

Volume 11
Peak Hour Factor, PHF 0.91
Hourly Flow Rate, HFR 12
Percent Heavy Vehicles 0

Percent Grade (%)
Flared Approach: Exists?/Storage
Lanes 1

0 0 cage /

Configuration L

Approach	_Delay, EB	Queue Le		and Leve		Ser		Southbour	d
Movement	1	4	7	8	9		10	11	12
Lane Config		LT	L			-			
v (vph)		20	12						
C(m) (vph)		1597	224						
v/c		0.01	0.05						
95% queue length		0.04	0.17						
Control Delay		7.3	22.0						
LOS		A	С						
Approach Delay				22.0					
Approach LOS				С					

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax: E-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Progeplan
Agency/Co.:
Date Performed: 05/06/2023
Analysis Time Period: Pico Tarde
Intersection: J
Jurisdiction: DER/DF
Units: U. S. Metric
Analysis Year: 2023

Analysis Year: 2023
Project ID: FUTURA
East/West Street: M2-M10

North/South Street: M9
Intersection Orientation: EW Study period (hrs): 1.00

incorporation offendatio				caay pc	1100 (1110	, . 1.00			
	Vehicle V	/olume:	s and Adj	justmen	ts				
Major Street Movements	_ 1	2	3	4	5	6			
3	L	Т	R	L	T	R			
Volume				19	1987				
Peak-Hour Factor, PHF				0.91	0.91)			
Peak-15 Minute Volume				5	546				
Hourly Flow Rate, HFR			>	20	2183	\		1	
Percent Heavy Vehicles	1.		/	6		-1	/	\	
Median Type/Storage	Undiv	/ided		/				\	
RT Channelized? Lanes				0	2				
Configuration					TT)
Upstream Signal?		No		/ / "	No	\)			
opseream bighai.		140		7	NO	1 ^			
Minor Street Movements	7	8	9	10		12	7	<u> </u>	. \
	L	T	R	L	Т	R		11	
Volume	11					\ \			
Peak Hour Factor, PHF	0.91				\				/
Peak-15 Minute Volume	3					_ \		///	
Hourly Flow Rate, HFR	12								
Percent Heavy Vehicles	0	0			0	7			
Percent Grade (%)	0 /0:	0		,	0		,		
Flared Approach: Exist	s?/Storage	9		/			/		
RT Channelized									



Lanes 1 Configuration

	I	Pedestri	ian Vol	umes ar	ıd Adju	stments		
Movements				14	15	16		
D1 (1 /1)				0	^	0		
Flow (ped/hr)	`) 3.6	3.6	0	3.6		
Lane Width (m)					3.6			
Walking Speed				1.2	1.2	1.2		
Percent Block	age	()	0	0	0		
		т	Instroa	m Signa	l Data			
	Prog.	Sat	-		reen	Cycle	Prog.	Distance
	Flow	Flow	v Typ	e I	'ime	Length	_	to Signal
	vph	vph			sec	sec	kph	meters
S2 Left-Turn								
Through								
S5 Left-Turn								
Through								
Worksheet 3-Da	ata for Co	omputino	g Effec	t of De	elay to	Major :	Street V	ehicles
					Moveme		Moveme	
					140 A GILLE	511 L Z	MOVEILLE	511C J
Shared ln volu	ume, maio	r t.h veh	nicles:				0	
							0	
Shared In vol:	ume. mai∩ı	r rt. wei						
Shared ln volu Sat flow rate)
Sat flow rate,	, major th	n vehicl	Les:				1700	
Sat flow rate, Sat flow rate,	, major th , major rt	n vehicl	Les: Les:				1700 1700	
Sat flow rate,	, major th , major rt	n vehicl	Les: Les:				1700	
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (, major th , major rt or street ritical Ga	through	les: les: n lanes	: up Time			1700 1700 2	
Sat flow rate Sat flow rate Number of majo Worksheet 4-C	, major th , major rt or street ritical Ga Calculation	n vehicle vehicle through through ap and H	Les: Les: n lanes Follow-	: up Time	9	10	1700 1700 2	12
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (, major th , major rt or street ritical Ga	through	les: les: n lanes	: up Time			1700 1700 2	
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (, major th , major rt or street ritical Ga Calculation	n vehicle vehicle through through ap and H	les: les: n lanes Follow- 7 L	: up Time	9	10	1700 1700 2	12
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement	, major th , major rt or street ritical Ga Calculation	n vehicle vehicle through through ap and I	les: les: n lanes Follow-	: up Time	9	10 L	1700 1700 2	12
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement t(c,base)	, major th , major rt or street ritical Ga Calculation	ap and I	les: les: n lanes Follow- 7 L	up Time	9 R	10 L	1700 1700 2	12 R
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv)	, major th , major rt or street ritical Ga Calculation	ap and F	les: les: n lanes Follow- 7 L 7.1 1.00	up Time	9 R	10 L	1700 1700 2	12 R
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g)	, major th , major rt or street ritical Ga Calculation 1 L	ap and F	Pollow- 7 L 7.1 1.00 0 0.20	: up Time 8 T	9 R 1.00	10 L	1700 1700 2 11 T 1.00	12 R 1.00
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade	, major th , major rt or street ritical Ga Calculation 1 L	ap and F	Tollow- 7 L 7.1 1.00 0 0.20 0.00	: up Time 8 T	9 R	10 L	1700 1700 2 11 T 1.00	12 R
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt)	, major th , major rt or street ritical Ga Calculatio 1 L	ap and I	7.1 1.00 0 0.20 0.70	: **Bup Time* 8	9 R 1.00	10 L 0 1.00 0 0.20 0 0.00	1700 1700 2 11 T 1.00 0.20 0.00	12 R 1.00 0.10 0.00
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-state	, major th , major rt or street ritical Ga Calculation 1 L	ap and I	Test les: Les: h lanes 7 L 7.1 1.00 0 0.20 0.00 0.70 0.00	: *** *** *** *** *** *** ***	9 R 1.00 0.10 0.00	10 L 1.00 0 0.20 0 0.00	1700 1700 2 11 T 1.00 0.20 0.00	12 R 1.00 0.10 0.00 0.00
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-st: 2-sta	, major th , major rt or street ritical Ga Calculation 1 L	ap and F A 1 1.00 0.00 0.00 0.00 0.00	7.1 1.00 0 0.20 0.70 0.00 1.00	: **Bup Time* 8	9 R 1.00	10 L 1.00 0 0.20 0 0.00	1700 1700 2 11 T 1.00 0.20 0.00	12 R 1.00 0.10 0.00
Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-state	, major th , major rt or street ritical Ga Calculation 1 L	ap and I	Test les: Les: h lanes 7 L 7.1 1.00 0 0.20 0.00 0.70 0.00	: *** *** *** *** *** *** ***	9 R 1.00 0.10 0.00	10 L 1.00 0 0.20 0 0.00	1700 1700 2 11 T 1.00 0.20 0.00	12 R 1.00 0.10 0.00 0.00
Sat flow rate, Sat flow rate, Sat flow rate, Number of major Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-sta 2-sta t(c) 1-sta 2-sta	, major th , major rt or street ritical Ga Calculation 1 L 1.00	ap and F The second of the se	7.1 1.00 0 0.20 0.70 0.00 1.00	: *** *** *** *** *** *** ***	9 R 1.00 0.10 0.00	10 L 1.00 0 0.20 0 0.00	1700 1700 2 11 T 1.00 0.20 0.00	12 R 1.00 0.10 0.00 0.00
Sat flow rate, Sat flow rate, Sat flow rate, Number of major Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-sta 2-sta t(c) 1-sta 2-sta Follow-Up Time	, major the major reconstruction of street ritical Galculation 1 L 1.00 age 0.00 age 0.00 age age e Calculation 2 calculation 2 calculation 2 calculation 3 calculation 2 calculation 3	ap and F The second of the se	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4	: 8 T 1.00 0.20 0.00 0.00 1.00	9 R 1.00 0.10 0.00 0.00	10 L 0 1.00 0 0.20 0 0.00 0 0.00 0 1.00	1700 1700 2 11 T 1.00 0.20 0.00 0.00	12 R 1.00 0.10 0.00 0.00 0.00
Sat flow rate, Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-sta 2-sta t(c) 1-sta 2-sta	, major th, major rtor street ritical Ga Calculation 1 1.00 age 0.00 age 0.00 age age e Calculati	ap and I ap and I 4.1 1.00 6 0.00 0.00 0.00 4.2	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4	: 8 T 1.00 0.20 0.00 0.00 1.00	9 R 1.000 0.100 0.000 0.000	10 L 0 1.00 0 0.20 0 0.00 0 1.00	1700 1700 2 11 11 T 1.00 0.20 0.00 1.00	12 R 1.00 0.10 0.00 0.00 0.00
Sat flow rate, Sat flow rate, Sat flow rate, Number of major Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-sta 2-sta t(c) 1-sta 2-sta Follow-Up Time	, major the major reconstruction of street ritical Galculation 1 L 1.00 age 0.00 age 0.00 age age e Calculation 2 calculation 2 calculation 2 calculation 3 calculation 2 calculation 3	ap and F The second of the se	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4	: 8 T 1.00 0.20 0.00 0.00 1.00	9 R 1.00 0.10 0.00 0.00	10 L 0 1.00 0 0.20 0 0.00 0 0.00 0 1.00	1700 1700 2 11 T 1.00 0.20 0.00 0.00	12 R 1.00 0.10 0.00 0.00 0.00
Sat flow rate, Sat flow rate, Sat flow rate, Number of major Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-sta 2-sta t(c) 1-sta 2-sta Follow-Up Time Movement	, major th, major rtor street ritical Ga Calculation 1 1.00 age 0.00 age 0.00 age age e Calculati	ap and I ap and I 4.1 1.00 6 0.00 0.00 0.00 4.2	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4	: 8 T 1.00 0.20 0.00 0.00 1.00	9 R 1.000 0.100 0.000 0.000	10 L 0 1.00 0 0.20 0 0.00 0 1.00	1700 1700 2 11 11 T 1.00 0.20 0.00 1.00	12 R 1.00 0.10 0.00 0.00 0.00
Sat flow rate, Sat flow rate, Sat flow rate, Number of major Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-sta 2-sta t(c) 1-sta 2-sta Follow-Up Time	, major th, major rtor street ritical Ga Calculation 1 1.00 age 0.00 age 0.00 age age e Calculati	ap and I through ap and I L 4.1 1.00 6 0.00 0.00 0.00 4.2	Tollow- 7 L 7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4	: 8 T 1.00 0.20 0.00 0.00 1.00	9 R 1.000 0.100 0.000 0.000	10 L 0 1.00 0 0.20 0 0.00 0 1.00	1700 1700 2 111 T 1.00 0.20 0.00 0.00 1.00	12 R 1.00 0.10 0.00 0.00 0.00
Sat flow rate, Sat flow rate, Sat flow rate, Number of major Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-sta 2-sta Follow-Up Time Movement t(f,base)	, major th , major rt or street ritical Ga Calculation 1 L 1.00 age 0.00 age 0.00 age age	ap and I ap and	Tollow- 7 L 7.1 1.00 0.20 0.70 0.70 0.00 1.00 6.4	: **Bup Time* 8	9 R 1.000 0.100 0.000 0.000	10 L 0 1.00 0 0.20 0 0.00 0 1.00	1700 1700 2 111 T 1.00 0.20 0.00 0.00 1.00	12 R 1.00 0.10 0.00 0.00 0.00
Sat flow rate, Sat flow rate, Sat flow rate, Number of majo Worksheet 4-C: Critical Gap (Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-sta 2-sta t(c) 1-sta 2-sta Follow-Up Time Movement t(f,base) t(f,HV)	, major th , major rt or street ritical Ga Calculation 1 L 1.00 age 0.00 age 0.00 age age	0.00 0.00 0.00 0.00 4.2 2.20 0.90	7.1 1.00 0 0.20 0.00 1.00 6.4 7 L	: **Bup Time* 8	9 R 1.000 0.100 0.000 0.000	10 L 0 1.00 0 0.20 0 0.00 0 1.00	1700 1700 2 111 T 1.00 0.20 0.00 0.00 1.00	12 R 1.00 0.10 0.00 0.00 0.00

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal Movement 2

Movement 2 Movement 5 V(t) V(1,prot) V(t) V(1,prot)

V prog
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P g (g1)

g (q2) g (q)



Computation 2-Proportion of TWSC Intersection Time blocked Movement 2 Movement 5 V(t) V(1,prot) V(t) V(1,prot) alpha beta Travel time, t(a) (sec) Smoothing Factor, F Proportion of conflicting flow, f Max platooned flow, V(c,max) Min platooned flow, V(c,min) Duration of blocked period, t(p) Proportion time blocked, p 0.000 0.000 Computation 3-Platoon Event Periods Result p(2) 0.000 p(5) 0.000 p (dom) p(subo) Constrained or unconstrained? Proportion unblocked (1) (2) (3) Single-stage for minor Two-Stage Process Stage II movements, p(x)Process Stage I p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12) Computation 4 and 5 Single-Stage Process 7 8 9 Movement 1 4 10 11 12 L L ${\tt L}$ R L Τ R V c,x 0 1131 Рx V c,u,x C r,x C plat,x Two-Stage Process 8 10 11 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 V(c,x) 3000 s P(x) V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St. 12 Conflicting Flows Potential Capacity 1.00 1.00 Pedestrian Impedance Factor Movement Capacity 1.00 1.00 Probability of Queue free St. Step 2: LT from Major St. 4 1 Conflicting Flows 0 1597 Potential Capacity Pedestrian Impedance Factor 1.00 1.00



			origorinaria o mo
Movement Capacity	1597		
Probability of Queue free St.	0.99	1.00	
Maj L-Shared Prob Q free St.	0.99		
			_
Step 3: TH from Minor St.	8	11	
Conflicting Flows			-
Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00	
Cap. Adj. factor due to Impeding mymnt	0.99	0.99	
Movement Capacity	0.33	0.33	
Probability of Queue free St.	1.00	1.00	
	_,,,,		
Step 4: LT from Minor St.	7	10	-
			_
Conflicting Flows	1131		
Potential Capacity	227		
Pedestrian Impedance Factor	1.00	1.00	
Maj. L, Min T Impedance factor		0.99	
Maj. L, Min T Adj. Imp Factor.		0.99	
Cap. Adj. factor due to Impeding mymnt	0.99	0.99	
Movement Capacity	224		
			_
Worksheet 7-Computation of the Effect of	Two-stage Can Accor	atanco	
Worksheet / Computation of the Effect of	Iwo stage dap Accel	Jeance	
Step 3: TH from Minor St.		11	_
step 3. In IIOM MINOI St.	0	11	
Part 1 - First Stage			_
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mymnt			
Movement Capacity			
Probability of Queue free St.			
Part 2 - Second Stage			-
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity			
			_
Part 3 - Single Stage			
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00	
Cap. Adj. factor due to Impeding mvmnt	0.99	0.99	
Movement Capacity			
			_
Result for 2 stage process:			
a			
Y C t			
Probability of Queue free St.	1.00	1.00	
riobability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	_
beep i. Hi from infiner be.		3	
Part 1 - First Stage			-
Conflicting Flows			
Potential Capacity	/ /	\ \ \	\
Pedestrian Impedance Factor			\
Cap. Adj. factor due to Impeding mymnt			
Movement Capacity			
Part 2 - Second Stage			
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor			111 L
Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity		\ \	
			_ //
Part 3 - Single Stage			
Conflicting Flows	1131		
Potential Capacity	227		
Pedestrian Impedance Factor	1.00	1. <mark>00</mark>	1
Maj. L, Min T Impedance factor		0.99	\
Maj. L, Min T Adj. Imp Factor.		0.99	



Cap. Adj. factor due to Impeding Movement Capacity		0.99 224			0.99		
Results for Two-stage process:							
a							
Y .			004				
C t			224				
Worksheet 8-Shared Lane Calculat.	ions						
Movement	7	8	9	10	11	12	
	L	Т	R	L	T	R	
Volume (vph)	12						
Movement Capacity (vph)	224	1					
Shared Lane Capacity (vph)							
Worksheet 9-Computation of Effect	t of Fla	ared Min	or Stree	et Appro	oaches		
Movement	7	8	9	10	11	12	
110 V GINGITE	L	T	R	L	Т	R	
C sep	224	1					
Volume	12						
Delay							
Q sep							
Q sep +1							
round (Qsep +1)							
n max							
C sh							
SUM C sep							
n							
C act							
C acc							
Worksheet 10-Delay, Queue Length	, and Le	evel of	Service				
Movement 1 4	7	8	9	10	11	12	
Lane Config LT	L						
v (vph) 20	12						
C(m) (vph) 1597	224						
C(III) (VPII)	0.05						
· / · ± /							
v/c 0.01	0.17						
v/c 0.01 95% queue length 0.04	0.17 22.0						
v/c 0.01 95% queue length 0.04 Control Delay 7.3							
v/c 0.01 95% queue length 0.04 Control Delay 7.3	22.0	22.0					

	Movement 2 Movement 5
p(oj) v(il), Volume for stream 2 or 5 v(i2), Volume for stream 3 or 6 s(il), Saturation flow rate for stream 2	1.00 0.99 0 0 0 1700
s(i2), Saturation flow rate for stream 3 $P^*(oj)$ d(M,LT), Delay for stream 1 or 4	or 6 1700 0.99 7.3
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5	2



1.1.4 Memória de cálculo da análise de capacidade e níveis de serviço — Cenário FUTURO Com empreendimento em funcionamento e com acréscimo de área — USO COMERCIAL

1.1.4.1 Interseção A – Pico Manhã

HCS+: Unsignalized Intersections Release 5.6

	TWO-WAY STO	P CONTRO	OL SUMM	MARY			_
Analyst: Agency/Co.:	Progeplan						
Date Performed:	05/06/2023						
Analysis Time Period:							
Intersection:	A						
Jurisdiction:	DER/DF						
Units: U. S. Metric Analysis Year:	2023						
Project ID: FUTURA C							
East/West Street:	MOV01-MOV04						
North/South Street: Intersection Orientat	MOV04		C+1:	ıdy perio	d (hre):	1 00	
Intersection Offendat					u (1113).	1.00	
Major Street: Approa	_Vehicle Volu	mes and tbound	Adjust		stbound		-
Moveme		2	3	4	5	6	
	L	T	R	L	T	R	
T/o l umo		1010	10				_
Volume Peak-Hour Factor, PHF	,	1819 0.91	48 1.00				
Hourly Flow Rate, HFR		1998	48				
Percent Heavy Vehicle							
Median Type/Storage RT Channelized?	Undivi			/			
Lanes Configuration		2 0 T TR					
Upstream Signal?		No			No		
							_
Minor Street: Approa		thbound			uthbound		
Moveme	ent 7 L	8 T	9 R	10 L	11 T	12 R	
	2	_	10	1 =	-	10	
Volume			15				_
Peak Hour Factor, PHF			0.91				
Hourly Flow Rate, HFR Percent Heavy Vehicle			16 0				
Percent Grade (%)		0			0		
Flared Approach: Exi	sts?/Storage			/		/	
Lanes Configuration		1 R					
Configuracion		IX					
Del	ay, Queue Ler	ath, and	d Level	of Serv	ice		_
	B WB		nbound	/		bound	-
Movement 1	4	7	3		10 1	.1 12	
Lane Config	I			R	_ `		
v (vph)			_	16			-
C(m) (vph))	289	1		
v/c				0.06		L /	\
95% queue length Control Delay		,		0.18 18.2			
LOS		\		C			
Approach Delay		<u>}</u>	18.2			>	
Approach LOS			С	\			
				 	_	-/7-	-
) [[1111
						((
HCS+:	Unsignalized	l Interse	ections	Release	5.6	\ \	
							~
Phone:			Fa	ax:			
			1.0	•			



E-Mail: TWO-WAY STOP CONTROL(TWSC) ANALYSIS_ Analyst: Progeplan Agency/Co.: 05/06/2023 Date Performed: Analysis Time Period: Pico Manha Intersection: Α Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL East/West Street: MOV01-MOV04 North/South Street: MOV04 Intersection Orientation: EW Study period (hrs): 1.00 Vehicle Volumes and Adjustments Major Street Movements 2 L Т R R Volume 1819 48 Peak-Hour Factor, PHF 0.91 1.00 Peak-15 Minute Volume 500 12 Hourly Flow Rate, HFR 1998 48 Percent Heavy Vehicles Median Type/Storage Undivided RT Channelized? 2 0 Lanes Configuration Т TR Upstream Signal? No No Minor Street Movements 10 11 12 Т R L Т R Volume 1.5 Peak Hour Factor, PHF 0.91 Peak-15 Minute Volume 4 16 Hourly Flow Rate, HFR Percent Heavy Vehicles 0 Percent Grade (%) 0 Flared Approach: Exists?/Storage RT Channelized No Lanes 1 Configuration R Pedestrian Volumes and Adjustments Movements 13 14 15 Flow (ped/hr) Lane Width (m) 3.6 3.6 3.6 3.6 Walking Speed (m/sec) 1.2 1.2 1.2 1.2 Percent Blockage 0 0 0 0 Upstream Signal Data Cycle Prog. Sat Arrival Green Prog. Distance Flow Flow Type Time Length to Signal Speed vph vph sec sec kph meters Left-Turn Through Left-Turn Through Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles Movement 2 Movement 5 Shared In volume, major th vehicles:

Shared in volume, major th vehicles: Shared in volume, major rt vehicles: Sat flow rate, major th vehicles: Sat flow rate, major rt vehicles: Number of major street through lanes:



Worksheet	4-Critical	Gap	and	Follow-up	Time	Calculation
-----------	------------	-----	-----	-----------	------	-------------

Critical	Gap Cal	culation	on						
Movement		1	4	7	8	9	10	11	12
		L	L	L	Т	R	L	Т	R
t(c,base	:)					6.2			
t(c,hv) P(hv)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
t(c,g)				0.20	0.20	0.10	0.20	0.20	0.10
Percent t(3,1t)	Grade			0.00	0.00	0.00	0.00	0.00	0.00
t(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2-stage		0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage					6.2			
	2-stage								
Follow-U	p Time C	alcula	tions						
Movement		1	4	7	8	9	10	11	12
		L	L	L	Т	R	L	Т	R
t(f,base)					3.30			
t(f,HV)		0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)						0			
t(f)						3.3			

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

Movement 2 Movement 5 V(t) V(1,prot) V(t) V(1,prot)

V prog
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P
g(q1)

g (q2) g (q)

Computation 2-Proportion of TWSC Intersection Time blocked

0.000

0.000

alpha beta

Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f
Max platooned flow, V(c,max)
Min platooned flow, V(c,min)
Duration of blocked period, t(p)
Proportion time blocked, p

Computation 3-Platoon Event Periods Result

p(2) 0.000
p(5) 0.000

p(dom) p(subo)

Constrained or unconstrained?

Proportion
unblocked (1) (2) (3)
for minor Single-stage Two-Stage Process
movements, p(x) Process Stage I Stage II

p(1) p(4) p(7) p(8) p(9) p(10)

p(11)



p(12)									engen	naria e
Computation 4 and 5									-	
Single-Stage Process Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R		
7 c, x					1023				-	
'x ' c,u,x										
r,x plat,x									-	
wo-Stage Process	7		8		10				_	
Stage1	Stage2	Stage		e2 Sta		tage2				
7(c,x)									_	
?(x) 7(c,u,x)										
C(r,x) C(plat,x)									-	
orksheet 6-Impedance	e and Cap	pacity	Equatio	ns					-	
tep 1: RT from Minor	St.				9		12		_	
Conflicting Flows					L023 289				_	
edestrian Impedance lovement Capacity	Factor			1	L.00 289		1.00			
robability of Queue	free St.).94		1.00			
tep 2: LT from Major	St.				4		1		_	
conflicting Flows otential Capacity edestrian Impedance	Factor			1	1.00		1.00			
Novement Capacity Probability of Queue					1.00		1.00			
Maj L-Shared Prob Q f	free St.								_	
tep 3: TH from Minor	st.				8		11		_	
Conflicting Flows Potential Capacity										
Pedestrian Impedance Cap. Adj. factor due		ding mv	mnt		L.00 L.00		1.00			
Novement Capacity Probability of Queue	free St.			1	1.00		1.00			
tep 4: LT from Minor	St.				7		10		-	
onflicting Flows otential Capacity edestrian Impedance	Factor				.00		1.00		<u> </u>	
aj. L, Min T Impedar aj. L, Min T Adj. In	nce facto np Factor	î.					1.00 1.00			
ap. Adj. factor due ovement Capacity	to Imped	ding mv	mnt		1.00		0.94			
orksheet 7-Computati	ion of th	ne Effe	ct of T	wo-stag	ge Gap <i>I</i>	Accepta	nce	> -		
tep 3: TH from Minor	st.				8	\Rightarrow	11		· ++	
art 1 - First Stage onflicting Flows otential Capacity							_ \		<u></u>	
edestrian Impedance		lina							///	
ap. Adj. factor due lovement Capacity crobability of Queue	_	-	mnt					_	$\overline{}$	
_ ~ ~										



```
Part 2 - Second Stage
Conflicting Flows
Potential Capacity
Pedestrian Impedance Factor
Cap. Adj. factor due to Impeding mvmnt
Movement Capacity
Part 3 - Single Stage
Conflicting Flows
Potential Capacity
Pedestrian Impedance Factor
                                                    1.00
                                                                       1.00
Cap. Adj. factor due to Impeding mvmnt
                                                    1.00
                                                                       1.00
Movement Capacity
Result for 2 stage process:
а
У
С t
Probability of Queue free St.
                                                    1.00
                                                                       1.00
Step 4: LT from Minor St.
                                                                         10
Part 1 - First Stage
Conflicting Flows
Potential Capacity
Pedestrian Impedance Factor
Cap. Adj. factor due to Impeding mymnt
Movement Capacity
Part 2 - Second Stage
Conflicting Flows
Potential Capacity
Pedestrian Impedance Factor
Cap. Adj. factor due to Impeding mvmnt
Movement Capacity
Part 3 - Single Stage
Conflicting Flows
Potential Capacity
                                                                       1.00
Pedestrian Impedance Factor
                                                    1.00
Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor.
                                                                       1.00
                                                                       1.00
Cap. Adj. factor due to Impeding mymnt
                                                    1.00
                                                                       0.94
Movement Capacity
Results for Two-stage process:
Сt
Worksheet 8-Shared Lane Calculations
Movement
                                                               10
                                                                       11
                                                                               12
                                                 Т
                                         L
                                                         R
                                                                L
                                                                        Τ
                                                                                R
Volume (vph)
                                                        16
Movement Capacity (vph)
Shared Lane Capacity (vph)
                                                        289
Worksheet 9-Computation of Effect of Flared Minor Street Approaches
Movement
                                                 8
                                                         9
                                                               10
                                                                       11
                                                                               12
                                         L
                                                 Т
                                                         R
                                                                        Т
                                                                                R
C sep
                                                        289
Volume
                                                        16
Delay
Q sep
Q sep +1
round (Qsep +1)
n max
C sh
SUM C sep
```



C act

Worksheet 10-Delay, Queue Length, and Level of Service 4 10 Movement 11 12 Lane Config R v (vph) 16 C(m) (vph) 289 v/c 0.06 95% queue length Control Delay 18.2 LOS С Approach Delay 18.2 Approach LOS С

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(il), Volume for stream 2 or 5		
v(i2), Volume for stream 3 or 6		
s(il), Saturation flow rate for stream 2 or 5		
s(i2), Saturation flow rate for stream 3 or 6 P*(oj)		
d(M,LT), Delay for stream 1 or 4 N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5		

1.1.4.2 Interseção A – Pico Tarde

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TWO-WAY STOP CONTROL SUMMARY

Progeplan Analyst: Agency/Co.: Date Performed: 05/06/2023 Analysis Time Period: Pico Tarde Intersection: DER/DF Jurisdiction: Units: U. S. Metric Analysis Year: 2023

Project ID:

East/West Street: MOV01-MOV04
North/South Street: MOV04 Intersection Orientation: EW

Study period (hrs): 1.00

	Vehicle Vol					
Major Street: Appr		stbound		/ W	estbound	
Move	ment 1	2	3	4	5	6
	L	T	R	L	T	R
Volume		731	154			
Peak-Hour Factor, P	HF	0.91	0.91			\ \
Hourly Flow Rate, H	FR	803	169	1		
Percent Heavy Vehic	les		/-			
Median Type/Storage	Undiv	ided	(/		
RT Channelized?					_	
Lanes		2 ()			
Configuration		T TI	3.	7		
Upstream Signal?		No		1 ~	No	
1						
Minor Street: Appr	oach No	rthbound	d	S	outhboun	d
Move	ment 7	8	9	10	11	12
	L	Т	R	L	T	R
Volume			164			
Peak Hour Factor, P.	HF		0.91			
Hourly Flow Rate, H	FR		180			
Percent Heavy Vehic			0			
Percent Grade (%)		0			0	
Flared Approach: E	xists?/Storage			/		



Lanes 1 Configuration R

Delay, Queue Length, and Level of Service Southbound 11 Approach WB EB Northbound 9 Movement 1 8 12 4 Lane Config R v (vph) 180 C(m) (vph) 585 v/c 0.31 95% queue length 1.32 Control Delay 13.9 LOS В Approach Delay 13.9 Approach LOS В

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Phone: E-Mail: Fax:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Progeplan
Agency/Co.:
Date Performed: 05/06/2023
Analysis Time Period: Pico Tarde
Intersection: A
Jurisdiction: DER/DF
Units: U. S. Metric
Analysis Year: 2023
Project ID:

East/West Street: MOV01-MOV04
North/South Street: MOV04
Intersection Orientation: EW

Intersection Orientation: EW Study period (hrs): 1.00

Major Street Movements 1	2	3	4	5	6	
L	T	R	L	T	R	
	731	154				
Peak-Hour Factor, PHF	0.91	0.91				
Peak-15 Minute Volume	201	42				
Hourly Flow Rate, HFR	803	169				
Percent Heavy Vehicles				/ \		
Median Type/Storage Un	divided		/	/ \		
RT Channelized?				L		
Lanes	2	0)
Configuration	T T	'R				
Upstream Signal?	No			No	1	
Minor Street Movements 7	8	9	10	11	12	
L	T	R	L	Т	R	
Volume		164			_	
Peak Hour Factor, PHF		0.91			/ /	
Peak-15 Minute Volume		45	7		ſ	\ _ \ \ /
Hourly Flow Rate, HFR		180			- 1	
Percent Heavy Vehicles		0			ر	
Percent Grade (%)	0			0		
Flared Approach: Exists?/Stor	age		/			
RT Channelized		No		\		
Lanes		1				
Configuration	R					
						
	an Volume	s and A	djustme 16	nts		



Flow (ped/hr) 0 0 0 Lane Width (m) 3.6 3.6 3.6 3.6 Walking Speed (m/sec) 1.2 1.2 1.2 1.2 Percent Blockage 0 0 0 0 Upstream Signal Data Prog. Sat Arrival Green Cycle Prog. Distance Flow Flow Type Time Length Speed to Signal vph vph sec sec kph meters Left-Turn Through S.5 Left-Turn Through Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles Movement 2 Movement 5 Shared In volume, major th vehicles: Shared In volume, major rt vehicles: Sat flow rate, major th vehicles: Sat flow rate, major rt vehicles: Number of major street through lanes: Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation 8 9 10 12 11 Movement 1 Т L L R L Т R t(c,base) 6.2 1.00 1.00 1.00 1.00 1.00 1.00 1.00 t(c,hv) 1.00 P(hv) 0 0.20 0.20 0.10 0.20 0.20 0.10 t(c,g) Percent Grade 0.00 0.00 0.00 0.00 0.00 0.00 t(3,lt)0.00 t(c,T): 1-stage 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 2-stage 0.00 0.00 1.00 1.00 0.00 1.00 1.00 0.00 t(c) 1-stage 6.2 2-stage Follow-Up Time Calculations Movement 1 4 8 9 10 11 12 L \mathbb{L} Τ R Τ R t(f,base) 3.30 t(f,HV) 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 P(HV) 0 t(f) 3.3 Worksheet 5-Effect of Upstream Signals Computation 1-Queue Clearance Time at Upstream Signal Movement 2 Movement 5 V(l,prot) V(t) V(t) V(1,prot) V prog
Total Saturation Flow Rate, s (vph) Arrival Type Effective Green, g (sec) Cycle Length, C (sec) Rp (from Exhibit 16-11) Proportion vehicles arriving on green P g(q1) g(q2)

Computation 2-Proportion of TWSC Intersection Time blocked Movement 2

Movement 2 Movement 5 V(t) V(1,prot) V(t) V(1,prot)

alpha

g (q)



beta
Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f

Max platooned flow, Min platooned flow,	V(c,max)	ow, I								
Duration of blocked proportion time bloc	period,	t (p)		0.0	000		0.000			
Computation 3-Platoo	n Event 1	Periods	Re	sult					_	
p(2) p(5) p(dom) p(subo)				000					_	
Constrained or uncon	strained [°]	?							_	
Proportion unblocked	(:	1)		(2)		(3)				
<pre>for minor movements, p(x)</pre>		e-stage cess	St	Two-Sage I	Stage P.	rocess Stage I	Ι			
p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12)									_	
Computation 4 and 5 Single-Stage Process									_	
Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R		
V c, x					486				_	
s Px										
V c,u,x										
C r,x C plat,x									_	
Two-Stage Process									_	
Stage1	7 Stage2	Stage1	8 L Stag	re2 Sta	10 age1 S	tage2 S	1: Stagel			
V(c,x)									_	
s P(x) V(c,u,x)										
C(r,x)						$\overline{}$			_	
C(plat,x)						\bot			_	
Worksheet 6-Impedance	e and Cap	pacity E	Equatio	ons	/ /	~				
Step 1: RT from Mino	r St.			\rightarrow	9		12		<u> </u>	
Conflicting Flows					186		T		- /	
Potential Capacity Pedestrian Impedance	Factor			-	85 1.00		1.00	_		
Movement Capacity Probability of Queue	free St				585).69		1.00			
Step 2: LT from Majo	r St.				4		1	> L	-///	\ \
Conflicting Flows					<u> </u>	\rightarrow			- \}	1
Potential Capacity Pedestrian Impedance	Factor			-	L.00		1.00			/
Movement Capacity					1.00		1.00		ノノ	
Probability of Queue Maj L-Shared Prob Q		•		-	.00		1.00			
Step 3: TH from Mino	r St.				8		11		_	\



			engennaria e mei
Conflicting Flows Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00	
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	1.00	
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor Maj. L, Min T Impedance factor	1.00	1.00	
Maj. L, Min T Adj. Imp Factor.		1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	0.69	
Movement Capacity			
Worksheet 7-Computation of the Effect of Tw	wo-stage Gap Acc	eptance	
Step 3: TH from Minor St.	8	11	
Part 1 - First Stage			-
Conflicting Flows			
Potential Capacity Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity Probability of Queue free St.			
Part 2 - Second Stage Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity			
Part 3 - Single Stage			
Conflicting Flows Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00	
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	1.00	
Result for 2 stage process:			
a			
Y C t			
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	
Part 1 - First Stage			-
Conflicting Flows			
Potential Capacity Pedestrian Impedance Factor	/	\	
Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity			
Part 2 - Second Stage	7/		
Conflicting Flows Potential Capacity	1		\
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	_/		
Part 3 - Single Stage			
Conflicting Flows Potential Capacity			////
Pedestrian Impedance Factor	1.00	1.00	4
Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor.	(1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	0.69	
Movement Capacity			
Results for Two-stage process:			_ \
У			



Сt

Movement		7	8	9	10	11	12
		L	T	R	L	Т	R
Volume (vph)				180			
Movement Capacity (vph)				585			
Shared Lane Capacity (vph)							
	ffect of	Flared	Min	or Stree	t Appro	oaches	
Movement		7	8	9	10	11	12
		L	T	R	L	Т	R
C sep				585			
Volume				180			
Delay							
Q sep							
Q sep +1							
round (Qsep +1)							
n max							
C sh							
SUM C sep							
n							
C act							
Worksheet 10-Delay, Queue Len	ngth, and	Level	of	Service			
Movement 1 4	1 7	8		9	10	11	12
Lane Config				R			
v (vph)				180			
C(m) (vph)				585			
v/c				0.31			
95% queue length				1.32			
Control Delay				13.9			
LOS				В			
Approach Delay Approach LOS		13	. 9				
		В					

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(il), Volume for stream 2 or 5		
v(i2), Volume for stream 3 or 6		
s(il), Saturation flow rate for stream 2 or 5	/ \	
s(i2), Saturation flow rate for stream 3 or 6	/ \	
P*(oj)		
d(M,LT), Delay for stream 1 or 4)
N, Number of major street through lanes		
d(rank.1) Delay for stream 2 or 5		\

1.1.4.3 Interseção B – Pico Manhã

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TWO-WAY STOP CONTROL SUMMARY

Analyst: Progeplan
Agency/Co.:
Date Performed: 05/06/2023
Analysis Time Period: Pico Manha
Intersection: B
Jurisdiction: DER/DF
Units: U. S. Metric
Analysis Year: 2023
Project ID: FUTURA COMERCIAL

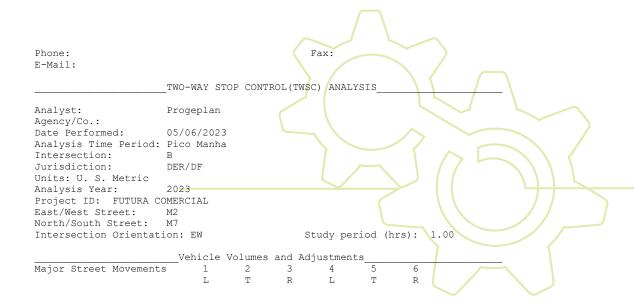


East/West Street: M2
North/South Street: M7
Intersection Orientation: F

Intersection Orientation: EW Study period (hrs): 1.00

	Veh	icle Vol	umes and	Adjus	tme	nts			
Major Street:			stbound	_			stbound		
	Movement	1	2	3		4	5	6	
		L	T	R		L	Т	R	
Volume						24			
Peak-Hour Fact	or, PHF					0.91	0.91		
Hourly Flow Ra						26	795		
Percent Heavy						12			
Median Type/St		Undiv	ided			/			
RT Channelized	?								
Lanes						0	2		
Configuration						L	тт		
Upstream Signa	1?		No				No		
Minor Street:	Approach		rthbound				uthbound		
	Movement	7	8	9	!	10	11	12	
		L	T	R		L	Т	R	
Volume		13							
Peak Hour Fact	or, PHF	0.91							
Hourly Flow Ra		14							
Percent Heavy		0							
Percent Grade	(%)		0				0		
Flared Approac	h: Exists?	/Storage			/				/
Lanes		1							
Configuration		L							
	Delav,	Queue Lei	ngth, an	d Leve	1 0:	f Serv	ice		
Approach	EB .	WB	-	hbound				bound	
Movement	1	4	7	8	9	1	10 1	1	12
Lane Config		LT	L			ĺ			
v (vph)		26	14						
C(m) (vph)		1560	561						
v/c		0.02	0.02						
95% queue leng	+h	0.02	0.02						
Control Delay	C11	7.3	11.6						
LOS		7.3 A	В						
Approach Delay		Д		11.6					
Approach LOS				В					
				-					

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Volume										
Peak-Hour Factor, PHF	Volume					24				-
Peak-In Kinute Volume Kourly Flow Pate, HFR Percent Reavy Vehicles Wordian Type/Storage Undivided VT Channelized? Undivided VD V V V V V V V V V V V V V V V V V V		PHF					0.91			
Hourly Flow Rate, HFR 26										
Percent Beavy Wehicles										
Modian Type/Storage										
### According to Programmer Street Wovements			IInd	irridad						
Cames		ye	ona	_v_ueu		/				
Configuration No						0	2			
### Movement Superior Signal Program										
Minor Street Movements 7 8 9 10 11 12 L T R L T R Peak Nour Pactor, PHF 13 Peak Nour Pactor, PHF 0.91 Peak 15 Minute Volume 4 Percent Heavy Webicles 0 Percent Grade (%) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-					LT.				
L T R L T R L T R	Upstream Signal?			No			No			
L T R L T R L T R	Minary Observat Massa					1.0	1 1	1.0		_
Volume	Minor Street Move	ments								
Peak Hour Factor, PHF			ь	Т	K	П	T	K		
Peak Hour Factor, PHF			12							_
Peak-15 Minute Volume 4 Hourly Flow Rate, HRR 14 Percent Heavy Vehicles 0 Percent Grade (8) 0 Flared Approach: Exists?/Storage / / / / RT Channelized Lanes 1 Configuration L Pedestrian Volumes and Adjustments Lanes 1 Configuration L Proceeding State of the State of Delay to Major Street Vehicles Proceeding State of Delay to Major Street Vehicles Lanes 1 Wuysheed Trunn Through State flow rate, major th vehicles: 0 Sate flow rate, major th vehicles: 1700 Sate flow rate, major the vehicles: 1700 Sate flow rate, major rate vehicles: 1700 Sate flow rate of the rate of t										
Percent Heavy Vehicles 0 Percent Grade (8) Plared Approach: Exists?/Storage / / / / RT Channelized Lanes 1 Configuration L Pedestrian Volumes and Adjustments Movements 13 14 15 16 Flow (ped/hr) 0 0 0 0 0 0 Lane Width (m) 3.6 3.6 3.6 3.6 3.6 Maiking Speed (m/sec) 1.2 1.2 1.2 Percent Blockage 0 0 0 0 0 0 Upstream Signal Data Prog. Sat Arrival Green Cycle Prog. Distance Plow Plow Type Time Length Speed to Signal Vph vph vph vph sec sec kph meters S2 Left-Turn Through Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles Movement 2 Movement 5 Shared In volume, major th vehicles: 0 Shared In volume, major the vehicles: 0 Sat flow rate, major the vehicles: 1700 Sat flow rate, major the vehicles: 1700 Sat flow rate, major the vehicles: 2 Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation Movement 1 4 7 8 9 10 11 12 Ltc, base) 4.1 7.1 Ltc, base) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.										
Percent Grade (8)	_									
Pare Approach: Exists?/Storage /			0							
Pedestrian Volumes and Adjustments							0			
Pedestrian Volumes and Adjustments	Flared Approach:	Exists	?/Stora	ge		/			/	
Pedestrian Volumes and Adjustments	RT Channelized									
Pedestrian Volumes and Adjustments	Lanes		1							
### Prove (ped/hr)	Configuration			L						
13										_
## Prove (ped/hr)		Pe	destria	n Volume	s and Ad	liustmen	t s			
Lane Width (m)	Movements					-				_
Lane Midth (m)	Flow (nod/hr)		0		^	0				_
Upstream Signal Data										
Upstream Signal Data	, ,									
Upstream Signal Data		sec)								
Prog. Sat Arrival Green Cycle Prog. Distance Flow Flow Type Time Length Speed to Signal with wi	Percent Blockage		0	Ü	0	0				
Prog. Sat Arrival Green Cycle Prog. Distance Flow Flow Type Time Length Speed to Signal with wi										_
Prog. Sat Arrival Green Cycle Prog. Distance Flow Flow Type Time Length Speed to Signal with			аU	stream S	ignal Da	ıta				
Flow vph Flow vph Type Time Length Speed to Signal vph vph vph sec sec kph meters		Prog.			-		Pro	g.	Distance	_
Victor V		_						_		
S2 Left-Turn Through S5 Left-Turn Through Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles Movement 2 Movement 5				21 -		_	_		_	
Through S5 Left-Turn Through Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles Movement 2 Movement 5		-	-				-			
Through S5 Left-Turn Through Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles Movement 2 Movement 5	S2 Left-Turn									_
## Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles Movement 2										
## Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles Movement 2	-									
Movement 2 Movement 5										
Movement 2 Movement 5 Shared In volume, major th vehicles: 0 Shared In volume, major rt vehicles: 0 Sat flow rate, major rt vehicles: 1700 Sat flow rate, major rt vehicles: 1700 Number of major street through lanes: 2 Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation Movement 1 4 7 8 9 10 11 12 L L T R L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	IIIIOugii									
Movement 2 Movement 5 Shared In volume, major th vehicles: 0 Shared In volume, major rt vehicles: 0 Sat flow rate, major rt vehicles: 1700 Sat flow rate, major rt vehicles: 1700 Number of major street through lanes: 2 Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation Movement 1 4 7 8 9 10 11 12 L L T R L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0										_
Shared In volume, major th vehicles: Shared In volume, major rt vehicles: Sat flow rate, major rt vehicles: Sat flow rate, major rt vehicles: Sat flow rate, major rt vehicles: Number of major street through lanes: Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation Movement 1	Worksheet 3-Data	for Com	puting	Effect o	f Delay	to Majo	r Stre	et V	ehicles	
Shared In volume, major rt vehicles: Sat flow rate, major rt vehicles: Sat flow rate, major rt vehicles: Number of major street through lanes: Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation Movement 1					Move	ement 2	Мо	vemer	nt 5	_
Shared In volume, major rt vehicles: Sat flow rate, major rt vehicles: Sat flow rate, major rt vehicles: Number of major street through lanes: Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation Movement 1										_
Sat flow rate, major th vehicles: 1700 Sat flow rate, major rt vehicles: 1700 Number of major street through lanes: 2 Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation Movement 1 4 7 8 9 10 11 12 L L L T R L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0										
Sat flow rate, major rt vehicles: Number of major street through lanes: Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation Movement 1 4 7 8 9 10 11 12 L L L T R L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0										
Number of major street through lanes: Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation Movement 1 4 7 8 9 10 11 12 L L T R L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0										
Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation Movement 1 4 7 8 9 10 11 12 L L T R L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0		_				/				
Critical Gap Calculation Movement 1 4 7 8 9 10 11 12 L L L T R L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Number of major s	treet t	hrough	⊥anes:		/	١.	2		
Critical Gap Calculation Movement 1 4 7 8 9 10 11 12 L L L T R L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0								<u> </u>		_
Critical Gap Calculation Movement 1 4 7 8 9 10 11 12 L L L T R L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Worksheet 4-Criti	cal Gar	and Fo	llow-up	Time Cal	culation	n			
Movement 1 4 7 8 9 10 11 12 L L L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0									/	
L L L T R t(c,base) 4.1 7.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	_					/		1	\ /	\
t(c,base)	Movement	1	4	7	8 / 9	10	1	1	12	\
t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0		L	L	L	T F	R L		Т	R	
t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0										
t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	t(c,base)		4.1	7.1					,	
P(hv) 12 0 t(c,g) 0.20 0.20 0.10 0.20 0.10 Percent Grade 0.00 0.00 0.00 0.00 0.00 t(3,1t) 0.00 0.70 t(c,T): 1-stage 0.00 0.00 0.00 0.00 0.00 0.00 2-stage 0.00 0.00 1.00 1.00 0.00 1.00 0.00 t(c) 1-stage 4.2 6.4 2-stage Follow-Up Time Calculations Movement 1 4 7 8 9 10 11 12		1.00	1.00	1.00 1	.00 1.	00 1.	00 1	.00/	1.00	
t(c,g)						1		ſ	<u> </u>	
Percent Grade					.20 0	10 0 4	20 0	.20	0.10/	111/
t(3,1t) 0.00 0.70 t(c,T): 1-stage 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.										1111
t(c,T): 1-stage 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.						0.	0	.00	5.00	
2-stage 0.00 0.00 1.00 1.00 0.00 1.00 0.00 1.00 0.00 t(c) 1-stage 4.2 6.4 2-stage Follow-Up Time Calculations Movement 1 4 7 8 9 10 11 12		0 00			00 0	00 0	0	00	0 00	
t(c) 1-stage 4.2 6.4 2-stage Follow-Up Time Calculations Movement 1 4 7 8 9 10 11 12										/ /
2-stage Follow-Up Time Calculations Movement 1 4 7 8 9 10 11 12		U.U0			.00 0.	00 1.	υυ 1	.00	0.00	
Follow-Up Time Calculations Movement 1 4 7 8 9 10 11 12	- · · ·		4.2	6.4						// /
Movement 1 4 7 8 9 10 11 12	2-stage								1	
Movement 1 4 7 8 9 10 11 12									}	
				7	0 0		_	1	10	
	Movement									
		Ь	Ь	Ь	T. B	L		T	K	\



```
t(f,base)
                           2.20
                                   3.50
                   0.90
                           0.90
                                           0.90
                                                   0.90
                                                           0.90
                                                                   0.90
                                                                           0.90
t(f,HV)
                                   0.90
P(HV)
                           12
                                   0
                                   3.5
t(f)
                           2.3
Worksheet 5-Effect of Upstream Signals
Computation 1-Queue Clearance Time at Upstream Signal
                                                  Movement 2
                                                                       Movement 5
                                               V(t)
                                                     V(l,prot) V(t)
                                                                          V(l,prot)
V prog
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P
g(q1)
g (q2)
g (q)
Computation 2-Proportion of TWSC Intersection Time blocked
                                                  Movement 2
                                                                       Movement 5
                                               V(t)
                                                     V(l,prot) V(t) V(l,prot)
alpha
beta
Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f
Max platooned flow, V(c,max)
Min platooned flow, V(c,min)
Duration of blocked period, t(p) Proportion time blocked, p
                                                    0.000
                                                                         0.000
Computation 3-Platoon Event Periods
                                              Result
p(2)
p(5)
                                              0.000
p(dom)
p(subo)
Constrained or unconstrained?
Proportion
unblocked
                               (1)
                                                  (2)
for minor
                          Single-stage
                                                  Two-Stage Process
movements, p(x)
                            Process
                                              Stage I
                                                                Stage II
p(1)
p(4)
p(7)
p(8)
p(9)
p(10)
p(11)
p(12)
Computation 4 and 5
Single-Stage Process
                                                   8
                                                           9
                                                                  10
Movement
                           1
                                   4
                                                                          11
                           L
                                   L
                                           L
                                                   Т
                                                                   L
                                                                                   R
V c,x
                                          449
S
Рx
V c,u,x
Cr,x
C plat,x
Two-Stage Process
                                          8
                                                           10
                                                                              11
                Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 Stage1
                                                                               Stage2
V(c,x)
```



3000 P(x) V(c,u,x)C(r,x) C(plat,x) Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St. 9 Conflicting Flows Potential Capacity Pedestrian Impedance Factor 1.00 1.00 Movement Capacity Probability of Queue free St. 1.00 1.00 Step 2: LT from Major St. 4 Conflicting Flows 0 Potential Capacity 1560 Pedestrian Impedance Factor 1.00 1.00 Movement Capacity 1560 Probability of Queue free St. 0.98 1.00 Maj L-Shared Prob Q free St. 0.98 Step 3: TH from Minor St. 11 Conflicting Flows Potential Capacity 1.00 1.00 Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity 0.98 0.98 Probability of Queue free St. 1.00 1.00 Step 4: LT from Minor St. 10 Conflicting Flows 449 Potential Capacity 571 Pedestrian Impedance Factor 1.00 1.00 Maj. L, Min T Impedance factor 0.98 Maj. L, Min T Adj. Imp Factor. 0.99 Cap. Adj. factor due to Impeding mymnt 0.98 0.99 Movement Capacity 561 Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance Step 3: TH from Minor St. 8 11 Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Movement Capacity Probability of Queue free St. Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity 1.00 1.00 Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt 0.98 0.98 Movement Capacity Result for 2 stage process: а Ct Probability of Queue free St. 1.00 1.00



tep 4: LT from Minor St.			7		10	
art 1 - First Stage						
onflicting Flows otential Capacity						
edestrian Impedance Factor						
ap. Adj. factor due to Impedi	ng mvmnt					
ovement Capacity						
Part 2 - Second Stage Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Factor						
Cap. Adj. factor due to Impedi	.ng mvmnt					
Movement Capacity						
Part 3 - Single Stage			449			
Conflicting Flows Potential Capacity			571			
Pedestrian Impedance Factor			1.00		1.00	
Maj. L, Min T Impedance factor					0.98	
Maj. L, Min T Adj. Imp Factor.			0 00		0.99	
Cap. Adj. factor due to Impedi Movement Capacity	ng mvmnt		0.98 561		0.99	
Results for Two-stage process:						
a						
Y						
C t			561			
Worksheet 8-Shared Lane Calcul	ations					
		8	9	10	11	12
Movement	7	0				_
Movement	L L	o T	R	L	Т	R
Movement Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)		Т		L	Т	R
Volume (vph) Movement Capacity (vph)	14 561	Т	R			R
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff	L 14 561 Fect of Fla	T ared Mino	R Property of the Research of	t Appro	aches	12
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff	L 14 561 Fect of Fla	T	R or Stree	t Appro	aches	
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep	14 561 Fect of Fla 7 L 561	T ared Mino	R Property of the Research of	t Appro	aches	12
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume	L 14 561 Fect of Fla 7 L	T ared Mino	R Property of the Research of	t Appro	aches	12
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay	14 561 Fect of Fla 7 L 561	T ared Mino	R Property of the Research of	t Appro	aches	12
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay Q sep	14 561 Fect of Fla 7 L 561	T ared Mino	R Property of the Research of	t Appro	aches	12
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay 2 sep 2 sep +1	14 561 Fect of Fla 7 L 561	T ared Mino	R Property of the Research of	t Appro	aches	12
Wolume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1)	14 561 Fect of Fla 7 L 561	T ared Mino	R Property of the Research of	t Appro	aches	12
Wolume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max C sh	14 561 Fect of Fla 7 L 561	T ared Mino	R Property of the Research of	t Appro	aches	12
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max C sh SUM C sep	14 561 Fect of Fla 7 L 561	T ared Mino	R Property of the Research of	t Appro	aches	12
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay Q sep 2 Q sep +1 round (Qsep +1) n max C sh SUM C sep	14 561 7 L 561	T ared Mino	R Property of the Research of	t Appro	aches	12
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max C sh SUM C sep	14 561 7 L 561	T ared Mino	R Property of the Research of	t Appro	aches	12
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)	14 561 Fect of Fla 7 L 561 14	T ared Mino	or Stree	t Appro	aches	12
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max C sh SUM C sep n C act	14 561 Fect of Fla 7 L 561 14	T ared Mino	or Stree	t Appro	aches	12
Tolume (vph) Novement Capacity (vph) Norksheet Lane Capacity (vph) Norksheet 9-Computation of Eff Novement Sep No	I 14 561 Fect of Fla 7 L 561 14	T 8 T	R or Stree 9 R	t Approx	aches 11 T	12 R
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay 2 sep +1 round (Qsep +1) n max C sh SUM C sep C act Worksheet 10-Delay, Queue Leng Movement 1 4 Lane Config LT (vph) 26	14 561 Fect of Fla 7 L 561 14	T 8 T	R or Stree 9 R	t Approx	aches 11 T	12 R
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max C sh SUM C sep n C act Worksheet 10-Delay, Queue Leng Movement 1 4 Lane Config LT v (vph) 26 C(m) (vph) 26 C(m) (vph)	14 561 Fect of Fla 7 L 561 344 560 561	T 8 T	R or Stree 9 R	t Approx	aches 11 T	12 R
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max C sh SUM C sep n C act Worksheet 10-Delay, Queue Leng Movement 1 4 Lane Config LT v (vph) 26 C(m) (vph) 156 v/c 0.0	14 561 Fect of Fla 7 L 561 14 50 561 02 0.02	T 8 T	R or Stree 9 R	t Approx	aches 11 T	12 R
Wolume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay 2 sep 2 sep +1 round (Qsep +1) n max C sh C act Worksheet 10-Delay, Queue Leng Movement 1 4 Lane Config LT v (vph) 26 C(m) (vph) 156 v/c 0.0 95% queue length 0.0	I 14 561 Fect of Fla 7 L 561 14 14 560 561 12 0.02 0.08	T 8 T	R or Stree 9 R	t Approx	aches 11 T	12 R
Wolume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Eff Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max C sh SUM C sep n C act Worksheet 10-Delay, Queue Leng Movement 1 4 Lane Config LT v (vph) 26 C(m) (vph) 26 C(m) (vph) 156 v/c 0.0 95% queue length 0.0 Control Delay 7.3 LOS A	14 561 Fect of Fla 7 L 561 14 50 561 12 0.02 0.02 0.08 11.6	T ared Mino 8 T	R or Stree 9 R	t Approx	aches 11 T	12 R
Worksheet 9-Computation of Eff Worksheet 9-Computation of Eff	14 561 Fect of Fla 7 L 561 14 50 561 12 0.02 0.02 0.08 11.6	red Mino 8 T	R or Stree 9 R	t Approx	aches 11 T	12 R
Tolume (vph) Idovement Capacity (vph) Idovement Capacity (vph) Idovement Capacity (vph) Idovement Idovemen	14 561 Fect of Fla 7 L 561 14 50 561 12 0.02 0.02 0.08 11.6	T ared Mino 8 T	R or Stree 9 R	t Approx	aches 11 T	12 R



	Movement 2	Movement 5
p(oj)	1.00	0.98
v(il), Volume for stream 2 or 5		0
v(i2), Volume for stream 3 or 6		0
s(il), Saturation flow rate for stream 2 or 5		1700
s(i2), Saturation flow rate for stream 3 or 6		1700
P*(oj)		0.98
d(M,LT), Delay for stream 1 or 4		7.3
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5		2

1.1.4.4 Interseção B — Pico Tarde

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__TWO-WAY STOP CONTROL SUMMARY_

Analyst: Progeplan Agency/Co.: 05/06/2023 Date Performed: Analysis Time Period: Pico Tarde Intersection: В DER/DF Jurisdiction: Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL East/West Street: North/South Street:

Approach Delay

Approach LOS

North/South Street:	M7					
Intersection Orienta	ation: EW		S	tudy perio	od (hrs)	: 1.00
	T7-1-1-1-1- T7-	1	-1 7 -1			
Maian Chasta Anna	Vehicle Vo				a a + b a a d	
Major Street: Appro		lastbound 2			estbound 5	
Moven		_	3	4		6
	L	Т	R	L	Т	R
Volume				12	2153	
Peak-Hour Factor, Ph	71			0.91		
Hourly Flow Rate, HE				13	2365	
Percent Heavy Vehicl				0	2505	
Median Type/Storage		vided		/		
RT Channelized?	Ullai	vided		/		
				0	0	
Lanes				0	2	
Configuration				1	LT T	
Upstream Signal?		No			No	
Minor Street: Appro	nach N	Jorthboun	d	S	outhboun	d
Moven		8	9	1 10	11	12
110 v Ch	T ₁	Т	R	I I	Т	R
	п.	-	11	1 4	1	10
Volume	171					
Peak Hour Factor, Ph	HF 0.91					
Hourly Flow Rate, HE		-		/	\	
Percent Heavy Vehicl						
Percent Grade (%)	20	0			0	
Flared Approach: Ex	riete2/Storac	-		,		/ /
Lanes	1		\	1		
Configuration	1	L	7		`	\
Configuration		ь		/		1 1 /
De	elay, Queue I	ength. a	nd Lev	el of Serv	vice	
Approach	EB WB		thboun			hbound
Movement.	1 4 1	7	8	9 1		11 12
Lane Config	LT I		O	7	10	
Hanc confirs	11	ш		'~		1 /> -
v (vph)	13	187		1) / /
C(m) (vph)	1636	185				
v/c	0.01	1.01				1 1
95% queue length	0.02	17.26			1	\ \
Control Delay	7.2	222.6				
LOS	Α.	F				$\neg \ \ \setminus \ \ $
Ammasah Dalam	-11	-	222 6			

222.6

F



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Phone: E-Mail:	Fax:								
	TWO-WAY STO	P CONTR	OL(TWS	C) ANAL	YSIS				
Analyst:	Progeplan								
Agency/Co.:									
Date Performed:	05/06/2023								
Analysis Time Period:									
Intersection: Jurisdiction:	B DER/DF								
Units: U. S. Metric	DER/ DE								
Analysis Year:	2023								
Project ID: FUTURA CO									
East/West Street:	M2								
North/South Street:	M7								
Intersection Orientati	on: EW		St	tudy pe	riod (h	rs): 1	.00		
	Vehicle V	olumes a	and Adj	justmen	ts				
Major Street Movements		2	3	4	5	6			
	L	Т	R	L	Т	R			
 Volume				12	2153				
Peak-Hour Factor, PHF				0.91	0.91				
Peak-15 Minute Volume				3	591				
Hourly Flow Rate, HFR				13	2365				
Percent Heavy Vehicles	3			0					
Median Type/Storage	Undiv	rided		/					
RT Channelized?									
Lanes				0	2				
Configuration		No		L'	T T				
Upstream Signal?		No			No				
Minor Street Movements		8	9	10	11	12			
	L	T	R	L	Т	R			
Volume	171								
Peak Hour Factor, PHF	0.91								
Peak-15 Minute Volume	47								
Hourly Flow Rate, HFR	187								
Percent Heavy Vehicles	20								
Percent Grade (%)		0		,	0		,		
Flared Approach: Exis	sts?/Storage			/			/		
RT Channelized Lanes	1								
Lanes Configuration	L								
	Pedestrian	Volumos	and no	Nine+ma	nt s			_	
Movements	_Pedestrian 13	14	and Ad	ijustme: 16	.165		\		
D1 (1/h)									
Flow (ped/hr) Lane Width (m)	0 3.6	0 3.6	0 3.6	0 3.6		\			
Walking Speed (m/sec)	1.2	1.2	1.2	1.2					
Percent Blockage	0	0	0	0					
			<u> </u>						
	Upst	ream Si	gnal Da	ata					
Prog.		rrival	Green	7	e Pro		stance		
Flow	Flow	Type	Time	Leng	_		Signal		
vph	vph		sec	sec	kp	h n	neters		
S2 Left-Turn							++		
Through					(/ /		
S5 Left-Turn									
Through									



						Movemen	t 2	Movemen	nt 5	
Shared lr Shared lr Sat flow Sat flow Number of	rate, marate,	, majo: ajor tl ajor r	r rt vel h vehici t vehici	nicles: les: les:	:			0 0 1700 1700 2		_
Worksheet	4-Crit	ical G	ap and l	Follow-	up Time	Calcula	ation			
Critical	Gap Calo	culation	on							_
Movement	-	1	4	7	8	9	10	11	12	
		L	L	L	Т	R	L	Т	R	
t(c,base) t(c,hv) P(hv)		1.00	4.1 1.00 0	7.1 1.00 20	1.00	1.00	1.00	1.00	1.00	_
t(c,g) Percent (t(3,lt)	Grade		0.00	0.20 0.00 0.70	0.20	0.10	0.20	0.20	0.10	
	1-stage 2-stage 1-stage 2-stage	0.00	0.00 0.00 4.1	0.00 1.00 6.6	0.00	0.00	0.00	0.00	0.00	
Follow-Up	Time Ca	alcula	tions							_
Movement		1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R	
t(f,base) t(f,HV) P(HV) t(f)		0.90	2.20 0.90 0 2.2	3.50 0.90 20 3.7	0.90	0.90	0.90	0.90	0.90	
V prog Total Sat	Type			(vph)	V (t) V(l,prot) 	V(t)	V(1,prot)	_
Effective Cycle Ler Rp (from Proportic g(q1) g(q2) g(q)	ngth, C Exhibit	(sec) 16-11)	on gree	n P					
Computati	on 2-Pro	oportio	on of TV	VSC Inte	ersecti	on Time	block	ed		
					V (Movement) V(nt 2 l,prot)	\	Vement 5 V(1,prot)	
alpha beta						$\overline{}$				
Travel ti Smoothing Proportic Max plate Min plate Duration Proportic	g Factor, on of cor ooned flo ooned flo of block	, F nflict: ow, V(c ow, V(c ked pe:	ing flow c,max) c,min) riod, t			0.000	1		0.000	
Computati				eriods	Res	ult		- {	7	-))(
p(2) p(5) p(dom) p(subo)					0.0		/			
Constrair	ned or un	nconst	rained?							
Proportion unblocked for minor	i		(1) Single			(2) Two-Sta	age Pro	(3) cess	1	_



novements, p(x)	Proce		Sta	_		Stage				
(1) (4)									_	
(7)										
(8)										
(9)										
(10)										
(11)										
(12)										
Computation 4 and 5										
Single-Stage Process	1	4	7	0	0	1.0	1.1	1.0		
Iovement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R		
	ш	ш	ш	1	1	ш	1	1		
7 C, X		0	1208							
3										
X										
/ c,u,x										
Cr,x Cplat,x										
Wo-Stage Process									_	
Stage1	7 Stage2	Stage1	8 Stage	2 Sta	10 age1 S	tage2	11 Stage1			
7(c,x)									_	
3	3000									
?(x) 7(c,u,x)										
C(plat,x)	and Capa	acity E	quation	s						
C(plat,x) Norksheet 6-Impedance		acity E	quation	S	9		12		_	
C(r,x) C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity		acity E	quation	s	9		12		 	
C(plat,x) Norksheet 6-Impedance Step 1: RT from Minor	St.	acity E	quation		9		12		_	
C(plat,x) Norksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity	St.	acity E	quation	1	.00		1.00		_	
C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance	St.	acity E	quation	1						
C(plat,x) Norksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity	Factor free St.	acity E	quation	1	.00		1.00			
Coplat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Cotential Capacity Cedestrian Impedance Movement Capacity Crobability of Queue Step 2: LT from Major Conflicting Flows	Factor free St.	acity E	quation	1	00		1.00			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Cotential Capacity Cedestrian Impedance Movement Capacity Crobability of Queue Step 2: LT from Major Conflicting Flows Conflicting Flows Conflicting Capacity	Factor free St.	acity E	quation	1 1 (00		1.00			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Pedestrian Impedance	Factor free St.	acity E	quation	1 1 0	00		1.00			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Cotential Capacity Cedestrian Impedance Movement Capacity Crobability of Queue Step 2: LT from Major Conflicting Flows Conflicting Flows Conflicting Capacity	Factor free St.	acity E	quation	1 1 0 1 1 1	00		1.00			
Conflicting Flows Porbability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Pedestrian Impedance Covement Capacity Pedestrian Impedance Covement Capacity	Factor free St. Factor free St.	acity E	quation	1 1 1 0 1 1	4		1.00			
Coplat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Pedestrian Impedance Conflicting Flows Potential Capacity Pedestrian Impedance Covement Capacity Probability of Queue	Factor free St. Factor free St. Factor free St.	acity E	quation	1 1 1 0 1 1	00 400 63600 63600		1.00			
Conflicting Flows Portable Type and Type Conflicting Flows Conflicting Flows Conflicting Flows Conflicting Impedance Movement Capacity Probability of Queue Conflicting Flows	Factor free St. Factor free St. Factor free St.	acity E	quation	1 1 1 0 1 1	00 00 4 00 00 00 636 99		1.00 1.00 1 1.00 1.00			
Coplat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Pedestrian Impedance Movement Capacity Pedestrian Impedance Movement Capacity Probability of Queue Maj L-Shared Prob Q for Step 3: TH from Minor Conflicting Flows Potential Capacity Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Maj L-Shared Prob Q for Step 3: TH from Minor Conflicting Flows Potential Capacity	Factor free St. Factor free St. St. Factor free St. St.	acity E	quation	11 11 11 11 11 11 11 11 11 11 11 11 11	00 00 4 00 636 00 99 99		1.00 1.00 1 1.00 1.00			
Coplat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Probability of Queue Major Conflicting Flows Potential Capacity Probability of Queue Major Conflicting Flows Probability of Queue Major Conflicting Flows Probability of Queue Major Conflicting Flows Potential Capacity Probability of Queue Major Conflicting Flows Potential Capacity Probability Of Queue Major Conflicting Flows Potential Capacity Probability Potential Capacity Potential Capac	Factor free St. Factor free St. Factor free St. St.				00 00 4 00 00 00 00 99 99		1.00 1.00 1 1.00 1.00			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Cotential Capacity Pedestrian Impedance Covement Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Cotential Capacity Pedestrian Impedance Covement Capacity Probability of Queue Maj L-Shared Prob Q f Cotential Capacity Cotential Capaci	Factor free St. Factor free St. Factor free St. St.				00 00 4 00 636 00 99 99		1.00 1.00 1 1.00 1.00			
Coplat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Probability of Queue Major Conflicting Flows Potential Capacity Probability of Queue Major Conflicting Flows Probability of Queue Major Conflicting Flows Probability of Queue Major Conflicting Flows Potential Capacity Probability of Queue Major Conflicting Flows Potential Capacity Probability Of Queue Major Conflicting Flows Potential Capacity Probability Potential Capacity Potential Capac	Factor free St. Factor free St. Factor free St. St.				00 00 4 00 00 00 00 99 99		1.00 1.00 1 1.00 1.00			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Step 2: LT from Major Conflicting Flows Potential Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Probability of Queue Maj L-Shared Prob Q for Step 3: TH from Minor Conflicting Flows Potential Capacity Probability of Queue Maj L-Shared Prob Q for Step 3: TH from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Capacity Pedestrian Impedance Capacity Pad Adj. factor due Movement Capacity	Factor free St. Factor free St. Factor free St. St. Factor free St. free St.				00 4 0 .636 00 636 99 0.99		1.00 1.00 1 1.00 1.00			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Step 2: LT from Major Conflicting Flows Potential Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Probability of Queue Maj L-Shared Prob Q f Step 3: TH from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Capacity Pedestrian Impedance Capacity Pedestrian Impedance Capacity Pedestrian Impedance Capacity Probability of Queue Step 4: LT from Minor Conflicting Flows Conflicting Flows	Factor free St. Factor free St. Factor free St. St. Factor free St. free St.				00 4 0 00 636 00 636 99 99 8 00 99		1.00 1.00 1.00 1.00 1.00 0.99 1.00			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Overent Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Probability of Queue Movement Capacity Probability of Queue Maj L-Shared Prob Q for Step 3: TH from Minor Conflicting Flows Potential Capacity Probability of Queue Maj L-Shared Prob Q for Movement Capacity Probability of Queue	Factor free St. Factor free St. Factor free St. St. Factor free St.				00 4 0 636 00 636 00 636 0.99 0.99 8		1.00 1.00 1.00 1.00 1.00 1.00 0.99 1.00	<i></i>		
Conflicting Flows Conflicting Flows Conflicting Flows Conflicting Flows Contain Impedance Conflicting Flows Conflicting	Factor free St. Factor free St. St. Factor free St. St. Factor to Impedifree St. St.	ing mvm			00 4 0 00 636 00 636 99 99 8 00 99		1.00 1.00 1.00 1.00 1.00 1.00 1.00			
Conflicting Flows Potential Capacity Probability of Queue Conflicting Flows Potential Capacity Probability of Queue Conflicting Flows Probability of Queue Conflicting Flows Potential Capacity Probability of Queue Conflicting Flows Potential Capacity Probability of Queue Conflicting Flows Probability of Queue Conflicting Flows Probability of Queue Conflicting Flows Potential Capacity Probability of Queue Conflicting Flows Potential Capacity Probability of Queue Conflicting Flows Probability of Queue	Factor free St. Factor free St. Factor free St. St. Factor to Impedi free St. St.	ing mvm			00 4 0 636 00 636 00 636 0.99 0.99 8		1.00 1.00 1.00 1.00 1.00 0.99 1.00 1.00			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Cotential Capacity Cedestrian Impedance Covement Capacity Conflicting Flows Cotential Capacity Companies Conflicting Flows Conflic	Factor free St. Factor free St. St. Factor free St. St. Factor to Impedifice St. St.	ing mvm	nt		00 4 0 636 00 636 00 636 0.99 0.99 8		1.00 1.00 1.00 1.00 1.00 1.00 1.00			
orksheet 6-Impedance tep 1: RT from Minor onflicting Flows otential Capacity edestrian Impedance ovement Capacity robability of Queue tep 2: LT from Major onflicting Flows otential Capacity edestrian Impedance ovement Capacity edestrian Impedance ovement Capacity robability of Queue aj L-Shared Prob Q f tep 3: TH from Minor onflicting Flows otential Capacity edestrian Impedance ap. Adj. factor due ovement Capacity robability of Queue tep 4: LT from Minor onflicting Flows otential Capacity edestrian Impedance aj. L, Min T Impedance aj. L, Min T Impedarce aj. L, Min T Impedarce	Factor free St. Factor free St. St. Factor free St. St. Factor to Impedifice St. St.	ing mvm	nt		00 00 4 00 00 00 00 00 		1.00 1.00 1.00 1.00 1.00 1.00 0.99 1.00 0.99 0.99			



Step 3: TH from Minor St.	8	11	
Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Movement Capacity Probability of Queue free St.			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Movement Capacity			
Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Movement Capacity	1.00	1.00	
Result for 2 stage process:			
y C t Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	
Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Movement Capacity			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Movement Capacity			
Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mymnt Movement Capacity	1208 186 1.00 0.99 185	1.00 0.99 0.99 0.99	
Results for Two-stage process:			-
y C t	185	$\langle \rangle$)
Worksheet 8-Shared Lane Calculations			
Movement 7	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	.0 11 12 L T R	
Volume (vph) 18 Movement Capacity (vph) 18 Shared Lane Capacity (vph)		775	
Worksheet 9-Computation of Effect of Fl	ared Minor Street Ap	pproaches	
Movement 7		.0 11 12 L T R	
C sep 18 Volume 18			



Delay Q sep Q sep +1 round (Qsep +1)

n max C sh SUM C sep n C act

Worksheet 10-Delay, Queue Length, and Level of Service

Movement	1	4	7	8	9	10	11	12
Lane Config		LT	L					
v (vph)		13	187					
C(m) (vph)		1636	185					
v/c		0.01	1.01					
95% queue length		0.02	17.26					
Control Delay		7.2	222.6					
LOS		A	F					
Approach Delay				222.6				
Approach LOS				F				

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	0.99
v(il), Volume for stream 2 or 5		0
v(i2), Volume for stream 3 or 6		0
s(il), Saturation flow rate for stream 2 or 5		1700
s(i2), Saturation flow rate for stream 3 or 6		1700
P*(oj)		0.99
d(M,LT), Delay for stream 1 or 4		7.2
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5		2

1.1.4.5 Interseção C – Pico Manhã

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: Progeplan Agency/Co.:
Date Performed: 05/06/2023 Analysis Time Period: Pico Manha Intersection: С DER/DF ${\tt Jurisdiction:}$ Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL East/West Street:

MOV01-MOV05-MOV07

North/South Street: MOV08

Intersection Orientation	on: EW	Study pe	eriod (hrs):	1.00
7	Vehicle Volumes a	nd Adjustments		
Major Street: Approach	n Eastboun	id \	Westbound	
Movement	1 2	3 4	5	6
	L T	R L	T	R
Volume	39 1812			
Peak-Hour Factor, PHF	0.91 0.91			
Hourly Flow Rate, HFR	42 1991			
Percent Heavy Vehicles	0		\	\\ / / /
Median Type/Storage	Undivided	/		
RT Channelized?				
Lanes	0 2			
Configuration	LT T			
Upstream Signal?	No		No	
Minor Street: Approach	n Northbou	ind	Southbound	



М	ovement	7 L	8 T	9 R		10 L	11 T	12 R	
Volume						9			
Peak Hour Factor	, PHF					0.91			
Hourly Flow Rate	, HFR					9			
Percent Heavy Vel	nicles					12			
Percent Grade (%))		0				0		
Flared Approach:	Exists?/S	Storage	€		/				/
Lanes						1			
Configuration						L			

Delay, Queue Length, and Level of Service

Northbound Southbound Approach 10 Movement 1 4 8 11 Lane Config LT L v (vph) 42 C(m) (vph) 1636 225 v/c 0.03 0.04 95% queue length 0.08 0.12 Control Delay 7.3 21.7 LOS Α Approach Delay 21.7 Approach LOS С

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax: E-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Progeplan Agency/Co.: 05/06/2023 Date Performed: Analysis Time Period: Pico Manha Intersection: С Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL MOV01-MOV05-MOV07 East/West Street:

North/South Street: MOV08 Intersection Orientation: EW

Study period (hrs): 1.00

					/ \					
	Vehicle	Volumes	and Ad	justmen	ts					
Major Street Movements	1	2	3 /	4	5	6				
	L	T	R	L	T	R)			
Volume	39	1812				7 7				
Peak-Hour Factor, PHF	0.91	0.91	/			- 1 1		\		
Peak-15 Minute Volume	11	498				_ \ \ '	\ /	\		
Hourly Flow Rate, HFR	42	1991								
Percent Heavy Vehicles	0		\- -	\						
Median Type/Storage	Und:	ivided		×						
RT Channelized?										
Lanes	0	2		7		ſ				
Configuration]	LT T				- 1			. \ \	\
Upstream Signal?		No			No				TT	
Minor Street Movements	7	8	9	10	11	12	++-			
	L	Т	R	L	Т	R	\ \			/
									/ /	
Volume				9					///	
Peak Hour Factor, PHF				0.91		`				
Peak-15 Minute Volume				2						
Hourly Flow Rate, HFR				9						
Percent Heavy Vehicles				12						



Percent Grade (%) 0 0
Flared Approach: Exists?/Storage // //
RT Channelized
Lanes 1
Configuration L

Movements	13	14	15	16	
Flow (ped/hr)	0	0	0	0	
Lane Width (m)	3.6	3.6	3.6	3.6	
Walking Speed (m/sec)	1.2	1.2	1.2	1.2	
Percent Blockage	0	0	0	0	

Upstream Signal Data Prog. Sat Arrival Green Cycle Prog. Distance Flow Flow Type Time Length Speed to Signal vph vph sec sec kph meters

S2 Left-Turn Through S5 Left-Turn Through

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

	Movement 2	Movement 5
Shared In volume, major th vehicles:	0	
Shared ln volume, major rt vehicles:	0	
Sat flow rate, major th vehicles:	1700	
Sat flow rate, major rt vehicles:	1700	
Number of major street through lanes:	2	

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical	l Gap Cal	culati	on						
Movement	t	1	4	7	8	9	10	11	12
		L	L	L	Т	R	L	Т	R
t(c,base	e)	4.1					7.1		
t(c,hv)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)		0					12		
t(c,g)				0.20	0.20	0.10	0.20	0.20	0.10
Percent	Grade			0.00	0.00	0.00	0.00	0.00	0.00
t(3,1t)		0.00					0.70		
t(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage						6.5		
	2-stage							\	

Follow-Up Ti	me Calculat	tions					\	_
Movement	1	4	7	8	9	10	11 12	
	L	L	L	Т	R	L	T R	
t(f,base)	2.20	0.00	0.00	0.00	200	3.50	0.00	_
t(f,HV) P(HV)	0.90 0	0.90	0.90	0.90	0.90	0.90 12	0.90 0.90	
t(f)	2.2					3.6		_

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

Movement 2 Movement 5 V(t) V(1,prot) V(t) V(1,prot)

V prog
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P



g(q1) g(q2) g (q) Computation 2-Proportion of TWSC Intersection Time blocked Movement 2 Movement 5 V(t) V(1,prot) V(t) V(1,prot) alpha beta Travel time, t(a) (sec) Smoothing Factor, F Proportion of conflicting flow, f Max platooned flow, V(c,max) Min platooned flow, V(c,min) Duration of blocked period, t(p) Proportion time blocked, p 0.000 0.000 Computation 3-Platoon Event Periods Result p(2) 0.000 p(5) 0.000 p(dom) p(subo) Constrained or unconstrained? Proportion unblocked (1) (2) (3) for minor Single-stage Two-Stage Process movements, p(x) Process Stage I Stage II p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12) Computation 4 and 5 Single-Stage Process 12 Movement 1 4 8 9 10 11 L R L Τ R V c,x 1079 Рx V c,u,x Cr,x C plat,x Two-Stage Process Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 V(c,x) 3000 P(x) V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St. 12 9 Conflicting Flows Potential Capacity 1.00 1.00 Pedestrian Impedance Factor

1.00

4

1.00

1

Movement Capacity

Probability of Queue free St.

Step 2: LT from Major St.



			engennaria e meio
Conflicting Flows		0	
Potential Capacity		1636	
Pedestrian Impedance Factor	1.00	1.00	
Movement Capacity		1636	
Probability of Queue free St.	1.00	0.97	
Maj L-Shared Prob Q free St.		0.97	
Step 3: TH from Minor St.	8	11	
			-
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00	
Cap. Adj. factor due to Impeding mvmnt	0.97	0.97	
Movement Capacity			
Probability of Queue free St.	1.00	1.00	
			-
Step 4: LT from Minor St.	7	10	
		1070	-
Conflicting Flows		1079	
Potential Capacity	1 00	231	
Pedestrian Impedance Factor	1.00	1.00	
Maj. L, Min T Impedance factor	0.97		
Maj. L, Min T Adj. Imp Factor.	0.98	0.07	
Cap. Adj. factor due to Impeding mymnt	0.98	0.97	
Movement Capacity		225	
			-
Mankahaat 7 Commitation - 5 11 755 1	Muse observe C 3	n+ an aa	
Worksheet 7-Computation of the Effect of	Two-stage Gap Acce	eptance	
Ober O. Mil from Miner Ob		1 1	-
Step 3: TH from Minor St.	8	11	
			-
Part 1 - First Stage			
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity			
Dechability of Output from Ct			
Probability of Queue free St.			
			-
Part 2 - Second Stage			-
Part 2 - Second Stage			
Part 2 - Second Stage Conflicting Flows			
Part 2 - Second Stage Conflicting Flows Potential Capacity			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity			-
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows	1.00	1.00	-
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity	1.00 0.97	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process:			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t	0.97	0.97	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t	0.97	0.97	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St.	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St.	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St.	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St.	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage Conflicting Flows Potenticting Flows	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage Conflicting Flows Potential Capacity	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a Y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Fart 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage	1.00	1.00	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a y C t Probability of Queue free St. Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	1.00	



Pedestrian Impedan Maj. L, Min T Impe Maj. L, Min T Adj. Cap. Adj. factor d Movement Capacity	g mvmnt	1 0 0 0	7					
Results for Two-st	age process:							
y C t						225		
Worksheet 8-Shared	Lane Calcula	tions						•
Movement		7 L	8 T	9 R	10 L	11 T	12 R	
Volume (vph) Movement Capacity Shared Lane Capaci					9 225			
Worksheet 9-Comput	ation of Effe	ct of Flare	ed Minor	Stree	et Appr	oaches		
Movement		7 L	8 T	9 R	10 L	11 T	12 R	•
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)					225 9			
C sh SUM C sep n C act	, Queue Lengt	h, and Leve	el of Se	ervice	10	11	12	-
Lane Config	LT				L			
v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS	42 1636 0.03 0.08 7.3			/	9 225 0.04 0.12 21.7 C	21.7 C		
Worksheet 11-Share	d Major LT Im	pedance and	d Delay					
				Moveme	ent 2	Move	ment 5	
p(oj) v(i1), Volume for v(i2), Volume for s(i1), Saturation s(i2), Saturation P*(oj) d(M,LT), Delay for N, Number of major d(rank,1) Delay fo	stream 3 or 6 flow rate for flow rate for stream 1 or street throu	stream 2 c stream 3 c 4 gh lanes		0.9 0 0 170 170 0.9 7.3	00 00 97	}	7	
1 1 4 6 Interco	.≈o.C. Dico.⁻	Tardo				_ \		
1.1.4.6 Interseç				. D-1				
н	CS+: Unsignal	ızeu inters	SECTIONS	vete;	15E J.6			_

TWO-WAY STOP CONTROL SUMMARY



Analyst: Progeplan

Agency/Co.:

Date Performed: 05/06/2023 Analysis Time Period: Pico Tarde

Intersection: C

Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023 Project ID: FUTUR COMERCIAL

East/West Street: MOV01-MOV05-MOV07

North/South Street: MOV08

Intersection Orientation: EW Study period (hrs): 1.00

					_	-		•	
	Vehi	cle Vol	umes an	nd Adiu	stme	nts			
Major Street:	Approach		stbound						
-	Movement	1	2	3	- 1	4	5	6	
		L	T	R	Ī	L	Т	R	
Volume		29	855						
Peak-Hour Fact	or, PHF	0.91	0.91						
Hourly Flow Ra	te, HFR	31	939						
Percent Heavy	Vehicles	21							
Median Type/Storage RT Channelized?		Undiv	ided			/			
Lanes		0	2						
Configuration		L'	т т						
Upstream Signa	1?		No				No		
Minor Street:	Approach	Northbound			Southbound				
	Movement	7	8	9		10	11	12	
		L	Т	R	I	L	Т	R	
Volume						12			
Peak Hour Fact	or, PHF					0.91			
Hourly Flow Ra	te, HFR					13			
Percent Heavy Vehicles						0			
Percent Grade	(%)		0				0		
Flared Approac	h: Exists?/	'Storage			/				/
Lanes						1			
Configuration						;	L		

Approach	_Delay,	Queue WB	Le	ngt	h, and Leve Northbound		Ser		uthboun	d
Movement	1	4		7	8	9		10	11	12
Lane Config	LT						I	L		
v (vph)	31							13		
C(m) (vph)	1507							501		
v/c	0.02							0.03		
95% queue length	0.06							0.08		
Control Delay	7.4							12.4		
LOS	A							В		
Approach Delay									12.4	
Approach LOS									В	

HCS+: Unsignalized Intersections Release 5.6

Phone: E-Mail: Fax:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Progeplan Agency/Co.:

Date Performed: 05/06/2023 Analysis Time Period: Pico Tarde

Intersection: C
Jurisdiction: DER/DF

Units: U. S. Metric



Analysis Year: 2023 Project ID: FUTUR COMERCIAL

East/West Street: MOV01-MOV05-MOV07 North/South Street: MOV08

Intersection Orientation: EW

Study period (hrs): 1.00

Movement 5

	Vehicle	Volumes	and Ad	ljustmer	nts		
Major Street Movements	_ 1	2	3	4	5	6	
3	L	T	R	L	T	R	
Volume	29	855					
Peak-Hour Factor, PHF	0.91	0.91					
Peak-15 Minute Volume	8	235					
Hourly Flow Rate, HFR	31	939					
Percent Heavy Vehicles	21						
Median Type/Storage	Undi	ivided		/			
RT Channelized?							
Lanes	0	2					
Configuration	I	T T					
Upstream Signal?		No			No		
	7			1.0	11	1.0	
Minor Street Movements		8	9	10	11	12	
	L	T	R	L	Т	R	
Volume				12			
Peak Hour Factor, PHF				0.91			
Peak-15 Minute Volume				3			
Hourly Flow Rate, HFR				13			
Percent Heavy Vehicles				0			
Percent Grade (%)		0		Ü	0		
Flared Approach: Exist	s2/Storac	-		/	Ü		/
RT Channelized	3./500140	JC .		/			/
Lanes				1			
Configuration				Ī			
Configuration				1	_		
	edestriar	n Volumes 14	and A	djustme 16	ents_		
Movements	13	14	15	10			
Flow (ped/hr)	0	0	0	0			
Lane Width (m)	3.6	3.6	3.6	3.6	ŝ		
Walking Speed (m/sec)	1.2	2 1.2	1.2	1.2	2		
Percent Blockage	0	0	0	0			
Prog.	Ups Sat	stream Si Arrival	-		lo B	rog.	Distance
Flow	Flow		Time	4		_	
		Type		-		peed knh	to Signal
vph	vph		sec	sec	-	kph	meters
S2 Left-Turn							
Through							
IIII Ougii							

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

	Movement 2
Shared ln volume, major th vehicles:	0
Shared In volume, major rt vehicles:	0
Sat flow rate, major th vehicles:	1700
Sat flow rate, major rt vehicles:	1700
Number of major street through lanes:	2

S5 Left-Turn Through

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical Gap Ca	alculati	on						
Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(c,base)	4.1					7.1		+-
t(c,hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)	21					0		
t(c,g)			0.20	0.20	0.10	0.20	0.20	0.10
Percent Grade			0.00	0.00	0.00	0.00	0.00	0.00



										engennaria e meio
t(3,1t)		0.00					0.70			
t(c,T):	1-stage		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
t(c)	2-stage 1-stage		0.00	1.00	1.00	0.00	1.00 6.4	1.00	0.00	
L (C)	2-stage						0.4			
	2 bluge									
	p Time C	alculat	tions							_
Movement		1	4	7	8	9	10	11	12	
		L	L	L	Т	R	L	Т	R	
t(f,base		2.20					3.50			_
t(f,HV)	;)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
P(HV)		21	0.50	0.50	0.50	0.50	0	0.50	0.90	
t(f)		2.4					3.5			
										_
Workshee	t 5-Effe	ct of T	Jpstream	m Signa	ls					
Computat	ion 1-Qu	0110 Cl	naranco	Timo a	t IInetr	oam Sig	n a 1			_
Computat	.ion i Qu	eue Cie	arance	IIIIC a	c opscr	Moveme		Mo	vement 5	
					V(l,prot)			
					- (-,	-,,	. (-)	. (-//	
V prog										_
Total Sa	turation	Flow I	Rate, s	(vph)						
Arrival										
	re Green,		2)							
	ngth, C									
-	Exhibit				- D					
g(q1)	on vehic	ies ari	riving	on gree	n P					
g (q1) g (q2)										
g (q2)										
5 (4)										
Computat	ion 2-Pr	oportio	on of T	WSC Int	ersecti	on Time	block	ed		_
						Moveme	nt 2	Mo	vement 5	
					V (t) V(l,prot)	V(t)	V(l,prot)	
										_
alpha										
beta	imo +/2	\ (000)	١							
	ime, t(a g Factor)							
Proporti	on of co	, r nflict:	ing flor	w.f						
	ooned fl			~, -						
	ooned fl									
	of bloc			(p)						
Proporti	on time	blocked	d, p			0.00	0		0.000	
										_
Computat	ion 3-Pl	atoon I	Event Pe	eriods	Res	ult				
p(2)					0.0	n n				_
p(2) p(5)					0.0					
p(dom)					0.0	00				
p(subo)										
	ned or u	nconsti	rained?							
								<u> </u>		_
Proporti							/	\		
unblocke			(1)			(2)		(3)		
for mino			Single-		C+ o		age Pro		/	
movement	.s, p(x)		Proce	288	Sta	ge I	5	tage II	/ _	
p(1)						7 /		$\overline{}$	-{/-	-\
p(4)						١ لـ				\
p(7)										
p(8)					1	\				
p(9)						_ \				
p(10)								//	_	
p(11)								1	\wedge	
p(12)								\		
<u> </u>		-1 F						\sim		- \
	ion 4 an								11	
Single-S Movement	tage Pro	CC33	1	4	7	8	9	10	11 12	//
1-10 v ement	•		L	L	L	T	R	L	T R	
			_	_	_	-		_	1 / "	
V c,x			0					531	7	
s									1	1
Px									1	\neg 1
1 21										
V c,u,x										



C r,x C plat,x			
Two-Stage Process			
7 8	10	11	
Stage1 Stage2 Stage1 Stage	ge2 Stage1 Stag	ge2 Stage1 Stage2	
V(c,x)			
S D (m)	3000)	
P(x) V(c,u,x)			
C(r,x)			
C(plat,x)			
Workshoot 6-Impodance and Canacity Equation	on a		
Worksheet 6-Impedance and Capacity Equation			
Step 1: RT from Minor St.	9	12	
Conflicting Flows			
Potential Capacity	4 00	1 00	
Pedestrian Impedance Factor	1.00	1.00	
Movement Capacity Probability of Queue free St.	1.00	1.00	
resolution of guede free St.	1.00	1.00	
Step 2: LT from Major St.	4	1	
Conflicting Flows		0	
Potential Capacity		1507	
Pedestrian Impedance Factor	1.00	1.00	
Movement Capacity		1507	
Probability of Queue free St.	1.00	0.98	
Maj L-Shared Prob Q free St.		0.98	
Step 3: TH from Minor St.	8	11	
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00	
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	0.98	0.98	
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	
step 4. II IIOM MINOI St.	,	10	
Conflicting Flows		531	
Potential Capacity	1 00	512	
Pedestrian Impedance Factor Maj. L, Min T Impedance factor	1.00	1.00	
Maj. L, Min T Adj. Imp Factor.	0.98 0.98		
Cap. Adj. factor due to Impeding mymnt	0.98	0.98	
Movement Capacity		501	
	/	\	
Worksheet 7-Computation of the Effect of '	Two-stage Gap Acc	ceptance	
Step 3: TH from Minor St.	8	1/1	
Part 1 - First Stage	7/		`\
Conflicting Flows	/		\
Potential Capacity			
Pedestrian Impedance Factor)
Cap. Adj. factor due to Impeding mvmnt Movement Capacity			
Probability of Queue free St.			
Part 2 - Second Store			////
Part 2 - Second Stage Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor			//
Cap. Adj. factor due to Impeding mvmnt			//
Movement Capacity			
Part 3 - Single Stage			
Conflicting Flows		/	< 1
Potential Capacity			



Movement Capacity	vmnt		.00		1.00			
Result for 2 stage process:							-	
a Y								
C t		1	.00		1.00			
Probability of Queue free St.							_	
Step 4: LT from Minor St.			7		10			
Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding m Movement Capacity	vmnt						-	
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding m Movement Capacity	vmnt						-	
Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding m	vmnt	0	.00		531 512 1.00		-	
Movement Capacity					501		_	
Results for Two-stage process:								
Y C t					501			
Worksheet 8-Shared Lane Calculation Movement	7	8	9	10	11_	12	_	
Movement		8 T	9 R	10 L	11 T	12 R	_	
	7						-	
Movement Volume (vph) Movement Capacity (vph)	7 L	Т	R	13 501	Т		-	
Movement Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)	7 L	Т	R	13 501	Т		-	
Movement Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Effect of	7 L of Flare	T ed Minor	R Stree	13 501 t Approa	T aches	R 12	-	
Movement Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Effect of Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max C sh	7 L of Flare	T ed Minor	R Stree	13 501 t Approa	T aches	R 12		
Movement Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Effect of Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max	7 L of Flare	T ed Minor	R Stree	13 501 t Approa	T aches	R 12		
Movement Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Effect of Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max C sh SUM C sep n	of Flare	T ed Minor	R Stree	13 501 t Approa	T aches	R 12		
Movement Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Effect of Movement C sep Volume Delay Q sep Q sep +1 round (Qsep +1) n max C sh SUM C sep n C act	of Flare	T ed Minor	R Stree	13 501 t Approa	T aches	R 12		



0.08 95% queue length 0.06 Control Delay 7.4 LOS Α В Approach Delay Approach LOS

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	0.98	1.00
v(il), Volume for stream 2 or 5	0	
v(i2), Volume for stream 3 or 6	0	
s(il), Saturation flow rate for stream 2 or 5	1700	
s(i2), Saturation flow rate for stream 3 or 6	1700	
P*(oj)	0.98	
d(M,LT), Delay for stream 1 or 4	7.4	
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5	2	

1.1.4.7 Interseção D – Pico Manhã

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

12.4

В

Analyst: Progeplan

Agency/Co.:
Date Performed: 05/06/2023 Analysis Time Period: Pico Manha Intersection: D

Jurisdiction: DER/DF

Units: U. S. Metric
Analysis Year: 2023
Project ID: FUTURA COMERCIAL

East/West Street: MOV01-MOV05-MOV07 North/South Street: MOV06

Study period (hrs): 1.00 Intersection Orientation: ${\tt EW}$

	ehicle Vol		_				
Major Street: Approach		stbound		W	estbound	l	
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume		1790	48				
Peak-Hour Factor, PHF		0.91					
		1967	52				
Hourly Flow Rate, HFR		1967	32				
Percent Heavy Vehicles				, /	\		
Median Type/Storage	Undiv	ıaea		/ /	\		
RT Channelized?							
Lanes		2 (_ `)	
Configuration		T TF	3				
Upstream Signal?		No			No		
						\ \ \	\
Minor Street: Approach		rthbound	i	-	outhbour		\
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume			15)	
Peak Hour Factor, PHF			0.91	7			
Hourly Flow Rate, HFR			16			1 / > -	<u> </u>
Percent Heavy Vehicles			34			\ / /	/ / /
Percent Grade (%)		0			0	7	
Flared Approach: Exist	s?/Storage			/		/	
Lanes		1	L	•	(\ \ \	//
Configuration		R			1		
						¬ \ \	
							_ / /
Delan	Queue Le	nath. ar	nd Levre	of Ser	vice	7	
Approach EB	WB		hbound			hbound	\
Movement. 1	4 I	7	8	9		11 12	
	4	,	0	R I	± 0	11 12	
Lane Config	I			Ν			



v (vph)	16	
C(m) (vph)	253	
v/c	0.06	
95% queue length	0.20	
Control Delay	20.2	
LOS	C	
Approach Delay	20.2	
Approach LOS	С	

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax:

E-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS_

Analyst: Progeplan Agency/Co.:
Date Performed: 05/06/2023 Analysis Time Period: Pico Manha Intersection: D

Intersection:
Jurisdiction:
Units: U. S. Metric
Analysis Year:
Project ID: FUTURA COMERCIAL

Project ID: FUTURA COMERC								
,	01-MOV0	o-MOVU'/						
North/South Street: MOV				. 1		, 1	0.0	
Intersection Orientation:	EW		S	tuay pe	erioa (n	rs): 1	.00	
Ve	ehicle \	/olumes	and Ad	iustmer	nts			
Major Street Movements	1	2	3	4	5	6		_
	L	Т	R	L	Т	R		
								_
Volume		1790	48					
Peak-Hour Factor, PHF		0.91	0.91					
Peak-15 Minute Volume		492	13					
Hourly Flow Rate, HFR		1967	52					
Percent Heavy Vehicles								
Median Type/Storage RT Channelized?	Undiv	vided		/				
Lanes		2	0					
Configuration		T T	R					
Upstream Signal?		No			No			
								_
Minor Street Movements	7	8	9	10	11	12		
	L	Т	R	L	/ T	R		
Volume			15		/ \			_
Peak Hour Factor, PHF			0.91)	
Peak-15 Minute Volume			4					
Hourly Flow Rate, HFR			16					
Percent Heavy Vehicles			34	/		- 1 1	/	\
Percent Grade (%)		0			0	1 1	/	\
Flared Approach: Exists?	/Storage	€		/				
RT Channelized			No	\				
Lanes			1	. \				
Configuration		R				ノノ		
3				7		ſ	<u> </u>	_ \ \
					_			11
	estrian				ents			_ \ \
Movements	13	14	15	16			- (
Flow (ped/hr)	0	0	0	0			- 	- / /
Lane Width (m)	3.6	-	-	-	,			
Walking Speed (m/sec)	1.2							
Percent Blockage	0	0	0	0				
Toronic Drockage	O	U	U	U		1		
								_

Upstream Signal Data



Prog. Sat Arrival Green Cycle Prog. Distance Flow Flow Type Time Length Speed to Signal vph vph sec sec kph meters

S2 Left-Turn Through S5 Left-Turn

Through

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

Movement 2 Movement 5

Shared ln volume, major th vehicles: Shared ln volume, major rt vehicles: Sat flow rate, major th vehicles: Sat flow rate, major rt vehicles: Number of major street through lanes:

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical	Gap Calc	culation	on						
Movement		1	4	7	8	9	10	11	12
		L	L	L	T	R	L	Т	R
t(c,base)					6.2			
t(c,hv) P(hv)		1.00	1.00	1.00	1.00	1.00 34	1.00	1.00	1.00
t(c,g)				0.20	0.20	0.10	0.20	0.20	0.10
Percent t(3,1t)	Grade			0.00	0.00	0.00	0.00	0.00	0.00
t(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage 2-stage					6.5			
Follow-U	Jp Time Ca	alcula	tions						
Movement		1	4	7	8	9	10	11	12
		L	L	L	Т	R	L	Т	R
t(f,base						3.30			
t(f,HV) P(HV) t(f)		0.90	0.90	0.90	0.90	0.90 34 3.6	0.90	0.90	0.90

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

Movement 2 Movement 5 V(t) V(1,prot) V(t) V(1,prot)

V prog
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P g(q1)
g(q2)

Computation 2-Proportion of TWSC Intersection Time blocked
Movement 2

alpha
beta
Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f
Max platooned flow, V(c,max)
Min platooned flow, V(c,min)
Duration of blocked period, t(p)
Proportion time blocked, p

g (q)

0.000 0.000



omputation 3-Platoon Event Periods Result		
(2) 0.000 (5) 0.000 (dom) (subo) onstrained or unconstrained?		_
roportion		-
nblocked (1) (2) (3) or minor Single-stage Two-Stage Process ovements, p(x) Process Stage I Stage I	II	
(1) (4) (7) (8) (9) (10) (11) (12)		_
omputation 4 and 5		-
ingle-Stage Process ovement $ \begin{array}{ccccccccccccccccccccccccccccccccccc$	11 12 T R	
c,x 1010 x c,u,x		-
r,x plat,x		-
wo-Stage Process 7 8 10 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 S	11 Stage1 Stage2	
		_
(c,x) (x) (c,u,x) (r,x) (plat,x)		_
(x) (c,u,x) (r,x) (plat,x)		-
(x) (c,u,x) (r,x)	12	-
(x) (c,u,x) (r,x) (plat,x) orksheet 6-Impedance and Capacity Equations	1.00	-
(x) (c,u,x) (r,x) (plat,x) orksheet 6-Impedance and Capacity Equations tep 1: RT from Minor St. 9 onflicting Flows otential Capacity 253 edestrian Impedance Factor 1.00 ovement Capacity 253	1.00	-
(x) (c,u,x) (r,x) (plat,x) orksheet 6-Impedance and Capacity Equations tep 1: RT from Minor St. onflicting Flows otential Capacity edestrian Impedance Factor ovement Capacity robability of Queue free St.	1.00	
(x) (c,u,x) (r,x) (plat,x) orksheet 6-Impedance and Capacity Equations tep 1: RT from Minor St. onflicting Flows otential Capacity edestrian Impedance Factor ovement Capacity robability of Queue free St. onflicting Flows otential Capacity 253 condition for the follows otential Capacity robability of Queue free St. onflicting Flows otential Capacity edestrian Impedance Factor ovement Capacity robability of Queue free St. 1.00 ovement Capacity robability of Queue free St. 1.00	1.00 1.00 1	
(x) (c,u,x) (r,x) (plat,x) orksheet 6-Impedance and Capacity Equations tep 1: RT from Minor St. onflicting Flows otential Capacity edestrian Impedance Factor ovement Capacity robability of Queue free St. onflicting Flows otential Capacity robability of Queue free St. 4 onflicting Flows otential Capacity edestrian Impedance Factor ovement Capacity robability of Queue free St. 1.00 ovement Capacity robability of Queue free St. aj L-Shared Prob Q free St.	1.00 1.00 1 1.00	
(x) (c,u,x) (r,x) (plat,x) orksheet 6-Impedance and Capacity Equations tep 1: RT from Minor St. onflicting Flows otential Capacity edestrian Impedance Factor ovement Capacity robability of Queue free St. onflicting Flows otential Capacity robability of Queue free St. 4 onflicting Flows otential Capacity edestrian Impedance Factor ovement Capacity robability of Queue free St. 1.00 ovement Capacity robability of Queue free St. aj L-Shared Prob Q free St. tep 3: TH from Minor St. 8 onflicting Flows otential Capacity edestrian Impedance Factor aj L-Shared Prob Q free St. 1.00 ap. Adj. factor due to Impeding mvmnt 1.00	1.00 1.00 1 1.00 1.00	



Movement 7	8 9	10 11 12	- {
Worksheet 8-Shared Lane Calculations		7/	
t	(
1 7		\rightarrow ((44
Results for Two-stage process:		17	1) / (
Cap. Adj. factor due to impeding mymnt Movement Capacity	1.00	///	
Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mymnt	1.00	1.00	
Pedestrian Impedance Factor Maj. L, Min T Impedance factor	1.00	1.00	
Potential Capacity	/ /		\
Part 3 - Single Stage Conflicting Flows			_
Movement Capacity			_
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	/ \	\	
Potential Capacity			
Part 2 - Second Stage Conflicting Flows			
Movement Capacity			_
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt			
Potential Capacity			
Part 1 - First Stage Conflicting Flows			
Step 4: LT from Minor St.	7	10	_
Probability of Queue free St.			-
C t	1.00	1.00	
a 7			
Result for 2 stage process:			-
Ag. Factor due to impeding mymnt Movement Capacity	1.00	1.00	
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt	1.00	1.00	
Conflicting Flows Potential Capacity			
Part 3 - Single Stage			-
Movement Capacity			
Redestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt			
Conflicting Flows Potential Capacity			
Part 2 - Second Stage			-
Probability of Queue free St.			
Cap. Adj. factor due to Impeding mvmnt Movement Capacity			
Pedestrian Impedance Factor			
Conflicting Flows Potential Capacity			
Part 1 - First Stage			-
Step 3: TH from Minor St.	8	11	-
Worksheet 7-Computation of the Effect of	Two-stage Gap Acc	eptance	
Movement Capacity			-
Cap. Adj. factor due to Impeding mvmnt	1.00	0.94	
Maj. L, Min T Adj. Imp Factor.		1.00	
Maj. L, Min T Impedance factor			



Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)

16

253

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

Movement	7	8	9	10	11	12
	L	T	R	L	Т	R
C sep			253			
Volume			16			
			10			
Delay						
Q sep						
Q sep +1						
round (Qsep +1)						
n max						
C sh						
SUM C sep						
n						
C act						
c acc						

Worksheet 10-Delay, Queue Length, and Level of Service

Movement	1	4	7	8	9	10	11	12
Lane Config					R			
v (vph)					16			
C(m) (vph)					253			
v/c					0.06			
95% queue length					0.20			
Control Delay					20.2			
LOS					С			
Approach Delay				20.2				
Approach LOS				С				

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
(jo) q	1.00	1.00
v(il), Volume for stream 2 or 5		
v(i2), Volume for stream 3 or 6		
s(il), Saturation flow rate for stream 2 or 5		
s(i2), Saturation flow rate for stream 3 or 6 P*(oi)		
d(M,LT), Delay for stream 1 or 4		
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5		

1.1.4.8 Interseção D – Pico Tarde

HCS+: Unsignalized Intersections Release 5.6

_two-way stop control s<mark>u</mark>mm<mark>a</mark>ry

Analyst: Progeplan Agency/Co.: Date Performed: 05/06/2023 Analysis Time Period: Pico Tarde Intersection: Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL East/West Street: MOV01-MOV05-MOV07 North/South Street: MOV06

Intersection Orientation: EW

Study period (hrs):

Vehicle Volumes and Adjustments

Westbound Major Street: Approach Movement 5 R



Volume			7	03	154						
Peak-Hour Factor,	PHF		0	.91	0.91						
Hourly Flow Rate,	HFR		7	72	169						
Percent Heavy Veh	icles		_	_							
Median Type/Stora		Undi	vide	d		,	/				
RT Channelized?	J -										
Lanes			2	0							
Configuration			Т	TR							
Upstream Signal?			N	0				No			
·											
Minor Street: Ap	proach	1	Jorth	oound				Southbou	ınd		
Mc	vement	7	8		9		10	11	12		
		L	Т		R		L	T	R		
Volume					164						
Peak Hour Factor,	PHF				0.91						
Hourly Flow Rate,	HFR				180						
Percent Heavy Veh	icles				0						
Percent Grade (%)			0					0			
Flared Approach:	Exists?/	Storac	je			/				/	
Lanes		_		1							
Configuration				R							
	Delay, Q	T	ona+1		d Torro	1 04	F C 0	rrri aa			
Approach	Delay, Q	WB	ieng ci		hbound		L SE		thboun		
Movement	1	4 1	7	NOLC	8	9	1	10	11	12	
Lane Config	_	7	,		O	R	- 1	10	11	12	
Lane Confing						L	- 1				
v (vph)						180	<u> </u>				
C(m) (ymh)						598	≺				
C(m) (vph)						598					
v/c						0.3	30				
v/c 95% queue length						0.3	30 28				
v/c 95% queue length Control Delay						0.3 1.2 13.	30 28				
v/c 95% queue length Control Delay LOS					12 6	0.3	30 28				
v/c 95% queue length Control Delay LOS Approach Delay					13.6	0.3 1.2 13.	30 28				
v/c 95% queue length Control Delay LOS					13.6 B	0.3 1.2 13.	30 28				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL (TWSC) ANALYSIS

Phone: Fax: E-Mail:

Analyst: Progeplan
Agency/Co.:
Date Performed: 05/06/2023
Analysis Time Period: Pico Tarde
Intersection: D
Jurisdiction: DER/DF
Units: U. S. Metric
Analysis Year: 2023
Project ID: FUTURA COMERCIAL

East/West Street: MOV01-MOV05-MOV07

North/South Street: MOV06 Intersection Orientation: EW

Study period (hrs): 1.00

Vehicle Volumes and Adjustments Major Street Movements 2 1 3 4 6 Т R R Volume 703 154 0.91 193 Peak-Hour Factor, PHF 0.91 Peak-15 Minute Volume 42 169 Hourly Flow Rate, HFR 772 Percent Heavy Vehicles --Median Type/Storage Undivided RT Channelized?



Lanes Configuration Upstream Signal?			2								
Upstream Signal?			T	0 TR							
			No				No				
Minor Street Move	ments	7 L	8 T		9 R	10 L	11 T	12 R			
Volume Peak Hour Factor, Peak-15 Minute Vo Hourly Flow Rate,	lume HFR			0 4 1	64 .91 .5 80						
Percent Heavy Veh Percent Grade (%) Flared Approach:		s?/Stora	0 age	0		/	0		/		
RT Channelized Lanes Configuration				1 R	o						
	Pe	edestria			_		s				
Movements		13	3 :	14	15	16					
Flow (ped/hr) Lane Width (m) Walking Speed (m/ Percent Blockage	sec)	0 3. 1. 0	6 3	0 3.6 1.2	0 3.6 1.2 0	0 3.6 1.2 0					
	Prog. Flow vph	Sat Flow vph	Arriv Type	val e	al Dat Green Time sec	Cycle Length sec	Sp	og. eed ph	Distance to Signa meters		
S5 Left-Turn Through											
Worksheet 3-Data	for Cor	nputing	Effect	t of I							
Worksheet 3-Data	for Cor	mputing	Effect	t of D		o Major nent 2		eet Ve			
Shared in volume, Shared in volume, Sat flow rate, ma Sat flow rate, ma	major major jor th	th vehi rt vehi vehicle	cles: cles: es:								
Shared In volume, Shared In volume, Sat flow rate, ma Sat flow rate, ma Number of major s	major major jor th jor rt treet t	th vehi rt vehi vehicle vehicle	cles: cles: es: es:	:	Movem	ment 2	M				
Shared In volume, Shared In volume, Sat flow rate, ma Sat flow rate, ma Number of major s Worksheet 4-Criti	major major the jor rt treet the cal Garantal Garantal Table 1	th vehi rt vehi vehicle vehicle through	cles: cles: es: es: lanes	: up Tim	Movem	eulation	M	loveme:	nt 5		
Shared ln volume, Shared ln volume, Sat flow rate, ma Sat flow rate, ma Number of major s Worksheet 4-Criti Critical Gap Calc	major major jor th jor rt treet t	th vehi rt vehicle vehicle through	cles: cles: es: es: lanes	: up Tim	Movement Calc	culation	M	loveme:	nt 5		
Shared in volume, Shared in volume, Sat flow rate, ma Sat flow rate, ma Number of major s Worksheet 4-Criti Critical Gap Calc Movement t(c,base) t(c,hv) P(hv)	major major the jor rt treet the cal Garantal Garantal Table 1	th vehi rt vehi vehicle vehicle through	cles: ccles: ss: es: lanes: pllow-t	: up Tim 8 T	Movem ne Calc 9 R 6.2 1.0	culation 10 L	M	11 T	12 R		
Shared in volume, Shared in volume, Sat flow rate, ma Sat flow rate, ma Number of major s Worksheet 4-Criti Critical Gap Calc Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade	major major th jor rt treet t cal Gap ulation 1	th vehicle vehicle through	cles: cles: es: es: lanes:	: up Tin 8 T	Movem 9 R 6.2 1.0 0 0 0.1	ulation 10 10 0 1.0 0 0.2 0 0.0	M 0 0	loveme:	12 R	\	
Shared In volume, Shared In volume, Sat flow rate, ma Sat flow rate, ma Number of major s Worksheet 4-Criti Critical Gap Calc Movement t(c,base) t(c,bv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage	major major the jor the treet to cal Gagulation 1 L 1.00	th vehicle vehicle through	cles: ccles: cles: plices: 1.00 0.20	: 8 T 1.00	Movem 9 R 6.2 1.0 0 0.1 0.0 0.0 0.0 0.0	10 1.0 0.2 0 0.2 0 0.0 0.0 0.0 0.0 0.0 0.0 0	M 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	11 T 1.00	12 R 1.00		
Shared In volume, Shared In volume, Sat flow rate, ma Sat flow rate, ma Number of major s Worksheet 4-Criti Critical Gap Calc Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage	major major th jor rt treet t cal Gap ulation 1 L 1.00	th vehicle vehicle vehicle through and Form 4 L 1.00	7 L 1.00 0.20 0.00 0.00	: 8 T 1.000 0.200 0.000	Movem 9 R 6.21.00 0.10.00 0.00 0.00 0.00 0.00	10 1.0 0.2 0 0.2 0 0.0 0.0 0.0 0.0 0.0 0.0 0	M 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	11 T 1.00 0.20 0.00 0.00	12 R 1.00 0.10 0.00		
Shared In volume, Shared In volume, Sat flow rate, ma Sat flow rate, ma Number of major s Worksheet 4-Criti Critical Gap Calc Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage	major major th jor rt treet t cal Gap ulation 1 L 1.00	th vehicle vehicle vehicle through and Form 4 L 1.00	7 L 1.00 0.20 0.00 0.00	: 8 T 1.000 0.200 0.000	Movem 9 R 6.21.00 0.10.00 0.00 0.00 0.00 0.00	10 1.0 0.2 0 0.2 0 0.0 0.0 0.0 0.0 0.0 0.0 0	0 0 0 0 0	11 T 1.00 0.20 0.00 0.00	12 R 1.00 0.10 0.00		



Computation 1-Queue Clearance Time at Upstream Signal Movement 2 Movement 5 V(t) V(l,prot) V(t) V(l,prot)V prog Total Saturation Flow Rate, s (vph) Arrival Type Effective Green, g (sec) Cycle Length, C (sec) Rp (from Exhibit 16-11) Proportion vehicles arriving on green P g(q1) g (q2) g (q) Computation 2-Proportion of TWSC Intersection Time blocked Movement 2 Movement 5 V(t) V(l,prot) V(t) V(l,prot)alpha beta Travel time, t(a) (sec) Smoothing Factor, F Proportion of conflicting flow, f Max platooned flow, V(c,max) Min platooned flow, V(c,min) Duration of blocked period, t(p) 0.000 Proportion time blocked, p 0.000 Computation 3-Platoon Event Periods Result 0.000 p(2) p(5) 0.000 p(dom) p(subo) Constrained or unconstrained? Proportion unblocked (1)(2) (3) for minor Single-stage Two-Stage Process movements, p(x)Process Stage I Stage II p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12) Computation 4 and 5 Single-Stage Process Movement 1 4 8 9 10 11 12 L Т R Т L L R V c,x 470 s Рx V c,u,x Cr,x C plat,x Two-Stage Process 10 11 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 V(c,x) P(x) V(c,u,x)C(r,x) C(plat,x)



Worksheet	6-Impedance	and	Capacity	Equations
-----------	-------------	-----	----------	-----------

Worksheet 6-Impedance and Capacity Equat	ions	
Step 1: RT from Minor St.	9	12
Conflicting Flows	470	
Potential Capacity	598	1 00
Pedestrian Impedance Factor Movement Capacity	1.00 598	1.00
Probability of Queue free St.	0.70	1.00
Step 2: LT from Major St.	4	1
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	1.00	1 00
Probability of Queue free St. Maj L-Shared Prob Q free St.	1.00	1.00
Step 3: TH from Minor St.	8	11
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	1.00
Probability of Queue free St.	1.00	1.00
Step 4: LT from Minor St.		10
step 4. II from Minor St.	,	10
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor.		1.00
Cap. Adj. factor due to Impeding mymnt	1.00	0.70
Movement Capacity		
Worksheet 7-Computation of the Effect of	Two-stage Gap Acce	ptance
Step 3: TH from Minor St.	8	11
Part 1 - First Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mymnt		
Movement Capacity Probability of Queue free St.		
resulting of gadac free oc.		
Part 2 - Second Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor	/ \	
Cap. Adj. factor due to Impeding mvmnt Movement Capacity		
Part 3 - Single Stage		
Conflicting Flows) /	
Potential Capacity Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mymnt	1.00	1.00
Movement Capacity	1 \	

1.00

1.00

10

Potential Capacity Pedestrian Impedance Factor
Cap. Adj. factor due to Impeding mvmnt
Movement Capacity Result for 2 stage process:

а У С t Probability of Queue free St.

Step 4: LT from Minor St.

Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt



```
Movement Capacity
Part 2 - Second Stage
Conflicting Flows
Potential Capacity
Pedestrian Impedance Factor
Cap. Adj. factor due to Impeding mvmnt
Movement Capacity
Part 3 - Single Stage
Conflicting Flows
Potential Capacity
Pedestrian Impedance Factor
                                                   1.00
                                                                      1.00
Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor.
                                                                      1.00
                                                                      1.00
Cap. Adj. factor due to Impeding mymnt
                                                   1.00
                                                                      0.70
Movement Capacity
Results for Two-stage process:
а
У
С t
Worksheet 8-Shared Lane Calculations
Movement
                                                              10
                                                                      11
                                                                             12
                                                8
                                         L
                                                Т
                                                        R
                                                                              R
Volume (vph)
                                                       180
Movement Capacity (vph)
                                                       598
Shared Lane Capacity (vph)
Worksheet 9-Computation of Effect of Flared Minor Street Approaches
Movement
                                                        9
                                                8
                                         L
                                                Т
                                                       R
                                                               L
                                                                       Τ
                                                                              R
C sep
                                                       598
Volume
                                                       180
Delay
Q sep
Q sep +1
round (Qsep +1)
n max
C sh
SUM C sep
C act
Worksheet 10-Delay, Queue Length, and Level of Service
Movement
                                                            10
                                                                    11
                                                                           12
Lane Config
                                                     R
v (vph)
                                                    180
C(m) (vph)
                                                    598
                                                    0.30
v/c
95% queue length
                                                   1.28
Control Delay
                                                   13.6
LOS
Approach Delay
                                            13.6
Approach LOS
                                             В
Worksheet 11-Shared Major LT Impedance and Delay
```

Movement 2

1.00

Movement 5

1 .00

p(oj) v(i1), Volume for stream 2 or 5 v(i2), Volume for stream 3 or 6 s(i1), Saturation flow rate for stream 2 or 5 s(i2), Saturation flow rate for stream 3 or 6 $P^*(oj)$



 $\mbox{d}\left(\mbox{M,LT}\right)\mbox{, Delay for stream 1 or 4}$ ${\rm N}\text{,}\ {\rm Number}$ of major street through lanes d(rank,1) Delay for stream 2 or 5

1.1.4.9 Interseção E – Pico Manhã

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: Progeplan Agency/Co.: 05/06/2023 Date Performed: Analysis Time Period: Pico Manha

Intersection:

Lanes

Configuration

Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL

East/West Street: M2-M7+M8-M11+M12-M13 North/South Street: M13

Intersection Orientation: ${\tt EW}$

Study period (hrs): 1.00

	Vehi	.cle Vo	lumes ar	nd Adjı	ıstme	nts			
Major Street:	Approach	E	astbound	d Westbound					
	Movement	1	2	3	- 1	4	5	6	
		L	T	R		L	Т	R	
Volume						5	733		
Peak-Hour Fact	or, PHF					0.91	0.91		
Hourly Flow Ra	ate, HFR					5	805		
Percent Heavy	Vehicles					0			
Median Type/St	corage	Undi	vided			/			
RT Channelized	1?								
Lanes						0	2		
Configuration]	T T		
Upstream Signa	11?		No				No		
Minor Street:	Approach	N	orthbour	nd		S	outhboun	nd	
	Movement	7	8	9	1	10	11	12	
		L	T	R		L	T	R	
Volume		21							
Peak Hour Fact	or, PHF	0.91							
Hourly Flow Ra	ate, HFR	23							
Percent Heavy	Vehicles	11							
Percent Grade	(%)		0				0		
Flared Approac	ch: Exists?/	Storag	е		/				/

Approach Movement Lane Config	_Delay, EB 1	Queue Le WB 4 LT	 and Level rthbound 8	of Service	Southbound 11 12
v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS		5 1636 0.00 0.01 7.2 A	11.5 B		70

1

HCS+: Unsignalized Intersections Release 5.6



Phone: Fax: E-Mail: TWO-WAY STOP CONTROL(TWSC) ANALYSIS_ Analyst: Progeplan Agency/Co.: 05/06/2023 Date Performed: Analysis Time Period: Pico Manha Intersection: Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL East/West Street: M2-M7+M8-M11+M12-M13North/South Street: M13 Intersection Orientation: EW Study period (hrs): 1.00 Vehicle Volumes and Adjustments Major Street Movements 1 2 3 4 733 Volume Peak-Hour Factor, PHF 0.91 0.91 Peak-15 Minute Volume 201 1 Hourly Flow Rate, HFR 5 805 Percent Heavy Vehicles Median Type/Storage Undivided RT Channelized? 0 2 Lanes Configuration LT T Upstream Signal? No No Minor Street Movements 8 10 11 12 Т R L L Τ R Volume Peak Hour Factor, PHF 0.91 Peak-15 Minute Volume 6 23 Hourly Flow Rate, HFR Percent Heavy Vehicles 11 Percent Grade (%) 0 0 Flared Approach: Exists?/Storage RT Channelized Lanes 1 Configuration L Pedestrian Volumes and Adjustments Movements 13 14 15 Flow (ped/hr) 0 0 0 0 Lane Width (m) 3.6 3.6 3.6 3.6 Walking Speed (m/sec) 1.2 1.2 1.2 1.2 Percent Blockage 0 0 0 0 _Upstream Signal Data Sat Arrival Green Cycle Distance Prog. Prog. Flow Flow Type Time Length Speed to Signal

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

sec

sec

kph

meters

vph

Left-Turn Through

Left-Turn Through

S5

vph

Movement 2 Movement 5

Shared In volume, major th vehicles: 0
Shared In volume, major rt vehicles: 0
Sat flow rate, major th vehicles: 1700
Sat flow rate, major rt vehicles: 1700
Number of major street through lanes: 2



	Worksheet	4-Critical	Gap and	Follow-up	Time	Calculation
--	-----------	------------	---------	-----------	------	-------------

Critical	Gap Calc	ulatio	n						
Movement	-	1	4	7	8	9	10	11	12
		L	L	L	T	R	L	T	R
t(c,base)		4.1	7.1					
t(c,hv)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)			0	11					
t(c,g)				0.20	0.20	0.10	0.20	0.20	0.10
Percent	Grade			0.00	0.00	0.00	0.00	0.00	0.00
t(3,1t)			0.00	0.70					
t(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage		4.1	6.5					
	2-stage								
Follow-U	Jp Time Ca	lculat	ions						
Movement		1	4	7	8	9	10	11	12
		L	L	L	T	R	L	Т	R
t(f,base	<u> </u>		2.20	3.50					
t(f,HV)		0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)			0	11					
t(f)			2.2	3.6					

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

Movement 2 Movement 5 V(t) V(l,prot) V(t) V(l,prot)

V prog Total Saturation Flow Rate, s (vph) Arrival Type Effective Green, g (sec) Cycle Length, C (sec) Rp (from Exhibit 16-11) Proportion vehicles arriving on green ${\tt P}$ g(q1) g(q2)

Computation 2-Proportion of TWSC Intersection Time blocked

Movement 2 Movement 5 V(t) V(l,prot) V(t) V(l,prot)

0.000

alpha Travel time, t(a) (sec) Smoothing Factor, F Proportion of conflicting flow, f Max platooned flow, V(c,max) Min platooned flow, V(c,min) Duration of blocked period, t(p) Proportion time blocked, p

0.000 Computation 3-Platoon Event Periods Result

0.000 p(2) p(5) 0.000 p (dom) p(subo) Constrained or unconstrained?

Proportion (2) unblocked (1) (3) for minor Two-Stage Process Single-stage movements, p(x) Process Stage I Stage II

p(1) p(4) p(7)

g (q)

p(8)

p(9) p(10)



n /11)								
p(11) p(12)								
Computation 4 and 5								
Single-Stage Process								
Movement	1	4	7	8	9	10	11	12
	L	L	L	Т	R	L	Т	R
V c,x		0	412					
S D								
Px V c,u,x								
C r,x C plat,x								
Iwo-Stage Process	7		8		10		11	
	Stage2	Stage1		e2 Sta		tage2 S		
V(c,x)								
S S	3000							
P(x)								
V(c,u,x)								
C(r,x)								
C(plat,x)								
Worksheet 6-Impedance	and Cap	acity E	Equatio	ns				
Step 1: RT from Minor	St.				9		12	
Conflicting Flows								
Potential Capacity								
Pedestrian Impedance	Factor			1	.00		1.00	
Movement Capacity Probability of Queue	free St.			1	.00		1.00	
Step 2: LT from Major	St.				4		1	
Conflicting Flows				0				
Potential Capacity					636		1 00	
Pedestrian Impedance Movement Capacity	Factor				.00 636		1.00	
Probability of Queue	free St.				.00		1.00	
Maj L-Shared Prob Q f					.00		1.00	
Cton 2. MII from Minor	C+				8		1.1	
Step 3: TH from Minor	St.				· · · · · · · · · · · · · · · · · · ·		11	
Conflicting Flows								
Potential Capacity Pedestrian Impedance	Factor			1	.00		1.00	
Cap. Adj. factor due		ling mvn	nnt		.00	_	1.00	
Movement Capacity						\		
Probability of Queue	free St.			1	.00		1.00	
Step 4: LT from Minor	St.				7		10	
Conflicting Flows				Δ	12		-/-	
Potential Capacity					79		11	/
Pedestrian Impedance	Factor				.00		1.00	/
Maj. L, Min T Impedan							1.00	
Maj. L, Min T Adj. Im	-		. \		\		1.00	
Cap. Adj. factor due	to Imped	ling mvm	nnt		.00		1.00	
Movement Capacity				7	77		1	
						_	1 /	7
Worksheet 7-Computati	on of th	e Effec	ct of T	wo-stag	e Gap	Acceptar	nce	
Step 3: TH from Minor	St.				8		11	\
Dart 1 - First Stage								
Part 1 - First Stage Conflicting Flows							一)	\ <u> </u>
Potential Capacity								
Pedestrian Impedance								
Cap. Adj. factor due	to Imped	ling mvm	nnt					
Movement Capacity								



Probability of Queue free St.

•		
Part 2 - Second Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt Movement Capacity		
110 Comonic Capacity		
Part 3 - Single Stage		
Conflicting Flows		
Potential Capacity	4 44	4 44
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	1.00
Movement Capacity		
Result for 2 stage process:		
a		
У		
Ct		
Probability of Queue free St.	1.00	1.00
Step 4: LT from Minor St.	7	10
ocep 1. Bi from Millor oc.	,	±0
Part 1 - First Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Part 2 - Second Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Part 3 - Single Stage		
Conflicting Flows	412	
Potential Capacity	579	
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor		1.00
Maj. L, Min T Adj. Imp Factor.		1.00
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00
Movement Capacity	577	
Results for Two-stage process:		
a		
У		
C t	577	
Worksheet 8-Shared Lane Calculations		
Movement 7		0 11 12
L	TR	L T R
Volume (vph) 23	\	
Movement Capacity (vph) 577		\ / _
Shared Lane Capacity (vph)	/ /	\ \ \ \ \
-		
Mankahaat 0 Camputatian at BSS 1 S = 1	Minor Ct.	nnaahas
Worksheet 9-Computation of Effect of Flared	Minor Street Ap	proacnes
Movement 7	8 9 1	0 11 12
L		L T R
C sep 577		
Volume 23	~	
Delay		\ \
Q sep Q sep +1	Ţ	
round (Qsep +1)		
n max		
C sh		
SUM C sep		



n C act

Worksheet 10-Delay	, Queue	Length,	and Le	evel of	Service				
Movement	1	4	7	8	9	10	11	12	
Lane Config		LT	L						
v (vph)		5	23						
C(m) (vph)		1636	577						
v/c		0.00	0.04						
95% queue length		0.01	0.12						
Control Delay		7.2	11.5						
T 00		70	ъ						

LOS A B
Approach Delay 11.5
Approach LOS B

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(il), Volume for stream 2 or 5		0
v(i2), Volume for stream 3 or 6		0
s(il), Saturation flow rate for stream 2 or 5		1700
s(i2), Saturation flow rate for stream 3 or 6		1700
P*(oj)		1.00
d(M,LT), Delay for stream 1 or 4		7.2
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5		2

1.1.4.10 Interseção E – Pico Tarde

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY____

Analyst: Progeplan
Agency/Co.:
Date Performed: 05/06/2023
Analysis Time Period: Pico Tarde
Intersection: E
Jurisdiction: DER/DF
Units: U. S. Metric
Analysis Year: 2023
Project ID: FUTURA COMERCIAL
East/West Street: M2-M7+M8-M11
North/South Street: M11

Intersection Orientation: EW Study period (hrs): 1.00

	icle Vol	umes a	nd Adju		
Major Street: Approach		stboun		We	stbound
Movement	1	2	3	4	5 6
	L	Т	R	L	TR
Volume			7	4	2120
Peak-Hour Factor, PHF				0.91	0.91
Hourly Flow Rate, HFR				4	2329
Percent Heavy Vehicles	11		\	,0	
Median Type/Storage	Undiv	rided		\ \	
RT Channelized?				0	2 / _ /
Lanes				0	T T
Configuration Upstream Signal?		No			No
opscream signar:		NO			NO
Minor Street: Approach	No	rthbou	ınd	So	outhbound
Movement	7	8	9	10	11 12
	L	T	R	L	T R
Volume	164				
Peak Hour Factor, PHF					/
Hourly Flow Rate, HFR	180				
Percent Heavy Vehicles	0				
Percent Grade (%)		0			0



Flared Approach: Exists?/Storage Lanes 1 Configuration L

Approach	EB	WB	Northbound				Southbound		
Movement	1	4	7	8	9		10	11	12
Lane Config		LT	L			I			
v (vph)		4	180						
C(m) (vph)		1636	214						
v/c		0.00	0.84						
95% queue length		0.01	10.00						
Control Delay		7.2	93.1						
LOS		A	F						
Approach Delay				93.1					
Approach LOS				F					

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax: E-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Progeplan

Agency/Co.:
Date Performed: 05/06/2023
Analysis Time Period: Pico Tarde Intersection: E DER/DF

Jurisdiction:

Units: U. S. Metric
Analysis Year: 2023
Project ID: FUTURA COMERCIAL

East/West Street: M2-M7+M8-M11
North/South Street: M11

Intersection Orientation: EW Study period (hrs): 1.00

	venicie	Volumes		justment	.s_			
Major Street Movements	1	2	3	4	5	6		
	L	T	R	L	T	R		
 Volume				4	2120			
Peak-Hour Factor, PHF				0.91	0.91			
Peak-15 Minute Volume				1	582			
Hourly Flow Rate, HFR				4	2329			
Percent Heavy Vehicles				0	\			
Median Type/Storage	Undi	vided			1			
RT Channelized?)	
Lanes				0	2			
Configuration			\	L	гт	\ /		
Upstream Signal?		No	/	/ /	No	1 1	/	\
.1				- 1		1 1	_ /	\
Minor Street Movements	7	8	9	10	11	12		_ \
	L	T	R	L	T	R		
				~ \				
Volume	164			1				
Peak Hour Factor, PHF						1	^ L	_ \ \
Peak-15 Minute Volume	45					1		111
Hourly Flow Rate, HFR	180						/	111
Percent Heavy Vehicles	-0							\rightarrow
Percent Grade (%)		0			0]]
Flared Approach: Exists	s?/Storag	е		/	\		\ \	//
RT Channelized	_							
Lanes	1							
Configuration	L							



Movements			13	14	15	16		
Flow (ped/hr) Lane Width (m)						0		
Walking Speed (1	m/sec)					1.2		
Percent Blockage			0	0)	0		
	Prog.		-	m Signa val G		ycle	Prog.	Distance
	Flow	Flo				ength	Speed	to Signal
	vph	vph		S	ec	sec	kph	meters
S2 Left-Turn								
Through								
S5 Left-Turn Through								
Worksheet 3-Data	a for Co	omputin	g Effec	t of De	lay to 1	Major :	Street V	ehicles
				1	Movemen	t 2	Moveme	ent 5
Shared ln volume	e. maio	r th vo	hicles:				0	
Shared in volume							0	
Sat flow rate, n	major th	n vehic	les:				1700	
Sat flow rate, n							1700	
Number of major	street	through	n lanes	:			2	
Worksheet 4-Cri	tical Ga	ap and	Follow-	up Time	Calcul	ation		
	lculation 1	on 4	7	8	9	10	11	12
			7 L	8 T	9 R	10 L	11 T	12 R
Movement	1	4 L	L					
Movement t(c,base)	1	4					Т	
Movement t(c,base) t(c,hv) P(hv)	1 L	4 L 4.1	7.1 1.00 0	1.00	1.00	1.00	1.00	1.00
t(c,base) t(c,hv) P(hv) t(c,g)	1 L	4 L 4.1 1.00	7.1 1.00 0 0.20	1.00 0.20	1.00 0.10	1.00 0.20	1.00 0.20	1.00 0.10
t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade	1 L	4 L 4.1 1.00	7.1 1.00 0	1.00	1.00	1.00	1.00 0.20	1.00
t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt)	1 L	4 L 4.1 1.00	7.1 1.00 0 0.20 0.00	1.00 0.20	1.00 0.10	1.00 0.20	1.00 0.20 0.00	1.00 0.10
Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-stage 2-stage	1 L 1.00	4 .1 1.00 0	7.1 1.00 0 0.20 0.00 0.70 0.00	1.00 0.20 0.00	1.00 0.10 0.00	1.00 0.20 0.00	1.00 0.20 0.00	1.00 0.10 0.00
Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-stag 2-stag t(c) 1-stag	1 L 1.00	4.1 1.00 0	7.1 1.00 0 0.20 0.00 0.70 0.00	1.00 0.20 0.00	1.00 0.10 0.00	1.00 0.20 0.00	1.00 0.20 0.00	1.00 0.10 0.00 0.00
Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-stage 2-stage	1 L 1.00	4 .1 1.00 0	7.1 1.00 0 0.20 0.00 0.70 0.00	1.00 0.20 0.00	1.00 0.10 0.00	1.00 0.20 0.00	1.00 0.20 0.00	1.00 0.10 0.00 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage	1 L 1.00 e 0.00 e 0.00 e e Calculat	4.1 1.00 0 0.00 0.00 0.00 4.1	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4	1.00 0.20 0.00 0.00	1.00 0.10 0.00 0.00	1.00 0.20 0.00 0.00	1.00 0.20 0.00 0.00 1.00	1.00 0.10 0.00 0.00 0.00
Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage Follow-Up Time (1 L 1.00 e 0.00 e 0.00 e e Calculat	4.1 1.00 0 0.00 0.00 0.00 4.1	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4	1.00 0.20 0.00 0.00 1.00	1.00 0.10 0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage	1 L 1.00 e 0.00 e 0.00 e e Calculat	4.1 1.00 0 0.00 0.00 0.00 4.1	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4	1.00 0.20 0.00 0.00	1.00 0.10 0.00 0.00	1.00 0.20 0.00 0.00	1.00 0.20 0.00 0.00 1.00	1.00 0.10 0.00 0.00 0.00
Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage t(c) 1-stage t(c) 1-stage t(c) 1-stage t(c) 1-stage t(c) 1-stage t(c) 1-stage t(d) 1-stage t	1 L 1.00 e 0.00 e 0.00 e e Calculat	4.1 1.00 0 0.00 0.00 0.00 4.1 tions 4 L	7.1 1.00 0.20 0.00 0.70 0.00 1.00 6.4	T 1.00 0.20 0.00 0.00 1.00	1.00 0.10 0.00 0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 122 R
Movement (c, base) (c, hv) (hv) (c(c,g) Percent Grade (3,1t) (c(T): 1-stage 2-stage (c) 1-stage 2-stage (d) (d) (e) (f) (f) (f) (f) (f) (f) (f) (f) (f) (f	1 L 1.00 e 0.00 e 0.00 e e Calculat	4.1 1.00 0 0.00 0.00 0.00 4.1 tions 4 L	7.1 1.00 0.20 0.00 0.70 0.00 1.00 6.4	T 1.00 0.20 0.00 0.00 1.00	1.00 0.10 0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 122 R
Movement (c, base) (c, hv) (hv) (c(c,g) (ercent Grade (3,1t) (c(c,T): 1-stage (1-stage (2-stage (1-stage (2-stage) (1-stage)	1 L 1.00 e 0.00 e 0.00 e e Calculat	4.1 1.00 0 0.00 0.00 0.00 4.1 tions 4 L	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4	T 1.00 0.20 0.00 0.00 1.00	1.00 0.10 0.00 0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 122 R
Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-stag 2-stag t(c) 1-stag 2-stag t(c) Time (for the companies) follow-Up Time (for the companies) t(f,base) t(f,HV) P(HV)	1 L 1.00 e 0.00 e 0.00 e e Calculat	4.1 1.00 0 0.00 0.00 0.00 4.1 tions 4 L	7.1 1.00 0.20 0.00 0.70 0.00 1.00 6.4	T 1.00 0.20 0.00 0.00 1.00	1.00 0.10 0.00 0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 122 R
Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-stag 2-stag t(c) 1-stag 2-stag t(d) 1-stag t(d) 1-sta	1 L 1.00 e 0.00 e 0.00 e e Calculat L 0.90	4.1 1.00 0 0.00 0.00 0.00 4.1 tions 4 L	7.1 1.00 0.20 0.00 0.70 0.00 1.00 6.4 7 L	T 1.00 0.20 0.00 0.00 1.00	1.00 0.10 0.00 0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 122 R
2-stage 2-stage 2-stage 2-stage 4 (c) 1-stage 2-stage 4 (follow-Up Time 6 (follow-Up	1 L 1.00 e 0.00 e 0.00 e Calculat L 0.90	4.1 1.00 0 0.00 0.00 0.00 4.1 tions 4 L 2.20 0.90 0 2.2	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4 7 L	T 1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 9 R 0.90	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 122 R
Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-stag 2-stag t(c) 1-stag 2-stag t(d) 1-stag t(d) 1-sta	1 L 1.00 e 0.00 e 0.00 e Calculat L 0.90	4.1 1.00 0 0.00 0.00 0.00 4.1 tions 4 L 2.20 0.90 0 2.2	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4 7 L	T 1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 9 R 0.90	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 12 R 0.90
Movement t(c,base) t(c,hv) P(hv) t(c,g) Percent Grade t(3,1t) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage t(d) 1-stage t	1 L 1.00 e 0.00 e 0.00 e Calculat L 0.90	4.1 1.00 0 0.00 0.00 0.00 4.1 tions 4 L 2.20 0.90 0 2.2	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4 7 L	1.00 0.20 0.00 0.00 1.00 8 T 0.90	R 1.00 0.10 0.00 0.00 0.00 0.00 9 R 0.90 Moveme	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 122 R
Movement E(c,base) E(c,hv) E(hv) E(c,g) Percent Grade E(3,1t) E(c,T): 1-stage 2-stage E(c) 1-stage 2-stage E(c) 1-stage E	1 L 1.00 e 0.00 e 0.00 e Calculat L 0.90	4.1 1.00 0 0.00 0.00 0.00 4.1 tions 4 L 2.20 0.90 0 2.2	7.1 1.00 0 0.20 0.00 0.70 0.00 1.00 6.4 7 L	1.00 0.20 0.00 0.00 1.00 8 T 0.90	R 1.00 0.10 0.00 0.00 0.00 0.00 9 R 0.90 Moveme	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	R 1.00 0.10 0.00 0.00 0.00 12 R 0.90

Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P
g(q1) g (q2) g (q)

Computation 2-Proportion of TWSC Intersection Time blocked

Movement 2 Mo

V(t) V(1,prot) V(t)

Movement 5 t) V(1,prot)



alpha beta Travel time, t(a) (sec) Smoothing Factor, F Proportion of conflicting flow, f Max platooned flow, V(c,max) Min platooned flow, V(c,min) Duration of blocked period, t(p) 0.000 0.000 Proportion time blocked, p Computation 3-Platoon Event Periods Result p(2) 0.000 p(5) 0.000 p (dom) p(subo) Constrained or unconstrained? Proportion unblocked (1) (2) (3) for minor Single-stage Two-Stage Process movements, p(x) Stage II Process Stage I p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12) Computation 4 and 5 Single-Stage Process Movement 1 4 7 9 10 11 12 L L L Т R V c,x 0 1172 S Рx V c,u,x Cr,x C plat,x Two-Stage Process 10 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 V(c,x) 3000 P(x) V(c,u,x) $\overline{C(r,x)}$ C(plat,x) Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St. 9 12 Conflicting Flows Potential Capacity 1.00 Pedestrian Impedance Factor 1.00 Movement Capacity Probability of Queue free St. 1.00 1.00 Step 2: LT from Major St. 4 1 Conflicting Flows 0 1636 Potential Capacity 1.00 Pedestrian Impedance Factor 1.00 Movement Capacity 1636 1.00 Probability of Queue free St. 1.00 Maj L-Shared Prob Q free St. 1.00 Step 3: TH from Minor St. 11

8



Conflicting Flows		
Potential Capacity Pedestrian Impedance Factor	1.00	1 00
Cap. Adj. factor due to Impeding mymnt	1.00	1.00
Movement Capacity		
Probability of Queue free St.	1.00	1.00
Step 4: LT from Minor St.	7	10
-		
Conflicting Flows Potential Capacity	1172 215	
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor		1.00
Maj. L, Min T Adj. Imp Factor.	1 00	1.00
ap. Adj. factor due to Impeding mvmnt ovement Capacity	1.00 214	1.00
ovement capacity	214	
orksheet 7-Computation of the Effect of T	wo-stage Gap Acc	eptance
tep 3: TH from Minor St.	8	11
	~	
art 1 - First Stage		
onflicting Flows otential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
ovement Capacity		
robability of Queue free St.		
art 2 - Second Stage		
onflicting Flows		
otential Capacity edestrian Impedance Factor		
up. Adj. factor due to Impeding mvmnt		
vement Capacity		
rt 3 - Single Stage		
onflicting Flows		
otential Capacity		
edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt	1.00	1.00
ovement Capacity	1.00	1.00
ogult for 2 stage process.		
esult for 2 stage process:		
•		
C t	1 00	1 00
robability of Queue free St.	1.00	1.00
tep 4: LT from Minor St.	7	10
art 1 - First Stage		
onflicting Flows	/ \	
otential Capacity edestrian Impedance Factor	~]	
ap. Adj. factor due to Impeding mvmnt	(~	
ovement Capacity		_ / _
art 2 - Second Stage	-}/	
onflicting Flows	/	
tential Capacity		
edestrian Impedance Factor		
ap. Adj. factor due to Impeding mvmnt ovement Capacity		//
rt 3 - Single Stage		
onflicting Flows	1172	\searrow \Box
otential Capacity edestrian Impedance Factor	215 1.00	1.00
aj. L, Min T Impedance factor	1.00	1.00
aj. L, Min T Adj. Imp Factor.	(1.00
ap. Adj. factor due to Impeding mvmnt	1.00	1.00
ovement Capacity	214	
esults for Two-stage process:		



y C t			214			
Worksheet 8-Shared Lane Calculation	ns					
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)	180 214					
Worksheet 9-Computation of Effect	of Flar	ed Mino	r Stree	t Appro	oaches	
Movement	7 L	8 T	9 R	10 L	11 T	12 R
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)	214 180					
C sh SUM C sep n C act						
Worksheet 10-Delay, Queue Length,	and Lev	el of S	ervice			
Movement 1 4 Lane Config LT	7 L	8	9	10	11	12
C(m) (vph) 1636 v/c 0.00 095% queue length 0.01	180 214 0.84 10.00 93.1 F	93.1 F				

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(il), Volume for stream 2 or 5		0
v(i2), Volume for stream 3 or 6	/ \	0
s(il), Saturation flow rate for stream 2 c	or 5 /	1700
s(i2), Saturation flow rate for stream 3 c	or 6	1700
P*(oj)		1.00
d(M,LT), Delay for stream 1 or 4		7.2
N, Number of major street through lanes	\	2
d(rank,1) Delay for stream 2 or 5	/ /	\ \ \ /
	<i></i>	

1.1.4.11 Interseção F — Pico Manhã

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: Progeplan
Agency/Co.:
Date Performed: 05/06/2023
Analysis Time Period: Pico Manha
Intersection: F
Jurisdiction: DER/DF
Units: U. S. Metric
Analysis Year: 2023



Project ID: FUTURA COMERCIAL

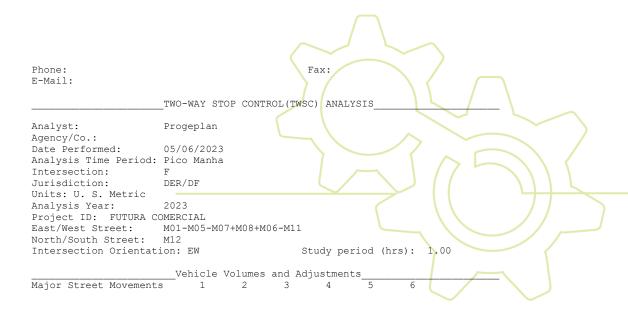
East/West Street: M01-M05-M07+M08+M06-M11
North/South Street: M12

Approach Delay Approach LOS

Study period (hrs): 1.00 Intersection Orientation: ${\tt EW}$

Major Street:	Approach	cle Volu Ea:	stbound				Westbound	<u> </u>	
-	Movement	1	2	3	- 1	4	5	6	
		L	T	R	i	L	T	R	
 Volume		9	1959						
Peak-Hour Facto	r, PHF	0.91	0.91						
Hourly Flow Rate	e, HFR	9	2152						
Percent Heavy V	ehicles	12							
Median Type/Sto RT Channelized?	rage	Undiv	ided			/			
Lanes		0	2						
Configuration		L'	ГТ						
Upstream Signal	?		No				No		
Minor Street:	Approach	No	rthboun	d			Southbour	nd	
1	Movement	7	8	9		10	11	12	
		L	Т	R	-	L	T	R	
						5			
Peak Hour Facto	r, PHF					0.	91		
Hourly Flow Rate						5			
Percent Heavy V						0			
Percent Grade (,		0				0		
Flared Approach	: Exists?/	Storage			/				/
Lanes							1		
Configuration							L		
	Delay, Q	110110 To	nath a	nd Lev	ر امر	f C	ervice		
 Approach	Deray, Q EB	WB		thboun		- 5		hbound	
Movement	1	4	7	8	9		1 10		12
Lane Config	LT	-		-			L		
		'							
v (vph)	9						5		
C(m) (vph)	1560						238		
v/c	0.01						0.02		
95% queue lengt							0.06		
Control Delay	7.3						20.5		
LOS	A						C		

HCS+: Unsignalized Intersections Release 5.6



20.5

С



	L	T	R	L	Т	R	
Volume	9	1959					
Peak-Hour Factor, PHF	0.91	0.91					
Peak-15 Minute Volume	2	538					
Hourly Flow Rate, HFR	9	2152					
Percent Heavy Vehicles	12			,			
Median Type/Storage RT Channelized?	Undiv	rided		/			
Lanes	0	2					
Configuration		' T					
Upstream Signal?	111	No			No		
-1							
Minor Street Movements	7	8	9	10	11	12	
	L	T	R	L	Т	R	
Volume				5			
Peak Hour Factor, PHF				0.91			
Peak-15 Minute Volume				1			
Hourly Flow Rate, HFR				5			
Percent Heavy Vehicles		0		0	0		
Percent Grade (%)	2 / 2 +	0		,	0		,
Flared Approach: Exists RT Channelized	:/Storage	:		/			/
Lanes				1			
Configuration				L			
		1					
Movements Pe	destrian 13	Volumes 14	and Ad	justmer 16	1TS		
110 v Chiciros	10	7.7	10	Τ 0			
Flow (ped/hr)	0	0	0	0			
Lane Width (m)	3.6	3.6	3.6	3.6			
Walking Speed (m/sec)	1.2	1.2	1.2	1.2			
Percent Blockage	0	0	0	0			
			1				
Prog.		ream Sig rrival	gnal Da Green		e Pro	~	Distance
Flow	Flow	Type	Time	Lengt		-	to Signal
vph	vph	Type	sec	sec	kp:		meters
S2 Left-Turn							
Through							
S5 Left-Turn							
Through							
Worksheet 3-Data for Com	outing Ef	fect of	Delav	to Maio	or Stre	et. V	ehicles
				ment 2		veme	
			MOVE	ment Z	1410.	v enie	J
Shared ln volume, major			0				
Shared In volume, major			0	0.0			
Sat flow rate, major th	vehicles:		17	00	/ \		

					1	Movement	t 2	Movemen	nt 5	
	n volume					0				
	n volume					0				
	rate, m	_				1700	/	\		
Sat flow	rate, m	ajor r	t vehic	les:		1700	/	\		
Number o	of major	street	through	h lanes	:	2				
Workshee	et 4-Crit	ical G	ap and 1	Follow-	up Time	Calcula	ation			
			. 1		-1	77		\	\	/ \
Critical	Gap Cal	culatio	on .			7				
Movement	-	1	4	7	8	9	10	11	12	
		L	L	L	T	R	L	T	R	
						_ \		^		
t(c,base	· · · · · · · · · · · · · · · · · · ·	4.1					7.1			
t(c,hv)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
P(hv)		12					0	~ l		
t(c,q)				0.20	0.20	0.10	0.20	0.20	0.10	1
Percent	Grade			0.00	0.00	0.00	0.00	0.00	0.00	1
t(3,1t)		0.00					0.70		1 1	
t(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	2-stage		0.00	1.00	1.00	0.00	1.00	1.00	0.00	
t(c)	1-stage						6.4		1 /	
- \ - /	2-stage								7	
Follow-U	Jp Time C	alculat	tions							
Movement	-	1	4	7	8	9	10	11	12	



	L	L	L	Т	R	L	Т	R	
(f,base) (f,HV)	2.20	0.90	0.90	0.90	0.90	3.50	0.90	0.90	
HV) f)	12 2.3					0 3.5			
ksheet 5-Ef	fect of	 Jpstream	m Signal	.s					
nputation 1-0	Queue Cl	earance	Time at	Upstre	eam Sign	nal			
				V (t	Moveme:	nt 2 l,prot)		vement 5 V(1,prot)	
prog tal Saturatio	on Flow 1	2ata 9	(ymh)						
rrival Type ffective Green ycle Length, (n, g (se		(v p i i)						
o (from Exhiberoportion vehical) (q1) (q2)	it 16-11		on green	n P					
(q)									
omputation 2-1	Proporti	on of T	WSC Inte	ersectio V(t	Moveme		Mo	vement 5 V(1,prot)	
lpha									
eta cavel time, to moothing Facto coportion of o	or, F conflict	ing flo	м , f						
x platooned in platooned in platooned in platooned in platooned in platooned in the comportion time.	flow, V(c,min) riod, t	(p)		0.00	0		0.000	
mputation 3-1	Platoon 1	Event Pe	eriods	Resi	ılt				
(2) (5) (dom)				0.00					
(subo) onstrained or	unconst	rained?							
roportion nblocked or minor		(1 Single			(2)	age Proc	(3)		
)	Proc	_	Stag	ge I	-	age II		
	,								
(1) (4) (7)	, 						\		
(1) (4) (7) (8) (9) (10)	,							\rightarrow	
(1) (4) (7) (8) (9) (10) (11) (12)				(\ \ \ \ \	
(1) (4)	and 5	1 T.	4	7	8	9 8	10	11 12 T P	
(1) (4) (7) (8) (9) (10) (11) (12) computation 4 a ingle-Stage Provement	and 5	L	4 L	7 L	8 T	9 R	L	11 12 T R	
(1) (4) (7) (8) (9) (10) (11) (12) computation 4 aingle-Stage Provement C, x	and 5								
(1) (4) (7) (8) (9) (10) (11) (12) computation 4 aingle-Stage Property of the control of the con	and 5	L					L		



V(c,x) 3000 P(x) V(c,u,x)C(r,x) C(plat,x)Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St. 9 12 Conflicting Flows Potential Capacity Pedestrian Impedance Factor 1.00 1.00 Movement Capacity Probability of Queue free St. 1.00 1.00 Step 2: LT from Major St. 4 1 Conflicting Flows Potential Capacity 1560 Pedestrian Impedance Factor 1.00 1.00 Movement Capacity 1560 Probability of Queue free St. 1.00 0.99 Maj L-Shared Prob Q free St. 0.99 11 Step 3: TH from Minor St. 8 Conflicting Flows Potential Capacity 1.00 1.00 Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt 0.99 0.99 Movement Capacity 1.00 1.00 Probability of Queue free St. 10 Step 4: LT from Minor St. Conflicting Flows 1094 Potential Capacity 239 Pedestrian Impedance Factor 1.00 1.00 Maj. L, Min T Impedance factor 0.99 Maj. L, Min T Adj. Imp Factor. 1.00 0.99 Cap. Adj. factor due to Impeding mvmnt 1.00 Movement Capacity 238 Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance Step 3: TH from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Movement Capacity Probability of Queue free St. Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity 1.00 Pedestrian Impedance Factor 1.00 0.99 Cap. Adj. factor due to Impeding mvmnt 0.99 Movement Capacity Result for 2 stage process: а y C t



Probability of Queue free St.		1	.00		1.00		
Step 4: LT from Minor St.			7		10		
Part 1 - First Stage							
Conflicting Flows							
Potential Capacity Pedestrian Impedance Factor							
Cap. Adj. factor due to Impeding mvr	nnt						
Movement Capacity							
Part 2 - Second Stage							
Conflicting Flows							
Potential Capacity							
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvr	mnt						
Movement Capacity							
Part 3 - Single Stage							
Conflicting Flows					1094		
Potential Capacity		1	0.0		239		
Pedestrian Impedance Factor Maj. L, Min T Impedance factor			.00		1.00		
Maj. L, Min T impedance factor Maj. L, Min T Adj. Imp Factor.			.00				
Cap. Adj. factor due to Impeding mvr	nnt		.00		0.99		
Movement Capacity					238		
Results for Two-stage process:							
д У							
C t					238		
Worksheet 8-Shared Lane Calculations	5						
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)				5 238			
Worksheet 9-Computation of Effect of							
Movement	7 L	8 T	9 R	10 L	11 T	12 R	
2 000				238			
C sep Volume				230 5			
Delay				Ü			
Q sep							
Q sep +1							
round (Qsep +1)							
n max							
C sh			~				
SUM C sep)		
n C act					\		\
Worksheet 10-Delay, Queue Length, an	 nd Lev <mark>∈</mark>	el of Se	rvice		1		
Movement 1 4	7	8	9	10	11	12	
Lane Config LT				L	/ /		
v (vph) 9				5		7	////
C(m) (vph) 1560		(_/	238	ן ן ע		-IIIII
v/c 0.01				0.02			
95% queue length 0.02 Control Delay 7.3				20.5	\ \		//
LOS A				20.3 C	_ \		//
Approach Delay					20.5		
Approach LOS					C		- (
Worksheet 11-Shared Major LT Impedam	nce and	d Delay					



	Movement 2	Movement 5
p(oj)	0.99	1.00
v(il), Volume for stream 2 or 5	0	
v(i2), Volume for stream 3 or 6	0	
s(il), Saturation flow rate for stream 2 or 5	1700	
s(i2), Saturation flow rate for stream 3 or 6	1700	
P*(oj)	0.99	
d(M,LT), Delay for stream 1 or 4	7.3	
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5	2	

1.1.4.12 Interseção F — Pico Tarde

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: Progeplan

Agency/Co.:

05/06/2023 Date Performed: Analysis Time Period: Pico Tarde

Intersection: F

Jurisdiction: DER/DF

Units: U. S. Metric
Analysis Year: 2023
Project ID: FUTURA COMERCIAL

East/West Street: M01-M05-M07+M08+M06-M11

North/South Street: Intersection Orient				St	udy	perio	d (hrs)	: 1.0	0	
	Vehicl	e Volu	mes and	Adius	tme	nts				
Major Street: Appr	oach		tbound	. 110,00	CILIC		stbound			_
		1	2	3	- 1	4	5	6		
MOVE		T ₁	T T	R	i	L' T	Ψ	R		
		ь	1	K	1	ш	1	А		
Volume		6	861							_
Peak-Hour Factor, F	HF	0.91	0.91							
Hourly Flow Rate, H	IFR	6	946							
Percent Heavy Vehic		0								
Median Type/Storage		Undivi	ded			/				
RT Channelized?		0110111	aca			′				
Lanes		0	2							
Configuration		LT	T							
Upstream Signal?			No				No			
Minor Street: Appr	oach	Nor	thbound			Sc	uthboun			_
1 1		7	8	9	1	10	11	12		
110 V C		T.	Т	R	i	T.	Т	R		
		_	-		'	_	-			
Volume						4				_
Peak Hour Factor, E	чь					0.91	\			
Hourly Flow Rate, H				^		4				
Percent Heavy Vehic						0				
Percent Grade (%)	.100		0				0	/		
Flared Approach: E	viete2/9+	orago	O		/		· ·		/	
Lanes	IAISUS:/SU	Orage		7		1		\	′ /	1
Configuration					- /	I		1 1	/	\
Configuration						1	1			1
					+					_
	elay, Que	ue Len	gth, an	d Leve	1 0	f Serv	rice/			
Approach	EB W	'B	Nort	hbound			Sout	hbound		_ `
Movement	1 4		7	8	9		10	11 /	12	
Lane Config	LT				-	_	L	\ /		/ /
										_ \
v (vph)	6						4			
C(m) (vph)	1636						543	\ \	\	
v/c	0.00						0.01	\		
95% queue length	0.01						0.02	_ \		
Control Delay	7.2						11.7		\	
LOS	A						В			
Approach Delay								11.7		
Approach LOS								В		



HCS+: Unsignalized Intersections Release 5.6

Phone: Fax: E-Mail: TWO-WAY STOP CONTROL(TWSC) ANALYSIS_ Analyst: Progeplan Agency/Co.: Date Performed: 05/06/2023 Analysis Time Period: Pico Tarde Intersection: F Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: Project ID: FUTURA COMERCIAL East/West Street: M01-M05-M07+M08+M06-M11 North/South Street: M12 Intersection Orientation: EW Study period (hrs): 1.00 Vehicle Volumes and Adjustments Major Street Movements 2 3 1 4 L Т R L Т R 861 Volume 6 Peak-Hour Factor, PHF 0.91 0.91 Peak-15 Minute Volume 237 2 Hourly Flow Rate, HFR 6 946 Percent Heavy Vehicles Median Type/Storage 0 Undivided RT Channelized? 0 2 Lanes Configuration LT T Upstream Signal? No No Minor Street Movements 10 L Τ R L Τ R Volume Δ Peak Hour Factor, PHF 0.91 Peak-15 Minute Volume 1 Hourly Flow Rate, HFR 4 Percent Heavy Vehicles Percent Grade (%) 0 0 Flared Approach: Exists?/Storage RT Channelized Lanes Configuration Pedestrian Volumes and Adjustments Movements 13 14 15 16 0 0 0 0 Flow (ped/hr) Lane Width (m) 3.6 3.6 3.6 3.6 Walking Speed (m/sec) Percent Blockage 1.2 1.2 1.2 1.2 0 0 _Upstream Signal Data Sat Arrival Prog. Cvcle Distance Green Prog. Speed Flow Flow Type Time Length to Signal kph vph vph sec sec meters

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

Left-Turn Through Left-Turn Through



					Movemen	t 2	Moveme	nt 5	_
Shared in volume Shared in volume Sat flow rate, m Sat flow rate, m Number of major	, majo ajor th ajor rt	r rt veh n vehicl t vehicl	nicles: les: les:	:	0 0 1700 1700 2				_
Worksheet 4-Crit	ical Ga	ap and E	Follow-	up Time	Calcul	ation			_
Critical Gap Cal	culatio	 on							_
Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R	
t(c,base) t(c,hv) P(hv)	4.1 1.00 0	1.00	1.00	1.00	1.00	7.1 1.00 0	1.00	1.00	_
t(c,g) Percent Grade t(3,lt)	0.00		0.20	0.20	0.10	0.20 0.00 0.70	0.20	0.10 0.00	
t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage	0.00 0.00 4.1	0.00	0.00	0.00	0.00	0.00 1.00 6.4	0.00	0.00	
Follow-Up Time C Movement	alculat 1 L	tions 4 L	7 L	8 T	9 R	10 L	11 T	12 R	_
t(f,base) t(f,HV) P(HV) t(f)	2.20 0.90 0 2.2	0.90	0.90	0.90	0.90	3.50 0.90 0 3.5	0.90	0.90	_
V prog Total Saturation Arrival Type Effective Green, Cycle Length, C Rp (from Exhibit Proportion vehic g(q1) g(q2) g(q)	g (sec (sec) 16-11)	e))		V(Moveme t) V(nt 2 1,prot)		vement 5 V(1,prot)	_
Computation 2-Pr	oportio	on of TV	ISC Inte		Moveme	nt <mark>2</mark>	Mo	vement 5 V(1,prot)	
alpha beta Travel time, t(a Smoothing Factor Proportion of co Max platooned fl Min platooned fl Duration of bloc Proportion time	, F nflict: ow, V(o ow, V(o ked per	ing flow c,max) c,min) riod, t			0.00	0	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	0.000	
Computation 3-Pl	atoon I	Event Pe	eriods	Res					- 111
p(2) p(5) p(dom) p(subo) Constrained or u	nconst	rained?		0.0					
Proportion unblocked		(1)			(2)		(3)		



movements, p(x)	Single	-stage ess	Sta	Two-St ge I	age Pi	rocess Stage	II			
(1) (4) (7) (8) (9) (10) (11) (12)									_	
Computation 4 and 5 Single-Stage Process										
Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R		
V c,x	0					485				
?x / c,u,x										
C r,x C plat,x									_	
Two-Stage Process	7	0. 1	8	0 01	10		1:			
V(c,x)	Stage2	Stage1	Stage	Z Stag	el St	tage2	Stage1	Stage2	_	
s					30	000				
V(c,u,x)									_	
V(c,u,x) C(r,x) C(plat,x)	e and Cap	acity E	quation	s					_	
V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance		acity E	quation	S	9		12		_	
V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity	st.	acity E	quation	s 1.			12			
V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity	St.	acity E	quation		00					
V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue	Factor free St.	acity E	quation	1.	00		1.00		_	
V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Step 2: LT from Major Conflicting Flows	Factor free St.	acity E	quation	1.	00		1.00		_	
V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity	Factor free St.		quation	1.	000		1.00 1.00 1 0 1636 1.00 1636		- - -	
V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Predestrian Impedance Movement Capacity Predestrian Impedance Movement Capacity Probability of Queue	Factor free St. Factor free St.		quation	1.	000 00 4		1.00 1.00 1 0 1636 1.00			
P(x) V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Maj L-Shared Prob Q f Step 3: TH from Minor	Factor free St. Factor free St. Factor free St.		quation	1.	000 00 4		1.00 1.00 1 0 1636 1.00 1636 1.00			
V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Maj L-Shared Prob Q f Step 3: TH from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Conflicting Flows Potential Capacity Pedestrian Impedance Capacity Pedestrian Impedance Capacity Pedestrian Impedance Capacity	Factor free St. Factor free St. Factor free St. Factor free St. Factor to Imped			1.	000 000 4 000 000 000 000 000 000 000 0		1.00 1.00 1 0 1636 1.00 1636 1.00			
V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Step 2: LT from Major Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Pedestrian Impedance Movement Capacity Probability of Queue Maj L-Shared Prob Q f	Factor free St. Factor free St. Factor free St. Factor free St. Factor to Imped free St.			1.	000 000 4 000 000 000 000 000 000 000 0		1.00 1.00 1 0 1636 1.00 1636 1.00 1.00			>



Step 3: TH from Minor St.	8	11	
Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Probability of Queue free St.			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity			
Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	1.00	
Result for 2 stage process: a Y C t			
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	
Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity			
Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity			
Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00 1.00 1.00 1.00	485 545 1.00 1.00 543	
Results for Two-stage process:			
a y C t 		543	
Worksheet 8-Shared Lane Calculations			
Movement 7 L	8 9 T R	10 11 12 L T R	
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)		4 543	
Worksheet 9-Computation of Effect of Fla	ared Minor Street	Approaches	
Movement 7 L	8 9 T R	10 11 12 L T R	
C sep		543	



Volume 4 Delay Q sep Q sep +1 round (Qsep +1)n max C sh SUM C sep C act Worksheet 10-Delay, Queue Length, and Level of Service 4 10 11 12 Lane Config $_{
m LT}$ L v (vph) C(m) (vph) 1636 543 0.00 0.01 v/c 95% queue length 0.01 0.02 Control Delay 7.2 11.7 LOS Α Approach Delay 11.7 Approach LOS В

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(il), Volume for stream 2 or 5	0	
v(i2), Volume for stream 3 or 6	0	
s(il), Saturation flow rate for stream 2 or 5	1700	
s(i2), Saturation flow rate for stream 3 or 6	1700	
P*(oj)	1.00	
d(M,LT), Delay for stream 1 or 4	7.2	
N, Number of major street through lanes	2	
d(rank,1) Delay for stream 2 or 5		

1.1.4.13 Interseção G - Pico Manhã

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY Analyst: Progeplan

Agency/Co.: Date Performed: 05/06/2023 Analysis Time Period: Pico Manha Intersection: G Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL

East/West Street: M2-M7+M8-M11+M12-M13

North/South Street: M13 Intersection Orientation: EW

Study period (hrs): 1.00

Vehicle Volumes and Adjustments Major Street: Approach Eastbound Westbound 6 5 Movement R L T Volume 30 736 Peak-Hour Factor, PHF 0.91 0.91 Hourly Flow Rate, HFR 32 808 Percent Heavy Vehicles Median Type/Storage 4 Undivided RT Channelized? 0 2 Lanes



Configuration LT T Upstream Signal? No No Minor Street: Approach Northbound Southbound 10 12 Movement 8 11 L Т R L Т R Volume 17 1.00 Peak Hour Factor, PHF Hourly Flow Rate, HFR 17 Percent Heavy Vehicles Percent Grade (%) 0 0 Flared Approach: Exists?/Storage Lanes Configuration Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound Movement 1 4 8 9 10 11 Lane Config LT L v (vph) 32 C(m) (vph) 1610 546 0.02 0.03 v/c 95% queue length 0.06 0.10 7.3 Control Delay 11.8

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11.8

В

В

Phone: Fax: E-Mail: TWO-WAY STOP CONTROL(TWSC) ANALYSIS_

Α

Analyst: Progeplan

Agency/Co.:

LOS

Approach Delay

Approach LOS

Date Performed: 05/06/2023 Analysis Time Period: Pico Manha Intersection:

Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023 Project ID: FUTURA COMERCIAL

East/West Street: M2-M7+M8-M11+M12-M13

North/South Street: M13

Intersection Orientation: EW Study period (hrs):

	_Vehicle	Volumes	and Ad	justmen	its		_
Major Street Movements	1	2	3	4	5	6	١
	L	T	R	L	T	R	
Volume				30	736		
Peak-Hour Factor, PHF				0.91	0.91		
Peak-15 Minute Volume				8	202	/ /	
Hourly Flow Rate, HFR				32	808	I	
Percent Heavy Vehicles				4		-1	_/
Median Type/Storage	Und	ivided					1
RT Channelized?				0	2		١
Configuration				Ŭ	тт\		-\
Upstream Signal?		No			No L		
opocicum bignai.		140			110		
Minor Street Movements	7	8	9	10	11	12	7
	L	T	R	L	T	R	
Volume	17						t



Peak Hour Factor, PHF 1.00
Peak-15 Minute Volume 4
Hourly Flow Rate, HFR 17
Percent Heavy Vehicles 0

Percent Grade (%) 0
Flared Approach: Exists?/Storage

RT Channelized

Lanes 1 Configuration L 0

Ü

	Pedestrian '	Volumes	and Adj	ustments
Movements	13	14	15	16
Flow (ped/hr)	0	0	0	0
Lane Width (m)	3.6	3.6	3.6	3.6
Walking Speed (m/sec)	1.2	1.2	1.2	1.2
Percent Blockage	0	0	0	0

Upstream Signal Data Prog. Sat Arrival Green Cycle Prog. Distance Flow Flow Time to Signal Type Length Speed vph vph sec sec kph meters

S2 Left-Turn Through S5 Left-Turn Through

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

	Movement 2	Movement 5	
Shared in volume, major th vehicles:		0	
Shared ln volume, major rt vehicles:		0	
Sat flow rate, major th vehicles:		1700	
Sat flow rate, major rt vehicles:		1700	
Number of major street through lanes:		2	

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical	. Gap Calculati	on							
Movement	1	4	7	8	9	10	11	12	
	L	L	L	T	R	L	Т	R	
t(c,base	;)	4.1	7.1						
t(c,hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
P(hv)		4	0						
t(c,g)			0.20	0.20	0.10	0.20	0.20	0.10	
Percent	Grade		0.00	0.00	0.00	0.00	0.00	0.00	
t(3,1t)		0.00	0.70						
t(c,T):	1-stage 0.00	0.00	0.00	0.00	0.00	0,00	0.00	0.00	
	2-stage 0.00	0.00	1.00	1.00	0.00	1,00	1.00	0.00	
t(c)	1-stage	4.1	6.4						
	2-stage								

Follow-IIn 7	Time Calaulat								
LOTION OF 1	Time Calculat	cions			>				
Movement	1	4	7	8	9	10	11	12	
	L	L	L	Т	R	L	T	R	
t(f,base) t(f,HV) P(HV) t(f)	0.90	2.20 0.90 4 2.2	3.50 0.90 0 3.5	0.90	0.90	0.90	0.90	0.90	_

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

Movement 2 M V(t) V(1,prot) V(t)

Movement 5 (t) V(1,prot)

V prog Total Saturation Flow Rate, s (vph) Arrival Type



Effective Green, g (sec) Cycle Length, C (sec) Rp (from Exhibit 16-11) Proportion vehicles arriving on green P g(q1) g(q2) g (q) Computation 2-Proportion of TWSC Intersection Time blocked Movement 2 Movement 5 V(t) V(l,prot) V(t) V(l,prot)alpha beta Travel time, t(a) (sec) Smoothing Factor, F Proportion of conflicting flow, f Max platooned flow, V(c,max) Min platooned flow, V(c,min) Duration of blocked period, t(p) Proportion time blocked, p 0.000 0.000 Computation 3-Platoon Event Periods Result p(2) 0.000 p(5) 0.000 p(dom) p(subo) Constrained or unconstrained? Proportion unblocked (1) (2) (3) for minor Single-stage Two-Stage Process movements, p(x)Stage I Process Stage II p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12) Computation 4 and 5 Single-Stage Process Movement 1 4 7 8 9 10 11 12 L L L Т R Т R V c,x 0 468 Рx V c,u,x Cr,x C plat,x Two-Stage Process 10 11 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 V(c,x) 3000 P(x) V(c,u,x) $\overline{C(r,x)}$ C(plat,x) Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St. 12 Conflicting Flows Potential Capacity 1.00 1.00 Pedestrian Impedance Factor Movement Capacity



			engenharia e
Probability of Queue free St.	1.00	1.00	
Step 2: LT from Major St.	4	1	
step 2. II IIOM Major St.		<u> </u>	
Conflicting Flows	0		
Potential Capacity Pedestrian Impedance Factor	1610 1.00	1.00	
Movement Capacity	1610	1.00	
Probability of Queue free St.	0.98	1.00	
Maj L-Shared Prob Q free St.	0.98		
Step 3: TH from Minor St.	8	11	
Conflicting Flows			
Potential Capacity	1.00	1.00	
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	0.98	0.98	
Movement Capacity			
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	
-	460		
Conflicting Flows Potential Capacity	468 557		
Pedestrian Impedance Factor	1.00	1.00	
Maj. L, Min T Impedance factor		0.98	
Maj. L, Min T Adj. Imp Factor.	0.00	0.98	
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	0.98 546	0.98	
Workshoot 7-Computation of the Effect of	Pro-stage Can Asso	ntango	
Worksheet 7-Computation of the Effect of 1	iwo-stage Gap Acce	ptance	
Step 3: TH from Minor St.	8	11	
Part 1 - First Stage			
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity			
Probability of Queue free St.			
Part 2 - Second Stage			
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt Movement Capacity			
Movement Capacity			
Part 3 - Single Stage			
Conflicting Flows Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00	
Cap. Adj. factor due to Impeding mvmnt	0.98	0.98	
Movement Capacity	_ /		
Result for 2 stage process:		\	
a		_	
Y C t) /		\
Probability of Queue free St.	1.00	1.00	\
Step 4: LT from Minor St.	7	10	$\langle \rangle$
Part 1 - First Stage			
Conflicting Flows Potential Capacity		1 /> -	////
Pedestrian Impedance Factor		ノニ	1111
Cap. Adj. factor due to Impeding mymnt			7
Movement Capacity		\ \	//
Part 2 - Second Stage			//
Conflicting Flows		7 /	
Potential Capacity			
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt			, 1
Movement Capacity			
÷			



Part 3 - Single St	age								
Conflicting Flows					468				
Potential Capacity Pedestrian Impedan		ar.			557 1.00		1.00	1	
Maj. L, Min T Impedan					1.00		0.98		
Maj. L, Min T Adj.							0.98		
Cap. Adj. factor d			mvmnt		0.98		0.98	3	
Movement Capacity					546				
Results for Two-st	age pro	cess:							_
a									
У					F 4.6				
Ct					546				
Worksheet 8-Shared	Lane Ca	alculat	ions						
Movement			7	8	9	10	11	12	
110 v 00110			L	Т	R	L	Т	R	
Volume (vph)			17						
Movement Capacity Shared Lane Capaci)	546						
Worksheet 9-Comput	ation of	f Effect	t of Fla	red Min	or Stree	et Appro	paches		_
Movement			7	8	9	10	11	12	
			L	Т	R	L	Т	R	
C sep Volume Delay			546 17						_
Q sep Q sep +1 round (Qsep +1)									
n max C sh SUM C sep n C act									
Worksheet 10-Delay	, Queue	Length	, and Le	vel of	Service				_
Movement	1	4	7	8	9	10	11	12	_
Lane Config	1	LT	L	0	9	10	11	12	
v (vph)		32	17						
C(m) (vph)		1610	546						
v/c		0.02	0.03						
95% queue length Control Delay		0.06 7.3	0.10 11.8						
LOS		A	В		/	\			
Approach Delay		11	D	11.8					
Approach LOS				В					
Worksheet 11-Share	d Major	LT Impe	edance a	nd Dela	У		1		
					Moveme	ent 2	Mover	ment 5	- \
p(oj) v(il), Volume for v(i2), Volume for s(il), Saturation	stream 3	3 or 6	stream 2	or 5	1.0	00	0 0 1	700	
s(i2), Saturation: P*(oj) d(M.IT) Polar for	_		stream 3	or 6		\rightarrow	0 .	700 .98	4
<pre>d(M,LT), Delay for N, Number of major d(rank,1) Delay fo.</pre>	street	through					2	.3	// ,
									7



1.1.4.14 Interseção G – Pico Tarde

HCS+: Unsignalized Intersections Release 5.6 TWO-WAY STOP CONTROL SUMMARY Analyst: Progeplan Agency/Co.: Date Performed: 05/06/2023 Analysis Time Period: Pico Tarde Intersection: Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL East/West Street: M2-M7+M8-M11+M12-M13 North/South Street: M13 Intersection Orientation: EW Study period (hrs): 1.00 _Vehicle Volumes and Adjustments_ Westbound Major Street: Approach Eastbound 2 5 Movement Т Т T. R | L R Volume 35 Peak-Hour Factor, PHF 0.91 0.91 Hourly Flow Rate, HFR 38 2332 0 Percent Heavy Vehicles Median Type/Storage Undivided RT Channelized? 2 Lanes 0 Configuration LT T Upstream Signal? No No Minor Street: Approach Northbound Southbound | 10 Movement 8 11 12 L Т R Τ Volume 170 Peak Hour Factor, PHF 0.91 Hourly Flow Rate, HFR Percent Heavy Vehicles 0 Percent Grade (%) Flared Approach: Exists?/Storage Lanes Configuration Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound Movement 1 4 11 8 Lane Config LT L v (vph) 38 186 C(m) (vph) 1636 190 v/c 0.02 0.98 15.73 95% queue length 0.07 Control Delay 188.7 7.3 LOS F Α Approach Delay 188.7 Approach LOS F HCS+: Unsignalized Intersections Release 5.6

Fax:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS_

Analyst: Progeplan

Phone:

E-Mail:



Agency/Co.:

Date Performed: 05/06/2023 Analysis Time Period: Pico Tarde

Intersection: G DER/DF

Jurisdiction:

Jurisdiction.
Units: U. S. Metric
Voar. 2023

Project ID: FUTURA COMERCIAL

East/West Street: M2-M7+M8-M11+M12-M13 North/South Street: M13

Study period (hrs): 1.00 Intersection Orientation: EW

Intersection Orientation	: EW		St	udy per	riod (hr	s): 1.0	0
	Vehicle V	olumes	and Adj	ustment	s		
Major Street Movements	1 L	2 T	3 R	4 L	5 T	6 R	
Volume Peak-Hour Factor, PHF Peak-15 Minute Volume Rourly Flow Rate, HFR Percent Heavy Vehicles Redian Type/Storage	Undiv	 ided		35 0.91 10 38 0	2123 0.91 583 2332		
T Channelized? anes onfiguration pstream Signal?		No		0 LT	2 T No		
Tinor Street Movements	7 L	8 T	9 R	10 L	11 T	12 R	
Volume Peak Hour Factor, PHF Peak-15 Minute Volume Hourly Flow Rate, HFR Percent Heavy Vehicles Percent Grade (%) Plared Approach: Exists Thannelized Lanes Configuration	170 0.91 47 186 0 ?/Storage	0		/	0		/
	destrian	Volumes	and Ad	justmen	ıts		
lovements	13	14	15	16			
Flow (ped/hr) Lane Width (m) Walking Speed (m/sec) Percent Blockage	0 3.6 1.2 0	0 3.6 1.2	0 3.6 1.2 0	0 3.6 1.2			
	IInst	ream Si	anal Da	t a			
Prog. Flow vph	Sat A	rrival Type	Green Time sec		_	d to S	ance ignal ers
2 Left-Turn Through 5 Left-Turn Through			\(\)				
Worksheet 3-Data for Com	puting Ef	fect of	Delay	to Majo	r Stree	t Vehicl	es
			Move	ment 2	Mov	ement 5	
Shared in volume, major Shared in volume, major Sat flow rate, major th	rt vehicl	es:			0 0 1	\ /	7 =

Worksheet 4-Critical Gap and Follow-up Time Calculation

Sat flow rate, major th vehicles: Sat flow rate, major rt vehicles:

Number of major street through lanes:

Critical Gap Calculation Movement 1 4 7 8 9 L L T R 10 11

2

1700 1700



t (a basa)		A 1	7 1					
t(c,base) t(c,hv)	1.00	4.1 1.00	7.1 1.00	1.00	1.00	1.00	1.00	1.00
P(hv)	1.00	0	0	1.00	1.00	1.00	1.00	1.00
t(c,g)			0.20	0.20	0.10	0.20	0.20	0.10
Percent Grade			0.00	0.00	0.00	0.00	0.00	0.00
t(3,1t)	- 0 00	0.00	0.70	0 00	0 00	0 00	0 00	0.00
t(c,T): 1-stage 2-stage		0.00	0.00	0.00	0.00	0.00	0.00	0.00
t(c) 1-stage		4.1	6.4	1.00	0.00	1.00	1.00	0.00
2-stage			•••					
Follow-Up Time (7	0	0	1.0		1.0
Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
	П	ш	ш	1	Λ	ш	1	K
t(f,base)		2.20	3.50					
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)		0	0					
t(f)		2.2	3.5					
Worksheet 5-Effe				Upstre	Movemen	nt 2		vement 5
				V (t) V(l,prot)	V(t)	V(1,prot)
Rp (from Exhibit Proportion vehic				_				
g(q1) g(q2) g(q)			_					
g (q1) g (q1)			_	ersectio	Movemen	nt 2	Mo	vement 5
g (q1) g (q1)			_		Movemen		Mo	
g (q1) g (q1)			_	ersectio	Movemen	nt 2	Mo	
g(q1) g(q2) g(q) Computation 2-P			_	ersectio	Movemen	nt 2	Mo	
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a	roportio	on of TV	_	ersectio	Movemen	nt 2	Mo	
g(q1) g(q2) g(q) Computation 2-Prairies alpha beta Fravel time, t(association)	roportion	on of TV	WSC Inte	ersectio	Movemen	nt 2	Mo	
g(q1) g(q2) g(q) Computation 2-Pi alpha beta Fravel time, t(a Smoothing Factor	roportion a) (secondary February Febru	on of TW	WSC Inte	ersectio	Movemen	nt 2	Mo	
g(q1) g(q2) g(q) Computation 2-Pa alpha beta Fravel time, t(a Smoothing Factor Proportion of co	a) (sector, Fonflict:	on of TW	WSC Inte	ersectio	Movemen	nt 2	Mo	
g(q1) g(q2) g(q) Computation 2-Pa alpha beta Fravel time, t(a Smoothing Factor Proportion of co Max platooned fi	a) (sector, Fonfliction, V(alow, V(alo	on of TW ing flow c,max) c,min)	WSC Inte	ersectio	Movemen	nt 2	Mo	
g(q1) g(q2) g(q) Computation 2-Practice alpha beta Fravel time, t(a Smoothing Factor Proportion of co Max platooned fi Min platooned fi Duration of bloc	roportion a) (sector, Foundation, V(clow, V(coked period))	on of Two	WSC Inte	ersectio	Movemen	nt 2 1,prot)	Mo'V(t)	
g(q1) g(q2) g(q) Computation 2-Properties alpha beta Fravel time, t(a Smoothing Factor Proportion of community Min platooned fill Min platooned fill Ouration of blood Proportion time	a) (sec) r, F onflict: low, V(d low, V(d cked pe: blocked	on of Two	NSC Inte	V(Movement) V(2	nt 2 1,prot)	Mo'V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pa alpha beta Fravel time, t(a Smoothing Factor Proportion of co	a) (sec) r, F onflict: low, V(d low, V(d cked pe: blocked	on of Two	NSC Inte	ersectio	Movement) V(2	nt 2 1,prot)	Mo'V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Properties alpha ceta Fravel time, t(a Emoothing Factor Proportion of community Max platooned find platooned find platooned find platooned find proportion time Computation 3-Piccomputation 3-Picco	a) (sec) r, F onflict: low, V(d low, V(d cked pe: blocked	on of Two	NSC Inte	V(Movement) V(2	nt 2 1,prot)	Mo'V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Pravel time, t(a Smoothing Factor Proportion of co Max platooned fi Ouration of bloo Proportion time Computation 3-Pi	a) (sec) r, F onflict: low, V(d low, V(d cked pe: blocked	on of Two	NSC Inte	V(0.000	nt 2 1,prot)	Mo'V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Properties alpha ceta Fravel time, t(a Emoothing Factor Proportion of community Max platooned find platooned find platooned find platooned find proportion time Computation 3-Piccomputation 3-Picco	a) (sec) r, F onflict: low, V(d low, V(d cked pe: blocked	on of Two	NSC Inte	V(0.000	nt 2 1,prot)	Mo'V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Properties alpha beta Fravel time, t(a Smoothing Factor Proportion of computation of blood Proportion of blood Proportion time Computation 3-Properties g(2) g(5)	a) (sec) r, F onflict: low, V(d low, V(d cked pe: blocked	on of Two	NSC Inte	V(0.000	nt 2 1,prot)	Mo'V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pi alpha beta Fravel time, t(a Smoothing Factor Proportion of co Max platooned fi Ouration of bloo Proportion time Computation 3-Pi p(2) p(5) p(dom)	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	on of Twing flow c,max) c,min) riod, td, p	NSC Inte	V(0.000	nt 2 1,prot)	Mo'V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a Emoothing Factor Proportion of co Max platooned fi Min platooned fi Couration of blood Proportion time Computation 3-Pr p(2) p(5) p(60m) p(subo) Constrained or u	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	on of Twing flow c,max) c,min) riod, td, p	NSC Inte	V(0.000	nt 2 1,prot)	Mo'V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a Smoothing Factor Proportion of co Max platooned fi Ouration of bloc Proportion time Computation 3-Pr p(2) p(5) p(dom) p(subo) Constrained or u	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	ing flow c., max) c., min) riod, td, p Event Personal Per	WSC Inte	Resi	0.000	nt 2 1,prot)	Mo V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a Emoothing Factor Proportion of co Max platooned fi Ouration of bloo Proportion time Computation 3-Pr p(2) p(5) p(dom) p(subo) Constrained or u Proportion unblocked	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	ing flow c, max) cc, min) riod, td, p Event Perained?	WSC Inte	Resi	0.000	nt 2 1,prot)	Mo V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a Emoothing Factor Proportion of co Max platooned fi Ouration of blood Proportion time Computation 3-Pi p(2) p(5) p(dom) p(subo) Constrained or u Proportion unblocked for minor	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	ing flow c,max) c,min) riod, t d, p Event Pe	WSC Inte	Rest	0.000 0.000 0.11t 00 00 Two-Sta	nt 2 1,prot)	Mo V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a Emoothing Factor Proportion of co Max platooned fi Ouration of bloo Proportion time Computation 3-Pr p(2) p(5) p(dom) p(subo) Constrained or u Proportion unblocked	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	ing flow c, max) cc, min) riod, td, p Event Perained?	WSC Inte	Rest	0.000	nt 2 1,prot)	Mo V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a Emoothing Factor Proportion of co Max platooned fi Ouration of blood Proportion time Computation 3-Pi p(2) p(5) p(dom) p(subo) Constrained or u Proportion unblocked for minor	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	ing flow c,max) c,min) riod, t d, p Event Pe	WSC Inte	Rest	0.000 0.000 0.11t 00 00 Two-Sta	nt 2 1,prot)	Mo V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a Smoothing Factor Proportion of co Max platooned fi Min platooned fi Proportion time Computation 3-Pr p(2) p(5) p(dom) p(subo) Constrained or n Proportion unblocked for minor movements, p(x)	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	ing flow c,max) c,min) riod, t d, p Event Pe	WSC Inte	Rest	0.000 0.000 0.11t 00 00 Two-Sta	nt 2 1,prot)	Mo V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a Smoothing Factor Proportion of co Max platoned fi Ouration of bloc Proportion time Computation 3-Pr p(2) p(5) p(dom) p(subo) Constrained or to Proportion unblocked for minor movements, p(x) p(1) p(4) p(7)	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	ing flow c,max) c,min) riod, t d, p Event Pe	WSC Inte	Rest	0.000 0.000 0.11t 00 00 Two-Sta	nt 2 1,prot)	Mo V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a Smoothing Factor Proportion of co Max platoned fi Ouration of blood Proportion time Computation 3-Pi p(2) p(5) p(dom) p(subo) Constrained or u Proportion unblocked for minor movements, p(x) p(1) p(4) p(7) p(8)	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	ing flow c,max) c,min) riod, t d, p Event Pe	WSC Inte	Rest	0.000 0.000 0.11t 00 00 Two-Sta	nt 2 1,prot)	Mo V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha Deta Fravel time, t(and Standard	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	ing flow c,max) c,min) riod, t d, p Event Pe	WSC Inte	Rest	0.000 0.000 0.11t 00 00 Two-Sta	nt 2 1,prot)	Mo V(t)	V(1,prot)
g(q1) g(q2) g(q) Computation 2-Pr alpha beta Fravel time, t(a Smoothing Factor Proportion of co Max platoned fi Ouration of blood Proportion time Computation 3-Pi p(2) p(5) p(dom) p(subo) Constrained or u Proportion unblocked for minor movements, p(x) p(1) p(4) p(7) p(8)	a) (sec) r, F onflict: low, V(c) low, V(c) cked pe: blocked	ing flow c,max) c,min) riod, t d, p Event Pe	WSC Inte	Rest	0.000 0.000 0.11t 00 00 Two-Sta	nt 2 1,prot)	Mo V(t)	V(1,prot)

1 4 7 8 9 10

12

11

Computation 4 and 5 Single-Stage Process Movement



						engennaria e mei
	L L	L	T R	L T	R	
		1010				
V c,x	0	1242				
S						
Px						
V c,u,x						
C r,x C plat,x						
Two-Stage Process		8	10	1	1	
	tage2 Stage			tage2 Stage1		
V(c,x)						
s 3	000					
P(x)						
V(c,u,x)						
C(r,x)						
C(plat,x)						
Worksheet 6-Impedance a	nd Capacity	Equations				
Step 1: RT from Minor S	t.		9	12		
Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Fa	ctor		1.00	1.00		
Movement Capacity	Q.1		1 00	1 00		
Probability of Queue fr	ee St.		1.00	1.00		
Step 2: LT from Major S	t.		4	1		
Conflicting Flows			0			
Potential Capacity			1636			
Pedestrian Impedance Fa	ctor		1.00	1.00		
Movement Capacity			1636	1 00		
Probability of Queue fr Maj L-Shared Prob Q fre			0.98 0.98	1.00	1	
Step 3: TH from Minor S	t.		8	11		
Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Fa	ctor		1.00	1.00		
Cap. Adj. factor due to		mnt	0.98	0.98		
Movement Capacity						
Probability of Queue fr	ee St.		1.00	1.00	l	
Step 4: LT from Minor S	t.		7	10		
Conflicting Flows			1242			
Potential Capacity			195			
Pedestrian Impedance Fa	ctor		1.00	1.00		
Maj. L, Min T Impedance	factor			0.98		
Maj. L, Min T Adj. Imp				0.98		
Cap. Adj. factor due to	Impeding my	/mnt	0.98	0.98		
Movement Capacity			190	\ ()
Worksheet 7-Computation	of the Effe	ect of Two	-stage Gan	Acceptance		
Step 3: TH from Minor S			8	11		
Part 1 - First Stage					>	\ \ \ \
Conflicting Flows				\ 		1111
Potential Capacity					1	
Pedestrian Impedance Fa					1	
Cap. Adj. factor due to	Impeding my	mnt			\	
Movement Capacity Probability of Queue fr	ee St.					
Part 2 - Second Stage						//
Conflicting Flows						1
Potential Capacity						< 1
Pedestrian Impedance Fa	ctor			l		



Cap. Adj. factor due to Impeding mvm Movement Capacity	nnt							
Part 3 - Single Stage							_	
Conflicting Flows								
Potential Capacity Pedestrian Impedance Factor		1	.00		1.00			
Cap. Adj. factor due to Impeding mvn	nnt		.98		0.98			
Movement Capacity								
Result for 2 stage process:							_	
a								
y C t								
Probability of Queue free St.		1	.00		1.00			
Step 4: LT from Minor St.			7		10		_	
Part 1 - First Stage							_	
Conflicting Flows								
Potential Capacity								
Pedestrian Impedance Factor								
Cap. Adj. factor due to Impeding mvr Movement Capacity	nnt							
Part 2 - Second Stage							_	
Conflicting Flows								
Potential Capacity								
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvm	nn+							
Movement Capacity	IIIIC							
Part 3 - Single Stage							_	
Conflicting Flows			242					
Potential Capacity			95		1 00			
Pedestrian Impedance Factor Maj. L, Min T Impedance factor		Τ	.00		1.00 0.98			
Maj. L, Min T Adj. Imp Factor.					0.98			
Cap. Adj. factor due to Impeding mvm	nnt	0	.98		0.98			
Movement Capacity		1	90					
Results for Two-stage process:							_	
a								
<u>Y</u>								
C t		1	90					
Worksheet 8-Shared Lane Calculations							_	
				1.0	1.1	10	_	
Movement	7 L	8 T	9 R	10 L	11 T	12 R		
							_	
Volume (vph) Movement Capacity (vph)	186 190							
Shared Lane Capacity (vph)	230							
				-			_	
Worksheet 9-Computation of Effect of	f Flare	d Minor	Street	Approa	aches			
Movement	7	8	9	10	11	12	<u> </u>	
	L	<i>†</i> /	R	L	1	R	\	
C sep	190					7		
Volume	186						_ ~)
Delay Q sep								
Q sep +1		7			1 ^		1	
round (Qsep +1)			_		1 /		<i>///</i>	١ ١
n max				\rightarrow			- \	1
C sh					\ \	\		/
SUM C sep				1	\			
n C act					\ \		//	
Worksheet 10-Delay, Queue Length, ar	nd T.evre	of se	rvice				_	1
"OINDINGED TO DETAY, Queue Bength, an	.a neve		T A TCC					1



Movement Lane Config	1	4 LT	7 L	8	9	10	11	12
v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay		38 1636 0.02 0.07 7.3 A	186 190 0.98 15.73 188.7	188.7				
Approach LOS				F				

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
	1.00	0.98
v(il), Volume for stream 2 or 5		0
v(i2), Volume for stream 3 or 6		0
s(il), Saturation flow rate for stream 2 or 5		1700
s(i2), Saturation flow rate for stream 3 or 6		1700
P*(oj)		0.98
d(M,LT), Delay for stream 1 or 4		7.3
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5		2

1.1.4.15 Interseção H – Pico Manhã

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY_

Analyst: Progeplan Agency/Co.: Date Performed: 05/06/2023 Analysis Time Period: Pico Manha Intersection: H

Jurisdiction: DER/DF Units: U. S. Metric
Analysis Year: 2023 Project ID: FUTURA COMERCIAL

East/West Street: M01-M05-M07+M08+M06-M11+M12
North/South Street: M14

Intersection Orientation: EW Study period (hrs): 1.00

Major Street: Approach	hicle Vol	stbound				estboun		
Movement	1 1		3		4	5 CDOUII	u 6	
Movement	L	T	R	i	L	T	R	
olume	1	1784				$\overline{}$		
eak-Hour Factor, PHF	0.91	0.91			/	\		
Mourly Flow Rate, HFR	1	1960						
Percent Heavy Vehicles	0)	
Median Type/Storage	Undiv	ided			1			
T Channelized?			\					
anes	0	2.	7				1 /	\
Configuration	•	ГТ		- /			1 [/	\
pstream Signal?		No				No		
poeream orginar.		110		-\		110		
Minor Street: Approach	No	rthboun	d	_	So	outhbou	nd	
Movement	7	8	9		10	11	12	
	T,	Т	R		T.	Т	R	
							1 7 7 1	
olume				τ	30		1 / /	/ / /
eak Hour Factor, PHF				_	0.91		-	
Mourly Flow Rate, HFR					32		1 1]]
Percent Heavy Vehicles					4	- [1 1	/ /
Percent Grade (%)		0				0		
'lared Approach: Exists	?/Storage			/				
anes					1			
Configuration								
3								
							/	
Doloss	Queue Lei	aath a	- d T	. 1 .	£ 0			



Approach	EB	WB			Nor	thbour	nd		Sc	outhbour	nd
Movement	1	4	- 1	7		8	9	- 1	10	11	12
Lane Config	LT							- 1	L		
v (vph)	1								32		
C(m) (vph)	1636								274		
v/c	0.00								0.12		
95% queue length	0.00								0.40		
Control Delay	7.2								19.9		
LOS	A								С		
Approach Delay										19.9	
Approach LOS										С	

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax: E-Mail:

_TWO-WAY STOP CONTROL(TWSC) ANALYSIS__

Analyst: Progeplan
Agency/Co.:
Date Performed: 05/06/2023
Analysis Time Period: Pico Manha
Intersection: H
Jurisdiction: DER/DF
Units: U. S. Metric

Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERC. East/West Street: M01-I North/South Street: M14 Intersection Orientation: I	M05-M07	'+M08+M			siad (b	a) . 1	.00	
Intersection Orientation:	±W		5	tudy per	10a (r	irs): I	.00	
Vel	nicle V	olumes	and Ad	justment	s			
Major Street Movements	1	2	3	4	5	6		_
	L	Т	R	L	T	R		
Volume	1	1784						_
Peak-Hour Factor, PHF	0.91	0.91						
Peak-15 Minute Volume	0	490						
Hourly Flow Rate, HFR	1	1960						
Percent Heavy Vehicles	0							
Median Type/Storage RT Channelized?	Undiv	rided		/				
Lanes	0	2						
Configuration	LT	T						
Upstream Signal?		No			No			
Minor Street Movements	7	8	9 /	10	11	12		_
minor street movements	L	T	R	T	T	R		
Volume				30				
Peak Hour Factor, PHF			/	0.91		- 1 1	/	\
Peak-15 Minute Volume				8		1 1	_ /	\
Hourly Flow Rate, HFR				32				
Percent Heavy Vehicles			\	4				
Percent Grade (%)		0		1 /	0			
Flared Approach: Exists?/	Storage						_ /	
RT Channelized						- 1		_ \
Lanes				1			/ /	1
Configuration								_
							 	_
Pede	strian	Volumes	s and A	djustmer	nts		//	
Movements	13	14	15	16				_//
Flow (ped/hr)	0	0	0	0				
Lane Width (m)	3.6	3.6	3.6	3.6				
Walking Speed (m/sec)	1.2	1.2	1.2	1.2			_	
Percent Blockage	0	0	0	0				



		τ	Jpstream	n Signa	al Data	ì		
	Prog. Flow	Sat	v Type)	Green Fime sec	Cycle Length sec	Prog. Speed	Distance to Signal meters
	vph	vph					kph	meters
2 Left-Turn Through 5 Left-Turn Through								
orksheet 3-Da	ta for Co	omputing	g Effect	of De	elay to	Major	Street V	ehicles
					Moveme	ent 2	Moveme	ent 5
chared in volument of the chared in volument of the character of the chara	me, major major th major rt	rt veh n vehici vehici	nicles: les: les:	:	0 0 1700 1700 2			
Jorksheet 4-Cr	itical Ga	ap and I	Follow-ı	ıp Time	e Calcu	ılation		
Critical Gap C								
lovement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
(c,base) (c,hv) (hv)	4.1 1.00 0	1.00	1.00	1.00	1.00	7.1 1.00 4	1.00	1.00
(c,g) ercent Grade			0.20	0.20	0.10	0.20	0.00	0.10 0.00
2-sta	0.00 ge 0.00 ge 0.00 ge 4.1 ge	0.00	0.00	0.00	0.00		0.00	0.00
ollow-Up Time	Calculat	ions						
ovement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
(f,base) (f,HV) (HV) (f)	2.20 0.90 0 2.2	0.90	0.90	0.90	0.90	3.50 0.90 4 3.5		0.90
Norksheet 5-Ef		_	_			-		
				V		ment 2 7(1,prot	\ \	V(1,prot)
7 prog Cotal Saturati Arrival Type Effective Gree Cycle Length, Rp (from Exhib	n, g (sed C (sec)	e)	(vph)					
RP (110M EXILD Proportion veh g(q1) g(q2) g(q)			on greer	n P				7
							ked	

alpha
beta
Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f
Max platooned flow, V(c,max)



Min platooned flow, V(c,min)
Duration of blocked period, t(p)
Proportion time blocked, p

Duration of blocked p Proportion time block		(p)		0.0	000		0.000			
Computation 3-Platoon	Event I	Periods	Re	sult					_	
p(2) p(5) p(dom) p(subo) Constrained or uncons	trained?	?		000					_	
Proportion									_	
<pre>unblocked for minor movements, p(x)</pre>	Single Prod	e-stage	St	(2) Two-S age I	Stage Pi	(3) rocess Stage I	I			
p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12)									_	
Computation 4 and 5 Single-Stage Process Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R	_	
									_	
V c,x s Px V c,u,x	0					982				
C r,x C plat,x									_	
Two-Stage Process									_	
Stage1	7 Stage2	Stage1	8 Stag	re2 Sta	10 age1 St	age2 S	1: Stage1			
V(c,x)					3(000			_	
P(x) V(c,u,x)										
C(r,x) C(plat,x)									_	
Worksheet 6-Impedance	and Car	pacity E	Equatio	ons					_	
Step 1: RT from Minor	St.				9		12		_	
Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity	Factor			1	.00		1.00		_	
Probability of Queue	free St.] 1	.00		1.00		\	
Step 2: LT from Major	St.				4		1		- \	
Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Maj L-Shared Prob Q f Step 3: TH from Minor	free St.				.00		0 1636 1.00 1636 1.00 1.00	\		_
Conflicting Flows Potential Capacity Pedestrian Impedance Cap. Adj. factor due Movement Capacity		ling mvm	nnt		1.00		1.00			



			engenharia e meio d
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	_
Conflicting Flows		982	_
Potential Capacity		274	
Pedestrian Impedance Factor	1.00	1.00	
Maj. L, Min T Impedance factor	1.00		
Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	
Movement Capacity	1.00	274	
			_
Worksheet 7-Computation of the Effect of	: Two-stage Gap Acc 	ceptance 11	_
Step 3: TH from Minor St.	· · · · · · · · · · · · · · · · · · ·		_
Part 1 - First Stage			
Conflicting Flows Potential Capacity			
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity			
Probability of Queue free St.			
Part 2 - Second Stage			
Conflicting Flows			
Potential Capacity Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mymnt			
Movement Capacity			
Part 3 - Single Stage			
Conflicting Flows			
Potential Capacity	1.00	1 00	
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	
Movement Capacity			
Result for 2 stage process:			
a			
У			
C t Probability of Queue free St.	1.00	1.00	
			_
Step 4: LT from Minor St.	7	10	
Part 1 - First Stage			
Conflicting Flows Potential Capacity			
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity			
Part 2 - Second Stage		\	_
Conflicting Flows			
Potential Capacity Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mymnt			
Movement Capacity	\		
Part 3 - Single Stage		1 1	- \
Conflicting Flows		982	
Potential Capacity	1,00	274	_ `)
Pedestrian Impedance Factor Maj. L, Min T Impedance factor	1.00	1.00	
Maj. L, Min T Adj. Imp Factor.	1.00		
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	
Movement Capacity		274	_ ++-
Results for Two-stage process:			
У			
C t		274	
			- [
Worksheet 8-Shared Lane Calculations			



Movement			7 L	8 T	9 R	10 L	11 T	12 R
Volume (vph) Movement Capacity Shared Lane Capaci						32 274		
Worksheet 9-Comput	ation of	Effect	of Flar	ed Mino	r Stree	t Appro	paches	
Movement			7 L	8 T	9 R	10 L	11 T	12 R
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)						274 32		
n max C sh SUM C sep n C act								
Worksheet 10-Delay	, Queue I	Length,	and Lev	el of S	ervice			
Movement Lane Config	1 LT	4	7	8	9	10 L	11	12
v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS	1 1636 0.00 0.00 7.2 A					32 274 0.12 0.40 19.9	19.9 C	

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(il), Volume for stream 2 or 5	0	
v(i2), Volume for stream 3 or 6	0	
s(il), Saturation flow rate for stream 2 or 5	1700	
s(i2), Saturation flow rate for stream 3 or 6	1700	
P*(oj)	1.00	
d(M,LT), Delay for stream 1 or 4	7.2	
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5	2	
d(tallk, 1) Detay for Scream 2 of 5	/ \	

1.1.4.16 Interseção H – Pico Tarde

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TWO-WAY STOP CONTROL SUMMARY

Analyst: Progeplan

Agency/Co::
Date Performed: 05/06/2023
Analysis Time Period: Pico Tarde
Intersection: H

Jurisdiction: DER/DF

Units: U. S. Metric
Analysis Year: 2023
Project ID: FUTURA COMERCIAL
East/West Street: M01-M05-

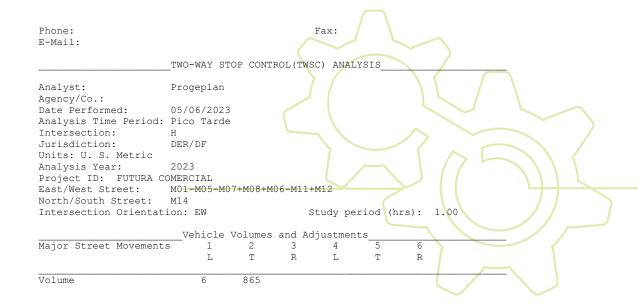
East/West Street: M01-M05-M07+M08+M06-M11+M12
North/South Street: M14



Intersection Orientation: EW Study period (hrs): 1.00

	Vehi	cle Vol	Lumes and	Adju	stme	nts			
Major Street:	Approach		astbound	_			Vestboun	ıd	
	Movement	1	2	3	- 1	4	5	6	
		L	T	R	- 1	L	Т	R	
Volume		6	865						
Peak-Hour Facto	or, PHF	0.91	0.91						
Hourly Flow Rat	e, HFR	6	950						
Percent Heavy V	/ehicles	0							
Median Type/Sto RT Channelized?		Undiv	/ided			/			
Lanes		0	2						
Configuration		I	LT T						
Upstream Signal	1?		No				No		
Minor Street:	Approach	No	orthbound				Southbou	ınd	
	Movement	7	8	9	- 1	10	11	12	
		L	Т	R	I	L	Т	R	
Volume						35			
Peak Hour Facto						0.91	L		
Hourly Flow Rat						38			
Percent Heavy V						0			
Percent Grade	. ,		0				0		
Flared Approach	n: Exists?/	Storage	€		/				/
Lanes						1	L		
Configuration							L		
	Dolos O	T	ength, an	d T 0 **		£ Co.			
Annroach	Delay, Q EB	WB		u Lev hboun		r sei		thbound	1
Approach Movement	ьь 1	wв 4 I		1100u11	9		10	11	12
Lane Config		4	,	0	9	- 1	L	11	12
Lane Confing	LT	1				1	Ь		
v (vph)	6						38		
C(m) (vph)	1636						541		
v/c	0.00						0.07		
95% queue lengt							0.23		
Control Delay	7.2						12.2		
LOS	A						В		
Approach Delay								12.2	
Approach LOS								В	

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												engenharia e i
Peak-Hour Factor,	, PHF	0.91	0.9	1								
Peak-15 Minute Vo	olume	2	238									
Hourly Flow Rate,		6	950									
Percent Heavy Vel		0			-	_	-					
Median Type/Stora RT Channelized?	age	Und	livided	L		/						
Lanes		0	2									
Configuration			LT T									
Upstream Signal?			No			N	0					
Minor Street Move	ments	7	8		9 1	n 1	1	12			_	
THE BELEGE HOVE	Smerres	L	Т				T	R				
Volume					3						-	
Peak Hour Factor,						.91						
Peak-15 Minute Vo					1							
Percent Heavy Vel					0							
Percent Grade (%)			0		•	0						
Flared Approach:	Exists	:?/Stora	.ge			/			/			
RT Channelized												
Lanes						1_						
Configuration						L						
	Pe	destria	n Volu	mes ar	nd Adiu	stments					_	
Movements		13		4	15	16					-	
Flow (ped/hr)		0	0		0	0					-	
Lane Width (m)		3.		. 6	3.6	3.6						
Walking Speed (m,	/sec)	1.		.2	1.2	1.2						
Percent Blockage		0	0		0	0						
				Cian	1 Data						-	
	Prog.	op	Arriv	_	al Data Green		Prog.		Distanc	 .e	-	
	Flow	Flow	Type			Length			to Sign	al		
	vph	vph		5	sec	sec	kph		meters			
S2 Left-Turn											-	
Through												
S5 Left-Turn												
Through												
											-	
Worksheet 3-Data	for Com	nputing	Effect	of De	elay to	Major	Street	. Vel	hicles			
					Moveme	nt 2	Move	emen	t 5		-	
Shared ln volume,	, major	th vehi	cles:		0						-	
Shared ln volume,					0							
Sat flow rate, ma					1700							
Sat flow rate, ma Number of major s					1700 2							
Number of major s	street t	.iii ougii	ranes.		2							
							$\overline{}$				_	
Worksheet 4-Crit:	ical Gap	and Fo	llow-u	p Time	e Calcu	lation					_	
Critical Gap Calo Movement	culation 1	4	7	8	9	10	11		12			
LIO A CHICII C	L	4 L	L	o T	R /	L L	T	1	R		\	
		_									_ \	
t(c,base)	4.1	1 00	1 00	1 0		7.1			1 00	1		
t(c,hv)	1.00	1.00	1.00	1.00	1.00		1.0)()	1.00)
P(hv) t(c,g)	0		0.20	0.20	0.10	0	0.2	20	0.10			
Percent Grade			0.00	0.20	0.00				0.00			
t(3,1t)	0.00				- 1 3 0	0.70			17		11	\ \
t(c,T): 1-stage	0.00		0.00	0.00	0.00	0.00	0.0		0.00		1/	1 6
2-stage	0.00	0.00	1.00	1.00	0.00		1.0	00	0.00		\dashv	
t(c) 1-stage						C 1						/
2-stage	4.1					6.4	1					
						6.4					رار_	/
Follow-Up Time Ca	alculati		7	8	9		11		12		<u> </u>	/
		ons 4 L	7 L	8 T	9 R	10 L	11 T		12 R			/
Follow-Up Time Ca	alculati 1	4				10	Т					/



```
t(f,HV)
                  0.90
                         0.90
                                0.90
                                       0.90
                                               0.90
                                                       0.90
                                                              0.90
                                                                     0.90
P(HV)
                  0
                                                       0
                  2.2
                                                       3.5
t(f)
Worksheet 5-Effect of Upstream Signals
Computation 1-Queue Clearance Time at Upstream Signal
                                              Movement 2
                                                                  Movement 5
                                           V(t)
                                                  V(l,prot) V(t)
                                                                      V(l,prot)
V prog
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P
g(q1)
g (q2)
g (q)
Computation 2-Proportion of TWSC Intersection Time blocked
                                              Movement 2
                                                                 Movement 5
                                                 V(l,prot) V(t) V(l,prot)
                                           V(t)
alpha
beta
Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f
Max platooned flow, V(c,max)
Min platooned flow, V(c,min)
Duration of blocked period, t(p)
Proportion time blocked, p
                                                0.000
                                                                    0.000
Computation 3-Platoon Event Periods
                                          Result
p(2)
                                          0.000
p(5)
                                          0.000
p(dom)
p(subo)
Constrained or unconstrained?
Proportion
unblocked
                             (1)
                                              (2)
                                                               (3)
for minor
                        Single-stage
                                              Two-Stage Process
movements, p(x)
                          Process
                                          Stage I
                                                           Stage II
p(1)
p(4)
p(7)
p(8)
p(9)
p(10)
p(11)
p(12)
Computation 4 and 5
Single-Stage Process
                                                                            12
Movement
                         1
                                 4
                                                       9
                                                              10
                                                                     11
                         L
                                 L
                                        L
                                                       R
                                                              L
                                                                             R
V c,x
                                                              487
S
Рx
V c,u,x
C r,x
C plat,x
Two-Stage Process
                                       8
                                                       1.0
                                                                        11
               Stagel Stagel Stagel Stagel Stage2
                                                                 Stage1
                                                                          Stage2
V(c,x)
                                                         3000
```

P(x)



V	(c,	11.	×

V(c,u,x)			
C(r,x) C(plat,x)			
Worksheet 6-Impedance and Capacity Equation	Lons		
Step 1: RT from Minor St.	9	12	
Conflicting Flows			
Potential Capacity Pedestrian Impedance Factor	1.00	1.00	
Movement Capacity	1.00	1.00	
Probability of Queue free St.	1.00	1.00	
Step 2: LT from Major St.	4	1	
Conflicting Flows		0	•
Potential Capacity Pedestrian Impedance Factor	1.00	1636 1.00	
Movement Capacity	1 00	1636	
Probability of Queue free St. Maj L-Shared Prob Q free St.	1.00	1.00 1.00	
Step 3: TH from Minor St.	8	11	
Conflicting Flows			
Potential Capacity	1.00	1 00	
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	
Movement Capacity	1 00	1 00	
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	
Conflicting Flows Potential Capacity		487 543	
Pedestrian Impedance Factor	1.00	1.00	
Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor.	1.00		
Cap. Adj. factor due to Impeding mymnt Movement Capacity	1.00	1.00 541	
Worksheet 7-Computation of the Effect of	Two-stage Can Acc	entance	
Step 3: TH from Minor St.	8	11	
Part 1 - First Stage			
Conflicting Flows			
Potential Capacity Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity Probability of Queue free St.	/ \	\	
•			
Part 2 - Second Stage Conflicting Flows			
Potential Capacity Pedestrian Impedance Factor) /)
Cap. Adj. factor due to Impeding mvmnt			\
Movement Capacity			
Part 3 - Single Stage		\wedge	
Conflicting Flows Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00	////
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	1.00	4
Result for 2 stage process:	·····		
a v			///
y C t			/ (
Probability of Queue free St.	1.00	1.00	~
Step 4: LT from Minor St.	7	10	



Part 1 - First Stac Conflicting Flows Potential Capacity Pedestrian Impedance	ce Factor							
Cap. Adj. factor do Movement Capacity	ue to Impedino	g mvmnt						
Part 2 - Second Sta	age							
Conflicting Flows Potential Capacity								
Pedestrian Impedano	ce Factor							
Cap. Adj. factor do Movement Capacity	ue to Impedino	g mvmnt						
Part 3 - Single Sta	age							
Conflicting Flows Potential Capacity						487 543		
Pedestrian Impedan	ce Factor		1	.00		1.00		
Maj. L, Min T Imped				1.00				
Maj. L, Min T Adj. Cap. Adj. factor di		mvmnt		.00		1.00		
Movement Capacity	-					541		
Results for Two-sta	age process:							
У						E 41		
C t						541		
Worksheet 8-Shared	Lane Calculat	cions						
Movement		7 L	8 T	9 R	10 L	11 T	12 R	
Wolumo (smb)					38			
Volume (vph) Movement Capacity	(vph)				38 541			
Shared Lane Capacit	-							
Movement		7 L	8 T	9 R	10 L	11 T	12 R	
C sep					541			
Volume					38			
Delay Q sep								
Q sep +1								
round (Qsep +1)								
n max C sh								
SUM C sep								
n C act			~		1			
C act								
Worksheet 10-Delay	, Queue Length	n, and Leve	l of Se	ervice		\		\
Movement Lane Config	1 4 LT	7	8	9	10 L	11	12	
v (vph)	6	———————————————————————————————————————			38			()
C(m) (vph)	1636				541	7		
V/C	0.00				0.07	1	>	
95% queue length Control Delay	0.01 7.2		l		0.23 12.2	١ / ()) L
LOS Approach Delay	A			~	В	12.2		
Approach LOS						В		
Worksheet 11-Shared	d Major IT Imr	nedance and	Delatr			7		
MOTIVALICEC II-Blidte	a najor bi illi		ретай					
				Movemer	nt 2	Moveme	ent 5	\



p(oj)	1.00	1.00
v(il), Volume for stream 2 or 5	0	
v(i2), Volume for stream 3 or 6	0	
s(il), Saturation flow rate for stream 2 or 5	1700	
s(i2), Saturation flow rate for stream 3 or 6	1700	
P*(oj)	1.00	
d(M,LT), Delay for stream 1 or 4	7.2	
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5	2	

1.1.4.17 Interseção I – Pico Manhã

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY_

Progeplan Analyst: Agency/Co.: 05/06/2023 Date Performed: Analysis Time Period: Pico Manha Intersection: Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023

Project ID: FUTURA COMERCIAL

East/West Street: MOV01-MOV04-MOV10
North/South Street: MOV10

Intersection Orientation: EW Study period (hrs): 1.00

INCCIDENCION C	rientation:	E W		5	tuay	perr	oa (nrs)	: 1.00
		cle Volu		d Adju	stme	nts		
Major Street:	Approach	Eas	tbound			W	estbound	l
	Movement	1	2	3		4	5	6
		L	T	R	I	L	T	R
Volume		14	1780					
Peak-Hour Fact	or, PHF	0.91	0.91					
Hourly Flow Ra	te, HFR	15	1956					
Percent Heavy	Vehicles	0						
Median Type/St		Undivi	ded			/		
RT Channelized	1?	_						
Lanes		0	2					
Configuration		LT	T					
Upstream Signa	11?		No				No	
Minor Street:	Approach	Nor	thbound	d		S	outhbour	nd
	Movement	7	8	9		10	11	12
		L	T	R	I	L	Т	R
Volume						48		
Peak Hour Fact	or, PHF					0.91		
Hourly Flow Ra	te, HFR					52		
Percent Heavy	Vehicles					17		
Percent Grade	(%)		0			/	0	
Flared Approac	h: Exists?/	Storage			/			/
Lanes						1	_ `	
Configuration							L	
					-/			$\overline{}$
	Delay, Q					f Ser		
Approach	EB	WB		thboun	\			hbound
Movement	1	4	7	8	9		10	11 12
Lane Config	LT	I			一)		L	>
v (vph)	15				7		52	
C(m) (vph)	1636					_	248	
v/c	0.01						0.21)
95% queue leng	th 0.03-				_		0.79	
Control Delay	7.2						23.4	1 1
LOS	A						C	\ \
Approach Delay	,							23.4
Approach LOS								C

HCS+: Unsignalized Intersections Release 5.6



Phone: Fax: E-Mail: TWO-WAY STOP CONTROL (TWSC) ANALYSIS Analyst: Progeplan Agency/Co.: Date Performed: 05/06/2023 Analysis Time Period: Pico Manha Intersection: Jurisdiction: Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL East/West Street: MOV01-MOV04-MOV10 North/South Street: MOV10 Intersection Orientation: EW Study period (hrs): 1.00 Vehicle Volumes and Adjustments Major Street Movements 1 2 3 4 6 Т 1780 Volume 14 Peak-Hour Factor, PHF 0.91 0.91 Peak-15 Minute Volume 489 4 Hourly Flow Rate, HFR 1.5 1956 Percent Heavy Vehicles 0 Median Type/Storage Undivided RT Channelized? Ω Lanes LT T Configuration Upstream Signal? No No Minor Street Movements 8 9 1.0 11 12 Τ R L Τ R Volume 48 Peak Hour Factor, PHF 0.91 Peak-15 Minute Volume 1.3 Hourly Flow Rate, HFR 52 Percent Heavy Vehicles 17 Percent Grade (%) 0 Flared Approach: Exists?/Storage RT Channelized Lanes Configuration Pedestrian Volumes and Adjustments Movements 15 13 14 16 Flow (ped/hr) Lane Width (m) 3.6 3.6 3.6 3.6 Walking Speed (m/sec) 1.2 1.2 1.2 1.2 Percent Blockage 0 0 0 Upstream Signal Data Prog. Sat Arrival Green Cycle Prog. Distance Flow Flow Time to Signal Type Length Speed meters kph vph vph sec sec S2 Left-Turn Through S.5 Left-Turn Through Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

Movement 2

Movement 5



Shared ln volume, major th vehicles: 0
Shared ln volume, major rt vehicles: 0
Sat flow rate, major th vehicles: 1700
Sat flow rate, major rt vehicles: 1700
Number of major street through lanes: 2

Critical	Gap Calo	l a + i							
Movement	-	iulati 1	4	7	8	9	1.0	11	12
PIOVENICITE		L	L	L	Т	R	L	Т	R
t(c,base	:)	4.1					7.1		
t(c,hv) P(hv)		1.00	1.00	1.00	1.00	1.00	1.00 17	1.00	1.00
t(c,q)				0.20	0.20	0.10	0.20	0.20	0.10
Percent t(3,1t)		0.00		0.00	0.00	0.00	0.00	0.00	0.00
t(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
t(c)	2-stage 1-stage 2-stage		0.00	1.00	1.00	0.00	1.00 6.6	1.00	0.00
Follow-U	Jp Time Ca	alcula	tions						
Movement		1	4	7	8	9	10	11	12
		L	L	L	T	R	L	Т	R
t(f,base	:)	2.20					3.50		
t(f,HV) P(HV) t(f)		0.90 0 2.2	0.90	0.90	0.90	0.90	0.90 17 3.7	0.90	0.90

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal Movement 2

Movement 2 Movement 5 V(t) V(1,prot) V(t) V(1,prot)

V prog
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P g(q1)
g(q2)
g(q)

Computation 2-Proportion of TWSC Intersection Time blocked

Movement 2

Movement 2 Movement 5 V(t) V(1,prot) V(t) V(1,prot)

alpha
beta
Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f
Max platooned flow, V(c,max)
Min platooned flow, V(c,min)
Duration of blocked period, t(p)
Proportion time blocked, p

0.000 0.000

Computation 3-Platoon Event Periods Result

p(2) 0.000
p(5) 0.000
p(dom)
p(subo)

Constrained or unconstrained?

Proportion unblocked (1) (2) (3) for minor Single-stage Two-Stage Process movements, p(x) Process Stage I Stage II



(1)									t	engennaria
p(1) p(4)										
p(7)										
p(8)										
p(9)										
p(10)										
p(11) p(12)										
P (12)										
Computation 4 and 5									_	
Single-Stage Process			_							
Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R		
	ш	ь	ш	1	T.	П	1	А		
V c,x	0					1008			_	
S										
Px										
V c,u,x										
C r,x									_	
C plat,x										
									_	
Two-Stage Process	7		8		10		11			
Stage1	Stage2	Stage1		Stad		age2				
									_	
V(c,x)					_					
S					30	00				
P(x) V(c,u,x)										
V (C, U, X)										
C(r,x)									_	
C(plat,x)										
									_	
Worksheet 6-Impedance	and Cap	acity E	guations							
		uo101 L	444010110							
Step 1: RT from Minor	St.				9		12			
Conflicting Flows									_	
Potential Capacity										
Pedestrian Impedance	Factor			1.	.00		1.00			
Movement Capacity										
Probability of Queue	free St.			1.	.00		1.00			
Step 2: LT from Major	St				4		1		_	
beep 2. Hi from Hajor	00.				-		-			
Conflicting Flows							0		_	
Potential Capacity							1636			
Pedestrian Impedance	Factor			1.	.00		1.00 1636			
Movement Capacity Probability of Queue	free St.			1	.00		0.99			
Maj L-Shared Prob Q f				_	• • • •		0.99			
									_	
Step 3: TH from Minor	St.				8	\	11			
Conflicting Flows				~		_			_	
Potential Capacity			(
Pedestrian Impedance				1.	.00		1.00			
Cap. Adj. factor due	to Imped	ing mvm	nt	0	.99		0.99			
Movement Capacity	fwoo Ct] [0.0		1.00	/	\	
Probability of Queue	iree St.			T .	.00		1.00			
Step 4: LT from Minor	St.				7		10		-	
Conflicting Flows							1008		_ \	
Potential Capacity Pedestrian Impedance	Factor			1	.00 /		250 1.00	> レ	\ \\\	\
Maj. L, Min T Impedance		r			.99		1.00		11	1 1
Maj. L, Min T Adj. Im					.99	\rightarrow	- 11		4	\rightarrow
Cap. Adj. factor due			nt	0 .	.99		0.99	\		1
Movement Capacity						\	248			/
							$\overline{}$		_//	
Worksheet 7-Computati	on of th	e Effec	t of Two	-stage	e Gap A	ccepta	nce			
<u>-</u>									_	1
Step 3: TH from Minor	St.				8		11			1



Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Probability of Queue free St. Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor 1.00 1.00 Cap. Adj. factor due to Impeding mymnt 0.99 0.99 Movement Capacity Result for 2 stage process: а У Сt Probability of Queue free St. 1.00 1.00 10 Step 4: LT from Minor St. Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 3 - Single Stage Conflicting Flows 1008 Potential Capacity 250 Pedestrian Impedance Factor 1.00 1.00 Maj. L, Min T Impedance factor 0.99 Maj. L, Min T Adj. Imp Factor. 0.99 Cap. Adj. factor due to Impeding mymnt 0.99 0.99 Movement Capacity 248 Results for Two-stage process: а У С t 248 Worksheet 8-Shared Lane Calculations Movement 8 9 10 11 12 Т R R L L Т Volume (vph) 52 Movement Capacity (vph) 248 Shared Lane Capacity (vph) Worksheet 9-Computation of Effect of Flared Minor Street Approaches Movement 10 8 9 11 12 Т R Τ. Τ. Т C sep 248 Volume 52

Part 1 - First Stage

Delay Q sep



Q sep +1 round (Qsep +1)

n max C sh SUM C sep n C act

Worksh

Worksheet 10-Delay,	Queue	Length,	and	Level	of	Service			
Movement	1	4	7	8		9	10	11	12
Lane Config	LT						L		
v (vph)	15						52		
C(m) (vph)	1636						248		
v/c	0.01						0.21		
95% queue length	0.03						0.79		
Control Delay	7.2						23.4		
LOS	A						С		
Approach Delay								23.4	
Approach LOS								С	

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	0.99	1.00
v(il), Volume for stream 2 or 5	0	
v(i2), Volume for stream 3 or 6	0	
s(il), Saturation flow rate for stream 2 or 5	1700	
s(i2), Saturation flow rate for stream 3 or 6	1700	
P*(oj)	0.99	
d(M,LT), Delay for stream 1 or 4	7.2	
N, Number of major street through lanes	2	
d(rank,1) Delay for stream 2 or 5		

1.1.4.18 Interseção I — Pico Tarde

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TWO-WAY STOP CONTROL SUMMARY

Analyst: Progeplan Agency/Co.: 05/06/2023 Date Performed: Analysis Time Period: Pico Tarde Intersection: Т Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: FUTURA COMERCIAL

MOV01-MOV04-MOV10 East/West Street:

Approach

Movement

MOV10 North/South Street: Intersection Orientation: ${\tt EW}$

Major Street:

1.00 Study period (hrs): Vehicle Volumes and Adjustments Westbound 5 6 R Τ R

L Τ 707 Volume Peak-Hour Factor, PHF 0.91 0.91 Hourly Flow Rate, HFR 776 Percent Heavy Vehicles 0 Median Type/Storage Undivided RT Channelized? Lanes 0 2 Configuration LT T Upstream Signal? No No Minor Street: Approach Northbound Southbound Movement 8 | 10

Eastbound

2



| L Т R Τ. Т R Volume 164 Peak Hour Factor, PHF 0.91 Hourly Flow Rate, HFR 180 Percent Heavy Vehicles 6 Percent Grade (%) 0 Flared Approach: Exists?/Storage Lanes 1 ${\tt Configuration}$ L

Delay, Queue Length, and Level of Service Northbound 7 8 9 Approach EΒ WB Southbound 10 Movement 1 4 8 11 12 Lane Config $_{
m LT}$ L v (vph) 180 C(m) (vph) 1636 596 v/c 0.00 0.30 95% queue length 0.01 1.29 Control Delay 7.2 13.6 LOS Α В Approach Delay 13.6 Approach LOS В

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Phone: Fax: E-Mail:

DER/DF

_____TWO-WAY STOP CONTROL(TWSC) ANALYSIS____

Analyst: Progeplan

Agency/Co.:

Date Performed: 05/06/2023 Analysis Time Period: Pico Tarde Intersection: I

Jurisdiction:

Units: U. S. Metric

Analysis Year: 2023 Project ID: FUTURA COMERCIAL

East/West Street: MOV01-MOV04-MOV10

North/South Street: MOV10

Intersection Orientation: EW Study period (hrs): 1.00

	Vehicle	Volumes	s and Adjustments
Major Street Movements	1	2	3 4 5 6
	L	Т	R L T R
Volume	6	707	
Peak-Hour Factor, PHF	0.91	0.91	
Peak-15 Minute Volume	2	194	
Hourly Flow Rate, HFR	6	776	
Percent Heavy Vehicles	0		<i> </i>
Median Type/Storage	Undi	vided	
RT Channelized?			
Lanes	0	2	
Configuration	L	ТТ	
Upstream Signal?		No	No
Minor Street Movements	7	8	9 10 11 12
	L	T	R L T R
Volume			164
Peak Hour Factor, PHF			0.91
Peak-15 Minute Volume			45
Hourly Flow Rate, HFR			180
Percent Heavy Vehicles			6
Percent Grade (%)		0	0



Flared Approach: Exists?/Storage / / / / RT Channelized

Lanes 1
Configuration L

	_Pedestrian	Volumes	and Adj	justments
Movements	13	14	15	16
Flow (ped/hr)	0	0	0	0
Lane Width (m)	3.6	3.6	3.6	3.6
Walking Speed (m/sec)	1.2	1.2	1.2	1.2
Percent Blockage	0	0	0	0

Upstream Signal Data Prog. Sat Arrival Green Cycle Prog. Distance Flow Flow Type Time Length Speed to Signal vph vph sec sec kph meters

S2 Left-Turn

Through

S5 Left-Turn Through

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

	Movement 2	Movement 5
Shared In volume, major th vehicles:	0	
Shared ln volume, major rt vehicles:	0	
Sat flow rate, major th vehicles:	1700	
Sat flow rate, major rt vehicles:	1700	
Number of major street through lanes:	2	

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical	Gap Cal	culati	on						
Movement		1	4	7	8	9	10	11	12
		L	L	L	T	R	L	Т	R
t(c,base)	4.1					7.1		
t(c,hv)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)		0					6		
t(c,g)				0.20	0.20	0.10	0.20	0.20	0.10
Percent	Grade			0.00	0.00	0.00	0.00	0.00	0.00
t(3,1t)		0.00					0.70		
t(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage	4.1					6.5		
	2-stage								

Follow-Up	Time Calcul	ations				7	\	
Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(f,base)	2.20		0.90	0.90	0.90	3.50	0.90	0.90
t(f,HV) P(HV)	0.90	0.90	0.90	0.90	0.90	6	0.90	0.90
t(f)	2.2					3.6		

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

Movement 2 Movement 5 V(t) V(1,prot) V(t) V(1,prot)

V prog
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P g (q1)



g (q2) g (q)

Computation 2-Proportion of TWSC Intersection Time blocked Movement 2 Movement 5 V(1,prot) V(t) V(1,prot) V(t) alpha beta Travel time, t(a) (sec) Smoothing Factor, F Proportion of conflicting flow, f Max platooned flow, V(c,max) Min platooned flow, V(c,min) Duration of blocked period, t(p) Proportion time blocked, p 0.000 0.000 Computation 3-Platoon Event Periods Result p(2) 0.000 p(5) 0.000 p (dom) p(subo) Constrained or unconstrained? Proportion unblocked (1) (2) (3) for minor Single-stage Two-Stage Process Process Stage I Stage II movements, p(x)p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12) Computation 4 and 5 Single-Stage Process Movement 1 4 7 8 9 10 11 12 L L L Т R L Τ \mathbb{R} V c,x 400 s Рx V c,u,x Cr,x C plat,x Two-Stage Process 10 11 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 V(c,x) 3000 S P(x) V(c,u,x) $\overline{C(r,x)}$ C(plat,x) Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St. 9 12 Conflicting Flows Potential Capacity Pedestrian Impedance Factor 1.00 1.00 Movement Capacity Probability of Queue free St. 1.00 1.00 Step 2: LT from Major St. 4 1 Conflicting Flows 0