

# Appendices

## Appendix A Turning Movement Counts

# City Of Danville VA Traffic Control

310 Industrial Ave  
Danville VA 24541

Default Comments

Change These in The Preferences Window

Select File/Preference in the Main Scree

Then Click the Comments Tab

## Groups Printed- Unshifted - Bank 1 - Bank 2

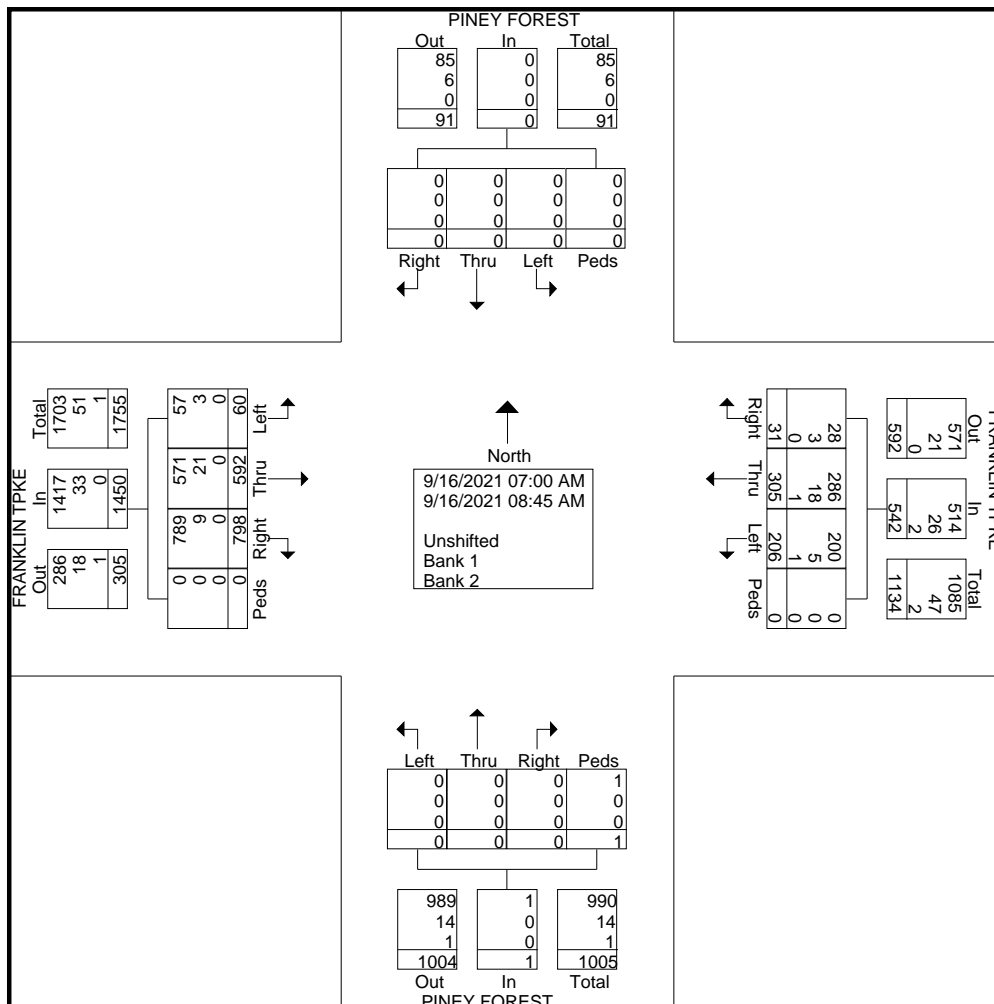
Start Time	PINEY FOREST From North					FRANKLIN TPKE From East					PINEY FOREST From South					FRANKLIN TPKE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	4	28	21	0	53	0	0	0	0	0	80	64	2	0	146	199
07:15 AM	0	0	0	0	0	4	59	23	0	86	0	0	0	0	0	102	83	6	0	191	277
07:30 AM	0	0	0	0	0	6	40	26	0	72	0	0	0	0	0	123	103	12	0	238	310
07:45 AM	0	0	0	0	0	4	44	37	0	85	0	0	0	0	0	118	80	5	0	203	288
Total	0	0	0	0	0	18	171	107	0	296	0	0	0	0	0	423	330	25	0	778	1074
08:00 AM	0	0	0	0	0	2	28	29	0	59	0	0	0	0	0	108	64	5	0	177	236
08:15 AM	0	0	0	0	0	4	36	26	0	66	0	0	0	0	0	107	56	8	0	171	237
08:30 AM	0	0	0	0	0	2	40	21	0	63	0	0	0	0	0	90	62	5	0	157	220
08:45 AM	0	0	0	0	0	5	30	23	0	58	0	0	0	1	1	70	80	17	0	167	226
Total	0	0	0	0	0	13	134	99	0	246	0	0	0	1	1	375	262	35	0	672	919

# City Of Danville VA Traffic Control

310 Industrial Ave  
Danville VA 24541

## Groups Printed- Unshifted - Bank 1 - Bank 2

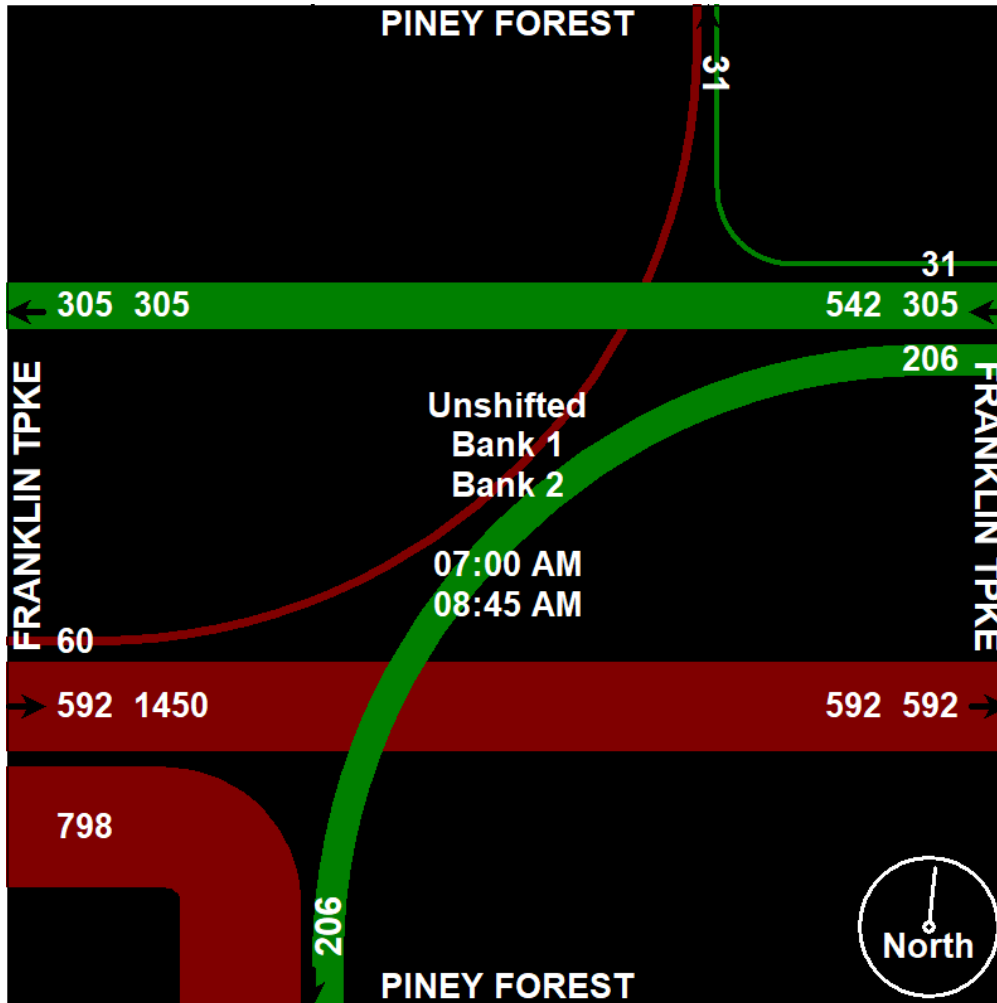
	PINEY FOREST From North					FRANKLIN TPKE From East					PINEY FOREST From South					FRANKLIN TPKE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	0	0	0	0	0	31	305	206	0	542	0	0	0	1	1	798	592	60	0	1450	1993
Apprch %	0	0	0	0	0	5.7	56.3	38	0	27.2	0	0	0	100	100	55	40.8	4.1	0	72.8	
Total %	0	0	0	0	0	1.6	15.3	10.3	0	27.2	0	0	0	0.1	0.1	40	29.7	3	0	72.8	
Unshifted	0	0	0	0	0	28	286	200	0	514	0	0	0	1	1	789	571	57	0	1417	1932
% Unshifted	0	0	0	0	0	90.3	93.8	97.1	0	94.8	0	0	0	100	100	98.9	96.5	95	0	97.7	96.9
Bank 1	0	0	0	0	0	3	18	5	0	26	0	0	0	0	0	9	21	3	0	33	59
% Bank 1	0	0	0	0	0	9.7	5.9	2.4	0	4.8	0	0	0	0	0	1.1	3.5	5	0	2.3	3
Bank 2	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	2
% Bank 2	0	0	0	0	0	0	0.3	0.5	0	0.4	0	0	0	0	0	0	0	0	0	0	0.1





# City Of Danville VA Traffic Control

310 Industrial Ave  
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Danville VA 24541

Default Comments

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Then Click the Comments Tab

## Groups Printed- Unshifted - Bank 1 - Bank 2

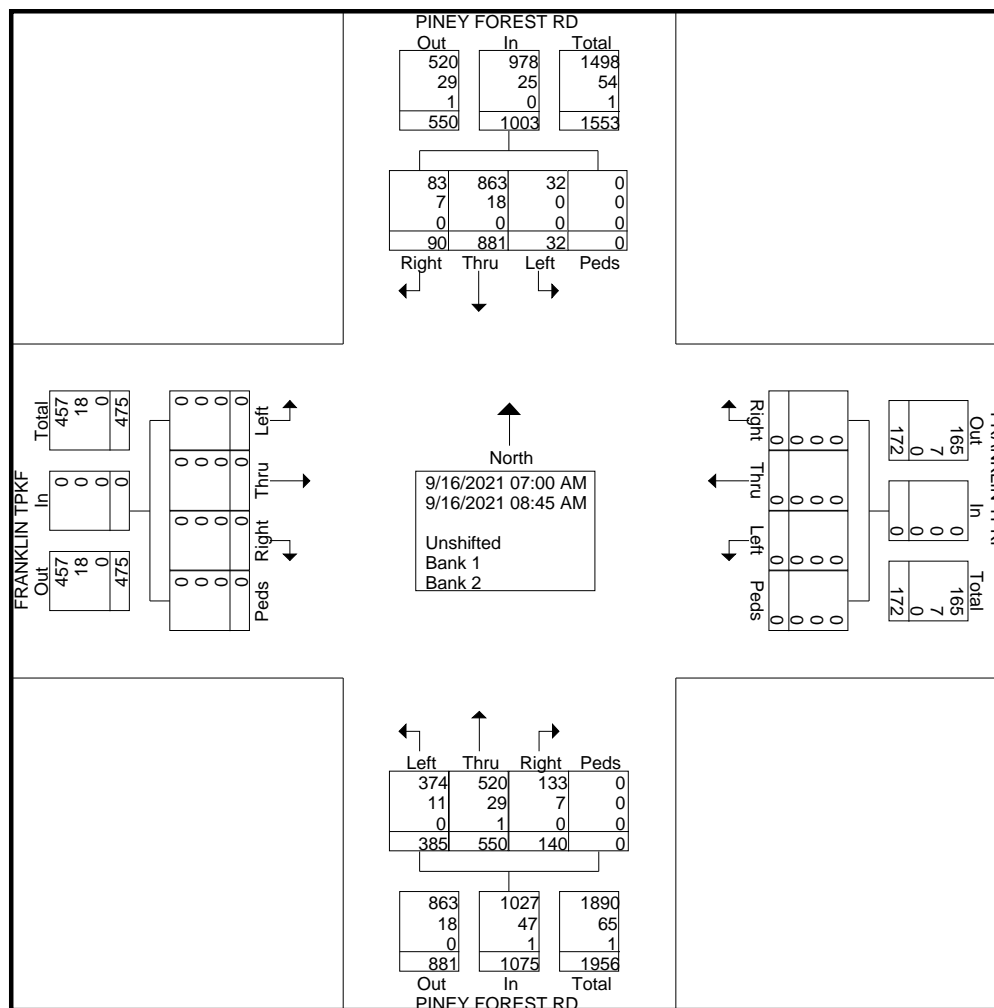
Start Time	PINEY FOREST RD From North					FRANKLIN TPKF From East					PINEY FOREST RD From South					FRANKLIN TPKF From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	7	68	1	0	76	0	0	0	0	0	8	43	38	0	89	0	0	0	0	0	165
07:15 AM	7	86	1	0	94	0	0	0	0	0	24	58	48	0	130	0	0	0	0	0	224
07:30 AM	15	139	4	0	158	0	0	0	0	0	12	58	41	0	111	0	0	0	0	0	269
07:45 AM	10	145	9	0	164	0	0	0	0	0	22	74	51	0	147	0	0	0	0	0	311
Total	39	438	15	0	492	0	0	0	0	0	66	233	178	0	477	0	0	0	0	0	969
08:00 AM	11	140	5	0	156	0	0	0	0	0	15	82	60	0	157	0	0	0	0	0	313
08:15 AM	16	98	2	0	116	0	0	0	0	0	20	82	54	0	156	0	0	0	0	0	272
08:30 AM	14	115	5	0	134	0	0	0	0	0	13	72	54	0	139	0	0	0	0	0	273
08:45 AM	10	90	5	0	105	0	0	0	0	0	26	81	39	0	146	0	0	0	0	0	251
Total	51	443	17	0	511	0	0	0	0	0	74	317	207	0	598	0	0	0	0	0	1109

# City Of Danville VA Traffic Control

310 Industrial Ave  
Danville VA 24541

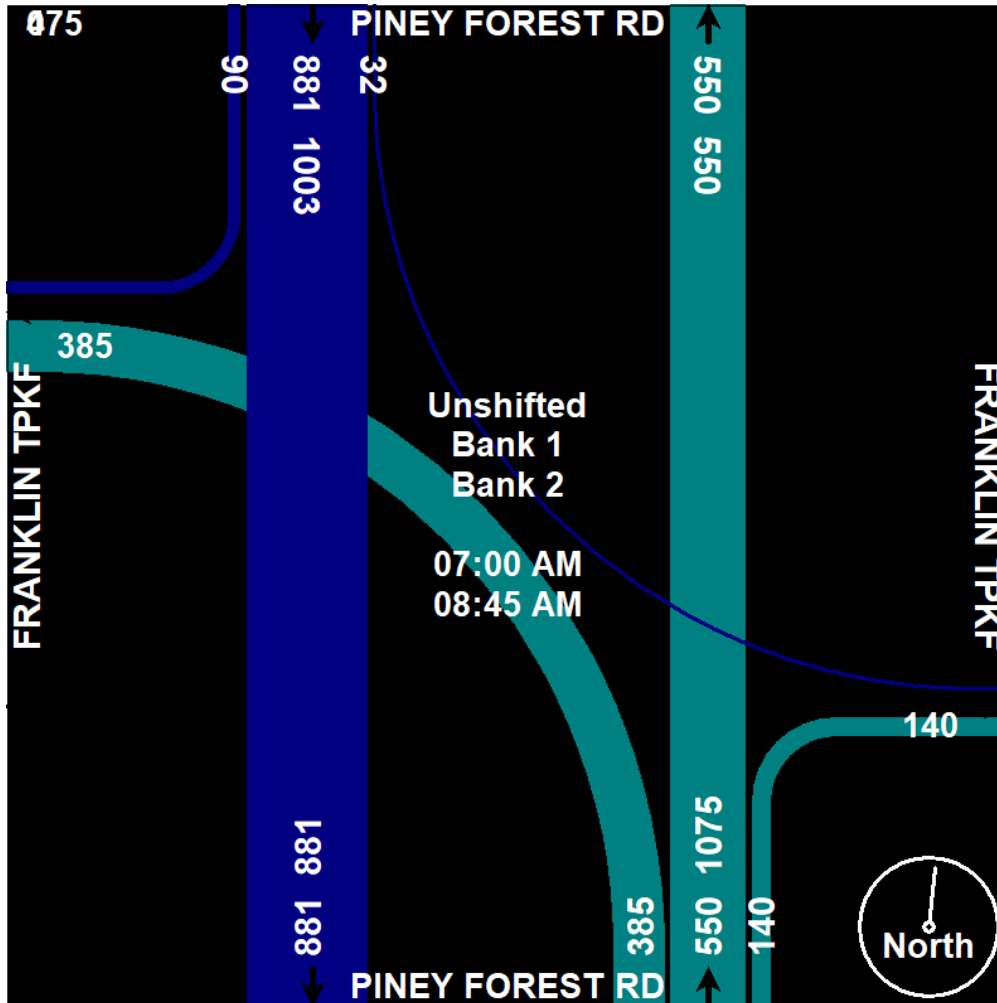
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST RD From North					FRANKLIN TPKF From East					PINEY FOREST RD From South					FRANKLIN TPKF From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	90	881	32	0	1003	0	0	0	0	0	140	550	385	0	1075	0	0	0	0	0	2078
Apprch %	9	87.8	3.2	0		0	0	0	0	0	13	51.2	35.8	0		0	0	0	0	0	
Total %	4.3	42.4	1.5	0	48.3	0	0	0	0	0	6.7	26.5	18.5	0	51.7	0	0	0	0	0	
Unshifted	83	863	32	0	978	0	0	0	0	0	133	520	374	0	1027	0	0	0	0	0	2005
% Unshifted	92.2	98	100	0	97.5	0	0	0	0	0	95	94.5	97.1	0	95.5	0	0	0	0	0	96.5
Bank 1	7	18	0	0	25	0	0	0	0	0	7	29	11	0	47	0	0	0	0	0	72
% Bank 1	7.8	2	0	0	2.5	0	0	0	0	0	5	5.3	2.9	0	4.4	0	0	0	0	0	3.5
Bank 2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0.1	0	0	0	0	0	0



# City Of Danville VA Traffic Control

310 Industrial Ave  
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## Default Comments

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Select File/Preference in the Main Scree

Then Click the Comments Tab

### Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	PINEY FOREST SOUTH From North					FRANKLIN TPKE From East					PINEY FOREST NORTH From South					RTE 41 - FRANKLIN TPKE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	25	150	116	0	291	0	0	0	0	0	17	89	10	0	116	0	0	0	0	0	407
04:15 PM	27	153	123	0	303	0	0	0	0	0	10	136	12	0	158	0	0	0	0	0	461
04:30 PM	13	142	106	0	261	0	0	0	0	0	17	116	8	0	141	0	0	0	0	0	402
04:45 PM	25	164	146	0	335	0	0	0	0	0	14	110	19	0	143	0	0	0	0	0	478
Total	90	609	491	0	1190	0	0	0	0	0	58	451	49	0	558	0	0	0	0	0	1748
05:00 PM	33	157	124	0	314	0	0	0	0	0	21	100	8	0	129	0	0	0	0	0	443
05:15 PM	32	162	173	0	367	0	0	0	0	0	19	126	13	0	158	0	0	0	0	0	525
05:30 PM	34	163	112	0	309	0	0	0	0	0	18	137	20	0	175	0	0	0	0	0	484
05:45 PM	41	148	113	0	302	0	0	0	0	0	13	116	13	0	142	0	0	0	0	0	444
Total	140	630	522	0	1292	0	0	0	0	0	71	479	54	0	604	0	0	0	0	0	1896

\*\*\* BREAK \*\*\*

I had North  
position pointing  
South Bound.  
  
pm time 4-6

# City Of Danville VA Traffic Control

310 Industrial Ave  
Danville VA 24541

Default Comments

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## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	PINEY FOREST From North					FRANKLIN TPKE From East					PINEY FOREST From South					FRANKLIN TPKE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	0	0	0	0	6	80	40	0	126	0	0	0	0	0	79	40	9	0	128	254
04:15 PM	0	0	0	0	0	8	85	25	0	118	0	0	0	0	0	57	72	19	0	148	266
04:30 PM	0	0	0	0	0	3	72	47	0	122	0	0	0	0	0	59	35	13	0	107	229
04:45 PM	0	0	0	0	0	9	98	45	0	152	0	0	0	0	0	71	52	23	0	146	298
Total	0	0	0	0	0	26	335	157	0	518	0	0	0	0	0	266	199	64	0	529	1047
05:00 PM	0	0	0	0	0	9	75	43	0	127	0	1	0	0	1	92	32	26	0	150	278
05:15 PM	0	0	0	0	0	7	120	30	0	157	0	0	0	0	0	82	49	15	0	146	303
05:30 PM	0	0	0	0	0	9	71	38	0	118	0	0	0	0	0	54	60	19	0	133	251
05:45 PM	0	0	0	0	0	6	64	38	0	108	0	0	0	0	0	56	51	10	0	117	225
Total	0	0	0	0	0	31	330	149	0	510	0	1	0	0	1	284	192	70	0	546	1057

\*\*\* BREAK \*\*\*

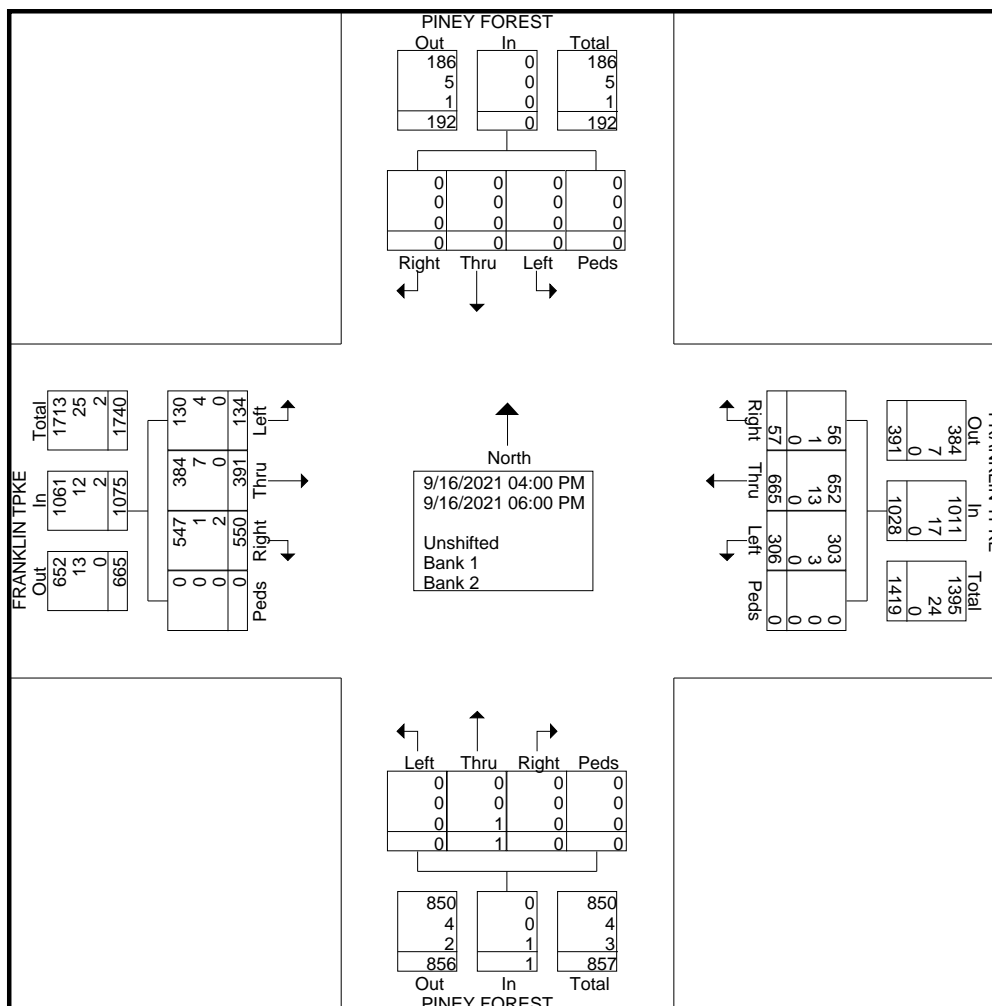


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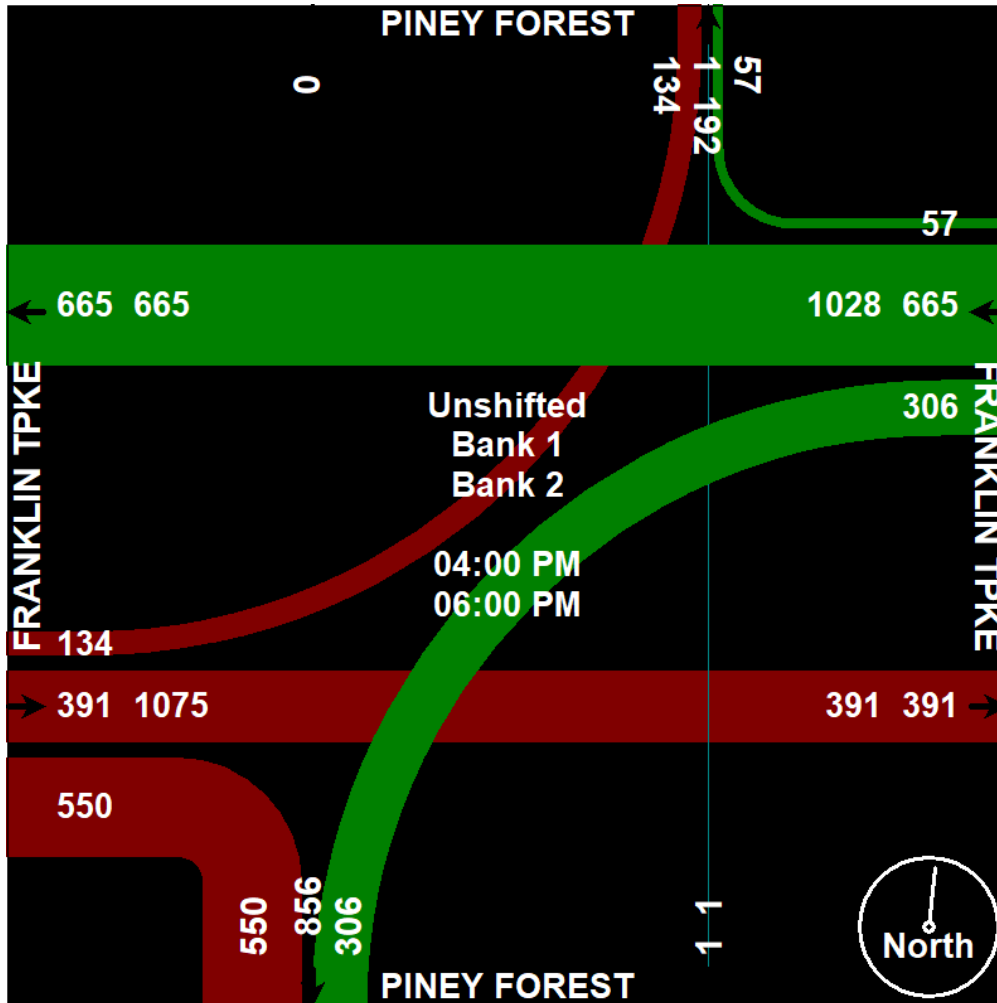
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					FRANKLIN TPKE From East					PINEY FOREST From South					FRANKLIN TPKE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	0	0	0	0	0	57	665	306	0	1028	0	1	0	0	1	550	391	134	0	1075	2104
Apprch %	0	0	0	0	0	5.5	64.7	29.8	0	48.9	0	100	0	0	0	51.2	36.4	12.5	0	0	
Total %	0	0	0	0	0	2.7	31.6	14.5	0	48.9	0	0	0	0	0	26.1	18.6	6.4	0	51.1	
Unshifted	0	0	0	0	0	56	652	303	0	1011	0	0	0	0	0	547	384	130	0	1061	2072
% Unshifted	0	0	0	0	0	98.2	98	99	0	98.3	0	0	0	0	0	99.5	98.2	97	0	98.7	98.5
Bank 1	0	0	0	0	0	1	13	3	0	17	0	0	0	0	0	1	7	4	0	12	29
% Bank 1	0	0	0	0	0	1.8	2	1	0	1.7	0	0	0	0	0	0.2	1.8	3	0	1.1	1.4
Bank 2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	2	3
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	100	0	0	100	0.4	0	0	0	0.2	0.1



# City Of Danville VA Traffic Control

310 Industrial Ave  
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Danville VA 24541

Default Comments

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Then Click the Comments Tab

## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	PINEY FOREST SOUTH From North					FRANKLIN TPKE From East					PINEY FOREST NORTH From South					RTE 41 - FRANKLIN TPKE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	25	150	116	0	291	0	0	0	0	0	17	89	10	0	116	0	0	0	0	0	407
04:15 PM	27	153	123	0	303	0	0	0	0	0	10	136	12	0	158	0	0	0	0	0	461
04:30 PM	13	142	106	0	261	0	0	0	0	0	17	116	8	0	141	0	0	0	0	0	402
04:45 PM	25	164	146	0	335	0	0	0	0	0	14	110	19	0	143	0	0	0	0	0	478
Total	90	609	491	0	1190	0	0	0	0	0	58	451	49	0	558	0	0	0	0	0	1748
05:00 PM	33	157	124	0	314	0	0	0	0	0	21	100	8	0	129	0	0	0	0	0	443
05:15 PM	32	162	173	0	367	0	0	0	0	0	19	126	13	0	158	0	0	0	0	0	525
05:30 PM	34	163	112	0	309	0	0	0	0	0	18	137	20	0	175	0	0	0	0	0	484
05:45 PM	41	148	113	0	302	0	0	0	0	0	13	116	13	0	142	0	0	0	0	0	444
Total	140	630	522	0	1292	0	0	0	0	0	71	479	54	0	604	0	0	0	0	0	1896

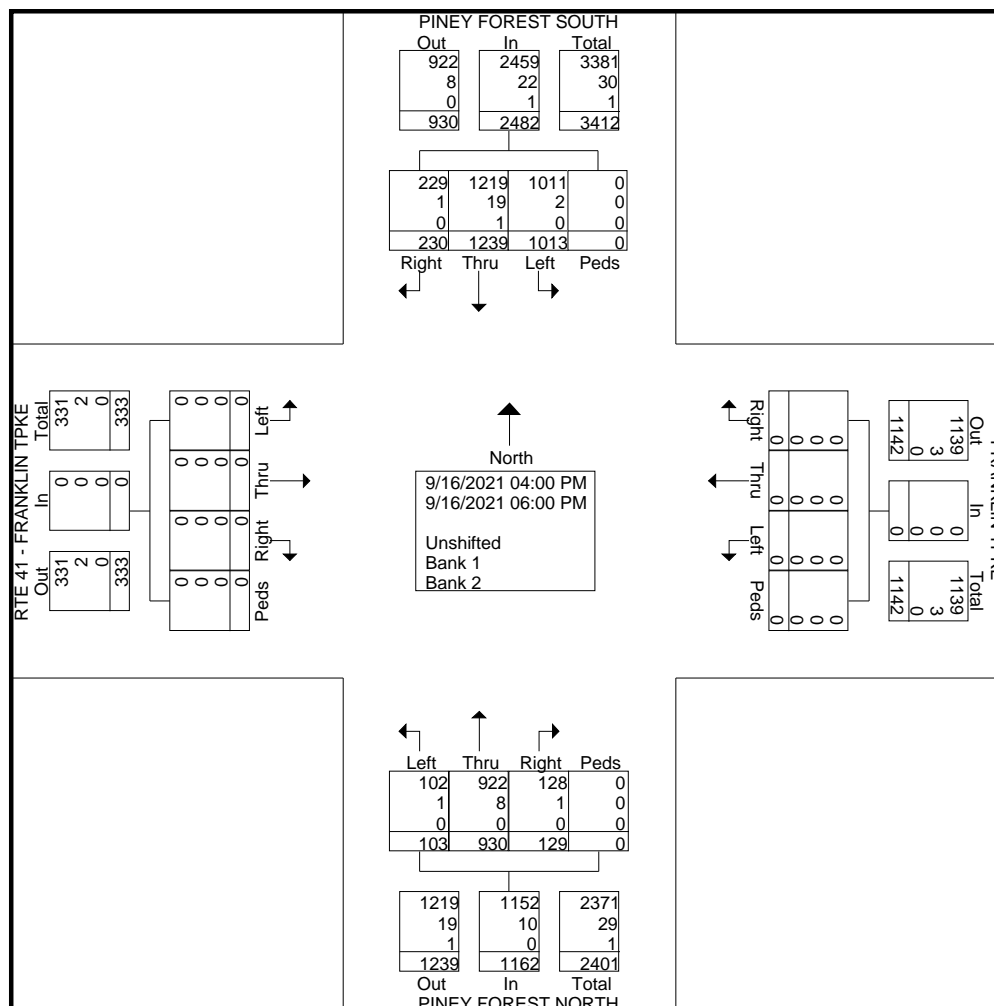
\*\*\* BREAK \*\*\*

# City Of Danville VA Traffic Control

310 Industrial Ave  
Danville VA 24541

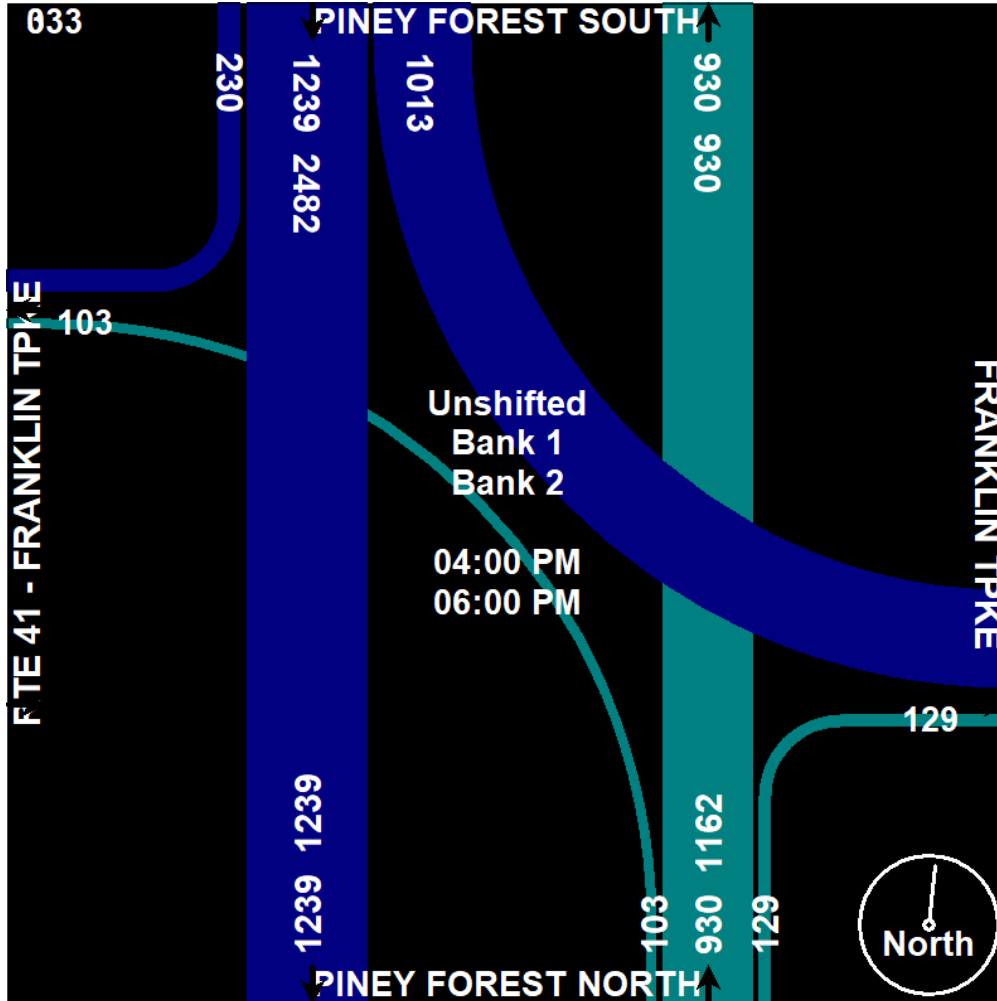
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST SOUTH From North					FRANKLIN TPKE From East					PINEY FOREST NORTH From South					RTE 41 - FRANKLIN TPKE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	230	1239	1013	0	2482	0	0	0	0	0	129	930	103	0	1162	0	0	0	0	0	3644
Apprch %	9.3	49.9	40.8	0		0	0	0	0		11.1	80	8.9	0		0	0	0	0		
Total %	6.3	34	27.8	0	68.1	0	0	0	0	0	3.5	25.5	2.8	0	31.9	0	0	0	0	0	
Unshifted	229	1219	1011	0	2459	0	0	0	0	0	128	922	102	0	1152	0	0	0	0	0	3611
% Unshifted	99.6	98.4	99.8	0	99.1	0	0	0	0	0	99.2	99.1	99	0	99.1	0	0	0	0	0	99.1
Bank 1	1	19	2	0	22	0	0	0	0	0	1	8	1	0	10	0	0	0	0	0	32
% Bank 1	0.4	1.5	0.2	0	0.9	0	0	0	0	0	0.8	0.9	1	0	0.9	0	0	0	0	0	0.9
Bank 2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Bank 2	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



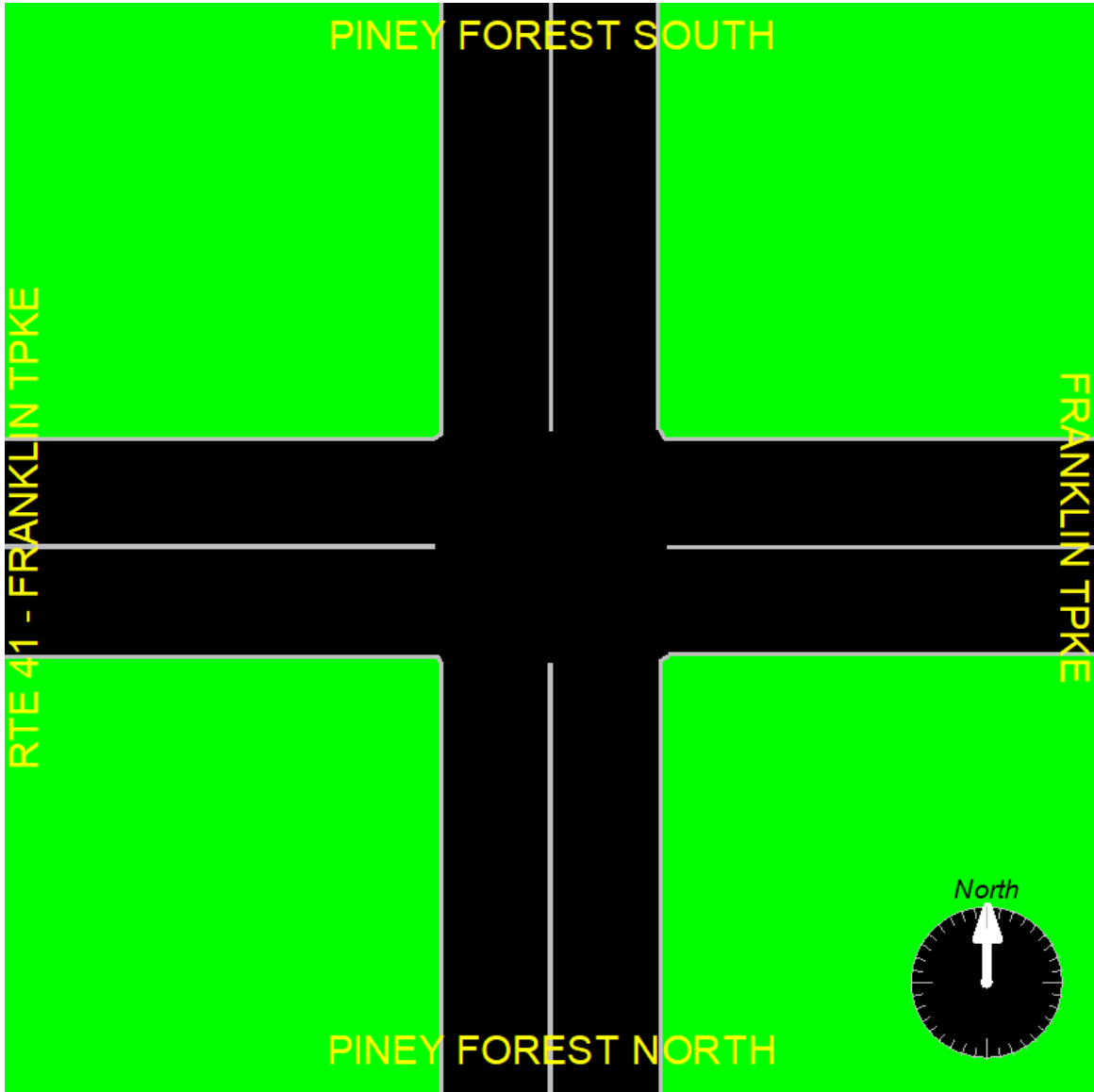
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## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	PINEY FOREST From North					NOR DAN DR From East					PINEY FOREST From South					NELSON AVE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	174	11	0	185	24	0	8	0	32	12	76	0	0	88	0	0	0	0	0	305
07:15 AM	2	235	15	0	252	16	0	8	0	24	8	96	0	0	104	3	0	0	0	3	383
07:30 AM	0	314	16	0	330	30	0	11	0	41	6	97	0	0	103	1	3	2	0	6	480
07:45 AM	2	373	28	0	403	23	0	11	0	34	18	123	2	0	143	2	0	0	0	2	582
Total	4	1096	70	0	1170	93	0	38	0	131	44	392	2	0	438	6	3	2	0	11	1750
08:00 AM	0	263	19	0	282	26	0	12	0	38	15	131	2	0	148	1	0	1	0	2	470
08:15 AM	1	281	13	0	295	31	0	14	0	45	18	149	1	0	168	1	0	0	0	1	509
08:30 AM	0	238	16	0	254	25	0	15	0	40	14	118	0	0	132	0	0	0	0	0	426
08:45 AM	3	205	24	0	232	28	1	15	0	44	23	130	0	0	153	3	1	0	0	4	433
Total	4	987	72	0	1063	110	1	56	0	167	70	528	3	0	601	5	1	1	0	7	1838

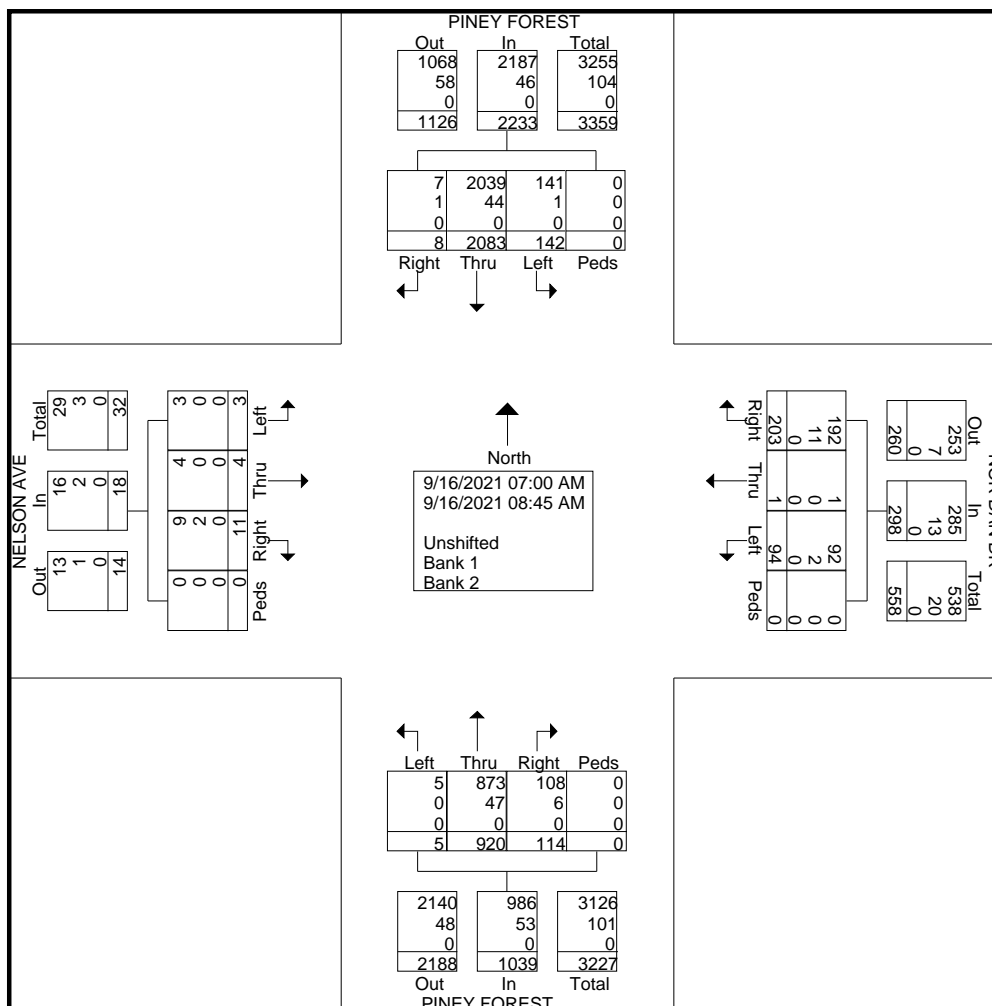


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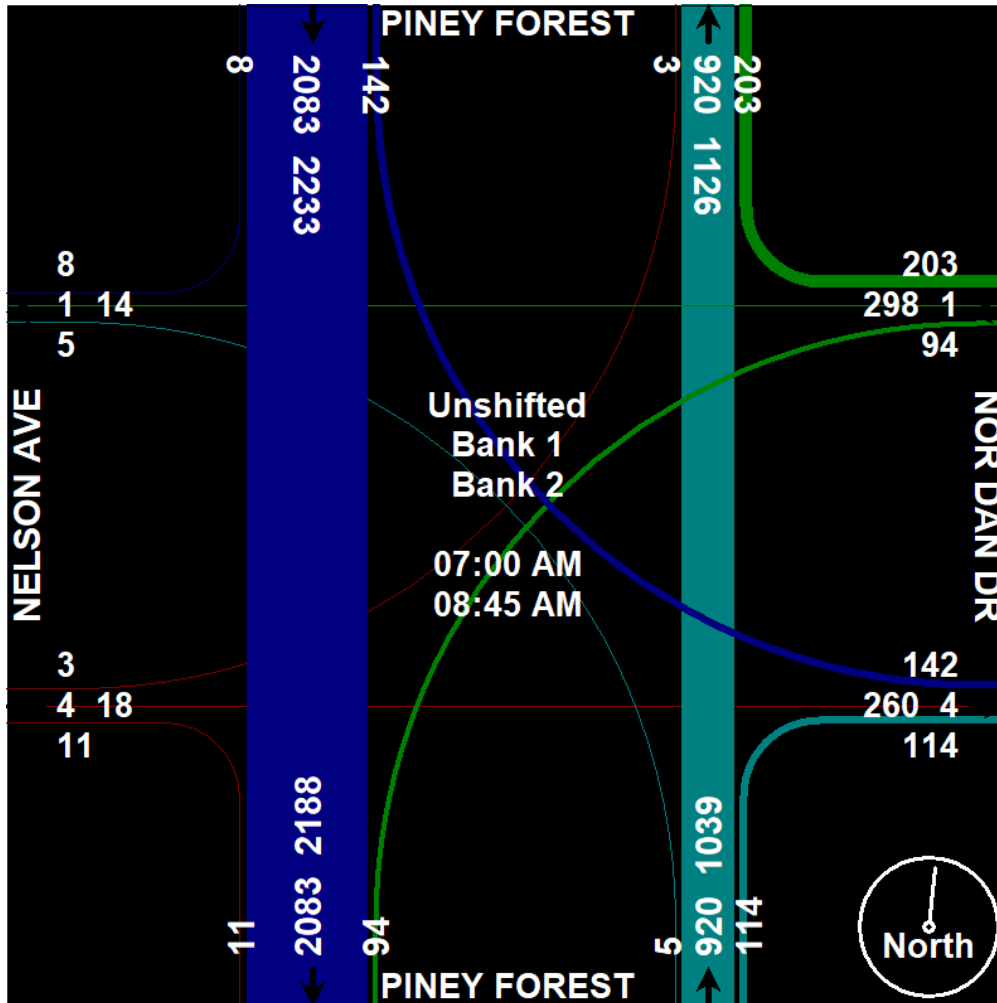
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					NOR DAN DR From East					PINEY FOREST From South					NELSON AVE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	8	2083	142	0	2233	203	1	94	0	298	114	920	5	0	1039	11	4	3	0	18	3588
Apprch %	0.4	93.3	6.4	0		68.1	0.3	31.5	0		11	88.5	0.5	0		61.1	22.2	16.7	0		
Total %	0.2	58.1	4	0	62.2	5.7	0	2.6	0	8.3	3.2	25.6	0.1	0	29	0.3	0.1	0.1	0	0.5	
Unshifted	7	2039	141	0	2187	192	1	92	0	285	108	873	5	0	986	9	4	3	0	16	3474
% Unshifted	87.5	97.9	99.3	0	97.9	94.6	100	97.9	0	95.6	94.7	94.9	100	0	94.9	81.8	100	100	0	88.9	96.8
Bank 1	1	44	1	0	46	11	0	2	0	13	6	47	0	0	53	2	0	0	0	2	114
% Bank 1	12.5	2.1	0.7	0	2.1	5.4	0	2.1	0	4.4	5.3	5.1	0	0	5.1	18.2	0	0	0	11.1	3.2
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



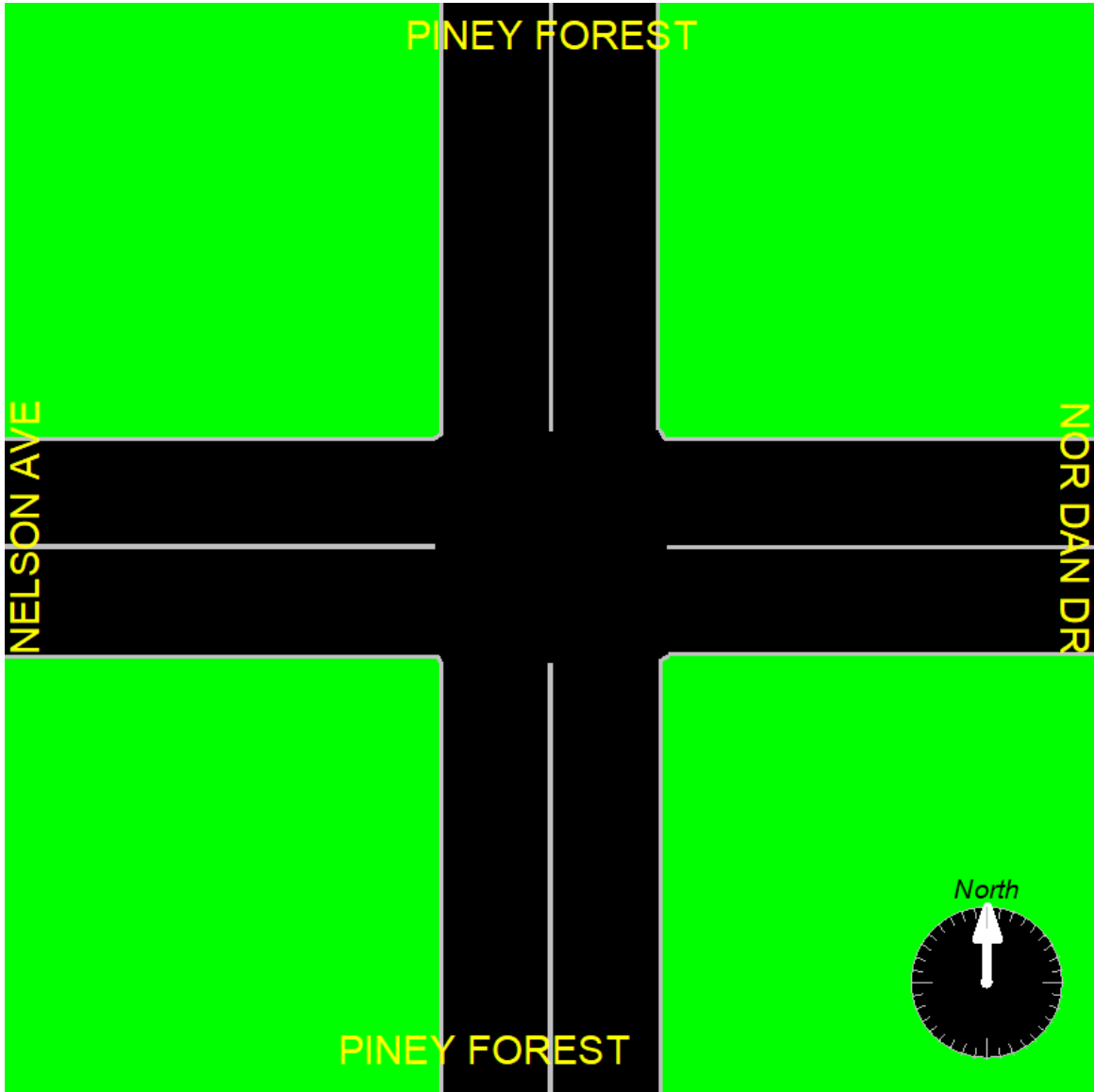
# City Of Danville VA Traffic Control

310 Industrial Ave  
Danville VA 24541



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## Groups Printed- Unshifted - Bank 1 - Bank 2

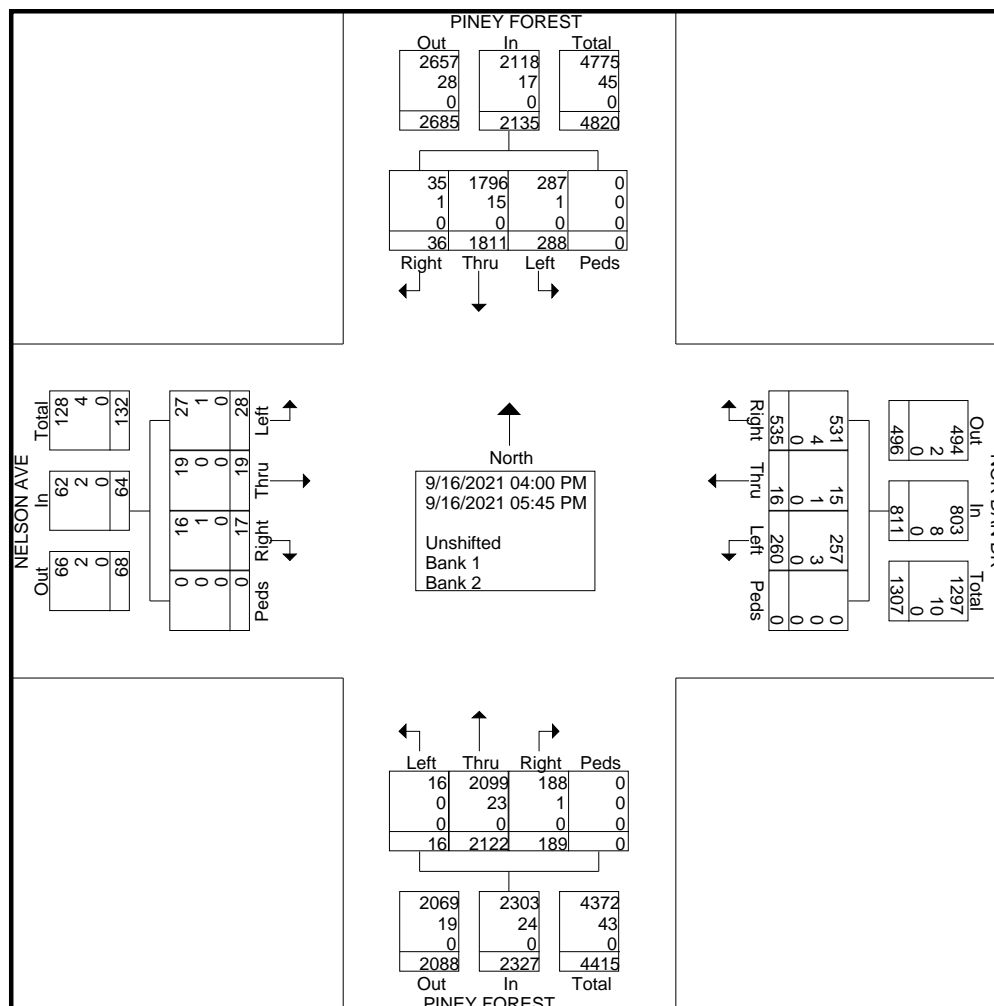
Start Time	PINEY FOREST From North					NOR DAN DR From East					PINEY FOREST From South					NELSON AVE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	4	203	33	0	240	75	2	27	0	104	19	251	4	0	274	3	4	2	0	9	627
04:15 PM	3	218	34	0	255	61	0	31	0	92	22	221	2	0	245	1	3	2	0	6	598
04:30 PM	3	237	38	0	278	52	2	31	0	85	20	288	3	0	311	4	0	3	0	7	681
04:45 PM	4	200	33	0	237	72	3	37	0	112	29	262	0	0	291	2	4	4	0	10	650
Total	14	858	138	0	1010	260	7	126	0	393	90	1022	9	0	1121	10	11	11	0	32	2556
05:00 PM	9	269	39	0	317	61	5	32	0	98	26	280	2	0	308	4	3	6	0	13	736
05:15 PM	5	239	35	0	279	97	3	37	0	137	29	328	1	0	358	1	1	5	0	7	781
05:30 PM	4	218	37	0	259	65	1	33	0	99	10	229	2	0	241	0	3	6	0	9	608
05:45 PM	4	227	39	0	270	52	0	32	0	84	34	263	2	0	299	2	1	0	0	3	656
Total	22	953	150	0	1125	275	9	134	0	418	99	1100	7	0	1206	7	8	17	0	32	2781

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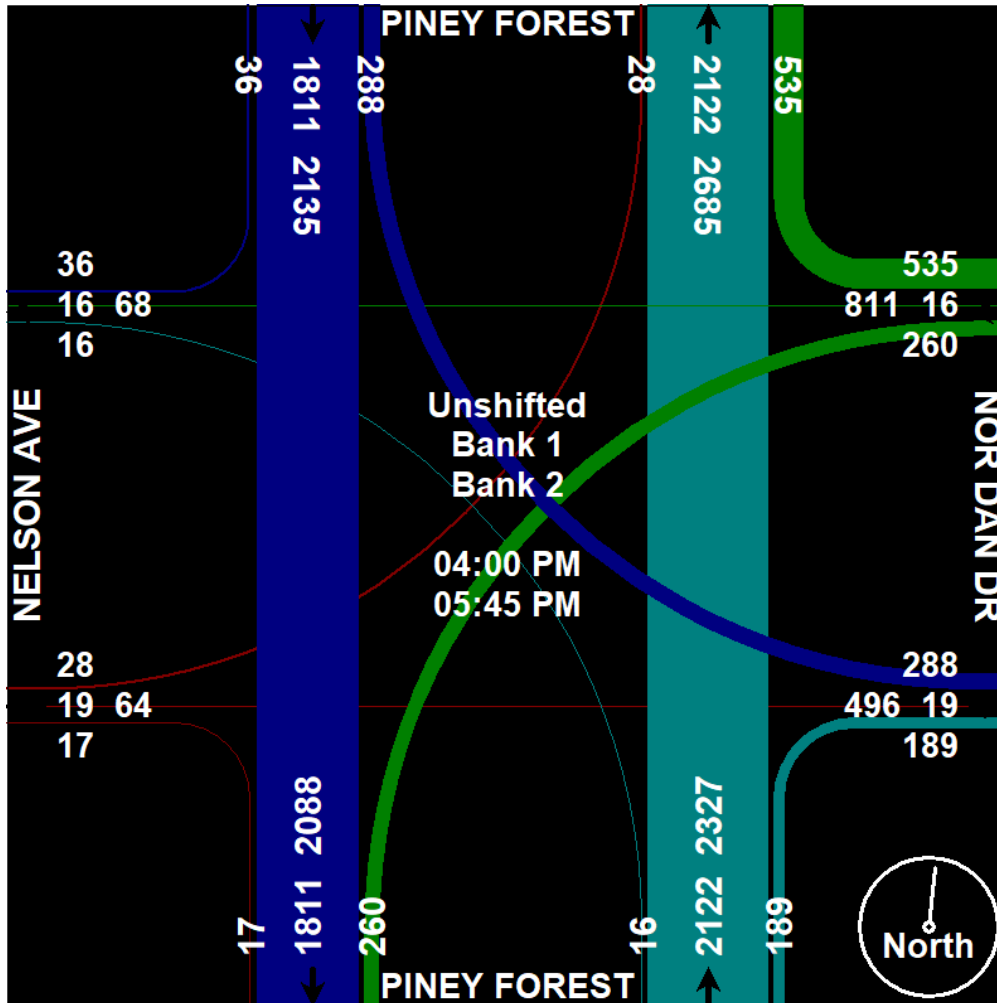
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					NOR DAN DR From East					PINEY FOREST From South					NELSON AVE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	36	1811	288	0	2135	535	16	260	0	811	189	2122	16	0	2327	17	19	28	0	64	5337
Apprch %	1.7	84.8	13.5	0		66	2	32.1	0		8.1	91.2	0.7	0		26.6	29.7	43.8	0		
Total %	0.7	33.9	5.4	0	40	10	0.3	4.9	0	15.2	3.5	39.8	0.3	0	43.6	0.3	0.4	0.5	0	1.2	
Unshifted	35	1796	287	0	2118	531	15	257	0	803	188	2099	16	0	2303	16	19	27	0	62	5286
% Unshifted	97.2	99.2	99.7	0	99.2	99.3	93.8	98.8	0	99	99.5	98.9	100	0	99	94.1	100	96.4	0	96.9	99
Bank 1	1	15	1	0	17	4	1	3	0	8	1	23	0	0	24	1	0	1	0	2	51
% Bank 1	2.8	0.8	0.3	0	0.8	0.7	6.2	1.2	0	1	0.5	1.1	0	0	1	5.9	0	3.6	0	3.1	1
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



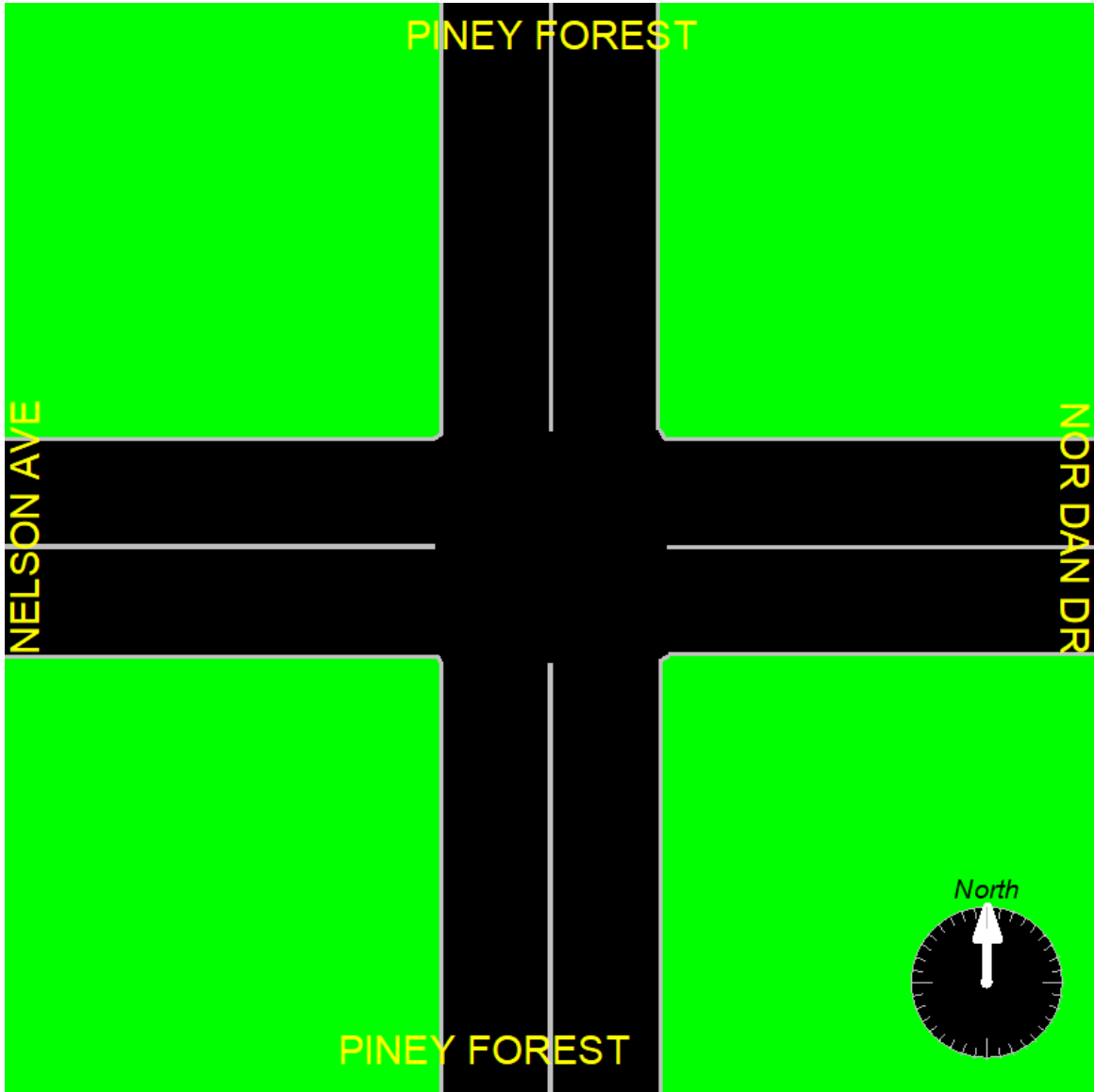
# City Of Danville VA Traffic Control

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## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	PINEY FOREST RD From North					ARNETT BLVD From East					PINEY FOREST RD From South					PARKING LOT From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	162	5	0	167	6	0	8	0	14	5	96	0	0	101	0	0	0	0	0	282
07:15 AM	0	235	13	0	248	9	0	8	0	17	9	112	0	0	121	0	0	0	0	0	386
07:30 AM	0	282	14	0	296	15	0	18	0	33	13	107	0	0	120	0	0	0	0	0	449
07:45 AM	0	312	29	0	341	12	0	20	0	32	14	150	0	0	164	1	0	0	0	1	538
Total	0	991	61	0	1052	42	0	54	0	96	41	465	0	0	506	1	0	0	0	1	1655
08:00 AM	0	240	13	0	253	13	0	17	0	30	12	153	0	0	165	0	0	0	0	0	448
08:15 AM	0	261	19	0	280	12	0	20	0	32	18	168	0	0	186	0	0	0	0	0	498
08:30 AM	0	199	16	0	215	9	0	20	0	29	16	136	1	0	153	0	0	0	0	0	397
08:45 AM	0	241	10	0	251	10	0	11	0	21	16	120	0	0	136	0	0	0	0	0	408
Total	0	941	58	0	999	44	0	68	0	112	62	577	1	0	640	0	0	0	0	0	1751

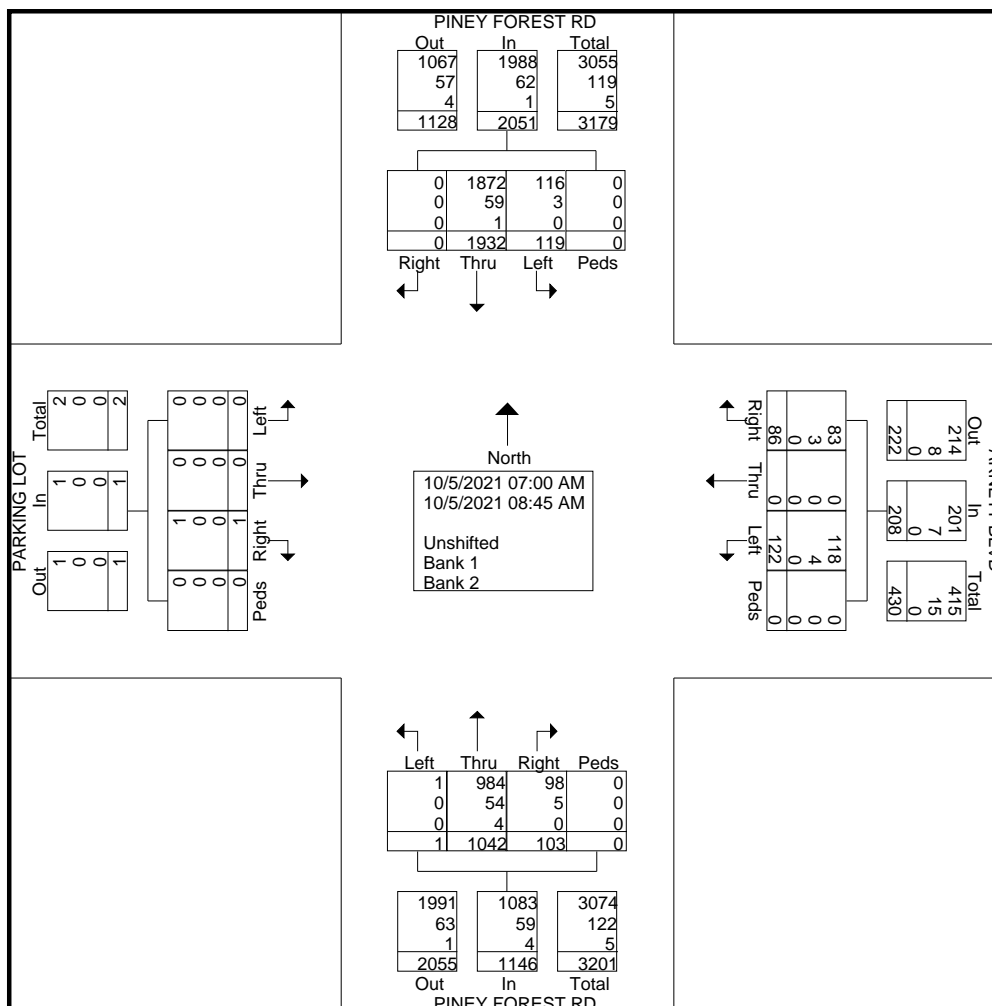


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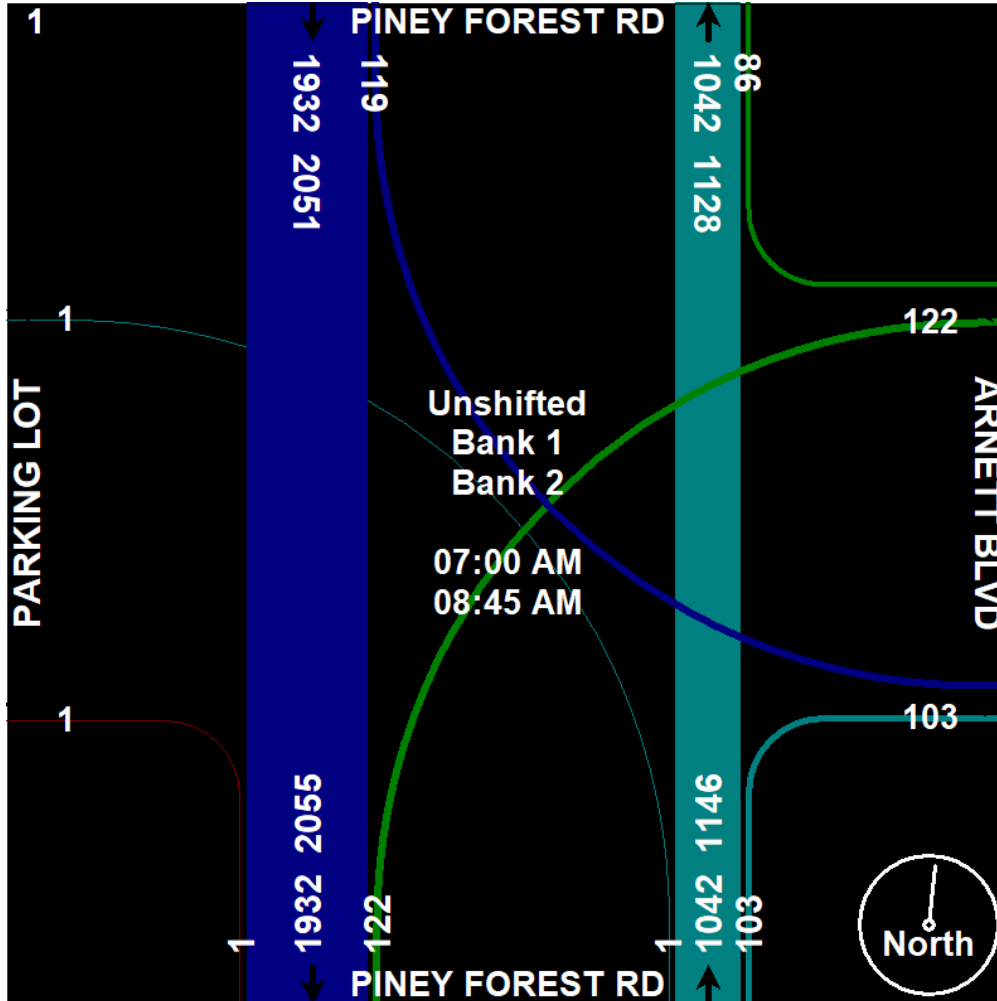
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST RD From North					ARNETT BLVD From East					PINEY FOREST RD From South					PARKING LOT From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	0	1932	119	0	2051	86	0	122	0	208	103	1042	1	0	1146	1	0	0	0	1	3406
Apprch %	0	94.2	5.8	0		41.3	0	58.7	0		9	90.9	0.1	0		100	0	0	0		
Total %	0	56.7	3.5	0	60.2	2.5	0	3.6	0	6.1	3	30.6	0	0	33.6	0	0	0	0	0	0
Unshifted	0	1872	116	0	1988	83	0	118	0	201	98	984	1	0	1083	1	0	0	0	1	3273
% Unshifted	0	96.9	97.5	0	96.9	96.5	0	96.7	0	96.6	95.1	94.4	100	0	94.5	100	0	0	0	100	96.1
Bank 1	0	59	3	0	62	3	0	4	0	7	5	54	0	0	59	0	0	0	0	0	128
% Bank 1	0	3.1	2.5	0	3	3.5	0	3.3	0	3.4	4.9	5.2	0	0	5.1	0	0	0	0	0	3.8
Bank 2	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	5
% Bank 2	0	0.1	0	0	0	0	0	0	0	0	0	0.4	0	0	0.3	0	0	0	0	0	0.1



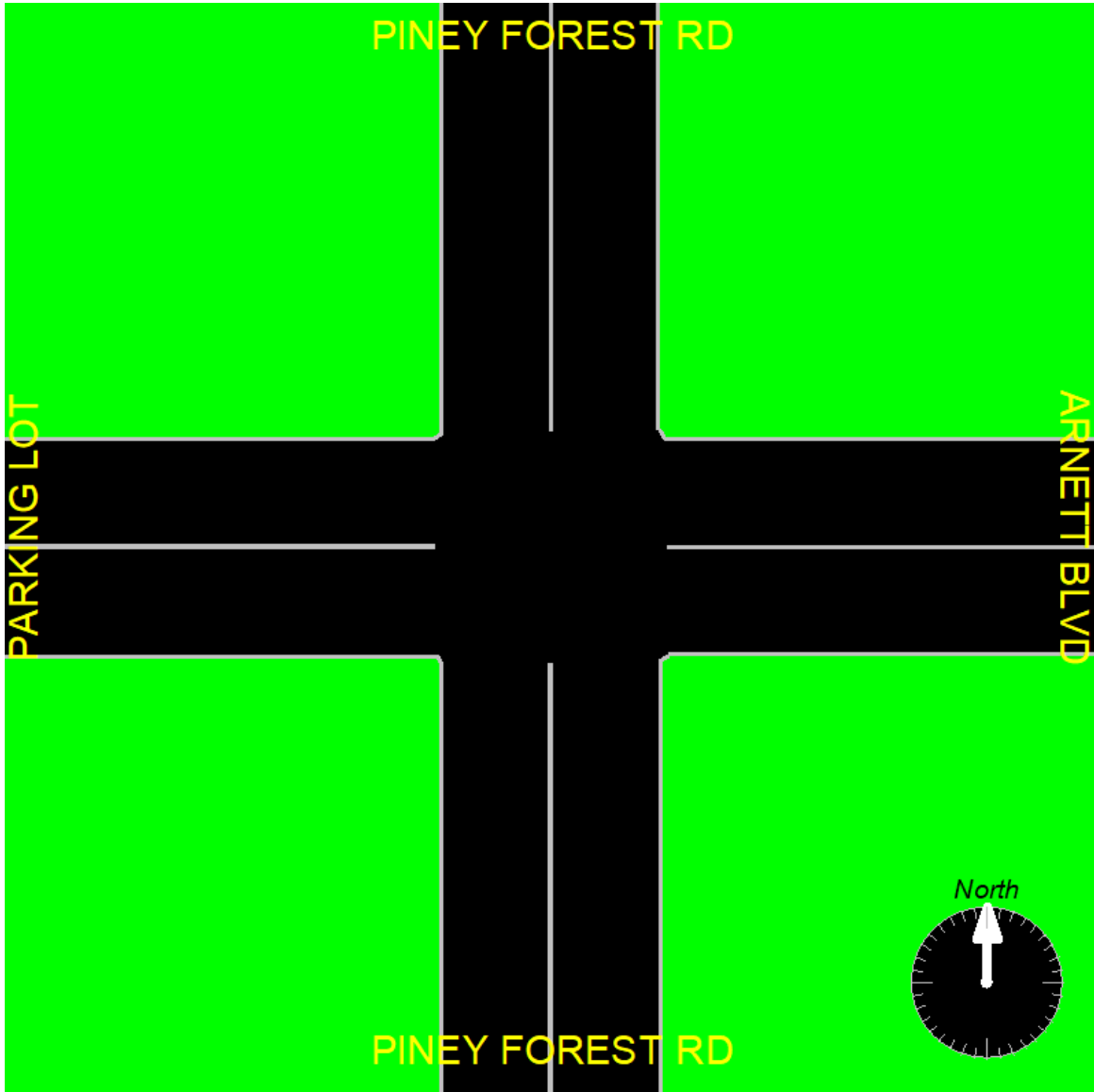
# City Of Danville VA Traffic Control

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## Groups Printed- Unshifted - Bank 1 - Bank 2

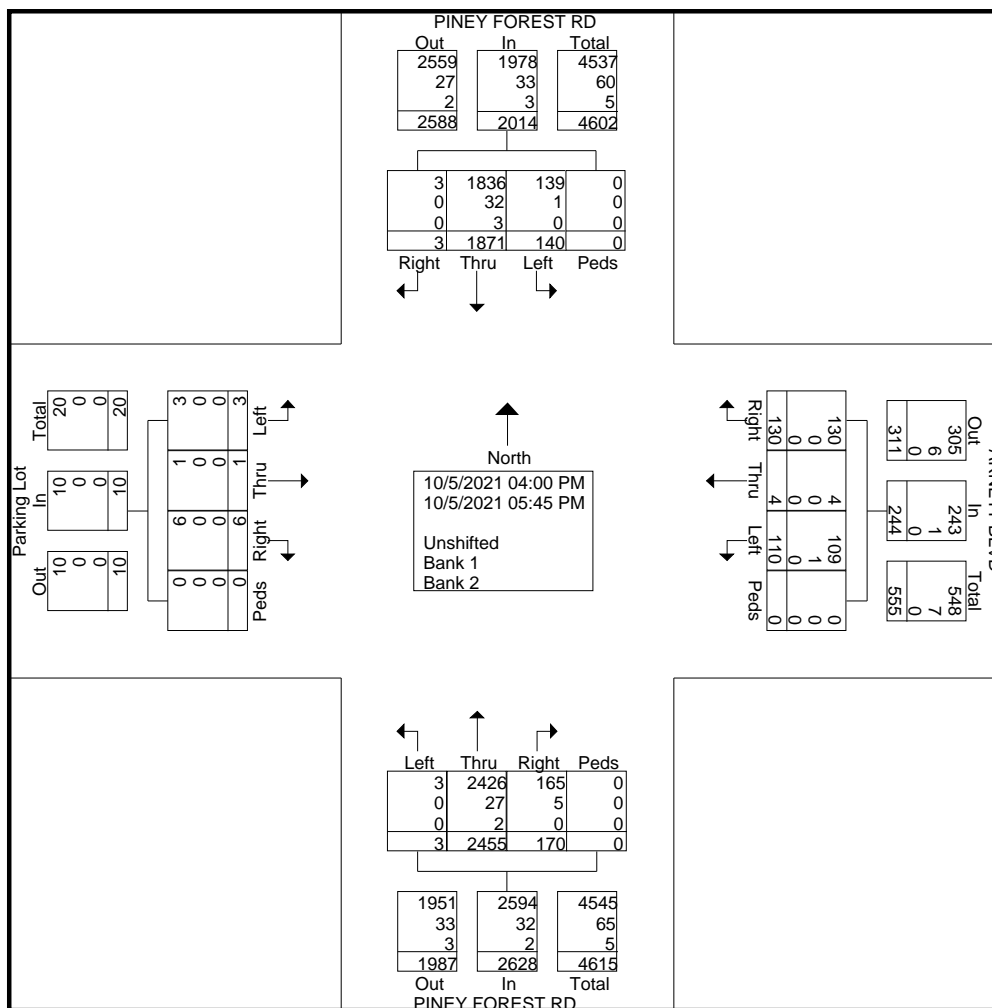
Start Time	PINEY FOREST RD From North					ARNETT BLVD From East					PINEY FOREST RD From South					Parking Lot From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	212	15	0	227	10	0	13	0	23	18	296	0	0	314	0	0	0	0	0	564
04:15 PM	0	229	19	0	248	16	1	14	0	31	26	262	0	0	288	0	0	0	0	0	567
04:30 PM	0	242	18	0	260	13	0	14	0	27	16	284	0	0	300	0	0	0	0	0	587
04:45 PM	0	232	18	0	250	18	0	13	0	31	18	365	1	0	384	0	1	0	0	1	666
Total	0	915	70	0	985	57	1	54	0	112	78	1207	1	0	1286	0	1	0	0	1	2384
05:00 PM	1	273	18	0	292	26	0	14	0	40	19	338	0	0	357	2	0	0	0	2	691
05:15 PM	0	261	18	0	279	20	0	12	0	32	30	347	1	0	378	4	0	1	0	5	694
05:30 PM	0	215	18	0	233	16	3	16	0	35	22	296	1	0	319	0	0	0	0	0	587
05:45 PM	2	207	16	0	225	11	0	14	0	25	21	267	0	0	288	0	0	2	0	2	540
Total	3	956	70	0	1029	73	3	56	0	132	92	1248	2	0	1342	6	0	3	0	9	2512

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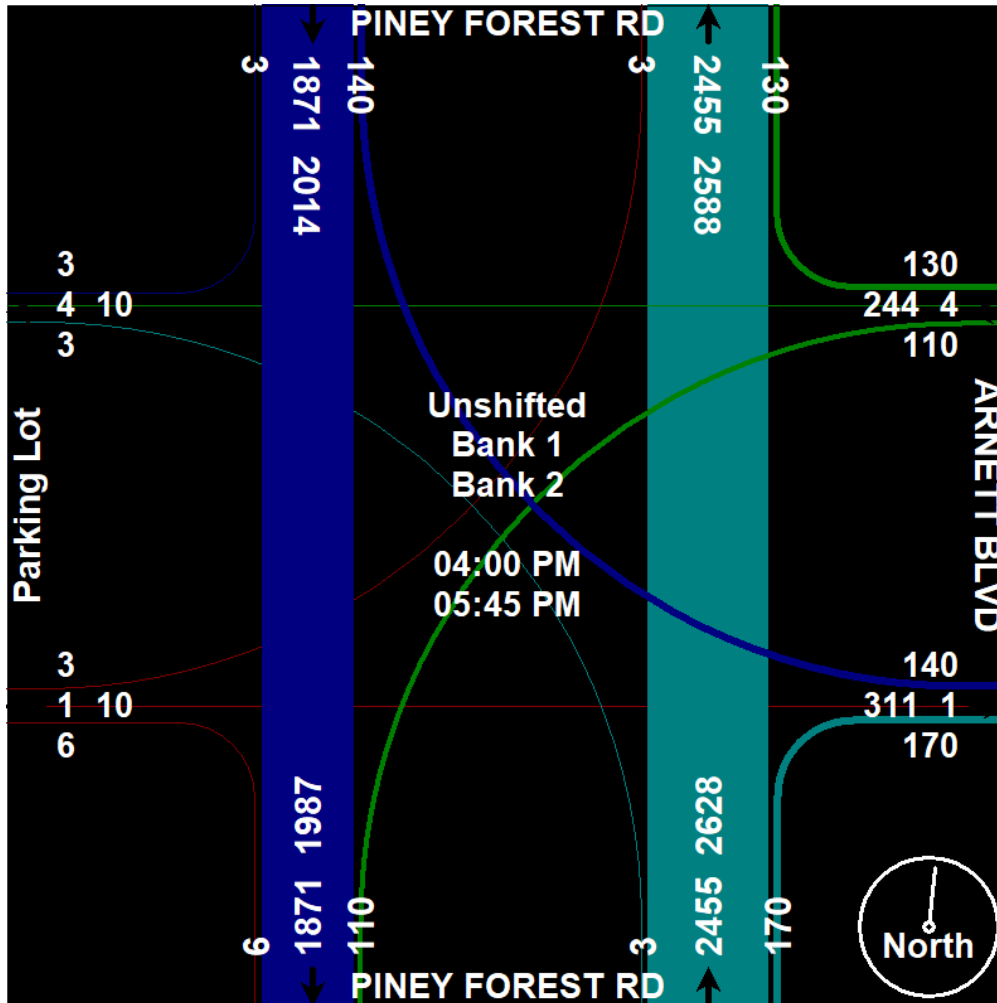
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST RD From North					ARNETT BLVD From East					PINEY FOREST RD From South					Parking Lot From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	3	1871	140	0	2014	130	4	110	0	244	170	2455	3	0	2628	6	1	3	0	10	4896
Apprch %	0.1	92.9	7	0		53.3	1.6	45.1	0		6.5	93.4	0.1	0		60	10	30	0		
Total %	0.1	38.2	2.9	0	41.1	2.7	0.1	2.2	0	5	3.5	50.1	0.1	0	53.7	0.1	0	0.1	0	0.2	
Unshifted	3	1836	139	0	1978	130	4	109	0	243	165	2426	3	0	2594	6	1	3	0	10	4825
% Unshifted	100	98.1	99.3	0	98.2	100	100	99.1	0	99.6	97.1	98.8	100	0	98.7	100	100	100	0	100	98.5
Bank 1	0	32	1	0	33	0	0	1	0	1	5	27	0	0	32	0	0	0	0	0	66
% Bank 1	0	1.7	0.7	0	1.6	0	0	0.9	0	0.4	2.9	1.1	0	0	1.2	0	0	0	0	0	1.3
Bank 2	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
% Bank 2	0	0.2	0	0	0.1	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0.1



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## Groups Printed- Bank 1

Start Time	PINEY FOREST RD From North					ARNETT BLVD From East					PINEY FOREST RD From South					PARKING LOT From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	7	0	0	7	0	0	0	0	0	1	8	0	0	9	0	0	0	0	0	16
07:15 AM	0	7	1	0	8	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	12
07:30 AM	0	10	0	0	10	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	15
07:45 AM	0	10	1	0	11	2	0	0	0	2	0	5	0	0	5	0	0	0	0	0	18
Total	0	34	2	0	36	2	0	1	0	3	2	20	0	0	22	0	0	0	0	0	61
08:00 AM	0	10	0	0	10	1	0	1	0	2	0	12	0	0	12	0	0	0	0	0	24
08:15 AM	0	7	1	0	8	0	0	1	0	1	1	10	0	0	11	0	0	0	0	0	20
08:30 AM	0	4	0	0	4	0	0	1	0	1	1	6	0	0	7	0	0	0	0	0	12
08:45 AM	0	4	0	0	4	0	0	0	0	0	1	6	0	0	7	0	0	0	0	0	11
Total	0	25	1	0	26	1	0	3	0	4	3	34	0	0	37	0	0	0	0	0	67

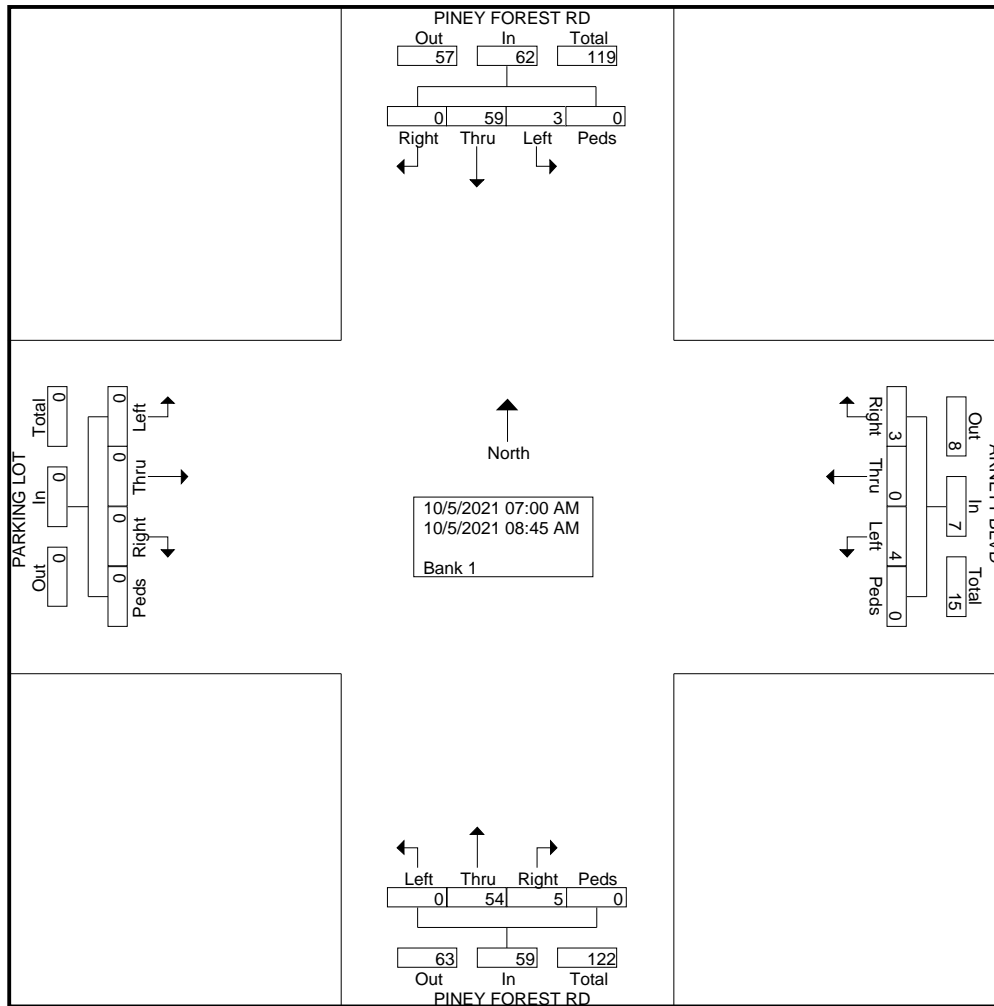


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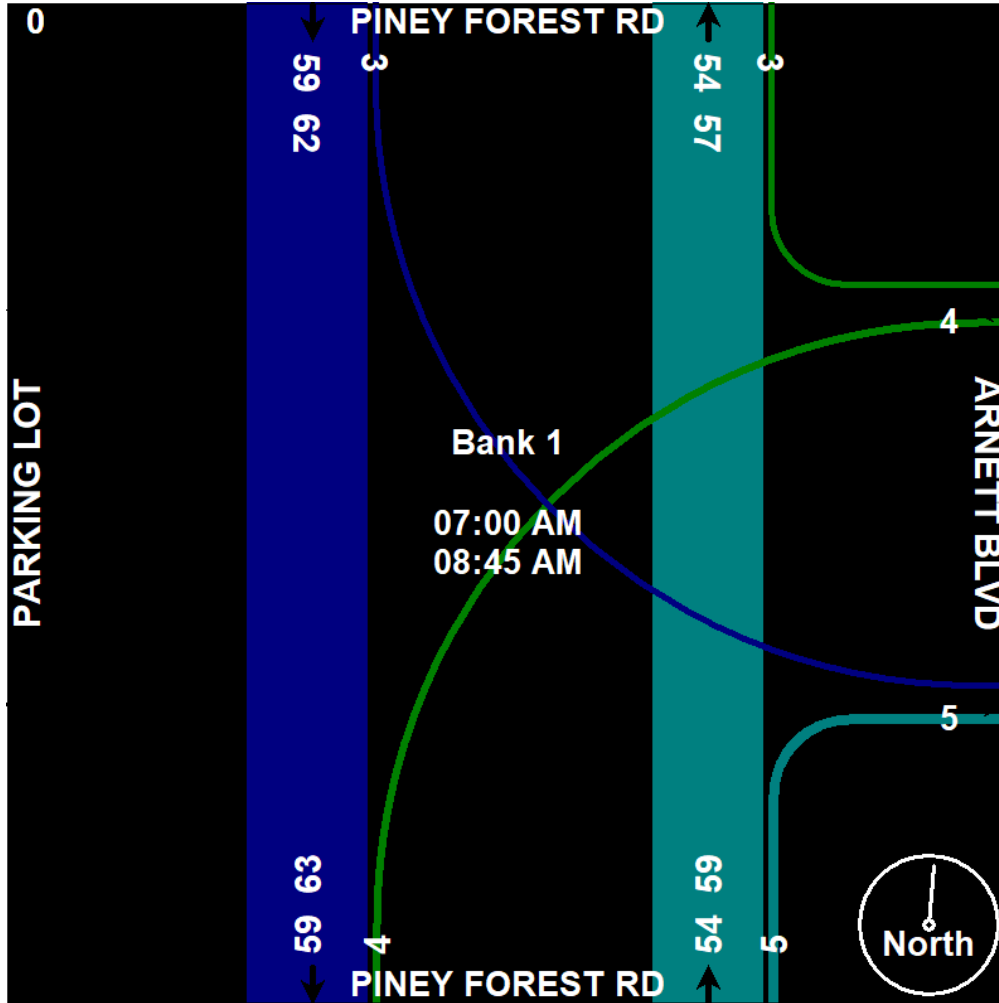
## Groups Printed- Bank 1

	PINEY FOREST RD From North					ARNETT BLVD From East					PINEY FOREST RD From South					PARKING LOT From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	0	59	3	0	62	3	0	4	0	7	5	54	0	0	59	0	0	0	0	0	128
Apprch %	0	95.2	4.8	0		42.9	0	57.1	0		8.5	91.5	0	0		0	0	0	0		
Total %	0	46.1	2.3	0	48.4	2.3	0	3.1	0	5.5	3.9	42.2	0	0	46.1	0	0	0	0		



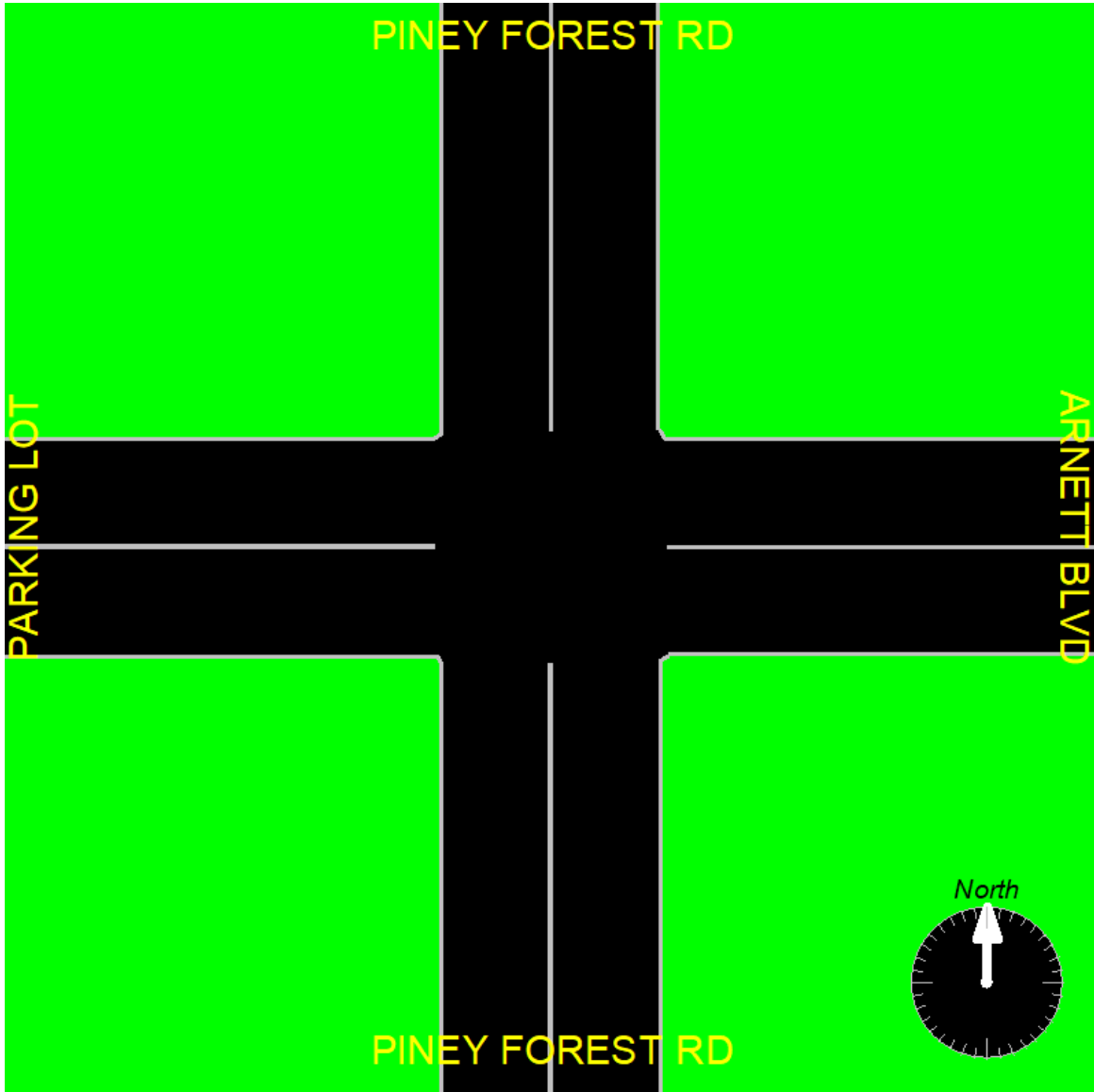
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## Groups Printed- Bank 1

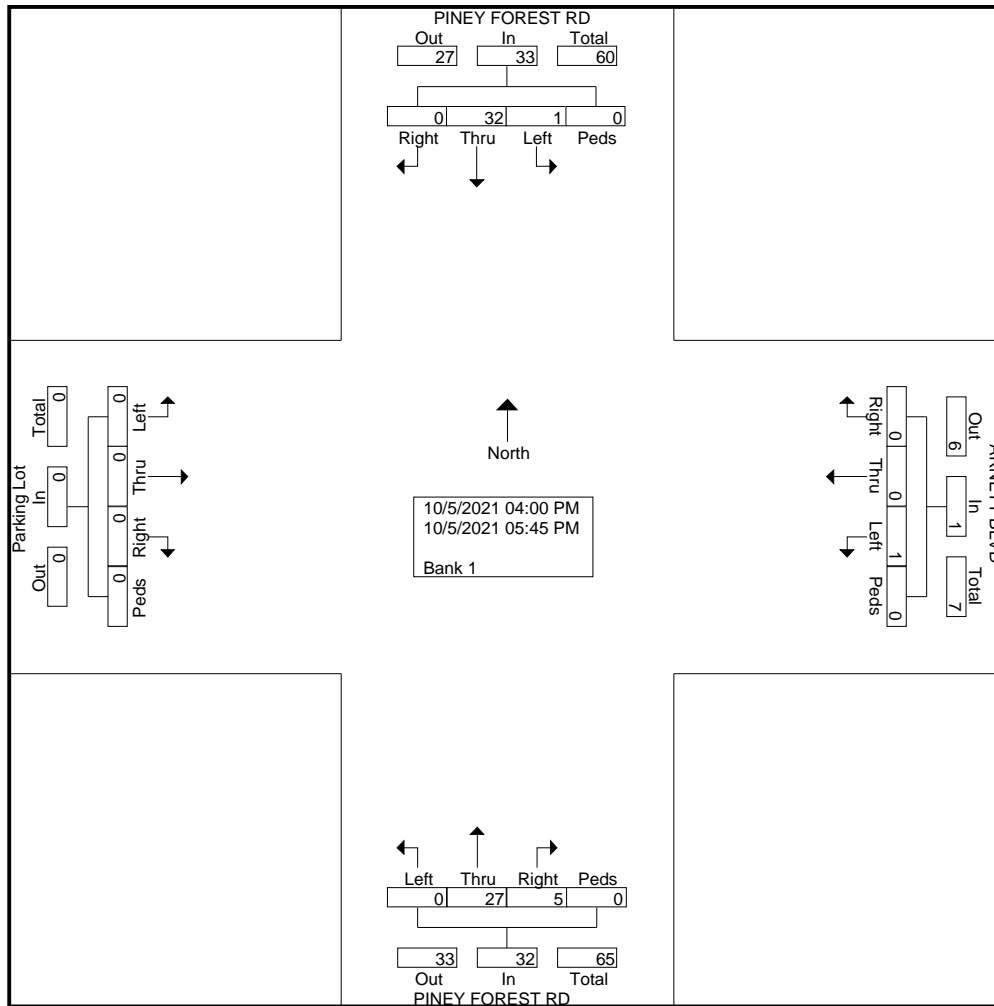
Start Time	PINEY FOREST RD From North					ARNETT BLVD From East					PINEY FOREST RD From South					Parking Lot From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	4	1	0	5	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	9
04:15 PM	0	4	0	0	4	0	0	1	0	1	1	4	0	0	5	0	0	0	0	0	10
04:30 PM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
04:45 PM	0	6	0	0	6	0	0	0	0	0	1	7	0	0	8	0	0	0	0	0	14
Total	0	16	1	0	17	0	0	1	0	1	2	18	0	0	20	0	0	0	0	0	38
05:00 PM	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
05:15 PM	0	5	0	0	5	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	8
05:30 PM	0	6	0	0	6	0	0	0	0	0	2	4	0	0	6	0	0	0	0	0	12
05:45 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	16	0	0	16	0	0	0	0	0	3	9	0	0	12	0	0	0	0	0	28

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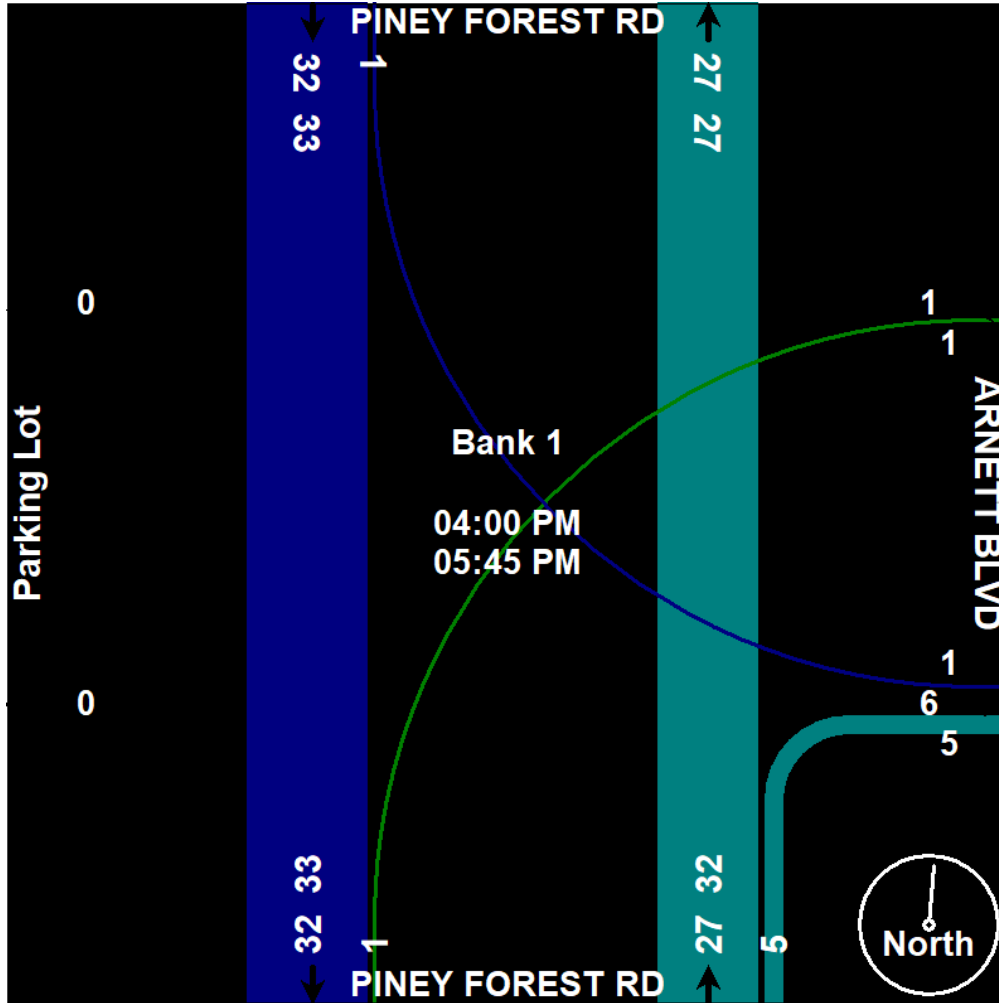
## Groups Printed- Bank 1

	PINEY FOREST RD From North					ARNETT BLVD From East					PINEY FOREST RD From South					Parking Lot From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	0	32	1	0	33	0	0	1	0	1	5	27	0	0	32	0	0	0	0	0	66
Apprch %	0	97	3	0		0	0	100	0		15.6	84.4	0	0		0	0	0	0		
Total %	0	48.5	1.5	0	50	0	0	1.5	0	1.5	7.6	40.9	0	0	48.5	0	0	0	0		



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## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	PINEY FOREST From North					WENDELL SCOTT DR From East					PINEY FOREST From South					BEAVERS MILL RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	5	170	1	0	176	7	8	2	0	17	0	99	5	0	104	14	3	10	0	27	324
07:15 AM	10	223	0	0	233	2	5	1	0	8	1	91	3	0	95	10	4	12	0	26	362
07:30 AM	7	290	1	0	298	3	1	4	0	8	3	103	2	0	108	12	5	16	0	33	447
07:45 AM	7	335	2	0	344	3	5	5	0	13	6	165	5	0	176	25	16	10	0	51	584
Total	29	1018	4	0	1051	15	19	12	0	46	10	458	15	0	483	61	28	48	0	137	1717
08:00 AM	9	258	7	0	274	8	6	6	0	20	4	136	5	0	145	14	11	10	0	35	474
08:15 AM	13	243	3	0	259	7	11	4	0	22	8	147	3	0	158	14	7	15	0	36	475
08:30 AM	8	200	3	0	211	5	4	2	0	11	4	143	2	0	149	8	8	12	0	28	399
08:45 AM	8	236	2	0	246	2	5	7	0	14	4	137	5	0	146	14	6	15	0	35	441
Total	38	937	15	0	990	22	26	19	0	67	20	563	15	0	598	50	32	52	0	134	1789

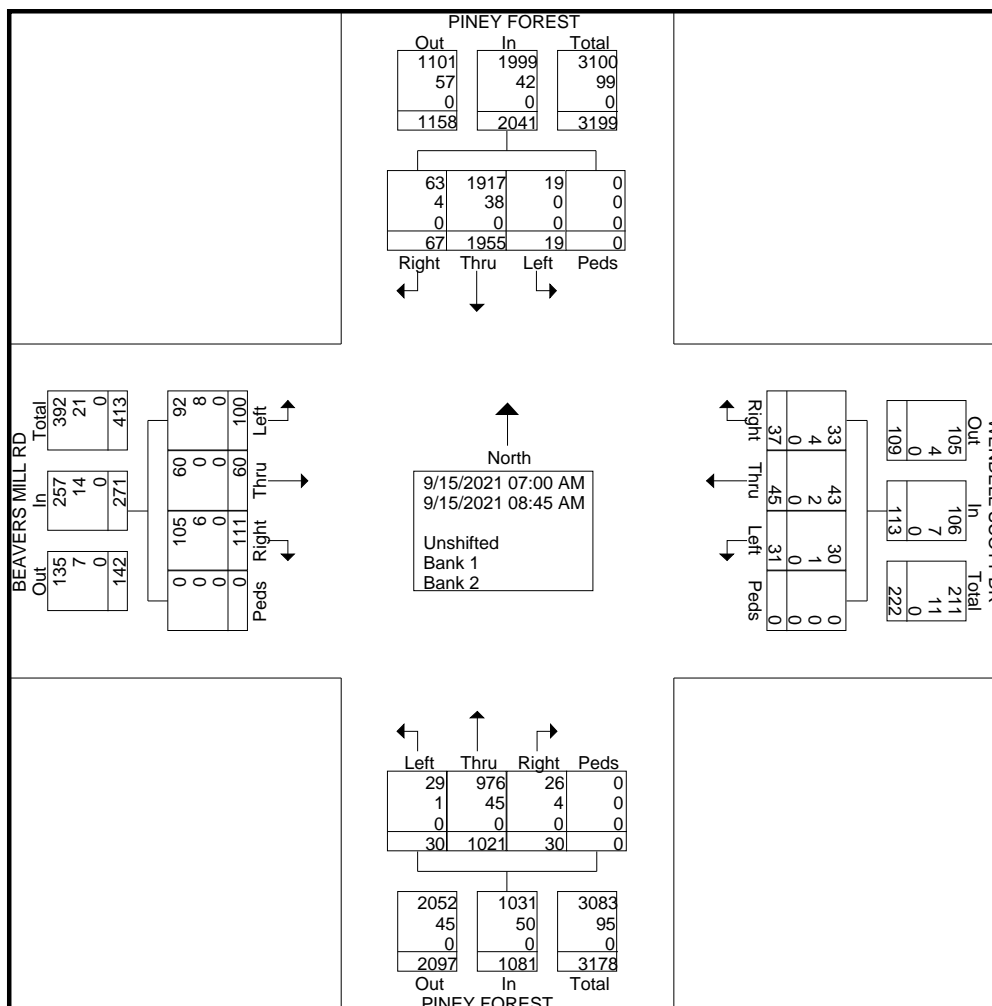


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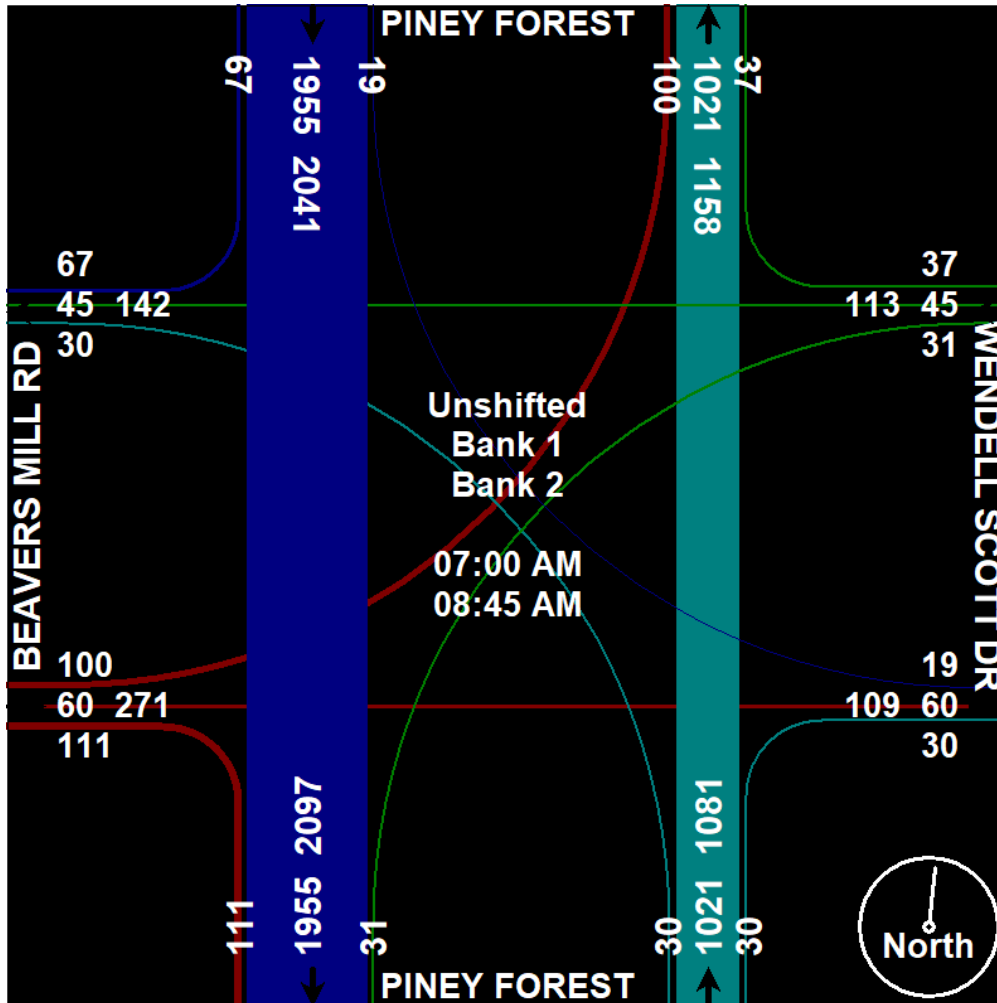
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					WENDELL SCOTT DR From East					PINEY FOREST From South					BEAVERS MILL RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	67	1955	19	0	2041	37	45	31	0	113	30	1021	30	0	1081	111	60	100	0	271	3506
Apprch %	3.3	95.8	0.9	0		32.7	39.8	27.4	0		2.8	94.4	2.8	0		41	22.1	36.9	0		
Total %	1.9	55.8	0.5	0	58.2	1.1	1.3	0.9	0	3.2	0.9	29.1	0.9	0	30.8	3.2	1.7	2.9	0	7.7	
Unshifted	63	1917	19	0	1999	33	43	30	0	106	26	976	29	0	1031	105	60	92	0	257	3393
% Unshifted	94	98.1	100	0	97.9	89.2	95.6	96.8	0	93.8	86.7	95.6	96.7	0	95.4	94.6	100	92	0	94.8	96.8
Bank 1	4	38	0	0	42	4	2	1	0	7	4	45	1	0	50	6	0	8	0	14	113
% Bank 1	6	1.9	0	0	2.1	10.8	4.4	3.2	0	6.2	13.3	4.4	3.3	0	4.6	5.4	0	8	0	5.2	3.2
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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## Groups Printed- Unshifted - Bank 1 - Bank 2

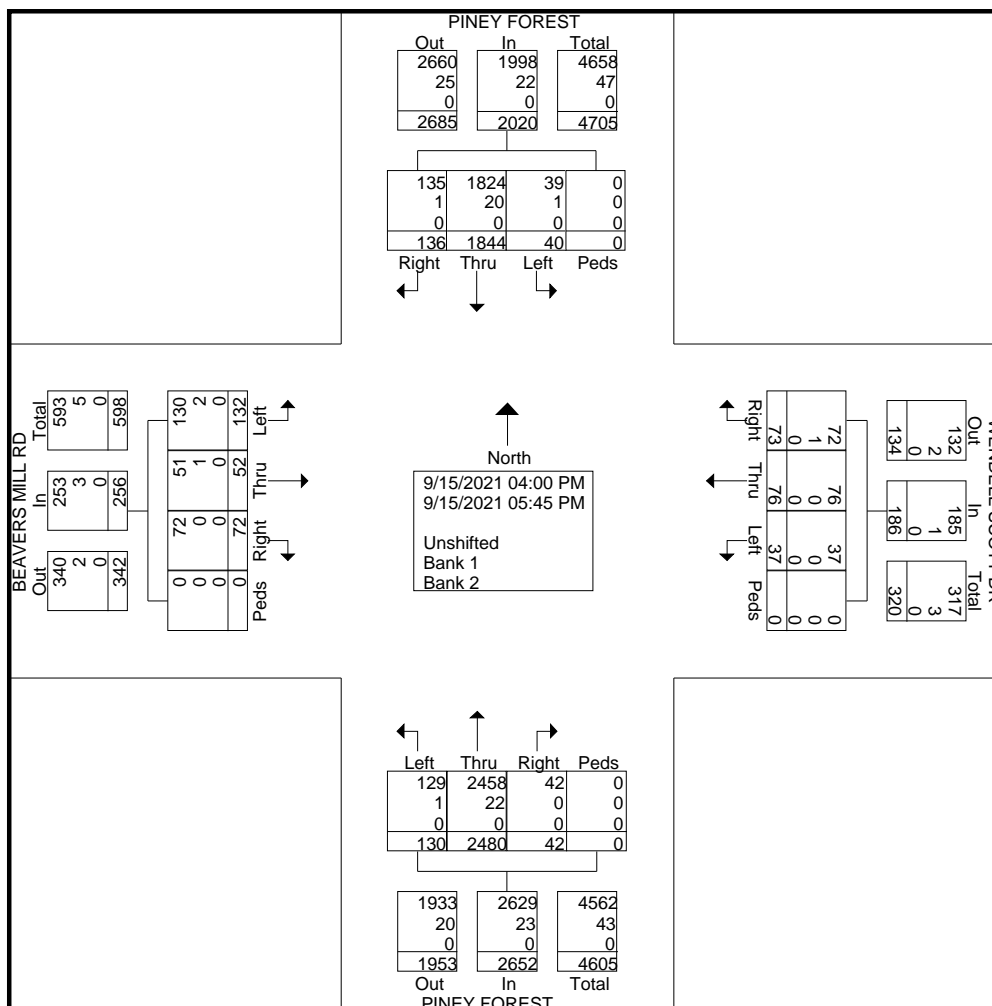
Start Time	PINEY FOREST From North					WENDELL SCOTT DR From East					PINEY FOREST From South					BEAVERS MILL RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	12	212	6	0	230	12	6	4	0	22	5	284	13	0	302	9	14	15	0	38	592
04:15 PM	17	234	7	0	258	9	8	5	0	22	6	311	9	0	326	15	7	19	0	41	647
04:30 PM	14	206	5	0	225	9	11	7	0	27	3	273	20	0	296	5	3	20	0	28	576
04:45 PM	19	255	6	0	280	7	8	5	0	20	2	311	19	0	332	4	3	16	0	23	655
Total	62	907	24	0	993	37	33	21	0	91	16	1179	61	0	1256	33	27	70	0	130	2470
05:00 PM	17	226	5	0	248	16	12	4	0	32	7	338	23	0	368	15	9	14	0	38	686
05:15 PM	23	229	4	0	256	9	6	4	0	19	2	358	22	0	382	9	9	13	0	31	688
05:30 PM	17	246	3	0	266	4	15	5	0	24	10	299	13	0	322	11	5	15	0	31	643
05:45 PM	17	236	4	0	257	7	10	3	0	20	7	306	11	0	324	4	2	20	0	26	627
Total	74	937	16	0	1027	36	43	16	0	95	26	1301	69	0	1396	39	25	62	0	126	2644

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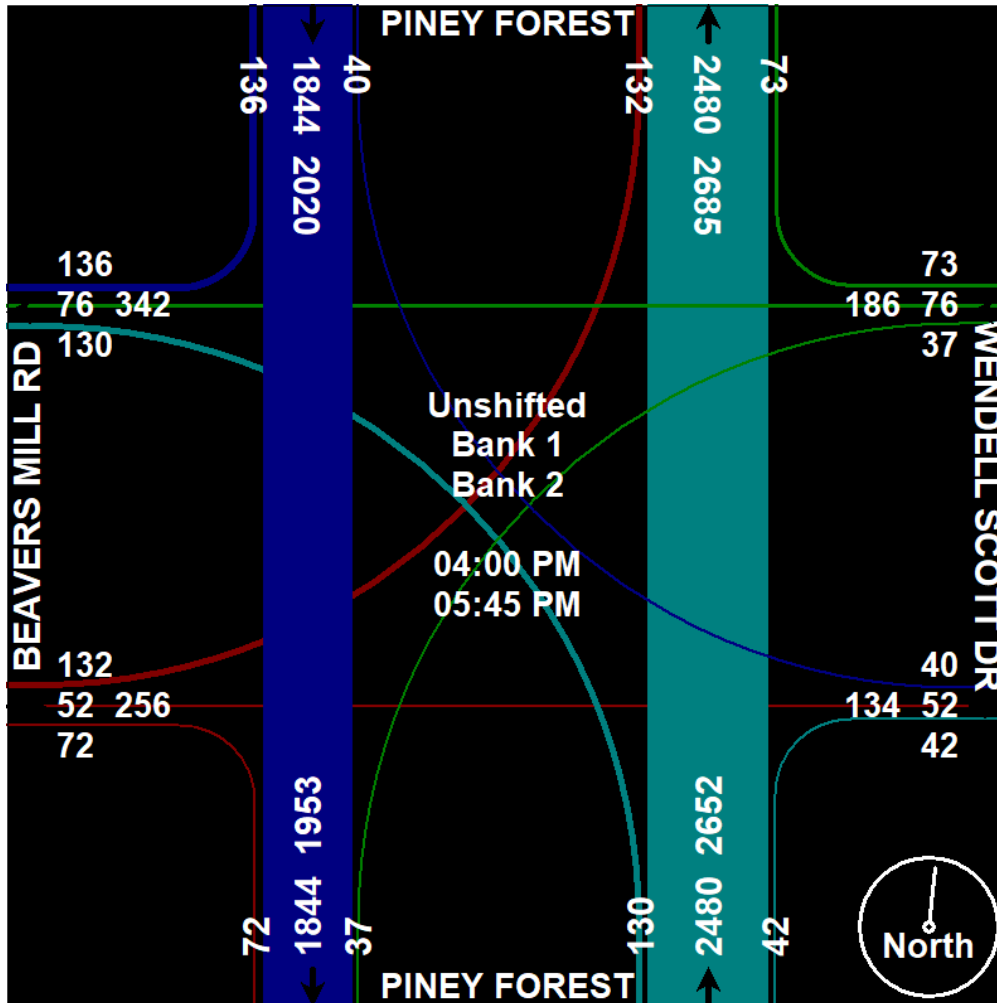
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					WENDELL SCOTT DR From East					PINEY FOREST From South					BEAVERS MILL RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	136	1844	40	0	2020	73	76	37	0	186	42	2480	130	0	2652	72	52	132	0	256	5114
Apprch %	6.7	91.3	2	0		39.2	40.9	19.9	0		1.6	93.5	4.9	0		28.1	20.3	51.6	0		
Total %	2.7	36.1	0.8	0	39.5	1.4	1.5	0.7	0	3.6	0.8	48.5	2.5	0	51.9	1.4	1	2.6	0	5	
Unshifted	135	1824	39	0	1998	72	76	37	0	185	42	2458	129	0	2629	72	51	130	0	253	5065
% Unshifted	99.3	98.9	97.5	0	98.9	98.6	100	100	0	99.5	100	99.1	99.2	0	99.1	100	98.1	98.5	0	98.8	99
Bank 1	1	20	1	0	22	1	0	0	0	1	0	22	1	0	23	0	1	2	0	3	49
% Bank 1	0.7	1.1	2.5	0	1.1	1.4	0	0	0	0.5	0	0.9	0.8	0	0.9	0	1.9	1.5	0	1.2	1
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



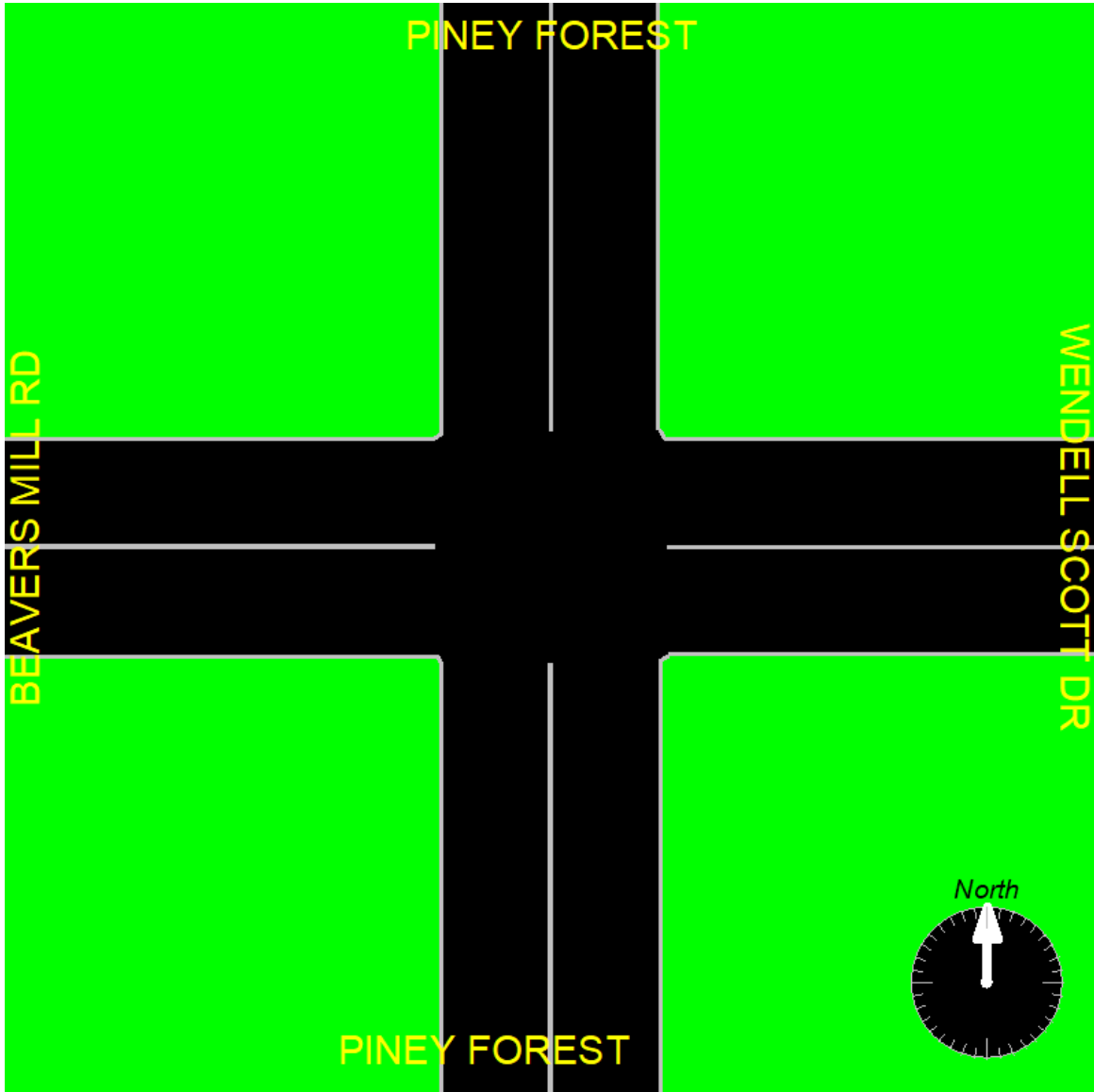
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## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	PINEY FOREST RD From North					OLD PINEY FOREST RD From East					PINEY FOREST RD From South					OLD PINEY FOREST RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	1	170	2	0	173	0	0	7	0	7	1	101	0	0	102	0	0	1	0	1	283
07:15 AM	2	204	0	0	206	0	0	9	0	9	5	100	0	0	105	1	0	0	0	1	321
07:30 AM	0	289	0	0	289	0	0	4	0	4	5	134	1	0	140	0	0	1	0	1	434
07:45 AM	3	318	0	0	321	2	0	10	0	12	10	189	1	0	200	0	0	1	0	1	534
Total	6	981	2	0	989	2	0	30	0	32	21	524	2	0	547	1	0	3	0	4	1572
08:00 AM	3	261	0	0	264	0	0	10	0	10	5	172	0	0	177	1	0	1	0	2	453
08:15 AM	0	257	0	0	257	4	1	5	0	10	9	167	2	0	178	1	0	2	0	3	448
08:30 AM	2	199	0	0	201	1	1	7	0	9	10	153	2	0	165	0	0	2	0	2	377
08:45 AM	3	245	1	0	249	1	2	10	0	13	9	132	3	0	144	1	0	1	0	2	408
Total	8	962	1	0	971	6	4	32	0	42	33	624	7	0	664	3	0	6	0	9	1686

\*\*\* BREAK \*\*\*

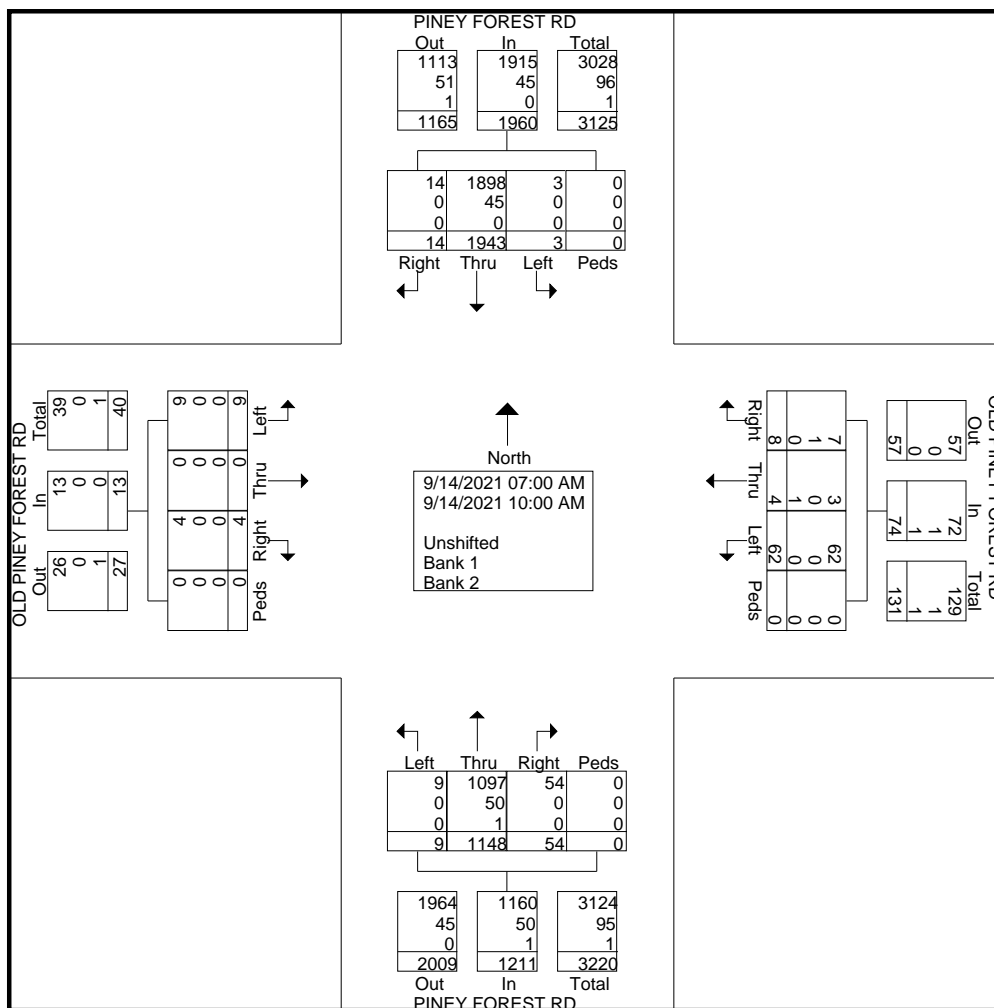


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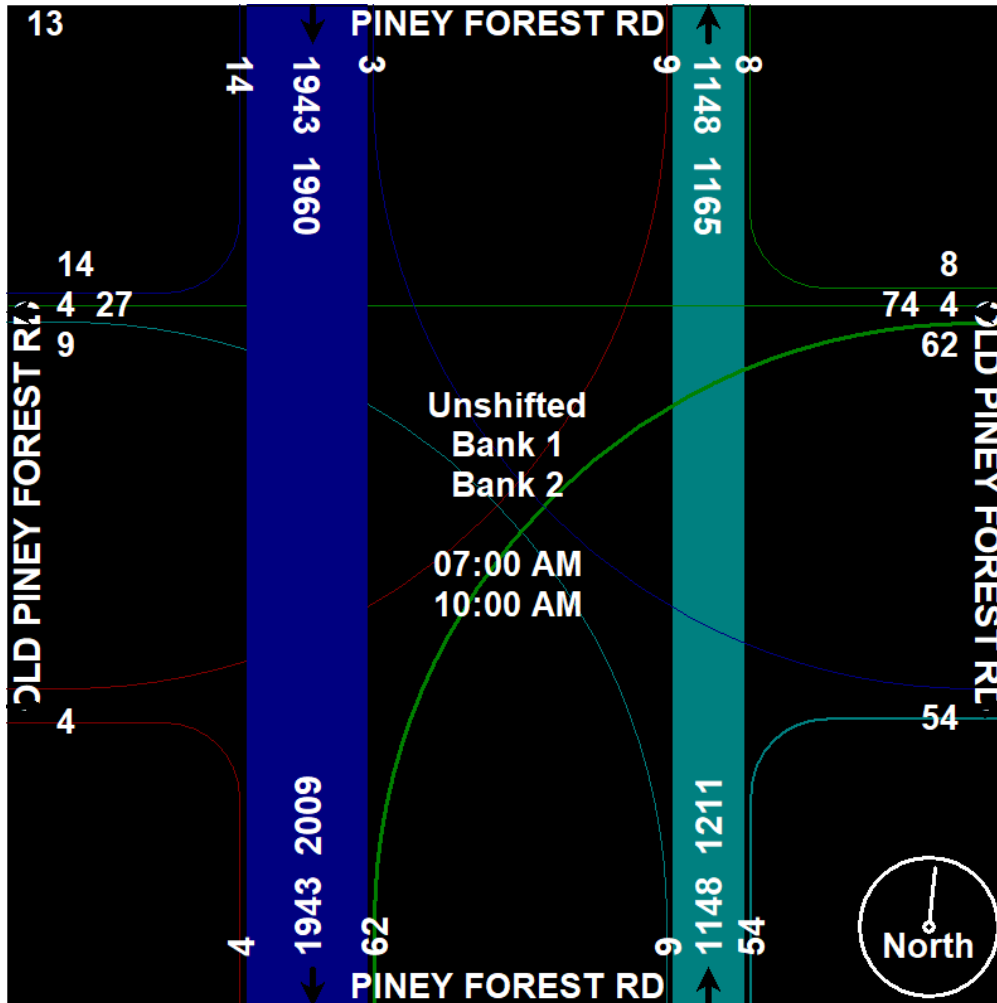
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST RD From North					OLD PINEY FOREST RD From East					PINEY FOREST RD From South					OLD PINEY FOREST RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	14	1943	3	0	1960	8	4	62	0	74	54	1148	9	0	1211	4	0	9	0	13	3258
Apprch %	0.7	99.1	0.2	0		10.8	5.4	83.8	0		4.5	94.8	0.7	0		30.8	0	69.2	0		
Total %	0.4	59.6	0.1	0	60.2	0.2	0.1	1.9	0	2.3	1.7	35.2	0.3	0	37.2	0.1	0	0.3	0	0.4	
Unshifted	14	1898	3	0	1915	7	3	62	0	72	54	1097	9	0	1160	4	0	9	0	13	3160
% Unshifted	100	97.7	100	0	97.7	87.5	75	100	0	97.3	100	95.6	100	0	95.8	100	0	100	0	100	97
Bank 1	0	45	0	0	45	1	0	0	0	1	0	50	0	0	50	0	0	0	0	0	96
% Bank 1	0	2.3	0	0	2.3	12.5	0	0	0	1.4	0	4.4	0	0	4.1	0	0	0	0	0	2.9
Bank 2	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	2
% Bank 2	0	0	0	0	0	0	25	0	0	1.4	0	0.1	0	0	0.1	0	0	0	0	0	0.1



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## Groups Printed- Unshifted - Bank 1 - Bank 2

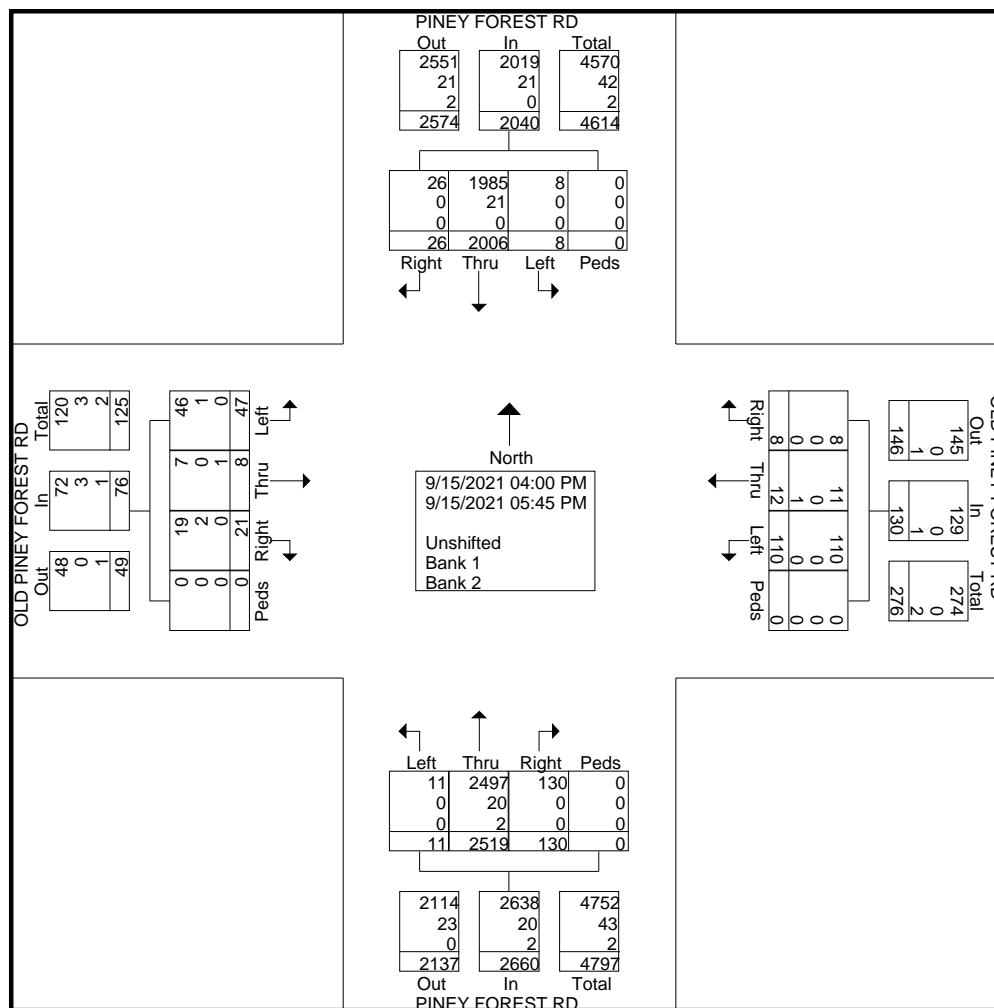
Start Time	PINEY FOREST RD From North					OLD PINEY FOREST RD From East					PINEY FOREST RD From South					OLD PINEY FOREST RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	1	256	2	0	259	1	1	13	0	15	23	306	1	0	330	4	1	4	0	9	613
04:15 PM	2	236	2	0	240	1	2	16	0	19	14	295	1	0	310	1	1	4	0	6	575
04:30 PM	6	224	1	0	231	1	2	17	0	20	15	300	0	0	315	3	2	6	0	11	577
04:45 PM	0	257	2	0	259	0	2	19	0	21	16	283	1	0	300	2	0	6	0	8	588
Total	9	973	7	0	989	3	7	65	0	75	68	1184	3	0	1255	10	4	20	0	34	2353
05:00 PM	4	297	0	0	301	0	1	12	0	13	17	384	3	0	404	2	0	5	0	7	725
05:15 PM	5	234	0	0	239	2	0	12	0	14	20	353	1	0	374	3	0	7	0	10	637
05:30 PM	3	263	1	0	267	2	3	14	0	19	12	300	2	0	314	1	3	7	0	11	611
05:45 PM	5	239	0	0	244	1	1	7	0	9	13	298	2	0	313	5	1	8	0	14	580
Total	17	1033	1	0	1051	5	5	45	0	55	62	1335	8	0	1405	11	4	27	0	42	2553

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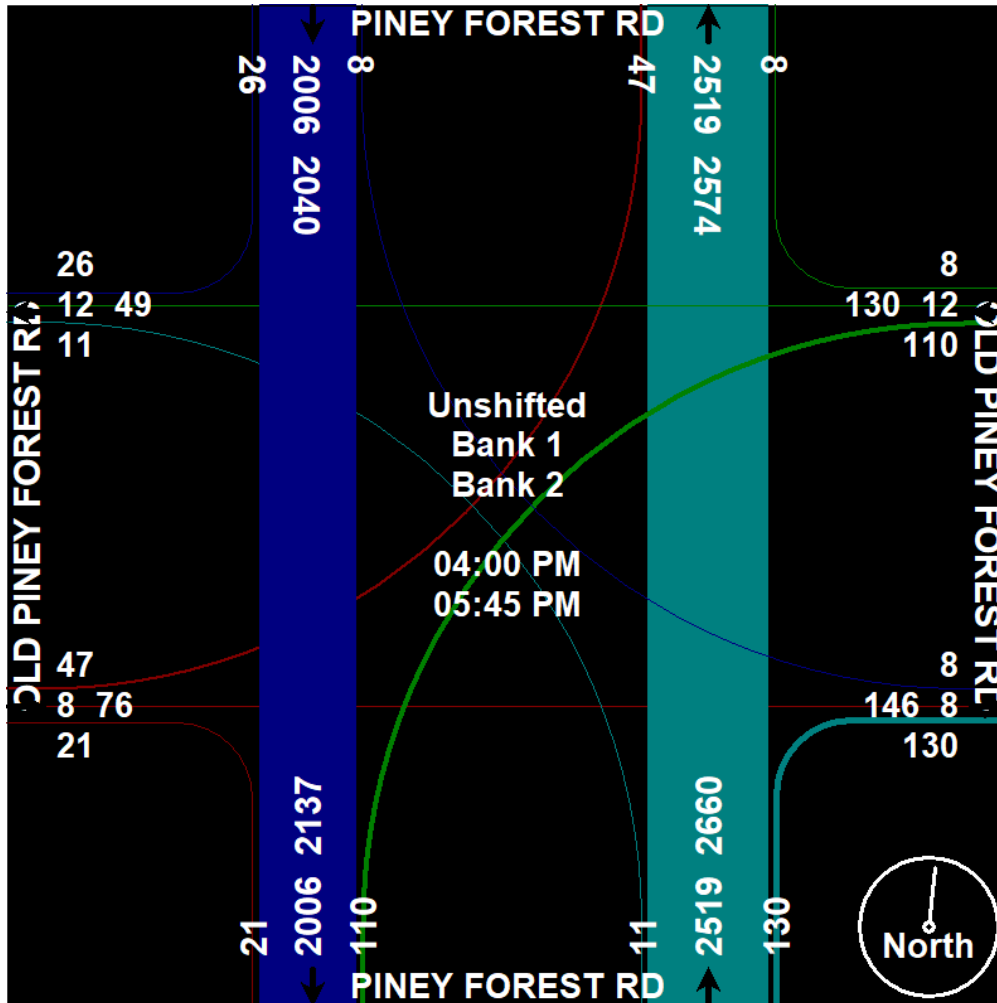
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST RD From North					OLD PINEY FOREST RD From East					PINEY FOREST RD From South					OLD PINEY FOREST RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	26	2006	8	0	2040	8	12	110	0	130	130	2519	11	0	2660	21	8	47	0	76	4906
Apprch %	1.3	98.3	0.4	0		6.2	9.2	84.6	0		4.9	94.7	0.4	0		27.6	10.5	61.8	0		
Total %	0.5	40.9	0.2	0	41.6	0.2	0.2	2.2	0	2.6	2.6	51.3	0.2	0	54.2	0.4	0.2	1	0	1.5	
Unshifted	26	1985	8	0	2019	8	11	110	0	129	130	2497	11	0	2638	19	7	46	0	72	4858
% Unshifted	100	99	100	0	99	100	91.7	100	0	99.2	100	99.1	100	0	99.2	90.5	87.5	97.9	0	94.7	99
Bank 1	0	21	0	0	21	0	0	0	0	0	0	20	0	0	20	2	0	1	0	3	44
% Bank 1	0	1	0	0	1	0	0	0	0	0	0	0.8	0	0	0.8	9.5	0	2.1	0	3.9	0.9
Bank 2	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	0	1	0	0	1	4
% Bank 2	0	0	0	0	0	0	8.3	0	0	0.8	0	0.1	0	0	0.1	0	12.5	0	0	1.3	0.1



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## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	3 From North					3 From East					3 From South					3 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	150	23	0	173	8	0	6	1	15	5	104	0	0	109	3	0	3	0	6	303
07:15 AM	0	195	15	0	210	9	0	11	0	20	4	134	1	0	139	0	0	0	0	0	369
07:30 AM	0	280	11	0	291	20	2	11	0	33	8	131	0	0	139	0	0	0	0	0	463
07:45 AM	0	262	18	0	280	21	0	15	0	36	7	199	1	0	207	1	1	1	0	3	526
Total	0	887	67	0	954	58	2	43	1	104	24	568	2	0	594	4	1	4	0	9	1661
08:00 AM	0	256	5	0	261	18	0	9	0	27	8	164	0	0	172	1	0	1	0	2	462
08:15 AM	0	268	16	0	284	15	1	15	0	31	7	150	0	0	157	0	0	1	0	1	473
08:30 AM	0	234	14	0	248	15	0	9	0	24	4	168	2	0	174	1	0	0	0	1	447
08:45 AM	0	256	7	0	263	12	0	16	0	28	2	153	0	0	155	0	0	1	0	1	447
Total	0	1014	42	0	1056	60	1	49	0	110	21	635	2	0	658	2	0	3	0	5	1829

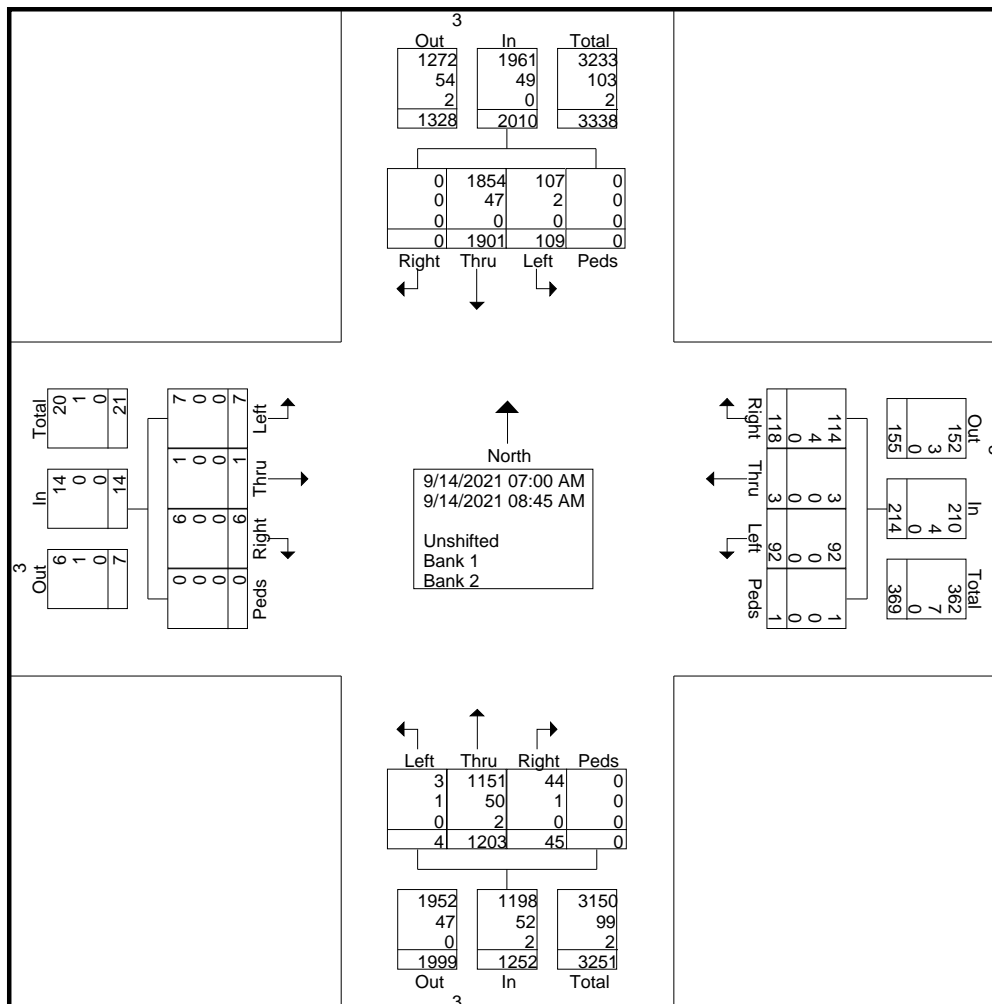


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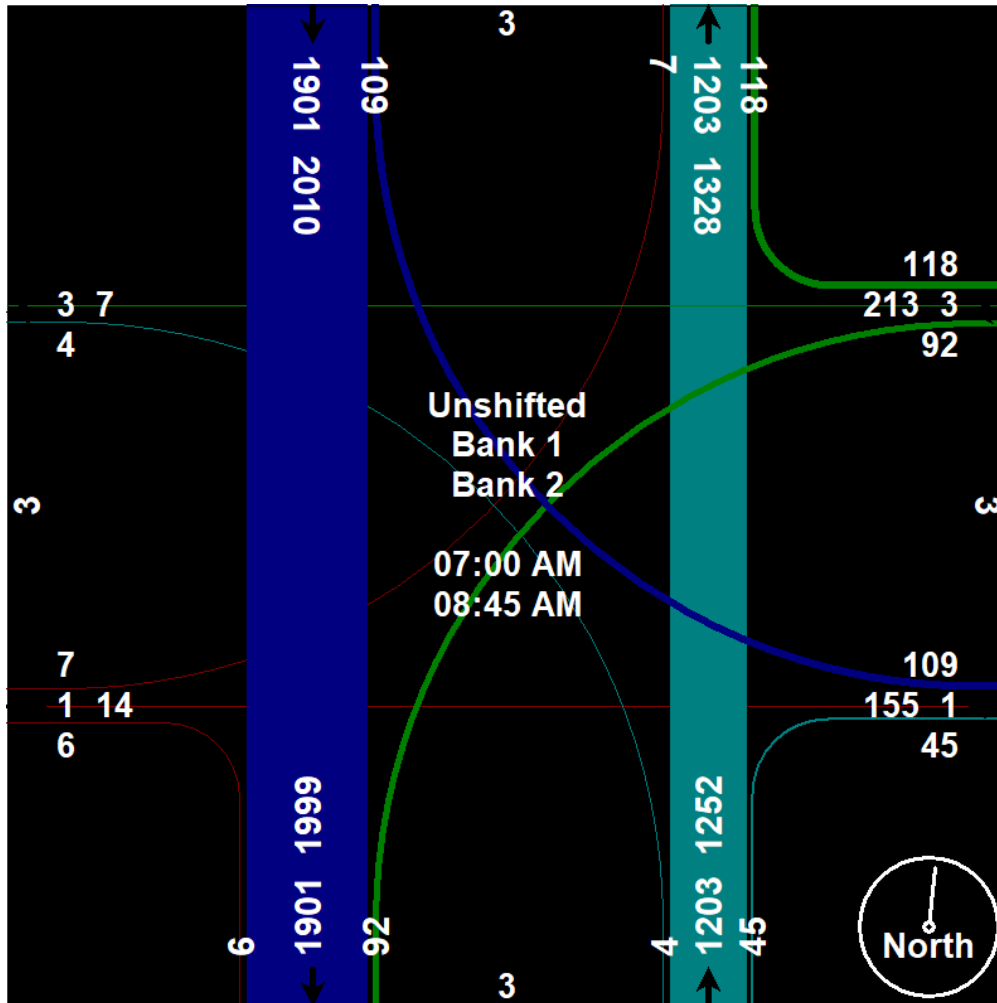
## Groups Printed- Unshifted - Bank 1 - Bank 2

	3 From North					3 From East					3 From South					3 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	0	1901	109	0	2010	118	3	92	1	214	45	1203	4	0	1252	6	1	7	0	14	3490
Apprch %	0	94.6	5.4	0		55.1	1.4	43	0.5		3.6	96.1	0.3	0		42.9	7.1	50	0		
Total %	0	54.5	3.1	0	57.6	3.4	0.1	2.6	0	6.1	1.3	34.5	0.1	0	35.9	0.2	0	0.2	0	0.4	
Unshifted	0	1854	107	0	1961	114	3	92	1	210	44	1151	3	0	1198	6	1	7	0	14	3383
% Unshifted	0	97.5	98.2	0	97.6	96.6	100	100	100	98.1	97.8	95.7	75	0	95.7	100	100	100	0	100	96.9
Bank 1	0	47	2	0	49	4	0	0	0	4	1	50	1	0	52	0	0	0	0	0	105
% Bank 1	0	2.5	1.8	0	2.4	3.4	0	0	0	1.9	2.2	4.2	25	0	4.2	0	0	0	0	0	3
Bank 2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0.1



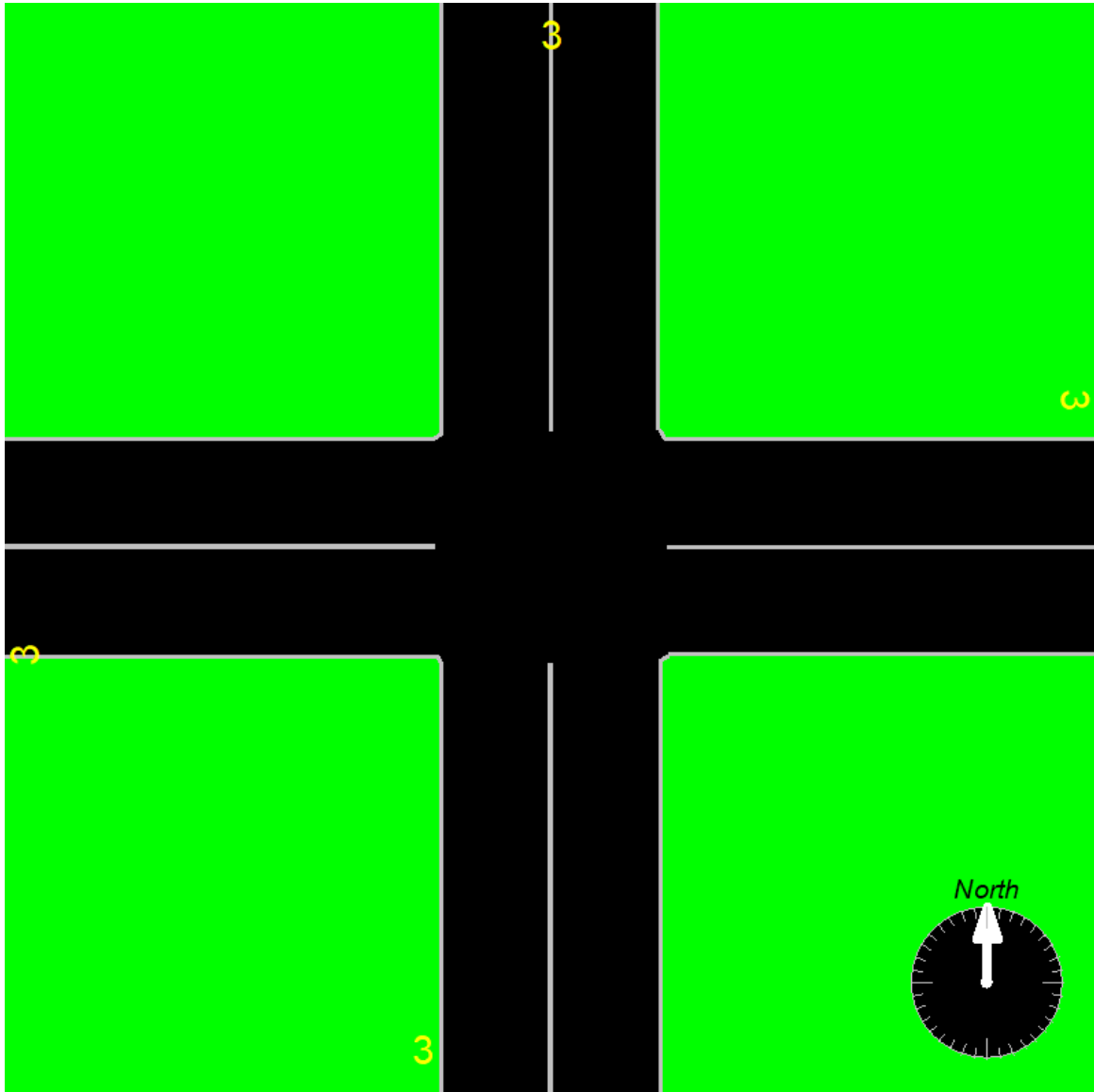
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## Groups Printed- Unshifted - Bank 1 - Bank 2

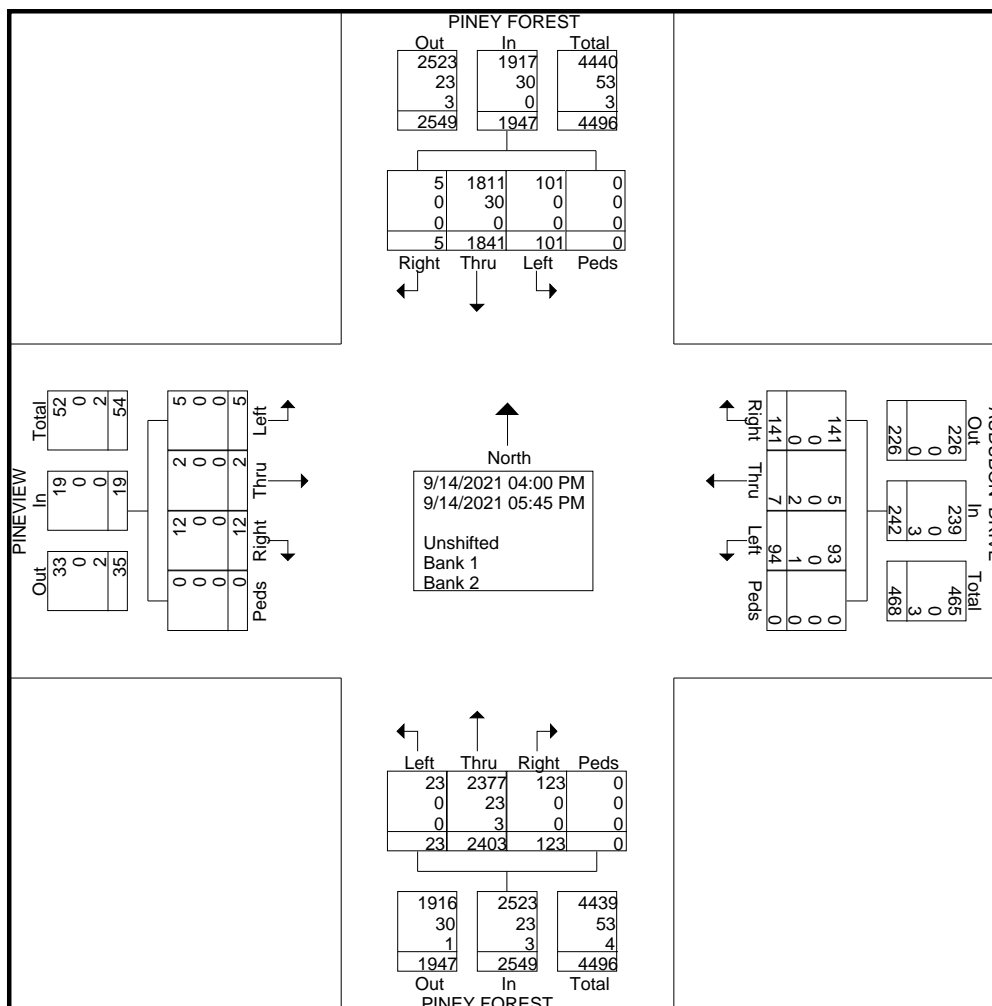
Start Time	PINEY FOREST From North					AUDUBON DRIVE From East					PINEY FOREST From South					PINEVIEW From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	4	249	17	0	270	13	2	14	0	29	7	296	3	0	306	0	0	0	0	0	605
04:15 PM	0	234	11	0	245	17	0	15	0	32	14	282	6	0	302	1	0	1	0	2	581
04:30 PM	0	220	13	0	233	22	1	17	0	40	19	304	1	0	324	3	0	0	0	3	600
04:45 PM	0	228	6	0	234	20	2	11	0	33	18	279	1	0	298	1	2	2	0	5	570
Total	4	931	47	0	982	72	5	57	0	134	58	1161	11	0	1230	5	2	3	0	10	2356
05:00 PM	0	275	19	0	294	16	2	12	0	30	25	345	3	0	373	1	0	0	0	1	698
05:15 PM	0	216	5	0	221	22	0	10	0	32	14	326	3	0	343	4	0	1	0	5	601
05:30 PM	1	204	14	0	219	10	0	7	0	17	15	306	3	0	324	1	0	0	0	1	561
05:45 PM	0	215	16	0	231	21	0	8	0	29	11	265	3	0	279	1	0	1	0	2	541
Total	1	910	54	0	965	69	2	37	0	108	65	1242	12	0	1319	7	0	2	0	9	2401

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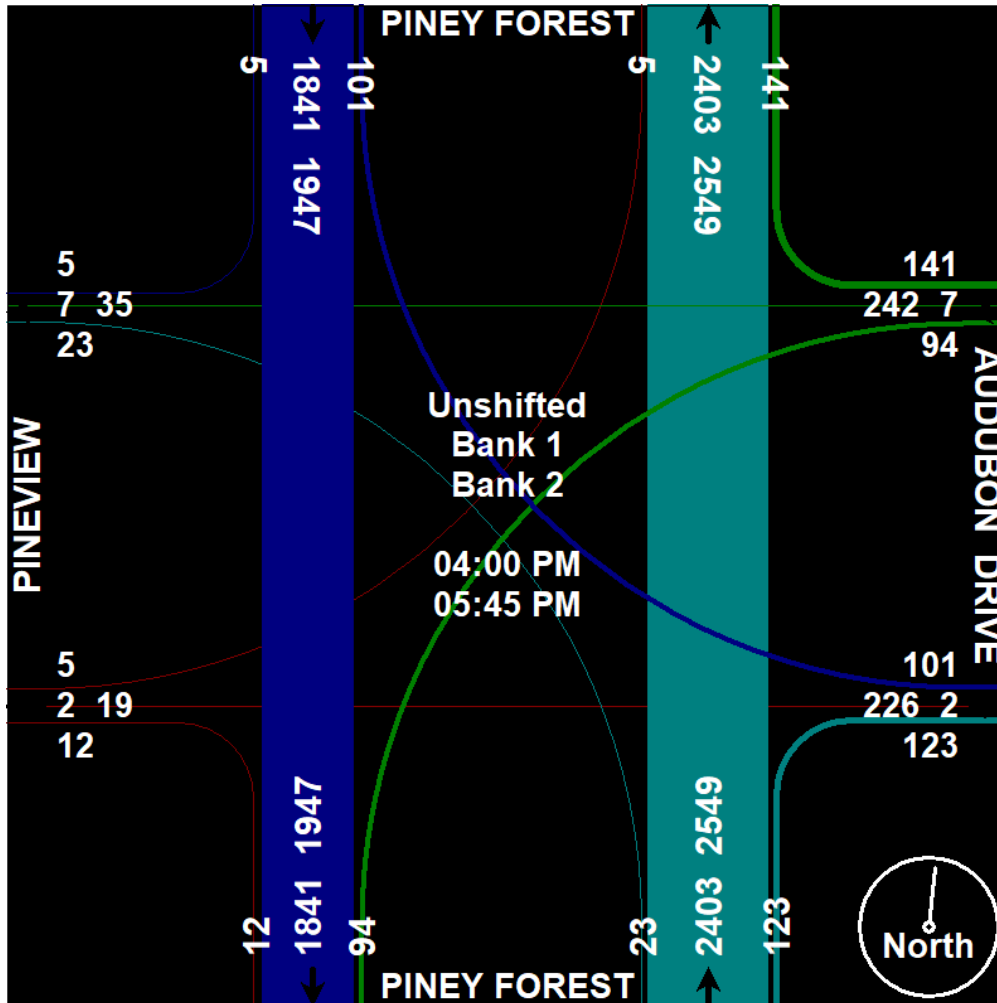
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					AUDUBON DRIVE From East					PINEY FOREST From South					PINEVIEW From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	5	1841	101	0	1947	141	7	94	0	242	123	2403	23	0	2549	12	2	5	0	19	4757
Apprch %	0.3	94.6	5.2	0		58.3	2.9	38.8	0		4.8	94.3	0.9	0		63.2	10.5	26.3	0		
Total %	0.1	38.7	2.1	0	40.9	3	0.1	2	0	5.1	2.6	50.5	0.5	0	53.6	0.3	0	0.1	0	0.4	
Unshifted	5	1811	101	0	1917	141	5	93	0	239	123	2377	23	0	2523	12	2	5	0	19	4698
% Unshifted	100	98.4	100	0	98.5	100	71.4	98.9	0	98.8	100	98.9	100	0	99	100	100	100	0	100	98.8
Bank 1	0	30	0	0	30	0	0	0	0	0	0	23	0	0	23	0	0	0	0	0	53
% Bank 1	0	1.6	0	0	1.5	0	0	0	0	0	0	1	0	0	0.9	0	0	0	0	0	1.1
Bank 2	0	0	0	0	0	0	2	1	0	3	0	3	0	0	3	0	0	0	0	0	6
% Bank 2	0	0	0	0	0	0	28.6	1.1	0	1.2	0	0.1	0	0	0.1	0	0	0	0	0	0.1



# City Of Danville VA Traffic Control

310 Industrial Ave  
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## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	PINEY FOREST From North					PARKER ROAD From East					PINEY FOREST From South					PARKER ROAD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	2	57	0	0	59	0	0	2	0	2	0	48	2	0	50	2	1	1	0	4	115
07:15 AM	8	172	0	0	180	2	0	1	0	3	3	119	3	0	125	11	0	5	0	16	324
07:30 AM	3	220	0	0	223	0	0	0	0	0	6	150	7	0	163	9	0	7	0	16	402
07:45 AM	8	273	0	0	281	1	1	3	0	5	3	181	4	0	188	16	1	6	0	23	497
Total	21	722	0	0	743	3	1	6	0	10	12	498	16	0	526	38	2	19	0	59	1338
08:00 AM	5	268	1	0	274	2	2	0	0	4	4	202	7	0	213	2	0	4	0	6	497
08:15 AM	7	252	2	0	261	1	1	0	0	2	4	168	7	0	179	13	0	6	0	19	461
08:30 AM	6	248	0	0	254	0	0	2	0	2	1	183	13	0	197	7	0	4	0	11	464
08:45 AM	5	262	0	0	267	0	1	1	0	2	1	186	6	0	193	14	2	2	0	18	480
Total	23	1030	3	0	1056	3	4	3	0	10	10	739	33	0	782	36	2	16	0	54	1902
09:00 AM	5	163	0	0	168	0	0	1	0	1	3	86	5	0	94	10	0	1	0	11	274

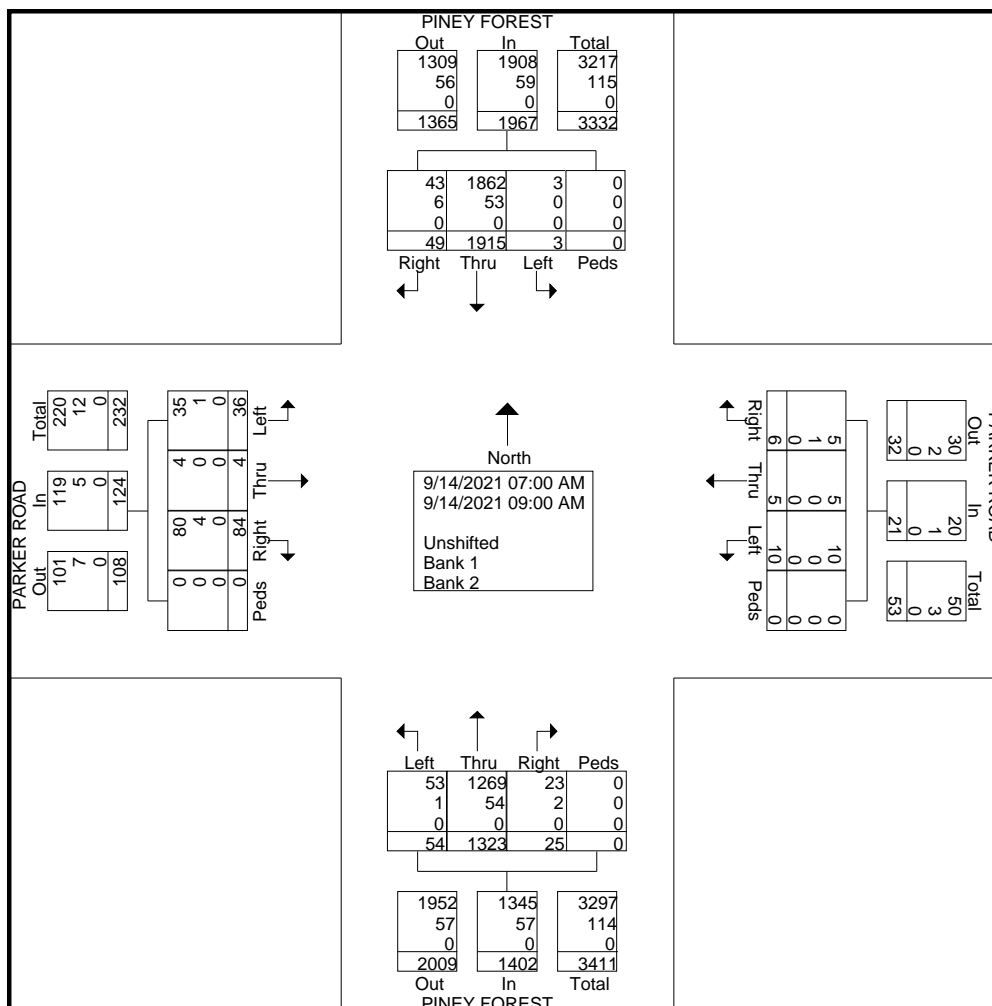


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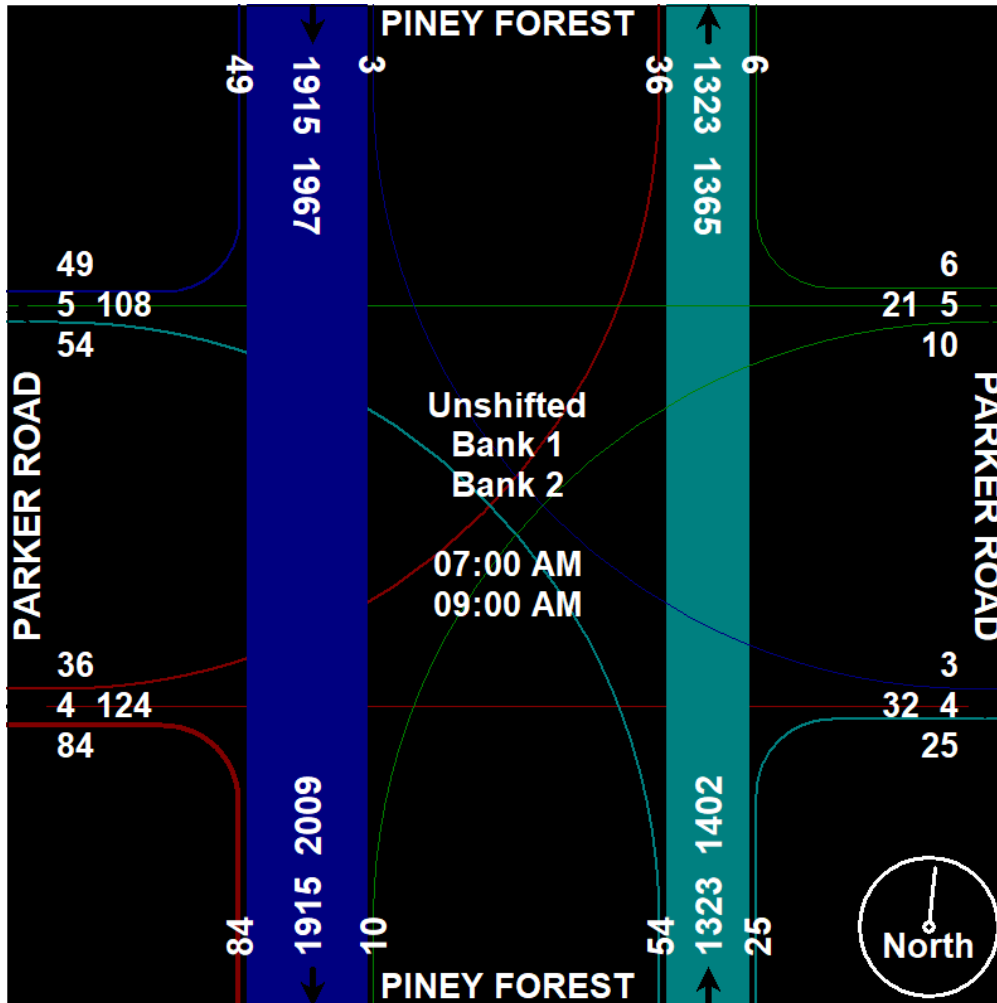
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					PARKER ROAD From East					PINEY FOREST From South					PARKER ROAD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	49	1915	3	0	1967	6	5	10	0	21	25	1323	54	0	1402	84	4	36	0	124	3514
Apprch %	2.5	97.4	0.2	0		28.6	23.8	47.6	0		1.8	94.4	3.9	0		67.7	3.2	29	0		
Total %	1.4	54.5	0.1	0	56	0.2	0.1	0.3	0	0.6	0.7	37.6	1.5	0	39.9	2.4	0.1	1	0	3.5	
Unshifted	43	1862	3	0	1908	5	5	10	0	20	23	1269	53	0	1345	80	4	35	0	119	3392
% Unshifted	87.8	97.2	100	0	97	83.3	100	100	0	95.2	92	95.9	98.1	0	95.9	95.2	100	97.2	0	96	96.5
Bank 1	6	53	0	0	59	1	0	0	0	1	2	54	1	0	57	4	0	1	0	5	122
% Bank 1	12.2	2.8	0	0	3	16.7	0	0	0	4.8	8	4.1	1.9	0	4.1	4.8	0	2.8	0	4	3.5
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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## Groups Printed- Unshifted - Bank 1 - Bank 2

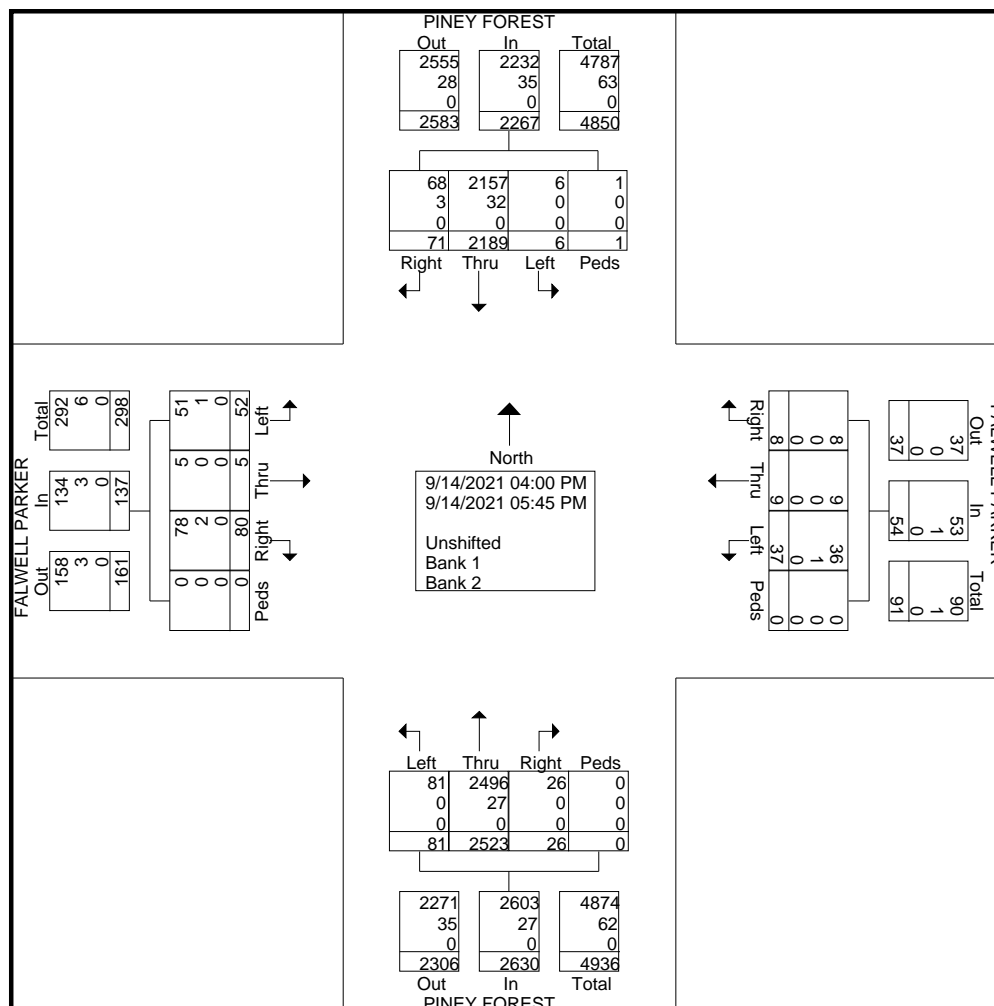
Start Time	PINEY FOREST From North					FALWELL PARKER From East					PINEY FOREST From South					FALWELL PARKER From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	6	261	1	0	268	2	3	2	0	7	3	296	10	0	309	9	1	7	0	17	601
04:15 PM	8	274	1	0	283	1	1	5	0	7	4	317	12	0	333	13	2	3	0	18	641
04:30 PM	8	264	0	0	272	0	1	8	0	9	4	318	9	0	331	8	1	10	0	19	631
04:45 PM	16	269	0	0	285	1	0	5	0	6	1	301	8	0	310	4	1	4	0	9	610
Total	38	1068	2	0	1108	4	5	20	0	29	12	1232	39	0	1283	34	5	24	0	63	2483
05:00 PM	10	306	1	0	317	0	1	7	0	8	4	370	11	0	385	20	0	9	0	29	739
05:15 PM	12	299	2	0	313	2	0	3	0	5	3	324	19	0	346	12	0	4	0	16	680
05:30 PM	7	246	1	0	254	1	3	2	0	6	4	312	7	0	323	10	0	4	0	14	597
05:45 PM	4	270	0	1	275	1	0	5	0	6	3	285	5	0	293	4	0	11	0	15	589
Total	33	1121	4	1	1159	4	4	17	0	25	14	1291	42	0	1347	46	0	28	0	74	2605

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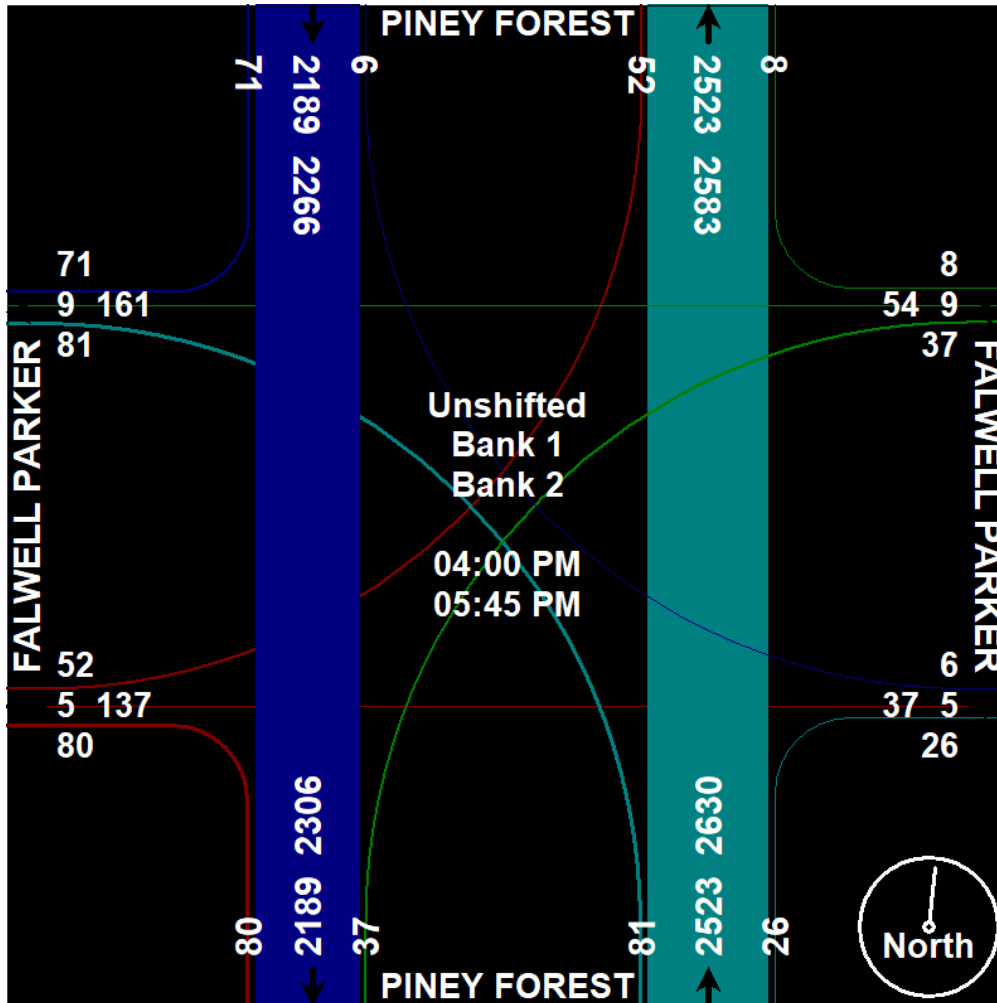
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					FALWELL PARKER From East					PINEY FOREST From South					FALWELL PARKER From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	71	2189	6	1	2267	8	9	37	0	54	26	2523	81	0	2630	80	5	52	0	137	5088
Apprch %	3.1	96.6	0.3	0		14.8	16.7	68.5	0		1	95.9	3.1	0		58.4	3.6	38	0		
Total %	1.4	43	0.1	0	44.6	0.2	0.2	0.7	0	1.1	0.5	49.6	1.6	0	51.7	1.6	0.1	1	0	2.7	
Unshifted	68	2157	6	1	2232	8	9	36	0	53	26	2496	81	0	2603	78	5	51	0	134	5022
% Unshifted	95.8	98.5	100	100	98.5	100	100	97.3	0	98.1	100	98.9	100	0	99	97.5	100	98.1	0	97.8	98.7
Bank 1	3	32	0	0	35	0	0	1	0	1	0	27	0	0	27	2	0	1	0	3	66
% Bank 1	4.2	1.5	0	0	1.5	0	0	2.7	0	1.9	0	1.1	0	0	1	2.5	0	1.9	0	2.2	1.3
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



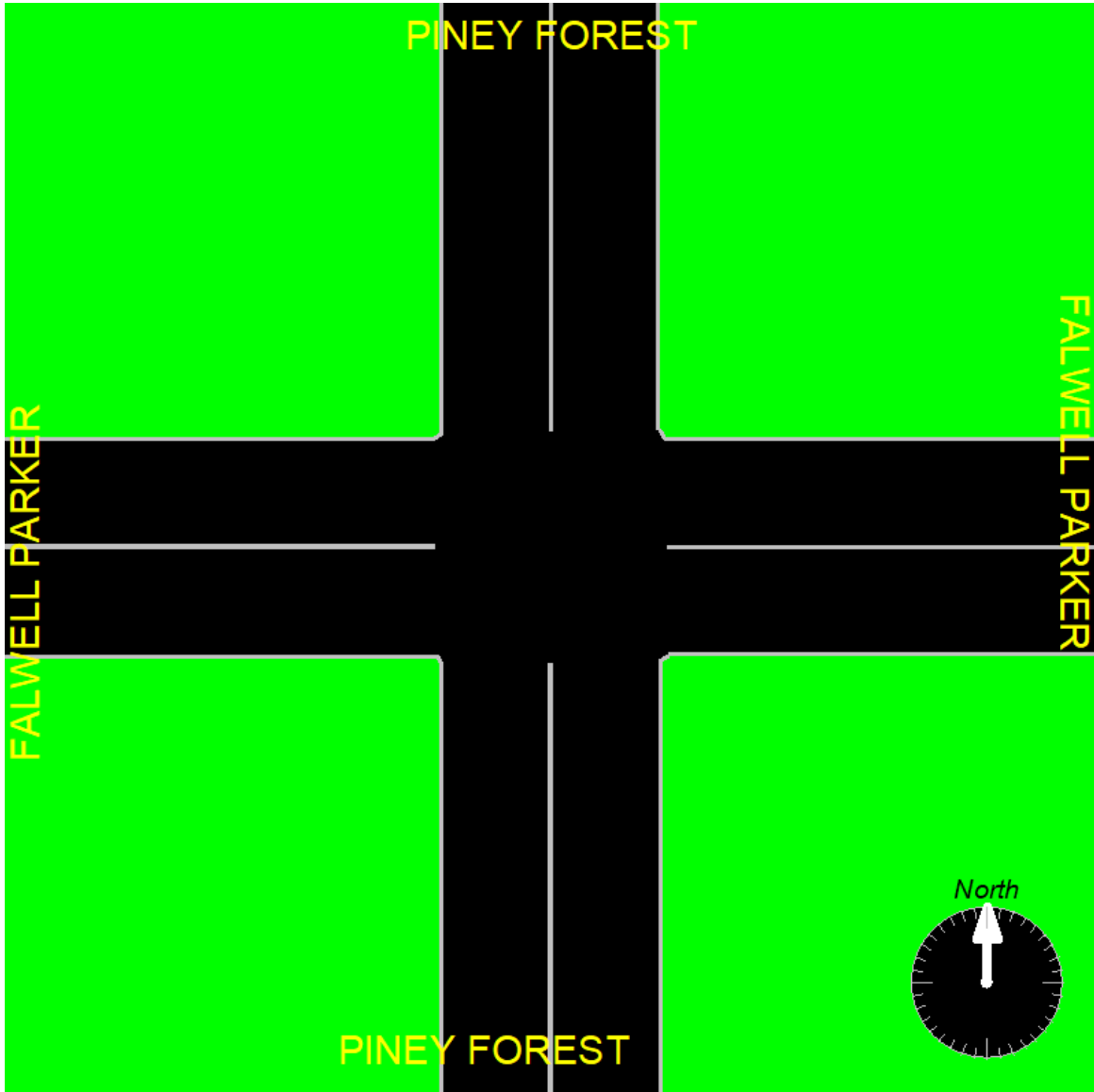
# City Of Danville VA Traffic Control

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## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	CENTRAL BLVD From North					BOXWOOD CT From East					CENTRAL BLVD From South					HOLT GARRISON PKWY From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	5	131	16	0	152	0	1	13	0	14	31	85	0	0	116	0	0	4	0	4	286
07:15 AM	9	168	23	0	200	0	3	11	0	14	11	117	2	0	130	0	0	3	0	3	347
07:30 AM	13	231	13	0	257	1	4	10	0	15	13	134	0	0	147	1	1	8	0	10	429
07:45 AM	20	286	13	0	319	1	4	5	0	10	26	198	1	0	225	2	4	5	0	11	565
Total	47	816	65	0	928	2	12	39	0	53	81	534	3	0	618	3	5	20	0	28	1627
08:00 AM	14	200	18	0	232	3	7	8	0	18	12	153	2	0	167	0	2	6	0	8	425
08:15 AM	26	228	36	0	290	2	5	6	0	13	20	131	3	0	154	1	2	12	0	15	472
08:30 AM	16	197	23	0	236	1	12	2	0	15	22	153	1	0	176	6	3	8	0	17	444
08:45 AM	33	207	18	0	258	1	13	8	0	22	17	141	3	0	161	2	3	15	0	20	461
Total	89	832	95	0	1016	7	37	24	0	68	71	578	9	0	658	9	10	41	0	60	1802

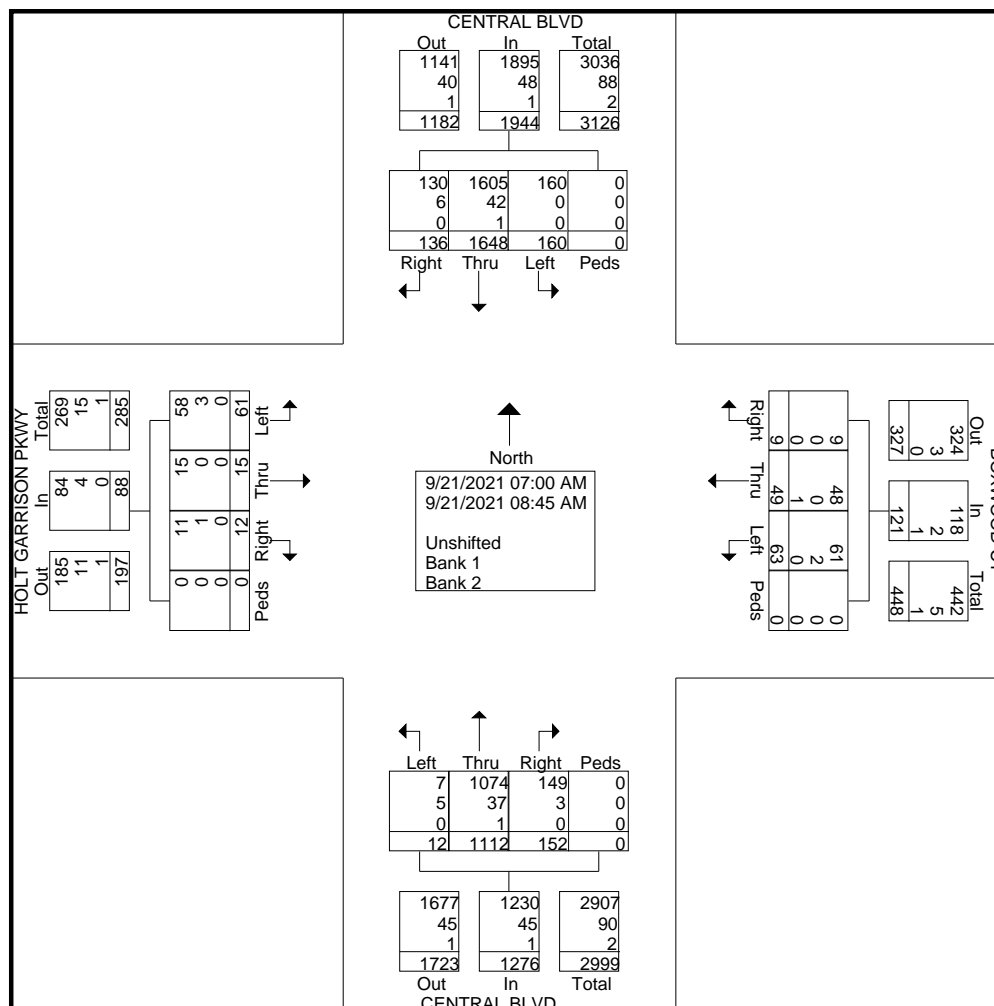


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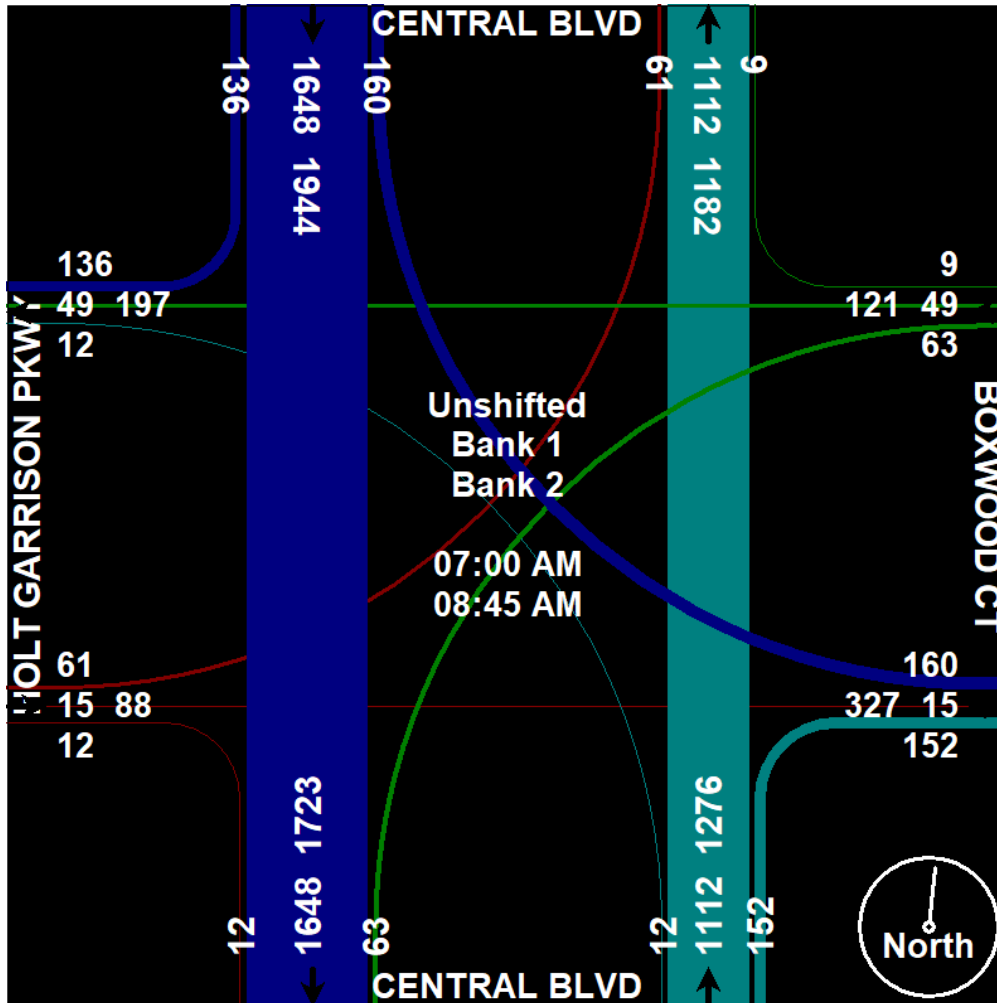
## Groups Printed- Unshifted - Bank 1 - Bank 2

	CENTRAL BLVD From North					BOXWOOD CT From East					CENTRAL BLVD From South					HOLT GARRISON PKWY From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	136	1648	160	0	1944	9	49	63	0	121	152	1112	12	0	1276	12	15	61	0	88	3429
Apprch %	7	84.8	8.2	0		7.4	40.5	52.1	0		11.9	87.1	0.9	0		13.6	17	69.3	0		
Total %	4	48.1	4.7	0	56.7	0.3	1.4	1.8	0	3.5	4.4	32.4	0.3	0	37.2	0.3	0.4	1.8	0	2.6	
Unshifted	130	1605	160	0	1895	9	48	61	0	118	149	1074	7	0	1230	11	15	58	0	84	3327
% Unshifted	95.6	97.4	100	0	97.5	100	98	96.8	0	97.5	98	96.6	58.3	0	96.4	91.7	100	95.1	0	95.5	97
Bank 1	6	42	0	0	48	0	0	2	0	2	3	37	5	0	45	1	0	3	0	4	99
% Bank 1	4.4	2.5	0	0	2.5	0	0	3.2	0	1.7	2	3.3	41.7	0	3.5	8.3	0	4.9	0	4.5	2.9
Bank 2	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	3
% Bank 2	0	0.1	0	0	0.1	0	2	0	0	0.8	0	0.1	0	0	0.1	0	0	0	0	0	0.1



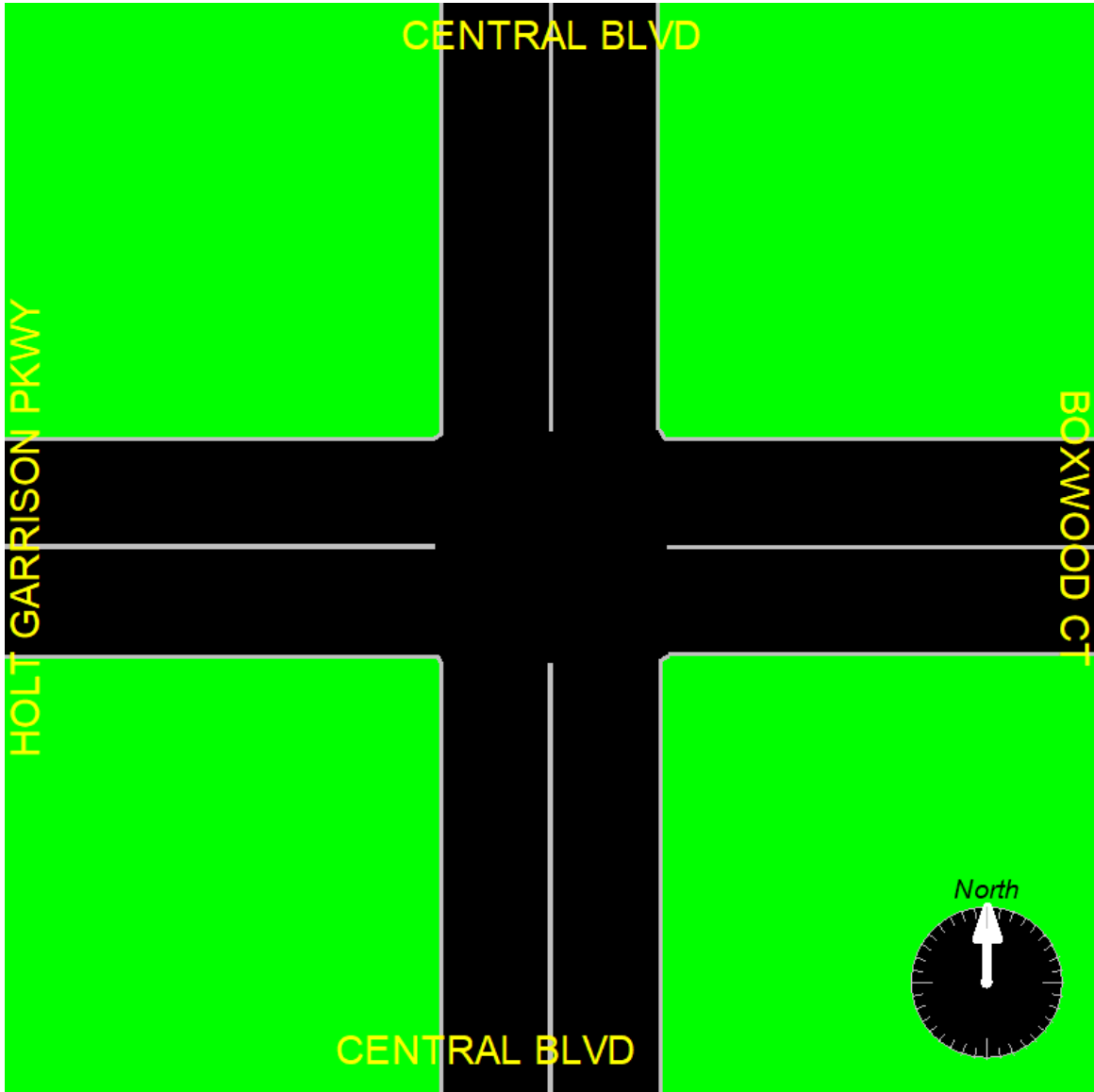
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## Groups Printed- Unshifted - Bank 1 - Bank 2

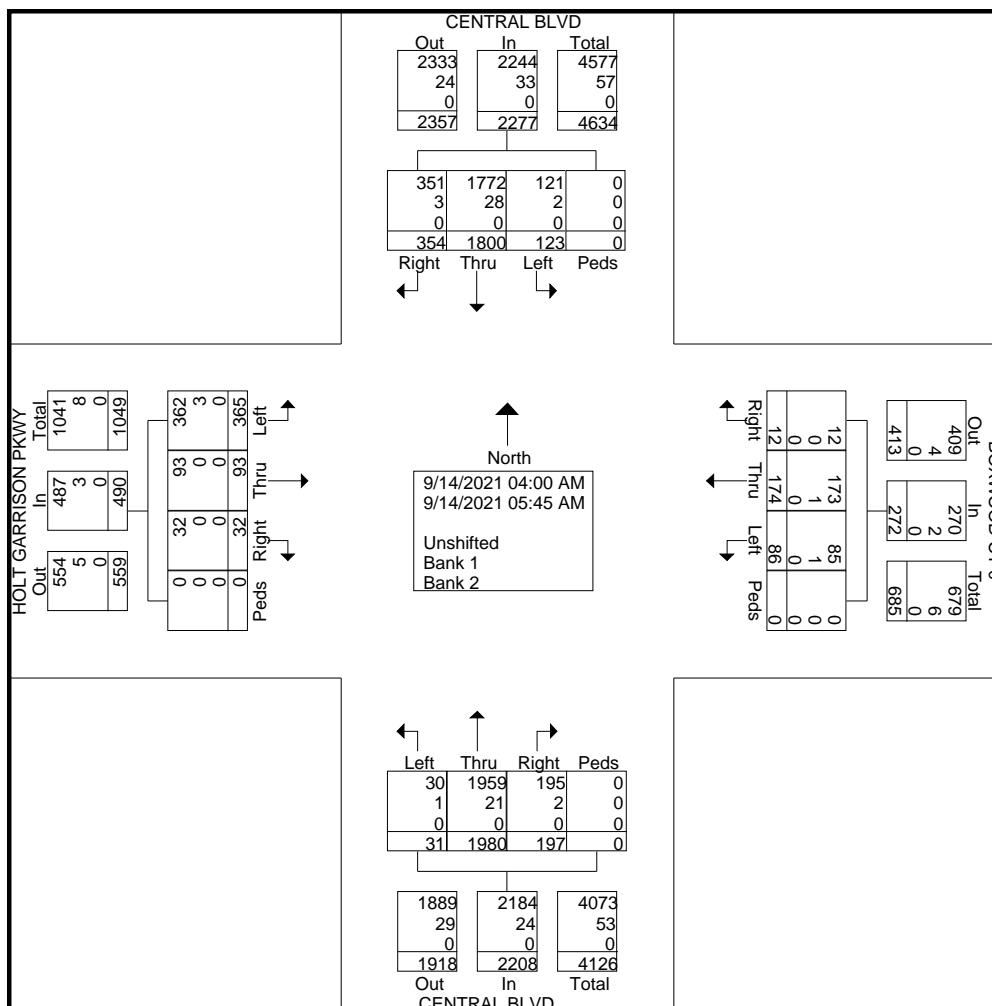
Start Time	CENTRAL BLVD From North					BOXWOOD CT 0 From East					CENTRAL BLVD From South					HOLT GARRISON PKWY From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 AM	37	210	16	0	263	1	26	14	0	41	23	219	2	0	244	3	10	66	0	79	627
04:15 AM	59	216	14	0	289	1	20	8	0	29	28	250	8	0	286	5	17	39	0	61	665
04:30 AM	45	217	18	0	280	1	17	7	0	25	30	236	3	0	269	5	10	47	0	62	636
04:45 AM	35	231	10	0	276	0	21	8	0	29	25	272	6	0	303	2	7	36	0	45	653
Total	176	874	58	0	1108	3	84	37	0	124	106	977	19	0	1102	15	44	188	0	247	2581
05:00 AM	53	257	16	0	326	3	23	20	0	46	22	258	0	0	280	4	13	43	0	60	712
05:15 AM	44	241	19	0	304	4	26	10	0	40	26	271	3	0	300	2	11	54	0	67	711
05:30 AM	46	203	18	0	267	1	22	8	0	31	16	217	7	0	240	4	11	49	0	64	602
05:45 AM	35	225	12	0	272	1	19	11	0	31	27	257	2	0	286	7	14	31	0	52	641
Total	178	926	65	0	1169	9	90	49	0	148	91	1003	12	0	1106	17	49	177	0	243	2666

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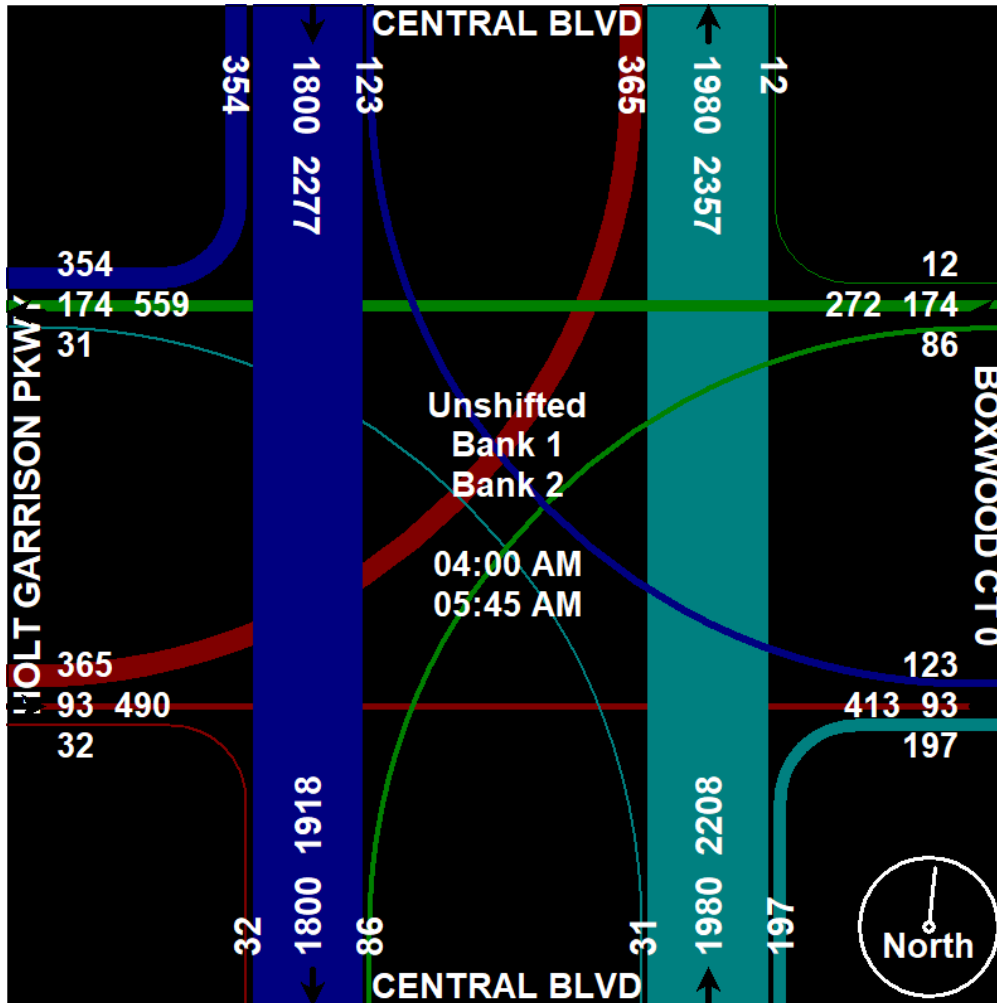
## Groups Printed- Unshifted - Bank 1 - Bank 2

	CENTRAL BLVD From North					BOXWOOD CT 0 From East					CENTRAL BLVD From South					HOLT GARRISON PKWY From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	354	1800	123	0	2277	12	174	86	0	272	197	1980	31	0	2208	32	93	365	0	490	5247
Apprch %	15.5	79.1	5.4	0		4.4	64	31.6	0		8.9	89.7	1.4	0		6.5	19	74.5	0		
Total %	6.7	34.3	2.3	0	43.4	0.2	3.3	1.6	0	5.2	3.8	37.7	0.6	0	42.1	0.6	1.8	7	0	9.3	
Unshifted	351	1772	121	0	2244	12	173	85	0	270	195	1959	30	0	2184	32	93	362	0	487	5185
% Unshifted	99.2	98.4	98.4	0	98.6	100	99.4	98.8	0	99.3	99	98.9	96.8	0	98.9	100	100	99.2	0	99.4	98.8
Bank 1	3	28	2	0	33	0	1	1	0	2	2	21	1	0	24	0	0	3	0	3	62
% Bank 1	0.8	1.6	1.6	0	1.4	0	0.6	1.2	0	0.7	1	1.1	3.2	0	1.1	0	0	0.8	0	0.6	1.2
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	PINEY EOREST From North					WOODSIDE DRIVE From East					PINEY EOREST From South					WOODSIDE DRIVE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	1	187	0	0	188	0	0	0	0	0	0	96	2	0	98	1	0	2	0	3	289
07:15 AM	5	246	0	0	251	0	0	0	0	0	0	113	0	0	113	4	0	1	0	5	369
07:30 AM	5	325	0	0	330	0	0	0	0	0	0	124	4	0	128	3	0	2	0	5	463
07:45 AM	4	383	0	0	387	0	0	0	0	0	0	137	4	0	141	4	0	3	0	7	535
Total	15	1141	0	0	1156	0	0	0	0	0	0	470	10	0	480	12	0	8	0	20	1656
08:00 AM	4	294	0	0	298	0	0	0	0	0	0	147	8	0	155	4	0	0	0	4	457
08:15 AM	5	260	0	0	265	0	0	0	0	0	0	174	3	0	177	6	0	0	0	6	448
08:30 AM	4	258	0	0	262	0	0	0	0	0	0	143	4	0	147	6	0	4	0	10	419
08:45 AM	4	223	0	0	227	0	0	0	0	0	0	148	10	0	158	7	0	0	0	7	392
Total	17	1035	0	0	1052	0	0	0	0	0	0	612	25	0	637	23	0	4	0	27	1716

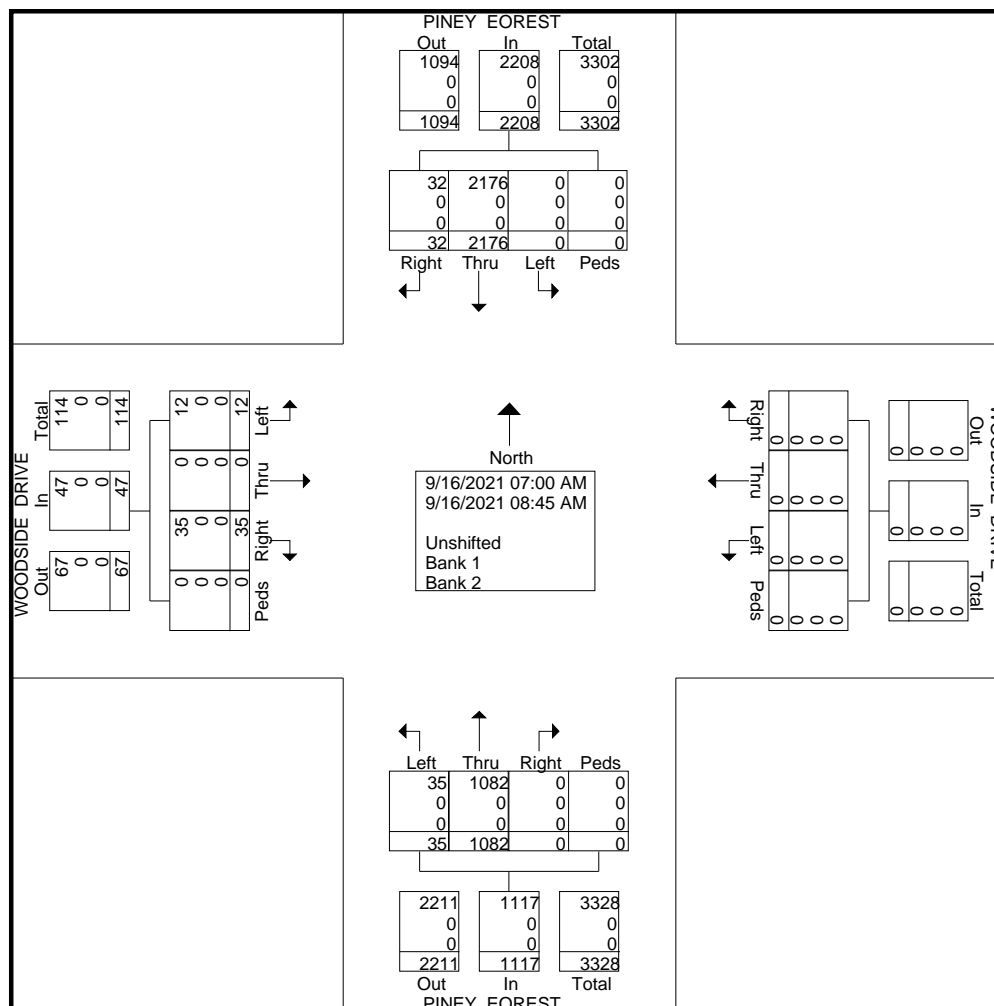


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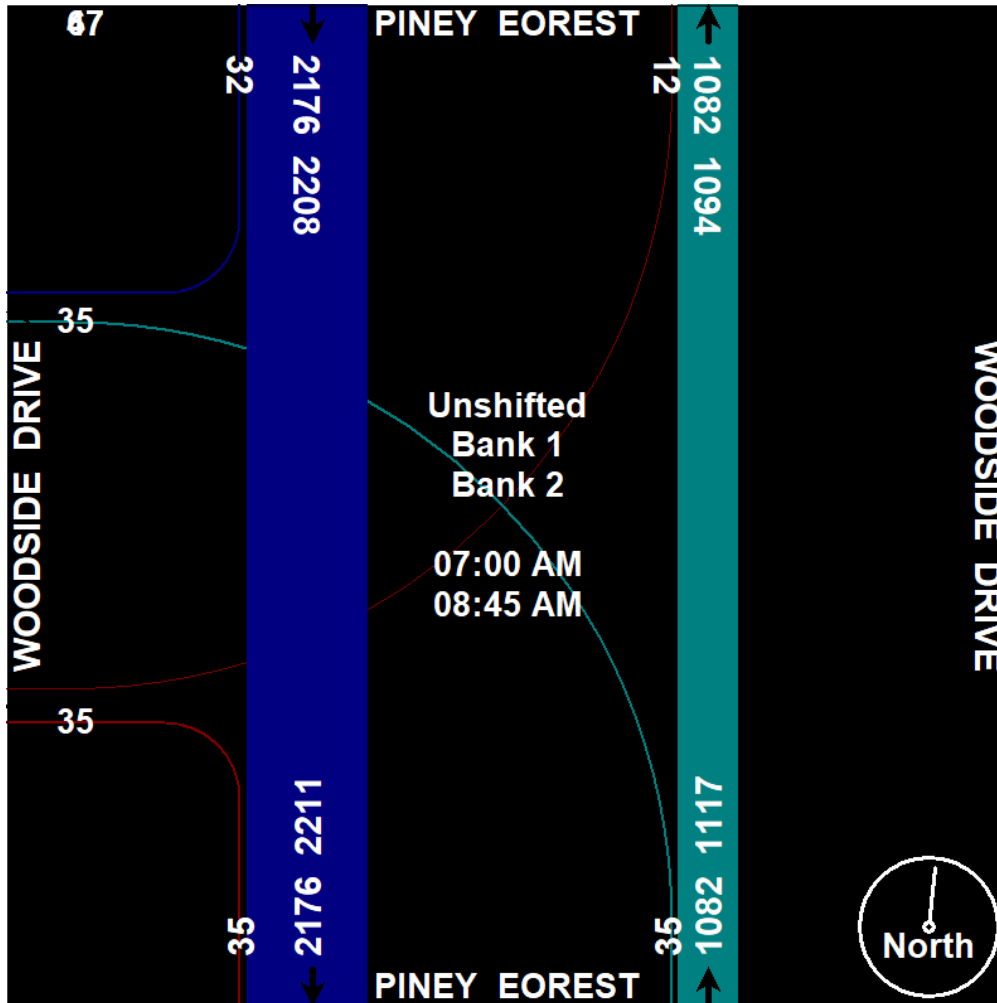
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY EOREST From North					WOODSIDE DRIVE From East					PINEY EOREST From South					WOODSIDE DRIVE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	32	2176	0	0	2208	0	0	0	0	0	0	1082	35	0	1117	35	0	12	0	47	3372
Apprch %	1.4	98.6	0	0		0	0	0	0	0	0	96.9	3.1	0		74.5	0	25.5	0		
Total %	0.9	64.5	0	0	65.5	0	0	0	0	0	0	32.1	1	0	33.1	1	0	0.4	0	1.4	
Unshifted	32	2176	0	0	2208	0	0	0	0	0	0	1082	35	0	1117	35	0	12	0	47	3372
% Unshifted	100	100	0	0	100	0	0	0	0	0	0	100	100	0	100	100	0	100	0	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



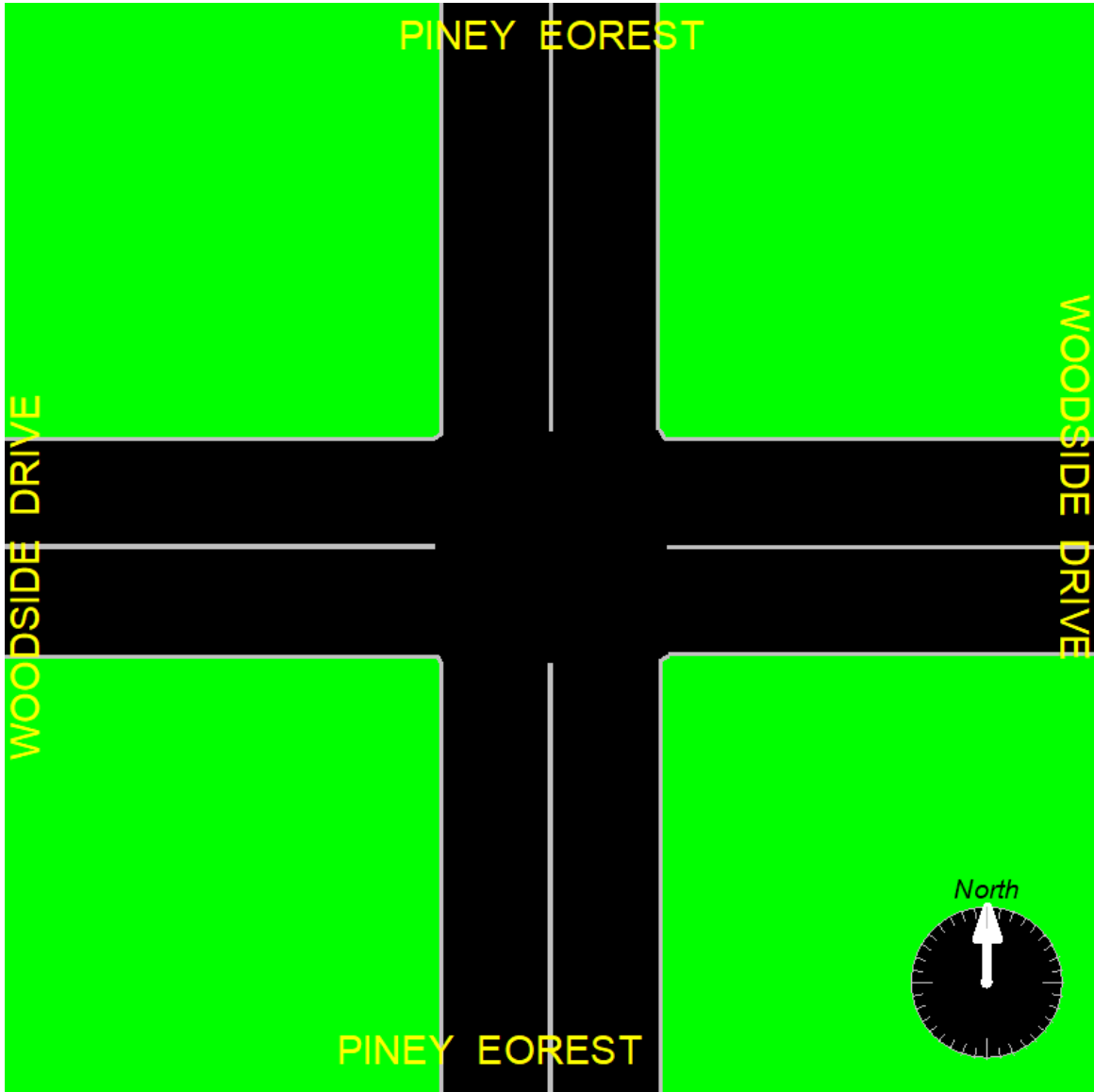
# City Of Danville VA Traffic Control

310 Industrial Ave  
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## Groups Printed- Unshifted - Bank 1 - Bank 2

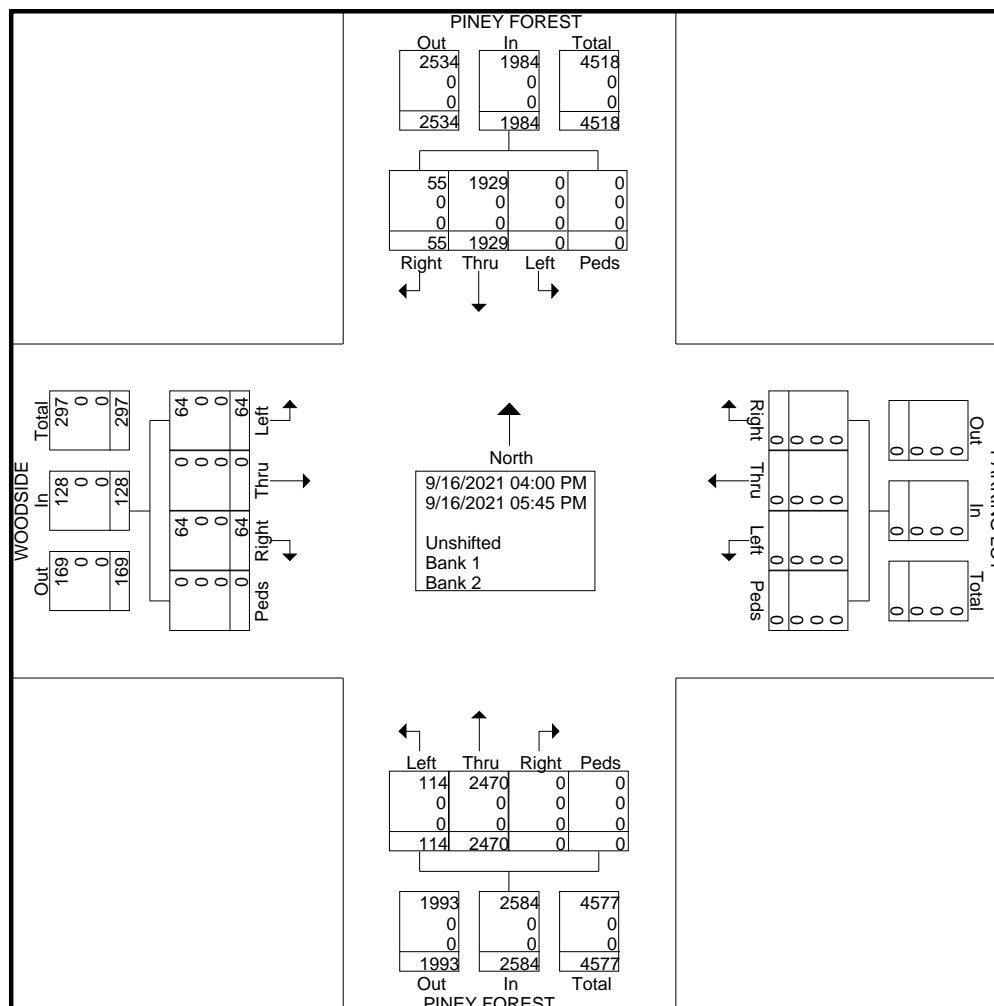
Start Time	PINEY FOREST From North					PARKING LOT From East					PINEY FOREST From South					WOODSIDE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	5	225	0	0	230	0	0	0	0	0	0	303	19	0	322	11	0	11	0	22	574
04:15 PM	5	238	0	0	243	0	0	0	0	0	0	292	4	0	296	3	0	6	0	9	548
04:30 PM	10	242	0	0	252	0	0	0	0	0	0	302	11	0	313	7	0	10	0	17	582
04:45 PM	9	239	0	0	248	0	0	0	0	0	0	328	20	0	348	6	0	6	0	12	608
Total	29	944	0	0	973	0	0	0	0	0	0	1225	54	0	1279	27	0	33	0	60	2312
05:00 PM	6	250	0	0	256	0	0	0	0	0	0	318	12	0	330	8	0	9	0	17	603
05:15 PM	2	249	0	0	251	0	0	0	0	0	0	370	18	0	388	10	0	5	0	15	654
05:30 PM	7	236	0	0	243	0	0	0	0	0	0	265	12	0	277	11	0	10	0	21	541
05:45 PM	11	250	0	0	261	0	0	0	0	0	0	292	18	0	310	8	0	7	0	15	586
Total	26	985	0	0	1011	0	0	0	0	0	0	1245	60	0	1305	37	0	31	0	68	2384

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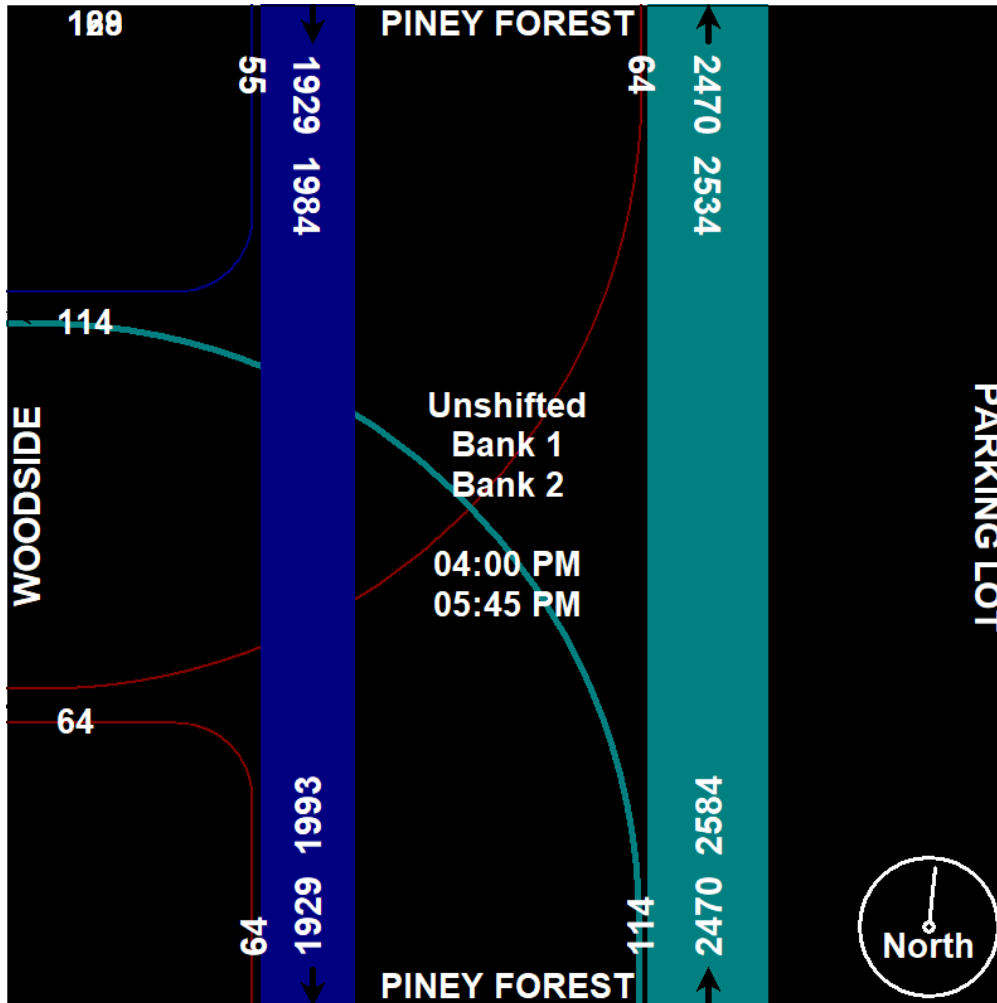
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					PARKING LOT From East					PINEY FOREST From South					WOODSIDE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	55	1929	0	0	1984	0	0	0	0	0	0	2470	114	0	2584	64	0	64	0	128	4696
Apprch %	2.8	97.2	0	0		0	0	0	0	0	0	95.6	4.4	0		50	0	50	0		
Total %	1.2	41.1	0	0	42.2	0	0	0	0	0	0	52.6	2.4	0	55	1.4	0	1.4	0	2.7	
Unshifted	55	1929	0	0	1984	0	0	0	0	0	0	2470	114	0	2584	64	0	64	0	128	4696
% Unshifted	100	100	0	0	100	0	0	0	0	0	0	100	100	0	100	100	0	100	0	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



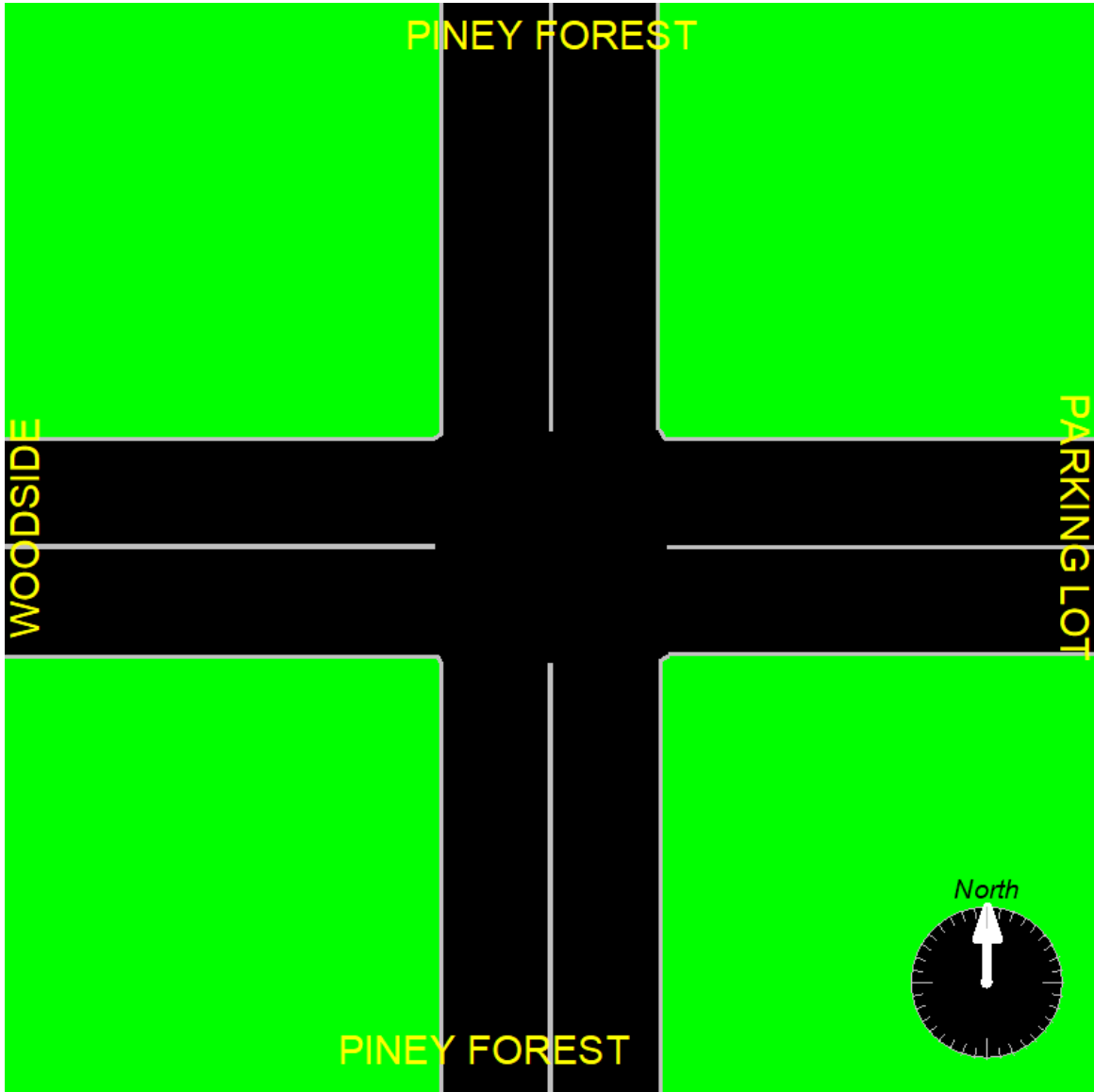
# City Of Danville VA Traffic Control

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9/16/2021 PINEY FOREST RD			1320 PINEY FOREST RD				PINEY FOREST RD			WOODSIDE DR				
FROM		NORTH	From East				From South			From West				
	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK		
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		
7:00 AM													110	12
7:15 AM														15
7:30 AM														21
7:45 AM														12
8:00 AM														
8:15 AM														20
8:30 AM														
9:00 AM														8
PEDS														9
TOTAL														
9/16/2021 PINEY FOREST RD			1320 PINEY FOREST RD				PINEY FOREST RD			WOODSIDE DR				
FROM NORTH				From East				From South			From West			
	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK		
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		
4:00 PM														11
4:15 PM*													100	6
4:30 PM														4
4:45 PM														5
5:00 PM														3
5:15 PM														7
5:30 PM														3
5:45 PM														3
6:00 PM														0
TOTAL														

PEDESTRIAN = |||| morning 4  
 ||||| Afternoon 8



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## Groups Printed- Unshifted - Bank 1 - Bank 2

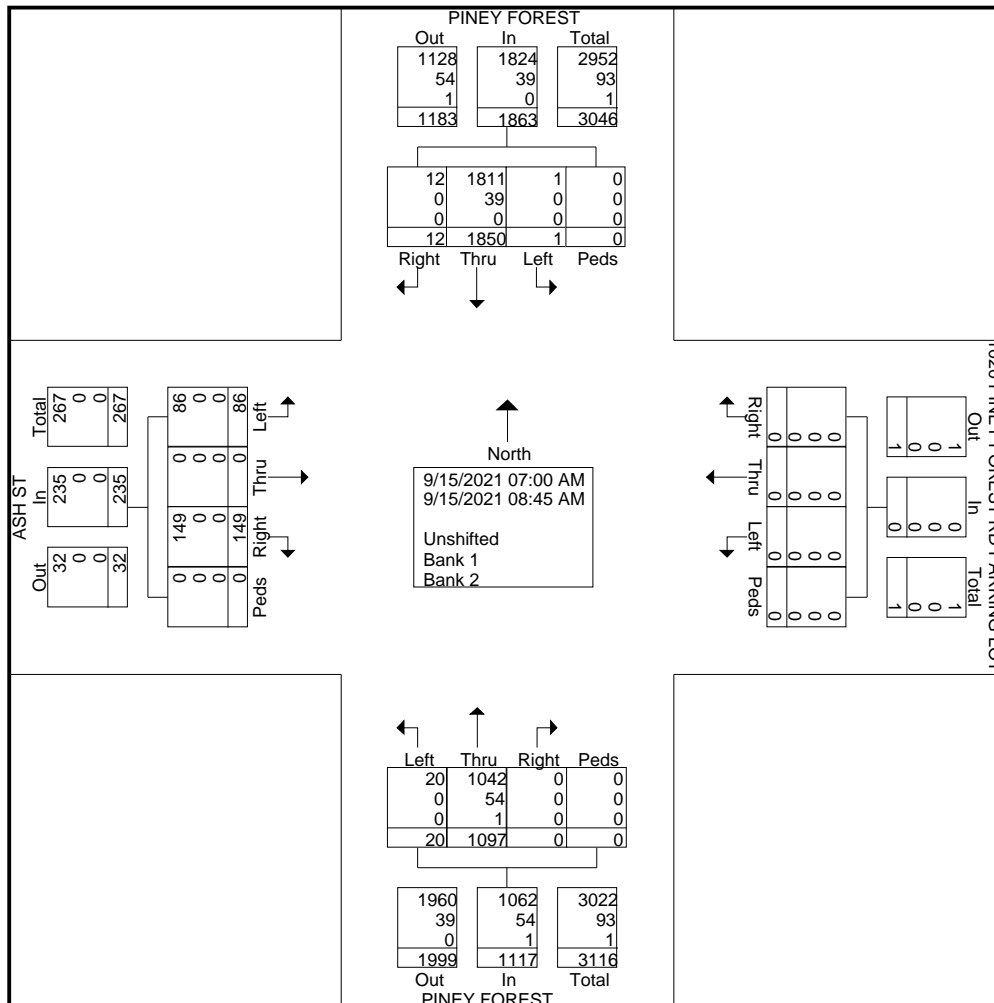
Start Time	PINEY FOREST From North					1020 PINEY FOREST RD PARKING LOT From East					PINEY FOREST From South					ASH ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	1	164	0	0	165	0	0	0	0	0	0	107	3	0	110	15	0	5	0	20	295
07:15 AM	0	198	0	0	198	0	0	0	0	0	0	100	3	0	103	21	0	9	0	30	331
07:30 AM	2	265	0	0	267	0	0	0	0	0	0	118	4	0	122	27	0	10	0	37	426
07:45 AM	2	324	0	0	326	0	0	0	0	0	0	157	4	0	161	23	0	12	0	35	522
Total	5	951	0	0	956	0	0	0	0	0	0	482	14	0	496	86	0	36	0	122	1574
08:00 AM	1	244	0	0	245	0	0	0	0	0	0	147	2	0	149	23	0	9	0	32	426
08:15 AM	4	243	1	0	248	0	0	0	0	0	0	163	2	0	165	13	0	16	0	29	442
08:30 AM	1	189	0	0	190	0	0	0	0	0	0	161	0	0	161	13	0	11	0	24	375
08:45 AM	1	223	0	0	224	0	0	0	0	0	0	144	2	0	146	14	0	14	0	28	398
Total	7	899	1	0	907	0	0	0	0	0	0	615	6	0	621	63	0	50	0	113	1641

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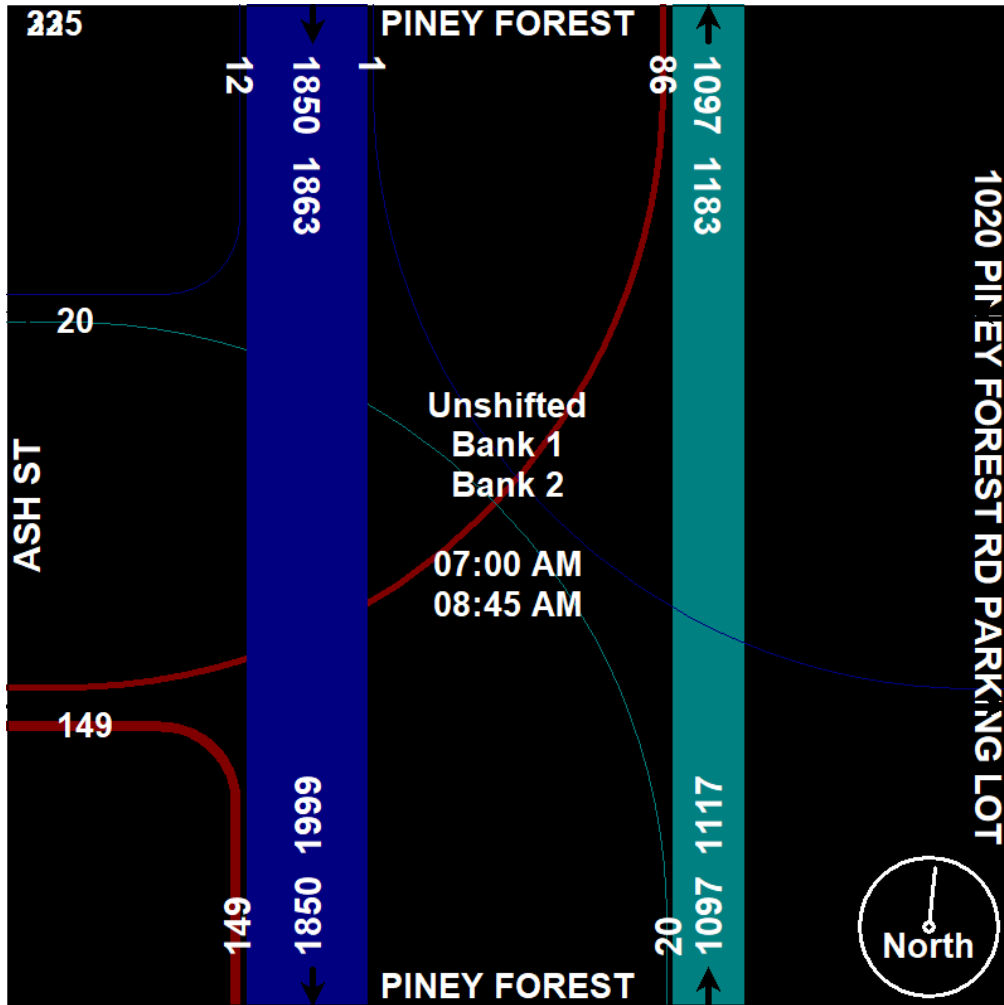
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					1020 PINEY FOREST RD PARKING LOT From East					PINEY FOREST From South					ASH ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	12	1850	1	0	1863	0	0	0	0	0	0	1097	20	0	1117	149	0	86	0	235	3215
Apprch %	0.6	99.3	0.1	0		0	0	0	0		0	98.2	1.8	0		63.4	0	36.6	0		
Total %	0.4	57.5	0	0	57.9	0	0	0	0	0	0	34.1	0.6	0	34.7	4.6	0	2.7	0	7.3	
Unshifted	12	1811	1	0	1824	0	0	0	0	0	0	1042	20	0	1062	149	0	86	0	235	3121
% Unshifted	100	97.9	100	0	97.9	0	0	0	0	0	0	95	100	0	95.1	100	0	100	0	100	97.1
Bank 1	0	39	0	0	39	0	0	0	0	0	0	54	0	0	54	0	0	0	0	0	93
% Bank 1	0	2.1	0	0	2.1	0	0	0	0	0	0	4.9	0	0	4.8	0	0	0	0	0	2.9
Bank 2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0



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## Groups Printed- Unshifted - Bank 1 - Bank 2

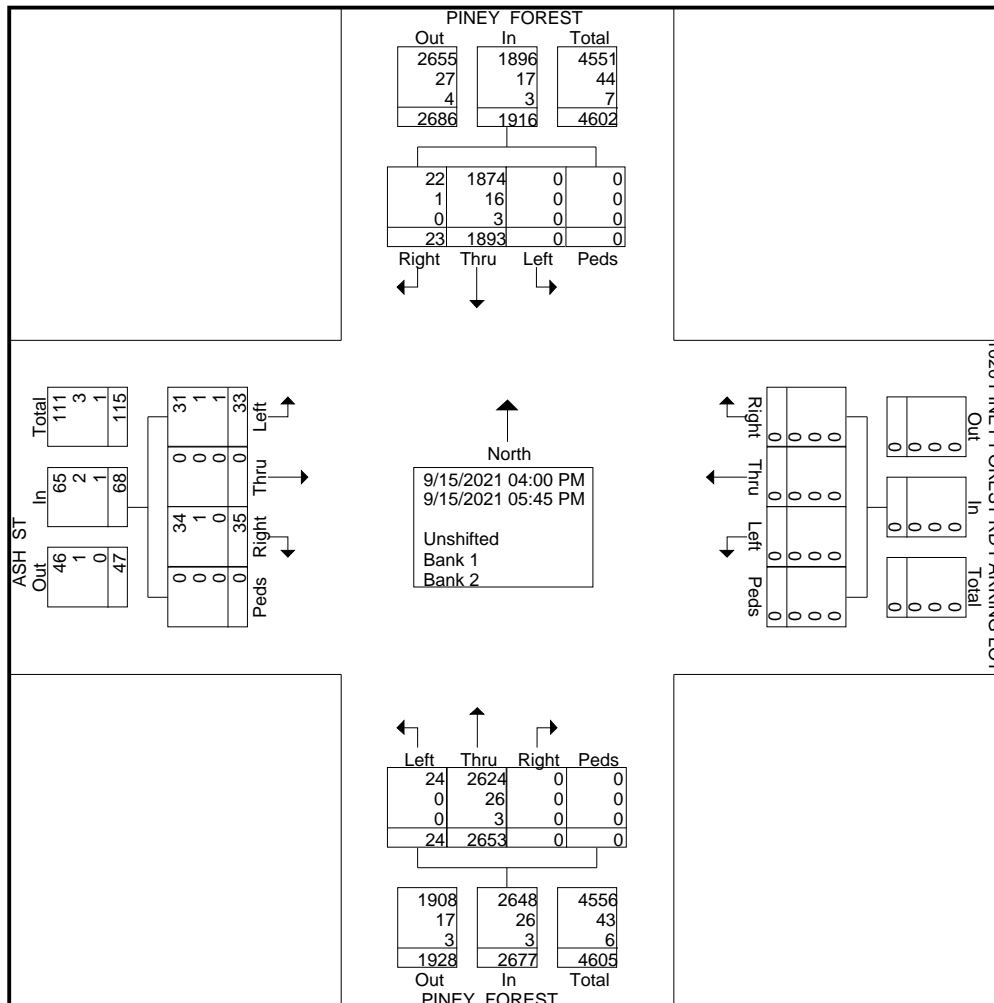
Start Time	PINEY FOREST From North					1020 PINEY FOREST RD PARKING LOT From East					PINEY FOREST From South					ASH ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	214	0	0	214	0	0	0	0	0	0	295	6	0	301	4	0	4	0	8	523
04:15 PM	3	236	0	0	239	0	0	0	0	0	0	334	5	0	339	5	0	7	0	12	590
04:30 PM	1	217	0	0	218	0	0	0	0	0	0	296	2	0	298	4	0	2	0	6	522
04:45 PM	9	279	0	0	288	0	0	0	0	0	0	322	1	0	323	1	0	6	0	7	618
Total	13	946	0	0	959	0	0	0	0	0	0	1247	14	0	1261	14	0	19	0	33	2253
05:00 PM	1	225	0	0	226	0	0	0	0	0	0	382	6	0	388	7	0	3	0	10	624
05:15 PM	6	253	0	0	259	0	0	0	0	0	0	368	1	0	369	3	0	3	0	6	634
05:30 PM	3	230	0	0	233	0	0	0	0	0	0	319	1	0	320	5	0	6	0	11	564
05:45 PM	0	239	0	0	239	0	0	0	0	0	0	337	2	0	339	6	0	2	0	8	586
Total	10	947	0	0	957	0	0	0	0	0	0	1406	10	0	1416	21	0	14	0	35	2408

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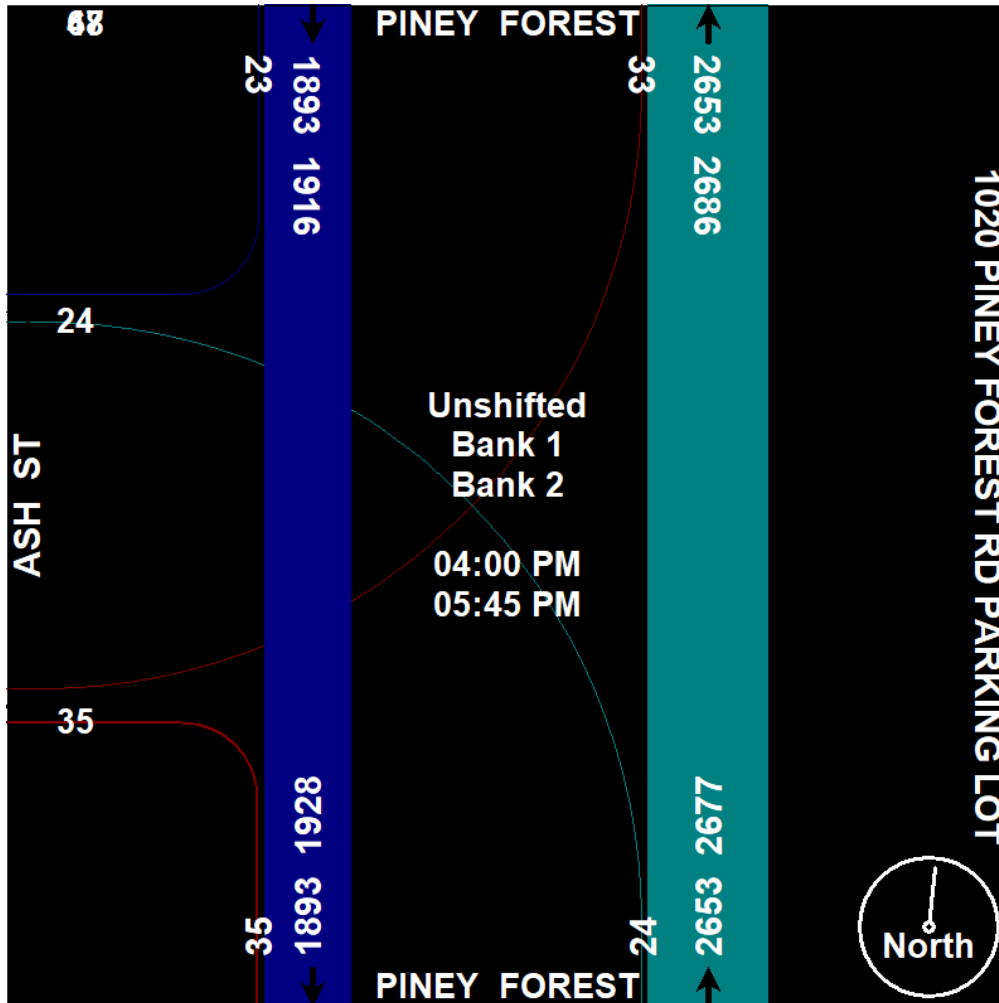
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					1020 PINEY FOREST RD PARKING LOT From East					PINEY FOREST From South					ASH ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	23	1893	0	0	1916	0	0	0	0	0	0	2653	24	0	2677	35	0	33	0	68	4661
Apprch %	1.2	98.8	0	0		0	0	0	0		0	99.1	0.9	0		51.5	0	48.5	0		
Total %	0.5	40.6	0	0	41.1	0	0	0	0	0	0	56.9	0.5	0	57.4	0.8	0	0.7	0	1.5	
Unshifted	22	1874	0	0	1896	0	0	0	0	0	0	2624	24	0	2648	34	0	31	0	65	4609
% Unshifted	95.7	99	0	0	99	0	0	0	0	0	0	98.9	100	0	98.9	97.1	0	93.9	0	95.6	98.9
Bank 1	1	16	0	0	17	0	0	0	0	0	0	26	0	0	26	1	0	1	0	2	45
% Bank 1	4.3	0.8	0	0	0.9	0	0	0	0	0	0	1	0	0	1	2.9	0	3	0	2.9	1
Bank 2	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	7
% Bank 2	0	0.2	0	0	0.2	0	0	0	0	0	0	0.1	0	0	0.1	0	0	3	0	1.5	0.2



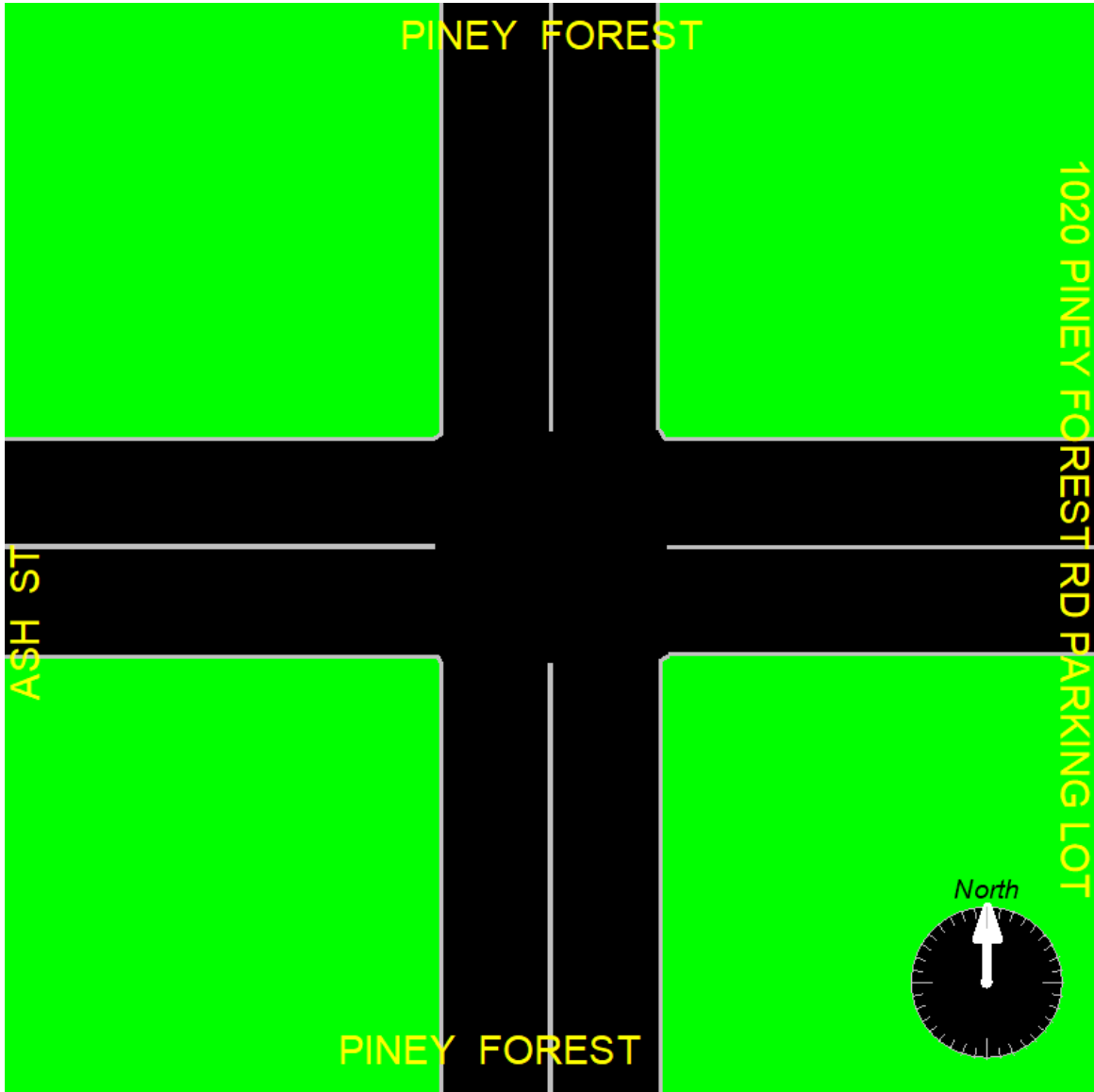
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## Groups Printed- Unshifted - Bank 1 - Bank 2

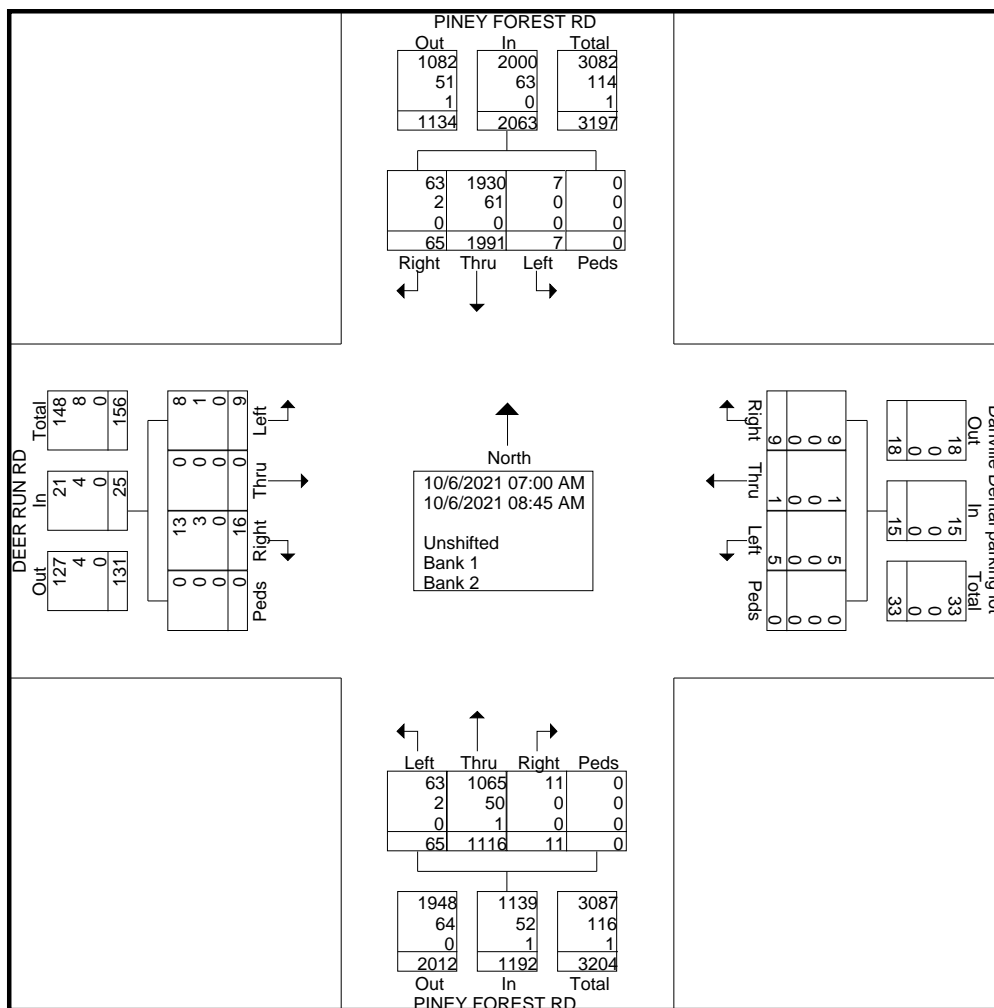
Start Time	PINEY FOREST RD From North					Danville Dental parking lot From East					PINEY FOREST RD From South					DEER RUN RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	1	171	1	0	173	0	1	0	0	1	1	99	0	0	100	0	0	0	0	0	274
07:15 AM	1	222	2	0	225	0	0	0	0	0	2	100	3	0	105	0	0	0	0	0	330
07:30 AM	7	287	0	0	294	0	0	0	0	0	0	172	1	0	173	1	0	1	0	2	469
07:45 AM	13	338	0	0	351	1	0	0	0	1	6	169	14	0	189	0	0	2	0	2	543
Total	22	1018	3	0	1043	1	1	0	0	2	9	540	18	0	567	1	0	3	0	4	1616
08:00 AM	9	234	0	0	243	2	0	0	0	2	0	160	13	0	173	1	0	0	0	1	419
08:15 AM	17	262	0	0	279	1	0	2	0	3	1	122	22	0	145	8	0	3	0	11	438
08:30 AM	9	240	2	0	251	1	0	1	0	2	1	163	5	0	169	3	0	1	0	4	426
08:45 AM	8	237	2	0	247	4	0	2	0	6	0	131	7	0	138	3	0	2	0	5	396
Total	43	973	4	0	1020	8	0	5	0	13	2	576	47	0	625	15	0	6	0	21	1679

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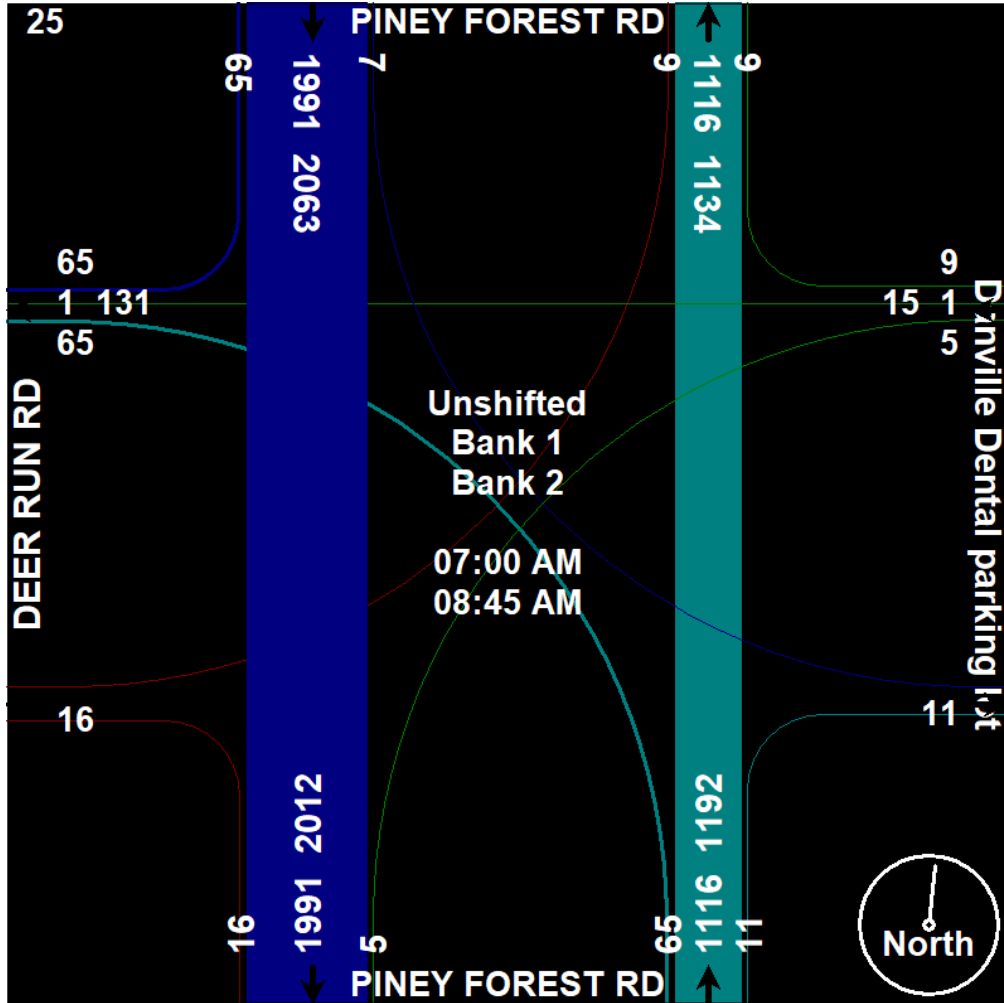
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST RD From North					Danville Dental parking lot From East					PINEY FOREST RD From South					DEER RUN RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	65	1991	7	0	2063	9	1	5	0	15	11	1116	65	0	1192	16	0	9	0	25	3295
Apprch %	3.2	96.5	0.3	0		60	6.7	33.3	0		0.9	93.6	5.5	0		64	0	36	0		
Total %	2	60.4	0.2	0	62.6	0.3	0	0.2	0	0.5	0.3	33.9	2	0	36.2	0.5	0	0.3	0	0.8	
Unshifted	63	1930	7	0	2000	9	1	5	0	15	11	1065	63	0	1139	13	0	8	0	21	3175
% Unshifted	96.9	96.9	100	0	96.9	100	100	100	0	100	100	95.4	96.9	0	95.6	81.2	0	88.9	0	84	96.4
Bank 1	2	61	0	0	63	0	0	0	0	0	0	50	2	0	52	3	0	1	0	4	119
% Bank 1	3.1	3.1	0	0	3.1	0	0	0	0	0	0	4.5	3.1	0	4.4	18.8	0	11.1	0	16	3.6
Bank 2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0



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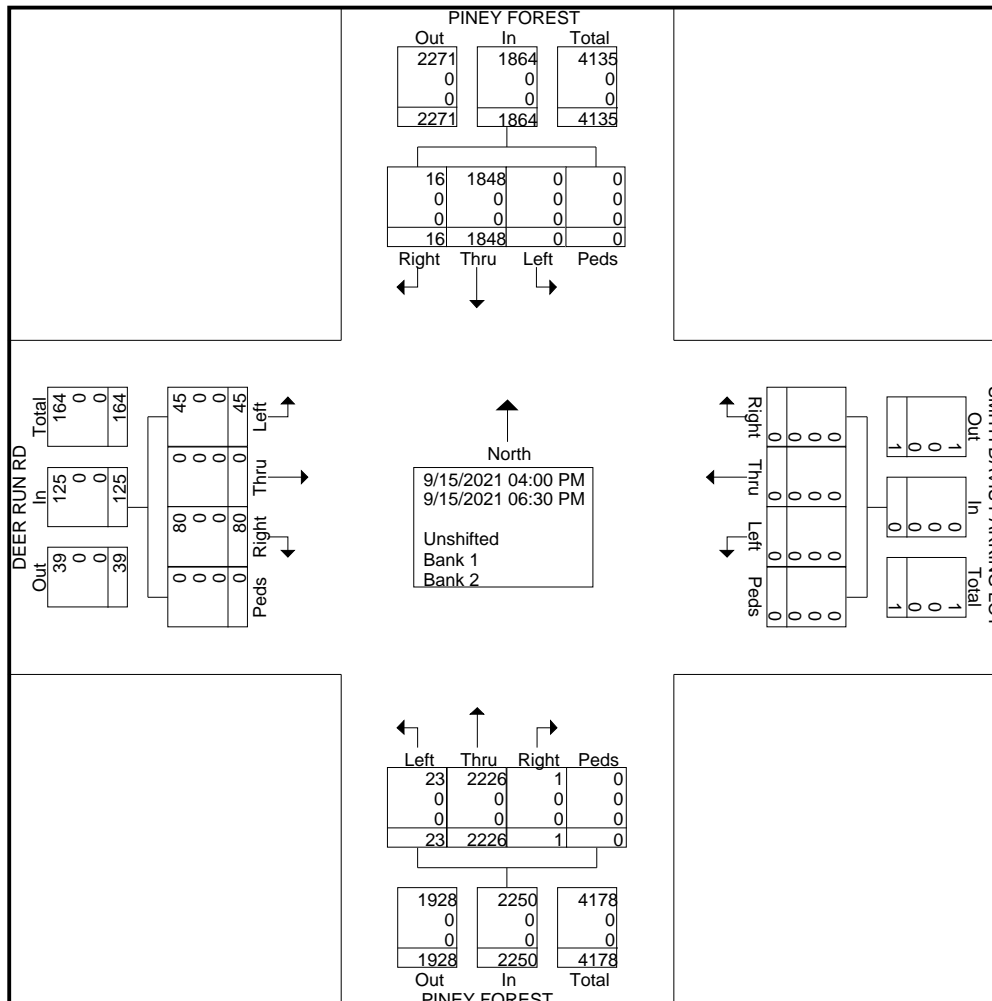


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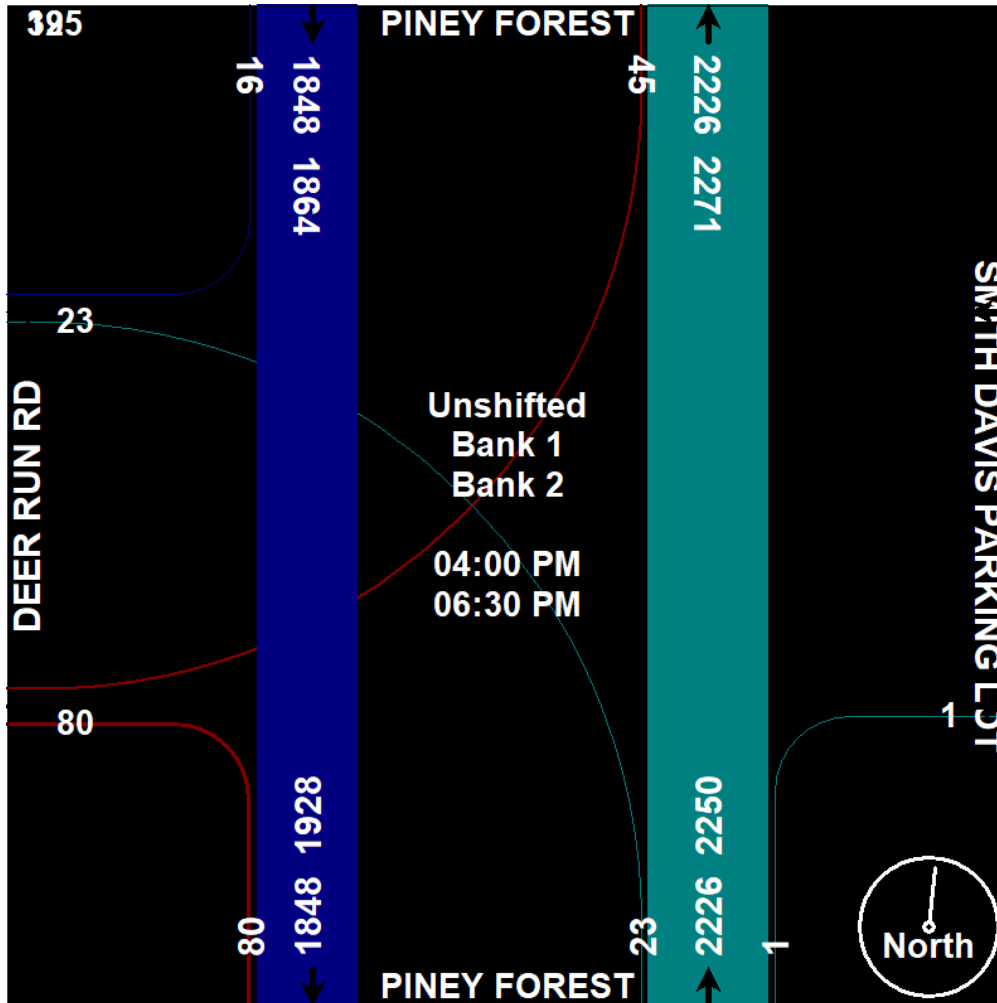
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					SMITH DAVIS PARKING LOT From East					PINEY FOREST From South					DEER RUN RD From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
Grand Total	16	1848	0	0	1864	0	0	0	0	0	1	2226	23	0	2250	80	0	45	0	125	4239	
Apprch %	0.9	99.1	0	0		0	0	0	0		0	98.9	1	0		64	0	36	0			
Total %	0.4	43.6	0	0	44	0	0	0	0	0	0	52.5	0.5	0	53.1	1.9	0	1.1	0	2.9		
Unshifted	16	1848	0	0	1864	0	0	0	0	0	1	2226	23	0	2250	80	0	45	0	125	4239	
% Unshifted	100	100	0	0	100	0	0	0	0	0	100	100	100	0	100	100	0	100	0	100	100	
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



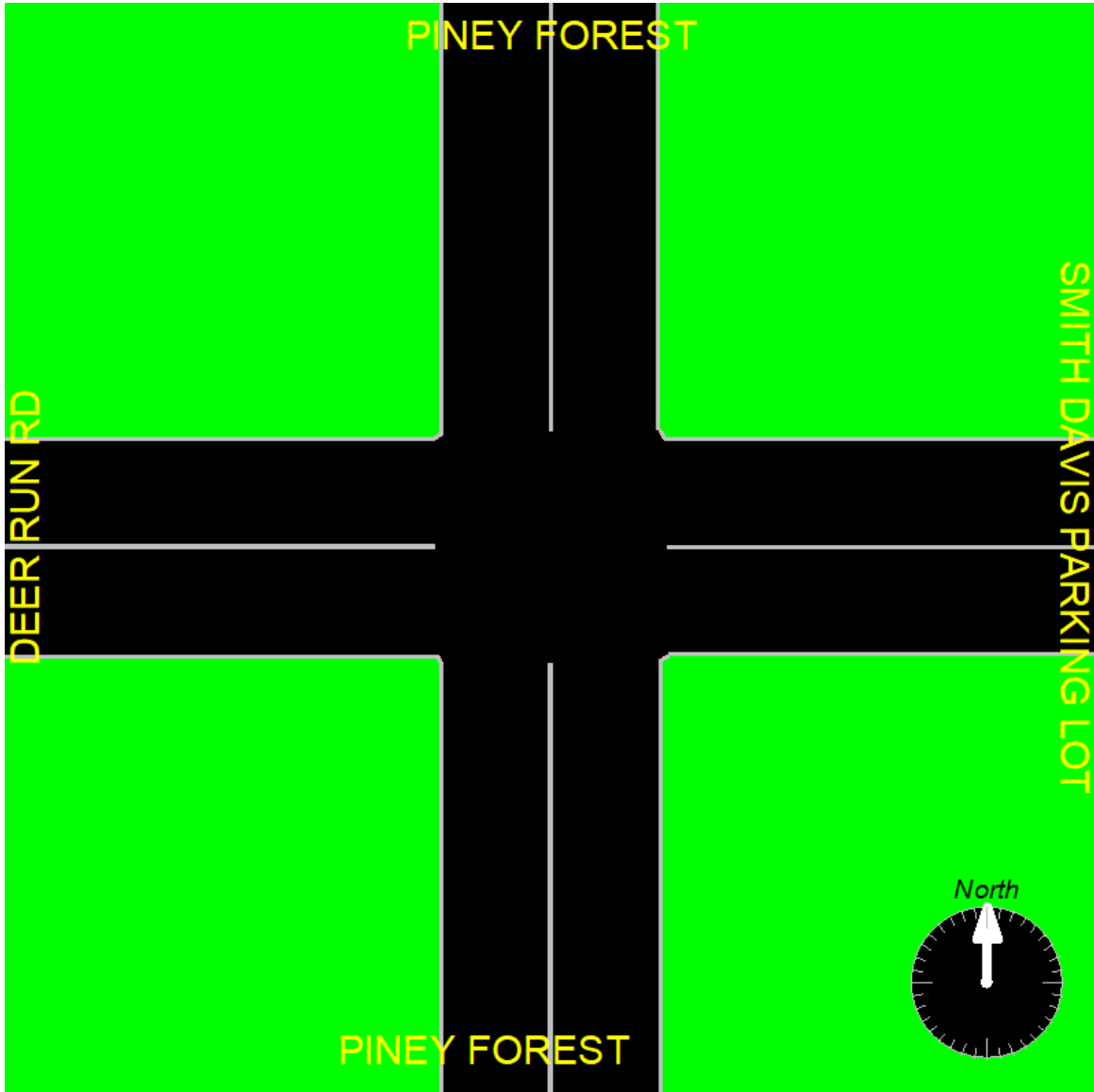
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## Groups Printed- Bank 1

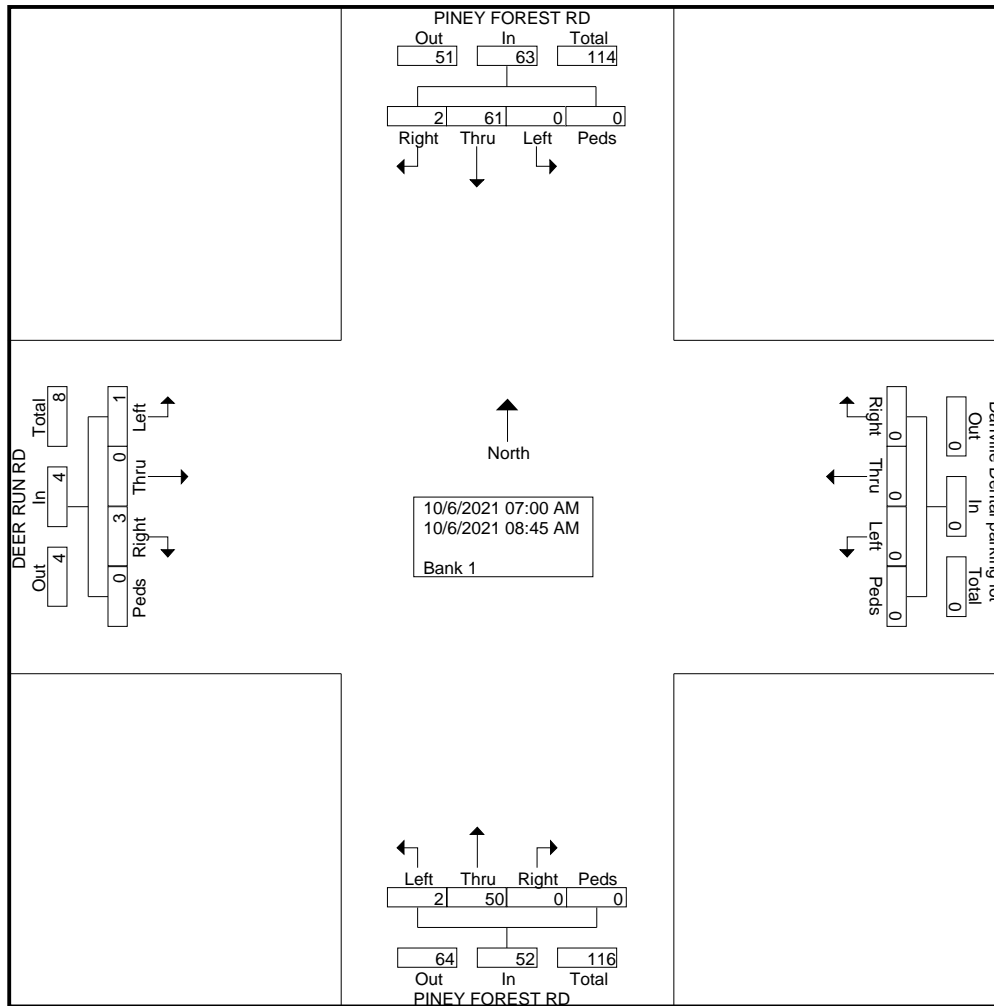
Start Time	PINEY FOREST RD From North					Danville Dental parking lot From East					PINEY FOREST RD From South					DEER RUN RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	8	0	0	8	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	17
07:15 AM	0	8	0	0	8	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	12
07:30 AM	1	12	0	0	13	0	0	0	0	0	0	4	0	0	4	1	0	0	0	1	18
07:45 AM	0	7	0	0	7	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	15
Total	1	35	0	0	36	0	0	0	0	0	0	25	0	0	25	1	0	0	0	1	62
08:00 AM	0	12	0	0	12	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	18
08:15 AM	1	6	0	0	7	0	0	0	0	0	0	10	2	0	12	2	0	1	0	3	22
08:30 AM	0	6	0	0	6	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	11
08:45 AM	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	6
Total	1	26	0	0	27	0	0	0	0	0	0	25	2	0	27	2	0	1	0	3	57

# City Of Danville VA Traffic Control

310 Industrial Ave  
Danville VA 24541

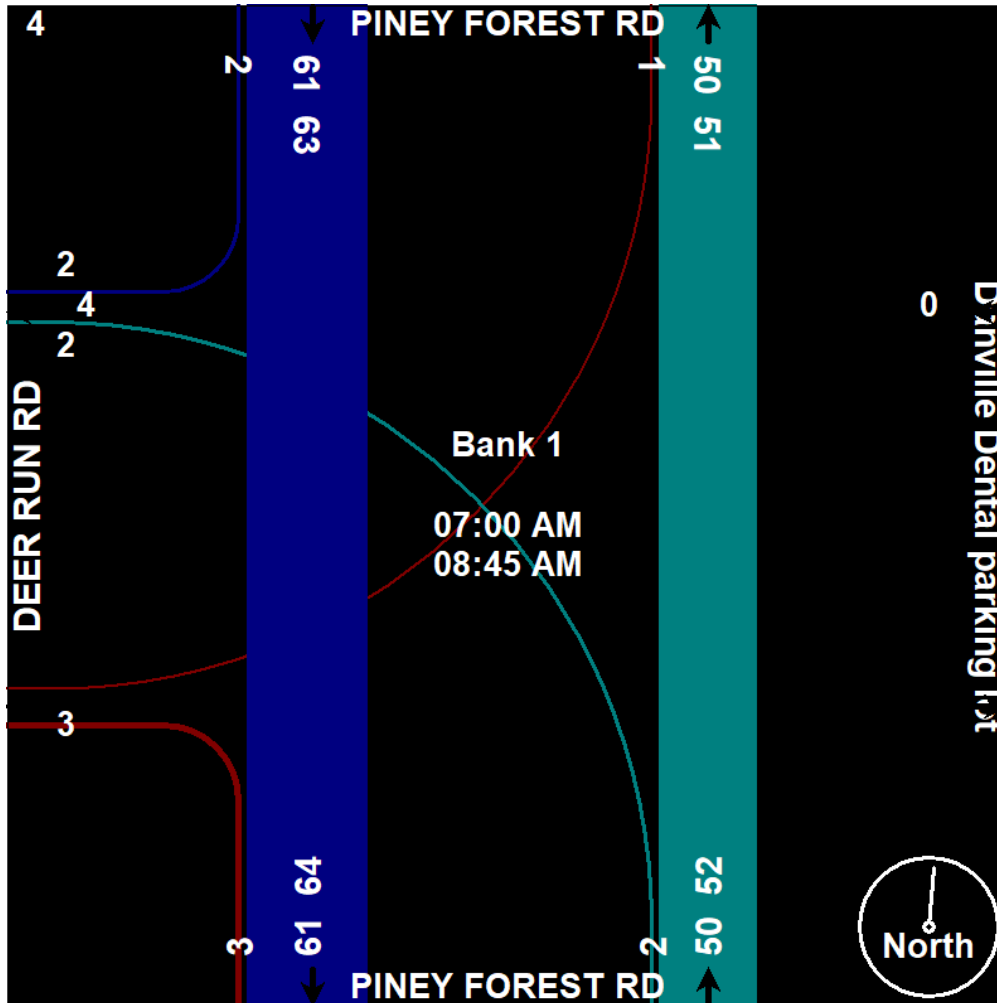
## Groups Printed- Bank 1

	PINEY FOREST RD From North					Danville Dental parking lot From East					PINEY FOREST RD From South					DEER RUN RD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	2	61	0	0	63	0	0	0	0	0	0	50	2	0	52	3	0	1	0	4	119
Apprch %	3.2	96.8	0	0		0	0	0	0		0	96.2	3.8	0		75	0	25	0		
Total %	1.7	51.3	0	0	52.9	0	0	0	0	0	0	42	1.7	0	43.7	2.5	0	0.8	0	3.4	



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310 Industrial Ave  
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310 Industrial Ave  
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Default Comments

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## Groups Printed- Unshifted

Start Time	PINEY FOREST From North					CHURCHVIEW From East					PINEY FOREST From South					CHURCHVIEW From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	1	158	0	0	159	1	0	0	0	1	0	106	2	0	108	0	0	0	0	0	268
07:15 AM	0	203	4	0	207	2	0	1	0	3	0	127	2	0	129	0	0	0	0	0	339
07:30 AM	3	261	0	0	264	0	0	3	0	3	1	134	1	0	136	0	0	0	0	0	403
07:45 AM	5	271	0	0	276	1	0	1	0	2	1	219	0	0	220	0	0	0	0	0	498
Total	9	893	4	0	906	4	0	5	0	9	2	586	5	0	593	0	0	0	0	0	1508
08:00 AM	0	247	2	0	249	0	1	2	0	3	0	159	6	0	165	2	0	1	0	3	420
08:15 AM	1	260	1	0	262	1	0	0	0	1	2	152	7	0	161	4	0	0	0	4	428
08:30 AM	0	223	0	0	223	0	0	0	0	0	0	154	1	0	155	1	0	1	0	2	380
08:45 AM	1	246	0	0	247	2	0	0	0	2	0	133	3	0	136	4	0	0	0	4	389
Total	2	976	3	0	981	3	1	2	0	6	2	598	17	0	617	11	0	2	0	13	1617

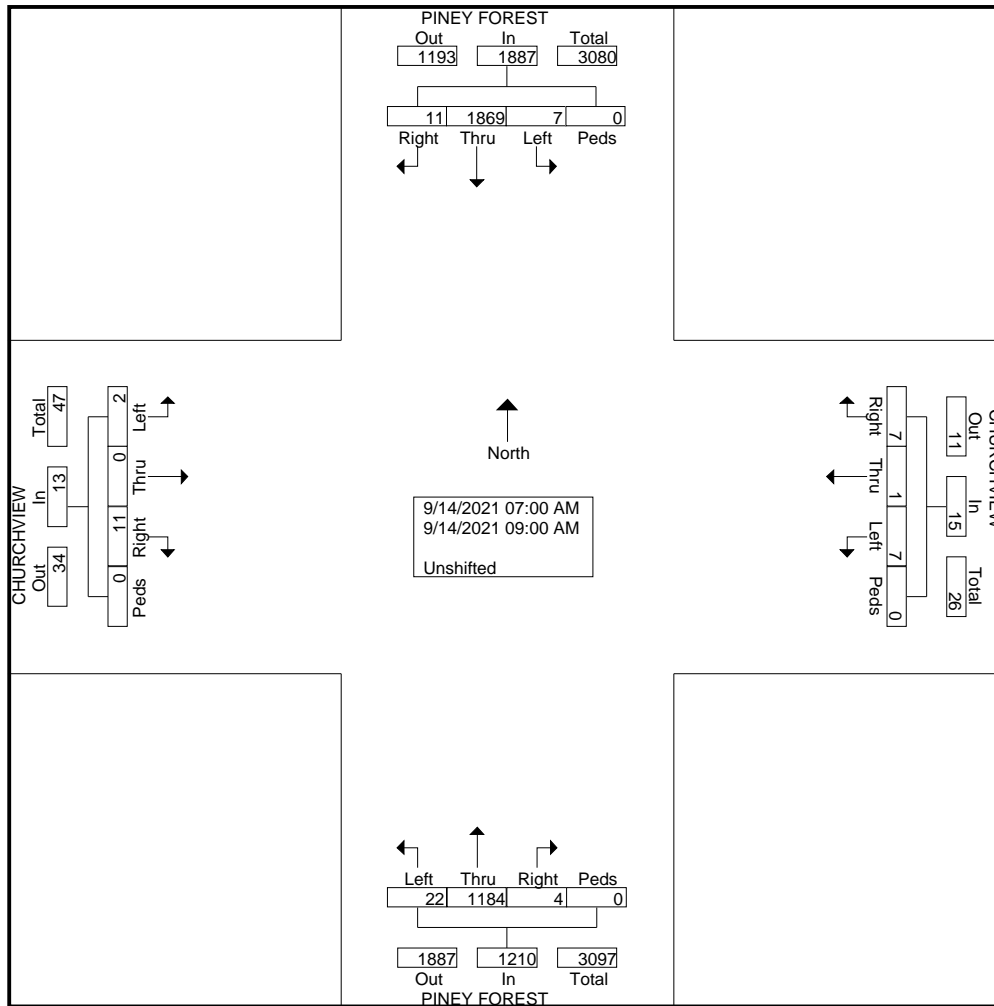
\*\*\* BREAK \*\*\*

# City Of Danville VA Traffic Control

310 Industrial Ave  
Danville VA 24541

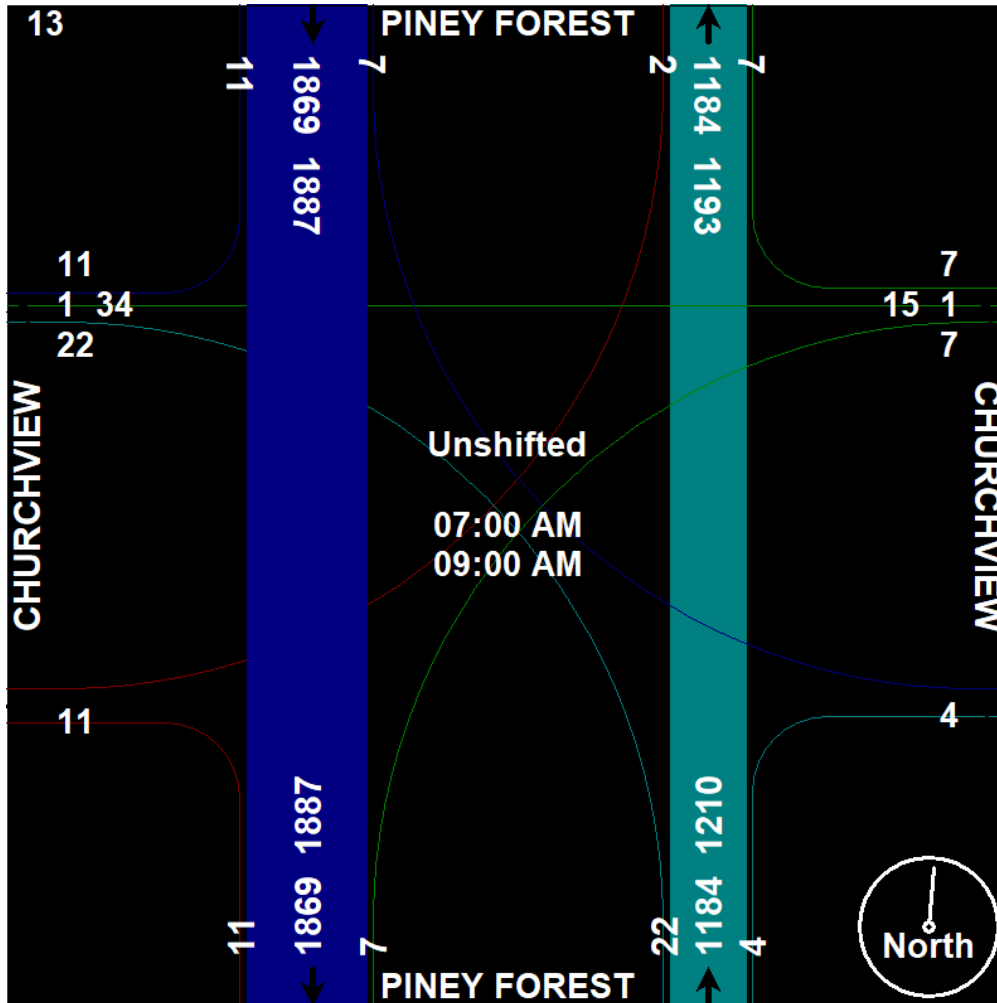
## Groups Printed- Unshifted

	PINEY FOREST From North					CHURCHVIEW From East					PINEY FOREST From South					CHURCHVIEW From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	11	1869	7	0	1887	7	1	7	0	15	4	1184	22	0	1210	11	0	2	0	13	3125
Apprch %	0.6	99	0.4	0		46.7	6.7	46.7	0		0.3	97.9	1.8	0		84.6	0	15.4	0		
Total %	0.4	59.8	0.2	0	60.4	0.2	0	0.2	0	0.5	0.1	37.9	0.7	0	38.7	0.4	0	0.1	0	0.4	



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310 Industrial Ave  
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Default Comments

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## Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	PINEY FOREST From North					REDWOOD DR From East					PINEY FOREST From South					CHURCHVIEW From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 AM	0	245	1	0	246	1	0	1	0	2	1	269	0	0	270	1	0	0	0	1	519
04:15 AM	0	234	0	0	234	1	0	1	0	2	1	288	5	0	294	1	0	1	0	2	532
04:30 AM	0	229	5	0	234	0	0	1	0	1	0	290	1	0	291	0	0	3	0	3	529
04:45 AM	0	238	1	0	239	0	0	0	0	0	1	287	0	0	288	1	0	1	0	2	529
Total	0	946	7	0	953	2	0	3	0	5	3	1134	6	0	1143	3	0	5	0	8	2109
05:00 AM	0	271	7	0	278	3	0	3	0	6	1	348	1	0	350	1	0	1	0	2	636
05:15 AM	0	256	1	0	257	2	0	1	0	3	1	315	2	0	318	2	0	1	0	3	581
05:30 AM	1	215	2	0	218	0	0	0	0	0	1	277	1	0	279	0	0	0	0	0	497
05:45 AM	0	219	1	0	220	0	0	0	0	0	0	275	0	0	275	0	0	0	0	0	495
Total	1	961	11	0	973	5	0	4	0	9	3	1215	4	0	1222	3	0	2	0	5	2209

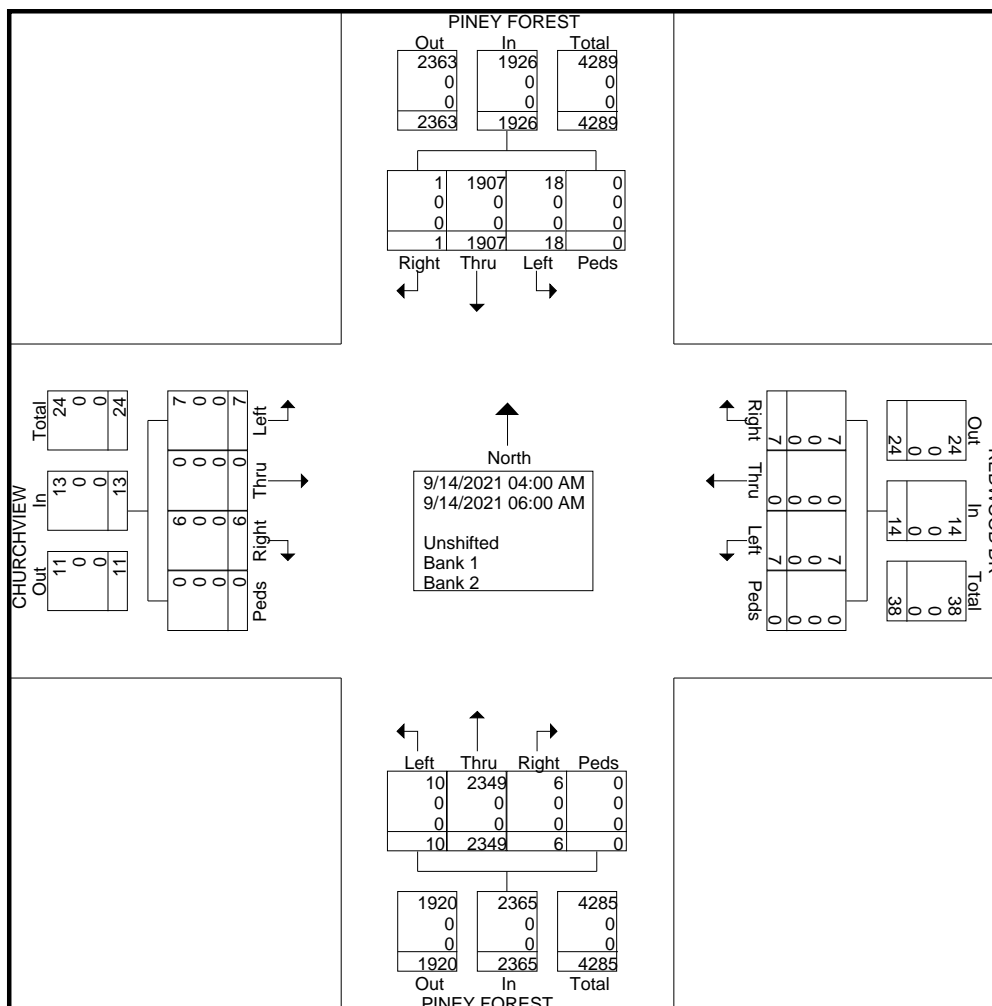
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# City Of Danville VA Traffic Control

310 Industrial Ave  
Danville VA 24541

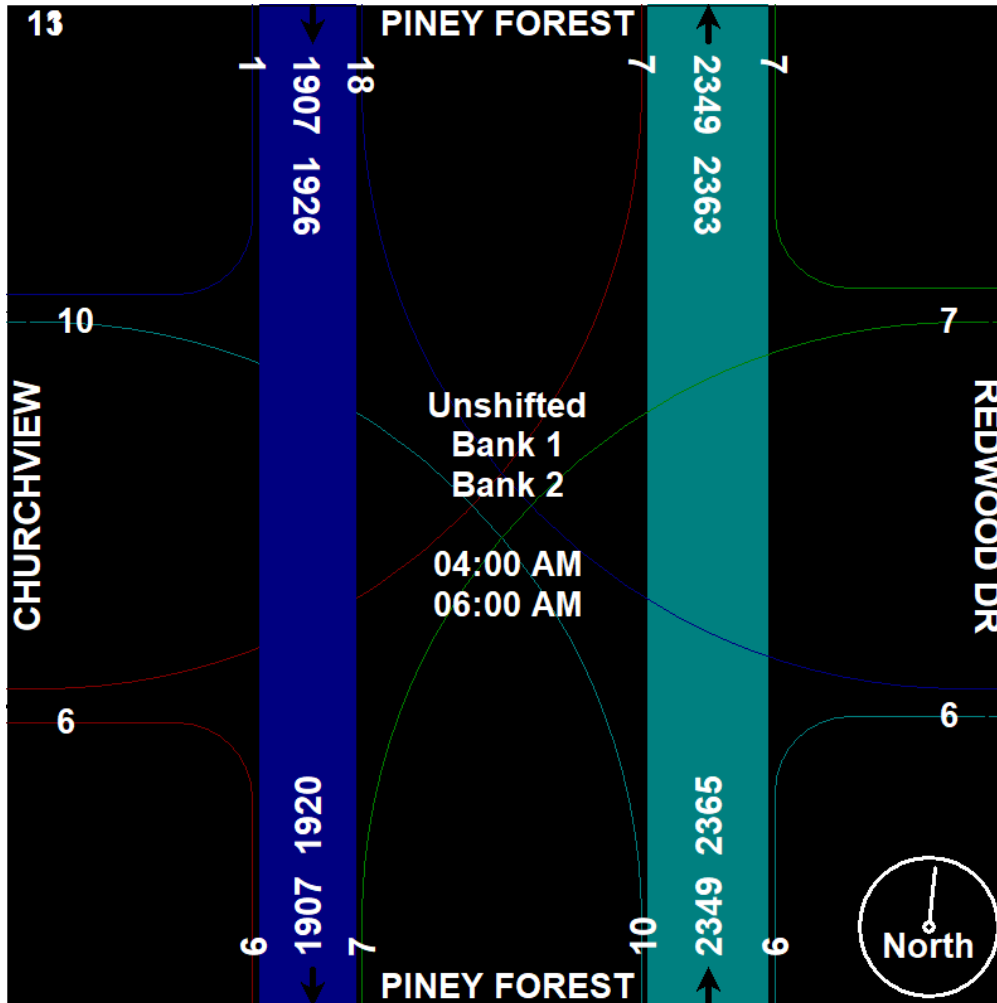
## Groups Printed- Unshifted - Bank 1 - Bank 2

	PINEY FOREST From North					REDWOOD DR From East					PINEY FOREST From South					CHURCHVIEW From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	1	1907	18	0	1926	7	0	7	0	14	6	2349	10	0	2365	6	0	7	0	13	4318
Apprch %	0.1	99	0.9	0		50	0	50	0		0.3	99.3	0.4	0		46.2	0	53.8	0		
Total %	0	44.2	0.4	0	44.6	0.2	0	0.2	0	0.3	0.1	54.4	0.2	0	54.8	0.1	0	0.2	0	0.3	
Unshifted	1	1907	18	0	1926	7	0	7	0	14	6	2349	10	0	2365	6	0	7	0	13	4318
% Unshifted	100	100	100	0	100	100	0	100	0	100	100	100	100	0	100	100	0	100	0	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



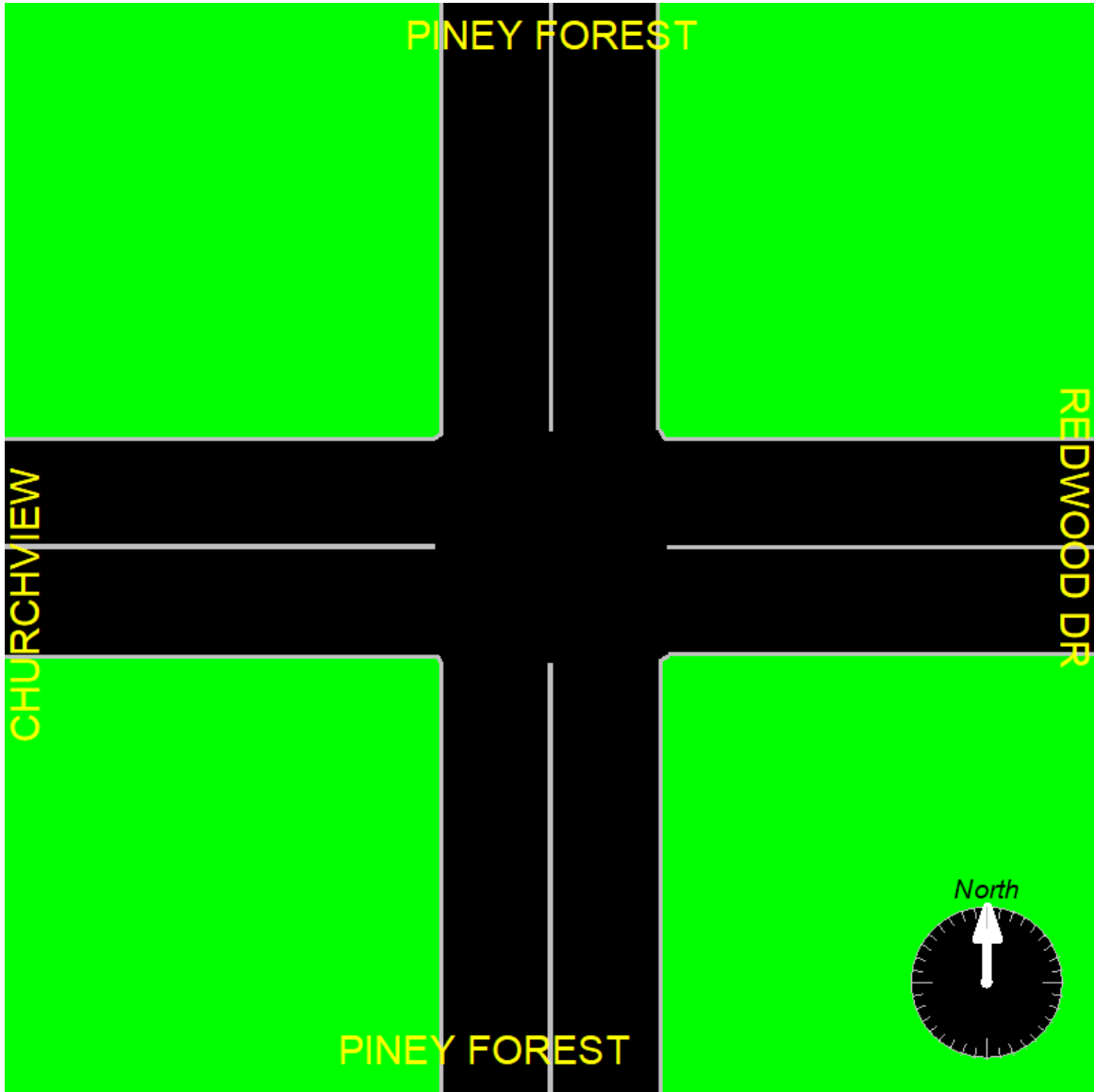
# City Of Danville VA Traffic Control

310 Industrial Ave  
Danville VA 24541



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310 Industrial Ave  
Danville VA 24541



B Robertson

7 Am 3 803

9/14/2021 PINEY FOREST RD				REDWOOD DR			PINEY FOREST RD			CHURCH VIEW AVE		
FROM		NORTH		From East			From South			From West		
	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left
7:00 AM												
7:15 AM												
7:30 AM												
7:45 AM												
8:00 AM												
8:15 AM												
8:30 AM												
9:00 AM												
PEDS		4:00						5:40				
TOTAL												
9/14/2021 PINEY FOREST RD				REDWOOD DR			PINEY FOREST RD			CHURCH VIEW AVE		
FROM NORTH		From East			From South			From West				
	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK	TRUCK
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left
4:00 PM												
4:15 PM*												
4:30 PM												
4:45 PM												
5:00 PM												
5:15 PM												
5:30 PM												
5:45 PM												
6:00 PM												
TOTAL												

## Appendix B Traffic Volume Development Memo

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MEMORANDUM

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TO: DAVID COOK  
CC: MICHAEL ARMBRISTER, WPPDC  
JOE BONANO, WPPDC  
BILL WUENSCH, EPR, P.C.  
WEI HE, EPR, P.C.

FROM: JEANIE ALEXANDER, P.E.

ORGANIZATION: VDOT

DATE: OCTOBER 26, 2021

PHONE NUMBER:

SENDER'S REFERENCE NUMBER:

RE: PINEY FOREST ROAD TRAFFIC VOLUME DEVELOPMENT

YOUR REFERENCE NUMBER:

URGENT     FOR YOUR USE     PLEASE COMMENT     PLEASE REPLY     PLEASE RECYCLE

---

## Introduction

The Danville Metropolitan Planning Organization is currently studying the 2.5-mile portion of Piney Forest Road between Franklin Turnpike, at the north, to Holt Garrison Parkway, at the south. The purpose of the Piney Forest Road Corridor Study is to identify strategies and improvements to address existing and future congestion, safety concerns, and multimodal needs.

The study includes detailed analysis of the following intersections.

1. Franklin Turnpike and Piney Forest Road
2. Woodside Drive and Piney Forest Road
3. Nelson Avenue/Nor Dan Drive and Piney Forest Road
4. Arnett Boulevard and Piney Forest Road
5. Ash Street and Piney Forest Road
6. Beavers Mill Road/Wendell Scott Drive and Piney Forest Road
7. Deer Run Road
8. Old Piney Forest Road/Piney Forest Shopping Center and Piney Forest Road
9. Pineview Drive/Audubon Drive and Piney Forest Road
10. Redwood Drive and Piney Forest Road
11. Churchview Drive and Piney Forest Road
12. Parker Road/Falwell Court and Piney Forest Road
13. Holt Garrison Parkway/Boxwood Court and Central Boulevard

This memorandum documents the traffic data and methodology used to develop:

- 2021 AM and PM peak hour traffic volumes for the study intersections that reflect pre-COVID traffic levels and
- Growth rates to determine the 2045 future traffic volumes.



## COVID Adjustments

A comparison of Pre-COVID 2019 VDOT traffic counts to the turning movement counts collected in September 2021, is shown in **Table 1**. The 2019 VDOT hourly volumes shown in Table 1 are based on the VDOT AADTs and K factors.

**Table 1 2019 and 2021 Traffic Volumes**

Road	Section	Relationship to Study Intersections	2019 VDOT Peak Hour Volume	AM Peak		PM Peak	
				2021 Count Volume	2021 Count/2019 VDOT Ratio	2021 Count Volume	2021 Count/2019 VDOT Ratio
Piney Forest Road	North of Franklin Turnpike	North of Franklin Turnpike	1288	936	0.73	1368	1.06
	Arnett Boulevard to Franklin Turnpike	South of Franklin Turnpike	2349	1667	0.71	2253	0.96
		North of Woodside Drive		1867	0.79	2309	0.98
		South of Woodside Drive		1880	0.80	2352	1.00
		North of Nelson Avenue		1923	0.82	2507	1.07
		South of Nelson Avenue		1846	0.79	2270	0.97
		North of Arnett Boulevard		1800	0.77	2481	1.06
		Wendell Scott Drive to Arnett Boulevard		South of Arnett Boulevard	2349	1806	0.77
	North of Ash Street		1718	0.73		2415	1.03
	South of Ash Street		1759	0.75		2403	1.02
	North of Wendell Scott Drive		1798	0.77		2450	1.04
	Audubon Drive to Wendell Scott Drive	South of Wendell Scott Drive	2225	1797	0.81	2417	1.09
		North of Deer Run Road		1800	0.81	2183	0.98
		South of Deer Run Road		1813	0.81	2197	0.99
		North of Old Piney Forest Road		1804	0.81	2415	1.09
		South of Old Piney Forest Road		1851	0.83	2508	1.13
		North of Audubon Drive		1837	0.83	2295	1.03
	Central Boulevard to Audubon Drive	South of Audubon Drive	2550	1793	0.70	2308	0.91
		North of Redwood Drive		1718	0.67	2227	0.87
		South of Redwood Drive		1724	0.68	2219	0.87
		North of Churchview Drive		1724	0.68	2219	0.87
		South of Churchview Drive		1733	0.68	2223	0.87
		North of Parker Road		1767	0.69	2501	0.98
South of Parker Road		1799		0.71	2547	1.00	
Central Boulevard	South of Piney Forest Road	North of Holt Garrison Parkway	2465	1752	0.71	2381	0.97
		South of Holt Garrison Parkway		1671	0.68	2113	0.86
				AVERAGE	<b>0.75</b>	AVERAGE	<b>0.99</b>

As shown, the 2021 morning peak hour volumes, counted in September, range from 67% to 83% of the pre-COVID 2019 calculated peak hour volumes and the afternoon peak volumes range from 86% to 113% of the pre-COVID 2019 calculated peak hour volumes. Understanding that the day-to-day variation in traffic volumes can be as much as 15%, **no COVID adjustments are recommended for the afternoon peak hour traffic volumes.** Further recognizing that the volumes calculated using the K factor and AADT represent the peak hour, in this case the afternoon peak, a COVID factor that increases the AM peak hour volumes is appropriate but the volumes would not be expected to reach the same level as those calculated using the AADTs and K factors. For the morning peak hour, **a COVID factor of 1.08 is recommended for the morning peak hour traffic volumes.**

## Future Growth Rate

The recommended annual growth rates for the study roadways were determined based on the historical VDOT data (2011 – 2019), Regional Travel Demand Model (Horizon Year 2045), and VDOT SPS data shown in **Table 2.**

**Table 2 Growth Rate Data**

Road Name	From	To	Growth Rate (Percent)		
			Historic Trend (2011-2019)	Travel Demand Model	VDOT SPS
Piney Forest Road	Franklin Turnpike	North Main Street	0.85	0.69	0.39
	Beavers Mill Road/ Wendell Scott Drive	Franklin Turnpike	0.43	0.18	0.8
	Holt Garrison Parkway/Boxwood Court	Beavers Mill Road/ Wendell Scott Drive	0.0	0.026	0.71
	Riverside Drive	Holt Garrison Parkway/Boxwood Court	0.77	-0.04	0.19
W Franklin Turnpike	Anhurst Drive	Piney Forest Road	1.48	-0.28	2.19
E Franklin Turnpike	North Main Street	Piney Forest Road	n/a	-0.47	0.08
Nor Dan Drive	Parrish Road	Piney Forest Road	6.55	0.22	0.5
Arnett Boulevard	Wendell Scott Drive	Piney Forest Road	-2.15	-0.78	n/a
Beavers Mill Road	West Danville City Limits	Piney Forest Road	0.28	-0.03	1.01
Wendell Scott Drive	Arnett Boulevard	Piney Forest Road	1.35	0.73	0.49
Audubon Drive	Woodview Drive	Piney Forest Road	-1.15	-0.61	0.5
Falwell Court	Woodberry Avenue	Piney Forest Road	n/a	-0.54	n/a

As shown above, the growth rate on Piney Forest Road varies between 0.0% and 0.85%. Most of the side street growth rates vary between -0.78% and 1.35% with a few outliers. Considering this data, the roadway network, and the potential for development the following growth rates are recommended.

- 0.75%: Piney Forest Road
- 1.5%: West Franklin Turnpike
- 0.5%: East Franklin Turnpike, Nor Dan Drive, Arnett Boulevard, Beavers Mill Road, Wendell Scott Drive, Audubon Drive, Parker Road, Falwell Court, Redwood Drive and Boxwood Court

**End of Memorandum**

## Appendix C Existing 2021 Synchro Reports

**2021 Existing**

Approach	Movement	Effective Storage	AM			PM		
			LOS	Delay (sec)	Max Queue (feet)	LOS	Delay (sec)	Max Queue (feet)
<b>1. Piney Forest Road/Franklin Turnpike</b> <span style="float:right"><i>Signalized</i></span>								
Franklin Turnpike	EBL	125	E	70.7	115	E	66.4	124
	EBT	-	D	41.5	243	D	51.1	199
	EBR	435	D	48.6	265	E	57.6	174
Franklin Turnpike	WBL	130	E	68.0	128	E	70.0	130
	WBT	-	C	31.4	212	D	49.3	295
	WBR	75	C	26.7	53	D	36.5	75
Piney Forest Road	NBL	360	D	52.3	167	E	63.9	359
	NBT	-	C	32.4	203	D	37.1	653
	NBR	220	A	0.1	22	A	0.1	198
Piney Forest Road	SBL	310	E	69.4	58	E	69.1	125
	SBT	-	D	40.7	304	D	42.3	259
	SBR	490	A	0.1	0	A	0.1	0
Intersection Overall			D	41.6		D	47.8	
<b>2. Piney Forest Road/Nelson Avenue/Nor-Dan Drive</b> <span style="float:right"><i>Signalized</i></span>								
Nelson Avenue	EBL/T/R	-	E	70.1	62	E	69.3	107
Nor Dan Drive	WBL/T	-	E	68.5	128	E	70.3	253
	WBR	-	D	51.0	102	D	42.2	263
Piney Forest Road	NBL	150	E	76.4	37	F	104.7	91
	NBT	-	A	6.5	159	B	13.9	361
	NBR	245	A	0.1	0	A	0.1	244
Piney Forest Road	SBL	215	E	68.4	181	E	66.1	214
	SBT	350	B	11.9	268	B	19.1	320
	SBR	185	A	0.0	0	A	0.0	129
Intersection Overall			B	16.2		C	24.8	
<b>3. Piney Forest Road/Arnett Boulevard</b> <span style="float:right"><i>Signalized</i></span>								
Arnett Boulevard	WBL	-	E	66.3	185	E	64.7	137
	WBR	85	E	58.4	85	E	60.7	85
Piney Forest Road	NBT	-	B	11.1	191	B	10.5	195
	NBT/R	-	B	11.1	214	B	10.5	201
Piney Forest Road	SBL	150	A	2.0	93	B	15.9	124
	SBT	-	A	3.1	192	A	4.3	214
Intersection Overall			A	9.6		B	11.0	
<b>4. Piney Forest Road/Beavers Mill Road/Wendell Scott Drive</b> <span style="float:right"><i>Signalized</i></span>								
Beavers Mill Road	EBL/T/R	-	E	70.2	308	E	69.7	202
Wendell Scott Drive	WBL/T	-	D	52.7	146	E	58.4	133
	WBR	90	D	49.9	84	E	55.3	88
Piney Forest Road	NBL	250	E	74.6	43	E	75.0	145
	NBT	-	B	10.9	212	A	2.9	260
	NBR	100	A	0.0	86	A	0.0	14
Piney Forest Road	SBL	285	F	88.5	49	E	70.5	59
	SBT	-	B	10.4	318	A	7.4	262
	SBR	100	A	0.0	79	A	0.1	91
Intersection Overall			B	17.2		B	12.0	

**2021 Existing**

Approach	Movement	Effective Storage	AM			PM		
			LOS	Delay (sec)	Max Queue (feet)	LOS	Delay (sec)	Max Queue (feet)
<b>5. Piney Forest Road/Piney Forest Shopping Center/Old Piney Forest Road</b> <span style="float:right"><i>Signalized</i></span>								
Piney Forest Shopping Center	EBL/T	-	E	69.6	35	E	70.2	91
	EBR	155	E	67.2	25	E	64.8	43
Old Piney Forest Road	WBL/T/R	150	E	67.2	106	E	65.2	145
Piney Forest Road	NBL	275	E	72.8	31	F	110.7	42
	NBT	-	A	2.3	103	A	2.4	198
	NBT/R	-	A	2.3	125	A	2.4	205
Piney Forest Road	SBL	210	A	0.0	0	E	60.8	27
	SBT	-	A	2.3	127	B	16.2	307
	SBT/R	-	A	2.3	137	B	16.2	319
Intersection Overall			A	3.9		B	11.1	
<b>6. Piney Forest Road/Pineview Drive/Audubon Drive</b> <span style="float:right"><i>Signalized</i></span>								
Pineview Drive	EBL/T/R	-	E	75.8	37	E	69.3	40
Audubon Drive	WBL/T	-	E	68.4	149	E	67.4	107
	WBR	170	E	56.3	88	E	56.8	74
Piney Forest Road	NBL	95	A	6.9	7	A	1.6	29
	NBT	-	A	9.2	145	A	5.5	166
	NBT/R	-	A	9.2	151	A	5.5	162
Piney Forest Road	SBL	170	A	0.6	56	A	8.2	84
	SBT	-	A	3.4	115	A	7.0	143
	SBT/R	-	A	3.4	114	A	7.0	153
Intersection Overall			A	9.4		A	8.8	
<b>7. Piney Forest Road/Parker Road/Falwell Court</b> <span style="float:right"><i>Signalized</i></span>								
Parker Road	EBL/T	-	E	66.7	104	E	66.7	93
	EBR	75	E	63.6	75	E	63.8	73
Falwell Court	WBL/T	-	E	75.8	41	E	68.1	82
	WBR	50	A	0.0	53	A	0.0	45
Piney Forest Road	NBL	190	E	65.1	89	F	87.0	97
	NBT	-	A	4.1	122	A	9.9	153
	NBR	600	A	4.1	16	A	4.9	4
Piney Forest Road	SBL	135	F	96.2	14	E	64.5	16
	SBT	-	A	2.1	167	B	14.7	322
	SBT/R	-	A	2.1	189	B	14.7	326
Intersection Overall			A	6.2		B	15.3	
<b>8. Central Boulevard/Holt Garrison Parkway/Boxwood Court</b> <span style="float:right"><i>Signalized</i></span>								
Holt Garrison Parkway	EBL	130	E	66.9	34	E	67.8	129
	EBL/T	-	E	66.7	94	E	67.8	285
	EBR	315	E	60.7	42	D	51.8	35
Boxwood Court	WBL	135	E	64.8	92	E	60.2	134
	WBT/R	225	E	63.6	89	E	66.3	198
Central Boulevard	NBL	395	E	73.5	61	E	68.6	59
	NBT	-	B	12.5	205	B	19.3	369
	NBR	600	A	6.7	52	A	8.1	49
Central Boulevard	SBL	270	E	79.2	171	E	55.9	166
	SBT	-	A	5.5	207	B	17.4	271
	SBR	290	A	0.1	0	A	0.1	128
Intersection Overall			B	14.1		C	24.8	

**2021 Existing**

Approach	Movement	Effective Storage	AM			PM		
			LOS	Delay (sec)	Max Queue (feet)	LOS	Delay (sec)	Max Queue (feet)
<i>9. Piney Forest Road/Woodside Drive</i> <span style="float:right"><i>Unsignalized</i></span>								
Woodside Drive	EBL/R	-	C	21.1	53	C	23.8	127
Piney Forest Road	NBL	75	B	14.4	58	B	11.2	60
	NBT	350	A	0.0	36	A	0.0	10
Piney Forest Road	SBT	-	A	0.0	58	A	0.0	3
	SBT/R	-	A	0.0	65	A	0.0	20
<i>10. Piney Forest Road/Ash Street</i> <span style="float:right"><i>Unsignalized</i></span>								
Ash Street	EBL	-	E	37.8	134	D	25.7	74
	EBR	40	C	17.2	40	B	12.8	48
Piney Forest Road	NBL	100	B	12.2	39	B	10.5	29
	NBT	-	A	0.0	0	A	0.0	72
Piney Forest Road	SBT	-	A	0.0	0	A	0.0	69
	SBT/R	-	A	0.0	5	A	0.0	76
<i>11. Piney Forest Road/Deer Run Road</i> <span style="float:right"><i>Unsignalized</i></span>								
Deer Run Road	EBL/T	-	F	171.9	50	F	163.0	78
	EBR	100	C	17.4	78	B	13.1	74
Parking Lot	WBL/T/R	-	D	30.2	32	A	0.0	0
Piney Forest Road	NBL	100	B	14.4	66	B	10.5	24
	NBT	-	A	0.0	8	A	0.0	23
	NBT/R	-	A	0.0	28	A	0.0	38
Piney Forest Road	SBL	100	A	0.0	0	A	0.0	0
	SBT	-	A	0.0	50	A	0.0	37
	SBT/R	-	A	0.0	55	A	0.0	45
<i>12. Piney Forest Road/Redwood Drive</i> <span style="float:right"><i>Unsignalized</i></span>								
Redwood Drive	WBL/R	-	C	18.2	37	C	22.2	39
Piney Forest Road	NBT	100	A	0.0	0	A	0.0	37
	NBT/R	100	A	0.0	0	A	0.0	42
Piney Forest Road	SBL	100	A	9.5	28	B	13.3	45
	SBT	-	A	0.0	0	A	0.0	14
<i>13. Piney Forest Road/Churchview Drive</i> <span style="float:right"><i>Unsignalized</i></span>								
Churchview Drive	EBL/R	-	C	15.6	35	C	20.1	30
Piney Forest Road	NBL	100	B	11.9	32	B	13.5	38
	NBT	-	A	0.0	0	A	0.0	51
Piney Forest Road	SBT	100	A	0.0	0	A	0.0	20
	SBT/R	100	A	0.0	0	A	0.0	30

# HCM Signalized Intersection Capacity Analysis

## 1: US 29/Piney Forest Rd & Franklin Turnpike

10/19/2021
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	32	327	492	127	160	17	222	320	75	22	564	56	
Future Volume (vph)	32	327	492	127	160	17	222	320	75	22	564	56	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.0	6.0	6.0	5.5	6.0	6.5	7.0	6.0	4.0	6.5	6.0	4.0	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1752	3438	2814	1752	3374	1336	3400	3438	1534	1805	3539	1450	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1752	3438	2814	1752	3374	1336	3400	3438	1534	1805	3539	1450	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	34	352	529	137	172	18	239	344	81	24	606	60	
RTOR Reduction (vph)	0	0	0	0	0	11	0	0	0	0	0	0	
Lane Group Flow (vph)	34	352	529	137	172	7	239	344	81	24	606	60	
Confl. Peds. (#/hr)	2			1		3			1	3		2	
Heavy Vehicles (%)	3%	5%	1%	3%	7%	19%	3%	5%	4%	0%	2%	10%	
Turn Type	Prot	NA	Prot	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	
Protected Phases	1	6	6	5	2	3	7	4		3	8		
Permitted Phases						2			Free			Free	
Actuated Green, G (s)	5.7	38.5	38.5	16.4	48.7	53.8	15.6	56.0	140.0	5.1	45.0	140.0	
Effective Green, g (s)	5.7	38.5	38.5	16.4	48.7	53.8	15.6	56.0	140.0	5.1	45.0	140.0	
Actuated g/C Ratio	0.04	0.28	0.28	0.12	0.35	0.38	0.11	0.40	1.00	0.04	0.32	1.00	
Clearance Time (s)	6.0	6.0	6.0	5.5	6.0	6.5	7.0	6.0		6.5	6.0		
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	3.0	4.0	7.0		3.0	5.0		
Lane Grp Cap (vph)	71	945	773	205	1173	513	378	1375	1534	65	1137	1450	
v/s Ratio Prot	0.02	0.10	c0.19	c0.08	0.05	0.00	c0.07	0.10		0.01	c0.17		
v/s Ratio Perm						0.00			0.05			0.04	
v/c Ratio	0.48	0.37	0.68	0.67	0.15	0.01	0.63	0.25	0.05	0.37	0.53	0.04	
Uniform Delay, d1	65.7	41.0	45.3	59.2	31.4	26.7	59.5	28.0	0.0	65.9	38.9	0.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.82	1.14	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.0	0.5	3.2	8.8	0.1	0.0	3.8	0.4	0.1	3.5	1.8	0.1	
Delay (s)	70.7	41.5	48.6	68.0	31.4	26.7	52.3	32.4	0.1	69.4	40.7	0.1	
Level of Service	E	D	D	E	C	C	D	C	A	E	D	A	
Approach Delay (s)		46.7			46.5			35.6			38.2		
Approach LOS		D			D			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			41.6		HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio			0.62										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)				25.0				
Intersection Capacity Utilization			64.4%		ICU Level of Service				C				
Analysis Period (min)			15										

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: US 29/Piney Forest Rd & Nelson Ave/Nor-Dan Dr

10/19/2021

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	3	3	5	52	0	119	5	540	62	82	1329	3	
Future Volume (vph)	3	3	5	52	0	119	5	540	62	82	1329	3	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0			5.5	6.0	6.0	6.5	4.0	6.0	6.5	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frbp, ped/bikes		0.96			1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1521			1736	1515	1805	3438	1519	1787	3505	1577	
Flt Permitted		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1521			1736	1515	1805	3438	1519	1787	3505	1577	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	
Adj. Flow (vph)	3	3	6	59	0	135	6	614	70	93	1510	3	
RTOR Reduction (vph)	0	6	0	0	0	114	0	0	0	0	0	0	
Lane Group Flow (vph)	0	6	0	0	59	21	6	614	70	93	1510	3	
Confl. Peds. (#/hr)	7		7	1		1	7		1	1		7	
Heavy Vehicles (%)	0%	0%	20%	4%	0%	6%	0%	5%	5%	1%	3%	0%	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	
Protected Phases	3	3		4	4	5	1	6		5	2		
Permitted Phases						4			Free			Free	
Actuated Green, G (s)		3.8			8.9	21.5	1.4	92.7	140.0	12.6	103.9	140.0	
Effective Green, g (s)		3.8			8.9	21.5	1.4	92.7	140.0	12.6	103.9	140.0	
Actuated g/C Ratio		0.03			0.06	0.15	0.01	0.66	1.00	0.09	0.74	1.00	
Clearance Time (s)		4.0			5.5	6.0	6.0	6.5		6.0	6.5		
Vehicle Extension (s)		5.0			3.0	3.0	3.0	5.0		3.0	5.0		
Lane Grp Cap (vph)		41			110	232	18	2276	1519	160	2601	1577	
v/s Ratio Prot		c0.00			c0.03	0.01	0.00	0.18		c0.05	c0.43		
v/s Ratio Perm						0.01			0.05			0.00	
v/c Ratio		0.15			0.54	0.09	0.33	0.27	0.05	0.58	0.58	0.00	
Uniform Delay, d1		66.5			63.5	50.8	68.8	9.7	0.0	61.2	8.2	0.0	
Progression Factor		1.00			1.00	1.00	0.96	0.63	1.00	1.04	1.35	1.00	
Incremental Delay, d2		3.5			5.0	0.2	10.3	0.3	0.1	4.8	0.9	0.0	
Delay (s)		70.1			68.5	51.0	76.4	6.5	0.1	68.4	11.9	0.0	
Level of Service		E			E	D	E	A	A	E	B	A	
Approach Delay (s)		70.1			56.3			6.4			15.2		
Approach LOS		E			E			A			B		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			16.2									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	27.0
Intersection Capacity Utilization			66.1%									ICU Level of Service	C
Analysis Period (min)			15										

c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

## 3: US 29/Piney Forest Rd & Arnett Blvd Ext

10/19/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	81	56	624	62	81	1183
Future Volume (vph)	81	56	624	62	81	1183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	6.0		5.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	1485	3387		1752	3505
Flt Permitted	0.95	1.00	1.00		0.33	1.00
Satd. Flow (perm)	1752	1485	3387		609	3505
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	90	62	693	69	90	1314
RTOR Reduction (vph)	0	56	3	0	0	0
Lane Group Flow (vph)	90	6	759	0	90	1314
Confl. Peds. (#/hr)	4	4		4	4	
Heavy Vehicles (%)	3%	6%	5%	4%	3%	3%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	12.5	12.5	103.2		115.0	115.0
Effective Green, g (s)	12.5	12.5	103.2		115.0	115.0
Actuated g/C Ratio	0.09	0.09	0.74		0.82	0.82
Clearance Time (s)	5.5	5.5	6.0		5.0	7.0
Vehicle Extension (s)	3.0	3.0	5.0		4.0	3.0
Lane Grp Cap (vph)	156	132	2496		563	2879
v/s Ratio Prot	c0.05		0.22		0.01	c0.37
v/s Ratio Perm		0.00			0.12	
v/c Ratio	0.58	0.04	0.30		0.16	0.46
Uniform Delay, d1	61.2	58.3	6.2		2.7	3.6
Progression Factor	1.00	1.00	1.73		0.66	0.73
Incremental Delay, d2	5.1	0.1	0.3		0.2	0.5
Delay (s)	66.3	58.4	11.1		2.0	3.1
Level of Service	E	E	B		A	A
Approach Delay (s)	63.1		11.1			3.0
Approach LOS	E		B			A






















### Intersection Summary

HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: US 29/Piney Forest Rd & Beavers Mill Rd/Wendell Scott Dr

10/19/2021

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	55	42	70	21	25	23	16	595	23	14	1216	39		
Future Volume (vph)	55	42	70	21	25	23	16	595	23	14	1216	39		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)		6.0			6.0	6.0	5.5	6.0	4.0	5.5	6.0	4.0		
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Frt		0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00		
Satd. Flow (prot)		1666			1733	1468	1805	3505	1357	1805	3539	1495		
Flt Permitted		0.87			0.71	1.00	0.95	1.00	1.00	0.95	1.00	1.00		
Satd. Flow (perm)		1471			1263	1468	1805	3505	1357	1805	3539	1495		
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85		
Adj. Flow (vph)	65	49	82	25	29	27	19	700	27	16	1431	46		
RTOR Reduction (vph)	0	20	0	0	0	23	0	0	0	0	0	0		
Lane Group Flow (vph)	0	176	0	0	54	4	19	700	27	16	1431	46		
Heavy Vehicles (%)	10%	0%	6%	5%	9%	10%	0%	3%	19%	0%	2%	8%		
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Free	Prot	NA	Free		
Protected Phases		4			4		5	2		1		6		
Permitted Phases	4			4		4			Free			Free		
Actuated Green, G (s)		22.0			22.0	22.0	4.8	97.3	140.0	3.2	95.7	140.0		
Effective Green, g (s)		22.0			22.0	22.0	4.8	97.3	140.0	3.2	95.7	140.0		
Actuated g/C Ratio		0.16			0.16	0.16	0.03	0.69	1.00	0.02	0.68	1.00		
Clearance Time (s)		6.0			6.0	6.0	5.5	6.0		5.5	6.0			
Vehicle Extension (s)		3.0			3.0	3.0	3.0	5.0		3.0	5.0			
Lane Grp Cap (vph)		231			198	230	61	2435	1357	41	2419	1495		
v/s Ratio Prot							c0.01	0.20		0.01	c0.40			
v/s Ratio Perm		c0.12			0.04	0.00			0.02			c0.03		
v/c Ratio		0.76			0.27	0.02	0.31	0.29	0.02	0.39	0.59	0.03		
Uniform Delay, d1		56.5			52.0	49.9	66.0	8.1	0.0	67.4	11.8	0.0		
Progression Factor		1.00			1.00	1.00	1.09	1.30	1.00	1.23	0.80	1.00		
Incremental Delay, d2		13.7			0.7	0.0	2.8	0.3	0.0	5.6	1.0	0.0		
Delay (s)		70.2			52.7	49.9	74.6	10.9	0.0	88.5	10.4	0.0		
Level of Service		E			D	D	E	B	A	F	B	A		
Approach Delay (s)		70.2			51.8			12.1			10.9			
Approach LOS		E			D			B			B			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			17.2									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.61											
Actuated Cycle Length (s)			140.0								17.5			
Intersection Capacity Utilization			59.8%										ICU Level of Service	B
Analysis Period (min)			15											
c Critical Lane Group														

# HCM Signalized Intersection Capacity Analysis

## 5: US 29/Piney Forest Rd & Piney Forest Shopping Center/Old Piney Forest Rd

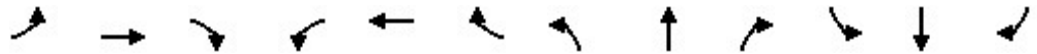
10/19/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↔		↖	↕		↖	↕	↗
Traffic Volume (vph)	5	0	2	31	1	6	4	715	31	0	1215	6
Future Volume (vph)	5	0	2	31	1	6	4	715	31	0	1215	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		5.5	6.0			6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95			0.95	
Frbp, ped/bikes		1.00	1.00		1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00			1.00	
Frt		1.00	0.85		0.98		1.00	0.99			1.00	
Flt Protected		0.95	1.00		0.96		0.95	1.00			1.00	
Satd. Flow (prot)		1805	1615		1731		1805	3452			3537	
Flt Permitted		0.95	1.00		0.96		0.95	1.00			1.00	
Satd. Flow (perm)		1805	1615		1731		1805	3452			3537	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	0	2	35	1	7	5	812	35	0	1381	7
RTOR Reduction (vph)	0	0	2	0	6	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	6	0	0	37	0	5	848	0	0	1388	0
Confl. Peds. (#/hr)	1			1		2			1	2		1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	17%	0%	4%	0%	0%	2%	0%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		2.8	2.8		7.4		1.4	111.8			104.9	
Effective Green, g (s)		2.8	2.8		7.4		1.4	111.8			104.9	
Actuated g/C Ratio		0.02	0.02		0.05		0.01	0.80			0.75	
Clearance Time (s)		6.0	6.0		6.0		5.5	6.0			6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	5.0			5.0	
Lane Grp Cap (vph)		36	32		91		18	2756			2650	
v/s Ratio Prot		c0.00			c0.02		0.00	c0.25			c0.39	
v/s Ratio Perm			0.00									
v/c Ratio		0.17	0.00		0.41		0.28	0.31			0.52	
Uniform Delay, d1		67.5	67.2		64.2		68.8	3.8			7.2	
Progression Factor		1.00	1.00		1.00		0.94	0.54			0.24	
Incremental Delay, d2		2.2	0.0		3.0		8.0	0.3			0.6	
Delay (s)		69.6	67.2		67.2		72.8	2.3			2.3	
Level of Service		E	E		E		E	A			A	
Approach Delay (s)		69.0			67.2			2.7			2.3	
Approach LOS		E			E			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			3.9									A
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			140.0							23.5		
Intersection Capacity Utilization			60.4%									B
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 6: US 29/Piney Forest Rd & Pineview Dr/Audobon Dr

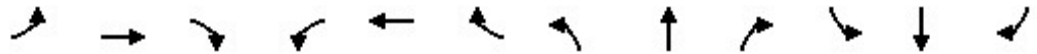
10/19/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕	↗	↖	↕	↕	↖	↗		
Traffic Volume (vph)	3	1	2	54	3	80	1	696	32	54	1151	0	
Future Volume (vph)	3	1	2	54	3	80	1	696	32	54	1151	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0		
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95		
Frbp, ped/bikes		1.00			1.00	0.99	1.00	1.00		1.00	1.00		
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00		
Frt		0.95			1.00	0.85	1.00	0.99		1.00	1.00		
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1770			1814	1519	1805	3451		1769	3505		
Flt Permitted		0.98			0.95	1.00	0.20	1.00		0.31	1.00		
Satd. Flow (perm)		1770			1814	1519	377	3451		581	3505		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	3	1	2	59	3	88	1	765	35	59	1265	0	
RTOR Reduction (vph)	0	2	0	0	0	79	0	1	0	0	0	0	
Lane Group Flow (vph)	0	4	0	0	62	9	1	799	0	59	1265	0	
Confl. Peds. (#/hr)				3		3			3	3			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	5%	0%	4%	0%	2%	3%	0%	
Turn Type	Split	NA		Split	NA	pm+ov	pm+pt	NA		pm+pt	NA		
Protected Phases	4	4		8	8	1	5	2		1	6		
Permitted Phases						8	2			6			
Actuated Green, G (s)		1.4			8.9	14.8	100.8	99.8		110.6	104.7		
Effective Green, g (s)		1.4			8.9	14.8	100.8	99.8		110.6	104.7		
Actuated g/C Ratio		0.01			0.06	0.11	0.72	0.71		0.79	0.75		
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0		
Vehicle Extension (s)		3.0			3.0	2.5	2.5	5.0		2.5	5.0		
Lane Grp Cap (vph)		17			115	225	281	2460		509	2621		
v/s Ratio Prot		c0.00			c0.03	0.00	0.00	0.23		c0.00	c0.36		
v/s Ratio Perm						0.00	0.00			0.09			
v/c Ratio		0.24			0.54	0.04	0.00	0.32		0.12	0.48		
Uniform Delay, d1		68.8			63.6	56.2	5.8	7.5		3.7	7.0		
Progression Factor		1.00			1.00	1.00	1.18	1.18		0.14	0.41		
Incremental Delay, d2		7.1			4.8	0.1	0.0	0.3		0.1	0.6		
Delay (s)		75.8			68.4	56.3	6.9	9.2		0.6	3.4		
Level of Service		E			E	E	A	A		A	A		
Approach Delay (s)		75.8			61.3			9.2			3.3		
Approach LOS		E			E			A			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			9.4		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.48										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)						24.0		
Intersection Capacity Utilization			56.8%		ICU Level of Service						B		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 7: US 29/Piney Forest Rd & Parker Rd/Falwell Ct

10/19/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↑↑	↗	↖	↖↗	
Traffic Volume (vph)	25	1	43	3	4	4	27	757	18	3	1094	25
Future Volume (vph)	25	1	43	3	4	4	27	757	18	3	1094	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	4.0	5.5	6.0	6.0	5.5	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1745	1495		1860	1292	1805	3471	1442	1805	3488	
Flt Permitted		0.95	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1745	1495		1860	1292	1805	3471	1442	1805	3488	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	27	1	46	3	4	4	29	814	19	3	1176	27
RTOR Reduction (vph)	0	0	44	0	0	0	0	0	5	0	1	0
Lane Group Flow (vph)	0	28	2	0	7	4	29	814	14	3	1202	0
Heavy Vehicles (%)	4%	0%	8%	0%	0%	25%	0%	4%	12%	0%	3%	9%
Turn Type	Split	NA	Perm	Split	NA	Free	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases			4			Free			6			
Actuated Green, G (s)		6.8	6.8		1.8	140.0	5.3	106.5	106.5	1.4	102.6	
Effective Green, g (s)		6.8	6.8		1.8	140.0	5.3	106.5	106.5	1.4	102.6	
Actuated g/C Ratio		0.05	0.05		0.01	1.00	0.04	0.76	0.76	0.01	0.73	
Clearance Time (s)		6.0	6.0		6.0		5.5	6.0	6.0	5.5	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)		84	72		23	1292	68	2640	1096	18	2556	
v/s Ratio Prot		c0.02			c0.00		c0.02	c0.23		0.00	c0.34	
v/s Ratio Perm			0.00			0.00			0.01			
v/c Ratio		0.33	0.03		0.30	0.00	0.43	0.31	0.01	0.17	0.47	
Uniform Delay, d1		64.4	63.5		68.5	0.0	65.9	5.2	4.0	68.7	7.6	
Progression Factor		1.00	1.00		1.00	1.00	0.93	0.73	1.00	1.34	0.19	
Incremental Delay, d2		2.3	0.2		7.4	0.0	4.1	0.3	0.0	4.0	0.6	
Delay (s)		66.7	63.6		75.8	0.0	65.1	4.1	4.1	96.2	2.1	
Level of Service		E	E		E	A	E	A	A	F	A	
Approach Delay (s)		64.8			48.3			6.1			2.3	
Approach LOS		E			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			6.2		HCM 2000 Level of Service				A			
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			140.0		Sum of lost time (s)				23.5			
Intersection Capacity Utilization			59.4%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct

10/19/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	10	4	31	22	8	6	665	77	86	1021	79
Future Volume (vph)	33	10	4	31	22	8	6	665	77	86	1021	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5		5.5	6.0	5.5	5.5	6.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1618	1703	1278	1752	1810		1203	3471	1569	1805	3505	1506
Flt Permitted	0.95	0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1618	1703	1278	1752	1810		1203	3471	1569	1805	3505	1506
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	39	12	5	37	26	10	7	792	92	102	1215	94
RTOR Reduction (vph)	0	0	5	0	9	0	0	0	28	0	0	0
Lane Group Flow (vph)	25	26	0	37	27	0	7	792	64	102	1215	94
Confl. Peds. (#/hr)	2		1	1		2	1		1	2		2
Heavy Vehicles (%)	6%	0%	25%	3%	0%	0%	50%	4%	1%	0%	3%	5%
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA	pm+ov	Prot	NA	Free
Protected Phases	4	4	1	3	3		1	6	3	5	2	
Permitted Phases			4						6			Free
Actuated Green, G (s)	6.7	6.7	9.7	8.7	8.7		3.0	88.9	97.6	13.2	99.1	140.0
Effective Green, g (s)	6.7	6.7	9.7	8.7	8.7		3.0	88.9	97.6	13.2	99.1	140.0
Actuated g/C Ratio	0.05	0.05	0.07	0.06	0.06		0.02	0.64	0.70	0.09	0.71	1.00
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5		5.5	6.0	5.5	5.5	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	5.5	3.0	3.0	5.5	
Lane Grp Cap (vph)	77	81	138	108	112		25	2204	1093	170	2481	1506
v/s Ratio Prot	c0.02	0.02	0.00	c0.02	0.01		0.01	0.23	0.00	c0.06	c0.35	
v/s Ratio Perm			0.00						0.04			0.06
v/c Ratio	0.32	0.32	0.00	0.34	0.24		0.28	0.36	0.06	0.60	0.49	0.06
Uniform Delay, d1	64.5	64.5	60.6	62.9	62.5		67.4	12.1	6.7	60.9	9.1	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.21	0.53	1.00
Incremental Delay, d2	2.5	2.3	0.0	1.9	1.1		6.0	0.5	0.0	5.3	0.7	0.1
Delay (s)	66.9	66.7	60.7	64.8	63.6		73.5	12.5	6.7	79.2	5.5	0.1
Level of Service	E	E	E	E	E		E	B	A	E	A	A
Approach Delay (s)		66.3			64.2			12.4			10.5	
Approach LOS		E			E			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			22.5		
Intersection Capacity Utilization			56.6%				ICU Level of Service			B		
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	18	21	629	1363	19
Future Vol, veh/h	5	18	21	629	1363	19
Conflicting Peds, #/hr	0	4	4	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	5	4	4	22
Mvmt Flow	6	20	24	707	1531	21

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1948	784	1556	0	0
Stage 1	1546	-	-	-	-
Stage 2	402	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-
Pot Cap-1 Maneuver	58	340	407	-	-
Stage 1	165	-	-	-	-
Stage 2	650	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	54	337	405	-	-
Mov Cap-2 Maneuver	128	-	-	-	-
Stage 1	155	-	-	-	-
Stage 2	647	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.1	0.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	405	-	249	-	-
HCM Lane V/C Ratio	0.058	-	0.104	-	-
HCM Control Delay (s)	14.4	-	21.1	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	-	-

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	51	93	13	632	1162	10
Future Vol, veh/h	51	93	13	632	1162	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	4	2	0
Mvmt Flow	59	107	15	726	1336	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1735	674	1347	0	-	0
Stage 1	1342	-	-	-	-	-
Stage 2	393	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	80	402	518	-	-	-
Stage 1	212	-	-	-	-	-
Stage 2	657	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	78	402	518	-	-	-
Mov Cap-2 Maneuver	167	-	-	-	-	-
Stage 1	206	-	-	-	-	-
Stage 2	657	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.5	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	518	-	167	402	-	-
HCM Lane V/C Ratio	0.029	-	0.351	0.266	-	-
HCM Control Delay (s)	12.2	-	37.8	17.2	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.5	1.1	-	-



Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	
Traffic Vol, veh/h	6	0	11	2	0	4	54	673	8	0	1211	50
Future Vol, veh/h	6	0	11	2	0	4	54	673	8	0	1211	50
Conflicting Peds, #/hr	2	0	2	1	0	1	2	0	1	1	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	17	0	30	0	0	0	4	4	0	0	3	4
Mvmt Flow	7	0	13	2	0	5	63	783	9	0	1408	58

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1959	2358	737	1621	2383	399	1468	0	0	793	0	0
Stage 1	1439	1439	-	915	915	-	-	-	-	-	-	-
Stage 2	520	919	-	706	1468	-	-	-	-	-	-	-
Critical Hdwy	7.84	6.5	7.5	7.5	6.5	6.9	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.84	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.84	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4	3.6	3.5	4	3.3	2.24	-	-	2.2	-	-
Pot Cap-1 Maneuver	32	36	304	70	35	606	446	-	-	837	-	-
Stage 1	121	200	-	298	354	-	-	-	-	-	-	-
Stage 2	471	353	-	397	194	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	28	31	303	60	30	604	445	-	-	836	-	-
Mov Cap-2 Maneuver	28	31	-	60	30	-	-	-	-	-	-	-
Stage 1	104	200	-	256	303	-	-	-	-	-	-	-
Stage 2	400	303	-	380	194	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	71.9		30.2		1.1		0	
HCM LOS	F		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	445	-	-	28	303	150	836	-	-
HCM Lane V/C Ratio	0.141	-	-	0.249	0.042	0.047	-	-	-
HCM Control Delay (s)	14.4	-	-	171.9	17.4	30.2	0	-	-
HCM Lane LOS	B	-	-	F	C	D	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	0.8	0.1	0.1	0	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↓		↔	↑↑
Traffic Vol, veh/h	8	2	718	4	3	1132
Future Vol, veh/h	8	2	718	4	3	1132
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	9	2	825	5	3	1301

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1485	415	0	0	830
Stage 1	828	-	-	-	-
Stage 2	657	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	118	592	-	-	811
Stage 1	394	-	-	-	-
Stage 2	483	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	118	592	-	-	811
Mov Cap-2 Maneuver	251	-	-	-	-
Stage 1	394	-	-	-	-
Stage 2	481	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	284	811
HCM Lane V/C Ratio	-	-	0.04	0.004
HCM Control Delay (s)	-	-	18.2	9.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	6	15	721	1129	11
Future Vol, veh/h	1	6	15	721	1129	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	2	2	0
Mvmt Flow	1	7	17	819	1283	13

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1734	648	1296	0	-	0
Stage 1	1290	-	-	-	-	-
Stage 2	444	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	80	418	541	-	-	-
Stage 1	226	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	78	418	541	-	-	-
Mov Cap-2 Maneuver	173	-	-	-	-	-
Stage 1	219	-	-	-	-	-
Stage 2	619	-	-	-	-	-

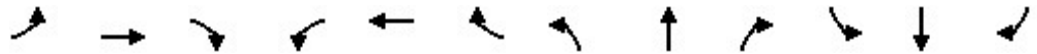
Approach	EB	NB	SB
HCM Control Delay, s	15.6	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	541	-	348	-	-
HCM Lane V/C Ratio	0.032	-	0.023	-	-
HCM Control Delay (s)	11.9	-	15.6	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

# HCM Signalized Intersection Capacity Analysis

## 1: US 29/Piney Forest Rd & Franklin Turnpike

10/19/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	83	193	299	156	364	34	555	646	124	60	473	72	
Future Volume (vph)	83	193	299	156	364	34	555	646	124	60	473	72	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.0	6.0	6.0	5.5	6.0	6.5	7.0	6.0	4.0	6.5	6.0	4.0	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	3539	2842	1787	3574	1598	3502	3574	1578	1805	3574	1615	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	3539	2842	1787	3574	1598	3502	3574	1578	1805	3574	1615	
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)	90	210	325	170	396	37	603	702	135	65	514	78	
RTOR Reduction (vph)	0	0	0	0	0	27	0	0	0	0	0	0	
Lane Group Flow (vph)	90	210	325	170	396	10	603	702	135	65	514	78	
Confl. Peds. (#/hr)				3		1	2		3	1			
Heavy Vehicles (%)	2%	2%	0%	1%	1%	0%	0%	1%	1%	0%	1%	0%	
Turn Type	Prot	NA	Prot	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	
Protected Phases	1	6	6	5	2	3	7	4		3	8		
Permitted Phases						2			Free			Free	
Actuated Green, G (s)	12.4	24.7	24.7	18.3	30.1	39.2	31.2	63.9	140.0	9.1	41.3	140.0	
Effective Green, g (s)	12.4	24.7	24.7	18.3	30.1	39.2	31.2	63.9	140.0	9.1	41.3	140.0	
Actuated g/C Ratio	0.09	0.18	0.18	0.13	0.22	0.28	0.22	0.46	1.00	0.06	0.29	1.00	
Clearance Time (s)	6.0	6.0	6.0	5.5	6.0	6.5	7.0	6.0		6.5	6.0		
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	3.0	4.0	7.0		3.0	5.0		
Lane Grp Cap (vph)	156	624	501	233	768	447	780	1631	1578	117	1054	1615	
v/s Ratio Prot	0.05	0.06	c0.11	c0.10	c0.11	0.00	c0.17	0.20		0.04	c0.14		
v/s Ratio Perm						0.00			0.09			0.05	
v/c Ratio	0.58	0.34	0.65	0.73	0.52	0.02	0.77	0.43	0.09	0.56	0.49	0.05	
Uniform Delay, d1	61.3	50.5	53.6	58.5	48.5	36.5	51.1	25.7	0.0	63.5	40.6	0.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.17	1.41	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.1	0.7	3.9	11.6	0.8	0.0	4.2	0.7	0.1	5.6	1.6	0.1	
Delay (s)	66.4	51.1	57.6	70.0	49.3	36.5	63.9	37.1	0.1	69.1	42.3	0.1	
Level of Service	E	D	E	E	D	D	E	D	A	E	D	A	
Approach Delay (s)		56.7			54.4			44.8			39.9		
Approach LOS		E			D			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			47.8									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	25.0
Intersection Capacity Utilization			72.4%									ICU Level of Service	C
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 2: US 29/Piney Forest Rd & Nelson Ave/Nor-Dan Dr

10/19/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	21	11	7	139	12	295	5	1099	94	144	926	22
Future Volume (vph)	21	11	7	139	12	295	5	1099	94	144	926	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			5.5	6.0	6.0	6.5	4.0	6.0	6.5	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frb, ped/bikes		0.99			1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1742			1800	1604	1805	3574	1595	1805	3574	1503
Flt Permitted		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1742			1800	1604	1805	3574	1595	1805	3574	1503
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	24	12	8	156	13	331	6	1235	106	162	1040	25
RTOR Reduction (vph)	0	6	0	0	0	218	0	0	0	0	0	0
Lane Group Flow (vph)	0	38	0	0	169	113	6	1235	106	162	1040	25
Confl. Peds. (#/hr)	6		6	1		1	6		1	1		6
Heavy Vehicles (%)	5%	0%	0%	1%	0%	0%	0%	1%	0%	0%	1%	5%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Free	Prot	NA	Free
Protected Phases	3	3		4	4	5	1	6		5	2	
Permitted Phases						4			Free			Free
Actuated Green, G (s)		7.8			17.9	35.7	1.4	74.5	140.0	17.8	90.9	140.0
Effective Green, g (s)		7.8			17.9	35.7	1.4	74.5	140.0	17.8	90.9	140.0
Actuated g/C Ratio		0.06			0.13	0.26	0.01	0.53	1.00	0.13	0.65	1.00
Clearance Time (s)		4.0			5.5	6.0	6.0	6.5		6.0	6.5	
Vehicle Extension (s)		5.0			3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		97			230	409	18	1901	1595	229	2320	1503
v/s Ratio Prot		c0.02			c0.09	0.04	0.00	c0.35		c0.09	0.29	
v/s Ratio Perm						0.04			0.07			0.02
v/c Ratio		0.40			0.73	0.28	0.33	0.65	0.07	0.71	0.45	0.02
Uniform Delay, d1		63.8			58.8	41.8	68.8	23.4	0.0	58.6	12.1	0.0
Progression Factor		1.00			1.00	1.00	1.39	0.53	1.00	0.98	1.52	1.00
Incremental Delay, d2		5.5			11.5	0.4	9.0	1.5	0.1	8.9	0.6	0.0
Delay (s)		69.3			70.3	42.2	104.7	13.9	0.1	66.1	19.1	0.0
Level of Service		E			E	D	F	B	A	E	B	A
Approach Delay (s)		69.3			51.7			13.2			24.9	
Approach LOS		E			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			24.8		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			140.0		Sum of lost time (s)				27.0			
Intersection Capacity Utilization			68.3%		ICU Level of Service				C			
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 3: US 29/Piney Forest Rd & Arnett Blvd Ext

10/19/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	55	80	1346	89	72	981
Future Volume (vph)	55	80	1346	89	72	981
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	6.0		5.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1563	3529		1805	3539
Flt Permitted	0.95	1.00	1.00		0.13	1.00
Satd. Flow (perm)	1805	1563	3529		249	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	84	1417	94	76	1033
RTOR Reduction (vph)	0	78	2	0	0	0
Lane Group Flow (vph)	58	6	1509	0	76	1033
Confl. Peds. (#/hr)	5	5		5	5	
Heavy Vehicles (%)	0%	0%	1%	4%	0%	2%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	10.1	10.1	106.0		117.4	117.4
Effective Green, g (s)	10.1	10.1	106.0		117.4	117.4
Actuated g/C Ratio	0.07	0.07	0.76		0.84	0.84
Clearance Time (s)	5.5	5.5	6.0		5.0	7.0
Vehicle Extension (s)	3.0	3.0	5.0		4.0	3.0
Lane Grp Cap (vph)	130	112	2671		291	2967
v/s Ratio Prot	c0.03		c0.43		0.01	c0.29
v/s Ratio Perm		0.00			0.21	
v/c Ratio	0.45	0.05	0.56		0.26	0.35
Uniform Delay, d1	62.3	60.5	7.2		5.0	2.6
Progression Factor	1.00	1.00	1.35		3.04	1.56
Incremental Delay, d2	2.4	0.2	0.8		0.6	0.3
Delay (s)	64.7	60.7	10.5		15.9	4.3
Level of Service	E	E	B		B	A
Approach Delay (s)	62.3		10.5			5.1
Approach LOS	E		B			A

### Intersection Summary

HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: US 29/Piney Forest Rd & Beavers Mill Rd/Wendell Scott Dr

10/19/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	58	26	39	18	41	36	77	1306	21	18	956	76
Future Volume (vph)	58	26	39	18	41	36	77	1306	21	18	956	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	6.0	4.0	5.5	6.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.96			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1777			1871	1568	1787	3574	1615	1805	3574	1599
Flt Permitted		0.82			0.84	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1490			1590	1568	1787	3574	1615	1805	3574	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	60	27	40	19	42	37	79	1346	22	19	986	78
RTOR Reduction (vph)	0	14	0	0	0	33	0	0	0	0	0	0
Lane Group Flow (vph)	0	113	0	0	61	4	79	1346	22	19	986	78
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	1%	1%	0%	0%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases		4			4		5	2		1		6
Permitted Phases	4			4		4			Free			Free
Actuated Green, G (s)		15.8			15.8	15.8	11.5	101.9	140.0	4.8	95.2	140.0
Effective Green, g (s)		15.8			15.8	15.8	11.5	101.9	140.0	4.8	95.2	140.0
Actuated g/C Ratio		0.11			0.11	0.11	0.08	0.73	1.00	0.03	0.68	1.00
Clearance Time (s)		6.0			6.0	6.0	5.5	6.0		5.5	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		168			179	176	146	2601	1615	61	2430	1599
v/s Ratio Prot							c0.04	c0.38		0.01	0.28	
v/s Ratio Perm		c0.08			0.04	0.00			0.01			0.05
v/c Ratio		0.67			0.34	0.02	0.54	0.52	0.01	0.31	0.41	0.05
Uniform Delay, d1		59.6			57.3	55.2	61.7	8.3	0.0	66.0	9.9	0.0
Progression Factor		1.00			1.00	1.00	1.16	0.27	1.00	1.03	0.70	1.00
Incremental Delay, d2		10.1			1.1	0.1	3.4	0.6	0.0	2.8	0.5	0.1
Delay (s)		69.7			58.4	55.3	75.0	2.9	0.0	70.5	7.4	0.1
Level of Service		E			E	E	E	A	A	E	A	A
Approach Delay (s)		69.7			57.2			6.8			8.0	
Approach LOS		E			E			A			A	

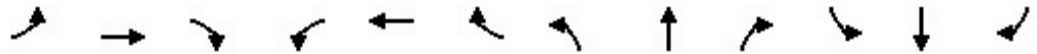
Intersection Summary

HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 5: US 29/Piney Forest Rd & Piney Forest Shopping Center/Old Piney Forest Rd

10/19/2021



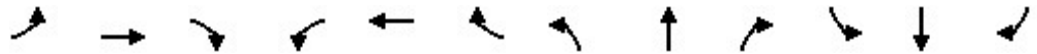
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕	↗		↔		↖	↕		↖	↕	↗	
Traffic Volume (vph)	25	3	8	57	6	4	7	1320	65	3	1051	12	
Future Volume (vph)	25	3	8	57	6	4	7	1320	65	3	1051	12	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		6.0	6.0		6.0		5.5	6.0		5.5	6.0		
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95		
Frbp, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00		
Frt		1.00	0.85		0.99		1.00	0.99		1.00	1.00		
Flt Protected		0.96	1.00		0.96		0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1818	1401		1804		1805	3547		1805	3568		
Flt Permitted		0.96	1.00		0.96		0.95	1.00		0.95	1.00		
Satd. Flow (perm)		1818	1401		1804		1805	3547		1805	3568		
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	
Adj. Flow (vph)	28	3	9	65	7	5	8	1500	74	3	1194	14	
RTOR Reduction (vph)	0	0	9	0	2	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	31	0	0	75	0	8	1574	0	3	1208	0	
Confl. Peds. (#/hr)	1		1	3		3	1		3	3		1	
Heavy Vehicles (%)	0%	0%	13%	0%	0%	0%	0%	1%	0%	0%	1%	0%	
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA		
Protected Phases	4	4		8	8		5	2		1	6		
Permitted Phases			4										
Actuated Green, G (s)		5.4	5.4		11.2		1.5	98.5		1.4	98.4		
Effective Green, g (s)		5.4	5.4		11.2		1.5	98.5		1.4	98.4		
Actuated g/C Ratio		0.04	0.04		0.08		0.01	0.70		0.01	0.70		
Clearance Time (s)		6.0	6.0		6.0		5.5	6.0		5.5	6.0		
Vehicle Extension (s)		3.0	3.0		3.0		3.0	5.0		3.0	5.0		
Lane Grp Cap (vph)		70	54		144		19	2495		18	2507		
v/s Ratio Prot		c0.02			c0.04		c0.00	c0.44		0.00	0.34		
v/s Ratio Perm			0.00										
v/c Ratio		0.44	0.01		0.52		0.42	0.63		0.17	0.48		
Uniform Delay, d1		65.8	64.7		61.8		68.8	11.1		68.7	9.3		
Progression Factor		1.00	1.00		1.00		1.43	0.13		0.82	1.66		
Incremental Delay, d2		4.4	0.0		3.4		12.3	1.0		4.2	0.6		
Delay (s)		70.2	64.8		65.2		110.7	2.4		60.8	16.2		
Level of Service		E	E		E		F	A		E	B		
Approach Delay (s)		69.0			65.2			3.0			16.3		
Approach LOS		E			E			A			B		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			11.1		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.61										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)						23.5		
Intersection Capacity Utilization			59.0%		ICU Level of Service						B		
Analysis Period (min)			15										

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis  
 6: US 29/Piney Forest Rd & Pineview Dr/Audobon Dr

10/19/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕	↕	↕	↕↔		↕	↕↔		
Traffic Volume (vph)	3	2	7	40	4	68	10	1256	72	44	1071	1	
Future Volume (vph)	3	2	7	40	4	68	10	1256	72	44	1071	1	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0		
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95		
Frbp, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00		
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00		
Frt		0.92			1.00	0.85	1.00	0.99		1.00	1.00		
Flt Protected		0.99			0.96	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1722			1818	1588	1805	3543		1805	3574		
Flt Permitted		0.99			0.96	1.00	0.20	1.00		0.12	1.00		
Satd. Flow (perm)		1722			1818	1588	384	3543		224	3574		
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	
Adj. Flow (vph)	3	2	8	46	5	78	11	1444	83	51	1231	1	
RTOR Reduction (vph)	0	8	0	0	0	70	0	1	0	0	0	0	
Lane Group Flow (vph)	0	5	0	0	51	8	11	1526	0	51	1232	0	
Confl. Peds. (#/hr)	3			3		6			3	6		3	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	
Turn Type	Split	NA		Split	NA	pm+ov	pm+pt	NA		pm+pt	NA		
Protected Phases	4	4		8	8	1	5	2		1	6		
Permitted Phases						8	2			6			
Actuated Green, G (s)		2.9			8.1	14.2	101.1	98.9		108.9	102.8		
Effective Green, g (s)		2.9			8.1	14.2	101.1	98.9		108.9	102.8		
Actuated g/C Ratio		0.02			0.06	0.10	0.72	0.71		0.78	0.73		
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0		
Vehicle Extension (s)		3.0			3.0	2.5	2.5	5.0		2.5	5.0		
Lane Grp Cap (vph)		35			105	229	299	2502		243	2624		
v/s Ratio Prot		c0.00			c0.03	0.00	0.00	c0.43		c0.01	c0.34		
v/s Ratio Perm						0.00	0.03			0.15			
v/c Ratio		0.15			0.49	0.03	0.04	0.61		0.21	0.47		
Uniform Delay, d1		67.3			63.9	56.7	5.9	10.6		7.7	7.5		
Progression Factor		1.00			1.00	1.00	0.26	0.42		1.04	0.85		
Incremental Delay, d2		1.9			3.5	0.0	0.0	1.0		0.3	0.6		
Delay (s)		69.3			67.4	56.8	1.6	5.5		8.2	7.0		
Level of Service		E			E	E	A	A		A	A		
Approach Delay (s)		69.3			61.0			5.5		7.0			
Approach LOS		E			E			A		A			
<b>Intersection Summary</b>													
HCM 2000 Control Delay			8.8		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.57										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)						24.0		
Intersection Capacity Utilization			61.0%		ICU Level of Service						B		
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 7: US 29/Piney Forest Rd & Parker Rd/Falwell Ct

10/19/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↑↑	↗	↖	↖↗	
Traffic Volume (vph)	21	1	46	17	4	4	45	1307	12	4	1120	45
Future Volume (vph)	21	1	46	17	4	4	45	1307	12	4	1120	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	4.0	5.5	6.0	6.0	5.5	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1730	1615		1825	1615	1805	3574	1615	1805	3549	
Flt Permitted		0.95	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1730	1615		1825	1615	1805	3574	1615	1805	3549	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	24	1	52	19	4	4	51	1469	13	4	1258	51
RTOR Reduction (vph)	0	0	50	0	0	0	0	0	3	0	1	0
Lane Group Flow (vph)	0	25	2	0	23	4	51	1469	10	4	1308	0
Heavy Vehicles (%)	5%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	4%
Turn Type	Split	NA	Perm	Split	NA	Free	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases			4			Free			6			
Actuated Green, G (s)		6.6	6.6		5.5	140.0	8.2	103.0	103.0	1.4	96.2	
Effective Green, g (s)		6.6	6.6		5.5	140.0	8.2	103.0	103.0	1.4	96.2	
Actuated g/C Ratio		0.05	0.05		0.04	1.00	0.06	0.74	0.74	0.01	0.69	
Clearance Time (s)		6.0	6.0		6.0		5.5	6.0	6.0	5.5	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)		81	76		71	1615	105	2629	1188	18	2438	
v/s Ratio Prot		c0.01			c0.01		c0.03	c0.41		0.00	0.37	
v/s Ratio Perm			0.00			0.00			0.01			
v/c Ratio		0.31	0.03		0.32	0.00	0.49	0.56	0.01	0.22	0.54	
Uniform Delay, d1		64.5	63.7		65.4	0.0	63.9	8.3	4.9	68.8	10.9	
Progression Factor		1.00	1.00		1.00	1.00	1.31	1.09	1.00	0.85	1.28	
Incremental Delay, d2		2.2	0.2		2.6	0.0	3.2	0.8	0.0	5.8	0.8	
Delay (s)		66.7	63.8		68.1	0.0	87.0	9.9	4.9	64.5	14.7	
Level of Service		E	E		E	A	F	A	A	E	B	
Approach Delay (s)		64.7			58.0			12.4			14.9	
Approach LOS		E			E			B			B	

Intersection Summary

HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct

10/19/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	42	12	46	92	8	16	1018	89	63	932	178
Future Volume (vph)	182	42	12	46	92	8	16	1018	89	63	932	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5		5.5	6.0	5.5	5.5	6.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1715	1750	1615	1770	1876		1805	3574	1615	1805	3574	1599
Flt Permitted	0.95	0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1715	1750	1615	1770	1876		1805	3574	1615	1805	3574	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	194	45	13	49	98	9	17	1083	95	67	991	189
RTOR Reduction (vph)	0	0	11	0	3	0	0	0	32	0	0	0
Lane Group Flow (vph)	118	121	2	49	104	0	17	1083	63	67	991	189
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA	pm+ov	Prot	NA	Free
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4						6			Free
Actuated Green, G (s)	14.9	14.9	19.6	13.1	13.1		4.7	80.2	93.3	9.3	84.8	140.0
Effective Green, g (s)	14.9	14.9	19.6	13.1	13.1		4.7	80.2	93.3	9.3	84.8	140.0
Actuated g/C Ratio	0.11	0.11	0.14	0.09	0.09		0.03	0.57	0.67	0.07	0.61	1.00
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5		5.5	6.0	5.5	5.5	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	5.5	3.0	3.0	5.5	
Lane Grp Cap (vph)	182	186	289	165	175		60	2047	1076	119	2164	1599
v/s Ratio Prot	0.07	c0.07	0.00	0.03	c0.06		0.01	c0.30	0.01	c0.04	c0.28	
v/s Ratio Perm			0.00						0.03			0.12
v/c Ratio	0.65	0.65	0.01	0.30	0.60		0.28	0.53	0.06	0.56	0.46	0.12
Uniform Delay, d1	60.0	60.1	51.8	59.2	60.9		66.0	18.3	8.1	63.4	15.1	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.80	1.11	1.00
Incremental Delay, d2	7.7	7.9	0.0	1.0	5.4		2.6	1.0	0.0	5.3	0.6	0.1
Delay (s)	67.8	67.9	51.8	60.2	66.3		68.6	19.3	8.1	55.9	17.4	0.1
Level of Service	E	E	D	E	E		E	B	A	E	B	A
Approach Delay (s)		67.0			64.4			19.1			16.8	
Approach LOS		E			E			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			24.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			140.0	Sum of lost time (s)					22.5			
Intersection Capacity Utilization			59.3%	ICU Level of Service			B					
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	35	62	1281	974	24
Future Vol, veh/h	30	35	62	1281	974	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	33	38	67	1392	1059	26

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1902	543	1085	0	0
Stage 1	1072	-	-	-	-
Stage 2	830	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	62	489	651	-	-
Stage 1	294	-	-	-	-
Stage 2	394	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	56	489	651	-	-
Mov Cap-2 Maneuver	169	-	-	-	-
Stage 1	264	-	-	-	-
Stage 2	394	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.8	0.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	651	-	261	-	-
HCM Lane V/C Ratio	0.104	-	0.271	-	-
HCM Control Delay (s)	11.2	-	23.8	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	16	9	1391	987	19
Future Vol, veh/h	18	16	9	1391	987	19
Conflicting Peds, #/hr	3	4	4	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	6	0	1	1	5
Mvmt Flow	19	17	9	1449	1028	20

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1788	532	1052	0	-	0
Stage 1	1042	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Critical Hdwy	6.8	7.02	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.36	2.2	-	-	-
Pot Cap-1 Maneuver	74	482	669	-	-	-
Stage 1	305	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	72	478	666	-	-	-
Mov Cap-2 Maneuver	193	-	-	-	-	-
Stage 1	300	-	-	-	-	-
Stage 2	433	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.6	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	666	-	193	478	-	-
HCM Lane V/C Ratio	0.014	-	0.097	0.035	-	-
HCM Control Delay (s)	10.5	-	25.7	12.8	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	0.1	-	-

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	
Traffic Vol, veh/h	31	0	48	0	0	0	7	1337	0	0	959	10
Future Vol, veh/h	31	0	48	0	0	0	7	1337	0	0	959	10
Conflicting Peds, #/hr	2	0	2	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	1	0
Mvmt Flow	34	0	52	0	0	0	8	1453	0	0	1042	11

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1795	2519	531	1992	2524	729	1055	0	0	1453	0	0
Stage 1	1050	1050	-	1469	1469	-	-	-	-	-	-	-
Stage 2	745	1469	-	523	1055	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	52	28	498	37	28	370	668	-	-	472	-	-
Stage 1	247	307	-	136	194	-	-	-	-	-	-	-
Stage 2	377	194	-	510	305	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	51	28	496	33	28	369	667	-	-	472	-	-
Mov Cap-2 Maneuver	51	28	-	33	28	-	-	-	-	-	-	-
Stage 1	244	306	-	134	192	-	-	-	-	-	-	-
Stage 2	372	192	-	455	304	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	71.9	0	0.1	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	667	-	-	51	496	-	472	-	-
HCM Lane V/C Ratio	0.011	-	-	0.661	0.105	-	-	-	-
HCM Control Delay (s)	10.5	-	-	163	13.1	0	0	-	-
HCM Lane LOS	B	-	-	F	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.6	0.3	-	0	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑↑		↘	↑↑
Traffic Vol, veh/h	4	5	1230	4	11	1138
Future Vol, veh/h	4	5	1230	4	11	1138
Conflicting Peds, #/hr	1	1	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	9	0
Mvmt Flow	5	6	1398	5	13	1293

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2076	704	0	0	1404
Stage 1	1402	-	-	-	-
Stage 2	674	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.28
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.29
Pot Cap-1 Maneuver	47	384	-	-	448
Stage 1	197	-	-	-	-
Stage 2	473	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	46	383	-	-	448
Mov Cap-2 Maneuver	143	-	-	-	-
Stage 1	197	-	-	-	-
Stage 2	459	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.2	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	219	448
HCM Lane V/C Ratio	-	-	0.047	0.028
HCM Control Delay (s)	-	-	22.2	13.3
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.1	0.1

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑↑	↑↑	
Traffic Vol, veh/h	3	4	4	1231	1141	1
Future Vol, veh/h	3	4	4	1231	1141	1
Conflicting Peds, #/hr	1	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	25	0	0	0
Mvmt Flow	3	4	4	1383	1282	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1985	644	1284	0	-	0
Stage 1	1284	-	-	-	-	-
Stage 2	701	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.6	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.45	-	-	-
Pot Cap-1 Maneuver	55	420	427	-	-	-
Stage 1	228	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	54	419	427	-	-	-
Mov Cap-2 Maneuver	159	-	-	-	-	-
Stage 1	226	-	-	-	-	-
Stage 2	459	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	427	-	246	-	-
HCM Lane V/C Ratio	0.011	-	0.032	-	-
HCM Control Delay (s)	13.5	-	20.1	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-



## Appendix D Existing 2021 SimTraffic Queue Reports

**Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike**

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	R	L	T	T	R	L	L	T
Maximum Queue (ft)	115	243	200	265	226	128	212	104	53	147	167	184
Average Queue (ft)	22	120	66	141	102	80	40	20	3	57	83	78
95th Queue (ft)	81	210	171	218	183	137	115	65	26	118	144	153
Link Distance (ft)		949	949				580	580				1528
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			435	435	130			75	360	360	
Storage Blk Time (%)	0	10				3	0	1	0			
Queuing Penalty (veh)	0	3				3	0	0	0			

**Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike**

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	T
Maximum Queue (ft)	203	22	58	304	283
Average Queue (ft)	95	1	7	177	163
95th Queue (ft)	172	20	32	271	257
Link Distance (ft)	1528			1420	1420
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		220	310		
Storage Blk Time (%)	0	0		0	
Queuing Penalty (veh)	0	0		0	

**Intersection: 2: US 29/Piney Forest Rd & Nelson Ave/Nor-Dan Dr**

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	L	T	T
Maximum Queue (ft)	62	128	102	37	147	159	181	258	268
Average Queue (ft)	14	55	45	4	48	44	70	74	81
95th Queue (ft)	45	110	81	21	113	111	138	185	194
Link Distance (ft)	1123	917	917		2320	2320		380	380
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				150			215		
Storage Blk Time (%)					0		0	0	1
Queuing Penalty (veh)					0		0	0	0

**Intersection: 3: US 29/Piney Forest Rd & Arnett Blvd Ext**

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	185	85	191	214	93	171	192
Average Queue (ft)	65	34	47	54	29	44	58
95th Queue (ft)	138	80	128	145	65	115	134
Link Distance (ft)	895		607	607		2320	2320
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		85			150		
Storage Blk Time (%)	9	0			0	0	
Queuing Penalty (veh)	5	0			0	0	

**Intersection: 4: US 29/Piney Forest Rd & Beavers Mill Rd/Wendell Scott Dr**

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	308	146	84	43	186	212	86	49	304	318	79
Average Queue (ft)	133	37	13	5	59	73	5	8	99	113	4
95th Queue (ft)	238	93	50	23	147	168	38	29	233	253	35
Link Distance (ft)	674	896			1252	1252			1538	1538	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			90	250			100	285			100
Storage Blk Time (%)		2	0		0	4	0		0	7	0
Queuing Penalty (veh)		1	0		0	1	0		0	3	0

**Intersection: 5: US 29/Piney Forest Rd & Piney Forest Shopping Center/Old Piney Forest Rd**

Movement	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	TR
Maximum Queue (ft)	35	25	106	31	103	125	127	137
Average Queue (ft)	6	2	37	2	18	24	21	32
95th Queue (ft)	25	14	82	14	64	79	76	95
Link Distance (ft)	530		206		1131	1131	847	847
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		155		275				
Storage Blk Time (%)								
Queuing Penalty (veh)								

**Intersection: 6: US 29/Piney Forest Rd & Pineview Dr/Audobon Dr**

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	37	149	88	7	145	151	56	115	114
Average Queue (ft)	6	49	27	0	36	40	17	19	27
95th Queue (ft)	24	102	59	5	102	110	45	69	81
Link Distance (ft)	781	934			1154	1154		1131	1131
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			170	95			170		
Storage Blk Time (%)		0	0		1			0	
Queuing Penalty (veh)		0	0		0			0	

**Intersection: 7: US 29/Piney Forest Rd & Parker Rd/Falwell Ct**

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	104	75	41	53	89	122	118	16	14	167	189
Average Queue (ft)	25	30	7	7	21	27	24	1	1	35	42
95th Queue (ft)	68	68	28	33	56	79	77	7	8	110	129
Link Distance (ft)	1170		869			304	304	304		668	668
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		75		50	190				135		
Storage Blk Time (%)	1	0	1	0						0	
Queuing Penalty (veh)	0	0	0	0						0	

**Intersection: 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct**

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	34	94	42	92	89	61	205	203	52	171	198	207
Average Queue (ft)	5	36	5	32	30	7	90	64	8	72	40	48
95th Queue (ft)	23	79	25	74	70	33	176	155	29	136	118	137
Link Distance (ft)		720			275		1513	1513				305
Upstream Blk Time (%)												0
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	130		315	135		395			600	270		
Storage Blk Time (%)		0		0								0
Queuing Penalty (veh)		0		0								0

**Intersection: 9: US 29/Piney Forest Rd & Woodside Dr**

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	53	58	23	36	58	65
Average Queue (ft)	18	14	1	1	2	3
95th Queue (ft)	46	42	13	13	22	27
Link Distance (ft)	462		380	380	1528	1528
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		75				
Storage Blk Time (%)		0	0			
Queuing Penalty (veh)		0	0			

**Intersection: 10: US 29/Piney Forest Rd & Ash St**

Movement	EB	EB	NB	SB
Directions Served	L	R	L	TR
Maximum Queue (ft)	134	40	39	5
Average Queue (ft)	52	35	9	0
95th Queue (ft)	102	50	31	5
Link Distance (ft)	1143			607
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		40	100	
Storage Blk Time (%)	11	8		
Queuing Penalty (veh)	10	4		

**Intersection: 11: US 29/Piney Forest Rd & Deer Run Rd/Parking Lot**

Movement	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	TR
Maximum Queue (ft)	50	78	32	66	8	28	50	55
Average Queue (ft)	7	15	5	19	0	1	2	3
95th Queue (ft)	30	53	25	47	5	11	25	28
Link Distance (ft)	1444		62		847	847	1252	1252
Upstream Blk Time (%)			0					
Queuing Penalty (veh)			0					
Storage Bay Dist (ft)		100		100				
Storage Blk Time (%)		0		0			0	
Queuing Penalty (veh)		0		0			0	

Intersection: 12: US 29/Piney Forest Rd & Redwood Dr

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	37	28
Average Queue (ft)	10	1
95th Queue (ft)	33	10
Link Distance (ft)	373	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: US 29/Piney Forest Rd & Churchview Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	35	32
Average Queue (ft)	8	8
95th Queue (ft)	30	28
Link Distance (ft)	434	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 33

**Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike**

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	R	L	T	T	R	L	L	T
Maximum Queue (ft)	124	199	156	174	142	130	295	258	75	352	359	653
Average Queue (ft)	52	72	19	90	52	103	131	101	12	220	237	199
95th Queue (ft)	114	151	88	159	128	157	246	197	56	369	376	470
Link Distance (ft)		949	949				580	580				1528
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			435	435	130			75	360	360	
Storage Blk Time (%)	1	2				10	6	14	0	0	6	3
Queuing Penalty (veh)	1	2				18	9	5	0	1	20	17

**Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike**

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	T
Maximum Queue (ft)	438	198	125	259	239
Average Queue (ft)	166	17	36	149	129
95th Queue (ft)	300	114	89	231	211
Link Distance (ft)	1528			1420	1420
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		220	310		
Storage Blk Time (%)	4	0		0	
Queuing Penalty (veh)	4	0		0	

**Intersection: 2: US 29/Piney Forest Rd & Nelson Ave/Nor-Dan Dr**

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	107	253	263	91	361	348	244	214	320	315	129
Average Queue (ft)	39	122	125	6	151	136	14	123	144	148	5
95th Queue (ft)	85	207	222	38	298	284	107	214	276	280	52
Link Distance (ft)	1123	917	917		2320	2320			380	380	
Upstream Blk Time (%)									0	0	
Queuing Penalty (veh)									0	0	
Storage Bay Dist (ft)				150			245	215			185
Storage Blk Time (%)				0	8	1	0	0	2	5	0
Queuing Penalty (veh)				0	0	1	0	2	3	1	0

**Intersection: 3: US 29/Piney Forest Rd & Arnett Blvd Ext**

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	137	85	195	201	124	214	210
Average Queue (ft)	43	40	49	53	40	57	73
95th Queue (ft)	98	78	127	138	87	146	167
Link Distance (ft)	895		607	607		2320	2320
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		85			150		
Storage Blk Time (%)	3	1			0	0	
Queuing Penalty (veh)	2	0			0	0	

**Intersection: 4: US 29/Piney Forest Rd & Beavers Mill Rd/Wendell Scott Dr**

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	202	133	88	145	260	260	14	59	230	262	91
Average Queue (ft)	94	47	19	50	70	81	0	10	77	88	9
95th Queue (ft)	167	102	61	109	177	186	10	33	172	191	50
Link Distance (ft)	674	896			1252	1252			1538	1538	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			90	250			100	285			100
Storage Blk Time (%)		4	0		0	5	0		0	6	0
Queuing Penalty (veh)		2	0		0	1	0		0	4	0

**Intersection: 5: US 29/Piney Forest Rd & Piney Forest Shopping Center/Old Piney Forest Rd**

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	91	43	145	42	198	205	27	307	319
Average Queue (ft)	29	7	63	7	46	52	3	105	117
95th Queue (ft)	71	28	119	26	131	142	16	244	259
Link Distance (ft)	530		206		1131	1131		847	847
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		155		275			210		
Storage Blk Time (%)					0			1	
Queuing Penalty (veh)					0			0	



**Intersection: 6: US 29/Piney Forest Rd & Pineview Dr/Audobon Dr**

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	40	107	74	29	166	162	84	143	153
Average Queue (ft)	11	41	27	5	31	33	26	22	33
95th Queue (ft)	32	89	56	20	97	99	62	80	101
Link Distance (ft)	781	934			1154	1154		1131	1131
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			170	95			170		
Storage Blk Time (%)					0			0	
Queuing Penalty (veh)					0			0	

**Intersection: 7: US 29/Piney Forest Rd & Parker Rd/Falwell Ct**

Movement	EB	EB	WB	WB	NB	NB	NB	NB	B27	B27	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	T	T	L	T
Maximum Queue (ft)	93	73	82	45	97	143	148	4	5	2	16	322
Average Queue (ft)	23	28	25	6	34	30	31	0	0	0	1	94
95th Queue (ft)	64	60	63	31	78	95	98	2	4	2	9	240
Link Distance (ft)	1170		869			304	304	304	258	258		668
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		75		50	190						135	
Storage Blk Time (%)	1	0	7	0		0						4
Queuing Penalty (veh)	0	0	0	0		0						0

**Intersection: 7: US 29/Piney Forest Rd & Parker Rd/Falwell Ct**

Movement	SB
Directions Served	TR
Maximum Queue (ft)	326
Average Queue (ft)	109
95th Queue (ft)	270
Link Distance (ft)	668
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	129	285	35	134	198	59	369	362	49	166	263	269
Average Queue (ft)	73	146	8	48	86	15	202	182	11	60	108	120
95th Queue (ft)	161	244	29	107	159	43	321	305	32	122	212	223
Link Distance (ft)		720			275		1513	1513			305	305
Upstream Blk Time (%)					0						0	0
Queuing Penalty (veh)					0						1	1
Storage Bay Dist (ft)	130		315	135		395			600	270		
Storage Blk Time (%)	1	14		0	3		0				0	0
Queuing Penalty (veh)	1	15		0	1		0				0	0

Intersection: 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct

Movement	SB	B17
Directions Served	R	T
Maximum Queue (ft)	128	2
Average Queue (ft)	7	0
95th Queue (ft)	67	2
Link Distance (ft)		258
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)	290	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 9: US 29/Piney Forest Rd & Woodside Dr

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	TR
Maximum Queue (ft)	127	60	10	3	20
Average Queue (ft)	41	22	1	0	1
95th Queue (ft)	84	51	12	3	18
Link Distance (ft)	462		380	1528	1528
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		75			
Storage Blk Time (%)		0			
Queuing Penalty (veh)		1			

**Intersection: 10: US 29/Piney Forest Rd & Ash St**

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	74	48	29	46	72	69	76
Average Queue (ft)	20	16	4	3	4	4	4
95th Queue (ft)	56	45	20	21	30	28	33
Link Distance (ft)	1143		1538		1538	607	607
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	40		100				
Storage Blk Time (%)	5	1					
Queuing Penalty (veh)	1	0					

**Intersection: 11: US 29/Piney Forest Rd & Deer Run Rd/Parking Lot**

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	T	TR	T	TR
Maximum Queue (ft)	78	74	24	23	38	37	45
Average Queue (ft)	27	28	2	1	2	2	2
95th Queue (ft)	61	55	13	11	15	15	19
Link Distance (ft)	1444		847		847	1252	1252
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100		100				
Storage Blk Time (%)	0	0					
Queuing Penalty (veh)	0	0					

**Intersection: 12: US 29/Piney Forest Rd & Redwood Dr**

Movement	WB	NB	NB	SB	SB	SB
Directions Served	LR	T	TR	L	T	T
Maximum Queue (ft)	39	37	42	45	14	14
Average Queue (ft)	8	1	1	6	0	1
95th Queue (ft)	31	14	16	28	7	11
Link Distance (ft)	373	76	76	1154		1154
Upstream Blk Time (%)	0		0			
Queuing Penalty (veh)	0		0			
Storage Bay Dist (ft)				100		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 13: US 29/Piney Forest Rd & Churchview Dr

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	30	38	26	51	20	30
Average Queue (ft)	7	2	1	2	1	1
95th Queue (ft)	27	17	16	20	10	12
Link Distance (ft)	434		668	668	76	76
Upstream Blk Time (%)						0
Queuing Penalty (veh)						0
Storage Bay Dist (ft)		100				
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 121

## Appendix E 2045 No Build Synchro Reports

**2045 No Build**

Approach	Movement	Effective Storage	AM			PM		
			LOS	Delay (sec)	Max Queue (feet)	LOS	Delay (sec)	Max Queue (feet)
<b>1. Piney Forest Road/Franklin Turnpike</b>								<i>Signalized</i>
Franklin Turnpike	EBL	125	E	58.8	125	F	94.6	125
	EBT	-	C	33.5	297	D	44.7	251
	EBR	435	D	46.7	396	E	65.3	277
Franklin Turnpike	WBL	130	E	76.2	129	F	86.5	130
	WBT	-	C	26.3	250	D	47.4	317
	WBR	75	C	21.8	67	C	31.1	75
Piney Forest Road	NBL	360	E	56.6	255	D	47.6	360
	NBT	-	C	22.4	196	C	25.2	1510
	NBR	220	A	0.1	30	A	0.1	175
Piney Forest Road	SBL	310	E	61.4	130	E	64.6	258
	SBT	-	E	61.3	357	E	57.0	363
	SBR	490	A	0.1	0	A	0.1	0
Intersection Overall			D	43.5		D	46.6	
<b>2. Piney Forest Road/Nelson Avenue/Nor Dan Drive</b>								<i>Signalized</i>
Nelson Avenue	EBL/T/R	-	E	62.8	63	E	66.3	109
Nor Dan Drive	WBL/T	-	E	74.1	150	F	91.9	286
	WBR	-	D	43.8	111	D	38.6	336
Piney Forest Road	NBL	150	D	48.6	47	F	81.7	126
	NBT	-	B	18.0	226	B	17.6	572
	NBR	245	A	0.1	0	A	0.1	245
Piney Forest Road	SBL	215	E	57.0	196	E	57.0	212
	SBT	350	A	6.1	276	B	12.2	265
	SBR	185	A	0.0	0	A	0.0	59
Intersection Overall			B	14.5		C	23.8	
<b>3. Piney Forest Road/Arnett Boulevard</b>								<i>Signalized</i>
Arnett Boulevard	WBL	-	C	27.0	136	D	54.9	172
	WBR	85	C	23.8	80	D	51.2	84
Piney Forest Road	NBT	-	B	11.0	189	A	7.2	370
	NBT/R	-	B	11.0	202	A	7.2	395
Piney Forest Road	SBL	150	A	3.2	117	C	27.3	131
	SBT	-	A	5.1	189	A	5.6	190
Intersection Overall			A	8.3		A	9.3	
<b>4. Piney Forest Road/Beavers Mill Road/Wendell Scott Drive</b>								<i>Signalized</i>
Beavers Mill Road	EBL/T/R	-	E	61.9	289	E	60.4	240
Wendell Scott Drive	WBL/T	-	D	45.0	113	D	49.0	114
	WBR	90	D	42.4	84	D	46.1	87
Piney Forest Road	NBL	250	E	69.7	42	E	66.5	188
	NBT	-	A	7.9	228	B	10.4	360
	NBR	100	A	0.0	61	A	0.0	19
Piney Forest Road	SBL	285	E	62.9	40	E	65.4	75
	SBT	-	B	10.9	382	A	9.3	310
	SBR	100	A	0.0	94	A	0.1	96
Intersection Overall			B	15.3		B	15.0	

**2045 No Build**

Approach	Movement	Effective Storage	AM			PM		
			LOS	Delay (sec)	Max Queue (feet)	LOS	Delay (sec)	Max Queue (feet)
<b>5. Piney Forest Road/Piney Forest Shopping Center/Old Piney Forest Road</b>								<i>Signalized</i>
Piney Forest Shopping Center	EBL/T	-	E	68.0	44	E	64.6	82
	EBR	155	E	58.6	28	E	55.9	51
Old Piney Forest Road	WBL/T/R	150	E	58.0	99	E	63.4	146
Piney Forest Road	NBL	275	E	60.3	29	F	87.0	36
	NBT	-	A	4.0	161	A	2.7	256
	NBT/R	-	A	4.0	171	A	2.7	266
Piney Forest Road	SBL	210	A	0.0	0	F	82.3	29
	SBT	-	A	2.8	182	A	6.1	253
	SBT/R	-	A	2.8	197	A	6.1	259
Intersection Overall			A	4.5		A	6.7	
<b>6. Piney Forest Road/Pineview Drive/Audubon Drive</b>								<i>Signalized</i>
Pineview Drive	EBL/T/R	-	E	67.1	41	E	61.4	48
Audubon Drive	WBL/T	-	E	60.1	116	E	59.3	128
	WBR	170	D	47.2	83	D	48.3	105
Piney Forest Road	NBL	95	A	5.3	7	A	2.0	45
	NBT	-	A	6.6	175	A	8.9	280
	NBT/R	-	A	6.6	192	A	8.9	295
Piney Forest Road	SBL	170	A	0.8	68	C	25.0	89
	SBT	-	A	2.3	165	A	5.8	200
	SBT/R	-	A	2.3	181	A	5.8	216
Intersection Overall			A	7.0		A	9.8	
<b>7. Piney Forest Road/Parker Road/Falwell Court</b>								<i>Signalized</i>
Parker Road	EBL/T	-	E	57.6	104	E	57.9	83
	EBR	75	D	54.4	75	D	54.8	71
Falwell Court	WBL/T	-	E	64.5	56	E	57.7	66
	WBR	50	A	0.0	53	A	0.0	46
Piney Forest Road	NBL	190	D	50.1	70	E	59.1	145
	NBT	-	A	6.5	200	A	7.2	334
	NBR	600	A	5.3	25	A	6.3	6
Piney Forest Road	SBL	135	E	76.4	16	E	79.2	22
	SBT	-	A	4.6	270	B	13.9	270
	SBT/R	-	A	4.6	285	B	13.9	300
Intersection Overall			A	7.8		B	12.7	
<b>8. Central Boulevard/Holt Garrison Parkway/Boxwood Court</b>								<i>Signalized</i>
Holt Garrison Parkway	EBL	130	E	56.9	52	E	59.8	129
	EBL/T	-	E	56.5	114	E	59.4	281
	EBR	315	D	51.1	53	D	43.4	44
Boxwood Court	WBL	135	E	55.1	83	D	53.0	134
	WBT/R	225	D	54.1	103	E	67.8	231
Central Boulevard	NBL	395	E	62.2	73	E	59.2	54
	NBT	-	B	15.2	257	C	23.2	400
	NBR	600	A	8.1	50	A	9.3	48
Central Boulevard	SBL	270	E	66.9	183	E	75.2	132
	SBT	-	A	3.7	266	A	8.9	260
	SBR	290	A	0.1	86	A	0.1	135
Intersection Overall			B	12.8		C	22.7	

**2045 No Build**

























Approach	Movement	Effective Storage	AM			PM		
			LOS	Delay (sec)	Max Queue (feet)	LOS	Delay (sec)	Max Queue (feet)
<b>9. Piney Forest Road/Woodside Drive</b> <span style="float:right"><i>Unsignalized</i></span>								
Woodside Drive	EBL/R	-	D	27.0	68	D	34.4	146
Piney Forest Road	NBL	75	C	17.0	60	B	12.7	71
	NBT	350	A	0.0	32	A	0.0	195
Piney Forest Road	SBT	-	A	0.0	55	A	0.0	6
	SBT/R	-	A	0.0	57	A	0.0	7
<b>10. Piney Forest Road/Ash Street</b> <span style="float:right"><i>Unsignalized</i></span>								
Ash Street	EBL	-	F	53.1	190	D	33.3	76
	EBR	40	C	20.1	40	B	14.2	54
Piney Forest Road	NBL	100	B	13.4	36	B	11.6	34
	NBT	-	A	0.0	0	A	0.0	83
Piney Forest Road	SBT	-	A	0.0	0	A	0.0	55
	SBT/R	-	A	0.0	0	A	0.0	63
<b>11. Piney Forest Road/Deer Run Road</b> <span style="float:right"><i>Unsignalized</i></span>								
Deer Run Road	EBL/T	-	F	309.4	63	F	506.0	134
	EBR	100	C	19.3	77	B	14.8	94
Parking Lot	WBL/T/R	-	E	35.9	32	A	0.0	0
Piney Forest Road	NBL	100	C	16.4	82	B	11.6	22
	NBT	-	A	0.0	26	A	0.0	34
	NBT/R	-	A	0.0	28	A	0.0	57
Piney Forest Road	SBL	100	A	0.0	0	A	0.0	0
	SBT	-	A	0.0	70	A	0.0	48
	SBT/R	-	A	0.0	73	A	0.0	54
<b>12. Piney Forest Road/Redwood Drive</b> <span style="float:right"><i>Unsignalized</i></span>								
Redwood Drive	WBL/R	-	C	20.6	37	D	27.1	46
Piney Forest Road	NBT	100	A	0.0	0	A	0.0	27
	NBT/R	100	A	0.0	0	A	0.0	11
Piney Forest Road	SBL	100	A	9.9	18	C	15.0	45
	SBT	-	A	0.0	0	A	0.0	23
<b>13. Piney Forest Road/Churchview Drive</b> <span style="float:right"><i>Unsignalized</i></span>								
Churchview Drive	EBL/R	-	C	17.3	30	C	23.0	37
Piney Forest Road	NBL	100	B	13.2	43	C	15.4	42
	NBT	-	A	0.0	0	A	0.0	77
Piney Forest Road	SBT	100	A	0.0	0	A	0.0	37
	SBT/R	100	A	0.0	2	A	0.0	30



# HCM Signalized Intersection Capacity Analysis

## 1: US 29/Piney Forest Rd & Franklin Turnpike

02/11/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	467	703	143	229	19	317	383	85	25	675	80
Future Volume (vph)	46	467	703	143	229	19	317	383	85	25	675	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	10.6	6.4	6.4	9.7	6.0	5.8	5.3	6.8	4.0	5.8	6.6	4.0
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3438	2814	1752	3374	1337	3400	3438	1534	1805	3539	1450
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3438	2814	1752	3374	1337	3400	3438	1534	1805	3539	1450
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	49	502	756	154	246	20	341	412	91	27	726	86
RTOR Reduction (vph)	0	0	0	0	0	12	0	0	0	0	0	0
Lane Group Flow (vph)	49	502	756	154	246	8	341	412	91	27	726	86
Confl. Peds. (#/hr)	2			1		3			1	3		2
Heavy Vehicles (%)	3%	5%	1%	3%	7%	19%	3%	5%	4%	0%	2%	10%
Turn Type	Prot	NA	Prot	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6	6	5	2	3	7	4		3		8
Permitted Phases						2			Free			Free
Actuated Green, G (s)	6.8	38.0	38.0	13.0	43.7	47.9	13.9	36.1	120.0	4.2	27.1	120.0
Effective Green, g (s)	6.8	38.0	38.0	13.0	43.7	47.9	13.9	36.1	120.0	4.2	27.1	120.0
Actuated g/C Ratio	0.06	0.32	0.32	0.11	0.36	0.40	0.12	0.30	1.00	0.04	0.23	1.00
Clearance Time (s)	10.6	6.4	6.4	9.7	6.0	5.8	5.3	6.8		5.8	6.6	
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	3.0	4.0	7.0		3.0	5.0	
Lane Grp Cap (vph)	99	1088	891	189	1228	533	393	1034	1534	63	799	1450
v/s Ratio Prot	0.03	0.15	c0.27	c0.09	c0.07	0.00	c0.10	0.12		0.01	c0.21	
v/s Ratio Perm						0.01			0.06			0.06
v/c Ratio	0.49	0.46	0.85	0.81	0.20	0.01	0.87	0.40	0.06	0.43	0.91	0.06
Uniform Delay, d1	54.9	32.8	38.3	52.3	26.2	21.8	52.1	33.3	0.0	56.7	45.2	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.74	0.64	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.7	8.3	23.9	0.1	0.0	17.9	1.1	0.1	4.6	16.1	0.1
Delay (s)	58.8	33.5	46.7	76.2	26.3	21.8	56.6	22.4	0.1	61.4	61.3	0.1
Level of Service	E	C	D	E	C	C	E	C	A	E	E	A
Approach Delay (s)		42.0			44.4			33.8			55.1	
Approach LOS		D			D			C			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			43.5			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			29.2			
Intersection Capacity Utilization			71.6%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: US 29/Piney Forest Rd & Nelson Ave/Nor-Dan Dr

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↗	↖	↖	↗	↗
Traffic Volume (vph)	3	3	6	59	0	134	6	646	70	92	1590	3
Future Volume (vph)	3	3	6	59	0	134	6	646	70	92	1590	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.7	5.8	6.4	5.5	4.0	5.8	5.5	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.95			1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1488			1736	1516	1805	3438	1519	1787	3505	1577
Flt Permitted		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1488			1736	1516	1805	3438	1519	1787	3505	1577
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)	3	3	7	64	0	146	7	702	76	100	1728	3
RTOR Reduction (vph)	0	7	0	0	0	123	0	0	0	0	0	0
Lane Group Flow (vph)	0	6	0	0	64	23	7	702	76	100	1728	3
Confl. Peds. (#/hr)	7		7	1		1	7		1	1		7
Heavy Vehicles (%)	0%	0%	20%	4%	0%	6%	0%	5%	5%	1%	3%	0%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Free	Prot	NA	Free
Protected Phases	3	3		4	4	5	1	6		5	2	
Permitted Phases						4			Free			Free
Actuated Green, G (s)		2.8			6.5	18.5	1.4	76.2	120.0	12.0	86.2	120.0
Effective Green, g (s)		2.8			6.5	18.5	1.4	76.2	120.0	12.0	86.2	120.0
Actuated g/C Ratio		0.02			0.05	0.15	0.01	0.64	1.00	0.10	0.72	1.00
Clearance Time (s)		5.5			5.7	5.8	6.4	5.5		5.8	5.5	
Vehicle Extension (s)		5.0			3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		34			94	233	21	2183	1519	178	2517	1577
v/s Ratio Prot		c0.00			c0.04	0.01	0.00	0.20		c0.06	c0.49	
v/s Ratio Perm						0.01			0.05			0.00
v/c Ratio		0.18			0.68	0.10	0.33	0.32	0.05	0.56	0.69	0.00
Uniform Delay, d1		57.5			55.7	43.6	58.8	10.0	0.0	51.5	9.4	0.0
Progression Factor		1.00			1.00	1.00	0.68	1.76	1.00	1.06	0.55	1.00
Incremental Delay, d2		5.3			18.4	0.2	8.3	0.4	0.1	2.5	1.0	0.0
Delay (s)		62.8			74.1	43.8	48.6	18.0	0.1	57.0	6.1	0.0
Level of Service		E			E	D	D	B	A	E	A	A
Approach Delay (s)		62.8			53.0			16.5			8.9	
Approach LOS		E			D			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.5		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				28.1			
Intersection Capacity Utilization			74.4%		ICU Level of Service				D			
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 3: US 29/Piney Forest Rd & Arnett Blvd Ext

02/11/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	91	63	747	70	91	1415
Future Volume (vph)	91	63	747	70	91	1415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	5.5		6.4	6.4
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.98	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	1489	3390		1752	3505
Flt Permitted	0.95	1.00	1.00		0.22	1.00
Satd. Flow (perm)	1752	1489	3390		397	3505
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	68	812	76	99	1538
RTOR Reduction (vph)	0	60	11	0	0	0
Lane Group Flow (vph)	99	8	877	0	99	1538
Confl. Peds. (#/hr)	4	4		4	4	
Heavy Vehicles (%)	3%	6%	5%	4%	3%	3%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	6.8	6.8	29.7		40.7	40.7
Effective Green, g (s)	6.8	6.8	29.7		40.7	40.7
Actuated g/C Ratio	0.11	0.11	0.49		0.68	0.68
Clearance Time (s)	6.1	6.1	5.5		6.4	6.4
Vehicle Extension (s)	3.0	3.0	5.0		4.0	3.0
Lane Grp Cap (vph)	198	168	1678		393	2377
v/s Ratio Prot	c0.06		0.26		0.02	c0.44
v/s Ratio Perm		0.01			0.15	
v/c Ratio	0.50	0.05	0.52		0.25	0.65
Uniform Delay, d1	25.0	23.7	10.3		4.6	5.5
Progression Factor	1.00	1.00	0.96		0.62	0.73
Incremental Delay, d2	2.0	0.1	1.1		0.4	1.1
Delay (s)	27.0	23.8	11.0		3.2	5.1
Level of Service	C	C	B		A	A
Approach Delay (s)	25.7		11.0			5.0
Approach LOS	C		B			A

### Intersection Summary

HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: US 29/Piney Forest Rd & Beavers Mill Rd/Wendell Scott Dr

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	62	47	79	24	28	26	18	712	26	16	1455	44
Future Volume (vph)	62	47	79	24	28	26	18	712	26	16	1455	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			5.9	5.9	8.6	5.5	4.0	7.3	5.5	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1666			1733	1468	1805	3505	1357	1805	3539	1495
Flt Permitted		0.87			0.71	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1471			1264	1468	1805	3505	1357	1805	3539	1495
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)	67	51	86	26	30	28	20	774	28	17	1582	48
RTOR Reduction (vph)	0	23	0	0	0	23	0	0	0	0	0	0
Lane Group Flow (vph)	0	181	0	0	56	5	20	774	28	17	1582	48
Heavy Vehicles (%)	10%	0%	6%	5%	9%	10%	0%	3%	19%	0%	2%	8%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases		4			4		5	2		1		6
Permitted Phases	4			4		4			Free			Free
Actuated Green, G (s)		19.3			19.3	19.3	2.9	79.1	120.0	2.9	77.8	120.0
Effective Green, g (s)		19.3			19.3	19.3	2.9	79.1	120.0	2.9	77.8	120.0
Actuated g/C Ratio		0.16			0.16	0.16	0.02	0.66	1.00	0.02	0.65	1.00
Clearance Time (s)		5.9			5.9	5.9	8.6	5.5		7.3	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		236			203	236	43	2310	1357	43	2294	1495
v/s Ratio Prot							c0.01	0.22		0.01	c0.45	
v/s Ratio Perm		c0.12			0.04	0.00			0.02			c0.03
v/c Ratio		0.76			0.28	0.02	0.47	0.34	0.02	0.40	0.69	0.03
Uniform Delay, d1		48.2			44.2	42.4	57.8	8.9	0.0	57.7	13.4	0.0
Progression Factor		1.00			1.00	1.00	1.08	0.84	1.00	1.00	0.70	1.00
Incremental Delay, d2		13.7			0.7	0.0	7.5	0.4	0.0	5.0	1.5	0.0
Delay (s)		61.9			45.0	42.4	69.7	7.9	0.0	62.9	10.9	0.0
Level of Service		E			D	D	E	A	A	E	B	A
Approach Delay (s)		61.9			44.1			9.2			11.1	
Approach LOS		E			D			A			B	

Intersection Summary		
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.70	B
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	67.1%	20.0
Analysis Period (min)	15	ICU Level of Service
		C
c Critical Lane Group		

# HCM Signalized Intersection Capacity Analysis

## 5: US 29/Piney Forest Rd & Piney Forest Shopping Center/Old Piney Forest Rd

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↔		↖	↕		↖	↕	↗
Traffic Volume (vph)	6	0	2	35	1	7	5	855	35	0	1454	7
Future Volume (vph)	6	0	2	35	1	7	5	855	35	0	1454	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7		6.1		6.0	5.5			5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95			0.95	
Frbp, ped/bikes		1.00	1.00		1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00			1.00	
Frt		1.00	0.85		0.98		1.00	0.99			1.00	
Flt Protected		0.95	1.00		0.96		0.95	1.00			1.00	
Satd. Flow (prot)		1805	1615		1727		1805	3453			3537	
Flt Permitted		0.95	1.00		0.96		0.95	1.00			1.00	
Satd. Flow (perm)		1805	1615		1727		1805	3453			3537	
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)	7	0	2	38	1	8	5	929	38	0	1580	8
RTOR Reduction (vph)	0	0	2	0	7	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	40	0	5	967	0	0	1588	0
Confl. Peds. (#/hr)	1			1		2			1	2		1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	17%	0%	4%	0%	0%	2%	0%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		1.4	1.4		6.6		1.4	94.7			87.3	
Effective Green, g (s)		1.4	1.4		6.6		1.4	94.7			87.3	
Actuated g/C Ratio		0.01	0.01		0.05		0.01	0.79			0.73	
Clearance Time (s)		5.7	5.7		6.1		6.0	5.5			5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	5.0			5.0	
Lane Grp Cap (vph)		21	18		94		21	2724			2573	
v/s Ratio Prot		c0.00			c0.02		0.00	c0.28			c0.45	
v/s Ratio Perm			0.00									
v/c Ratio		0.33	0.00		0.43		0.24	0.35			0.62	
Uniform Delay, d1		58.8	58.6		54.9		58.8	3.7			8.1	
Progression Factor		1.00	1.00		1.00		0.93	1.00			0.23	
Incremental Delay, d2		9.1	0.0		3.1		5.5	0.3			0.9	
Delay (s)		68.0	58.6		58.0		60.3	4.0			2.8	
Level of Service		E	E		E		E	A			A	
Approach Delay (s)		65.9			58.0			4.3			2.8	
Approach LOS		E			E			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			4.5									A
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			120.0							23.3		
Intersection Capacity Utilization			66.5%									C
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 6: US 29/Piney Forest Rd & Pineview Dr/Audobon Dr

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↔		↕	↕↔	
Traffic Volume (vph)	3	1	2	61	3	90	1	833	36	61	1377	0
Future Volume (vph)	3	1	2	61	3	90	1	833	36	61	1377	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.2	6.8	6.8	6.8		6.8	6.8	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.95			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770			1813	1521	1805	3452		1769	3505	
Flt Permitted		0.98			0.95	1.00	0.14	1.00		0.26	1.00	
Satd. Flow (perm)		1770			1813	1521	268	3452		476	3505	
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)	3	1	2	66	3	98	1	905	39	66	1497	0
RTOR Reduction (vph)	0	2	0	0	0	86	0	2	0	0	0	0
Lane Group Flow (vph)	0	4	0	0	69	12	1	942	0	66	1497	0
Confl. Peds. (#/hr)				3		3			3	3		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	5%	0%	4%	0%	2%	3%	0%
Turn Type	Split	NA		Split	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases						8	2			6		
Actuated Green, G (s)		1.1			8.1	14.1	81.4	80.4		91.4	85.4	
Effective Green, g (s)		1.1			8.1	14.1	81.4	80.4		91.4	85.4	
Actuated g/C Ratio		0.01			0.07	0.12	0.68	0.67		0.76	0.71	
Clearance Time (s)		5.6			5.2	6.8	6.8	6.8		6.8	6.8	
Vehicle Extension (s)		3.0			3.0	2.5	2.5	5.0		2.5	5.0	
Lane Grp Cap (vph)		16			122	178	194	2312		427	2494	
v/s Ratio Prot		c0.00			c0.04	0.00	0.00	0.27		c0.01	c0.43	
v/s Ratio Perm						0.00	0.00			0.11		
v/c Ratio		0.25			0.57	0.06	0.01	0.41		0.15	0.60	
Uniform Delay, d1		59.0			54.2	47.1	7.2	9.0		4.4	8.7	
Progression Factor		1.00			1.00	1.00	0.74	0.68		0.16	0.16	
Incremental Delay, d2		8.1			5.9	0.1	0.0	0.5		0.1	0.9	
Delay (s)		67.1			60.1	47.2	5.3	6.6		0.8	2.3	
Level of Service		E			E	D	A	A		A	A	
Approach Delay (s)		67.1			52.5			6.6			2.2	
Approach LOS		E			D			A			A	

### Intersection Summary

HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 7: US 29/Piney Forest Rd & Parker Rd/Falwell Ct

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↖	↗		↖	↗	↖	↑↑	↗	↖	↖↗		
Traffic Volume (vph)	28	1	48	3	5	5	30	906	20	3	1309	28	
Future Volume (vph)	28	1	48	3	5	5	30	906	20	3	1309	28	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		7.0	7.0		8.0	4.0	6.0	5.6	5.6	5.6	5.5		
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95		
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00		
Flt Protected		0.95	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1745	1495		1865	1292	1805	3471	1442	1805	3490		
Flt Permitted		0.95	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (perm)		1745	1495		1865	1292	1805	3471	1442	1805	3490		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	30	1	52	3	5	5	32	974	22	3	1408	30	
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	6	0	1	0	
Lane Group Flow (vph)	0	31	3	0	8	5	32	974	16	3	1437	0	
Heavy Vehicles (%)	4%	0%	8%	0%	0%	25%	0%	4%	12%	0%	3%	9%	
Turn Type	Split	NA	Perm	Split	NA	Free	Prot	NA	Perm	Prot	NA		
Protected Phases	4	4		8	8		1	6		5	2		
Permitted Phases			4			Free			6				
Actuated Green, G (s)		6.0	6.0		1.8	120.0	4.6	84.6	84.6	1.4	81.1		
Effective Green, g (s)		6.0	6.0		1.8	120.0	4.6	84.6	84.6	1.4	81.1		
Actuated g/C Ratio		0.05	0.05		0.02	1.00	0.04	0.70	0.70	0.01	0.68		
Clearance Time (s)		7.0	7.0		8.0		6.0	5.6	5.6	5.6	5.5		
Vehicle Extension (s)		3.0	3.0		3.0		3.0	5.0	5.0	3.0	5.0		
Lane Grp Cap (vph)		87	74		27	1292	69	2447	1016	21	2358		
v/s Ratio Prot		c0.02			c0.00		c0.02	c0.28		0.00	c0.41		
v/s Ratio Perm			0.00			0.00			0.01				
v/c Ratio		0.36	0.04		0.30	0.00	0.46	0.40	0.02	0.14	0.61		
Uniform Delay, d1		55.1	54.2		58.5	0.0	56.5	7.3	5.3	58.7	10.7		
Progression Factor		1.00	1.00		1.00	1.00	0.81	0.83	1.00	1.26	0.33		
Incremental Delay, d2		2.5	0.2		6.1	0.0	4.6	0.5	0.0	2.7	1.0		
Delay (s)		57.6	54.4		64.5	0.0	50.1	6.5	5.3	76.4	4.6		
Level of Service		E	D		E	A	D	A	A	E	A		
Approach Delay (s)		55.6			39.7			7.8			4.8		
Approach LOS		E			D			A			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			7.8		HCM 2000 Level of Service					A			
HCM 2000 Volume to Capacity ratio			0.58										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)					26.5			
Intersection Capacity Utilization			67.5%		ICU Level of Service					C			
Analysis Period (min)			15										
c Critical Lane Group													



HCM Signalized Intersection Capacity Analysis  
 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖		↖	↑↑	↖	↖	↑↑	↖
Traffic Volume (vph)	37	11	5	35	25	9	7	796	87	97	1222	89
Future Volume (vph)	37	11	5	35	25	9	7	796	87	97	1222	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	5.8	6.0	6.0		5.8	5.5	6.0	6.7	5.5	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1618	1703	1278	1752	1813		1203	3471	1569	1805	3505	1506
Flt Permitted	0.95	0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1618	1703	1278	1752	1813		1203	3471	1569	1805	3505	1506
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)	40	12	5	38	27	10	8	865	95	105	1328	97
RTOR Reduction (vph)	0	0	5	0	9	0	0	0	34	0	0	0
Lane Group Flow (vph)	26	26	0	38	28	0	8	865	61	105	1328	97
Confl. Peds. (#/hr)	2		1	1		2	1		1	2		2
Heavy Vehicles (%)	6%	0%	25%	3%	0%	0%	50%	4%	1%	0%	3%	5%
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA	pm+ov	Prot	NA	Free
Protected Phases	4	4	1	3	3		1	6	3	5	2	
Permitted Phases			4						6			Free
Actuated Green, G (s)	6.3	6.3	9.3	8.0	8.0		3.0	68.9	76.9	12.3	79.1	120.0
Effective Green, g (s)	6.3	6.3	9.3	8.0	8.0		3.0	68.9	76.9	12.3	79.1	120.0
Actuated g/C Ratio	0.05	0.05	0.08	0.07	0.07		0.02	0.57	0.64	0.10	0.66	1.00
Clearance Time (s)	6.3	6.3	5.8	6.0	6.0		5.8	5.5	6.0	6.7	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	5.5	3.0	3.0	5.5	
Lane Grp Cap (vph)	84	89	99	116	120		30	1992	1005	185	2310	1506
v/s Ratio Prot	c0.02	0.02	0.00	c0.02	0.02		0.01	0.25	0.00	c0.06	c0.38	
v/s Ratio Perm			0.00						0.03			0.06
v/c Ratio	0.31	0.29	0.00	0.33	0.23		0.27	0.43	0.06	0.57	0.57	0.06
Uniform Delay, d1	54.8	54.7	51.1	53.4	53.1		57.4	14.5	8.1	51.3	11.2	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.23	0.25	1.00
Incremental Delay, d2	2.1	1.8	0.0	1.7	1.0		4.7	0.7	0.0	3.5	0.9	0.1
Delay (s)	56.9	56.5	51.1	55.1	54.1		62.2	15.2	8.1	66.9	3.7	0.1
Level of Service	E	E	D	E	D		E	B	A	E	A	A
Approach Delay (s)		56.2			54.6			14.9			7.8	
Approach LOS		E			D			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.8			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			24.5			
Intersection Capacity Utilization			62.6%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group



Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑↑	↑↑	
Traffic Vol, veh/h	6	20	24	753	1631	21
Future Vol, veh/h	6	20	24	753	1631	21
Conflicting Peds, #/hr	0	4	4	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	5	4	4	22
Mvmt Flow	7	22	26	818	1773	23

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	2250	906	1800	0	0
Stage 1	1789	-	-	-	-
Stage 2	461	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-
Pot Cap-1 Maneuver	36	283	326	-	-
Stage 1	122	-	-	-	-
Stage 2	607	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	33	281	325	-	-
Mov Cap-2 Maneuver	93	-	-	-	-
Stage 1	112	-	-	-	-
Stage 2	605	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27	0.5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	325	-	192	-	-
HCM Lane V/C Ratio	0.08	-	0.147	-	-
HCM Control Delay (s)	17	-	27	-	-
HCM Lane LOS	C	-	D	-	-
HCM 95th %tile Q(veh)	0.3	-	0.5	-	-

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↵	↶	↵	↑↑	↑↑	
Traffic Vol, veh/h	57	105	15	756	1390	11
Future Vol, veh/h	57	105	15	756	1390	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	4	2	0
Mvmt Flow	62	114	16	822	1511	12
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1960	762	1523	0	-	0
Stage 1	1517	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	~ 57	352	444	-	-	-
Stage 1	171	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 55	352	444	-	-	-
Mov Cap-2 Maneuver	134	-	-	-	-	-
Stage 1	165	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	31.7	0.3	0			
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	444	-	134	352	-	-
HCM Lane V/C Ratio	0.037	-	0.462	0.324	-	-
HCM Control Delay (s)	13.4	-	53.1	20.1	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	2.1	1.4	-	-
Notes						
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	
Traffic Vol, veh/h	7	0	12	2	0	5	61	805	9	0	1449	56
Future Vol, veh/h	7	0	12	2	0	5	61	805	9	0	1449	56
Conflicting Peds, #/hr	2	0	2	1	0	1	2	0	1	1	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	17	0	30	0	0	0	4	4	0	0	3	4
Mvmt Flow	8	0	13	2	0	5	66	875	10	0	1575	61

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2180	2626	822	1803	2651	446	1638	0	0	886	0	0
Stage 1	1608	1608	-	1013	1013	-	-	-	-	-	-	-
Stage 2	572	1018	-	790	1638	-	-	-	-	-	-	-
Critical Hdwy	7.84	6.5	7.5	7.5	6.5	6.9	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.84	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.84	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4	3.6	3.5	4	3.3	2.24	-	-	2.2	-	-
Pot Cap-1 Maneuver	21	24	265	51	23	565	383	-	-	773	-	-
Stage 1	94	166	-	260	319	-	-	-	-	-	-	-
Stage 2	437	317	-	354	160	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	18	20	264	42	19	563	382	-	-	772	-	-
Mov Cap-2 Maneuver	18	20	-	42	19	-	-	-	-	-	-	-
Stage 1	78	166	-	215	263	-	-	-	-	-	-	-
Stage 2	357	262	-	336	160	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	126.2	35.9	1.1	0
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	382	-	-	18	264	124	772	-	-
HCM Lane V/C Ratio	0.174	-	-	0.423	0.049	0.061	-	-	-
HCM Control Delay (s)	16.4	-	-	309.4	19.3	35.9	0	-	-
HCM Lane LOS	C	-	-	F	C	E	A	-	-
HCM 95th %tile Q(veh)	0.6	-	-	1.2	0.2	0.2	0	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↓		↔	↑↑
Traffic Vol, veh/h	9	2	859	5	3	1354
Future Vol, veh/h	9	2	859	5	3	1354
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	10	2	934	5	3	1472

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1679	470	0	0	939
Stage 1	937	-	-	-	-
Stage 2	742	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	88	545	-	-	738
Stage 1	346	-	-	-	-
Stage 2	437	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	88	545	-	-	738
Mov Cap-2 Maneuver	215	-	-	-	-
Stage 1	346	-	-	-	-
Stage 2	435	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	242	738
HCM Lane V/C Ratio	-	-	0.049	0.004
HCM Control Delay (s)	-	-	20.6	9.9
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑↑	↑↑	
Traffic Vol, veh/h	1	7	17	863	1351	12
Future Vol, veh/h	1	7	17	863	1351	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	2	2	0
Mvmt Flow	1	8	18	938	1468	13

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1980	741	1481	0	-	0
Stage 1	1475	-	-	-	-	-
Stage 2	505	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	55	363	460	-	-	-
Stage 1	180	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	53	363	460	-	-	-
Mov Cap-2 Maneuver	138	-	-	-	-	-
Stage 1	173	-	-	-	-	-
Stage 2	577	-	-	-	-	-

























Approach	EB	NB	SB
HCM Control Delay, s	17.3	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	460	-	302	-	-
HCM Lane V/C Ratio	0.04	-	0.029	-	-
HCM Control Delay (s)	13.2	-	17.3	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

# HCM Signalized Intersection Capacity Analysis

## 1: US 29/Piney Forest Rd & Franklin Turnpike

02/11/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	276	427	176	520	38	793	773	140	68	566	103
Future Volume (vph)	119	276	427	176	520	38	793	773	140	68	566	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	10.6	6.4	6.4	9.7	6.0	5.8	5.3	6.8	4.0	5.8	6.6	4.0
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	2842	1787	3574	1598	3502	3574	1578	1805	3574	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	2842	1787	3574	1598	3502	3574	1578	1805	3574	1615
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)	129	300	464	191	565	41	862	840	152	74	615	112
RTOR Reduction (vph)	0	0	0	0	0	29	0	0	0	0	0	0
Lane Group Flow (vph)	129	300	464	191	565	12	862	840	152	74	615	112
Confl. Peds. (#/hr)				3		1	2		3	1		
Heavy Vehicles (%)	2%	2%	0%	1%	1%	0%	0%	1%	1%	0%	1%	0%
Turn Type	Prot	NA	Prot	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6	6	5	2	3	7	4		3	8	
Permitted Phases						2			Free			Free
Actuated Green, G (s)	10.0	22.1	22.1	14.4	26.0	33.9	30.9	46.9	120.0	7.9	24.6	120.0
Effective Green, g (s)	10.0	22.1	22.1	14.4	26.0	33.9	30.9	46.9	120.0	7.9	24.6	120.0
Actuated g/C Ratio	0.08	0.18	0.18	0.12	0.22	0.28	0.26	0.39	1.00	0.07	0.21	1.00
Clearance Time (s)	10.6	6.4	6.4	9.7	6.0	5.8	5.3	6.8		5.8	6.6	
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	3.0	4.0	7.0		3.0	5.0	
Lane Grp Cap (vph)	147	651	523	214	774	451	901	1396	1578	118	732	1615
v/s Ratio Prot	0.07	0.08	c0.16	c0.11	c0.16	0.00	c0.25	0.24		0.04	c0.17	
v/s Ratio Perm						0.01			0.10			0.07
v/c Ratio	0.88	0.46	0.89	0.89	0.73	0.03	0.96	0.60	0.10	0.63	0.84	0.07
Uniform Delay, d1	54.4	43.6	47.7	52.0	43.7	31.1	43.9	29.1	0.0	54.6	45.8	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.71	0.82	1.00	1.00	1.00	1.00
Incremental Delay, d2	40.2	1.1	17.6	34.5	3.7	0.0	16.3	1.4	0.1	10.0	11.2	0.1
Delay (s)	94.6	44.7	65.3	86.5	47.4	31.1	47.6	25.2	0.1	64.6	57.0	0.1
Level of Service	F	D	E	F	D	C	D	C	A	E	E	A
Approach Delay (s)		62.6			56.0			33.6			49.7	
Approach LOS		E			E			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			46.6				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			29.2		
Intersection Capacity Utilization			85.0%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: US 29/Piney Forest Rd & Nelson Ave/Nor-Dan Dr

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	24	12	8	157	14	333	6	1315	106	162	1108	25
Future Volume (vph)	24	12	8	157	14	333	6	1315	106	162	1108	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.7	5.8	6.4	5.5	4.0	5.8	5.5	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frb, ped/bikes		0.99			1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1739			1800	1606	1805	3574	1595	1805	3574	1503
Flt Permitted		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1739			1800	1606	1805	3574	1595	1805	3574	1503
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)	26	13	9	171	15	362	7	1429	115	176	1204	27
RTOR Reduction (vph)	0	7	0	0	0	139	0	0	0	0	0	0
Lane Group Flow (vph)	0	41	0	0	186	223	7	1429	115	176	1204	27
Confl. Peds. (#/hr)	6		6	1		1	6		1	1		6
Heavy Vehicles (%)	5%	0%	0%	1%	0%	0%	0%	1%	0%	0%	1%	5%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Free	Prot	NA	Free
Protected Phases	3	3		4	4	5	1	6		5		2
Permitted Phases						4			Free			Free
Actuated Green, G (s)		5.6			13.6	32.0	1.4	59.9	120.0	18.4	76.3	120.0
Effective Green, g (s)		5.6			13.6	32.0	1.4	59.9	120.0	18.4	76.3	120.0
Actuated g/C Ratio		0.05			0.11	0.27	0.01	0.50	1.00	0.15	0.64	1.00
Clearance Time (s)		5.5			5.7	5.8	6.4	5.5		5.8	5.5	
Vehicle Extension (s)		5.0			3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		81			204	428	21	1784	1595	276	2272	1503
v/s Ratio Prot		c0.02			c0.10	0.08	0.00	c0.40		c0.10	0.34	
v/s Ratio Perm						0.06			0.07			0.02
v/c Ratio		0.51			0.91	0.52	0.33	0.80	0.07	0.64	0.53	0.02
Uniform Delay, d1		55.9			52.6	37.5	58.8	25.1	0.0	47.7	12.0	0.0
Progression Factor		1.00			1.00	1.00	1.28	0.59	1.00	1.13	0.97	1.00
Incremental Delay, d2		10.4			39.2	1.1	6.6	2.8	0.1	3.0	0.6	0.0
Delay (s)		66.3			91.9	38.6	81.7	17.6	0.1	57.0	12.2	0.0
Level of Service		E			F	D	F	B	A	E	B	A
Approach Delay (s)		66.3			56.7			16.6			17.5	
Approach LOS		E			E			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			23.8		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				28.1			
Intersection Capacity Utilization			76.9%		ICU Level of Service				D			
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 3: US 29/Piney Forest Rd & Arnett Blvd Ext

02/11/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	62	90	1610	100	81	1174
Future Volume (vph)	62	90	1610	100	81	1174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	5.5		6.4	6.4
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1566	3532		1805	3539
Flt Permitted	0.95	1.00	1.00		0.07	1.00
Satd. Flow (perm)	1805	1566	3532		140	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	65	95	1695	105	85	1236
RTOR Reduction (vph)	0	87	3	0	0	0
Lane Group Flow (vph)	65	8	1797	0	85	1236
Confl. Peds. (#/hr)	5	5		5	5	
Heavy Vehicles (%)	0%	0%	1%	4%	0%	2%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	9.6	9.6	85.9		97.9	97.9
Effective Green, g (s)	9.6	9.6	85.9		97.9	97.9
Actuated g/C Ratio	0.08	0.08	0.72		0.82	0.82
Clearance Time (s)	6.1	6.1	5.5		6.4	6.4
Vehicle Extension (s)	3.0	3.0	5.0		4.0	3.0
Lane Grp Cap (vph)	144	125	2528		204	2887
v/s Ratio Prot	c0.04		c0.51		0.02	c0.35
v/s Ratio Perm		0.00			0.32	
v/c Ratio	0.45	0.06	0.71		0.42	0.43
Uniform Delay, d1	52.7	51.0	9.9		11.8	3.1
Progression Factor	1.00	1.00	0.58		2.18	1.67
Incremental Delay, d2	2.2	0.2	1.4		1.6	0.4
Delay (s)	54.9	51.2	7.2		27.3	5.6
Level of Service	D	D	A		C	A
Approach Delay (s)	52.7		7.2			7.0
Approach LOS	D		A			A

### Intersection Summary

HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis  
 4: US 29/Piney Forest Rd & Beavers Mill Rd/Wendell Scott Dr

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	65	29	44	20	46	41	87	1563	24	20	1144	86
Future Volume (vph)	65	29	44	20	46	41	87	1563	24	20	1144	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			5.9	5.9	8.6	5.5	4.0	7.3	5.5	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.96			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1777			1871	1568	1787	3574	1615	1805	3574	1599
Flt Permitted		0.82			0.84	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1484			1593	1568	1787	3574	1615	1805	3574	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	67	30	45	21	47	42	90	1611	25	21	1179	89
RTOR Reduction (vph)	0	15	0	0	0	37	0	0	0	0	0	0
Lane Group Flow (vph)	0	127	0	0	68	5	90	1611	25	21	1179	89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	1%	1%	0%	0%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases		4			4		5	2		1		6
Permitted Phases	4			4		4			Free			Free
Actuated Green, G (s)		15.0			15.0	15.0	10.9	83.2	120.0	3.1	74.1	120.0
Effective Green, g (s)		15.0			15.0	15.0	10.9	83.2	120.0	3.1	74.1	120.0
Actuated g/C Ratio		0.12			0.12	0.12	0.09	0.69	1.00	0.03	0.62	1.00
Clearance Time (s)		5.9			5.9	5.9	8.6	5.5		7.3	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		185			199	196	162	2477	1615	46	2206	1599
v/s Ratio Prot							c0.05	c0.45		0.01	0.33	
v/s Ratio Perm		c0.09			0.04	0.00			0.02			0.06
v/c Ratio		0.69			0.34	0.03	0.56	0.65	0.02	0.46	0.53	0.06
Uniform Delay, d1		50.3			48.0	46.1	52.2	10.3	0.0	57.6	13.1	0.0
Progression Factor		1.00			1.00	1.00	1.21	0.92	1.00	1.02	0.64	1.00
Incremental Delay, d2		10.1			1.0	0.1	3.1	1.0	0.0	6.6	0.9	0.1
Delay (s)		60.4			49.0	46.1	66.5	10.4	0.0	65.4	9.3	0.1
Level of Service		E			D	D	E	B	A	E	A	A
Approach Delay (s)		60.4			47.9			13.2			9.6	
Approach LOS		E			D			B			A	

Intersection Summary		
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.69	B
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	79.1%	20.0
Analysis Period (min)	15	ICU Level of Service
		D
c Critical Lane Group		

# HCM Signalized Intersection Capacity Analysis

## 5: US 29/Piney Forest Rd & Piney Forest Shopping Center/Old Piney Forest Rd

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	
Traffic Volume (vph)	28	3	9	64	7	5	8	1579	73	3	1257	14
Future Volume (vph)	28	3	9	64	7	5	8	1579	73	3	1257	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7		6.1		6.0	5.5		5.7	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.99		1.00	0.99		1.00	1.00	
Flt Protected		0.96	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817	1400		1806		1805	3549		1805	3568	
Flt Permitted		0.96	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1817	1400		1806		1805	3549		1805	3568	
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)	30	3	10	70	8	5	9	1716	79	3	1366	15
RTOR Reduction (vph)	0	0	10	0	2	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	33	0	0	81	0	9	1795	0	3	1380	0
Confl. Peds. (#/hr)	1		1	3		3	1		3	3		1
Heavy Vehicles (%)	0%	0%	13%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		4.2	4.2		8.6		1.4	82.8		1.4	82.5	
Effective Green, g (s)		4.2	4.2		8.6		1.4	82.8		1.4	82.5	
Actuated g/C Ratio		0.04	0.04		0.07		0.01	0.69		0.01	0.69	
Clearance Time (s)		5.7	5.7		6.1		6.0	5.5		5.7	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		63	49		129		21	2448		21	2453	
v/s Ratio Prot		c0.02			c0.04		c0.00	c0.51		0.00	0.39	
v/s Ratio Perm			0.00									
v/c Ratio		0.52	0.01		0.63		0.43	0.73		0.14	0.56	
Uniform Delay, d1		56.9	55.9		54.1		58.9	11.7		58.7	9.6	
Progression Factor		1.00	1.00		1.00		1.30	0.10		1.35	0.55	
Incremental Delay, d2		7.6	0.1		9.2		10.5	1.5		2.8	0.8	
Delay (s)		64.6	55.9		63.4		87.0	2.7		82.3	6.1	
Level of Service		E	E		E		F	A		F	A	
Approach Delay (s)		62.6			63.4			3.2			6.2	
Approach LOS		E			E			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			6.7		HCM 2000 Level of Service						A	
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)					23.3		
Intersection Capacity Utilization			66.6%		ICU Level of Service					C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 6: US 29/Piney Forest Rd & Pineview Dr/Audobon Dr

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↔		↕	↕↔	
Traffic Volume (vph)	3	2	8	45	5	77	11	1503	81	50	1281	1
Future Volume (vph)	3	2	8	45	5	77	11	1503	81	50	1281	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.2	6.8	6.8	6.8		6.8	6.8	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.91			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1717			1818	1590	1805	3545		1805	3574	
Flt Permitted		0.99			0.96	1.00	0.16	1.00		0.08	1.00	
Satd. Flow (perm)		1717			1818	1590	304	3545		149	3574	
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)	3	2	9	49	5	84	12	1634	88	54	1392	1
RTOR Reduction (vph)	0	9	0	0	0	75	0	3	0	0	0	0
Lane Group Flow (vph)	0	5	0	0	54	9	12	1719	0	54	1393	0
Confl. Peds. (#/hr)	3			3		6			3	6		3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Split	NA		Split	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases						8	2			6		
Actuated Green, G (s)		2.0			6.9	12.7	83.0	80.9		90.4	84.6	
Effective Green, g (s)		2.0			6.9	12.7	83.0	80.9		90.4	84.6	
Actuated g/C Ratio		0.02			0.06	0.11	0.69	0.67		0.75	0.70	
Clearance Time (s)		5.6			5.2	6.8	6.8	6.8		6.8	6.8	
Vehicle Extension (s)		3.0			3.0	2.5	2.5	5.0		2.5	5.0	
Lane Grp Cap (vph)		28			104	168	236	2389		192	2519	
v/s Ratio Prot		c0.00			c0.03	0.00	0.00	c0.49		c0.01	c0.39	
v/s Ratio Perm						0.00	0.03			0.20		
v/c Ratio		0.18			0.52	0.05	0.05	0.72		0.28	0.55	
Uniform Delay, d1		58.2			54.9	48.2	6.6	12.4		10.8	8.6	
Progression Factor		1.00			1.00	1.00	0.29	0.59		2.28	0.58	
Incremental Delay, d2		3.2			4.3	0.1	0.1	1.6		0.5	0.8	
Delay (s)		61.4			59.3	48.3	2.0	8.9		25.0	5.8	
Level of Service		E			E	D	A	A		C	A	
Approach Delay (s)		61.4			52.6			8.8			6.5	
Approach LOS		E			D			A			A	

Intersection Summary		
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.67	A
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	69.7%	24.4
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 7: US 29/Piney Forest Rd & Parker Rd/Falwell Ct

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↑↑	↗	↖	↖↗	
Traffic Volume (vph)	24	1	52	19	5	5	51	1564	14	5	1340	51
Future Volume (vph)	24	1	52	19	5	5	51	1564	14	5	1340	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		8.0	4.0	6.0	5.6	5.6	5.6	5.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1729	1615		1826	1615	1805	3574	1615	1805	3551	
Flt Permitted		0.95	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1729	1615		1826	1615	1805	3574	1615	1805	3551	
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)	26	1	57	21	5	5	55	1700	15	5	1457	55
RTOR Reduction (vph)	0	0	54	0	0	0	0	0	5	0	2	0
Lane Group Flow (vph)	0	27	3	0	26	5	55	1700	10	5	1510	0
Heavy Vehicles (%)	5%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	4%
Turn Type	Split	NA	Perm	Split	NA	Free	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases			4			Free			6			
Actuated Green, G (s)		5.6	5.6		5.4	120.0	6.9	81.4	81.4	1.4	75.6	
Effective Green, g (s)		5.6	5.6		5.4	120.0	6.9	81.4	81.4	1.4	75.6	
Actuated g/C Ratio		0.05	0.05		0.05	1.00	0.06	0.68	0.68	0.01	0.63	
Clearance Time (s)		7.0	7.0		8.0		6.0	5.6	5.6	5.6	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)		80	75		82	1615	103	2424	1095	21	2237	
v/s Ratio Prot		c0.02			c0.01		c0.03	c0.48		0.00	0.43	
v/s Ratio Perm			0.00			0.00			0.01			
v/c Ratio		0.34	0.04		0.32	0.00	0.53	0.70	0.01	0.24	0.68	
Uniform Delay, d1		55.4	54.6		55.5	0.0	55.0	11.8	6.2	58.8	14.3	
Progression Factor		1.00	1.00		1.00	1.00	0.99	0.49	1.00	1.26	0.87	
Incremental Delay, d2		2.5	0.2		2.2	0.0	4.4	1.4	0.0	5.2	1.5	
Delay (s)		57.9	54.8		57.7	0.0	59.1	7.2	6.3	79.2	13.9	
Level of Service		E	D		E	A	E	A	A	E	B	
Approach Delay (s)		55.8			48.4			8.8			14.1	
Approach LOS		E			D			A			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.7		HCM 2000 Level of Service						B	
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)					26.5		
Intersection Capacity Utilization			69.1%		ICU Level of Service					C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct

02/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	47	14	52	104	9	18	1218	100	71	1115	201
Future Volume (vph)	205	47	14	52	104	9	18	1218	100	71	1115	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	5.8	6.0	6.0		5.8	5.5	6.0	6.7	5.5	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1715	1750	1615	1770	1876		1805	3574	1615	1805	3574	1599
Flt Permitted	0.95	0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1715	1750	1615	1770	1876		1805	3574	1615	1805	3574	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	218	50	15	55	111	10	19	1296	106	76	1186	214
RTOR Reduction (vph)	0	0	13	0	3	0	0	0	41	0	0	0
Lane Group Flow (vph)	133	135	2	55	118	0	19	1296	65	76	1186	214
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA	pm+ov	Prot	NA	Free
Protected Phases	4	4	1	3	3		1	6	3	5	2	
Permitted Phases			4						6			Free
Actuated Green, G (s)	13.8	13.8	18.0	10.5	10.5		4.2	63.2	73.7	8.0	67.9	120.0
Effective Green, g (s)	13.8	13.8	18.0	10.5	10.5		4.2	63.2	73.7	8.0	67.9	120.0
Actuated g/C Ratio	0.12	0.12	0.15	0.09	0.09		0.04	0.53	0.61	0.07	0.57	1.00
Clearance Time (s)	6.3	6.3	5.8	6.0	6.0		5.8	5.5	6.0	6.7	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	5.5	3.0	3.0	5.5	
Lane Grp Cap (vph)	197	201	242	154	164		63	1882	991	120	2022	1599
v/s Ratio Prot	c0.08	0.08	0.00	0.03	c0.06		0.01	c0.36	0.01	c0.04	c0.33	
v/s Ratio Perm			0.00						0.03			0.13
v/c Ratio	0.68	0.67	0.01	0.36	0.72		0.30	0.69	0.07	0.63	0.59	0.13
Uniform Delay, d1	50.9	50.9	43.4	51.6	53.3		56.5	21.1	9.3	54.6	16.9	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.22	0.47	1.00
Incremental Delay, d2	8.8	8.5	0.0	1.4	14.5		2.7	2.1	0.0	8.5	1.0	0.1
Delay (s)	59.8	59.4	43.4	53.0	67.8		59.2	23.2	9.3	75.2	8.9	0.1
Level of Service	E	E	D	D	E		E	C	A	E	A	A
Approach Delay (s)		58.7			63.2			22.6			11.0	
Approach LOS		E			E			C			B	

Intersection Summary

HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.5
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th TWSC  
 9: US 29/Piney Forest Rd & Woodside Dr

02/11/2022

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑↑	↑↑	
Traffic Vol, veh/h	34	39	70	1533	1165	27
Future Vol, veh/h	34	39	70	1533	1165	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	37	42	76	1666	1266	29

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2266	648	1295	0	-	0
Stage 1	1281	-	-	-	-	-
Stage 2	985	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	~ 35	418	542	-	-	-
Stage 1	228	-	-	-	-	-
Stage 2	327	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 30	418	542	-	-	-
Mov Cap-2 Maneuver	125	-	-	-	-	-
Stage 1	196	-	-	-	-	-
Stage 2	327	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	34.4	0.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	542	-	200	-	-
HCM Lane V/C Ratio	0.14	-	0.397	-	-
HCM Control Delay (s)	12.7	-	34.4	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.5	-	1.8	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	18	10	1664	1181	21
Future Vol, veh/h	20	18	10	1664	1181	21
Conflicting Peds, #/hr	3	4	4	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	6	0	1	1	5
Mvmt Flow	21	19	10	1733	1230	22

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2135	634	1256	0	-	0
Stage 1	1245	-	-	-	-	-
Stage 2	890	-	-	-	-	-
Critical Hdwy	6.8	7.02	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.36	2.2	-	-	-
Pot Cap-1 Maneuver	43	412	561	-	-	-
Stage 1	239	-	-	-	-	-
Stage 2	366	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	42	409	559	-	-	-
Mov Cap-2 Maneuver	148	-	-	-	-	-
Stage 1	234	-	-	-	-	-
Stage 2	365	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.3	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	559	-	148	409	-	-
HCM Lane V/C Ratio	0.019	-	0.141	0.046	-	-
HCM Control Delay (s)	11.6	-	33.3	14.2	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	0.1	-	-

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	
Traffic Vol, veh/h	35	0	54	0	0	0	8	1600	0	0	1147	11
Future Vol, veh/h	35	0	54	0	0	0	8	1600	0	0	1147	11
Conflicting Peds, #/hr	2	0	2	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	1	0
Mvmt Flow	38	0	59	0	0	0	9	1739	0	0	1247	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2145	3012	634	2383	3018	872	1261	0	0	1739	0	0
Stage 1	1255	1255	-	1757	1757	-	-	-	-	-	-	-
Stage 2	890	1757	-	626	1261	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 28	14	427	18	13	298	558	-	-	367	-	-
Stage 1	185	245	-	90	140	-	-	-	-	-	-	-
Stage 2	308	140	-	443	244	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 28	14	425	15	13	297	557	-	-	367	-	-
Mov Cap-2 Maneuver	~ 28	14	-	15	13	-	-	-	-	-	-	-
Stage 1	182	245	-	89	138	-	-	-	-	-	-	-
Stage 2	302	138	-	381	244	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	208	0	0.1	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	557	-	-	28	425	-	367	-	-
HCM Lane V/C Ratio	0.016	-	-	1.359	0.138	-	-	-	-
HCM Control Delay (s)	11.6	-	-	\$ 506	14.8	0	0	-	-
HCM Lane LOS	B	-	-	F	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	4.5	0.5	-	0	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon



HCM 6th TWSC  
 12: US 29/Piney Forest Rd & Redwood Dr

02/11/2022

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	TT		TT		TT	TT
Traffic Vol, veh/h	5	6	1472	5	12	1362
Future Vol, veh/h	5	6	1472	5	12	1362
Conflicting Peds, #/hr	1	1	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	9	0
Mvmt Flow	5	7	1600	5	13	1480

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2371	805	0	0	1606
Stage 1	1604	-	-	-	-
Stage 2	767	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.28
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.29
Pot Cap-1 Maneuver	30	330	-	-	372
Stage 1	153	-	-	-	-
Stage 2	424	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	29	329	-	-	372
Mov Cap-2 Maneuver	112	-	-	-	-
Stage 1	153	-	-	-	-
Stage 2	409	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.1	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	175	372
HCM Lane V/C Ratio	-	-	0.068	0.035
HCM Control Delay (s)	-	-	27.1	15
HCM Lane LOS	-	-	D	C
HCM 95th %tile Q(veh)	-	-	0.2	0.1

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	5	5	1473	1365	1
Future Vol, veh/h	3	5	5	1473	1365	1
Conflicting Peds, #/hr	1	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	25	0	0	0
Mvmt Flow	3	5	5	1601	1484	1

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	2298	745	1486	0	0
Stage 1	1486	-	-	-	-
Stage 2	812	-	-	-	-
Critical Hdwy	6.8	6.9	4.6	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.45	-	-
Pot Cap-1 Maneuver	34	361	350	-	-
Stage 1	177	-	-	-	-
Stage 2	402	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	33	360	350	-	-
Mov Cap-2 Maneuver	123	-	-	-	-
Stage 1	174	-	-	-	-
Stage 2	402	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	350	-	209	-	-
HCM Lane V/C Ratio	0.016	-	0.042	-	-
HCM Control Delay (s)	15.4	-	23	-	-
HCM Lane LOS	C	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

# Appendix F 2045 No Build SimTraffic Queue Reports

**Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike**

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	R	L	T	T	R	L	L	T
Maximum Queue (ft)	125	290	297	396	363	129	250	206	67	242	255	194
Average Queue (ft)	40	161	114	207	171	83	60	37	3	117	141	81
95th Queue (ft)	120	257	239	330	294	143	166	121	27	219	237	157
Link Distance (ft)		949	949				580	580				1528
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			435	435	130			75	360	360	
Storage Blk Time (%)	0	18	0	0		6	1	2	0	0	0	0
Queuing Penalty (veh)	0	8	0	0		7	1	0	0	0	0	0

**Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike**

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	T
Maximum Queue (ft)	196	30	130	357	346
Average Queue (ft)	98	1	11	217	200
95th Queue (ft)	166	24	61	312	301
Link Distance (ft)	1528			1420	1420
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		220	310		
Storage Blk Time (%)	0	0	0	1	
Queuing Penalty (veh)	0	0	0	0	

**Intersection: 2: US 29/Piney Forest Rd & Nelson Ave/Nor-Dan Dr**

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	L	T	T
Maximum Queue (ft)	63	150	111	47	226	209	196	264	276
Average Queue (ft)	16	59	49	6	85	78	71	87	96
95th Queue (ft)	48	117	86	26	187	174	142	205	216
Link Distance (ft)	1123	917	917		2320	2320		380	380
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				150			215		
Storage Blk Time (%)					2	0	0	1	1
Queuing Penalty (veh)					0	0	0	1	0

**Intersection: 3: US 29/Piney Forest Rd & Arnett Blvd Ext**

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	136	80	189	202	117	170	189
Average Queue (ft)	50	34	61	70	36	70	87
95th Queue (ft)	100	69	140	154	79	152	168
Link Distance (ft)	895		607	607		2320	2320
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		85			150		
Storage Blk Time (%)	2	0			0	0	
Queuing Penalty (veh)	1	0			0	0	

**Intersection: 4: US 29/Piney Forest Rd & Beavers Mill Rd/Wendell Scott Dr**

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	289	113	84	42	185	228	61	40	364	382	94
Average Queue (ft)	134	35	14	5	55	71	3	8	140	157	8
95th Queue (ft)	236	86	49	21	142	168	30	27	293	312	48
Link Distance (ft)	674	896			1252	1252			1538	1538	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			90	250			100	285			100
Storage Blk Time (%)		2	0		0	4	0		1	11	0
Queuing Penalty (veh)		1	0		0	1	0		0	5	0

**Intersection: 5: US 29/Piney Forest Rd & Piney Forest Shopping Center/Old Piney Forest Rd**

Movement	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	TR
Maximum Queue (ft)	44	28	99	29	161	171	182	197
Average Queue (ft)	7	2	37	4	34	40	42	53
95th Queue (ft)	28	14	77	19	104	115	124	139
Link Distance (ft)	530		206		1131	1131	847	847
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		155		275				
Storage Blk Time (%)							0	
Queuing Penalty (veh)							0	

Intersection: 6: US 29/Piney Forest Rd & Pineview Dr/Audobon Dr

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	41	116	83	7	175	192	68	165	181
Average Queue (ft)	5	47	32	0	41	46	23	30	40
95th Queue (ft)	23	93	63	4	114	129	53	98	121
Link Distance (ft)	781	934			1154	1154		1131	1131
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			170	95			170		
Storage Blk Time (%)					2			0	
Queuing Penalty (veh)					0			0	

Intersection: 7: US 29/Piney Forest Rd & Parker Rd/Falwell Ct

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	104	75	56	53	70	198	200	25	16	270	285
Average Queue (ft)	26	35	10	5	21	47	48	1	1	64	71
95th Queue (ft)	68	73	35	29	52	134	137	11	9	180	196
Link Distance (ft)	1170		869			304	304	304		668	668
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		75		50	190				135		
Storage Blk Time (%)	1	1	1	0		0				2	
Queuing Penalty (veh)	0	0	0	0		0				0	

Intersection: 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	52	114	53	83	103	73	257	223	50	183	257	262
Average Queue (ft)	6	40	6	31	31	12	118	92	10	79	67	74
95th Queue (ft)	29	87	31	70	75	47	210	188	29	150	184	195
Link Distance (ft)		720			275		1513	1513			305	305
Upstream Blk Time (%)											0	0
Queuing Penalty (veh)											0	1
Storage Bay Dist (ft)	130		315	135		395			600	270		
Storage Blk Time (%)	0	0		0	0					0	0	0
Queuing Penalty (veh)	0	0		0	0					0	0	0

Intersection: 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct

Movement	SB	B17	B17
Directions Served	R	T	T
Maximum Queue (ft)	86	5	4
Average Queue (ft)	3	0	0
95th Queue (ft)	46	5	4
Link Distance (ft)		258	258
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)	290		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 9: US 29/Piney Forest Rd & Woodside Dr

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	68	60	32	28	55	57
Average Queue (ft)	20	15	1	1	3	2
95th Queue (ft)	49	45	15	11	22	23
Link Distance (ft)	462		380	380	1528	1528
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		75				
Storage Blk Time (%)		0	0			
Queuing Penalty (veh)		1	0			

**Intersection: 10: US 29/Piney Forest Rd & Ash St**

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	190	40	36
Average Queue (ft)	70	37	8
95th Queue (ft)	138	47	30
Link Distance (ft)	1143		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		40	100
Storage Blk Time (%)	21	12	
Queuing Penalty (veh)	23	7	

**Intersection: 11: US 29/Piney Forest Rd & Deer Run Rd/Parking Lot**

Movement	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	TR
Maximum Queue (ft)	63	77	32	82	26	28	70	73
Average Queue (ft)	9	15	7	25	1	1	4	4
95th Queue (ft)	37	51	28	59	15	12	29	30
Link Distance (ft)	1444		62	847		847	1252	1252
Upstream Blk Time (%)	0							
Queuing Penalty (veh)	0							
Storage Bay Dist (ft)	100		100					
Storage Blk Time (%)	0	0	0		0	0		
Queuing Penalty (veh)	0	0	1		0	0		

**Intersection: 12: US 29/Piney Forest Rd & Redwood Dr**

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	37	18
Average Queue (ft)	10	1
95th Queue (ft)	34	9
Link Distance (ft)	373	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		



Intersection: 13: US 29/Piney Forest Rd & Churchview Dr

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	30	43	2
Average Queue (ft)	7	8	0
95th Queue (ft)	27	31	2
Link Distance (ft)	434		76
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 41: Bend

Movement	SB
Directions Served	T
Maximum Queue (ft)	98
Average Queue (ft)	4
95th Queue (ft)	79
Link Distance (ft)	580
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 61

**Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike**

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	R	L	T	T	R	L	L	T
Maximum Queue (ft)	125	251	217	277	242	130	317	283	75	354	360	1510
Average Queue (ft)	76	109	49	143	107	113	169	143	16	306	318	803
95th Queue (ft)	137	205	153	242	209	159	284	245	65	453	458	1666
Link Distance (ft)		949	949				580	580				1528
Upstream Blk Time (%)												2
Queuing Penalty (veh)												20
Storage Bay Dist (ft)	125			435	435	130			75	360	360	
Storage Blk Time (%)	3	6				13	12	27	0	2	37	36
Queuing Penalty (veh)	4	8				34	21	10	1	8	143	285

**Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike**

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	T
Maximum Queue (ft)	1473	175	258	363	334
Average Queue (ft)	493	8	52	206	191
95th Queue (ft)	1277	74	149	312	292
Link Distance (ft)	1528			1420	1420
Upstream Blk Time (%)	1				
Queuing Penalty (veh)	8				
Storage Bay Dist (ft)		220	310		
Storage Blk Time (%)	1	0	0	1	
Queuing Penalty (veh)	2	0	0	1	

**Intersection: 2: US 29/Piney Forest Rd & Nelson Ave/Nor-Dan Dr**

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	109	286	336	126	570	572	245	212	260	265	59
Average Queue (ft)	40	136	142	9	251	234	42	112	127	135	1
95th Queue (ft)	84	241	264	48	480	469	193	197	225	238	25
Link Distance (ft)	1123	917	917		2320	2320			380	380	
Upstream Blk Time (%)											0
Queuing Penalty (veh)											0
Storage Bay Dist (ft)				150			245	215			185
Storage Blk Time (%)				0	20	8	0	0	1	2	0
Queuing Penalty (veh)				0	1	9	1	2	1	1	0

**Intersection: 3: US 29/Piney Forest Rd & Arnett Blvd Ext**

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	172	84	370	395	131	187	190
Average Queue (ft)	46	43	114	122	48	66	81
95th Queue (ft)	117	82	266	284	99	148	169
Link Distance (ft)	895		607	607		2320	2320
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		85			150		
Storage Blk Time (%)	5	1			0	0	
Queuing Penalty (veh)	4	1			1	0	

**Intersection: 4: US 29/Piney Forest Rd & Beavers Mill Rd/Wendell Scott Dr**

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	240	114	87	188	341	360	19	75	294	310	96
Average Queue (ft)	98	42	19	56	123	144	1	13	145	158	17
95th Queue (ft)	182	89	58	136	271	300	13	49	262	279	72
Link Distance (ft)	674	896			1252	1252			1538	1538	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			90	250			100	285			100
Storage Blk Time (%)		2	0	0	1	9	0		0	15	0
Queuing Penalty (veh)		1	0	0	1	2	0		0	13	1

**Intersection: 5: US 29/Piney Forest Rd & Piney Forest Shopping Center/Old Piney Forest Rd**

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	82	51	146	36	256	266	29	253	259
Average Queue (ft)	28	8	64	8	75	83	3	62	74
95th Queue (ft)	66	32	121	27	185	195	15	176	191
Link Distance (ft)	530		206		1131	1131		847	847
Upstream Blk Time (%)			0						
Queuing Penalty (veh)			0						
Storage Bay Dist (ft)		155		275			210		
Storage Blk Time (%)					0			0	
Queuing Penalty (veh)					0			0	

**Intersection: 6: US 29/Piney Forest Rd & Pineview Dr/Audobon Dr**

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	48	128	105	45	280	295	89	200	216
Average Queue (ft)	11	41	33	7	71	79	31	54	68
95th Queue (ft)	34	92	69	28	189	208	70	151	174
Link Distance (ft)	781	934			1154	1154		1131	1131
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			170	95			170		
Storage Blk Time (%)		0	0	0	3		0	0	
Queuing Penalty (veh)		0	0	0	0		0	0	

**Intersection: 7: US 29/Piney Forest Rd & Parker Rd/Falwell Ct**

Movement	EB	EB	WB	WB	NB	NB	NB	NB	B27	B27	B17	SB
Directions Served	LT	R	LT	R	L	T	T	R	T	T	T	L
Maximum Queue (ft)	83	71	66	46	145	308	317	6	21	17	2	22
Average Queue (ft)	20	31	23	7	40	96	98	0	1	1	0	2
95th Queue (ft)	55	63	57	34	98	234	240	2	11	10	2	12
Link Distance (ft)	1170		869			304	304	304	258	258	305	
Upstream Blk Time (%)						0	0					
Queuing Penalty (veh)						1	2					
Storage Bay Dist (ft)		75		50	190							135
Storage Blk Time (%)	0	0	6	0	0	2						
Queuing Penalty (veh)	0	0	0	0	0	1						

**Intersection: 7: US 29/Piney Forest Rd & Parker Rd/Falwell Ct**

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	270	300
Average Queue (ft)	85	107
95th Queue (ft)	204	244
Link Distance (ft)	668	668
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	3	
Queuing Penalty (veh)	0	

Intersection: 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	129	281	44	134	231	54	400	376	48	132	260	251
Average Queue (ft)	78	144	10	53	97	15	227	211	14	57	109	118
95th Queue (ft)	163	232	33	117	182	42	330	319	35	114	213	220
Link Distance (ft)		720			275		1513	1513			305	305
Upstream Blk Time (%)					0						0	0
Queuing Penalty (veh)					0						0	0
Storage Bay Dist (ft)	130		315	135		395			600	270		
Storage Blk Time (%)	1	14		0	5		0				0	0
Queuing Penalty (veh)	1	17		0	3		0				0	0

Intersection: 8: US 29/Piney Forest Rd & Holt Garrison Pkwy/Boxwood Ct

Movement	SB
Directions Served	R
Maximum Queue (ft)	135
Average Queue (ft)	7
95th Queue (ft)	60
Link Distance (ft)	
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	290
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 9: US 29/Piney Forest Rd & Woodside Dr

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	146	71	195	154	6	7
Average Queue (ft)	55	32	23	16	0	0
95th Queue (ft)	162	66	150	135	3	5
Link Distance (ft)	462		380	380	1528	1528
Upstream Blk Time (%)	2		1	0		
Queuing Penalty (veh)	0		7	3		
Storage Bay Dist (ft)		75				
Storage Blk Time (%)		1	4			
Queuing Penalty (veh)		4	3			

**Intersection: 10: US 29/Piney Forest Rd & Ash St**

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	76	54	34	64	83	55	63
Average Queue (ft)	22	16	7	5	5	3	4
95th Queue (ft)	61	46	27	30	37	23	29
Link Distance (ft)	1143		1538		1538	607	607
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	40		100				
Storage Blk Time (%)	6	1	0				
Queuing Penalty (veh)	1	0	0				

**Intersection: 11: US 29/Piney Forest Rd & Deer Run Rd/Parking Lot**

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	T	TR	T	TR
Maximum Queue (ft)	134	94	22	34	57	48	54
Average Queue (ft)	33	35	3	2	3	2	3
95th Queue (ft)	89	73	14	14	22	20	23
Link Distance (ft)	1444		847		847	1252	1252
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100		100				
Storage Blk Time (%)	2	0	0				
Queuing Penalty (veh)	1	0	0				

**Intersection: 12: US 29/Piney Forest Rd & Redwood Dr**

Movement	WB	NB	NB	SB	SB	SB
Directions Served	LR	T	TR	L	T	T
Maximum Queue (ft)	46	27	11	45	23	18
Average Queue (ft)	11	1	1	8	1	1
95th Queue (ft)	36	14	11	32	13	14
Link Distance (ft)	373	76	76	1154		1154
Upstream Blk Time (%)	0		0			
Queuing Penalty (veh)	0		0			
Storage Bay Dist (ft)				100		
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 13: US 29/Piney Forest Rd & Churchview Dr

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	37	42	67	77	37	30
Average Queue (ft)	9	3	3	3	1	1
95th Queue (ft)	32	21	25	30	15	15
Link Distance (ft)	434		668	668	76	76
Upstream Blk Time (%)					0	0
Queuing Penalty (veh)					0	0
Storage Bay Dist (ft)		100				
Storage Blk Time (%)			0			
Queuing Penalty (veh)			0			

Network Summary

Network wide Queuing Penalty: 632

## Appendix G MetroQuest Survey 1 Results



# Piney Forest Road CORRIDOR STUDY

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PHASE I SURVEY RESULTS

6-22-21

**Danville MPO**

Metropolitan  
Planning  
Organization



*Advancing transportation in Danville & Pittsylvania County*


# Piney Forest Rd Corridor Study

More at: <https://danvillempo.org/piney-forest-road-study/>

1 **Welcome**  
Learn a bit about this initiative before you begin.

**Piney Forest Road Corridor Study**  
A planning study is being conducted for Piney Forest Road from Franklin Turnpike to Holt Garrison Parkway. The purpose of the study is to identify strategies and improvements to address existing and future traffic congestion, safety concerns, and the ability to more comfortably walk, bicycle, and use transit in the corridor.

[View Study Area Map](#) [Next](#)



Improvements being considered include signal timing changes, intersection lane configurations, addition of medians and turn lanes, pedestrian safety enhancements, sidewalks and shared-use paths, and transit shelters.

**Danville MPO**

2 **PRIORITY RANKING**  
3 **MAP MARKERS**  
4 **STANDARD SURVEY**  
5 **WRAP UP**

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## Overview

562 Participants

Ran from April to June 2021

Gathered input on existing conditions and issues

# Issues

Please rank the issues below.



↑ Order your top 5 items above this line ↑

Traffic Queue/Congestion

Vehicular Safety

Access Management

☰ Suggest Another Priority

Roadway Geometry

Pedestrian/Bicycle Safety

## Traffic Queue/Congestion



Long back-ups of traffic or excessive delay, frequently having to sit in traffic when driving the study area under typical conditions.



# Issues Ranking

# Issues

Please rank the issues below.




↑ Order your top 5 items above this line ↑

Traffic Queue/Congestion **#1**

Vehicular Safety **#2**

Access Management **#3**

 Suggest Another Priority **#4**

Roadway Geometry **#5**

Pedestrian/Bicycle Safety **#6**

## Traffic Queue/Congestion



Long back-ups of traffic or excessive delay, frequently having to sit in traffic when driving the study area under typical conditions.



# Issues Ranking



## Issues

Please rank the issues below.




↑ Order your top 5 items above this line ↑

Traffic Queue/Congestion

Vehicular Safety

Access Management

 Suggest Another Priority

Roadway Geometry

Pedestrian/Bicycle Safety

### Traffic Queue/Congestion



Long back-ups of traffic or excessive delay, frequently having to sit in traffic when driving the study area under typical conditions.



# Issues Ranking

Representative Comments:

“Lower speed limits since cars fly up and down Piney Forest.”

“Visual improvements are needed to this busy entrance corridor of Danville.”

“teach people how to drive and be nice to other drives.”

2 3 Map Exercise Drag at least 3 markers to the map. 4 5

WELCOME PRIORITY RANKING MAP MARKERS STANDARD SURVEY WRAP UP

Congestion Safety Accessibility Multimodal Other Issues

Map Satellite

Walmart Supercenter

Google

Keyboard shortcuts Map data ©2021 Terms of Use

# Map Exercise

1,452 markers

2 3 **Map Exercise** 4 5  
Drag at least 3 markers to the map.

WELCOME  
PRIORITY RANKING  
MAP MARKERS  
STANDARD SURVEY  
WRAP UP

42%	26%	21%	4%	6%
Congestion	Safety	Accessibility	Multimodal	Other Issues

The map shows a street grid with several roads highlighted in orange, including Franklin Turnpike and E Franklin Turnpike. A Walmart Supercenter is marked with a blue location pin. The map interface includes zoom controls and a Google logo.

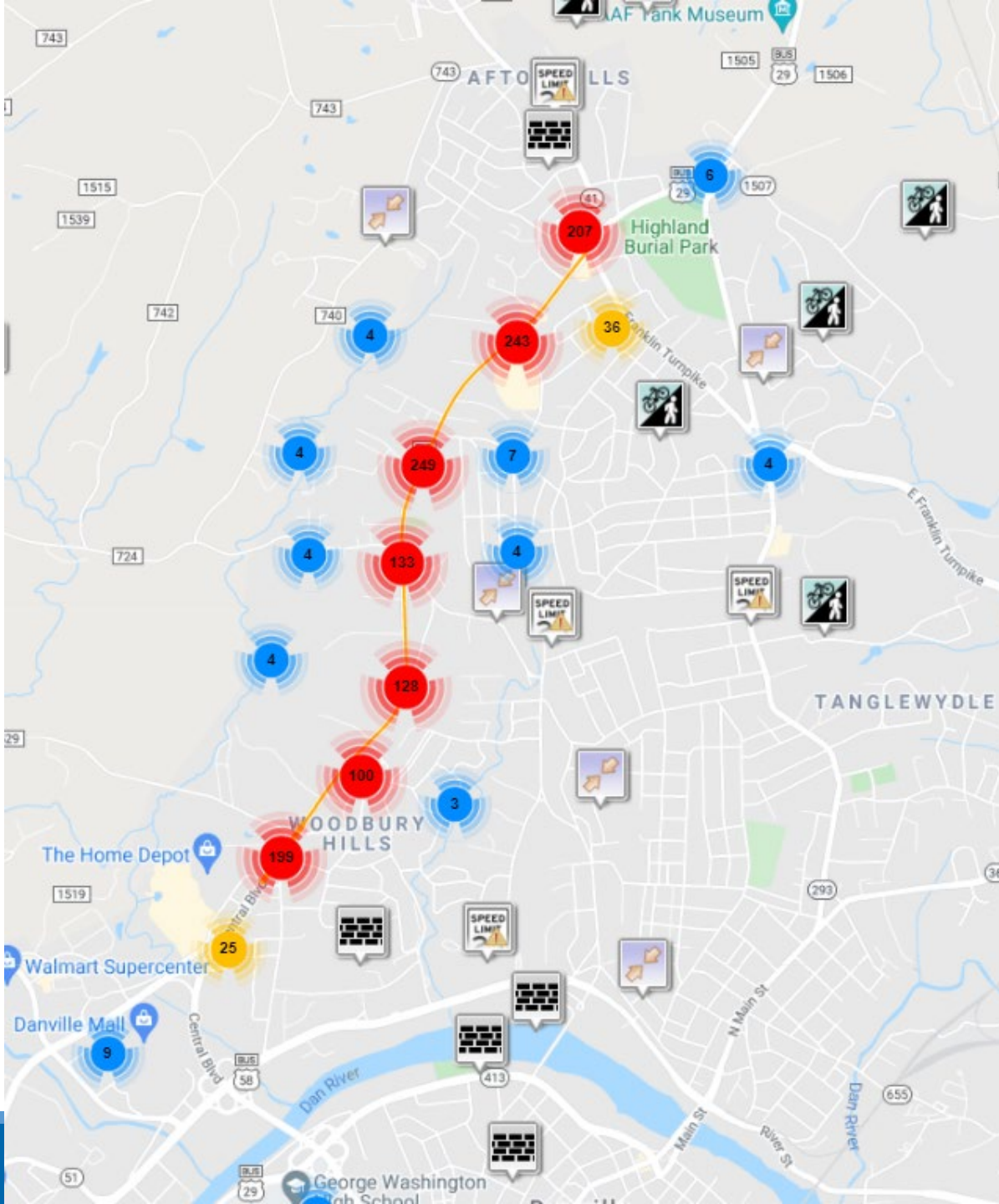
Google  
Keyboard shortcuts | Map data ©2021 | Terms of Use

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# Map Exercise

1,452 markers





# All Markers Heatmap

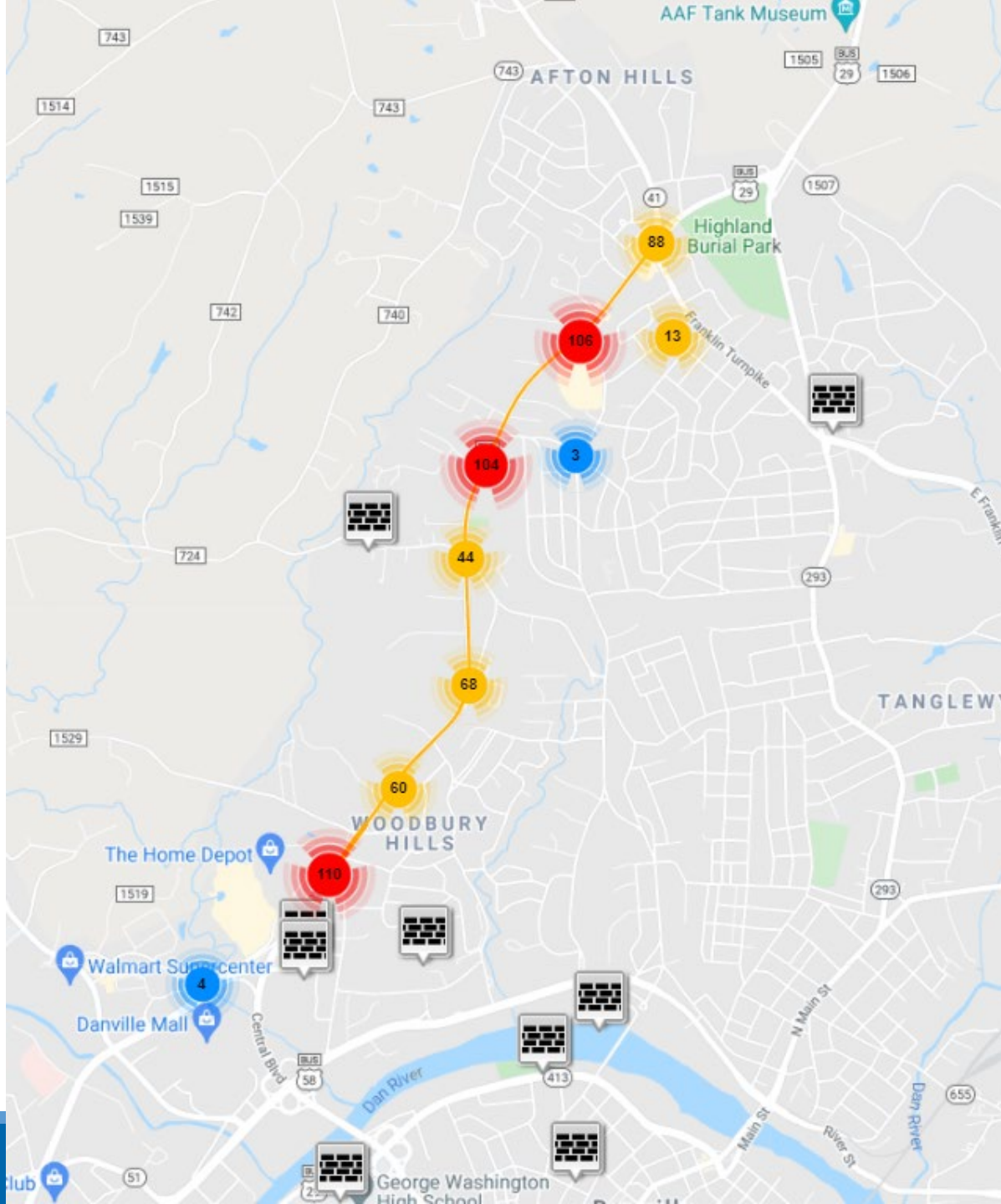
1,452 markers



# Congestion Markers Heatmap

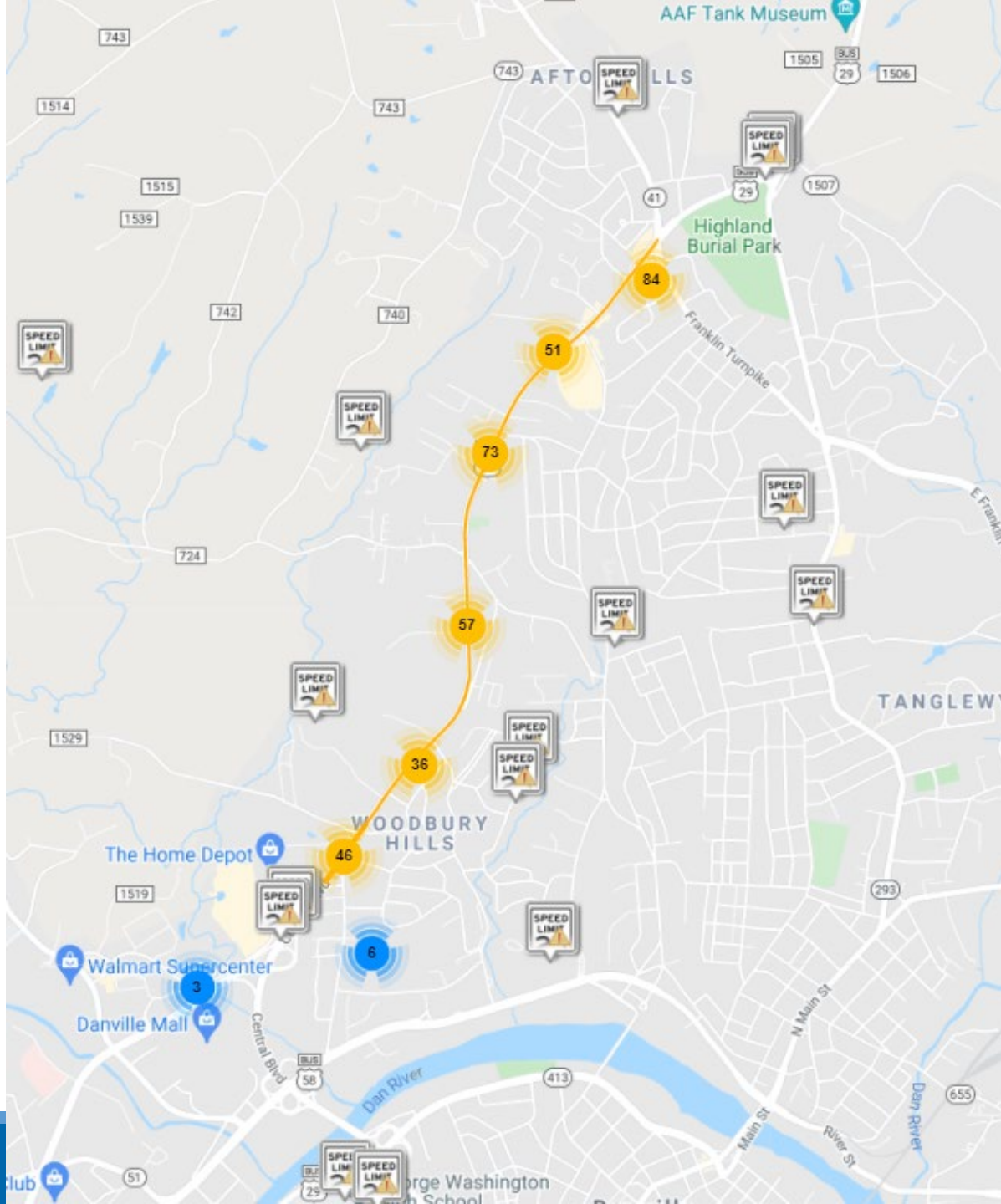
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615 markers



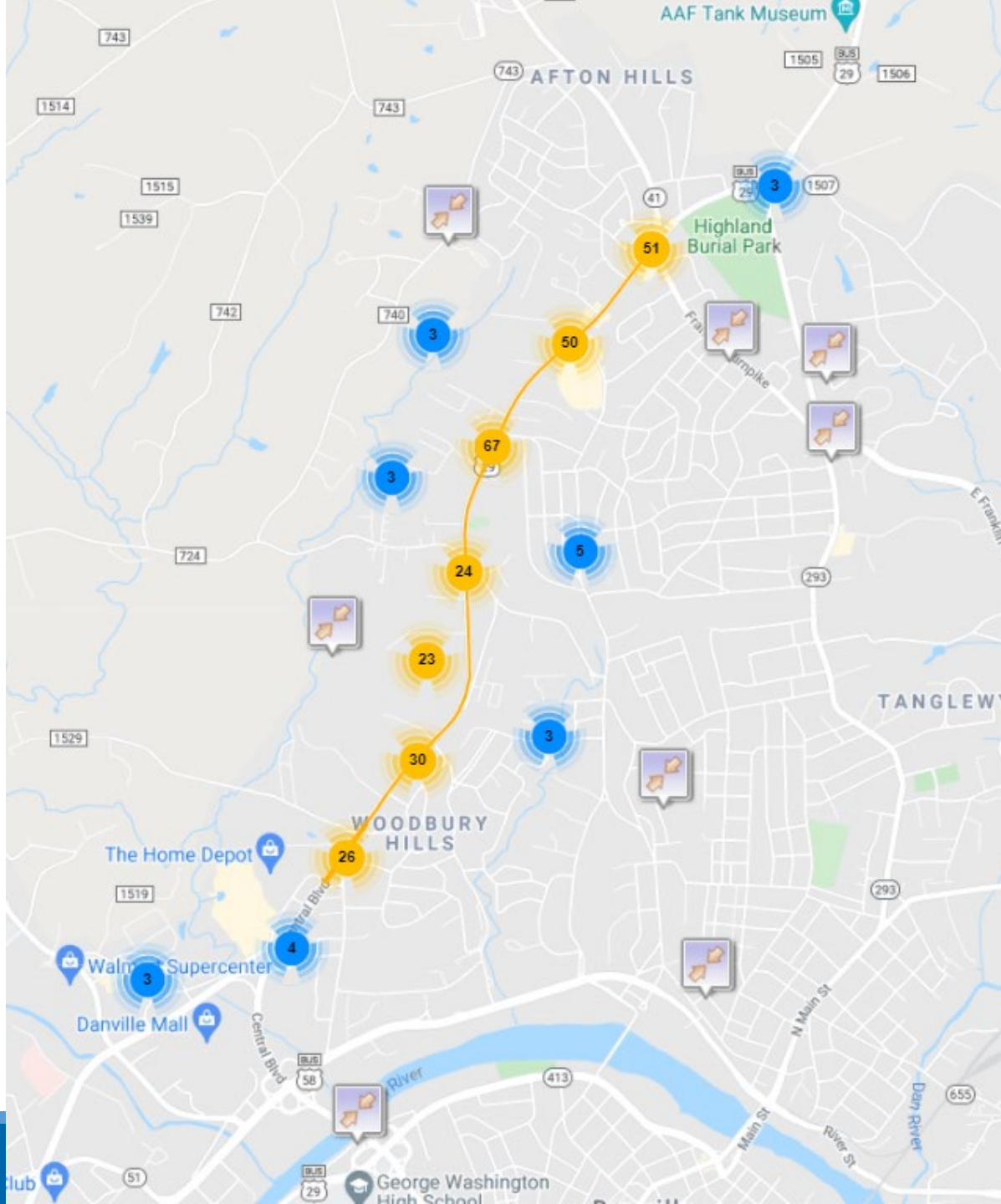
# Safety Markers Heatmap

374 markers



# Accessibility Markers Heatmap

304 markers



1 2 3 4 5

WELCOME PRIORITY RANKING MAP MARKERS STANDARD SURVEY WRAP UP

### Corridor Use and Issues

Answer survey questions

**Corridor Use and Frequency**

Congestion

Accessibility

Safety

Multimodal

How often do you travel this section of Piney Forest Road under typical conditions?

Daily A few times per week A few times per month A few times per year

Less than one time per year

What is/are the reason(s) you travel along this corridor under typical conditions? (check all that apply)

Work  Home

School  Shopping / Errands

Entertainment  Other

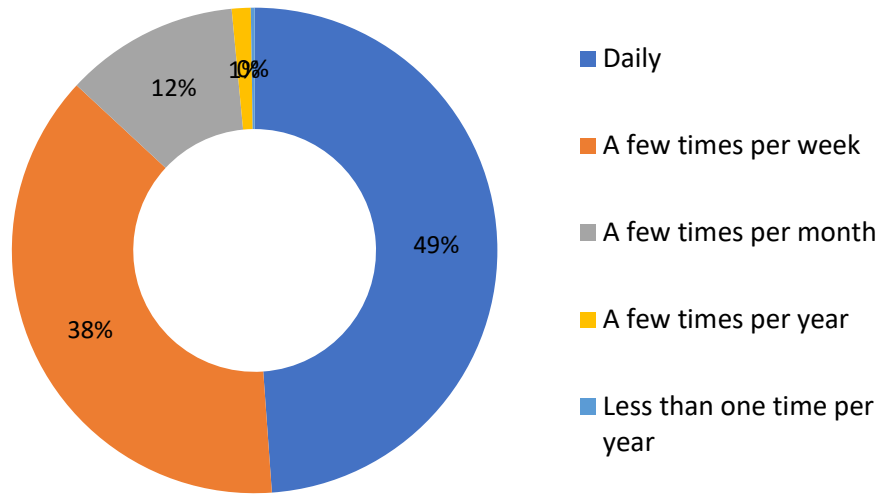
Passing through to a destination outside the study area

# Travel Behavior and Issues

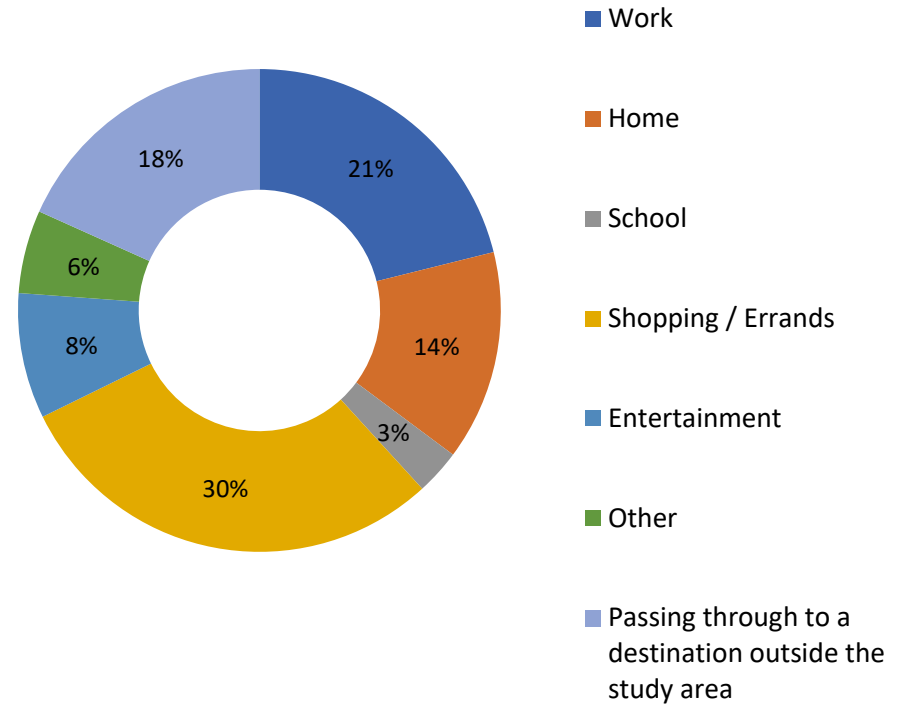


# Corridor Use and Frequency

How often do you travel this section of Piney Forest Road under typical conditions?

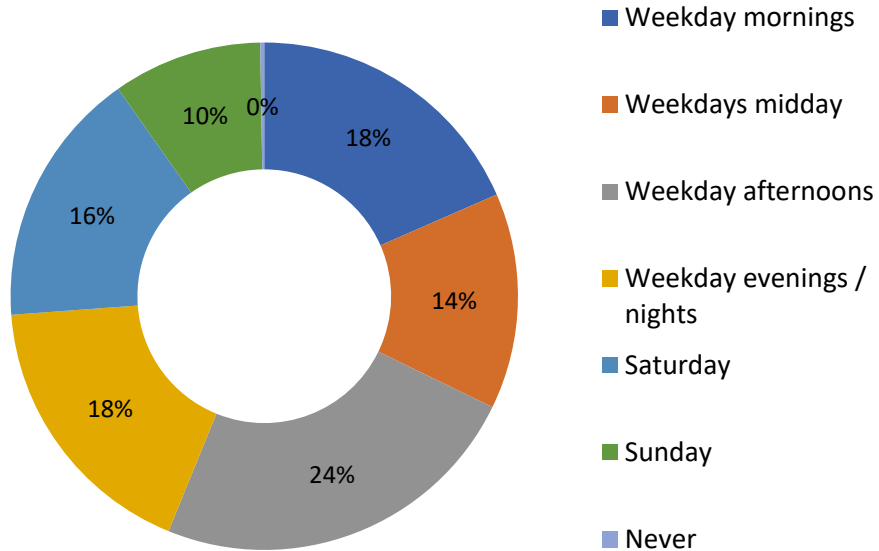


What is/are the reason(s) you travel along this corridor under typical conditions? (check all that apply)

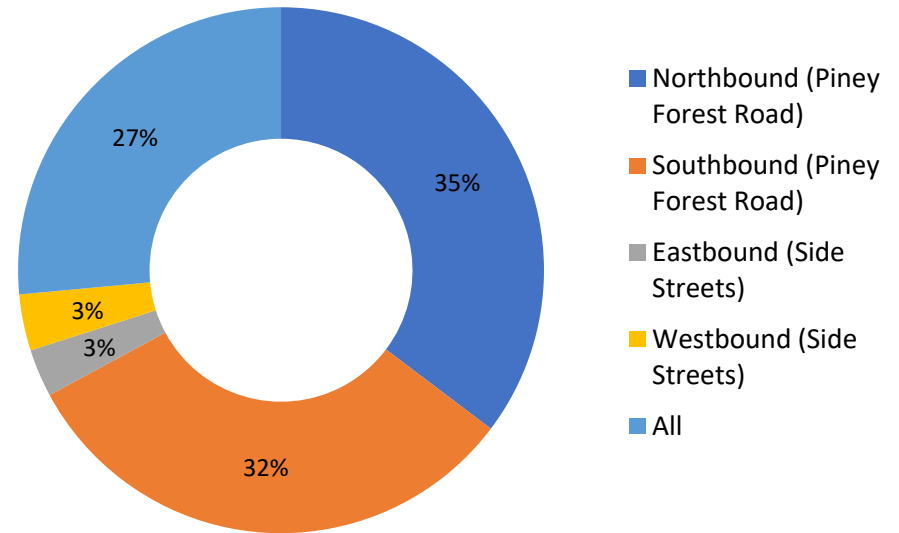


# Congestion

When do you experience congestion when using this corridor under typical conditions? (check all that apply)

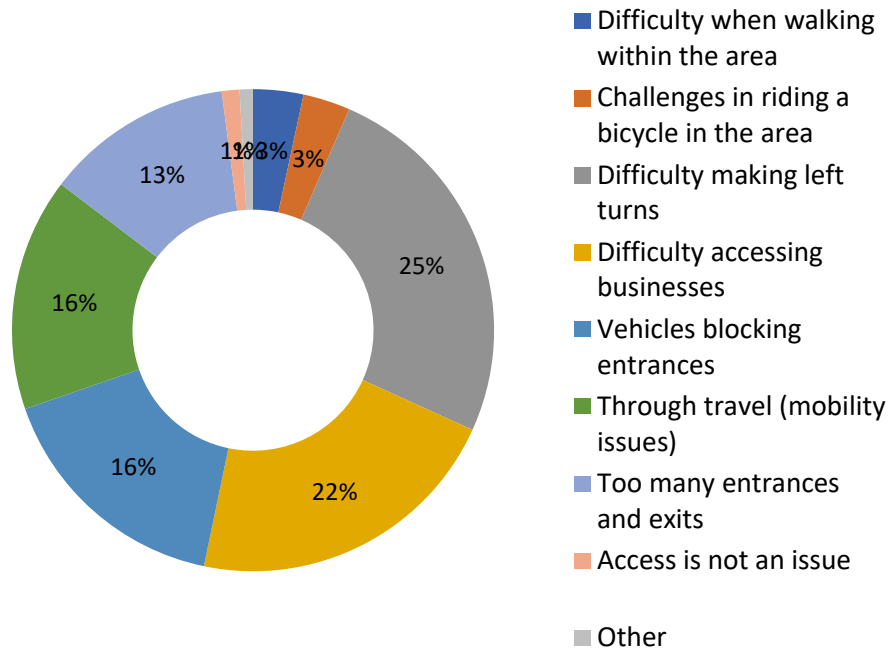


Where do you experience congestion under typical conditions? (check all that apply)

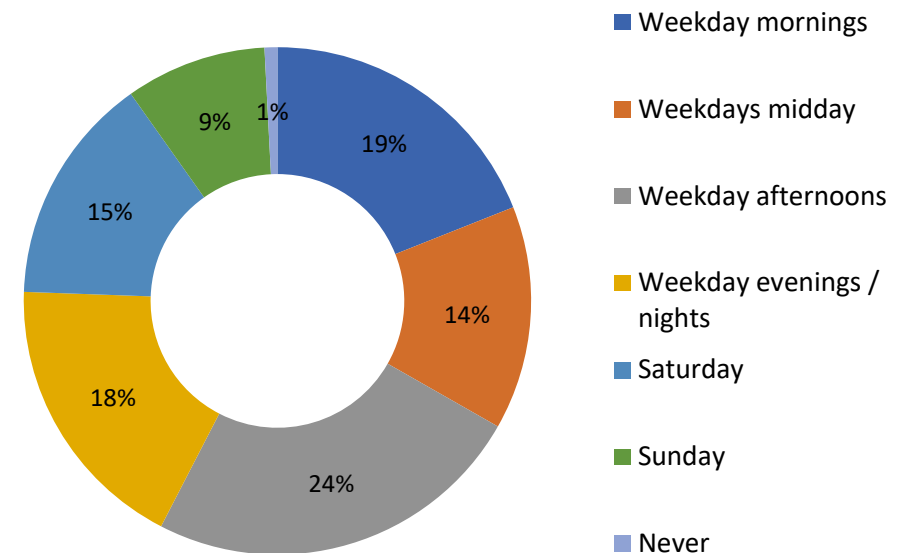


# Accessibility

What accessibility issues do you experience when using this corridor under typical conditions? (check all that apply)

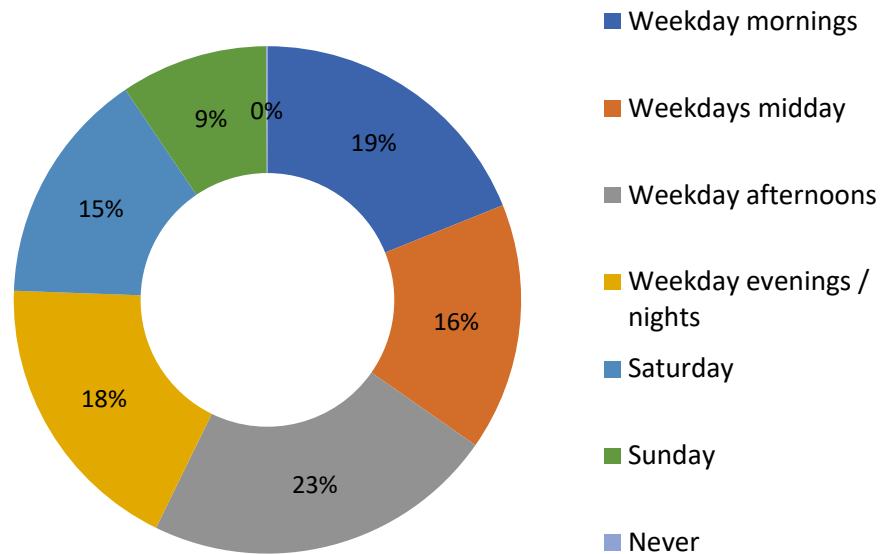


When do you experience accessibility issues under typical conditions? (check all that apply)

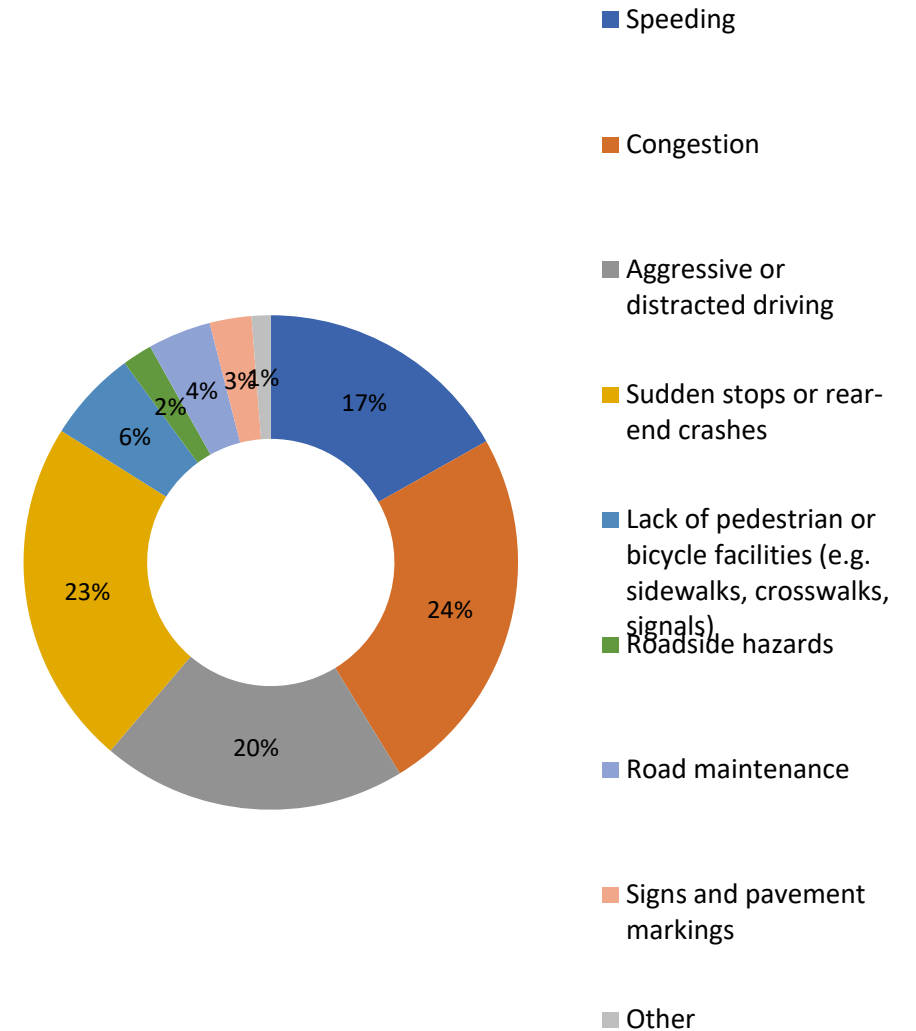


# Safety

When do you experience safety issues along this corridor under typical conditions? (check all that apply)



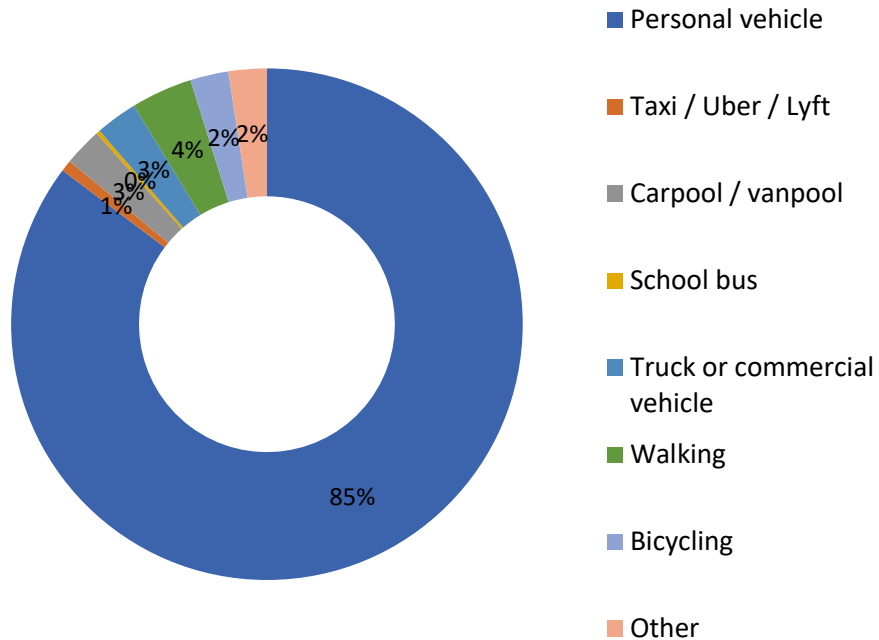
What safety issues do you experience when using this corridor under typical conditions? (check all that apply)



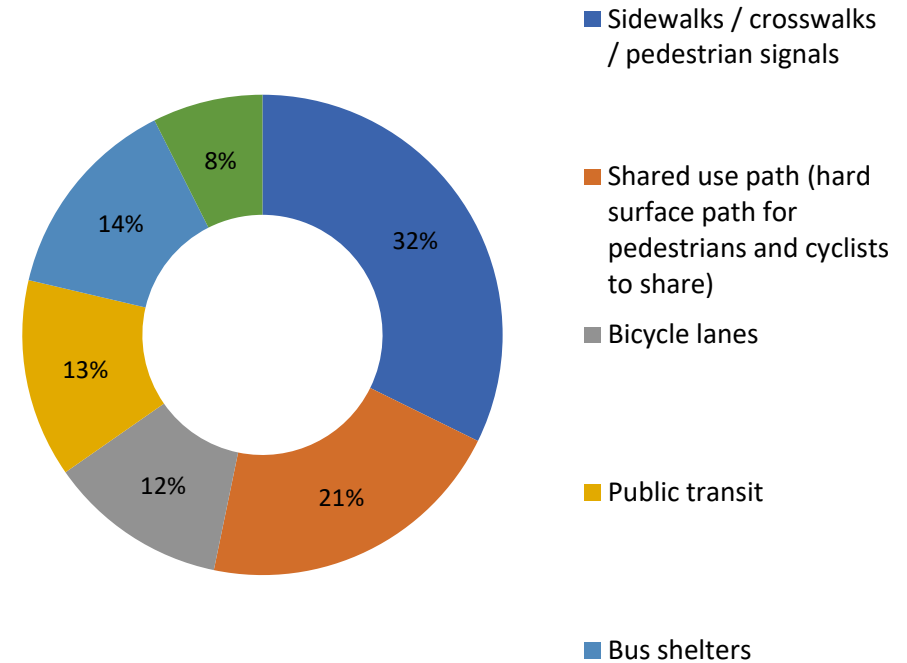


# Multimodal

What mode(s) of travel do you use when traveling along this corridor under typical conditions? (check all that apply)



What multimodal facilities are needed along this corridor? (check all that apply)



1 2 3 4 5 **Thank you!**  
Tell us about yourself

WELCOME  
PRIORITY RANKING  
MAP MARKERS  
STANDARD SURVEY  
WRAP UP

### Final Questions (Optional)



- > Do you live or work near the study area?
- > Gender
- > Race and Ethnicity
- > Age
- > How did you find out about this survey?
- > Additional Comments  
  
0/500

Answer the questions you want to, then click Finish.

### Thank You!

We appreciate your help with this survey!

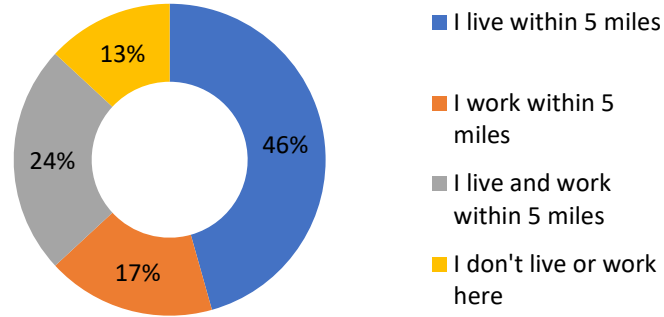
Please share this with others and help us get everyone involved!

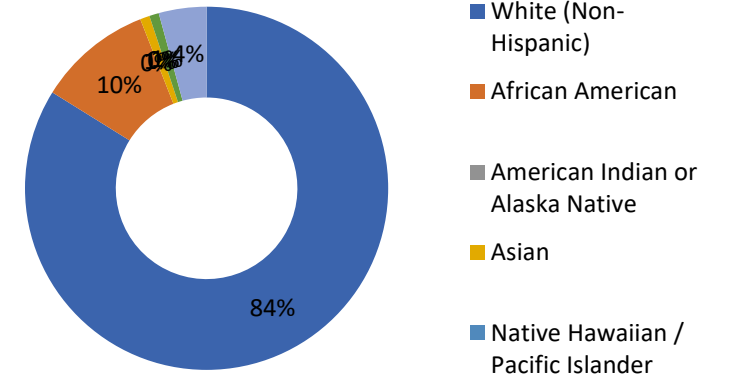
# Demographics

# Demographics

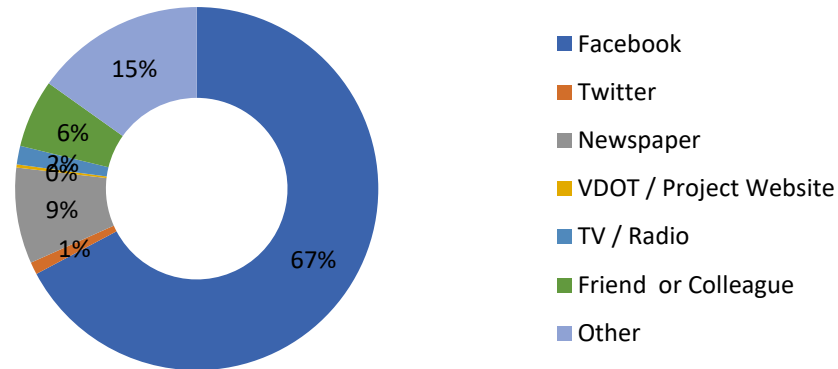
## Do you live or work near the study area?



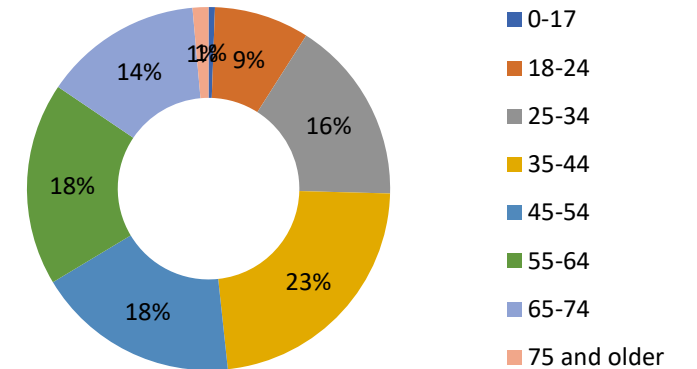
## Race and Ethnicity



## How did you find out about this survey?



## Age



# Key Themes from Written Comments

---



## Representative Comments:

“Too many **access points**. Not enough instructions for traffic. People using middle turn lane incorrectly causing accidents. More structure.”

“**Cross walks** are desperately needed!”

“Sequencing the **traffic lights** would help traffic flow.”

“**Visual improvements** are needed to this busy entrance corridor of Danville. If the center turning lane is removed, it would improve safety, and there could also be a center island with trees and landscaping.”

## Appendix H MetroQuest Survey 2 Results

# Piney Forest Road MetroQuest Survey 2

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# Overview and Demographics

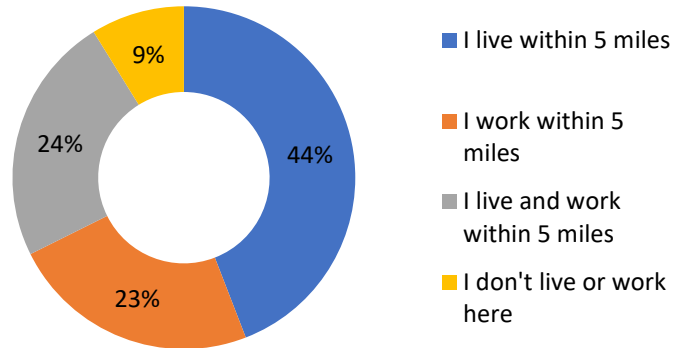
April 28 – June 1

99 participants

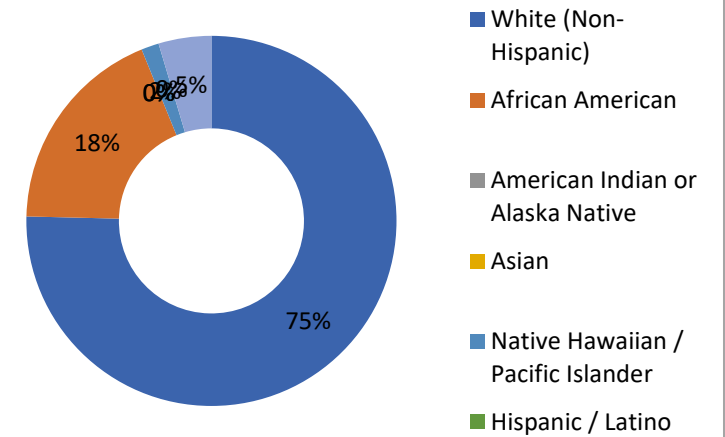
Similar Demographics to 1<sup>st</sup> Survey

- slightly more work within 5 miles/slightly less don't live or work here
- increase in African American participation (8%)
- Decrease in Facebook as source
- Variety of ages

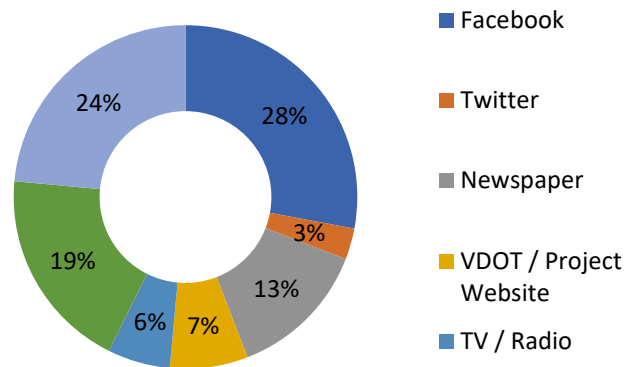
## Do you live or work near the study area?



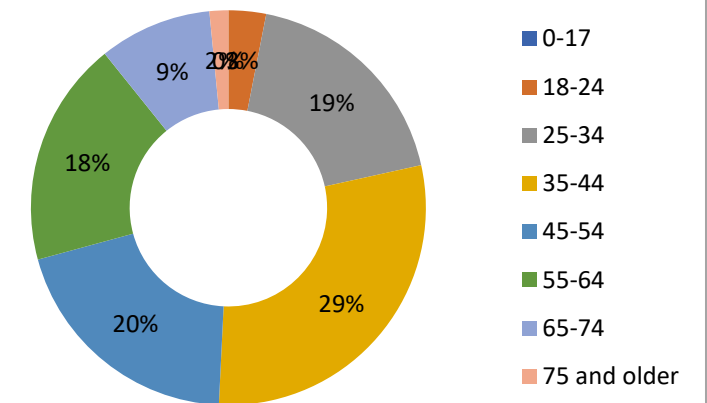
## Race and Ethnicity



## How did you find out about this survey?



## Age





# Intersection Improvements

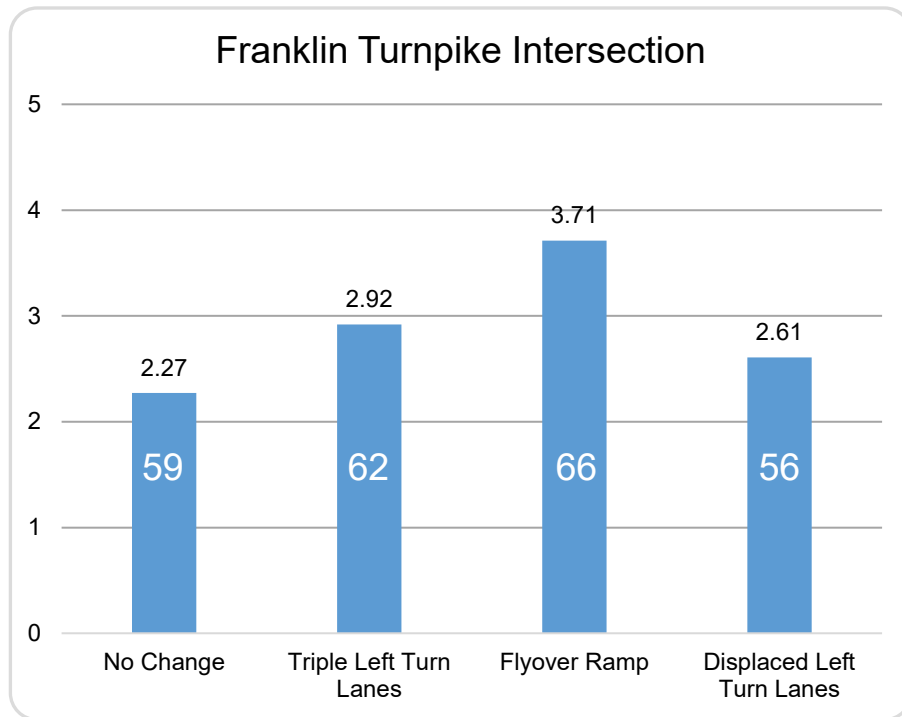
Respondents were asked to rate  
the improvements 1-5 stars

A star rating of 5 is the most  
preferable

## Improvements Included

- Franklin Turnpike – 3 improvement concepts
- Nelson Avenue/Nor Dan Drive
- Beavers Mill Road/Wendell Scott Drive
- Arnett Boulevard

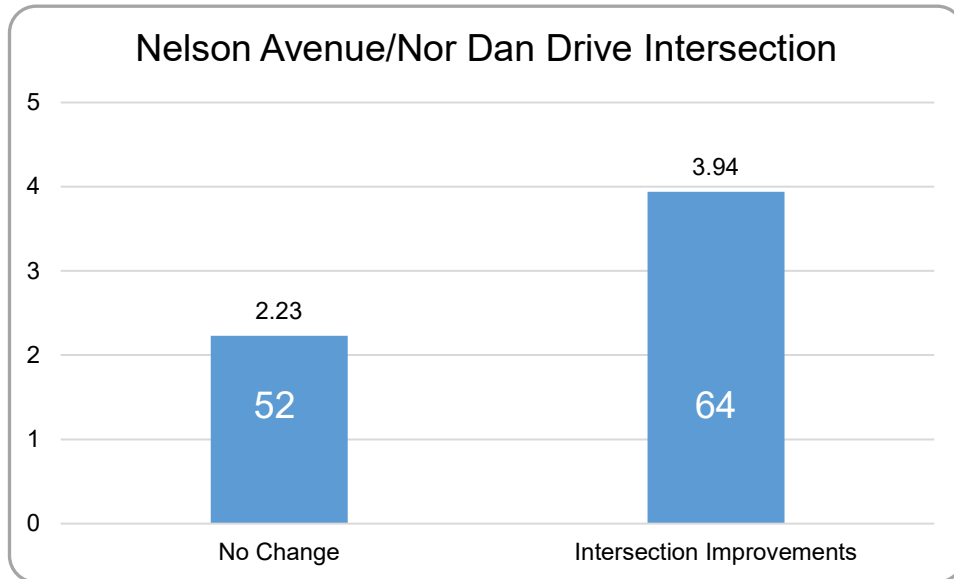
# Intersection Improvement Franklin Turnpike



The screenshots show a digital interface for public input on intersection improvements. The interface includes a navigation bar with steps: WELCOME, INTERSECTION IMPROVEMENTS, CORRIDOR IMPROVEMENTS, RANK THE CONCEPTS, and WRAP UP. The main content area displays the following information for each alternative:

- Alternative Name:** Franklin Turnpike, Triple Left Turn Lanes, Flyover Ramp, or Displaced Left Turn Lanes.
- Description:**
  - Triple Left Turn Lanes:** Three northbound left turn lanes on Piney Forest Road reduce the northbound queue to less than 750 feet in the future.
  - Flyover Ramp:** A flyover ramp for northbound left turns reduces the northbound queue to less than 550 feet in the future.
  - Displaced Left Turn Lanes:** Northbound and southbound left turn vehicles cross to the left side of opposing through traffic, ahead of the main intersection, using a series of three traffic signals. A DLT reduces the future queues to less than 500 feet. For more information click [here](#).
- Map:** An aerial map showing the intersection with colored overlays indicating the proposed improvement.
- Rating:** A star rating system (1 to 5 stars) for the user to rate the image.

# Intersection Improvements Nelson Avenue/Nor Dan Drive



2 Intersection Improvements  
Please provide input on the following alternatives.

Franklin Turnpike (0/5)  
**Nelson Avenue/Nor Dan Drive (2/5)**  
 Beavers Mill Road/Wendell Scott Drive (2/5)  
 Arnett Boulevard (2/5)

The intersection experiences more crashes than would be expected and lacks pedestrian amenities.

**Intersection Improvements**

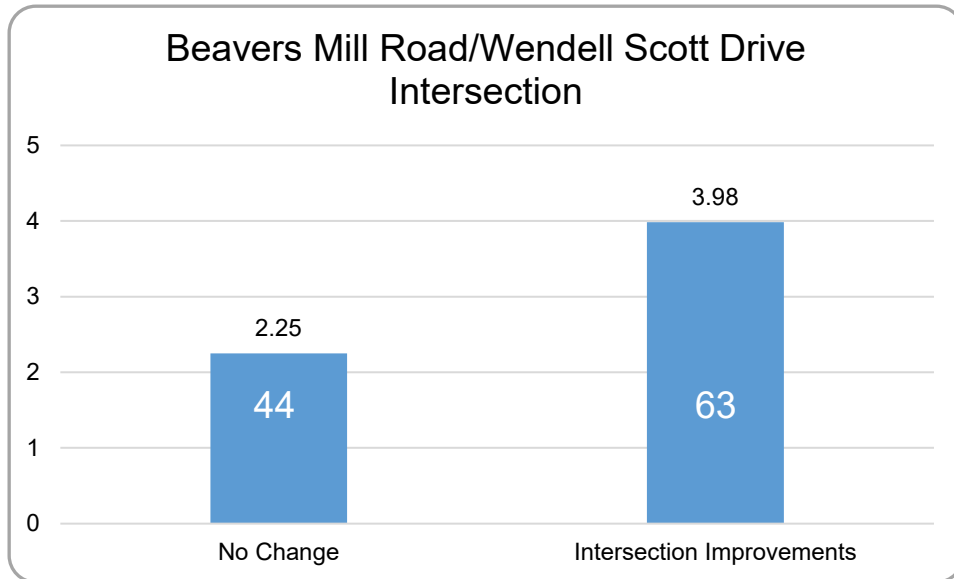
The [intersection is reconfigured](#) so that southbound right turns are made at the main intersection, an eastbound left-turn lane is added, and the westbound approach is marked for a separate left-turn lane. Crosswalks, curb ramps, and pedestrian signals are also included.

Legend:  
 - Signalized Intersection  
 - Shared access opportunity  
 - Close driveway  
 - Modify driveway  
 - Existing median  
 - Proposed median  
 - Proposed Pedestrian Signal

Please rate this image from 1 star (least preferred) to 5 stars (most preferred)

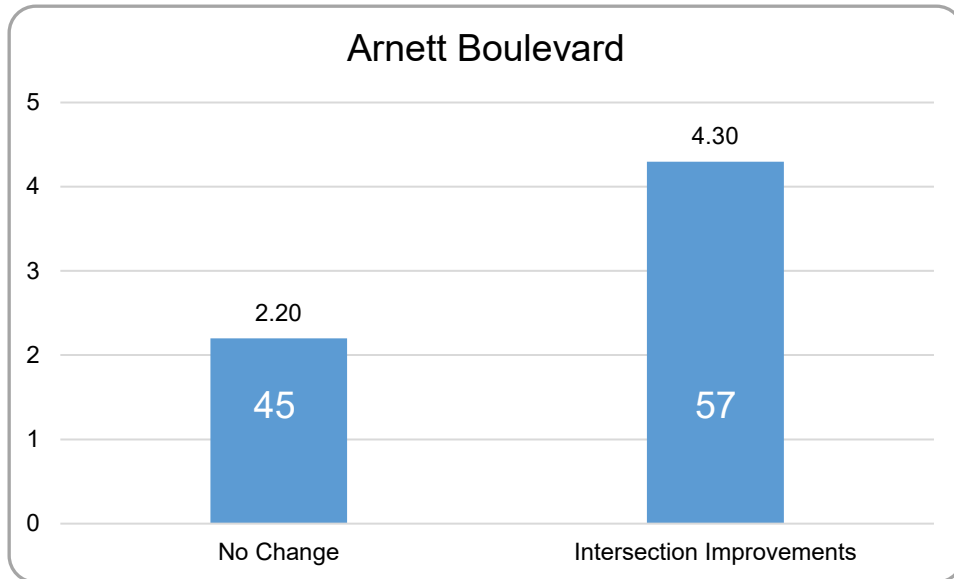
Navigation: WELCOME, INTERSECTION IMPROVEMENTS, CORRIDOR IMPROVEMENTS, RANK THE CONCEPTS, WRAP UP

# Intersection Improvements Beavers Mill Road/Wendell Scott Drive



The screenshot shows a survey interface titled "Intersection Improvements" with the instruction "Please provide input on the following alternatives." The interface includes a progress bar at the top with steps: WELCOME, INTERSECTION IMPROVEMENTS (current), CORRIDOR IMPROVEMENTS, RANK THE CONCEPTS, and WRAP UP. Under the current step, four alternatives are listed: Franklin Turnpike, Nelson Avenue/Nor Dan Drive, Beavers Mill Road/Wendell Scott Drive (highlighted), and Arnett Boulevard. A text box states: "The intersection experiences more crashes than would be expected and lacks pedestrian amenities." Below this, a section titled "Turn Lane Improvements" describes the proposed changes: "An eastbound left turn lane is added, and the westbound approach is marked for a separate left turn lane. Crosswalks, curb ramps, and pedestrian signals are also included." An aerial map shows the intersection of Beavers Mill Road and Piney Forest Road. A rating scale from 1 to 5 stars is provided at the bottom of the map section.

# Intersection Improvements Arnett Boulevard



The screenshot shows a digital interface for "Intersection Improvements" at Arnett Boulevard. It features a navigation bar with five steps: WELCOME, INTERSECTION IMPROVEMENTS (current step), CORRIDOR IMPROVEMENTS, RANK THE CONCEPTS, and WRAP UP. The main content area includes:

- Four alternative options: Franklin Turnpike, Nelson Avenue/Nor Dan Drive, Beavers Mill Road/Wendell Scott Drive, and Arnett Boulevard (highlighted).
- A description: "The intersection experiences more crashes than would be expected and lacks pedestrian amenities."
- Two options for improvement: "No Change" and "Improvements" (highlighted).
- A detailed description of the "Improvements": "Shopping center driveways are consolidated and a new driveway is added as the fourth leg of the intersection. A median is added along with crosswalks, curb ramps, and pedestrian signals."
  - Shopping center driveways are consolidated
  - A new driveway is added as the fourth leg of the intersection
  - A median is added along with crosswalks, curb ramps, and pedestrian signals
- An aerial map showing the intersection with various improvement markers: Signalized Intersection, Shared access opportunity, Close driveway, Modify driveway, Existing median, Proposed median, Proposed Pedestrian Signal, and Proposed Sidewalk.
- A rating prompt: "Please rate this image from 1 star (least preferred) to 5 stars (most preferred)" with a star rating interface.



# Corridor Improvements

Respondents were asked to rate the improvements 1-5 stars

A star rating of 5 is the most preferable

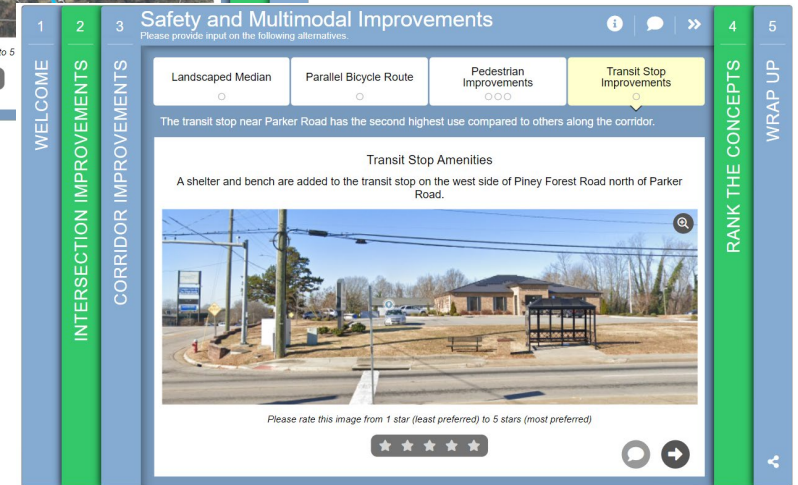
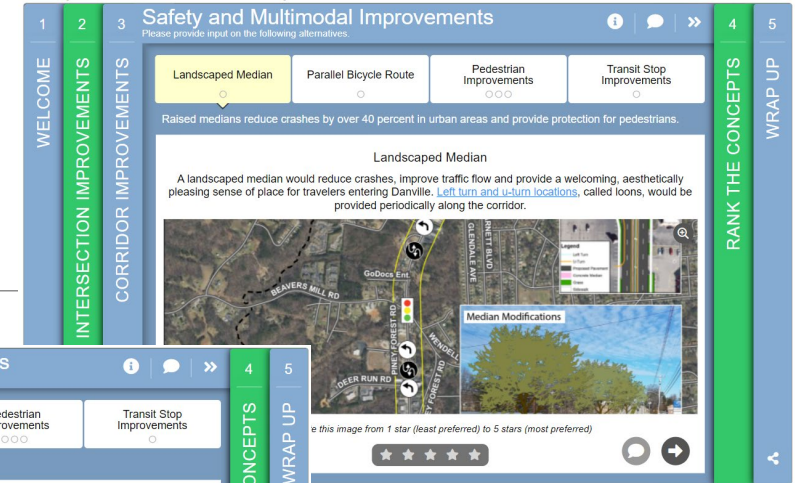
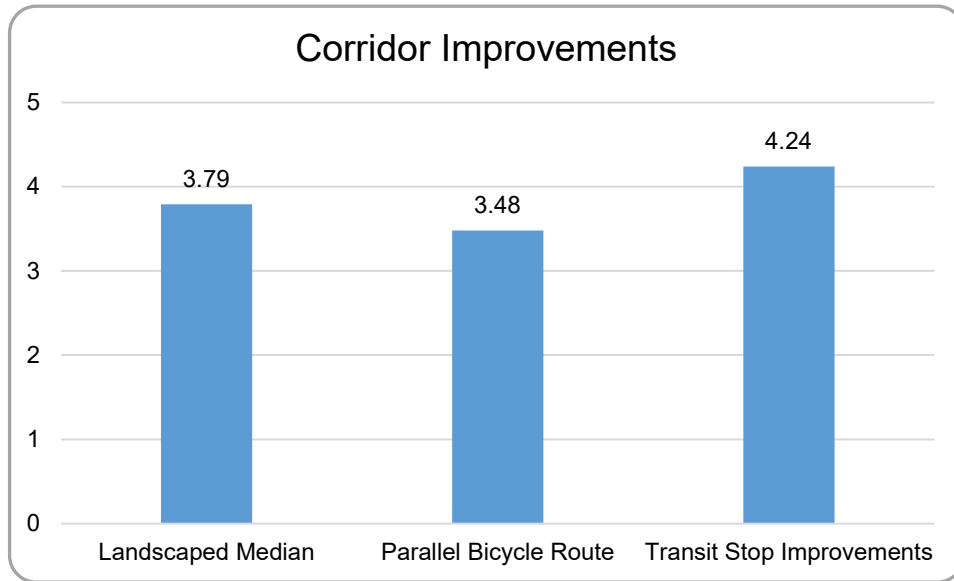
Respondents were asked to rate the improvements 1-5 stars

A star rating of 5 is the most preferable

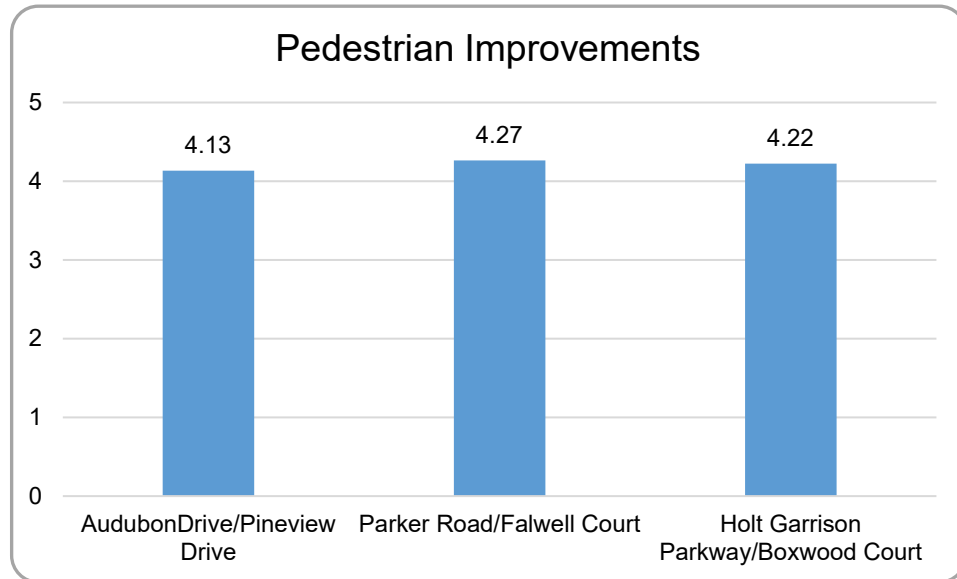
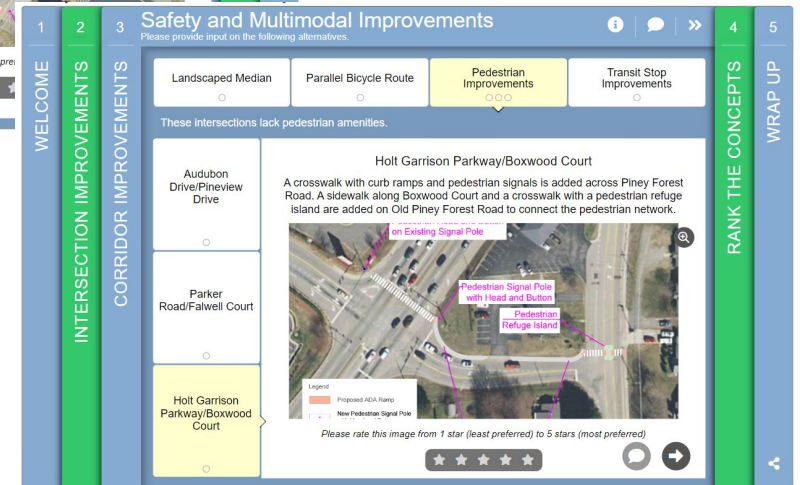
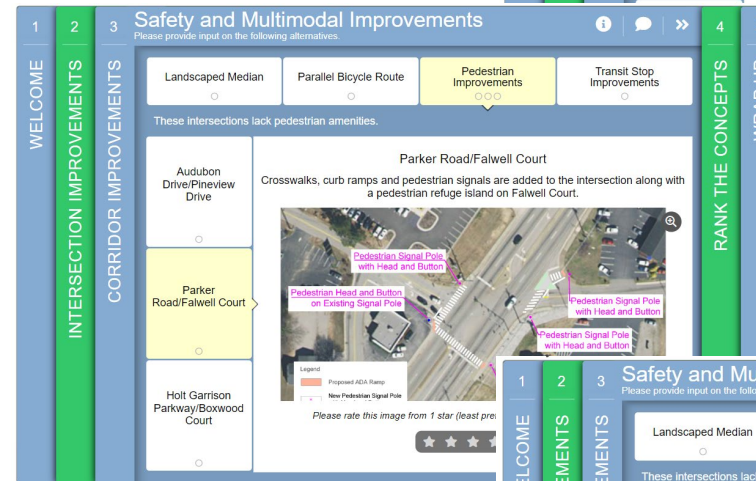
## Comment Themes

- Access management
- Pedestrian crossings
- Traffic signal timings

# Landscaped Median, Bicycle and Transit Improvements



# Pedestrian Improvements

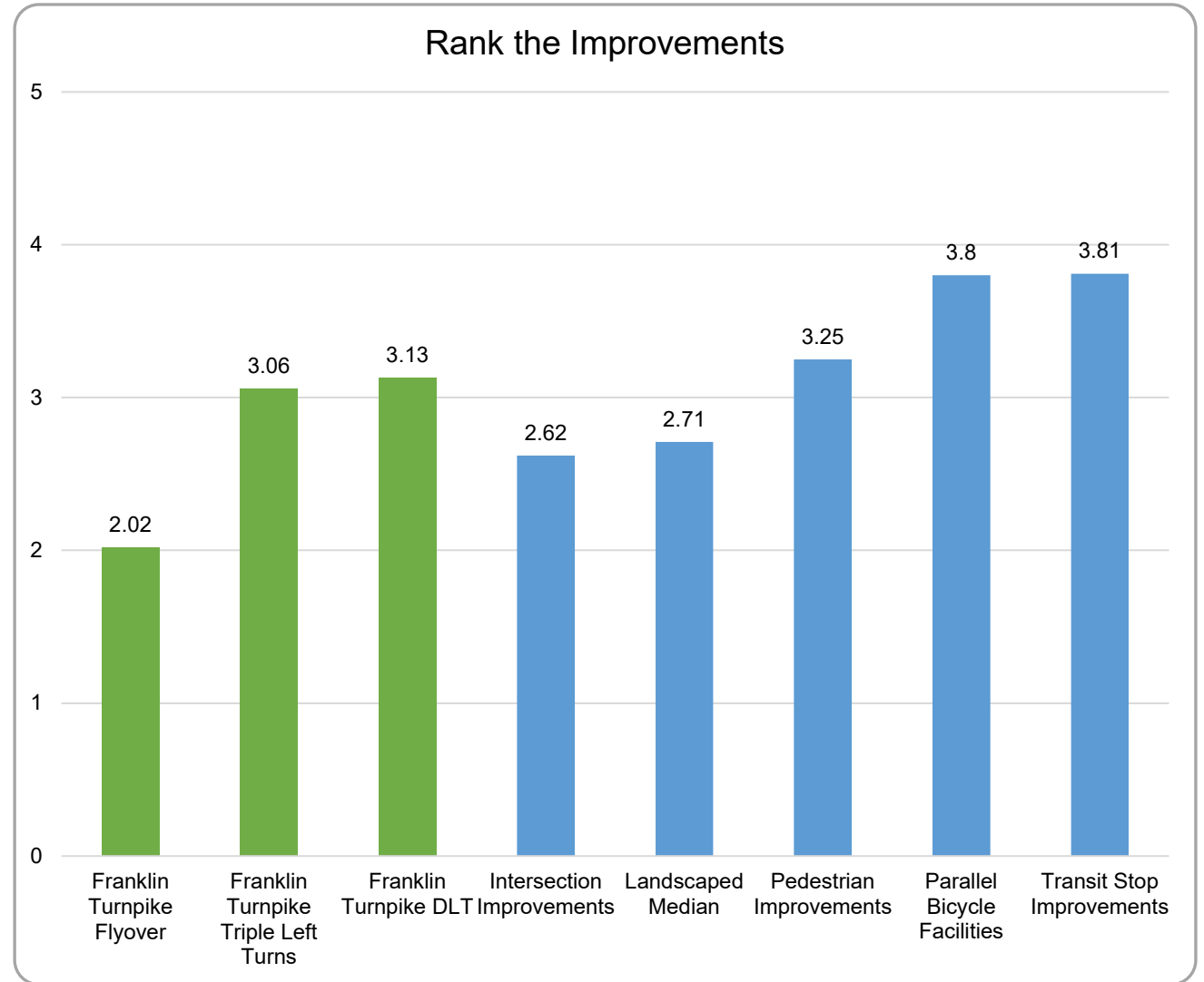




# Rank the Concepts

Respondents were asked to rank their top 5 concepts.

A rank of 1 is the most preferable



## Appendix I Parallel Corridor Information

## Piney Forest Road Frontage/Backage Road Notes

### 1) **East side of Piney Forest Road between Franklin Turnpike and Nor Dan Drive**

An analysis of the commercial development located on the east side of Piney Forest Road between Franklin Turnpike and Nor Dan Drive indicates that the properties immediately adjacent to the corridor are zoned Highway Retail Commercial HR-C and are characterized by a variety of low-intensity businesses such as restaurants, a pawn shop, a dry cleaner, a bank, and other commercial strip-type businesses. These establishments have some rear property which could possibly accommodate a backage road, and a topographical analysis revealed relatively level land. These properties, however, directly abut a single-family residential area zoned Old-Town Residential District OT-R, and so a backage road, if constructed, would directly abut these residential properties. A further analysis revealed that among the businesses fronting Piney Forest Road are three single-family residences, rendering the possibility of a backage road not possible.

### 2) **East side of Piney Forest Road between Nor Dan Drive and Fairlawn Drive**

An analysis of the commercial development located on the east side of Piney Forest Road between Nor Dan Drive and Fairlawn Drive reveals a shopping center at the intersection of Nor Dan Drive and Piney Forest Road containing relatively large-scale businesses including a Wal-Mart Neighborhood Market, a Big Lots, and a gas station, among other establishments, situated within the Planned Shopping Center Commercial District PS-C zoning district. Located further south along Piney Forest Road are a motel, two fast-food restaurants, and an auto parts store, all located within the Highway Retail Commercial HR-C zoning district. A topographical analysis revealed that the land these buildings is situated on is fairly level, though a possible drainage ditch or basin may be present just south of the shopping center abutting Nor Dan Drive. An initial analysis shows adequate space to construct a backage road connecting the shopping center located at the intersection of Piney Forest Road with the commercial establishments further south, however, Fairlawn Drive is a residential street with single-family homes, precluding the possibility of any connection to the south. Therefore, if a backage road were to be constructed, it would simply link the shopping center and the businesses to south, and would not be able to link to Fairlawn Drive.

### 3) **East side of Piney Forest Road between Arnett Blvd Ext and Wendell Scott Dr**

An analysis of properties located adjacent to the east side of Piney Forest Road between Arnett Boulevard Extension and Wendell Scott Drive reveals the

presence of a jewelry store, two restaurants, a motel, and a convenience store. Farther south are located several single-family residences, which are all situated within the Highway Retail Commercial District HR-C zoning district. To the east and south of these of these properties fronting Piney Forest Road is the Transitional Office District TO-C zoning district. Within the TO-C District, fronting Piney Forest Road is a cemetery, and woodlands are located adjacent to Piney Forest Road south of the cemetery and north of Wendell Scott Drive. A topographical analysis of the land zoned TO-C east of the existing development reveals somewhat descending elevation with a drainage basin at the bottom. Furthermore, contour lines reveal evidence of several drainage ditches leading to the main drainage basin. There is the possibility for development of a backage road behind the business, residences, and cemetery, but further study would be needed, especially since existing drainage features may increase the cost of providing a backage road. The backage road, if constructed, would connect to Arnett Boulevard Extension on the north and Wendell Scott Drive to the south. Such a road would create a rear ingress/egress point for existing businesses and potential future businesses on south end of this segment of Piney Forest Road.

4) **East side of Piney Forest Road between Wendell Scott Dr and Doss Business Center/Old Piney Forest Road**

This segment of Piney Forest Road, located between Wendell Scott Drive on the north and Doss Business Center and the intersection of Old Piney Forest Road on the south, is characterized by single-family residences along the north portion of the Piney Forest Road corridor and businesses along the southern portion of the corridor. Commercial establishments are more densely situated here than farther north along the corridor, and include a fast food restaurant, a gas station, several professional/medical offices, and a strip shopping plaza containing numerous establishments at the very south end of the segment. Single-family residences located along the northern portion of the segment are situated within the Old Town Residential District OT-R, while businesses to the south are situated within the Neighborhood Commercial Retail District N-C and the Highway Retail Commercial District HR-C zoning districts. Old Piney Forest Road serves as a parallel corridor to Piney Forest Road, located just east of the main corridor, and already serves as a backage road to many of the businesses fronting Piney Forest Road. There are two businesses, however, that do not appear to be linked to Old Piney Forest Road, and there appears to be an elevation differential between these two businesses and Old Piney Forest Road, so further study pertaining to linkage would have to be conducted. Immediately to the east side of Old Piney Forest Road is a trailer community. While Old Piney Forest Road intersects with Piney Forest Road on the south end of the segment, it intersects Wendell Scott Drive to the north, approximately 0.17-mile east of Piney Forest Road. Two strengths of Old Piney Forest Road as a backage road are, first, that minimal work would be needed to upgrade the road to better serve businesses, as many are already

served by this road, and second, that the intersection of Old Piney Forest Road with Piney Forest Road almost perfectly aligns with a shared entrance to two shopping complexes located adjacent to the west side of Piney Forest Road.

5) **East Side of Piney Forest Road from Doss Business Center/Old Piney Forest Road to Boxwood Ct/Holt Garrison Parkway**

This segment of Piney Forest Road, extending from Doss Business Center/Old Piney Forest Road on the north to Boxwood Court on the south is characterized by a variety of commercial establishments including an auto parts store; a new credit union; beauty salons; a car wash; a health and rehabilitation facility; and numerous other small, professional-type establishments. The east side of this segment is comprised of the Highway Retail Commercial District HR-C zoning district, and the health and rehabilitation facility falls within the Transitional Office District TO-C zoning district. A topographical analysis of this segment reveals downward topography on the east end of the corridor, but nothing that would preclude development. A series of residential streets parallels the corridor, but there are few or no opportunities for rear connections to businesses due to the presence of single-family homes. The future land use analysis of this segment reveals the continuity of commercial uses along this corridor. An aerial analysis reveals the possibility of constructing a backage road Redwood Drive on the south and Audubon Drive on the north, however, the recent construction of a car wash may preclude that possibility, as development appears to extend nearly to the rear property line. Therefore, a field visit will be required.

6) **West side of Piney Forest Road Corridor from Holt Garrison Parkway north to Pineview Drive**

This segment, located on the west side of Piney Forest Road, extending from Holt Garrison Parkway north to Pineview Drive is characterized by a variety of commercial establishments including a restaurant, health care offices, other professional-type offices, a gas station, a tattoo parlor, and a loan establishment. Interspersed with these land uses are single- and multi-family residential uses. This segment falls within the Highway Retail Commercial District HR-C and Planned Shopping Center Commercial Districts PS-C and PSC-O zoning districts. A topographical analysis reveals slightly down-sloping land on the west side of the corridor, however, nothing that would preclude development. A future land use analysis reveals that land use along the western side of this corridor is planned to remain commercial. A backage road cannot be constructed from Holt Garrison Parkway north to Parker Road because Sweetbriar Drive, serving a variety of single-family residences, is located between those two potential termini. Furthermore, the presence of single-family residences along the western segment within this corridor are on properties that extend within the path of a potential backage road.

7) **West side of Piney Forest Road Corridor from Pineview Drive north to Deer Run Road**

A variety of commercial uses front this segment of the western side of Piney Forest Road, including an express oil change establishment; a variety of small service, retail, and professional establishments; a shopping center with an anchor grocery store; two healthcare centers; and a U-Haul trailer rental facility. The zoning districts along this segment include the Highway Retail Commercial District HR-C and Planned Shopping Center Commercial District PS-C zoning districts. A topographic analysis reveals a slight downward slope west of the corridor, though nothing that would preclude development. An analysis of the future land use along this segment reveals a combination of commercial land uses as well as mixed-use land use types. A backage road would likely be difficult to construct along this segment because an oil change express establishment is located along Pineview Drive with a single-family residence located directly behind (to the west) of it, and vehicle movements in and out of the garage would not permit any of that land to be used for such a road. There is, however, some inter-parcel connectivity already established between a shopping center and a complex containing multiple professional and service-related establishments just to its south. Furthermore, there are opportunities to increase inter-parcel connectivity with businesses farther to the south, as small strips of grass and curbing appear to separate them. In this situation, then, an informal frontage or backage road could be established between the shopping center and Pineview Drive to the south.

8) **West side of Piney Forest Road Corridor from Deer Run Road north to Beavers Mill Road**

This segment of Piney Forest Road, between Deer Run Road on the south and Beavers Mill Road on the north, is occupied by an elementary school, a car wash, a restaurant, and a single-family residence. Zoning within this segment includes the Transitional Office District TO-C and the Highway Retail Commercial District HR-C zoning districts. An analysis of future land use shows a mix of commercial and community commercial (the parcel occupied by the elementary school) land uses. A topographical analysis reveals that the land adjacent to the western side of Piney Forest Road is relatively level, with little topographical relief. An aerial analysis appears to show a frontage road fronting the elementary school, but a closer examination revealed that this was likely designed for school bus drop-offs and pickups, and a sign at the front of the school appears to show that only school bus traffic is permitted there between 2:30 and 3:15 p.m., which would preclude the use of this as a frontage road. North of the elementary school are located a car wash, a dry cleaner, a restaurant, and two single-family residential units. The aerial analysis further indicates that neither a frontage road nor a backage road could be constructed because of residential properties both fronting Piney Forest

Road as well as farther west, behind businesses. Additionally, the few businesses along this segment would likely generate relatively little traffic, thereby resulting in little benefit for the corridor.

9) **West side of Piney Forest Road Corridor from Beavers Mill Road north to Ash Street**

This segment of Piney Forest Road, extending from Beavers Mill Road on the south to Ash Street on the north, is largely fronted by single-family residences and a trailer community. A restaurant is situated along the north end of this segment; a used car lot is located at the intersection of Piney Forest Road and Beavers Mill Road; and a medical office is situated in the center of the segment, set back from the corridor. Zoning consists of the Highway Retail Commercial District HR-C zoning district, Old Town Residential District OT-R zoning district, and the Transitional Office District TO-C zoning district. A future land use analysis shows Regional Commercial uses at the north and south intersections of the segment, Community Commercial, High Density Residential, and Medium Density Residential. A mixed use future land use is proposed to be situated immediately behind the land uses adjacent to the corridor. A topographical analysis of this segment reveals that the land gently slopes downward moving west of the corridor, as well as the possible presence of a drainage ditch proceeding from east to west at about the segment's mid-point. An aerial analysis revealed that the large number of residential structures immediately alongside the corridor and along Beavers Mill Road and Ash Street would render the business justification of a parallel connector infeasible and would not make it possible. However, the presence of two apartment complexes was noted approximately 0.25 mile west of the corridor, which do not connect with one-another. There does appear to be the possibility for constructing a parallel connection between Beavers Mill Road and Ash Street just to the east of these two apartment complexes to link these two local streets. At present, drivers leaving both complexes must travel to the corridor to access the other complex, just a stone's throw away, but separated by what appears to be a drainage channel. Furthermore, traffic approaching the corridor on the Beavers Mill Road approach would be able to access the northern-most apartment complex, the surrounding neighborhood, and a variety of businesses including Biscuitville without having to venture out onto the corridor.

10) **West side of Piney Forest Road Corridor from Ash Street to Nelson Ave/Nor Dan Drive**

This 0.6-mile segment of Piney Forest Road, extending from Ash Street north to Nelson Ave/Nor Dan Drive, is comprised mostly of strip development and appears to be one of the more promising segments with regard to package road development. Establishments include fast food restaurants, retail outlets, auto-

oriented businesses, a warehouse, a church, and service-related businesses. One single-family residence is located between Lansdale Drive and Wilbourne Avenue. Zoning along the corridor consists of the Highway Retail Commercial District HR-C zoning district located directly adjacent to the corridor throughout, with the Old Town Residential OT-R, Multifamily Residential District M-R, and the Manufacturing District I-M located directly behind. A future land use analysis of this segment reveals that its entire frontage consists of the Regional Commercial designation, indicating a desire by the City for commercial uses along this segment of the corridor going forward. A topographical analysis reveals that the land along this segment is generally level with little topographical variation. An aerial analysis shows a significant possibility of a backage road being constructed between Ash Street and Lansdale Drive, just to the north. Adequate land appears to be available behind businesses, and a dirt road currently extends approximately 280 feet behind businesses, and accesses Lansdale Drive. Such a backage road appears to be able to be extended farther north behind businesses located between Lansdale Drive and Wilbourne Avenue. One single-family residential unit exists along this latter portion of the segment; this home's property extends a significant distance back from the corridor, but it appears to be virtually all wooded behind the immediate vicinity of the house. A backage road could extend farther north of Wilbourne Avenue, behind approximately four additional businesses, but it would not likely be able to link with Nelson Avenue, at the north terminus of this segment because of the presence of single-family residences. This continuous backage road network would complement a connection between Beavers Mill Road and Ash Street (see #9), and would enable employees of the warehouse at the end of Wilbourne Avenue to access local business without having to turn onto Piney Forest Road.

**11) West side of Piney Forest Road Corridor from Nelson Ave/Nor Dan Drive to Franklin Turnpike**

The segment of Piney Forest Road, extending from Nelson Avenue/Nor Dan Drive to Franklin Turnpike, is fronted by a variety of establishments including fast food restaurants, gas stations, two small strip shopping plazas, a single-family residence, a UPS package facility, and a property owned by the City of Danville and occupied by a water tower. Most of the land directly adjacent to this segment is zoned Highway Retail Commercial District HR-C, but one small segment near the south end is zoned Attached Residential District A-R. A future land use analysis indicates that the land immediately adjoining the western side of this segment is planned as Regional Commercial in its entirety. A topographical analysis along the west side of this segment indicates the land is relatively level with little topographical variation, and no indication of watercourses. An aerial analysis shows little opportunity for a backage road connection linking to Nelson Avenue on the south end of the segment because of inadequate space between



two existing buildings, as well as single-family residences immediately west of those commercial buildings. There does, however, appear to be potential for construction of a backage road behind several businesses between Woodside Drive and Maplewood Avenue, though one property is a single family residence; however, a backage road would only occupy the rear-most portion of that property. There appears to be sufficient space along Woodside Drive to accommodate the linkage of a backage road. Furthermore, the Maplewood Avenue end is occupied by property belonging to the City of Danville (Danville Life Saving Crew), and there appears to be adequate land on the east side of the building occupying that parcel. While the portion of the segment between Maplewood Avenue to the south and Franklin Turnpike to the north show less promise for a backage road, there may be an opportunity for a connection. Tamworth Drive dead-ends just west of this row of businesses, and there appears to be an opportunity to link Tamworth Drive into part of a city-owned parcel (occupied by a water tower), which can connect with a gas station and fast food restaurant. There is, however, the possibility of resident opposition.

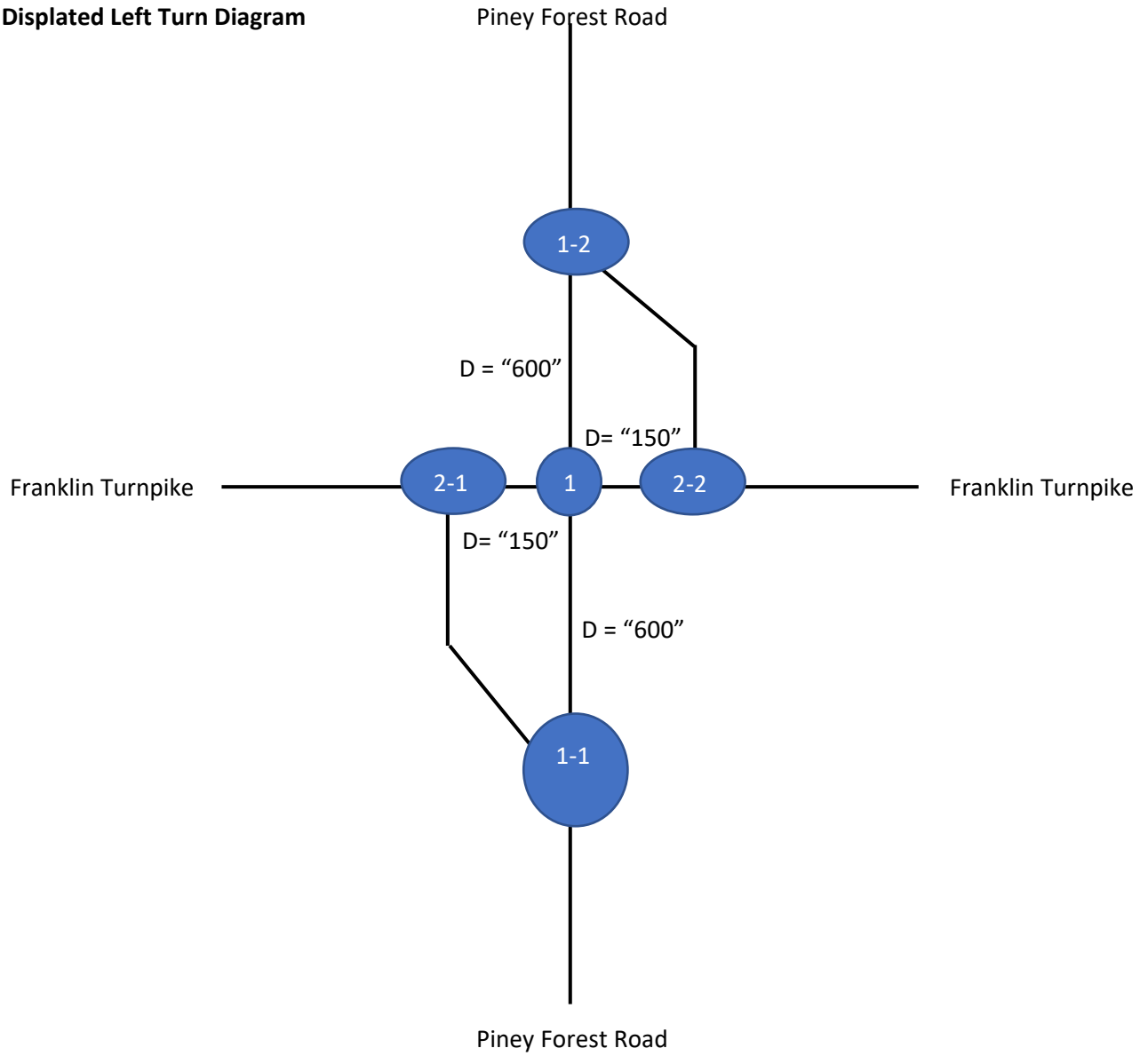
# Appendix J Franklin Turnpike Intersection Improvement Alternatives Operations Analysis Summary

2045 Northbound Triple Left Turn Lanes								
Approach	Movement	Effective Storage	AM			PM		
			LOS	Delay (sec)	Max Queue (feet)	LOS	Delay (sec)	Max Queue (feet)
<i>1. Piney Forest Road/Franklin Turnpike</i>								<i>Signalized</i>
Franklin Turnpike	EBL	125	E	58.8	124	E	69.4	124
	EBT	-	C	32.5	295	D	43.4	248
	EBR	435	D	44.2	330	E	58.2	248
Franklin Turnpike	WBL	130	E	69.1	129	E	65.9	130
	WBT	-	C	25.0	212	D	44.9	308
	WBR	75	C	20.7	61	C	31.3	75
Piney Forest Road	NBL	360	D	49.3	224	D	39.6	359
	NBT	-	C	23.9	190	C	26.7	735
	NBR	220	A	0.1	35	A	0.1	175
Piney Forest Road	SBL	310	E	61.4	138	F	96.8	147
	SBT	-	E	56.1	371	D	47.2	295
	SBR	490	A	0.1	0	A	0.1	0
Intersection Overall			D	40.7		D	41.6	

2045 Northbound Left Turn Flyover Ramp								
Approach	Movement	Effective Storage	AM			PM		
			LOS	Delay (sec)	Max Queue (feet)	LOS	Delay (sec)	Max Queue (feet)
<i>1. Piney Forest Road/Franklin Turnpike</i>								<i>Signalized</i>
Franklin Turnpike	EBL	125	E	58.3	124	E	56.2	125
	EBT	-	C	29.9	290	C	34.6	203
	EBR	435	D	38.4	315	D	43.8	192
Franklin Turnpike	WBL	130	E	60.3	128	E	56.6	130
	WBT	-	C	22.1	227	D	35.8	257
	WBR	75	B	18.2	60	C	24.7	75
Piney Forest Road	NBL	360	Flyover					
	NBT	-	D	36.8	257	B	16.5	536
	NBR	220	A	0.1	71	A	0.1	196
Piney Forest Road	SBL	310	E	61.4	71	E	70.2	106
	SBT	-	D	36.2	283	C	21.0	195
	SBR	490	A	0.1	0	A	0.1	0
Intersection Overall			C	34.2		C	29.3	

2045 Displaced Left Turn Intersection								
Approach	Movement	Effective Storage	AM			PM		
			LOS	Delay (sec)	Max Queue (feet)	LOS	Delay (sec)	Max Queue (feet)
<b>1. Piney Forest Road/Franklin Turnpike</b>								<i>Signalized</i>
Franklin Turnpike	EBL	150	A	1.7	35	A	3.6	72
	EBT	-	B	18.1	71	C	22.0	71
Franklin Turnpike	WBL	150	A	3.1	69	A	1.9	66
	WBT	-	B	19.6	74	B	15.3	76
Piney Forest Road	NBT	600	B	18.5	127	C	23.3	235
	NBR	220	B	10.8	101	B	15.6	141
Piney Forest Road	SBT	600	C	23.3	269	C	21.1	194
	SBR	490	B	15.1	104	B	16.3	105
Intersection Overall			B	18.2		B	18.2	
<b>1-1. Piney Forest Road/NB DLT</b>								<i>Signalized</i>
NB DLT	EBR	-	D	51.2	328	D	51.4	239
Piney Forest Road	NBL	300	D	53.5	226	D	44.4	299
	NBT	-	A	3.4	173	A	3.1	478
Piney Forest Road	SBT	600	A	4.2	365	C	23.8	334
Intersection Overall			C	25.2		C	27.0	
<b>1-2. Piney Forest Road/SB DLT</b>								<i>Signalized</i>
SB DLT	WBR	-	E	56.2	80	D	52.4	81
Piney Forest Road	NBT	600	A	0.9	50	A	1.1	213
Piney Forest Road	SBL	300	E	56.8	71	E	57.1	122
	SBT	-	A	1.6	93	A	2.3	88
Intersection Overall			A	3.3		A	5.0	
<b>2-1. Franklin Turnpike/NB DLT</b>								<i>Signalized</i>
Franklin Turnpike	EBT	-	C	21.6	489	C	31.9	219
	EBR	435	A	0.2	129	A	0.1	0
Franklin Turnpike	WBT	150	A	9.6	75	A	5.6	76
NB DLT	NBL	-	A	2.8	73	A	1.3	225
Intersection Overall			A	8.2		A	7.7	
<b>2-2. Franklin Turnpike/SB DLT</b>								<i>Signalized</i>
Franklin Turnpike	EBT	150	A	5.7	92	B	13.5	106
Franklin Turnpike	WBT	-	C	27.8	230	C	22.6	511
	WBR	75	A	0.0	74	A	0.0	75
NB DLT	SBL	-	A	2.7	72	A	4.0	101
Intersection Overall			B	14.0		B	17.8	

**Displaced Left Turn Diagram**


































# Appendix K Franklin Turnpike Intersection Improvement Alternatives Synchro Reports

# HCM Signalized Intersection Capacity Analysis

## 1: US 29/Piney Forest Rd & Franklin Turnpike

03/16/2022

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 	 		 		  	 			 	
Traffic Volume (vph)	46	467	703	143	229	19	317	383	85	25	675	80
Future Volume (vph)	46	467	703	143	229	19	317	383	85	25	675	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	10.6	6.4	6.4	9.7	6.0	5.8	5.3	6.8	4.0	5.8	6.6	4.0
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95	1.00	0.94	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3438	2814	1752	3374	1337	4942	3438	1534	1805	3539	1450
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3438	2814	1752	3374	1337	4942	3438	1534	1805	3539	1450
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	49	502	756	154	246	20	341	412	91	27	726	86
RTOR Reduction (vph)	0	0	0	0	0	12	0	0	0	0	0	0
Lane Group Flow (vph)	49	502	756	154	246	8	341	412	91	27	726	86
Confl. Peds. (#/hr)	2			1		3			1	3		2
Heavy Vehicles (%)	3%	5%	1%	3%	7%	19%	3%	5%	4%	0%	2%	10%
Turn Type	Prot	NA	Prot	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6	6	5	2	3	7	4		3		8
Permitted Phases						2			Free			Free
Actuated Green, G (s)	6.8	39.1	39.1	13.7	45.5	49.7	10.9	34.3	120.0	4.2	28.3	120.0
Effective Green, g (s)	6.8	39.1	39.1	13.7	45.5	49.7	10.9	34.3	120.0	4.2	28.3	120.0
Actuated g/C Ratio	0.06	0.33	0.33	0.11	0.38	0.41	0.09	0.29	1.00	0.04	0.24	1.00
Clearance Time (s)	10.6	6.4	6.4	9.7	6.0	5.8	5.3	6.8		5.8	6.6	
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	3.0	4.0	7.0		3.0	5.0	
Lane Grp Cap (vph)	99	1120	916	200	1279	553	448	982	1534	63	834	1450
v/s Ratio Prot	0.03	0.15	c0.27	c0.09	c0.07	0.00	c0.07	0.12		0.01	c0.21	
v/s Ratio Perm						0.01			0.06			0.06
v/c Ratio	0.49	0.45	0.83	0.77	0.19	0.01	0.76	0.42	0.06	0.43	0.87	0.06
Uniform Delay, d1	54.9	31.9	37.3	51.6	24.9	20.7	53.3	34.8	0.0	56.7	44.1	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.78	0.65	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.6	6.9	17.5	0.1	0.0	7.7	1.3	0.1	4.6	12.0	0.1
Delay (s)	58.8	32.5	44.2	69.1	25.0	20.7	49.3	23.9	0.1	61.4	56.1	0.1
Level of Service	E	C	D	E	C	C	D	C	A	E	E	A
Approach Delay (s)		40.2			41.0			31.6			50.5	
Approach LOS		D			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			40.7		HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)					29.2		
Intersection Capacity Utilization			71.6%		ICU Level of Service					C		
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 1: US 29/Piney Forest Rd & Franklin Turnpike

03/16/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	119	276	427	176	520	38	793	773	140	68	566	103	
Future Volume (vph)	119	276	427	176	520	38	793	773	140	68	566	103	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	10.6	6.4	6.4	9.7	6.0	5.8	5.3	6.8	4.0	5.8	6.6	4.0	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95	1.00	0.94	0.95	1.00	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	3539	2842	1787	3574	1597	5090	3574	1578	1805	3574	1615	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	3539	2842	1787	3574	1597	5090	3574	1578	1805	3574	1615	
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)	129	300	464	191	565	41	862	840	152	74	615	112	
RTOR Reduction (vph)	0	0	0	0	0	29	0	0	0	0	0	0	
Lane Group Flow (vph)	129	300	464	191	565	12	862	840	152	74	615	112	
Confl. Peds. (#/hr)				3		1	2		3	1			
Heavy Vehicles (%)	2%	2%	0%	1%	1%	0%	0%	1%	1%	0%	1%	0%	
Turn Type	Prot	NA	Prot	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	
Protected Phases	1	6	6	5	2	3	7	4		3	8		
Permitted Phases						2			Free			Free	
Actuated Green, G (s)	11.7	23.4	23.4	16.4	27.6	33.7	23.5	45.4	120.0	6.1	28.7	120.0	
Effective Green, g (s)	11.7	23.4	23.4	16.4	27.6	33.7	23.5	45.4	120.0	6.1	28.7	120.0	
Actuated g/C Ratio	0.10	0.19	0.19	0.14	0.23	0.28	0.20	0.38	1.00	0.05	0.24	1.00	
Clearance Time (s)	10.6	6.4	6.4	9.7	6.0	5.8	5.3	6.8		5.8	6.6		
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	3.0	4.0	7.0		3.0	5.0		
Lane Grp Cap (vph)	172	690	554	244	822	448	996	1352	1578	91	854	1615	
v/s Ratio Prot	0.07	0.08	c0.16	c0.11	c0.16	0.00	c0.17	0.24		0.04	c0.17		
v/s Ratio Perm						0.01			0.10			0.07	
v/c Ratio	0.75	0.43	0.84	0.78	0.69	0.03	0.87	0.62	0.10	0.81	0.72	0.07	
Uniform Delay, d1	52.7	42.5	46.5	50.1	42.3	31.3	46.7	30.3	0.0	56.4	42.0	0.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.71	0.83	1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.7	0.9	11.8	15.8	2.6	0.0	6.2	1.6	0.1	40.5	5.2	0.1	
Delay (s)	69.4	43.4	58.2	65.9	44.9	31.3	39.6	26.7	0.1	96.8	47.2	0.1	
Level of Service	E	D	E	E	D	C	D	C	A	F	D	A	
Approach Delay (s)		54.9			49.2			30.5			45.2		
Approach LOS		D			D			C			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			41.6									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.82										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	29.2
Intersection Capacity Utilization			77.4%									ICU Level of Service	D
Analysis Period (min)			15										





























c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

## 1: US 29/Piney Forest Rd & Franklin Turnpike

02/17/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 	 		 			 			 		
Traffic Volume (vph)	46	467	703	143	229	19	0	383	85	25	675	80	
Future Volume (vph)	46	467	703	143	229	19	0	383	85	25	675	80	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	10.6	6.4	6.4	9.7	6.0	5.8		6.8	4.0	5.8	6.6	4.0	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99		1.00	0.99	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1752	3438	2814	1752	3374	1337		3438	1534	1805	3539	1450	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1752	3438	2814	1752	3374	1337		3438	1534	1805	3539	1450	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	49	502	756	154	246	20	0	412	91	27	726	86	
RTOR Reduction (vph)	0	0	0	0	0	11	0	0	0	0	0	0	
Lane Group Flow (vph)	49	502	756	154	246	9	0	412	91	27	726	86	
Confl. Peds. (#/hr)	2			1		3			1	3		2	
Heavy Vehicles (%)	3%	5%	1%	3%	7%	19%	3%	5%	4%	0%	2%	10%	
Turn Type	Prot	NA	Prot	Prot	NA	pm+ov		NA	Free	Prot	NA	Free	
Protected Phases	1	6	6	5	2	3		4		3	8		
Permitted Phases						2			Free			Free	
Actuated Green, G (s)	7.0	42.4	42.4	15.1	50.0	54.2		29.6	120.0	4.2	39.8	120.0	
Effective Green, g (s)	7.0	42.4	42.4	15.1	50.0	54.2		29.6	120.0	4.2	39.8	120.0	
Actuated g/C Ratio	0.06	0.35	0.35	0.13	0.42	0.45		0.25	1.00	0.04	0.33	1.00	
Clearance Time (s)	10.6	6.4	6.4	9.7	6.0	5.8		6.8		5.8	6.6		
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	3.0		7.0		3.0	5.0		
Lane Grp Cap (vph)	102	1214	994	220	1405	603		848	1534	63	1173	1450	
v/s Ratio Prot	0.03	0.15	c0.27	c0.09	c0.07	0.00		0.12		0.01	c0.21		
v/s Ratio Perm						0.01			0.06			0.06	
v/c Ratio	0.48	0.41	0.76	0.70	0.18	0.01		0.49	0.06	0.43	0.62	0.06	
Uniform Delay, d1	54.7	29.4	34.3	50.3	22.0	18.2		38.7	0.0	56.7	33.7	0.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.90	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	0.5	4.1	10.1	0.1	0.0		1.9	0.1	4.6	2.5	0.1	
Delay (s)	58.3	29.9	38.4	60.3	22.1	18.2		36.8	0.1	61.4	36.2	0.1	
Level of Service	E	C	D	E	C	B		D	A	E	D	A	
Approach Delay (s)		35.9			35.9			30.2			33.3		
Approach LOS		D			D			C			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			34.2									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.75										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	29.2
Intersection Capacity Utilization			69.1%									ICU Level of Service	C
Analysis Period (min)			15										

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 1: US 29/Piney Forest Rd & Franklin Turnpike

02/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	276	427	176	520	38	0	773	140	68	566	103
Future Volume (vph)	119	276	427	176	520	38	0	773	140	68	566	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	10.6	6.4	6.4	9.7	6.0	5.8		6.8	4.0	5.8	6.6	4.0
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99		1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	2842	1787	3574	1598		3574	1578	1805	3574	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	2842	1787	3574	1598		3574	1578	1805	3574	1615
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)	129	300	464	191	565	41	0	840	152	74	615	112
RTOR Reduction (vph)	0	0	0	0	0	29	0	0	0	0	0	0
Lane Group Flow (vph)	129	300	464	191	565	12	0	840	152	74	615	112
Confl. Peds. (#/hr)				3		1	2		3	1		
Heavy Vehicles (%)	2%	2%	0%	1%	1%	0%	0%	1%	1%	0%	1%	0%
Turn Type	Prot	NA	Prot	Prot	NA	pm+ov		NA	Free	Prot	NA	Free
Protected Phases	1	6	6	5	2	3		4		3	8	
Permitted Phases						2			Free			Free
Actuated Green, G (s)	10.2	21.3	21.3	13.8	24.4	30.0		30.6	100.0	5.6	42.2	100.0
Effective Green, g (s)	10.2	21.3	21.3	13.8	24.4	30.0		30.6	100.0	5.6	42.2	100.0
Actuated g/C Ratio	0.10	0.21	0.21	0.14	0.24	0.30		0.31	1.00	0.06	0.42	1.00
Clearance Time (s)	10.6	6.4	6.4	9.7	6.0	5.8		6.8		5.8	6.6	
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	3.0		7.0		3.0	5.0	
Lane Grp Cap (vph)	180	753	605	246	872	479		1093	1578	101	1508	1615
v/s Ratio Prot	0.07	0.08	c0.16	c0.11	0.16	0.00		c0.24		c0.04	0.17	
v/s Ratio Perm						0.01			c0.10			0.07
v/c Ratio	0.72	0.40	0.77	0.78	0.65	0.03		0.77	0.10	0.73	0.41	0.07
Uniform Delay, d1	43.5	33.8	37.0	41.6	33.9	24.7		31.5	0.0	46.5	20.2	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.43	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.7	0.7	6.8	15.0	1.9	0.0		2.9	0.1	23.7	0.8	0.1
Delay (s)	56.2	34.6	43.8	56.6	35.8	24.7		16.5	0.1	70.2	21.0	0.1
Level of Service	E	C	D	E	D	C		B	A	E	C	A
Approach Delay (s)		42.5			40.2			14.0			22.6	
Approach LOS		D			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			29.3			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			29.2			
Intersection Capacity Utilization			72.1%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 1: US 29/Piney Forest Rd & Franklin Turnpike

03/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑		↘	↑↑			↑↑	↘		↑↑	↘
Traffic Volume (vph)	46	467	0	143	229	0	0	383	85	0	675	80
Future Volume (vph)	46	467	0	143	229	0	0	383	85	0	675	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95	1.00		0.95	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1752	3438		1752	3374			3438	1553		3539	1468
Flt Permitted	0.48	1.00		0.40	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	877	3438		736	3374			3438	1553		3539	1468
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	49	502	0	154	246	0	0	412	91	0	726	86
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	51	0	0	48
Lane Group Flow (vph)	49	502	0	154	246	0	0	412	40	0	726	38
Heavy Vehicles (%)	3%	5%	0%	3%	7%	0%	0%	5%	4%	0%	2%	10%
Turn Type	pm+pt	NA		pm+pt	NA			NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	54.2	31.7		43.6	26.4			53.1	53.1		53.1	53.1
Effective Green, g (s)	54.2	31.7		43.6	26.4			53.1	53.1		53.1	53.1
Actuated g/C Ratio	0.45	0.26		0.36	0.22			0.44	0.44		0.44	0.44
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	560	908		413	742			1521	687		1566	649
v/s Ratio Prot	0.02	c0.15		c0.05	0.07			0.12			c0.21	
v/s Ratio Perm	0.02			0.08					0.03			0.03
v/c Ratio	0.09	0.55		0.37	0.33			0.27	0.06		0.46	0.06
Uniform Delay, d1	18.7	38.0		26.7	39.4			21.2	19.1		23.5	19.1
Progression Factor	0.09	0.46		0.10	0.49			0.85	0.56		0.95	0.78
Incremental Delay, d2	0.1	0.7		0.6	0.3			0.4	0.2		1.0	0.2
Delay (s)	1.7	18.1		3.1	19.6			18.5	10.8		23.3	15.1
Level of Service	A	B		A	B			B	B		C	B
Approach Delay (s)		16.6			13.2			17.1			22.4	
Approach LOS		B			B			B			C	

### Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 11: US 29/Piney Forest Rd & NB-DLT

03/14/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔↔	↔↔	↑↑	↑↑	
Traffic Volume (vph)	0	703	317	468	818	0
Future Volume (vph)	0	703	317	468	818	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	
Lane Util. Factor		0.88	0.97	0.95	0.95	
Frt		0.85	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		2814	3400	3438	3539	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		2814	3400	3438	3539	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	756	341	503	880	0
RTOR Reduction (vph)	0	593	0	0	0	0
Lane Group Flow (vph)	0	163	341	503	880	0
Heavy Vehicles (%)	0%	1%	3%	5%	2%	0%
Turn Type		Prot	Prot	NA	NA	
Protected Phases		4	5	2	6	
Permitted Phases						
Actuated Green, G (s)		13.7	17.2	94.3	71.1	
Effective Green, g (s)		13.7	17.2	94.3	71.1	
Actuated g/C Ratio		0.11	0.14	0.79	0.59	
Clearance Time (s)		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		321	487	2701	2096	
v/s Ratio Prot		c0.06	c0.10	0.15	c0.25	
v/s Ratio Perm						
v/c Ratio		0.51	0.70	0.19	0.42	
Uniform Delay, d1		50.0	48.9	3.2	13.3	
Progression Factor		1.00	1.00	1.00	0.28	
Incremental Delay, d2		1.2	4.5	0.2	0.6	
Delay (s)		51.2	53.5	3.4	4.2	
Level of Service		D	D	A	A	
Approach Delay (s)	51.2			23.6	4.2	
Approach LOS	D			C	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			25.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			57.2%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis  
 12: US 29/Piney Forest Rd & SB-DLT

03/14/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕		↗	↕
Traffic Volume (vph)	0	19	429	0	25	755
Future Volume (vph)	0	19	429	0	25	755
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	0.95		1.00	0.95
Frt		0.86	1.00		1.00	1.00
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1381	3438		1805	3539
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1381	3438		1805	3539
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	20	461	0	27	812
RTOR Reduction (vph)	0	19	0	0	0	0
Lane Group Flow (vph)	0	1	461	0	27	812
Heavy Vehicles (%)	0%	19%	5%	0%	0%	2%
Turn Type		Prot	NA		Prot	NA
Protected Phases		8	2		1	6
Permitted Phases						
Actuated Green, G (s)		4.0	92.0		6.0	104.0
Effective Green, g (s)		4.0	92.0		6.0	104.0
Actuated g/C Ratio		0.03	0.77		0.05	0.87
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		46	2635		90	3067
v/s Ratio Prot		c0.00	0.13		0.01	c0.23
v/s Ratio Perm						
v/c Ratio		0.01	0.17		0.30	0.26
Uniform Delay, d1		56.1	3.8		55.0	1.4
Progression Factor		1.00	0.20		1.00	1.00
Incremental Delay, d2		0.1	0.1		1.9	0.2
Delay (s)		56.2	0.9		56.8	1.6
Level of Service		E	A		E	A
Approach Delay (s)	56.2		0.9			3.4
Approach LOS	E		A			A
<b>Intersection Summary</b>						
HCM 2000 Control Delay			3.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.27			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			37.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 21: NB-DLT & Franklin Turnpike

03/14/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑↑		↑↑	↑↑	
Traffic Volume (vph)	513	703	0	309	317	0
Future Volume (vph)	513	703	0	309	317	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		6.0	6.0	
Lane Util. Factor	0.95	0.88		0.95	0.97	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	0.95	
Satd. Flow (prot)	3438	2814		3374	3400	
Flt Permitted	1.00	1.00		1.00	0.95	
Satd. Flow (perm)	3438	2814		3374	3400	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	552	756	0	332	341	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	552	756	0	332	341	0
Heavy Vehicles (%)	5%	1%	0%	7%	3%	0%
Turn Type	NA	Free		NA	Prot	
Protected Phases	4 7			3 8	2	
Permitted Phases		Free				
Actuated Green, G (s)	54.2	120.0		43.6	53.1	
Effective Green, g (s)	54.2	120.0		43.6	53.1	
Actuated g/C Ratio	0.45	1.00		0.36	0.44	
Clearance Time (s)					6.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1552	2814		1225	1504	
v/s Ratio Prot	c0.16			0.10	0.10	
v/s Ratio Perm		c0.27				
v/c Ratio	0.36	0.27		0.27	0.23	
Uniform Delay, d1	21.5	0.0		27.0	20.7	
Progression Factor	1.00	1.00		0.35	0.12	
Incremental Delay, d2	0.1	0.2		0.1	0.3	
Delay (s)	21.6	0.2		9.6	2.8	
Level of Service	C	A		A	A	
Approach Delay (s)	9.3			9.6	2.8	
Approach LOS	A			A	A	

### Intersection Summary

HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 22: Franklin Turnpike & SB-DLT

03/14/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗	↘	
Traffic Volume (vph)	0	552	372	19	25	0
Future Volume (vph)	0	552	372	19	25	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0	
Lane Util. Factor		0.95	0.95	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3438	3374	1357	1805	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3438	3374	1357	1805	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	594	400	20	27	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	594	400	20	27	0
Heavy Vehicles (%)	0%	5%	7%	19%	0%	0%
Turn Type		NA	NA	Free	Prot	
Protected Phases		4 7	3 8		6	
Permitted Phases				Free		
Actuated Green, G (s)		54.2	43.6	120.0	53.1	
Effective Green, g (s)		54.2	43.6	120.0	53.1	
Actuated g/C Ratio		0.45	0.36	1.00	0.44	
Clearance Time (s)					6.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		1552	1225	1357	798	
v/s Ratio Prot		c0.17	0.12		c0.01	
v/s Ratio Perm				0.01		
v/c Ratio		0.38	0.33	0.01	0.03	
Uniform Delay, d1		21.8	27.6	0.0	18.9	
Progression Factor		0.26	1.00	1.00	0.14	
Incremental Delay, d2		0.1	0.2	0.0	0.1	
Delay (s)		5.7	27.8	0.0	2.7	
Level of Service		A	C	A	A	
Approach Delay (s)		5.7	26.4		2.7	
Approach LOS		A	C		A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			14.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.22			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			44.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 1: US 29/Piney Forest Rd & Franklin Turnpike

03/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑		↘	↑↑			↑↑	↘		↑↑	↘
Traffic Volume (vph)	119	276	0	176	520	0	0	773	140	0	566	103
Future Volume (vph)	119	276	0	176	520	0	0	773	140	0	566	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95	1.00		0.95	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539		1787	3574			3574	1599		3574	1615
Flt Permitted	0.43	1.00		0.39	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	801	3539		724	3574			3574	1599		3574	1615
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)	129	300	0	191	565	0	0	840	152	0	615	112
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	85	0	0	62
Lane Group Flow (vph)	129	300	0	191	565	0	0	840	67	0	615	50
Heavy Vehicles (%)	2%	2%	0%	1%	1%	0%	0%	1%	1%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA			NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	38.3	22.9		54.9	33.5			53.1	53.1		53.1	53.1
Effective Green, g (s)	38.3	22.9		54.9	33.5			53.1	53.1		53.1	53.1
Actuated g/C Ratio	0.32	0.19		0.46	0.28			0.44	0.44		0.44	0.44
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	380	675		561	997			1581	707		1581	714
v/s Ratio Prot	0.04	0.08		c0.07	c0.16			c0.24			0.17	
v/s Ratio Perm	0.06			0.08					0.04			0.03
v/c Ratio	0.34	0.44		0.34	0.57			0.53	0.10		0.39	0.07
Uniform Delay, d1	30.0	42.9		20.2	37.0			24.4	19.5		22.5	19.2
Progression Factor	0.10	0.50		0.08	0.39			0.91	0.79		0.91	0.84
Incremental Delay, d2	0.5	0.4		0.3	0.7			1.2	0.3		0.7	0.2
Delay (s)	3.6	22.0		1.9	15.3			23.3	15.6		21.1	16.3
Level of Service	A	C		A	B			C	B		C	B
Approach Delay (s)		16.4			11.9			22.1			20.4	
Approach LOS		B			B			C			C	

### Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 11: US 29/Piney Forest Rd & NB-DLT

03/14/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔↔	↔↔	↕↕	↕↕	
Traffic Volume (vph)	0	427	793	913	742	0
Future Volume (vph)	0	427	793	913	742	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	
Lane Util. Factor		0.88	0.97	0.95	0.95	
Frt		0.85	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		2842	3502	3574	3574	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		2842	3502	3574	3574	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	464	862	992	807	0
RTOR Reduction (vph)	0	425	0	0	0	0
Lane Group Flow (vph)	0	39	862	992	807	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Turn Type		Prot	Prot	NA	NA	
Protected Phases		4	5	2	6	
Permitted Phases						
Actuated Green, G (s)		10.0	35.9	98.0	56.1	
Effective Green, g (s)		10.0	35.9	98.0	56.1	
Actuated g/C Ratio		0.08	0.30	0.82	0.47	
Clearance Time (s)		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		236	1047	2918	1670	
v/s Ratio Prot		c0.01	c0.25	0.28	c0.23	
v/s Ratio Perm						
v/c Ratio		0.16	0.82	0.34	0.48	
Uniform Delay, d1		51.1	39.1	2.8	22.0	
Progression Factor		1.00	1.00	1.00	1.04	
Incremental Delay, d2		0.3	5.3	0.3	1.0	
Delay (s)		51.4	44.4	3.1	23.8	
Level of Service		D	D	A	C	
Approach Delay (s)	51.4			22.3	23.8	
Approach LOS	D			C	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			27.0		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.57			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			53.1%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 12: US 29/Piney Forest Rd & SB-DLT

03/14/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕		↘	↕
Traffic Volume (vph)	0	38	892	0	68	669
Future Volume (vph)	0	38	892	0	68	669
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	0.95		1.00	0.95
Frt		0.86	1.00		1.00	1.00
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1644	3574		1805	3574
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1644	3574		1805	3574
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	41	970	0	74	727
RTOR Reduction (vph)	0	38	0	0	0	0
Lane Group Flow (vph)	0	3	970	0	74	727
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Turn Type		Prot	NA		Prot	NA
Protected Phases		8	2		1	6
Permitted Phases						
Actuated Green, G (s)		8.0	84.7		9.3	100.0
Effective Green, g (s)		8.0	84.7		9.3	100.0
Actuated g/C Ratio		0.07	0.71		0.08	0.83
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		109	2522		139	2978
v/s Ratio Prot		c0.00	c0.27		c0.04	0.20
v/s Ratio Perm						
v/c Ratio		0.03	0.38		0.53	0.24
Uniform Delay, d1		52.4	7.1		53.3	2.1
Progression Factor		1.00	0.10		1.00	1.00
Incremental Delay, d2		0.1	0.4		3.9	0.2
Delay (s)		52.4	1.1		57.1	2.3
Level of Service		D	A		E	A
Approach Delay (s)	52.4		1.1			7.4
Approach LOS	D		A			A
<b>Intersection Summary</b>						
HCM 2000 Control Delay			5.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.37			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			43.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 21: NB-DLT & Franklin Turnpike

03/14/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑↑		↑↑	↑↑	
Traffic Volume (vph)	395	427	0	623	793	0
Future Volume (vph)	395	427	0	623	793	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		6.0	6.0	
Lane Util. Factor	0.95	0.88		0.95	0.97	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	0.95	
Satd. Flow (prot)	3539	2842		3574	3502	
Flt Permitted	1.00	1.00		1.00	0.95	
Satd. Flow (perm)	3539	2842		3574	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	464	0	677	862	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	429	464	0	677	862	0
Heavy Vehicles (%)	2%	0%	0%	1%	0%	0%
Turn Type	NA	Free		NA	Prot	
Protected Phases	4 7			3 8	2	
Permitted Phases		Free				
Actuated Green, G (s)	38.3	120.0		54.9	53.1	
Effective Green, g (s)	38.3	120.0		54.9	53.1	
Actuated g/C Ratio	0.32	1.00		0.46	0.44	
Clearance Time (s)					6.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1129	2842		1635	1549	
v/s Ratio Prot	0.12			0.19	0.25	
v/s Ratio Perm		0.16				
v/c Ratio	0.38	0.16		0.41	0.56	
Uniform Delay, d1	31.7	0.0		21.8	24.7	
Progression Factor	1.00	1.00		0.25	0.01	
Incremental Delay, d2	0.2	0.1		0.2	1.1	
Delay (s)	31.9	0.1		5.6	1.3	
Level of Service	C	A		A	A	
Approach Delay (s)	15.4			5.6	1.3	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 22: Franklin Turnpike & SB-DLT

03/14/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑	↑	
Traffic Volume (vph)	0	416	696	38	68	0
Future Volume (vph)	0	416	696	38	68	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0	
Lane Util. Factor		0.95	0.95	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3539	3574	1615	1805	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3539	3574	1615	1805	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	452	757	41	74	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	452	757	41	74	0
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Turn Type		NA	NA	Free	Prot	
Protected Phases		4 7	3 8		6	
Permitted Phases				Free		
Actuated Green, G (s)		38.3	54.9	120.0	53.1	
Effective Green, g (s)		38.3	54.9	120.0	53.1	
Actuated g/C Ratio		0.32	0.46	1.00	0.44	
Clearance Time (s)					6.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		1129	1635	1615	798	
v/s Ratio Prot		0.13	c0.21		c0.04	
v/s Ratio Perm				0.03		
v/c Ratio		0.40	0.46	0.03	0.09	
Uniform Delay, d1		31.9	22.4	0.0	19.4	
Progression Factor		0.42	1.00	1.00	0.19	
Incremental Delay, d2		0.2	0.2	0.0	0.2	
Delay (s)		13.5	22.6	0.0	4.0	
Level of Service		B	C	A	A	
Approach Delay (s)		13.5	21.5		4.0	
Approach LOS		B	C		A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			17.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.30			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			48.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

# Appendix L Franklin Turnpike Intersection Improvement Alternatives SimTraffic Queue Reports

Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	R	L	T	T	R	L	L	L
Maximum Queue (ft)	124	295	262	330	285	129	212	132	61	157	214	224
Average Queue (ft)	25	145	98	183	144	81	58	33	4	69	119	138
95th Queue (ft)	94	248	215	287	247	142	146	97	31	150	206	217
Link Distance (ft)		935	935				580	580				
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			435	435	130			75	360	360	360
Storage Blk Time (%)	0	13				4	1	2	0			
Queuing Penalty (veh)	0	6				5	1	0	0			

Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike

Movement	NB	NB	NB	SB	SB	SB
Directions Served	T	T	R	L	T	T
Maximum Queue (ft)	190	189	35	138	371	348
Average Queue (ft)	86	105	1	10	219	202
95th Queue (ft)	160	171	22	78	323	302
Link Distance (ft)	1528	1528			1399	1399
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			220	310		
Storage Blk Time (%)		0	0	0	2	
Queuing Penalty (veh)		0	0	0	0	

Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	R	L	T	T	R	L	L	L
Maximum Queue (ft)	124	248	203	248	214	130	308	269	75	296	351	359
Average Queue (ft)	67	99	45	124	88	108	160	136	16	182	248	258
95th Queue (ft)	135	198	144	203	169	158	270	231	66	310	395	395
Link Distance (ft)		935	935				580	580				
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			435	435	130			75	360	360	360
Storage Blk Time (%)	3	3				8	10	23	0		1	4
Queuing Penalty (veh)	4	4				22	18	9	1		3	16

Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike

Movement	NB	NB	NB	SB	SB	SB
Directions Served	T	T	R	L	T	T
Maximum Queue (ft)	735	482	175	147	295	283
Average Queue (ft)	207	162	12	32	179	165
95th Queue (ft)	503	303	94	89	264	252
Link Distance (ft)	1528	1528			1399	1399
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			220	310		
Storage Blk Time (%)	4	1	0		0	
Queuing Penalty (veh)	33	2	0		0	

Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	R	L	T	T	R	T	T	R
Maximum Queue (ft)	124	290	253	315	278	128	227	167	60	220	257	71
Average Queue (ft)	32	153	101	179	138	82	52	31	4	103	122	14
95th Queue (ft)	101	248	215	274	235	141	142	93	31	214	237	81
Link Distance (ft)		949	949				580	580		1528	1528	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	125			435	435	130			75			220
Storage Blk Time (%)	0	15				4	1	1	0		3	0
Queuing Penalty (veh)	0	7				5	1	0	0		3	0

Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	71	283	277
Average Queue (ft)	11	180	167
95th Queue (ft)	43	261	255
Link Distance (ft)		1420	1420
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	310		
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	



Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	R	L	T	T	R	T	T	R
Maximum Queue (ft)	125	203	169	192	174	130	257	211	75	516	536	196
Average Queue (ft)	64	86	33	105	67	93	115	98	11	224	242	29
95th Queue (ft)	125	165	118	172	146	150	208	180	54	790	802	126
Link Distance (ft)		949	949				580	580		1528	1528	
Upstream Blk Time (%)										1	2	
Queuing Penalty (veh)										12	19	
Storage Bay Dist (ft)	125			435	435	130			75			220
Storage Blk Time (%)	1	3				4	4	14	0		10	0
Queuing Penalty (veh)	2	3				9	7	5	0		14	1

Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	106	195	191
Average Queue (ft)	32	116	100
95th Queue (ft)	78	178	169
Link Distance (ft)		1420	1420
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	310		
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	T	T	T	R	T	T	R
Maximum Queue (ft)	35	71	71	69	74	72	124	127	101	269	262	104
Average Queue (ft)	7	61	61	31	52	47	50	53	27	151	150	31
95th Queue (ft)	26	78	79	68	81	90	99	109	69	233	230	76
Link Distance (ft)	60	60	60	66	66	66	475	475		494	494	
Upstream Blk Time (%)	0	9	9	3	5	6						
Queuing Penalty (veh)	0	15	16	3	6	7						
Storage Bay Dist (ft)									300			490
Storage Blk Time (%)												
Queuing Penalty (veh)												

**Intersection: 11: US 29/Piney Forest Rd & NB-DLT**

Movement	EB	EB	B43	B43	NB	NB	NB	NB	SB	SB
Directions Served	R	R	T	T	L	L	T	T	T	T
Maximum Queue (ft)	156	164	155	164	210	226	173	170	358	365
Average Queue (ft)	137	145	43	44	105	145	78	81	151	167
95th Queue (ft)	167	181	113	119	196	212	146	151	314	324
Link Distance (ft)	73	73	396	396			1479	1479	475	475
Upstream Blk Time (%)	39	41							0	0
Queuing Penalty (veh)	139	143							0	0
Storage Bay Dist (ft)					300	300				
Storage Blk Time (%)										
Queuing Penalty (veh)										

**Intersection: 12: US 29/Piney Forest Rd & SB-DLT**

Movement	WB	NB	NB	SB	SB	SB
Directions Served	R	T	T	L	T	T
Maximum Queue (ft)	80	50	42	71	93	79
Average Queue (ft)	15	5	2	21	26	16
95th Queue (ft)	49	28	21	55	75	57
Link Distance (ft)	94	494	494		1464	1464
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)				300		
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 21: NB-DLT & Franklin Turnpike**

Movement	EB	EB	EB	WB	WB	NB	NB
Directions Served	T	T	R	T	T	L	L
Maximum Queue (ft)	214	489	129	46	75	61	73
Average Queue (ft)	27	214	6	8	41	4	5
95th Queue (ft)	168	392	90	31	80	26	31
Link Distance (ft)	1362	1362		60	60	396	396
Upstream Blk Time (%)	0	0		0	7		
Queuing Penalty (veh)	0	0		1	11		
Storage Bay Dist (ft)			435				
Storage Blk Time (%)		0	0				
Queuing Penalty (veh)		0	0				

**Intersection: 22: Franklin Turnpike & SB-DLT**

Movement	EB	EB	WB	WB	WB	SB
Directions Served	T	T	T	T	R	L
Maximum Queue (ft)	50	92	154	230	74	72
Average Queue (ft)	11	56	68	98	9	10
95th Queue (ft)	39	95	130	185	48	41
Link Distance (ft)	66	66	1517	1517		414
Upstream Blk Time (%)	0	10				
Queuing Penalty (veh)	1	27				
Storage Bay Dist (ft)					75	
Storage Blk Time (%)				18	0	
Queuing Penalty (veh)				4	0	

**Network Summary**

Network wide Queuing Penalty: 372
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**Intersection: 1: US 29/Piney Forest Rd & Franklin Turnpike**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	T	T	T	R	T	T	R
Maximum Queue (ft)	72	71	70	66	72	76	221	235	141	192	194	105
Average Queue (ft)	33	58	56	23	67	69	129	138	47	107	105	34
95th Queue (ft)	71	79	88	55	74	73	201	210	98	171	170	76
Link Distance (ft)	60	60	60	66	66	66	475	475		494	494	
Upstream Blk Time (%)	3	8	10	1	7	8						
Queuing Penalty (veh)	4	11	13	2	17	19						
Storage Bay Dist (ft)									300			490
Storage Blk Time (%)												
Queuing Penalty (veh)												

**Intersection: 11: US 29/Piney Forest Rd & NB-DLT**

Movement	EB	EB	B43	B43	NB	NB	NB	NB	SB	SB
Directions Served	R	R	T	T	L	L	T	T	T	T
Maximum Queue (ft)	146	157	82	72	294	299	478	391	331	334
Average Queue (ft)	113	111	12	8	224	245	131	111	206	212
95th Queue (ft)	163	166	51	41	314	315	357	239	300	299
Link Distance (ft)	73	73	396	396			1479	1479	475	475
Upstream Blk Time (%)	34	31								
Queuing Penalty (veh)	73	66								
Storage Bay Dist (ft)					300	300				
Storage Blk Time (%)					0	1	1			
Queuing Penalty (veh)					1	6	8			

**Intersection: 12: US 29/Piney Forest Rd & SB-DLT**

Movement	WB	NB	NB	SB	SB	SB
Directions Served	R	T	T	L	T	T
Maximum Queue (ft)	81	196	213	122	88	85
Average Queue (ft)	24	42	43	51	29	21
95th Queue (ft)	59	125	139	101	74	64
Link Distance (ft)	94	494	494		1464	1464
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)				300		
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 21: NB-DLT & Franklin Turnpike**

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	L
Maximum Queue (ft)	150	219	56	76	224	225
Average Queue (ft)	62	119	18	57	83	85
95th Queue (ft)	119	197	49	91	190	194
Link Distance (ft)	1362	1362	60	60	396	396
Upstream Blk Time (%)			1	16		0
Queuing Penalty (veh)			2	51		1
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 22: Franklin Turnpike & SB-DLT**

Movement	EB	EB	WB	WB	WB	SB
Directions Served	T	T	T	T	R	L
Maximum Queue (ft)	50	106	238	511	75	101
Average Queue (ft)	10	66	86	274	23	28
95th Queue (ft)	36	101	191	451	79	73
Link Distance (ft)	66	66	1517	1517		414
Upstream Blk Time (%)	0	14				
Queuing Penalty (veh)	1	29				
Storage Bay Dist (ft)					75	
Storage Blk Time (%)				48	0	
Queuing Penalty (veh)				18	1	

**Network Summary**

Network wide Queuing Penalty: 322
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## Appendix M Cost Estimates

Franklin Turnpike Flyover  
Danville, VA



Project No./UPC:  
Current Estimate Phase: PRE-SCOPING  
Estimate Date:

6/26/2022

VDOT District: SALEM  
Project Tier: (TIER 1/2)  
Project Complexity: MOST COMPLEX

Total Project Cost Estimate Summary			Date of Current Cost
			6/26/2022
Phase	Base Estimate (\$)	Contingency (\$)	Total Phase
PE Phase Estimate	\$ 2,220,000.00	\$ 888,000.00	\$ 3,108,000.00
RW Phase Estimate	\$ 2,322,036.40	\$ 1,587,833.20	\$ 3,909,869.60
CN Phase Estimate(without CEI)	\$ 13,272,083.14	\$ 8,066,375.83	\$ 21,338,458.97
Total CEI	\$ 2,413,106.03	\$ 1,206,553.01	\$ 3,619,659.04
CN Phase Estimate(with CEI)	\$ 15,685,189.17	\$ 9,272,928.84	\$ 24,958,118.01
<b>Total Estimate</b>	<b>\$ 20,227,225.57</b>	<b>\$ 11,748,762.04</b>	<b>\$ 31,975,987.61</b>

# Franklin Turnpike Flyover

0

Danville, VA

6/26/2022

Prepared By: EPR, P.C.

## PRELIMINARY ENGINEERING ESTIMATE

Discipline	%	Source Cost	PE Cost (Allowance)	Assumptions
Roadway	10.00%	\$ 4,109,087.31	\$ 411,000.00	10% of the Base CN Costs of Roadway, Earthwork, Mobilization, and 1/2 MOT
Hydraulics	10.00%	\$ 1,781,095.18	\$ 179,000.00	10% of the Base CN Cost of Hydraulics
In-plan Utilities	10.00%	\$ 427,000.00	\$ 43,000.00	10% of the Base CN Cost of In-plan Utilities
Traffic	10.00%	\$ 661,629.31	\$ 67,000.00	10% of the Base CN Costs of Traffic and 1/2 MOT
Structures/Bridges	8.00%	\$ 5,086,718.33	\$ 407,000.00	8% of the Base CN Cost of Structures/Bridge
Materials/Geotech	3.00%	#####	\$ 362,000.00	2-3% of the Total Base CN Cost (use 3% if Interstate project and/or Bridges/Walls are required)
Survey/SUE/Quality Level A SUE	2.00%	#####	\$ 242,000.00	2-3% of the Total Base CN Cost (use 3% if urban environment or Interstate project)
Environmental	1.00%	#####	\$ 121,000.00	1-2% of the Total Base CN Cost (use 2% if known impacts or Envi. Assess. Required)
Right of Way	1.00%	1,707,260.00	\$ 18,000.00	1% of the Total Base RW Cost
Other			\$ -	
VDOT Project PE Oversight	20.00%	\$ 1,850,000.00	\$ 370,000.00	20% of PE above (use when know consultant project)
Base Cost			\$ 2,220,000.00	
Contingency	40.00%		\$ 888,000.00	
<b>TOTAL</b>			<b>\$ 3,108,000.00</b>	



**Franklin Turnpike Flyover**

0

Danville, VA

6/26/2022

Prepared By: EPR, P.C.

**RIGHT OF WAY & UTILITIES ESTIMATE**

**Right of Way Acquisition**

Parcel	Property Number	Address	Area		Assessed Value			\$/SF		Property Type	Proposed ROW (Calculated Area)	Proposed ROW Cost	
			Ac.	SF	Land Value	Improve.	Total	Land	Building SF				Building
1	59576	1435 Piney Forest Rd (McDonalds Corp)	1.018	44,344	\$ 288,000.00	\$ 352,800.00	\$ 640,800.00	\$ 20.00	3000.00	\$ 120.00	Commercial	44,344.00	\$ 1,246,880.00
2	54398	150 Tamworth Pl (Hyer, Michelle)	0.1793	7,810	\$ 5,800.00	\$ 73,300.00	\$ 79,100.00	\$ 10.00	2500.00	\$ 30.00	Residential	7,810.00	\$ 153,100.00
3	50512	142 Tamworth Pl (Ouaami, Brahim & Hourri Aiche)	0.2166	9,435	\$ 7,000.00	\$ 85,700.00	\$ 92,700.00	\$ 10.00	1500.00	\$ 60.00	Residential	9,435	\$ 184,350.00
4	54395	Franklin Turnpike (Shelton, Paul & James D)	0.6480	28,227	\$ 23,400.00	\$ -	\$ 23,400.00	\$ 10.00	0.00	\$ -	Residential	5,575	\$ 55,750.00
5	54394	Franklin Turnpike (Shelton, Paul & James D)	1.661	72,353	\$ 42,400.00	\$ -	\$ 42,400.00	\$ 10.00	0.00	\$ -	Residential	6,718	\$ 67,180.00
6			1	43,560			\$ -	\$ -	0.00	\$ -	Commercial		\$ -
7			1	43,560			\$ -	\$ -	0.00	\$ -	Commercial		\$ -
8			1	43,560	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	Commercial		\$ -
<b>Base Right of Way Total</b>											73,882.00	\$ 1,707,260.00	
<b>Contingency</b>											75%	\$ 1,280,445.00	
<b>TOTAL</b>												\$ 2,987,705.00	

**Utilities**

Type	Unit	Quantity	Unit Price	Total
Underground	LF	0	\$ 150.00	\$ -
Overhead	EA (Poles)	5	\$ 100,000.00	\$ 500,000.00
Allowance (Based on CN Base Cost)		0%		\$ -
<b>Base Utilities Total</b>				\$ 500,000.00
<b>Contingency</b>				\$ 250,000.00 50%
<b>TOTAL</b>				\$ 750,000.00

**VDOT Project RW Oversight**

<b>Base Oversight Total</b>	\$	114,776.40	20%
<b>Contingency</b>	\$	57,388.20	50%
<b>TOTAL</b>	\$	172,164.60	

**Franklin Turnpike Flyover**

0

Danville, VA

6/26/2022

Prepared By: EPR, P.C.

**CONSTRUCTION ESTIMATE**

**MOBILIZATION/CONSTR. SURVEY**

Mobilization		\$	598,000.00
Construction Survey		\$	114,000.00
<b>Base Cost (Defined + Allowance)</b>		\$	<b>712,000.00</b>
Contingency	60.00%	\$	427,200.00
<b>MOBILIZATION/CONSTR. SURVEY TOTAL</b>		\$	<b>1,139,200.00</b>

ASSUMPTIONS

**MOT**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -

ASSUMPTIONS

Allowance (by Percentage)	%	Total
MOT	15.00%	\$ 1,281,000.00
	0.00%	\$ -
	0.00%	\$ -
<b>Total</b>		\$ 1,281,000.00

<b>Base Cost (Defined + Allowance)</b>		\$	1,281,000.00
Contingency	60.00%	\$	768,600.00
<b>MOT TOTAL</b>		\$	<b>2,049,600.00</b>

**ROADWAY**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Pavement Items</b>	25506	FIELD OFFICE TY.II	MO	24	\$ 2,301.20	\$ 55,228.80
	00111	CLEARING AND GRUBBING	ACRE	1	\$ 72,616.77	\$ 72,616.77
	00120	REGULAR EXCAVATION	CY	4223	\$ 13.53	\$ 57,137.19
	13220	HYDR. CEMENT CONC. SIDEWALK 4"	SY	945	\$ 72.56	\$ 68,569.20
	10128	AGGR. BASE MATL. TY. I NO. 21B	TON	2483	\$ 36.73	\$ 91,200.59
	10611	ASPHALT CONCRETE TY. IM-19.0D	TON	1790	\$ 116.72	\$ 208,928.80
	10067	AGGR. MATL. NO. 1	TON	1972	\$ 51.30	\$ 101,163.60
	10629	FLEXIBLE PAVE. PLANING ABOVE 2"-4"	SY	8896	\$ 12.74	\$ 113,335.04
	10636	ASPHALT CONC.TY. SM-9.5D	TON	1689	\$ 122.91	\$ 207,594.99
	10643	ASPHALT CONCRETE TY. BM-25.0D	TON	1304	\$ 115.00	\$ 149,960.00
	12600	STD. COMB. CURB & GUTTER CG-6	LF	1700	\$ 41.31	\$ 70,227.00

ASSUMPTIONS

	13108	CG-12 DETECTABLE WARNING SURFACE	SY	4	\$ 678.11	\$ 2,712.44
	11070	NS SAW-CUT ASPH CONC	LF	1700	\$ 20.00	\$ 34,000.00
	13280	GUARDRAIL GR-MGS1	LF	1700	\$ 22.75	\$ 38,675.00
	13286	GUARDRAIL TERMINAL GR-MGS2	EA	4	\$ 3,067.29	\$ 12,269.16
	13383	FIXED OBJECT ATTACH. GR-FOA-1 TY. I	EA	12	\$ 3,161.25	\$ 37,935.00
	12940	ENTRANCE GUTTER CG-9D	SY	180	\$ 245.96	\$ 44,272.80
	13601	BULL NOSE BARRIER	EA	2	\$ 6,100.00	\$ 12,200.00
	13607	IMPCT ATTN. ST.IA-1, TL-3,>=40MPH DE:	EA	2	\$ 34,000.00	\$ 68,000.00
	13460	MEDIAN BARRIER MB-7D	LF	900	\$ 102.05	\$ 91,845.00
	21020	MEDIAN STRIP MS-1	SY	6552	\$ 180.97	\$ 1,185,715.44
	14120	REMOVE COMB. CURB AND GUTTER	LF	1700	\$ 12.01	\$ 20,417.00
					\$ -	\$ -
<b>Incidental Items</b>	27012	TOPSOIL CLASS A 2"	ACRE	1	\$ 7,122.29	\$ 7,122.29
	27101	TEMPORARY SEED	LB	100	\$ 16.56	\$ 1,656.00
	27102	REGULAR SEED	LB	120	\$ 17.98	\$ 2,157.60
	27103	OVERSEEDING	LB	120	\$ 13.73	\$ 1,647.60
					\$ -	\$ -
					\$ -	\$ -
<b>Total</b>						<b>\$ 2,756,587.31</b>

<b>Allowance (by Percentage)</b>	<b>%</b>	<b>Total</b>
<b>Total</b>		<b>\$ -</b>
<b>Base Cost (Defined + Allowance)</b>		<b>\$ 2,756,587.31</b>
<b>Contingency</b>	<b>60.00%</b>	<b>\$ 1,653,952.39</b>
<b>ROADWAY TOTAL</b>		<b>\$ 4,410,539.70</b>

#### HYDRAULICS

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Drainage Items	00211	MINOR STR. EXCAV. PIPE CULVERT	CY	1087	\$ 32.44	\$ 35,262.28
	00505	BEDDING MATL.AGGR.NO. 25 OR 26	TON	3130	\$ 55.53	\$ 173,808.90
	01186	STORM SEWER PIPE 18"	LF	800	\$ 127.71	\$ 102,168.00
	01246	STORM SEWER PIPE 24"	LF	1700	\$ 195.24	\$ 331,908.00
	00588	UNDERDRAIN UD-4	LF	1700	\$ 16.44	\$ 27,948.00
	06838	DROP INLET DI-3C,L=12'	EA	12	\$ 6,391.93	\$ 76,703.16
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -

#### ASSUMPTIONS

<b>Total</b>						\$ 671,095.18
<b>Allowance (by Percentage)</b>	<b>%</b>					<b>Total</b>
Stormwater Mgmt	8.00%					\$ 683,000.00
E & S	5.00%					\$ 427,000.00
	0.00%					\$ -
<b>Total</b>						<b>\$ 1,110,000.00</b>
<b>Base Cost (Defined + Allowance)</b>						<b>\$ 1,781,095.18</b>
Contingency	60.00%					\$ 1,068,657.11
<b>HYDRAULICS TOTAL</b>						<b>\$ 2,849,752.29</b>

Nutrient Credit/Stormwater Facility

**IN-PLAN UTILITIES**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -
<b>Allowance (by Percentage)</b>	<b>%</b>					<b>Total</b>
	5.00%	Utility relocations				\$ 427,000.00
	0.00%					\$ -
	0.00%					\$ -
<b>Total</b>						<b>\$ 427,000.00</b>
<b>Base Cost (Defined + Allowance)</b>						<b>\$ 427,000.00</b>
Contingency	75.00%					\$ 320,250.00
<b>IN-PLAN UTILITIES TOTAL</b>						<b>\$ 747,250.00</b>

ASSUMPTIONS

**TRAFFIC**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Signal	51834	HANGER ASSEMBLY SMB-2, ONE WAY	EA	2	\$ 280.64	\$ 561.28
	52404	PEDESTRIAN SIGNAL HEAD SP-9	EA	2	\$ 771.66	\$ 1,543.32
	51198	PEDESTRIAN ACTUATION PA-2	EA	2	\$ 1,657.86	\$ 3,315.72
	50108	SIGN PANEL	SF	48	\$ 33.60	\$ 1,612.80
	51185	TRAF. SIG. HEAD SEC 12" HVS BACKPLAT	EA	8	\$ 329.03	\$ 2,632.24
	51248	CONCRETE FOUNDATION CF-4	EA	1	\$ 4,406.14	\$ 4,406.14
	51478	SIGNAL MAST ARM POLE MP-3, TY. C	EA	1	\$ 14,469.52	\$ 14,469.52
	55100	10 CONDUCTOR CABLE	LF	1700	\$ 2.85	\$ 4,845.00
	51490	MAST ARM 70'	EA	2	\$ 12,209.01	\$ 24,418.02
	51937	REMOVE EXISTING MANHOLE/JUNCTION	EA	1	\$ 526.21	\$ 526.21
	50300	REMOVE EXISTING 1 POST SIGN STRUCT	EA	4	\$ 290.61	\$ 1,162.44
	55188	LIGHTING POLE LP-2 TYPE D	EA	2	\$ 7,000.00	\$ 14,000.00
	51210	PEDESTAL POLE PF-2 10'	EA	2	\$ 1,613.32	\$ 3,226.64

ASSUMPTIONS



				\$	-	\$	-
<b>Total</b>						\$	5,086,718.33
<b>Allowance (by Percentage)</b>	<b>%</b>					<b>Total</b>	
<b>Total</b>						\$	-
<b>Base Cost (Defined + Allowance)</b>						\$	5,086,718.33
<b>Contingency</b>	75.00%					\$	3,815,038.75
<b>STRUCTURES/BRIDGES TOTAL</b>						\$	<b>8,901,757.08</b>

**EARTHWORK/GEOTECH**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total	
<b>Total</b>						\$ -	
<b>Allowance (by Percentage)</b>	<b>%</b>					<b>Total</b>	
<b>Total</b>						\$	-
<b>Base Cost (Defined + Allowance)</b>						\$	-
<b>Contingency</b>	60.00%					\$	-
<b>EARTHWORK/GEOTECH TOTAL</b>						\$	-

ASSUMPTIONS

**ENVIRONMENTAL/SOUNDWALLS**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total	
<b>Total</b>						\$ -	
<b>Allowance (by Percentage)</b>	<b>%</b>					<b>Total</b>	
<b>Total</b>						\$	-
<b>Base Cost (Defined + Allowance)</b>						\$	-
<b>Contingency</b>	60.00%					\$	-
<b>ENVIRONMENTAL/SOUNDWALLS TOTAL</b>						\$	-

ASSUMPTIONS

**OTHER**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total	
<b>Total</b>						\$ -	
<b>Allowance (by Percentage)</b>	<b>%</b>					<b>Total</b>	
<b>Total</b>						\$	-

ASSUMPTIONS

<b>Base Cost (Defined + Allowance)</b>		\$	-
<b>Contingency</b>	60.00%	\$	-
<b>OTHER TOTAL</b>		\$	-

Construction Base Cost (No Contingency)		\$	12,065,530.13	
<b>CONSTRUCTION ITEM SUBTOTAL</b>		\$	20,131,905.96	
<b>CONSTRUCTION CONTINGENCY</b>	10.00%	\$	1,206,553.01	% of base cost (from VDOT CEWB)
<b>CEI</b>	20.00%	\$	2,413,106.03	% of base cost (from VDOT CEWB)
<b>CEI CONTINGENCY</b>	50.00%	\$	1,206,553.01	
<b>CONSTRUCTION TOTAL</b>		\$	<b>24,958,118.01</b>	

Parker Rd/Falwell Court Pedestrian Improvements  
Danville, VA



Project No./UPC:  
Current Estimate Phase: PRE-SCOPING  
Estimate Date:

6/25/2022

VDOT District: SALEM  
Project Tier: (TIER 1/2)  
Project Complexity: MODERATELY COMPLEX

Total Project Cost Estimate Summary			Date of Current Cost
			6/25/2022
Phase	Base Estimate (\$)	Contingency (\$)	Total Phase
PE Phase Estimate	\$ 20,000.00	\$ 6,000.00	\$ 26,000.00
RW Phase Estimate	\$ -	\$ -	\$ -
CN Phase Estimate(without CEI)	\$ 102,472.79	\$ 34,530.78	\$ 137,003.57
Total CEI	\$ 18,631.42	\$ 9,315.71	\$ 27,947.12
CN Phase Estimate(with CEI)	\$ 121,104.20	\$ 43,846.49	\$ 164,950.70
<b>Total Estimate</b>	<b>\$ 141,104.20</b>	<b>\$ 49,846.49</b>	<b>\$ 190,950.70</b>



## Parker Rd/Falwell Court Pedestrian Improvements

0

Danville, VA

6/25/2022

Prepared By: EPR, P.C.

### PRELIMINARY ENGINEERING ESTIMATE

Discipline	%	Source Cost	PE Cost (Allowance)	Assumptions
Roadway	10.00%	\$ 24,820.48	\$ 3,000.00	10% of the Base CN Costs of Roadway, Earthwork, Mobilization, and 1/2 MOT
Hydraulics	10.00%	\$ 2,000.00	\$ 1,000.00	10% of the Base CN Cost of Hydraulics
In-plan Utilities	10.00%	\$ -	\$ -	10% of the Base CN Cost of In-plan Utilities
Traffic	10.00%	\$ 61,836.60	\$ 7,000.00	10% of the Base CN Costs of Traffic and 1/2 MOT
Structures/Bridges	8.00%	\$ -	\$ -	8% of the Base CN Cost of Structures/Bridge
Materials/Geotech	2.00%	\$ 93,157.08	\$ 2,000.00	2-3% of the Total Base CN Cost (use 3% if Interstate project and/or Bridges/Walls are required)
Survey/SUE/Quality Level A SUE	2.00%	\$ 93,157.08	\$ 2,000.00	2-3% of the Total Base CN Cost (use 3% if urban environment or Interstate project)
Environmental	1.00%	\$ 93,157.08	\$ 1,000.00	1-2% of the Total Base CN Cost (use 2% if known impacts or Envi. Assess. Required)
Right of Way	1.00%	\$ -	\$ -	1% of the Total Base RW Cost
Other			\$ -	
VDOT Project PE Oversight	20.00%	\$ 16,000.00	\$ 4,000.00	20% of PE above (use when know consultant project)
Base Cost			\$ 20,000.00	
Contingency	30.00%		\$ 6,000.00	
<b>TOTAL</b>			<b>\$ 26,000.00</b>	

**Parker Rd/Falwell Court Pedestrian Improvements**

0

Danville, VA

6/25/2022

Prepared By: EPR, P.C.

**CONSTRUCTION ESTIMATE**

**MOBILIZATION/CONSTR. SURVEY**

Mobilization						\$	9,000.00
Construction Survey						\$	1,000.00
<b>Base Cost (Defined + Allowance)</b>						\$	<b>10,000.00</b>
Contingency	30.00%					\$	3,000.00
<b>MOBILIZATION/CONSTR. SURVEY TOTAL</b>						\$	<b>13,000.00</b>

**ASSUMPTIONS**

**MOT**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -

**ASSUMPTIONS**

Allowance (by Percentage)	%	Total
MOT	10.00%	\$ 8,000.00
	0.00%	\$ -
	0.00%	\$ -
<b>Total</b>		\$ 8,000.00

Will have MOT concerns with high traffic

<b>Base Cost (Defined + Allowance)</b>		\$	8,000.00
Contingency	40.00%	\$	3,200.00
<b>MOT TOTAL</b>		\$	<b>11,200.00</b>

Increased due to traffic volumes

**ROADWAY**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Pavement Items</b>	00120	REGULAR EXCAVATION	CY	8	\$ 13.53	\$ 108.24
	13220	HYDR. CEMENT CONC. SIDEWALK 4"	SY	12	\$ 72.56	\$ 870.72
	10128	AGGR. BASE MATL. TY. I NO. 21B	TON	9	\$ 36.73	\$ 330.57
	13108	CG-12 DETECTABLE WARNING SURFACE	SY	5	\$ 678.11	\$ 3,390.55
	10881	REINF. HYDR.CEM.CONC. PAVE. 8"	SY	7	\$ 313.00	\$ 2,191.00
	10771	PLAIN HYDR. CEM.CONC. PAVE. 7"	SY	7	\$ 295.00	\$ 2,065.00
	12020	STD. CURB CG-2	LF	40	\$ 46.61	\$ 1,864.40
					\$ -	\$ -
					\$ -	\$ -
<b>Total</b>						\$ 10,820.48

**ASSUMPTIONS**

Allowance (by Percentage)	%	Total
Total		\$ -
<b>Base Cost (Defined + Allowance)</b>		
		\$ 10,820.48
Contingency	30.00%	\$ 3,246.14
<b>ROADWAY TOTAL</b>		<b>\$ 14,066.62</b>

**HYDRAULICS**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -
<b>Allowance (by Percentage)</b>						
						\$ -
Stormwater Mgmt	0.00%					\$ -
E & S	2.00%					\$ 2,000.00
	0.00%					\$ -
<b>Total</b>						<b>\$ 2,000.00</b>
<b>Base Cost (Defined + Allowance)</b>						
						\$ 2,000.00
Contingency	30.00%					\$ 600.00
<b>HYDRAULICS TOTAL</b>						<b>\$ 2,600.00</b>

ASSUMPTIONS

**IN-PLAN UTILITIES**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -
<b>Allowance (by Percentage)</b>						
						\$ -
<b>Total</b>						<b>\$ -</b>
<b>Base Cost (Defined + Allowance)</b>						
						\$ -
Contingency	30.00%					\$ -
<b>IN-PLAN UTILITIES TOTAL</b>						<b>\$ -</b>

ASSUMPTIONS

**TRAFFIC**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Signal	51834	HANGER ASSEMBLY SMB-2, ONE WAY	EA	6	\$ 280.64	\$ 1,683.84
	52404	PEDESTRIAN SIGNAL HEAD SP-9	EA	6	\$ 771.66	\$ 4,629.96
	51198	PEDESTRIAN ACTUATION PA-2	EA	6	\$ 1,657.86	\$ 9,947.16
	50108	SIGN PANEL	SF	96	\$ 33.60	\$ 3,225.60

ASSUMPTIONS

	51210	PEDESTAL POLE PF-2 10'	EA	4	\$ 1,613.32	\$ 6,453.28
	51240	CONC. FOUNDATION PF-2	EA	4	\$ 1,381.19	\$ 5,524.76
	56050	BORED CONDUIT 2"	LF	400	\$ 23.84	\$ 9,536.00
	51600	14/2 CONDUCTOR CABLE	LF	1000	\$ 3.00	\$ 3,000.00
	51602	14/4 CONDUCTOR CABLE	LF	1000	\$ 2.28	\$ 2,280.00
					\$ -	\$ -
					\$ -	\$ -
<b>Pavement Marking Items</b>	54042	TY.B CL.I PAVE. LINE MARK. 24"	LF	428	\$ 27.00	\$ 11,556.00
					\$ -	\$ -
					\$ -	\$ -
<b>Total</b>						\$ 57,836.60

<b>Allowance (by Percentage)</b>	%	<b>Total</b>
<b>Total</b>		\$ -

<b>Base Cost (Defined + Allowance)</b>	\$ 57,836.60
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<b>Contingency</b>	40.00%	\$ 23,134.64
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Increased contingency due to delivery delays/cost

<b>TRAFFIC TOTAL</b>	\$ 80,971.24
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**STRUCTURES/BRIDGES**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -

**ASSUMPTIONS**

<b>Allowance (by Percentage)</b>	%	<b>Total</b>
<b>Total</b>		\$ -

<b>Base Cost (Defined + Allowance)</b>	\$ -
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<b>Contingency</b>	30.00%	\$ -
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<b>STRUCTURES/BRIDGES TOTAL</b>	\$ -
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**EARTHWORK/GEOTECH**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -

**ASSUMPTIONS**

<b>Allowance (by Percentage)</b>	%	<b>Total</b>
<b>Total</b>		\$ -

<b>Base Cost (Defined + Allowance)</b>	\$ -
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<b>Contingency</b>	30.00%	\$ -
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<b>EARTHWORK/GEOTECH TOTAL</b>	<b>\$ -</b>
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**ENVIRONMENTAL/SOUNDWALLS**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						<b>\$ -</b>

ASSUMPTIONS

Allowance (by Percentage)	%	Total
<b>Total</b>		<b>\$ -</b>

<b>Base Cost (Defined + Allowance)</b>	<b>\$ -</b>
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<b>Contingency</b>	30.00%	<b>\$ -</b>
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<b>ENVIRONMENTAL/SOUNDWALLS TOTAL</b>	<b>\$ -</b>
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**OTHER**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
		Bus Shelter		1	\$ 4,500.00	\$ 4,500.00
					\$ -	\$ -
					\$ -	\$ -
<b>Total</b>						<b>\$ 4,500.00</b>

ASSUMPTIONS

Allowance (by Percentage)	%	Total
<b>Total</b>		<b>\$ -</b>

<b>Base Cost (Defined + Allowance)</b>	<b>\$ 4,500.00</b>
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<b>Contingency</b>	30.00%	<b>\$ 1,350.00</b>
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<b>OTHER TOTAL</b>	<b>\$ 5,850.00</b>
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Construction Base Cost (No Contingency)	\$ 93,157.08
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<b>CONSTRUCTION ITEM SUBTOTAL</b>	<b>\$ 127,687.86</b>
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<b>CONSTRUCTION CONTINGENCY</b>	10.00%	\$ 9,315.71
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% of base cost (from VDOT CEWB)

<b>CEI</b>	20.00%	\$ 18,631.42
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% of base cost (from VDOT CEWB)

<b>CEI CONTINGENCY</b>	50.00%	\$ 9,315.71
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<b>CONSTRUCTION TOTAL</b>	<b>\$ 164,950.70</b>
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**Audubon Dr/Pineview Dr Pedestrian Improvements  
Danville, VA**



Project No./UPC:  
Current Estimate Phase: PRE-SCOPING  
Estimate Date:

6/25/2022

VDOT District: SALEM  
Project Tier: (TIER 1/2)  
Project Complexity: MODERATELY COMPLEX

<b>Total Project Cost Estimate Summary</b>			<b>Date of Current Cost</b>
			6/25/2022
<b>Phase</b>	<b>Base Estimate (\$)</b>	<b>Contingency (\$)</b>	<b>Total Phase</b>
PE Phase Estimate	\$ 16,000.00	\$ 4,800.00	\$ 20,800.00
RW Phase Estimate	\$ -	\$ -	\$ -
CN Phase Estimate(without CEI)	\$ 72,288.12	\$ 25,456.18	\$ 97,744.29
Total CEI	\$ 13,143.29	\$ 6,571.65	\$ 19,714.94
CN Phase Estimate(with CEI)	\$ 85,431.41	\$ 32,027.82	\$ 117,459.23
<b>Total Estimate</b>	\$ <b>101,431.41</b>	\$ <b>36,827.82</b>	\$ <b>138,259.23</b>

## Audubon Dr/Pineview Dr Pedestrian Improvements

0

Danville, VA

6/25/2022

Prepared By: EPR, P.C.

### PRELIMINARY ENGINEERING ESTIMATE

Discipline	%	Source Cost	PE Cost (Allowance)	Assumptions
Roadway	10.00%	\$ 15,304.13	\$ 2,000.00	10% of the Base CN Costs of Roadway, Earthwork, Mobilization, and 1/2 MOT
Hydraulics	10.00%	\$ 2,000.00	\$ 1,000.00	10% of the Base CN Cost of Hydraulics
In-plan Utilities	10.00%	\$ -	\$ -	10% of the Base CN Cost of In-plan Utilities
Traffic	10.00%	\$ 48,412.34	\$ 5,000.00	10% of the Base CN Costs of Traffic and 1/2 MOT
Structures/Bridges	8.00%	\$ -	\$ -	8% of the Base CN Cost of Structures/Bridge
Materials/Geotech	2.00%	\$ 65,716.47	\$ 2,000.00	2-3% of the Total Base CN Cost (use 3% if Interstate project and/or Bridges/Walls are required)
Survey/SUE/Quality Level A SUE	2.00%	\$ 65,716.47	\$ 2,000.00	2-3% of the Total Base CN Cost (use 3% if urban environment or Interstate project)
Environmental	1.00%	\$ 65,716.47	\$ 1,000.00	1-2% of the Total Base CN Cost (use 2% if known impacts or Envi. Assess. Required)
Right of Way	1.00%	\$ -	\$ -	1% of the Total Base RW Cost
Other			\$ -	
VDOT Project PE Oversight	20.00%	\$ 13,000.00	\$ 3,000.00	20% of PE above (use when know consultant project)
Base Cost			\$ 16,000.00	
Contingency	30.00%		\$ 4,800.00	
<b>TOTAL</b>			<b>\$ 20,800.00</b>	

# Audubon Dr/Pineview Dr Pedestrian Improvements

0

Danville, VA

6/25/2022

Prepared By: EPR, P.C.

## CONSTRUCTION ESTIMATE

### MOBILIZATION/CONSTR. SURVEY

Mobilization		\$	6,000.00
Construction Survey		\$	1,000.00
<b>Base Cost (Defined + Allowance)</b>		\$	<b>7,000.00</b>
Contingency	30.00%	\$	2,100.00
<b>MOBILIZATION/CONSTR. SURVEY TOTAL</b>		\$	<b>9,100.00</b>

ASSUMPTIONS

### MOT

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -

ASSUMPTIONS

Allowance (by Percentage)	%	Total
MOT	10.00%	\$ 6,000.00
	0.00%	\$ -
	0.00%	\$ -
<b>Total</b>		\$ 6,000.00

<b>Base Cost (Defined + Allowance)</b>		\$	6,000.00
Contingency	50.00%	\$	3,000.00
<b>MOT TOTAL</b>		\$	<b>9,000.00</b>

### ROADWAY

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Pavement Items	00120	REGULAR EXCAVATION	CY	7.5	\$ 39.92	\$ 299.40
	13220	HYDR. CEMENT CONC. SIDEWALK 4"	SY	24	\$ 62.18	\$ 1,492.32
	10128	AGGR. BASE MATL. TY. I NO. 21B	TON	0.5	\$ 43.02	\$ 21.51
	13108	CG-12 DETECTABLE WARNING SURFACE	SY	7	\$ 498.70	\$ 3,490.90
					\$ -	\$ -
					\$ -	\$ -
<b>Total</b>						\$ 5,304.13

ASSUMPTIONS

Allowance (by Percentage)	%	Total
Total		\$ -



Base Cost (Defined + Allowance)		\$	5,304.13
Contingency	30.00%	\$	1,591.24
<b>ROADWAY TOTAL</b>		<b>\$</b>	<b>6,895.37</b>

**HYDRAULICS**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -

ASSUMPTIONS

Allowance (by Percentage)	%	Total
Stormwater Mgmt	0.00%	\$ -
E & S	2.00%	\$ 2,000.00
	0.00%	\$ -
<b>Total</b>		<b>\$ 2,000.00</b>

Base Cost (Defined + Allowance)		\$	2,000.00
Contingency	30.00%	\$	600.00
<b>HYDRAULICS TOTAL</b>		<b>\$</b>	<b>2,600.00</b>

**IN-PLAN UTILITIES**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -

ASSUMPTIONS

Allowance (by Percentage)	%	Total
Total		\$ -

Base Cost (Defined + Allowance)		\$	-
Contingency	30.00%	\$	-
<b>IN-PLAN UTILITIES TOTAL</b>		<b>\$</b>	<b>-</b>

**TRAFFIC**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Signal	51834	HANGER ASSEMBLY SMB-2, ONE WAY	EA	6	\$ 300.00	\$ 1,800.00
	52404	PEDESTRIAN SIGNAL HEAD SP-9	EA	6	\$ 933.42	\$ 5,600.52
	51198	PEDESTRIAN ACTUATION PA-2	EA	6	\$ 2,770.00	\$ 16,620.00
	50108	SIGN PANEL	SF	96	\$ 33.60	\$ 3,225.60
	51210	PEDESTAL POLE PF-2 10'	EA	2	\$ 1,410.64	\$ 2,821.28
	51240	CONC. FOUNDATION PF-2	EA	2	\$ 956.32	\$ 1,912.64
	56050	BORED CONDUIT 2"	LF	250	\$ 35.98	\$ 8,995.00
	51600	14/2 CONDUCTOR CABLE	LF	350	\$ 1.77	\$ 619.50

ASSUMPTIONS

	51602	14/4 CONDUCTOR CABLE	LF	350	\$ 2.28	\$ 798.00
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
Pavement Marking Items	54042	TY.B CL.I PAVE. LINE MARK. 24"	LF	420	\$ 7.19	\$ 3,019.80
					\$ -	\$ -
					\$ -	\$ -
<b>Total</b>						\$ 45,412.34

<b>Allowance (by Percentage)</b>	<b>%</b>					<b>Total</b>
<b>Total</b>						\$ -

<b>Base Cost (Defined + Allowance)</b>						\$ 45,412.34
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Contingency	40.00%					\$ 18,164.94
<b>TRAFFIC TOTAL</b>						\$ <b>63,577.28</b>

Increased contingency due to delivery delays/cost

**STRUCTURES/BRIDGES**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -

ASSUMPTIONS

<b>Allowance (by Percentage)</b>	<b>%</b>					<b>Total</b>
<b>Total</b>						\$ -

<b>Base Cost (Defined + Allowance)</b>						\$ -
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Contingency	30.00%					\$ -
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<b>STRUCTURES/BRIDGES TOTAL</b>						\$ -
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**EARTHWORK/GEOTECH**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -

ASSUMPTIONS

<b>Allowance (by Percentage)</b>	<b>%</b>					<b>Total</b>
<b>Total</b>						\$ -

<b>Base Cost (Defined + Allowance)</b>						\$ -
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Contingency	30.00%					\$ -
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<b>EARTHWORK/GEOTECH TOTAL</b>						\$ -
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**ENVIRONMENTAL/SOUNDWALLS**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -
<b>Allowance (by Percentage)</b>						<b>Total</b>
<b>Total</b>						\$ -
<b>Base Cost (Defined + Allowance)</b>						\$ -
<b>Contingency</b>		30.00%				\$ -
<b>ENVIRONMENTAL/SOUNDWALLS TOTAL</b>						\$ -

ASSUMPTIONS

**OTHER**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -
<b>Allowance (by Percentage)</b>						<b>Total</b>
<b>Total</b>						\$ -
<b>Base Cost (Defined + Allowance)</b>						\$ -
<b>Contingency</b>		30.00%				\$ -
<b>OTHER TOTAL</b>						\$ -

ASSUMPTIONS

Construction Base Cost (No Contingency)					\$	65,716.47
<b>CONSTRUCTION ITEM SUBTOTAL</b>					\$	91,172.65
<b>CONSTRUCTION CONTINGENCY</b>			10.00%		\$	6,571.65
<b>CEI</b>				20.00%	\$	13,143.29
<b>CEI CONTINGENCY</b>				50.00%	\$	6,571.65
<b>CONSTRUCTION TOTAL</b>					\$	<b>117,459.23</b>

% of base cost (from VDOT CEWB)

% of base cost (from VDOT CEWB)

Holt Garrison Pkwy/Boxwood Ct Pedestrian Improvements  
Danville, VA



Project No./UPC:  
Current Estimate Phase: PRE-SCOPING  
Estimate Date:

6/25/2022

VDOT District: SALEM  
Project Tier: (TIER 1/2)  
Project Complexity: MODERATELY COMPLEX

Total Project Cost Estimate Summary			Date of Current Cost
			6/25/2022
Phase	Base Estimate (\$)	Contingency (\$)	Total Phase
PE Phase Estimate	\$ 28,000.00	\$ 8,400.00	\$ 36,400.00
RW Phase Estimate	\$ -	\$ -	\$ -
CN Phase Estimate(without CEI)	\$ 149,487.47	\$ 51,966.67	\$ 201,454.14
Total CEI	\$ 27,179.54	\$ 13,589.77	\$ 40,769.31
CN Phase Estimate(with CEI)	\$ 176,667.01	\$ 65,556.44	\$ 242,223.45
<b>Total Estimate</b>	<b>\$ 204,667.01</b>	<b>\$ 73,956.44</b>	<b>\$ 278,623.45</b>

# Holt Garrison Pkwy/Boxwood Ct Pedestrian Improvements .

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Danville, VA

6/25/2022

Prepared By: EPR, P.C.

## PRELIMINARY ENGINEERING ESTIMATE

Discipline	%	Source Cost	PE Cost (Allowance)	Assumptions
Roadway	10.00%	\$ 35,424.07	\$ 4,000.00	10% of the Base CN Costs of Roadway, Earthwork, Mobilization, and 1/2 MOT
Hydraulics	10.00%	\$ 5,000.00	\$ 1,000.00	10% of the Base CN Cost of Hydraulics
In-plan Utilities	10.00%	\$ -	\$ -	10% of the Base CN Cost of In-plan Utilities
Traffic	10.00%	\$ 95,473.63	\$ 10,000.00	10% of the Base CN Costs of Traffic and 1/2 MOT
Structures/Bridges	8.00%	\$ -	\$ -	8% of the Base CN Cost of Structures/Bridge
Materials/Geotech	2.00%	\$ 135,897.70	\$ 3,000.00	2-3% of the Total Base CN Cost (use 3% if Interstate project and/or Bridges/Walls are required)
Survey/SUE/Quality Level A SUE	2.00%	\$ 135,897.70	\$ 3,000.00	2-3% of the Total Base CN Cost (use 3% if urban environment or Interstate project)
Environmental	1.00%	\$ 135,897.70	\$ 2,000.00	1-2% of the Total Base CN Cost (use 2% if known impacts or Envi. Assess. Required)
Right of Way	1.00%	\$ -	\$ -	1% of the Total Base RW Cost
Other			\$ -	
VDOT Project PE Oversight	20.00%	\$ 23,000.00	\$ 5,000.00	20% of PE above (use when know consultant project)
Base Cost			\$ 28,000.00	
Contingency	30.00%		\$ 8,400.00	
<b>TOTAL</b>			<b>\$ 36,400.00</b>	

**Holt Garrison Pkwy/Boxwood Ct Pedestrian Improvements**

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Danville, VA

6/25/2022

Prepared By: EPR, P.C.

**CONSTRUCTION ESTIMATE**

**MOBILIZATION/CONSTR. SURVEY**

Mobilization		\$	13,000.00
Construction Survey		\$	2,000.00
<b>Base Cost (Defined + Allowance)</b>		\$	<b>15,000.00</b>
Contingency	30.00%	\$	4,500.00
<b>MOBILIZATION/CONSTR. SURVEY TOTAL</b>		\$	<b>19,500.00</b>

**ASSUMPTIONS**

**MOT**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -

**ASSUMPTIONS**

Allowance (by Percentage)	%	Total
MOT	10.00%	\$ 11,000.00
	0.00%	\$ -
	0.00%	\$ -
<b>Total</b>		<b>\$ 11,000.00</b>

Will have MOT concerns with high traffic

<b>Base Cost (Defined + Allowance)</b>		\$	11,000.00
Contingency	50.00%	\$	5,500.00
<b>MOT TOTAL</b>		\$	<b>16,500.00</b>

Increased due to traffic volumes

**ROADWAY**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Pavement Items	00120	REGULAR EXCAVATION	CY	29	\$ 13.53	\$ 392.37
	13220	HYDR. CEMENT CONC. SIDEWALK 4"	SY	128	\$ 72.56	\$ 9,287.68
	10128	AGGR. BASE MATL. TY. I NO. 21B	TON	32	\$ 36.73	\$ 1,175.36
	13108	CG-12 DETECTABLE WARNING SURFACE	SY	6	\$ 678.11	\$ 4,068.66
					\$ -	\$ -
<b>Total</b>						<b>\$ 14,924.07</b>

**ASSUMPTIONS**

Allowance (by Percentage)	%	Total
Total		\$ -

Base Cost (Defined + Allowance)		\$	14,924.07
Contingency	30.00%	\$	4,477.22
<b>ROADWAY TOTAL</b>		<b>\$</b>	<b>19,401.29</b>

**HYDRAULICS**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -

ASSUMPTIONS

Allowance (by Percentage)	%	Total
Stormwater Mgmt	0.00%	\$ -
E & S	4.00%	\$ 5,000.00
	0.00%	\$ -
<b>Total</b>		<b>\$ 5,000.00</b>

Base Cost (Defined + Allowance)		\$	5,000.00
Contingency	30.00%	\$	1,500.00
<b>HYDRAULICS TOTAL</b>		<b>\$</b>	<b>6,500.00</b>

**IN-PLAN UTILITIES**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -

ASSUMPTIONS

Allowance (by Percentage)	%	Total
Total		\$ -

Base Cost (Defined + Allowance)		\$	-
Contingency	30.00%	\$	-
<b>IN-PLAN UTILITIES TOTAL</b>		<b>\$</b>	<b>-</b>

**TRAFFIC**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Signal	51834	HANGER ASSEMBLY SMB-2, ONE WAY	EA	2	\$ 280.64	\$ 561.28
	52404	PEDESTRIAN SIGNAL HEAD SP-9	EA	2	\$ 771.66	\$ 1,543.32
	51198	PEDESTRIAN ACTUATION PA-2	EA	2	\$ 1,657.86	\$ 3,315.72
	50108	SIGN PANEL	SF	96	\$ 33.60	\$ 3,225.60
	51210	PEDESTAL POLE PF-2 10'	EA	1	\$ 1,613.32	\$ 1,613.32
	51240	CONC. FOUNDATION PF-2	EA	1	\$ 1,381.19	\$ 1,381.19
	56050	BORED CONDUIT 2"	LF	150	\$ 23.84	\$ 3,576.00
	51600	14/2 CONDUCTOR CABLE	LF	200	\$ 3.00	\$ 600.00

ASSUMPTIONS

	51602	14/4 CONDUCTOR CABLE	LF	200	\$ 2.28	\$ 456.00
	50434	SIGN POST STP-1, 2 1/2", 10 GAUGE	LF	44	\$ 1,304.79	\$ 57,410.76
	50486	CONC. SIGN FDN. STP-1 TY.B	EA	4	\$ 1,589.16	\$ 6,356.64
	10881	REINF. HYDR.CEM.CONC. PAVE. 8"	SY	20	\$ 107.89	\$ 2,157.80
					\$ -	\$ -
					\$ -	\$ -
Pavement Marking Items	54042	TY.B CL.I PAVE. LINE MARK. 24"	LF	288	\$ 27.00	\$ 7,776.00
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
<b>Total</b>						\$ 89,973.63

<b>Allowance (by Percentage)</b>	<b>%</b>	<b>Total</b>
<b>Total</b>		\$ -

<b>Base Cost (Defined + Allowance)</b>	\$ 89,973.63
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<b>Contingency</b>	40.00%	\$ 35,989.45
<b>TRAFFIC TOTAL</b>		\$ 125,963.08

Increased contingency due to delivery delays/cost

**STRUCTURES/BRIDGES**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -

ASSUMPTIONS

<b>Allowance (by Percentage)</b>	<b>%</b>	<b>Total</b>
<b>Total</b>		\$ -

<b>Base Cost (Defined + Allowance)</b>	\$ -
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<b>Contingency</b>	30.00%	\$ -
<b>STRUCTURES/BRIDGES TOTAL</b>		\$ -

**EARTHWORK/GEOTECH**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -

ASSUMPTIONS

<b>Allowance (by Percentage)</b>	<b>%</b>	<b>Total</b>
<b>Total</b>		\$ -

<b>Base Cost (Defined + Allowance)</b>	\$ -
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<b>Contingency</b>	30.00%	\$ -
<b>EARTHWORK/GEOTECH TOTAL</b>		\$ -



**ENVIRONMENTAL/SOUNDWALLS**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -
<b>Allowance (by Percentage)</b>						<b>Total</b>
						\$ -
<b>Base Cost (Defined + Allowance)</b>						\$ -
Contingency		30.00%				\$ -
<b>ENVIRONMENTAL/SOUNDWALLS TOTAL</b>						\$ -

ASSUMPTIONS

**OTHER**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -
<b>Allowance (by Percentage)</b>						<b>Total</b>
						\$ -
<b>Base Cost (Defined + Allowance)</b>						\$ -
Contingency		30.00%				\$ -
<b>OTHER TOTAL</b>						\$ -

ASSUMPTIONS

Construction Base Cost (No Contingency)

\$ 135,897.70

**CONSTRUCTION ITEM SUBTOTAL**

\$ 187,864.37

**CONSTRUCTION CONTINGENCY**

10.00% \$ 13,589.77

% of base cost (from VDOT CEWB)

CEI

20.00% \$ 27,179.54

% of base cost (from VDOT CEWB)

**CEI CONTINGENCY**

50.00% \$ 13,589.77

**CONSTRUCTION TOTAL**

\$ **242,223.45**

**Franklin Turnpike Pedestrian Improvements  
Danville, VA**



Project No./UPC:  
Current Estimate Phase: PRE-SCOPING  
Estimate Date:

6/25/2022

VDOT District: SALEM  
Project Tier: (TIER 1/2)  
Project Complexity: MODERATELY COMPLEX

Total Project Cost Estimate Summary			Date of Current Cost
			6/25/2022
Phase	Base Estimate (\$)	Contingency (\$)	Total Phase
PE Phase Estimate	\$ 10,000.00	\$ 3,000.00	\$ 13,000.00
RW Phase Estimate	\$ -	\$ -	\$ -
CN Phase Estimate(without CEI)	\$ 40,628.50	\$ 14,284.79	\$ 54,913.29
Total CEI	\$ 7,387.00	\$ 3,693.50	\$ 11,080.50
CN Phase Estimate(with CEI)	\$ 48,015.50	\$ 17,978.29	\$ 65,993.79
<b>Total Estimate</b>	<b>\$ 58,015.50</b>	<b>\$ 20,978.29</b>	<b>\$ 78,993.79</b>

# Franklin Turnpike Pedestrian Improvements

0

Danville, VA

6/25/2022

Prepared By: EPR, P.C.

## PRELIMINARY ENGINEERING ESTIMATE

Discipline	%	Source Cost	PE Cost (Allowance)	Assumptions
Roadway	10.00%	\$ 8,392.10	\$ 1,000.00	10% of the Base CN Costs of Roadway, Earthwork, Mobilization, and 1/2 MOT
Hydraulics	10.00%	\$ 1,000.00	\$ 1,000.00	10% of the Base CN Cost of Hydraulics
In-plan Utilities	10.00%	\$ -	\$ -	10% of the Base CN Cost of In-plan Utilities
Traffic	10.00%	\$ 27,542.90	\$ 3,000.00	10% of the Base CN Costs of Traffic and 1/2 MOT
Structures/Bridges	8.00%	\$ -	\$ -	8% of the Base CN Cost of Structures/Bridge
Materials/Geotech	2.00%	\$ 36,935.00	\$ 1,000.00	2-3% of the Total Base CN Cost (use 3% if Interstate project and/or Bridges/Walls are required)
Survey/SUE/Quality Level A SUE	2.00%	\$ 36,935.00	\$ 1,000.00	2-3% of the Total Base CN Cost (use 3% if urban environment or Interstate project)
Environmental	1.00%	\$ 36,935.00	\$ 1,000.00	1-2% of the Total Base CN Cost (use 2% if known impacts or Envi. Assess. Required)
Right of Way	1.00%	\$ -	\$ -	1% of the Total Base RW Cost
Other			\$ -	
VDOT Project PE Oversight	20.00%	\$ 8,000.00	\$ 2,000.00	20% of PE above (use when know consultant project)
Base Cost			\$ 10,000.00	
Contingency	30.00%		\$ 3,000.00	
<b>TOTAL</b>			<b>\$ 13,000.00</b>	

# Franklin Turnpike Pedestrian Improvements

0

Danville, VA

6/25/2022

Prepared By: EPR, P.C.

## CONSTRUCTION ESTIMATE

### MOBILIZATION/CONSTR. SURVEY

Mobilization		\$	4,000.00
Construction Survey		\$	1,000.00
<b>Base Cost (Defined + Allowance)</b>		\$	<b>5,000.00</b>
Contingency	30.00%	\$	1,500.00
<b>MOBILIZATION/CONSTR. SURVEY TOTAL</b>		\$	<b>6,500.00</b>

ASSUMPTIONS

### MOT

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -

ASSUMPTIONS

Allowance (by Percentage)	%	Total
MOT	10.00%	\$ 3,000.00
	0.00%	\$ -
	0.00%	\$ -
<b>Total</b>		\$ 3,000.00

Will have MOT concerns with high traffic

<b>Base Cost (Defined + Allowance)</b>		\$	3,000.00
Contingency	50.00%	\$	1,500.00
<b>MOT TOTAL</b>		\$	<b>4,500.00</b>

Increased due to traffic volumes

### ROADWAY

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Pavement Items	00120	REGULAR EXCAVATION	CY	2	\$ 13.53	\$ 27.06
	13220	HYDR. CEMENT CONC. SIDEWALK 4"	SY	6	\$ 72.56	\$ 435.36
	10128	AGGR. BASE MATL. TY. I NO. 21B	TON	2	\$ 36.73	\$ 73.46
	13108	CG-12 DETECTABLE WARNING SURFACE	SY	2	\$ 678.11	\$ 1,356.22
					\$ -	\$ -
<b>Total</b>						\$ 1,892.10

ASSUMPTIONS

Allowance (by Percentage)	%	Total
Total		\$ -

Base Cost (Defined + Allowance)						\$	1,892.10
Contingency	30.00%					\$	567.63
<b>ROADWAY TOTAL</b>						\$	<b>2,459.73</b>

**HYDRAULICS**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -

ASSUMPTIONS

Allowance (by Percentage)	%	Total
Stormwater Mgmt	0.00%	\$ -
E & S	2.00%	\$ 1,000.00
	0.00%	\$ -
<b>Total</b>		<b>\$ 1,000.00</b>

Base Cost (Defined + Allowance)						\$	1,000.00
Contingency	30.00%					\$	300.00
<b>HYDRAULICS TOTAL</b>						\$	<b>1,300.00</b>

**IN-PLAN UTILITIES**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Total						\$ -

ASSUMPTIONS

Allowance (by Percentage)	%	Total
Total		\$ -

Base Cost (Defined + Allowance)						\$	-
Contingency	30.00%					\$	-
<b>IN-PLAN UTILITIES TOTAL</b>						\$	<b>-</b>

**TRAFFIC**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
Signal	51834	HANGER ASSEMBLY SMB-2, ONE WAY	EA	1	\$ 280.64	\$ 280.64
	52404	PEDESTRIAN SIGNAL HEAD SP-9	EA	1	\$ 771.66	\$ 771.66
	51198	PEDESTRIAN ACTUATION PA-2	EA	1	\$ 1,657.86	\$ 1,657.86
	50108	SIGN PANEL	SF	16	\$ 33.60	\$ 537.60
	51210	PEDESTAL POLE PF-2 10'	EA	1	\$ 1,613.32	\$ 1,613.32
	51240	CONC. FOUNDATION PF-2	EA	1	\$ 1,381.19	\$ 1,381.19
	56050	BORED CONDUIT 2"	LF	150	\$ 23.84	\$ 3,576.00
	51600	14/2 CONDUCTOR CABLE	LF	200	\$ 3.00	\$ 600.00

ASSUMPTIONS

	51602	14/4 CONDUCTOR CABLE	LF	200	\$ 2.28	\$ 456.00
	51933	REMOVE EXISTING POLE	EA	1	\$ 1,304.79	\$ 1,304.79
	51934	REMOVE EXISTING FOUNDATION	EA	1	\$ 1,589.16	\$ 1,589.16
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
Pavement Marking Items	54042	TY.B CL.I PAVE. LINE MARK. 24"	LF	428	\$ 27.00	\$ 11,556.00
	54625	PVMT SYMB MRKG YIELD (2'x 3') TY B, C	EA	12	\$ 59.89	\$ 718.68
					\$ -	\$ -
					\$ -	\$ -
<b>Total</b>						\$ 26,042.90

<b>Allowance (by Percentage)</b>	%	<b>Total</b>
<b>Total</b>		\$ -

**Base Cost (Defined + Allowance)** \$ 26,042.90

**Contingency** 40.00% \$ 10,417.16

Increased contingency due to delivery delays/cost

**TRAFFIC TOTAL** \$ 36,460.06

**STRUCTURES/BRIDGES**

<b>Defined (by Quantity)</b>	<b>Code</b>	<b>Description</b>	<b>Unit</b>	<b>Qty</b>	<b>Unit Price</b>	<b>Total</b>
<b>Total</b>						\$ -

ASSUMPTIONS

<b>Allowance (by Percentage)</b>	%	<b>Total</b>
<b>Total</b>		\$ -

**Base Cost (Defined + Allowance)** \$ -

**Contingency** 30.00% \$ -

**STRUCTURES/BRIDGES TOTAL** \$ -

**EARTHWORK/GEOTECH**

<b>Defined (by Quantity)</b>	<b>Code</b>	<b>Description</b>	<b>Unit</b>	<b>Qty</b>	<b>Unit Price</b>	<b>Total</b>
<b>Total</b>						\$ -

ASSUMPTIONS

<b>Allowance (by Percentage)</b>	%	<b>Total</b>
<b>Total</b>		\$ -

**Base Cost (Defined + Allowance)** \$ -

**Contingency** 30.00% \$ -

**EARTHWORK/GEOTECH TOTAL** \$ -

**ENVIRONMENTAL/SOUNDWALLS**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -
<b>Allowance (by Percentage)</b>						<b>Total</b>
						\$ -
<b>Base Cost (Defined + Allowance)</b>						\$ -
Contingency		30.00%				\$ -
<b>ENVIRONMENTAL/SOUNDWALLS TOTAL</b>						\$ -

ASSUMPTIONS

**OTHER**

Defined (by Quantity)	Code	Description	Unit	Qty	Unit Price	Total
<b>Total</b>						\$ -
<b>Allowance (by Percentage)</b>						<b>Total</b>
						\$ -
<b>Base Cost (Defined + Allowance)</b>						\$ -
Contingency		30.00%				\$ -
<b>OTHER TOTAL</b>						\$ -

ASSUMPTIONS

Construction Base Cost (No Contingency)

\$ 36,935.00

**CONSTRUCTION ITEM SUBTOTAL**

\$ 51,219.79

**CONSTRUCTION CONTINGENCY**

10.00% \$ 3,693.50

% of base cost (from VDOT CEWB)

CEI

20.00% \$ 7,387.00

% of base cost (from VDOT CEWB)

**CEI CONTINGENCY**

50.00% \$ 3,693.50

**CONSTRUCTION TOTAL**

\$ **65,993.79**