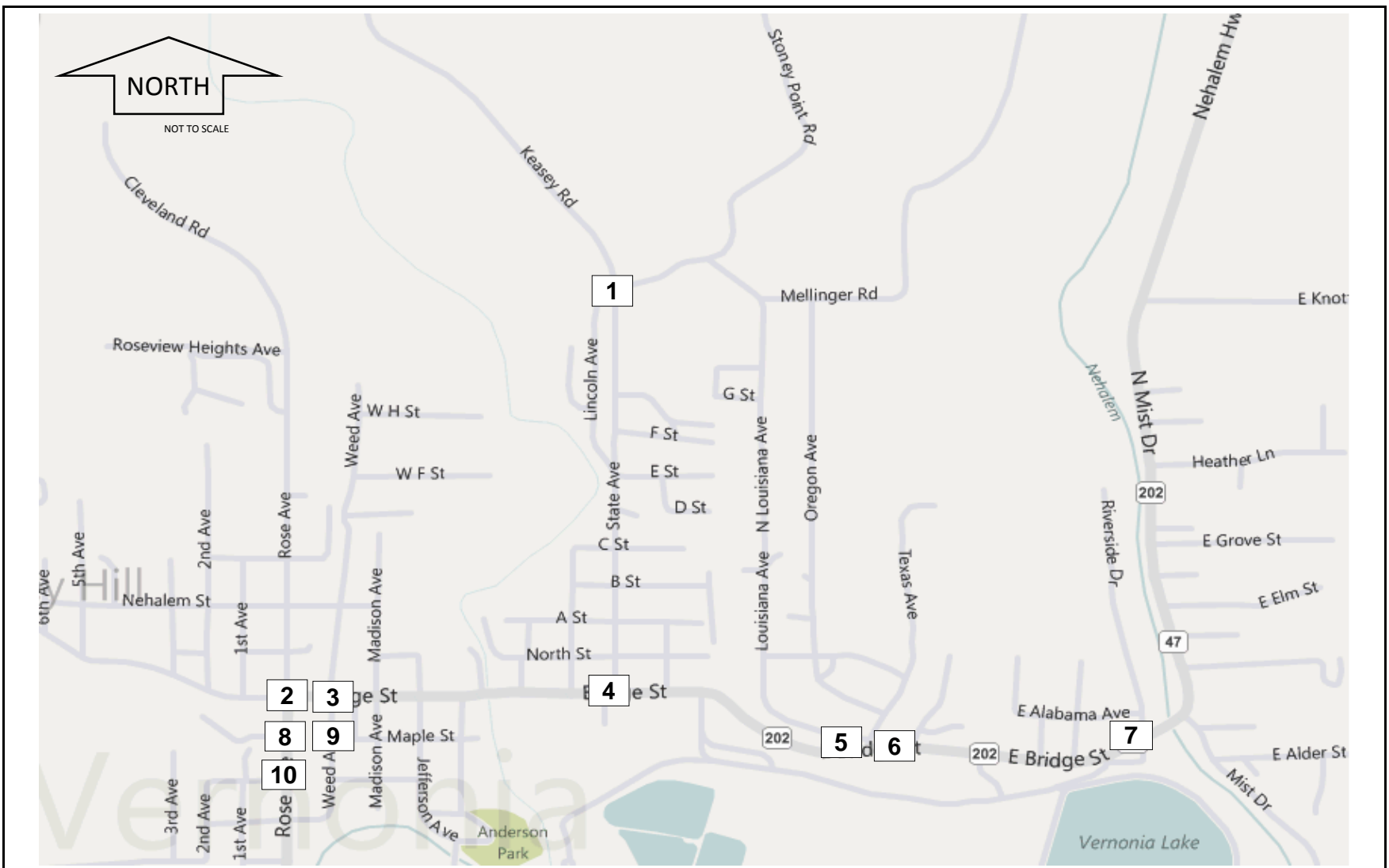


# Appendix A Traffic Analysis

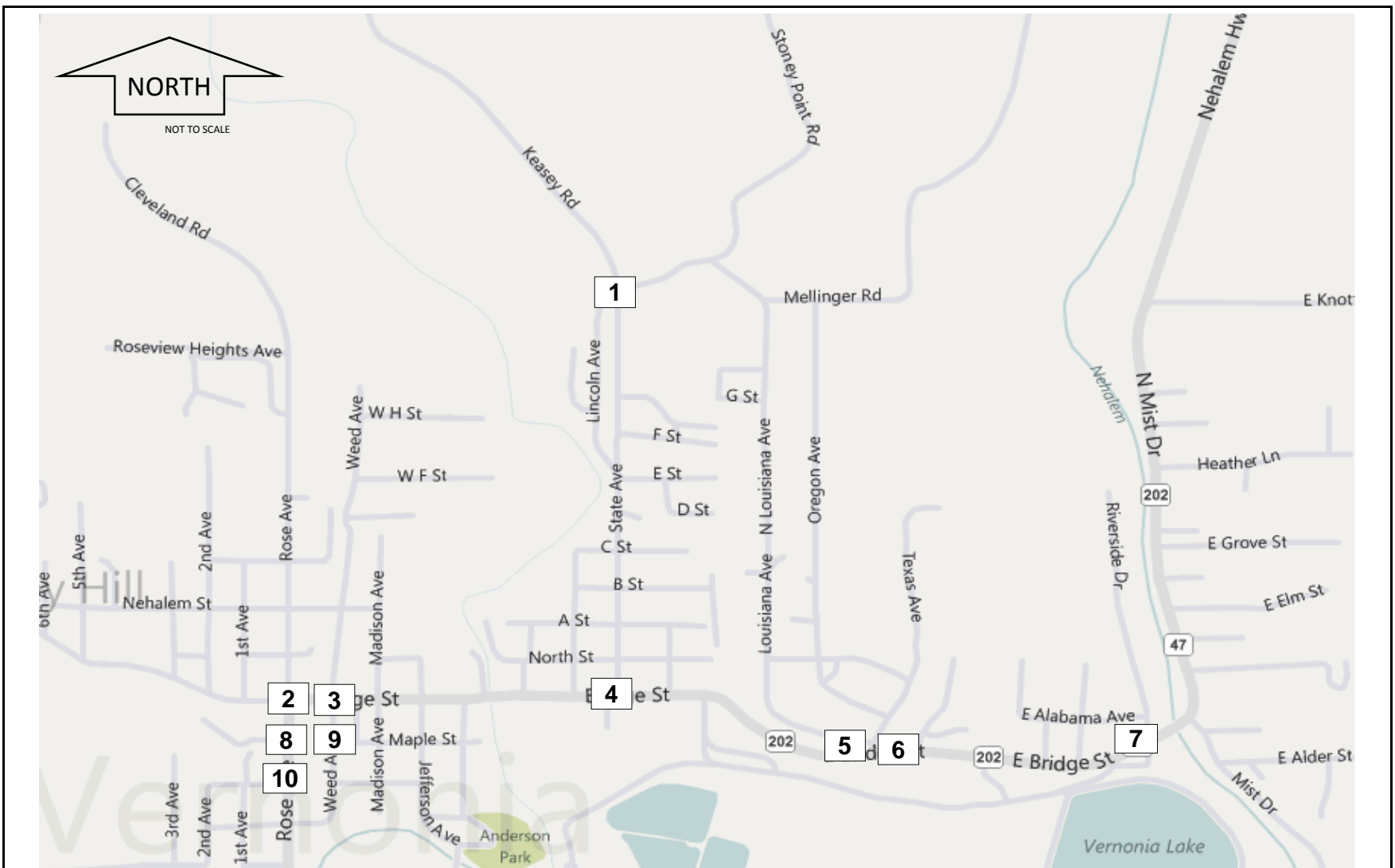
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1	2	3	4
<b>1 Stoney Point Road/State Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: April 15th, 2008 Type: 2 Hour Manual Turning Movement 	<b>2 Bridge Street/Rose Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: March 10th, 2010 Type: 2 Hour Manual Turning Movement 	<b>3 Bridge Street/Weed Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: March 10th, 2010 Type: 2 Hour Manual Turning Movement 	<b>4 Bridge Street/State Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: April 15th, 2008 Type: 2 Hour Manual Turning Movement 
<b>5 Bridge Street/Texas Avenue</b> Peak Hour: 3:45 PM to 4:45 PM Date: December 2nd, 2009 Type: 3.5 Hour Manual Turning Movement 	<b>6 Bridge Street/Missouri Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: December 2nd, 2009 Type: 3 Hour Manual Turning Movement 	<b>7 Bridge Street/Riverside Drive</b> Peak Hour: 4:30 PM to 5:30 PM Date: April 24th, 2008 Type: 2 Hour Manual Turning Movement 	<b>8 Maple Street/Rose Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: March 10th, 2010 Type: 2 Hour Manual Turning Movement 
<b>9 Maple Street/Weed Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: March 10th, 2010 Type: 2 Hour Manual Turning Movement 	<b>10 Cougar Street/Rose Street</b> Peak Hour: 4:00 PM to 5:00 PM Date: March 10th, 2010 Type: 2 Hour Manual Turning Movement 	<b>Legend:</b> Volume Diagram  100 Turning Movement Volume Channelization Stop Controlled Approach/Intersection Yield Controlled Approach/Intersection Free Movement 1 Study Intersection	

Notes:  
Map Source: www.bing.com/maps

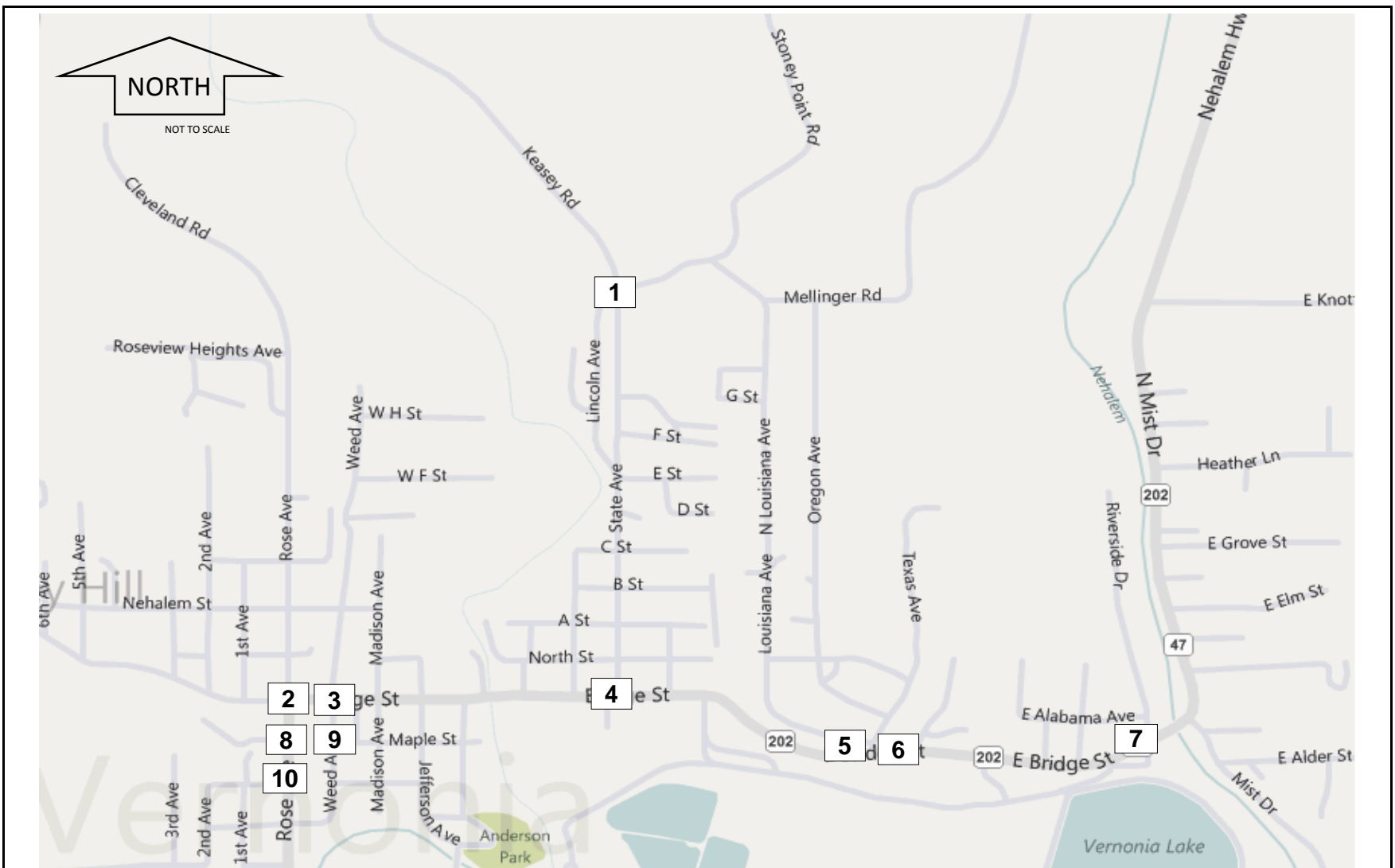
FIGURE A.1 Raw Count: 2008-2010 Individual Intersection Peak Hour Volumes & Channelization  
Vernonia Transportation System Plan



1	2	3	4
<b>1 Stoney Point Road/State Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: April 15th, 2008 Type: 2 Hour Manual Turning Movement 	<b>2 Bridge Street/Rose Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: March 10th, 2010 Type: 2 Hour Manual Turning Movement 	<b>3 Bridge Street/Weed Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: March 10th, 2010 Type: 2 Hour Manual Turning Movement 	<b>4 Bridge Street/State Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: April 15th, 2008 Type: 2 Hour Manual Turning Movement 
<b>5 Bridge Street/Texas Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: December 2nd, 2009 Type: 3.5 Hour Manual Turning Movement 	<b>6 Bridge Street/Missouri Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: December 2nd, 2009 Type: 3 Hour Manual Turning Movement 	<b>7 Bridge Street/Riverside Drive</b> Peak Hour: 4:00 PM to 5:00 PM Date: April 24th, 2008 Type: 2 Hour Manual Turning Movement 	<b>8 Maple Street/Rose Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: March 10th, 2010 Type: 2 Hour Manual Turning Movement 
<b>9 Maple Street/Weed Avenue</b> Peak Hour: 4:00 PM to 5:00 PM Date: March 10th, 2010 Type: 2 Hour Manual Turning Movement 	<b>10 Cougar Street/Rose Street</b> Peak Hour: 4:00 PM to 5:00 PM Date: March 10th, 2010 Type: 2 Hour Manual Turning Movement 	<b>Legend:</b> Volume Diagram <ul style="list-style-type: none"> <li>100 Turning Movement Volume</li> <li>Channelization</li> <li>Stop Controlled Approach/Intersection</li> <li>Yield Controlled Approach/Intersection</li> <li>Free Movement</li> <li>1 Study Intersection</li> </ul>	

**Notes:**  
 1. Map Source: www.bing.com/maps  
 2. System peak hour occurred between 4:00 PM to 5:00 PM.  
 3. System peak hour was based on the individual peak hour of the majority of intersections.

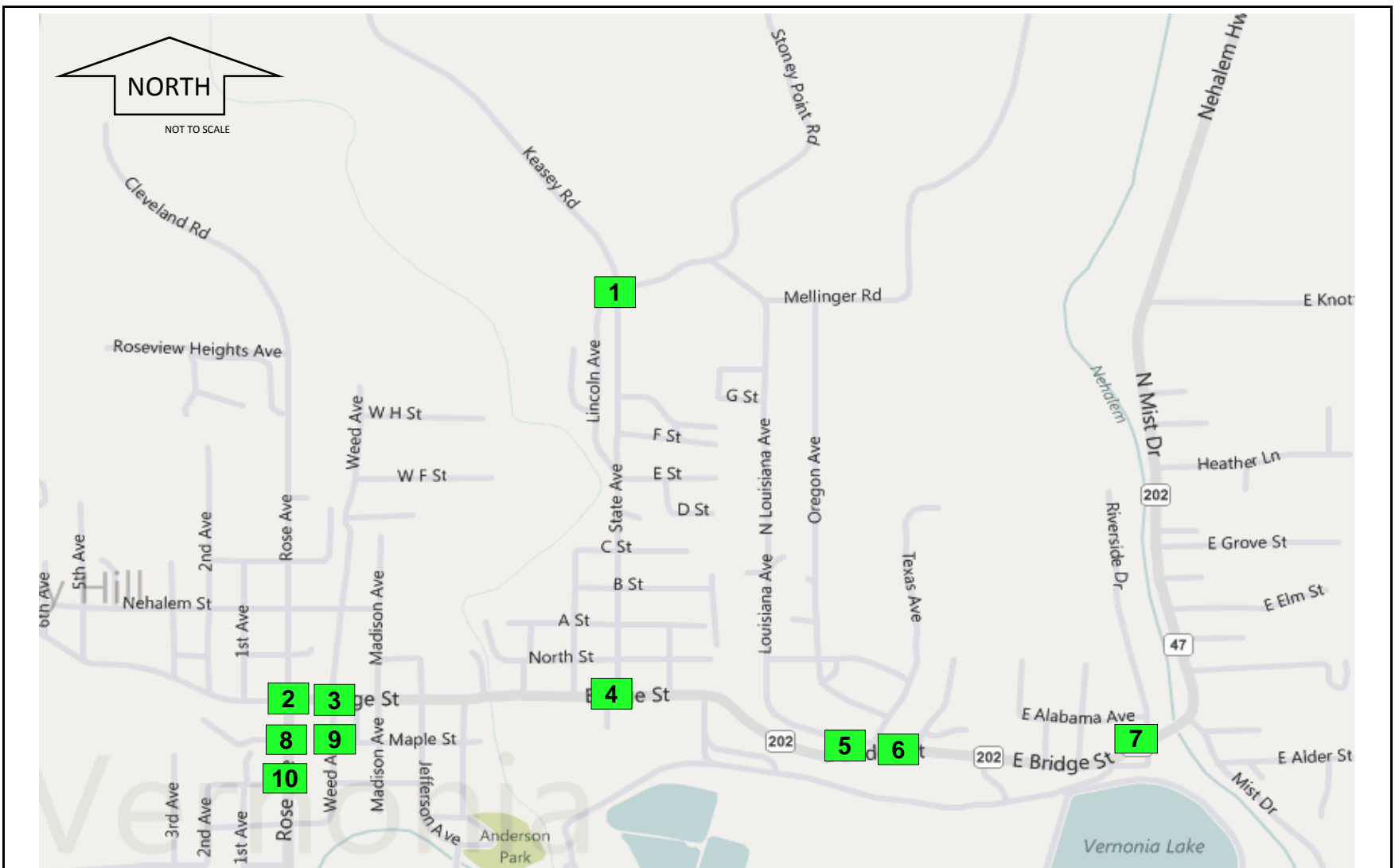
**FIGURE A.2 Raw System Peak: 2008-2010 Individual Intersection Peak Hour Volumes & Channelization**  
 Vernonia Transportation System Plan



1	2	3	4
<b>1 Stoney Point Road/State Avenue</b> Date: April 15th, 2008 Growth Factor: 1.02 30th HV Factor: 1.09 	<b>2 Bridge Street/Rose Avenue</b> Date: March 10th, 2010 Growth Factor: 1.00 30th HV Factor: 1.15 	<b>3 Bridge Street/Weed Avenue</b> Date: March 10th, 2010 Growth Factor: 1.00 30th HV Factor: 1.15 	<b>4 Bridge Street/State Avenue</b> Date: April 15th, 2008 Growth Factor: 1.02 30th HV Factor: 1.09 
<b>5 Bridge Street/Texas Avenue</b> Date: December 2nd, 2009 Growth Factor: 1.01 30th HV Factor: 1.19 	<b>6 Bridge Street/Missouri Avenue</b> Date: December 2nd, 2009 Growth Factor: 1.01 30th HV Factor: 1.19 	<b>7 Bridge Street/Riverside Drive</b> Date: April 24th, 2008 Growth Factor: 1.02 30th HV Factor: 1.08 	<b>8 Maple Street/Rose Avenue</b> Date: March 10th, 2010 Growth Factor: 1.00 30th HV Factor: 1.15 
<b>9 Maple Street/Weed Avenue</b> Date: March 10th, 2010 Growth Factor: 1.00 30th HV Factor: 1.15 	<b>10 Cougar Street/Rose Street</b> Date: March 10th, 2010 Growth Factor: 1.00 30th HV Factor: 1.15 	<b>Legend:</b> Volume Diagram <ul style="list-style-type: none"> <li>100 Turning Movement Volume</li> <li>Channelization</li> <li>Stop Controlled Approach/Intersection</li> <li>Yield Controlled Approach/Intersection</li> <li>Free Movement</li> <li>1 Study Intersection</li> </ul>	

**Notes:**  
 1. Map Source: www.bing.com/maps  
 2. System peak hour occurred between 4:00 PM to 5:00 PM.  
 3. System peak hour was based on the individual peak hour of the majority of intersections.  
 4. Annual growth factor was assumed to be 1 percent/year per ODOT Region 1 Traffic.  
 5. 30th highest hour factor is derived from ATR station 03-013.

**FIGURE A.3 Unrounded and Unbalanced Existing 30th Highest Hour Volumes & Channelization**  
 Vernonia Transportation System Plan



1	2	3	4
<b>Stoney Point Road/State Avenue</b> Date: April 15th, 2008 V/C Ratio Std: LOS D V/C Ratio***: LOS A (9.7 sec/veh) 	<b>Bridge Street/Rose Avenue</b> Date: March 10th, 2010 V/C Ratio Std: 0.95/0.95 V/C Ratio: 0.25 	<b>Bridge Street/Weed Avenue</b> Date: March 10th, 2010 V/C Ratio Std: 0.95/0.95 V/C Ratio: 0.02/0.16 	<b>Bridge Street/State Avenue</b> Date: April 15th, 2008 V/C Ratio Std: 0.90/0.90 V/C Ratio: 0.15/0.14 
5	6	7	8
<b>Bridge Street/Texas Avenue</b> Date: December 2nd, 2009 V/C Ratio Std: 0.90/0.90 V/C Ratio: 0.02/0.05 	<b>Bridge Street/Missouri Avenue</b> Date: December 2nd, 2009 V/C Ratio Std: 0.90/0.90 V/C Ratio: 0.00/0.03 	<b>Bridge Street/Riverside Drive</b> Date: April 24th, 2008 V/C Ratio Std: 0.90/0.90 V/C Ratio: 0.01/0.02 	<b>Maple Street/Rose Avenue</b> Date: March 10th, 2010 V/C Ratio Std: 0.90/0.90 V/C Ratio: 0.00/0.08 
9	10	Legend:	
<b>Maple Street/Weed Avenue</b> Date: March 10th, 2010 V/C Ratio Std: LOS D V/C Ratio***: LOS A (7.5 sec/veh) 	<b>Cougar Street/Rose Street</b> Date: March 10th, 2010 V/C Ratio Std: 0.90/0.90 V/C Ratio: 0.00/0.05 	<b>Volume Diagram</b> 100 Turning Movement Volume 	

















**Notes:**  
 1. Map Source: www.bing.com/maps  
 2. System peak hour occurred between 4:00 PM to 5:00 PM.  
 3. Mobility Standards are based on the Oregon Highway Plan or City of Vernonia LOS Standards.  
 4. Synchro software version 7 used for analysis.  
 5. VC = Volume to Capacity Ratio  
 6. V/C Ratio Std = Intersection Mobility Standard (per ODOT)  
 \*\*\* City of Vernonia has a LOS D mobility standard. LOS (avg delay/veh) is reported for the worst operating movement (for TWSC) and total intersection (for AWSC).

**FIGURE A.4 Rounded and Balanced Existing 30th Highest Hour Volumes, Channelization, and Operations**  
 Vernonia Transportation System Plan

# HCM Unsignalized Intersection Capacity Analysis

## 1: Stoney Point Rd & State St

10/25/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1	0	15	0	0	0	35	20	1	25	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.60	0.60	0.60	0.76	0.76	0.76	0.61	0.61	0.61
Hourly flow rate (vph)	0	4	0	25	0	0	0	46	26	2	41	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	103	117	41	105	103	59	41			72		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	103	117	41	105	103	59	41			72		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	99	100	97	100	100	100			100		
cM capacity (veh/h)	881	777	1036	875	789	1012	1568			1484		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	4	25	72	43								
Volume Left	0	25	0	2								
Volume Right	0	0	26	0								
cSH	777	875	1568	1484								
Volume to Capacity	0.01	0.03	0.00	0.00								
Queue Length 95th (ft)	0	2	0	0								
Control Delay (s)	9.7	9.2	0.0	0.3								
Lane LOS	A	A		A								
Approach Delay (s)	9.7	9.2	0.0	0.3								
Approach LOS	A	A										
<b>Intersection Summary</b>												
Average Delay			2.0									
Intersection Capacity Utilization			17.6%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 2: Bridge St & Rose Ave

10/25/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕	↗		↕	
Sign Control		Stop			Yield			Stop	↗		Stop	
Volume (vph)	1	20	5	130	35	25	15	35	175	30	15	0
Peak Hour Factor	0.69	0.69	0.69	0.91	0.91	0.91	0.74	0.74	0.74	0.67	0.67	0.67
Hourly flow rate (vph)	1	29	7	143	38	27	20	47	236	45	22	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	38	209	68	236	67
Volume Left (vph)	1	143	20	0	45
Volume Right (vph)	7	27	0	236	0
Hadj (s)	-0.11	0.09	0.13	-0.53	0.13
Departure Headway (s)	4.4	4.4	4.7	3.2	4.7
Degree Utilization, x	0.05	0.25	0.09	0.21	0.09
Capacity (veh/h)	788	792	723	1122	722
Control Delay (s)	7.6	8.8	8.1	7.0	8.1
Approach Delay (s)	7.6	8.8	7.3		8.1
Approach LOS	A	A	A		A

Intersection Summary				
Delay			7.9	
HCM Level of Service			A	
Intersection Capacity Utilization		34.9%	ICU Level of Service	A
Analysis Period (min)		15		

# HCM Unsignalized Intersection Capacity Analysis

## 3: Bridge St & Weed Ave

10/25/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↕	
Volume (veh/h)	25	195	5	30	180	35	0	0	0	40	2	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.96	0.96	0.96	0.92	0.92	0.92	0.77	0.77	0.77
Hourly flow rate (vph)	32	250	6	31	188	36	0	0	0	52	3	13
Pedestrians					3			4			12	
Lane Width (ft)					12.0			0.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	236			260			604	620	260	601	605	218
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	236			260			604	620	260	601	605	218
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			100	100	100	87	99	98
cM capacity (veh/h)	1312			1310			384	381	776	390	388	814

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	288	255	68
Volume Left	32	31	52
Volume Right	6	36	13
cSH	1312	1310	433
Volume to Capacity	0.02	0.02	0.16
Queue Length 95th (ft)	2	2	14
Control Delay (s)	1.1	1.1	14.8
Lane LOS	A	A	B
Approach Delay (s)	1.1	1.1	14.8
Approach LOS			B

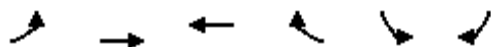
Intersection Summary		
Average Delay		2.6
Intersection Capacity Utilization	29.8%	ICU Level of Service
Analysis Period (min)		15
		A



# HCM Unsignalized Intersection Capacity Analysis

## 4: Bridge St & State St

10/25/2010



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Volume (veh/h)	65	235	185	20	10	55
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.78	0.78	0.83	0.83	0.69	0.69
Hourly flow rate (vph)	83	301	223	24	14	80
Pedestrians		1	7		6	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	253				716	242
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	253				716	242
tC, single (s)	4.1				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.4
p0 queue free %	94				96	90
cM capacity (veh/h)	1300				361	780

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	385	247	94
Volume Left	83	0	14
Volume Right	0	24	80
cSH	1300	1700	662
Volume to Capacity	0.06	0.15	0.14
Queue Length 95th (ft)	5	0	12
Control Delay (s)	2.2	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	2.2	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay		2.6	
Intersection Capacity Utilization	44.2%		ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 5: Bridge St & Texas Ave

10/25/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	30	200	0	0	160	4	0	0	0	2	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.75	0.75	0.75	0.92	0.92	0.92	0.75	0.75	0.75
Hourly flow rate (vph)	32	215	0	0	213	5	0	0	0	3	0	33
Pedestrians		1			2							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		4.0			4.0							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	219			215			530	498	217	498	496	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	219			215			530	498	217	498	496	217
tC, single (s)	4.2			4.2			7.1	6.5	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	98			100			100	100	100	99	100	96
cM capacity (veh/h)	1327			1314			432	462	821	458	450	798

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	247	219	0	36
Volume Left	32	0	0	3
Volume Right	0	5	0	33
cSH	1327	1314	1700	756
Volume to Capacity	0.02	0.00	0.00	0.05
Queue Length 95th (ft)	2	0	0	4
Control Delay (s)	1.2	0.0	0.0	10.0
Lane LOS	A		A	A
Approach Delay (s)	1.2	0.0	0.0	10.0
Approach LOS			A	A

### Intersection Summary

Average Delay		1.3		
Intersection Capacity Utilization		36.6%	ICU Level of Service	A
Analysis Period (min)		15		

# HCM Unsignalized Intersection Capacity Analysis

## 6: Bridge St & Missouri Ave

10/25/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	2	190	10	0	160	2	5	0	2	1	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.82	0.82	0.82	0.35	0.35	0.35	0.44	0.44	0.44
Hourly flow rate (vph)	2	211	11	0	195	2	14	0	6	2	0	5
Pedestrians		1						3				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	198			225			426	422	220	423	426	197
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	198			225			426	422	220	423	426	197
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.4	6.8	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	100			100			97	100	99	100	100	99
cM capacity (veh/h)	1363			1311			536	524	823	486	474	770

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	224	198	20	7
Volume Left	2	0	14	2
Volume Right	11	2	6	5
cSH	1363	1311	595	645
Volume to Capacity	0.00	0.00	0.03	0.01
Queue Length 95th (ft)	0	0	3	1
Control Delay (s)	0.1	0.0	11.3	10.6
Lane LOS	A		B	B
Approach Delay (s)	0.1	0.0	11.3	10.6
Approach LOS			B	B

### Intersection Summary

Average Delay		0.7	
Intersection Capacity Utilization		23.6%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 7: Bridge St & Riverside Dr

10/25/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	10	170	0	0	145	2	0	0	0	2	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.38	0.38	0.38
Hourly flow rate (vph)	12	212	0	0	181	2	0	0	0	5	0	11
Pedestrians								2				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	184			214			433	423	214	420	422	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	184			214			433	423	214	420	422	182
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	99	100	99
cM capacity (veh/h)	1373			1324			525	520	829	543	521	865

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	225	184	0	16
Volume Left	12	0	0	5
Volume Right	0	2	0	11
cSH	1373	1324	1700	722
Volume to Capacity	0.01	0.00	0.00	0.02
Queue Length 95th (ft)	1	0	0	2
Control Delay (s)	0.5	0.0	0.0	10.1
Lane LOS	A		A	B
Approach Delay (s)	0.5	0.0	0.0	10.1
Approach LOS			A	B

### Intersection Summary

Average Delay	0.6
Intersection Capacity Utilization	28.6%
ICU Level of Service	A
Analysis Period (min)	15

# HCM Unsignalized Intersection Capacity Analysis

## 8: Maple St & Rose Ave

10/25/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Volume (veh/h)	2	1	1	30	2	25	2	200	40	5	135	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.78	0.78	0.78	0.79	0.79	0.79	0.89	0.89	0.89
Hourly flow rate (vph)	4	2	2	38	3	32	3	253	51	6	152	11
Pedestrians		4			1			4				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	473	482	165	460	463	279	167			305		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	473	482	165	460	463	279	167			305		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.2		
p0 queue free %	99	100	100	92	99	96	100			100		
cM capacity (veh/h)	475	482	878	493	482	745	1394			1255		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	73	306	169
Volume Left	4	38	3	6
Volume Right	2	32	51	11
cSH	539	876	1394	1255
Volume to Capacity	0.01	0.08	0.00	0.00
Queue Length 95th (ft)	1	7	0	0
Control Delay (s)	11.8	11.7	0.1	0.3
Lane LOS	B	B	A	A
Approach Delay (s)	11.8	11.7	0.1	0.3
Approach LOS	B	B		

### Intersection Summary

Average Delay	1.8
Intersection Capacity Utilization	32.1%
ICU Level of Service	A
Analysis Period (min)	15

# HCM Unsignalized Intersection Capacity Analysis

## 9: Maple St & Weed Ave

10/25/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	45	1	0	45	0	2	0	1	25	0	10
Peak Hour Factor	0.65	0.65	0.65	0.66	0.66	0.66	0.75	0.75	0.75	0.81	0.81	0.81
Hourly flow rate (vph)	0	69	2	0	68	0	3	0	1	31	0	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	71	68	4	43
Volume Left (vph)	0	0	3	31
Volume Right (vph)	2	0	1	12
Hadj (s)	0.07	0.05	0.49	0.02
Departure Headway (s)	4.1	4.1	4.7	4.2
Degree Utilization, x	0.08	0.08	0.01	0.05
Capacity (veh/h)	851	856	727	821
Control Delay (s)	7.5	7.5	7.8	7.5
Approach Delay (s)	7.5	7.5	7.8	7.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay		7.5	
HCM Level of Service		A	
Intersection Capacity Utilization	19.2%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 10: Cougar St & Rose Ave

10/25/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	15	0	2	1	0	0	3	225	0	1	150	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.61	0.61	0.61	0.25	0.25	0.25	0.76	0.76	0.76	0.87	0.87	0.87
Hourly flow rate (vph)	25	0	3	4	0	0	4	296	0	1	172	17
Pedestrians		8										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	495	495	189	491	504	296	198			296		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	495	495	189	491	504	296	198			296		
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	100	100	99	100	100	100			100		
cM capacity (veh/h)	481	474	852	486	468	748	1360			1265		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	28	4	300	191
Volume Left	25	4	4	1
Volume Right	3	0	0	17
cSH	507	486	1360	1265
Volume to Capacity	0.05	0.01	0.00	0.00
Queue Length 95th (ft)	4	1	0	0
Control Delay (s)	12.5	12.5	0.1	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	12.5	12.5	0.1	0.1
Approach LOS	B	B		

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		

**Intersection: 1: Stoney Point Rd & State St**

Movement	EB	WB
Directions Served	LTR	LR
Maximum Queue (ft)	30	38
Average Queue (ft)	2	14
95th Queue (ft)	14	39
Link Distance (ft)	524	999
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 2: Bridge St & Rose Ave**

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	LT	R	LTR
Maximum Queue (ft)	50	56	74	77	54
Average Queue (ft)	22	10	28	8	25
95th Queue (ft)	51	38	57	45	51
Link Distance (ft)	1293	224	265		448
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				75	
Storage Blk Time (%)			0	0	
Queuing Penalty (veh)			0	0	

**Intersection: 3: Bridge St & Weed Ave**

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	19	63	71
Average Queue (ft)	1	11	32
95th Queue (ft)	9	43	64
Link Distance (ft)	224	2044	618
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			



**Intersection: 4: Bridge St & State St**

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	92	7	76
Average Queue (ft)	24	0	34
95th Queue (ft)	71	6	65
Link Distance (ft)	2044	1938	3068
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 5: Bridge St & Texas Ave**

Movement	EB	WB	SB
Directions Served	LTR	LTR	LR
Maximum Queue (ft)	47	15	74
Average Queue (ft)	5	1	18
95th Queue (ft)	27	14	50
Link Distance (ft)	1938	295	1761
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 6: Bridge St & Missouri Ave**

Movement	NB	SB
Directions Served	LR	LR
Maximum Queue (ft)	24	34
Average Queue (ft)	5	3
95th Queue (ft)	21	18
Link Distance (ft)	294	320
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Bridge St & Riverside Dr

Movement	EB	SB
Directions Served	LTR	LR
Maximum Queue (ft)	35	30
Average Queue (ft)	2	4
95th Queue (ft)	17	20
Link Distance (ft)	1614	674
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Maple St & Rose Ave

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	31	62	54	7	21
Average Queue (ft)	4	24	20	0	1
95th Queue (ft)	20	54	55	5	9
Link Distance (ft)	488	298		252	265
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			25		
Storage Blk Time (%)		3	2		
Queuing Penalty (veh)		1	1		

Intersection: 9: Maple St & Weed Ave

Movement	EB	WB	NB	SB
Directions Served	TR	LT	LR	LR
Maximum Queue (ft)	70	45	47	50
Average Queue (ft)	28	19	4	26
95th Queue (ft)	58	42	25	52
Link Distance (ft)	298	630	226	264
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

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Intersection: 10: Cougar St & Rose Ave

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Movement	EB	WB
Directions Served	LR	LR
Maximum Queue (ft)	43	20
Average Queue (ft)	14	1
95th Queue (ft)	43	10
Link Distance (ft)	548	236
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Network Summary

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Network wide Queuing Penalty: 2

# City of Vernonia TSP Update

Population 2340  
 ADT 4000  
 2-lane District Highway  
 Weekday Rural Populated  
 ATR Range 3600 4400  
 Highway 102 MP 62.5

Note: Table was modified to include 2009  
 Seasonal Trends for ATR Station 03-013 and  
 seasonal adjustment interpolation  
 calculations.  
 -JDJ

**NO ONSITE OR NEARBY ATR!**

**1. Similar ATR Method**

Trend	Area	Facility	Classifica	ADT	Designation	Population					
<b>BEST METHOD</b>	-2.50%	<b>ATR 03-013</b>	Aggricultural	Rural	2 lane	Weekday	District Hi	3900	OR 213	Cascade	
Marquam			31	28	31	30	31	30	31	30	31

03-013	Peak Month	Peak%	January	February	March	April	May	June	July	August	September	October	November	December
2009	August	109	93	94	96	102	105	105	106	109	108	103	98	91
2008	July	114	91	100	102	104	110	109	114	106	103	100	105	84
2007	June	112	84	96	101	103	107	109	110	112	109	102	100	89
2006	August	113	89	92	94	103	105	109	111	113	111	106	98	92
2005	August	111	92	95	97	101	105	109	110	111	107	103	102	94
	Average	112	91	95	98	103	106	109	110	111	108	103	100	91
	Factor		1.2353	1.1789	1.1429	1.0909	1.0599	1.0275	1.0151	1.0120	1.0370	1.0909	1.1200	1.2353

**Seasonal Adjustment Interpolation**

Month	Date	Days Ahead	Days Back	Month Ahead	Month Back	Seasonal Adj Factor
December	2	13	17	1.2353	1.1200	1.185
March	10	5	23	1.1429	1.1789	1.149
April	24	21	9	1.0599	1.0909	1.082

**2. Seasonal Trend Table**

	January	February	March	April	May	June	July	August	September	October	November	December	Peak
<b>AGRICULTURE</b>	1.1881	1.0732	1.0221	0.9854	0.9446	0.9240	0.8917	0.8940	0.9054	0.9336	0.9865	1.1632	0.8821
Factor	1.3469	1.2166	1.1587	1.1171	1.0709	1.0475	1.0109	1.0134	1.0264	1.0583	1.1184	1.3186	

**Yearly Growth Adjustment Factor**

MP	Location	Growth																			Avg		
		2009 ADT	2008 ADT	2007 ADT	2006 ADT	2005 ADT	2004 ADT	2003 ADT	2002 ADT	2001 ADT	2000 ADT	1999 ADT	2000	2001	2002	2003	2004	2005	2006	2007		2008	2009
61.72	0.01 mile wes	5100	4000	4200	4200	3900	4000	4000	5300	5100	4900	4600	1.0652	1.0408	0.9623	0.7547	1.0000	0.9750	1.0769	1.0000	0.9524	1.2750	1.0102
62.11	0.02 mile wes	6600	4800	5100	5000	4900	5000	5000	6500	6400	6300	5900	1.0678	1.0159	0.9846	0.7692	1.0000	0.9800	1.0204	1.0200	0.9412	1.3750	1.0174
62.27	Rock Creek E	7200	5200	5400	5400	5300	5400	5400	6900	6800	6700	6700	1.0000	1.0149	0.9855	0.7826	1.0000	0.9815	1.0189	1.0000	0.9630	1.3846	1.0131
62.52	0.02 mile eas	5200	3600	3800	3700	4200	4300	4300	5500	5400	5300	5200	1.0192	1.0189	0.9818	0.7818	1.0000	0.9767	0.8810	1.0270	0.9474	1.4444	1.0078
62.56	0.02 mile sou	4100	3200	3400	3300	3600	3700	3700	4600	4500	4400	4200	1.0476	1.0227	0.9783	0.8043	1.0000	0.9730	0.9167	1.0303	0.9412	1.2813	0.9995
62.79	0.02 mile sou	3900	3100	3300	3300	3300	3400	3400	4100	4000	3900	3800	1.0263	1.0256	0.9756	0.8293	1.0000	0.9706	1.0000	1.0000	0.9394	1.2581	1.0025
	AVG	5350	3983	4200	4150	4200	4300	4300	5483	5367	5250	5067										1.008	Average

**ANNUAL GROWTH**