0	0		0	
Minimum Pedestrian Time					3.2			3.2			3.2	

Phasing	WB Only	02	03	04	NS Perm	06	07	08
Timing	G = 106.0	G =	G =	G =	G = 31.0	G =	G =	G =
	Y = 3	Y =	Y =	Y =	Y = 3	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 143.0			

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate				1352	22			166	0		161	
Lane Group Capacity				1219	1076			410	356		195	
v/c Ratio				1.11	0.02			0.40	0.00		0.83	
Green Ratio				0.74	0.74			0.22	0.22		0.22	
Uniform Delay d_1				18.5	4.9			48.1	43.9		53.4	
Delay Factor k				0.50	0.11			0.11	0.11		0.36	
Incremental Delay d_2				61.1	0.0			0.7	0.0		24.3	
PF Factor				1.000	1.000			1.000	1.000		1.000	
Control Delay				79.6	4.9			48.7	43.9		77.7	
Lane Group LOS				E	A			D	D		E	
Approach Delay				78.5			48.7			77.7		
Approach LOS				E			D			E		
Intersection Delay	75.5			Intersection LOS						E		

TWO-WAY STOP CONTROL SUMMARY						
General Information			Site Information			
Analyst	José L. Pérez Berenguer		Intersection	5		
Agency/Co.	Pérez Berenguer y Asoc.		Jurisdiction	Gurabo		
Date Performed	8/7/2006		Analysis Year	2030		
Analysis Time Period	2:45 - 3:45 PM					
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: PR-9943			North/South Street: PR-942			
Intersection Orientation: North-South			Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	121	33			32	0
Peak-Hour Factor, PHF	0.83	0.70	1.00	1.00	0.50	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	94	0	0	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT			TR		
Upstream Signal		0			0	
Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	51			
Peak-Hour Factor, PHF	1.00	1.00	0.54	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	64	0	145	47	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	6			0		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (veh/h)	145						94	
C (m) (veh/h)	1551						1006	
v/c	0.09						0.09	
95% queue length	0.31						0.31	
Control Delay (s/veh)	7.6						8.9	
LOS	A						A	
Approach Delay (s/veh)	-	-					8.9	
Approach LOS	-	-					A	

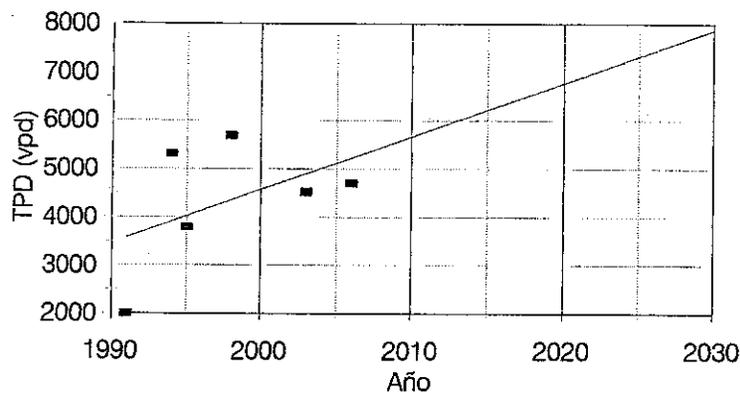
TWO-WAY STOP CONTROL SUMMARY						
General Information				Site Information		
Analyst	José L. Pérez Berenguer		Intersection	6		
Agency/Co.	Pérez Berenguer y Asoc.		Jurisdiction	Gurabo		
Date Performed	8/7/2006		Analysis Year	2030		
Analysis Time Period	2:45 - 3:45 PM					
Project Description <i>Estudio de Impacto en el Tránsito La Aventura</i>						
East/West Street: PR-942			North/South Street: PR-9941			
Intersection Orientation: East-West			Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		27	11	2	30	
Peak-Hour Factor, PHF	1.00	0.44	0.44	0.25	0.65	1.00
Hourly Flow Rate, HFR (veh/h)	0	61	25	8	46	0
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	
Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	4			
Peak-Hour Factor, PHF	1.00	1.00	0.25	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	16	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	10			0		
Flared Approach		N			N	
Storage		0			0	

RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LTR				
v (veh/h)		8		16				
C (m) (veh/h)		1523		993				
v/c		0.01		0.02				
95% queue length		0.02		0.05				
Control Delay (s/veh)		7.4		8.7				
LOS		A		A				
Approach Delay (s/veh)	-	-	8.7					
Approach LOS	-	-	A					

Apéndice 6. Determinación del Factor de Crecimiento del Tránsito Promedio Diario
Carretera PR-941, al sur de Carretera PR-942, barrio Celada, Gurabo, Puerto Rico

Año	Obtenido	Calculado	Regression Output:	
1991	2010	3590	Constant	-215762537364517
1994	5310	3920	Std Err of Y Est	129476244783175
1995	3800	4031	R Squared	227646655946906
1998	5700	4361	No. of Observations	6
2003	4527	4912	Degrees of Freedom	4
2006	4709	5242		
2020		6785	X Coefficient(s)	110171954966806
2030		7887	Std Err of Coef.	101465509001969



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

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

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

$$i = \sqrt[n]{\frac{F}{P}} - 1 = \sqrt[39]{\frac{7887}{3590}} - 1 = 2\%$$

Apéndice 7. Generación, Asignación y Proyección de Viajes Generación de Viajes

Con el propósito de determinar el flujo vehicular que generará el proyecto La Aventura (caso 2001-47-0705-JPU ante la Junta de Planificación), se utilizó la referencia *Trip Generation* (**ITE, 2003a,b**). 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.

La Aventura será un proyecto residencial, comercial e institucional que se compondrá de 1245 residencias unifamiliares, 755 apartamentos, un centro comercial a ubicarse en una parcela de 11.1 cuerdas, una escuela a ubicarse en un predio con cabida de 7.7 cuerdas y un área recreativa para uso de los residentes del proyecto a ubicarse en un predio de 10.3 cuerdas. Para poder estimar el flujo vehicular que generará este proyecto se utilizaron los usos de terreno 210 ("*Single-Family Detached Housing*"), 230 ("*Residential Condominium/Townhouse*"), 536 ("*Private School (K-12)*") y 820 ("*Shopping Center*"), según definido por *Trip Generation* (**ITE, 2003a,b**). No se utilizó ningún uso de terreno relacionado al área recreativa ya que esta será utilizada mayormente por los residentes del proyecto, por lo que no se espera que genere una cantidad considerable de viajes que afecten a la red vial aquí analizada. Se supuso que el área de alquiler del centro comercial sería de 63000 pies cuadrados ya que es un tamaño típico para este

tipo de proyectos. Para la escuela se supuso que el área de piso sería de 44000 pies cuadrados, calculada como una proporción de la cabida del solar de la escuela al solar comercial y multiplicada por el área de alquiler supuesta para el centro comercial. El estimado del volumen en las horas pico se realizó basado en el número de unidades de vivienda propuestas, para los usos residenciales, área de piso para la escuela y pietaje para alquiler para el centro comercial. Para los períodos críticos de la mañana y de la tarde se utilizó, generalmente, la información que ofrece la referencia relacionada al tránsito que generará el proyecto propuesto durante sus horas pico, las cuales coinciden con las de las calles adyacentes, de acuerdo a los supuestos en los que se basa la información, para este uso de terreno. No se utilizó esta información solamente para la hora pico de la tarde en el uso de terreno comercial, donde se utilizó la hora pico de las calles adyacentes, las cuales deben coincidir con las del generador, de acuerdo a la referencia.

Para generar los viajes se supuso que las distintas etapas del proyecto se irían entregando según se fueran terminando, por lo tanto entre la entrega de la primer unidad de vivienda y la última transcurrirían 12 años. También se supuso que la primer fase estaría culminada para el año 2008, lo cual podría ser posible si se continúan los trámites de forma normal. También se supuso que tanto el centro comercial como la escuela comenzarían operaciones

en el año en el que se ocupe la última fase del proyecto. Los viajes generados se ilustran en la tabla A7-1.

Tabla A7-1. Viajes Generados por La Aventura Durante las Horas Pico de un Día Laborable Típico

Etapa	Uso de Terreno	Año de Entrega	Hora Pico AM		Hora Pico PM	
			Entrando	Saliendo	Entrando	Saliendo
A	210	2008	23	66	77	44
B	210	2009	26	74	86	49
C	230	2010	18	81	72	41
D	210	2011	23	66	77	44
E	230	2012	11	49	51	28
F	210	2013	23	66	77	44
G	210	2014	24	69	81	45
H	210	2015	24	69	81	45
I	230	2016	21	96	83	47
J	210	2017	33	95	111	62
K	210	2018	29	81	96	54
L	210	2019	28	79	93	52
M	230	2020	21	94	82	46
Comercial	820	2020	73	46	221	240
Escuela	536	2020	98	58	68	174

Además del proyecto La Aventura, otros proyectos se proponen para el mismo sector. Los viajes que generen estos proyectos se sumarán a los que generará La Aventura y a los que utilizan la red vial analizada. A falta de mayor información, se supuso que estos proyectos abrirán para el mismo año en el que se supuso que se

ocupará completamente a La Aventura. La descripción de estos proyectos, según la Junta de Planificación de Puerto Rico, aparece en la tabla A7-2. La descripción del proyecto Palacios de Gurabo, la que se obtuvo de parte de la Declaración de Impacto Ambiental del proyecto. En este mismo documento se indica que solamente la sección 3 de dicho proyecto tendrá acceso por la carretera PR-942. El resto del proyecto tendrá acceso por la carretera PR-9945. La ubicación aproximada de estos proyectos se ilustra en las figuras 1 y 2. Los viajes que generarán los proyectos que se proponen para el entorno de La Aventura, de acuerdo a la referencia *Trip Generation (ITE 2003a,b)*, se resumen en la tabla A7-3.

Tabla A7-2. Proyectos Propuestos Aledaños a La Aventura

Nombre del Proyecto	Número de Caso Junta de Planificación	Dirección	Descripción
Alborada del Río	2000-47-1021- JPU	Carretera PR-941, Km. 2.7	300 apartamentos y 70 solares de 600 metros cuadrados
Valle Encantado	1998-47-0866- JPU	Carretera PR-941, Km. 4.0	294 unidades de vivienda en solares de 300 metros ²
La Esmeralda	2005-47-0014- JPU	Carretera PR-941, Km. 5.8	180 unidades en solares de 300 metros cuadrados
Vista Bella de Gurabo	2005-47-0296- JPU	Carretera PR-941, Km. 3.8, interior	16 apartamentos
Palacios de Gurabo (sección 3)	2005-47-0209- JPU	Carretera PR-942	352 unidades unifamiliares

Tabla A7-3. Viajes que Generarán los Proyectos Propuestos Aledaños a La Aventura

Proyecto	Uso de Terreno	Hora Pico AM		Hora Pico PM	
		Entrando	Saliendo	Entrando	Saliendo
Alborada del Río	230	23	104	90	50
	210	16	45	52	29
Valle Encantado	210	57	161	186	104
La Esmeralda	210	36	102	120	67
Vista Bella de Gurabo	230	2	10	28	16
Palacios de Gurabo (sección 3)	210	67	191	218	122

Ajuste por Viajes "Multi-Use"

Originalmente se calcula una cantidad de viajes que representa la que generará el desarrollo propuesto según la referencia *Trip Generation*. Una característica particular de La Aventura es que será un desarrollo consistente de varios usos de terreno diferentes. Esta característica crea la posibilidad de que se realicen viajes internos (viajes "multi-use") entre las zonas definidas. Ciertas características definen un desarrollo que produzca viajes "multi-use". Estas son (ITE, 2001):

- Típicamente se planifica como un solo proyecto en términos de bienes raíces
- Típicamente tiene un área de entre 100000 y 2 millones de pies cuadrados
- Contiene dos o más usos de terreno
- Algunos viajes serán entre los diferentes usos de terreno

- Los viajes entre los usos de terreno no utilizan un sistema de calles principal

La mayoría de las características se ajustan a este desarrollo. Algunos proyectos no son "multi-use", aunque cumplan con las características arriba descritas. Estos son (**ITE, 2001**):

- Distritos Centrales de Negocios (CBD, por sus siglas en inglés)
- Centros de Actividad Suburbana
- Una clasificación de uso de terreno que tenga el potencial para una mezcla de usos como por ejemplo:
 - un centro comercial
 - un parque de oficinas con tiendas
 - un edificio de oficinas con tiendas
 - un hotel con un espacio limitado para tiendas y restaurantes

Debido a las características que tendrá La Aventura se realizó un ajuste por viajes "multi-use" a los que generará. Este ajuste consistió en restar un 24% de los viajes que se había estimado que generará cada componente del proyecto, ya que es el valor recomendado (**Edwards, 2003**). Los resultados obtenidos en este ajuste se resumen en la tabla A7-4.

Ajuste por Viajes "Pass-By"

Es reconocido que los viajes generados por centros comerciales y otros establecimientos (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 centros comerciales son simplemente viajes desviados del tránsito actual en el sistema de carreteras adyacente. Estos viajes se conocen como "pass-by".

Tabla A7-4. Viajes Generados por La Aventura Durante las Horas Pico de un Día Laborable Típico, Ajustados por viajes "Multi-Use" y "Pass-by"

Etapa	Uso de Terreno	Año de Entrega	Hora Pico AM		Hora Pico PM	
			Entrando	Saliendo	Entrando	Saliendo
A	210	2008	17	50	59	33
B	210	2009	20	56	65	37
C	230	2010	14	62	55	31
D	210	2011	17	50	59	33
E	230	2012	8	37	39	21
F	210	2013	17	50	59	33
G	210	2014	18	52	62	34
H	210	2015	18	52	62	34
I	230	2016	16	73	63	36
J	210	2017	25	72	84	47
K	210	2018	22	62	73	41
L	210	2019	21	60	71	40
M	230	2020	16	71	62	35
Comercial	820	2020	55	35	93	101
Escuela	536	2020	74	44	52	132

Debido a que La Aventura incluye un área comercial, los viajes generados por ésta deben ser ajustados por viajes "pass-by". El

Trip Generation Handbook (ITE, 2001) incluye estadísticas para estimar los porcentajes de viajes "pass-by" en función del área de alquiler comercial. Siguiendo las guías de esta referencia, se supuso que un 44.5% de los viajes generados por el área comercial del desarrollo propuesto serán viajes "pass-by". Los viajes ajustados se resumen en la tabla A7-4. Solamente los viajes del área comercial se ajustan tanto por viajes "pass-by" como por viajes "multi-use".

Distribución de Viajes

Una vez determinado el flujo vehicular que generarán La Aventura y los otros proyectos propuestos para el área, durante las horas pico de un día laborable típico, se procedió a distribuir la nueva demanda de vehículos. Esta distribución, para la red vial comprendida entre la intersección de las carreteras PR-941 y PR-9941 hasta la intersección de las carreteras PR-942 y PR-9942 se realizó basada en la proporción direccional obtenida durante las horas pico, en un día laborable típico, en los conteos realizados recientemente en las cercanías del proyecto propuesto. Se supuso que los viajes generados por los proyectos propuestos, excepto los que generará el centro comercial de La Aventura, que transiten por esta última intersección virarán de la carretera PR-942 a la carretera PR-9942 y viceversa. Esto se hizo ya que la carretera PR-942, desde esta intersección hasta 3.7 kilómetros al norte, donde termina, sirve a los residentes de las pequeñas comunidades

existentes en la misma, donde no existe ni se proponen grandes generadores. Por este motivo se supuso que los residentes de los nuevos proyectos que lleguen a la mencionada intersección transitarán hacia la zona urbana de Gurabo o viceversa. Los viajes que generará el centro comercial de La Aventura que transiten por la mencionada intersección se distribuyeron basados en la distribución proporcional obtenida en los conteos realizados ya que parte de los visitantes del centro comercial serán residentes de las comunidades ubicadas al norte de la mencionada intersección. En la figura A7-1 se ilustran los viajes que generarán durante las horas pico, en un día laborable típico, los proyectos propuestos para el área analizada y como se distribuirán por la red de carreteras estudiada.

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 de la carretera PR-941 ubicada entre su intersección con la carretera PR-942 y la zona urbana de Gurabo. Con estos datos 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 la página 32 de este informe y se detallan en el Apéndice 6. Como esta es la carretera principal en el área estudiada, se supuso que el crecimiento que se experimenta

anualmente en el flujo vehicular que la utiliza será similar en las otras carreteras que la alimentan y que se analizaron en este estudio. Utilizando la ley de interés compuesto y el crecimiento anual obtenido, se proyectaron los datos actuales al año 2020, para las horas pico de un día laborable típico. En la figura A7-2 se ilustra la proyección de los datos de flujo vehicular actuales al mencionado año. También se fue proyectando el flujo vehicular que generará cada fase de La Aventura desde el año en el que se supuso que se ocupará hasta el año 2020. Los resultados de esta proyección aparecen en la tabla A7-5. La proyección de estos viajes generados por La Aventura se realizó antes de la distribución descrita en la sección anterior. Los viajes generados por La Aventura, según generados y proyectados al año 2020, se sumaron a los que se generarán los otros proyectos propuestos para el área. Para hacer esto se supuso que los otros proyectos se ocuparán en el año 2020. Luego de esta suma se distribuyeron tal y como se indica en la sección anterior. Estos datos, según aparecen en la figura A7-1, se sumaron a los viajes actuales proyectados, según aparecen en la figura A7-2, para obtener el tránsito que utilizará la red vial en el año 2020. Estos viajes sumados se ilustran en la figura 19 de este informe. y fueron los que se utilizaron para hacer los análisis operacionales correspondientes al momento en el que se espera que se ocupe por completo a La Aventura. Utilizando el factor de crecimiento

obtenido y con la ley de interés compuesto se proyectaron estos datos de flujo vehicular al año 2030, y se utilizaron para realizar los análisis operacionales correspondientes a ese escenario. Los resultados de esta última proyección aparecen en la figura 21 de este informe.

Nota

Luego de realizados los análisis operacionales de La Aventura los desarrolladores del proyecto realizaron un ajuste al mismo. Dicho ajuste consistió en aumentar el número de unidades unifamiliares de 1245 a 1407 y disminuir el número de apartamentos de 755 a 528. También redefinieron el área comercial de forma que se tendrán 89200 pies cuadrados de espacio para alquiler divididos en un espacio para supermercado de 30000 pies cuadrados, un espacio para tiendas de 27600 pies cuadrados, un espacio para farmacia de 15400 pies cuadrados, cinco "free standing" de 3000 pies cuadrados cada uno y una gasolinera. Estos cambios representan una reducción de unos 43 viajes durante la hora pico de la mañana y 87 viajes durante la hora pico de la tarde. Estas cantidades, además de ser pequeñas, cuando se comparan con los viajes totales que generará el proyecto, son menores a las utilizadas en los análisis, razones por la cuales los análisis operacionales realizados tienen validez. Con ambos escenarios se obtienen básicamente los mismos resultados, siendo, en todo caso, el escenario resumido en este informe más crítico que el que se debiera producir.

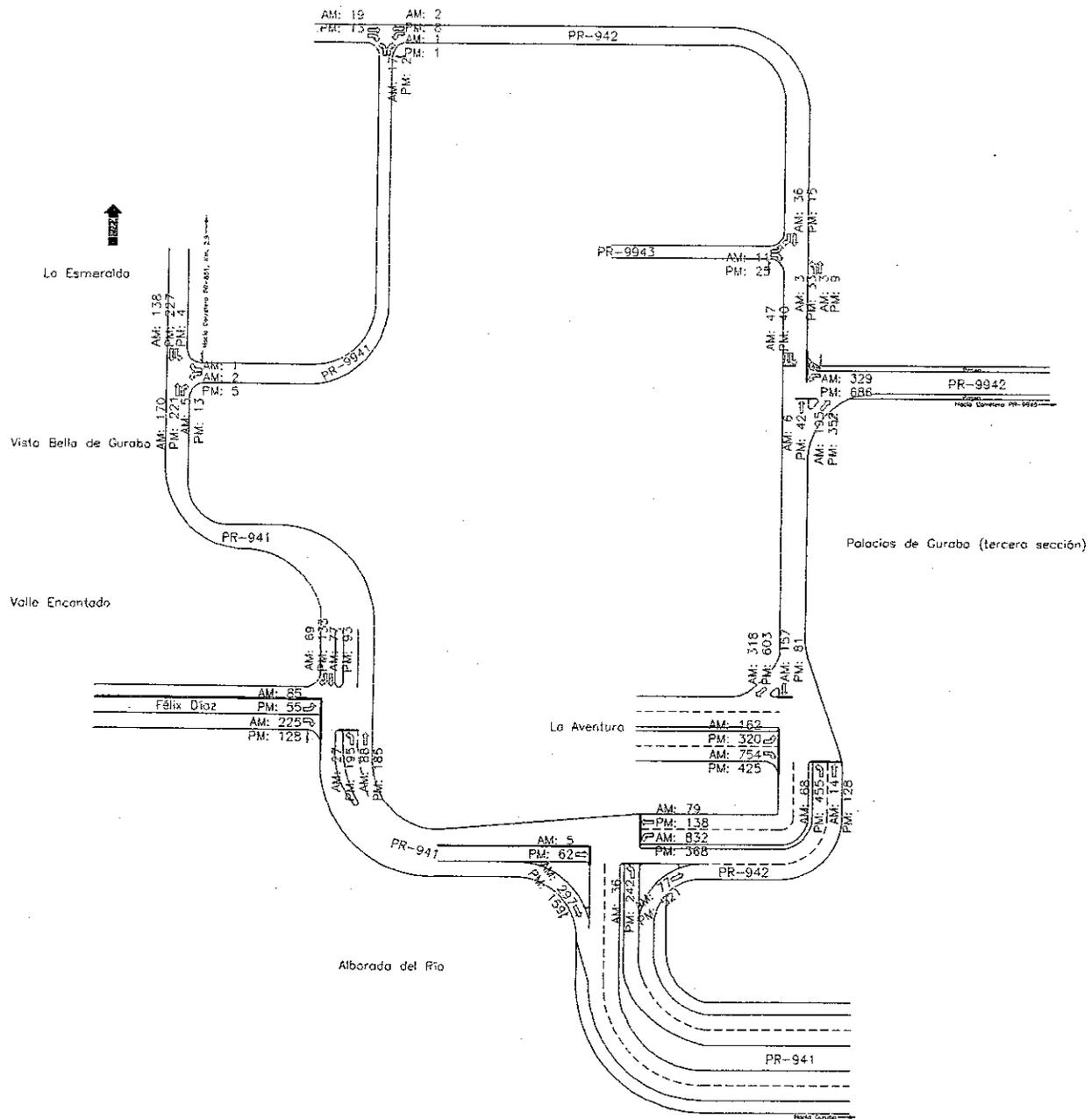


Figura A7-1. Viajes que generarán los proyectos propuestos para el área analizada, durante las horas pico de un día laborable típico, distribuidos por las intersecciones estudiadas. Los viajes generados se expresan en vehículos por hora

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

2003 Edition

Page 4C-1

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 geometries, 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.

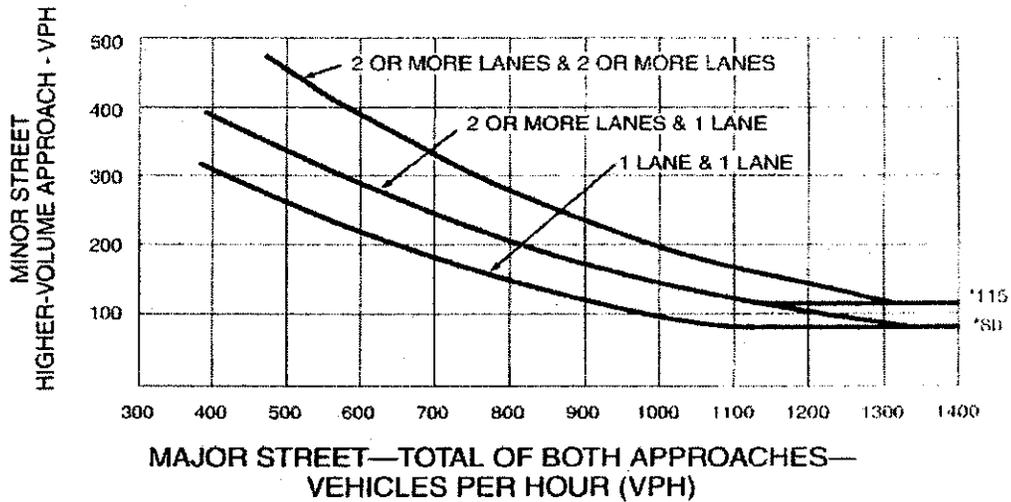
Standard:

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

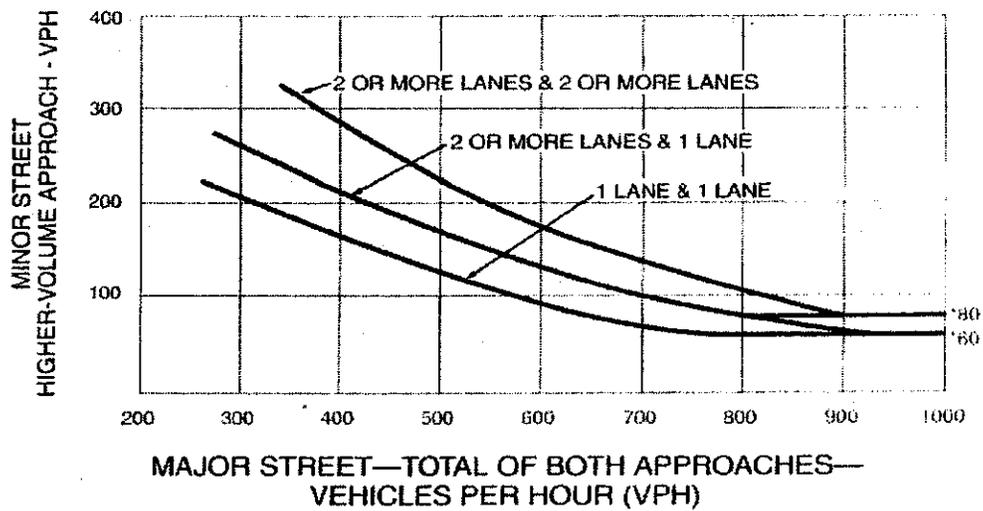
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*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).

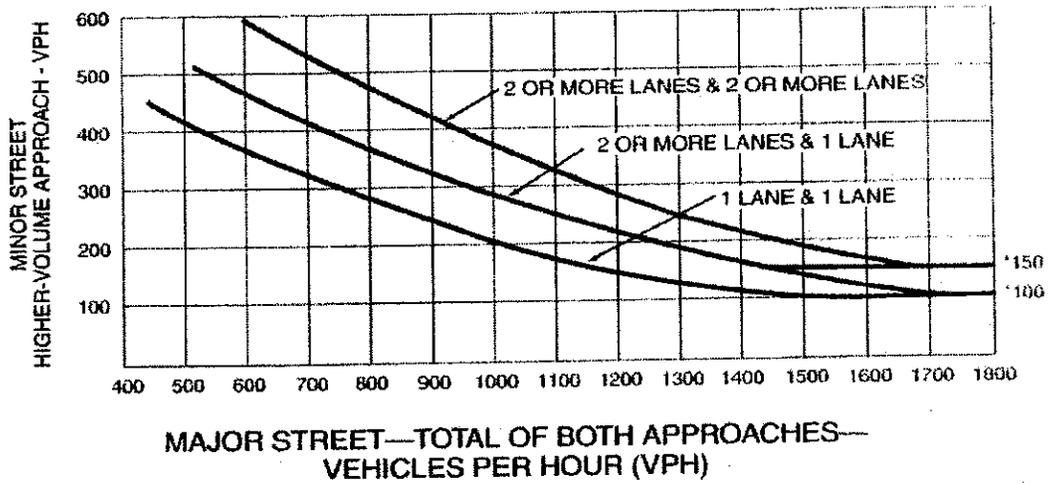
A traffic control signal may not be needed at the study location if adjacent coordinated traffic control signals consistently provide gaps of adequate length for pedestrians to cross the street, even if the rate of gap occurrence is less than one per minute.

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.

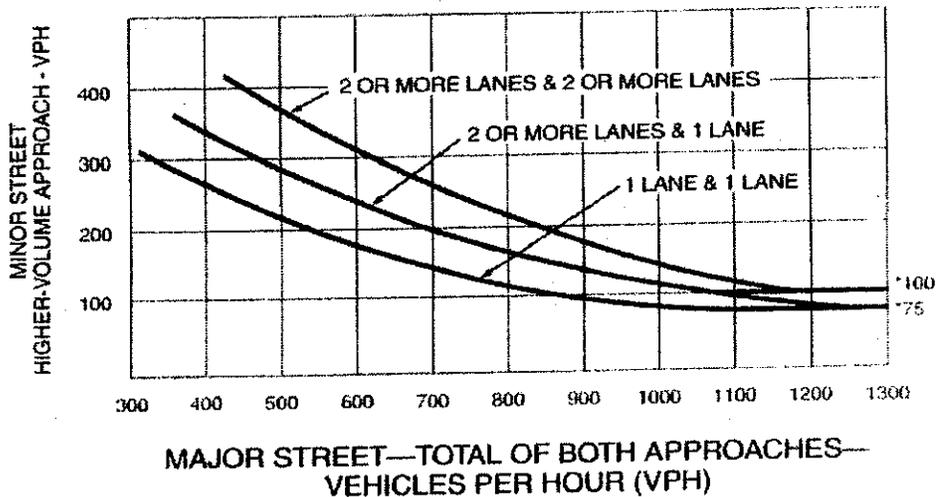
Figure 4C-3. Warrant 3, Peak Hour



*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)



*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. Gestiones Realizadas Conducentes a la Incorporación de la Extensión de la Carretera PR-203 en el Plan Vial de la Autoridad de Carreteras y Transportación



OSVALDO RIVERA & ASSOCIATES
consulting  engineers

tel: (787) 725-2775
fax: (787) 721-0467
e-mail: orc@osriba.net

P.O. BOX 8042
San Juan, P.R. 00908

19 de mayo de 2006

Ing. Al Rizek
Integral Corporation
PMB 430 Ave. Ashford 1357
San Juan, PR 00907
Tel. (787) 763-2202
Fax. (787) 765-3634

DESARROLLO SECTOR URRUTIA GURABO, PUERTO RICO

Estimado Ing. Rizek:

El 18 de mayo nos reunimos con personal del Area de Programación y Estudios Especiales y personal de la Sección de Consultas de la Autoridad de Carreteras y Transportación (ACT).

En dicha reunión corroboramos que la futura expansión (prolongación de la Carretera Estatal PR-203) NO esta programada dentro del Plan Vial de la ACT. Sin embargo, en enero de 2003, el Alcalde del Municipio de Gurabo, solicito al área de programación que evaluara un proyecto que consistia en la *prolongación de la PR-203 hasta la int. PR-942 con PR-941, desvío Norte.*

La solicitud fue evaluada por el Grupo Interdisciplinario de Evaluación de Propuestas (GIEP). El comité comentó que: *"el proyecto propuesto discurre a través del área inundable del Rio Gurabo y requiere la construcción de un puente de 1.0 Km de longitud. El proyecto aumentará el flujo vehicular a la intersección existente de la PR-203 y la PR-30".*

Como se aprecia de la contestación del comité, no se puede inferir si en base a su evaluación la solicitud del Municipio es viable o no. El área de programación no ha recibido ningún tipo de solicitud o documentación adicional posterior a la evaluación de enero 2003.

Para poder tener un insumo mas claro de la posición u opinión del GIEP, se esta coordinando una reunión con alguna persona que haya participado en la evaluación. En adición, se nos informó que es necesario conocer que otras mejoras estan contempladas dentro del Plan de Ordenamiento Territorial (POT) del Municipio de Gurabo. Esto para poder sustentar ante el GIEP la necesidad de la via propuesta.

Ing. Al Rizek
Desarrollo Sector Urbana

19 de mayo de 2006
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Será necesario coordinar con el Alcalde para que sea el quien da seguimiento al proyecto propuesto y el mismo se incorpore dentro del plan vial de la ACT con los correspondientes estudios de viabilidad y acuerdos económicos pertinentes.

La ACT solicitó copia del Plan de Ordenamiento del Municipio ilustrando la nueva conexión. Es de suma importancia que el Alcalde sea miembro activo de las reuniones y coordinaciones de este proyecto.

El comité evaluará la conexión una vez se le entregue copia del Plan de Ordenamiento Territorial para luego coordinar una reunión en la que sería imprescindible la presencia del Alcalde.

De tener alguna duda o pregunta, favor de comunicarse a nuestra oficina.

Cordialmente,



Osvaldo Rivera, P.E.

jd/zr

Estado Libre Asociado de Puerto Rico
GOBIERNO MUNICIPAL DE GURABO
Oficina del Alcalde



H. Víctor M. Ortiz Díaz
Alcalde

19 de junio de 2006

Ing. Fernando Vargas
Director Ejecutivo
Autoridad de Carreteras y Transportación
Área de Programación y Estudios Especiales
Apartado Postal 42007
San Juan, P.R. 00940-2007

**PROLONGACION DE LA PR-203 HASTA INTERSECCION PR-942 CON PR-941-
DESVIÓ NORTE, GURABO, PUERTO RICO**

Estimado Ingeniero Vargas:

Me refiero a la Petición de Evaluación #02-124 realizada por el Grupo Interdisciplinario de Evaluación de Proyectos (GIEP) el 22 de enero de 2003. La misma consistía en la prolongación de la Carretera Estatal PR-203 (Expreso Cheyanne) en dirección Norte hasta la intersección con la PR-941 y PR-942. Dicho desvío fue incorporado en el Plan de Ordenamiento Territorial del Municipio (ver copia adjunta).

Actualmente, en nuestro Municipio, existen varios desarrolladoras con propuestas de proyectos para esa zona de Gurabo. Estos, se verían impactados positivamente por la construcción del tramo de vía. Debido al interés del municipio y el presentado por los desarrolladores en que este proyecto se lleve a cabo, muy respetuosamente, solicito al GIEP, la re-evaluación del caso. Solicitamos una reunión con su personal para formalizar dicho proyecto.

Atentamente,

Hon. Víctor M. Ortiz Díaz
Alcalde

/spc

RECIBIDO
SECRETARÍA DE PLANEACIÓN
Y ECONOMÍA
MUNICIPAL
GURABO
PUERTO RICO
JUN 20 2006





OSVALDO RIVERA & ASSOCIATES
consulting  engineers

Tel: (787) 725-2729
Fax: (787) 721-0487
e-mail: orr@caribe.net

P.O. BOX 9042
San Juan, P.R. 00906

5 de julio de 2006

Ing. Fernando Vargas, Director Ejecutivo
Autoridad de Carreteras y Transportación
Área de Programación y Estudios Especiales
San Juan, Puerto Rico 00940-2007

**PROLONGACIÓN DE LA PR-203 HASTA INTERSECCIÓN PR-942 CON PR-941 - DESVÍO NORTE
GURABO, PUERTO RICO**

Estimado Ing. Vargas:

Me refiero a las cartas del 19 de mayo y 19 de junio de 2006 (ver copia adjunta). En ellas se hace referencia a una solicitud de Extensión del Puente Núm. 598 en la Carretera PR-181, sobre Río Gurabo. En síntesis, la carta establece que la solicitud de extensión del puente no es viable ya que, la misma conllevaría depósito de relleno en la Zona-1 del valle inundable de Río Gurabo. Como es de conocimiento general, una porción considerable de la PR-181, en el tramo que pasa sobre el valle inundable de Río Gurabo, se inunda dejando incomunicados al Municipio de Gurabo.

Según su carta, actualmente, la única mejora propuesta en esta zona es el ensanche de 0.8 Km de la PR-181 desde el puente de la PR-181 hasta la PR-189. Este proyecto tiene un costo preliminar estimado en \$2.2 millones sin embargo, no representa una solución al problema de inundación ya que, como mencionáramos, no se está elevando el nivel de la rasante de la carretera.

En nuestra opinión, sería beneficioso que la Autoridad considere alternativas costo efectivas que de alguna manera mejoren los problemas de inundaciones que sufren los residentes del Municipio de Gurabo. Por tal razón, muy respetuosamente, solicitamos se considere nuestra petición para la evaluación del proyecto que consiste en la extensión de la PR-203 (Expreso Chayanrie) hasta la intersección de la PR-941 con la PR-942.

La prolongación de la PR-203 provee una solución viable al problema de inundación del área. Además, provee una opción para el fácil tránsito vehicular tanto de los residentes actuales del área, como de los futuros compradores de viviendas en los desarrollos propuestos a los que dará acceso la extensión de la PR-203.

Ing. Fernando Vargas, Director Ejecutivo
Prolongación de la PR-203, Gurabo

3 de julio de 2006
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La extensión de la PR-203 es un elemento esencial del Plan de Ordenamiento Territorial del Municipio de Gurabo. La construcción de la extensión de la PR-203 fomentaría los desarrollos de vivienda tanto como la adquisición de propiedades en el área, fomentando así la densificación poblacional; uno de los objetivos principales del Planes de Ordenamiento Territorial.

Los \$2.2 millones a invertirse en mejoras geométricas no solucionar el problema de inundación y los mismos podrían invertirse en este proyecto. En adición, como mencionáramos en la solicitud formal radicada al Director Ejecutivo de la ACT (ver copia adjunta) existen varios desarrolladores con gran interés en el proyecto de la prolongación del Expreso Cheyenne cuya aportación económica sería de gran alivio a la Autoridad. A la misma vez, se estaría proveyendo una solución al problema de inundación que sufre el Municipio al facilitar una vía de rodeaje por encima del nivel de inundación y con fácil acceso a la PR-30 y otras vías importantes.

Atentamente,



Osvaldo Rivera, P.E.

/jd/zr

Anejo

Of: Hon. Víctor M. Ortiz Díaz, Alcalde (787) 737-5250
Sr. Rafael Rodríguez Rivera, Vice-Alcalde (787) 737-5250
Ing. Al Rizek (787) 727-3304

Apéndice 10. 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

PBA soc@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 Ingeniería 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

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 Marriott Hotel, Palm Beach Gardens, Florida

JULY 1998

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

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. Massachusetts Institute of Technology, Cambridge, Massachusetts

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. Massachusetts Institute of Technology, Cambridge, Massachusetts

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 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:

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 Chinaea 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

AUGUST 2003

Final Design and procedures for the construction permit of the infrastructure of the project Garden State Commercial Center, to be located at the State Highway PR-100, Km. 4.2, Guanajibo ward, Cabo Rojo, Puerto Rico, for Mr. Guisepe Marino

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 a proposed housing development in the 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. Guiseppe 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.

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 analyze 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. Guiseppe 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

2



Market Study

**Proposed Master Planned Residential Complex
PR-941 & PR-942, Jaguas and Celada Ward
Gurabo, Puerto Rico**

At the request of

**Integral Development Strategists
PMB 430, 1357 Ashford Avenue
San Juan PR 00907**

As of

August 30, 2006

Prepared by

**J.Porrata, PSC
898 Muñoz Rivera Avenue, Suite 300
San Juan PR 00927**

Prepared on

September 29, 2006

898 Muñoz Rivera Avenue
Suite 300
San Juan, PR 00927
Tel. 787 772-9056
Fax 787 754-3285
www@jporrata.com



J. PORRATA
TASADORES

September 29, 2006

Eng. Al Rizek
Integral Development Strategists
PMB 430, 1357 Ashford Avenue
San Juan PR 00907

Re: **Proposed Master Planned Residential Complex**
PR-941 & PR-942, Jaguas and Celada Ward
Gurabo, Puerto Rico

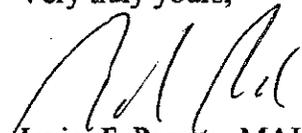
Dear Mr. Rizek:

Per your request, we have prepared a market study of residential projects in the Caguas-Gurabo region to assist you to determine the proper product (unit sizes) and pricing in which the proposed Master Planned Residential Complex should generate demand and be absorbed at adequate levels under current market conditions. The market study includes single-family and multi-family projects in Caguas, Gurabo, San Lorenzo and Las Piedras municipalities.

The purpose of the following market study is to assist the client to determine the proper product and pricing of a proposed master planned complex to be developed on a 376 cuerda farm located at the northwestern section of the Gurabo urban core and at nearby distance from PR-30. The intended use of the report is to provide a basis for an internal decision making process by the project's sponsor related to the unit mix to be submitted to the Planning Board as part of the Master Planned permit process. The market analysis is qualified by certain definitions, limiting conditions, and certifications which are set forth in the attached report.

Attached please find the market study with the market research, findings, and conclusions. Please contact us if you require further assistance.

Very truly yours,


Javier E. Porrata, MAI
Consultant

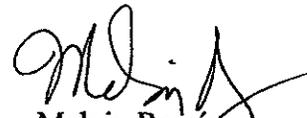

Melvin Ramirez
Consultant

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 Copies of project's brochures and related information

Market Area Analysis

Introduction

The proposed Master Planned Residential Complex site lies at the intersection of PR-941 and PR-942, in the Celada Ward of Gurabo at short distance from PR-30. Construction of residential projects specifically of single-family subdivisions have been increasing in the Caguas region and along the PR-30 span, including the municipalities of Caguas, San Lorenzo, Gurabo and Las Piedras. The strong residential market activity in the area reflects the limited single-family housing units at competitive price levels in the San Juan Metropolitan Area along with a natural urban expansion of the San Juan urban base to this location.

Accessibility to the overall region from San Juan is by way of PR-52 (Luis A. Ferré Expressway) and PR-1 leading to PR-30. The subject lies at an adequate location northwest of the Gurabo urban core with adequate access to PR-30. The immediate vicinity is accessed from PR-30 by way of PR-9944 (first exit to Gurabo traveling from Caguas) and turning to the left at PR-941. An alternate route is by the same exit but through PR-943, PR-9945 and PR-9942 which intersects PR-942. The proposed extension of the Chayanne expressway from PR-30 to PR-942 will enhance the accessibility of the immediate area with a direct access to PR-30, thus presenting additional positive accessibility factors for residential development. The current driving distance from the vicinity is approximately 5 minutes to PR-30, 10 minutes to Caguas and 25 minutes to San Juan, but these times are substantially higher at peak hours due to a heavy traffic along PR-30 and PR-52.

Gurabo has experienced a strong residential development with several new projects recently completed, under construction, or proposed, with most of these projects developed within a five-mile radius from the site. Given its proximity to Caguas and the San Juan metro area, the sector has attracted the single-family home market for primary residences, including an emerging upscale segment. In addition, the sector has attracted the condominium market with several multi-family projects currently under construction or proposed. The ongoing expansion of the San Juan metro area towards outskirts municipalities has translated into increased residential activity in the neighborhood, with adequate absorption levels.

The immediate vicinity is mostly comprised of vacant land with some custom single-family residences. The proposed Master Planned Residential complex will occupy approximately 376 cuerdas formerly used as a dairy farm. The urban expansion towards the subject neighborhood is evidenced by the recently completed 206-unit Lomas del Sol project located at nearby distance and by the Planning Board land resolution in process for the development of 964 single-family units and 390 multi-family units in an approximately 230 cuerda parcel located across PR-942 from the subject site.

Market Area Analysis

In addition, the 376 cuerda subject parcel was part of an approximately 543 cuerda parcel previously set for the 1,219-unit Aurora Master Planned Community. The Planning Board approved a land resolution permit as per Case No. 1998-47-0866-JPU, dated June 4, 2004, authorizing the construction of 294 units in an approximately 167 cuerda section segregated from the main tract. The remnant represents the subject parcel and the site of the proposed residential project.

In summary, the 376 cuerda parcel presents positive economics for residential development supported by the residential market activity in the neighborhood and approvals and/or permit process for development at adjacent parcels.

For the purpose of this market analysis, we gathered information of single-family and multi-family projects established in Caguas, Gurabo, San Lorenzo, and Las Piedras municipalities with price levels between \$175,000 and \$400,000.

Demographics

Absorption at the proposed residential project is most likely influenced by the previously mentioned municipalities, plus Juncos. Therefore, the demographic analysis include these five municipalities, with the following table summarizing the population changes from the last decade, according to the 2000 Census data.

Municipality	Population 1990	Population 2000	% Change
Caguas	133,447	140,502	5.0
Gurabo	28,737	36,743	27.9
San Lorenzo	35,163	40,997	16.6
Juncos	30,612	36,452	19.1
Las Piedras	27,896	34,485	23.6
Total	255,855	289,179	13.0

The population in the listed municipalities shows an increase over the last decade of approximately 5% to 28%, with an average of 13%, consistent with a strong residential market activity in the area. Comparing increments in housing units (supply) to increments in households (demand) in the market area over the last decade evidenced an oversupply of approximately 1,500 units. In summary:

1990 vs 2000			
Municipality	Increment in Housing Units - Supply	Increment in Households - Demand	Difference
Caguas	7,275	6,833	(442)
Gurabo	3,488	3,320	(168)
San Lorenzo	3,203	2,922	(281)
Juncos	2,829	2,829	0
Las Piedras	3,619	3,037	(582)
Total	20,414	18,941	(1,473)

Nevertheless, the apparent oversupply in housing has not affected new construction at these municipalities, with successful absorptions at ongoing projects evidencing adequate demand for new units at competitive prices and providing for upward price revisions. Consequently, it is our opinion that demand for housing at these municipalities exists as strongly supported by the successful completion and delivery of existing projects and current construction trends with adequate absorption levels. The demand for housing units also reflects the ongoing expansion to outskirt municipalities around the San Juan metro area, supported by the lower and more attractive price levels, and good product mixes.

The following table summarizes population, household, and housing unit data of the overall market area according to 2000 Census data.

2000 Census	Caguas	Gurabo	San Lorenzo	Juncos	Las Piedras	Total	%
Total Population	140,502	36,743	40,997	36,452	34,485	289,179	
Population 25-59 years	63,972	17,427	18,506	16,657	15,898	132,460	45.8 %
Increment Pop. (25 - 59)	5,709	4,849	4,015	3,721	3,888	22,182	17 %
Households	46,397	11,741	13,138	11,933	11,145	94,354	
Avg. Household Size	2.97	3.11	3.10	3.11	3.08		
Total Housing Units	50,568	12,854	14,594	13,064	12,421	103,501	100%
Occupied units	46,397	11,741	13,138	11,933	11,145	94,354	91.2%
Vacant units	4,171	1,113	1,456	1,131	1,276	9,147	8.8%

The population in the market area amounts to 289,179 persons, with 46% of the population falling between the age group of 25 and 59 years which represents the main target market for the proposed units. An important consideration is the fact that while the market area's overall population growth was 13% over the past decade, a higher 17% increment was reported for the age group of 25 to 59 years, reflecting additional potential demand implications.

Demand for housing

A housing demand study prepared for J. Porrata, PSC, as of December 2004, by the consulting firm Advantage Business Consulting, Corp. estimates the demand for housing units per municipality in the \$190,000 to \$400,000 price range. The following table presents the estimated demand (units per year) in the market area including the San Juan and Guaynabo municipalities given the ongoing expansion to the Caguas-Gurabo region from these locations supported by the lower and more attractive price levels.

Municipality	Demand 2005	Demand 2008
Caguas	147	170
Gurabo	34	43
San Lorenzo	26	34
Juncos	26	35
Las Piedras	26	35
Subtotal	259	317
San Juan	416	426
Guaynabo	115	115
Total	790	858

The preceding table indicates an estimated demand of 259 units in 2005 increasing to 317 units in 2008 within the delineated price bracket, excluding San Juan and Guaynabo. Considering San Juan and Guaynabo, substantially higher demands of 790 and 858 units in 2005 and 2008, respectively, result. The scarcity of new housing units, specifically in the single-family segment, at these price levels in San Juan and Guaynabo translate into positive demand implications for housing units in the Gurabo region mostly offerings units between the \$200,000 and \$325,000 price levels.

In summary, new residential projects with proper product mixes and competitive price levels should continue to experience adequate market demand levels. However, careful analysis, proper pricing, and adequate timing is suggested for future residential development in the area.

Proposed Improvements

The preliminary unit mix for the intended master planned community was developed during the preparation of this report. The current preliminary design consists of different phases including single-family units, row-houses, duplex and condominium units. The following table summarizes the distribution of the 1,935 proposed residential units.

Phase	Type	Basic Lot	Site Area	Units	Units/cda.
1	Single-family	350 SM	15.4 cdas.	96	6.2
2	Row-houses & duplex	161 SM	14.9 cdas.	157	10.5
3	Row-houses & duplex	161 SM	22.1 cdas.	245	11.1
4	Row-houses & duplex	161 SM	11.8 cdas.	121	10.2
5	Condominium	N/A	21.3 cdas.	168	24.8
6	Condominium	N/A		360	
7	Single-family	350 SM	26.2 cdas.	171	6.5
8	Single-family	350 SM	25.8 cdas.	164	6.4
9	Single-family	450 SM	19.8 cdas.	110	5.6
10	Single-family	450 SM	19.6 cdas.	100	5.1
11	Single-family	600 SM	57.8 cdas.	243	4.2
Total			234.7 cdas.	1,935	8.2

The preceding table demonstrates 1,935 proposed units distributed among approximately 235 cuerdas with a resulting density of 8.2 units per cuerda. The purpose of the developer is to obtain the highest density possible for the land resolution from the Planning Board. The complex will include space for a strip shopping center, private school and extensive recreational facilities. The following table summarizes the overall project.

Proposed Improvements

Description	Units	Land Area
Single-Family Units	1,407	209.9
Condominium Units	528	24.8
Recreational Facilities	N/A	10.2
Private School	N/A	7.7
Shopping Center	N/A	11.1
Green Areas	N/A	112.3
Total	1,935	376 cdas.

The shopping center will consist of a main two story structure of 40,000 SF for commercial and office use, plus two additional buildings of 20,000 SF each, 5 commercial outlots of approximately 3,000 SM, and an additional outlot of approximately 4,000 SM for a gas station use.

The recreational facilities are preliminary planned to include club house, meeting room, gazebos, several swimming pools, gymnasium, jogging/walking trail of 1.5 km., tennis, basketball and volleyball courts, baseball/football park and playgrounds. In addition, the complex will enjoy professional landscaped green areas and artificial lagoons.

The private school will have a separate entrance from the complex to not affect the ingress/egress of the project.

The extensive recreational facilities and green areas, along with a private school and commercial supporting facilities as part of a master planned community will enhance the marketability and future upward price revisions of the proposed units.

In summary, the adequate location of the property along with the proposed supporting facilities present positive economics for future residential development.

Residential Market

The market area has experienced stable and strong residential development throughout the past years. Residential prices for new primary residences in the region hover from approximately \$175,000 to \$500,000 and up to over \$800,000 at upscale units located at established residential complexes in Caguas. The location and positioning of the proposed project directs our analysis towards the primary single-family residential market targeting the middle to upper-middle income market segment, delineated by projects with sales prices between \$200,000 and the lower \$300,000's price level.

The following table presents the recently completed, under construction and/or proposed single-family projects in the market area, including the city, number of units, units available for sale, basic lot size, gross construction area and sales price range. In summary:

Project	Location	Units	Units Available	Lot Areas (SM)	GCA (SF)	Price Range
Montefiori	Caguas	121	59	340	2,140	\$245,000 - \$265,000
Paseos del Río	Caguas	217	21	300-380	1,500 - 1,800	\$190,000 - \$235,000
Bosque de La Sierra	Caguas	185	173	360	1,844 - 2,390	\$235,000 - \$294,000
Altapaz	Gurabo	61	26	350	2,400	\$229,000 - \$250,000
Praderas de Navarro	Gurabo	385	4	350	1,509-2,750	\$168,000-\$309,900
Veredas	Gurabo	754	5	350 - 540	2,000-2,700	\$179,000-\$322,500
Estancias Sierva Maria	Gurabo	72	47	800	3,000	\$260,000-\$315,000
Heavenly View	Gurabo	48	0	425	2,200 - 2,300	\$205,000 - \$250,000
Lomas del Sol	Gurabo	206	5	350 & 390	1,500 & 2,000	\$150,000 - \$205,000
Paraíso	Gurabo	93	0	350	1,900	\$210,000 - \$225,000
Villas del Este	Gurabo	194	156	450 & 515	2,255-2,515	\$265,000-\$320,000
Los Caminos	San Lorenzo	260	169	540	2,040-2,730	\$250,000-\$388,900
Savannah Real	San Lorenzo	306	141	320	1,700 - 2,330	\$197,000 - \$257,700
Olympic Court	Las Piedras	74	36	415	2,400-2,760	\$245,000 - \$285,000
Mansiones de los Artesanos	Las Piedras	165	69	470	2,200 - 2,580	\$230,000 - \$305,000
Total/Range		3,141	911	320 - 540	1,500 - 2,727	\$150,000 - \$390,000

A total of fifteen single-family residential subdivisions were researched in the market area. Heavenly View, Paraíso and Lomas del Sol represent recently completed projects at nearby distance to the subject, while the other listed projects refer to under construction or proposed subdivisions in the market area.

Residential Market Analysis

The multi-family development is the other component proposed in the 376 cuerda parcel. We concentrated our analysis in the recent multi-family market activity in Gurabo and San Lorenzo, which best reflects the economics for this component. The following table summarizes relevant information referent to the multi-family residential products in the market area:

Project	Location	Units	Units Available	Gross Areas (SF)	Price Range
Ventanas de Gurabo	Gurabo	396	306 ¹	1,526 - 3,018	\$247,000-\$357,000
Paseo Gales	Gurabo	88	6	1,575 - 2,180	\$155,000 - \$230,000
Paseo Gran Vista	Gurabo	60	0	1,500 - 1,600	\$170,000-\$210,200
Las Vistas de Gurabo	Gurabo	94	30	1,405 - 2,543	\$197,000 - \$231,000
Villas del Este (Modena)	Gurabo	156	48	1,239 - 1,540	\$179,500 - \$210,000
Alondra	San Lorenzo	100	0	1,371 - 1,600	\$180,000 - \$220,000
Total/Range		894	390	1,239 - 3,018	\$155,000 - \$357,000

The market data presented evidences a recent trend towards multi-family units in the market area, specifically in mid-rise condominium projects, consistent with the current market trends for mid-rise condominium construction in the San Juan metro area.

Marketing programs at the listed projects evidence adequate absorption levels with approximately 68% of the new (proposed) units already absorbed (delivered/optioned), with 32% still unsold. The ratio does not considers the 1,935 proposed subject units and the large-scale Palacios de Gurabo complex currently under the permit process and located across PR-942 from the subject. Palacios will consist of 964 single-family units and 180 multi-family units as per documents submitted to the Planning Board. Alborada del Río is another project under evaluation by the Planning Board as per Consultation 2000-47-1021 to consist of 67 single-family and 270 multi-family units. The proposed subject project is under the preliminary design and documentation process to be submitted for approval to the Planning Board. Therefore, the immediate vicinity will have a substantial incoming supply of over 3,400 units evidencing potential economics for development and future increased market competition. The following table summarizes the proposed projects set for future development in the subject vicinity.

Project Name	Single Family Units	Multi-Family Units	Total
Palacios de Gurabo	964	180	1,144
Alborada del Río	67	270	337
Subject	1,407	528	1,935
Total	2,438	978	3,416

¹ The 306 units excluding the 18 units reserved waiting for the final price level.

Residential Market Analysis

However, these units are expected commence entering the market over the next two to three years and to be constructed in subsequent phases over possibly five to ten year periods.

Overall, there is a total incoming supply of approximately 3,138 units under construction or proposed in the market area, including the already contracted units, between the \$200,000 and the mid's \$300,000 price level to be developed between 2006 and 2010, excluding the previously proposed projects in the evaluation process or to be submitted for evaluation by the Planning Board.

However, the proposed subject units and the proposed projects set for future development in the immediate market area, assuming approval from the Planning Board in a reasonable time, are expected to reach the market by 2009 with most of these units to be delivered possibly between 2009 to 2,014.

Conversations with the project developers, along with estimated construction and delivery periods, provided the following expected preliminary time frame for the incoming supply, excluding the additional expected supply if the Planning Board approved the proposed projects set for future development in the immediate vicinity.

Expected Supply	2006	2007	2008	2009	2010	2011	Total
Lomas del Sol	36	10					46
Altapaz	12	38					50
Villa del Este			84	84	26		194
Praderas		21	70				91
Veredas	24	96					120
Paseos del Río	21	84	9				114
Los Caminos	21	60	60	60	47		248
Olympic Court	12	27					39
Man. de Los Artesanos	27	84	37				148
Bosque de La Sierra	16	85	84				185
Montefiori			96	25	36		157
Savannah Real II		96	96	96	18		306
Single Family Units	169	601	584	481	415		2,250
Ventanas de Gurabo		70	84	84	84	74	396
Paseo Gran Vista	34						34
Las Vistas de Gurabo	24	47					71
Paseo Gales	6						6
Villa del Este	16	96	44	84	41		281
Alondra			16	84			100
Multi-Family Units	80	213	144	252	125	74	888
Total Residential Units	249	814	728	733	540	74	3,138

The market data reveals an estimated incoming supply of approximately 3,138 units over the next five years, with the bulk expected by 2007-2009. Demand analysis evidences that approximately 36% (1,140 units) of the total of 3,138 unit incoming supply of the next four to five years is already absorbed (optioned).

Residential Market Analysis

The following table summarizes our findings in terms of single-family and multi-family units.

Description	Supply	Optioned	%
Single-Family	2,250	785	35%
Multi-Family	888	355	40%
Total	3,138	1,140	36%

The preceding analysis could imply a slightly oversupply market based on a housing demand study prepared by the consulting firm Advantage Business Consulting, Corporation. The demand analysis based on the demand indications of the study indicates an average annual demand for a 2005-2008 period of approximately 800 units in the delineated price bracket in a market area including San Juan and Guaynabo municipalities. In addition, the multi-family component does not consider the condominium projects located in Caguas, which provide additional supply of condominium units to the delineated market area. Increase competition is expected in the market area with the large scale proposed projects in the subject's vicinity.

In addition, the 167 cuerda section next to the subject parcel has an expired land resolution authorizing 234 single-family and 52 multi-family units, formerly known as the Primavera project, which forms part of an intended over 1,200-unit master planned community to be developed in the approximate 540 cuerda main parcel, including the subject site. A local developer previously optioned the overall farm but only acquired the 167 cuerda section with approvals and recently placed the site for sale. The remnant 376-cuerda site was recently optioned by our client and represent the subject site.

Given its proximity and adequate road linkages to the San Juan metro area, the overall Caguas region has attracted the development of several master planned communities targeting the upper-middle to high income market segments. The following table summarizes several master planned-communities in the market area targeting the upscale market segment with current price levels, including re-sales.

Projects	Price Range
Ciudad Jardín de Gurabo	\$450,000 - \$625,000
Los Prados Complex	\$200,000 - \$630,000
Hacienda San José	\$325,000 - \$1,000,000
Caguas Real	\$580,000 - \$825,000

The 200'000's price level at Los Prados represents residential apartment units, while single-family units evidence higher price levels starting at approximately \$325,000 and consistent with recent re-sales at the older phases of Hacienda San José located nearby.

Residential Market Analysis

Data at the existing master planned communities indicate higher price levels than those preliminary considered for the subject proposed subject units, thus inferring that the propose subject's master planned complex could be positioned at a lower more attractive price bracket that would target a different (and larger) market base.

With the exception of Ciudad Jardín, all the listed master-planned complexes are located in Caguas with good access to Luis A. Ferre Expressway. Reportedly, Ciudad Jardín de Gurabo located along the PR-30 in Gurabo has evidenced a lower absorption pace at a \$600,000 price level.

Proposed and ongoing developments enjoying convenient access to PR-30 present increase sales price trends and adequate absorption levels. Absorption levels registered at several of these projects indicate adequate demand that do not reflect the oversupply implications of the demographic data (household increments) and of the demand analysis. Projects with adequate unit mixes and proper pricing are the ones with the best demand factors, while the projects offering units at the upper price levels evidence lower sales paces.

Single Family Subdivisions

Although, there are several single-family residential projects in the market area, we concentrated our analysis in the projects offering competitive units to those that could be developed at the subject site. The following pages summarize the most relevant facts referent to these projects, including their physical characteristics and marketing programs providing an adequate basis to assist the client in positioning the proposed Master Planned project.

The project listed and analyzed include the followings:

Name	Location	Status	Units	Type
Lomas del Sol	Gurabo	Recently completed	206	One Story
Altapaz	Gurabo	Under construction	61	Two Story
Villa del Este	Gurabo	Proposed	194	One and Two Story
Praderas	Gurabo	Final stage of construction	385	One and Two Story
Veredas	Gurabo	Final stage of construction	754	One Story (last units)
Paseos del Río	Caguas	Under construction	217	One Story
Montefiori	Caguas	Proposed	121	One Story
Bosque de La Sierra	Caguas	Under construction	185	One and Two Story
Savannah Real II	San Lorenzo	Under construction	306	One and Two Story
Los Caminos	San Lorenzo	Under construction	260	One Story
Olympic Court	Las Piedras	Final stage of construction	74	Two Story
Mansiones de los Artesanos	Las Piedras	Under construction	165	One and Two Story
Total			2,928	

In summary, there are twelve competitive projects that were analyzed to position the potential subject pricing and unit mix in the single-family segment.

Lomas del Sol

Lomas del Sol is a recent mostly completed project along PR-9945 at nearby distance from the subject. The following table summarizes the current data related to the model units.

Lomas del Sol	
Units	206
One Story Models	Cristina 3BR-2BA Andrea 4BR-2BA
Gross Construction Area	Cristina 1,500 SF Andrea 2,000 SF
Sales Prices	Cristina \$175,000, or \$117/SF Andrea \$205,000 or \$103/SF
Construction Commencement	November 2004
Expected Completion	Mostly completed
Construction Period	2 years
Sales Program Commencement	March 2005
Delivery of first units	September 2005
Absorption-Units Delivered	160
Units Optioned	41
Units Available	5, or 2%
Delivery Pace	14-15 units per month
Basic Lot Area	Cristina 350 SM Andrea 392 SM
Price per Additional SM	\$150/SM
Cul-de-sac/Corner premiums	\$3,000
Recreational Facilities	Basketball Courts, Meeting Room, Playground

Reportedly, original sales prices commenced at \$150,000 and \$205,000 for the Cristina and Andrea, respectively, resulting in price appreciations of 17% and 11% in an approximately one year period. The strong absorption of the units reflects good demand for residential units in the area and the attractive price levels of the units at the lower end of the market.

Altapaz

Altapaz represent the phase II of the existing Preciosa subdivision currently under construction along the Santa Barbara Road interior of PR-189 in the Rincón ward of Gurabo.

Altapaz	
Units	61
Two Story Model	4BR-2.5BA
Gross Construction Area	2,400
Sales Price	\$250,000, or \$104/SF
Construction Commencement	Last quarter 2004
Expected Completion	End of 2006
Construction Period	2 years
Sales Program Commencement	August 2005
Delivery of first units	December 2005
Absorption-Units Delivered	11
Units Optioned	24
Units Available	26, or 43%
Delivery Pace	1-2 units per month
Basic Lot Area	350 SM
Price per Additional SM	N/A
Cul-de-sac/Corner premiums	\$5,000
Recreational Facilities	Gazebo and Playgrounds

Reportedly, original sales prices started at \$229,000 for a price increment of approximately 9% in a one year period. The delivery and market absorption of the units have been adversely affected by the construction delays with construction originally expected to commence during the first quarter of 2004 and completion during 2005.

Villa del Este

The 475-unit Villa del Este master-planned development includes 281 walk-up apartments and 194 single-family units, built on a 115-cuerda tract located at the intersection of PR-30 and PR-203, just east of the Caguas-Gurabo boundary limits. The construction of the first phase of the multi-family units is in advanced stages of construction. The marketing for the single-family units was limited to 38 units of a one story layout that were optioned without a formal marketing program.

VILLA DEL ESTE	
Units	194
Models:	One-story - 4BR - 2.5 BA Two-story - 4BR - 2.5 BA
Gross Construction Areas	
One-story	2,355 SF
Two-story	2,255 SF
Sales Prices	
One-story	\$299,000, or \$127/SF
Two-story	\$270,000, or \$120/SF
Construction Commencement	Last quarter 2006
Expected Completion	N/A
Construction Period	N/A
Sales Program Commencement	Unknown
Expected Delivery of first units	Unknown
Absorption-Units Optioned	38 (all units that were available for sale)
Basic Lot Area	515 SM (one-story) 450 SM (two-story)
Price per Additional SM	\$100/SM flat \$40/SM slope
Cul-de-sac/Corner premiums	\$5,000 each
Recreational Facilities	Clubhouse, gym, sauna, swimming pools, tennis courts (3), basketball court, soccer field, jogging trail

There are 38 one-story units with contracted (optioned) prices ranging from \$299,000 to approximately \$320,000. The information presented was based on the original design of the project, however, the project is under the re-design and price revision process. Therefore, changes are expected in the future. Villa del Este will enjoy an extensive resort-style recreational facilities, with a competitive location with exposure to PR-30 and direct access to the Chayane Expressway providing excellent road linkages.

Praderas

Praderas is a 385-unit single-family residential project in its final stages of construction along PR-931, in the Navarro sector of Gurabo.

PRADERAS	
Units	385
Models:	One level 3BR - 2BA Two level 4BR - 2.5BA Rocio 4BR -
Gross Construction Areas	
One level	1,930 SF
One level	2,130 SF
Two Level	2,750 SF
Current Sales Prices	
One level	\$260,000 or \$135/SF
One level	\$290,000, or \$136/SF
Two level	\$309,900 or \$113/SF
Construction Commencement	Mid 2002
Expected Completion	December 2007
Construction Period	5 years
Sales Program Commencement	October 2001
Delivery of First Units	February 2003
Absorption-Units Delivered	379
Units Optioned	2
Available	4, or 1%
Delivery Pace	9 units per month
Basic Lot	425 SM
Price per Additional SM	\$100/SM
Cul-de-sac/Corner premiums	\$2,000 each
Recreational Facilities	Clubhouse, gym, tennis, basketball and racketball courts, pool, activities room and jogging trail

The project evidences good market absorption at competitive price levels. The project's sales history evidences price increments of 5% to 7% per year. The price levels presented represent the last phase comprising 91 units currently under final stage of construction.

Veredas

Veredas refers to a 754-unit master planned community distributed among six phases, also located along PR-931 in the Navarro sector of Gurabo. The marketing program of phases I and II commenced during 1999 with the delivery of the first units taking place at the end of 2000, with basic sales price of \$179,000 for a two-story model unit. The success of the marketing program provided for revised prices at increasing price levels in the subsequent phases. The following table summarizes the market data of the last 120 units:

VEREDAS	
Units	754
Models:	Oasis 3BR - 2.5BA (one-story) Casona 4BR - 2.5BA (one-story)
Gross Construction Areas	
Oasis	2,300 SF
Casona	2,500 SF
Sales Prices	
Oasis	\$295,000, or \$128/SF
Casona	\$322,500, or \$129/SF
Construction Commencement	Mid 1999
Expected Completion	End 2006
Construction Period	7 years
Sales Program Commencement	Mid 1999
Delivery of first units	End 2000
Absorption-Units Delivered	634
Units Optioned	115
Units Available	5, or 1%
Delivery Pace	9 units per month
Basic Lot	350-540 SM(540 for the last 120 units)
Price per Additional SM	\$100/SM
Cul-de-sac/Corner premiums	\$5,000 each
Recreational Facilities	Clubhouse, gym, swimming pool, tennis and basketball courts, playground and children nursery

The project reflects adequate demand providing for upward price revisions of approximately 5% to 10% per year, consistent with its well established market and maturity. The project is supported by good recreational facilities and good landscaped green areas.

Paseos del Río

Paseos del Río is an under construction project along the PR-183 in the Turabo Ward of Caguas. The project is currently delivering units and in advanced stage of construction with two phases completed. The data presented in the following table represents the current price level for the phase III consisting of the last 62 units.

Paseos del Río	
Units	217
One Story Models:	Model A 3BR - 2BA Model B 3BR - 2BA Model C 3BR - 2BA
Gross Construction Areas	A 1,500SF B 1,800 SF C 1,800 SF
Sales Prices	A \$189,900, or \$127/SF B \$229,900, or \$127/SF C \$234,900, or \$131/SF
Construction Commencement	End of 2003
Expected Completion	End of 2006
Construction Period	3 years
Sales Program Commencement	May 2004
Delivery of first units	May 2005
Absorption-Units Delivered	100
Units Optioned	96
Units Available	21, or 10%
Delivery Pace	6-7 units per month
Basic Lot	Model A-300SM Models B & C-378 SM
Price per Additional SM	\$140/SM
Cul-de-sac/Corner premiums	\$3,000 each
Recreational Facilities	Clubhouse, gym, swimming pool, tennis and basketball courts and playground.

The project is supported by adequate recreational facilities in an area evidencing recent residential market activity triggered by its location close to the urban core and within the area where the proposed peripheral avenue around the Caguas urban core will be constructed. The differences between the two 1,800 SF models is the layout and kitchen area.

Montefiori

Montefiori represent a proposed subdivision to be located at km. 1.5, PR-789 in Tomas de Castro Ward at the southeast section of Caguas urban core.

Montefiori	
Units	121
One Story Model:	3BR - 2.5BA
Gross Construction Area	2,168 SF
Sales Prices	Phase I - \$245,000, or \$113/SF Phase II- \$265,000, or \$122/SF
Construction Commencement	2007
Expected Completion	N/A
Construction Period	N/A
Sales Program Commencement	July 2006
Delivery of first units	2008
Absorption-Units Delivered	0
Units Optioned	62
Units Available	59
Basic Lot	338 SM
Price per Additional SM	\$110/SM
Cul-de-sac/Corner premiums	\$10,000 each
Recreational Facilities	Clubhouse, gym, swimming pool, tennis and basketball courts and jogging trail.

The project is located close to the proposed peripheral avenue to be constructed around the Caguas urban core. The second phase began its marketing program in August 2006 at a base sales price level of \$265,000, or \$122/SF, evidencing an 8% increment when compared to phase I.

Bosque de La Sierra

Bosque de La Sierra is a 185-unit project currently under construction along the PR- 765 in the Borinquen ward of Caguas. The project is located toward the Cayey boundary limits but offering a competitive one and two story model units.

Bosque de La Sierra	
Units	185
Models:	Ebano - 3BR - 2BA (one-story) Ausubo - 4BR - 2BA (one-story) Flamboyán - 4BR - 2.5BA (two-story)
Gross Construction Areas	
Ebano	1,844 SF
Ausubo	2,119 SF
Flamboyán	2,390 SF
Sales Prices	
Ebano	\$235,000, or \$127/SF
Ausubo	\$270,000, or \$127/SF
Flamboyán	\$294,000, or \$123/SF
Construction Commencement	During 2006
Expected Completion	2008
Construction Period	2 years
Sales Program Commencement	September 2006
Expected Delivery of first units	October 2007
Absorption	
Units Optioned	12
Units Available	173, or 94%
Basic Lot Area	360 SM
Price per Additional SM	\$135
Cul-de-sac/Corner premiums	\$5,000
Recreational Facilities	Clubhouse, swimming pool, basketball court and playground.

The 12 units optioned in approximately one month evidences adequate market acceptance at the developer price levels, which are consistent with current market levels.

Savannah Real II

Savannah Real II represents an extension of the existing 261-unit Savannah Real completed several years ago. The project is located along the PR-181 in the Quebrada Ward of San Lorenzo at nearby distance from the Chayane Expressway.

Savannah Real II	
Units	306
Models:	Miro 3BR - 2BA (one story) Casals 3BR - 2BA (one story) Vermier 4BR - 2.5BA (two story)
Gross Construction Area	
Miro	1,760 SF
Casals	1,700 SF
Vermier	2,330 SF
Sales Prices	
Miro	\$197,000, or \$112/SF
Casals	\$209,000, or \$123/SF
Vermier	\$257,700, or \$111/SF
Construction Commencement	February 2006
Expected Completion	2007
Construction Period	2 years
Sales Program Commencement	March 2006
Delivery of first units	Expected at January 2007
Absorption-Units Delivered	0
Units Optioned	165
Units Available	141, or 46%
Basic Lot	340 SM
Price per Additional SM	\$100/SM
Cul-de-sac/Corner premiums	\$5,000 each
Recreational Facilities	Activity Center, swimming pool, gazebo, tennis and basketball courts and jogging trail and soccer park.

The sales program evidences strong market acceptance with 165 units optioned in a five month period supporting strong demand for single-family units at these price levels in the market area.

Los Caminos

Los Caminos master-planned development refers to a 260-unit single-family residential project located along the PR-181/788 intersection in the Hato Ward sector of San Lorenzo. It offers one-story units with original sales prices ranging from \$239,500 to \$283,900. Its formal sales program and construction commenced on January and April 2004, respectively.

LOS CAMINOS		
Units	260	
Models:	Andiroba - 4BR-3.5BA (one story) Cedrillo - 3BR-2.5BA (one story)	
Gross Living Areas		
Andiroba	2,730 SF	
Cedrillo	2,040 SF	
Current Sales Prices	Original	Revised
Andiroba	\$283,900, or \$104/SF	\$388,900, or \$142/SF
Cedrillo	\$239,500, or \$117/SF	\$318,000, or \$156/SF
Construction Commencement	April 2004	
Expected Completion	April 2007	
Construction Period	3 years	
Sales Program Commencement	January 2004	
Delivery of First Units	June 2006	
Absorption-Units Delivered	12	
Units Optioned	79	
Units Available	169, or 65%	
Delivery Pace	6 units per month	
Basic Lot	540 SM	
Price per Additional SM	\$150/SM	
Cul-de-sac/Corner premiums	\$5,000 each	
Recreational Facilities	Clubhouse, gym, tennis, basketball and racketball courts, swimming pool, jogging trail and playground.	

The sales program indicates adequate market acceptance at its original sales prices with 64 units optioned at the end of January 2004, however, at the upper revised price levels the units have not been adequately absorbed. This project includes resort-style recreational facilities typical of a master-planned development, but in a hilly topography requiring several contention walls.

Olympic Court

Olympic Court is a 74-unit project part of the Olympic City master-planned community, currently under construction along PR-9937, behind the Olympic Plaza shopping center in Las Piedras.

OLYMPIC COURT

Units	74
Two-story models:	Nubia - 4BR - 2.5BA Osiris - 4BR - 2.5BA
Gross Construction Areas	
Nubia	2,400 SF
Osiris	2,760 SF
Sales Prices	
Nubia	\$268,000, or \$112/SF
Osiris	\$285,000, or \$103/SF
Construction Commencement	October 2004
Expected Completion	Under Final Stage of Construction
Construction Period	2 years
Sales Program Commencement	January 2005
Delivery of first units	October 2005
Absorption-Units Delivered	35
Units Optioned	3
Units Available	36, or 49%
Delivery Pace	3 units per month
Basic Lot Area	415 SM
Price per Additional SM	\$65/SM (original)
Cul-de-sac/Corner premiums	\$4,000 each
Recreational Facilities	Clubhouse, swimming pool, half-basketball court, gazebo and jogging trail

The physical observation of the project evidences concrete street levels below the upper sanitary manholes levels, that could affect adversely the market absorption of the project with 36 units already available for sale.

Mansiones de los Artesanos

Mansiones de los Artesanos project is currently under construction across the PR-9937 from the Olympic City master planned community. The 160-unit Mansiones de los Cedros project has two phases almost completed with the third phase of approximately 60 units currently under construction.

MANSIONES DE LOS ARTESANOS	
Units	165
Models:	Cemi 4BR - 2.5BA (two-story) Sol 3BR - 2.5BA (one-story)
Gross Construction Areas	
Cemi	2,580 SF
Sol	2,200 SF
Sales Prices	
Cemi	\$305,000, or \$118/SF
Sol	\$295,000, or \$134/SF
Construction Commencement	May 2005
Expected Completion	2007
Construction Period	2 years
Sales Program Commencement	April 2005
Delivery of first units	May 2006
Absorption-Units Delivered	37
Units Optioned	59
Units Available	28 (Plus 41 units for future marketing program)
Delivery Pace	12 units per month
Basic Lot Area	470 SM
Price per Additional SM	N/A
Cul-de-sac/Corner premiums	\$5,000 - \$7,500
Recreational Facilities	Clubhouse, swimming pool, gymnasium, half basketball court, playground and jogging trail.

The sales program indicates adequate absorption at competitive price levels and providing for upward price revisions. The project is not located at close distance to Caguas but enjoys a good direct access to PR-30. Original sales prices started at \$245,000 and \$228,000, with price revisions reflecting yearly increments of 25% and 13% for the Cemi and Sol models, respectively. The units have been marketed in sections with 41 units on hold and not currently for sale.

Summary of Single-Family Market Analysis

The listed market data evidences the market trend during the last years toward larger unit areas with good quality finishes, including modern designs and façades. The interior finishes and improvements will include larger ceramic tile floors such as 16" x 16", ceiling heights at or above 9 feet, european kitchen cabinet designs with several units including granite counter tops, glass and aluminum windows. In addition, some of the units are delivered with intelligent home systems with high speed internet access, cable and security capability and rough-ins installations for split units at bedrooms and for emergency power plant systems.

Unit layout are mostly three to four bedrooms with two to two-and-a-half bathrooms, plus family room and foyer. The half bathroom is now common at one story model units, as it has been for two story layouts.

The market data also indicates a market trend toward the one story layout, although two story units continue to evidence adequate market absorptions. The following table summarizes the relevant physical characteristics of the projects presented that evidence the best market acceptance.

Project Name	Model Type	Area (SF)	Room Count	Basic Lot SM
Praderas	One Story	1,930 - 2,130	3BR-2BA	425
	Two Story	2,750	4BR-2.5BA	425
Veredas	One Story	2,300	3BR-2.5BA	540
	One Story	2,500	4BR-2.5BA	540
Man. de Los Artesanos	One Story	2,200	3BR-2.5BA	470
	Two Story	2,580	4BR-2.5BA	470
Lomas del Sol	One Story	1,500	3BR-2BA	350
	One Story	2,000	4BR-2BA	392
Paseos del Río	One Story	1,500 - 1,800	3BR-2BA	300-378
Bosque de La Sierra	One Story	1,844	3BR-2BA	360
	One Story	2,119	4BR-2BA	360
	Two Story	2,390	4BR-2.5BA	360
Savannah Real II	One Story	1,700 - 1,760	3BR-2BA	340
	Two Story	2,330	4BR-2.5BA	340
Montefiori	One Story	2,168	3BR-2.5BA	338

The preceding table evidences that most projects offer one story model units and different size models. The pressure of increasing construction costs and higher interest rates could force future construction towards smaller unit models, thus supporting the larger and smaller unit mix.

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Project Name	Model Type	Area (SF)	Room Count	Basic Lot SM
Praderas	One Story	1,930 - 2,130	3BR-2BA	425
	Two Story	2,750	4BR-2.5BA	425
Veredas	One Story	2,300	3BR-2.5BA	540
	One Story	2,500	4BR-2.5BA	540
Man. de Los Artesanos	One Story	2,200	3BR-2.5BA	470
	Two Story	2,580	4BR-2.5BA	470
Lomas del Sol	One Story	1,500	3BR-2BA	350
	One Story	2,000	4BR-2BA	392
Paseos del Río	One Story	1,500 - 1,800	3BR-2BA	300-378
Bosque de La Sierra	One Story	1,844	3BR-2BA	360
	One Story	2,119	4BR-2BA	360
	Two Story	2,390	4BR-2.5BA	360
Savannah Real II	One Story	1,700 - 1,760	3BR-2BA	340
	Two Story	2,330	4BR-2.5BA	340
Montefiori	One Story	2,168	3BR-2.5BA	338

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Single Family Subdivisions

Projects with the most recent sales programs, including Bosque de La Sierra, Savannah Real and Montefiori are offering products with adequate unit sizes but not towards the upper end, with relatively small basic lot areas and prices ranging between \$200,000 and \$270,000, with adequate sales paces. The following table summarize relevant information regarding these projects including model type, unit areas, basic lot, price levels, and sales pace.

Project Name	Model Type	Area (SF)	Room Count	Basic Lot (SM)	Sales Price	Sales Pace
Bosque de La Sierra	One Story	1,844	3BR-2BA	360	\$235,000	12/month
	One Story	2,119	4BR-2BA	360	\$270,000	
	Two Story	2,390	4BR-2.5BA	360	\$294,000	
Savannah Real II	One Story	1,700	3BR-2BA	340	\$209,000	33/month
	One Story	1,760	3BR-2BA	340	\$197,000	
	Two Story	2,330	4BR-2.5BA	340	\$257,700	
Montefiori	One Story	2,168	3BR-2.5BA	338	\$245,000- \$265,000	62/month

Overall, model units vary in size from 1,700 to 2,390 SF, with consistent basic lot areas ranging from approximately 340 to 360 square meters. The three projects presented share attractive price levels, and relatively smaller basic lot areas. The original sales price at Montefiori was a lower \$245,000 with a price increment to \$265,000, translating into unit price per square foot toward the lower end of the market. The other listed projects evidences different prices and larger and smaller model units targeting a larger market base that enhances the potential demand factors.

Pricing Analysis

In order to determine the proper pricing in which the proposed master planned project would generate demand at adequate absorption levels, we considered and analyzed the most relevant products (i.e. model units) from the projects presented in the previous section. The following table summarize relevant information regarding the one and two-story models, including unit areas, price levels, and price per square foot.

Single Family Subdivisions

One-story units

Project	Lot Area (SM)	GCA (SF)	Basic Sales Price	Per SF
Lomas del Sol	350	1,500	\$175,000	\$117
	392	2,000	205,000	\$103
Montefiori	338	2,168	\$265,000 ²	\$122
Savannah Real	340	1,760	\$197,000	\$112
		1,700	\$209,000	\$123
Bosque de La Sierra	360	1,844	\$235,000	\$127
		2,119	\$270,000	\$127
Villa del Este	515	2,355	\$299,000	\$127
Paseos del Río	300	1,500	\$189,900	\$127
	378	1,800	\$229,000	\$127
	378	1,800	\$234,900	\$130
Veredas	540	2,300	\$295,000	\$128
		2,500	\$322,500	\$129
Mansiones de Los Artesanos	470	2,200	\$295,000	\$134
Praderas	425	1,930	\$260,000	\$135
	425	2,130	\$290,000	\$136
Los Caminos	540	2,730	\$388,900	\$142
		2,040	\$318,000	\$156

*Table shows the project's current pricing structure.

Overall, the listed projects provide basic sales prices ranging from \$175,000 to \$388,900 for one-story single-family dwellings offering 1,500 to 2,730 square feet of gross construction area, with minimum lot areas of 300 to 540 square meters. On an unit basis, the prices per square foot range from \$103 to \$156 of gross construction area, with the lower level delineated by a recent completed project in the subject neighborhood, while the upper levels represent proposed or under construction units in well established residential areas. The upper level delineated by Los Caminos has not been adequately accepted by the market reflecting poor absorption levels.

The following table summarizes the relevant information for the two-story models.

²Represent phase II price levels

Single Family Subdivisions

Two-story units

Project	Lot Area (SM)	GCA (SF)	Basic Sales Price	Per SF
Altapaz	350	2,400	\$250,000	\$104
Savannah Real	340	2,330	\$257,700	\$111
Olympic Court	415	2,400 2,760	\$268,000 \$285,000	\$112 \$103
Praderas	425	2,750	\$309,900	\$113
Mansiones de Los Artesanos	470	2,580	\$305,000	\$118
Villa del Este	450	2,255	\$270,000	\$120
Bosque de La Sierra	360	2,390	\$294,000	\$123

Again, the listed projects provide basic sales prices of \$250,000 to \$309,900 for two-story single-family units offering from 2,255 to 2,760 square feet of gross construction area, with minimum lot areas of 340 to 470 square meters. On an unit basis, the prices per square foot range consistently from \$103 to \$123 of gross construction area, with only two model units falling below the \$110 per square foot price.

The subject's location with good access to and from major road linkages (PR-30), along with its proposed condition and future initial sales program in at least two years support unit price indications toward the upper levels.

Consequently, the following table summarizes our estimate of the proper single-family product (unit sizes) and pricing in which the proposed Master Planned Residential Complex is likely to generate demand or be competitive in the market area.

Model Type	Basic Lot Areas SM	GCA	Sales Prices	Unit Prices
One Story	350 - 500	1,950 - 2,400	\$250,000 - \$325,000	\$130 - \$135
Two Story	350 - 450	2,200 - 2,400	\$265,000 - \$300,000	\$120 - \$125

The basic lot must be in proportion to the size of the dwelling, more specifically in the one story layout which occupies a larger foot print.

Additional Premiums

Typically in single-family projects additional premiums are added to the base price to account for the extra area over the basic lot area and for locations such as corner or culdezac. The following table summarizes the premium being charged for these conditions in the previously listed projects.

Single Family Subdivisions

Project	Price/extra SM	Corner/Culdezac
Lomas del Sol	\$150	\$3,000
Altapaz	N/A	\$5,000
Villa del Este	\$100	\$5,000
Praderas	\$100	\$2,000
Veredas	\$100	\$5,000
Paseos del Río	\$100	\$3,000
Bosque de La Sierra	\$135	\$5,000
Montefiori	\$110	\$10,000
Savannah Real	\$100	\$5,000
Olympic Court	\$65	\$4,000
Mansiones de los Artesanos	N/A	\$5,000 - \$7,500
Los Caminos	\$150	\$5,000

The market data indicates a consistent value of \$100 per square meter for additional land area over the basic lot and \$5,000 premium for corner and/or culdezac.

Price Appreciations

The sales programs experienced at several listed projects provide for upward price revisions. The following table summarizes our findings.

Project Name	Price Increment	Period (years)
Praderas	5% - 7%	One
Veredas	5% - 10%	One
Montefiori	8%	One
Altapaz	9%	One
Lomas del Sol	11% - 17%	One
Los Caminos	33% - 37%	Three

The market data indicate quite consistent annual price increment ranging from 5% to 10%, suggesting annual price increment expectancies between the 5% to 10% level. The slower pace at higher revised prices at Los Caminos does not support its aggressive price revisions and price levels at the upper end of the market.

Condominium Market Study

The other component of the proposed master-planned complex represents a multi-family development. We concentrated our analysis in the condominium projects proposed or under construction in Gurabo plus one proposed in San Lorenzo. In summary:

Name	Location	Units	Type
Ventanas de Gurabo	Gurabo	396	Mid-Rise
Paseo Gran Vista	Gurabo	60	Walk-up
Las Vistas de Gurabo	Gurabo	94	Walk-Up
Paseo Gales	Gurabo	88	Walk-Up
Modena (Villa del Este)	Gurabo	156	Walk-Up
Alondra	San Lorenzo	100	Mid-Rise

Multi-family construction is increasing its presence in the market area, with emerging projects also enjoying adequate acceptance. The following pages summarizes the most relevant facts of multi-family projects (walk-up and mid-rise) ongoing or proposed in the market area.

Ventanas de Gurabo

Ventanas de Gurabo refers to an upscale mid-rise condominium project currently under construction along PR-189 close to the intersection with PR-931 in Gurabo.

Ventanas de Gurabo	
Units	396
Stories	7
Units per floor	2 per cluster
Parking Ratio	2
Models	Mirador 2BR-2.5BA (convertible to 3BR)
	Veranda 2BR-2BA (convertible to 3BR)
	Balcones 3BR-3BA (convertible to 4BR)
	Terrazas 3BR-3.5BA (convertible to 4BR)
Gross Construction Area	
Mirador	1,653 SF
Veranda	1,526 SF
Balcones	2,718 SF
Terrazas	3,006 SF
Sales Prices	
Mirador	\$266,000, or \$161/SF
Veranda	\$247,000, or \$162/SF
Balcones	\$347,000, or \$128/SF
Terrazas	\$357,000, or \$119/SF
Construction Commencement	April 2005
Expected Completion	2010
Construction Period	5 years
Sales Program Commencement	February 2006
Delivery of first units	March 2007
Absorption	
Units Optioned	72
Units Available	36 (from the 108 unit phase I)
Floor-Height Premium	\$10,000
Corner Premium	\$9,000
Recreational Facilities	Club house, gymnasium, swimming pool, tennis and basketball courts, playgrounds, jogging & walking trail.

The overall project will be divided in four phases: Ventanas al Valle, Ventanas a la Cordillera, Ventanas a la Colina, and Ventanas al Llano. The data presented refers to the 108-unit Ventanas al Valle, which represent the phase I of the overall project. The project will enjoy an emergency power generator for common areas and all the apartments, and water cistern.

Reportedly, there are 18 additional units reserved waiting for an upward price revision. The sales program evidences good demand implications for a product not typically offered in the immediate market area and at upper price levels. The difference in unit price per square foot in the Balcones and Terrazas (PH-units) models reflects the large open terraces and balconies areas in these units.

Paseo Gran Vista

Paseo Gran Vista represent an almost completed walk-up project along the PR-931 in Gurabo in an area with strong residential market activity and at nearby distance from Ventanas de Gurabo.

Paseo Gran Vista	
Units	60
Stories	4
Parking Ratio	2
Models	Garden 3BR-2BA (convertible to 4BR) Typical 3BR-2BA (convertible to 4BR) Penthouse 3BR-2BA (convertible to 4BR)
Gross Construction Area	
Garden	1,500 SF
Typical	1,500 SF
Penthouse	1,692 SF
Sales Prices	
Garden	\$185,000 - \$210,000, or \$123 to \$140/SF
Typical	\$170,000 - \$195,000, or \$113 to \$130/SF
Penthouse	\$190,000 - \$213,000, or \$112 to \$126/SF
Construction Commencement	2004
Completion	Last quarter 2006
Construction Period	2 years
Sales Program Commencement	During 2004
Delivery of first units	April 2006
Absorption-Units Delivered	26
Units Optioned	34
Units Available	0
Delivery Pace	6-7 units per month
Floor-Height Premium	N/A
Corner Premium	\$5,000
Recreational Facilities	Swimming pool, gazebo and gymnasium.

The project has been adequately absorbed at competitive price levels with upward price revisions supporting recent demand for residential apartment units in the area. The sales program indicates annual price appreciations of approximately 6% to 8%.

Las Vistas de Gurabo

Las Vistas de Gurabo represents a recently completed walk-up project along PR-931 in Gurabo, at nearby distance from its intersection with the Chayane expressway.

Las Vistas de Gurabo	
Units	94
Stories	4-5
Parking Ratio	2
Models	Garden 3BR-2BA Typical 3BR-2BA Penthouse 3BR-3.5BA
Gross Construction Area	
Garden	1,400 SF
Typical	1,400 SF
PH-A	2,543 SF
PH-B	2,383 SF
Sales Prices	
Garden	\$221,000, or \$158/SF
Typical	\$202,500, or \$145/SF
PH-A	\$231,000, or \$91/SF
PH-B	\$222,000, or \$93/SF
Construction Commencement	Beginning of 2005
Completion	End of 2006
Construction Period	2 years
Sales Program Commencement	During 2004
Delivery of first units	May 2006
Absorption-Units Delivered	23
Units Optioned	41
Units Available	30, or 32%
Delivery Pace	7-8 units per month
Floor-Height Premium	N/A
Corner Premium	\$3,000
Recreational Facilities	Club house, swimming pool, gymnasium and playgrounds.

The listed prices represent the current revised levels. The 30 units available reflect higher unit price levels at the ground and typical units than those models at Paseo Gran Vista. The lower unit prices for the Penthouses reflects the larger over 500 square feet open terraces.

Paseo Gales

Paseo Gales refers to a recently completed walk-up project located interior of km. 4.0 of PR-189, along PR-9189, also known as Santa Bárbara road, in the Rincón Ward of Gurabo. The following table summarizes the project's general description:

Paseo Gales		
Units	88	
Stories	4-6	
Parking Ratio	2 per unit	
Models	Garden	3BR-2.5BA (Two Levels)
	Typical	3BR-2.5BA (Two Levels)
	Penthouse	3BR-2.5BA (Three Levels)
Gross Construction Area		
	Garden	1,575 SF
	Typical	1,575 SF
	PH	2,180 SF
Sales Prices	<i>Original</i>	<i>Last Revised</i>
	Garden	\$165,000, or \$105/SF \$210,000, or \$133/SF
	Typical	\$155,000, or \$98/SF \$205,000, or \$130/SF
	PH-A	\$180,000, or \$83/SF \$230,000, or \$106/SF
Construction Commencement	During 2002	
Completion	May 2006	
Construction Period	4 years	
Sales Program Commencement	May 2002	
Delivery of first units	May 2004	
Absorption-Units Delivered	82	
Units Optioned	0	
Units Available	6	
Delivery Pace	3 units per month	
Floor-Height Premium	N/A	
Corner Premium	\$2,500	
Recreational Facilities	Gazebo, swimming pool, half-basketball court and playground.	

The project's original sales prices range from \$155,000 to \$180,000, reflecting annual average price appreciations between 7% and 8% in a 4 year period. The project evidences a rather slow delivery pace of 3 units per month, with six units currently available for sale. The two and three story layout for the typical and PH units, which are not typical in the market, along with recent construction of competitive apartment units in the immediate vicinity could have caused the slow sales pace.

Villa del Este

As mentioned in the single-family market analysis section Villa del Este is a master-planned development consisting as originally designed of 281 walk-up apartments and 194 single-family units. The 156-unit Modena walk-up project is currently under the final stage of construction on the site. The following table summarizes the data referent to the 156- unit phase I walk-up component of the overall project.

Modena Condominium	
Units	156
Stories	3
Parking Ratio	2
Models	Garden 3BR-2BA Typical 3BR-2BA Penthouse 3BR-3.5BA
Gross Construction Area	
Garden	1,239 SF
Typical	1,239 SF
Penthouse	1,540 SF
Sales Prices	
Garden	\$186,000 - \$205,000, or \$150 to \$165/SF
Typical	\$179,000 - \$190,000, or \$144 to \$153/SF
Penthouse	\$196,500 - \$210,000, or \$128 to \$136/SF
Construction Commencement	Beginning of 2005
Completion	End of 2006
Construction Period	2 years
Sales Program Commencement	Beginning 2005
Delivery of first units	Last quarter 2006
Absorption-Units Delivered	0
Units Optioned	108
Units Available	48, or 30%
Delivery Pace	7-8 units per month
Floor-Height Premium	N/A
Corner Premium	N/A
Recreational Facilities	Clubhouse, gym, sauna, swimming pools, tennis courts (3), basketball court, soccer field, jogging trail

The price levels represent the current contracted price levels of the units. The 108 units optioned without an aggressive marketing program indicates adequate absorption for multi-family units supported by an adequate location with good access to PR-30 and good recreational facilities.

Alondra

Alondra is a proposed mid-rise condominium project next to the San Lorenzo urban core and San Lorenzo Shopping Center with good access to the Chayane expressway.

Alondra	
Units	100
Stories	5
Parking Ratio	2
Models	Garden 3BR-2.5BA Typical 3BR-2.5BA Penthouse 3BR-3.5BA
Gross Construction Area	
Garden	1,371 SF
Typical	1,371 SF
Penthouse	2,300 SF
Sales Prices	
Garden	\$190,000, or \$139/SF
Typical	\$180,000 - \$186,000, or \$131 to \$136/SF
Penthouse	\$220,000, or \$96/SF
Construction Commencement	Expected by September 2006
Completion	End of 2008.
Construction Period	2 years
Sales Program Commencement	January 21, 2006
Delivery of first units	End of 2007
Absorption-Units Delivered	0
Units Optioned	100 (Reserved with a \$1,000 deposit)
Units Available	0
Floor-Height Premium	\$3,000
Corner Premium	\$2,500
Recreational Facilities	Clubhouse, gym, swimming pool, tennis and basketball courts and playgrounds.

The 100 units were separated in one day with a \$1,000 deposit. Reportedly, the prospective buyers will be contacted to sign the option contract during the next weeks. The successful marketing program support the development of mid-rise condominium project with elevators and adequate recreational facilities in the market area consistent with current market parameters in the San Juan metro area.

Summary of the Condominium Market Analysis

The listed projects indicate the introduction of the residential apartment units in the Gurabo region, with several walk-up projects recently completed or at advanced stages of construction. The interior finishes are typical of the market with average interior finishes such as ceramic tile floors, wood kitchen cabinets with laminated countertops, single-hung aluminum-glass windows, wood doors, and closet sliding mirror doors. The projects are supported by adequate recreational facilities and two open parking spaces per unit.

Intelligent home systems are included in some projects, with emergency power generator providing energy to the common areas and in some cases to several outlets of the units. Water cisterns are provided. The walk-up units evidence adequate demand at price levels at the lower end of single-family products available in the area.

Ventanas de Gurabo represents an under construction condominium project with expected delivery of the first units in March 2007. The project will consist of several mid-rise condominium totaling 396 units. The sales program of the 108-unit phase I Ventanas al Valle evidences adequate market acceptance at upper price levels, with all the PH-units available for sale already contracted (optioned). The price levels at Ventanas de Gurabo are even higher than competitive single-family products in the market area.

The interior finishes at Ventanas al Valle are of superior quality than the ones offered at typical walk-up projects and will also enjoy superior recreational facilities. The project is located at the top of a hill with a panoramic view of the area.

The successful market activity at upper price levels of Ventanas de Gurabo adequately support the mid-rise condominium product in the vicinity, yet at lower price levels than single-family units, consistent with the historic current trend in the metro area.

Unit layout are mostly three bedrooms with two bathrooms with some units offering a studio or family with the potential to be converted into an additional bedroom. The PH units typically offers a second level with a family in some cases convertible to an additional bedroom, additional bathroom and covered and open terraces. Ventanas al Valle is a mid-rise condominium which only offers a two bedroom model unit convertible to three translating into a higher density of units in the overall project.

The following table summarizes the relevant characteristics of the model units available at the listed projects including type, unit area, room count and comments.

Condominium Market Study

Project Name	Type	Ground & Typical		PH-Units		Comments
		Area	Room Count	Area	Room Count	
Paseo Gran Vista	WU	1,500	3B-2BA	1,692	3BR-2BA	Convertible to four bedrooms. PH with covered terrace at second level.
Las Vistas de Gurabo	WU	1,400	3BR-2BA	2,383 2,543	3BR-3.5BA 3BR-3.5BA	Three level PH-units with family with bath and open terrace at the third level.
Paseo Gales	WU	1,575	3BR-2.5BA	2,180	3BR-2.5BA	Two level ground and typical units and a three level PH-unit with covered and open terrace on the roof level.
Alondra	MR	1,371	3BR-2.5BA	2,300	3BR-3.5BA	Two level PH-units
Ventanas de Gurabo	MR	1,526 1,653	2BR-2BA 2BR-2.5BA	2,718 3,006	3BR-3BA 3BR-3.5BA	Two level PH units with additional bedroom with bath, covered and open terrace at roof level. Two bedrooms convertible to three and three bedrooms convertible to four.

Overall, the unit areas for the typical units range from 1,371 to 1,653 and for the PH units from 1,692 to 3,006 square feet. The two and three bedroom layout convertible to three and four bedroom, respectively, at Ventanas de Gurabo provide a higher density (number of units) in the project, and not necessarily smaller unit areas. Alondra and Ventanas de Gurabo represent a mid-rise projects, while the other projects are walk-up.

Pricing Analysis

The following table summarizes relevant information regarding the ground and typical units of the listed condominium projects.

Project	Ground			Typical		
	Area	Sales Price	Unit Price	Area	Sales Price	Unit Price
Ventanas de Gurabo	2,718	\$347,000	\$128	1,526 - 1,653	\$247,000-\$266,000	\$161- \$162
Alondra	1,371	\$190,000	\$139	1,371	\$180,000-\$186,000	\$131-\$136
Paseo Gales	1,575	\$210,000	\$133	1,575	\$205,000	\$130
Paseo Gran Vista	1,500	\$210,000	\$140	1,500	\$195,000	\$130
Las Vistas de Gurabo	1,400	\$221,000	\$158	1,400	\$202,500	\$145
Modena (Villa del Este)	1,239	\$205,000	\$165	1,239	\$190,000	\$153

The typical models vary from 1,239 to 1,575 SF at the walk-up projects, with a larger unit size of 1,371 to 2,718 at the mid-rise components. Sales prices range typically from \$180,000 to \$221,000, except for the upscale Ventanas de Gurabo units that hover at an upper \$247,000 to \$347,000 level. Unit prices vary from \$130 to \$165 per square foot.

Condominium Market Study

Based on the market data, typical units should range in size from 1,400 to 1,600 square feet, with 3BR-2BA layouts and sales prices between \$200,000 and \$225,000, at approximately \$140 per square foot.

PH units are typically larger units with a second level space which includes open terrace areas. The following table summarizes the relevant data referent to the Penthouse units.

Project	Penthouse		
	Area	Sales Price	Unit Price
Ventanas de Gurabo	2,454	\$357,000	\$145
Alondra	1,600	\$220,000	\$138
Paseo Gales	2,180	\$230,000	\$106
Paseo Gran Vista	1,692	\$213,000	\$126
Las Vistas de Gurabo	1,993 - 1,833	\$231,000 - \$222,000	\$116 - \$121
Modena (Villa del Este)	1,540	\$210,000	\$136

The PH-unit areas reported considers only the covered areas excluding the open terraces. The shadowed projects refers to mid-rise projects while the others represent walk-up projects. The upper level for all model units is delineated by Ventanas de Gurabo, which is a mid-rise condominium project with good quality interior finishes and good exposure and access to PR-30.

PH units of 1,700 to 2,000 square feet are delineated, with layouts of 3BR-3BA. Sales prices should hover between \$230,000 and \$250,000 at unit rates of \$120 to \$130 per square foot.

The current market trends point toward walk-up and mid-rise condominium projects. However, mid-rise projects are typically priced at the upper end and enjoys superior ambiance than the typical walk-up development. Consequently, a mid-rise is recommended to be developed in the intended master planned community.

The following table summarizes our recommended price levels.

Model Type	GLA	Sales Prices	Unit Prices
Ground	1,400 - 1,600	\$210,000 - \$225,000	\$140 - \$150
Typicals	1,400 - 1,600	\$200,000 - \$215,000	\$135 - \$140
Penthouse	1,700 - 2,000	\$230,000 - \$250,000	\$125 - \$135

Overall, the price levels for condominium units range from \$200,000 to \$250,000, falling below the \$250,000 to \$325,000 level delineated for the single-family component.

Additional Premiums

The condominium market segment recognizes premiums for corner location and floor height difference. The following table summarizes the reported premium in the listed projects.

Project Name	Corner	Floor Height
Ventanas al Valle	\$9,000	\$10,000
Paseo Gran Vista	\$5,000	N/A
Las Vistas de Gurabo	\$3,000	N/A
Paseo Gales	\$2,500	N/A
Modena (Villa del Este)	N/A	N/A
Alondra	\$2,500	\$3,000

The market data indicate corner premium ranging from \$2,500 to \$9,000, with the upper end delineated by the upscale Ventanas al Valle. As typical of the market the walk-up project do not provide for floor height premium. The mid-rise projects indicates floor height premium of \$3,000 and \$10,000 per floor, with the upper end also delineated by the upscale Ventanas al Valle.

Price Appreciations

Paseo Gales and Paseo Gran Vista evidences consistent annual price appreciations of 6% to 8% consistent with the single-family component. However, Las Vistas de Gurabo only indicates an approximate 3% price increment from the original sales prices reflecting original upper price levels.

Market Absorption Analysis

Absorption of new units in the market area evidences an adequate sales pace in terms of marketing and delivery. The following table summarizes the reported absorption activity at the listed projects.

Project	Units	Marketing Period*	Units Sold	%	Mark. Pace Units/Mo.	Units Delivered	Delivery Period*	Delivery Units/Mo.
Single-Family								
Lomas del Sol	206	17	201	98%	12	160	11	14-15
Altapaz	61	12	35	57%	3	11	8	1-2
Praderas	385	72	381	99%	6-7	379	42	9
Veredas	754	85	749	99%	8-9	634	79	8
Paseos del Río	217	27	196	90%	7	100	15	6-7
Olympic Court	74	19	38	51%	2	35	10	3-4
Mansiones de los Artesanos	165	16	96	58%	6	37	3	12
Los Caminos	260	30	91	37%	3	12	2	6
Montefiori	121	1	62	51%	62	0	---	---
Savannah Real	306	5	165	54%	33	0	---	---
Bosque de La Sierra	185	1	12	6%	12	0	---	---
Multi-Family								
Ventanas de Gurabo	396	6	72	18%	12	0	---	---
Alondra	100	8	100	100%	100 ³	0	---	---
Paseo Gales	88	52	82	93%	1-2	82	28	3
Paseo Gran Vista	60	+/-12	60	100%	5	26	4	6-7
Las Vistas de Gurabo	94	+/-12	64	68%	5-6	23	3	7-8
Villa del Este (Modena)	156	18	108	69%	6	0	---	---
Total	3,628		2,512	69%				

*In months. Shaded projects refer to multi-family projects.

³Reportedly, all the units were reserved during one day pre-sale activity pending the sign of the option contracts.

Market Absorption Analysis

The single-family component of Villa del Este is not being marketed and is not included in the analysis. The more attractive (lower) price levels offering competitive products as Lomas del Sol, Savannah Real and Alondra evidence the best market absorption, while products at upper price levels indicate lower marketing paces. However, lower marketing pace also reflects construction delays such as in Altapaz and Olympic Courts.

As previously mentioned Los Caminos evidenced adequate market absorption at its original basic sales prices below the 300,000's. The sales program was adversely affected by higher revised at \$320,000 to \$390,000 for basic models, which set the upper level for the listed projects.

The preceding analysis indicates adequate absorption pace, for projects offering competitive unit mixes and price levels, with approximately 69% of the current supply available for sale already optioned or delivered, evidencing enhanced demand in the subject's market area. Delivery paces range from 1 to 15 units per month, with most projects within a 6 to 7 unit rate.

Conclusion

The following table summarizes data referent to the projects analyzed with our recommended unit sizes and price levels placed in context of the market.

Project	Units	Mark. Pace Units/Mo.	Deliv. Pace Units/Mo.	GCA	Per SF	Sales Prices
Lomas del Sol	206	12	14-15	1,500 - 2,000	\$103 - \$117	\$175,000 - \$205,000
Paseos del Río	217	7	6-7	1,500 - 1,800	\$127 - \$130	\$189,900 - \$234,900
Savannah Real	306	33	---	1,700 - 2,330	\$111-\$123	\$197,000 - \$257,700
Altapaz	61	3	1-2	2,400	\$104	\$250,000
Praderas	385	6-7	9	1,930 - 2,750	\$135 - \$136	\$260,000 - \$290,000
Montefiori	121	31	---	2,168	\$113 - \$122	\$245,000 - \$265,000
Subject Level	---	---	---	1,950 - 2,400	\$120 - \$135	\$250,000 - \$325,000
Olympic Court	74	2	3-4	2,400 - 2,760	\$112 - \$114	\$268,000 - \$285,000
Villa del Este	194	---	---	2,255 - 2,355	\$120 - \$127	\$270,000 - \$299,000
Mansiones de los Artesanos	165	6	12	2,200 - 2,580	\$118 - \$134	\$295,000 - \$305,000
Veredas	754	8-9	8	2,300 - 2,500	\$128 - \$129	\$295,000 - \$322,500
Los Caminos	245	3	6	2,040 - 2,730	\$142 - \$156	\$318,000 - \$388,900
Alondra	100	100 ⁴	---	1,371 - 1,600	\$131 - \$138	\$180,000 - \$190,000
Villa del Este (Modena)	156	6	---	1,239 - 1,540	\$136 - \$165	\$190,000 - \$210,000
Paseo Gales	88	1-2	4	1,575 - 2,180	\$83 - \$133	\$155,000 - \$230,000
Paseo Gran Vista	60	5	6-7	1,500 - 1,692	\$126 - \$140	\$195,000 - \$213,000
Las Vistas de Gurabo	94	5-6	7-8	1,400 - 1993	\$116 - \$158	\$199,500 - \$222,000
Subject Level	---	---	---	1,400 - 2,000	\$125 - \$150	\$200,000 - \$250,000
Ventanas de Gurabo	396	12	---	1,526 - 2,718	\$128 - \$162	\$247,000 - \$357,000
Total	3,340					

The successful marketing program of Montefiori with 62 units optioned in two months evidence the market trends towards a one story model units with good quality interior finishes such as granite kitchen countertops and vanities, 16" x 16" ceramic floor tiles and projected aluminum glass windows. In addition, its price schedule with base price levels of \$245,000 for the phase I and \$265,000 for the phase II falls within the listed market data with sales prices mostly below the \$300,000's price level.

⁴Reportedly, all the units were reserved during one day pre-sale activity still pending the sign of the option contracts.

In terms of multi-family units Ventanas al Valle, representing the phase -I of Ventanas de Gurabo condominium project, is the first mid-rise project in the immediate area with 72 units already contracted out of the total of 108 units. The 108 units contracted plus the 18 additional units separated pending final price result in an adequate marketing absorption of 83% (90 ÷ 108). In addition, the sales program of the listed walk-up projects in the area indicates last revised price levels ranging from \$190,000 to \$230,000, thus supporting adequate demand for multi-family units at competitive price levels.

In summary, the preceding table indicates that the price levels concluded in the proposed master planned community will be adequately absorbed and are adequately supported by the market data and consistent with current market trends.

The developer has the intention to include row house units in the master planned project. However, due to the lack of this product in the market area, there is no market data available to research or analyze. However, considering row-houses as an economic alternative for single-family units within the proposed master planned complex we recommended a unit price level slightly below the \$250,000 to \$325,000 price range delineated for the single-family component.

Consequently, a unit price level of approximately \$230,000 to \$245,000 could be reasonable with gross construction areas of approximately 1,800 to 1,900 square feet, including a double garage. The resulting gross living areas of approximately 1,400 to 1,500 units, considering a 400 SF garage, are consistent with the gross areas of typical apartment units in the area. Therefore, the row-house product could represent an alternative for the condominium units.

The following table summarizes our results considering the most relevant and competitive products.

Description	Market Single-Family	Recommended S-F Units	Market Apt. Units	Recommended Apt. Units
Gross Construction Areas Basic Lot Areas	1,500-2,760 SF 340 - 540 SM	1,950 - 2,400 350 - 500 SM	Typ. 1,371 - 2,718 SF PH. 1,600 - 2454 SF	1,400 - 1,600 SF 1,700 - 2,000 SF
Basic Sales Prices	\$200,000-\$325,000	\$250,000 - \$325,000	Typ. \$190,000-\$266,000 PH. \$210,000-\$357,000	\$200,000 - \$225,000 \$230,000 - \$250,000
Per SF- GCA	\$110-\$135	\$120 - \$135	Typ. \$128 - \$162 PH. \$116-\$145	\$135 - \$150 \$125 - \$135
Premiums Extra SM Corner Floor Height	\$100-\$150 \$5,000 - \$10,000 N/A		N/A \$2,500 - \$9,000 \$3,000 - \$10,000	
Project Absorptions Delivery Rates Average Typical Price Increments	6%-99% 1-15 units per month 6-7 units per month 5% to 10% per year		18% - 100% 3-8 units per month 5-6 units per month 6% to 8%	

Preliminary Total Cumulative sellout

As per the client request we provided a preliminary estimate of potential sales proceeds based on the current market conditions. Large scale projects like the intended 1,935 unit complex require between five to ten years to develop with associated price increments consistent with the changes in market conditions. Therefore, price increments should be incorporated over the projection period, with the listed projects evidencing strong upward price revisions in the 5% to 10% per year level. Nevertheless, as per the client's request we based the potential sellout estimate on current price levels. The unit areas were submitted by the developer. The numbers presented are only a preliminary estimate of a potential cumulative sellout level for the intended project based on current market parameters to assist the client in a decision making process regarding the property.

The following table summarizes a preliminary total potential cumulative sellout based on current market parameters and the previously mentioned assumptions, including preliminary price levels and unit areas based on the developer's feedback and current market conditions in the market area.

Phase	Type	Basic Lot	Avg. GCA	% One Story	Avg. Price	Per SF	Units	Total
1	Single-family	350 SM	2,100	12%	\$270,000	\$129	96	\$25,920,000
2	Row-houses	161 SM	1,900	---	\$240,000	\$126	157	\$37,680,000
3	Row-houses	161 SM	1,900	--	\$240,000	\$126	245	\$58,800,000
4	Row-houses	161 SM	1,900	--	\$240,000	\$126	121	\$29,040,000
5	Condominium	N/A	1,525	--	\$220,000	\$144	168	\$36,960,000
6	Condominium	N/A	1,735	--	\$235,000	\$135	360	\$84,600,000
7	Single-family	350 SM	2,100	12%	\$270,000	\$129	171	\$46,170,000
8	Single-family	350 SM	2,100	12%	\$270,000	\$129	164	\$44,280,000
9	Single-family	450 SM	2,200	12%	\$302,500	\$138	110	\$33,275,000
10	Single-family	450 SM	2,200	12%	\$302,500	\$138	100	\$30,250,000
11	Single-family	600 SM	2,600	80%	\$370,000	\$142	243	\$89,910,000
Total					\$267,124	\$133	1,935	\$516,885,000

Overall, the total potential sellout results in approximately \$500,000,000 based on current market parameters on each of the intended phases of the project. However, this figure does not consider additional premium such as corner and additional land area over the basic lot area supporting a higher potential sellout. Most single-family units fall within the delineated \$250,000 to \$325,000 market range, except for phase 11 at an upper \$370,000. However, subsequent price appreciation support a higher price level for the last projects within the master planned development. The pricing of the condominium units fall well within the delineated range.

Conclusion

The project will be developed in subsequent phases implying upward price revisions and higher potential total sellout. However, for this analysis a rounded \$500,000,000 potential sellout was considered.

Hypothetical Valuation

This assignment also includes a preliminary restricted valuation of the different components of the master planned under the hypothetical condition as if the parcel has the land resolution from the Planning Board authorizing the intended master planned project. It also considers that the proposed commercial buildings are completed.

Land Value Residential Component

The relationship (percentage) of land price per unit to the total cumulative sellout for large scale projects with land resolutions in place typically range between 5% and 7%. Therefore, a rounded 6% midpoint level provides a land value indication for the residential component at a rounded \$30,000,000 result. In summary:

Approval Condition	Units	Potential Sellout	%	Land Value	Per cuerda
Land Resolution	1,935	\$500,000,000	6	\$30,000,000	\$85,000

The value reported assumes typical site work costs, the land resolution authorizing the intended project already in place and that the development of 1,935 residential units as proposed are possible in the site. Otherwise, the as is value is approximately \$15,000,000, or approximately \$40,000 per cuerda.

Commercial Component

The commercial component consist of 7.7 cuerdas delineated for a private school, and a strip shopping center to consist of a main two-story structure comprising 40,000 SF of commercial and office use, two free standing structures of approximately 20,000 SF each, 5 commercial lots of approximately 3,000 SM and a 4,000 SM lot delineated for a gas station. The following table summarizes the preliminary restricted value conclusions for the commercial-institutional component based on current market levels.

Description	Units	Area	Unit Price	Total
Retail-Office Buildings	---	80,000 SF	\$175-\$200	\$15,000,000
Commercial Lots	5 ea	3,000 SM	\$300-\$350	\$5,000,000
Lot for Gas Station	1 ea	4,000 SM	\$300-\$350	\$1,500,000
Institutional Parcel	1 ea	7.7 cdas.	\$300,000 -\$350,000	\$2,500,000
Total				\$24,000,000

Hypothetical Valuation

The potential sellout of the land component, plus the commercial buildings, of the proposed subject's 376-cuerda subdivision under the hypothetical conditions considered are \$54,000,000, summarizes below:

Preliminary Restricted Value

Description	Total
Residential Land Component	\$30,000,000
Commercial Buildings	\$15,000,000
Commercial Outlots	\$6,500,000
Institutional Land	\$2,500,000
Total Hypothetical Value	\$54,000,000

The values reported assumed approvals in place for the intended master planned community and completion as per typical market parameters for the strip shopping center structures. The commercial outlots assume site work and infrastructure in place as typically in the market. The values based on current market parameters are limited to assist the client in an internal decision making process regarding the property.

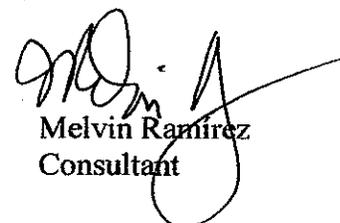
The preliminary residential land value component of \$30,000,000 are based on the overall 1,935 unit complex in an early and preliminary design. The value of each of the sites of the different residential phases of the master planned is out of the scope of this assignment. Therefore, the value of each of the project sites that comprises the overall complex could not be estimated from the total value reported. The value of each site as an individual property must be evaluated in a separate valuation analysis, with potential higher individual value implications.

Certification

I certify, that, to the best of my knowledge and belief:

- The statements of fact contained in this report are true and correct.
- The reported analyses, opinions and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, impartial, unbiased professional analyses, opinions and conclusions.
- I have no present or prospective interest in the property that is the subject of this report, and no personal interest with respect to the parties involved.
- My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value estimate, the attainment of a stipulated result, or the occurrence of a subsequent directly related to the intended use of this appraisal.
- The reported analyses, opinions and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics & Standards of Professional Appraisal Practice of the Appraisal Institute, which include the Uniform Standards of Professional Appraisal Practice.
- We have made a personal observation of the property that is the subject of this report.
- The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
- As of the date of this report, Javier E. Porrata has completed the requirements of the continuing education program of the Appraisal Institute.


Javier E. Porrata, MAI
Consultant


Melvin Ramirez
Consultant

General Limiting Conditions

The appraiser will not be required to give testimony or appear in court because of having made this appraisal, with reference to the property in question, unless arrangements have been previously made thereof.

Any cause of action resulting between the appraiser and the client in conjunction with this appraisal, either directly or indirectly, will be limited in damages to the amount of the appraisal fee received for the assignment. Furthermore, it is agreed that you will indemnify Javier E. Porrata, Melvin Ramirez and/or J. Porrata, PSC for any damages, costs, expense, and attorney's fees resulting from any cause of action by any interested party, other than the client, concerning the appraisal report.

Possession of this report, or a copy thereof, does not carry with it the right of publication. It may not be used for any purpose by any person other than the party to whom it is addressed without the written consent of the appraiser, and in any event, only with the proper written qualification and only in its entirety.

In the case where an improvement is considered, the distribution of the total valuation between land and improvements applies only under the reported highest and best use of the property. The allocations of value for land and improvements must not be used in conjunction with any other appraisal and are invalid if so used.

Disclosure of the contents of this report is governed by the By-Laws and Regulations of the Appraisal Institute. Neither all nor any part of the contents of this report, or copy thereof, shall be conveyed to the public through advertising, public relations, news, sales or any other media, without written consent and approval of the appraiser. Nor shall the appraiser, firm or professional organization of which the appraiser is a member, be identified without prior written consent of the appraiser.

The physical condition of the improvements described herein is based on visual inspection only. No liability is assumed for the soundness of structural members, including roof (wear and leakage), foundation (settling or leakage), footings, exterior and interior walls, partitions, floors, or any other part of the structure, since no engineering tests were made of same and no termite inspection was conducted. Furthermore, we accept no legal responsibility for the efficiency of the plumbing and electrical systems, air conditioning equipment, or any major appliances. Unless otherwise noted, all of these items appeared adequate and operational.

General Assumptions

In this appraisal assignment, the existence of potentially hazardous material used in the construction or maintenance of the building, such as the presence of urea formaldehyde foam insulation or asbestos, and/or existence of toxic waste, which may be or may not be present on the property, has not been considered. The appraiser is not qualified to detect such substances. We urge the client to retain an expert in this field if desired.

General Assumptions

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This appraisal report has been made with the following general assumptions:

- 1) No responsibility is assumed for the legal description or matters including legal or title considerations. Title to the property is assumed to be good and marketable unless otherwise stated.
- 2) The property is appraised free and clear of any or all liens or encumbrances unless otherwise stated. All taxes are assumed to be current. In specific cases, at the request of the client, the appraiser may present data on past due ad valorem taxes. However, this data is not certified and is only a verbal confirmation by the tax authority. This data should not be relied upon by the client and has no affect on the final value estimate.
- 3) The property is appraised as though under responsible, adequately capitalized ownership and competent property management.
- 4) The information furnished by others is believed to be reliable. However, no warranty is given for its accuracy.
- 5) All engineering is assumed to be correct. The plot plans and illustrative material in this report are included only to assist the reader in visualizing the property.
- 6) It is assumed that there are no hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for such a conditions or for arranging for engineering studies that may be required to discover them.
- 7) It is assumed that there is full compliance with all applicable federal, state, and local environmental regulations and laws unless noncompliance is stated, defined and considered in the appraisal report.
- 8) It is assumed that all applicable zoning and use regulations and restrictions have been complied with, unless a nonconformity has been stated, defined, and considered in the appraisal report.
- 9) It is assumed that all required licenses, certificates of occupancy, consents, or other legislative or administrative authority from any local, state, or national government or private entity or organization have been or can be obtained or renewed for any use on which the value estimate contained in this report is based.

General Assumptions

- 10) It is assumed that the utilization of the land and improvements is within the boundaries or property lines of the property described and that there is no encroachment or trespass unless noted in the report.
- 11) The availability of capacity and/or connection rights to any or all public utilities had not been determined by the appraiser. The value estimate reported herein is contingent upon and limited to said capacity and right of connection.



Qualification Data 2006
Javier Porrata, MAI

898 Muñoz Rivera Avenue
Suite 300
San Juan, PR 00927
Tel. 787 772-9056
Fax 787 754-3285
www.jporrata.com



J. PORRATA
TASADORES

Javier E. Porrata, MAI

Full Name Javier Enrique Porrata Monserrate

Office Address **J.Porrata, PSC**
898 Muñoz Rivera Avenue, Suite 300
San Juan, PR 00927
Telephone: 787-772-9056
Fax: 787-754-3285
jporrata@jporrata.com

College Education Bachelor of Science Degree
Majors in Finance and Marketing
Saint Joseph's University
Philadelphia, Pennsylvania

Licenses, Commonwealth of Puerto Rico Certified General Real Estate Appraiser, Certificate 127
Authorized Professional Real Estate Appraiser, Certificate 644
Real Estate Broker, License 4343
Federal Housing Administration (FHA), HUD Certification PR-644

Professional Experience

6/2002 to Present **President**
Javier Porrata, PSC
Real Estate Appraisers & Consultants
898 Muñoz Rivera Avenue, Suite 300
San Juan, Puerto Rico

8/2000 to 6/2002 **President**
TasaTech, PSC
898 Muñoz Rivera Avenue, Suite 202
San Juan, Puerto Rico

1992 to 8/2000 **Certified General Appraiser**
Vallejo & Vallejo
1610 Ponce de León Avenue
San Juan, Puerto Rico

1989 to 2004 **Administrator**
HEM Holding Corporation
Commercial Properties
PO Box 20222
San Juan, Puerto Rico 00928

Qualification Data

1989 to 1992

Staff Consultant

Manuel L. Porrata & Associates
 Economic and Management Consultants
 898 Muñoz Rivera Avenue
 San Juan, Puerto Rico

Special Appointments

Special Commissioner, Tribunal de Primera Instancia
 Sala Superior de San Juan

Board Member

1999 to 2003

Appraisal Institute, Puerto Rico & Caribbean Chapter

1989 to Present

HEM Holding Corporation

1999 and 2000

Mansiones Reales Homeowners Association

Professional Affiliations

MAI Member of the Appraisal Institute

Member, Urban Land Institute

Executive Member, United Who's Who

Past Member, Puerto Rico Chamber of Commerce - Real Estate Committee

Member, Centro Unido de Detallistas

Offices Held

2006

Education Chair, Puerto Rico & Caribbean Chapter

2003

Board Member, Appraisal Institute, Puerto Rico & Caribbean Chapter

2002

President, Appraisal Institute, Puerto Rico & Caribbean Chapter

2001

Education Chair, Puerto Rico & Caribbean Chapter, Appraisal Institute

1999 and 2000

Secretary, Puerto Rico & Caribbean Chapter, Appraisal Institute

1999

Government Relations Committee Chair, Puerto Rico Chapter

1998 and 1999

Member, Young Advisory Council, Appraisal Institute Washington

1998

Vice President, Puerto Rico Committee, Appraisal Institute

1998 to 2000

Editor, *REALities...Real Issues on Real Estate Valuation*

Appraisal Courses

Appraisal Institute

<u>Course Name</u>	<u>Year</u>
National USPAP Course	2004
Appraisal Principles	2002
USPAP, Part C	2000
Litigation Valuation	1998
Advanced Applications	1997
Report Writing and Valuation Analysis	1997
Highest & Best Use & Market Analysis	1996
Advanced Sales Comparison & Cost Approaches	1995
Advanced Income Capitalization	1995
USPAP, Part A	1994
USPAP, Part B	1994
General Applications	1994
Appraisal Principles	1994
Basic Income Capitalization	1993
Residential Case Study	1993
Applied Residential Property Valuation	1991

Qualification Data

<i>Instituto de Evaluadores</i>	Eminent Domain Valuation	1991
	Mathematics for Real Estate Appraisers	1991

<i>Colegio de Ingenieros</i>	Mathematics for Real Estate Appraisers	1990
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<i>Appraisal Seminars</i> <i>Appraisal Institute</i>	<u>Seminar Name</u>	<u>Year</u>
	The Professional's Guide to the URAR	2005
	Business Practices and Ethics	2004
	20 Common Appraisal Errors	2004
	Appraisal Consulting	2003
	Subdivision Analysis	2002
	Instructor Leadership & Development Conference	2001
	Chapter Presidents Leadership Program	2001
	Case Studies in Residential Highest & Best Use	2000
	Comprehensive Appraisal Workshop (Ted Whitmer)	2000
	FHA and the Appraisal Process	1999
	Appraising from Blueprints & Specifications I	1999
	National Summer Conference - Orlando, FL.	1999
	Case Studies in Commercial Highest & Best Use	1999
	Non-Residential Demonstration Report Writing	1997
	Environmental Risk & the RE Appraisal Process	1997
	Accrued Depreciation Seminar	1997
	Appraisal of Retail Properties	1996
	Dynamics of Office Building Valuation	1995
	Feasibility Analysis and Highest & Best Use	1994
	Rates, Ratios & Reasonableness	1994
	Rates, Ratios and Reasonableness, Part II	1994
	The Appraiser's Guide to the URAR Form	1993
	Exam Preparation for State Appraiser Certification	1990

<i>Massachusetts Institute of Technology (MIT)</i>	Capital Markets I: Advanced Topics on REITs and CMBSs	1998
	Capital Markets II: Advanced Topics on REITs and CMBSs	1998

<i>Marshall & Swift Publication</i>	Marshall & Swift Cost Service, Residential Cost Approach	1996
	Marshall & Swift Cost Service, Commercial Cost Approach	1996

<i>PR Association of Realtors</i>	Lease Agreements	1995
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Type of Appraisals Performed

Single-Family Residences and Condominium Apartment Units
 Single-Family Residential Subdivisions
 Condominium Residential Projects (High-Rise, Walk-Up)
 Condominium Commercial Projects (Office, Medical Office)
 Vacant Parcels (Residential, Commercial, Agricultural)
 Low Income Housing Projects

Office and Industrial Buildings
Hotels & Resorts
Shopping Centers
Hospitals and Special Purpose Properties

Major Clients Served

Banks

Banco Bilbao Vizcaya
Banco Popular de Puerto Rico
Banco Santander Puerto Rico
Citibank, N.A.
Doral Bank
FirstBank
RG Premier Bank of Puerto Rico
Oriental Group
Scotiabank de Puerto Rico
The Bank & Trust of Puerto Rico
Westernbank de Puerto Rico
Doral Mortgage
H.F. Mortgage
Popular Mortgage
R&G Mortgage
Santander Mortgage

Private

F&R Construction, S.E.
Interlink Group, Inc.
Gutiérrez-Latimer C.S.P.
Northwestern Selecta, Inc.
Acana Real Estate
T. Development Group
Fernando L. Sumaza & Co.
Lema Developers & Associates, Inc.
O'Neill & Borges
Garage Isla Verde, Inc.
Commercial Centers Management, Inc.
Pan American Grain
Wyeth-Ayerst Laboratories (PR) Inc.
Abbott Laboratories
Golden Mile Development
Makro Importers & Distributors
Conceptos Urbanos, Inc.
Cemex - Puerto Rican Cement
Juan R. Zalduondo, Esquire
Río Construction Corp.
Instituto de Banca y Comercio
Martinal Management Corp.

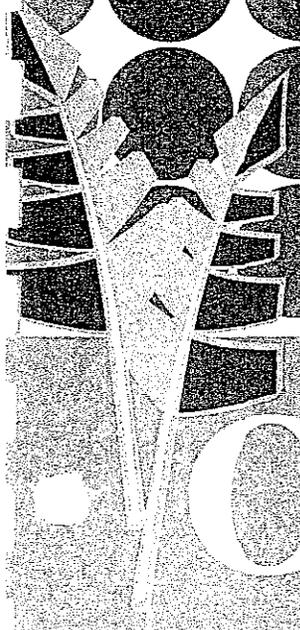
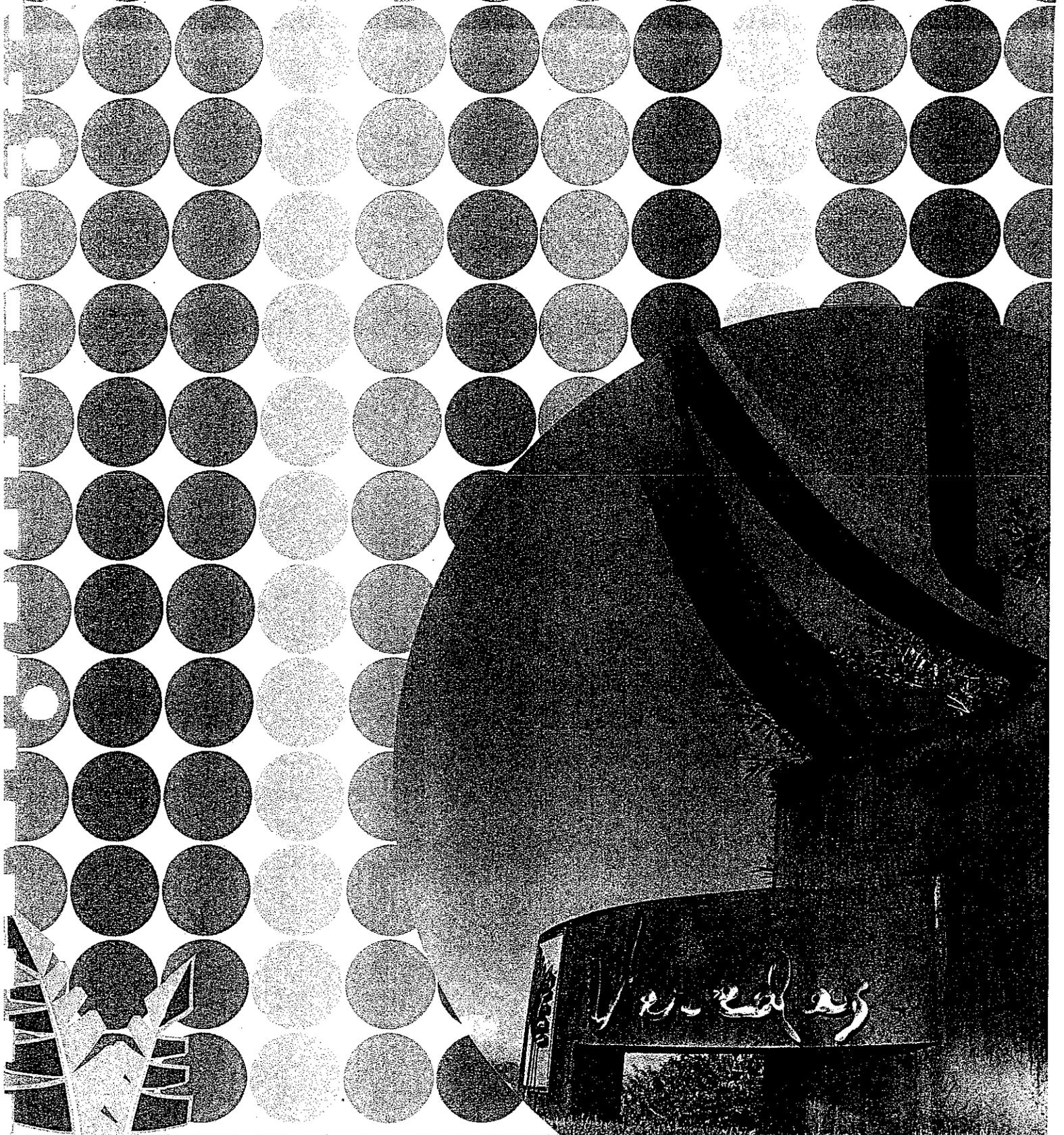
Fiddler, González & Rodríguez PSC
John Dewey College
Metropolitan Marble Corp.
Tech-Products Inc.
Luis Freire Division of K.M.A.
Developers of Prime Properties Inc.
Donato, Design & Development
Puerto Rico Telephone Company
Resort Homes at Dorado Beach

U.S.

First Union Corporation, Miami FL
Integra Realty Resources-Krauser & Cirz, New York, NY
Structured Capital Corp., New York, NY
Visteon Caribbean, Inc., Rio Grande, PR
The Riverside Company, Rockefeller Center, NY
Simpson Housing Solutions, LLC, Long Beach, California
MMA Financial, LLC, Boston, MA
Gibraltar Construction, Clearwater, FL
Chevron-Texaco Industries Limited, San Ramon, CA
Dorado Beach Hotel Corporation, Chicago, IL
Department of the Treasury (IRS), Laguna Miguel, CA
Forest City, LLC, New York, NY
Federal Aviation Administration (FAA), Atlanta, GA

Government

Government Development Bank for Puerto Rico
United States Department of Agriculture
Department of Family, Commonwealth of PR
Puerto Rico Industrial Development Company
Department of Housing, Commonwealth of PR
Puerto Rico Tourism Company
Puerto Rico Housing Finance Authority
Puerto Rico Economic Development Bank
University of Puerto Rico

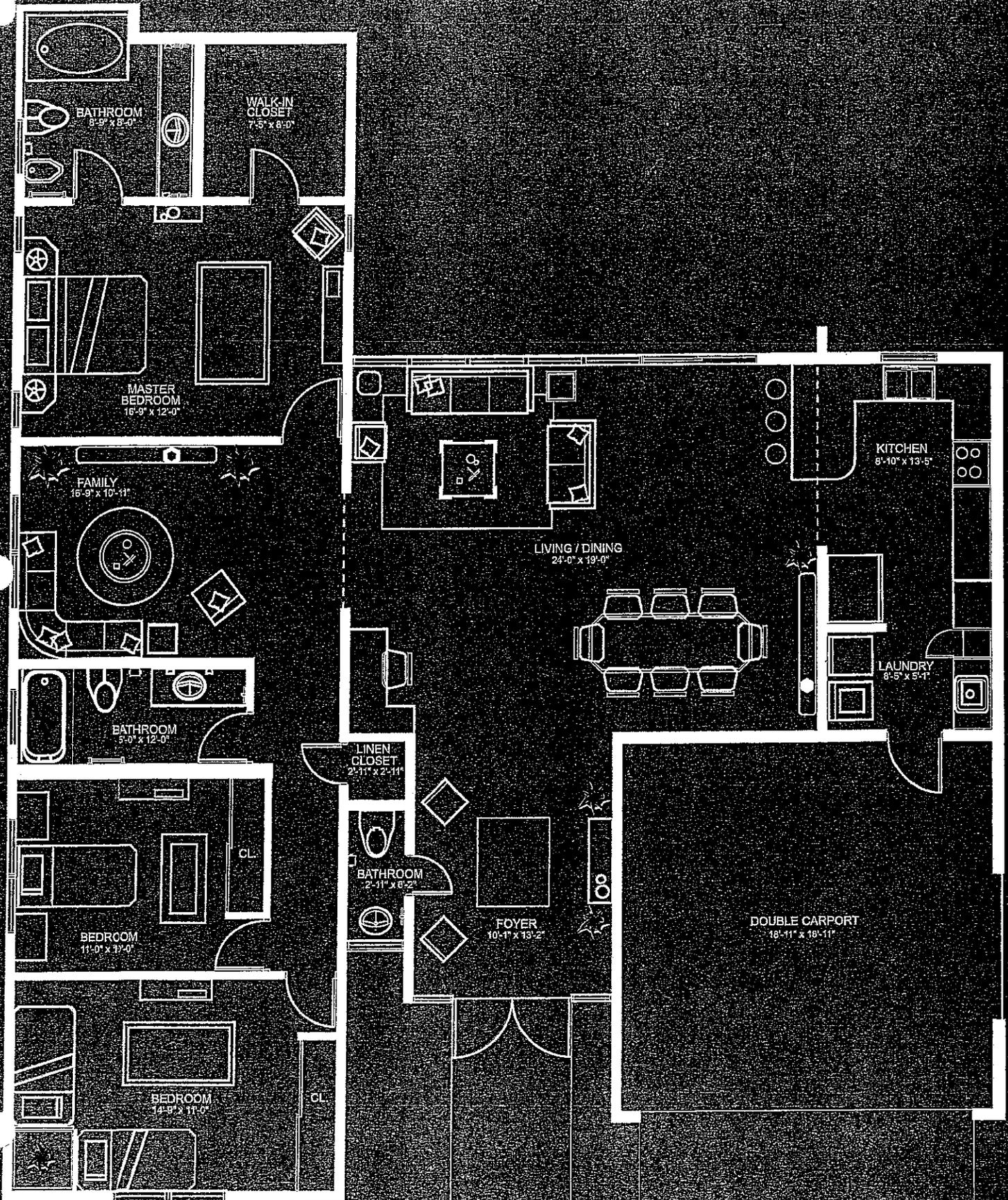


OASIS

en Veredas

Modelo Oasis

- 3 Habitaciones
- 2 1/2 Baños
- "Family Room"
- Marquesina doble
- 2,300 p.c de construcción aprox.



Casona Oasis

- 4 Habitaciones
- 2 1/2 Baños
- "Family Area"
- Cocina con isla
- "Workshop Area" en marquesina doble
- 2,500 p.c de construcción aprox.

