



# Attachments

- Trip Generation
- Intersection Capacity Analyses



**PHASE I TRIP GENERATION INPUTS**

Land Use	Size	Units
Townhomes	75	dwelling units
Apartments	122	dwelling units
Independent Senior Housing	103	dwelling units
Assisted / Memory Care	130	beds
Medical Office Building	45,000	sf
Lab Space	0	sf
Office	0	sf
Hotel	135	rooms

	Units	Beds	
AL		84	88.2
MC		36	37.8
		120	126
	1.05		

**PHASE I TRIP GENERATION SUMMARY**

	Residential								Office				Hotel			Total Unadjusted Trips	Total Gross New Trips	Total Adjusted Trips	Pass-By	Internal Capture
	Townhomes LUC 220 Rate <sup>1</sup>	Apartments LUC 221 Rate <sup>2</sup>	Total Senior/Ass Living	Senior Housing LUC 252 Rate <sup>3</sup>	Assisted Living LUC 254 Rate <sup>4</sup>	Total Gross Residential	Internal Capture	Net Residential	Medical Office LUC 720 Rate <sup>5</sup>	Total Gross Office	Internal Capture	Net Office	Hotel LUC 310 Rate <sup>6</sup>	Internal Capture	Net Hotel					
<b>Weekday Daily</b>																				
Enter	263	332	363	194	169	958	10	948	821	821	-	821	549	6	543	2,328	2,312	2,312	16	
Exit	263	332	363	194	169	958	-	958	821	821	16	805	549	-	549	2,328	2,312	2,312	16	
<b>Total</b>	<b>526</b>	<b>664</b>	<b>726</b>	<b>388</b>	<b>338</b>	<b>1,916</b>	<b>10</b>	<b>1,906</b>	<b>1,642</b>	<b>1,642</b>	<b>16</b>	<b>1,626</b>	<b>1,098</b>	<b>6</b>	<b>1,092</b>	<b>4,656</b>	<b>4,624</b>	<b>4,624</b>	<b>-</b>	
<b>Weekday Morning - Adjacent Street</b>																				
Enter	8	11	23	7	16	42	-	42	86	86	5	81	37	-	37	165	160	160	5	
Exit	28	33	22	13	9	83	2	81	24	24	-	24	25	3	22	132	127	127	5	
<b>Total</b>	<b>36</b>	<b>44</b>	<b>45</b>	<b>20</b>	<b>25</b>	<b>125</b>	<b>2</b>	<b>123</b>	<b>110</b>	<b>110</b>	<b>5</b>	<b>105</b>	<b>62</b>	<b>3</b>	<b>59</b>	<b>297</b>	<b>287</b>	<b>287</b>	<b>-</b>	
<b>Weekday Evening - Adjacent Street</b>																				
Enter	29	33	28	15	13	90	2	88	44	44	3	41	38	2	36	172	165	165	7	
Exit	17	21	33	12	21	71	5	66	112	112	2	110	37	-	37	220	213	213	7	
<b>Total</b>	<b>46</b>	<b>54</b>	<b>61</b>	<b>27</b>	<b>34</b>	<b>161</b>	<b>7</b>	<b>154</b>	<b>156</b>	<b>156</b>	<b>5</b>	<b>151</b>	<b>75</b>	<b>2</b>	<b>73</b>	<b>392</b>	<b>378</b>	<b>378</b>	<b>-</b>	
<b>Saturday Daily</b>																				
Enter	265	300	364	174	190	929	3	926	193	193	-	193	502	1	501	1,624	1,620	1,620	4	
Exit	265	300	364	174	190	929	-	929	193	193	4	189	502	-	502	1,624	1,620	1,620	4	
<b>Total</b>	<b>530</b>	<b>600</b>	<b>728</b>	<b>348</b>	<b>380</b>	<b>1,858</b>	<b>3</b>	<b>1,855</b>	<b>386</b>	<b>386</b>	<b>4</b>	<b>382</b>	<b>1,004</b>	<b>1</b>	<b>1,003</b>	<b>3,248</b>	<b>3,240</b>	<b>3,240</b>	<b>-</b>	
<b>Saturday Midday - Peak of Generator</b>																				
Enter	24	26	37	21	16	87	1	86	80	80	3	77	55	2	53	222	216	216	6	
Exit	24	27	32	13	19	83	5	78	60	60	1	59	43	-	43	186	180	180	6	
<b>Total</b>	<b>48</b>	<b>53</b>	<b>69</b>	<b>34</b>	<b>35</b>	<b>170</b>	<b>6</b>	<b>164</b>	<b>140</b>	<b>140</b>	<b>4</b>	<b>136</b>	<b>98</b>	<b>2</b>	<b>96</b>	<b>408</b>	<b>396</b>	<b>396</b>	<b>-</b>	

1 Trip generation rate based on ITE LUC 220 (Multifamily Housing - Low-Rise)  
 2 Trip generation rate based on ITE LUC 221 (Multifamily Housing - Mid-Rise)  
 3 Trip generation rate based on ITE LUC 252 (Senior Adult Housing Attached)  
 4 Trip generation rate based on ITE LUC 254 (Assisted Living)  
 5 Trip generation rate based on ITE LUC 720 (Medical-Dental Office Building)  
 6 Trip generation rate based on ITE LUC 310 (Hotel)



**ITE TRIP GENERATION WORKSHEET**  
*(10th Edition, Updated 2017)*

**LANDUSE:** Multi-Family Housing (Low-Rise - 1-2 Story)  
**LANDUSE CODE:** 220 Independent Variable --- Number of Units  
**SETTING/LOCATION:** General Urban/Suburban  
**JOB NAME:** \_\_\_\_\_ 75 units  
**JOB NUMBER:** \_\_\_\_\_

**WEEKDAY**

RATES:	# Studies	R <sup>2</sup>	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	29	0.96	7.32	4.45	10.97	168	5	590	50%	50%
AM PEAK (ADJACENT ST)	42	0.90	0.46	0.18	0.74	199	5	650	23%	77%
PM PEAK (ADJACENT ST)	50	0.86	0.56	0.18	1.25	187	5	650	63%	37%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	549	275	275	526	263	263
AM PEAK (ADJACENT ST)	35	8	27	36	8	28
PM PEAK (ADJACENT ST)	42	26	16	46	29	17

**SATURDAY**

RATES:	# Studies	R <sup>2</sup>	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	5	0.93	8.14	3.36	11.40	89	48	148	50%	50%
PEAK OF GENERATOR	5	0.92	0.70	0.41	0.93	89	48	148	N/A	N/A

TRIPS:	BY AVERAGE			BY REGRESSION			
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	611	305	305	529	265	265	<i>Caution - Small . Caution - Small .</i>
PEAK OF GENERATOR	53	N/A	N/A	48	N/A	N/A	

**SUNDAY**

RATES:	# Studies	R <sup>2</sup>	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	5	0.96	6.28	2.61	8.22	89	48	148	50%	50%
PEAK OF GENERATOR	5	0.93	0.67	0.36	0.93	89	48	148	N/A	N/A

TRIPS:	BY AVERAGE			BY REGRESSION			
	Total	Enter	Exit	Total	Enter	Exit	
DAILY	471	236	236	418	209	209	<i>Caution - Small . Caution - Small .</i>
PEAK OF GENERATOR	50	N/A	N/A	44	N/A	N/A	

**ITE TRIP GENERATION WORKSHEET**  
 (10th Edition, Updated 2017)

**LANDUSE:** Mid-Rise Residential  
**LANDUSE CODE:** 221  
**SETTING/LOCATION:** General Urban/Suburban  
**JOB NAME:**  
**JOB NUMBER:**

Independent Variable --- Number of Units

122 units

**WEEKDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	27	0.77	5.44	1.27	12.50	205	21	494	50%	50%
AM PEAK (ADJACENT ST)	53	0.67	0.36	0.06	1.61	207	26	703	26%	74%
PM PEAK (ADJACENT ST)	60	0.72	0.44	0.15	1.11	208	26	703	61%	39%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	664	332	332	663	332	332
AM PEAK (ADJACENT ST)	44	11	33	42	11	31
PM PEAK (ADJACENT ST)	54	33	21	54	33	21

**SATURDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	0.73	4.91	4.03	8.51	224	111	336	50%	50%
PEAK OF GENERATOR	8	0.89	0.44	0.34	0.73	264	111	462	49%	51%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	599	300	300	788	394	394
PEAK OF GENERATOR	54	26	27	58	28	30

**SUNDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	--	4.09	3.06	8.41	224	111	336	50%	50%
PEAK OF GENERATOR	6	--	0.39	0.26	1.07	224	111	336	62%	38%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	499	249	249	N/A	N/A	N/A
PEAK OF GENERATOR	48	29	18	N/A	N/A	N/A

**ITE TRIP GENERATION WORKSHEET**  
 (10th Edition, Updated 2017)

**LANDUSE:** Senior Adult Housing - Attached  
**LANDUSE CODE:** 252 Independent Variable --- Dwelling Units  
**SETTING/LOCATION:** General Urban/Suburban  
**JOB NAME:**  
**JOB NUMBER:** **DWELLING UNITS (#):** 103

**WEEKDAY**

RATES:	# Studies	R <sup>2</sup>	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	0.99	3.70	2.59	4.79	81	28	256	50%	50%
AM PEAK (ADJACENT ST)	11	0.98	0.20	0.06	0.27	148	28	684	35%	65%
PM PEAK (ADJACENT ST)	11	0.96	0.26	0.08	0.43	148	28	684	55%	45%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	381	191	191	389	194	194
AM PEAK (ADJACENT ST)	21	7	13	20	7	13
PM PEAK (ADJACENT ST)	27	15	12	27	15	12

**SATURDAY**

RATES:	# Studies	R <sup>2</sup>	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	0.99	3.23	1.84	4.07	81	28	256	50%	50%
PEAK OF GENERATOR	7	0.99	0.33	0.23	0.43	91	28	256	62%	38%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	333	166	166	349	174	174
PEAK OF GENERATOR	34	21	13	34	21	13

**SUNDAY**

RATES:	# Studies	R <sup>2</sup>	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	0.99	3.14	2.20	4.25	81	28	256	50%	50%
PEAK OF GENERATOR	6	0.95	0.36	0.27	0.55	81	28	256	64%	36%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	323	162	162	331	166	166
PEAK OF GENERATOR	37	24	13	36	23	13

**ITE TRIP GENERATION WORKSHEET**  
*(10th Edition, Updated 2017)*

**LANDUSE:** Assisted Living  
**LANDUSE CODE:** 254  
**SETTING/LOCATION:** General Urban/Suburban  
**JOB NAME:**  
**JOB NUMBER:**

Independent Variable --- Beds

**DWELLING UNITS (#):** 130

**WEEKDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	2	--	2.60	1.86	4.14	135	87	183	50%	50%
AM PEAK (ADJACENT ST)	9	--	0.19	0.08	0.43	123	83	183	63%	37%
PM PEAK (ADJACENT ST)	9	--	0.26	0.11	0.53	123	83	183	38%	62%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	338	169	169	--	--	--
AM PEAK (ADJACENT ST)	25	16	9	--	--	--
PM PEAK (ADJACENT ST)	34	13	21	--	--	--

**SATURDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	1	--	2.93	2.93	2.93	87	87	87	50%	50%
PEAK OF GENERATOR	6	--	0.27	0.17	0.44	111	83	154	46%	54%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	381	190	190	--	--	--
PEAK OF GENERATOR	35	16	19	--	--	--

**SUNDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	1	--	3.15	3.15	3.15	87	87	87	50%	50%
PEAK OF GENERATOR	6	--	0.28	0.13	0.36	111	83	154	43%	57%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	410	205	205	--	--	--
PEAK OF GENERATOR	36	16	21	--	--	--



**ITE TRIP GENERATION WORKSHEET**  
 (10th Edition, Updated 2017)

**LANDUSE:** Medical-Dental Office Building  
**LANDUSE CODE:** 720  
**SETTING/LOCATION:** General Urban/Suburban  
**JOB NAME:**  
**JOB NUMBER:**

Independent Variable --- 1,000 Sq. Feet Gross Floor Area

**FLOOR AREA (KSF):** 45

**WEEKDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	28	0.95	34.80	9.14	100.75	24	2	111	50%	50%
AM PEAK OF GENERATOR	36	0.90	3.53	1.21	19.28	27	0	175	62%	38%
PM PEAK OF GENERATOR	42	0.91	4.10	1.49	15.55	26	0	175	39%	61%
AM PEAK (ADJACENT ST)	44	0.80	2.78	0.85	14.30	32	2	112	78%	22%
PM PEAK (ADJACENT ST)	65	0.73	3.46	0.25	8.86	28	2	112	28%	72%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,566	783	783	1641	821	821
AM PEAK OF GENERATOR	159	98	60	157	97	60
PM PEAK OF GENERATOR	185	72	113	188	73	114
AM PEAK (ADJACENT ST)	125	98	28	110	86	24
PM PEAK (ADJACENT ST)	156	44	112	155	43	111

**SATURDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	--	8.57	1.10	21.93	41	18	111	50%	50%
PEAK OF GENERATOR	4	0.78	3.10	1.33	4.02	28	18	43	57%	43%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	386	193	193	N/A	N/A	N/A
PEAK OF GENERATOR	140	80	60	172	98	74

**SUNDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	5	--	1.42	0.39	5.11	44	18	111	50%	50%
PEAK OF GENERATOR	3	--	0.32	0.12	0.63	31	24	43	52%	48%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	64	32	32	N/A	N/A	N/A
PEAK OF GENERATOR	14	7	7	N/A	N/A	N/A

**ITE TRIP GENERATION WORKSHEET**  
 (10th Edition, Updated 2017)

**LANDUSE:** Hotel  
**LANDUSE CODE:** 310  
**SETTING/LOCATION:** General Urban/Suburban  
**JOB NAME:**  
**JOB NUMBER:**

Independent Variable --- Number of Rooms

135 rooms

**WEEKDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	0.92	8.36	5.31	9.53	146	100	260	50%	50%
AM PEAK OF GENERATOR	30	0.64	0.54	0.25	1.42	288	86	575	54%	46%
PM PEAK OF GENERATOR	29	0.71	0.61	0.22	0.97	292	86	575	58%	42%
AM PEAK (ADJACENT ST)	25	0.85	0.47	0.20	0.84	178	74	426	59%	41%
PM PEAK (ADJACENT ST)	28	0.80	0.60	0.26	1.06	183	74	426	51%	49%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,129	564	564	1,097	549	549
AM PEAK OF GENERATOR	73	39	34	79	43	36
PM PEAK OF GENERATOR	82	48	35	83	48	35
AM PEAK (ADJACENT ST)	63	37	26	62	37	25
PM PEAK (ADJACENT ST)	81	41	40	75	38	37

**SATURDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	8	0.93	8.19	6.35	9.79	206	100	355	50%	50%
PEAK OF GENERATOR	9	0.80	0.72	0.49	1.23	194	100	355	56%	44%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,106	553	553	1,004	502	502
PEAK OF GENERATOR	97	54	43	97	55	43

**SUNDAY**

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	8	0.90	5.95	4.01	8.48	206	100	355	50%	50%
PEAK OF GENERATOR	8	0.87	0.56	0.39	0.72	206	100	355	46%	54%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	803	402	402	617	309	309
PEAK OF GENERATOR	76	35	41	65	30	35



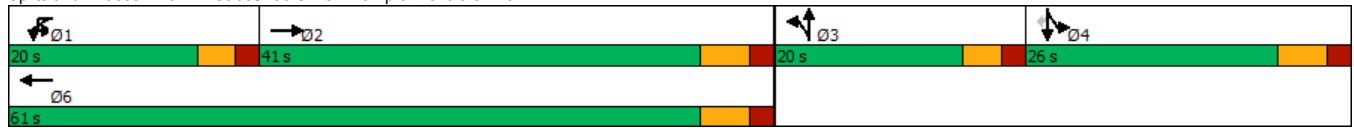


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑				↑↑			↑↓		↑	↑	↑
Traffic Volume (vph)	0	830	70	5	125	875	0	90	0	170	710	60	510
Future Volume (vph)	0	830	70	5	125	875	0	90	0	170	710	60	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		80		180		0	0		0	160		185
Storage Lanes	0		1		1		0	0		0	1		1
Taper Length (ft)	25				25			25			25		
Satd. Flow (prot)	0	4826	0	0	1736	3471	0	0	1670	0	1681	1697	1583
Flt Permitted					0.950				0.983		0.950	0.959	
Satd. Flow (perm)	0	4826	0	0	1734	3471	0	0	1669	0	1681	1697	1561
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)		13							143				174
Link Speed (mph)		30				30			30			30	
Link Distance (ft)		1061				363			744			422	
Travel Time (s)		24.1				8.3			16.9			9.6	
Confl. Peds. (#/hr)			1		1			1					1
Confl. Bikes (#/hr)			1				1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)											46%		
Lane Group Flow (vph)	0	978	0	0	141	951	0	0	283	0	417	420	554
Turn Type		NA		Prot	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases		2		1	1	6		3	3		4	4	
Permitted Phases													4
Detector Phase		2		1	1	6		3	3		4	4	4
Switch Phase													
Minimum Initial (s)		10.0		6.0	6.0	20.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)		26.0		11.0	11.0	26.0		11.0	11.0		21.0	21.0	21.0
Total Split (s)		41.0		20.0	20.0	61.0		20.0	20.0		26.0	26.0	26.0
Total Split (%)		38.3%		18.7%	18.7%	57.0%		18.7%	18.7%		24.3%	24.3%	24.3%
Yellow Time (s)		4.0		3.0	3.0	4.0		3.0	3.0		4.0	4.0	4.0
All-Red Time (s)		2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.0		5.0	5.0	6.0		5.0	5.0		6.0	6.0	6.0
Lead/Lag		Lag		Lead	Lead			Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?		Yes		Yes	Yes			Yes	Yes		Yes	Yes	Yes
Recall Mode		Min		None	None	Min		None	None		Max	Max	Max
Act Effect Green (s)		29.6		11.7	11.7	46.4		13.0	13.0		20.3	20.3	20.3
Actuated g/C Ratio		0.31		0.12	0.12	0.48		0.13	0.13		0.21	0.21	0.21
v/c Ratio		0.66		0.67	0.67	0.57		0.82	0.82		1.18	1.18	1.19
Control Delay		31.4		58.9	58.9	19.5		40.4	40.4		145.5	144.2	132.6
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		31.4		58.9	58.9	19.5		40.4	40.4		145.5	144.2	132.6
LOS		C		E	E	B		D	D		F	F	F
Approach Delay		31.4				24.6		40.4	40.4			140.0	
Approach LOS		C				C		D	D			F	
Queue Length 50th (ft)		195			88	220		87	87		~355	~357	~350
Queue Length 95th (ft)		249			158	278		#227	#227		#593	#595	#596
Internal Link Dist (ft)		981				283		664	664			342	
Turn Bay Length (ft)					180						160		185
Base Capacity (vph)		1777			272	1999		382	382		352	355	464
Starvation Cap Reductn		0			0	0		0	0		0	0	0
Spillback Cap Reductn		0			0	0		0	0		0	0	0
Storage Cap Reductn		0			0	0		0	0		0	0	0
Reduced v/c Ratio		0.55			0.52	0.48		0.74	0.74		1.18	1.18	1.19

**Intersection Summary**

Area Type: Other  
 Cycle Length: 107  
 Actuated Cycle Length: 96.9  
 Natural Cycle: 90  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.19  
 Intersection Signal Delay: 70.5 Intersection LOS: E  
 Intersection Capacity Utilization 85.5% ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hill Street/I-93 SB Off-Ramp & Montvale Ave





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑				↑↑			↑↓		↑	↑	↑
Traffic Volume (vph)	0	1395	65	5	115	705	0	95	0	190	490	50	505
Future Volume (vph)	0	1395	65	5	115	705	0	95	0	190	490	50	505
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		80		180		0	0		0	160		185
Storage Lanes	0		1		1		0	0		0	1		1
Taper Length (ft)	25				25			25			25		
Satd. Flow (prot)	0	5045	0	0	1752	3505	0	0	1646	0	1698	1717	1599
Flt Permitted					0.950				0.984		0.950	0.961	
Satd. Flow (perm)	0	5045	0	0	1752	3505	0	0	1646	0	1673	1697	1599
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)		7							136				200
Link Speed (mph)		30				30			30			30	
Link Distance (ft)		1060				363			744			422	
Travel Time (s)		24.1				8.3			16.9			9.6	
Confl. Peds. (#/hr)	1		1		1		1			10	10		
Confl. Bikes (#/hr)			1				1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)											45%		
Lane Group Flow (vph)	0	1587	0	0	130	766	0	0	310	0	293	294	549
Turn Type		NA		Prot	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases		2		1	1	6		3	3		4	4	
Permitted Phases													4
Detector Phase		2		1	1	6		3	3		4	4	4
Switch Phase													
Minimum Initial (s)		10.0		6.0	6.0	20.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)		26.0		11.0	11.0	26.0		11.0	11.0		21.0	21.0	21.0
Total Split (s)		41.0		20.0	20.0	61.0		20.0	20.0		31.0	31.0	31.0
Total Split (%)		36.6%		17.9%	17.9%	54.5%		17.9%	17.9%		27.7%	27.7%	27.7%
Yellow Time (s)		4.0		3.0	3.0	4.0		3.0	3.0		4.0	4.0	4.0
All-Red Time (s)		2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.0		5.0	5.0	6.0		5.0	5.0		6.0	6.0	6.0
Lead/Lag		Lag		Lead	Lead			Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?		Yes		Yes	Yes			Yes	Yes		Yes	Yes	Yes
Recall Mode		Min		None	None	Min		None	None		Max	Max	Max
Act Effect Green (s)		35.0		11.8	11.8	51.8		14.6	14.6		25.0	25.0	25.0
Actuated g/C Ratio		0.32		0.11	0.11	0.48		0.13	0.13		0.23	0.23	0.23
v/c Ratio		0.97		0.68	0.68	0.46		0.91	0.91		0.75	0.74	1.05
Control Delay		53.3		65.1	65.1	20.0		58.5	58.5		52.7	52.2	80.5
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		53.3		65.1	65.1	20.0		58.5	58.5		52.7	52.2	80.5
LOS		D		E	E	B		E	E		D	D	F
Approach Delay		53.3				26.5		58.5	58.5			66.0	
Approach LOS		D				C		E	E			E	
Queue Length 50th (ft)		401			89	182		125	125		203	203	~307
Queue Length 95th (ft)		#534			152	233		#298	#298		#345	#343	#537
Internal Link Dist (ft)		980				283		664	664			342	
Turn Bay Length (ft)					180						160		185
Base Capacity (vph)		1634			242	1779		345	345		391	396	522
Starvation Cap Reductn		0			0	0		0	0		0	0	0
Spillback Cap Reductn		0			0	0		0	0		0	0	0
Storage Cap Reductn		0			0	0		0	0		0	0	0
Reduced v/c Ratio		0.97			0.54	0.43		0.90	0.90		0.75	0.74	1.05

**Intersection Summary**

Area Type: Other  
 Cycle Length: 112  
 Actuated Cycle Length: 108.5  
 Natural Cycle: 90  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 51.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 83.9%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hill Street/I-93 SB Off-Ramp & Montvale Ave





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑				↑↑			↑↓		↑	↑	↑
Traffic Volume (vph)	0	1095	95	10	170	750	0	140	0	235	305	55	410
Future Volume (vph)	0	1095	95	10	170	750	0	140	0	235	305	55	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		80		180		0	0		0	160		185
Storage Lanes	0		1		1		0	0		0	1		1
Taper Length (ft)	25				25			25			25		
Satd. Flow (prot)	0	5014	0	0	1770	3539	0	0	1707	0	1681	1709	1583
Flt Permitted					0.950				0.982		0.950	0.966	
Satd. Flow (perm)	0	5014	0	0	1766	3539	0	0	1706	0	1681	1709	1561
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)		14							143				164
Link Speed (mph)		30				30			30			30	
Link Distance (ft)		1060				363			744			422	
Travel Time (s)		24.1				8.3			16.9			9.6	
Confl. Peds. (#/hr)	1		3		3		1	1					1
Confl. Bikes (#/hr)			1				1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Shared Lane Traffic (%)											41%		
Lane Group Flow (vph)	0	1293	0	0	196	815	0	0	407	0	196	196	446
Turn Type		NA		Prot	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases		2		1	1	6		3	3		4	4	
Permitted Phases													4
Detector Phase		2		1	1	6		3	3		4	4	4
Switch Phase													
Minimum Initial (s)		10.0		6.0	6.0	20.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)		26.0		11.0	11.0	26.0		11.0	11.0		21.0	21.0	21.0
Total Split (s)		41.0		20.0	20.0	61.0		20.0	20.0		26.0	26.0	26.0
Total Split (%)		38.3%		18.7%	18.7%	57.0%		18.7%	18.7%		24.3%	24.3%	24.3%
Yellow Time (s)		4.0		3.0	3.0	4.0		3.0	3.0		4.0	4.0	4.0
All-Red Time (s)		2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.0		5.0	5.0	6.0		5.0	5.0		6.0	6.0	6.0
Lead/Lag		Lag		Lead	Lead			Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?		Yes		Yes	Yes			Yes	Yes		Yes	Yes	Yes
Recall Mode		Min		None	None	Min		None	None		Max	Max	Max
Act Effect Green (s)		34.2		13.9	13.9	53.1		15.0	15.0		20.0	20.0	20.0
Actuated g/C Ratio		0.33		0.13	0.13	0.50		0.14	0.14		0.19	0.19	0.19
v/c Ratio		0.79		0.84	0.84	0.46		1.11	1.11		0.61	0.60	1.04
Control Delay		36.1		74.3	74.3	17.6		109.5	109.5		48.9	48.3	81.4
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		36.1		74.3	74.3	17.6		109.5	109.5		48.9	48.3	81.4
LOS		D		E	B			F	F		D	D	F
Approach Delay		36.1				28.6			109.5			66.1	
Approach LOS		D				C			F			E	
Queue Length 50th (ft)		289			132	177			~233		131	130	~236
Queue Length 95th (ft)		346			#248	227			#426		213	212	#435
Internal Link Dist (ft)		980				283			664			342	
Turn Bay Length (ft)					180						160		185
Base Capacity (vph)		1679			252	1852			366		320	325	430
Starvation Cap Reductn		0			0	0			0		0	0	0
Spillback Cap Reductn		0			0	0			0		0	0	0
Storage Cap Reductn		0			0	0			0		0	0	0
Reduced v/c Ratio		0.77			0.78	0.44			1.11		0.61	0.60	1.04

**Intersection Summary**

Area Type: Other  
 Cycle Length: 107  
 Actuated Cycle Length: 105.2  
 Natural Cycle: 75  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.11  
 Intersection Signal Delay: 49.5 Intersection LOS: D  
 Intersection Capacity Utilization 82.6% ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.



Splits and Phases: 3: Hill Street/I-93 SB Off-Ramp & Montvale Ave

