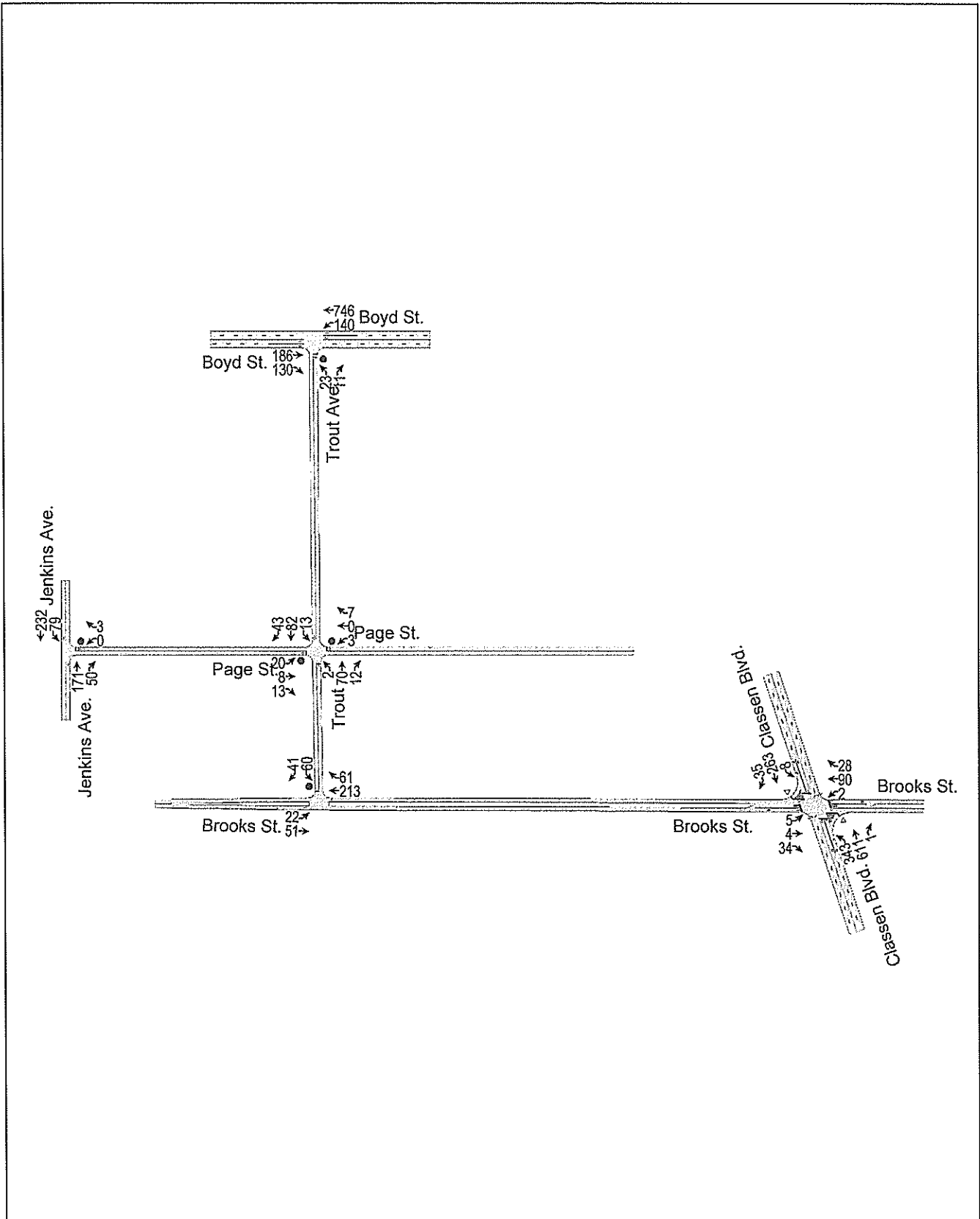


CAPACITY ANALYSES



T-2388 - Norman, OK 2014 Existing Traffic: A.M. Peak Hour
Traffic Engineering Consultants, Inc.

HCM Signalized Intersection Capacity Analysis

3: Brooks St. & Classen Blvd.

11/4/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	4	34	2	90	28	343	611	1	8	263	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.86		1.00	0.96			1.00			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98			1.00	
Satd. Flow (prot)	1770	1611		1770	1797			3476			3474	
Flt Permitted	0.67	1.00		0.73	1.00			0.72			0.93	
Satd. Flow (perm)	1257	1611		1360	1797			2534			3236	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	4	37	2	98	30	373	664	1	9	286	38
RTOR Reduction (vph)	0	32	0	0	13	0	0	0	0	0	9	0
Lane Group Flow (vph)	5	9	0	2	115	0	0	1038	0	0	324	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.4	7.4		7.4	7.4			34.7			34.7	
Effective Green, g (s)	7.4	7.4		7.4	7.4			34.7			34.7	
Actuated g/C Ratio	0.14	0.14		0.14	0.14			0.67			0.67	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	179	229		193	255			1688			2155	
v/s Ratio Prot		0.01			c0.06							
v/s Ratio Perm	0.00			0.00				c0.41			0.10	
v/c Ratio	0.03	0.04		0.01	0.45			0.61			0.15	
Uniform Delay, d1	19.3	19.3		19.2	20.5			4.9			3.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.1		0.0	1.3			0.7			0.0	
Delay (s)	19.3	19.4		19.2	21.8			5.6			3.3	
Level of Service	B	B		B	C			A			A	
Approach Delay (s)		19.4			21.7			5.6			3.3	
Approach LOS		B			C			A			A	

Intersection Summary

HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

6: Brooks St. & Trout Ave.

11/4/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	↱
Volume (veh/h)	22	51	213	61	60	41
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	55	232	66	65	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	298				368	265
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	298				368	265
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				89	94
cM capacity (veh/h)	1263				620	774

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	79	298	110
Volume Left	24	0	65
Volume Right	0	66	45
cSH	1263	1700	675
Volume to Capacity	0.02	0.18	0.16
Queue Length 95th (ft)	1	0	14
Control Delay (s)	2.5	0.0	11.4
Lane LOS	A		B
Approach Delay (s)	2.5	0.0	11.4
Approach LOS			B

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization		34.6%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

7: Page St. & Jenkins Ave.

11/4/2014

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙↖		↑			↗↘
Volume (veh/h)	0	3	171	50	79	232
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	186	54	86	252
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	637	213			240	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	637	213			240	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			94	
cM capacity (veh/h)	413	827			1326	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	3	240	338
Volume Left	0	0	86
Volume Right	3	54	0
cSH	827	1700	1326
Volume to Capacity	0.00	0.14	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	9.4	0.0	2.5
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	2.5
Approach LOS	A		

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		42.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

8: Page St. & Trout Ave.

11/4/2014

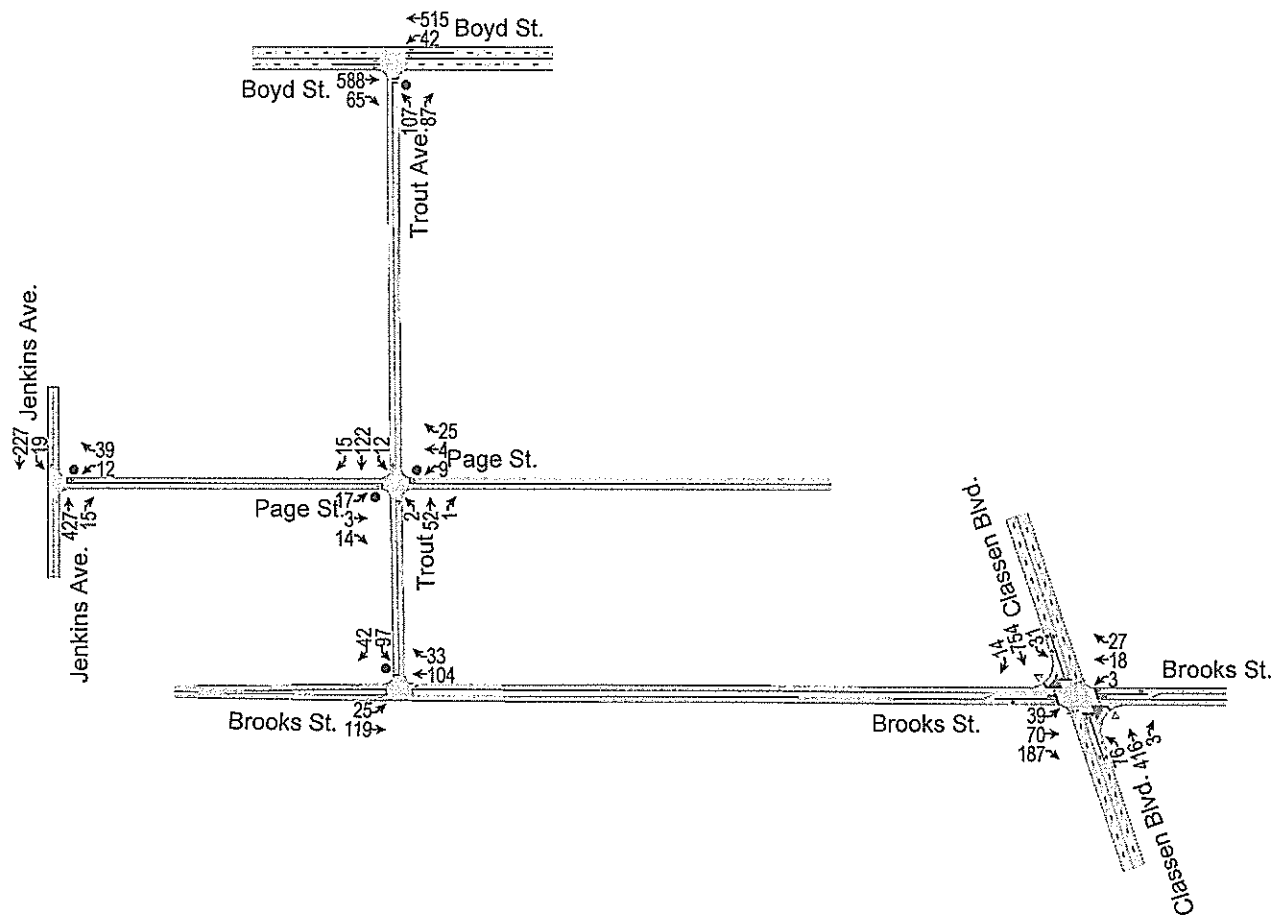
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	8	13	3	0	7	2	70	12	13	82	43
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	9	14	3	0	8	2	76	13	14	89	47
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	235	234	112	246	251	83	136			89		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	235	234	112	246	251	83	136			89		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	98	100	100	99	100			99		
cM capacity (veh/h)	708	659	940	684	645	977	1448			1506		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	45	11	91	150								
Volume Left	22	3	2	14								
Volume Right	14	8	13	47								
cSH	756	866	1448	1506								
Volume to Capacity	0.06	0.01	0.00	0.01								
Queue Length 95th (ft)	5	1	0	1								
Control Delay (s)	10.1	9.2	0.2	0.8								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.1	9.2	0.2	0.8								
Approach LOS	B	A										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			24.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

11: Boyd St. & Trout Ave.

11/4/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	
Volume (veh/h)	186	130	140	746	23	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	202	141	152	811	25	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			343		983	172
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			343		983	172
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		88	99
cM capacity (veh/h)			1212		215	842
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	135	209	422	541	37	
Volume Left	0	0	152	0	25	
Volume Right	0	141	0	0	12	
cSH	1700	1700	1212	1700	283	
Volume to Capacity	0.08	0.12	0.13	0.32	0.13	
Queue Length 95th (ft)	0	0	11	0	11	
Control Delay (s)	0.0	0.0	3.8	0.0	19.6	
Lane LOS			A		C	
Approach Delay (s)	0.0		1.7		19.6	
Approach LOS					C	
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			47.3%		ICU Level of Service	A
Analysis Period (min)			15			



T-2388 - Norman, OK 2014 Existing Traffic: P.M. Peak Hour
Traffic Engineering Consultants, Inc.

HCM Signalized Intersection Capacity Analysis

3: Brooks St. & Classen Blvd.

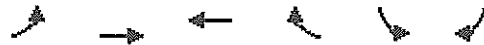
11/4/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	39	70	187	3	18	27	76	416	3	31	754	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.89		1.00	0.91			1.00			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1770	1659		1770	1697			3509			3523	
Flt Permitted	0.73	1.00		0.57	1.00			0.75			0.92	
Satd. Flow (perm)	1351	1659		1059	1697			2667			3253	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	76	203	3	20	29	83	452	3	34	820	15
RTOR Reduction (vph)	0	113	0	0	22	0	0	1	0	0	2	0
Lane Group Flow (vph)	42	166	0	3	27	0	0	537	0	0	867	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.6	9.6		9.6	9.6			19.0			19.0	
Effective Green, g (s)	9.6	9.6		9.6	9.6			19.0			19.0	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.49			0.49	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	336	413		263	422			1313			1601	
v/s Ratio Prot		c0.10			0.02							
v/s Ratio Perm	0.03			0.00				0.20			c0.27	
v/c Ratio	0.12	0.40		0.01	0.06			0.41			0.54	
Uniform Delay, d1	11.2	12.1		10.9	11.1			6.2			6.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.6		0.0	0.1			0.2			0.4	
Delay (s)	11.4	12.8		10.9	11.1			6.4			7.2	
Level of Service	B	B		B	B			A			A	
Approach Delay (s)		12.6			11.1			6.4			7.2	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	38.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis 6: Brooks St. & Trout Ave.

11/4/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	
Volume (veh/h)	25	119	104	33	97	42
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	129	113	36	105	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	149				315	131
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149				315	131
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				84	95
cM capacity (veh/h)	1433				665	919

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	157	149	151
Volume Left	27	0	105
Volume Right	0	36	46
cSH	1433	1700	726
Volume to Capacity	0.02	0.09	0.21
Queue Length 95th (ft)	1	0	20
Control Delay (s)	1.4	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	1.4	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay		4.2	
Intersection Capacity Utilization		33.1%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

7: Page St. & Jenkins Ave.

11/4/2014

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	39	427	15	19	227
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	42	464	16	21	247
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	760	472			480	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	760	472			480	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	93			98	
cM capacity (veh/h)	367	592			1082	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	55	480	267
Volume Left	13	0	21
Volume Right	42	16	0
cSH	517	1700	1082
Volume to Capacity	0.11	0.28	0.02
Queue Length 95th (ft)	9	0	1
Control Delay (s)	12.8	0.0	0.8
Lane LOS	B		A
Approach Delay (s)	12.8	0.0	0.8
Approach LOS	B		

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		37.6%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

8: Page St. & Trout Ave.

11/4/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	3	14	9	4	25	2	52	1	12	122	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	3	15	10	4	27	2	57	1	13	133	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	258	229	141	245	236	57	149			58		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	258	229	141	245	236	57	149			58		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	98	99	99	97	100			99		
cM capacity (veh/h)	668	664	907	689	658	1009	1433			1547		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	37	41	60	162								
Volume Left	18	10	2	13								
Volume Right	15	27	1	16								
cSH	749	865	1433	1547								
Volume to Capacity	0.05	0.05	0.00	0.01								
Queue Length 95th (ft)	4	4	0	1								
Control Delay (s)	10.1	9.4	0.3	0.7								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.1	9.4	0.3	0.7								
Approach LOS	B	A										
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			22.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

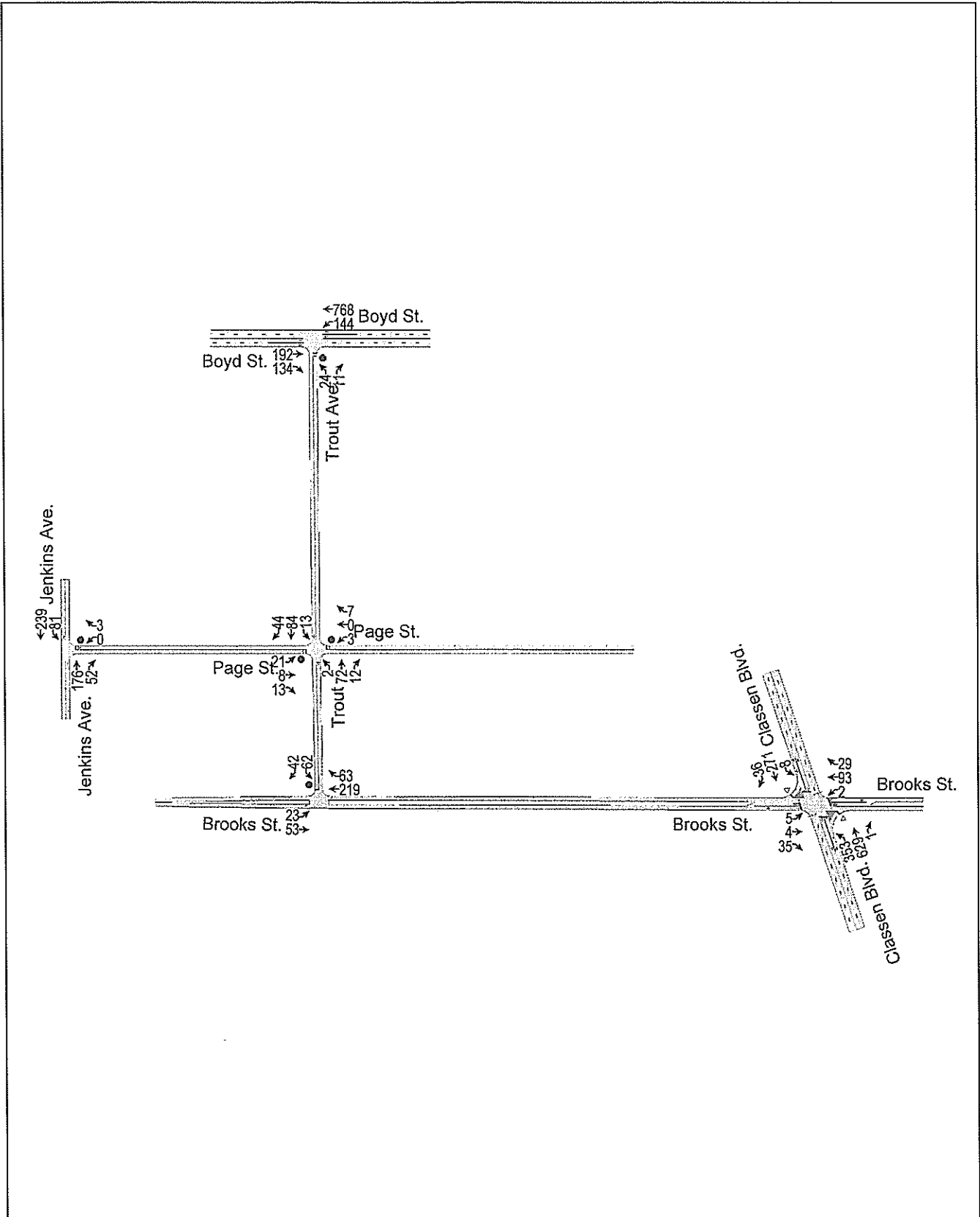
11: Boyd St. & Trout Ave.

11/4/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	
Volume (veh/h)	588	65	42	515	107	87
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	639	71	46	560	116	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			710		1046	355
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			710		1046	355
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		45	85
cM capacity (veh/h)			885		212	641

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	426	284	232	373	211
Volume Left	0	0	46	0	116
Volume Right	0	71	0	0	95
cSH	1700	1700	885	1700	303
Volume to Capacity	0.25	0.17	0.05	0.22	0.69
Queue Length 95th (ft)	0	0	4	0	121
Control Delay (s)	0.0	0.0	2.3	0.0	40.0
Lane LOS			A		E
Approach Delay (s)	0.0		0.9		40.0
Approach LOS					E

Intersection Summary					
Average Delay		5.9			
Intersection Capacity Utilization		55.0%	ICU Level of Service	B	
Analysis Period (min)		15			



T-2388 - Norman, OK 2017 Projected Background Traffic: A.M. Peak Hour
Traffic Engineering Consultants, Inc.

HCM Signalized Intersection Capacity Analysis

3: Brooks St. & Classen Blvd.

11/4/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	4	35	2	93	29	353	629	1	8	271	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Flt	1.00	0.86		1.00	0.96			1.00			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98			1.00	
Satd. Flow (prot)	1770	1610		1770	1796			3476			3474	
Flt Permitted	0.67	1.00		0.73	1.00			0.71			0.93	
Satd. Flow (perm)	1252	1610		1359	1796			2521			3235	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	4	38	2	101	32	384	684	1	9	295	39
RTOR Reduction (vph)	0	33	0	0	14	0	0	0	0	0	9	0
Lane Group Flow (vph)	5	9	0	2	119	0	0	1069	0	0	334	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.6	7.6		7.6	7.6			35.9			35.9	
Effective Green, g (s)	7.6	7.6		7.6	7.6			35.9			35.9	
Actuated g/C Ratio	0.14	0.14		0.14	0.14			0.67			0.67	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	178	229		193	255			1692			2171	
v/s Ratio Prot		0.01			c0.07							
v/s Ratio Perm	0.00			0.00				c0.42			0.10	
v/c Ratio	0.03	0.04		0.01	0.47			0.63			0.15	
Uniform Delay, d1	19.8	19.8		19.7	21.1			5.0			3.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.1		0.0	1.4			0.8			0.0	
Delay (s)	19.8	19.9		19.7	22.4			5.8			3.3	
Level of Service	B	B		B	C			A			A	
Approach Delay (s)		19.9			22.4			5.8			3.3	
Approach LOS		B			C			A			A	

Intersection Summary

HCM Average Control Delay	7.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

6: Brooks St. & Trout Ave.

11/4/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	23	53	219	63	62	42
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	58	238	68	67	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	307				380	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	307				380	272
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				89	94
cM capacity (veh/h)	1254				610	766

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	83	307	113
Volume Left	25	0	67
Volume Right	0	68	46
cSH	1254	1700	665
Volume to Capacity	0.02	0.18	0.17
Queue Length 95th (ft)	2	0	15
Control Delay (s)	2.5	0.0	11.5
Lane LOS	A		B
Approach Delay (s)	2.5	0.0	11.5
Approach LOS			B

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization		35.4%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

7: Page St. & Jenkins Ave.

11/4/2014

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	3	176	52	81	239
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	191	57	88	260
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	655	220			248	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	655	220			248	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			93	
cM capacity (veh/h)	402	820			1318	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	3	248	348			
Volume Left	0	0	88			
Volume Right	3	57	0			
cSH	820	1700	1318			
Volume to Capacity	0.00	0.15	0.07			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	9.4	0.0	2.5			
Lane LOS	A		A			
Approach Delay (s)	9.4	0.0	2.5			
Approach LOS	A					
Intersection Summary						
Average Delay		1.5				
Intersection Capacity Utilization		42.8%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8: Page St. & Trout Ave.

11/4/2014

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Volume (veh/h)	21	8	13	3	0	7	2	72	12	13	84	44								
Sign Control		Stop			Stop			Free			Free									
Grade		0%			0%			0%			0%									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	23	9	14	3	0	8	2	78	13	14	91	48								
Pedestrians																				
Lane Width (ft)																				
Walking Speed (ft/s)																				
Percent Blockage																				
Right turn flare (veh)																				
Median type								None			None									
Median storage (veh)																				
Upstream signal (ft)																				
pX, platoon unblocked																				
vC, conflicting volume	240	239	115	251	257	85	139			91										
vC1, stage 1 conf vol																				
vC2, stage 2 conf vol																				
vCu, unblocked vol	240	239	115	251	257	85	139			91										
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1										
tC, 2 stage (s)																				
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2										
p0 queue free %	97	99	98	100	100	99	100			99										
cM capacity (veh/h)	702	655	937	679	640	974	1444			1504										
Direction, Lane #	EB 1	WB 1	NB 1	SB 1																
Volume Total	46	11	93	153																
Volume Left	23	3	2	14																
Volume Right	14	8	13	48																
cSH	750	862	1444	1504																
Volume to Capacity	0.06	0.01	0.00	0.01																
Queue Length 95th (ft)	5	1	0	1																
Control Delay (s)	10.1	9.2	0.2	0.8																
Lane LOS	B	A	A	A																
Approach Delay (s)	10.1	9.2	0.2	0.8																
Approach LOS	B	A																		
Intersection Summary																				
Average Delay		2.3																		
Intersection Capacity Utilization		24.7%	ICU Level of Service	A																
Analysis Period (min)		15																		

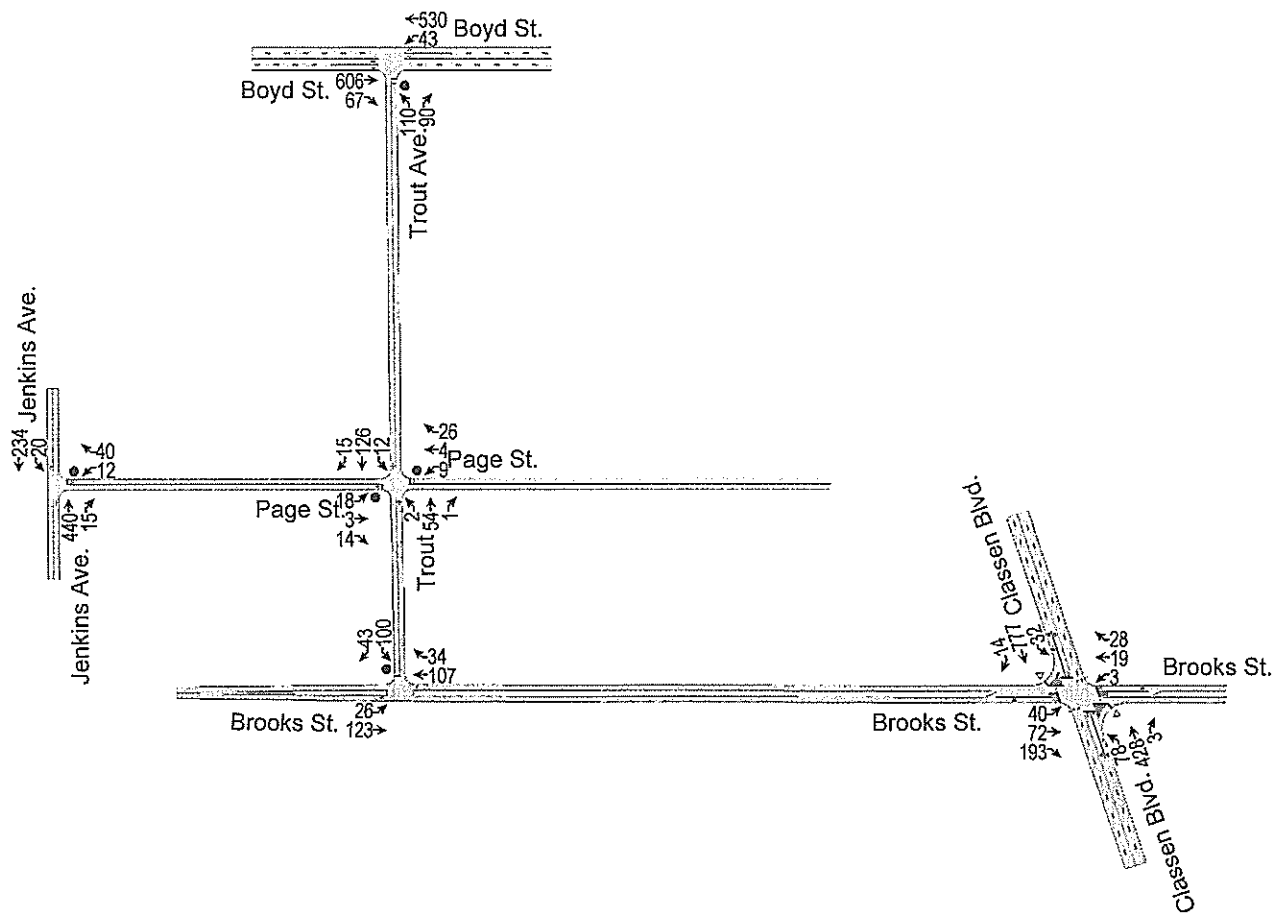
HCM Unsignalized Intersection Capacity Analysis 11: Boyd St. & Trout Ave.

11/4/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↗	
Volume (veh/h)	192	134	144	768	24	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	209	146	157	835	26	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			354		1012	177
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			354		1012	177
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		87	99
cM capacity (veh/h)			1201		205	835

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	139	215	435	557	38
Volume Left	0	0	157	0	26
Volume Right	0	146	0	0	12
cSH	1700	1700	1201	1700	269
Volume to Capacity	0.08	0.13	0.13	0.33	0.14
Queue Length 95th (ft)	0	0	11	0	12
Control Delay (s)	0.0	0.0	3.9	0.0	20.6
Lane LOS			A		C
Approach Delay (s)	0.0		1.7		20.6
Approach LOS					C

Intersection Summary					
Average Delay		1.8			
Intersection Capacity Utilization		48.3%	ICU Level of Service	A	
Analysis Period (min)		15			



HCM Signalized Intersection Capacity Analysis

3: Brooks St. & Classen Blvd.

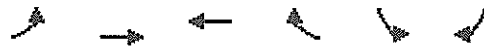
11/4/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	72	193	3	19	28	78	428	3	32	777	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.89		1.00	0.91			1.00			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1770	1659		1770	1698			3509			3523	
Flt Permitted	0.72	1.00		0.55	1.00			0.75			0.92	
Satd. Flow (perm)	1348	1659		1019	1698			2646			3249	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	78	210	3	21	30	85	465	3	35	845	15
RTOR Reduction (vph)	0	115	0	0	22	0	0	1	0	0	2	0
Lane Group Flow (vph)	43	173	0	3	29	0	0	552	0	0	893	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.9	9.9		9.9	9.9			19.5			19.5	
Effective Green, g (s)	9.9	9.9		9.9	9.9			19.5			19.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.49			0.49	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	339	417		256	427			1310			1608	
v/s Ratio Prot		c0.10			0.02							
v/s Ratio Perm	0.03			0.00				0.21			c0.27	
v/c Ratio	0.13	0.41		0.01	0.07			0.42			0.56	
Uniform Delay, d1	11.4	12.3		11.1	11.2			6.4			6.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.7		0.0	0.1			0.2			0.4	
Delay (s)	11.6	13.0		11.1	11.3			6.6			7.4	
Level of Service	B	B		B	B			A			A	
Approach Delay (s)		12.8			11.3			6.6			7.4	
Approach LOS		B			B			A			A	

Intersection Summary												
HCM Average Control Delay		8.2	HCM Level of Service		A							
HCM Volume to Capacity ratio		0.51										
Actuated Cycle Length (s)		39.4	Sum of lost time (s)		10.0							
Intersection Capacity Utilization		65.2%	ICU Level of Service		C							
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
6: Brooks St. & Trout Ave.

11/4/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	↱
Volume (veh/h)	26	123	107	34	100	43
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	134	116	37	109	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	153				325	135
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	153				325	135
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				83	95
cM capacity (veh/h)	1427				656	914

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	162	153	155
Volume Left	28	0	109
Volume Right	0	37	47
cSH	1427	1700	717
Volume to Capacity	0.02	0.09	0.22
Queue Length 95th (ft)	2	0	21
Control Delay (s)	1.5	0.0	11.4
Lane LOS	A		B
Approach Delay (s)	1.5	0.0	11.4
Approach LOS			B

Intersection Summary			
Average Delay		4.3	
Intersection Capacity Utilization		33.8%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

7: Page St. & Jenkins Ave.

11/4/2014

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	40	440	15	20	234
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	43	478	16	22	254
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	784	486			495	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	784	486			495	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	93			98	
cM capacity (veh/h)	354	581			1069	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	57	495	276			
Volume Left	13	0	22			
Volume Right	43	16	0			
cSH	506	1700	1069			
Volume to Capacity	0.11	0.29	0.02			
Queue Length 95th (ft)	9	0	2			
Control Delay (s)	13.0	0.0	0.9			
Lane LOS	B		A			
Approach Delay (s)	13.0	0.0	0.9			
Approach LOS	B					
Intersection Summary						
Average Delay		1.2				
Intersection Capacity Utilization		38.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8: Page St. & Trout Ave.

11/4/2014

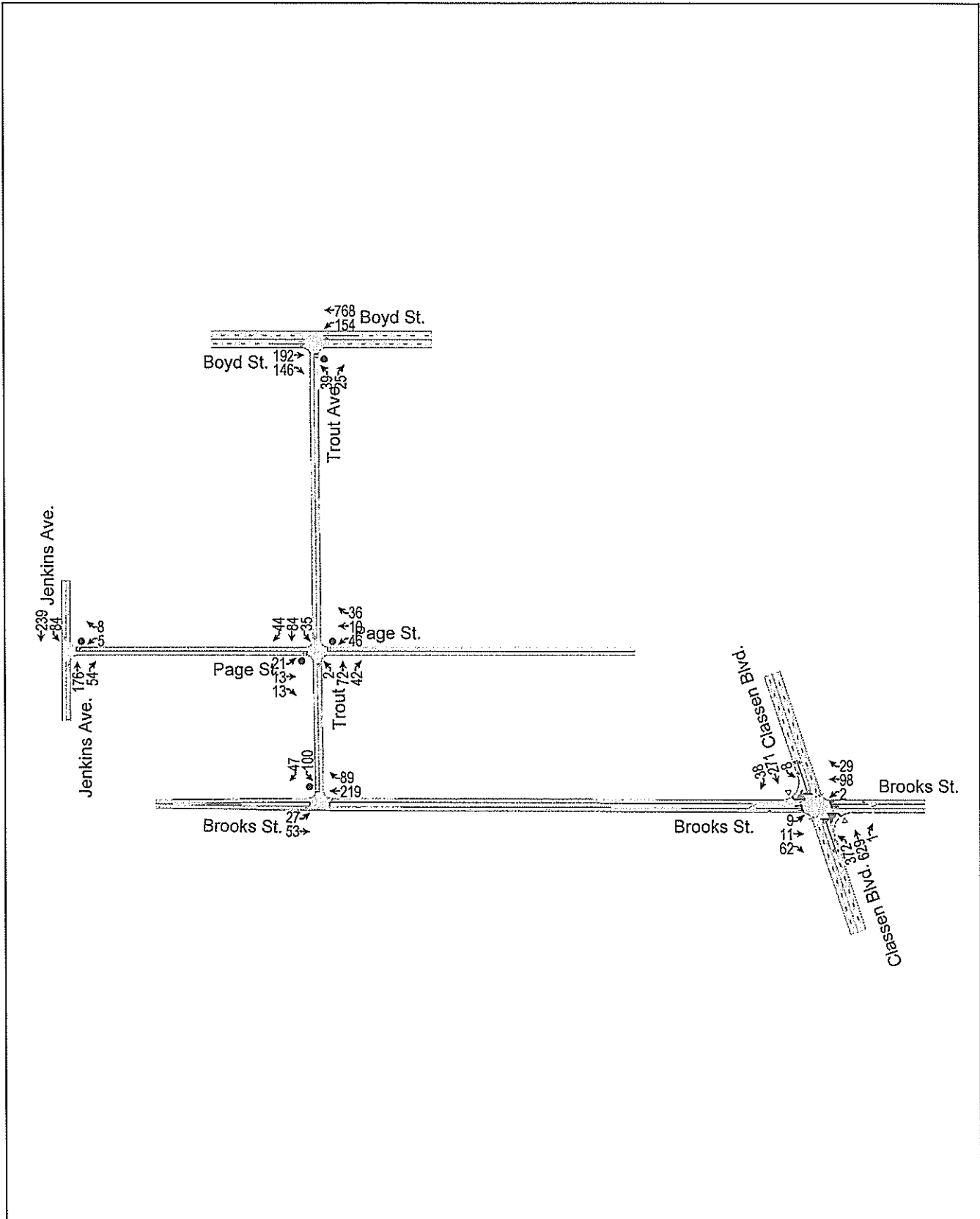
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	3	14	9	4	26	2	54	1	12	126	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	3	15	10	4	28	2	59	1	13	137	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	265	235	145	252	243	59	153			60		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	265	235	145	252	243	59	153			60		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	98	99	99	97	100			99		
cM capacity (veh/h)	660	659	902	682	652	1006	1427			1544		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	38	42	62	166								
Volume Left	20	10	2	13								
Volume Right	15	28	1	16								
cSH	739	864	1427	1544								
Volume to Capacity	0.05	0.05	0.00	0.01								
Queue Length 95th (ft)	4	4	0	1								
Control Delay (s)	10.1	9.4	0.3	0.6								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.1	9.4	0.3	0.6								
Approach LOS	B	A										
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			23.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

11: Boyd St. & Trout Ave.

11/4/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↗	
Volume (veh/h)	606	67	43	530	110	90
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	659	73	47	576	120	98
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			732		1077	366
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			732		1077	366
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		41	85
cM capacity (veh/h)			869		202	631
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	439	292	239	384	217	
Volume Left	0	0	47	0	120	
Volume Right	0	73	0	0	98	
cSH	1700	1700	869	1700	291	
Volume to Capacity	0.26	0.17	0.05	0.23	0.75	
Queue Length 95th (ft)	0	0	4	0	138	
Control Delay (s)	0.0	0.0	2.3	0.0	46.3	
Lane LOS			A		E	
Approach Delay (s)	0.0		0.9		46.3	
Approach LOS					E	
Intersection Summary						
Average Delay			6.8			
Intersection Capacity Utilization			56.4%		ICU Level of Service	B
Analysis Period (min)			15			



T-2388 - Norman, OK 2017 Projected Background Traffic with Future Page Circle Apartment Traffic: A.M. Peak Hour
Traffic Engineering Consultants, Inc.

HCM Signalized Intersection Capacity Analysis

3: Brooks St. & Classen Blvd.

11/4/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 			 	
Volume (vph)	9	11	62	2	98	29	372	629	1	8	271	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.87		1.00	0.97			1.00			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98			1.00	
Satd. Flow (prot)	1770	1626		1770	1798			3474			3472	
Flt Permitted	0.67	1.00		0.71	1.00			0.71			0.93	
Satd. Flow (perm)	1245	1626		1314	1798			2504			3231	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	12	67	2	107	32	404	684	1	9	295	41
RTOR Reduction (vph)	0	57	0	0	13	0	0	0	0	0	9	0
Lane Group Flow (vph)	10	22	0	2	126	0	0	1089	0	0	336	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.9	7.9		7.9	7.9			36.5			36.5	
Effective Green, g (s)	7.9	7.9		7.9	7.9			36.5			36.5	
Actuated g/C Ratio	0.15	0.15		0.15	0.15			0.67			0.67	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	181	236		191	261			1680			2168	
v/s Ratio Prot		0.01			c0.07							
v/s Ratio Perm	0.01			0.00				c0.43			0.10	
v/c Ratio	0.06	0.09		0.01	0.48			0.65			0.15	
Uniform Delay, d1	20.0	20.1		19.9	21.4			5.2			3.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.2		0.0	1.4			0.9			0.0	
Delay (s)	20.2	20.3		19.9	22.8			6.1			3.3	
Level of Service	C	C		B	C			A			A	
Approach Delay (s)		20.3			22.7			6.1			3.3	
Approach LOS		C			C			A			A	

Intersection Summary

HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis 6: Brooks St. & Trout Ave.

11/4/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	↱
Volume (veh/h)	27	53	219	89	100	47
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	58	238	97	109	51
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	335				403	286
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	335				403	286
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				82	93
cM capacity (veh/h)	1225				589	753

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	87	335	160
Volume Left	29	0	109
Volume Right	0	97	51
cSH	1225	1700	633
Volume to Capacity	0.02	0.20	0.25
Queue Length 95th (ft)	2	0	25
Control Delay (s)	2.8	0.0	12.6
Lane LOS	A		B
Approach Delay (s)	2.8	0.0	12.6
Approach LOS			B

Intersection Summary			
Average Delay		3.9	
Intersection Capacity Utilization		39.6%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

7: Page St. & Jenkins Ave.

11/4/2014

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	8	176	54	84	239
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	9	191	59	91	260
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	663	221			250	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	663	221			250	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			93	
cM capacity (veh/h)	397	819			1316	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	14	250	351			
Volume Left	5	0	91			
Volume Right	9	59	0			
cSH	581	1700	1316			
Volume to Capacity	0.02	0.15	0.07			
Queue Length 95th (ft)	2	0	6			
Control Delay (s)	11.4	0.0	2.5			
Lane LOS	B		A			
Approach Delay (s)	11.4	0.0	2.5			
Approach LOS	B					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			43.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 8: Page St. & Trout Ave.

11/4/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	13	13	46	10	36	2	72	42	35	84	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	14	14	50	11	39	2	78	46	38	91	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	341	320	115	318	321	101	139			124		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	341	320	115	318	321	101	139			124		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	98	98	92	98	96	100			97		
cM capacity (veh/h)	567	581	937	601	580	954	1444			1463		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	51	100	126	177								
Volume Left	23	50	2	38								
Volume Right	14	39	46	48								
cSH	641	699	1444	1463								
Volume to Capacity	0.08	0.14	0.00	0.03								
Queue Length 95th (ft)	6	12	0	2								
Control Delay (s)	11.1	11.0	0.1	1.8								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.1	11.0	0.1	1.8								
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			29.4%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

11: Boyd St. & Trout Ave.

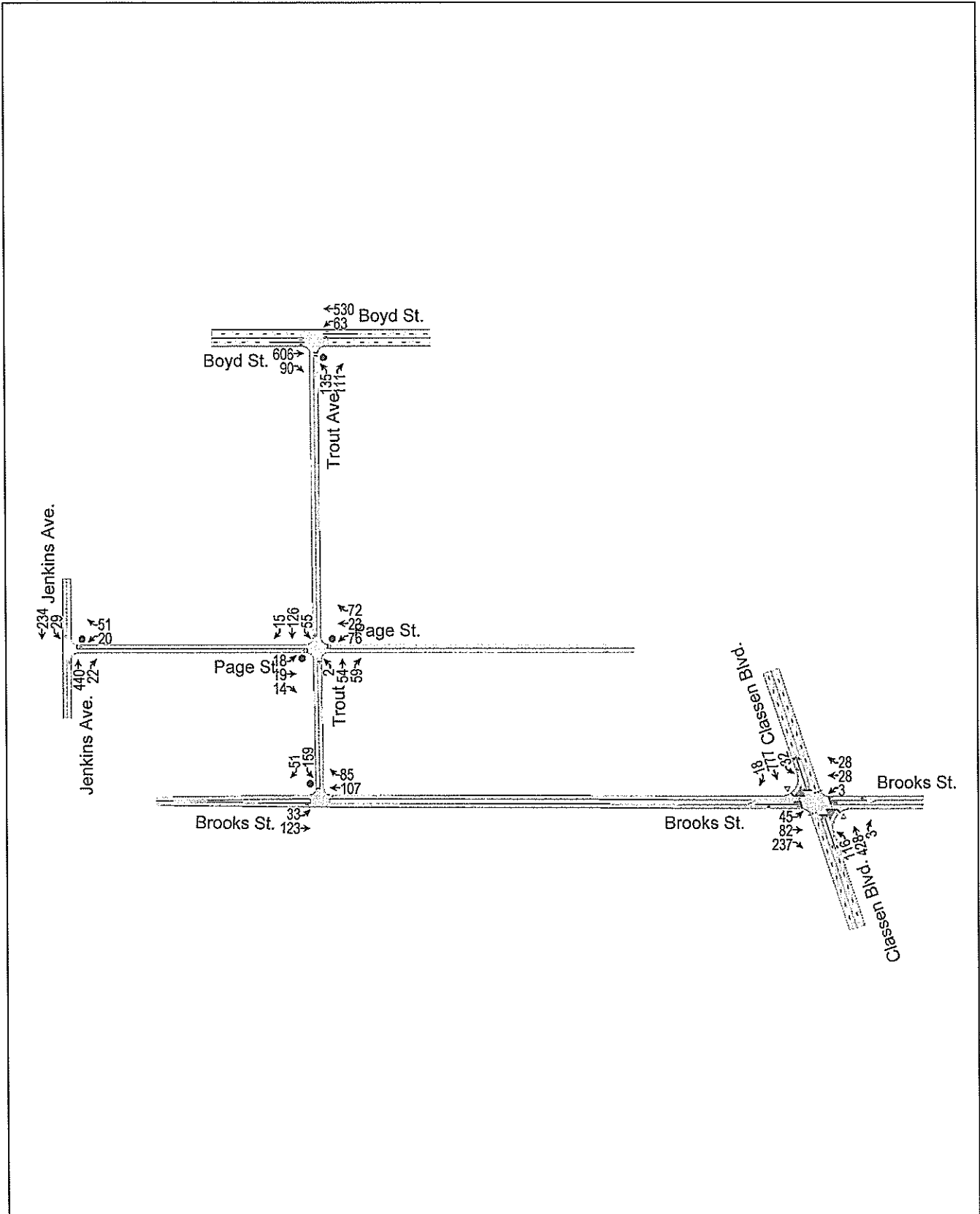
11/4/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	192	146	154	768	39	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	209	159	167	835	42	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			367		1040	184
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			367		1040	184
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			86		78	97
cM capacity (veh/h)			1188		194	827

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	139	228	446	557	70
Volume Left	0	0	167	0	42
Volume Right	0	159	0	0	27
cSH	1700	1700	1188	1700	277
Volume to Capacity	0.08	0.13	0.14	0.33	0.25
Queue Length 95th (ft)	0	0	12	0	24
Control Delay (s)	0.0	0.0	4.1	0.0	22.3
Lane LOS			A		C
Approach Delay (s)	0.0		1.8		22.3
Approach LOS					C

Intersection Summary					
Average Delay		2.3			
Intersection Capacity Utilization		49.4%		ICU Level of Service	A
Analysis Period (min)		15			



T-2388 - Norman, OK 2017 Projected Background Traffic with Future Page Circle Apartment Traffic: P.M. Peak Hour
Traffic Engineering Consultants, Inc.

HCM Signalized Intersection Capacity Analysis

3: Brooks St. & Classen Blvd.

11/4/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	82	237	3	28	28	116	428	3	32	777	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.89		1.00	0.92			1.00			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1770	1655		1770	1723			3499			3521	
Flt Permitted	0.72	1.00		0.45	1.00			0.65			0.92	
Satd. Flow (perm)	1337	1655		840	1723			2310			3237	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	89	258	3	30	30	126	465	3	35	845	20
RTOR Reduction (vph)	0	120	0	0	22	0	0	1	0	0	2	0
Lane Group Flow (vph)	49	227	0	3	39	0	0	593	0	0	898	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.9	11.9		11.9	11.9			20.1			20.1	
Effective Green, g (s)	11.9	11.9		11.9	11.9			20.1			20.1	
Actuated g/C Ratio	0.28	0.28		0.28	0.28			0.48			0.48	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	379	469		238	488			1106			1549	
v/s Ratio Prot		c0.14			0.02							
v/s Ratio Perm	0.04			0.00				0.26			c0.28	
v/c Ratio	0.13	0.48		0.01	0.08			0.54			0.58	
Uniform Delay, d1	11.2	12.5		10.8	11.0			7.7			7.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.8		0.0	0.1			0.5			0.6	
Delay (s)	11.4	13.3		10.8	11.1			8.2			8.5	
Level of Service	B	B		B	B			A			A	
Approach Delay (s)		13.0			11.1			8.2			8.5	
Approach LOS		B			B			A			A	

Intersection Summary												
HCM Average Control Delay		9.4		HCM Level of Service		A						
HCM Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		42.0		Sum of lost time (s)		10.0						
Intersection Capacity Utilization		69.7%		ICU Level of Service		C						
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

6: Brooks St. & Trout Ave.

11/4/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		←	→		←	→
Volume (veh/h)	33	123	107	85	159	51
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	134	116	92	173	55
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	209				368	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	209				368	162
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				72	94
cM capacity (veh/h)	1362				615	882

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	170	209	228
Volume Left	36	0	173
Volume Right	0	92	55
cSH	1362	1700	664
Volume to Capacity	0.03	0.12	0.34
Queue Length 95th (ft)	2	0	38
Control Delay (s)	1.8	0.0	13.2
Lane LOS	A		B
Approach Delay (s)	1.8	0.0	13.2
Approach LOS			B

Intersection Summary			
Average Delay		5.5	
Intersection Capacity Utilization		41.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

7: Page St. & Jenkins Ave.

11/4/2014

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	51	440	22	29	234
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	55	478	24	32	254
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	808	490			502	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	808	490			502	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	90			97	
cM capacity (veh/h)	340	578			1062	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	77	502	286			
Volume Left	22	0	32			
Volume Right	55	24	0			
cSH	483	1700	1062			
Volume to Capacity	0.16	0.30	0.03			
Queue Length 95th (ft)	14	0	2			
Control Delay (s)	13.9	0.0	1.2			
Lane LOS	B		A			
Approach Delay (s)	13.9	0.0	1.2			
Approach LOS	B					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			47.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Page St. & Trout Ave.

11/4/2014

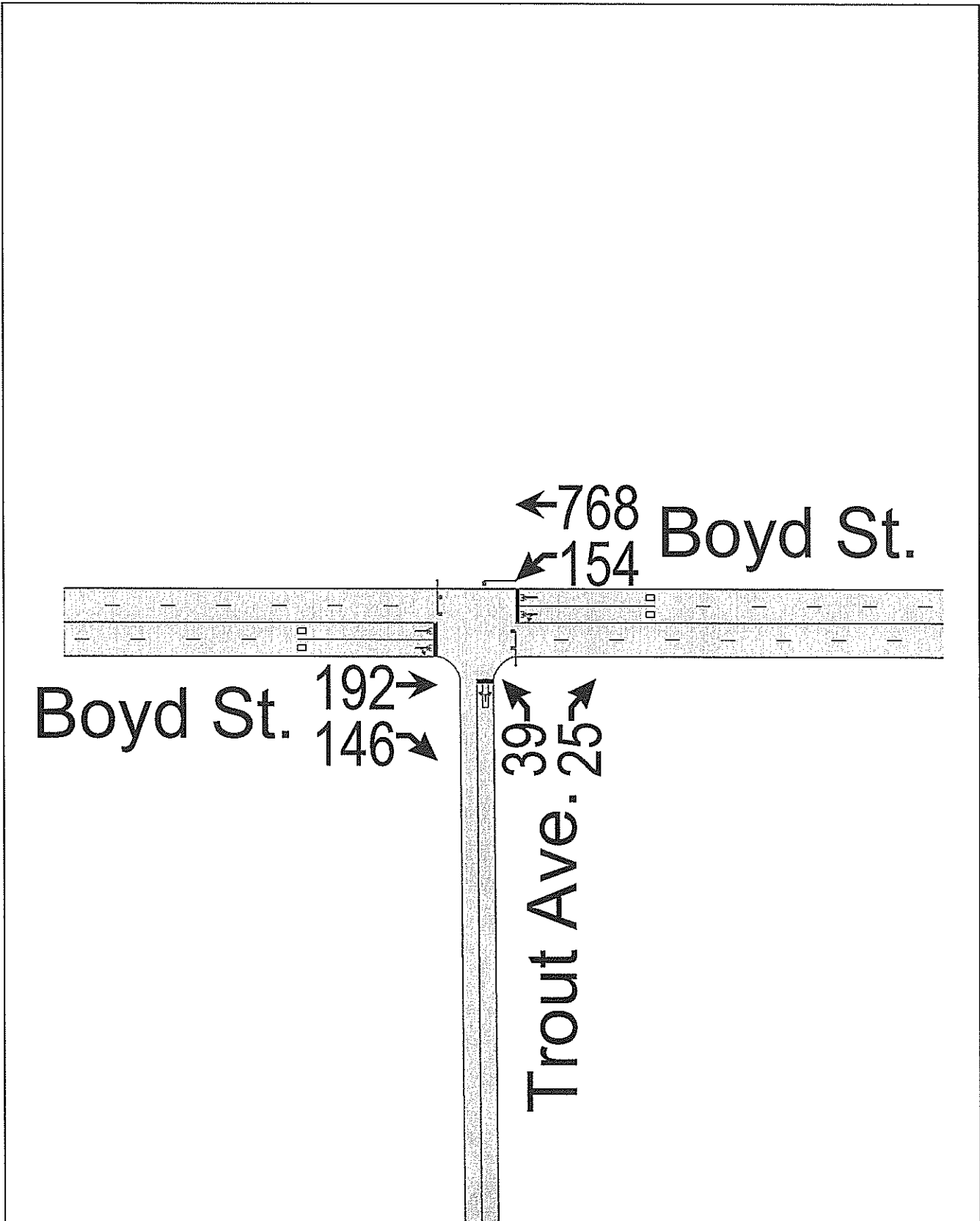
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	19	14	76	23	72	2	54	59	55	126	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	21	15	83	25	78	2	59	64	60	137	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	451	392	145	385	368	91	153			123		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	451	392	145	385	368	91	153			123		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	96	98	84	95	92	100			96		
cM capacity (veh/h)	445	521	902	529	537	967	1427			1464		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	55	186	125	213								
Volume Left	20	83	2	60								
Volume Right	15	78	64	16								
cSH	552	655	1427	1464								
Volume to Capacity	0.10	0.28	0.00	0.04								
Queue Length 95th (ft)	8	29	0	3								
Control Delay (s)	12.3	12.7	0.1	2.4								
Lane LOS	B	B	A	A								
Approach Delay (s)	12.3	12.7	0.1	2.4								
Approach LOS	B	B										
Intersection Summary												
Average Delay		6.1										
Intersection Capacity Utilization		38.0%			ICU Level of Service				A			
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis

11: Boyd St. & Trout Ave.

11/4/2014

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	
Volume (veh/h)	606	90	63	530	135	111
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	659	98	68	576	147	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			757		1133	378
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			757		1133	378
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		19	81
cM capacity (veh/h)			850		181	619
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	439	317	261	384	267	
Volume Left	0	0	68	0	147	
Volume Right	0	98	0	0	121	
cSH	1700	1700	850	1700	266	
Volume to Capacity	0.26	0.19	0.08	0.23	1.01	
Queue Length 95th (ft)	0	0	7	0	253	
Control Delay (s)	0.0	0.0	3.2	0.0	98.3	
Lane LOS			A		F	
Approach Delay (s)	0.0		1.3		98.3	
Approach LOS					F	
Intersection Summary						
Average Delay			16.3			
Intersection Capacity Utilization			60.4%		ICU Level of Service	B
Analysis Period (min)			15			

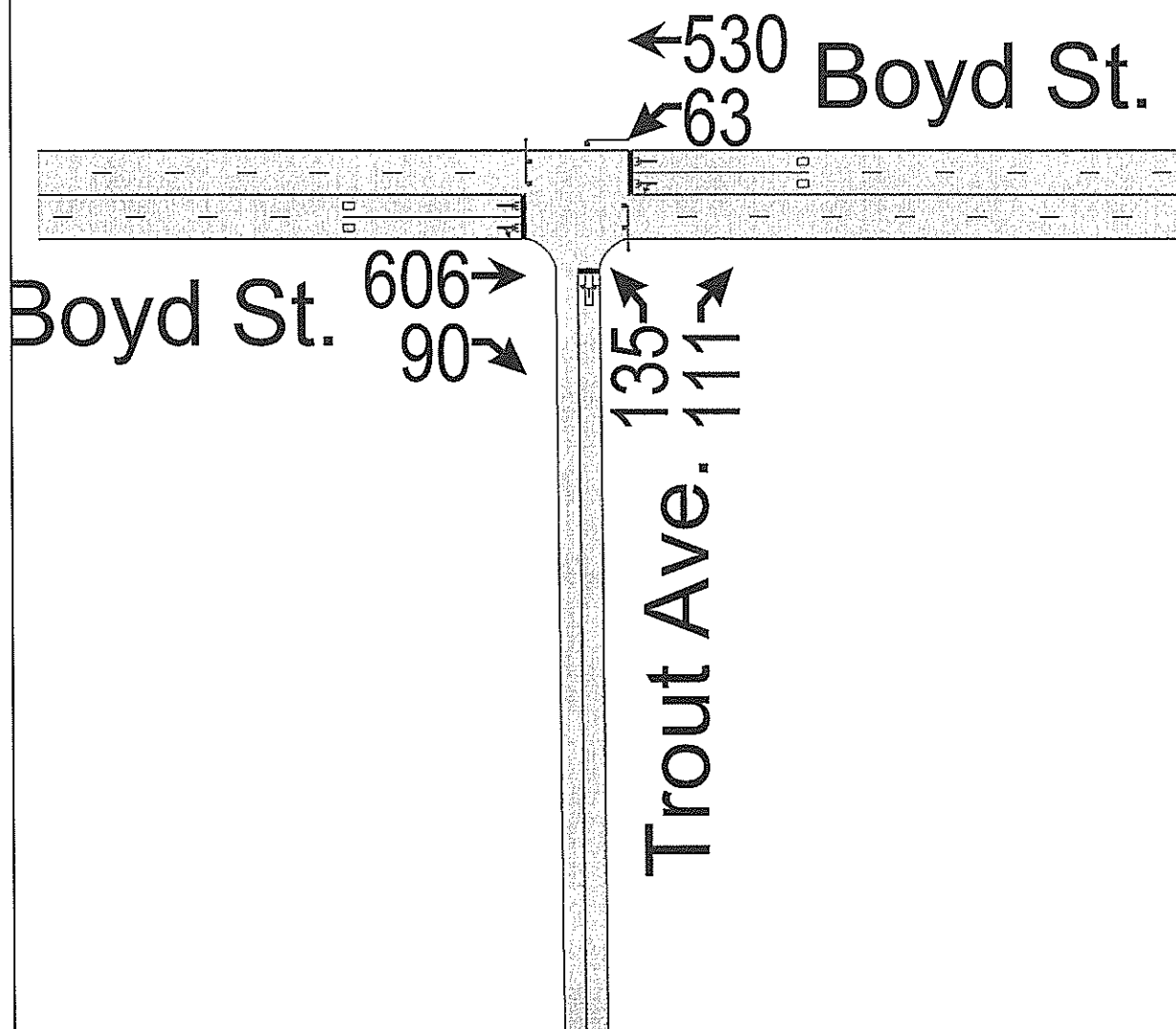


HCM Signalized Intersection Capacity Analysis

11: Boyd St. & Trout Ave.

11/4/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖↗	
Volume (vph)	192	146	154	768	39	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	0.95			0.95	1.00	
Frt	0.94			1.00	0.95	
Flt Protected	1.00			0.99	0.97	
Satd. Flow (prot)	3310			3510	1712	
Flt Permitted	1.00			0.81	0.97	
Satd. Flow (perm)	3310			2866	1712	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	159	167	835	42	27
RTOR Reduction (vph)	68	0	0	0	22	0
Lane Group Flow (vph)	300	0	0	1002	47	0
Turn Type			pm+pt			
Protected Phases	4		3	8	2	
Permitted Phases			8			
Actuated Green, G (s)	22.7			22.7	6.9	
Effective Green, g (s)	22.7			22.7	6.9	
Actuated g/C Ratio	0.57			0.57	0.17	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1897			1643	298	
v/s Ratio Prot	0.09				c0.03	
v/s Ratio Perm				c0.35		
v/c Ratio	0.16			0.61	0.16	
Uniform Delay, d1	4.0			5.5	13.9	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.0			0.6	0.2	
Delay (s)	4.0			6.2	14.1	
Level of Service	A			A	B	
Approach Delay (s)	4.0			6.2	14.1	
Approach LOS	A			A	B	
Intersection Summary						
HCM Average Control Delay			6.0		HCM Level of Service	A
HCM Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			39.6		Sum of lost time (s)	10.0
Intersection Capacity Utilization			51.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

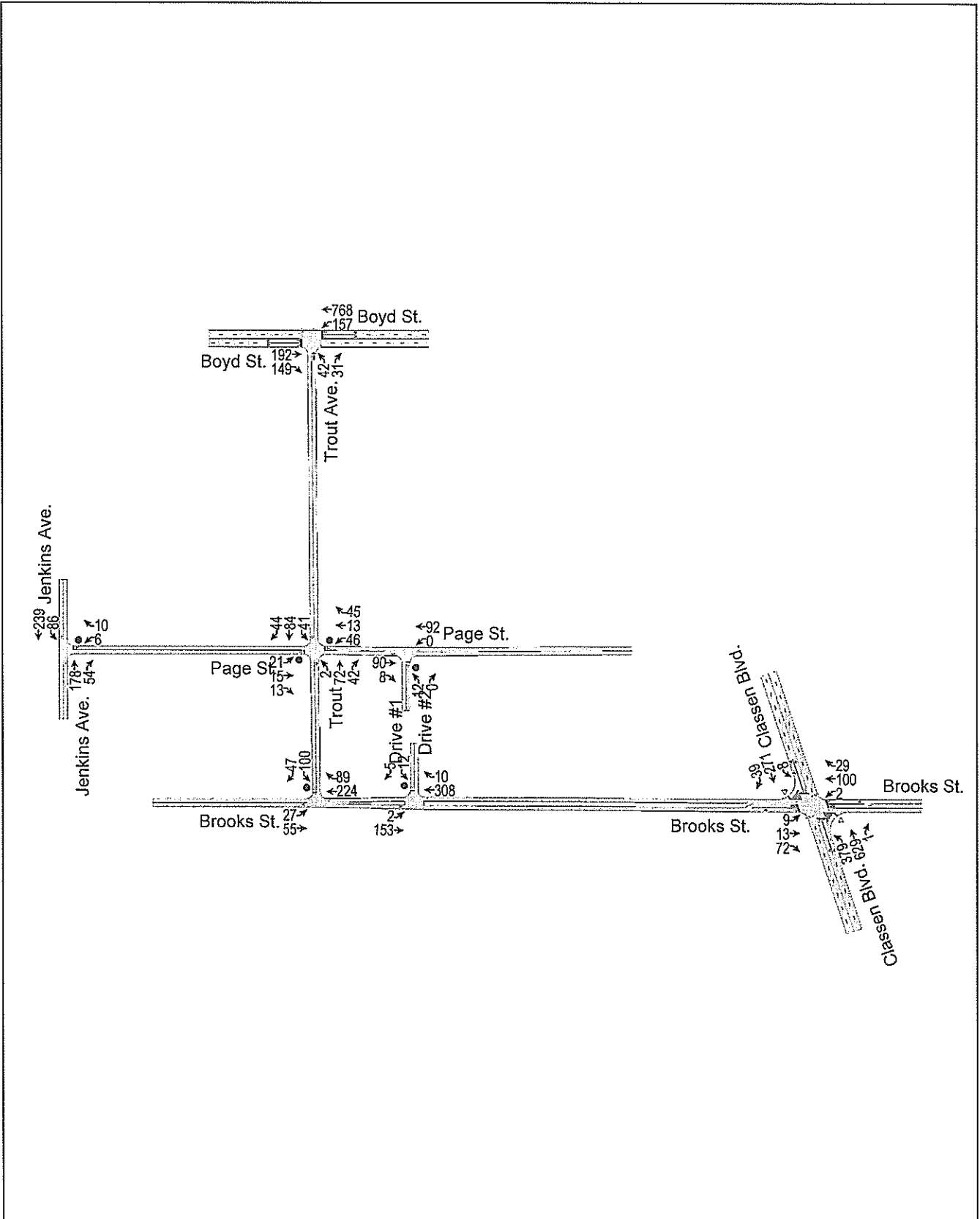


HCM Signalized Intersection Capacity Analysis

11: Boyd St. & Trout Ave.

11/4/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	↑↑
Volume (vph)	606	90	63	530	135	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	0.95			0.95	1.00	
Frt	0.98			1.00	0.94	
Flt Protected	1.00			0.99	0.97	
Satd. Flow (prot)	3470			3521	1703	
Flt Permitted	1.00			0.82	0.97	
Satd. Flow (perm)	3470			2891	1703	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	659	98	68	576	147	121
RTOR Reduction (vph)	13	0	0	0	37	0
Lane Group Flow (vph)	744	0	0	644	231	0
Turn Type			pm+pt			
Protected Phases	4		3	8	2	
Permitted Phases			8			
Actuated Green, G (s)	16.2			16.2	11.1	
Effective Green, g (s)	16.2			16.2	11.1	
Actuated g/C Ratio	0.43			0.43	0.30	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1507			1256	507	
v/s Ratio Prot	0.21				c0.14	
v/s Ratio Perm				c0.22		
v/c Ratio	0.49			0.51	0.46	
Uniform Delay, d1	7.6			7.7	10.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.3			0.4	0.7	
Delay (s)	7.9			8.0	11.3	
Level of Service	A			A	B	
Approach Delay (s)	7.9			8.0	11.3	
Approach LOS	A			A	B	
Intersection Summary						
HCM Average Control Delay		8.5		HCM Level of Service		A
HCM Volume to Capacity ratio		0.49				
Actuated Cycle Length (s)		37.3		Sum of lost time (s)	10.0	
Intersection Capacity Utilization		62.9%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						



T-2388 - Norman, OK 2017 Projected Combined Traffic: A.M. Peak Hour
Traffic Engineering Consultants, Inc.

HCM Signalized Intersection Capacity Analysis

3: Brooks St. & Classen Blvd.

11/4/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	13	72	2	100	29	379	629	1	8	271	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.87		1.00	0.97			1.00			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98			1.00	
Satd. Flow (prot)	1770	1626		1770	1799			3474			3470	
Flt Permitted	0.67	1.00		0.70	1.00			0.71			0.93	
Satd. Flow (perm)	1243	1626		1299	1799			2497			3229	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	14	78	2	109	32	412	684	1	9	295	42
RTOR Reduction (vph)	0	67	0	0	13	0	0	0	0	0	10	0
Lane Group Flow (vph)	10	25	0	2	128	0	0	1097	0	0	336	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.0	8.0		8.0	8.0			36.8			36.8	
Effective Green, g (s)	8.0	8.0		8.0	8.0			36.8			36.8	
Actuated g/C Ratio	0.15	0.15		0.15	0.15			0.67			0.67	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	181	237		190	263			1677			2168	
v/s Ratio Prot		0.02			c0.07							
v/s Ratio Perm	0.01			0.00				c0.44			0.10	
v/c Ratio	0.06	0.11		0.01	0.49			0.65			0.16	
Uniform Delay, d1	20.1	20.3		20.0	21.5			5.3			3.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.2		0.0	1.4			0.9			0.0	
Delay (s)	20.3	20.5		20.0	22.9			6.2			3.3	
Level of Service	C	C		C	C			A			A	
Approach Delay (s)		20.5			22.9			6.2			3.3	
Approach LOS		C			C			A			A	

Intersection Summary												
HCM Average Control Delay		7.9		HCM Level of Service		A						
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		54.8		Sum of lost time (s)		10.0						
Intersection Capacity Utilization		57.4%		ICU Level of Service		B						
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Page St. & Jenkins Ave.

11/4/2014

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	6	10	178	54	86	239
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	11	193	59	93	260
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	670	223			252	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	670	223			252	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			93	
cM capacity (veh/h)	392	817			1313	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	17	252	353			
Volume Left	7	0	93			
Volume Right	11	59	0			
cSH	581	1700	1313			
Volume to Capacity	0.03	0.15	0.07			
Queue Length 95th (ft)	2	0	6			
Control Delay (s)	11.4	0.0	2.6			
Lane LOS	B		A			
Approach Delay (s)	11.4	0.0	2.6			
Approach LOS	B					
Intersection Summary						
Average Delay		1.8				
Intersection Capacity Utilization		43.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8: Page St. & Trout Ave.

11/4/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	15	13	46	13	45	2	72	42	41	84	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	16	14	50	14	49	2	78	46	45	91	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)											885	
pX, platoon unblocked												
vC, conflicting volume	366	333	115	332	334	101	139			124		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	366	333	115	332	334	101	139			124		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	97	98	91	98	95	100			97		
cM capacity (veh/h)	536	568	937	584	568	954	1444			1463		

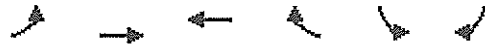
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	53	113	126	184
Volume Left	23	50	2	45
Volume Right	14	49	46	48
cSH	617	699	1444	1463
Volume to Capacity	0.09	0.16	0.00	0.03
Queue Length 95th (ft)	7	14	0	2
Control Delay (s)	11.4	11.1	0.1	2.0
Lane LOS	B	B	A	A
Approach Delay (s)	11.4	11.1	0.1	2.0
Approach LOS	B	B		

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

9: Brooks St. & Drive #1

11/4/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	
Volume (veh/h)	2	153	308	10	12	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	166	335	11	13	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1155			
pX, platoon unblocked						
vC, conflicting volume	346				511	340
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	346				511	340
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	99
cM capacity (veh/h)	1213				522	702

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	168	346	18
Volume Left	2	0	13
Volume Right	0	11	5
cSH	1213	1700	564
Volume to Capacity	0.00	0.20	0.03
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.1	0.0	11.6
Lane LOS	A		B
Approach Delay (s)	0.1	0.0	11.6
Approach LOS			B

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		26.8%	ICU Level of Service
Analysis Period (min)		15	A

HCM Signalized Intersection Capacity Analysis

11: Boyd St. & Trout Ave.

11/4/2014

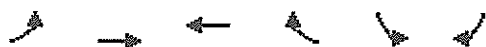
	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	192	149	157	768	42	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	0.95			0.95	1.00	
Frt	0.93			1.00	0.94	
Flt Protected	1.00			0.99	0.97	
Satd. Flow (prot)	3307			3509	1707	
Flt Permitted	1.00			0.81	0.97	
Satd. Flow (perm)	3307			2852	1707	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	162	171	835	46	34
RTOR Reduction (vph)	69	0	0	0	28	0
Lane Group Flow (vph)	302	0	0	1006	52	0
Turn Type			pm+pt			
Protected Phases	4		3	8	2	
Permitted Phases			8			
Actuated Green, G (s)	23.1			23.1	7.1	
Effective Green, g (s)	23.1			23.1	7.1	
Actuated g/C Ratio	0.57			0.57	0.18	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1900			1639	301	
v/s Ratio Prot	0.09				c0.03	
v/s Ratio Perm				c0.35		
v/c Ratio	0.16			0.61	0.17	
Uniform Delay, d1	4.0			5.6	14.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.0			0.7	0.3	
Delay (s)	4.0			6.3	14.3	
Level of Service	A			A	B	
Approach Delay (s)	4.0			6.3	14.3	
Approach LOS	A			A	B	

Intersection Summary

HCM Average Control Delay	6.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	40.2	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis 15: Brooks St. & Trout Ave.

11/4/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Volume (veh/h)	27	55	224	89	100	47
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	60	243	97	109	51
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	340				410	292
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	340				410	292
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				81	93
cM capacity (veh/h)	1219				583	747

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	89	340	160
Volume Left	29	0	109
Volume Right	0	97	51
cSH	1219	1700	627
Volume to Capacity	0.02	0.20	0.25
Queue Length 95th (ft)	2	0	25
Control Delay (s)	2.8	0.0	12.7
Lane LOS	A		B
Approach Delay (s)	2.8	0.0	12.7
Approach LOS			B

Intersection Summary			
Average Delay		3.9	
Intersection Capacity Utilization		40.0%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

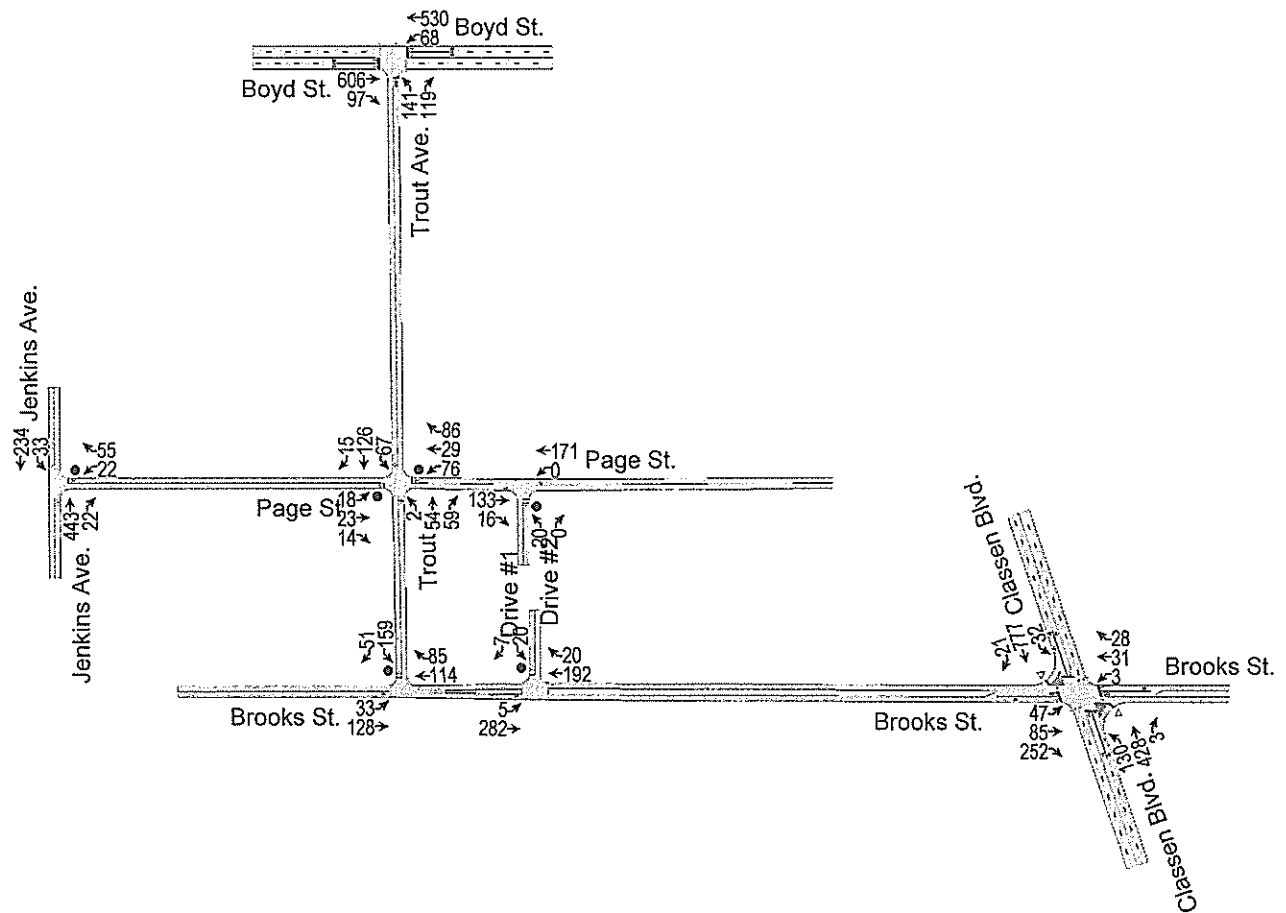
17: Page St. & Drive #2

11/4/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↘
Volume (veh/h)	90	8	0	92	12	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	9	0	100	13	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			107		202	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			107		202	102
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1484		786	953

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	107	100	13
Volume Left	0	0	13
Volume Right	9	0	0
cSH	1700	1484	786
Volume to Capacity	0.06	0.00	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	9.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		15.2%	ICU Level of Service
Analysis Period (min)		15	A



HCM Signalized Intersection Capacity Analysis

3: Brooks St. & Classen Blvd.

11/4/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			↰↱			↰↱	
Volume (vph)	47	85	252	3	31	28	130	428	3	32	777	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.89		1.00	0.93			1.00			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1770	1654		1770	1732			3496			3519	
Flt Permitted	0.72	1.00		0.42	1.00			0.62			0.92	
Satd. Flow (perm)	1332	1654		780	1732			2203			3232	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	92	274	3	34	30	141	465	3	35	845	23
RTOR Reduction (vph)	0	123	0	0	21	0	0	1	0	0	2	0
Lane Group Flow (vph)	51	243	0	3	43	0	0	608	0	0	901	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.6	12.6		12.6	12.6			20.9			20.9	
Effective Green, g (s)	12.6	12.6		12.6	12.6			20.9			20.9	
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.48			0.48	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	386	479		226	502			1058			1553	
v/s Ratio Prot		c0.15			0.02							
v/s Ratio Perm	0.04			0.00				0.28			c0.28	
v/c Ratio	0.13	0.51		0.01	0.09			0.58			0.58	
Uniform Delay, d1	11.4	12.9		11.0	11.3			8.1			8.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.8		0.0	0.1			0.8			0.6	
Delay (s)	11.6	13.7		11.0	11.3			8.9			8.7	
Level of Service	B	B		B	B			A			A	
Approach Delay (s)		13.5			11.3			8.9			8.7	
Approach LOS		B			B			A			A	

Intersection Summary

HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	43.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

7: Page St. & Jenkins Ave.

11/4/2014

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	22	55	443	22	33	234
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	60	482	24	36	254
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	820	493			505	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	820	493			505	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	90			97	
cM capacity (veh/h)	333	576			1059	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	84	505	290			
Volume Left	24	0	36			
Volume Right	60	24	0			
cSH	477	1700	1059			
Volume to Capacity	0.18	0.30	0.03			
Queue Length 95th (ft)	16	0	3			
Control Delay (s)	14.2	0.0	1.4			
Lane LOS	B		A			
Approach Delay (s)	14.2	0.0	1.4			
Approach LOS	B					
Intersection Summary						
Average Delay		1.8				
Intersection Capacity Utilization		51.4%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8: Page St. & Trout Ave.

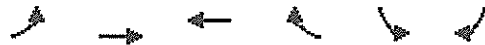
11/4/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	23	14	76	29	86	2	54	59	67	126	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	25	15	83	32	93	2	59	64	73	137	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											885	
pX, platoon unblocked												
vC, conflicting volume	495	418	145	414	394	91	153			123		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	495	418	145	414	394	91	153			123		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	95	98	83	94	90	100			95		
cM capacity (veh/h)	401	499	902	499	515	967	1427			1464		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	60	208	125	226								
Volume Left	20	83	2	73								
Volume Right	15	93	64	16								
cSH	517	642	1427	1464								
Volume to Capacity	0.12	0.32	0.00	0.05								
Queue Length 95th (ft)	10	35	0	4								
Control Delay (s)	12.9	13.3	0.1	2.7								
Lane LOS	B	B	A	A								
Approach Delay (s)	12.9	13.3	0.1	2.7								
Approach LOS	B	B										
Intersection Summary												
Average Delay			6.7									
Intersection Capacity Utilization			40.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: Brooks St. & Drive #1

11/4/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	↱
Volume (veh/h)	5	282	192	20	20	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	307	209	22	22	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1155			
pX, platoon unblocked						
vC, conflicting volume	230				537	220
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	230				537	220
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	99
cM capacity (veh/h)	1337				503	820

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	312	230	29
Volume Left	5	0	22
Volume Right	0	22	8
cSH	1337	1700	559
Volume to Capacity	0.00	0.14	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.2	0.0	11.8
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	11.8
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		28.8%	ICU Level of Service
Analysis Period (min)		15	A

HCM Signalized Intersection Capacity Analysis

11: Boyd St. & Trout Ave.

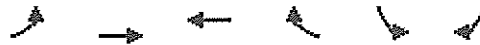
11/4/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	606	97	68	530	141	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	0.95			0.95	1.00	
Frt	0.98			1.00	0.94	
Flt Protected	1.00			0.99	0.97	
Satd. Flow (prot)	3466			3519	1702	
Flt Permitted	1.00			0.80	0.97	
Satd. Flow (perm)	3466			2846	1702	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	659	105	74	576	153	129
RTOR Reduction (vph)	13	0	0	0	37	0
Lane Group Flow (vph)	751	0	0	650	245	0
Turn Type			pm+pt			
Protected Phases	4		3	8	2	
Permitted Phases			8			
Actuated Green, G (s)	16.9			16.9	11.6	
Effective Green, g (s)	16.9			16.9	11.6	
Actuated g/C Ratio	0.44			0.44	0.30	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1521			1249	513	
v/s Ratio Prot	0.22				c0.14	
v/s Ratio Perm				c0.23		
v/c Ratio	0.49			0.52	0.48	
Uniform Delay, d1	7.7			7.9	11.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.3			0.4	0.7	
Delay (s)	8.0			8.2	11.7	
Level of Service	A			A	B	
Approach Delay (s)	8.0			8.2	11.7	
Approach LOS	A			A	B	
Intersection Summary						
HCM Average Control Delay		8.7		HCM Level of Service		A
HCM Volume to Capacity ratio		0.50				
Actuated Cycle Length (s)		38.5		Sum of lost time (s)		10.0
Intersection Capacity Utilization		64.1%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis

15: Brooks St. & Trout Ave.

11/4/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	
Volume (veh/h)	33	128	114	85	159	51
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	139	124	92	173	55
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	216				381	170
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	216				381	170
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				71	94
cM capacity (veh/h)	1353				605	874

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	175	216	228
Volume Left	36	0	173
Volume Right	0	92	55
cSH	1353	1700	654
Volume to Capacity	0.03	0.13	0.35
Queue Length 95th (ft)	2	0	39
Control Delay (s)	1.8	0.0	13.4
Lane LOS	A		B
Approach Delay (s)	1.8	0.0	13.4
Approach LOS			B

Intersection Summary			
Average Delay		5.4	
Intersection Capacity Utilization		41.7%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis 17: Page St. & Drive #2

11/4/2014

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	133	16	0	171	20	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	145	17	0	186	22	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			162		339	153
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			162		339	153
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	100
cM capacity (veh/h)			1417		657	893
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	162	186	22			
Volume Left	0	0	22			
Volume Right	17	0	0			
cSH	1700	1417	657			
Volume to Capacity	0.10	0.00	0.03			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	10.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		19.0%	ICU Level of Service	A		
Analysis Period (min)		15				

TRAFFIC SIGNAL WARRANT ANALYSIS

Traffic Engineering Consultants, Inc.

Boyd Street & Trout Avenue - Norman, OK

2017 Projected Background Traffic with Future Page Circle Apartment Traffic

Signal Warrants - Summary

Major Street Approaches

Eastbound: Boyd Street

Number of Lanes: 2

85% Speed < 40 MPH.

Total Approach Volume: 1,122

Westbound: Boyd Street

Number of Lanes: 2

85% Speed < 40 MPH.

Total Approach Volume: 1,603

Minor Street Approaches

Northbound: Trout Avenue

Number of Lanes: 1

Total Approach Volume: 332

Warrant Summary (Urban values apply.)

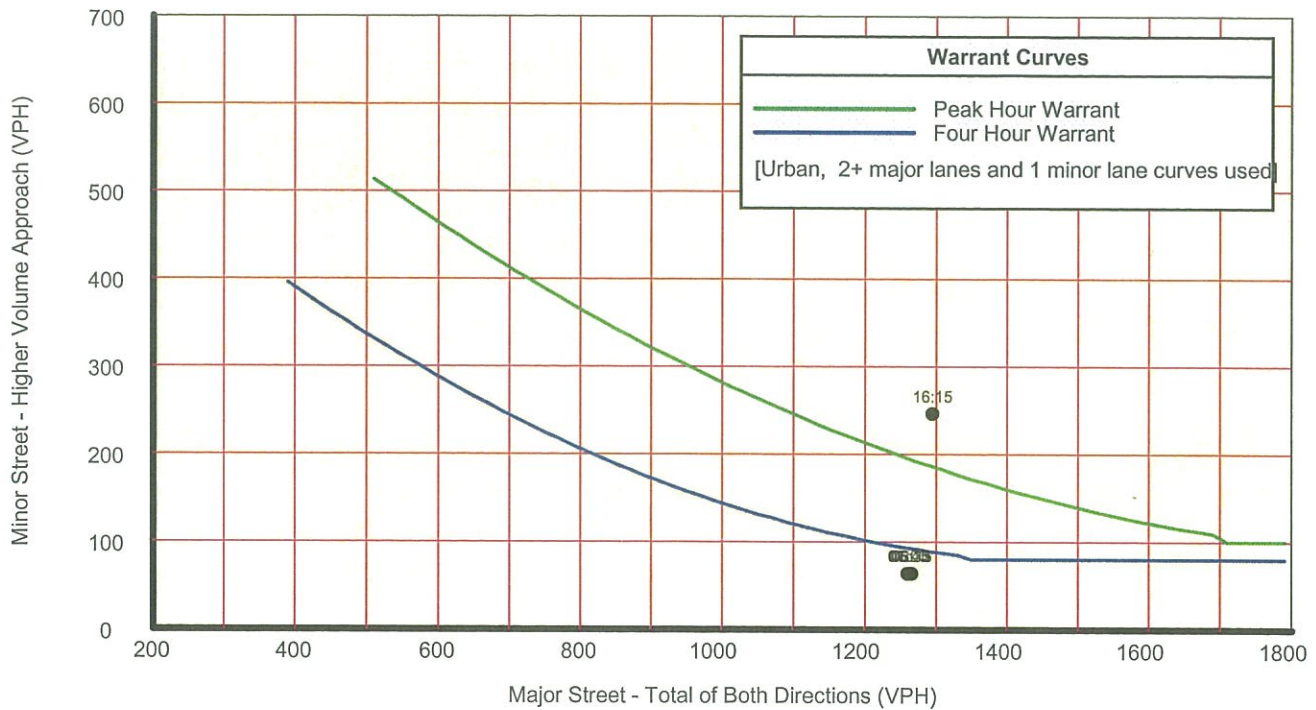
Warrant 1 - Eight Hour Vehicular Volumes	Not Satisfied
Warrant 1A - Minimum Vehicular Volume	Not Satisfied
Required volumes reached for 1 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic	Not Satisfied
Required volumes reached for 1 hours, 8 are needed	
Warrant 1 A&B - Combination of Warrants	Not Satisfied
Required volumes reached for 1 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Not Satisfied
Number of hours (1) volumes exceed minimum < minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay	Satisfied
Number of hours (4) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes	Satisfied
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

Traffic Engineering Consultants, Inc.

Boyd Street & Trout Avenue - Norman, OK

2017 Projected Background Traffic with Future Page Circle Apartment Traffic

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol Dir	Maj 600	Min 150	Hour Begin	Major Total	Minor Vol Dir	Maj 900	Min 75	Hour Begin	Major Total	Minor Vol Dir	Maj 720	Min 120
16:15	1,295	246 NB	Yes	Yes	16:15	1,295	246 NB	Yes	Yes	16:15	1,295	246 NB	Yes	Yes
06:15	1,266	64 NB	Yes	No	06:15	1,266	64 NB	Yes	No	06:15	1,266	64 NB	Yes	No
06:30	1,264	64 NB	Yes	No	06:30	1,264	64 NB	Yes	No	06:30	1,264	64 NB	Yes	No
06:45	1,262	64 NB	Yes	No	06:45	1,262	64 NB	Yes	No	06:45	1,262	64 NB	Yes	No
07:00	1,260	64 NB	Yes	No	07:00	1,260	64 NB	Yes	No	07:00	1,260	64 NB	Yes	No
22:45	8	0 SB	No	No	22:45	8	0 SB	No	No	22:45	8	0 SB	No	No
22:30	8	0 SB	No	No	22:30	8	0 SB	No	No	22:30	8	0 SB	No	No
22:15	8	0 SB	No	No	22:15	8	0 SB	No	No	22:15	8	0 SB	No	No
22:00	8	0 SB	No	No	22:00	8	0 SB	No	No	22:00	8	0 SB	No	No
21:45	8	0 SB	No	No	21:45	8	0 SB	No	No	21:45	8	0 SB	No	No
21:30	8	0 SB	No	No	21:30	8	0 SB	No	No	21:30	8	0 SB	No	No
21:15	8	0 SB	No	No	21:15	8	0 SB	No	No	21:15	8	0 SB	No	No
21:00	8	0 SB	No	No	21:00	8	0 SB	No	No	21:00	8	0 SB	No	No
20:45	8	0 SB	No	No	20:45	8	0 SB	No	No	20:45	8	0 SB	No	No
20:30	8	0 SB	No	No	20:30	8	0 SB	No	No	20:30	8	0 SB	No	No
20:15	8	0 SB	No	No	20:15	8	0 SB	No	No	20:15	8	0 SB	No	No
20:00	8	0 SB	No	No	20:00	8	0 SB	No	No	20:00	8	0 SB	No	No
19:45	8	0 SB	No	No	19:45	8	0 SB	No	No	19:45	8	0 SB	No	No
19:30	8	0 SB	No	No	19:30	8	0 SB	No	No	19:30	8	0 SB	No	No
19:15	8	0 SB	No	No	19:15	8	0 SB	No	No	19:15	8	0 SB	No	No
19:00	8	0 SB	No	No	19:00	8	0 SB	No	No	19:00	8	0 SB	No	No
18:45	8	0 SB	No	No	18:45	8	0 SB	No	No	18:45	8	0 SB	No	No
18:30	8	0 SB	No	No	18:30	8	0 SB	No	No	18:30	8	0 SB	No	No
18:15	8	0 SB	No	No	18:15	8	0 SB	No	No	18:15	8	0 SB	No	No