APPENDIX

C

CAPACITY ANALYSIS WORKSHEETS - EXISTING TRAFFIC SITUATION

Board of Zoning Adjustment
District of Columbia
CASE NO. 17013
EXHIBIT NO. 31A2

SHORT REPORT

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning Rd. & G St., SE*
Agency or Co.	*ORGA*	Area Type	*All other areas*
Date Performed	*3/20/03*	Jurisdiction	*Washington, DC*
Time Period	*AM Peak (7:30-8:30)*	Analysis Year	*2003*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*2*	*0*	*0*	*1*	*1*
Lane group		*LTR*			*LTR*			*LTR*			*LT*	*R*
Volume (vph)	*24*	*27*	*6*	*20*	*50*	*80*	*5*	*810*	*12*	*16*	*235*	*23*
% Heavy veh	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
PHF	*0.79*	*0.79*	*0.79*	*0.83*	*0.83*	*0.83*	*0.95*	*0.95*	*0.95*	*0.88*	*0.88*	*0.88*
Actuated (P/A)	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*	*P*
Startup lost time		*2.0*			*2.0*			*2.0*			*2.0*	*2.0*
Ext. eff. 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*	*0*		*0*	*0*		*0*	*0*		*0*
Lane Width		*12.0*			*12.0*			*12.0*			*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/hr												
Bus stops/hr		*0*			*0*			*0*			*0*	*0*
Unit Extension		*3.0*			*3.0*			*3.0*			*3.0*	*3.0*

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = *20.0*	G =	G =	G =	G = *30.0*	G =	G =	G =
	Y = *5*	Y =	Y =	Y =	Y = *5*	Y =	Y =	Y =

Duration of Analysis (hrs) = *1.00* Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adj. flow rate		*72*			*180*			*871*			*285*	*26*
Lane group cap.		*532*			*565*			*1717*			*890*	*808*
v/c ratio		*0.14*			*0.32*			*0.51*			*0.32*	*0.03*
Green ratio		*0.33*			*0.33*			*0.50*			*0.50*	*0.50*
Unif. delay d1		*14.0*			*14.9*			*10.0*			*8.9*	*7.6*
Delay factor k		*0.50*			*0.50*			*0.50*			*0.50*	*0.50*
Increm. delay d2		*0.5*			*1.5*			*1.1*			*1.0*	*0.1*
PF factor		*1.000*			*1.000*			*1.000*			*1.000*	*1.000*
Control delay		*14.5*			*16.4*			*11.1*			*9.9*	*7.7*
Lane group LOS		*B*			*B*			*B*			*A*	*A*
Apprch. delay	*14.5*			*16.4*			*11.1*			*9.7*		
Approach LOS	*B*			*B*			*B*			*A*		
Intersec. delay	*11.6*			Intersection LOS			*B*					

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & G St., SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	PM Peak (5:15-6:15)	Analysis Year	2003

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	1	0	0	1	1	0	2	0
Lane group		LTR			LTR			LT	R		LTR	
Volume (vph)	33	49	11	41	38	32	13	422	29	64	753	32
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.89	0.89	0.89	0.71	0.71	0.71	0.88	0.88	0.88	0.94	0.94	0.94
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time		2.0			2.0			2.0	2.0		2.0	
Ext. eff. 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	0		0	0		0	0		0
Lane Width		12.0			12.0			12.0	12.0		12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0			0			0	0		0	
Unit Extension		3.0			3.0			3.0	3.0		3.0	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 25.0	G =	G =	G =	G = 45.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 1.00					Cycle Length C = 80.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate		104			157			495	33		903	
Lane group cap.		507			492			1035	908		1772	
v/c ratio		0.21			0.32			0.48	0.04		0.51	
Green ratio		0.31			0.31			0.56	0.56		0.56	
Unif. delay d1		20.2			21.0			10.5	7.8		10.7	
Delay factor k		0.50			0.50			0.50	0.50		0.50	
Increm. delay d2		0.9			1.7			1.6	0.1		1.1	
PF factor		1.000			1.000			1.000	1.000		1.000	
Control delay		21.1			22.7			12.1	7.9		11.8	
Lane group LOS		C			C			B	A		B	
Apprch. delay	21.1			22.7			11.8			11.8		
Approach LOS	C			C			B			B		
Intersec. delay	13.4			Intersection LOS						B		

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

C-2

SHORT REPORT

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning Rd. & H St., SE*
Agency or Co.	*ORGA*	Area Type	*All other areas*
Date Performed	*3/20/03*	Jurisdiction	*Washington, DC*
Time Period	*AM Peak (7:45-8:45)*	Analysis Year	*2003*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	0	0	0	2	0	0	1	1
Lane group		LTR						LTR			LT	R
Volume (vph)	21	19	15				21	840	17	5	256	11
% Heavy veh	0	0	0				0	0	0	0	0	0
PHF	0.69	0.69	0.69				0.94	0.94	0.94	0.93	0.93	0.93
Actuated (P/A)	P	P	P				P	P	P	P	P	P
Startup lost time		2.0						2.0			2.0	2.0
Ext. eff. green		2.0						2.0			2.0	2.0
Arrival type		3						3			3	3
Unit Extension		3.0						3.0			3.0	3.0
Ped/Bike/RTOR Volume	0		0	0			0		0	0		0
Lane Width		12.0						12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N		N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0						0			0	0
Unit Extension		3.0						3.0			3.0	3.0

Phasing	EB Only	02	03	04	NS Perm	06	07	08
Timing	G = 20.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = *1.00*

Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate		81						934			280	12
Lane group cap.		599						1700			937	808
v/c ratio		0.14						0.55			0.30	0.01
Green ratio		0.33						0.50			0.50	0.50
Unif. delay d1		14.0						10.3			8.8	7.6
Delay factor k		0.50						0.50			0.50	0.50
Increm. delay d2		0.5						1.3			0.8	0.0
PF factor		1.000						1.000			1.000	1.000
Control delay		14.4						11.6			9.6	7.6
Lane group LOS		B						B			A	A
Apprch. delay	14.4						11.6			9.6		
Approach LOS	B						B			A		
Intersec. delay	11.3			Intersection LOS			B					

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

C-3

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & H St., SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	PM Peak (4:45-5:45)	Analysis Year	2003

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	0	0	0	1	1	0	2	0
Lane group		LTR						LT	R		LTR	
Volume (vph)	37	21	27				27	416	19	22	691	23
% Heavy veh	0	0	0				0	0	0	0	0	0
PHF	0.82	0.82	0.82				0.92	0.92	0.92	0.89	0.89	0.89
Actuated (P/A)	P	P	P				P	P	P	P	P	P
Startup lost time		2.0						2.0	2.0		2.0	
Ext. eff. green		2.0						2.0	2.0		2.0	
Arrival type		3						3	3		3	
Unit Extension		3.0						3.0	3.0		3.0	
Ped/Bike/RTOR Volume	0		0	0			0		0	0		0
Lane Width		12.0						12.0	12.0		12.0	
Parking/Grade/Parking	N	0	N	N		N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0						0	0		0	
Unit Extension		3.0						3.0	3.0		3.0	

Phasing	EB Only	02	03	04	NS Perm	06	07	08
Timing	G = 20.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 | Cycle Length C = 60.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate		104						481	21		827	
Lane group cap.		593						884	808		1677	
v/c ratio		0.18						0.54	0.03		0.49	
Green ratio		0.33						0.50	0.50		0.50	
Unif. delay d1		14.2						10.3	7.6		10.0	
Delay factor k		0.50						0.50	0.50		0.50	
Increm. delay d2		0.6						2.4	0.1		1.0	
PF factor		1.000						1.000	1.000		1.000	
Control delay		14.8						12.7	7.7		11.0	
Lane group LOS		B						B	A		B	
Apprch. delay	14.8						12.5			11.0		
Approach LOS	B						B			B		
Intersec. delay	11.8			Intersection LOS						B		

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & Southern Ave, SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	AM Peak (7:30-8:30)	Analysis Year	2003

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	1	1	0	0	2	0	0	1	0	0	2	2
Lane group	L	TR			LTR			LTR			LT	R
Volume (vph)	228	378	3	38	472	56	6	487	42	12	125	134
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.93	0.93	0.93	0.96	0.96	0.96	0.95	0.95	0.95	0.90	0.90	0.90
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time	2.0	2.0			2.0			2.0			2.0	2.0
Ext. eff. green	2.0	2.0			2.0			2.0			2.0	2.0
Arrival type	3	3			3			3			3	3
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0
Ped/Bike/RTOR Volume	0		0	0		0	0		0	0		0
Lane Width	12.0	12.0			12.0			12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr	0	0			0			0			0	0
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0

Phasing	EB Only	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 10.0	G = 40.0	G =	G =	G = 35.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 Cycle Length C = 100.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	245	409			590			563			152	149
Lane group cap.	456	1044			1279			656			1175	995
v/c ratio	0.54	0.39			0.46			0.86			0.13	0.15
Green ratio	0.55	0.55			0.40			0.35			0.35	0.35
Unif. delay d1	12.8	12.9			22.1			30.2			22.1	22.3
Delay factor k	0.50	0.50			0.50			0.50			0.50	0.50
Increm. delay d2	4.5	1.1			1.2			13.7			0.2	0.3
PF factor	1.000	1.000			1.000			1.000			1.000	1.000
Control delay	17.3	14.0			23.3			43.9			22.4	22.6
Lane group LOS	B	B			C			D			C	C
Apprch. delay	15.3			23.3			43.9			22.5		
Approach LOS	B			C			D			C		
Intersec. delay	26.2			Intersection LOS						C		

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & Southern Ave, SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	PM Peak (5:30-6:30)	Analysis Year	2003

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	1	1	0	0	2	0	0	1	0	0	2	2
Lane group	L	TR			LTR			LTR			LT	R
Volume (vph)	191	463	10	91	443	57	8	272	68	27	451	272
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.92	0.92	0.92	0.95	0.95	0.95
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time	2.0	2.0			2.0			2.0			2.0	2.0
Ext. eff. green	2.0	2.0			2.0			2.0			2.0	2.0
Arrival type	3	3			3			3			3	3
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0
Ped/Bike/RTOR Volume	0		0	0		0	0		0	0		0
Lane Width	12.0	12.0			12.0			12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr	0	0			0			0			0	0
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0

Phasing	EB Only	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 15.0	G = 40.0	G =	G =	G = 35.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 Cycle Length C = 105.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adj. flow rate	225	557		664			379			503	286
Lane group cap.	480	1082		1036			608			1128	947
v/c ratio	0.47	0.51		0.64			0.62			0.45	0.30
Green ratio	0.57	0.57		0.38			0.33			0.33	0.33
Unif. delay d1	12.7	13.7		26.6			29.5			27.4	25.9
Delay factor k	0.50	0.50		0.50			0.50			0.50	0.50
Increm. delay d2	3.3	1.8		3.0			4.8			1.3	0.8
PF factor	1.000	1.000		1.000			1.000			1.000	1.000
Control delay	15.9	15.4		29.7			34.2			28.7	26.8
Lane group LOS	B	B		C			C			C	C
Apprch. delay	15.6			29.7			34.2			28.0	
Approach LOS	B			C			C			C	
Intersec. delay	25.6			Intersection LOS						C	

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning @ Hanna (East)*
Agency/Co.	*ORGA*	Jurisdiction	*Washington, D.C.*
Date Performed	*4/11/03*	Analysis Year	*2003*
Analysis Time Period	*AM Peak (7:30-8:30)*		
Project Description			
East/West Street: *Hanna Place (East Leg)*		North/South Street: *Benning Road*	
Intersection Orientation: *North-South*		Study Period (hrs): *1.00*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*852*	*1*	*8*	*251*	*0*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.90*	*0.90*	*0.89*	*0.89*
Hourly Flow Rate, HFR	*0*	*896*	*1*	*8*	*282*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*1*	*0*
Configuration		*T*	*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*5*	*0*	*16*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*5*	*0*	*17*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*8*		*22*				
C (m) (vph)		*765*		*380*				
v/c		*0.01*		*0.06*				
95% queue length		*0.03*		*0.18*				
Control Delay		*9.8*		*15.1*				
LOS		*A*		*C*				
Approach Delay	--	--	*15.1*					
Approach LOS	--	--	*C*					

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning @ Hanna (East)*
Agency/Co.	*ORGA*	Jurisdiction	*Washington, D.C.*
Date Performed	*4/11/03*	Analysis Year	*2003*
Analysis Time Period	*PM Peak (4:30-5:30)*		
Project Description			
East/West Street:	*Hanna Place (East Leg)*	North/South Street:	*Benning Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*445*	*10*	*21*	*765*	*0*
Peak-Hour Factor, PHF	*0.88*	*0.88*	*0.90*	*0.90*	*0.94*	*0.94*
Hourly Flow Rate, HFR	*0*	*505*	*11*	*23*	*813*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*0*	*2*	*1*
Configuration		*T*	*R*	*LT*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*9*	*0*	*25*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*10*	*0*	*27*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*23*		*37*				
C (m) (vph)		*1060*		*404*				
v/c		*0.02*		*0.09*				
95% queue length		*0.07*		*0.30*				
Control Delay		*8.5*		*14.8*				
LOS		*A*		*B*				
Approach Delay	--	--	*14.8*					
Approach LOS	--	--	*B*					

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning @ Hanna (West)*
Agency/Co.	*ORGA*	Jurisdiction	*Washington, D.C.*
Date Performed	*4/11/03*	Analysis Year	*2003*
Analysis Time Period	*AM Peak (7:30-8:30)*		
Project Description			
East/West Street:	*Hanna Place (West Leg)*	North/South Street:	*Benning Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*12*	*856*	*0*	*0*	*259*	*19*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.90*	*0.90*	*0.89*	*0.89*
Hourly Flow Rate, HFR	*12*	*901*	*0*	*0*	*291*	*21*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*1*	*1*
Configuration	*LT*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*							
v (vph)	*12*							
C (m) (vph)	*1260*							
v/c	*0.01*							
95% queue length	*0.03*							
Control Delay	*7.9*							
LOS	*A*							
Approach Delay	--	--						
Approach LOS	--	--						

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning @ Hanna (West)*
Agency/Co.	*ORGA*	Jurisdiction	*Washington, D.C.*
Date Performed	*4/11/03*	Analysis Year	*2003*
Analysis Time Period	*PM Peak (4:30-5:30)*		
Project Description			
East/West Street:	*Hanna Place (West Leg)*	North/South Street:	*Benning Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*8*	*462*	*0*	*0*	*786*	*18*
Peak-Hour Factor, PHF	*0.88*	*0.88*	*0.90*	*0.90*	*0.94*	*0.94*
Hourly Flow Rate, HFR	*9*	*525*	*0*	*0*	*836*	*19*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*2*	*0*
Configuration	*LT*				*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*							
v (vph)	*9*							
C (m) (vph)	*793*							
v/c	*0.01*							
95% queue length	*0.03*							
Control Delay	*9.6*							
LOS	*A*							
Approach Delay	--	--						
Approach LOS	--	--						

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

APPENDIX

D

STUDY AREA INTERSECTIONS –
ACCIDENT RECORD SUMMARY
(1999 – 2001)

DCDPW: Accident Summary Report (R-4)

Date: 2/24/2003
Prepared By: Kenney

Location: Quadrant:

BENNING RD And **SOUTHERN AVE** **SE**

Summary for the time period of: **1/1/1999** To: **12/31/2001**

Total Number of Accident **2**
Total Number of Injuries **3**

Contributing Factors:

Driver:		Vehicle:		Roadway:		Unknown:	
1	50.00%	0	0.00%	0	0.00%	1	50.00%

Collision Types:

Right Angle	Left Turn:	Right Turn:	Rear End:	Side Swiped:	Head On:	Parked
0	1	0	0	0	1	0

Fixed Object	Ran Off Road:	Pedestrian:	Backing	Non Collision:	Other:
0	0	0	0	0	0

Accident Times:

Time	Number	Percent
07:30-09:30	0	0.00%
09:30-11:30	0	0.00%
11:30-13:30	0	0.00%
13:30-16:00	0	0.00%
16:00-18:30	1	50.00%
18:30-07:30	1	50.00%
Weekday:	1	50.00%
Weekend:	1	50.00%

DCDPW: Accident Summary Report (R-4)

Date: 2/24/2003
Prepared By: Kenney

Location: Quadrant:

BENNING RD And **HANNA PL** **SE**

Summary for the time period of: **1/1/1999** To: **12/31/2001**

Total Number of Accident **6**

Total Number of Injuries **2**

Contributing Factors:

Driver:		Vehicle:		Roadway:		Unknown:	
2	33.33%	0	0.00%	0	0.00%	4	66.67%

Collision Types:

Right Angle	Left Turn:	Right Turn:	Rear End:	Side Swiped:	Head On:	Parked
0	0	0	2	3	0	1

Fixed Object	Ran Off Road:	Pedestrian:	Backing	Non Collision:	Other:
0	0	0	0	0	0

Accident Times:

Time	Number	Percent
07:30-09:30	0	0.00%
09:30-11:30	0	0.00%
11:30-13:30	0	0.00%
13:30-16:00	2	33.33%
16:00-18:30	0	0.00%
18:30-07:30	4	66.67%
Weekday:	4	66.67%
Weekend:	2	33.33%

DCDPW: Accident Summary Report (R-4)

Date: 2/24/2003
Prepared By: Kenney

Location: Quadrant:

46TH ST And **H ST** **SE**

Summary for the time period of: **1/1/1999** To: **12/31/2001**

Total Number of Accident **1**

Total Number of Injuries **0**

Contributing Factors:

Driver:		Vehicle:		Roadway:		Unknown:	
0	0.00%	0	0.00%	0	0.00%	1	100.00%

Collision Types:

Right Angle	Left Turn:	Right Turn:	Rear End:	Side Swiped:	Head On:	Parked
0	0	0	0	1	0	0

Fixed Object	Ran Off Road:	Pedestrian:	Backing	Non Collision:	Other:
0	0	0	0	0	0

Accident Times:

Time	Number	Percent
07:30-09:30	0	0.00%
09:30-11:30	0	0.00%
11:30-13:30	1	100.00%
13:30-16:00	0	0.00%
16:00-18:30	0	0.00%
18:30-07:30	0	0.00%
Weekday:	0	0.00%
Weekend:	1	100.00%

DCDPW: Accident Summary Report (R-4)

Date: 2/24/2003
Prepared By: Kenney

Location: Quadrant:

ALABAMA AVE And **H ST** **SE**

Summary for the time period of: **1/1/1999** To: **12/31/2001**

Total Number of Accident **3**

Total Number of Injuries **3**

Contributing Factors:

Driver:		Vehicle:		Roadway:		Unknown:	
1	33.33%	0	0.00%	1	33.33%	1	33.33%

Collision Types:

Right Angle	Left Turn:	Right Turn:	Rear End:	Side Swiped:	Head On:	Parked
0	0	0	0	0	0	1

Fixed Object	Ran Off Road:	Pedestrian:	Backing	Non Collision:	Other:
1	0	1	0	0	0

Accident Times:

Time	Number	Percent
07:30-09:30	0	0.00%
09:30-11:30	0	0.00%
11:30-13:30	0	0.00%
13:30-16:00	2	66.67%
16:00-18:30	0	0.00%
18:30-07:30	1	33.33%
Weekday:	2	66.67%
Weekend:	1	33.33%

APPENDIX

E

EXTRACTS FROM ITE TRIP
TRIP GENERATION MANUAL

Land Use: 253
Elderly Housing — Attached

Description

Elderly housing (attached) — restricted to senior citizens — contains residential units similar to apartments and condominiums, and it is sometimes a self-contained village. They may also contain special services such as medical facilities; dining facilities; and some limited, supporting retail facilities.

Additional Data

The sites were surveyed in the 1980s and the 1990s.

Source Numbers

237, 272, 412

Land Use: 253
Elderly Housing — Attached
Independent Variables with One Observation

The following trip generation data are for independent variables with only one observation. This information is shown in this table only; there are no related plots for these data.

Users are cautioned to use these data with care because of the small sample size.

Day/Time Period	Trip Generation Rate	Size of Independent Variable	Number of Studies	Directional Distribution
Occupied Dwelling Units				
Weekday	3.48	67	1	50% entering, 50% exiting
Saturday	2.51	67	1	50% entering, 50% exiting
Saturday Peak Hour of Generator	0.30	67	1	Not Available
Sunday	2.70	67	1	50% entering, 50% exiting
Sunday Peak Hour of Generator	0.55	67	1	Not Available

Elderly Housing - Attached
(253)

Average Vehicle Trip Ends vs: **Occupied Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

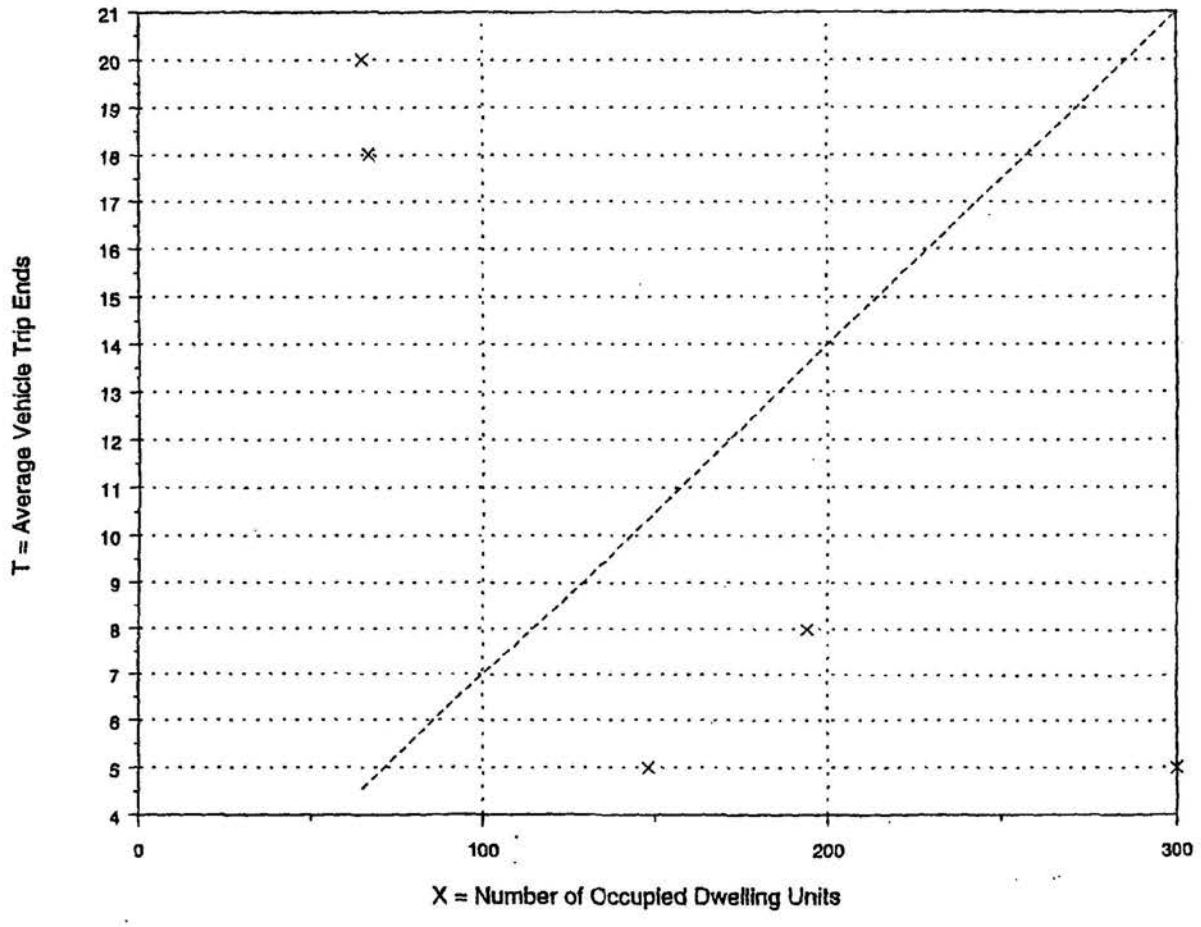
Number of Studies: 5
Avg. Num. of Occupied Dwelling Units: 155
Directional Distribution: 63% entering, 37% exiting

Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.07	0.02 - 0.31	0.29

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Fitted Curve Equation: Not given

R^2 = ****

Elderly Housing - Attached
(253)

Average Vehicle Trip Ends vs: **Occupied Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

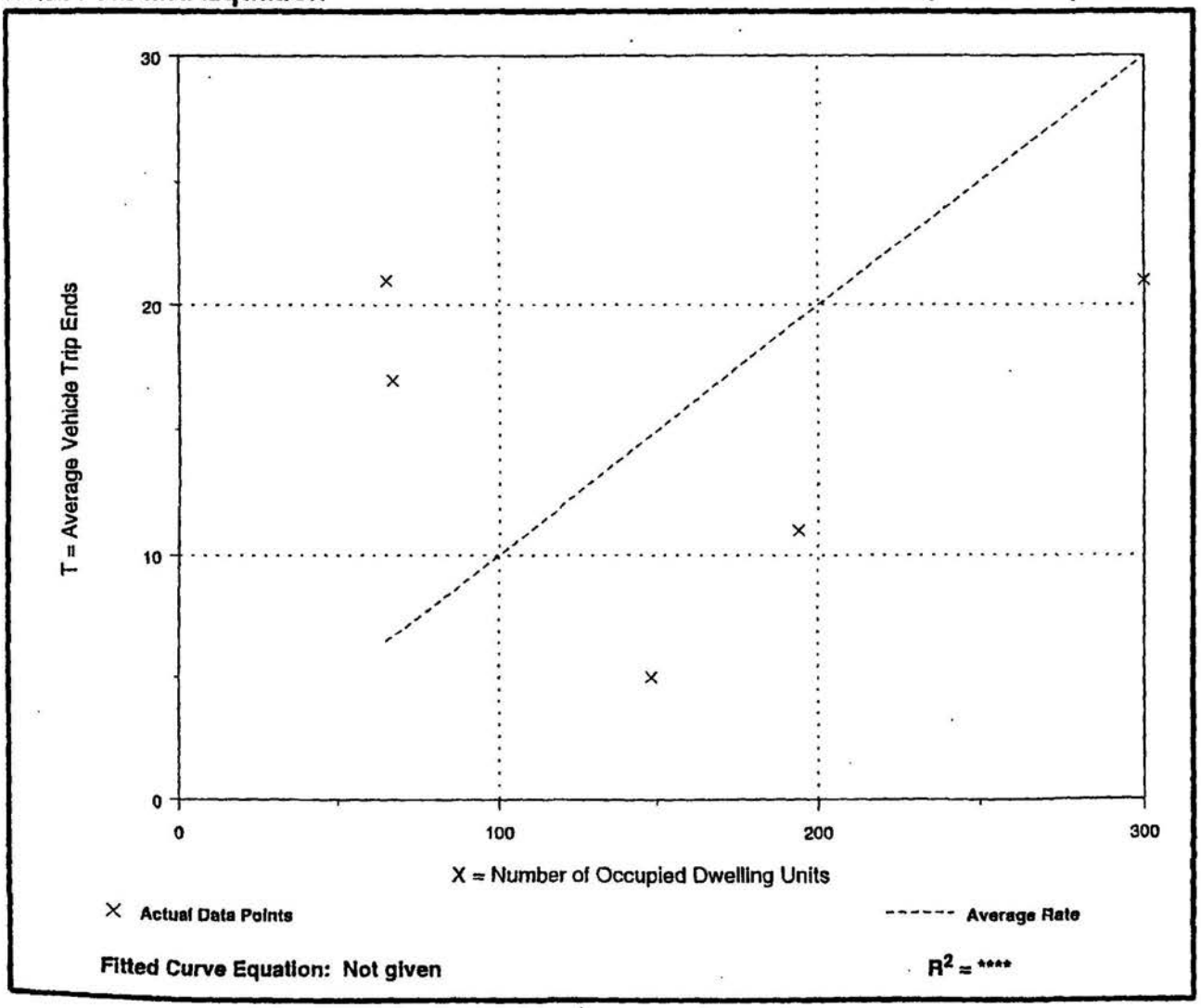
Number of Studies: 5
Avg. Num. of Occupied Dwelling Units: 155
Directional Distribution: 59% entering, 41% exiting

Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.10	0.03 - 0.32	0.32

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Fitted Curve Equation: Not given

R^2 = ****

Land Use: 565
Day Care Center

Description

A day care center is a facility where care for pre-school age children is provided, normally during the daytime hours. Day care facilities generally include classrooms, offices, eating areas, and playgrounds. Some centers also provide after-school care for children.

Additional Data

Peak hours of the generator —

> The weekday A.M. and P.M. peak hours of the generator typically coincide with the peak hour of the adjacent street traffic.

The sites were surveyed from the mid-1980s to the 1990s throughout the United States.

Source Numbers

169, 208, 216, 253, 335, 336, 337, 355, 418, 423

Day Care Center
(565)

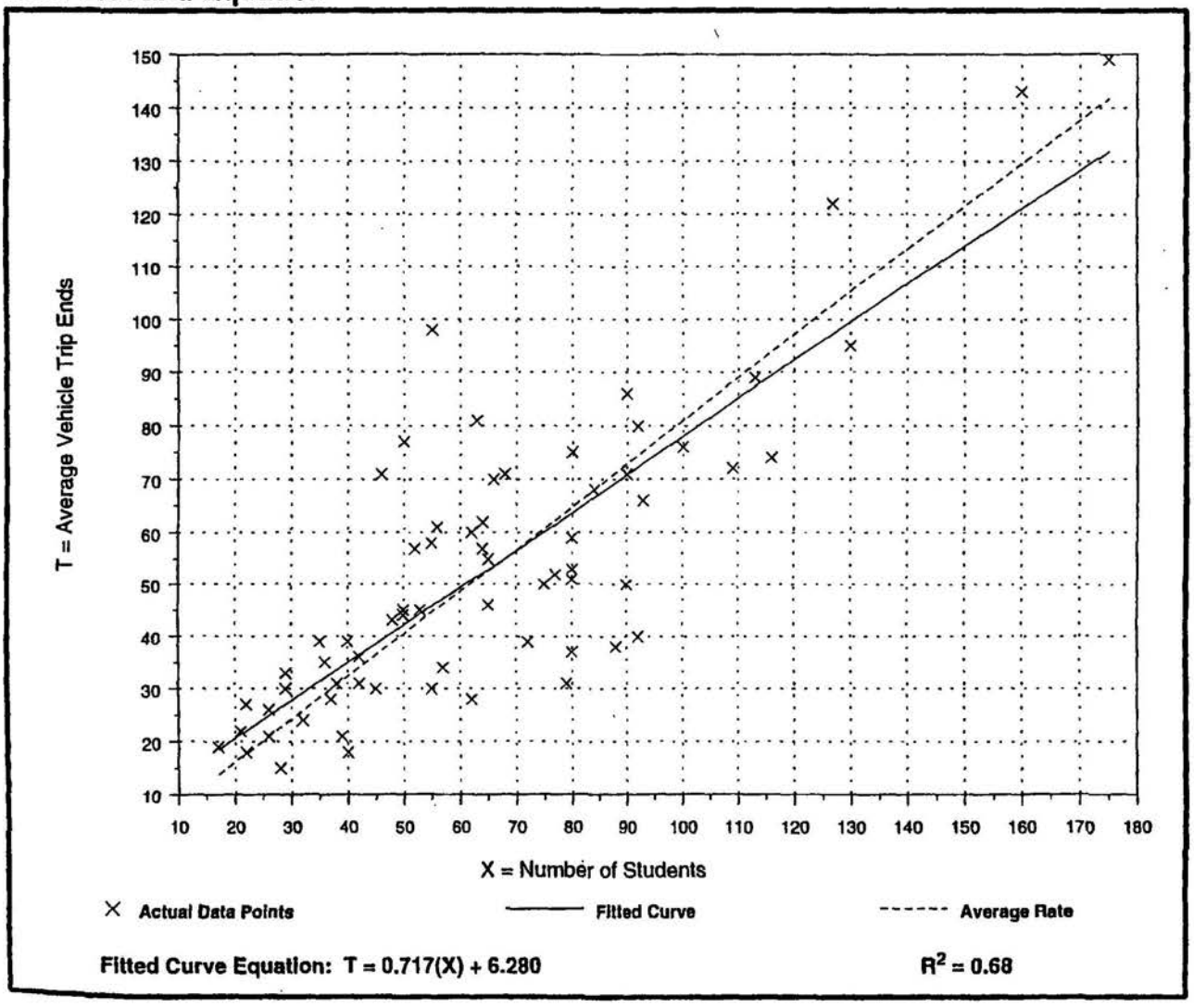
Average Vehicle Trip Ends vs: **Students**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 66
Average Number of Students: 65
Directional Distribution: 53% entering, 47% exiting

Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.81	0.39 - 1.78	0.93

Data Plot and Equation



Fitted Curve Equation: T = 0.717(X) + 6.280

R^2 = 0.68

Day Care Center
(565)

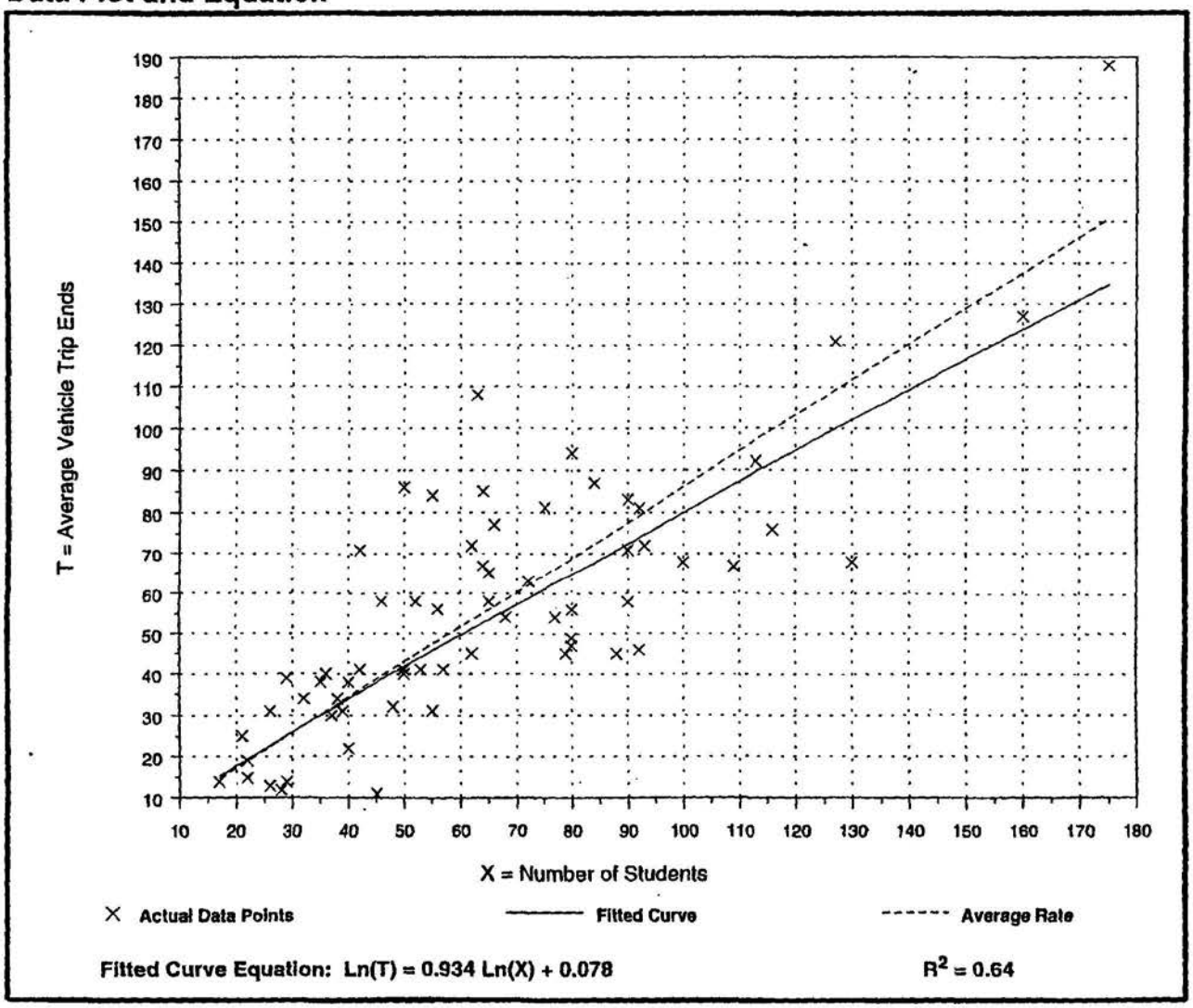
Average Vehicle Trip Ends vs: **Students**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 66
Average Number of Students: 65
Directional Distribution: 47% entering, 53% exiting

Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.86	0.24 - 1.72	0.96

Data Plot and Equation



APPENDIX

F

CAPACITY ANALYSIS WORKSHEETS -
YEAR 2004 BACKGROUND TRAFFIC SITUATION

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & G St., SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	AM Peak (7:30-8:30)	Analysis Year	2004 Projected Traffic

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	1	0	0	2	0	0	1	1
Lane group		LTR			LTR			LTR			LT	R
Volume (vph)	24	28	6	20	52	80	5	834	12	16	242	23
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.79	0.79	0.79	0.83	0.83	0.83	0.95	0.95	0.95	0.88	0.88	0.88
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time		2.0			2.0			2.0			2.0	2.0
Ext. eff. 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	0		0	0		0	0		0
Lane Width		12.0			12.0			12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0			0			0			0	0
Unit Extension		3.0			3.0			3.0			3.0	3.0

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 20.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 60.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate		73			183			896			293	26
Lane group cap.		533			566			1717			889	808
v/c ratio		0.14			0.32			0.52			0.33	0.03
Green ratio		0.33			0.33			0.50			0.50	0.50
Unif. delay d1		14.0			14.9			10.1			9.0	7.6
Delay factor k		0.50			0.50			0.50			0.50	0.50
Increm. delay d2		0.5			1.5			1.1			1.0	0.1
PF factor		1.000			1.000			1.000			1.000	1.000
Control delay		14.5			16.5			11.3			10.0-	7.7
Lane group LOS		B			B			B			A	A
Apprch. delay	14.5			16.5			11.3			9.8		
Approach LOS	B			B			B			A		
Intersec. delay	11.8			Intersection LOS			B					

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

F-1

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & G St., SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	PM Peak (5:15-6:15)	Analysis Year	2004 Projected Traffic

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	1	0	0	1	1	0	2	0
Lane group		LTR			LTR			LT	R		LTR	
Volume (vph)	33	50	11	41	39	32	13	435	29	64	776	32
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.89	0.89	0.89	0.71	0.71	0.71	0.88	0.88	0.88	0.94	0.94	0.94
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time		2.0			2.0			2.0	2.0		2.0	
Ext. eff. 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	0		0	0		0	0		0
Lane Width		12.0			12.0			12.0	12.0		12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0			0			0	0		0	
Unit Extension		3.0			3.0			3.0	3.0		3.0	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 25.0	G =	G =	G =	G = 45.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 | Cycle Length C = 80.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB	NB		SB
Adj. flow rate	105	158	509	33	928
Lane group cap.	507	492	1034	908	1772
v/c ratio	0.21	0.32	0.49	0.04	0.52
Green ratio	0.31	0.31	0.56	0.56	0.56
Unif. delay d1	20.2	21.0	10.6	7.8	10.9
Delay factor k	0.50	0.50	0.50	0.50	0.50
Increm. delay d2	0.9	1.7	1.7	0.1	1.1
PF factor	1.000	1.000	1.000	1.000	1.000
Control delay	21.1	22.7	12.3	7.9	12.0
Lane group LOS	C	C	B	A	B
Apprch. delay	21.1	22.7	12.0		12.0
Approach LOS	C	C	B		B
Intersec. delay	13.5	Intersection LOS			B

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

F-2

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & H St., SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	AM Peak (7:45-8:45)	Analysis Year	2004 Projected Traffic

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	0	0	0	2	0	0	1	1
Lane group		LTR						LTR			LT	R
Volume (vph)	21	20	15				21	864	17	5	264	11
% Heavy veh	0	0	0				0	0	0	0	0	0
PHF	0.69	0.69	0.69				0.94	0.94	0.94	0.93	0.93	0.93
Actuated (P/A)	P	P	P				P	P	P	P	P	P
Startup lost time		2.0						2.0			2.0	2.0
Ext. eff. green		2.0						2.0			2.0	2.0
Arrival type		3						3			3	3
Unit Extension		3.0						3.0			3.0	3.0
Ped/Bike/RTOR Volume	0		0	0			0		0	0		0
Lane Width		12.0						12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N		N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0						0			0	0
Unit Extension		3.0						3.0			3.0	3.0

Phasing	EB Only	02	03	04	NS Perm	06	07	08
Timing	G = 20.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 60.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate		82						959			289	12
Lane group cap.		599						1700			937	808
v/c ratio		0.14						0.56			0.31	0.01
Green ratio		0.33						0.50			0.50	0.50
Unif. delay d1		14.0						10.4			8.9	7.6
Delay factor k		0.50						0.50			0.50	0.50
Increm. delay d2		0.5						1.4			0.9	0.0
PF factor		1.000						1.000			1.000	1.000
Control delay		14.4						11.8			9.7	7.6
Lane group LOS		B						B			A	A
Apprch. delay	14.4						11.8			9.6		
Approach LOS	B						B			A		
Intersec. delay	11.5			Intersection LOS			B					

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

F-3

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & H St., SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	PM Peak (4:45-5:45)	Analysis Year	2004 Projected Traffic

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	0	0	0	1	1	0	2	0
Lane group		LTR						LT	R		LTR	
Volume (vph)	37	22	27				27	428	19	22	751	23
% Heavy veh	0	0	0				0	0	0	0	0	0
PHF	0.82	0.82	0.82				0.92	0.92	0.92	0.89	0.89	0.89
Actuated (P/A)	P	P	P				P	P	P	P	P	P
Startup lost time		2.0						2.0	2.0		2.0	
Ext. eff. green		2.0						2.0	2.0		2.0	
Arrival type		3						3	3		3	
Unit Extension		3.0						3.0	3.0		3.0	
Ped/Bike/RTOR Volume	0		0	0			0		0	0		0
Lane Width		12.0						12.0	12.0		12.0	
Parking/Grade/Parking	N	0	N	N		N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0						0	0		0	
Unit Extension		3.0						3.0	3.0		3.0	

Phasing	EB Only	02	03	04	NS Perm	06	07	08
Timing	G = 20.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 — Cycle Length C = 60.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB	NB	SB
Adj. flow rate	105		494 21	895
Lane group cap.	594		880 808	1680
v/c ratio	0.18		0.56 0.03	0.53
Green ratio	0.33		0.50 0.50	0.50
Unif. delay d1	14.2		10.4 7.6	10.2
Delay factor k	0.50		0.50 0.50	0.50
Increm. delay d2	0.7		2.6 0.1	1.2
PF factor	1.000		1.000 1.000	1.000
Control delay	14.8		13.0 7.7	11.4
Lane group LOS	B		B A	B
Apprch. delay	14.8		12.8	11.4
Approach LOS	B		B	B
Intersec. delay	12.1	Intersection LOS		B

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

F-4

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & Southern Ave, SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	AM Peak (7:30-8:30)	Analysis Year	2004 Projected Traffic

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	1	1	0	0	2	0	0	1	0	0	2	2
Lane group	L	TR			LTR			LTR			LT	R
Volume (vph)	228	389	3	38	486	56	6	502	42	12	129	134
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.93	0.93	0.93	0.96	0.96	0.96	0.95	0.95	0.95	0.90	0.90	0.90
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time	2.0	2.0			2.0			2.0			2.0	2.0
Ext. eff. green	2.0	2.0			2.0			2.0			2.0	2.0
Arrival type	3	3			3			3			3	3
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0
Ped/Bike/RTOR Volume	0		0	0		0	0		0	0		0
Lane Width	12.0	12.0			12.0			12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr	0	0			0			0			0	0
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0

Phasing	EB Only	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 10.0	G = 40.0	G =	G =	G = 35.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 Cycle Length C = 100.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	245	421			604			578			156	149
Lane group cap.	449	1044			1280			657			1174	995
v/c ratio	0.55	0.40			0.47			0.88			0.13	0.15
Green ratio	0.55	0.55			0.40			0.35			0.35	0.35
Unif. delay d1	12.9	13.0			22.2			30.5			22.2	22.3
Delay factor k	0.50	0.50			0.50			0.50			0.50	0.50
Increm. delay d2	4.7	1.2			1.2			15.6			0.2	0.3
PF factor	1.000	1.000			1.000			1.000			1.000	1.000
Control delay	17.6	14.2			23.4			46.1			22.4	22.6
Lane group LOS	B	B			C			D			C	C
Apprch. delay	15.4			23.4			46.1			22.5		
Approach LOS	B			C			D			C		
Intersec. delay	26.9			Intersection LOS			C					

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

F-5

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & Southern Ave, SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	PM Peak (5:30-6:30)	Analysis Year	2004 Projected Traffic

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	1	1	0	0	2	0	0	1	0	0	2	2
Lane group	L	TR			LTR			LTR			LT	R
Volume (vph)	191	477	10	91	456	57	8	280	68	27	465	272
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.92	0.92	0.92	0.95	0.95	0.95
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time	2.0	2.0			2.0			2.0			2.0	2.0
Ext. eff. green	2.0	2.0			2.0			2.0			2.0	2.0
Arrival type	3	3			3			3			3	3
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0
Ped/Bike/RTOR Volume	0		0	0		0	0		0	0		0
Lane Width	12.0	12.0			12.0			12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr	0	0			0			0			0	0
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0

Phasing	EB Only	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 15.0	G = 40.0	G =	G =	G = 35.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 | Cycle Length C = 105.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	225	573			678			387			517	286
Lane group cap.	474	1082			1035			609			1128	947
v/c ratio	0.47	0.53			0.66			0.64			0.46	0.30
Green ratio	0.57	0.57			0.38			0.33			0.33	0.33
Unif. delay d1	12.8	13.8			26.8			29.6			27.5	25.9
Delay factor k	0.50	0.50			0.50			0.50			0.50	0.50
Increm. delay d2	3.4	1.9			3.2			5.0			1.3	0.8
PF factor	1.000	1.000			1.000			1.000			1.000	1.000
Control delay	16.2	15.7			30.0			34.6			28.9	26.8
Lane group LOS	B	B			C			C			C	C
Apprch. delay	15.8			30.0			34.6			28.1		
Approach LOS	B			C			C			C		
Intersec. delay	25.9			Intersection LOS						C		

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

F-6

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning @ Hanna (East)*
Agency/Co.	*ORGA*	Jurisdiction	*Washington, D.C.*
Date Performed	*4/11/03*	Analysis Year	*2004 Projected Traffic*
Analysis Time Period	*AM Peak (7:30-8:30)*		
Project Description			
East/West Street:	*Hanna Place (East Leg)*	North/South Street:	*Benning Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*878*	*1*	*8*	*259*	*0*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.90*	*0.90*	*0.89*	*0.89*
Hourly Flow Rate, HFR	*0*	*924*	*1*	*8*	*291*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*1*	*0*
Configuration		*T*	*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*5*	*0*	*16*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*5*	*0*	*17*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*8*		*22*				
C (m) (vph)		*747*		*365*				
v/c		*0.01*		*0.06*				
95% queue length		*0.03*		*0.19*				
Control Delay		*9.9*		*15.5*				
LOS		*A*		*C*				
Approach Delay	--	--	*15.5*					
Approach LOS	--	--	*C*					

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

F-7

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning @ Hanna (East)*
Agency/Co.	*ORGA*	Jurisdiction	*Washington, D.C.*
Date Performed	*4/11/03*	Analysis Year	*2004 Projected Traffic*
Analysis Time Period	*PM Peak (4:30-5:30)*		
Project Description			
East/West Street:	*Hanna Place (East Leg)*	North/South Street:	*Benning Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*458*	*10*	*21*	*788*	*0*
Peak-Hour Factor, PHF	*0.88*	*0.88*	*0.90*	*0.90*	*0.94*	*0.94*
Hourly Flow Rate, HFR	*0*	*520*	*11*	*23*	*838*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*0*	*2*	*1*
Configuration		*T*	*R*	*LT*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*9*	*0*	*25*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*10*	*0*	*27*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*23*		*37*				
C (m) (vph)		*1047*		*392*				
v/c		*0.02*		*0.09*				
95% queue length		*0.07*		*0.31*				
Control Delay		*8.5*		*15.1*				
LOS		*A*		*C*				
Approach Delay	--	--	*15.1*					
Approach LOS	--	--	*C*					

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning @ Hanna (West)*
Agency/Co.	*ORGA*	Jurisdiction	*Washington, D.C.*
Date Performed	*4/11/03*	Analysis Year	*2004 Projected Traffic*
Analysis Time Period	*AM Peak (7:30-8:30)*		
Project Description			
East/West Street:	*Hanna Place (West Leg)*	North/South Street:	*Benning Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*12*	*882*	*0*	*0*	*267*	*19*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.90*	*0.90*	*0.89*	*0.89*
Hourly Flow Rate, HFR	*12*	*928*	*0*	*0*	*300*	*21*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*1*	*1*
Configuration	*LT*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	*7*	*8*	*9*	*10*	*11*	*12*
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*							
v (vph)	*12*							
C (m) (vph)	*1250*							
v/c	*0.01*							
95% queue length	*0.03*							
Control Delay	*7.9*							
LOS	*A*							
Approach Delay	--	--						
Approach LOS	--	--						

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

F-9

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning @ Hanna (West)
Agency/Co.	ORGA	Jurisdiction	Washington, D.C.
Date Performed	4/11/03	Analysis Year	2004 Projected Traffic
Analysis Time Period	PM Peak (4:30-5:30)		
Project Description			
East/West Street:	Hanna Place (West Leg)	North/South Street:	Benning Road
Intersection Orientation:	North-South	Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	8	476	0	0	800	18
Peak-Hour Factor, PHF	0.88	0.88	0.90	0.90	0.94	0.94
Hourly Flow Rate, HFR	9	540	0	0	851	19
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	2	0
Configuration	LT				T	TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	0
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT							
v (vph)	9							
C (m) (vph)	783							
v/c	0.01							
95% queue length	0.03							
Control Delay	9.7							
LOS	A							
Approach Delay	--	--						
Approach LOS	--	--						

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

APPENDIX

G

CAPACITY ANALYSIS WORKSHEETS -
2004 TOTAL TRAFFIC SITUATION
(INCLUDING SUBJECT DEVELOPMENT)

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & G St., SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	AM Peak (7:30-8:30)	Analysis Year	2004 Total Traffic Situation

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	1	0	0	2	0	0	1	1
Lane group		LTR			LTR			LTR			LT	R
Volume (vph)	24	28	7	32	44	80	5	839	12	16	243	23
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.79	0.79	0.79	0.83	0.83	0.83	0.95	0.95	0.95	0.88	0.88	0.88
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time		2.0			2.0			2.0			2.0	2.0
Ext. eff. 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	0		0	0		0	0		0
Lane Width		12.0			12.0			12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0			0			0			0	0
Unit Extension		3.0			3.0			3.0			3.0	3.0

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 20.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 | Cycle Length C = 60.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adj. flow rate		74			188			901		294	26
Lane group cap.		532			550			1717		889	808
v/c ratio		0.14			0.34			0.52		0.33	0.03
Green ratio		0.33			0.33			0.50		0.50	0.50
Unif. delay d1		14.0			15.0			10.2		9.0	7.6
Delay factor k		0.50			0.50			0.50		0.50	0.50
Increm. delay d2		0.5			1.7			1.2		1.0	0.1
PF factor		1.000			1.000			1.000		1.000	1.000
Control delay		14.5			16.7			11.3		10.0-	7.7
Lane group LOS		B			B			B		A	A
Apprch. delay	14.5			16.7			11.3			9.8	
Approach LOS	B			B			B			A	
Intersec. delay	11.8			Intersection LOS						B	

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & G St., SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	PM Peak (5:15-6:15)	Analysis Year	2004 Total Traffic Situation

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	1	0	0	1	1	0	2	0
Lane group		LTR			LTR			LT	R		LTR	
Volume (vph)	33	50	13	42	39	32	15	436	29	64	781	32
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.89	0.89	0.89	0.71	0.71	0.71	0.88	0.88	0.88	0.94	0.94	0.94
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time		2.0			2.0			2.0	2.0		2.0	
Ext. eff. 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	0		0	0		0	0		0
Lane Width		12.0			12.0			12.0	12.0		12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0			0			0	0		0	
Unit Extension		3.0			3.0			3.0	3.0		3.0	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 25.0	G =	G =	G =	G = 45.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 80.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB	NB		SB	
Adj. flow rate	108	159	512	33	933	
Lane group cap.	507	491	1028	908	1772	
v/c ratio	0.21	0.32	0.50	0.04	0.53	
Green ratio	0.31	0.31	0.56	0.56	0.56	
Unif. delay d1	20.3	21.0	10.6	7.8	10.9	
Delay factor k	0.50	0.50	0.50	0.50	0.50	
Increm. delay d2	1.0	1.8	1.7	0.1	1.1	
PF factor	1.000	1.000	1.000	1.000	1.000	
Control delay	21.2	22.8	12.4	7.9	12.0	
Lane group LOS	C	C	B	A	B	
Apprch. delay	21.2	22.8	12.1		12.0	
Approach LOS	C	C	B		B	
Intersec. delay	13.6	Intersection LOS			B	

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

G-2

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & H St., SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	AM Peak (7:45-8:45)	Analysis Year	2004 Total Traffic Situation

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	0	0	0	2	0	0	1	1
Lane group		LTR						LTR			LT	R
Volume (vph)	41	24	22				22	865	17	5	258	13
% Heavy veh	0	0	0				0	0	0	0	0	0
PHF	0.69	0.69	0.69				0.94	0.94	0.94	0.93	0.93	0.93
Actuated (P/A)	P	P	P				P	P	P	P	P	P
Startup lost time		2.0						2.0			2.0	2.0
Ext. eff. green		2.0						2.0			2.0	2.0
Arrival type		3						3			3	3
Unit Extension		3.0						3.0			3.0	3.0
Ped/Bike/RTOR Volume	0		0	0			0		0	0		0
Lane Width		12.0						12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N		N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0						0			0	0
Unit Extension		3.0						3.0			3.0	3.0

Phasing	EB Only	02	03	04	NS Perm	06	07	08
Timing	G = 20.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 60.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate		127						961			282	14
Lane group cap.		598						1699			937	808
v/c ratio		0.21						0.57			0.30	0.02
Green ratio		0.33						0.50			0.50	0.50
Unif. delay d1		14.3						10.5			8.8	7.6
Delay factor k		0.50						0.50			0.50	0.50
Increm. delay d2		0.8						1.4			0.8	0.0
PF factor		1.000						1.000			1.000	1.000
Control delay		15.2						11.8			9.7	7.6
Lane group LOS		B						B			A	A
Apprch. delay	15.2						11.8			9.6		
Approach LOS	B						B			A		
Intersec. delay	11.7			Intersection LOS			B					

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

G-3

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & H St., SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	PM Peak (4:45-5:45)	Analysis Year	2004 Total Traffic Situation

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	0	1	0	0	0	0	0	1	1	0	2	0
Lane group		LTR						LT	R		LTR	
Volume (vph)	43	37	32				28	428	19	19	749	26
% Heavy veh	0	0	0				0	0	0	0	0	0
PHF	0.82	0.82	0.82				0.92	0.92	0.92	0.89	0.89	0.89
Actuated (P/A)	P	P	P				P	P	P	P	P	P
Startup lost time		2.0						2.0	2.0		2.0	
Ext. eff. green		2.0						2.0	2.0		2.0	
Arrival type		3						3	3		3	
Unit Extension		3.0						3.0	3.0		3.0	
Ped/Bike/RTOR Volume	0		0	0			0		0	0		0
Lane Width		12.0						12.0	12.0		12.0	
Parking/Grade/Parking	N	0	N	N		N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr		0						0	0		0	
Unit Extension		3.0						3.0	3.0		3.0	

Phasing	EB Only	02	03	04	NS Perm	06	07	08
Timing	G = 20.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 60.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate		136						495	21		892	
Lane group cap.		597						877	808		1686	
v/c ratio		0.23						0.56	0.03		0.53	
Green ratio		0.33						0.50	0.50		0.50	
Unif. delay d1		14.4						10.4	7.6		10.2	
Delay factor k		0.50						0.50	0.50		0.50	
Increm. delay d2		0.9						2.7	0.1		1.2	
PF factor		1.000						1.000	1.000		1.000	
Control delay		15.3						13.1	7.7		11.4	
Lane group LOS		B						B	A		B	
Apprch. delay	15.3						12.9			11.4		
Approach LOS	B						B			B		
Intersec. delay	12.2			Intersection LOS						B		

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

G-4

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & Southern Ave, SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	AM Peak (7:30-8:30)	Analysis Year	2004 Total Traffic Situation

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	1	1	0	0	2	0	0	1	0	0	2	2
Lane group	L	TR			LTR			LTR			LT	R
Volume (vph)	228	389	3	38	486	57	6	503	42	12	130	134
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.93	0.93	0.93	0.96	0.96	0.96	0.95	0.95	0.95	0.90	0.90	0.90
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time	2.0	2.0			2.0			2.0			2.0	2.0
Ext. eff. green	2.0	2.0			2.0			2.0			2.0	2.0
Arrival type	3	3			3			3			3	3
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0
Ped/Bike/RTOR Volume	0		0	0		0	0		0	0		0
Lane Width	12.0	12.0			12.0			12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr	0	0			0			0			0	0
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0

Phasing	EB Only	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 10.0	G = 40.0	G =	G =	G = 35.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 Cycle Length C = 100.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	245	421			605			579			157	149
Lane group cap.	449	1044			1279			657			1175	995
v/c ratio	0.55	0.40			0.47			0.88			0.13	0.15
Green ratio	0.55	0.55			0.40			0.35			0.35	0.35
Unif. delay d1	12.9	13.0			22.2			30.5			22.2	22.3
Delay factor k	0.50	0.50			0.50			0.50			0.50	0.50
Increm. delay d2	4.7	1.2			1.3			15.7			0.2	0.3
PF factor	1.000	1.000			1.000			1.000			1.000	1.000
Control delay	17.6	14.2			23.5			46.3			22.4	22.6
Lane group LOS	B	B			C			D			C	C
Apprch. delay	15.4			23.5			46.3			22.5		
Approach LOS	B			C			D			C		
Intersec. delay	27.0			Intersection LOS						C		

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

G-5

SHORT REPORT

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning Rd. & Southern Ave, SE
Agency or Co.	ORGA	Area Type	All other areas
Date Performed	3/20/03	Jurisdiction	Washington, DC
Time Period	PM Peak (5:30-6:30)	Analysis Year	2004 Total Traffic Situation

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	1	1	0	0	2	0	0	1	0	0	2	2
Lane group	L	TR			LTR			LTR			LT	R
Volume (vph)	191	477	10	91	456	57	8	281	68	28	467	273
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.92	0.92	0.92	0.95	0.95	0.95
Actuated (P/A)	P	P	P	P	P	P	P	P	P	P	P	P
Startup lost time	2.0	2.0			2.0			2.0			2.0	2.0
Ext. eff. green	2.0	2.0			2.0			2.0			2.0	2.0
Arrival type	3	3			3			3			3	3
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0
Ped/Bike/RTOR Volume	0		0	0		0	0		0	0		0
Lane Width	12.0	12.0			12.0			12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/hr												
Bus stops/hr	0	0			0			0			0	0
Unit Extension	3.0	3.0			3.0			3.0			3.0	3.0

Phasing	EB Only	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 15.0	G = 40.0	G =	G =	G = 35.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 Cycle Length C = 105.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	225	573			678			388			521	287
Lane group cap.	474	1082			1035			609			1126	947
v/c ratio	0.47	0.53			0.66			0.64			0.46	0.30
Green ratio	0.57	0.57			0.38			0.33			0.33	0.33
Unif. delay d1	12.8	13.8			26.8			29.6			27.6	26.0
Delay factor k	0.50	0.50			0.50			0.50			0.50	0.50
Increm. delay d2	3.4	1.9			3.2			5.0			1.4	0.8
PF factor	1.000	1.000			1.000			1.000			1.000	1.000
Control delay	16.2	15.7			30.0			34.7			29.0	26.8
Lane group LOS	B	B			C			C			C	C
Apprch. delay	15.8			30.0			34.7			28.2		
Approach LOS	B			C			C			C		
Intersec. delay	25.9			Intersection LOS			C					

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

G-6

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning @ Hanna (East)*
Agency/Co.	*ORGA*	Jurisdiction	*Washington, D.C.*
Date Performed	*4/11/03*	Analysis Year	*2004 Total Traffic Situation*
Analysis Time Period	*AM Peak (7:30-8:30)*		

Project Description

East/West Street: *Hanna Place (East Leg)*	North/South Street: *Benning Road*
Intersection Orientation: *North-South*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*887*	*10*	*8*	*255*	*0*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.90*	*0.90*	*0.89*	*0.89*
Hourly Flow Rate, HFR	*0*	*933*	*11*	*8*	*286*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*1*	*0*
Configuration		*T*	*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*5*	*0*	*17*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*5*	*0*	*18*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*8*		*23*				
C (m) (vph)		*735*		*366*				
v/c		*0.01*		*0.06*				
95% queue length		*0.03*		*0.20*				
Control Delay		*10.0-*		*15.5*				
LOS		*A*		*C*				
Approach Delay	--	--	*15.5*					
Approach LOS	--	--	*C*					

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Robert C. Young	Intersection	Benning @ Hanna (East)
Agency/Co.	ORGA	Jurisdiction	Washington, D.C.
Date Performed	4/11/03	Analysis Year	2004 Total Traffic Situation
Analysis Time Period	PM Peak (4:30-5:30)		

Project Description	
East/West Street: Hanna Place (East Leg)	North/South Street: Benning Road
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	464	10	21	783	0
Peak-Hour Factor, PHF	0.88	0.88	0.90	0.90	0.94	0.94
Hourly Flow Rate, HFR	0	527	11	23	832	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	1	0	2	1
Configuration		T	R	LT	T	R
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	9	0	25	0	0	0
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	10	0	27	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (vph)		23		37				
C (m) (vph)		1040		389				
v/c		0.02		0.10				
95% queue length		0.07		0.31				
Control Delay		8.5		15.2				
LOS		A		C				
Approach Delay	--	--	15.2					
Approach LOS	--	--	C					

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning @ Hanna (West)*
Agency/Co.	*ORGA*	Jurisdiction	*Washington, D.C.*
Date Performed	*4/11/03*	Analysis Year	*2004 Total Traffic Situation*
Analysis Time Period	*AM Peak (7:30-8:30)*		

Project Description

East/West Street: *Hanna Place (West Leg)*	North/South Street: *Benning Road*
Intersection Orientation: *North-South*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*26*	*887*	*0*	*0*	*263*	*44*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.90*	*0.90*	*0.89*	*0.89*
Hourly Flow Rate, HFR	*27*	*933*	*0*	*0*	*295*	*49*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*1*	*1*
Configuration	*LT*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*							
v (vph)	*27*							
C (m) (vph)	*1226*							
v/c	*0.02*							
95% queue length	*0.07*							
Control Delay	*8.0*							
LOS	*A*							
Approach Delay	--	--						
Approach LOS	--	--						

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Robert C. Young*	Intersection	*Benning @ Hanna (West)*
Agency/Co.	*ORGA*	Jurisdiction	*Washington, D.C.*
Date Performed	*4/11/03*	Analysis Year	*2004 Total Traffic Situation*
Analysis Time Period	*PM Peak (4:30-5:30)*		

Project Description	
East/West Street: *Hanna Place (West Leg)*	North/South Street: *Benning Road*
Intersection Orientation: *North-South*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*15*	*479*	*0*	*0*	*805*	*47*
Peak-Hour Factor, PHF	*0.88*	*0.88*	*0.90*	*0.90*	*0.94*	*0.94*
Hourly Flow Rate, HFR	*17*	*544*	*0*	*0*	*856*	*50*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*2*	*0*
Configuration	*LT*				*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*							
v (vph)	*17*							
C (m) (vph)	*759*							
v/c	*0.02*							
95% queue length	*0.07*							
Control Delay	*9.9*							
LOS	*A*							
Approach Delay	--	--						
Approach LOS	--	--						

>

HCS2000™ Copyright © 2000 University of Florida, All Rights Reserved Version 4.1b