HCS2000: Signalized Intersections Release 4.1

Phone: Fax:
E-Mail:

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: 10th Street

North/South 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 BOUND	WEST BOUND	NORTH BOUND	SOUTH 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):	E	E	E	E
Left Turn Treatment Type:	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)	E	S	E	E
6. RT volume	208	25	47	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		55	24
10. Shared lane vol		29		
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:				
18. Through lane volume	147	350	154	248
19. Critical lane volume	245	350	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 BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Critical through-RT vol: [19]	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

< 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH Ph 3
Movement codes		EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]		8	57	293	76	96	248
Critical sum [CS]	778						
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		4.5	3.2	20.6	8.3	5.4	18.0
Critical v/c Ratio [Xcm]	0.77						
Status	Under capacity						

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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/Cons
Analysis Year: 2011
Project ID: WesPac Energy, Pittsburg Traffic Impact Study

East/West Street: 10th Street
North/South 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	314	25	203	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 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):	E	E	E	E
Left Turn Treatment Type:	P	P	P	P
4. LT adjustment factor	0.950	0.950	0.950	0.950
5. LT lane vol	8	65	214	76
RIGHT TURN MOVEMENT				
Right Lane Configuration (E=Excl, S=Shrd)	E	S	E	E
6. RT volume	208	25	47	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		55	24
10. Shared lane vol		29		
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 BOUND	WEST BOUND	NORTH BOUND	SOUTH 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

< 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH Ph 3
Movement codes		EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]		8	57	372	76	138	248
Critical sum [CS]	899						
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

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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/Ops
Analysis Year:	2011

Project ID: WesPac Energy, Pittsburg Traffic Impact Study

East/West Street: 10th Street

North/South 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	253	25	164	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 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):	E	E	E	E
Left Turn Treatment Type:	P	P	P	P
4. LT adjustment factor	0.950	0.950	0.950	0.950
5. LT lane vol	8	65	173	76
RIGHT TURN MOVEMENT				
Right Lane Configuration (E=Excl, S=Shrd)	E	S	E	E
6. RT volume	208	25	47	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		55	24
10. Shared lane vol		29		
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)				

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]	245	352	154	248
LT lane vol: [5]	8	65	173	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

< 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH Ph 3
Movement codes		EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]		8	57	295	76	97	248
Critical sum [CS]	781						
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		4.5	3.2	20.6	8.3	5.5	18.0
Critical v/c Ratio [Xcm]	0.77						
Status	Under capacity						

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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: PM Peak Hour-Existing
Analysis Year: 2011
Project ID: WesPac Energy, Pittsburg Traffic Impact Study

East/West Street: 10th Street
North/South 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	27	224	150	96	197	46	134	227	99	32	152	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 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):	E	E	E	E
Left Turn Treatment Type:	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)	E	S	E	E
6. RT volume	150	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	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:				
18. Through lane volume	224	314	227	152
19. Critical lane volume	224	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 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

< 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH Ph 3
Movement codes		EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]		28	73	241	34	107	152
Critical sum [CS]	635						
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		5.9	5.1	20.7	6.4	7.4	14.5
Critical v/c Ratio [Xcm]	0.63						
Status	Under capacity						

HCS2000: Signalized Intersections Release 4.1

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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: PM Peak Hour-Existing/Const
Analysis Year: 2011
Project ID: WesPac Energy, Pittsburg Traffic Impact Study

East/West Street: 10th Street
North/South 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	27	287	190	96	197	46	134	227	99	32	152	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 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):	E	E	E	E
Left Turn Treatment Type:	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)	E	S	E	E
6. RT volume	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:				
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 BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
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

< 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH Ph 3
Movement codes		EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]		28	73	287	34	107	152
Critical sum [CS]	681						
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						

HCS2000: Signalized Intersections Release 4.1

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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: PM Peak Hour-Existing/Ops
Analysis Year: 2011
Project ID: WesPac Energy, Pittsburg Traffic Impact Study

East/West Street: 10th Street
North/South 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	27	226	151	96	197	46	134	227	99	32	152	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 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):	E	E	E	E
Left Turn Treatment Type:	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)	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:				
18. Through lane volume	226	314	227	152
19. Critical lane volume	226	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 BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Critical through-RT vol: [19]	226	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

< 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH Ph 3
Movement codes		EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]		28	73	241	34	107	152
Critical sum [CS]	635						
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		5.9	5.1	20.7	6.4	7.4	14.5
Critical v/c Ratio [Xcm]	0.63						
Status	Under capacity						

HCS2000: Unsignalized Intersections Release 4.1

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	1	2	3	4	5	6
	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
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			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	0	3
Percent Heavy Vehicles	1	1	1	1
Percent Grade (%)	0		0	
Median Storage				
Flared Approach: Exists?				
Storage				
RT Channelized?		No		No
Lanes	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		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		

HCS2000: Unsignalized Intersections Release 4.1

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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
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	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			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		1				
Hourly Flow Rate, HFR	1		1	0		3				
Percent Heavy Vehicles	1		1	1		1				
Percent Grade (%)		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. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal 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
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
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)			

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	375	176	572		176	567		367
s								
Px								
V c,u,x								
C r,x								
C plat,x								

Two-Stage Process

	7		8		10		11	
	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2
V(c,x)								
s	1700				1700			
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	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	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 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	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 mvmnt	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 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	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 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	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 mvmnt			0.99		0.99	
Movement Capacity			427		432	

Results for Two-stage process:

a	
y	
C t	427

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(il), Volume for stream 2 or 5	367	
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	8.1	7.6
N, Number of major street through lanes	1	
d(rank,1) Delay for stream 2 or 5	0.0	

HCS2000: Unsignalized Intersections Release 4.1

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					
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	0	3
Percent Heavy Vehicles	1	1	1	1
Percent Grade (%)	0		0	
Median Storage				
Flared Approach: Exists?				
Storage				
RT Channelized?		No		No
Lanes	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		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
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
Approach Delay			13.9			10.3		
Approach LOS			B			B		

HCS2000: Unsignalized Intersections Release 4.1

Phone: Fax:
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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

Vehicle Volumes and Adjustments

Major Street Movements	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
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		1
Hourly Flow Rate, HFR	1		1	0		3
Percent Heavy Vehicles	1		1	1		1
Percent Grade (%)		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. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal 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
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
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) Stage II
p(1)			
p(4)			
p(7)			
p(8)			
p(9)			
p(10)			
p(11)			
p(12)			

Computation 4 and 5

Single-Stage Process

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
V c,x	478	176	830		176	773		367
s								
Px								
V c,u,x								
C r,x								
C plat,x								

Two-Stage Process

	7		8		10		11	
	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2
V(c,x)								
s	1700				1700			
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	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 mvmnt	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 mvmnt	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 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	0.89	0.89
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 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	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
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
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(il), Volume for stream 2 or 5		367
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	8.7	7.6
N, Number of major street through lanes		1
d(rank,1) Delay for stream 2 or 5		0.0

HCS2000: Unsignalized Intersections Release 4.1

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	0	3
Percent Heavy Vehicles	1	1	1	1
Percent Grade (%)	0		0	
Median Storage				
Flared Approach: Exists?				
Storage				
RT Channelized?		No		No
Lanes	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		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
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: 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/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	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		1			
Hourly Flow Rate, HFR	1		1	0		3			
Percent Heavy Vehicles	1		1	1		1			
Percent Grade (%)		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. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal 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
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
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)			

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	378	176	578		176	571		367
s								
Px								
V c,u,x								
C r,x								
C plat,x								

Two-Stage Process

	7		8		10		11			
	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2		
V(c,x)										
s	1700				1700					
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	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 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	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

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 mvmnt		
Movement Capacity		
Part 3 - Single Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	0.99	0.99
Movement Capacity		
Result for 2 stage process:		
a		
y		
C t		
Probability of Queue free St.	1.00	1.00
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	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

C t 423 429

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
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		

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		367
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	8.1	7.6
N, Number of major street through lanes		1
d(rank,1) Delay for stream 2 or 5		0.0

HCS2000: Unsignalized Intersections Release 4.1

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	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	4		8
Peak Hour Factor, PHF	1.00		1.00	1.00		1.00

Hourly Flow Rate, HFR	0	1	4	8
Percent Heavy Vehicles	1	1	1	1
Percent Grade (%)	0		0	
Median Storage				
Flared Approach: Exists?				
Storage				
RT Channelized?		No		No
Lanes	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		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
95% queue length	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
Approach Delay			10.4			10.6		
Approach LOS			B			B		

HCS2000: Unsignalized Intersections Release 4.1

Phone: Fax:
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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		2
Hourly Flow Rate, HFR	0		1	4		8
Percent Heavy Vehicles	1		1	1		1
Percent Grade (%)		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. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal 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:		187
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
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
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)			

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		190	386	578		386	573		187
s									
Px									
V c,u,x									
C r,x									
C plat,x									

Two-Stage Process								
	7		8		10		11	
	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2
V(c,x)								
s	1700				1700			
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	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 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		
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	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	
C t	425 431

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
95% queue length	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
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(il), Volume for stream 2 or 5		187
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	7.6	8.1
N, Number of major street through lanes		1
d(rank,1) Delay for stream 2 or 5		0.0

HCS2000: Unsignalized Intersections Release 4.1

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	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	107		111
Peak Hour Factor, PHF	1.00		1.00	1.00		1.00

Hourly Flow Rate, HFR	0	1	107	111
Percent Heavy Vehicles	1	1	1	1
Percent Grade (%)	0		0	
Median Storage				
Flared Approach: Exists?				
Storage				
RT Channelized?		No		No
Lanes	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		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
95% queue length	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		

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	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	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	
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. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal 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:		187
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
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
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)			

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	190	386	630		386	573		187
s								
Px								
V c,u,x								
C r,x								
C plat,x								

Two-Stage Process

	7		8		10		11			
	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2		
V(c,x)										
s	1700				1700					
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	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 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	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 mvmnt		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 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		
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	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 mvmnt			0.87		1.00	
Movement Capacity			345		431	

Results for Two-stage process:

a		
y		
C t	345	431

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
95% queue length	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(il), Volume for stream 2 or 5		187
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	7.6	8.1
N, Number of major street through lanes		1
d(rank,1) Delay for stream 2 or 5		0.0

HCS2000: Unsignalized Intersections Release 4.1

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	7	10
Percent Heavy Vehicles	1	1	1	1
Percent Grade (%)	0		0	
Median Storage				
Flared Approach: Exists?				
Storage				
RT Channelized?		No		No
Lanes	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		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: 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/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	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	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	
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. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal 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:		187
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
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
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) Stage II
p(1)			
p(4)			
p(7)			
p(8)			
p(9)			
p(10)			
p(11)			
p(12)			

Computation 4 and 5

Single-Stage Process

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R	
V c,x	190	386	580		386	573		187
s								
Px								
V c,u,x								
C r,x								
C plat,x								

Two-Stage Process

	7		8		10		11	
	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2
V(c,x)								
s	1700				1700			
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	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	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			

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 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		
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	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

C t 422 431

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
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		

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		187
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	7.6	8.1
N, Number of major street through lanes		1
d(rank,1) Delay for stream 2 or 5		0.0

HCS2000: Signalized Intersections Release 4.1

Phone: Fax:
E-Mail:

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
Analysis Year: 2011
Project ID: WesPac Energy - Pittsburg Traffic Impact Study
East/West Street: Willow Pass Road
North/South Street: Bailey Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Num. Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Volume	7	270	183	309	685	1	290	7	207	1	1	6
Parking		N			N			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 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):	E	E	E	E
Left Turn Treatment Type:	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)	E	E	E	S
6. RT volume	183	1	207	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	244	
10. Shared lane vol				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 equivalence				
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

< 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH 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 [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						

HCS2000: Signalized Intersections Release 4.1

Phone: Fax:
E-Mail:

PLANNING ANALYSIS

Analyst: Brent Moore
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Agency/Co.: WesPac Energy-Pittsburg, LLC
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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
North/South Street: Bailey Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Num. Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Volume	7	325	183	309	685	1	290	7	255	1	1	6
Parking		N			N			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 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):	E	E	E	E
Left Turn Treatment Type:	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)	E	E	E	S
6. RT volume	183	1	255	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

< 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH 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 [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						

HCS2000: Signalized Intersections Release 4.1

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Analysis Year: 2011
Project ID: WesPac Energy - Pittsburg Traffic Impact Study
East/West Street: Willow Pass Road
North/South Street: Bailey Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Num. Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Volume	7	271	183	309	685	1	290	7	208	1	1	6
Parking		N			N			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 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):	E	E	E	E
Left Turn Treatment Type:	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)	E	E	E	S
6. RT volume	183	1	208	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

< 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH 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 [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						

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Analysis Year: 2011
Project ID: WesPac Energy - Pittsburg Traffic Impact Study

East/West Street: Willow Pass Road
North/South Street: Bailey Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Num. Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Volume	8	568	171	215	240	7	235	22	416	8	4	16
Parking		N			N			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 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):	E	E	E	E
Left Turn Treatment Type:	P	P	P	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)	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	
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 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH Ph 3
Movement codes		EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]		8	218	284	8	239	250
Critical sum [CS]	1007						
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	9.5	16.4	4.3	10.4	14.9
Critical v/c Ratio [Xcm]	0.99						
Status	At capacity						

HCS2000: Signalized Intersections Release 4.1

Phone: Fax:
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PLANNING ANALYSIS

Analyst: Brent Moore
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East/West Street: Willow Pass Road
North/South Street: Bailey Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Num. Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Volume	8	568	171	263	295	7	235	22	416	8	4	16
Parking		N			N			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 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):	E	E	E	E
Left Turn Treatment Type:	P	P	P	P
4. LT adjustment factor	0.950	0.950	0.950	0.950
5. LT lane vol	8	277	247	8
RIGHT TURN MOVEMENT				
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	
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 BOUND	WEST BOUND	NORTH BOUND	SOUTH 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 Ph 1	EAST-WEST Ph 2	EAST-WEST Ph 3	NORTH-SOUTH Ph 1	NORTH-SOUTH Ph 2	NORTH-SOUTH Ph 3
Movement codes		EWL	WTL	EWT	NSL	NTL	NST
Critical phase vol [CV]		8	269	284	8	239	250
Critical sum [CS]	1058						
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						

HCS2000: Signalized Intersections Release 4.1

Phone: Fax:
E-Mail:

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/Ops
Analysis Year:	2011

Project ID: WesPac Energy - Pittsburg Traffic Impact Study

East/West Street: Willow Pass Road
North/South Street: Bailey Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Num. Lanes	1	2	1	1	2	1	1	1	1	1	1	0
Volume	8	568	171	216	241	7	235	22	416	8	4	16
Parking		N			N			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 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):	E	E	E	E
Left Turn Treatment Type:	P	P	P	P
4. LT adjustment factor	0.950	0.950	0.950	0.950
5. LT lane vol	8	227	247	8
RIGHT TURN MOVEMENT				
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	
10. Shared lane vol				19
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

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