

HCS2000: Signalized Intersections Release 4.1

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: 10th Street/Railroad Ave  
 Agency/Co.: WesPac Energy, Pittsburg LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: AM Peak Hour-Existing  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg Traffic Impact Study  
                     East/West Street                      North/South Street  
                     10th Street                                  Railroad Avenue

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Num. Lanes	1	1	1	1	1	0	1	1	1	1	1	1
Volume	8	147	208	62	251	25	163	154	47	72	248	20
Parking		N			Y			N			N	
Coord.		N			N			N			N	
LT Treat.	P			P			P			P		
Peak hour factor:	0.90			Area Type: CBD or Similar								



LANE VOLUME WORKSHEET

	EAST	WEST	NORTH	SOUTH
	BOUND	BOUND	BOUND	BOUND

LEFT TURN MOVEMENT

- 1. LT volume 8 62 163 72
- 2. Opposing mainline volume 276 355 268 201
- 3. Number of exclusive LT lanes 1 1 1 1
- Cross Product [2] \* [1] 2208 22010 43684 14472

Left Lane Configuration (E=Excl, S=Shrd) :  
 Left Turn Treatment Type: E E E E  
 P P P P

- 4. LT adjustment factor 0.950 0.950 0.950 0.950
- 5. LT lane vol 8 65 172 76

RIGHT TURN MOVEMENT

- Right Lane Configuration (E=Excl, S=Shrd)
- 6. RT volume E 208 S 25 E 47 E 20
  - 7. Exclusive lanes 1 0 1 1
  - 8. RT adjustment factor 0.850 0.850 0.850 0.850
  - 9. Exclusive RT lane volume 245 29 55 24
  - 10. Shared lane vol

THROUGH MOVEMENT

- 11. Thru volume 147 251 154 248
- 12. Parking adjustment factor 1.00 0.80 1.00 1.00
- 13. No. of thru lanes including shared 1 1 1 1
- 14. Total approach volume 147 350 154 248
- 15. Prop. of left turns in lane group 0.00 0.00 0.00 0.00
- 16. Left turn equivalence
- 17. LT adj. factor: 147 350 154 248
- 18. Through lane volume 245 350 154 248
- 19. Critical lane volume

Left Turn Check (lf [16] > 3.5)

0. Permitted left turn sneaker capacity:  
7200/Cmax

SIGNAL OPERATIONS WORKSHEET

Phase Plan Selection from Lane Volume Worksheet	EAST		WEST		NORTH		SOUTH	
	BOUND	BOUND	BOUND	BOUND	BOUND	BOUND	BOUND	BOUND
Critical through-RT vol: [119]	245	350	154	248				
LT lane vol: [5]	8	65	172	76				
Left turn protection: (P/U/N)	P	P	P	P				
Dominant left turn: (Indicate by '<')		<	<	<				

Selection Criteria based on the specified left turn protection

Plan 1:	U	U	U	U
Plan 2a:	U	P	U	P
Plan 2b:	P	U	P	U
Plan 3a:	<P	P	<P	P
Plan 3b:	P	<P	P	<P
Plan 4:	N	N	N	N

< Indicates the dominant left turn for each opposing pair

Phase plan selected (1 to 4)

Min. cycle (Cmin) 60      Max. cycle (Cmax) 120

Timing Plan	Value	EAST-WEST			NORTH-SOUTH		
		Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3
Movement codes							
Critical phase vol [CV]	778	EWL	WTL	EWT	NSL	NTL	NST
Critical sum [CS]	8	8	57	293	76	96	248
CBD adjustment [CBD]	0.90						
Reference sum [RS]	1385						
Lost time/phase [PL]	4	4	0	4	4	0	4
Lost time/cycle [TL]	16						
Cycle length [CYC]	60.0						
Phase time		4.5	3.2	20.6	8.3	5.4	18.0
Critical v/c Ratio [Xcm]	0.77						
Status	Under capacity						

Phase plan selected (1 to 4)

3b      3a

HCS2000: Signalized Intersections Release 4.1

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: 10th Street/Railroad Ave  
 Agency/Co.: WestPac Energy, Pittsburg LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: AM Peak Hour-Existing/Cons  
 Analysis Year: 2011  
 Project ID: WestPac Energy, Pittsburg Traffic Impact Study  
 East/West Street North/South Street  
 10th Street Railroad Avenue

VOLUME DATA

Num. Lanes	Eastbound		Westbound		Northbound		Southbound	
	L	T	L	T	L	T	L	T
1	1	1	1	0	1	1	1	1
8	147	208	62	314	25	203	154	47
Volume								
Parking Coord.	N	N	Y	N	N	N	N	N
LT Treat.	P	N	P	N	P	P	N	P
Peak hour factor:	0.90		Area Type: CBD or Similar					

LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	------------	------------	-------------	-------------

LEFT TURN MOVEMENT

1. LT volume	8	62	203	72
2. Opposing mainline volume	339	355	268	201
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	2712	22010	54404	14472

Left Lane Configuration (E=Excl, S=Shrd):  
 Left Turn Treatment Type:

4. LT adjustment factor	E	E	E	E
5. LT lane vol	P	P	P	P
	0.950	0.950	0.950	0.950
	8	65	214	76

RIGHT TURN MOVEMENT

Right Lane Configuration (E=Excl, S=Shrd)

6. RT volume	E	S	E	E
7. Exclusive lanes	208	25	47	20
8. RT adjustment factor	1	0	1	1
9. Exclusive RT lane volume	0.850	0.850	0.850	0.850
10. Shared lane vol	245	29	55	24

THROUGH MOVEMENT

11. Thru volume	147	314	154	248
12. Parking adjustment factor	1.00	0.80	1.00	1.00
13. No. of thru lanes including shared	1	1	1	1
14. Total approach volume	147	429	154	248
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalence				
17. LT adj. factor:				
18. Through lane volume	147	429	154	248
19. Critical lane volume	245	429	154	248

Left Turn Check (if [16] > 3.5)

0. Permitted left turn sneaker capacity:  
7200/Cmax

SIGNAL OPERATIONS WORKSHEET

Phase Plan Selection from Lane Volume Worksheet	EAST		WEST		NORTH		SOUTH	
	BOUND	BOUND	BOUND	BOUND	BOUND	BOUND	BOUND	
Critical through-RT vol: [19]	245	429	154	248				
LT lane vol: [5]	8	65	214	76				
Left turn protection: (P/U/N)	P	P	P	P				
Dominant left turn: (Indicate by '<')	<	<	<	<				

Selection Criteria based on the specified left turn protection

Plan 1:	U	U	U	U
Plan 2a:	U	P	U	P
Plan 2b:	P	U	P	U
Plan 3a:	<P	P	<P	P
Plan 3b:	P	<P	P	<P
Plan 4:	N	N	N	N

< Indicates the dominant left turn for each opposing pair

Phase plan selected (1 to 4) 3b 3a

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan	Value	EAST-WEST			NORTH-SOUTH		
		Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3

Movement codes							
Critical phase vol [CV]	899	EWL	WTL	EWT	NSL	NTL	NST
Critical sum [CS]	8	57	372	76	138	248	
CBD adjustment [CBD]	0.90						
Reference sum [RS]	1385						
Lost time/phase [PL]	4	0	4	4	0	4	
Lost time/cycle [TL]	16						
Cycle length [CYC]	60.0						
Phase time		4.4	2.8	22.2	7.7	6.8	16.1
Critical v/c Ratio [Xcm]	0.89						
Status	Near capacity						

HCS2000: Signalized Intersections Release 4.1

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: 10th Street/Railroad Ave  
 Agency/Co.: WestPac Energy, Pittsburg LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: AM Peak Hour-Existing/Ops  
 Analysis Year: 2011  
 Project ID: WestPac Energy, Pittsburg Traffic Impact Study  
 East/West Street North/South Street  
 10th Street Railroad Avenue

VOLUME DATA

Num. Lanes	Eastbound		Westbound		Northbound		Southbound	
	L	T	L	R	L	T	L	T
8	147	208	62	25	164	47	72	20
Parking	N	N	Y	N	N	N	N	N
Coord.	N	N	N	N	N	N	N	N
LT Treat.	P	P	P	P	P	P	P	P
Peak hour factor:	0.90		Area Type: CBD or Similar					



LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	------------	------------	-------------	-------------

LEFT TURN MOVEMENT

1. LT volume	8	62	164	72
2. Opposing mainline volume	278	355	268	201
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	2224	22010	43952	14472

Left Lane Configuration (E=Excl, S=Shrd):  
 Left Turn Treatment Type:

4. LT adjustment factor	E	E	E	E
5. LT lane vol	P	P	P	P
	0.950	0.950	0.950	0.950
	8	65	173	76

RIGHT TURN MOVEMENT

Right Lane Configuration (E=Excl, S=Shrd)

6. RT volume	E	S	E	E
7. Exclusive lanes	208	25	47	20
8. RT adjustment factor	1	0	1	1
9. Exclusive RT lane volume	0.850	0.850	0.850	0.850
10. Shared lane vol	245	29	55	24

THROUGH MOVEMENT

11. Thru volume	147	253	154	248
12. Parking adjustment factor	1.00	0.80	1.00	1.00
13. No. of thru lanes including shared	1	1	1	1
14. Total approach volume	147	352	154	248
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalence				
17. LT adj. factor:				
18. Through lane volume	147	352	154	248
19. Critical lane volume	245	352	154	248

Left Turn Check (if [16] > 3.5)



HCS2000: Signalized Intersections Release 4.1

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: 10th Street/Railroad Ave  
 Agency/Co.: WestPac Energy, Pittsburg LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: PM Peak Hour-Existing  
 Analysis Year: 2011  
 Project ID: WestPac Energy, Pittsburg Traffic Impact Study  
 East/West Street North/South Street  
 10th Street Railroad Avenue

VOLUME DATA

Num. Lanes	Eastbound		Westbound		Northbound		Southbound	
	L	T	L	T	L	T	L	T
1	1	1	1	1	1	1	1	1
27	224	150	96	197	46	134	227	99
Parking Coord.	N	N	Y	N	N	N	N	N
LT Treat.	P	N	P	N	P	P	N	N
Peak hour factor:	0.90		Area Type: CBD or Similar					

LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	------------	------------	-------------	-------------

LEFT TURN MOVEMENT

1. LT volume	27	96	134	32
2. Opposing mainline volume	243	374	172	326
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	6561	35904	23048	10432

Left Lane Configuration (E=Excl, S=Shrd):  
 Left Turn Treatment Type:

4. LT adjustment factor	E 0.950	E 0.950	E 0.950	E 0.950
5. LT lane vol	P 28	P 101	P 141	P 34

RIGHT TURN MOVEMENT

Right Lane Configuration (E=Excl, S=Shrd)

6. RT volume	E 150	S 46	E 99	E 20
7. Exclusive lanes	1	0	1	1
8. RT adjustment factor	0.850	0.850	0.850	0.850
9. Exclusive RT lane volume	176		116	24
10. Shared lane vol		54		

THROUGH MOVEMENT

11. Thru volume	224	197	227	152
12. Parking adjustment factor	1.00	0.80	1.00	1.00
13. No. of thru lanes including shared	1	1	1	1
14. Total approach volume	224	314	227	152
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalence				
17. LT adj. factor:	224	314	227	152
18. Through lane volume	224	314	227	152
19. Critical lane volume				

Left Turn Check (if [16] > 3.5)

0. Permitted left turn sneaker capacity:  
7200/Cmax

SIGNAL OPERATIONS WORKSHEET

Phase Plan Selection from Lane Volume Worksheet	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Critical through-RT vol: [19]	224	314	227	152
LT lane vol: [5]	28	101	141	34
Left turn protection: (P/U/N)	P	P	P	P
Dominant left turn: (Indicate by '<')	<	<	<	<

Selection Criteria based on the specified left turn protection

Plan	1:	U	U	U	U
Plan 2a:	U	P	U	P	P
Plan 2b:	P	U	P	U	U
Plan 3a:	<P	P	<P	P	P
Plan 3b:	P	<P	P	<P	<P
Plan 4:	N	N	N	N	N

< Indicates the dominant left turn for each opposing pair

Phase plan selected (1 to 4) 3b 3a

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan	Value	EAST-WEST			NORTH-SOUTH		
		Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3

Movement codes							
Critical phase vol [CV]	635	EWL 28	WTL 73	EWT 241	NSL 34	NTL 107	NST 152
Critical sum [CS]	0.90						
CBD adjustment [CBD]	1385						
Reference sum [RS]		4	0	4	4	0	4
Lost time/phase [PL]	16						
Lost time/cycle [TL]	60.0						
Cycle length [CYC]		5.9	5.1	20.7	6.4	7.4	14.5
Phase time							
Critical v/c Ratio [Xcm]	0.63						
Status	Under capacity						

HCSS2000: Signalized Intersections Release 4.1

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: 10th Street/Railroad Ave  
 Agency/Co.: WestPac Energy, Pittsburg LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: PM Peak Hour-Existing/Const  
 Analysis Year: 2011  
 Project ID: WestPac Energy, Pittsburg Traffic Impact Study  
 East/West Street North/South Street  
 10th Street Railroad Avenue

VOLUME DATA

Num. Lanes	Eastbound		Westbound		Northbound		Southbound	
	L	T	L	T	L	T	L	T
27	1	1	1	0	1	1	1	1
Volume	287	190	96	46	134	227	99	32
Parking Coord.	N	N	Y	N	N	N	N	N
LT Treat.	P		P		P		P	
Peak hour factor:	0.90							
Area Type:	CBD or Similar							

LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	------------	------------	-------------	-------------

LEFT TURN MOVEMENT

1. LT volume	27	96	134	32
2. Opposing mainline volume	243	477	172	326
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	6561	45792	23048	10432

Left Lane Configuration (E=Excl, S=Shrd):

Left Turn Treatment Type:	E	E	E	E
	P	P	P	P

4. LT adjustment factor	0.950	0.950	0.950	0.950
5. LT lane vol	28	101	141	34

RIGHT TURN MOVEMENT

Right Lane Configuration (E=Excl, S=Shrd)

6. RT volume	E	S	E	E
	190	46	99	20
7. Exclusive lanes	1	0	1	1
8. RT adjustment factor	0.850	0.850	0.850	0.850
9. Exclusive RT lane volume	224		116	24
10. Shared lane vol		54		

THROUGH MOVEMENT

11. Thru volume	287	197	227	152
12. Parking adjustment factor	1.00	0.80	1.00	1.00
13. No. of thru lanes including shared	1	1	1	1
14. Total approach volume	287	314	227	152
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalence				
17. LT adj. factor:	287	314	227	152
18. Through lane volume	287	314	227	152
19. Critical lane volume	287	314	227	152

Left Turn Check (if [16] > 3.5)

0. Permitted left turn sneaker capacity:  
7200/Cmax

SIGNAL OPERATIONS WORKSHEET

Phase Plan Selection from Lane Volume Worksheet	EAST		WEST		NORTH		SOUTH	
	BOUND	BOUN	BOUND	BOUN	BOUND	BOUN	BOUND	BOUN
Critical through-RT vol: [19]	287		314		227		152	
LT lane vol: [5]	28		101		141		34	
Left turn protection: (P/U/N)	P		P		P		P	
Dominant left turn: (Indicate by '<')			<		<			

Selection Criteria based on the specified left turn protection

Plan 1:	U	U	U	U
Plan 2a:	U	P	U	P
Plan 2b:	P	U	P	U
Plan 3a:<P	P	<P	P	P
Plan 3b:	P	<P	P	<P
Plan 4:	N	N	N	N

< Indicates the dominant left turn for each opposing pair

Phase plan selected (1 to 4) 3b 3a

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan	Value	EAST-WEST			NORTH-SOUTH		
		Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3

Movement codes								
Critical phase vol [CV]	681	EWL	WTL	EWT	NSL	NTL	NST	
Critical sum [CS]	28	28	73	287	34	107	152	
CBD adjustment [CBD]	0.90							
Reference sum [RS]	1385							
Lost time/phase [PL]	4		0	4		4	0	4
Lost time/cycle [TL]	16							
Cycle length [CYC]	60.0							
Phase time	5.8		4.7	22.5		6.2	6.9	13.8
Critical v/c Ratio [Xcm]	0.67							
Status	Under capacity							



HCSS2000: Signalized Intersections Release 4.1

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: 10th Street/Railroad Ave  
 Agency/Co.: WestPac Energy, Pittsburg LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: PM Peak Hour-Existing/Ops  
 Analysis Year: 2011  
 Project ID: WestPac Energy, Pittsburg Traffic Impact Study  
 East/West Street North/South Street  
 10th Street Railroad Avenue

VOLUME DATA

Num. Lanes	Eastbound		Westbound		Northbound		Southbound	
	L	T	L	T	L	T	L	T
1	1	1	1	1	1	1	1	1
27	226	151	96	197	46	134	227	99
Parking Coord.	N	N	Y	N	N	N	N	N
LT Treat.	P	N	P	N	P	P	P	P
Peak hour factor:	0.90		Area Type: CBD or Similar					

LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	------------	------------	-------------	-------------

LEFT TURN MOVEMENT

1. LT volume	27	96	134	32
2. Opposing mainline volume	243	377	172	326
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	6561	36192	23048	10432

Left Lane Configuration (E=Excl, S=Shrd) :  
 Left Turn Treatment Type: E P E P E P E P

4. LT adjustment factor	0.950	0.950	0.950	0.950
5. LT lane vol	28	101	141	34

RIGHT TURN MOVEMENT

	E	S	E	E
Right Lane Configuration (E=Excl, S=Shrd)	E	S	E	E
6. RT volume	151	46	99	20
7. Exclusive lanes	1	0	1	1
8. RT adjustment factor	0.850	0.850	0.850	0.850
9. Exclusive RT lane volume	178		116	24
10. Shared lane vol		54		

THROUGH MOVEMENT

11. Thru volume	226	197	227	152
12. Parking adjustment factor	1.00	0.80	1.00	1.00
13. No. of thru lanes including shared	1	1	1	1
14. Total approach volume	226	314	227	152
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalence				
17. LT adj. factor:	226	314	227	152
18. Through lane volume	226	314	227	152
19. Critical lane volume	226	314	227	152

Left Turn Check (lf [16] > 3.5)



TWO-WAY STOP CONTROL SUMMARY

Analyst: Brent Moore  
 Agency/Co.: WesPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: AM Peak Hour - Existing  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street:	Approach	Eastbound	Westbound
Movement			
L	T	R   L	T R
		1	2 3   4 5 6

Volume	9	175	1	3	367	8
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	9	175	1	3	367	8
Percent Heavy Vehicles	1	--	--	1	--	--
Median Type	Undivided					
RT Channelized?	No					
Lanes	1	1	0	0	1	1
Configuration	L	TR		LT	R	
Upstream Signal?	No					

Minor Street:	Approach	Northbound	Southbound
Movement			
L	T	R   L	T R
		7	8 9   10 11 12

Volume	1	1	0	3
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00

Hourly Flow Rate, HFR 1 1 1 0 3  
 Percent Heavy Vehicles 1 1 1 1 1  
 Percent Grade (%) 0 0 0 0 1  
 Median Storage  
 Flared Approach: Exists?

RT Channelized? No No No  
 Storage

Lanes 1 1 1 1 1  
 Configuration L R L R

Delay, Queue Length, and Level of Service \_\_\_\_\_

Approach	EB	WB	Northbound	Southbound
Movement	1	4   7	8	9   10
Lane Config	L	LT   L	R   L	R
v (vph)	9	3	1	0
C(m) (vph)	1189	1406	427	870
v/c	0.01	0.00	0.00	0.00
95% queue length	0.02	0.01	0.01	0.00
Control Delay	8.1	7.6	13.5	9.1
LOS	A	A	B	B
Approach Delay			11.3	10.3
Approach LOS			B	B

HCS2000: Unsignalized Intersections Release 4.1

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-Mail: \_\_\_\_\_

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

Analyst: Brent Moore  
 Agency/Co.: WestPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: AM Peak Hour - Existing  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WestPac Energy, Pittsburg, LLC  
 EastWest Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street Movements

L	T	R	L	T	R
---	---	---	---	---	---

Volume	9	175	1	3	367	8
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Peak-15 Minute Volume	2	44	0	1	92	2
Hourly Flow Rate, HFR	9	175	1	3	367	8
Percent Heavy Vehicles	1	--	--	1	--	--

Median Type: Undivided  
 RT Channelized?: No  
 Lanes: 1 1 0 0 1 1  
 Configuration: L TR LT R  
 Upstream Signal?: No

Minor Street Movements

L	T	R	L	T	R
---	---	---	---	---	---

Volume	1	1	0	3
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00
Peak-15 Minute Volume	0	0	0	1
Hourly Flow Rate, HFR	1	1	0	3
Percent Heavy Vehicles	1	1	1	1
Percent Grade (%)	0	0	0	0
Median Storage				

Flared Approach: Exists?

Storage

RT Channelized?

1

1

1

1

No

Lanes Configuration

L

R

L

R

Pedestrian Volumes and Adjustments

Movements

13

14

15

16

Flow (ped/hr)

0

0

0

0

Lane Width (ft)

12.0

12.0

12.0

12.0

Walking Speed (ft/sec)

4.0

4.0

4.0

4.0

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

mph

feet

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: 367

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: 1

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical Gap Calculation

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(c,base)	4.1	4.1	7.1		6.2	7.1		6.2
t(c,hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)	1	1	1	1	1	1	1	1
t(c,g)		0.20	0.20	0.10	0.20	0.20	0.20	0.10
Grade/100		0.00	0.00	0.00	0.00	0.00	0.00	0.00
t(3.lt)	0.00	0.00	0.00		0.00	0.00		0.00
t(c,T): 1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage	4.1	4.1	7.1	6.2	7.1		6.2
	2-stage							

Follow-Up Time Calculations

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(f,base)	2.20	2.20	3.50		3.30	3.50		3.30
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)	1	1	1	1	1	1	1	1
t(f)	2.2	2.2	3.5		3.3	3.5		3.3

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

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

V prog

Total Saturation Flow Rate, s (vph)

Arrival Type

Effective Green, g (sec)

Cycle Length, C (sec)

Rp (from table 9-2)

Proportion vehicles arriving on green P



g(q1)  
g(q2)  
g(q)

Computation 2-Proportion of TWSC Intersection Time blocked  
Movement 2      Movement 5  
V(t)   V(l,prot)   V(t)   V(l,prot)

alpha  
beta  
Travel time, t(a) (sec)  
Smoothing Factor, F  
Proportion of conflicting flow, f  
Max platooned flow, V(c,max)  
Min platooned flow, V(c,min)  
Duration of blocked period, t(p)  
Proportion time blocked, p      0.000      0.000

Computation 3-Platoon Event Periods      Result  
p(2)      0.000  
p(5)      0.000

p(dom)  
p(subo)  
Constrained or unconstrained?

Proportion unblocked for minor movements, p(x)

	(1) Single-stage Process	(2) Two-Stage Process Stage I	(3) Two-Stage Process Stage II
p(1)			
p(4)			
p(7)			
p(8)			
p(9)			
p(10)			
p(11)			
p(12)			

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<sub>c,x</sub>      375   176   572      176   567      367

S

P<sub>x</sub>

V<sub>c,u,x</sub>

C<sub>r,x</sub>

C<sub>plat,x</sub>

Two-Stage Process

	7	8	10	11
Stage1	Stage2	Stage1	Stage2	Stage1
	Stage2	Stage1	Stage2	Stage1
		Stage2	Stage1	Stage2

V<sub>(c,x)</sub>

1700

1700

P(x)

V<sub>(c,u,x)</sub>

C<sub>(r,x)</sub>

C<sub>(plat,x)</sub>

Worksheet 6-Impedance and Capacity Equations

Step 1: RT from Minor St.      9      12

Conflicting Flows

Potential Capacity

Pedestrian Impedance Factor

Movement Capacity

Probability of Queue free St.

176      367

870      681

1.00      1.00

870      681

1.00      1.00

Step 2: LT from Major St.      4      1

Conflicting Flows	176	375
Potential Capacity	1406	1189
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	1406	1189
Probability of Queue free St.	1.00	0.99
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 mvmt	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	572	567
Potential Capacity	432	436
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.99	0.99
Maj. L, Min T Adj. Imp Factor.	0.99	0.99
Cap. Adj. factor due to Impeding mvmt	0.99	0.99
Movement Capacity	427	432

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 mvmt	
Movement Capacity	
Probability of Queue free St.	

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

Part 3 - Single Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

	1.00	1.00
	0.99	0.99

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 mvmt  
 Movement Capacity

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

Part 3 - Single Stage  
 Conflicting Flows      572      567  
 Potential Capacity      432      436

Pedestrian Impedance Factor 1.00 1.00  
 Maj. L, Min T Impedance factor 0.99 0.99  
 Maj. L, Min T Adj. Imp Factor. 0.99 0.99  
 Cap. Adj. factor due to Impeding mvmt 0.99 0.99  
 Movement Capacity 427 432

Results for Two-stage process:

a  
 y 427 432  
 C t

Worksheet 8-Shared Lane Calculations

Movement 7 8 9 10 11 12  
 L T R L T R

Volume (vph) 1 1 0 3  
 Movement Capacity (vph) 427 870 432 681  
 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 427 870 432 681  
 Volume 1 1 0 3  
 Delay  
 Q sep  
 Q sep +1  
 round (Qsep +1)

n max  
 C sh  
 SUM C sep  
 n  
 C act

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

Movement	1	4	7	8	9	10	11	12
Lane Config	L	LT	L		R	L		R

v (vph)	9	3	1	1	0	3		
C(m) (vph)	1189	1406	427	870	432	681		
v/c	0.01	0.00	0.00	0.00	0.00	0.00		
95% queue length	0.02	0.01	0.01	0.00	0.00	0.01		
Control Delay	8.1	7.6	13.5	9.1	13.3	10.3		
LOS	A	A	B	A	B	B		
Approach Delay			11.3			10.3		
Approach LOS			B			B		

Worksheet 11-Shared Major LT Impedance and Delay

Movement 2	Movement 5
------------	------------

p(oj)	0.99	1.00		
v(i1), Volume for stream 2 or 5		367		
v(i2), Volume for stream 3 or 6		0		
s(i1), 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,L,LT), Delay for stream 1 or 4		8.1		7.6
N, Number of major street through lanes				1
d(rank, 1) Delay for stream 2 or 5				0.0

TWO-WAY STOP CONTROL SUMMARY

Analyst: Brent Moore  
 Agency/Co.: WesPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: AM Peak Hour - Existing/Const  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound	Westbound
Movement 1	2 3   4 5 6	
L T	R   L T R	

Volume	112	175	1	3	367	111
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	112	175	1	3	367	111
Percent Heavy Vehicles	1	--	--	1	--	--
Median Type	Undivided		No			
RT Channelized?	No					
Lanes	1	1	0	0	1	1
Configuration	L	TR		LT	R	
Upstream Signal?	No		No			

Minor Street: Approach	Northbound	Southbound
Movement 7	8 9   10 11 12	
L T	R   L T R	

Volume	1	1	0	3
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00

Hourly Flow Rate, HFR 1 1 1 0 3  
 Percent Heavy Vehicles 1 1 1 1 1  
 Percent Grade (%) 0 0 0 0 1

Median Storage  
 Flared Approach: Exists?  
 Storage

RT Channelized? No No No  
 Lanes 1 1 1 1  
 Configuration L R L R

Delay, Queue Length, and Level of Service \_\_\_\_\_

Approach	EB		WB		Northbound		Southbound	
	1	4	7	8	9	10	11	12
Movement	L	LT	L	R	L	L	R	R
Lane Config	L	LT   L	L	R   L	R	L   L	R	R
v (vph)	112	3	1	1	1	0	3	
C(m) (vph)	1090	1406	265	265	0.00	0.00	291	681
v/c	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95% queue length	0.34	0.01	0.01	0.01	0.00	0.00	0.00	0.01
Control Delay	8.7	7.6	18.6	9.1	17.4	10.3		
LOS	A	A	C	A	A	C	B	
Approach Delay				13.9			10.3	
Approach LOS				B			B	

HCSS2000: Unsignalized Intersections Release 4.1

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-Mail: \_\_\_\_\_

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



Analyst: Brent Moore  
 Agency/Co.: WesPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: AM Peak Hour - Existing/Const  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Major Street Movements Vehicle Volumes and Adjustments  
 L T R L T R

Volume 112 175 1 3 367 111  
 Peak-Hour Factor, PHF 1.00 1.00 1.00 1.00 1.00 1.00  
 Peak-15 Minute Volume 28 44 0 1 92 28  
 Hourly Flow Rate, HFR 112 175 1 3 367 111  
 Percent Heavy Vehicles 1 -- -- 1 -- --  
 Median Type Undivided  
 RT Channelized? No  
 Lanes 1 1 0 0 1 1  
 Configuration L TR LT R  
 Upstream Signal? No No

Minor Street Movements 7 8 9 10 11 12  
 L T R L T R

Volume 1 1 0 3  
 Peak Hour Factor, PHF 1.00 1.00 1.00 1.00  
 Peak-15 Minute Volume 0 0 0 0  
 Hourly Flow Rate, HFR 1 1 0 3  
 Percent Heavy Vehicles 1 1 1 1  
 Percent Grade (%) 0 0 0 0  
 Median Storage

Flared Approach: Exists?

Storage

RT Channelized?

Lanes 1 1 1 1 No

Configuration L R L R

Pedestrian Volumes and Adjustments

Movements 13 14 15 16

Flow (ped/hr) 0 0 0 0  
Lane Width (ft) 12.0 12.0 12.0 12.0  
Walking Speed (ft/sec) 4.0 4.0 4.0 4.0  
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 mph feet

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: 367  
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: 1

Worksheet 4-Critical Gap and Follow-up Time Calculation

**Critical Gap Calculation**

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(c,base)	4.1	4.1	7.1		6.2	7.1		6.2
t(c,hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)	1	1	1	1	1	1	1	1
t(c,g)		0.20	0.20	0.10	0.20	0.20	0.20	0.10
Grade/100		0.00	0.00	0.00	0.00	0.00	0.00	0.00
t(3,lt)	0.00	0.00	0.00		0.00	0.00		0.00
t(c,T): 1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage	4.1	4.1	7.1	6.2	7.1		6.2
	2-stage							

**Follow-Up Time Calculations**

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R

t(f,base)	2.20	2.20	3.50		3.30	3.50		3.30
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)	1	1	1	1	1	1	1	1
t(f)	2.2	2.2	3.5		3.3	3.5		3.3

**Worksheet 5-Effect of Upstream Signals**

**Computation 1-Queue Clearance Time at Upstream Signal**

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

**V prog**

Total Saturation Flow Rate, s (vph)

Arrival Type

Effective Green, g (sec)

Cycle Length, C (sec)

Rp (from table 9-2)

Proportion vehicles arriving on green P

g(q1)  
g(q2)  
g(q)

Computation 2-Proportion of TWSC Intersection Time blocked  
Movement 2      Movement 5  
V(t)   V(l,prot)   V(t)   V(l,prot)

alpha  
beta  
Travel time, t(a) (sec)  
Smoothing Factor, F  
Proportion of conflicting flow, f  
Max platooned flow, V(c,max)  
Min platooned flow, V(c,min)  
Duration of blocked period, t(p)  
Proportion time blocked, p      0.000      0.000

Computation 3-Platoon Event Periods      Result  
p(2)      0.000  
p(5)      0.000  
p(dom)  
p(subo)  
Constrained or unconstrained?

Proportion unblocked for minor movements, p(x)

	(1) Single-stage Process	(2) Two-Stage Process Stage I	(3) Two-Stage Process Stage II
p(1)			
p(4)			
p(7)			
p(8)			
p(9)			
p(10)			
p(11)			
p(12)			

p(1)  
p(4)  
p(7)  
p(8)  
p(9)  
p(10)  
p(11)  
p(12)

Computation 4 and 5

Single-Stage Process											
Movement	L	L	L	T	R	L	T	R			
	1	4	7	8	9	10	11	12			

V<sub>c,x</sub> 478 176 830 176 773 367

S

P<sub>x</sub>

V<sub>c,u,x</sub>

C<sub>r,x</sub>

C<sub>plat,x</sub>

Two-Stage Process

	7	8	10	11
Stage1	Stage2	Stage1	Stage2	Stage1
Stage2	Stage1	Stage2	Stage1	Stage2

V<sub>(c,x)</sub>

1700

1700

P<sub>(x)</sub>

V<sub>(c,u,x)</sub>

C<sub>(r,x)</sub>

C<sub>(plat,x)</sub>

Worksheet 6-Impedance and Capacity Equations

Step 1: RT from Minor St. 9 12

Conflicting Flows	176	367
Potential Capacity	870	681
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	870	681
Probability of Queue free St.	1.00	1.00

Step 2: LT from Major St. 4 1

Conflicting Flows	176	478
Potential Capacity	1406	1090
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	1406	1090
Probability of Queue free St.	1.00	0.90
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 mvmt	0.89	0.89
Movement Capacity		
Probability of Queue free St.	1.00	1.00

Step 4: LT from Minor St.      7      10

Conflicting Flows	830	773
Potential Capacity	290	317
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.89	0.89
Maj. L, Min T Adj. Imp Factor.	0.92	0.92
Cap. Adj. factor due to Impeding mvmt	0.92	0.92
Movement Capacity	265	291

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 mvmt	
Movement Capacity	
Probability of Queue free St.	

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

Part 3 - Single Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

	1.00	1.00
	0.89	0.89

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 mvmt  
 Movement Capacity

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

Part 3 - Single Stage  
 Conflicting Flows      830      773  
 Potential Capacity      290      317

Pedestrian Impedance Factor 1.00 1.00  
 Maj. L, Min T Impedance factor 0.89 0.89  
 Maj. L, Min T Adj. Imp Factor: 0.92 0.92  
 Cap. Adj. factor due to Impeding mvmnt 0.92 0.92  
 Movement Capacity 265 291

Results for Two-stage process:

a  
 Y  
 C t 265 291

Worksheet 8-Shared Lane Calculations

Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (vph)	1	1	0	3		
Movement Capacity (vph)	265	870	291	681		
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	265	870	291	681		
Volume	1	1	0	3		
Delay						
Q sep						
Q sep +1						
round (Qsep +1)						

n max  
 C sh  
 SUM C sep  
 n  
 C act



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

Movement	1	4	7	8	9	10	11	12
Lane Config	L	LT	L		R	L		R
v (vph)	112	3	1	1	0	3		
C(m) (vph)	1090	1406	265		870	291		681
v/c	0.10	0.00	0.00	0.00	0.00	0.00		0.00
95% queue length	0.34	0.01	0.01		0.00	0.00		0.01
Control Delay	8.7	7.6	18.6		9.1	17.4		10.3
LOS	A	A	C	A	C	B		B
Approach Delay				13.9		10.3		
Approach LOS				B		B		

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	0.90	1.00
v(ii), Volume for stream 2 or 5		367
v(i2), Volume for stream 3 or 6		0
s(ii), 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	8.7	7.6
N, Number of major street through lanes		1
d(rank, 1) Delay for stream 2 or 5	0.0	

TWO-WAY STOP CONTROL SUMMARY

Analyst: Brent Moore  
 Agency/Co.: WesPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: AM Peak Hour - Existing/Ops  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach Eastbound Westbound  
 Movement 1 2 3 | 4 5 6  
 L T R | L T R

Volume 11 175 1 3 367 11  
 Peak-Hour Factor, PHF 1.00 1.00 1.00 1.00 1.00 1.00  
 Hourly Flow Rate, HFR 11 175 1 3 367 11  
 Percent Heavy Vehicles 1 -- -- 1 -- --  
 Median Type Undivided  
 RT Channelized? No  
 Lanes 1 1 0 0 1 1  
 Configuration L TR LT R  
 Upstream Signal? No No

Minor Street: Approach Northbound Southbound  
 Movement 7 8 9 | 10 11 12  
 L T R | L T R

Volume 1 1 0 3  
 Peak Hour Factor, PHF 1.00 1.00 1.00 1.00

Hourly Flow Rate, HFR 1 1 1 0 3  
 Percent Heavy Vehicles 1 1 1 1 1  
 Percent Grade (%) 0 0 0 0 1  
 Median Storage

Flared Approach: Exists?  
 Storage

RT Channelized? No No No  
 Lanes 1 1 1 1 1  
 Configuration L R L R

Delay, Queue Length, and Level of Service \_\_\_\_\_

Approach	EB	WB	Northbound		Southbound	
Movement	1	4   7	8	9   10	11	12
Lane Config	L	LT   L	L	R   L	R	R
v (vph)	11	3	1	1	0	3
C(m) (vph)	1186	1406	423	1	870	429
v/c	0.01	0.00	0.00	0.00	0.00	0.00
95% queue length	0.03	0.01	0.01	0.00	0.00	0.01
Control Delay	8.1	7.6	13.5	9.1	13.4	10.3
LOS	A	A	B	A	B	B
Approach Delay			11.3			10.3
Approach LOS			B			B

HCS2000: Unsignalized Intersections Release 4.1

Phone:  
 E-Mail:

Fax:

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

Analyst: Brent Moore  
 Agency/Co.: WestPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: AM Peak Hour - Existing/Ops  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WestPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street Movements 1 2 3 4 5 6

L T R L T R

Volume 11 175 1 3 367 11  
 Peak-Hour Factor, PHF 1.00 1.00 1.00 1.00 1.00 1.00  
 Peak-15 Minute Volume 3 44 0 1 92 3  
 Hourly Flow Rate, HFR 11 175 1 3 367 11  
 Percent Heavy Vehicles 1 -- -- 1 -- --  
 Median Type Undivided  
 RT Channelized? No  
 Lanes 1 1 0 0 1 1  
 Configuration L TR LT R  
 Upstream Signal? No No

Minor Street Movements 7 8 9 10 11 12

L T R L T R

Volume 1 1 0 3  
 Peak Hour Factor, PHF 1.00 1.00 1.00 1.00  
 Peak-15 Minute Volume 0 0 0 0  
 Hourly Flow Rate, HFR 1 1 0 3  
 Percent Heavy Vehicles 1 1 1 1  
 Percent Grade (%) 0 0 0 0  
 Median Storage

Flared Approach: Exists?

Storage

RT Channelized?

Lanes

Configuration

	1	1	No	1	No
	L	R		L	R

Pedestrian Volumes and Adjustments \_\_\_\_\_

Movements	13	14	15	16
-----------	----	----	----	----

Flow (ped/hr)	0	0	0	0
Lane Width (ft)	12.0	12.0	12.0	12.0
Walking Speed (ft/sec)	4.0	4.0	4.0	4.0
Percent Blockage	0	0	0	0

Upstream Signal Data \_\_\_\_\_

Prog.	Sat	Arrival	Green	Cycle	Prog.	Distance
Flow	Flow	Type	Time	Length	Speed	to Signal
yph	yph	sec	sec	sec	mph	feet

S2 Left-Turn  
Through  
S5 Left-Turn  
Through

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

Movement 2	Movement 5
------------	------------

Shared ln volume, major th vehicles:	367
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:	1

Worksheet 4-Critical Gap and Follow-up Time Calculation

**Critical Gap Calculation**

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(c,base)	4.1	4.1	7.1		6.2	7.1		6.2
t(c,hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)	1	1	1	1	1	1	1	1
t(c,g)		0.20	0.20	0.10	0.20	0.20	0.10	
Grade/100		0.00	0.00	0.00	0.00	0.00	0.00	
t(3,lt)	0.00	0.00	0.00		0.00	0.00		0.00
t(c,T): 1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage	4.1	4.1	7.1		6.2	7.1	6.2
	2-stage							

**Follow-Up Time Calculations**

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R

t(f,base)	2.20	2.20	3.50		3.30	3.50		3.30
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)	1	1	1	1	1	1	1	1
t(f)	2.2	2.2	3.5		3.3	3.5		3.3

**Worksheet 5-Effect of Upstream Signals**

**Computation 1-Queue Clearance Time at Upstream Signal**

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

**V prog**

Total Saturation Flow Rate, s (vph)

Arrival Type

Effective Green, g (sec)

Cycle Length, C (sec)

Rp (from table 9-2)

Proportion vehicles arriving on green P

g(q1)  
g(q2)  
g(q)

Computation 2-Proportion of TWSC Intersection Time blocked  
 Movement 2      Movement 5  
 V(t)   V(l,prot)   V(t)   V(l,prot)

alpha  
beta  
Travel time, t(a) (sec)  
Smoothing Factor, F  
Proportion of conflicting flow, f  
Max platooned flow, V(c,max)  
Min platooned flow, V(c,min)  
Duration of blocked period, t(p)  
Proportion time blocked, p      0.000      0.000

Computation 3-Platoon Event Periods      Result  
 p(2)      0.000  
 p(5)      0.000  
 p(dom)  
 p(subo)  
 Constrained or unconstrained?

Proportion unblocked for minor movements, p(x)      (1)      (2)      (3)  
 Single-stage Process      Two-Stage 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	L	L	L	T	R	L	T	R			
	1	4	7	8	9	10	11	12			

V<sub>c,x</sub> 378 176 578 176 571 367

S

P<sub>x</sub>

V<sub>c,u,x</sub>

C<sub>r,x</sub>

C<sub>plat,x</sub>

Two-Stage Process

	7	8	10	11
Stage1	Stage2	Stage1	Stage2	Stage1
Stage2	Stage1	Stage2	Stage1	Stage2

V<sub>(c,x)</sub>

1700

1700

P<sub>(x)</sub>

V<sub>(c,u,x)</sub>

C<sub>(r,x)</sub>

C<sub>(plat,x)</sub>

Worksheet 6-Impedance and Capacity Equations

Step 1: RT from Minor St. 9 12

Conflicting Flows	176	367
Potential Capacity	870	681
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	870	681
Probability of Queue free St.	1.00	1.00

Step 2: LT from Major St. 4 1



Conflicting Flows	176	378
Potential Capacity	1406	1186
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	1406	1186
Probability of Queue free St.	1.00	0.99
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 mvmt	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	578	571
Potential Capacity	429	433
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.99	0.99
Maj. L, Min T Adj. Imp Factor.	0.99	0.99
Cap. Adj. factor due to Impeding mvmt	0.99	0.99
Movement Capacity	423	429

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 mvmt	
Movement Capacity	
Probability of Queue free St.	

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

Part 3 - Single Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

	1.00	1.00
	0.99	0.99

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 mvmt  
 Movement Capacity

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

Part 3 - Single Stage  
 Conflicting Flows      578      571  
 Potential Capacity      429      433

Pedestrian Impedance Factor 1.00 1.00  
 Maj. L, Min T Impedance factor 0.99 0.99  
 Maj. L, Min T Adj. Imp Factor. 0.99 0.99  
 Cap. Adj. factor due to Impeding mvmnt 0.99 0.99  
 Movement Capacity 423 429

Results for Two-stage process:

a  
 Y 423 429  
 C t

Worksheet 8-Shared Lane Calculations

Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (vph)	1	1	0	3		
Movement Capacity (vph)	423	870	429	681		
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	423	870	429	681		
Volume	1	1	0	3		
Delay						
Q sep						
Q sep +1						
round (Qsep +1)						

n max  
 C sh  
 SUM C sep  
 n  
 C act

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

Movement	1	4	7	8	9	10	11	12
Lane Config	L	LT	L		R	L		R
v (vph)	11	3	1	1	0	3		
C(m) (vph)	1186	1406	423		870	429		681
v/c	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
95% queue length	0.03	0.01	0.01		0.00	0.00		0.01
Control Delay	8.1	7.6	13.5		9.1	13.4		10.3
LOS	A	A	B	A	B	B		B
Approach Delay				11.3		10.3		
Approach LOS				B		B		

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	0.99	1.00
v(i1), Volume for stream 2 or 5		367
v(i2), Volume for stream 3 or 6		0
s(i1), 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	8.1	7.6
N, Number of major street through lanes		1
d(rank, 1) Delay for stream 2 or 5		0.0

TWO-WAY STOP CONTROL SUMMARY

Analyst: Brent Moore  
 Agency/Co.: WesPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: PM Peak Hour - Existing  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound	Westbound
Movement 1	2	3
Movement 2	4	5
Movement 3	6	1
Movement 4	1	2
Movement 5	3	4
Movement 6	5	6

Volume	0	385	1	0	187	3
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	385	1	0	187	3
Percent Heavy Vehicles	1	--	--	1	--	--
Median Type	Undivided					
RT Channelized?	No					
Lanes	1	1	0	0	1	1
Configuration	L	TR		LT	R	
Upstream Signal?	No					

Minor Street: Approach	Northbound	Southbound
Movement 7	8	9
Movement 8	10	11
Movement 9	12	1
Movement 10	1	2
Movement 11	3	4
Movement 12	5	6

Volume	0	1	4	8
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00

Hourly Flow Rate, HFR 0 1 1 4 8  
 Percent Heavy Vehicles 1 1 1 1 1  
 Percent Grade (%) 0 0 0 0 0

Median Storage  
 Flared Approach: Exists?  
 Storage

RT Channelized? No No No  
 Lanes 1 1 1 1 1  
 Configuration L R L R

Delay, Queue Length, and Level of Service \_\_\_\_\_

Approach	EB	WB	Northbound	Southbound
Movement	1	4   7	8	9   10
Lane Config	L	LT   L	R   L	R   L
v (vph)	0	0	1	4
C(m) (vph)	1390	1178	425	664
v/c	0.00	0.00	0.00	0.01
95% queue length	0.00	0.00	0.00	0.01
Control Delay	7.6	8.1	13.5	10.4
LOS	A	A	B	B
Approach Delay			10.4	
Approach LOS			B	

HCSS2000: Unsignalized Intersections Release 4.1

Phone:  
 E-Mail:

Fax:

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

Analyst: Brent Moore  
 Agency/Co.: WesPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: PM Peak Hour - Existing  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments \_\_\_\_\_

Major Street Movements 1 2 3 4 5 6  
 L T R L T R

Volume 0 385 1 0 187 3  
 Peak-Hour Factor, PHF 1.00 1.00 1.00 1.00 1.00 1.00  
 Peak-15 Minute Volume 0 96 0 0 47 1  
 Hourly Flow Rate, HFR 0 385 1 0 187 3  
 Percent Heavy Vehicles 1 -- 1 -- --  
 Median Type Undivided  
 RT Channelized? No  
 Lanes 1 1 0 0 1 1  
 Configuration L TR LT R  
 Upstream Signal? No No

Minor Street Movements 7 8 9 10 11 12  
 L T R L T R

Volume 0 1 4 8  
 Peak Hour Factor, PHF 1.00 1.00 1.00 1.00  
 Peak-15 Minute Volume 0 0 1 1  
 Hourly Flow Rate, HFR 0 1 4 8  
 Percent Heavy Vehicles 1 1 1 1  
 Percent Grade (%) 0 0 0  
 Median Storage

Flared Approach: Exists?

Storage

RT Channelized?

			No		No
Lanes	1	1	1	1	
Configuration	L	R	L	R	

Pedestrian Volumes and Adjustments

Movements	13	14	15	16
-----------	----	----	----	----

Flow (ped/hr)	0	0	0	0
Lane Width (ft)	12.0	12.0	12.0	12.0
Walking Speed (ft/sec)	4.0	4.0	4.0	4.0
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	mph	feet

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:	187
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:	1

Worksheet 4-Critical Gap and Follow-up Time Calculation



Critical Gap Calculation

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(c,base)	4.1	4.1	7.1		6.2	7.1		6.2
t(c,hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)	1	1	1	1	1	1	1	1
t(c,g)		0.20	0.20	0.10	0.20	0.20	0.20	0.10
Grade/100		0.00	0.00	0.00	0.00	0.00	0.00	0.00
t(3,lt)	0.00	0.00	0.00		0.00	0.00		0.00
t(c,T): 1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage	4.1	4.1	7.1		6.2	7.1	
2-stage					6.2	7.1		6.2

Follow-Up Time Calculations

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(f,base)	2.20	2.20	3.50		3.30	3.50		3.30
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)	1	1	1	1	1	1	1	1
t(f)	2.2	2.2	3.5		3.3	3.5		3.3

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

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

V prog

Total Saturation Flow Rate, s (vph)

Arrival Type

Effective Green, g (sec)

Cycle Length, C (sec)

Rp (from table 9-2)

Proportion vehicles arriving on green P

g(q1)  
g(q2)  
g(q)

Computation 2-Proportion of TWSC Intersection Time blocked  
 Movement 2      Movement 5  
 V(t)   V(l,prot)   V(t)   V(l,prot)

alpha  
beta  
Travel time, t(a) (sec)  
Smoothing Factor, F  
Proportion of conflicting flow, f  
Max platooned flow, V(c,max)  
Min platooned flow, V(c,min)  
Duration of blocked period, t(p)  
Proportion time blocked, p      0.000      0.000

Computation 3-Platoon Event Periods      Result  
 p(2)      0.000  
 p(5)      0.000  
 p(dom)  
 p(subo)  
 Constrained or unconstrained?

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

p(1)  
p(4)  
p(7)  
p(8)  
p(9)  
p(10)  
p(11)  
p(12)

Computation 4 and 5

Single-Stage Process											
Movement	1	4	7	8	9	10	11	12			
	L	L	L	T	R	L	T	R			

V<sub>c,x</sub> 190 386 578 578 386 573 187

S

P<sub>x</sub>

V<sub>c,u,x</sub>

C<sub>r,x</sub>

C<sub>plat,x</sub>

Two-Stage Process

	7	8	10	11
Stage1	Stage2	Stage1	Stage2	Stage1
Stage2	Stage1	Stage2	Stage1	Stage2

V<sub>(c,x)</sub>

1700

1700

P<sub>(x)</sub>

V<sub>(c,u,x)</sub>

C<sub>(r,x)</sub>

C<sub>(plat,x)</sub>

Worksheet 6-Impedance and Capacity Equations

Step 1: RT from Minor St. 9 12

Conflicting Flows	386	187
Potential Capacity	664	858
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	664	858
Probability of Queue free St.	1.00	0.99

Step 2: LT from Major St. 4 1

Conflicting Flows	386	190
Potential Capacity	1178	1390
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	1178	1390
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

Conflicting Flows	578	573
Potential Capacity	429	432
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	1.00
Cap. Adj. factor due to Impeding mvmnt	0.99	1.00
Movement Capacity	425	431

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 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 mvmt  
 Movement Capacity

Part 3 - Single Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

	1.00	1.00
	1.00	1.00

Result for 2 stage process:  
 a  
 y  
 C t  
 Probability of Queue free St.

	1.00	1.00
	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 mvmt  
 Movement Capacity

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

Part 3 - Single Stage  
 Conflicting Flows      578      573  
 Potential Capacity      429      432

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 1.00  
 Cap. Adj. factor due to Impeding mvmnt 0.99 1.00  
 Movement Capacity 425 431

Results for Two-stage process:

a  
 y 425 431  
 C t

Worksheet 8-Shared Lane Calculations

Movement 7 8 9 10 11 12  
 L T R L T R

Volume (vph) 0 1 4 8  
 Movement Capacity (vph) 425 664 431 858  
 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 425 664 431 858  
 Volume 0 1 4 8  
 Delay  
 Q sep  
 Q sep +1  
 round (Qsep +1)

n max  
 C sh  
 SUM C sep  
 n  
 C act

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

Movement	1	4	7	8	9	10	11	12
Lane Config	L	LT	L		R	L		R
v (vph)	0	0	0	1	4	8		
C(m) (vph)	1390	1178	425		664	431		858
v/c	0.00	0.00	0.00	0.00	0.01	0.01		0.01
95% queue length	0.00	0.00	0.00	0.00	0.00	0.03		0.03
Control Delay	7.6	8.1	13.5		10.4	13.4		9.2
LOS	A	A	B	B	B	A		A
Approach Delay				10.4		10.6		
Approach LOS				B		B		

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(i1), Volume for stream 2 or 5		187
v(i2), Volume for stream 3 or 6		0
s(i1), 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	7.6	8.1
N, Number of major street through lanes		1
d(rank, 1) Delay for stream 2 or 5	0.0	

TWO-WAY STOP CONTROL SUMMARY

Analyst: Brent Moore  
 Agency/Co.: WesPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: PM Peak Hour - Existing/Const  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound	Westbound
Movement 1	2	3
Movement 2	4	5
Movement 3	6	
Movement 4		1
Movement 5		2
Movement 6		3

Volume	0	385	1	0	187	3
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	385	1	0	187	3
Percent Heavy Vehicles	1	--	--	1	--	--
Median Type	Undivided					
RT Channelized?	No					
Lanes	1	1	0	0	1	1
Configuration	L	TR		LT	R	
Upstream Signal?	No					

Minor Street: Approach	Northbound	Southbound
Movement 7	8	9
Movement 8	10	11
Movement 9	12	
Movement 10		1
Movement 11		2
Movement 12		3

Volume	0	1	107	111
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00



Hourly Flow Rate, HFR 0 1 1 107 111  
 Percent Heavy Vehicles 1 1 1 1 1  
 Percent Grade (%) 0 0 0 0 0

Median Storage  
 Flared Approach: Exists?  
 Storage

RT Channelized? No No No  
 Lanes 1 1 1 1 1  
 Configuration L R L R

Delay, Queue Length, and Level of Service \_\_\_\_\_

Approach	EB	WB	Northbound			Southbound		
Movement	1	4   7	8	9   10	11	12	11	12
Lane Config	L	LT   L	R	R   L	R	R	R	R
v (vph)	0	0	0	1	107	111	111	858
C(m) (vph)	1390	1178	345	0.00	664	431	858	858
v/c	0.00	0.00	0.00	0.00	0.25	0.13	0.13	0.13
95% queue length	0.00	0.00	0.00	0.00	0.00	0.98	0.98	0.45
Control Delay	7.6	8.1	15.4	10.4	16.1	9.8	9.8	9.8
LOS	A	A	C	B	C	A	A	A
Approach Delay			10.4	10.4		12.9	12.9	
Approach LOS			B	B		B	B	

HCS2000: Unsignalized Intersections Release 4.1

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-Mail: \_\_\_\_\_

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

Analyst: Brent Moore  
 Agency/Co.: WesPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: PM Peak Hour - Existing/Const  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street Movements

L	T	R	L	T	R
1	2	3	4	5	6

Volume	0	385	1	0	187	3
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Peak-15 Minute Volume	0	96	0	0	47	1
Hourly Flow Rate, HFR	0	385	1	0	187	3
Percent Heavy Vehicles	1	--	--	1	--	--
Median Type	Undivided					
RT Channelized?			No			
Lanes	1	1	0	0	1	1
Configuration	L	TR		LT	R	
Upstream Signal?			No			

Minor Street Movements

L	T	R	L	T	R
7	8	9	10	11	12

Volume	0	1	107	111
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00
Peak-15 Minute Volume	0	0	27	28
Hourly Flow Rate, HFR	0	1	107	111
Percent Heavy Vehicles	1	1	1	1
Percent Grade (%)	0	0	0	0
Median Storage				

Flared Approach: Exists?

Storage

RT Channelized?

Lanes

Configuration

1 1 1 1  
L R L R

Pedestrian Volumes and Adjustments

Movements 13 14 15 16

Flow (ped/hr) 0 0 0 0  
Lane Width (ft) 12.0 12.0 12.0 12.0  
Walking Speed (ft/sec) 4.0 4.0 4.0 4.0  
Percent Blockage 0 0 0 0

Upstream Signal Data

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

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: 187  
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: 1

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical Gap Calculation

Movement	1	4	7	8	9	10	11	12
L	L	L	T	R	L	T	R	
t(c,base)	4.1	4.1	7.1		6.2	7.1		6.2
t(c,hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)	1	1	1	1	1		1	
t(c,g)		0.20	0.20	0.10	0.20	0.20	0.10	
Grade/100		0.00	0.00	0.00	0.00	0.00	0.00	
t(3,l,t)	0.00	0.00	0.00		0.00	0.00	0.00	
t(c,T): 1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage 4.1	4.1	7.1		6.2	7.1		6.2
2-stage								

Follow-Up Time Calculations

Movement	1	4	7	8	9	10	11	12
L	L	L	T	R	L	T	R	
t(f,base)	2.20	2.20	3.50		3.30	3.50		3.30
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)	1	1	1	1	1		1	
t(f)	2.2	2.2	3.5		3.3	3.5		3.3

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

Movement 2	Movement 5
V(t)	V(t)
V(l,prot)	V(t)
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 table 9-2)

Proportion vehicles arriving on green P



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<sub>c,x</sub> 190 386 630 386 573 187

S

P<sub>x</sub>

V<sub>c,u,x</sub>

C<sub>r,x</sub>

C<sub>plat,x</sub>

Two-Stage Process

	7	8	10	11
Stage1	Stage2	Stage1	Stage2	Stage1
	Stage2	Stage1	Stage2	Stage1
		Stage2	Stage1	Stage2

V<sub>(c,x)</sub>

1700

1700

P<sub>(x)</sub>

V<sub>(c,u,x)</sub>

C<sub>(r,x)</sub>

C<sub>(plat,x)</sub>

Worksheet 6-Impedance and Capacity Equations

Step 1: RT from Minor St. 9 12

Conflicting Flows 386 187

Potential Capacity 664 858

Pedestrian Impedance Factor 1.00 1.00

Movement Capacity 664 858

Probability of Queue free St. 1.00 0.87

Step 2: LT from Major St. 4 1

Conflicting Flows	386	190
Potential Capacity	1178	1390
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	1178	1390
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 mvmt	1.00	1.00
Movement Capacity		
Probability of Queue free St.	1.00	1.00

Step 4: LT from Minor St.            7            10

Conflicting Flows	630	573
Potential Capacity	396	432
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	1.00
Cap. Adj. factor due to Impeding mvmt	0.87	1.00
Movement Capacity	345	431

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 mvmt	
Movement Capacity	
Probability of Queue free St.	

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

---

Part 3 - Single Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

	1.00	1.00
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmt	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 mvmt  
 Movement Capacity

---

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

---

Part 3 - Single Stage  
 Conflicting Flows  
 Potential Capacity

	630	573
Conflicting Flows	396	432
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 1.00  
 Cap. Adj. factor due to Impeding mvmnt 0.87 1.00  
 Movement Capacity 345 431

Results for Two-stage process:

a  
 Y 345 431  
 C t

Worksheet 8-Shared Lane Calculations

Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (vph)	0	1	107	111		
Movement Capacity (vph)	345	664	431	858		
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	345	664	431	858		
Volume	0	1	107	111		
Delay						
Q sep						
Q sep +1						
round (Qsep +1)						

n max  
 C sh  
 SUM C sep  
 n  
 C act

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

Movement	1	4	7	8	9	10	11	12
Lane Config	L	LT	L		R	L		R
v (Vph)	0	0	0	1	107	111		
C(m) (Vph)	1390	1178	345		664	431		858
v/c	0.00	0.00	0.00	0.00	0.25	0.13		0.45
95% queue length	0.00	0.00	0.00	0.00	0.00	0.98		0.45
Control Delay	7.6	8.1	15.4		10.4	16.1		9.8
LOS	A	A	C	B	C	A		
Approach Delay				10.4		12.9		
Approach LOS				B		B		

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(i1), Volume for stream 2 or 5		187
v(i2), Volume for stream 3 or 6		0
s(i1), 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	7.6	8.1
N, Number of major street through lanes		1
d(rank, 1) Delay for stream 2 or 5		0.0

TWO-WAY STOP CONTROL SUMMARY

Analyst: Brent Moore  
 Agency/Co.: WesPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: PM Peak Hour - Existing/Ops  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach Eastbound Westbound  
 Movement 1 2 3 | 4 5 6  
 L T R | L T R

Volume 0 385 1 0 187 3  
 Peak-Hour Factor, PHF 1.00 1.00 1.00 1.00 1.00 1.00  
 Hourly Flow Rate, HFR 0 385 1 0 187 3  
 Percent Heavy Vehicles 1 -- -- 1 -- --  
 Median Type Undivided  
 RT Channelized? No  
 Lanes 1 1 0 0 1 1  
 Configuration L TR LT R  
 Upstream Signal? No No

Minor Street: Approach Northbound Southbound  
 Movement 7 8 9 | 10 11 12  
 L T R | L T R

Volume 0 1 7 10  
 Peak Hour Factor, PHF 1.00 1.00 1.00 1.00

Hourly Flow Rate, HFR 0 1 1 7 10  
 Percent Heavy Vehicles 1 1 1 1 1  
 Percent Grade (%) 0 0 0 0 0

Median Storage

Flared Approach: Exists?

Storage

RT Channelized?

Lanes 1 1 1 1 1

Configuration

L R R L R

Delay, Queue Length, and Level of Service \_\_\_\_\_

Approach	EB	WB	Northbound	Southbound
Movement	1	4   7	8	9   10
Lane Config	L	LT   L	R   L	R

v (vph)	0	0	0	1	7	10
C(m) (vph)	1390	1178	422	664	431	858
v/c	0.00	0.00	0.00	0.00	0.02	0.01
95% queue length	0.00	0.00	0.00	0.00	0.05	0.04
Control Delay	7.6	8.1	13.5	10.4	13.5	9.2
LOS	A	A	B	B	B	A
Approach Delay			10.4			11.0
Approach LOS			B			B

HCS2000: Unsignalized Intersections Release 4.1

Phone:  
 E-Mail:

Fax:

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

Analyst: Brent Moore  
 Agency/Co.: WesPac Energy, Pittsburg, LLC  
 Date Performed: 9/12/2011  
 Analysis Time Period: PM Peak Hour - Existing/Ops  
 Intersection: W 10th St/GenOn & Enterprise  
 Jurisdiction: City of Pittsburg  
 Analysis Year: 2011  
 Project ID: WesPac Energy, Pittsburg, LLC  
 East/West Street: West 10th Street  
 North/South Street: GenOn & Enterprise Circle

Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street Movements

L	T	R	L	T	R
1	2	3	4	5	6

Volume	0	385	1	0	187	3
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Peak-15 Minute Volume	0	96	0	0	47	1
Hourly Flow Rate, HFR	0	385	1	0	187	3
Percent Heavy Vehicles	1	--	--	1	--	--
Median Type	Undivided					
RT Channelized?	No					
Lanes	1	1	0	0	1	1
Configuration	L	TR		LT	R	
Upstream Signal?	No					

Minor Street Movements

L	T	R	L	T	R
7	8	9	10	11	12

Volume	0	1	7	10
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00
Peak-15 Minute Volume	0	0	2	2
Hourly Flow Rate, HFR	0	1	7	10
Percent Heavy Vehicles	1	1	1	1
Percent Grade (%)	0	0	0	0
Median Storage				

Flared Approach: Exists?

Storage

RT Channelized?

Lanes

Configuration

1 1 1 1  
L R L R

Pedestrian Volumes and Adjustments

Movements 13 14 15 16

Flow (ped/hr) 0 0 0 0  
Lane Width (ft) 12.0 12.0 12.0 12.0  
Walking Speed (ft/sec) 4.0 4.0 4.0 4.0  
Percent Blockage 0 0 0 0

Upstream Signal Data

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

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: 187  
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: 1

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical Gap Calculation

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(c,base)	4.1	4.1	7.1		6.2	7.1		6.2
t(c,hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)	1	1	1	1	1	1	1	1
t(c,g)		0.20	0.20	0.10	0.20	0.20	0.20	0.10
Grade/100		0.00	0.00	0.00	0.00	0.00	0.00	0.00
t(3,lt)	0.00	0.00	0.00		0.00	0.00		0.00
t(c,T): 1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage	4.1	4.1	7.1		6.2	7.1	6.2
	2-stage							

Follow-Up Time Calculations

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(f,base)	2.20	2.20	3.50		3.30	3.50		3.30
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)	1	1	1	1	1	1	1	1
t(f)	2.2	2.2	3.5		3.3	3.5		3.3

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

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

V prog

Total Saturation Flow Rate, s (vph)

Arrival Type

Effective Green, g (sec)

Cycle Length, C (sec)

Rp (from table 9-2)

Proportion vehicles arriving on green P





Computation 4 and 5

Single-Stage Process											
Movement	L	L	L	T	R	L	T	R			
	1	4	7	8	9	10	11	12			

V<sub>c,x</sub> 190 386 580 386 573 187

S

P<sub>x</sub>

V<sub>c,u,x</sub>

C<sub>r,x</sub>

C<sub>plat,x</sub>

Two-Stage Process

	7	8	10	11
Stage1	Stage2	Stage1	Stage2	Stage1
Stage2	Stage1	Stage2	Stage1	Stage2

V<sub>(c,x)</sub> 1700 1700

S 1700

P<sub>(x)</sub>

V<sub>(c,u,x)</sub>

C<sub>(r,x)</sub>

C<sub>(plat,x)</sub>

Worksheet 6-Impedance and Capacity Equations

Step 1: RT from Minor St. 9 12

Conflicting Flows	386	187
Potential Capacity	664	858
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	664	858
Probability of Queue free St.	1.00	0.99

Step 2: LT from Major St. 4 1

Conflicting Flows	386	190
Potential Capacity	1178	1390
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	1178	1390
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 mvmt	1.00	1.00
Movement Capacity		
Probability of Queue free St.	1.00	1.00

Step 4: LT from Minor St.                    7                    10

Conflicting Flows	580	573
Potential Capacity	427	432
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	1.00
Cap. Adj. factor due to Impeding mvmt	0.99	1.00
Movement Capacity	422	431

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 mvmt	
Movement Capacity	
Probability of Queue free St.	

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

Part 3 - Single Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

	1.00	1.00
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmt	1.00	1.00

Result for 2 stage process:  
 a  
 y  
 C t  
 Probability of Queue free 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  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

Part 2 - Second Stage  
 Conflicting Flows  
 Potential Capacity  
 Pedestrian Impedance Factor  
 Cap. Adj. factor due to Impeding mvmt  
 Movement Capacity

Part 3 - Single Stage  
 Conflicting Flows      580      573  
 Potential Capacity      427      432

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 1.00  
 Cap. Adj. factor due to Impeding mvmnt 0.99 1.00  
 Movement Capacity 422 431

Results for Two-stage process:

a  
 Y 422 431  
 C t

Worksheet 8-Shared Lane Calculations

Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (vph)	0	1	7	10		
Movement Capacity (vph)	422	664	431	858		
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	422	664	431	858		
Volume	0	1	7	10		
Delay						
Q sep						
Q sep +1						
round (Qsep +1)						

n max  
 C sh  
 SUM C sep  
 n  
 C act

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

Movement	1	4	7	8	9	10	11	12
Lane Config	L	LT	L		R	L		R
v (Vph)	0	0	0	1	7	10		
C(m) (vph)	1390	1178	422		664	431		858
v/c	0.00	0.00	0.00	0.00	0.02	0.01		0.04
95% queue length	0.00	0.00	0.00	0.00	0.00	0.05		0.04
Control Delay	7.6	8.1	13.5		10.4	13.5		9.2
LOS	A	A	B		B	B		A
Approach Delay				10.4		11.0		
Approach LOS				B		B		

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(i1), Volume for stream 2 or 5		187
v(i2), Volume for stream 3 or 6		0
s(i1), 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	7.6	8.1
N, Number of major street through lanes		1
d(rank, 1) Delay for stream 2 or 5		0.0



LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	------------	------------	-------------	-------------

LEFT TURN MOVEMENT

1. LT volume	7	309	290	1
2. Opposing mainline volume	686	453	7	214
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	4802	139977	2030	214

Left Lane Configuration (E=Excl, S=Shrd):  
 Left Turn Treatment Type:

4. LT adjustment factor	E	E	E	E
5. LT lane vol	P	P	P	P
	0.950	0.950	0.950	0.950
	7	325	305	1

RIGHT TURN MOVEMENT

Right Lane Configuration (E=Excl, S=Shrd)

6. RT volume	E	E	E	S
7. Exclusive lanes	183	1	207	6
8. RT adjustment factor	1	1	1	0
9. Exclusive RT lane volume	0.850	0.850	0.850	0.850
10. Shared lane vol	215	1	244	7

THROUGH MOVEMENT

11. Thru volume	270	685	7	1
12. Parking adjustment factor	1.00	1.00	1.00	1.00
13. No. of thru lanes including shared	2	2	1	1
14. Total approach volume	270	685	7	8
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalance				
17. LT adj. factor:				
18. Through lane volume	135	342	7	8
19. Critical lane volume	215	342	244	8

Left Turn Check (if [16] > 3.5)

0. Permitted left turn sneaker capacity:  
7200/Cmax

SIGNAL OPERATIONS WORKSHEET

Phase Plan Selection from Lane Volume Worksheet

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Critical through-RT vol: [19]	215	342	244	8
LT lane vol: [5]	7	325	305	1
Left turn protection: (P/U/N)	P	P	P	P
Dominant left turn: (Indicate by '<')	<	<	<	<

Selection Criteria based on the specified left turn protection

	Plan 1:	Plan 2a:	Plan 2b:	Plan 3a:	Plan 3b:	Plan 4:
< Indicates the dominant left turn for each opposing pair	U	U	U	P	<P	N
	U	P	U	P	P	N
	U	P	U	<P	<P	N

Phase plan selected (1 to 4) 3b 3a

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan

Value	EAST-WEST			NORTH-SOUTH		
	Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3

Movement codes

	EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]	7	318	215	1	304	8
Critical sum [CS]						
CBD adjustment [CBD]						
Reference sum [RS]						
Lost time/phase [PL]	4	0	4	4	0	4
Lost time/cycle [TL]	16					
Cycle length [CYC]	60.0					
phase time	4.4	16.4	15.1	4.1	15.7	4.4
Critical v/c Ratio [Xcm]	0.84					
Status	Under capacity					



HCSS2000: Signalized Intersections Release 4.1

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: Willow Pass/Bailey Road  
 Agency/Co.: Wespac Energy-Pittsburg, LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: AM Peak Hour-Existing/Const  
 Analysis Year: 2011  
 Project ID: Wespac Energy - Pittsburg Traffic Impact Study  
 East/West Street  
 Willow Pass Road Bailey Road

VOLUME DATA

Num. Lanes	Eastbound		Westbound		Northbound		Southbound	
	L	T	L	T	L	T	L	T
1	2	1	1	2	1	1	1	1
Volume	325	183	309	685	1	290	7	255
Parking Coord.	N	N	N	N	N	N	N	N
LT Treat.	P	N	P	N	P	N	P	N
Peak hour factor:	0.90		Area Type: CBD or Similar					

LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	------------	------------	-------------	-------------

LEFT TURN MOVEMENT

1. LT volume	7	309	290	1
2. Opposing mainline volume	686	508	7	262
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	4802	156972	2030	262

Left Lane Configuration (E=Excl, S=Shrd):  
 Left Turn Treatment Type: E P E P E P E P

4. LT adjustment factor	0.950	0.950	0.950	0.950
5. LT lane vol	7	325	305	1

RIGHT TURN MOVEMENT

Right Lane Configuration (E=Excl, S=Shrd)

6. RT volume	E 183	E 1	E 255	S 6
7. Exclusive lanes	1	1	1	0
8. RT adjustment factor	0.850	0.850	0.850	0.850
9. Exclusive RT lane volume	215	1	300	
10. Shared lane vol				7

THROUGH MOVEMENT

11. Thru volume	325	685	7	1
12. Parking adjustment factor	1.00	1.00	1.00	1.00
13. No. of thru lanes including shared	2	2	1	1
14. Total approach volume	325	685	7	8
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalence				
17. LT adj. factor:				
18. Through lane volume	162	342	7	8
19. Critical lane volume	215	342	300	8

Left Turn Check (if [16] > 3.5)

0. Permitted left turn sneaker capacity:  
7200/Cmax

SIGNAL OPERATIONS WORKSHEET

Phase Plan Selection from Lane Volume Worksheet

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Critical through-RT vol: [19]	215	342	300	8
LT lane vol: [5]	7	325	305	1
Left turn protection: (P/U/N)	P	P	P	P
Dominant left turn: (Indicate by '<')	<	<	<	<

Selection Criteria based on the specified left turn protection

	Plan 1:	Plan 2a:	Plan 2b:	Plan 3a:<P	Plan 3b:	Plan 4:
< Indicates the dominant left turn for each opposing pair	U	U	U	P	<P	N
Phase plan selected (1 to 4)	3b	3a				

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan

Value	EAST-WEST			NORTH-SOUTH		
	Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3
Movement codes						
Critical phase vol [CV]	EWL 7	WTL 318	EWT 215	NSL 1	NTL 304	NST 8
Critical sum [CS]	853					
CBD adjustment [CBD]	0.90					
Reference sum [RS]	1385					
Lost time/phase [PL]	4	0	4	4	0	4
Lost time/cycle [TL]	16					
Cycle length [CYC]	60.0					
Phase time	4.4	16.4	15.1	4.1	15.7	4.4
Critical v/c Ratio [Xcm]	0.84					
Status	Under capacity					

Under capacity

HCSS2000: Signalized Intersections Release 4.1

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: Willow Pass/Bailey Road  
 Agency/Co.: Wespac Energy-Pittsburg, LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: AM Peak Hour-Existing/Ops  
 Analysis Year: 2011  
 Project ID: Wespac Energy - Pittsburg Traffic Impact Study  
 East/West Street  
 Willow Pass Road Bailey Road

VOLUME DATA

Num. Lanes	Eastbound		Westbound		Northbound		Southbound	
	L	T	L	T	L	T	L	T
1	2	1	1	2	1	1	1	1
7	271	183	309	685	1	290	7	208
	N	N	N	N	N	N	N	N
	N	N	N	N	N	N	N	N
LT Treat.	P	P	P	P	P	P	P	P
Peak hour factor:	0.90		Area Type: CBD or Similar					

LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	------------	------------	-------------	-------------

LEFT TURN MOVEMENT

1. LT volume	7	309	290	1
2. Opposing mainline volume	686	454	7	215
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	4802	140286	2030	215

Left Lane Configuration (E=Excl, S=Shrd):  
 Left Turn Treatment Type: E E E E E P P P P

4. LT adjustment factor	0.950	0.950	0.950	0.950
5. LT lane vol	7	325	305	1

RIGHT TURN MOVEMENT

Right Lane Configuration (E=Excl, S=Shrd)

6. RT volume	E 183	E 1	E 208	S 6
7. Exclusive lanes	1	1	1	0
8. RT adjustment factor	0.850	0.850	0.850	0.850
9. Exclusive RT lane volume	215	1	245	
10. Shared lane vol				7

THROUGH MOVEMENT

11. Thru volume	271	685	7	1
12. Parking adjustment factor	1.00	1.00	1.00	1.00
13. No. of thru lanes including shared	2	2	1	1
14. Total approach volume	271	685	7	8
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalence				
17. LT adj. factor:				
18. Through lane volume	136	342	7	8
19. Critical lane volume	215	342	245	8

Left Turn Check (if [16] > 3.5)

0. Permitted left turn sneaker capacity:  
7200/Cmax

SIGNAL OPERATIONS WORKSHEET

Phase Plan Selection from Lane Volume Worksheet

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Critical through-RT vol: [19]	215	342	245	8
LT lane vol: [5]	7	325	305	1
Left turn protection: (P/U/N)	P	P	P	P
Dominant left turn: (Indicate by '<')	<	<	<	<

Selection Criteria based on the specified left turn protection

	Plan 1:	Plan 2a:	Plan 2b:	Plan 3a:	Plan 3b:	Plan 4:
< Indicates the dominant left turn for each opposing pair	U	U	U	P	<P	N
	U	P	U	P	P	N
	U	P	U	<P	<P	N

Phase plan selected (1 to 4) 3b 3a

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan

Value	EAST-WEST			NORTH-SOUTH		
	Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3

Movement codes

	EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]	7	318	215	1	304	8
Critical sum [CS]	853					
CBD adjustment [CBD]	0.90					
Reference sum [RS]	1385					
Lost time/phase [PL]	4	0	4	4	0	4
Lost time/cycle [TL]	16					
Cycle length [CYCL]	60.0					
Phase time	4.4	16.4	15.1	4.1	15.7	4.4
Critical v/c Ratio [Xcm]	0.84					
Status	Under capacity					

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: Willow Pass/Bailey Road  
 Agency/Co.: Wespac Energy-Pittsburg, LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: PM Peak Hour-Existing  
 Analysis Year: 2011  
 Project ID: Wespac Energy - Pittsburg Traffic Impact Study  
 East/West Street North/South Street  
 Willow Pass Road Bailey Road

VOLUME DATA

Num. Lanes	Eastbound		Westbound		Northbound		Southbound	
	L	T	L	T	L	T	L	T
1	2	1	1	2	1	1	1	1
8	568	171	215	240	7	235	22	416
Volume	N	N	N	N	N	N	N	N
Parking	N	N	N	N	N	N	N	N
Coord.	N	N	N	N	N	N	N	N
LT Treat.	P	P	P	P	P	P	P	P
Peak hour factor:	0.90		Area Type: CBD or Similar					

LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	------------	------------	-------------	-------------

LEFT TURN MOVEMENT

1. LT volume	8	215	235	8
2. Opposing mainline volume	247	739	20	438
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	1976	158885	4700	3504

Left Lane Configuration (E=Excl, S=Shrd) :

Left Turn Treatment Type: E P E P E P E P

4. LT adjustment factor	0.950	0.950	0.950	0.950
5. LT lane vol	8	226	247	8

RIGHT TURN MOVEMENT

Right Lane Configuration (E=Excl, S=Shrd)

6. RT volume	E 171	E 7	E 416	S 16
7. Exclusive lanes	1	1	1	0
8. RT adjustment factor	0.850	0.850	0.850	0.850
9. Exclusive RT lane volume	201	8	489	
10. Shared lane vol				19

THROUGH MOVEMENT

11. Thru volume	568	240	22	4
12. Parking adjustment factor	1.00	1.00	1.00	1.00
13. No. of thru lanes including shared	2	2	1	1
14. Total approach volume	568	240	22	23
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalence				
17. LT adj. factor:				
18. Through lane volume	284	120	22	23
19. Critical lane volume	284	120	489	23

Left Turn Check (if [16] > 3.5)



0. Permitted left turn sneaker capacity:  
7200/Cmax

SIGNAL OPERATIONS WORKSHEET

Phase Plan Selection from Lane Volume Worksheet

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Critical through-RT vol: [19]	284	120	489	23
LT lane vol: [5]	8	226	247	8
Left turn protection: (P/U/N)	P	P	P	P
Dominant left turn: (Indicate by '<')	<	<	<	<

Selection Criteria based on the specified left turn protection

< Indicates the dominant left turn for each opposing pair

Plan	Plan 1:	Plan 2a:	Plan 2b:	Plan 3a:	Plan 3b:	Plan 4:
U	U	P	U	<P	P	<P
U	U	U	P	P	P	N
U	U	U	U	P	P	N
U	U	U	U	P	P	N

Phase plan selected (1 to 4)

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan

Value	EAST-WEST			NORTH-SOUTH		
	Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3
EWL	8	218	284	8	239	250

Movement codes

Movement	Value	EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]	1007	8	218	284	8	239	250
Critical sum [CS]	0.90						
CBD adjustment [CBD]	1385						
Reference sum [RS]	4	4	0	4	4	0	4
Lost time/phase [PL]	16						
Lost time/cycle [TL]	60.0						
Cycle length [CYC]	4.3	9.5	16.4	4.3	10.4	14.9	
Phase time	0.99						
Critical v/c Ratio [Xcm]	At capacity						
Status							

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: Willow Pass/Bailey Road  
 Agency/Co.: WestPac Energy-Pittsburg, LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: PM Peak Hour-Existing/Const  
 Analysis Year: 2011  
 Project ID: WestPac Energy - Pittsburg Traffic Impact Study  
 East/West Street North/South Street  
 Willow Pass Road Bailey Road

VOLUME DATA

Num. Lanes	Eastbound		Westbound		Northbound		Southbound	
	L	T	L	T	L	T	L	T
1	2	1	1	2	1	1	1	1
Volume	568	171	263	295	7	235	22	416
Parking Coord.	N	N	N	N	N	N	N	N
LT Treat.	P	N	P	N	P	P	N	N
Peak hour factor:	0.90		Area Type: CBD or Similar					

LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	------------	------------	-------------	-------------

LEFT TURN MOVEMENT

1. LT volume	8	263	235	8
2. Opposing mainline volume	302	739	20	438
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	2416	194357	4700	3504

Left Lane Configuration (E=Excl, S=Shrd):  
 Left Turn Treatment Type:

4. LT adjustment factor	E 0.950	E 0.950	E 0.950	E 0.950
5. LT lane vol	P 8	P 277	P 247	P 8

RIGHT TURN MOVEMENT

Right Lane Configuration (E=Excl, S=Shrd)

6. RT volume	E 171	E 7	E 416	S 16
7. Exclusive lanes	1	1	1	0
8. RT adjustment factor	0.850	0.850	0.850	0.850
9. Exclusive RT lane volume	201	8	489	
10. Shared lane vol				19

THROUGH MOVEMENT

11. Thru volume	568	295	22	4
12. Parking adjustment factor	1.00	1.00	1.00	1.00
13. No. of thru lanes including shared	2	2	1	1
14. Total approach volume	568	295	22	23
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalence				
17. LT adj. factor:				
18. Through lane volume	284	148	22	23
19. Critical lane volume	284	148	489	23

Left Turn Check (if [16] > 3.5)

0. Permitted left turn sneaker capacity:  
7200/Cmax

SIGNAL OPERATIONS WORKSHEET

Phase Plan Selection from Lane Volume Worksheet	EAST		WEST		NORTH		SOUTH	
	BOUND	BOUND	BOUND	BOUND	BOUND	BOUND	BOUND	
Critical through-RT vol: [19]	284	148	489	23				
LT lane vol: [5]	8	277	247	8				
Left turn protection: (P/U/N)	P	P	P	P				
Dominant left turn: (Indicate by '<')	<	<	<	<				

Selection Criteria based on the specified left turn protection

< Indicates the dominant left turn for each opposing pair

Plan 1:	U	U	U	U
Plan 2a:	U	P	U	P
Plan 2b:	P	U	P	U
Plan 3a:	<P	P	<P	P
Plan 3b:	P	<P	P	<P
Plan 4:	N	N	N	N

Phase plan selected (1 to 4) 3b 3a

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan	Value	EAST-WEST			NORTH-SOUTH		
		Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3
Movement codes		EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]	1058	8	269	284	8	239	250
Critical sum [CS]							
CBD adjustment [CBD]	0.90						
Reference sum [RS]	1385						
Lost time/phase [PL]		4	0	4	4	0	4
Lost time/cycle [TL]	16						
Cycle length [CYC]	67.8						
Phase time		4.4	13.2	17.9	4.4	11.7	16.2
Critical v/c Ratio [Xcm]	1.00						
Status	At capacity						

Phone:  
E-Mail:

Fax:

PLANNING ANALYSIS

Analyst: Brent Moore  
 Intersection: Willow Pass/Bailey Road  
 Agency/Co.: WestPac Energy-Pittsburg, LLC  
 Area Type: CBD or Similar  
 Date Performed: 9/12/2011  
 Jurisdiction: City of Pittsburg  
 Analysis Time Period: PM Peak Hour-Existing/Ops  
 Analysis Year: 2011  
 Project ID: WestPac Energy - Pittsburg Traffic Impact Study  
 East/West Street North/South Street  
 Willow Pass Road Bailey Road

VOLUME DATA

Num. Lanes	Eastbound		Westbound		Northbound		Southbound			
	L	T	L	T	L	T	L	T		
8	2	1	1	2	1	1	1	1	0	
Volume	568	171	216	241	7	235	22	416	8	
Parking Coord.	N	N	N	N	N	N	N	N	N	
LT Treat.	P	P	P	P	P	P	P	P	P	
Peak hour factor:	0.90		Area Type: CBD or Similar							

LANE VOLUME WORKSHEET

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
--	---------------	---------------	----------------	----------------

LEFT TURN MOVEMENT

1. LT volume	8	216	235	8
2. Opposing mainline volume	248	739	20	438
3. Number of exclusive LT lanes	1	1	1	1
Cross Product [2] * [1]	1984	159624	4700	3504

Left Lane Configuration (E=Excl, S=Shrd) :  
 Left Turn Treatment Type:

4. LT adjustment factor	0.950	0.950	0.950	0.950
5. LT lane vol	8	227	247	8

RIGHT TURN MOVEMENT

	E	E	E	S
Right Lane Configuration (E=Excl, S=Shrd)	E	E	E	S
6. RT volume	171	7	416	16
7. Exclusive lanes	1	1	1	0
8. RT adjustment factor	0.850	0.850	0.850	0.850
9. Exclusive RT lane volume	201	8	489	19
10. Shared lane vol				

THROUGH MOVEMENT

11. Thru volume	568	241	22	4
12. Parking adjustment factor	1.00	1.00	1.00	1.00
13. No. of thru lanes including shared	2	2	1	1
14. Total approach volume	568	241	22	23
15. Prop. of left turns in lane group	0.00	0.00	0.00	0.00
16. Left turn equivalence				
17. LT adj. factor:				
18. Through lane volume	284	120	22	23
19. Critical lane volume	284	120	489	23

Left Turn Check (if [16] > 3.5)

0. Permitted left turn sneaker capacity:  
7200/Cmax

SIGNAL OPERATIONS WORKSHEET

Phase Plan Selection from Lane Volume Worksheet

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Critical through-RT vol: [19]	284	120	489	23
LT lane vol: [5]	8	227	247	8
Left turn protection: (P/U/N)	P	P	P	P
Dominant left turn: (Indicate by '<')	<	<	<	<

Selection Criteria based on the specified left turn protection

	Plan 1:	Plan 2a:	Plan 2b:	Plan 3a:	Plan 3b:	Plan 4:
< Indicates the dominant left turn for each opposing pair	U	U	U	P	<P	N
	U	P	U	P	P	N
	U	P	P	<P	P	N
	U	U	U	P	<P	N

Phase plan selected (1 to 4) 3b 3a

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan

Value	EAST-WEST			NORTH-SOUTH		
	Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3
EWL	8	219	284	8	239	250

Movement codes

	EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]	8	219	284	8	239	250
Critical sum [CS]	1008					
CBD adjustment [CBD]	0.90					
Reference sum [RS]	1385					
Lost time/phase [PL]	4	0	4	4	0	4
Lost time/cycle [TL]	16					
Cycle length [CYC]	60.0					
Phase time	4.3	9.6	16.4	4.3	10.4	14.9
Critical v/c Ratio [Xcm]	0.99					
Status	At capacity					