```
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(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
                                           0.000
p(2)
p(5)
                                          0.000
p(dom)
p(subo)
Constrained or unconstrained?
Proportion
                             (1)
unblocked
                                              (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
                                         7
                                                       9
                                                             10
                                                                     11
                                                                             12
                         L
                                 L
                                        L
                                                               L
                                                                              R
V c,x
                                0
                                       1224
s
Рx
V c,u,x
Cr,x
C plat,x
Two-Stage Process
                                       8
                                                       10
                                                                        11
               Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 Stage2
\overline{\mathbb{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
```

4

1

Step 2: LT from Major St.

Conflicting Flows	0	
Potential Capacity	1597	
Pedestrian Impedance Factor	1.00	1.00
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	1.00	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	1224	
Potential Capacity	200	
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor.		0.99 1.00
Cap. Adj. factor due to Impeding mvmnt	0.99	1.00
Movement Capacity	199	1.00
Worksheet 7-Computation of the Effect of Tw	o-stage Gap Acce	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.		
Dart 2 - Cogond Stage		
Part 2 - Second Stage Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mymnt		
Movement Capacity		
Davit 2 0:000 0:000		
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:		
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 mvmnt		
Movement Capacity		
Part 3 - Single Stage		
Conflicting Flows	1224	
Potential Capacity	200	
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor		0.99
Maj. L, Min T Adj. Imp Factor.		1.00

Cap. Adj. factor d Movement Capacity	ue to Im	peding	mvmnt		0.99 199		1.00	
Results for Two-sta a	age proc	ess:						
У								
C t					199			
Worksheet 8-Shared	Lane Ca	lculati	Lons					
Movement			7	8	9	10	11	12
			L	Т	R	L	Т	R
Volume (vph)			6					
Movement Capacity	(vph)		199					
Shared Lane Capaci	ty (vph)							
Worksheet 9-Comput	ation of	Effect	of Flar	ed Min	or Stree	et Appr	oaches	
Movement			7	8	9	10	11	12
			L	Т	R	L	Т	R
C sep			199					
Volume			6					
Delay								
Q sep								
Q sep +1								
round (Qsep +1)								
n max								
C sh								
C sh SUM C sep n								
C sh SUM C sep n								
C sh SUM C sep n C act	, Queue	Length,	and Lev	vel of	Service			
C sh SUM C sep n C act Worksheet 10-Delay	, Queue 1	Length,	and Lev	vel of	Service	10	11	12
C sh SUM C sep n C act Worksheet 10-Delay						10	11	12
C sh SUM C sep n C act Worksheet 10-Delay Movement Lane Config v (vph)		4 LT	7 L			10	11	12
C sh SUM C sep n C act Worksheet 10-Delay Movement Lane Config v (vph) C(m) (vph)		4 LT 10 1597	7 L 6 199			10	11	12
C sh SUM C sep n C act Worksheet 10-Delay Movement Lane Config v (vph) C (m) (vph) v/c		4 LT 10 1597 0.01	7 L 6 199 0.03			10	11	12
C sh SUM C sep n C act  Worksheet 10-Delay  Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length		10 1597 0.01 0.02	7 L 6 199 0.03 0.09			10	11	12
C sh SUM C sep n C act  Worksheet 10-Delay  Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay		4 LT 10 1597 0.01 0.02 7.3	7 L 6 199 0.03 0.09 23.7			10	11	12
C sh SUM C sep n C act  Worksheet 10-Delay  Movement Lane Config  v (vph) c(m) (vph) v/c 95% queue length Control Delay LOS		10 1597 0.01 0.02	7 L 6 199 0.03 0.09	8		10	11	12
C sh SUM C sep n C act Worksheet 10-Delay Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay		4 LT 10 1597 0.01 0.02 7.3	7 L 6 199 0.03 0.09 23.7	23.7		10	11	12
C sh SUM C sep n C act Worksheet 10-Delay Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay		4 LT 10 1597 0.01 0.02 7.3	7 L 6 199 0.03 0.09 23.7	8		10	11	12
C sh SUM C sep n C act  Worksheet 10-Delay  Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS	1	4 LT 10 1597 0.01 0.02 7.3 A	7 L 6 199 0.03 0.09 23.7 C	8 23.7 C	9	10	11	12
C sh SUM C sep n C act  Worksheet 10-Delay  Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS	1	4 LT 10 1597 0.01 0.02 7.3 A	7 L 6 199 0.03 0.09 23.7 C	8 23.7 C	9			12 ent 5
C sh SUM C sep n C act Worksheet 10-Delay Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS Worksheet 11-Shared	1	4 LT 10 1597 0.01 0.02 7.3 A	7 L 6 199 0.03 0.09 23.7 C	8 23.7 C	9 Y Movem	ent 2	Movem	ent 5
C sh SUM C sep n C act  Worksheet 10-Delay  Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS  Worksheet 11-Shared	1 d Major :	4 LT 10 1597 0.01 0.02 7.3 A	7 L 6 199 0.03 0.09 23.7 C	8 23.7 C	9	ent 2	Movem 0.	ent 5
C sh SUM C sep n C act  Worksheet 10-Delay  Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS  Worksheet 11-Shared	d Major	4 LT 10 1597 0.01 0.02 7.3 A	7 L 6 199 0.03 0.09 23.7 C	8 23.7 C	9 Y Movem	ent 2	Movem 0. 0	ent 5
C sh SUM C sep n C act Worksheet 10-Delay Movement Lane Config v (vph) C(m) (vph) v/c gueue length Control Delay LOS Approach Delay Approach LOS Worksheet 11-Shared	d Major :	4 LT 10 1597 0.01 0.02 7.3 A	7 L 6 199 0.03 0.09 23.7 C	23.7 C	9 Y Movem	ent 2	Movem 0. 0	ent 5
C sh SUM C sep n C act Worksheet 10-Delay Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS Worksheet 11-Shared	d Major : stream 2 stream 3 flow rat	4 LT 10 1597 0.01 0.02 7.3 A LT Impe	7 L 6 199 0.03 0.09 23.7 C	8 23.7 C	9 Y Movem	ent 2	Movem 0. 0 0	ent 5 99
C sh SUM C sep n C act Worksheet 10-Delay Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS Worksheet 11-Shared p(oj) v(i1), Volume for s s(i1), Saturation s s(i2), Saturation	d Major : stream 2 stream 3 flow rat	4 LT 10 1597 0.01 0.02 7.3 A LT Impe	7 L 6 199 0.03 0.09 23.7 C	8 23.7 C	9 Y Movem	ent 2	Movem 0. 0. 0. 17 17	ent 5 99
C sh SUM C sep n C act  Worksheet 10-Delay  Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS  Worksheet 11-Shared p(oj) v(ii), Volume for second se	d Major: stream 2 stream 3 flow rate	4 LT 10 1597 0.01 0.02 7.3 A LT Impe	7 L 6 199 0.03 0.09 23.7 C	8 23.7 C	9 Y Movem	ent 2	Movem 0. 0 0 17 17 0.	ent 5 99 00 00 99
C sh SUM C sep n C act  Worksheet 10-Delay  Movement Lane Config v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS  Worksheet 11-Shared p(oj) v(i1), Volume for solution is s(i2), Saturation is	d Major: stream 2 stream 3 flow rate	4 LT 10 1597 0.01 0.02 7.3 A LT Impe	7 L 6 199 0.03 0.09 23.7 C	8 23.7 C	9 Y Movem	ent 2	Movem 0. 0. 0. 17 17	ent 5 99 00 00 99



#### 1.1.1 Memória de cálculo da análise de capacidade e níveis de serviço - Cenário SEM O **EMPREENDIMENTO**

# 1.1.1.1 Interseção B – 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: В Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023

Project ID: ATUAL SEM EMPREENDIMENTO

East/West Street: M2 М7 North/South Street:

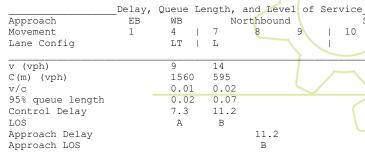
Southbound

11

12

10

Intersection C	rientation:	EW		S	tudy	perio	d (hrs)	: 1.00	
	Vehi	icle Vo	lumes ar	nd Adju	stme	nts			
Major Street:	Approach	E	astbound	i		We	stbound		
	Movement	1	2	3	- 1	4	5	6	
		L	T	R	- 1	L	T	R	
Volume						9	724		
Peak-Hour Fact	or, PHF					0.91	0.91		
Hourly Flow Ra	te, HFR					9	795		
Percent Heavy	Vehicles					12			
Median Type/St	orage	Undi	vided			/			
RT Channelized	1?								
Lanes						0	2		
Configuration						L'	гт		
Upstream Signa	1?		No				No		
Minor Street:	Approach	N	orthbour	nd		Son	ıthboun	d	
	Movement	7	8	9	- 1	10	11	12	
		L	T	R	I	L	T	R	
Volume		13							
Peak Hour Fact	or, PHF	0.91							
Hourly Flow Ra	te, HFR	14							
Percent Heavy	Vehicles	0				/	\		
Percent Grade	(%)		0				0		
Flared Approac	h: Exists?	Storag	е		/			/	
Lanes		1							
Configuration			L						
									/





# HCS+: Unsignalized Intersections Release 5.6

Phor E-Ma				Fa	ıx:				
		_TWO-WAY S	TOP CONTRO	OL(TWSC)	ANALYS	SIS			_
Ager Date Anal Inte Juri Unit Anal Proj East Nort	lyst: ncy/Co.: e Performed: lysis Time Period: lysis Time Period: lsdiction: lsdiction: lss: U. S. Metric lysis Year: lect ID: ATUAL SET c/West Street: ch/South Street: ersection Orientat:	B DER/DF 2023 M EMPREEND M2 M7	a	Str	ady peri	od (hr	·s)• 1	.00	
	2200001011 021011040							• • • •	
 Majo	or Street Movements		Volumes a	and Adju 3 R	stments 4 L	5 T	6 R		_
Peak Hour Pero Medi	x-Hour Factor, PHF x-15 Minute Volume rly Flow Rate, HFR cent Heavy Vehicles ian Type/Storage		 ivided		9 0.91 2 9 12	724 0.91 199 795			_
Lane Conf	Channelized? es figuration tream Signal?		No		0 LT	2 T No			
Mino	or Street Movements	s 7 L	8 T	9 R	10 L	11 T	12 R		_
Peak Hour Pero Flar RT (	K Hour Factor, PHF K-15 Minute Volume cly Flow Rate, HFR cent Heavy Vehicles cent Grade (%) ced Approach: Exis Channelized	sts?/Stora 1	-		/	0		/	_
Move	ements	_Pedestria 13	n Volumes 14	and Adj	ustment 16	s	_	<u> </u>	_
Lane Walk	v (ped/hr) e Width (m) king Speed (m/sec) cent Blockage	0 3. 1. 0	0 3.6 2 1.2 0	0 3.6 1.2 0	0 3.6 1.2 0		1		
	Prog Flow vph		stream Sig Arrival Type	gnal Dat Green Time sec	Cycle Length		ed   to	stance Signal eters	
s2 s5	Left-Turn Through Left-Turn Through								- ۱

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

Movement 2 Movement 5



Sat flow rate, m Sat flow rate, m Number of major	, major ajor th ajor rt	r rt vel n vehic t vehic	les: les:	:			0 0 1700 1700 2	
Worksheet 4-Crit	ical Ga	ap and 1	Follow-	up Time	Calcula	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)	1.00	4.1 1.00 12	7.1 1.00 0	1.00	1.00	1.00	1.00	1.00
t(c,g) Percent Grade			0.20	0.20	0.10	0.20	0.20	0.10 0.00
t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage	0.00	0.00 0.00 0.00 4.2	0.70 0.00 1.00 6.4	0.00	0.00	0.00	0.00	0.00
Follow-Up Time C	alculat	tions 4	7	8	9	10	11	12
riovement	L	L	L	T	R	L	Т	R
t(f,base) t(f,HV) P(HV) t(f)	0.90	2.20 0.90 12 2.3	3.50 0.90 0 3.5	0.90	0.90	0.90	0.90	0.90
Computation 1-Qu		earance			Movemen			vement 5 V(1,prot)
V prog Total Saturation Arrival Type Effective Green, Cycle Length, C Rp (from Exhibit Proportion vehic g(q1) g(q2)	Flow F g (sec) 16-11)	earance Rate, s	Time a	t Upstre	Movemen	nt 2		
	Flow I g (sec) 16-11) les arr	earance	Time a (vph)	V (	Movement) V(	nt 2 1,prot)	V(t)	
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) les arrivoportion (sec), F mflict: ow, V((sed per less than 10 to 10 t	earance  Rate, s  c)  riving (  on of Ti  ing flow c,max) c,min) riod, t	Time a (vph)  On green  WSC Inter  W, f	V(	Movement) V(	blockent 2 (1, prot)	V(t)  ed Mov V(t)	V(1,prot)
V prog Total Saturation Arrival Type Effective Green, Cycle Length, C Rp (from Exhibit Proportion vehic g(q1) g(q2) g(q)  Computation 2-Pr  alpha beta Travel time, t(a Smoothing Factor Proportion of co Max platooned fl Duration of bloc	g (sec (sec) 16-11) les arrivoportion ) (sec), F nflict: ow, V((ow, V((ked per blocked)))	earance  Rate, s  c)  riving of  pon of To  ing flow  c, max)  c, min)  riod, t  d, p	Time a (vph)  On gree:  WSC Into	V(	Movement) V(	blockent 2 (1, prot)	V(t)  ed Mov V(t)	vement 5 V(1,prot)
V prog Total Saturation Arrival Type Effective Green, Cycle Length, C Rp (from Exhibit Proportion vehic g(q1) g(q2) g(q)  Computation 2-Pr  alpha beta Travel time, t(a Smoothing Factor Proportion of co Max platooned fl Min platooned fl Duration of bloc Proportion time	g (sec (sec) 16-11; les arrivoportion (sec), F nflict: ow, V((sed per blocked atoon I	earance Rate, s c) priving of To the second of To the sec	Time a (vph)  On gree:  WSC Into	V(	Movement) V(	blockent 2 (1, prot)	V(t)  ed Mov V(t)	vement 5 V(1,prot)



10(4)   10(7)   10(8)   10(8)   10(9)   10(10)									
10	p(1)								
1	p(4)								
109   100   101	-								
Computation 4 and 5	• ' '								
Computation 4 and 5   Single-Stage Process									
Computation 4 and 5 Single-Stage Process 1									
Computation 4 and 5   Single-Stage Process   Movement									
Single-Stage Process	ρ(12)								
Single-Stage Process   1	Computation 4 and 5								
1	=								
V c,x s series of the control of the series of two-stage Gap Acceptance of the control of the series of t	Movement	1	4	7	8	9	10	11	12
Por Stage Process 7 cplat,x Pwo-Stage Process 7 sagel Stagel Stagel Stagel Stagel Stagel Stagel Stagel P(c,x) 8 3000 P(x) P(c,u,x) P(cpu,x) P(cpu,x		L	L	L	T	R	L	T	R
Por Stage Process 7 cplat,x Pwo-Stage Process 7 sagel Stagel Stagel Stagel Stagel Stagel Stagel Stagel 8 stagel Stagel Stagel Stagel Stagel Stagel Stagel 9 stagel Stagel Stagel Stagel Stagel Stagel Stagel 9 stagel Stagel Stagel Stagel Stagel Stagel 9 stagel 9 stagel Stag									
PX C, u, x C r, x C plat, x  Fwo-Stage Process  Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2  V(c, x) S			0	415					
Torus Country									
Stage Process  Stage Sta									
The stage of the s	C/ U/ A								
The stage of the s	r,x								
Stage1   Stage2   Stage1   S									
Stage1   Stage2   Stage1   S									
Stage1 Stage2 Stage1 Stage2 Stage1 Stage2 Stage1 Stage2  (c,x) 3000  (x) (c,u,x)  (r,x) (plat,x)  orksheet 6-Impedance and Capacity Equations  tep 1: RT from Minor St. 9 12  onflicting Flows otential Capacity edestrian Impedance Factor 1.00 1.00  ovement Capacity robability of Queue free St. 1.00 1.00  tep 2: LT from Major St. 4 1  onflicting Flows otential Capacity 1560 edestrian Impedance Factor 1.00 1.00  ovement Capacity 1560 robability of Queue free St. 0.99  aj L-Shared Prob Q free St. 0.99  tep 3: TH from Minor St. 8 11  onflicting Flows otential Capacity edestrian Impedance Factor 0.99  aj L-Shared Prob Q free St. 0.99  tep 3: TH from Minor St. 8 11  onflicting Flows otential Capacity edestrian Impedance Factor 1.00 1.00  ap. Adj. factor due to Impeding mvmnt 0.99 ovement Capacity robability of Queue free St. 1.00 1.00  tep 4: LT from Minor St. 7 10  onflicting Flows otential Capacity edestrian Impedance Factor 1.00 1.00  tep 4: LT from Minor St. 7 10  onflicting Flows otential Capacity 598 edestrian Impedance Factor 1.00 1.00  tep 4: LT from Minor St. 7 10  onflicting Flows otential Capacity 598 otential Capacity 598 otential Capacity 595  orksheet 7-Computation of the Effect of Two-stage Gap Acceptance	wo-Stage Process	_							
(c,x) (x) (x) (x) (x) (x) (x) (x) (x) (x) (	0+ 1		C+ 1		C+		2002		
3000 ((c, u, x)) ((r, x) ((c, u, x)) ((r, x) ((plat, x) ((r, x) ((r, x) ((r, x) ((r) ((r) ((r) ((r) ((r) ((r) ((r) ((	Stagel	scage2	scagel	stage2	stage	ı St	ayez	stagel	stage2
(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 edestrian Impedance Factor  tep 2: LT from Major St.  onflicting Flows otential Capacity edestrian Impedance Factor  ovement Capacity probability of Queue free St.  onflicting Flows otential Capacity from Minor St.  onflicting Flows otential Capacity cedestrian Impedance Factor  onflicting Flows otential Capacity edestrian Impedance Factor a) L. Start from Minor St.  function Flows otential Capacity cedestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity robability of Queue free St.  onflicting Flows otential Capacity cedestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity robability of Queue free St.  onflicting Flows otential Capacity cedestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt onflicting Flows otential Capacity cedestrian Impedance Factor aj. L, Min T Adj. Imperfactor. aj. L, Min T Adj. Imp	(c,x)								
P(C, u, x)		3000							
C(r,x) C(plat,x)  Norksheet 6-Impedance and Capacity Equations  Step 1: RT from Minor St. 9 12  Conflicting Flows Potential Capacity Probability of Queue free St. 1.00 1.00  Step 2: LT from Major St. 4 1  Conflicting Flows Potential Capacity 1560									
Torksheet 6-Impedance and Capacity Equations  tep 1: RT from Minor St. 9 12  Tonflicting Flows Totential Capacity Totential Cap	(c,u,x)								
orksheet 6-Impedance and Capacity Equations  tep 1: RT from Minor St. 9 12  onflicting Flows otential Capacity edestrian Impedance Factor 1.00 1.00  owement Capacity robability of Queue free St. 1.00 1.00  tep 2: LT from Major St. 4 1  onflicting Flows otential Capacity 1560 robability of Queue free St. 1.00 1.00  ovement Capacity 1560 robability of Queue free St. 0.99 1.00 aj L-Shared Prob Q free St. 0.99 1.00 aj L-Shared Prob Q free St. 0.99 1.00 aj L-Shared Prob Q free St. 0.99 1.00  oredicting Flows otential Capacity 1560 robability of Queue free St. 0.99 1.00  oredicting Flows otential Capacity 1500 robability of Queue free St. 100 1.00  ovement Capacity 1									
orksheet 6-Impedance and Capacity Equations  tep 1: RT from Minor St. 9 12  onflicting Flows otential Capacity edestrian Impedance Factor 1.00 1.00  ovement Capacity robability of Queue free St. 1.00 1.00  tep 2: LT from Major St. 4 1  onflicting Flows 0 0 cotential Capacity 1560 edestrian Impedance Factor 1.00 1.00  ovement Capacity 1560 robability of Queue free St. 0.99 1.00  aj L-Shared Prob Q free St. 0.99 1.00  aj L-Shared Prob Q free St. 0.99  tep 3: TH from Minor St. 8 11  onflicting Flows otential Capacity 0.99  destrian Impedance Factor 0.99  tep 3: Th from Minor St. 7 10  onflicting Flows otential Capacity 0.99 ovement Capacity 0.99 ovement Capacity 1.00 1.00  ap. Adj. factor due to Impeding mvmnt 0.99 0.99 ovement Capacity 1.00 1.00  ap. Adj. Impedance Factor 1.00 1.00  aj. L, Min T Impedance Factor 1.00 1.00 aj. L, Min T Impedance Factor 1.00 1.00 aj. L, Min T Impedance Factor 1.00 1.00 aj. L, Min T Impedance Factor 1.00 aj. L, Min T Adj. Imp Factor. 1.00 ap. Adj. factor due to Impeding mvmnt 0.99 ovement Capacity 595  orksheet 7-Computation of the Effect of Two-stage Gap Acceptance									
Conflicting Flows Contential Capacity Codestrian Impedance Factor Conflicting Flows Codestrian Impedance Factor Comparison Conflicting Flows Codestrian Impedance Factor Conflicting Flows Codestrian Impedance Factor Conflicting Flows Codestrian Impedance Factor Comparison Comparison Codestrian Impedance Factor	(plat,x)								
Step 1: RT from Minor St. 9 12  Conflicting Flows Potential Capacity Pedestrian Impedance Factor 1.00 1.00  Advement 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  Advement Capacity 1560 Probability of Queue free St. 0.99 1.00  Advement Capacity 1560 Probability of Queue free St. 0.99 1.00  Step 3: TH from Minor St. 8 11  Conflicting Flows Potential Capacity Pedestrian Impedance Factor 1.00 1.00  Step 4: LT from Minor St. 1.00 1.00  Step 4: LT from Minor St. 7 10  Conflicting Flows Potential Capacity Probability of Queue free St. 1.00 1.00  Step 4: LT from Minor St. 7 10  Conflicting Flows Pedestrian Impedance Factor 1.00 1.00  Step 4: LT from Minor St. 7 10  Conflicting Flows Pedestrian Impedance Factor 1.00 1.00  Advement Capacity 598 Pedestrian Impedance Factor 1.00 1.00  Adj. L, Min T Impedance factor 1.00  Adj. L, Min T Impedance factor 1.00  Adj. L, Min T Adj. Imp Factor. 1.00  Cap. Adj. factor due to Impeding mvmnt 0.99 1.00  Advement Capacity 595  Norksheet 7-Computation of the Effect of Two-stage Gap Acceptance									
Conflicting Flows Probability of Queue free St.  Conflicting Flows Cotential Capacity Probability of Queue free St.  Conflicting Flows Cotential Capacity Probability of Queue free St.  Conflicting Flows Probability Of Queue free St.	Jorksheet 6-Impedance	e and Cap	acity E	quations					
Conflicting Flows Potential Capacity Pedestrian Impedance Factor Movement Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Movement Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Potenti				_					
Potential Capacity Pedestrian Impedance Factor Probability of Queue free St.  1.00  Step 2: LT from Major St.  Conflicting Flows Pedestrian Impedance Factor Pedestrian Impedance Factor Pedestrian Impedance Factor Probability of Queue free St.  Step 2: LT from Major St.  Conflicting Flows Pedestrian Impedance Factor Pedestrian Impedance Factor Probability of Queue free St.  Step 3: TH from Minor St.  Conflicting Flows Pedestrian Impedance Factor Probability of Queue free St.  Cap. Adj. factor due to Impeding mvmnt Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Probability of Queue f	Step 1: RT from Minor	r St.				9		12	
Potential Capacity Pedestrian Impedance Factor Probability of Queue free St.  1.00  Step 2: LT from Major St.  Conflicting Flows Pedestrian Impedance Factor Pedestrian Impedance Factor Pedestrian Impedance Factor Probability of Queue free St.  Step 2: LT from Major St.  Conflicting Flows Pedestrian Impedance Factor Pedestrian Impedance Factor Probability of Queue free St.  Step 3: TH from Minor St.  Conflicting Flows Pedestrian Impedance Factor Probability of Queue free St.  Cap. Adj. factor due to Impeding mvmnt Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Probability of Queue f	G 61' - ' 71								
Pedestrian Impedance Factor Movement Capacity Probability of Queue free St.  Step 2: LT from Major St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Probability of Queue free St.  Step 3: TH from Minor St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Podestrian Impedance Factor Maj. I, Min T Impedance factor Maj. I, Min T Impedance factor Maj. I, Min T Adj. Imp Factor.  Cap. Adj. factor due to Impeding mvmnt Movement Capacity  Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance	=								
Movement Capacity Probability of Queue free St.  1.00  1.00  Step 2: LT from Major St.  4  1  Conflicting Flows Pedestrian Impedance Factor Advement Capacity Probability of Queue free St.  Maj L-Shared Prob Q free St.  Conflicting Flows Pedestrian Impedance Factor Adj L-Shared Prob Q free St.  Conflicting Flows Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Capacity Probability of Queue free St.  Conflicting Flows Cap. Adj. factor due to Impeding mvmnt Capacity Probability of Queue free St.  Conflicting Flows Conflicting Flows Cap. Adj. Impedance Factor Cap. Adj. Impedance Factor Cap. Adj. In T Impedance factor Cap. Adj. Impedance factor Cap. Adj. factor due to Impeding mvmnt Cap. Adj. factor due to Impeding mvmnt Capacity Cap		Factor			1 0			1 00	
Probability of Queue free St.  1.00  Step 2: LT from Major St.  4  1  Conflicting Flows Pedential Capacity Pedential Capacity Pedestrian Impedance Factor Maj L-Shared Prob Q free St.  Conflicting Flows Potential Capacity Pedestrian Impedance Factor Maj L-Shared Prob Q free St.  Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Pedestrian Impedance Factor Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt Movement Capacity Pedestrian Impedance factor Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt Movement Capacity Movement Capacity  M		140001			1.0			1.00	
Conflicting Flows Potential Capacity Potential Capacity Potential Capacity Potential Capacity Potential Capacity Potential Capacity Probability of Queue free St.  Step 3: TH from Minor St.  Conflicting Flows Potential Capacity Potential Capa		free St.			1.0	0		1.00	
Conflicting Flows Potential Capacity Potential Capacity Potential Capacity Potential Capacity Potential Capacity Potential Capacity Probability of Queue free St.  Step 3: TH from Minor St.  Conflicting Flows Potential Capacity Potential Capa									
Potential Capacity Pedestrian Impedance Factor Movement Capacity Probability of Queue free St. Maj L-Shared Prob Q free St.  Step 3: TH from Minor St.  Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Potential Ca	Step 2: LT from Major	r St.				4		1	
Potential Capacity Pedestrian Impedance Factor Movement Capacity Probability of Queue free St. Maj L-Shared Prob Q free St.  Step 3: TH from Minor St.  Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Probability of Queue free St.  Conflicting Flows Potential Capacity Potential Ca	Conflicting Flore								
Pedestrian Impedance Factor  Movement Capacity Probability of Queue free St.  Maj L-Shared Prob Q free St.  Step 3: TH from Minor St.  Conflicting Flows Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt  Conflicting Flows Probability of Queue free St.  Step 4: LT from Minor St.  Conflicting Flows Probability of Queue free St.  Conflicting Flows Prodestrian Impedance Factor Maj. L, Min T Impedance Factor Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt  Cap. Adj. factor due to Impeding mvmnt  Movement Capacity  Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance	=								
Movement Capacity Probability of Queue free St. Maj L-Shared Prob Q free St. O.99  Step 3: TH from Minor St.  Conflicting Flows Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt O.99  Movement Capacity Probability of Queue free St.  Conflicting Flows Pedestrian Impedance Factor Maj. L, Min T Impedance factor Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt O.99  Movement Capacity  Movement Capacity  Movement Capacity  Movement Capacity  Movement Capacity  Movement Capacity  Movement 7-Computation of the Effect of Two-stage Gap Acceptance		Factor						1 00	
Probability of Queue free St.  Maj L-Shared Prob Q free St.  Step 3: TH from Minor St.  Step 4: LT fro	-	ractor						1.00	
Maj L-Shared Prob Q free St.  Step 3: TH from Minor St.  Conflicting Flows Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt  Probability of Queue free St.  Step 4: LT from Minor St.  Conflicting Flows Pedestrian Impedance Factor  Step 4: LT from Minor St.  Conflicting Flows Pedestrian Impedance Factor Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt  Cap. Adj. factor due to		free St.						1.00	
Step 3: TH from Minor St.  Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt O.99  Movement Capacity Probability of Queue free St.  Step 4: LT from Minor St.  Conflicting Flows Potential Capacity Pedestrian Impedance Factor Maj. L, Min T Impedance Factor Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt O.99  Movement Capacity  Morksheet 7-Computation of the Effect of Two-stage Gap Acceptance							_		
Conflicting Flows Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Conflicting Flows Conflict									
Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt O.99 Movement Capacity Probability of Queue free St.  Step 4: LT from Minor St.  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 O.99 Movement Capacity  Norksheet 7-Computation of the Effect of Two-stage Gap Acceptance	Step 3: TH from Minor	r St.				8	1	11	
Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt O.99  Movement Capacity Probability of Queue free St.  Step 4: LT from Minor St.  Conflicting Flows Pedestrian Impedance Factor Adj. L, Min T Impedance Factor Adj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt O.99  Movement Capacity Overksheet 7-Computation of the Effect of Two-stage Gap Acceptance									
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt O.99  Novement Capacity Probability of Queue free St.  Step 4: LT from Minor St.  Conflicting Flows Podestrian Impedance Factor Cap. Adj. L, Min T Impedance factor Cap. Adj. factor due to Impeding mvmnt O.99  Novement Capacity O.99  O.00								)	
Cap. Adj. factor due to Impeding mvmnt  O.99  Overement Capacity Probability of Queue free St.  To 10  Conflicting Flows Pedestrian Impedance Factor Inj. L, Min T Impedance factor Inj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt  Overement Capacity  Overement Capac	1 1	Footon			1 0	0		1/00	_
Movement Capacity Probability of Queue free St.  1.00  1.00  Step 4: LT from Minor St.  7  10  Conflicting Flows 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  Norksheet 7-Computation of the Effect of Two-stage Gap Acceptance			ina mum	n+	, ,				/
Probability of Queue free St.  1.00  1.00  Step 4: LT from Minor St.  7  10  Conflicting Flows 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  Norksheet 7-Computation of the Effect of Two-stage Gap Acceptance		to imped	iiiig ilivili	116	J Y.3	9		0.99	/
Step 4: LT from Minor St.  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  Norksheet 7-Computation of the Effect of Two-stage Gap Acceptance		free St			1.0	0		1.00	
Conflicting Flows 415 Potential Capacity 598 Pedestrian Impedance Factor 1.00 Maj. L, Min T Impedance factor 0.99 Maj. L, Min T Adj. Imp Factor. 1.00 Cap. Adj. factor due to Impeding mvmnt 0.99 1.00 Movement Capacity 595  Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance				(	1.0	-		00	
Conflicting Flows Pedestrian 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  Norksheet 7-Computation of the Effect of Two-stage Gap Acceptance	Step 4: LT from Minor	r St.			- /	7		10	
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  Norksheet 7-Computation of the Effect of Two-stage Gap Acceptance	<del>-</del>								
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  Norksheet 7-Computation of the Effect of Two-stage Gap Acceptance	Conflicting Flows							1 /	> _
Maj. L, Min T Impedance factor  Maj. L, Min T Adj. Imp Factor.  Cap. Adj. factor due to Impeding mvmnt  Movement Capacity  Norksheet 7-Computation of the Effect of Two-stage Gap Acceptance								\ /	
Maj. L, Min T Adj. Imp Factor.  Cap. Adj. factor due to Impeding mvmnt  O.99  1.00  Movement Capacity  Orksheet 7-Computation of the Effect of Two-stage Gap Acceptance					1.0	0			
Cap. Adj. factor due to Impeding mvmnt 0.99 1.00 Movement Capacity 595  Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance									
Movement Capacity 595  Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance				n+	Λ 0	a			\
Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance		со тшћеа	TITA IIIAU	116				1.00	
	smene sapacity				555				\ <u> </u>
Step 3: TH from Minor St. 8	Worksheet 7-Computati	ion of th	e Effec	t of Two	-stage	Gap A	ccepta	nce	
Step 3: TH from Minor St. 8									
	Step 3: TH from Minor	r 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.			
riobability of guede free be.			
Part 2 - Second Stage			
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mymnt			
Movement Capacity			
Pont 2 Cinalo Ctoro			
Part 3 - Single Stage			
Conflicting Flows			
Potential Capacity	1 00	1 00	
Pedestrian Impedance Factor	1.00	1.00	
Cap. Adj. factor due to Impeding mvmnt	0.99	0.99	
Movement Capacity			
Popult for 2 store process:			
Result for 2 stage process:			
a 			
y C +			
C t Probability of Queue free St.	1.00	1.00	
rrowaurrrey or Queue tree St.	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			
Cap. Adj. factor due to Impeding mvmnt Movement Capacity			
Movement Capacity	415		
Movement Capacity  Part 3 - Single Stage	415 598		
Movement Capacity  Part 3 - Single Stage Conflicting Flows		1.00	
Movement Capacity  Part 3 - Single Stage Conflicting Flows Potential Capacity	598	1.00	
Movement Capacity  Part 3 - Single Stage  Conflicting Flows  Potential Capacity  Pedestrian Impedance Factor	598		
Movement Capacity  Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Maj. L, Min T Impedance factor	598	0.99	
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.	598 1.00	0.99	
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	598 1.00 0.99	0.99	
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  Results for Two-stage process:	598 1.00 0.99	0.99	
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  Results for Two-stage process: a	598 1.00 0.99	0.99	
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  Results for Two-stage process:	598 1.00 0.99 595	0.99	
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  Results for Two-stage process: a y	598 1.00 0.99	0.99	
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  Results for Two-stage process: a y	598 1.00 0.99 595	0.99	
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  Results for Two-stage process: a y	598 1.00 0.99 595	0.99	
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  Results for Two-stage process: a y C t	598 1.00 0.99 595	0.99	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations	598 1.00 0.99 595	0.99 1.00 1.00	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations	598 1.00 0.99 595	0.99 1.00 1.00	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations	598 1.00 0.99 595	0.99 1.00 1.00	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations  Movement 7 L  Volume (vph) 14	598 1.00 0.99 595 595	0.99 1.00 1.00	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations  Movement  7 Uolume (vph) 14 Movement Capacity (vph) 595	598 1.00 0.99 595 595	0.99 1.00 1.00	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations  Movement 7 L  Volume (vph) 14	598 1.00 0.99 595 595	0.99 1.00 1.00	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations  Movement  7 Uolume (vph) 14 Movement Capacity (vph) 595	598 1.00 0.99 595 595	0.99 1.00 1.00	
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  Results for Two-stage process: a  Y C t  Worksheet 8-Shared Lane Calculations  Movement  Volume (vph)  Movement Capacity (vph)  Shared Lane Capacity (vph)	598 1.00 0.99 595 595	0.99 1.00 1.00	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations  Movement  7 Uolume (vph) 14 Movement Capacity (vph) 595	598 1.00 0.99 595 595	0.99 1.00 1.00	
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  Results for Two-stage process: a  Y C t  Worksheet 8-Shared Lane Calculations  Movement  Volume (vph)  Movement Capacity (vph)  Shared Lane Capacity (vph)	598 1.00 0.99 595 595	0.99 1.00 1.00	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations  Movement  7 L  Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)  Worksheet 9-Computation of Effect of Flat	598 1.00 0.99 595 595 8 9 1 T R	0.99 1.00 1.00 0 11 12 L T R	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations  Movement  7  Volume (vph) Movement Capacity (vph)  Shared Lane Capacity (vph)  Worksheet 9-Computation of Effect of Flat Movement  7	598 1.00 0.99 595 595 8 9 1 T R	0.99 1.00 1.00 0 11 12 L T R	
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  Results for Two-stage process: a Y C t  Worksheet 8-Shared Lane Calculations  Movement  7 L  Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)  Worksheet 9-Computation of Effect of Flam Movement 7 L C sep 595	598 1.00 0.99 595 595 8 9 1 T R	0.99 1.00 1.00 0 11 12 L T R	
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  Results for Two-stage process: a  y C t  Worksheet 8-Shared Lane Calculations  Movement  7 L  Volume (vph) Movement Capacity (vph)  Shared Lane Capacity (vph)  Worksheet 9-Computation of Effect of Flat Movement  7 L	598 1.00 0.99 595 595 8 9 1 T R	0.99 1.00 1.00 0 11 12 L T R	
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  Results for Two-stage process: a y C t  Worksheet 8-Shared Lane Calculations  Movement  7 L  Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)  Worksheet 9-Computation of Effect of Flam Movement 7 L C sep 595	598 1.00 0.99 595 595 8 9 1 T R	0.99 1.00 1.00 0 11 12 L T R	



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)		9	14					
C(m) (vph)		1560	595					
v/c		0.01	0.02					
95% queue length		0.02	0.07					
Control Delay		7.3	11.2					
LOS		A	В					
Approach Delay				11.2				
Approach LOS				В				

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		7.3
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5 $$		2

## 1.1.1.2 Interseção B – Pico Tarde

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY\_\_\_

Progeplan Analyst: Agency/Co.: 05/06/2023 Date Performed: Analysis Time Period: Pico Tarde Intersection: Jurisdiction: DER/DF Units: U. S. Metric 2023 Analysis Year: Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: M2 North/South Street: М7 Intersection Orientation: EW \_Vehicle Volumes and Adjustments<sub>\_</sub> Major Street: Approach Eastbound Movement 2 Т Volume Peak-Hour Factor, PHF

> Approach Movement

Hourly Flow Rate, HFR

RT Channelized?

Upstream Signal?

Minor Street:

Lanes Configuration

Percent Heavy Vehicles Median Type/Storage Study period (hrs): 1.00

Westbound 3 5 6 L Τ R 1989 0.91 0.91 13 2185 Undivided 0 LT T No No Northbound Southbound 8 | 10 11



Volume 17
Peak Hour Factor, PHF 0.91
Hourly Flow Rate, HFR 18
Percent Heavy Vehicles 20
Percent Grade (%) 0 0
Flared Approach: Exists?/Storage / /
Lanes 1
Configuration L

Delay, Queue Length, and Level of Service Approach EΒ WB Northbound Southbound 9 10 Movement 1 4 8 11 12 Lane Config  $_{
m LT}$ v (vph) 13 18 C(m) (vph) 1636 209 v/c 0.01 0.09 95% queue length 0.02 0.28 Control Delay 7.2 23.8 Α С Approach Delay 23.8 Approach LOS

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

Date Performed: 05/06/2023
Analysis Time Period: Pico Tarde
Intersection: B
Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023

Project ID: ATUAL SEM EMPREENDIMENTO

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

Study period (hrs): 1.00

	Vehicle Volume	s and Adjustments	
Major Street Movements	_ 1 2	3 4 5 6	
	L T	R L / T \ R	
Volume		12 1989	)
Peak-Hour Factor, PHF		0.91 0.91	
Peak-15 Minute Volume		3 546	
Hourly Flow Rate, HFR		13 2185	\ / \
Percent Heavy Vehicles		0	
Median Type/Storage	Undivided		
RT Channelized?			
Lanes		0 2	
Configuration		LT T	
Upstream Signal?	No	No	
Minor Street Movements	7 8	9 10 11 12	
	L T	R L T R	
Volume	17	\	
Peak Hour Factor, PHF	0.91		
Peak-15 Minute Volume	5		
Hourly Flow Rate, HFR	18		
Percent Heavy Vehicles	20	_	\ \
Percent Grade (%)	0	0	
Flared Approach: Exist	s?/Storage	/	



RT Channelized

Lanes  ${\tt Configuration}$  1 L

	Pedestria:	n 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		
	Up:	stream Si	gnal Dat			
Pro	·	stream Si Arrival	_	ca	Prog.	Distance
Pro	g. Sat		_		Prog. Speed	Distance to Signal

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 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	Т	R	L	Т	R
t(c,base	<del></del>		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	20					
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	6.6					
	2-stage								

Follow-Up Tim	ne Calcula	tions							
Movement	1	4	7	8	9	10	11	12	
	L	L	L	Т	R	Ĺ	T	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)		0	20		<b>\</b>				
t(f)		2.2	3.7		/ /		\	1	_/

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

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

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)

g (q)								
Computation 2-Proport	tion of T	TWSC In	tersect	ion Tim	ne bloc	cked		
-				Movem	ent 2	M	lovement	
			V	7(t) V	(1,prot	t) V(t)	V (I,	,prot)
ılpha								
oeta Pravol timo (t/a) (so	00)							
ravel time, t(a) (se Smoothing Factor, F	ec)							
Proportion of conflic	ctina flo	w, f						
Max platooned flow, N		,						
Min platooned flow, N								
Duration of blocked p		(p)						
Proportion time block	kea, p			0.0	100		0.000	
Computation 3-Platoor	n Event E	Periods	Re	esult				
o (2)			0.	000				
p (5)				000				
p(dom)								
o(subo)								
Constrained or uncons	strained?	2						
Proportion								
unblocked	(1	L)		(2)		(3)		
for minor		e-stage			Stage Pr		_	
movements, p(x)	Proc	cess	St	age I		Stage I	I	
0(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	T	R	L	T	R
		0	1118					
V C,X s		U	1110					
Px								
J c,u,x								
C r, x								
C plat,x								
Two-Stage Process								
_	7		8		10		13	
Stage1	Stage2	Stage	1 Stag	ge2 Sta	ige1 St	tage2 S	tage1	Stage2
V(c,x)								
S S	3000							
P(x)					~ _	_ `	)	
V(c,u,x)								
C(r,x)				<del></del>	/		<del>\                                    </del>	
C(plat,x)							1 L	/
- (F//								
Worksheet 6-Impedance	e and Cap	pacity 1	Equatio	ns			>	
Step 1: RT from Minor	r St.			<del></del>	9		12	
000p 1. KI 110M H1110							\ 7	7 -
Conflicting Flows							) [	
Potential Capacity					0.0	$\overline{}$	, L.	(
Pedestrian Impedance	Factor			1	.00		1.00	\
Movement Capacity Probability of Queue	free St			1	.00		1.00	
rrobability or Queue	TTCC DL.			1			1.00	/ _
Step 2: LT from Major	r St.				4		1	
Conflicting Dlass								
Conflicting Flows Potential Capacity				0	.636			
ICCONCIUL CAPACILY				1				



			engennaria e me
Pedestrian Impedance Factor	1.00	1.00	
Movement Capacity Probability of Oueue free St.	1636 0.99	1.00	
Maj L-Shared Prob Q free St.	0.99	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	0.99	0.99	
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	-
-	1110		_
Conflicting Flows Potential Capacity	1118 211		
Pedestrian Impedance Factor	1.00	1.00	
Maj. L, Min T Impedance factor		0.99	
Maj. L, Min T Adj. Imp Factor.	0.00	0.99	
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	0.99 209	0.99	
			_
Worksheet 7-Computation of the Effect of	Two-stage Gap Ac	ceptance	
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 mymnt			
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:			-
а У			
Ĉ t		<b>\</b>	
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	_
Part 1 - First Stage	<b>\</b>		
Conflicting Flows Potential Capacity			\
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt	<b>1</b> \		
Movement Capacity		$\rightarrow$	
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	1118		
Potential Capacity	211		
Pedestrian Impedance Factor	1.00	1.00	¬
Maj. L, Min T Impedance factor		0.99	



Maj. L, Min T Adj. Imp Facto Cap. Adj. factor due to Impe Movement Capacity			).99 209		0.99	
Results for Two-stage proces	s:					
a 						
Y C t		2	209			
<u> </u>						
Worksheet 8-Shared Lane Calc	ulations					
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)	18 209					
Worksheet 9-Computation of E	ffect of Flare	ed Minor	Stree	et Appro	aches	
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)	209 18					
	ngth, and Leve	el of Se	ervice	10	11	12
v (vph) 1 C(m) (vph) 1 v/c 0 95% queue length 0 Control Delay 7	3 18 636 209 .01 0.09 .02 0.28 .2 23.8 A C	23.8 C				
Worksheet 11-Shared Major LT	Impedance and	d Delay	Moveme	ent 2	Move	nent 5
p(oj) v(i1), Volume for stream 2 o v(i2), Volume for stream 3 o s(i1), Saturation flow rate s(i2), Saturation flow rate P*(oj) d(M,LT), Delay for stream 1 N, Number of major street th d(rank,1) Delay for stream 2	r 6 for stream 2 of for stream 3 or 4 rough lanes		1.0	00	0 0 1 1	700 700 992
1.1.1.3 Interseção C – Pio	co Manhã		<u> </u>		7 (	

HCS+: Unsignalized Intersections Release 5.6

Analyst: Progeplan
Agency/Co.:
Date Performed: 05/06/2023

\_\_\_\_TWO-WAY STOP CONTROL SUMMARY\_



Analysis Time Period: Pico Manha

Intersection: Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023
Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: MOV01-MOV05-MOV07
North/South Street: MOV08

Intersection Orientation:  ${\tt EW}$ 

Study period (hrs): 1.00

Vehicle Volumes and Adjustments

	veni	CTE AOTI	ımes an	a Aaju	stme	nts			
Major Street:	Approach	Eas	stbound			W	estbound	1	
	Movement	1	2	3		4	5	6	
		L	T	R		L	T	R	
Volume		39	1764						
Peak-Hour Fact	or, PHF	0.91	0.91						
Hourly Flow Ra	ate, HFR	42	1938						
Percent Heavy	Vehicles	0							
Median Type/St	corage	Undivi	lded			/			
RT Channelized	1?								
Lanes		0	2						
Configuration		L	ТТ						
Upstream Signa	11?		No				No		
Minor Street:	Approach	Noi	thboun	d		S	outhbour	nd	
	Movement	7	8	9		10	11	12	
		L	T	R		L	T	R	
Volume						9			
Peak Hour Fact	or, PHF					0.91			
Hourly Flow Ra	ate, HFR					9			
Percent Heavy	Vehicles					12			
Percent Grade	(%)		0				0		
Flared Approac	ch: Exists?/	Storage			/				/
Lanes						1			
Configuration							L		

	_Delay,		Le	ngt				Ser		. 1 1		
Approach	EB	WB			North	bouna			Sc	uthboun	ia	
Movement	1	4		7	8		9		10	11	12	
Lane Config	LT							I	L			
v (vph)	42								9			
C(m) (vph)	1636								234			
v/c	0.03								0.04			
95% queue length	0.08								0.12			
Control Delay	7.3								21.0			
LOS	A								С			
Approach Delay										21.0		
Approach LOS										С		

HCS+: Unsignalized Intersections Release 5.6

Phone: E-Mail:

TWO-WAY STOP CONTROL (TWSC) ANALYSIS

Progeplan

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

Intersection: C Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023

Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: MOV01-MOV05-MOV07 Fax:



North/South Street: MOV08 Intersection Orientation: EW

Study period (hrs): 1.00

Vehicle Volumes and Adjustments  Major Street Movements 1 2 3 4 5 6							
		2	_		5	6	
	L	Т	R	L	T	R	
	39	1764					
Peak-Hour Factor, PHF	0.91	0.91					
Peak-15 Minute Volume	11	485					
Hourly Flow Rate, HFR	42	1938					
-	0	1930					
Percent Heavy Vehicles		vided		/			
Median Type/Storage	Unai	viaea		/			
RT Channelized?	0	2					
lanes	0						
Configuration	Ь	тт					
Jpstream Signal?		No			No		
finor Street Movements	7	8	9	10	11	12	
illior bereet novements	L	T	R	L	T	R	
				9			
Peak Hour Factor, PHF				0.91			
Peak-15 Minute Volume				2			
Hourly Flow Rate, HFR				9			
=				12			
Percent Heavy Vehicles		0		12	0		
Percent Grade (%)	0 / 0 +			,	U		,
	?/Storag	е		/			/
RT Channelized							
lanes				1			
Configuration				L			
Pe Movements	destrian 13	volumes 14	and Ad	justmen 16	ts		
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	1.2			
Percent Blockage	0	0	0	0			
		tream Si	-				
Prog.		Arrival	Green	-	_		stance
Flow	Flow	Type	Time	Lengt	_		Signal
vph	vph		sec	sec	kph	m	eters
2 Left-Turn							
Through							
S5 Left-Turn							
Through							
111104911							
Norksheet 3-Data for Com	puting E	ffect of	Delay	to Majo	r Stree	t Vehi	cles
			Move	ment 2	Mov	ement	5
Shared In volume, major	th vehic	les:	0				<del>}</del>
Shared in volume, major			0				
Sat flow rate, major th			17	00		\ /	
Sat flow rate, major rt			17	/		1 1	/
Number of major street t			2			1 1	_ /

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

Critical	Gap Cal	culatio	n						
Movement		1	4	7	8	9	10	11	12
		L	L	L	Т	R 🧶	L	T	R
t(c,base	:)	4.1					7.1		1 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



	tage 4.1					6.5			engenharia e meio c
Follow-Up Tir		lations 4	7	8	9	10	11	12	_
	L	L	L	T	R	L	T	R	
t(f,base) t(f,HV) P(HV) t(f)	2.20 0.90 0 2.2		0.90	0.90	0.90	3.50 0.90 12 3.6	0.90	0.90	_
Worksheet 5-F					eam Sig	nal			_
				Λ(.	Moveme t) V(		Mo V(t)	vement 5 V(1,prot)	
V prog Total Saturat Arrival Type Effective Gre Cycle Length, Rp (from Exhi Proportion ve g(q1) g(q2) g(q)	een, g (s , C (sec) ibit 16-1	sec)		ı P					
Computation 2	2-Proport	ion of T	WSC Inte		Moveme	ent 2	Mo	vement 5 V(l,prot)	_
Proportion of Max platooned Min platooned Duration of k Proportion to	d flow, N d flow, N olocked p	(c,max) (c,min) period, t			0.00	00		0.000	
Computation 3	3-Platoor	Event Pe	eriods	Res	ult				
p(2) p(5) p(dom) p(subo) Constrained	or uncons	strained?		0.0					_
Proportion unblocked for minor movements, p	(x)	(1) Single	-stage		(2) Two-St ge I	age Pro	(3) cess tage II		_
p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12)									
Computation Single-Stage Movement		1 L	4 L	7 L	8 T	9 R	10 L	11 12 R	
V c,x s Px		0					1053		
V c,u,x									_ (
C r,x C plat,x								1	



Two-Stage Process 7 8 Stage1 Stage2 Stage1 Stage2  V(c,x) SP(x) V(c,u,x) C(r,x) C(plat,x)  Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St. Conflicting Flows	300		
Stage1 Stage2 Stage1 Stage2  V(c,x) 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.	Stagel Sta	ge2 Stage1 Stage2	
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.		0	-
P(x) V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St.			
V(c,u,x) C(r,x) C(plat,x) Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St.			
C(r,x) C(plat,x) Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St.			
Worksheet 6-Impedance and Capacity Equations Step 1: RT from Minor St.			_
Step 1: RT from Minor St.			•
Conflicting Flows	9	12	
=			
Potential Capacity	1 00	1 00	
Pedestrian Impedance Factor Movement Capacity	1.00	1.00	
Probability of Queue free St.	1.00	1.00	
Step 2: LT from Major St.	4	1	<u>.</u>
			-
Conflicting Flows		0	
Potential Capacity Pedestrian Impedance Factor	1.00	1636 1.00	
Movement Capacity	1.00	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	4.00	4 00	
Pedestrian Impedance Factor	1.00 0.97	1.00 0.97	
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	0.31	0.37	
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	
Conflicting Flows		1053	-
Potential Capacity		240	
Pedestrian Impedance Factor	1.00	1.00	
Maj. L, Min T Impedance factor	0.97		
Maj. L, Min T Adj. Imp Factor.	0.98		
Cap. Adj. factor due to Impeding mvmnt	0.98	0.97	
Movement Capacity		234	
Worksheet 7-Computation of the Effect of Two	-stage Gap Ac	ceptance	
Step 3: TH from Minor St.	8	11	-
Part 1 - First Stage			
Conflicting Flows		\ / _	
Potential Capacity	) /	\	1
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	] [	\	\
Movement Capacity			
Probability of Queue free St.	\		
Part 2 - Second Stage	$\overline{}$	$\rightarrow$	
Conflicting Flows	1	- 1 /	11/
Potential Capacity		\ \ \ / /	1111
Pedestrian Impedance Factor		$\vee$ $\sqcap$	
Cap. Adj. factor due to Impeding mvmnt Movement Capacity			77
		+	_ / /
Part 3 - Single Stage Conflicting Flows			ノノー
Conflicting Flows Potential Capacity			///
. O COLLOTAT CAPACTOY	1 00	1 00	1
Pedestrian Impedance Factor	1.00	1.00	
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	0.97	0.97	~



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	
Don't 1 Pinch Ober						
Part 1 - First Stage Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Factor						
Cap. Adj. factor due to Impeding	g mvmnt					
Movement Capacity						
Part 2 - Second Stage						
Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Factor						
Cap. Adj. factor due to Impeding	g mvmnt					
Movement Capacity						
Part 3 - Single Stage						
Conflicting Flows					1053	
Potential Capacity					240	
Pedestrian Impedance Factor			.00		1.00	
Maj. L, Min T Impedance factor			0.97			
Maj. L, Min T Adj. Imp Factor.	x mrmn+		.98 .98		0.97	
Cap. Adj. factor due to Impeding Movement Capacity	J IIIVIIIIIC	U	. 30		234	
Results for Two-stage process:						
a						
Y C t					234	
					234	
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume (vph)				9		
Movement Capacity (vph) Shared Lane Capacity (vph)				234		
Worksheet 9-Computation of Effec	ct of Flare	ed Minor	Stree	t Approa	aches	
Movement	7	8	9	10	11	12
	L	T	R	L	Т	R
C sep				234		
Volume				9		
Delay			/	\		
Q sep						
Q sep +1			_			
round (Qsep +1)						_
n max		7	/		11	
C sh					1	/
SUM C sep	(					
n	\		\			_
C act					>	
		]			1	5 [
Worksheet 10-Delay, Queue Length	n, and Leve	el of Se	rvice		) /	
1		8	9	10	11	12
Movement 1 4						
	/			L	\ \	\
Lane Config LT	/					
Lane Config LT v (vph) 42	/			9	_/	
Lane Config LT  v (vph) 42 C(m) (vph) 1636	/			9 234	_/	
Lane Config LT  v (vph) 42  C(m) (vph) 1636  v/c 0.03	/			9 234 0.04	7	
V (vph) 42 C(m) (vph) 1636 v/c 0.03 95% queue length 0.08	/			9 234		_
V (vph) 42 C(m) (vph) 1636 v/c 0.03 95% queue length 0.08	,			9 234 0.04 0.12		



Approach Delay 21.0 Approach LOS С

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	0.97	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)	0.97	
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	

# 1.1.1.4 Interseção C – 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:

Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023

Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: MOV01-MOV05-MOV07
North/South Street: MOV08

Intersection Orientation: EW Study period (hrs): 1.00

	Vehi	cle Vol	umes and	l Adju	stments	3		
Major Street:	Approach	Ea	stbound			Westbou	nd	
-	Movement	1	2	3	4	5	6	
		L	T	R	, L	T	R	
Volume		29	691					
Peak-Hour Fact	or. PHF	0.91	0.91					
Hourly Flow Ra		31	759					
Percent Heavy		21						
Median Type/St	orage	Undiv			/			
	. •	0	2					
Lanes		0	Z T T					
Configuration	1.0	Ь				27		
Upstream Signa	1;		No			No		
Minor Street:	Approach	No	rthbound	1		Southbor	und	
	Movement	7	8	9 /	10	11	12	
		T.	T	R	T.	Т	R	
		_	-		· -		· · /	
Volume					12	2		
Peak Hour Fact	or, PHF				0.	. 91	\\\ /	\
Hourly Flow Ra	te, HFR				13	3		\
Percent Heavy	Vehicles				0			
Percent Grade	(%)		0	(	\	0		
Flared Approac	h: Exists?/	Storage			_ /			
Lanes		_				1		
Configuration					1	L		
							<del></del>	/ / /
	Delay,	ueue Le	ngth, ar	d Lev	el of S	Service	-	4
Approach	EB EB	WB		hboun			uthbound	
Movement	1	4	7	8	9	10	11 12	//
Lane Config	LT	i				L	_ / /	
v (vph)	31					13		
C(m) (vph)	1507					565		1
v/c	0.02					0.02	1 ,	_
95% queue leng	th 0.06					0.07		
Control Delay	7.4					11.5		



LOS В Α Approach Delay 11.5 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: Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023
Project ID: ATUAL SEM EMPREENDIMENTO
East/West Street: MOV01-MOV05-MOV07

North/South Street: MOV08 Intersection Orientation: EW

Study period (hrs): 1.00

Prog.

Speed

kph

Distance

to Signal

meters

	Vehicle	Volumes	and Ac	ljustmen	ts		
Major Street Movements	_ 1	2	3	4	5	6	
	L	T	R	L	Т	R	
Volume	29	691					
Peak-Hour Factor, PHF	0.91	0.91					
Peak-15 Minute Volume	8	190					
Hourly Flow Rate, HFR	31	759					
Percent Heavy Vehicles	21						
Median Type/Storage	Undi	ivided		/			
RT Channelized?							
Lanes	0	2					
Configuration	I	T T					
Upstream Signal?		No			No		
				1.0		1.0	
Minor Street Movements	7 T.	8 T	9 R	10 T.	11 T	12 R	
	ь	T	K	Ь	T	K	
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			0		
Flared Approach: Exist	s?/Storac	re.			/ · \		1
RT Channelized	/	, -					
Lanes				1			
Configuration			\	, I	1		
						\ \	
					nts		
Movements	13	14	15	16		_	
Flow (ped/hr)	0	0	0	0		$\rightarrow$	
Lane Width (m)	-	-	-			1	A [
Walking Speed (m/sec)	1.2	1.2	1.2	1.2			/ / /
Movements Flow (ped/hr)	edestriar 13 0	0	0	16		7	

Upstream Signal Data
Sat Arrival Green Cycle

sec

Type

Time Length

sec

S2 Left-Turn Through

Prog.

Flow

vph

Flow

vph



### S5 Left-Turn Through

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

					Movement	2	Movemen	nt 5
Shared ln volum	e, majo	r th vel	nicles:		0			
Shared ln volum					0			
Sat flow rate,					1700			
Sat flow rate,					1700			
Number of major				:	2			
Worksheet 4-Cri	tical G	ap and	Follow-	up Time	Calcula	tion		
Critical Gap Ca	lculati	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,q)			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-stag		0.00	0.00	0.00	0.00	0.00	0.00	0.00
	e 0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c) 1-stag						6.4		
2-stag								
Follow-Up Time	Calcula	tions						
Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	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	0.90	0.90	0.90	0.90	0.90	0.90	0.90
E (11 A )	2.4					3.5		
t(f)	4.4					٠.٥		

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 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



p(subo) Constrained or unconstrained?

Proportion									_	
unblocked for minor	(1 Sinale	l) e-stage		(2) Two-S	Stage Pi	(3) rocess				
movements, p(x)	Proc		Sta	age I	ougo 1	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	0					441			_	
s Px V c,u,x	-								_	
C r,x C plat,x										
Two-Stage Process									_	
-	7		8		10		11			
Stage1	Stage2	Stage1	Stage	e2 Sta	ige1 St	tage2 S	stage1	Stage2		
V(c,x)						0.00			_	
s P(x)					31	000				
V(c,u,x)										
C(r,x) C(plat,x)									_	
									_	
Worksheet 6-Impedance	e and Car	pacity E	quation	ns					_	
		pacity E	quation	ns	9		12		_	
Worksheet 6-Impedance		pacity E	quation	ns	9		12			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity	st.	pacity E	quation						-	
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity	f St.		quation		9		1.00		-	
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance	f St.		quation	1					-	
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity	Factor free St.		quation	1	.00		1.00		-	
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue	Factor free St.		quation	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	Factor free St.		quation	1	.00		1.00 1.00 1 0 1507		-	
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	.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 Movement Capacity Probability of Queue	Factor free St.  Factor free St.		quation	1 1 1	.00		1.00 1.00 1 0 1507 1.00 1507 0.98		-	
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	Factor free St.  Factor free St.		quation	1 1 1	.00		1.00 1.00 1 0 1507 1.00 1507 0.98 0.98		-	
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	Factor free St.  Factor free St.		quation	1 1 1	.00		1.00 1.00 1 0 1507 1.00 1507 0.98		-	
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	Factor free St.  Factor free St.  Factor free St.  Factor free St.		quation	1 1 1 1 1	.00 .00 4 .00 .00		1.00 1.00 1 0 1507 1.00 1507 0.98 0.98		-	
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 for Step 3: TH from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Cap. Adj. factor due	Factor free St.  Factor free St.  Factor free St.  Factor free St.  Factor			1 1 1 1 1 1	.00		1.00 1.00 1 0 1507 1.00 1507 0.98 0.98		-	
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 Cap. Adj. factor due Movement Capacity	Factor free St.  Factor free St.  Factor free St.  Factor free St.  Factor to Imped	ding mvm		1 1 1 1 1 0 0	.00 .00 4 .00 .00 .00 .00 8		1.00 1.00 1.00 1 0 1507 1.00 1507 0.98 0.98 11	<i>Y</i> =		
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 for Step 3: TH from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Cap. Adj. factor due	Factor free St.  Factor free St.  Factor free St.  Factor to Impeding	ding mvm		1 1 1 1 1 0 0	.00 .00 4 .00 .00		1.00 1.00 1 0 1507 1.00 1507 0.98 0.98			
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 Cap. Adj. factor due Movement Capacity Probability of Queue Step 4: LT from Minor Conflicting Flows	Factor free St.  Factor free St.  Factor free St.  Factor to Impeding	ding mvm		1 1 1 1 1 0 0	.00 .00 4 .00 .00		1.00 1.00 1.00 1 0 1507 1.00 1507 0.98 0.98 11 1.00 0.98 1.00 1.			
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 Cap. Adj. factor due Movement Capacity Probability of Queue Step 4: LT from Minor Conflicting Flows Potential Capacity Probability of Queue	Factor free St.  Factor free St.  Factor free St.  Factor free St.  St.	ding mvm		1 1 1 1 0 0 1	.00 .00 4 .00 .00 .00 .00 .98 .00		1.00 1.00 1.00 1.00 1507 1.00 1507 0.98 0.98 11 1.00 0.98 1.00 1.			
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 Cap. Adj. factor due Movement Capacity Probability of Queue Step 4: LT from Minor Conflicting Flows	Factor free St.  Factor free St.  Factor free St.  Factor to Impediate St.  Factor free St.	ding mvm		1 1 1 1 0 1	.00 .00 4 .00 .00		1.00 1.00 1.00 1 0 1507 1.00 1507 0.98 0.98 11 1.00 0.98 1.00 1.			



tage Gap <i>P</i>	Acceptance	-
	•	
8	11	-
1.00	1.00 0.98	
1.00	1.00	
7	10	-
1.00 0.98 0.98 0.98	441 577 1.00 0.98 565	
_(		. \
	565	
1	1/7-	
9 R	10 11 12 L T R	7/
	13 565	
	1.00 7 1.00 0.98 0.98 0.98	1.00 1.00 7 10  1.00 1.00 7 10  441 577 1.00 0.98 0.98 0.98 0.98 0.98 565  565  9 10 11 12 R L T R



Movement			7		8	9	10	11	12
			L	ı	T	R	L	Т	R
C sep							565		
Volume							13		
Delay									
Q sep									
Q sep +1									
round (Qsep +1)									
n max									
C sh									
SUM C sep									
n									
n C act									
C act									
	, Queue	Length,	and L	evel o	of Serv	vice			
C act	, Queue	Length,	and L	evel o	of Serv	rice	10	11	12
C act Worksheet 10-Delay Movement						rice	10 L	11	12
C act Worksheet 10-Delay Movement Lane Config	1 LT					rice	L	11	12
C act  Worksheet 10-Delay  Movement Lane Config  v (vph)	1 LT					rice	L 13	11	12
C act  Worksheet 10-Delay  Movement Lane Config  v (vph) C(m) (vph)	1 LT 31 1507					rice	13 565	11	12
C act  Worksheet 10-Delay  Movement Lane Config  v (vph) C(m) (vph) v/c	1 LT 31 1507 0.02					rice	13 565 0.02	11	12
C act Worksheet 10-Delay Movement Lane Config  v (vph) C(m) (vph) v/c 95% queue length	1 LT 31 1507 0.02 0.06					rice	13 565 0.02 0.07	11	12
C act  Worksheet 10-Delay  Movement Lane Config  v (vph) C(m) (vph) v/c 95% queue length Control Delay	1 LT 31 1507 0.02 0.06 7.4					rice	13 565 0.02 0.07 11.5	11	12
C act  Worksheet 10-Delay  Movement Lane Config  v (vph) C(m) (vph)	1 LT 31 1507 0.02 0.06					rice	13 565 0.02 0.07	11 11 11.5	12

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	2	
d(rank,1) Delay for stream 2 or 5		

# 1.1.1.5 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 G Intersection: Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: M2-M7+M8-M11+M12-M13 North/South Street: M13 Intersection Orientation: EW Study period (hrs): Vehicle Volumes and Adjustments Major Street: Approach Eastbound Westbound Movement 1 2 4 5 6 | L Т Volume 685 Peak-Hour Factor, PHF 0.91 0.91 Hourly Flow Rate, HFR 5 752 Percent Heavy Vehicles Median Type/Storage 0 Undivided RT Channelized?



Lanes 0 2 Configuration LT T Upstream Signal? No No

Minor Street: Approach Northbound Southbound | 10 12 Movement 8 11 Т L Т R | L R Volume 6 0.91 Peak Hour Factor, PHF Hourly Flow Rate, HFR 6 Percent Heavy Vehicles 11 Percent Grade (%) 0 0 Flared Approach: Exists?/Storage Lanes Configuration L

Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound 4 11 Movement 8 Lane Config  $_{
m LT}$ L v (vph) C(m) (vph) 1636 598 v/c 0.00 0.01

 v/c
 0.00
 0.01

 95% queue length
 0.01
 0.03

 Control Delay
 7.2
 11.1

 LOS
 A
 B

 Approach Delay
 11.1

 Approach LOS
 B

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: G
Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023

Project ID: ATUAL SEM EMPREENDIMENTO
East/West Street: M2-M7+M8-M11+M12-M13

North/South Street: M2-M7+1 Intersection Orientation: EW

Study period (hrs): 1.00

						\		
	_Vehicle	Volumes	and Ad	justmer	nts	\_\		
Major Street Movements	1	2	3	4	5	6		
	L	Т	R	L	Т	R		
Volume				5	685			
Peak-Hour Factor, PHF				0.91	0.91	///		
Peak-15 Minute Volume				1	188	ſ		
Hourly Flow Rate, HFR				5	752	- 1	/ /	
Percent Heavy Vehicles				0	/ <b>\</b>	<u>_</u> _	/ /	
Median Type/Storage	Und	ivided						
RT Channelized?							l I	
Lanes				0	2		\ \	
Configuration				1	тт 🗸			
Upstream Signal?		No			No			
Minor Street Movements	7	8	9	10	11	12		
	L	Т	R	L	T	R		_
							$\leftarrow +$	



Volume 0.91 Peak Hour Factor, PHF Peak-15 Minute Volume 2 Hourly Flow Rate,  ${\tt HFR}$ 6 11

RT Channelized

Lanes 1 L Configuration

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

	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 Type Time Length Speed to Signal 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:		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 Calo	culation	on						
Movement	5	1	4	7	8	9	10	11	12
		L	L	L	T	R	L	T	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	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 2-stage		4.1	6.5				\	

						/		
Follow-Up T	ime Calculat	cions						
Movement	1	4	7	8	9	10	11	12
	L	L	L	Т	R	L	T	R
				<b>\</b>				

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	11					
t(f)		2.2	3.6					_ / /

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

Movement 5

V(1,prot)

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

V(t)

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 0.000 p(2) p(5) 0.000 p(dom) p(subo) Constrained or unconstrained? Proportion unblocked (1) (2) (3) Two-Stage Process Single-stage for minor 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 Movement 1 4 7 8 9 10 11 12 L  $_{\rm L}$ L R Τ R V c,x 0 386 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

1.00

1.00

Potential Capacity

Pedestrian Impedance Factor



Movement Capacity Probability of Queue free St.	1.00	1.00	
Step 2: LT from Major St.	4		
	<u>-</u>		_
Conflicting Flows	0		
Potential Capacity Pedestrian Impedance Factor	1636 1.00	1.00	
Movement Capacity	1636	1.00	
Probability of Queue free St.	1.00	1.00	
Maj L-Shared Prob Q free St.	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	1.00	1.00	
Movement Capacity			
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	
	386		
Conflicting Flows Potential Capacity	386 600		
Potential Capacity Pedestrian Impedance Factor	1.00	1.00	
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	598		
Washahaat 7 Camputation of 11 PSC 1 CT			
Worksheet 7-Computation of the Effect of Tw	70-stage Gap A  8	cceptance 11	
Step 3: TH from Minor St.	0	11	
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	1.00	1.00	
Movement Capacity	(		
Result for 2 stage process:			
a	<b>\</b>	\	1
У		\ \ \	\
C t  Probability of Oyoua from St	1 00	1 00	\
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	
Part 1 - First Stage			_ \ \ \
Conflicting Flows			
	7	~   // _	/////
Potential Capacity			7777
Potential Capacity Pedestrian Impedance Factor			
Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt		$\geq$	
Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Part 2 - Second Stage			
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 2 - Second Stage Conflicting Flows Potential Capacity			
Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity  Part 2 - Second Stage Conflicting Flows			



Movement Capacity							
Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor		6	86 00 .00		1.00		_
Maj. L, Min T Impedance factor	<u> </u>	_	.00		1.00		
Maj. L, Min T Adj. Imp Factor.		1	0.0		1.00		
Cap. Adj. factor due to Impedi Movement Capacity	ing momnt		.00 98		1.00		
							_
Results for Two-stage process:							
У							
Ct		5	98				
Worksheet 8-Shared Lane Calcul	ations						_
Movement	7	8	9	10	11	12	_
	L	T	R	L	Т	R	
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)	6 598						_
							_
Worksheet 9-Computation of Eff	ect of Flare	d Minor	Street	Appro	aches		
Movement	7 L	8 T	9 R	10 L	11 T	12 R	
C sep	598						_
Volume	6						
Delay Q sep							
Q sep +1							
round (Qsep +1)							
n max							_
C sh							
SUM C sep							
C act							
Worksheet 10-Delay, Queue Leng	gth, and Level	l of Se	rvice				_
Movement 1 4			9	10	11	12	_
Lane Config LT		S	,	10		12	
v (vph) 5	6						_
C(m) (vph) 163 v/c 0.0							
95% queue length 0.0							
Control Delay 7.2				\			
LOS A Approach Delay	B 1	1.1					
Approach LOS		В					
		<del></del>			$\overline{}$	-	_
Worksheet 11-Shared Major LT I	Impedance and	Delay					
			Movemer	nt 2	Moveme	ent 5	
p(oj)			1.00		1.0	10	
v(i1), Volume for stream 2 or v(i2), Volume for stream 3 or			_		0	> レ	///
s(il), Saturation flow rate for		r 5			170	0	11
s(i2), Saturation flow rate for			<u> </u>	$\rightarrow$	170		+
P*(oj) d(M,LT), Delay for stream 1 or	~ 4				1.0 7.2		
N, Number of major street thro					2		
d(rank,1) Delay for stream 2 of	or 5						
					7		



1.1.1.6 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: Ε Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: M2-M7+M8-M11 North/South Street: M11 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 1966 4 Peak-Hour Factor, PHF 0.91 0.91 Hourly Flow Rate, HFR 4 2160 Percent Heavy Vehicles 0 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 Peak Hour Factor, PHF 0.91 Hourly Flow Rate, HFR 0 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 8 11 Lane Config LT L v (vph) 4 C(m) (vph) 1636 240 0.00 v/c 0.00 95% queue length 0.01 Control Delay 7.2 20.0 LOS Α С

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax: E-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS\_

Analyst: Progeplan

Approach Delay Approach LOS



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: ATUAL SEM EMPREENDIMENTO

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

Study period (hrs): 1.00 Intersection Orientation: EW

Intersection Orientation	ı: EW		St	udy per	iod (hı	rs): 1.	00
	Vehicle Vo	olumes a	and Adj	ustment			
Major Street Movements	1	2	3	4	5	6	
	L	Т	R	L	T	R	
/olume				4	1966		
Peak-Hour Factor, PHF				0.91	0.91		
Peak-15 Minute Volume				1	540		
Hourly Flow Rate, HFR				4	2160		
Percent Heavy Vehicles				0			
Median Type/Storage	Undiv	i ded		/			
RT Channelized?	011021			,			
Lanes				0	2		
Configuration				LT			
Jpstream Signal?		No		11.1	No		
opstream Signar:		NO			NO		
Minor Street Movements	7	8	9	10	11	12	
	L	Т	R	L	T	R	
olume Tolume	0						
Peak Hour Factor, PHF	0.91						
Peak-15 Minute Volume	0						
Hourly Flow Rate, HFR	Ō						
Percent Heavy Vehicles	0						
Percent Grade (%)	-	0			0		
Flared Approach: Exists	?/Storage	-		/	Ŭ		/
RT Channelized	., storage			,			,
Lanes	1						
Configuration	L						
		. 1	, , ,				
Pe Movements	edestrian \ 13	volumes 14	and Ad	justmen 16	ts		
TOVERREITES	13	14	13	10			
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			
		ream Si					
Prog.		rrival	Green	-			tance
Flow		Гуре	Time	Lengt	/ \-		Signal
vph	vph		sec	sec	kpł	n me	ters
2 Left-Turn					-		
Through							)
S5 Left-Turn						/	<i>*</i>
Through						\ /	
			1	/		1 /	/
				+		11	
Worksheet 3-Data for Com	puting Ef	fect of	Delay	to Majo	r Stree	et Vehic	les
			Move	ment 2	MOT	rement 5	
Shared in volume, major					(		/> L
Shared ln volume, major		es:		1 /		) /	
Sat flow rate, major th						700	1
Sat flow rate, major rt						700	(
Number of major street t	hrough lar	nes:				2	\
					1	\	

Worksheet 4-Critical Gap and Follow-up Time Calculation

10

L

11

Movement 1 4 7 8 9
L L L T R

Critical Gap Calculation



+ (a baga)			1 1	7 1					
t(c,base) t(c,hv)	1.0	00	4.1 1.00	7.1 1.00	1.00	1.00	1.00	1.00	1.00
P(hv)	-•\	-	0	0					
t(c <b>,</b> g)				0.20	0.20	0.10	0.20	0.20	0.10
Percent Gr	ade		0 00	0.00	0.00	0.00	0.00	0.00	0.00
t(3,1t) t(c,T): 1	-stage 0.0	0.0	0.00	0.70	0.00	0.00	0.00	0.00	0.00
	-stage 0.0		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-Up	Time Calcı	ılat	ions						
Movement	1		4	7	8	9	10	11	12
	L		L	L	T	R	L	T	R
t(f,base)			2.20	3.50					
t(f,HV)	0.9	90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)			0	0					
(f)			2.2	3.5					
	5-Effect on 1-Queue					eam Sign Movemen		Mo	vement 5
					∨ (1	t) V(	l,prot)	V(t)	V(1,prot)
Cycle Leng		2)							
Cycle Leng Rp (from E Proportion g(q1) g(q2) g(q)	th, C (sec Exhibit 16- vehicles	c) -11) arr	iving (			on Time Movemen			vement 5
Cycle Leng Rp (from E Proportion g(q1) g(q2) g(q)	th, C (sec Exhibit 16- vehicles	c) -11) arr	iving (			Movemen		Mo	
Cycle Leng Rp (from E Proportion g(q1) g(q2) g(q) Computatio  alpha oeta Fravel tim Smoothing Proportion Max platoo Min platoo	th, C (secondary to the control of t	c) -11) arr rtio  sec) icti V(c V(c	n of Ti	VSC Inte	ersectio	Movemen	nt 2	Mo	
Cycle Leng Rp (from E Proportion g(q1) g(q2) g(q) Computatio  alpha oeta Travel tim Smoothing Proportion Max platoo Min platoo Duration o	th, C (secondary control of the cont	c) -11) arr rtio  sec) V(c V(c per	ng flow , max) , min) iod, t	VSC Inte	ersectio	Movemen	nt 2 1,prot)	Mo'V(t)	
	th, C (sec exhibit 16- a vehicles on 2-Proportion de, t(a) (s Factor, F a of confli- oned flow, oned flow, of blocked a time block	rtio	ng flow, max), min) io, p	NSC Inte	ersectio	Movement) V(2	nt 2 1,prot)	Mo'V(t)	V(1,prot)
Cycle Leng Rp (from E Proportion g(q1) g(q2) g(q) Computatio  alpha beta Travel tim Smoothing Proportion Max platoo Duration o Proportion	th, C (sec exhibit 16- exhibit	rtio	n of TW  ng flow ,max) ,min) iod, t , p	NSC Inte	V(·	Movement) V(2	nt 2 1,prot)	Mo'V(t)	V(1,prot)
Cycle Leng Rp (from E Proportion g(q1) g(q2) g(q2) g(q)  Computatio  alpha beta Travel tim Smoothing Proportion Max platoo Duration o Proportion Computatio  Computatio	th, C (secondary control of the cont	rtio  rtio  sec)  icti V(c V(c percked	n of TW  ng flow ,max) ,min) iod, t , p	NSC Inte	Rest	0.000  0.000  0.000  0.000  0.000	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



								engenhar
	L	L	L	T :	R L	Т	R	
V C, X		0	1088					_
s Px								
V c,u,x								
C r,x C plat,x								_
Two-Stage Process								_
-	7 Stage2	Stage1	8 Stage2		10 Stage2	1 Stage1		
V(C, X)								_
s	3000							
P(x)								
V(c,u,x)								
C(r,x) C(plat,x)								_
Worksheet 6-Impedanc	e and Capa	acity E	quations					-
Step 1: RT from Mino	r 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 Majo	r St.			4		1		_
Conflicting Flows				0 1636				_
Potential Capacity Pedestrian Impedance	Factor			1.00		1.00		
Movement Capacity	ractor			1636		1.00		
Probability of Queue Maj L-Shared Prob Q				1.00		1.00		
Step 3: TH from Mino				8		11		_
Conflicting Flows								_
Potential Capacity								
Pedestrian Impedance	Factor			1.00		1.00		
Cap. Adj. factor due Movement Capacity	to Imped	ing mvm	nt	1.00		1.00		
Probability of Queue	free St.			1.00		1.00		
Step 4: LT from Mino	r St.			7		10		_
Conflicting Flows				1088				_
Potential Capacity				241				
Pedestrian Impedance	Factor			1.00	/ \	1.00		
Maj. L, Min T Impeda	nce facto:	r				1.00		
Maj. L, Min T Adj. I			(	, The state of the		1.00		
Cap. Adj. factor due Movement Capacity	to Imped:	ing mvm	nt	1.00 240		1.00		$\neg$
				1		1	$\overline{}$	- \
Worksheet 7-Computat		e Eifec	t of Two	\_	ap Accept 		~	_
Step 3: TH from Mino				1 8		<u> </u>		
Part 1 - First Stage Conflicting Flows						\ /	> ト	11/
Potential Capacity						\ /	/	1111
Potential Capacity Pedestrian Impedance	Factor							44-5
Cap. Adj. factor due		ing mvm	nt			\	\	] ]
Movement Capacity Probability of Queue	_	,				\		// _
Part 2 - Second Stag								_//
Conflicting Flows	-							1
Potential Capacity								$\neg$
Pedestrian Impedance	Factor							



Cap. Adj. factor due to Impeding mv Movement Capacity	mnt							
Part 3 - Single Stage							_	
Conflicting Flows								
Potential Capacity		1	0.0		1 00			
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mv	mn+		.00		1.00			
Movement Capacity	IIIIC	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.					10		_	
							_	
Part 1 - First Stage Conflicting Flows								
Potential Capacity								
Pedestrian Impedance Factor								
Cap. Adj. factor due to Impeding mv	mnt							
Movement Capacity								
Part 2 - Second Stage							-	
Conflicting Flows Potential Capacity								
Pedestrian Impedance Factor								
Cap. Adj. factor due to Impeding mv	mnt							
Movement Capacity								
Part 3 - Single Stage							-	
Conflicting Flows			088					
Potential Capacity			41		1 00			
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 mv	mnt	1	.00		1.00			
Movement Capacity		2	40					
Results for Two-stage process:							-	
a								
y 2		0	4.0					
Ct		2	40					
Worksheet 8-Shared Lane Calculation	ıs						-	
Manager	7	8	9	1.0	1.1	10	_	
Movement	L L	o T	R	10 L	11 T	12 R		
							_	
Volume (vph) Movement Capacity (vph)	0							
Shared Lane Capacity (vph)	240							
				\			_	
Worksheet 9-Computation of Effect o	f Flare	d Minor	Street	. Approa	aches			
Movement	7	8	9	10	11	12	_	
Hovement	L	T	R	L	T	R	\	
C sep	240 /					egthankowskip	- \_	
Volume	0	\						
Delay					$\rightarrow$			
Q sep					< ~			
Q sep +1 round (Qsep +1)			_	_		>  -	///	1
n max			<u> </u>	$\rightarrow$	7		- 1	
C sh								
SUM C sep				\	\			
n					- \		//	
C act							/ /	
							-	
Worksheet 10-Delay, Queue Length, a	nd Leve	l of Se	rvice				1	1
						<i>-</i>		



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 Approach LOS		4 1636 0.00 0.01 7.2 A	0 240 0.00 0.00 20.0 C					

Worksheet 11-Shared Major LT Impedance and Delay

Movement 2	Movement 5
1.00	1.00
	0
	0
	1700
	1700
	1.00
	7.2
	2
	Movement 2

# 1.1.1.7 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 Analysis Time Period: Pico Mc
Intersection: F
Jurisdiction: DER/DF
Units: U. S. Metric
Analysis Year: 2023

Project ID: SEM EMPREENDIMENTO

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

Study period (hrs): 1.00 Intersection Orientation: EW

	Vehic	e Volu	mes and	Adjus	tmer	nts			_
Major Street: App	oroach	Eas	tbound				Westbound		
Mo	vement	1	2	3		4	5	6	
		L	T	R	Ī	L	T	R	
Volume		9	1944						_
Peak-Hour Factor,	DUE	0.91	0.91				/ \		
						_ /	\		
Hourly Flow Rate,		9	2136						
Percent Heavy Veh		12		-(				)	
Median Type/Storage		Undivi	ded		/				
RT Channelized?									
Lanes		0	2	/	/			\ \ /	\
Configuration		LT	T					1 \ /	\
Upstream Signal?			No		-		No		
1					\				
Minor Street: App	proach	Nor	thbound				Southbound	i	
Mo	vement	7	8	9	V	10	11	/12	_ /
		L	T	R	ì	L	T	R	
							_		<u> </u>
Volume						5/		<del>}                                    </del>	- / / / /
Peak Hour Factor,	PHF —				_	0.9	91		
Hourly Flow Rate,						5		1 1	11
Percent Heavy Veh						0	(	\ \	//
Percent Grade (%)	10100		0			Ŭ	0		
Flared Approach:	Exists?/St	orage	0		/		9	7 //	
Tanes		Jorage			,		1		
Configuration							T,	7	
Confriguration							ш		
									-\
	Doloss Oss		~+h ~n	d T 0**0	1 64	F C.			
	_Delay, Que	eue Len	gun, an	и теле	T 01	L 56	ervice		_



Approach		Northboun	d		Southbound					
Movement	1	4		7	8	9	- 1	10	11	12
Lane Config	LT		-				I	L		
v (vph)	9							5		
C(m) (vph)	1560							241		
v/c	0.01							0.02		
95% queue length	0.02							0.06		
Control Delay	7.3							20.3		
LOS	A							С		
Approach Delay									20.3	
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: F
Jurisdiction: DER/DF
Units: U. S. Metric
Analysis Year: 2023

North/South Street: M12	MENTO -M05-M0	7+M08+M					
Intersection Orientation:	ΕW		S	tudy per	riod (h	rs): 1.00	
V∈	ehicle '	Volumes	and Ad	ljustment	ts		
Major Street Movements	1	2	3	4	5	6	
	L	Т	R	L	Т	R	
Volume	9	1944					
Peak-Hour Factor, PHF	0.91	0.91					
Peak-15 Minute Volume	2	534					
Hourly Flow Rate, HFR	9	2136					
Percent Heavy Vehicles	12						
Median Type/Storage RT Channelized?	Undi	vided		/			
Lanes	0	2					
Configuration	L'	гт					
Upstream Signal?		No			No		
Minor Street Movements	7 L	8 T	9 R	10 L	11 T	12 R	
Volume				5		<del>\                                    </del>	
Peak Hour Factor, PHF			/	0.91		\ \ \	/ \
Peak-15 Minute Volume				1			/
Hourly Flow Rate, HFR				1 5 0			
Percent Heavy Vehicles			\	0			
Percent Grade (%)		0		7 \	0		
Flared Approach: Exists?/	Storage	9				/	
RT Channelized							
Lanes				1		\ / /	
Configuration							7
						- + +	
Pede	strian	Volume	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			



\_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 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: 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: Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation 8 9 10 11 12 Movement 1 Т R L L L L Τ R t(c,base) 4.1 7.1 1.00 1.00 1.00 1.00 1.00 1.00 1.00 t(c,hv) 1.00 P(hv) 12 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 0.00 t(3,1t)0.70 0.00 0.00 0.00 0.00 0.00 0.00 1-stage 0.00 t(c,T): 0.00 2-stage 0.00 0.00 1.00 1.00 0.00 1.00 1.00 0.00 1-stage 4.2 t(c) 6.4 2-stage Follow-Up Time Calculations Movement 1 4 9 10 11 12 L L R L 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) 12 0 t(f) 2.3 3.5 Worksheet 5-Effect of Upstream Signals Computation 1-Queue Clearance Time at Upstream Signal Movement 5 V(t) V(t) V(1,prot) 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 (g2) g (q) Computation 2-Proportion of TWSC Intersection Time blocked Movement 5 Movement 2 V(t) V(t) V(l,prot) V(1,prot) alpha

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

Proportion time block		(p)		0.0	00		0.000			
Computation 3-Platoon	Event F	Periods	Re	sult						
p(2) p(5) p(dom) p(subo)	t no i no do			000					_	
Constrained or uncons	trained:	·								
Proportion unblocked for minor movements, p(x)	(1 Single Proc	-stage	St	(2) Two-S age I	tage Pr	(3) rocess Stage II	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	0					1086				
s Px V c,u,x										
C r,x C plat,x									_	
Two-Stage Process										
Stage1	7 Stage2	Stage1	8 Stag	e2 Sta	10 gel St	age2 St	11 tage1			
V(c,x)										
s P(x) V(c,u,x)					3(	000				
C(r,x) C(plat,x)									_	
Worksheet 6-Impedance	and Cap	acity E	quatio	ns						
Step 1: RT from Minor	St.				9	7	12			
Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue					.00		1.00			
Step 2: LT from Major	St.				4		1	<del></del>	_ \	
Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue Maj L-Shared Prob Q f	free St. Tree St.				.00		0 1560 1.00 1560 0.99 0.99	> [		) _
Step 3: TH from Minor	St.				8		11		_// _	
Conflicting Flows Potential Capacity Pedestrian Impedance Cap. Adj. factor due Movement Capacity		ling mvm	nt		.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		1086	
Potential Capacity		242	
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 00	
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	0.99 241	
			_
Worksheet 7-Computation of the Effect of	Two-stage Gap Acc	ceptance	
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	0.99	0.99	
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 mymnt			
Movement Capacity			
Part 2 - Second Stage		\	_
Conflicting Flows			
Potential Capacity Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mymnt			
Movement Capacity	<b>\</b>		
Part 3 - Single Stage			_ \
Conflicting Flows		1086	
Potential Capacity Pedestrian Impedance Factor	1.00	242	$\sim$ $\rangle$
Maj. L, Min T Impedance factor	0.99	ノバー	_ /
Maj. L, Min T Adj. Imp Factor.	1.00		_ \ \ /
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	0.99	)))[
Results for Two-stage process:			- ++
a			
У		241	
C t		241	_/ /
Manhahaat 0 Ghanad T. C. J. J. J.			_
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						5 241		
Worksheet 9-Comput	ation of	Effect	of Fla	ared Min	or Stree	et 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)						241		
n max C sh SUM C sep n C act								
Worksheet 10-Delay	, Queue	Length,	and Le	evel of	Service			
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	9 1560 0.01 0.02 7.3 A					5 241 0.02 0.06 20.3 C	20.3 C	

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	7.3	
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5	2	

# 1.1.1.8 Interseção F – 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:

Units: U. S. Metric

Analysis Year: 2023

Project ID: ATUAL SEM EMPREENDIMENTO

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

Intersection Orientation: EW Study period (hrs):

Major Street: Approach Eastbound



Мо	vement	1 L	2 T	3 R	I	4 L	5 T	6 R	
Volume Peak-Hour Factor, Hourly Flow Rate, Percent Heavy Veh Median Type/Stora RT Channelized?	HFR icles	6 0.91 6 0 Undi	697 0.91 765  vided		,	/			
Lanes Configuration Upstream Signal?		0	2 LT T No				No		
Minor Street: Ap	proach	N	orthbou	nd			Southbou	ınd	
	vement	7	8	9	1	10	11	12	
		L	T	R	1	L	T	R	
Volume Peak Hour Factor, Hourly Flow Rate, Percent Heavy Veh Percent Grade (%) Flared Approach: Lanes Configuration	HFR icles	/Storag	0		/	4 0.91 4 0	0		/
	Delay,	Queue L	ength,	and Lev	el o	f Sei	rvice		
Approach	EB E	WB	No	rthboun	d		Soi	ıthboun	d
Movement Lane Config	1 LT	4	7	8	9	I	10 L	11	12
v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS	6 1636 0.00 0.01 7.2 A						4 613 0.01 0.02 10.9 B	10.9 B	

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: Jurisdiction: Units: U. S. Metric Analysis Year: DER/DF 2023 Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: M01-M05-M07+M08+M06-M11 North/South Street: M12 1.00/ Intersection Orientation: EW Study period (hrs): Vehicle Volumes and Adjustments 2 T Major Street Movements 1 3 4 5 6 Т L R R L  $\overline{\text{Volume}}$ 697 6 0.91 Peak-Hour Factor, PHF 0.91 2 Peak-15 Minute Volume 191 Hourly Flow Rate, HFR 6 765 Percent Heavy Vehicles 0 --



Median Type/Stor	age	Undivi	ded		/				
Lanes			2						
Configuration Upstream Signal?		LT :	r 10		No				
opscream bignar:		1	VO.		140	,			
Minor Street Mov	ements	7 L		9 10 R L		l 12 r R		_	
Volume Peak Hour Factor Peak-15 Minute V Hourly Flow Rate Percent Heavy Ve	olume , HFR			4 0. 1 4	91			_	
Percent Grade (% Flared Approach:	)	/Storage	)	/	0		/		
RT Channelized									
Lanes Configuration					1 L				
	Pede	estrian Vo	olumes a	nd Adjus	tments_			_	
Movements		13	14	15	16			_	
Flow (ped/hr) Lane Width (m)		0 3.6	0 3.6		0 3.6				
Walking Speed (m Percent Blockage		1.2	1.2	1.2	1.2				
								_	
	Prog.		-	al Data_ Green C	ycle	Prog.	Distance	_	
	Flow vph		уре	Time I	ength sec	_	to Signal meters		
S2 Left-Turn Through S5 Left-Turn Through Worksheet 3-Data	for Compu	ıting Effe	ect of D	elay to	Major S	Street V	/ehicles	_	
				Movemen	it 2	Moveme	ent 5	_	
Shared in volume Shared in volume Sat flow rate, m Sat flow rate, m Number of major	, major rt ajor th ve ajor rt ve	vehicles: chicles: chicles:	S:	0 0 1700 1700 2				_	
Worksheet 4-Crit	ical Gap a	and Follow	v-up Tim	e Calcul	ation			_	
Critical Gap Cal	culation					7		_	
Movement		1 7 L L	8 T	9 R	10 L	11 T	12 R		
t(c,base) t(c,hv) P(hv)	4.1 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	0.00	0.00	0.20 0.00 0.70	0.20	0.10		
t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage	0.00 0.	.00 0.00 .00 1.00			0.00 1.00 6.4	0.00	0.00		
Follow-Up Time C								- \-	
Movement		1 7 L 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 0 2.2	.90 0.90	0.90	0.90	3.50 0.90 0 3.5	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(l,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(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
                                           0.000
p(dom)
p(subo)
Constrained or unconstrained?
Proportion
unblocked
                             (1)
                                                                (3)
                        Single-stage
                                               Two-Stage Process
for minor
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
                                                               10
                                                                              12
Movement
                          1
                                                                      11
                                                Т
                          \mathbb{L}
                                                                       Τ
                                                                               R
                                                               L
V c,x
                         0
                                                               394
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
S
P(x)
V(c,u,x)
C(r,x)
C(plat,x)
```



			_
Step 1: RT from Minor St.	9	12	
Conflicting Flows			_
Potential Capacity Pedestrian Impedance Factor	1.00	1.00	
ovement Capacity			
robability of Queue free St.	1.00	1.00	
tep 2: LT from Major St.	4	1	
onflicting Flows		0	_
otential Capacity edestrian Impedance Factor	1.00	1636 1.00	
ovement Capacity	2.00	1636	
robability of Queue free St.	1.00	1.00	
aj L-Shared Prob Q free St.		1.00	
cep 3: TH from Minor St.	8	11	_
onflicting Flows			_
otential Capacity	4 00	4 00	
edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt	1.00	1.00	
ovement Capacity			
robability of Queue free St.	1.00	1.00	
tep 4: LT from Minor St.	7	10	_
onflicting Flows		394	_
otential Capacity edestrian Impedance Factor	1.00	615 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		613	
Norksheet 7-Computation of the Effect of Step 3: TH from Minor St.	Two-stage Gap Acc	 11	_
Part 1 - First Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt			_
Novement Capacity			
Movement Capacity Probability of Queue free St. Part 2 - Second Stage			_
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 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			_
Probability of Queue free St.  Part 2 - Second Stage Conflicting Flows Protential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Covement Capacity Part 3 - Single Stage Conflicting Flows Protential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt	1,00	1.00	
art 2 - Second Stage conflicting Flows cotential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt covement Capacity eart 3 - Single Stage conflicting Flows cotential Capacity eart 3 - Adj. factor due to Impeding mvmnt covement Capacity eart 3 - Single Stage conflicting Flows cotential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt covement Capacity	1		
ovement Capacity robability of Queue free St.  art 2 - Second Stage onflicting Flows otential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity  art 3 - Single Stage onflicting Flows otential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity esult for 2 stage process:	1		
art 2 - Second Stage onflicting Flows otential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity art 3 - Single Stage onflicting Flows otential Capacity art 3 - Single Stage onflicting Flows otential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity esult for 2 stage process:	1		
dovement Capacity probability of Queue free St.  Part 2 - Second Stage conflicting Flows potential Capacity pedestrian Impedance Factor pap. Adj. factor due to Impeding mymnt provement Capacity  Part 3 - Single Stage ponflicting Flows potential Capacity pedestrian Impedance Factor pap. Adj. factor due to Impeding mymnt provement Capacity pedestrian Impedance Factor pap. Adj. factor due to Impeding mymnt provement Capacity pesult for 2 stage process:	1		
Probability of Queue free St.  Part 2 - Second Stage Conflicting Flows Cotential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mymnt Covement Capacity Cart 3 - Single Stage	1.00	1.00	
ovement Capacity robability of Queue free St.  art 2 - Second Stage onflicting Flows otential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity  art 3 - Single Stage onflicting Flows otential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity esult for 2 stage process:  t trobability of Queue free St.  tep 4: LT from Minor St.  art 1 - First Stage	1.00	1.00	
provement Capacity robability of Queue free St.  art 2 - Second Stage conflicting Flows contential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt covement Capacity eart 3 - Single Stage conflicting Flows contential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt covement Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt covement Capacity esult for 2 stage process:  t crobability of Queue free St.  art 1 - First Stage conflicting Flows	1.00	1.00	
ovement Capacity robability of Queue free St.  art 2 - Second Stage onflicting Flows otential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity  art 3 - Single Stage onflicting Flows otential Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt ovement Capacity esult for 2 stage process:  t robability of Queue free St.  tep 4: LT from Minor St.	1.00	1.00	



Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity

Part 2 - Second St	age						
Conflicting Flows	-						
Potential Capacity							
Pedestrian Impedan							
Cap. Adj. factor d		ng mvmnt					
Movement Capacity		,					
nevement capacity							
Part 3 - Single St	ane						
Conflicting Flows	age					394	
Potential Capacity						615	
Pedestrian Impedan			1	.00		1.00	
				.00		1.00	
Maj. L, Min T Impe							
Maj. L, Min T Adj.				.00		1 00	
Cap. Adj. factor d	ue to Impedir	ng mvmnt	1	.00		1.00	
Movement Capacity						613	
Results for Two-st	age process:						
a							
У							
Ct						613	
Worksheet 8-Shared	Lane Calcula	ations					
Movement		7	8	9	10	11	12
		L	T	R	L	T	R
Volume (vph)					4		
Movement Capacity	(vph)				613		
Shared Lane Capaci	ty (vph)						
Worksheet 9-Comput	ation of Effe	ect of Flare	d Minor	Stree	t Approa	aches	
Worksheet 9-Comput	ation of Effe	ect of Flare	d Minor	Stree	t Approa	aches	
Worksheet 9-Comput	ation of Effe	ect of Flare	d Minor	Stree 9	t Approa	aches	12
	ation of Effe						12 R
	ation of Effe	7	8	9	10	11	
Movement	ation of Effe	7	8	9	10	11	
Movement C sep	ation of Effe	7	8	9	10 L	11	
Movement  C sep Volume	ation of Effe	7	8	9	10 L 613	11	
Movement  C sep Volume Delay	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep Q sep +1	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)  n max C sh	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)  n max C sh SUM C sep	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)  n max C sh SUM C sep n	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)  n max C sh SUM C sep	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)  n max C sh SUM C sep n	ation of Effe	7	8	9	10 L 613	11	
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)  n max C sh SUM C sep n C act		7 L	8 T	9 R	10 L 613	11	
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)  n max C sh SUM C sep n		7 L	8 T	9 R	10 L 613	11	
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 Lengt	Th, and Leve	8 T	9 R	10 L 613 4	11 T	R
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 Lengt	Th, and Leve	8 T	9 R	10 L 613 4	11	
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 Lengt	Th, and Leve	8 T	9 R	10 L 613 4	11 T	R
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 Lengt	Th, and Leve	8 T	9 R	10 L 613 4	11 T	R
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  Movement Lane Config v (vph)	, Queue Lengt  1 4  LT	Th, and Leve	8 T	9 R	10 L 613 4	11 T	R
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  Movement Lane Config v (vph) C(m) (vph)	1 4 LT 6 1636	Th, and Leve	8 T	9 R	10 L 613 4	11 T	R
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  Movement Lane Config  v (vph) C(m) (vph) v/c	, Queue Lengt  1 4  LT	Th, and Leve	8 T	9 R	10 L 613 4	11 T	R
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  Movement Lane Config v (vph) C(m) (vph)	1 4 LT 6 1636 0.00 0.01	Th, and Leve	8 T	9 R	10 L 613 4	11 T	R
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  Movement Lane Config  v (vph) C(m) (vph) v/c	1 4 LT 6 1636 0.00	Th, and Leve	8 T	9 R	10 L 613 4 4 613 0.01	11 T	R

Worksheet 11-Shared Major LT Impedance and Delay

Approach Delay Approach LOS

	\	
	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	

В

10.9

В



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

## 1.1.1.9 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 2023

Analysis Year: Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: M2-M7+M8-M11+M12-M13 North/South Street: M13

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

Major Street:	Approach	Ea	stbound			Wes	stbound			
	Movement	1	2	3	1	4	5	6		
		L	T	R	i	L	T	R		
Volume						30	688			
Peak-Hour Fact	or, PHF					0.91	0.91			
Hourly Flow Ra	te, HFR					32	756			
Percent Heavy	Vehicles					4				
Median Type/St	orage	Undiv	ided			/				
RT Channelized	1?									
Lanes						0	2			
Configuration						L'	ГТ			
Upstream Signa	1?		No				No			
Minor Street:	Approach	Northbound				Southbound				
	Movement	7	8	9	1	10	11	12		
		L	Т	R	i	L	T	R		
Volume		2								
Peak Hour Fact	or, PHF	1.00								
Hourly Flow Ra	te, HFR	2								
Percent Heavy	Vehicles	0								
Percent Grade	(%)		0				0			
Flared Approac	h: Exists?	/Storage			/				/	
Lanes		ĺ								
Configuration		L				_	_			
							\			

	Delay,	Queue Le	ngth,	and Level	of Ser	rvice	
Approach	EB	WB	No	rthbound	~	South	oound
Movement	1	4	7	8	9 1	10 13	1 / 12
Lane Config		LT	L				<
v (vph)		32	2				7
C(m) (vph)		1610	566		\	· ·	
v/c		0.02	0.00	(	\		
95% queue length		0.06	0.01			^	
Control Delay		7.3	11.4				
LOS		A	В		7		
Approach Delay				11.4	ر ا	<u> </u>	/ / /
Approach LOS				В			

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: G Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: ATUAL SEM EMPREENDIMENTO 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 Movements 1 2 Τ R Volume 30 688 Peak-Hour Factor, PHF 0.91 0.91 Peak-15 Minute Volume 8 189 Hourly Flow Rate, HFR 32 756 Percent Heavy Vehicles Median Type/Storage Undivided RT Channelized? Lanes 0 2 Configuration LT T Upstream Signal? No No Minor Street Movements 10 12 8 11 Т R Τ. L Т R Volume Peak Hour Factor, PHF 1.00 Peak-15 Minute Volume 0 Hourly Flow Rate, HFR 2 Percent Heavy Vehicles Percent Grade (%) 0 0 Flared Approach: Exists?/Storage RT Channelized Lanes Configuration L Pedestrian Volumes and Adjustments Movements 13 14 15 Flow (ped/hr) Lane Width (m) 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 Sat Arrival Cycle Prog. Green Prog. Distance Flow Flow Type Time Length Speed to Signal sec vph vph kph meters sec Left-Turn Through 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 0 Shared In volume, major rt vehicles: 1700 Sat flow rate, major th vehicles: Sat flow rate, major rt vehicles: 1700

Number of major street through lanes:



Critical Gap Ca				_				
Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
(c,base)		4.1	7.1					
(c, hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
(hv)		4	0	0.00	0 10	0 00	0 00	0.10
c(c,g) Percent Grade			0.20	0.20	0.10	0.20	0.20	0.10
(3,1t)		0.00	0.70	0.00	0.00	0.00	0.00	0.00
(c,T): 1-stag		0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-stag (c) 1-stag	ge 0.00	0.00 4.1	1.00 6.4	1.00	0.00	1.00	1.00	0.00
2-stag	-	4.1	0.4					
ollow-Up Time	Calcula	tions						
ovement	1	4	7	8	9	10	11	12
	L	L	L	Т	R	L	Т	R
(f,base)		2.20	3.50					
(f,HV)	0.90	0.90 4	0.90	0.90	0.90	0.90	0.90	0.90
P(HV) :(f)		2.2	0 3.5					
rksheet 5-Efi	fect of	Upstream	m Signa	ls				
omputation 1-(	Dueue Cla	earance	Time a	t. Upstr	eam Sign	nal		
mpacacion i ,	gueue er	carance	111110 0	c opoci	Moveme:		Мо	vement 5
				Λ(.	t) V(	l,prot)	V(t)	V(l,prot)
rrival Type ffective Greer ycle Length, (	n, g (se C (sec)	c)	(vph)					
rrival Type ffective Greer ycle Length, ( p (from Exhibit roportion vehic (q1) (q2)	n, g (sec C (sec) it 16-11	c) )	-	n P				
rrival Type ffective Greer ycle Length, ( p (from Exhibi roportion vehi (q1) (q2) (q)	n, g (sec C (sec) it 16-11 icles ar	c) ) riving (	on gree		on Time	block	ed	
Arrival Type Effective Greer Eycle Length, (  Rp (from Exhibit Proportion vehic g(q1) g(q2) g(q)	n, g (sec C (sec) it 16-11 icles ar	c) ) riving (	on gree	ersecti	Moveme	nt 2	Mo	vement 5
arrival Type  Iffective Green  Iffective	n, g (sec C (sec) it 16-11 icles ar	c) ) riving (	on gree		Moveme		Mo	
Fotal Saturation Arrival Type Effective Greer Cycle Length, ( RRP (from Exhibit Proportion vehic g(q1) g(q2) g(q2) g(q)  Computation 2-I  alpha beta Fravel time, t Smoothing Facto Proportion of of Max platooned for Curation of blo Proportion time	en, g (sec C (sec) it 16-11 icles are Proportion (a) (sec Dr, F conflict. flow, V(conflict.	c)  riving of Ti  on of Ti  ing floo c,max) c,min) riod, t	WSC Into	ersecti	Moveme	nt 2 1,prot)	Mo V(t)	
Arrival Type Effective Green Eycle Length, (R) Exportion vehicle Exportion vehicle Exportion vehicle Exportion 2-1  Exportion 2-1  Exportion of Computation 5-1  Exportion of Computation of block Exportion of the Exportion of th	(a) (sec proportion) (a) (sec proportion) (b) (sec proportion) (c) (sec proportion) (d) (sec proportion) (e) (sec proportion) (e) (sec proportion) (e) (sec proportion) (e) (sec proportion) (f) (sec	c)  riving  pon of The control of Th	WSC Into	v(	Moveme: t) V(.	nt 2 1,prot)	Mo V(t)	V(l,prot)
Arrival Type Effective Green Eycle Length, (R) Exportion vehical Exportion vehical Exportion 2-1 Exportion 2-1 Exportion 2-1 Exportion of Care Exportion of	(a) (sec proportion) (a) (sec proportion) (b) (sec proportion) (c) (sec proportion) (d) (sec proportion) (e) (sec proportion) (e) (sec proportion) (e) (sec proportion) (e) (sec proportion) (f) (sec	c)  riving  pon of The control of Th	WSC Into	v(	Moveme: t) V( 0.00) ult	nt 2 1,prot)	Mo V(t)	V(l,prot)
rrival Type ffective Greer ycle Length, ( p (from Exhibit roportion vehi (q1) (q2) (q)  omputation 2-I  lpha eta ravel time, t moothing Fact roportion of c ax platooned i uration of blo roportion time omputation 3-I	(a) (sec proportion) (a) (sec proportion) (b) (sec proportion) (c) (sec proportion) (d) (sec proportion) (e) (sec proportion) (e) (sec proportion) (e) (sec proportion) (e) (sec proportion) (f) (sec	c)  riving  pon of The control of Th	WSC Into	v(	Moveme: t) V( 0.00) ult	nt 2 1,prot)	Mo V(t)	V(l,prot)
rrival Type ffective Greer ycle Length, (p p (from Exhibit roportion vehic (q1) (q2) (q) computation 2-1  lpha eta ravel time, t moothing Factor roportion of c ax platooned f in platoone	(a) (sec proportion (a) (sec proportion (b) (sec proportion (c) (s	on of The control of	WSC Into	v(	Moveme: t) V( 0.00) ult	nt 2 1,prot)	Mo V(t)	V(l,prot)
rrival Type ffective Greer ycle Length, ( p (from Exhibit roportion vehic (q1) (q2) (q) omputation 2-1  lpha eta ravel time, t moothing Factor roportion of c ax platooned furation of blo roportion time omputation 3-1  (2) (5) (dom) (subo)	(a) (sec proportion (a) (sec proportion (b) (sec proportion (c) (s	on of The control of	WSC Into	v(	Moveme: t) V( 0.00) ult	nt 2 1,prot)	Mo V(t)	V(l,prot)
rrival Type  iffective Green  ycle Length, ( pp (from Exhibit  roportion vehic  (q1)  (q2)  (q2)  (q)  computation 2-I  computation 2-I  computation of computation of computation of blue  roportion time  computation 3-I  (q2) (q3) (q4)  computation 2-I  computation 3-I  computation of blue  computation of blue  computation 3-I  (q2) (q3) (q4) (q5) (q5) (q6) (q6) (q6) (q6) (q7) (q7) (q7) (q7) (q8) (q8) (q8) (q8) (q9) (q9) (q9) (q9) (q9) (q9) (q9) (q9	(a) (sec proportion (a) (sec proportion (b) (sec proportion (c) (s	on of The original property of the property of	WSC Intervention (p)	Res:	0.000 ult	nt 2 1,prot)	Mo V(t)	V(l,prot)
rrival Type  ffective Greer  ycle Length, ( p (from Exhibit  roportion vehic  (q1)  (q2)  (q)  computation 2-I  lpha  eta  ravel time, t  moothing Factor  roportion of clax platooned for platooned f	(a) (sec proportion (a) (sec proportion (b) (sec proportion (c) (s	riving or riving of Times of T	www.f (p)	Res:	Moveme: t) V( 0.000 ult 00 00	nt 2 1,prot)	Mo V(t)	V(l,prot)
Arrival Type Effective Green Cycle Length, (R Cycle Lengt	(a) (secont)  (a) (secont)  (b) (secont)  (c) (secont)  (d) (secont)  (e) (secont)  (e) (secont)  (flow, V()  (flow)	on of The original property of the property of	www.f (p)	Res:	Moveme: t) V( 0.000 ult 00 00	nt 2 1,prot)	Mo V(t)	V(1,prot)
Arrival Type Effective Green Eycle Length, (R Eycle Lengt	(a) (secont)  (a) (secont)  (b) (secont)  (c) (secont)  (d) (secont)  (e) (secont)  (e) (secont)  (flow, V()  (flow)	c) ) riving ( on of Ti ) ing floo c,max) c,min, riind, t d, p  Event Po  rained?  (1 Single	www.f (p)	Res:	Moveme: t) V( 0.000 ult 00 00 (2) Two-St.	nt 2 1,prot)	Mo V(t)	V(1,prot)
rrival Type  ffective Greer  ycle Length, ( p (from Exhibit  roportion vehic  (q1)  (q2)  (q)  computation 2-I  lpha  eta  ravel time, to  moothing Factor  roportion of clax platooned for  fin platooned for  fromputation 3-I  (2)  (5)  (dom)  (subo)  constrained or  roportion  mblocked  or minor  rovements, p(x)  (1)  (4)	(a) (secont)  (a) (secont)  (b) (secont)  (c) (secont)  (d) (secont)  (e) (secont)  (e) (secont)  (flow, V()  (flow)	c) ) riving ( on of Ti ) ing floo c,max) c,min, riind, t d, p  Event Po  rained?  (1 Single	www.f (p)	Res:	Moveme: t) V( 0.000 ult 00 00 (2) Two-St.	nt 2 1,prot)	Mo V(t)	V(1,prot)
rrival Type  ffective Greer  ycle Length, ( p (from Exhibit  roportion vehic  (q1)  (q2)  (q)  computation 2-1  lpha  teta  ravel time, to  moothing Factor  roportion of clax platooned fin platooned fin platooned for  proportion time  computation 3-1  (2)  (5)  (dom)  (subo)  onstrained or  roportion  nblocked  or minor  rovements, p(x)	(a) (secont)  (a) (secont)  (b) (secont)  (c) (secont)  (d) (secont)  (e) (secont)  (e) (secont)  (flow, V()  (flow)	c) ) riving ( on of Ti ) ing floo c,max) c,min, riind, t d, p  Event Po  rained?  (1 Single	www.f (p)	Res:	Moveme: t) V( 0.000 ult 00 00 (2) Two-St.	nt 2 1,prot)	Mo V(t)	V(1,prot)



										origorinaria o n
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	T	R	L	Т	R		
V c,x		0	442						_	
s Px										
V c,u,x										
C r,x C plat,x									_	
Two-Stage Process									_	
Stage1	7 Stage2	Stage1	8 Stage2	Stage	10 1 S	tage2	1 Stage1			
V(c,x)									_	
s	3000									
P(x)										
V(c,u,x)										
C(r,x)									_	
C(plat,x)									_	
Worksheet 6-Impedance	e and Capa	acity E	quations							
Step 1: RT from Minor	r St.				9		12		_	
Conflicting Flows									_	
Potential Capacity				1.0	_		1 00			
Pedestrian Impedance Movement Capacity	Factor			1.0	U		1.00			
Probability of Queue	free St.			1.0	0		1.00			
Step 2: LT from Majo:	r St.				4		1		_	
Conflicting Flows				0					_	
Potential Capacity				161	0					
Pedestrian Impedance	Factor			1.0			1.00			
Movement Capacity	£ 0+			161			1 00			
Probability of Queue Maj L-Shared Prob Q				0.9			1.00			
							11		_	
Step 3: TH from Mino:	r St.				8		11		_	
Conflicting Flows Potential Capacity										
Pedestrian Impedance				1.0		_	1.00			
Cap. Adj. factor due	to Imped:	ing mvm	nt	0.9	8	\	0.98			
Movement Capacity Probability of Queue	free St.			1.0	0		1.00			
Step 4: LT from Minor	r St.				7		10		_	
Conflicting Flows				442			1		-\	
Potential Capacity				577					\	
Pedestrian Impedance		~		1.0	0		1.00 0.98			
Maj. L, Min T Impeda Maj. L, Min T Adj. Ir				_ \			0.98			)
Cap. Adj. factor due			nt	0.9			0.98		_ \	
Movement Capacity				566	_		\ /	> レ	<i>\\\</i>	\
Worksheet 7-Computat:	ion of the	e Effec	t of Two	-stage	Gap	Accepta	ance		- 7	1
Step 3: TH from Mino:					8		11	<del></del>	- /	
<u> </u>									_//	′
Part 1 - First Stage Conflicting Flows										
Potential Capacity							1			1
Pedestrian Impedance									7	
Cap. Adj. factor due	to Imped:	ing mvm	nt							ノ



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 0.98 0.98 Movement Capacity Result for 2 stage process: а У 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 442 Potential Capacity 577 1.00 Pedestrian Impedance Factor 1.00 Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor. 0.98 0.98 Cap. Adj. factor due to Impeding mvmnt 0.98 0.98 Movement Capacity 566 Results for Two-stage process: а У Ĉt 566 Worksheet 8-Shared Lane Calculations Movement 8 10 11 12 Т Т  $_{\rm L}$ R R L Volume (vph) 566 Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Effect of Flared Minor Street Approaches Movement 8 9 10 11 12 L Т R Τ R L C sep 566 Volume 2 Delay Q sep Q sep +1 round (Qsep +1) n max

C sh



SUM C sep n C act

Worksheet 10-Delay,	Oueue	Length.	and Le	evel of	Service	ż		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT	L					
v (vph)		32	2					
C(m) (vph)		1610	566					
v/c		0.02	0.00					
95% queue length		0.06	0.01					
Control Delay		7.3	11.4					
LOS		A	В					
Approach Delay				11.4				
Approach LOS				В				

Worksheet 11-Shared Major LT Impedance and Delay

	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

# 1.1.1.10 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: ATUAL SEM EMPREENDIMENTO
M2-M7-M8-M11+M12

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

Intersection Orientation:  ${\tt EW}$ 

Study period (hrs): 1.00

Ve	hicle Volur	nes and Adju	stments	\	
Major Street: Approach	East	bound	Wes	tbound	
Movement	1	2 3	4	5 6	
	L	T R	L	T R	
Volume Peak-Hour Factor, PHF Hourly Flow Rate, HFR Percent Heavy Vehicles			35 0.91 38	1969 0.91 2163	
Median Type/Storage RT Channelized? Lanes Configuration	Undivid	ded	0 LT	2	
Upstream Signal?		No		No	
Minor Street: Approach	Nort	hbound	Sou	thbound	
Movement	7	8 9	10	11 12	\ /////////////////////////////////////
	L	T R	L	T R	
Volume	6				
Peak Hour Factor, PHF	0.91				\
Hourly Flow Rate, HFR	6				
Percent Heavy Vehicles	0				
Percent Grade (%)		0		0	



Flared Approach: Exists?/Storage Lanes Configuration L

Approach	_Delay, EB	Queue Le WB	,	and Leve		Ser	_	outhbour	nd
Movement	1	4	7	8	9	- 1	10	11	12
Lane Config		LT	L						
v (vph)		38	6						
C(m) (vph)		1636	214						
v/c		0.02	0.03						
95% queue length		0.07	0.09						
Control Delay		7.3	22.3						
LOS		A	С						
Approach Delay				22.3					
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: G DER/DF

Jurisdiction:

Units: U. S. Metric
Analysis Year: 2023
Project ID: ATUAL SEM EMPREENDIMENTO

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

Intersection Orientation: EW Study period (hrs): 1.00

	Vehicle '	Volumes	and Ad	justmen	ts			
Major Street Movements	_ 1	2	3	4	5	6		_
	L	Т	R	L	T	R		
Volume				35	1969			_
Peak-Hour Factor, PHF				0.91	0.91			
Peak-15 Minute Volume				10	541			
Hourly Flow Rate, HFR				38	2163			
Percent Heavy Vehicles				0	/ \			
Median Type/Storage	Undi	vided			L			
RT Channelized?							)	
Lanes				0	2	\ /		
Configuration				L	т т	\ /		
Upstream Signal?		No	/	/	No	1 1	/	\
						1 5		\
Minor Street Movements	7	8	9	10	11	12		_ \
	L	Т	R	L	Т	R		
Volume	6							
Peak Hour Factor, PHF	0.91					1	$\wedge$ $\vdash$	_ / / /
Peak-15 Minute Volume	2					\ /		
Hourly Flow Rate, HFR	6					( ) 1	- /	111
Percent Heavy Vehicles	0							<del> </del>
Percent Grade (%)		0			0	\	\	/ /
Flared Approach: Exist	s?/Storag	е		/	<b>\</b>		V	
RT Channelized								// _
Lanes	1							
Configuration	L					· ·		
								_
								$\neg$
P	edestrian	Volume	es and Ad	djustme	nts			_ \



Marramant -		-	13	1 /	1 5	1.6		
Movements			L3	14	15	16		
Flow (ped/hr) Lane Width (m)			3.6	0 3.6	0 3.6	0 3.6		
Walking Speed (1	m/sec)		1.2	1.2	1.2	1.2		
Percent Blockage			)	0	0	0		
	Dwag	t Sat		m Signa val (			Dwa	Distance
	Prog. Flow	Flov			Green Time	Cycle Length	Prog. Speed	Distance to Signal
	vph	vph			sec	sec	kph	meters
2 Left-Turn								
Through 35 Left-Turn								
55 Left-Turn Through								
Worksheet 3-Data	a for Co	omputino	r Effec	t of De	elav to	Maior	Street V	ehicles
					Moveme			
					Moveme	:IIT Z	Moveme	J
Shared in volume							0	
Shared ln volume Sat flow rate, n							0 1700	)
Sat flow rate, i							1700	
Number of major				:			2	
Critical Gap Ca: Movement	lculatio 1 L	on 4 L	7 L	8 T	9 R	10 L	11 T	12 R
(c,base)		4.1	7.1					
(c,hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
?(hv) :(c,q)		U	0 0.20	0.20	0.10	0.20	0.20	0.10
Percent Grade			0.00	0.00				0.00
(3,1t)		0.00	0.70					
t(c,T): 1-stage		0.00	0.00	0.00				0.00
2-stage (c) 1-stage		0.00 4.1	1.00 6.4	1.00	0.00	1.00	1.00	0.00
2-stage		4.T	0.4					
ollow-Up Time		ions						
Movement	1	4	7	8	9	10	11	12
	L	L	L	Т	R	L	T	R
(f,base)		2.20	3.50					
(f, HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)		0	0					
(f)		2.2	3.5			/	\	
Vorksheet 5-Eff	ect of T	Jpstrear	n Signa	ıls				
Computation 1-Q					ream Si	gnal	_	
- 1p a c a c 1 c 1					Movem	ent 2		ovement 5
				V	(t) V	(l,prot	) V(t)	V(l,prot)
V prog Fotal Saturation				$\overline{}$				

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 4 7 10 11 12 1 L L L Т R V c,x 0 1157 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 1.00 Pedestrian Impedance Factor Movement Capacity 1636 1.00 Probability of Queue free St. 0.98 Maj L-Shared Prob Q free St. 0.98 Step 3: TH from Minor St. 11

8



Conflicting Flows		
Potential Capacity Podestrian Impodance Factor	1.00	1.00
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	0.98	0.98
Movement Capacity	0.90	0.30
Probability of Queue free St.	1.00	1.00
tep 4: LT from Minor St.		10
tep 4. II from minor St.	1	10
Conflicting Flows	1157	
Potential Capacity	219	1 00
Pedestrian Impedance Factor Maj. L, Min T Impedance factor	1.00	1.00 0.98
Maj. L, Min T Adj. Imp Factor.		0.98
Cap. Adj. factor due to Impeding mvmnt	0.98	0.98
Movement Capacity	214	
orksheet 7-Computation of the Effect of	Two-stage Gap Acce	eptance
ep 3: TH from Minor St.	8	11
art 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		
edestrian Impedance Factor		
ap. Adj. factor due to Impeding mvmnt		
ovement Capacity		
art 3 - Single Stage		
Conflicting Flows		
otential Capacity		
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt Iovement Capacity	0.98	0.98
desult for 2 stage process:		
· •		
C t		
Probability of Queue free St.	1.00	1.00
tep 4: LT from Minor St.	7	10
art 1 - First Stage		
onflicting Flows		
Potential Capacity	_ /	\
edestrian Impedance Factor ap. Adj. factor due to Impeding mvmnt		
ap. Adj. factor due to impeding mvmnt  Novement Capacity		_ /
art 2 - Second Stage	77	
onflicting Flows	/	
otential Capacity edestrian Impedance Factor		
up. Adj. factor due to Impeding mvmnt		
evement Capacity		ノノ゛ー
rt 3 - Single Stage		
onflicting Flows	1157 219	$\searrow$ $\square$
otential Capacity edestrian Impedance Factor	1.00	1.00
aj. L, Min T Impedance factor	1.00	0.98
aj. L, Min T Adj. Imp Factor.	\	0.98
ap. Adj. factor due to Impeding mvmnt	0.98	0.98
ovement Capacity	214	
esults for Two-stage process:		
ebuild for two beage process.		



У С t 214 Worksheet 8-Shared Lane Calculations Movement 10 12 8 9 11 L Τ R Τ R Volume (vph) 6 214 Movement Capacity (vph) Shared Lane Capacity (vph) Worksheet 9-Computation of Effect of Flared Minor Street Approaches Movement 11 12 L Т R Т R L C sep 214 Volume 6 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 9 Movement 10 12 4 11 LT Lane Config L v (vph) 38 6 C(m) (vph) 1636 214 v/c 0.02 0.03 95% queue length 0.07 0.09 7.3 22.3 Control Delay LOS Α С Approach Delay 22.3 Approach LOS С

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
o(oj)	1.00	0.98
(il), Volume for stream 2 or 5		0
(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
?*(oj)		0.98
d(M,LT), Delay for stream 1 or 4		7.3
N. Number of major street through lanes		2
d(rank,1) Delay for stream 2 or 5		\\\ /

### 1.1.1.11 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: ATUAL SEM EMPREENDIMENTO

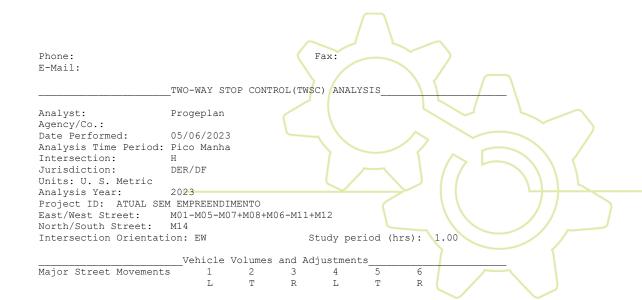


East/West Street: M01-M05-M07+M08+M06-M11+M12 North/South Street: M14

Intersection Orientation: EW Study period (hrs): 1.00

	Veh	icle Vol	umes a	nd Adju	stme	nts			
Major Street:	Approach	Εá	stboun	.d			Westboun	d	
-	Movement	1	2	3		4	5	6	
		L	T	R		L	T	R	
Volume		1	1769						
Peak-Hour Fact	or, PHF	0.91	0.91						
Hourly Flow Ra	ate, HFR	1	1943						
Percent Heavy	Vehicles	0							
Median Type/St RT Channelized		Undiv	vided			/			
Lanes		0	2						
Configuration		I	тт						
Upstream Signa	1?		No				No		
Minor Street:	Approach	No	rthbou	nd			Southbou	nd	
	Movement	7	8	9		10	11	12	
		L	Т	R		L	T	R	
Volume						30			
Peak Hour Fact	or, PHF					0.9	1		
Hourly Flow Ra	ate, HFR					32			
Percent Heavy	Vehicles					4			
Percent Grade	(%)		0				0		
Flared Approac	ch: Exists?	/Storage	)		/				/
Lanes							1		
Configuration							L		
	Delay,	Queue Le	ength,	and Lev	rel o	f Se	rvice		
Approach	EB	WB	No	rthboun	ıd		Sou	thboun	d
Movement	1	4	7	8	9	1	10	11	12
Lane Config	LT	i				İ	L		
v (vph)	1						32		
C(m) (vph)	1636						277		
v/c	0.00						0.12		
95% queue leng	gth 0.00						0.39		
Control Delay	7.2						19.7		
LOS	A						С		
Approach Delay	?							19.7	
Approach LOS								C	

HCS+: Unsignalized Intersections Release 5.6





Volume		1	1769							
Peak-Hour Factor,		0.91	0.91							
Peak-15 Minute Vo		0	486							
Hourly Flow Rate, Percent Heavy Veh		1	1943							
Median Type/Stora		Undiv			/					
RT Channelized?	J -				,					
Lanes		0	2							
Configuration		LT								
Upstream Signal?			No			No				
Minor Street Move	ments	7	8	9	10	11	12			
		L	T	R	L	T	R			
** 1					20					
Volume Peak Hour Factor,	DUF				30 0.91					
Peak-15 Minute Vo					8					
Hourly Flow Rate,	HFR				32					
Percent Heavy Veh					4					
Percent Grade (%)		/ 0 +	0		,	0		,		
Flared Approach: RT Channelized	EXISTS?	storage			/			/		
Lanes					1					
Configuration					L					
	Pade	estrian '	70]11mes	and Ad	instmer	t s				
Movements		13	14	15	16					
==										
Flow (ped/hr)		0	0	0	0					
Lane Width (m) Walking Speed (m/	sec)	3.6 1.2	3.6 1.2	3.6 1.2	3.6 1.2					
Percent Blockage	500)	0	0	0	0					
		IInet	ream Sic	rnal Da	+ 2					
	Prog.		rrival		Cycle	Pro	a. 1	Distance		
	Flow		Гуре	Time		h Spe		to Signal		
	vph	vph		sec	sec	kpl	h	meters		
S2 Left-Turn										
Through										
S5 Left-Turn										
Through										
Worksheet 3-Data	for Compu	ıting Ef:	fect of	Delav	to Majo:	r Stree	et Vel	hicles		
				Move	ment 2	Mor	vemen	t 5		
Shared ln volume,	maior th	n vehicle	es:	0						
Shared in volume,				0						
Sat flow rate, ma				17	00					
Sat flow rate, ma					00	\				
Number of major s	treet thi	rough lai	nes:	2						
								<del></del>		
Worksheet 4-Criti	cal Gap a	and Foll	ow-up Ti	ime Cal	culation	n		/		
Critical Gap Calc	ulation			$\longrightarrow$			$\rightarrow$	<del></del>	.)	
Movement		1 7	8	9	10	1:	1	12	\	
× <del>-</del>		L L		R			T	R		
- <del></del>				<b>\</b>						)
	4.1	00 1	20 1 1	10 1	7.1			1 00		
	1.00 1. 0	.00 1.	00 1.0	10 I.	00 1.	UU I	.00	1.00		
t(c,g)	-	0.	20 0.2	20 0.	10 0.	20 0	.20	0.10	111/	
Percent Grade		0.			00 0.	0 0	.00	0.00	1111	
	0.00 -	00 -			0.		0.0		44	
t(c,T): 1-stage		.00 0.			00 0.		.00	0.00	//	
2-stage t(c) 1-stage		.00 1.	00 1.0	, U .	00 1.		.00	0.00	//	
2-stage	- • ±				0.	-				
								)		
Follow-Up Time Ca			^	^	1.0		1	10	_	
Movement		1 7 L L	8 T	9 R		1:	1 T	12 R	/ /	
	ا ب	ىل ـ	1	R	ь		_			



t(f,base)	2.20 3.	50
t(f,HV) P(HV) t(f)	0.90 0.90 0.90 0.90 0.90 0. 0 4 2.2 3.	90 0.90 0.90 5
Worksheet 5-Effe	ect of Upstream Signals	
Computation 1-Qu	eue Clearance Time at Upstream Signal Movement 2 V(t) V(1,pr	Movement 5 ot) V(t) V(1,prot)
Arrival Type Effective Green, Cycle Length, C Rp (from Exhibit	(sec)	
Computation 2-Pi	oportion of TWSC Intersection Time bloomer 2 Movement 2 V(t) V(1,pr	
Max platooned fl Min platooned fl	c, F enflicting flow, f ency, V(c,max) ency, V(c,min) eked period, t(p)	0.000
Computation 3-Pl	atoon Event Periods Result	
p(2) p(5) p(dom) p(subo) Constrained or u	0.000 0.000 unconstrained?	
Proportion unblocked for minor movements, p(x)	(1) (2) Single-stage Two-Stage Process Stage I	(3) Process Stage II
p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12)		
Computation 4 an Single-Stage Pro Movement		10 11 12 L T R
V c,x s Px V c,u,x	0	978
C r,x C plat,x		
Two-Stage Proces	7 8 10	111
St	agel Stage2 Stage1 Stage2 Stage1	
V(c,x)		



3000 P(x) V(c,u,x)C(r,x) C(plat,x) Worksheet 6-Impedance and Capacity Equations 12 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 Potential Capacity 1636 Pedestrian Impedance Factor 1.00 1.00 Movement Capacity 1636 Probability of Queue free St. 1.00 1.00 Maj L-Shared Prob Q free St. 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 Movement Capacity 1.00 1.00 Probability of Queue free St. 1.00 1.00 Step 4: LT from Minor St. 1.0 Conflicting Flows 973 277 Potential Capacity 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 mymnt 1.00 1.00 Movement Capacity 2.77 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 Pedestrian Impedance Factor 1.00 Cap. Adj. factor due to Impeding mvmnt 1.00 1.00 Movement Capacity Result for 2 stage process: а Ct

1.00

1.00

Probability of Queue free St.



tep 4: LT from Minor St.			7		10	
art 1 - First Stage						
Conflicting Flows						
otential Capacity Dedestrian Impedance Factor						
Cap. Adj. factor due to Impeding	mvmnt					
ovement Capacity						
art 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					973	
Potential Capacity Pedestrian Impedance Factor		1	.00		277 1.00	
Maj. L, Min T Impedance factor			.00		1.00	
Maj. L, Min T Adj. Imp Factor.			.00			
Cap. Adj. factor due to Impeding	mvmnt	1	.00		1.00	
Movement Capacity					277	
Results for Two-stage process:						
a Y						
y C t					277	
Worksheet 8-Shared Lane Calculat	ions					
Movement	7	8	9	10	11	12
	L	Т	R	L	Т	R
Volume (vph)				32		
Movement Capacity (vph) Shared Lane Capacity (vph)				277		
Worksheet 9-Computation of Effec	t of Flare	d Minor	Street 9	Approa 10	ches	12
Movement	L	T	R	L	Т	R
C sep				277		
Volume				32		
Delay						
Q sep Q sep +1						
round (Qsep +1)						
n max				7		
C sh				1		
SUM C sep n		(				
C act						
					1 1	
		7			1 1	
Worksheet 10-Delay, Queue Length	, and Leve	l of Se	rvice			
Movement 1 4			rvice	10	11	12
fovement 1 4				10 L	11	12
Movement 1 4 Lane Config LT				L	11	12
Movement 1 4 Lane Config LT v (vph) 1					11	12
Movement 1 4 Lane Config LT  v (vph) 1 C(m) (vph) 1636 v/c 0.00				32 277 0.12	11	12
Movement 1 4 Lane Config LT  v (vph) 1 C(m) (vph) 1636 v/c 0.00 95% queue length 0.00				32 277 0.12 0.39	11	12
Movement 1 4 Lane Config LT  v (vph) 1 C(m) (vph) 1636 v/c 0.00 95% queue length 0.00 Control Delay 7.2				32 277 0.12 0.39 19.7	11	12
Movement 1 4 Lane Config LT  v (vph) 1 C(m) (vph) 1636 v/c 0.00 95% queue length 0.00 Control Delay 7.2 LOS A				32 277 0.12 0.39 19.7 C	> \\ \( \left( \)	12
Movement 1 4 Lane Config LT  v (vph) 1 C(m) (vph) 1636 v/c 0.00 95% queue length 0.00 Control Delay 7.2 LOS Approach Delay				32 277 0.12 0.39 19.7 C	19.7	12
Movement 1 4 Lane Config LT  7 (vph) 1 C(m) (vph) 1636 7/c 0.00 25% queue length 0.00 Control Delay 7.2 LOS A				32 277 0.12 0.39 19.7 C	> \\ \( \left( \)	12
Movement 1 4 Lane Config LT  (vph) 1 C(m) (vph) 1636 C/c 0.00 D5% queue length 0.00 Control Delay 7.2 Los A Lapproach Delay Los A Lo	7	8		32 277 0.12 0.39 19.7 C	19.7	12
lovement 1 4 Jane Config LT  (vph) 1 S(m) (vph) 1636 V/c 0.00 José queue length 0.00 Jontrol Delay 7.2 José Approach Delay	7	8		32 277 0.12 0.39 19.7 C	19.7	12



	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		

### 1.1.1.12 Interseção H - 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: Н DER/DF Jurisdiction: Units: U. S. Metric

Analysis Year: 2023
Project ID: ATUAL SEM EMPREENDIMENTO

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

Study period (hrs): 1.00 Intersection Orientation: EW

\_Vehicle Volumes and Adjustments\_

Major Street:	Approach	Eas	tbound	u 11uju	0 0101		Westbound	
-	Movement	1	2	3	1	4	5	6
		L	T	R	i	L	Т	R
Volume		6	701					
Peak-Hour Factor	r, PHF	0.91	0.91					
Hourly Flow Rate		6	770					
Percent Heavy Ve		0						
Median Type/Sto		Undivi	ded		,	/		
RT Channelized?					,			
Tanes		0	2					
Configuration		т.т	T					
Upstream Signal	?		No				No	
Minan Observation	7 1-	NT	+ l- l	-1			Southbound	
Minor Street:	Approacn Movement	7	thboun 8	a 9		10	outnbouna 11	12
	MO A GIII GII C	L L	8 T	9 R		T.	T T	12 R
		ь	1	А	- 1	ь	1.	K
Volume						35		
Peak Hour Factor						0.9		
Hourly Flow Rate						38	\	
Percent Heavy Ve						0	\	
Percent Grade (			0				0	
Flared Approach	: Exists?/	Storage		(				) /
Lanes							1_	
Configuration				<b>&gt;</b>			L	
					_/_			<del>-                                    </del>
	Delay, Q	ueue Len	igth, ai	nd Lev	el of	Se	rvice	
Approach	EB	WB		thboun				bound
Movement	1	4	7	8	9			1 12
Lane Config	LT	i			1,	\i	L	7 <u> </u>
		'			7			A [
v (vph)	6						38	17
C(m) (vph)	1636				l		610	/ /
v/c	0.00				_	_	0.06	
95% queue lengt							0.20	1 1
Control Delay	7.2						11.3	\ \
LOS	A						В	
Approach Delay								1.3
Approach LOS								В
1.PP104011 100								- 1
								1 ~



### HCS+: Unsignalized Intersections Release 5.6

Phone: E-Mail:			F	ax:				
	TWO-WAY ST	OP CONTI	ROL(TWSC	) ANAL	YSIS			
Analyst:	Progeplan							
Agency/Co.: Date Performed: Analysis Time Period: Intersection: Jurisdiction: Units: U. S. Metric	05/06/2023							
Analysis Year: Project ID: ATUAL SEN East/West Street: North/South Street: Intersection Orientat:	M01-M05-M0 M14			12 udy pe:	riod (	hre).	1.00	
intersection offendat.		1				1115/.	1.00	
Major Street Movements	Vehicle ` s 1 L	Volumes 2 T	and Adj 3 R	ustmen 4 L	5 T	6 R		
Volume Peak-Hour Factor, PHF Peak-15 Minute Volume Hourly Flow Rate, HFR Percent Heavy Vehicles Median Type/Storage		701 0.91 193 770  vided		/				
RT Channelized? Lanes Configuration Upstream Signal?	0 L	2 T T No			No			
Minor Street Movements	5 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 (%) Flared Approach: Exis RT Channelized Lanes Configuration		0 e		35 0.91 10 38 0 /	0		/	
	Pedestrian	Volumes	s and Ad	justme	nts			
Movements	13	14	1.5	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	0 3.6 1.2 0				
	IIne	tream Ci	ignal Da	ta				_
Prog Flow vph		Arrival Type	Green Time sec		th Spe	eed t	istance o Signal 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 Ω Shared In volume, major rt vehicles: 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 10 11 12 L  $\mathbb{L}$ Τ R L Τ R t(c,base) 4.1 t(c,hv) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 P(hv) 0 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(3,1t) 0.70 0.00 0.00 0.00 0.00 0.00 0.00 1-stage 0.00 0.00 t(c,T): 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-Up Time Calculations 8 10 11 12 Movement 1 4 R L L R 2.20 3.50 t(f,base) t(f,HV) 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0 P(HV) 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 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

for minor

movements, p(x)

(1)

Single-stage

Process

(3)

Stage II

Two-Stage 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	8	9	10	11	12
	L	L	L	T	R	L	T	R
V c,x	0					397		
S								
Px								
V c,u,x								
C r,x								
C plat,x								
o piac, n								
Two-Stage Process								
•	7		8		10		1	1
Stage1	Stage2	Stage1	Stage2	Stage	1 S	tage2	Stage1	Stage2
V(c,x)								
5					3	000		
? (x)								
/(c,u,x)								
C(r,x)								
C(plat,x)								
o (p100 <b>/</b> 11/								
Worksheet 6-Impedance	e and Cap	acity E	quations					
Step 1: RT from Mino	r St.				9		12	
Conflicting Flows								
Potential Capacity	Footon			1.0	n		1 00	
Pedestrian Impedance Movement Capacity	Factor			1.0	J		1.00	
Probability of Queue	free St.			1.0	)		1.00	
rioxasirio, or gasas	1100 00.			1.0	9		1.00	
Step 2: LT from Majo	r St.				4		1	
1								
Conflicting Flows							0	
Potential Capacity							1636	
Pedestrian Impedance	Factor			1.0	)		1.00	
Movement Capacity					_		1636	
Probability of Queue				1.0	J		1.00	
Maj L-Shared Prob Q	ree St.						1.00	
Step 3: TH from Mino:	r C+				8		11	
oceh o. tu trom MIDO:	L DL.			<u></u>			11	
Conflicting Flows							<del></del>	
Potential Capacity			\				_ /	
Pedestrian Impedance	Factor			1.0	)		1.00	
Cap. Adj. factor due		ing mvmr	nt	1.0			1.00	/
Movement Capacity	-	2						/
Probability of Queue	free St.			1.0	)		1.00	
Step 4: LT from Mino	r St.			77	7		10	
Conflicting Flows							397/	>  -
Potential Capacity	_						612	/
Pedestrian Impedance				1.0			1.00	l
Maj. L, Min T Impedan				1.0		$\overline{}$		1
Maj. L, Min T Adj. In			n+	1.0		(	1.00	\
Cap. Adj. factor due Movement Capacity	со тиреа	TIIA IUAIUI	1 C	1.0	J		610	
110 venierie capacity							010	/ _
Worksheet 7-Computat.	ion of th	e Effect	of Two	-stage	Gap	Accept	ance	
_								
Step 3: TH from Mino	r 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.			
ricoadrire, or gadae rice se.			
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:			-
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	1.00	397 612 1.00	-
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	1.00 610	
Results for Two-stage process:			_
Y C t		610	_
Worksheet 8-Shared Lane Calculations			
Movement 7 L	8 9 R	10 11 12 L T R	
Volume (vph)		38	
Movement Capacity (vph) Shared Lane Capacity (vph)		610	
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 Volume Delay		610	
I			



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)	6					38		
C(m) (vph)	1636					610		
v/c	0.00					0.06		
95% queue length	0.01					0.20		
Control Delay	7.2					11.3		
LOS	A					В		
Approach Delay							11.3	
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 $d(rank,1)$ Delay for stream 2 or 5	2	

### 1.1.1.13 Interseção I – 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: DER/DF Jurisdiction: Units: U. S. Metric

2023 Analysis Year: Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: MOV01-MOV04-MOV10

North/South Street: MOV10

Intersection Orientation: EW			St	udy peri	od (hrs)	: 1.00	
	Veh	icle Volu	ımes and	d Adjus	stments		
Major Street:	Approach	Eas	stbound		W	estbound	
	Movement	1	2	3	4	5	6
		L	T	R	L	T	R
Volume		14	1780		7		
Peak-Hour Fact	or, PHF	0.91	0.91		1 ~	_	
Hourly Flow Ra	ate, HFR	15	1956				] / / \ \ \ \
Percent Heavy	Vehicles -	0			$\overline{}$		
Median Type/St RT Channelized	-	Undiv	ided		/		
Lanes		0	2				
Configuration		L.	ТТ				
Upstream Signa	11?		No			No	
Minor Street:	Approach	Noi	rthboun	d	S	outhboun	d
	Movement	7	8	9	10	11	12
		L	T	R	l L	T	R



Delay, Queue Length, and Level of Service Southbound Approach EΒ WB Northbound 9 10 Movement 1 4 8 11 12 Lane Config  $_{
m LT}$ L v (vph) 15 0 C(m) (vph) 1636 248 v/c 0.01 0.00 95% queue length 0.03 0.00 Control Delay 7.2 19.5 LOS Α С Approach Delay Approach LOS

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: I
Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023

Project ID: ATUAL SEM EMPREENDIMENTO
East/West Street: MOV01-MOV04-MOV10

North/South Street: MOV10
Intersection Orientation: EV

Intersection Orientation: EW Study period (hrs): 1.00

	Vehicle	Volumes	and Adj	justments
Major Street Movements	_ 1	2	3	4 5 6
	L	T	R	L / T \ R
Volume	14	1780		
Peak-Hour Factor, PHF	0.91	0.91		
Peak-15 Minute Volume	4	489	<b>\</b>	
Hourly Flow Rate, HFR	15	1956	/	/ / / /
Percent Heavy Vehicles	0			
Median Type/Storage	Undi	vided		
RT Channelized?			\	
Lanes	0	2		
Configuration	L	TT		
Upstream Signal?		No		No
Minor Street Movements	7	8	9	10 11 12
	L	T	R	L T R
Volume				0
Peak Hour Factor, PHF				0.91
Peak-15 Minute Volume				0
Hourly Flow Rate, HFR				0
Percent Heavy Vehicles				17
Percent Grade (%)		0		0
Flared Approach: Exist	s?/Storag	e		



RT Channelized Lanes Configuration

1 L

Pedestrian Volumes and Adjustments										
Mov	rements		13	14	15	16				
Flo	w (ped/hr)		0	0	0	0				
Lan	e Width (m)		3.	6 3.6	3.6	3.6				
Wal	king Speed (	m/sec)	1.	2 1.2	1.2	1.2				
Per	cent Blockag	e	0	0	0	0				
			up	stream Si	gnal Dat	:a				
		Prog.		stream Si Arrival	-		Prog.	Distance		
		Prog. Flow		Arrival	Green	Cycle	Prog. Speed	Distance to Signal		
		-	Sat	Arrival	Green	Cycle	-			
	Left-Turn	Flow	Sat Flow	Arrival	Green Time	Cycle Length	Speed	to Signal		
	Left-Turn Through	Flow	Sat Flow	Arrival	Green Time	Cycle Length	Speed	to Signal		
		Flow	Sat Flow	Arrival	Green Time	Cycle Length	Speed	to Signal		

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

				1	lovemer	nt 2	Moveme	ent 5
Shared ln vo	Lume, majo	r th ve	hicles:		0			
Shared ln vol	lume, majo	r rt ve	ehicles:		0			
Sat flow rate	e, major t	h vehic	cles:		1700			
Sat flow rate	e, major r	t vehic	cles:		1700			
Number of mag	Number of major street through lanes:							
Worksheet 4-0	Critical G	ap and	Follow-up	Time	Calcul	lation		
Critical Gap	Calculati	on						
Movement	1	4	7	8	9	10	11	12
	T,	T,	T.	Т	R	T,	Т	R

Movement		1	4	7	8	9	10	11	12	
		L	L	L	T	R	L	T	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					17			
t(c,g)	t(c,q)			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					6.6			
	2-stage									
Follow-U	Jp Time C	alcula	tions							
Movement	-	1	4	7	8	9	1.0	11	12	

Movement	1	4	7	8	9	10	11	12
	L	L	L	Т	R	Ĺ	T	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)	0					17		
t(f)	2.2				_ / /	3.7	\	1
					1 1			

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-Proport	tion of T	WSC Int	ersect						
					ent 2		Movement 5 V(t) V(l,prot)		
			V	7(t) V	(1,prot)	v (L)	V (⊥,	, bror)	
alpha									
beta Travel time (1) (2)	201								
Travel time, t(a) (se Smoothing Factor, F	eC)								
Proportion of conflic	ctina flo	w, f							
Max platooned flow, N		, -							
Min platooned flow, V									
Duration of blocked p		(p)							
Proportion time block	ked, p			0.0	00		0.000		
Computation 3-Platoor	n Event P	eriods	Re	sult					
p(2)				000					
p(5)			0.	000					
p(dom) p(subo)									
Constrained or uncons	strained?								
Proportion		,		(0)					
unblocked for minor	(1			(2)	tage Pro	(3)			
movements, p(x)	Single	-stage ess	S+	rwo-s age I	tage Pro	cess Stage I	I		
p(1)									
p(4)									
o(7) o(8)									
p(9)									
p(10)									
p(11)									
(12)									
Computation 4 and 5									
Single-Stage Process									
Movement	1	4	7	8	9	10	11	12	
	L	L	L	Т	R	L	T	R	
Л с, x	0					1008			
S									
Px									
/ c,u,x									
C r,x									
C plat,x									
Wo-Stage Process									
-	7		8		10		11		
Stage1	Stage2	Stage1	Stag	ge2 Sta	gel Sta	ige2 S	tage1	Stage2	
/(c,x)					/_	+			
v (C, x)				^	300	0			
P(x)					- 500	~~	)		
V(c,u,x)									
C ( x y )				<del></del>	<del>/</del>		<del>\                                    </del>	-	
C(r,x) C(plat,x)							1 [	/	
C (P100, A)								$\checkmark$	
Worksheet 6-Impedance	e and Cap	acity E	quatio	ons			>		
Step 1: RT from Minor	c 9+			<del></del>	9		12		
step 1: KT from Minor	r St.				9	~	1/	> レ	
Conflicting Flows				t	/_		<del>)                                    </del>	/	
Potential Capacity					<u> </u>	<u> </u>			
Pedestrian Impedance	Factor			1	.00		1.00	\	
Movement Capacity	£ 0:				0.0	\	1 00		
Probability of Queue	iree St.			1	.00		1.00		
Step 2: LT from Major	r St.				4		1		
Conflicting Flows							0		
Potential Capacity							1636		



			origorinaria o me
Pedestrian Impedance Factor	1.00	1.00	
Movement Capacity		1636	
Probability of Queue free St.	1.00	0.99	
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 mvmnt	0.99	0.99	
Movement Capacity			
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	-
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. Cap. Adj. factor due to Impeding mvmnt	0.99 0.99	0.99	
Movement Capacity	0.33	248	
Worksheet 7-Computation of the Effect of	Two-stage Can Age	ontango	-
			_
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.			
riobability of gadae fiee be.			
Part 2 - Second Stage			-
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt Movement Capacity			
novement 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 0.99	
Movement Capacity	0.99	0.99	
			_
Result for 2 stage process:			
a Y			
Ct			
Probability of Queue free St.	1.00	1.00	
			_
Step 4: LT from Minor St.	7	10	
Part 1 - First Stage		$\overline{}$	5
Conflicting Flows		\ \ \	\
Potential Capacity			\
Pedestrian Impedance Factor			
Cap. Adj. factor due to Impeding mvmnt	\		_ )
Movement Capacity			
Part 2 - Second Stage			_ / /
Conflicting Flows			111
Potential Capacity		\	/
Pedestrian Impedance Factor			41
Cap. Adj. factor due to Impeding mvmnt		\ \	
Movement Capacity	\		
Part 3 - Single Stage			
Conflicting Flows		1008	/ /
Potential Capacity		25 <mark>0</mark>	1
Pedestrian Impedance Factor	1.00	1.00	<b>\  </b>
Maj. L, Min T Impedance factor	0.99		



Movement Capacity	Imp Factor lue to Imped			0.99		0.9	9
Results for Two-st a y	age process	:					
Ct						248	
Worksheet 8-Shared	l Lane Calcu	lations					
Movement		7 L	8 T			11 T	12 R
Volume (vph) Movement Capacity Shared Lane Capaci					0 248	· · · · · · · · · · · · · · · · · · ·	
Worksheet 9-Comput	ation of Ef	fect of Fla	ared Mi	nor Str	eet Appr	coaches	
Movement		7 L	8 T			11 T	12 R
C sep Volume Delay Q sep Q sep +1 round (Qsep +1)					248		
n max C sh SUM C sep n							
C act							
C act Worksheet 10-Delay						11	12
C act	, Queue Len		evel of	Servic	10 L	11	12
C act Worksheet 10-Delay Movement	1 4				10	11	12
C act  Worksheet 10-Delay  Movement Lane Config  v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay	1 4 LT  15 1636 0.01 0.03 7.2 A	7	8	9	10 L 0 248 0.00 0.00 19.5	11	12
C act  Worksheet 10-Delay  Movement Lane Config  v (vph) C(m) (vph) v/c 95% queue length Control Delay LOS Approach Delay Approach LOS	1 4 LT  15 1636 0.01 0.03 7.2 A	7	8	9	10 L 0 248 0.00 0.00 19.5		12 ment 5

# 1.1.1.14 Interseção I — Pico Tarde

HCS+: Unsignalized Intersections Release 5.6

\_TWO-WAY STOP CONTROL SUMMARY\_

Analyst:
Agency/Co.:

Progeplan



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

Intersection:

I DER/DF

Jurisdiction:

Units: U. S. Metric
Analysis Year: 2023
Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: MOV01-MOV04-MOV10
North/South Street: MOV10

Intersection Orientation:  ${\tt EW}$ 

Study period (hrs): 1.00

	Vehi		umes and	Adjus	stme				
Major Street:	Approach	Ea	stbound			W∈	estbound		
	Movement	1	2	3		4	5	6	
		L	T	R		L	T	R	
Volume		6	707						
Peak-Hour Facto	or, PHF	0.91	0.91						
Hourly Flow Rat	te, HFR	6	776						
Percent Heavy '	Vehicles	0							
Median Type/Sto	orage	Undiv	ided			/			
RT Channelized	?								
Lanes		0	2						
Configuration		L	т т						
Upstream Signal	1?		No				No		
Minor Street:	Approach	No	rthbound			Sc	uthboun	d	
	Movement	7	8	9		10	11	12	
		L	T	R		L	T	R	
Volume						10			
Peak Hour Facto	or, PHF					0.91			
Hourly Flow Rat	te, HFR					10			
Percent Heavy '	Vehicles					6			
Percent Grade	(%)		0				0		
Flared Approach	n: Exists?/	Storage			/				/
Lanes		- 2 -				1			
Configuration						I			
						_			

Approach	_Delay, EB	Queue WB	Le	ngt		d Leve		Ser	_	outhboun	
Movement	1	4		7	8	3	9		10	11	12
Lane Config	LT							- 1	L		
v (vph)	6								10		
C(m) (vph)	1636								596		
v/c	0.00								0.02		
95% queue length	0.01								0.05		
Control Delay	7.2								11.1		
LOS	A								В		
Approach Delay										11.1	
Approach LOS										В	

HCS+: Unsignalized Intersections Release 5.6

Phone: E-Mail:

\_TWO-WAY STOP CONTROL(TWSC) ANALYSIS\_

Fax:

Analyst: Progeplan

Agency/Co.:

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

Jurisdiction: Units: U. S. Metric

2023 Analysis Year:

Project ID: ATUAL SEM EMPREENDIMENTO



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

Intersection Orientation: EW

Study period (hrs): 1.00

	Vehicle '	Volumes	and Adj	ustments	;	
Major Street Movements	_ 1	2	3	4	5	6
J	L	T	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					
Median Type/Storage RT Channelized?	Undi	vided		/		
Lanes	0	2				
Configuration	L'	г т				
Upstream Signal?		No			No	
Minor Street Movements	7	8	9	10		12
	L	Т	R	L	T	R
Volume				10		
Peak Hour Factor, PHF				0.91		
Peak-15 Minute Volume				3		
Hourly Flow Rate, HFR				10		
Percent Heavy Vehicles		_		6		
Percent Grade (%)		0			0	
Flared Approach: Exist RT Channelized	s?/Storage	9		/		/
Lanes				1		
Configuration				L		
	edestrian				.s	
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		
	II a	troom C:	anal Da	+ 2		
Prog.		tream Si Arrival	gnai Da Green		Prog.	Distance
Flow	Flow	Type	Time	Length	_	
vph	vph		sec	sec	kph	meters
S2 Left-Turn						
Through						
S5 Left-Turn						
Through						

Through

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

Worksheet 3-Data for Computing Effect o	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:	0 0 1700 1700 2	
Worksheet 4-Critical Gap and Follow-up	Time Calculation	$\rightarrow$

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

Critical Gap	Calculation	on					1	77
Movement	1	4	7	8	9	10	11	12
	L	L	L	Т	R	L	T	R
t(c,base)	4.1					7.1	<del>                                     </del>	-++
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 Grad	.e		0.00	0.00	0.00	0.00	0.00	0.00
t(3,1t)	0.00					0.70		
t(c,T): 1-s	tage 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



t(c)	2-stage 1-stage 2-stage	4.1	0.00	1.00	1.00	0.00	1.00 6.5	1.00	0.00	engenharia e me
Follow-	Up Time C		ions							
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)	e)	2.20 0.90 0 2.2	0.90	0.90	0.90	0.90	3.50 0.90 6 3.6	0.90	0.90	
	et 5-Effe	ct of (	Jpstrear	m Signai	ls					
Computat	tion 1-Qu	eue Cle	earance	Time at	t Upstr	Moveme			vement 5 V(1,prot)	
Arrival Effectiv Cycle Le Rp (from	aturation Type ve Green, ength, C m Exhibit ion vehic	g (sec (sec) 16-11)	e)		n P					
Computat	tion 2-Pr	oportio	on of TV	NSC Inte	ersecti V(	Moveme		Mo	vement 5 V(1,prot)	<del></del>
Smoothin Proport: Max plat Min plat Duration	time, t(a ng Factor ion of co tooned fl tooned fl n of bloc ion time	, F nflicti ow, V(c ow, V(c ked per	ing flow c,max) c,min) ciod, t			0.00	0	ı	0.000	
Computat	tion 3-Pl	atoon E	Event Pe	eriods	Res	ult				
p(2) p(5) p(dom) p(subo) Constra	ined or u	nconsti	rained?		0.0					
Proport: unblocke for mine movement	ed or		(1) Single- Proce	-stage		(2) Two-St ge I	age Prod	(3) cess cage II	$\rightarrow$	
p(1) p(4) p(7) p(8) p(9) p(10) p(11) p(12)						$\left\langle \right\rangle$				
Single-S Movement	tion 4 and Stage Pro t		1 L	4 L	7 L	8 T	9 R	10 L	11 12 R	
V c,x s Px V c,u,x			0					400	}	
C r,x									1	=



C .	plat	, X

C plat,x			
Two-Stage Process			-
7 8	10	11	
Stage1 Stage2 Stage1 Stag	ez Stagei Stag	gez Stagel Stagez	
V(C, X)			-
S	3000	)	
P(x) V(c,u,x)			
v (C, u, x)			
C(r,x) C(plat,x)			-
			-
Worksheet 6-Impedance and Capacity Equation	ns		
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	1 00	1636	
Pedestrian Impedance Factor Movement Capacity	1.00	1.00 1636	
Probability of Queue free St.	1.00	1.00	
Maj L-Shared Prob Q free St.	2.00	1.00	
	8	11	-
Step 3: TH from Minor St.	δ	11	_
Conflicting Flows	-		=
Potential Capacity Pedestrian Impedance Factor	1.00	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	
Movement Capacity	2.00	2.00	
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	-
Conflicting Flows		400	-
Potential Capacity		598	
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	1.00	
Movement Capacity	1.00	596	
			-
Worksheet 7-Computation of the Effect of T	wo-stage Gap Acc	ceptance	
Step 3: TH from Minor St.	8	11	-
	<u> </u>	<u> </u>	-
Part 1 - First Stage Conflicting Flows			
Potential Capacity	1 /	\ \ \	\
Pedestrian Impedance Factor	/		\
Cap. Adj. factor due to Impeding mvmnt			
Movement Capacity	\		
Probability of Queue free St.		$/\rangle$	
Part 2 - Second Stage			
Conflicting Flows			1111
Potential Capacity			
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt			11
Movement Capacity			
Part 3 - Single Stage		7/	// /-
Conflicting Flows			
Potential Capacity			\
Pedestrian Impedance Factor	1.00	1.00	7
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	\



Movement	Capacity

						_	
Result for 2 stage process:							
a Y							
Ct							
Probability of Queue free St.		1.00		1.00			
Step 4: LT from Minor St.		7		10		_	
step 4. If from Minor St.				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				400			
Potential Capacity				598			
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			
Cap. Adj. factor due to Impeding mvmnt		1.00		1.00 596			
Movement Capacity						_	
Results for Two-stage process: a							
У							
c t				596			
Worksheet 8-Shared Lane Calculations						_	
	7 8 L T		10 L	11 T	12 R		
Volume (rmh)			10			_	
Volume (vph) Movement Capacity (vph)			596				
Shared Lane Capacity (vph)			030				
Worksheet 9-Computation of Effect of F	lared Mi	nor Stree	et Appro	aches		_	
	7 8		10	11	12	_	
	L T		L	Т	R		
C sep			596			-	
Volume		/	10				
Delay							
2 sep				/			
Q sep +1 round (Qsep +1)	\						
Louna (goop 'I)	7			11	/	\	
n max						- \	
C sh		1					
SUM C sep	1	\					
n		1 /		<b>^</b>			
C act		1		/ .			
				1-/	$\rightarrow$ $\vdash$	-//	
Worksheet 10-Delay, Queue Length, and	Level of	Service		١ / (			
Movement 1 4 7	8	9	10	11	12	- <i>TT</i>	
Lane Config LT			I	\			
v (vph) 6			10			_// _	
C(m) (vph) 1636			596				
v/c 0.00			0.02			1	
95% queue length 0.01			0.05			<b>√</b>	
Control Delay 7.2			11.1				



LOS A B
Approach Delay 11.1
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	

### 1.1.1.15 Interseção J – 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: J
Jurisdiction: DER/DF

Units: U. S. Metric

95% queue length

Control Delay

Analysis Year: 2023

Project ID: ATUAL SEM EMPREENDIMENTO

East/West Street: M2-M10 North/South Street: M9

Intersection Orientation: EW Study period (hrs): 1.00

0.00 0.07

11100100001011		2			Jouan	Porre	, a (11110)	. 1.00	
	Veh	icle Vol	umes a	nd Adjı	ıstmeı	nts			
Major Street:	Approach	Ea	stboun	d		₩€	stbound		
-	Movement	1	2	3	- 1	4	5	6	
		L	T	R	-	L	T	R	
Volume						0	751		
Peak-Hour Fact	or, PHF					0.91	0.91		
Hourly Flow Ra	te, HFR					0	825		
Percent Heavy	Vehicles					17			
Median Type/St	orage	Undiv	ided		,	/			
RT Channelized	1?								
Lanes						0	2		
Configuration						I	T T		
Upstream Signa	1?		No				No		
Minor Street:	Approach	No	rthbou	nd		Sc	uthbound	i	
	Movement	7	8	9 /		10	11	12	
		L	Т	R		L	T	R	
Volume		14			, /				
Peak Hour Fact	or, PHF	1.00			/ /			\ \	/
Hourly Flow Ra	ite, HFR	14							/
Percent Heavy	Vehicles	0			- \				
Percent Grade	(%)		0	1	\		0		
Flared Approac	h: Exists?	/Storage					_	/	
Lanes		1						/	
Configuration		I			7				
								) [ [	
		Queue Le				f Serv			
Approach	EB	WB		rthbour				nbound	
Movement	1	4	7	8	9		10	11 12	
Lane Config		LT	L			I		¬ \ \	
v (vph)		0	14					-	
C(m) (vph)		1530	600						
v/c		0.00	0.02						_



LOS Α В

Approach Delay 11.1 Approach LOS В

Phone: Fax:

E-Mail:

TWO-WAY STOP CONTROL (TWSC) ANALYSIS

HCS+: Unsignalized Intersections Release 5.6

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

Units: U. S. Metric

Analysis Year: 2023
Project ID: ATUAL SEM EMPREENDIMENTO
East/West Street: M2-M10

M2-M10 North/South Street: М9 Intersection Orientation: EW

Study period (hrs): 1.00

	_Vehicle	Volumes	and	Adjustment	S		
Major Street Movements	_ 1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume				0	751		
Peak-Hour Factor, PHF				0.91	0.91		
Peak-15 Minute Volume				0	206		
Hourly Flow Rate, HFR				0	825		
Percent Heavy Vehicles				17			
Median Type/Storage RT Channelized?	Und	ivided		/			
Lanes				0	2		
Configuration				LT	T		
Upstream Signal?		No			No		
Minor Street Movements	7	8	9	10	11	12	
	L	T	R	L	T	R	

Volume

1.00 Peak Hour Factor, PHF Peak-15 Minute Volume Hourly Flow Rate, HFR 14 Percent Heavy Vehicles 0 Percent Grade (%)

Flared Approach: Exists?/Storage RT Channelized

Lanes 1 Configuration

Pedestrian Volumes and Adjustments

Flow (ped/hr) 0 0 0 0 0 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2	Movements	13	14	15	16
	Lane Width (m) Walking Speed (m/sec)				

	Up	stream Sig	nal Dat	a		
Prog.	Sat	Arrival	Green	Cycle	Prog.	Distance
Flow vph	Flow vph	Type	Time sec	Length sec	Speed kph	to Signal meters

S2 Left-Turn Through



#### S5 Left-Turn Through

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

				]	Movemen	t 2	Movemen	nt 5
Shared ln volu	me, maio	r t.h ve	hicles:				0	
Shared ln volu							0	
Sat flow rate,							1700	
Sat flow rate,							1700	
Number of majo							2	
Number of majo	I SCICCE	ciiroug.	ii Tancs	•			2	
Worksheet 4-Cr	itical G	ap and	Follow-	up Time	Calcul	ation		
Critical Gap C	alculati	on						
Movement	1	4	7	8	9	10	11	12
	L	L	L	Т	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)		17	0					
t(c,q)			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-sta	ge 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ge 0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c) 1-sta		4.3	6.4					
2-sta	-							
Follow-Up Time	Calcula	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					
L(I,Dase)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
		17	0					
t(f,HV) P(HV)		± /						

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 Movement 5  $V(t) \quad V(\text{l,prot}) \quad V(t) \quad V(\text{l,prot}) \label{eq:vector}$ 

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



p(subo) Constrained or unconstrained?

Proportion									
unblocked	(1)	)	(	2)	(3)				
for minor	Single				e Process				
movements, p(x)	Proce	-	Stage	_	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		9 10	11	12		
	L	L	L	T	R L	Т	R		
V c, x		0	412						
S S		O	412						
Px									
V c,u,x									
. 0, 4, 11									
C r,x									
C plat,x									
Two-Stage Process									
	7		8		10	11			
Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2		
V(c,x)	2000								
s P(x)	3000								
* *									
V(c,u,x)									
C(r,x)									
C(plat,x)									
Worksheet 6-Impedance	and Capa	acity E	quations						
Worksheet 6-Impedance		acity E	quations						
		acity E	quations	9		12			
Worksheet 6-Impedance Step 1: RT from Minor		acity E	quations	9		12			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows		acity E	quations	9		12			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity	St.	acity E	quations						
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance	St.	acity E	quations	9		12			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity	St.	acity Ed	quations	1.00		1.00			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance	St.	acity E	quations						
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity Probability of Queue	St. Factor free St.	acity E	quations	1.00		1.00			
Worksheet 6-Impedance Step 1: RT from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Movement Capacity	St. Factor free St.	acity E	quations	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	St. Factor free St.	acity E	quations	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	St. Factor free St.	acity E	quations	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	St. Factor free St.	acity E	quations	1.00 1.00 4 0 1530		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	St. Factor free St.	acity E	quations	1.00 1.00 4 0 1530 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 Movement Capacity	St. Factor free St. St.	acity Ed	quations	1.00 1.00 4 0 1530		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	St. Factor free St. St. Factor	acity E	quations	1.00 1.00 4 0 1530 1.00 1530		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 Movement Capacity Probability of Queue	St. Factor free St. St. Factor	acity E	quations	1.00 1.00 4 0 1530 1.00 1530 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 Movement Capacity Probability of Queue	St. Factor free St. St. Factor free St. ree St.	acity E	quations	1.00 1.00 4 0 1530 1.00 1530 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 Movement Capacity Probability of Queue Maj L-Shared Prob Q f Step 3: TH from Minor	St. Factor free St. St. Factor free St. ree St.	acity E	quations	1.00 1.00 4 0 1530 1.00 1530 1.00		1.00 1.00 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 Movement Capacity Probability of Queue Maj L-Shared Prob Q f Step 3: TH from Minor Conflicting Flows	St. Factor free St. St. Factor free St. ree St.	acity E	quations	1.00 1.00 4 0 1530 1.00 1530 1.00		1.00 1.00 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 Movement Capacity Probability of Queue Maj L-Shared Prob Q f Step 3: TH from Minor Conflicting Flows Potential Capacity	St. Factor free St. St. Factor free St. st. St.	acity E	quations	1.00 1.00 4 0 1530 1.00 1530 1.00		1.00 1.00 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 Movement Capacity Probability of Queue Maj L-Shared Prob Q f Step 3: TH from Minor Conflicting Flows Potential Capacity Pedestrian Impedance	St. Factor free St. St. Factor free St. ree St. St.			1.00 1.00 4 0 1530 1.00 1.530 1.00 1.00		1.00 1.00 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 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 Cap. Adj. factor due	St. Factor free St. St. Factor free St. ree St. St.			1.00 1.00 4 0 1530 1.00 1530 1.00		1.00 1.00 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 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 Cap. Adj. factor due Movement Capacity	St.  Factor free St.  St.  Factor free St.  Factor free St.  The st.  St.  Factor The st.  Th			1.00 1.00 4 0 1530 1.00 1530 1.00 1.00		1.00 1.00 1.00 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 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 Cap. Adj. factor due	St.  Factor free St.  St.  Factor free St.  Factor free St.  The st.  St.  Factor The st.  Th			1.00 1.00 4 0 1530 1.00 1.530 1.00 1.00		1.00 1.00 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 Movement 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	St.  Factor free St.  Factor free St.  St.  Factor free St.  free St.  factor free St.			1.00 1.00 4 0 1530 1.00 1.00 1.00 1.00 1.00		1.00 1.00 1.00 1.00 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 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 Cap. Adj. factor due Movement Capacity	St.  Factor free St.  Factor free St.  St.  Factor free St.  free St.  factor free St.			1.00 1.00 4 0 1530 1.00 1530 1.00 1.00		1.00 1.00 1.00 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 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 Cap. Adj. factor due Movement Capacity Probability of Queue Step 4: LT from Minor	St.  Factor free St.  Factor free St.  St.  Factor free St.  free St.  factor free St.			1.00 1.00 4 0 1530 1.00 1.00 1.00 1.00 1.00		1.00 1.00 1.00 1.00 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 Movement Capacity Probability of Queue Maj L-Shared Prob Q f Step 3: TH from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Cap. Adj. factor due Movement Capacity Probability of Queue Step 4: LT from Minor Conflicting Flows	St.  Factor free St.  Factor free St.  St.  Factor free St.  free St.  factor free St.			1.00 1.00 4 0 1530 1.00 1530 1.00 1.00 1.00 7 412		1.00 1.00 1.00 1.00 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 Movement Capacity Probability of Queue Maj L-Shared Prob Q f  Step 3: TH from Minor  Conflicting Flows Potential Capacity Pedestrian Impedance Cap. Adj. factor due Movement Capacity Probability of Queue  Step 4: LT from Minor  Conflicting Flows Potential Capacity	St.  Factor free St.  St.  Factor free St.  St.  St.  St.  Factor to Imped: free St.  St.			1.00 1.00 4 0 1530 1.00 1.00 1.00 1.00 7 412 600		1.00 1.00 1.00 1.00 1.00 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 Movement Capacity Probability of Queue Maj L-Shared Prob Q f Step 3: TH from Minor Conflicting Flows Potential Capacity Pedestrian Impedance Cap. Adj. factor due Movement Capacity Probability of Queue Step 4: LT from Minor Conflicting Flows Potential Capacity Probability of Queue	St.  Factor free St. St.  Factor free St. St.  St.  Factor to Imped: free St. St.	ing mvm		1.00 1.00 4 0 1530 1.00 1530 1.00 1.00 1.00 7 412		1.00 1.00 1.00 1.00 1.00 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 Movement Capacity Probability of Queue Maj L-Shared Prob Q f  Step 3: TH from Minor  Conflicting Flows Potential Capacity Pedestrian Impedance Cap. Adj. factor due Movement Capacity Probability of Queue  Step 4: LT from Minor  Conflicting Flows Potential Capacity	St.  Factor free St.  St.  Factor free St.  St.  Factor to Imped: free St.  St.	ing mvmi		1.00 1.00 4 0 1530 1.00 1.00 1.00 1.00 7 412 600		1.00 1.00 1.00 1.00 1.00 1.00 1.00			



Cap. Adj. factor due to Impeding mvmnt Movement Capacity	1.00	1.00	engenharia e me
Worksheet 7-Computation of the Effect of Tw	ro-stage Gap Acce	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 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	412 600 1.00 1.00 600	1.00 1.00 1.00 1.00	\
Results for Two-stage process:	7		
a y C t	600	<i>&gt;</i>	
	1	JAF	
Movement 7 L	8 9 T R	10 11 12 L T R	77
Volume (vph) 14 Movement Capacity (vph) 600 Shared Lane Capacity (vph)		7	

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			600	)				
Volume			14					
Delay								
Q sep								
Q sep +1								
round (Qsep +1)								
n max								
C sh								
SUM C sep								
n								
C act								
C act Worksheet 10-Delay Movement Lane Config	7, Queue	Length,	, and Le	evel of	Servic	e 10	11	12
C act Worksheet 10-Delay Movement Lane Config		4	7				11	12
C act Worksheet 10-Delay Movement Lane Config v (vph)		4 LT	7 L				11	12
C act  Worksheet 10-Delay  Movement Lane Config  v (vph) C(m) (vph)		4 LT	7 L 14 600				11	12
C act  Worksheet 10-Delay  Movement Lane Config  v (vph) C(m) (vph) v/c		4 LT 0 1530 0.00	7 L 14 600 0.02				11	12
C act Worksheet 10-Delay Movement Lane Config  v (vph) C(m) (vph) v/c 95% queue length		4 LT 0 1530	7 L 14 600				11	12
C act  Worksheet 10-Delay  Movement Lane Config  v (vph) C(m) (vph) v/c 95% queue length Control Delay		4 LT 0 1530 0.00 0.00 7.4	7 L 14 600 0.02 0.07 11.1				11	12
C act Worksheet 10-Delay Movement		4 LT 0 1530 0.00 0.00	7 L 14 600 0.02 0.07				11	12

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		7.4
N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5		2

### 1.1.1.16 Interseção J – 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: J Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: ATUAL SEM EMPREENDIMENTO East/West Street: M2-M10 North/South Street: M9 Intersection Orientation: EW Study period (hrs): 1.00 Vehicle Volumes and Adjustments Major Street: Approach Eastbound Westbound 2 T Movement 1 4 5 6 Т 10 Volume 1984 Peak-Hour Factor, PHF 0.91 0.91 Hourly Flow Rate, HFR 10 2180 Percent Heavy Vehicles Median Type/Storage 6 Undivided RT Channelized?



0 2 Lanes LT T Configuration Upstream Signal? No No

Minor Street: Approach Northbound Southbound | 10 12 Movement 8 11 Т R Т L | L R Volume 6 Peak Hour Factor, PHF 0.91 Hourly Flow Rate, HFR 6 Percent Heavy Vehicles 0 Percent Grade (%) 0 0 Flared Approach: Exists?/Storage Lanes Configuration L

Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound 4 8 10 11 Movement Lane Config LT L v (vph) 10 C(m) (vph) 1597 233 v/c 0.01 0.03 0.08 95% queue length 0.02 Control Delay 7.3 20.9 LOS Α С Approach Delay 20.9 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 Tarde Intersection: Jurisdiction: DER/DF

Units: U. S. Metric

Analysis Year: 2023

Project ID: ATUAL SEM EMPREENDIMENTO

East/West Street: M2-M10

North/South Street: M Intersection Orientatio			S	tudy pe	eriod (h	rs): 1	.00	
	Vehicle	Volumes	and Ac	ljustmer	nts	1/		\
Major Street Movements	1 1	2 T	3 R	4 L	5 T	6 R		1
Volume				10	1984			
Peak-Hour Factor, PHF				0.91	0.91			
Peak-15 Minute Volume				3	545	1		
Hourly Flow Rate, HFR				10	2180			
Percent Heavy Vehicles				6				
Median Type/Storage	Undi	vided						
RT Channelized?							<b>\</b> \	
Lanes				0	2			
Configuration				I	LT T			
Upstream Signal?		No			No			
Minor Street Movements	7	8	9	10	11	12		
	L	Т	R	L	Т	R		



Volume 0.91 Peak Hour Factor, PHF Peak-15 Minute Volume 2 Hourly Flow Rate,  ${\tt HFR}$ 6 0

RT Channelized

Lanes 1 L Configuration

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

	Pedestrian V	olumes	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 Type Time Length Speed to Signal 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:		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 Calcula	tion						
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)	1.0	0 1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)		6	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 0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2-stage 0.0	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage 2-stage	4.2	6.4				\	

					· >	/	\	
Follow-Up Time	Calculat	cions			7 /			1 1
Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	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)		6	0					
t(f)		2.3	3.5				1	\
								1 / /

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

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

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

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 0.000 p(2) p(5) 0.000 p(dom) p(subo) Constrained or unconstrained? Proportion unblocked (1) (2) (3) Two-Stage Process Single-stage for minor 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 Movement 1 4 9 10 11 12 L  $_{\rm L}$ L R Τ R V c,x 0 1110 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



Marramant Canagity			
Movement Capacity Probability of Queue free St.	1.00	1.00	
Step 2: LT from Major St.	4	1	-
Conflicting Flows	0		-
Potential Capacity	1597		
Pedestrian Impedance Factor	1.00	1.00	
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	1 00	1 00	
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	1.00 0.99	1.00 0.99	
Movement Capacity	0.99	0.99	
Probability of Queue free St.	1.00	1.00	
Step 4: LT from Minor St.	7	10	-
			_
Conflicting Flows	1110		
Potential Capacity	234	1 00	
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 mvmnt	0.99	1.00	
Movement Capacity	233	1.00	
Workshoot 7-Computation of the Effect of	Tuo-etago Can Aca	ent and	-
Worksheet 7-Computation of the Effect of T  Step 3: TH from Minor St.		eptance 11	-
Jeep 3. In From Minor St.		тт	_
Conflicting Flows Potential Capacity Pedestrian Impedance Factor			
Potential Capacity			
Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity			-
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			-
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 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 Potential Capacity Part 3 - Single Stage Conflicting Flows Potential Capacity			-
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 Peart 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	-
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 Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity		<b>\</b>	-
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 Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Reduction Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process:		<b>\</b>	
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  Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity  Result for 2 stage process: a		<b>\</b>	
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 Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Peart 3 - Single Stage Conflicting Flows Potential Capacity Peart 3 - Single 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 Result for 2 stage process:		<b>\</b>	
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 Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process: a		<b>\</b>	
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 Part 3 - Single Stage Conflicting Flows Potential Capacity Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Reduction Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Result for 2 stage process:	0.99	0.99	
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 Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement 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	0.99	
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 Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt Movement Capacity Peart 3 - Single 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 Result for 2 stage process: a  Y C t Probability of Queue free St.  Step 4: LT from Minor St.	1.00	0.99	
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 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	0.99	
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 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	0.99	
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 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	0.99	
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 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	0.99	
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 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 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	1.00	0.99	
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 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 Part 2 - Second Stage Conflicting Flows Potential Capacity	1.00	0.99	
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 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 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	1.00	0.99	



Movement Capacity							
Part 3 - Single Stage							
Conflicting Flows				1110			
Potential Capacity				234			
Pedestrian Impedance	Factor			1.00		1.00	)
Maj. L, Min T Impedan	ce factor					0.99	)
Maj. L, Min T Adj. Im	p Factor.					1.00	)
Cap. Adj. factor due	to Impeding	mvmnt		0.99		1.00	)
Movement Capacity				233			
Results for Two-stage	process:						
ì.							
7				222			
: t 				233			
Worksheet 8-Shared La	ne Calculat	ions					
Movement		7	8	9	10	11	12
		L	Т	R	L	Т	R
Volume (vph)	L \	6	2				
Novement Capacity (vp Shared Lane Capacity		23	3				
mared mane capacity	(vpii)						
Worksheet 9-Computati	on of Effec	et of Fla	ared Mir	nor Stre	et Appro	oaches	
Movement		7	8	9	10	11	12
		L	T	R	L	T	R
Sep		23	3				
/olume		6					
Delay							
) sep							
2 sep +1							
round (Qsep +1)							
n max							
C sh							
SUM C sep							
ו							
C act							
Worksheet 10-Delay, Q	nene Lenath	and Ta	evel of	Service			
					1.0	11	
	1 4	7	8	9	10	11	12
ane Config	LT	L					
(vph)	10	6					
C(m) (vph)	1597	233					
/(m) (vpii)	0.01	0.03					
95% queue length	0.02	0.08					
Control Delay	7.3	20.9		/	\		
LOS	A	C C	^				
Approach Delay	Δ.	C	20.9			<u> </u>	
Approach LOS			C C			/	
-PP-04011 100			~ \			\ /	
				7		77	
Worksheet 11-Shared M	ajor LT Imp	edance	and Dela	ìУ			_ /
			$\overline{}$	Movem	ent 2	Movem	ment 5
						<u> </u>	
o(oj)					00		() ()
				1.		0.	.99
(il), Volume for str				1		0	· 99
$\sigma(i1)$ , Volume for str $\sigma(i2)$ , Volume for str	eam 3 or 6					0	7 [
v(il), Volume for str v(i2), Volume for str s(il), Saturation flo	eam 3 or 6 w rate for					0 0 17	700
v(i1), Volume for str v(i2), Volume for str s(i1), Saturation flo s(i2), Saturation flo	eam 3 or 6 w rate for					0 0 17 17	700
r(il), Volume for str r(i2), Volume for str s(il), Saturation flo s(i2), Saturation flo o*(oj)	eam 3 or 6 w rate for w rate for	stream :				0 0 17 17	700 700 .99
r(il), Volume for str r(i2), Volume for str r(i1), Saturation flo r(i2), Saturation flo	eam 3 or 6 w rate for w rate for ream 1 or 4	stream :				0 0 17 17 0.	700 700 .99
(il), Volume for str (i2), Volume for str (i1), Saturation flo (i2), Saturation flo *(oj) (M,LT), Delay for st , Number of major st	eam 3 or 6 w rate for w rate for ream 1 or 4 reet throug	stream : h lanes				0 0 17 17	700 700 .99
v(il), Volume for str v(i2), Volume for str s(il), Saturation flo	eam 3 or 6 w rate for w rate for ream 1 or 4 reet throug	stream : h lanes				0 0 17 17 0.	700 700 .99



# 1.1.2 Memória de cálculo da análise de capacidade e níveis de serviço – Cenário ATUAL 2023 com o empreendimento sem ampliação do empreendimento

### 1.1.2.1 Interseção A – 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: Α Jurisdiction: DER/DE Units: U. S. Metric Analysis Year: 2023 Project ID: MOV01-MOV04 East/West Street: MOV04 North/South Street: Study period (hrs): 0.25 Intersection Orientation: EW \_Vehicle Volumes and Adjustments Major Street: Approach Eastbound Westbound Movement L Т R | L Т R Volume 22 1813 Peak-Hour Factor, PHF 0.91 1.00 Hourly Flow Rate, HFR 1992 22 Percent Heavy Vehicles Median Type/Storage Undivided RT Channelized? Lanes 2 0 Configuration Τ TR Upstream Signal? No No Minor Street: Northbound Southbound Approach 8 10 Movement 11 12 R Volume 26 Peak Hour Factor, PHF 0.91 Hourly Flow Rate, HFR 28 Percent Heavy Vehicles 0 Percent Grade (%) Flared Approach: Exists?/Storage Lanes 1 Configuration R Delay, Queue Length, and Level of Service WB Northbound Approach EΒ Southbound 4 10 Movement 1 8 11 12 Lane Config R v (vph) 2.8 C(m) (vph) 295 v/c 0.09 95% queue length 0.31 Control Delay 18.5 LOS С Approach Delay 18.5 Approach LOS С HCS+: Unsignalized Intersections Release 5.6



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 Manha Intersection: A

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): 0.25

	Vehicle V	olume	s and Ad	iustmer	nts		
Major Street Movements	- 1	2	3	4	5	6	
-	L	T	R	L	T	R	
Volume		1813	22				
Peak-Hour Factor, PHF		0.91	1.00				
Peak-15 Minute Volume		498	6				
Hourly Flow Rate, HFR		1992	22				
Percent Heavy Vehicles							
Median Type/Storage RT Channelized?	Undiv	rided		/			
Lanes		2	0				
Configuration		Т	TR				
Upstream Signal?		No			No		
Minor Street Movements	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume			26				
Peak Hour Factor, PHF			0.91				
Peak-15 Minute Volume			7				
Hourly Flow Rate, HFR			28				
Percent Heavy Vehicles			0				
Percent Grade (%)		0			0		
Flared Approach: Exist	s?/Storage	•		/			/
RT Channelized			No				
Lanes			1				
Configuration			R				

	Pedestrian V	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	

	Up	stream Si	gnal Dat	a		
Prog.	Sat	Arrival			_	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: Shared in volume, major rt vehicles: Sat flow rate, major th vehicles: Sat flow rate, major rt vehicles:



Vorksheet	t 4-Crit	ical Ga	ap and :	Follow-	up Time	Calcula	ation		
Critical	Gap Cal			7	0		1.0	11	10
Movement		1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
		-	-	_	-	10	-	-	10
(c,base)	)					6.2			
(c,hv)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
(hv) (c,g)				0.20	0.20	0 0.10	0.20	0.20	0.10
ercent G	Grade			0.00	0.00	0.00	0.00	0.00	0.00
(3,1t)						0.00			
(c,T):	_		0.00	0.00	0.00	0.00	0.00	0.00	0.00
(c)	2-stage 1-stage	0.00	0.00	1.00	1.00	0.00 6.2	1.00	1.00	0.00
(0)	2-stage					0.2			
	Time Ca						1.0		10
ovement		1 L	4 T.	7 L	8 T	9 R	10 L	11 T	12 R
		ь	ъ	ъ	1	1/	ъ	1	L/
(f,base)	)					3.30			
(f,HV)		0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
(HV)						0 3.3			
(f)						3.3			
otal Sat		Flow H	Rate, s	(vph)	V (*	Movement) V(	nt 2 1,prot)		vement 5 V(1,prot)
otal Sat rrival T ffective ycle Ler p (from roportic (q1) (q2)	Type e Green, ngth, C Exhibit	g (sec (sec) 16-11)	c) )						
Cotal Satarrival Tarrival Tarrival Tarrival Tarrival Tarrival Tarrival Tarrival (Grown reportion) (q1) (q2) (q1)	Type e Green, ngth, C Exhibit on vehic	g (sec) (sec) 16-11; les arr	c) ) riving (	on green	n P	on Time	blocke	V(t)	V(1,prot)
Cotal Satarrival Tarrival Tarr	Type e Green, ngth, C Exhibit on vehic	g (sec) (sec) 16-11; les arr	c) ) riving (	on green	n P	on Time	blocke	V(t)	V(1,prot)
V prog Total Sat Arrival T Effective Cycle Ler Rp (from Proportic g(q1) g(q2) g(q) Computati	Type e Green, ngth, C Exhibit on vehic	g (sec) (sec) 16-11; les arr	c) ) riving (	on green	n P ersectio	on Time	blockent 2	V(t)	V(1,prot)
Cotal Satarrival Tarrival Tarr	Type e Green, ngth, C Exhibit on vehic ion 2-Pro ime, t(a) g Factor, on of con- coned floored floored floored floored block	g (sec (sec) 16-11; les arrivoportion (sec), Fow, V(cow, V(cked per les arrivoportion) (sec), Fow, V(cked per les arrivoportion) (sec), Fow, V(cked per les arrivoportion) (sec)	on of Ti	on green	n P ersectio	on Time	blockent 2	ed Mov V(t)	V(1,prot)
Cotal Satarrival Taffective Eycle Ler Rycle Ler Rycle (19) (19) (19) (19) (19) (19) (19) (19)	Type e Green, ngth, C Exhibit on vehic  ion 2-Pro  ime, t(a. g Factor, on of col coned flo coned flo coned flo con time I	g (sec (sec) 16-11) les arrivoportion (sec), F nflict. ow, V((ow, V) (ked per blocked)	c)  riving  non of Ti  ing floc, max)  c, min)  riving  td, p	on green  WSC Inte	n P ersectio	on Time Movement V(	blockent 2	ed Mov V(t)	vement 5 V(1,prot)
Cotal Saturrival Tarrival Tarr	Type e Green, ngth, C Exhibit on vehic  ion 2-Pro  ime, t(a. g Factor, on of col coned flo coned flo coned flo con time I	g (sec (sec) 16-11) les arrivoportion (sec), F nflict. ow, V((ow, V) (ked per blocked)	c)  riving  non of Ti  ing floc, max)  c, min)  riving  td, p	on green  WSC Inte	Resi	on Time Movement b) V()	blockent 2	ed Mov V(t)	vement 5 V(1,prot)
cotal Saturival Tarrival Tarri	Type e Green, ngth, C Exhibit on vehic  ion 2-Pro  ime, t(a. g Factor, on of col coned flo coned flo coned flo con time I	g (sec (sec) 16-11) les arrivoportion (sec), F nflict. ow, V((ow, V) (ked per blocked)	c)  riving  non of Ti  ing floc, max)  c, min)  riving  td, p	on green  WSC Inte	n P ersectio	on Time Movement b) V()	blockent 2	ed Mov V(t)	vement 5 V(1,prot)
otal Sat rrival T ffective ycle Ler ycle Ler ycle (q1) (q2) (q1) omputati  lpha eta ravel ti moothing roportic fax plate uration roportic omputati  (2)	Type e Green, ngth, C Exhibit on vehic  ion 2-Pro  ime, t(a. g Factor, on of col coned flo coned flo coned flo con time I	g (sec (sec) 16-11) les arrivoportion (sec), F nflict. ow, V((ow, V) (ked per blocked)	c)  riving  non of Ti  ing floc, max)  c, min)  riving  td, p	on green  WSC Inte	Resi	on Time Movement b) V()	blockent 2	ed Mov V(t)	vement 5 V(1,prot)

Proportion
unblocked
for minor
movements, p(x) (1) Single-stage Process (2) (3)
Two-Stage Process
Stage I Stage II p(1) p(4) p(7) p(8)



				engennaria e m
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		R L	T R	
V c,x		1007		
s				
Px V c,u,x				
C r,x C plat,x				
Two-Stage Process				
7 Stage1 Stage2 St	8 age1 Stage2 Sta	10 .ge1 Stage2	11 Stagel Stage	e2
V(c,x) s				
P(x) V(c,u,x)				
C(r,x)				
C(plat,x)				
Worksheet 6-Impedance and Capaci	ty Equations			
Step 1: RT from Minor St.		9	12	
Conflicting Flows	1	007		
Potential Capacity		95	1 00	
Pedestrian Impedance Factor Movement Capacity		.00 95	1.00	
Probability of Queue free St.	0	.91	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		.00	1.00	
Movement Capacity Probability of Queue free St.	1	.00	1.00	
Step 4: LT from Minor St.	<u> </u>	7	10	
Conflicting Flows			+ $+$ $+$	\
Potential Capacity				
Pedestrian Impedance Factor Maj. L, Min T Impedance factor		.00	1.00	
Maj. L, Min T Adj. Imp Factor.			1.00	
Cap. Adj. factor due to Impeding Movement Capacity	mvmnt 1	.00	0.91	
<u> </u>		$\checkmark$	<del>-                                    </del>	_ 1117
Worksheet 7-Computation of the E	ffect of Two-stag	e Gap Accepta	ance	
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 mymnt 1.00 1.00 Movement Capacity Result for 2 stage process: а У Ĉt 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 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 1.00 Maj. L, Min T Adj. Imp Factor. 1.00 Cap. Adj. factor due to Impeding mvmnt 1.00 0.91 Movement Capacity Results for Two-stage process: а Сt Worksheet 8-Shared Lane Calculations Movement 8 11 12 10 Т L R L Т R 28 Volume (vph) Movement Capacity (vph) 295 Shared Lane Capacity (vph) Worksheet 9-Computation of Effect of Flared Minor Street Approaches Movement. 8 9 10 11 12 L Т R R L Т C sep 295 Volume 28 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

Worksheet 10-Delay,	Queue	Length,	and 1	evel o	r Service				
Movement	1	4	7	8	9	10	11	12	
Lane Config					R				
v (vph)					28				
C(m) (vph)					295				
v/c					0.09				
95% queue length					0.31				
Control Delay					18.5				
LOS					С				
Approach Delay				18.5					
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		

## 1.1.2.2 Interseção A – Pico Tarde

HCS+: Unsignalized Intersections Release 5.6

	TV	NO-WAY S	TOP CON'	TROL SU	JMMARY	<u></u>				
Analyst:	Pro	geplan								
Agency/Co.:										
Date Performed		06/2023								
Analysis Time		co Tarde								
Intersection:	A									
Jurisdiction:		R/DF								
Units: U. S. N										
Analysis Year:		-								
Project ID: A							1			
East/West Stre			4			/	\			
North/South St										
Intersection (	rientation:	EW		( 5	study	peri	od (hrs	): 0.25		
				\						
		nicle Vo		-	stmer					
Major Street:		E	astbound	/	' /	M	estboun		/ \	
	Movement	1	2	3	- 1	4	5	6	/ \	
		L	T	R		L	T	R	<b>」</b>	
					\_					
Volume			726	8	_ \					
Peak-Hour Fact			0.91	0.91	. \			7		
Hourly Flow Ra	,		797	8	7			1 ^		
Percent Heavy						_		\/ /		. \ \
Median Type/St		Undi	vided		/			) / /		7 1 1
RT Channelized	1?				_			-		$\rightarrow$
Lanes			2	0				1 1		11
Configuration			T :	ľR			1	\ \		///
Upstream Signa	11?		No				No			/ /
Minor Street:	Approach	N	orthbou	nd		S	outhbou			
	Movement	7	8	9	- 1	10	11	12		1
		L	Т	R		L	Т	R		
/olume				12						$\setminus$ $\cup$



Peak Hour Factor, PHF Hourly Flow Rate, HFR 0.91 13 Percent Heavy Vehicles Percent Grade (%) 0

Flared Approach: Exists?/Storage

Lanes 1 Configuration R

Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound 9 Movement 1 4 8 10 11 12 Lane Config R v (vph) 13 C(m) (vph) 653 v/c 0.02 95% queue length 0.06 Control Delay 10.6 LOS В Approach Delay 10.6 Approach LOS В

HCS+: Unsignalized Intersections Release 5.6

Phone: E-Mail: Fax:

0

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Progeplan Agency/Co.: 05/06/2023 Date Performed: Analysis Time Period: Pico Tarde Intersection: Α Jurisdiction: DER/DF Units: U. S. Metric Analysis Year: 2023 Project ID: AMPLIAÇÃO EDIFÍCIO East/West Street: MOV01-MOV04 North/South Street: MOV04

North/South Street:

Intersection Orientation: EW Study period (hrs): 0.25

	Vehicle V	/olumes	and Ad	justmen	ts		
Major Street Movements	_ 1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume		726	8		/		
Peak-Hour Factor, PHF		0.91	0.91		L		
Peak-15 Minute Volume		199	2 (			<b>)</b>	
Hourly Flow Rate, HFR		797	8			_ /	
Percent Heavy Vehicles			\			<del>\</del> - /	
Median Type/Storage	Undi	vided	/	//		\ \	
RT Channelized?							
Lanes		2	0				
Configuration		T T	R	\			
Upstream Signal?		No		, \	No		
						/ /	
Minor Street Movements	7	8	9	10	11	12	
	L	T	R	L	T	R /	
Volume			12	$\overline{}$			
Peak Hour Factor, PHF			0.91			1 1	
Peak-15 Minute Volume			3		<b>\</b>	\ \	
Hourly Flow Rate, HFR			13				
Percent Heavy Vehicles			0				
Percent Grade (%)		0			0	<b>\</b>	
Flared Approach: Exist	s?/Storage	9		/			/
RT Channelized			No				
Lanes			1			(	



Configuration R

Movements				umes an	_	_		
		=	L3	14	15	16		
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		
ercent Blockag	re	(	)	0	0	0		
			-	m Signa	_			
	Prog. Flow	Sat	Arri			Cycle Length	Prog.	Distance to Signal
		Flow	v Typ			_	Speed	_
	vph	vph		S	ec	sec	kph	meters
32 Left-Turn								
Through								
55 Left-Turn								
Through								
orksheet 3-Dat	a for Co	omputing	g Eitec	t of De	ıay to	Major S	treet V	enicles
					Movemer	nt 2	Moveme	nt 5
hared ln volum	ne. maio	r th vel	nicles:					
hared in volum								
at flow rate,								
at flow rate,								
imber of major								
	DULCCE	JIII Ougi		•				
ritical Gap Ca ovement	lculation 1	on 4 L	7 L	8 T	9 R	10 L	11 T	12 R
	ш	ш	ъ	1	I.	П	1	Λ
					6.2			
(c,base)					0.2		1 00	
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
c(c,base) c(c,hv) c(hv)	1.00	1.00	1.00	1.00		1.00	1.00	1.00
(c,hv)	1.00	1.00	1.00	1.00	1.00	0.20	0.20	1.00
(c,hv) (hv) (c,g)	1.00	1.00			1.00			
c(c,hv) P(hv) c(c,g) Percent Grade	1.00	1.00	0.20	0.20	1.00 0 0.10	0.20	0.20	0.10
c(c,hv) c(hv) c(c,g) Percent Grade c(3,lt)		0.00	0.20	0.20	1.00 0 0.10 0.00	0.20	0.20	0.10
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag	re 0.00	0.00	0.20 0.00	0.20 0.00	1.00 0 0.10 0.00 0.00 0.00	0.20 0.00	0.20 0.00	0.10 0.00
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag 2-stag	re 0.00 re 0.00		0.20	0.20	1.00 0 0.10 0.00 0.00 0.00	0.20	0.20	0.10
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag 2-stag (c) 1-stag	re 0.00 re 0.00	0.00	0.20 0.00	0.20 0.00	1.00 0 0.10 0.00 0.00 0.00	0.20 0.00	0.20 0.00	0.10 0.00
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag 2-stag	re 0.00 re 0.00	0.00	0.20 0.00	0.20 0.00	1.00 0 0.10 0.00 0.00 0.00	0.20 0.00	0.20 0.00	0.10 0.00
(c,hv) (hv) (c,g) ercent Grade (3,1t) (c,T): 1-stag 2-stag (c) 1-stag 2-stag Collow-Up Time	re 0.00 re 0.00 re re	0.00 0.00	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag	re 0.00 re 0.00 re re Calcula	0.00 0.00	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00 0.00
(c,hv) (hv) (c,g) rcent Grade (3,lt) (c,T): 1-stag 2-stag (c) 1-stag 2-stag 0llow-Up Time	re 0.00 re 0.00 re re	0.00 0.00	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag 2-stag (c) 1-stag 2-stag ollow-Up Time ovement	re 0.00 re 0.00 re re Calcula	0.00 0.00	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag 2-stag (c) 1-stag 2-stag collow-Up Time ovement (f,base)	re 0.00 re 0.00 re re Calcula	0.00 0.00	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00 0.00
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag 2-stag (c) 1-stag 2-stag  collow-Up Time ovement  (f,base) (f,HV)	re 0.00 re 0.00 re re re Calculat	0.00 0.00 tions 4 L	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag 2-stag (c) 1-stag 2-stag (ollow-Up Time (f,base) (f,HV) (HV)	re 0.00 re 0.00 re re re Calculat	0.00 0.00 tions 4 L	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00 0.00
(c,hv) (hv) (c,g) (ercent Grade (3,1t) (c,T): 1-stag 2-stag (c) 1-stag 2-stag (c) 1-stag (c) follow-Up Time (f,base) (f,HV) (HV)	re 0.00 re 0.00 re re re Calculat	0.00 0.00 tions 4 L	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00 0.00
(c,hv) (hv) (c,g) ercent Grade (3,1t) (c,T): 1-stag 2-stag (c) 1-stag 2-stag (c) 1-stag (c) f,base) (f,base) (f,HV) (HV) (f)	Calcular L 0.90	0.00 0.00 cions 4 L	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00 0.00
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag 2-stag (c) 1-stag 2-stag  collow-Up Time ovement  (f,base) (f,HV) (HV) (f)  orksheet 5-Eff	re 0.00 re 0.00 re re Calcular 1 L 0.90	0.00 0.00 tions 4 L 0.90	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag 2-stag (c) 1-stag 2-stag  collow-Up Time ovement  (f,base) (f,HV) (HV) (f)  orksheet 5-Eff	re 0.00 re 0.00 re re Calcular 1 L 0.90	0.00 0.00 tions 4 L 0.90	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2 9 R 3.30 0.90 0.3.3	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00 0.00
(c,hv) (hv) (c,g) ercent Grade (3,lt) (c,T): 1-stag 2-stag (c) 1-stag 2-stag (low-Up Time evement (f,base) (f,HV) (HV) (f) erksheet 5-Eff	re 0.00 re 0.00 re re Calcular 1 L 0.90	0.00 0.00 tions 4 L 0.90	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00 8 T 0.90	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2 9 R 3.30 0.90 0.3.3	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00 0.00
c(c,hv) c(hv) c(c,g) Percent Grade c(3,lt) c(c,T): 1-stag 2-stag c(c) 1-stag	re 0.00 re 0.00 re re Calcular 1 L 0.90	0.00 0.00 tions 4 L 0.90	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	1.00 0 0.10 0.00 0.00 0.00 0.00 6.2 9 R 3.30 0.90 0.3.3	0.20 0.00 0.00 1.00	0.20 0.00 0.00 1.00	0.10 0.00 0.00 0.00 0.00

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 (q2) g (q)



alpha								-
beta								
Travel time, t(a) (se	ec)							
Smoothing Factor, F								
Proportion of conflic		f						
Max platooned flow, V								
Min platooned flow, V								
Duration of blocked p Proportion time block			0.0	000		0.000		
Computation 3-Platoor		ods F	Result					-
								-
p(2)			0.000					
p(5) p(dom)		(	0.000					
p (dolli) p (subo)								
Constrained or uncons	strained?							
Proportion								-
Proportion unblocked	(1)		(2)		(3)			
for minor	Single-sta	age		Stage P				
movements, p(x)	Process	-	Stage I	J	Stage 1	II		
								-
p(1) p(4)								
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	Т	R	
V c,x				402				-
S								
Px								
V c,u,x								
C r,x								-
C plat,x								
Two-Stage Process								-
iwo blage fiodess	7	8		10		11	L	
Stage1	Stage2 Sta		age2 Sta		tage2 S			
V(c,x)								-
S					\			
P(x)					\			
V(c,u,x)								
C(r,x)			_					-
C(plat,x)						\		<b>\</b>
						11	/	- \
Worksheet 6-Impedance	and Canadi	ty Fanati	one					\
MOT VOILEEC 0-THINEGRICE	and capaci	cy Equali	10113	\				
Step 1: RT from Minor	r St.		4	9		12		/
				100		<del>/</del>		_ /
Conflicting Flows				102		1	> —	11/
Potential Capacity Pedestrian Impedance	Factor			.00		1.00	/	/////
Movement Capacity	1 0 0 0 1			553		1.00		445
Probability of Queue	free St.			.98		1.00	\	] ]
								_ //
Step 2: LT from Major	r St.			4		1		ノノー
Conflicting Flows								
Potential Capacity								1
Pedestrian Impedance	Factor		1	.00		1.00		<b>√</b>
Movement Capacity								



			origonina ia o m
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.	7	10	
Conflicting Flows Potential Capacity			
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 Movement Capacity	1.00	0.98	
Worksheet 7-Computation of the Effect of Tw	wo-stage Gap Acc	ceptance	
Step 3: TH from Minor St.	8	11	
Part 1 - First Stage Conflicting Flows		<u>-</u>	
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 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	<b>\</b>	\	
Pedestrian Impedance Factor	] [	\ \ \ /	\
Cap. Adj. factor due to Impeding mvmnt Movement Capacity			
Part 2 - Second Stage Conflicting Flows	7/	$\nearrow$	
Potential Capacity	7		
Pedestrian Impedance Factor			////
Cap. Adj. factor due to Impeding mvmnt Movement Capacity		$\rightarrow$	4
Part 3 - Single Stage			
Conflicting Flows Potential Capacity			// /
Pedestrian Impedance Factor	1.00	1.00	///
Maj. L, Min T Impedance factor		1.00	1
Maj. L, Min T Adj. Imp Factor.	1 00	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	0.98	



Movement Capacity

Results for Two-stage process: У С t Worksheet 8-Shared Lane Calculations Movement 8 9 10 11 12 Τ R R Volume (vph) 13 653 Movement Capacity (vph) Shared Lane Capacity (vph)

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

Movement	7	8	9	10	11	12
	L	T	R	L	T	R
C sep			653			
Volume			13			
Delay						
Q sep						
Q sep +1						
round (Qsep +1)						
n max						
C sh						
SUM C sep						
n						
C act						

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

Movement	1	4	7	8	9	10	11	12
Lane Config					R			
v (vph)					13			
C(m) (vph)					653			
v/c					0.02			
95% queue length					0.06			
Control Delay					10.6			
LOS					В			
Approach Delay				10.6				
Approach LOS				В				

1.00

Worksheet 11-Shared Major LT Impedance and Delay

Movement 2 Movement 5 1.00 p(oj) v(il), 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) N, Number of major stream 1 or 4 N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5

### 1.1.2.3 Interseção B – Pico Manhã

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: Agency/Co.: Progeplan