APPENDIX K: PROCEDURE TO ESTIMATE TMC FROM AWDT

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TO: File

FROM: Paul Konieczka, AICP PK
Linda C. Greer, PE, PTOE LG

DATE: September 29, 2017

RE: Traffic Technical Memo
Procedure for Estimating Intersection Turning Movement Volumes from Exit 4A Model AWDT's
CLD | Fuss & O'Neill Reference No. 05-0244

The Exit 4A project has been using the Southern New Hampshire Planning Commission's (SNHPC) regional travel demand model to develop traffic projections for the 2015 base year and 2040 design year for the No-Build and the five 4A alternative interchange/connector road configurations. This model provides Average Weekday Traffic volumes (AWDTs) based on existing traffic volume information and existing/projected land use and socio-economic data for the SNHPC region, and has been calibrated by SNHPC to replicate base conditions to current standards.

However, the model is only calibrated to daily volumes on the primary roadway segments in the SNHPC area and not down to the intersection level. Therefore, for design purposes, these AWDT volumes must be converted into AM and PM peak hour turning movement volumes at the key intersections in the Exit 4A study area for each alternative for analysis so that the appropriate level of roadway and intersection improvements can be determined to serve the expected traffic demands in the 2040 design year, as well as to determine the expected level of impact of each alternative on natural and cultural resources for the SDEIS document.

The base AM and PM peak hour intersection turning movement volumes collected by the NHDOT at 19 study area intersections in 2016 were adjusted to develop base year 2015 volumes to be consistent with the base year of the SNHPC model. The SNHPC model is able to provide AWDTs at intersections by using the node and the intersecting links to create a series of 'From Link->Through Node> To Link' paths to simulate the allowed turning movement volumes at any particular node on a daily basis, including new intersections that will be created under some of the Exit 4A alternatives. This intersection-level information from the model was provided by SNHPC for all alternatives and was used as guidance to develop turning movement volume estimates for the 2040 No-Build and Build conditions for design and analysis purposes.

Basic Procedure

A separate spreadsheet was developed for each alternative that included all the intersections to be analyzed for that alternative. The 2015 base AM and PM peak hour turning movement volumes for each approach were inserted, along with the corresponding From Link>Thru Node>To Link volumes representing each turning movement for that scenario. The total approach volume was

calculated for each peak hour, as well as the existing percentage of the total volume represented by each turning movement on that approach. This was then compared to the model-provided AWDT for each of these movements, as well as the percent of the total approach AWDT from the model that each of these movements represented.

It should be noted that some of the movements on any intersection approach may not have a corresponding model link associated with it, since the model does not include every minor street or driveway in its network. In these cases, the existing counted volumes were either perpetuated or adjusted to reflect a reasonable growth rate, depending on the characteristics of that particular approach and/or movement.

Intersection-level AWDTs were then provided for each alternative, and the percentage of the total approach AWDT for each movement calculated again for that alternative. The total AWDT for that approach was compared to the 2015 model results, and the ratio between the two was calculated. This ratio was then applied to the total 2015 peak hour volume on that approach to derive the peak hour volume for that approach. If the ratio was greater than 1.0, the total approach volume was increased proportionately, and vice versa.

Since the model volumes should reflect changes in traffic distribution associated with the alternative being analyzed, the change in the percentage of the AWDT for each movement should be indicative of how turning movements at any intersection would be affected by an Exit 4A interchange alternative being added to the network. As such, the ratio comparing the turn percentage for an alternative to the base 2015 model was calculated on an AWDT basis. This turn percentage ratio was then multiplied by the existing turn percentages as reflected in the 2015 traffic counts on each approach. In some cases, this ratio may be greater than 1.0, indicating that movement should now represent a higher percentage of the total approach movements than exhibited in the 2015 base condition. At no time should the sum of the adjusted turn percentages be greater than 1.0, so in some cases engineering judgment was applied to make one of the movements (usually the highest percentage one, but not always) balance the approach so that the total turn percentages were equal to 1.0.

There were also other individual manual adjustments made to balance volumes between adjacent intersections where there should be little, if any, differences in directional volumes, such as between Ross' Corner (Crystal Avenue, Folsom Road and Tsienneto Road) and the Tsienneto/Pinkerton Street intersection. Resulting peak hour volumes at an intersection were also compared to model-projected volumes on adjacent links as a reasonableness test. Traffic volumes directly added to the network from zone connections in the vicinity of these intersections were also evaluated to determine if any differences between intersections could be attributed to the traffic heading to and from these zones, based on an assumed AM peak/PM peak split of 7% and 9% of AWDT, respectively, as reflected in the actual field counts.

Other Adjustments

One notable traffic distribution challenge was discovered under Alternative A. The SNHPC model showed a larger than expected increase in westbound AWDT for the right turn movement from NH 102 to Crystal Avenue northbound, then a left turn at Rollins Street, followed by a right turn onto Franklin Street. This resulted in a substantial increase in left turns from Franklin Street onto North

High Street, which appeared to be an unreasonable path given the existing characteristics of Franklin Street. At our request, SNHPC performed a 'trace' of the path of westbound trips that were on the NH 102 link just east of Crystal Avenue that were destined for the Franklin/North High Street intersection. The attached graphics show the eastbound and westbound traces for the 2015, 2040 No-Build and 2040 Alternative A scenarios.

This trace found that a large number of trips from both East Derry Road and the traffic zone serving the Pinkerton Street area north of NH 102 were being directed along this path. These trips were manually redistributed to the NH 102/NH 28 Bypass traffic circle and to Pinkerton Street directly to adjust to what was considered a more reasonable path between these locations.

This basic procedure will be used for all alternatives to develop 2040 AM and PM peak hour intersection volumes for analysis purposes. Other alternative-specific adjustments may also be needed at certain locations based on the model-generated AWDT intersection assignments as we proceed further.

PK:LCG:ams

Attachments

- Alternative A intersection volume spreadsheet
- Alternative A – 2040 AM and PM peak hour intersection volumes - final
- SNHPC trace for westbound trips to Franklin Street (2015, 2040 No-Build, 2040 Alt A)

#5 **NH 102 at Londonderry Road**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 exist Model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
3556	791	3251	EB Left	75	12.5%	638	6.0%	515	6.0%	0.99	12.3%	60	515	523	1105	1083	1569	2136
		792	EB Thru	520	86.7%	9915	94.0%	8111	94.0%	1.00	87.7%	430	8111	7748	8555	9509	14981	13168
			EB Right	5	0.8%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
				600		10553		8626		0.817	1	490	8626	8271	9660	10592	16550	15304
792	791		WB Left	5	0.4%	0	0.0%	0	0.0%	-	0.4%	5	0	0	0	0	0	0
		3556	WB Thru	1090	97.3%	9567	83.0%	6688	67.5%	0.81	97.3%	930	6688	8105	7803	8660	15931	15412
		3251	WB Right	25	2.2%	1959	17.0%	3221	32.5%	1.91	2.2%	20	3221	2764	3132	3070	464	449
				1120		11526		9909		0.860	1	960	9909	10869	10935	11730	16395	15861
None			NB Left	0	0.0%	0	#DIV/0!	0	#DIV/0!	-	0.0%	#DIV/0!	0	0	0	0	0	0
			NB Thru	0	0.0%	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0.0%	#DIV/0!	0	0	0	0	0	0
			NB Right	1	100.0%	0	#DIV/0!	0	#DIV/0!	#DIV/0!	100.0%	#DIV/0!	0	0	0	0	0	0
				1		0		0		#DIV/0!	1	#DIV/0!	0	0	0	0	0	0
3251	791	792	SB Left	10	8.7%	1543	71.9%	2394	85.5%	1.19	52.7%	80	2394	2465	2170	1975	1143	875
			SB Thru	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
		3556	SB Right	105	91.3%	602	28.1%	407	14.5%	0.52	47.3%	70	407	556	1226	1225	1345	1364
				115		2145		2801		1.306	1	150	2801	3021	3396	3200	2488	2239

#5 **NH 102 at Londonderry Road**

PM Traffic

	Adjusted 2015	Exist Turn %	2015 exist Model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	285	21.0%	638	6.0%	515	6.0%	0.99	20.8%	210	515	523	1105	1083	1569	2136
EB Thru	950	70.1%	9915	94.0%	8111	94.0%	1.00	79.2%	880	8111	7748	8555	9509	14981	13168
EB Right	120	8.9%	0	0.0%	0	0.0%	#DIV/0!	0.0%	120	0	0	0	0	0	0
	1355		10553		8626		0.817	1	1110	8626	8271	9660	10592	16550	15304
WB Left	5	0.7%	0	0.0%	0	0.0%	-	0.7%	5	0	0	0	0	0	0
WB Thru	720	94.7%	9567	83.0%	6688	67.5%	0.81	77.0%	500	6688	8105	7803	8660	15931	15412
WB Right	35	4.6%	1959	17.0%	3221	32.5%	1.91	22.3%	140	3221	2764	3132	3070	464	449
	760		11526		9909		0.860	1	650	9909	10869	10935	11730	16395	15861
NB Left	5	50.0%	0	#DIV/0!	0	#DIV/0!	-	50.0%	10	0	0	0	0	0	0
NB Thru	0	0.0%	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0.0%	0	0	0	0	0	0	0
NB Right	5	50.0%	0	#DIV/0!	0	#DIV/0!	#DIV/0!	50.0%	10	0	0	0	0	0	0
	10		0		0		#DIV/0!	1	10	0	0	0	0	0	0
SB Left	10	6.9%	1543	71.9%	2394	85.5%	1.19	53.6%	100	2394	2465	2170	1975	1143	875
SB Thru	5	3.4%	0	0.0%	0	0.0%	#DIV/0!	0.0%	5	0	0	0	0	0	0
SB Right	130	89.7%	602	28.1%	407	14.5%	0.52	46.4%	90	407	556	1226	1225	1345	1364
	145		2145		2801		1.306	1	190	2801	3021	3396	3200	2488	2239

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

#6 **NH 102 at Fordway/High**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
1868	1869	2128	EB Left	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
		1870	EB Thru	400	76.2%	9909	86.8%	9173	87.3%	1.01	77.1%	370	9173	8916	9394	10147	13316	11221
		2138	EB Right	125	23.8%	1501	13.2%	1331	12.7%	0.96	22.9%	110	1331	1297	1331	1333	2257	2165
				525		11410		10504		0.921	1	480	10504	10213	10725	11480	15573	13386
1870	1869	2138	WB Left	15	2.5%	771	8.7%	220	2.9%	0.34	0.8%	15	220	273	607	847	162	165
		1868	WB Thru	595	97.5%	8089	91.3%	7252	97.1%	1.06	99.2%	495	7252	7969	7404	8193	11666	10773
		2128	WB Right	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
				610		8860		7472		0.843	1	510	7472	8242	8011	9040	11828	10938
2138	1869	1868	NB Left	345	83.1%	1681	60.0%	2024	71.1%	1.18	87.8%	370	2024	1971	2129	2122	2059	1674
		2128	NB Thru	0	0.0%	0	0.0%	0	0.0%	-	0.0%	0	0	0	0	0	0	0
		1870	NB Right	70	16.9%	1121	40.0%	824	28.9%	0.72	12.2%	50	824	676	585	433	556	575
				415		2802		2848		1.016417	1	420	2848	2647	2714	2555	2615	2249
2128	1869	1870	SB Left	5	12.5%	234	28.4%	246	15.7%	0.55	6.9%	10	246	231	266	262	97	99
		2138	SB Thru	25	62.5%	570	69.2%	1316	84.3%	1.22	86.1%	70	1316	925	238	331	329	365
		1868	SB Right	10	25.0%	20	2.4%	0	0.0%	-	6.9%	10	0	0	0	0	4	9
				40		824		1562		1.896	1	80	1562	1156	504	593	430	473

#6 **NH 102 at Fordway/High**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
EB Thru	760	83.5%	9909	86.8%	9173	87.3%	1.01	84.1%	710	9173	8916	9394	10147	13316	11221
EB Right	150	16.5%	1501	13.2%	1331	12.7%	0.96	15.9%	130	1331	1297	1331	1333	2257	2165
	910		11410		10504		0.921	1	840	10504	10213	10725	11480	15573	13386
WB Left	15	3.5%	771	8.7%	220	2.9%	0.34	1.2%	15	220	273	607	847	162	165
WB Thru	415	96.5%	8089	91.3%	7252	97.1%	1.06	98.8%	345	7252	7969	7404	8193	11666	10773
WB Right	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
	430		8860		7472		0.843	1	360	7472	8242	8011	9040	11828	10938
NB Left	230	69.7%	1681	60.0%	2024	71.1%	1.18	78.1%	270	2024	1971	2129	2122	2059	1674
NB Thru	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
NB Right	100	30.3%	1121	40.0%	824	28.9%	0.72	21.9%	70	824	676	585	433	556	575
	330		2802		2848		1.016	1	340	2848	2647	2714	2555	2615	2249
SB Left	15	21.4%	234	28.4%	246	15.7%	0.55	11.9%	20	246	231	266	262	97	99
SB Thru	50	71.4%	570	69.2%	1316	84.3%	1.22	88.1%	110	1316	925	238	331	329	365
SB Right	5	7.1%	20	2.4%	0	0.0%	-	0.0%	5	0	0	0	0	4	9
	70		824		1562		1.896	1	130	1562	1156	504	593	430	473

Percentage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

#7 **NH 102 at NH 28**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBld Model
1875	1859	1860	EB Left	105	28.4%	2405	27.1%	375	4.3%	0.16	4.5%	20	375	1565	1348	1792	3054	1799
		1876	EB Thru	205	55.4%	4357	49.2%	5768	65.6%	1.33	74.9%	280	5768	3920	3358	4339	5751	5008
		3534	EB Right	60	16.2%	2100	23.7%	2647	30.1%	1.27	20.6%	80	2647	2815	2662	2791	3882	3150
				370		8862		8790		0.992	1	370	8790	8300	7568	8922	12687	9957
1876	1859	3534	WB Left	35	7.0%	1298	24.4%	771	11.9%	0.49	3.4%	20	771	847	834	859	1255	1222
		1875	WB Thru	385	77.0%	3928	74.0%	4383	67.7%	0.91	70.4%	430	4383	3454	4156	5280	5144	5297
		1860	WB Right	80	16.0%	84	1.6%	1322.25	20.4%	12.91	26.1%	160	3075	1564	144	198	1483	1269
				500		5310		6476.25		1.220	1	610	8229	5865	5134	6337	7882	7788
3534	1859	1875	NB Left	60	16.7%	2775	33.5%	4982	58.2%	1.74	46.5%	170	4982	4502	3174	3158	4832	4065
		1860	NB Thru	260	72.2%	4129	49.9%	2810	32.8%	0.66	47.5%	180	2810	3102	4277	4515	1567	2545
		1876	NB Right	40	11.1%	1372	16.6%	765	8.9%	0.54	6.0%	20	765	808	775	982	1217	1376
				360		8276		8557		1.034	1	370	8557	8412	8226	8655	7616	7986
1860	1859	1876	SB Left	70	17.3%	89	1.3%	681	11.3%	8.51	25.4%	90	681	551	702	227	980	731
		3534	SB Thru	230	56.8%	4520	67.4%	4817	79.9%	1.19	67.3%	240	4817	4558	4701	4840	2009	2409
		1875	SB Right	105	25.9%	2093	31.2%	529	8.8%	0.28	7.3%	30	529	299	805	593	2474	2247
				405		6702		6027		0.899	1	360	6027	5438	6208	5660	5463	5387

0.10279

#7 **NH 102 at NH 28**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBld Model
EB Left	135	23.1%	2405	27.1%	375	4.3%	0.16	3.6%	20	375	1565	1348	1792	3054	1799
EB Thru	410	70.1%	4357	49.2%	5768	65.6%	1.33	89.6%	520	5768	3920	3358	4339	5751	5008
EB Right	40	6.8%	2100	23.7%	2647	30.1%	1.27	6.8%	40	2647	2815	2662	2791	3882	3150
	585		8862		8790		0.992	1	580	8790	8300	7568	8922	12687	9957
WB Left	75	19.2%	1298	24.4%	771	11.9%	0.49	9.4%	60	771	847	834	859	1255	1222
WB Thru	250	64.1%	3928	74.0%	4383	67.7%	0.91	58.6%	360	4383	3454	4156	5280	5144	5297
WB Right	65	16.7%	84	1.6%	1322.25	20.4%	12.91	32.0%	200	3075	1564	144	198	1483	1269
	390		5310		6476.25		1.220	1	480	8229	5865	5134	6337	7882	7788
NB Left	70	17.5%	2775	33.5%	4982	58.2%	1.74	46.7%	170	4982	4502	3174	3158	4832	4065
NB Thru	295	73.8%	4129	49.9%	2810	32.8%	0.66	48.5%	180	2810	3102	4277	4515	1567	2545
NB Right	35	8.8%	1372	16.6%	765	8.9%	0.54	4.7%	20	765	808	775	982	1217	1376
	400		8276		8557		1.034	1	410	8557	8412	8226	8655	7616	7986
SB Left	135	21.6%	89	1.3%	681	11.3%	8.51	21.6%	80	681	551	702	227	980	731
SB Thru	340	54.4%	4520	67.4%	4817	79.9%	1.19	71.7%	260	4817	4558	4701	4840	2009	2409
SB Right	150	24.0%	2093	31.2%	529	8.8%	0.28	6.7%	20	529	299	805	593	2474	2247
	625		6702		6027		0.899	1	560	6027	5438	6208	5660	5463	5387

Percetage adjusted manually to add to 100% on approach

Existing percentages or volumes carried forward

Adjusted WB RT volume to divert excess trips destined for Franklin via Rollins (43% of total trips)

#8 **N High St/ Ash St Extension**

AM Traffic

Nodes From	Thru	To	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
2125	3485	2124		EB Left	180	94.7%	1654	100.0%	2217	100.0%	1.00	94.7%	240	2217	1875	3213	3387	3746	4501
				EB Thru	0	0.0%	0	0.0%	0	0.0%	-	0.0%	0						0
		2123		EB Right	10	5.3%	0	0.0%	0	0.0%	1.00	5.3%	10	0	0	0	0	0	0
					190		1654		2217		1.340	1	250						4501
None	3485			WB Left	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0.0%	0						0
				WB Thru	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0.0%	0						0
				WB Right	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0.0%	0						0
					0		0		0		#DIV/0!	0	0						0
2123	3485	2125	133	NB Left	5	3.8%	0	0.0%	0	0.0%	1.00	3.8%	5	0	0	0	0	0	0
		2124		NB Thru	125	96.2%	1630	100.0%	3167	100.0%	1.00	96.2%	240	3167	601	1604	1014	678	1110
				NB Right	0	0.0%	0	0.0%		0.0%	1.00	0.0%	0						0
					130		1630		3167		1.943	1	250						1110
2124	3485			SB Left	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0						0
		2123		SB Thru	175	43.2%	1464	38.2%	2317	54.2%	1.42	57.9%	260	2317	1432	570	664	1045	1461
		2125		SB Right	230	56.8%	2366	61.8%	1961	45.8%	0.74	42.1%	190	1961	1832	3315	2618	4026	4049
					405		3830		4278		1.117	1	450						5510

Notes:

133=Zone Centroid

2123 to 133 = 143, 2124 to 133 = 139, 2125 to 133 = 59
133 to 2123 =164, to 2124=124, to 2125 = 52

#8 **N High St/ Ash St Extension**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	420	98.8%	1654	100.0%	2217	100.0%	1.00	98.8%	560	2217	1875	3213	3387	3746	4501
EB Thru	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
EB Right	5	1.2%	0	0.0%	0	0.0%	1.00	1.2%	10	0	0	0	0	0	0
	425		1654		2217		1.340	1	570						4501
WB Left	0	#DIV/0!	0	#DIV/0!	0	0.0%	-	0.0%	0	0	0	0	0	0	0
WB Thru	0	#DIV/0!	0	#DIV/0!	0	0.0%	-	0.0%	0	0	0	0	0	0	0
WB Right	0	#DIV/0!	0	#DIV/0!	0	0.0%	-	0.0%	0	0	0	0	0	0	0
	0		0				0.000	0	0						0
NB Left	5	1.7%	0	0.0%	0	0.0%	1.00	1.7%	5	0	0	0	0	0	0
NB Thru	290	98.3%	1630	100.0%	3167	100.0%	1.00	98.3%	555	3167	601	1604	1014	678	1110
NB Right	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
	295		1630		3167		1.943	1	570						1110
SB Left	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
SB Thru	170	39.1%	1464	38.2%	2317	54.2%	1.42	54.8%	270	2317	1432	570	664	1045	1461
SB Right	265	60.9%	2366	61.8%	1961	45.8%	0.74	45.2%	220	1961	1832	3315	2618	4026	4049
	435		3830		4278		1.117	1	490						5510

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

#9 **N High St/ Madden Road**

From	Nodes Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	2015 existing model % ADT	AM Traffic 2040 Alt A ADT	AM Traffic 2040 Alt A % ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	NOT USED 2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
377	2124	2106	EB Left	10	100.0%	149	60.8%	0	#DIV/0!	#DIV/0!	100.0%	0		117	146	146	100	100
			EB Thru	0	0.0%	0	0.0%	0	#DIV/0!	1.00	0	0						0
		3485	EB Right	0	0.0%	96	39.2%	0	#DIV/0!	#DIV/0!	0	0		57	85	85	131	131
				10		245		0		0.000	1	0						231
None			WB Left	0	0.0%	0	0.0%	0	0.0%	1.00	0	0						0
			WB Thru	0	0.0%	0	0.0%	0	0.0%	1.00	0	0						0
			WB Right	0	0.0%	0	0.0%	0	0.0%	1.00	0	0						0
				0		0		0		0.000	0	0						0
3485	2124	377	NB Left	0	0.0%	92	2.7%	0	#DIV/0!	-	0.0%	0		85	87	87	121	129
		2106	NB Thru	310	100.0%	3316	97.3%	0	#DIV/0!	1.00	100.0%	0		2758	4901	4486	4376	5557
			NB Right	0	0.0%	0	0.0%	0	#DIV/0!	-	0.0%	0						0
				310		3408		0		0.000	1	0						5686
2106	2124		SB Left	0	0.0%	0	0.0%	0	#DIV/0!	#DIV/0!	0.0%	0						0
		3485	SB Thru	400	95.2%	3873	96.2%	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		3468	3967	3366	5003	5488
		377	SB Right	20	4.8%	153	3.8%	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		112	144	144	110	102
				420		4026		0		0.000	#DIV/0!	0						5590

Notes: 377 is zone centroid for Madden Rd

#9 **N High St/ Madden Road**

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	2015 existing model % ADT	PM Traffic 2040 Alt A ADT	PM Traffic 2040 Alt A % ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	NOT USED 2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	10	100.0%	149	60.8%	0	#DIV/0!	#DIV/0!	100.0%	0	0	117	146	146	100	100
EB Thru	0	0.0%	0	0.0%	0	#DIV/0!	1.00	0	0	0	0	0	0	0	0
EB Right	0	0.0%	96	39.2%	0	#DIV/0!	#DIV/0!	0	0	0	57	85	85	131	131
	10		245		0		0.000	1	0						231
WB Left	0	0.0%	0	0.0%	0	0.0%	1.00	0	0	0	0	0	0	0	0
WB Thru	0	0.0%	0	0.0%	0	0.0%	1.00	0	0	0	0	0	0	0	0
WB Right	0	0.0%	0	0.0%	0	0.0%	1.00	0	0	0	0	0	0	0	0
	0		0		0		0.000	0	0						0
NB Left	0	0.0%	92	2.7%	0	#DIV/0!	#DIV/0!	0.0%	0	0	85	87	87	121	129
NB Thru	700	100.0%	3316	97.3%	0	#DIV/0!	1.00	100.0%	0	0	2758	4901	4486	4376	5557
NB Right	0	0.0%	0	0.0%	0	#DIV/0!	#DIV/0!	0.0%	0	0	0	0	0	0	0
	700		3408		0		0.000	1	0						5686
SB Left	0	0.0%	0	0.0%	0	#DIV/0!	#DIV/0!	0.0%	0	0	0	0	0	0	0
SB Thru	440	97.8%	3873	96.2%	0	#DIV/0!	1.00	#DIV/0!	#DIV/0!	0	3468	3967	3366	5003	5488
SB Right	10	2.2%	153	3.8%	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	112	144	144	110	102
	450		4026		0		0.000	#DIV/0!	0						5590

Percetage adjusted manually to add to 100% on approach

Existing percentages or volumes carried forward

#9A **N High St/Connector Road**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	2015 ex Model	2040 NBld Model	2040 NBld Turn	2040 Alt A Model	2040 Alt A Turn	Est AM Peak as 7% of ADT	Manual Alt A Adjustments	Comments	2040 Alt B Turn	2040 Alt C Model	2040 Alt C Turn	2040 Alt D Model	2040 Alt D Turn	2040 Alt F Model	2040 Alt F Turn
6531	2124		EB Left				#DIV/0!	0	0.0%	-			#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
		2106	EB Thru				#DIV/0!	18553	88.4%	1,670	1090		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
		3485	EB Right				#DIV/0!	2429	11.6%	220	270		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
								20982		1890									
2106	2124	3485	WB Left				#DIV/0!	2095	11.6%	150	180		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
		6531	WB Thru				#DIV/0!	15953	88.4%	1,110	1110		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
			WB Right				#DIV/0!	0	0.0%	-			#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
								18048		1260									
3485	2124	6531	NB Left				#DIV/0!	3301	58.0%	230	280		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
			NB Thru				#DIV/0!	0	0.0%	-			#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
		2106	NB Right				#DIV/0!	2393	42.0%	170	200		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
								5694		400	480	Balance to Ash St Ext							
None			SB Left				#DIV/0!	0	#DIV/0!				#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
			SB Thru				#DIV/0!	0	#DIV/0!				#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
			SB Right				#DIV/0!	0	#DIV/0!				#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
								0		0									

#9A **N High St/Connector Road**

PM Traffic

	4:30 PM Adjusted 2015	2015 ex Model	2040 NBld Model	2040 NBld Turn	2040 Alt A Model	2040 Alt A Turn	PM Peak as 9% of ADT			2040 Alt B Turn	2040 Alt C Model	2040 Alt C Turn	2040 Alt D Model	2040 Alt D Turn	2040 Alt F Model	2040 Alt F Turn
EB Left	10	0	0	#DIV/0!	0	0.0%	-			#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
EB Thru	0	0	0	#DIV/0!	18553	88.4%	1,670			#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
EB Right	0	0	0	#DIV/0!	2429	11.6%	220	220	262.9268293	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
					20982		1890									
WB Left	0	0	0	#DIV/0!	2095	11.6%	190			#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
WB Thru	0	0	0	#DIV/0!	15953	88.4%	1,430			#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
WB Right	0	0	0	#DIV/0!	0	0.0%	-	190	227.0731707	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
					18048		1620	410	490							
NB Left	0	0	0	#DIV/0!	3301	58.0%	300	660	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
NB Thru	700	700	0	0	0	0.0%	-		0	0	0	0	0	0	0	0
NB Right	0	0	0	#DIV/0!	2393	42.0%	210	460	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
					5694		510	1115	Balance to Ash St Ext							
SB Left	0	0	0	#DIV/0!	0	#DIV/0!			0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
SB Thru	440	440	0	0	0	#DIV/0!			0	0	0	0	0	0	0	0
SB Right	10	10	0	0	0	#DIV/0!			0	0	0	0	0	0	0	0
					0											

#10 **Folsom Rd at Franklin St**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments	
2124	2106	3484	EB Left	35	11.3%	470	13.6%	764	3.6%	0.27	3.0%	60	764	627	537	530	557	546		
		3483	EB Thru	270	87.1%	2958	85.4%	18004	85.5%	1.00	95.4%	1790	18004	2206	4484	4076	3892	5063	1200	-590
		2113	EB Right	5	1.6%	37	1.1%	2301	10.9%	1.00	1.6%	30	2301	41	26	26	27	28		
				310		3465		21069		6.081	1	1880						5657		
3483	2106	2113	WB Left	30	7.1%	1	0.0%	0	0.0%	-	3.0%	50	0	4	0	0	0	0		
		2124	WB Thru	385	90.6%	3535	100.0%	13719	100.0%	1.00	94.6%	1560	13719	2059	3012	2499	4261	4518	1100	-460
		3484	WB Right	10	2.4%	0	0.0%	0	0.0%	1.00	2.4%	40		974	21	37	39	39		
				425		3536		13719		3.880	1	1650						4557		
2113	2106	2124	NB Left	10	20.0%	43	14.1%	1307	99.7%	7.09	70.0%	150	3844	58	32	33	35	35		
		3484	NB Thru	5	10.0%	259	84.6%	4	0.3%	1.00	10.0%	20	4	620	188	194	242	244		
		3483	NB Right	35	70.0%	4	1.3%	0	0.0%	1.00	20.0%	40	0	100	1	1	1	2		
				50		306		1310.96		4.284	1	210						281		
3484	2106	3483	SB Left	10	22.2%	0	0.0%	0	0.0%	1.00	22.0%	5		700	150	141	64	67		
		2113	SB Thru	5	11.1%	77	14.7%	3	0.5%	0.03	0.4%	5	3	324	121	138	63	67		
		2124	SB Right	30	66.7%	448	85.3%	596	99.5%	1.17	77.6%	40	596	1462	1067	978	817	996		
				45		525		599		1.141	1	50						1130		

#10 **Folsom Rd at Franklin St**

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A Model	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments	
EB Left	45	6.3%	470	13.6%	764	3.6%	0.27	1.7%	70	764	627	537	530	557	546		
EB Thru	665	93.0%	2958	85.4%	18004	85.5%	1.00	97.6%	4250	18004	2206	4484	4076	3892	5063	2075	-2175
EB Right	5	0.7%	37	1.1%	2301	10.9%	1.00	0.7%	30	2301	41	26	26	27	28		
	715		3465		21069		6.081	1	4350						5657		
WB Left	30	7.1%	1	0.0%	0	0.0%	1.00	7.1%	120	0	4	0	0	0	0		
WB Thru	375	88.2%	3535	100.0%	13719	100.0%	1.00	88.2%	1460	13719	2059	3012	2499	4261	4518	960	250
WB Right	20	4.7%	0	0.0%	0	0.0%	1.00	4.7%	80	0	974	21	37	39	39		
	425		3536		13719		3.880	1	1650						4557		
NB Left	5	7.7%	43	14.1%	1307	99.7%	7.09	70.0%	200	3844	58	32	33	35	35		
NB Thru	10	15.4%	259	84.6%	4	0.3%	0.00	10.0%	30	4	620	188	194	242	244		
NB Right	50	76.9%	4	1.3%	0	0.0%	-	20.0%	60	0	100	1	1	1	2		
	65		306		1310.96		4.284	1	280						281		
SB Left	20	20.0%	0	0.0%	0	0.0%	1.00	20.0%	20	0	700	150	141	64	67		
SB Thru	10	10.0%	77	14.7%	3	0.5%	0.03	0.3%	10	3	324	121	138	63	67		
SB Right	70	70.0%	448	85.3%	596	99.5%	1.17	79.7%	90	596	1462	1067	978	817	996		
	100		525		599		1.141	1	110						1130		

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Adjusted NB LT volume to divert excess trips destined for Franklin via Rollins and Rt 102 WB onto Crystal (34% of total)

#11 Ross' Corner (Folsom/Tsienneto at NH 28/Crystal)

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments
3483	1863	1864	EB Left	135	41.5%	1215	26.5%	1139	6.5%	0.24	10.2%	130	1139	13	1780	1518	768	582	
		2107	EB Thru	170	52.3%	3242	70.8%	15176	86.5%	1.22	63.9%	800	15176	2671	4489	4351	4100	5269	820
		1862	EB Right	20	6.2%	123	2.7%	1228	7.0%	2.61	25.9%	320	1228	0	0	0	0	0	
				325		4580		17543		3.830	1	1245						5851	
2107	1863	1862	WB Left	125	15.9%	1495	14.6%	385	2.8%	0.20	3.1%	30	385	427	509	348	1693	1629	
		3483	WB Thru	290	36.9%	2578	25.1%	9700	71.7%	2.85	77.0%	800	9700	1965	3171	2746	4354	4686	935
		1864	WB Right	370	47.1%	6179	60.3%	3444	25.5%	0.42	19.9%	210	3444	8568	8302	12265	5564	4901	220
				785		10252		13529		1.320	1	1040						11216	
1862	1863	3483	NB Left	20	5.2%	0	0.0%	1627	44.3%	1.50	47.8%	100	1627	81	0	0	0	0	
		1864	NB Thru	230	59.7%	4742	70.0%	1495	40.7%	0.58	34.7%	70	1495	4035	4496	4547	2411	3115	
		2107	NB Right	135	35.1%	2028	30.0%	548	14.9%	0.50	17.5%	40	548	1510	1569	2144	2901	1831	
				385		6770		3670		0.542	1	210						4946	
1864	1863	2107	SB Left	310	45.9%	5682	45.4%	567	17.4%	1.50	29.8%	50	567	7758	7168	8224	5165	5388	
		1862	SB Thru	220	32.6%	5019	40.1%	1959	59.9%	1.49	48.7%	100	1959	4512	6154	6186	3308	3644	
		3483	SB Right	145	21.5%	1803	14.4%	742	22.7%	1.00	21.5%	50	742	0	54	31	0	0	
				675		12504		3268		0.261	1	180						9032	

#11 Ross' Corner (Folsom/Tsienneto at NH 28/Crystal)

PM Traffic (rev per new TMC)

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model		
EB Left	240	36.9%	1215	26.5%	1139	6.5%	0.24	9.0%	230	1139	13	1780	1518	768	582		
EB Thru	320	49.2%	3242	70.8%	15176	86.5%	1.22	77.1%	1920	15176	2671	4489	4351	4100	5269	1380	
EB Right	90	13.8%	123	2.7%	1228	7.0%	1.00	13.6%	340	1228	0	0	0	0	0		
	650		4580		17543		3.830	1	2490						5851		
WB Left	150	20.0%	1495	14.6%	385	2.8%	0.20	3.9%	40	385	427	509	348	1693	1629	44.44444	45
WB Thru	220	29.3%	2578	25.1%	9700	71.7%	2.85	74.7%	740	9700	1965	3171	2746	4354	4686	822.2222	820
WB Right	380	50.7%	6179	60.3%	3444	25.5%	0.42	21.4%	210	3444	8568	8302	12265	5564	4901	233.3333	235
	750		10252		13529		1.320	1	990						11216	1100	
NB Left	80	13.6%	0	0.0%	1627	44.3%	0.90	12.2%	40	1627	81	0	0	0	0		
NB Thru	360	61.0%	4742	70.0%	1495	40.7%	0.58	75.1%	240	1495	4035	4496	4547	2411	3115		
NB Right	150	25.4%	2028	30.0%	548	14.9%	0.50	12.7%	40	548	1510	1569	2144	2901	1831		
	590		6770		3670		0.542	1	320						4946		
SB Left	520	45.6%	5682	45.4%	567	17.4%	0.38	17.4%	50	567	7758	7168	8224	5165	5388		
SB Thru	430	37.7%	5019	40.1%	1959	59.9%	1.49	65.9%	200	1959	4512	6154	6186	3308	3644		
SB Right	190	16.7%	1803	14.4%	742	22.7%	1.00	16.7%	50	742	0	54	31	0	0		
	1140		12504		3268		0.261	1	300						9032		

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Manual adjustment to balance to Pinkerton inbx

#12 **Tsiennetо Rd at Pinkerton St**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments	
1863	2107	2108	EB Thru	370	60.2%	5732	52.3%	9325	57.2%	1.09	64.3%	580	9325	5372	6699	7959	7499	7778		
		2109	EB Right	245	39.8%	5220	47.7%	6966	42.8%	0.90	35.7%	330	6966	6431	6527	6761	4667	4710		
				615		10952		16291		1.487	1.00	910						12488		
2108	2107	2109	WB Left	80	12.3%	159	2.1%	106	0.9%	0.42	5.2%	50	106	111	126	124	131	131		
		1863	WB Thru	570	87.7%	7582	97.9%	12168	99.1%	1.01	94.8%	960	12168	8817	8159	11297	10700	10314		
				650		7741		12274		1.586	1.00	1030						10445		
2109	2107	1863	NB Left	215	72.9%	2670	78.6%	1361	68.5%	0.87	63.5%	110	1361	2116	3824	4062	911	902	205	95
		2108	NB Right	80	27.1%	728	21.4%	626	31.5%	1.47	36.5%	60	626	655	660	661	646	653		
				295		3398		1987		0.585	1.00	170						1555		

Base volumes balanced to match Ross' Corner data

#12 **Tsiennetо Rd at Pinkerton St**

PM Traffic

		4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments	
	EB Thru	580	58.6%	5732	52.3%	9325	57.2%	1.09	62.8%	920	9325	5372	6999	7959	7499	7778		
	EB Right	410	41.4%	5220	47.7%	6966	42.8%	0.90	37.2%	550	6966	6431	6527	6761	4667	4710		
		990		10952		16291		1.487	1.00	1470						12488		
	WB Left	115	16.8%	159	2.1%	106	0.9%	0.42	7.1%	80	106	111	126	124	131	131		
	WB Thru	570	83.2%	7582	97.9%	12168	99.1%	1.01	92.9%	1010	12168	8817	8159	11297	10700	10314		
		685		7741		12274		1.586	1.00	1090						10445		
	NB Left	180	60.0%	2670	78.6%	1361	68.5%	0.87	52.3%	90	1361	2116	3824	4062	911	902	115	
	NB Right	120	40.0%	728	21.4%	626	31.5%	1.47	47.7%	90	626	655	660	661	646	653		
		300		3398		1987		0.585	1.00	180						1555		

Base volumes balanced to match Ross' Corner data

Percentage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Adjusted NB LT volume to divert excess trips destined for Franklin via Rollins and Rt 102 WB onto Crystal (34% of total)

#13 NH 28 at Linlew Dr

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	2015 existing model % ADT	2040 Alt A ADT	2040 Alt A % ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
None	1865		EB Left	5	50.0%	0	#DIV/0!	0	#DIV/0!	1.00	50.0%	5	0	0	0	0	0	0
			EB Thru	0	0.0%	0	#DIV/0!	0	#DIV/0!	1.00	0.0%	0	0	0	0	0	0	0
			EB Right	5	50.0%	0	#DIV/0!	0	#DIV/0!	1.00	50.0%	5	0	0	0	0	0	0
				10		0		0		1.000	1	10						0
2100	1865	1864	WB Left	50	16.9%	1319	98.0%	437	47.0%	0.48	8.1%	20	437	262	213	418	618	710
			WB Thru	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
		1866	WB Right	245	83.1%	27	2.0%	493	53.0%	26.43	91.9%	180	493	86	0	478	77	44
				295		1346		930		0.691	1	200						754
1864	1865		NB Left	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
		1866	NB Thru	655	95.6%	12136	100.0%	6017	99.0%	1.00	95.6%	330	6017	12591	14578	18330	8743	8598
		2100	NB Right	30	4.4%	1	0.0%	61	1.0%	121.81	4.4%	10	61	0	0	0	1	1
				685		12137		6078		0.501	1	340						8599
1866	1865	2100	SB Left	50	6.0%	790	6.2%	810	21.0%	1.00	6.0%	20	810	208	427	2384	878	693
		1864	SB Thru	790	94.0%	11898	93.8%	3055	79.0%	1.00	94.0%	240	3055	11940	13963	14812	8462	8943
			SB Right	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
				840		12688		3865		0.305	1	260						9636

#13 NH 28 at Linlew Dr

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	2015 existing model % ADT	2040 Alt A ADT	2040 Alt A % ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	
EB Left	15	37.5%	0	#DIV/0!	0	#DIV/0!	1.00	37.5%	15	0	0	0	0	0	0	
EB Thru	10	25.0%	0	#DIV/0!	0	#DIV/0!	1.00	25.0%	10	0	0	0	0	0	0	
EB Right	15	37.5%	0	#DIV/0!	0	#DIV/0!	1.00	37.5%	15	0	0	0	0	0	0	
	40		0		0		1.000	1	40						0	
WB Left	45	16.7%	1319	98.0%	437	47.0%	0.48	8.0%	20	437	262	213	418	618	710	
WB Thru	10	3.7%	0	0.0%	0	0.0%	1.00	3.7%	10	0	0	0	0	0	0	
WB Right	215	79.6%	27	2.0%	493	53.0%	26.43	88.3%	170	493	86	0	478	77	44	
	270		1346		930		0.691	1	190						754	
NB Left	20	2.1%	0	0.0%	0	0.0%	1.00	2.1%	20	0	0	0	0	0	0	
NB Thru	855	89.5%	12136	100.0%	6017	99.0%	1.00	89.5%	430	6017	12591	14578	18330	8743	8598	120
NB Right	80	8.4%	1	0.0%	61	1.0%	121.81	8.4%	40	61	0	0	0	1	1	
	955		12137		6078		0.501	1	450						8599	
SB Left	170	10.8%	790	6.2%	810	21.0%	3.37	36.3%	170	810	208	427	2384	878	693	
SB Thru	1400	88.9%	11898	93.8%	3055	79.0%	1.00	63.4%	300	3055	11940	13963	14812	8462	8943	
SB Right	5	0.3%	0	0.0%	0	0.0%	1.00	0.3%	5	0	0	0	0	0	0	
	1575		12688		3865		0.305	1	480						9636	

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Manual adjustment to balance between intersections

#14 **NH 28 at Ashleigh Dr**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
125	3295	1867	EB Left	10	50.0%	664	37.0%	646	40.3%	1.09	51.3%	10	646	523	968	1052	623	613
		381	EB Thru	5	25.0%	13	0.7%	9	0.6%	1.00	25.0%	5	9	8	7	9	10	10
		3378	EB Right	5	25.0%	1117	62.3%	947	59.1%	0.95	23.7%	5	947	1072	663	597	1022	1033
				20		1794		1602		0.893	1.000	20						1656
381	3295	3378	WB Left	180	63.2%	952	60.9%	885	57.6%	0.95	59.7%	170	885	1011	902	565	952	964
		125	WB Thru	5	1.6%	13	0.8%	9	0.6%	1.00	1.8%	5	9	8	100	9	10	10
		1867	WB Right	100	35.1%	599	38.3%	643	41.8%	1.09	38.5%	110	643	518	6144	1008	618	606
				285		1564		1537		0.983	1	280						1580
3378	3295	125	NB Left	5	0.6%	1121	9.2%	934	14.3%	1.56	0.6%	5	934	1391	676	597	1018	1013
		1867	NB Thru	610	73.1%	10087	82.9%	4709	72.3%	1.00	73.1%	330	4709	4314	19350	17663	6854	6685
		381	NB Right	220	26.3%	955	7.9%	867	13.3%	1.70	26.3%	120	867	1332	805	566	949	944
				835		12163		6510		0.535	1	450						8642
1867	3295	381	SB Left	100	13.6%	596	5.0%	660	17.9%	3.58	12.3%	30	660	197	5937	1008	621	626
		3378	SB Thru	630	85.7%	10619	89.4%	2358	64.1%	1.00	85.7%	200	2358	3258	19426	16805	7697	7927
		125	SB Right	5	0.7%	660	5.6%	659	17.9%	3.22	2.0%	5	659	204	982	1052	627	632
				735		11875		3677		0.310	1	230						9165

#14 **NH 28 at Ashleigh Dr**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	40	66.7%	664	37.0%	646	40.3%	1.09	67.5%	30	646	523	968	1052	623	613
EB Thru	10	16.7%	13	0.7%	9	0.6%	1.00	16.7%	10	9	8	7	9	10	10
EB Right	10	16.7%	1117	62.3%	947	59.1%	0.95	15.8%	10	947	1072	663	597	1022	1033
	60		1794		1602		0.893	1.000	50						1656
WB Left	345	71.1%	952	60.9%	885	57.6%	0.95	67.3%	320	885	1011	902	565	952	964
WB Thru	5	1.0%	13	0.8%	9	0.6%	1.00	1.0%	5	9	8	100	9	10	10
WB Right	135	27.8%	599	38.3%	643	41.8%	1.09	31.7%	150	643	518	6144	1008	618	606
	485		1564		1537		0.983	1.000	480						1580
NB Left	5	0.5%	1121	9.2%	934	14.3%	1.56	0.7%	5	934	1391	676	597	1018	1013
NB Thru	800	75.1%	10087	82.9%	4709	72.3%	1.00	75.1%	430	4709	4314	19350	17663	6854	6685
NB Right	260	24.4%	955	7.9%	867	13.3%	1.70	24.2%	140	867	1332	805	566	949	944
	1065		12163		6510		0.535	1.000	570						8642
SB Left	110	9.1%	596	5.0%	660	17.9%	3.58	8.2%	30	660	197	5937	1008	621	626
SB Thru	1095	90.5%	10619	89.4%	2358	64.1%	1.00	90.5%	330	2358	3258	19426	16805	7697	7927
SB Right	5	0.4%	660	5.6%	659	17.9%	3.22	1.3%	5	659	204	982	1052	627	632
	1210		11875		3677		0.310	1.000	370						9165

Percetage adjusted manually to add to 100% on approach

Existing percentages or volumes carried forward

#15 NH 28 at Scobie Pond Rd

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	**2040 Alt A** ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
2099	1867	3295	WB Left	80	69.6%	2115	98.6%	850	61.5%	0.62	43.4%	30	850	1139	387	507	1026	958
		793	WB Right	35	30.4%	29	1.4%	531	38.5%	28.43	56.6%	40	531	307	1328	1681	85	95
				115		2144		1381		0.644	1.00	70						1053
3295	1867	793	NB Thru	645	94.2%	9581	84.4%	5429	90.5%	1.07	96.4%	350	5429	4912	20011	19301	7425	7245
		2099	NB Right	40	5.8%	1769	15.6%	569	9.5%	0.61	3.6%	10	569	444	327	423	669	659
				685		11350		5998		0.528	1.00	360						7904
793	1867	2099	SB Left	15	2.0%	21	0.2%	652	18.7%	87.26	20.2%	50	652	254	1099	1324	47	71
		3295	SB Thru	720	98.0%	9760	99.8%	2828	81.3%	0.81	79.8%	210	2828	2520	20020	18157	7919	8227
				735		9781		3480		0.356	1.00	260						8298

#15 NH 28 at Scobie Pond Rd

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	**2040 Alt A** ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
WB Left	70	70.0%	2115	98.6%	850	61.5%	0.62	43.7%	30	850	1139	387	507	1026	958
WB Right	30	30.0%	29	1.4%	531	38.5%	28.43	56.3%	30	531	307	1328	1681	85	95
	100		2144		1381		0.644	1.00	60						1053
NB Thru	700	81.4%	9581	84.4%	5429	90.5%	1.07	87.3%	390	5429	4912	20011	19301	7425	7245
NB Right	160	18.6%	1769	15.6%	569	9.5%	0.61	12.7%	60	569	444	327	423	669	659
	860		11350		5998		0.528	1.00	450						7904
SB Left	40	3.4%	21	0.2%	652	18.7%	87.26	3.4%	10	652	254	1099	1324	47	71
SB Thru	1125	96.6%	9760	99.8%	2828	81.3%	0.81	96.6%	400	2828	2520	20020	18157	7919	8227
	1165		9781		3480		0.356	1.00	410						8298

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

#16 NH 102/NH Rt 28 Bypass/E Derry Rd (circle)

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBld Model	Manual Alt A Adjustments	
3535	1841	2143	EB Left	60	16.2%	0	0.0%	0	0.0%	1.00	15.2%	70	0	0	0	0	0	0		
	1878		EB Thru(102)	120	32.4%	3346	60.5%	3757	56.9%	0.94	30.5%	140	3757	1873	1034	2402	3392	3182		
	2054		EB Thru (EDR)	90	24.3%	1277	23.8%	1695	25.7%	1.08	25.2%	120	1695	1754	1882	1795	2091	2018		
	1842		EB Right	100	27.0%	839	15.6%	1153	17.5%	1.12	27.1%	120	1153	1063	1125	1092	1155	1051		
				370		5362		6605		1.232	1.000	480						6251		
1878	1841	2054	WB Left (EDR)	5	1.5%	0	0.0%	0	0.0%	1.00	1.5%	5	0	0	0	0	0	0		
	1842		WB Left (28 Byp S)	75	22.7%	1261	40.0%	562	26.8%	0.52	11.8%	30	562	536	548	599	654	724		
	3535		WB Thru	240	72.7%	1889	60.0%	2145	79.2%	1.32	83.7%	230	2145	964	1258	2402	1886	1955		
	2143		WB Right	10	3.0%	0	0.0%	1	0.0%	1.00	3.0%	10	1	0	0	1	0	0		
				330		3150		2708		0.860	1.000	280						2379		
1842	1841	3535	NB Left	75	23.0%	929	16.1%	1371	37.5%	2.33	45.0%	108	1371	1370	1055	1044	1042	1066	100	-10
	2143		NB Thru	245	65.3%	3839	68.2%	1382	37.8%	0.55	36.2%	90	1382	1670	2118	1890	1377	1404	100	10
	1878		NB Right (102)	50	13.3%	620	10.7%	459	12.6%	1.17	15.6%	40	459	340	485	539	518	565		
	2054		NB Right (EDR)	5	1.3%	287	5.0%	444	12.1%	2.44	3.3%	10	444	555	469	439	420	444		
				375		5774		3656		0.633	1.000	240						3479		
2143	1841	1878	SB Left (102)	15	3.4%	0	0.0%	0	0.0%	1.00	3.4%	10	0	0	0	0	0	0		
	2054		SB Left (EDR)	120	27.0%	2453	37.0%	2983	58.2%	1.57	44.4%	150	2983	2077	1980	2620	1970	1971		
	1842		SB Thru	250	56.2%	4120	62.2%	2096	40.9%	0.66	36.9%	130	2096	2334	2584	2268	1793	1796		
	3535		SB Right	60	13.5%	56	0.8%	49	1.0%	1.13	15.3%	50	49	48	66	129	70	77		
				445		6629		5128		0.774	1.000	340	5128					3844		
2054	1841	1842	EDR LT (28 B S)	10	2.1%	232	7.2%	184	3.9%	0.55	1.2%	10	184	212	260	264	241	277		
	3535		EDR LT (102 WB)	165	35.1%	1548	48.0%	3057	65.1%	1.36	54.5%	370	3057	1728	1784	1779	2631	2879	325	-45
	2143		EDR Thru (28 B N)	280	59.6%	1447	44.8%	1454	31.0%	0.69	41.1%	280	1454	1853	1885	2319	1073	1052	325	45
	1878		EDR RT (102 EB)	15	3.2%	0	0.0%	0	0.0%	1.00	3.2%	20	0	0	0	0	0	0		
				470		3227		4695		1.455	1.000	680						4208		

#16 NH 102/NH Rt 28 Bypass/E Derry Rd (circle)

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBld Model	Manual Alt A Adjustments
EB Left	40	6.5%	0	0.0%	0	0.0%	1.00	6.5%	50	0	0	0	0	0	0	
EB Thru(102)	245	39.5%	3346	60.5%	3757	56.9%	0.94	37.1%	280	3757	1873	1034	2402	3392	3182	
EB Thru (EDR)	265	42.7%	1277	23.8%	1695	25.7%	1.08	45.1%	340	1695	1754	1882	1795	2091	2018	
EB Right	70	11.3%	839	15.6%	1153	17.5%	1.12	11.3%	90	1153	1063	1125	1092	1155	1051	
	620		5362		6605		1.232	1.000	760						6251	
WB Left (EDR)	10	4.2%	0	0.0%	0	0.0%	1.00	4.2%	10	0	0	0	0	0	0	
WB Left (28 Byp)	60	25.0%	1261	40.0%	562	26.8%	0.52	13.0%	30	562	536	548	599	654	724	
WB Thru	150	62.5%	1889	60.0%	2145	79.2%	1.32	74.5%	160	2145	964	1258	2402	1886	1955	
WB Right	20	8.3%	0	0.0%	1	0.0%	1.00	8.3%	20	1	0	0	1	0	0	
	240		3150		2708		0.860	1.000	210						2379	
NB Left	70	16.5%	929	16.1%	1371	37.5%	2.33	38.4%	100	1371	1370	1055	1044	1042	1066	-10
NB Thru	265	62.4%	3839	66.2%	1382	37.8%	0.55	34.6%	90	1382	1670	2118	1890	1377	1404	10
NB Right (102)	85	20.0%	620	10.7%	459	12.6%	1.17	24.1%	70	459	340	485	539	518	565	
NB Right (EDR)	5	1.2%	287	5.0%	444	12.1%	2.44	2.9%	10	444	555	469	439	420	444	
	425		5774		3656		0.633	1.000	270						3479	
SB Left (102)	15	2.0%	0	0.0%	0	0.0%	1.00	2.0%	15	0	0	0	0	0	0	
SB Left (EDR)	375	50.7%	2453	37.0%	2983	58.2%	1.57	64.6%	370	2983	2077	1980	2620	1970	1971	
SB Thru	315	42.6%	4120	62.2%	2096	40.9%	0.66	28.0%	160	2096	2334	2584	2268	1793	1796	
SB Right	35	4.7%	56	0.8%	49	1.0%	1.13	5.3%	30	49	48	66	129	70	77	
	740		6629		5128		0.774	1.000	570						3844	
EDR LT (28 B S)	10	2.0%	232	7.2%	184	3.9%	1.00	2.0%	10	184	212	260	264	241	277	
EDR LT (102 WB)	195	39.4%	1548	48.0%	3057	65.1%	1.36	56.3%	320	3057	1728	1784	1779	2631	2879	-55
EDR Thru (28 B N)	270	54.5%	1447	44.8%	1454	31.0%	0.69	37.7%	210	1454	1853	1885	2319	1073	1052	55
EDR RT (102 EB)	20	4.0%	0	0.0%	0	0.0%	1.00	4.0%	20	0	0	0	0	0	0	
	495		3227		4695		1.455	1.000	720						4208	

Percetage adjusted manually to add to 100% on approach

Existing percentages or volumes carried forward

Adjusted NB LT volume to divert excess trips destined for Franklin via Rollins and Rt 102 WB onto Crystal (34% of total)

#17 NH 28 Bypass/Pinkerton St/Nesmith St

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	**2040 Alt A** ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBld Model	Manual Alt A Adjustments		
2110	1840	3532	EB Left	10	4.8%	331	11.6%	109	2.9%	0.25	1.2%	10	109	107	146	145	129	133			
			EB Thru	15	7.1%	0	0.0%		0.0%	1.00	7.1%	20						0			
		2143	EB Right	185	88.1%	2534	88.4%	3662	97.1%	1.10	91.7%	260	3662	2972	3153	3371	2038	2040		5128	
				210		2865		3771		1.316	1.000	280						2173			
	1840		WB Left	5	5.3%	0	#DIV/0!	0	#DIV/0!	1.00	5.3%	10						0			
			WB Thru	40	42.1%	0	#DIV/0!	0	#DIV/0!	1.00	42.1%	40						0			
			WB Right	50	52.6%	0	#DIV/0!	0	#DIV/0!	1.00	52.6%	50						0			
				95		0		0		1.000	1.000	100						0			
2143	1840	2110	NB Left	230	38.7%	2353	43.7%	1881	66.3%	1.52	62.3%	590	1881	2597	3004	3223	1399	1403	55	275.8065	280
		3532	NB Thru	360	60.5%	3033	56.3%	955	33.7%	0.60	36.2%	340	955	926	999	986	1051	1053		159.6774	160
			NB Right	5	0.8%	0	0.0%		0.0%	1.00	1.5%	15						0		7.258065	10
				595		5386		2836		0.527	1.000	945						2456		450	450
																				1.451613	
3532	1840		SB Left	10	3.2%	0	0.0%	0	0.0%	1.00	3.2%	10						0		442.7419	
		2143	SB Thru	255	82.3%	4095	92.9%	1486	92.5%	1.00	81.9%	90	1486	1487	1577	1645	1785	1804			
		2110	SB Right	45	14.5%	313	7.1%	119	7.5%	1.00	14.9%	20	119	135	146	144	180	222			
				310		4408		1585		0.360	1.000	110						2226			

#17 NH 28 Bypass/Pinkerton St/Nesmith St

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	**2040 Alt A** ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBld Model	Manual Alt A Adjustments		
EB Left	10	2.1%	331	11.6%	109	2.9%	0.25	1.6%	10	109	107	146	149	129	133			
EB Thru	40	8.2%	0	0.0%	0	0.0%	1.00	8.2%	50	0	0	0	0	0	0			
EB Right	435	89.7%	2534	88.4%	3662	97.1%	1.10	90.2%	580	3662	2972	3153	3371	2038	2049			
	485		2865		3771		1.316	1.000	640						2173			
WB Left	5	9.1%	0	#DIV/0!	0	#DIV/0!	1.00	9.1%	10	0	0	0	0	0	0			
WB Thru	30	54.5%	0	#DIV/0!	0	#DIV/0!	1.00	54.5%	30	0	0	0	0	0	0			
WB Right	20	36.4%	0	#DIV/0!	0	#DIV/0!	1.00	36.4%	20	0	0	0	0	0	0			
	55		0		0		1.000	1.000	60						0			
NB Left	185	31.1%	2353	43.7%	1881	66.3%	1.52	58.1%	550	1881	2597	3004	3223	1399	1403	65	214.8387	215
NB Thru	400	67.2%	3033	56.3%	955	33.7%	0.60	40.2%	380	955	926	999	986	1051	1053		143.2258	145
NB Right	10	1.7%	0	0.0%	0	0.0%	1.00	1.7%	15	0	0	0	0	0	0		11.93548	10
	595		5386		2836		0.527	1.000	945						2456		370	370
																	1.193548	
SB Left	25	7.5%	0	0.0%	0	0.0%	1.00	7.5%	25	0	0	0	0	0	0		370	
SB Thru	295	88.1%	4095	92.9%	1486	92.5%	1.00	88.1%	110	1486	1487	1577	1645	1785	1804			
SB Right	15	4.5%	313	7.1%	119	7.5%	1.00	4.5%	10	119	135	146	144	180	222			
	335		4408		1585		0.360	1.000	120						2026			

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Manual adjustment to balance to traffic circle
Adjusted NB LT volume to divert excess trips destined for Franklin via Rollins and Rt 102 WB onto Crystal (34% of total)

#18 **NH 28 Bypass at Tsienneto Rd**

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	AM Traffic 2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NBld Model
2108	1839	1838	EB Left	120	40.0%	1564	41.2%	1080	15.7%	0.38	26.0%	150	1080	159	202	475	1070	1096
		2086	EB Thru	100	33.3%	1630	43.0%	5298	77.1%	1.79	59.8%	320	5298	2144	3385	4367	3469	3786
		3532	EB Right	80	26.7%	601	15.8%	497	7.2%	0.46	12.2%	70	497	532	542	527	562	585
				300		3795		6875		1.812	1.000	540						
2086	1839	3532	WB Left	80	18.2%	387	8.9%	310	4.4%	0.50	9.1%	60	310	310	318	348	372	370
		2108	WB Thru	270	61.4%	3623	83.0%	6341	90.4%	1.09	66.8%	470	6341	3975	3287	6292	5854	5536
		1838	WB Right	90	20.5%	355	8.1%	366	5.2%	0.64	24.1%	170	366	252	151	193	200	210
				440		4365		7017		1.608	1.000	710						
3532	1839	2108	NB Left	100	29.4%	0	0.0%	0	0.0%	1.00	29.4%	30	0	0	0	0	0	0
		1838	NB Thru	220	64.7%	2910	88.7%	623	66.3%	0.75	53.0%	50	623	597	675	615	708	716
		2086	NB Right	20	5.9%	370	11.3%	316	33.7%	2.98	17.5%	20	316	315	310	346	362	361
				340		3280		939		0.286	1.000	100						
1838	1839	2086	SB Left	25	5.1%	1044	23.0%	554	25.6%	1.12	5.7%	10	554	756	474	2003	935	752
		3532	SB Thru	210	42.9%	3049	67.1%	588	27.2%	0.41	17.4%	40	588	577	591	583	761	821
		2108	SB Right	255	52.0%	453	10.0%	1018	47.1%	4.73	76.9%	180	1018	149	197	349	472	476
				490		4546		2160		0.475	1.000	230						

#18 **NH 28 Bypass at Tsienneto Rd**

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	PM Traffic 2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NBld Model
EB Left	280	40.0%	1564	41.2%	1080	15.7%	0.38	15.2%	190	1080	159	202	475	1070	1096
EB Thru	345	49.3%	1630	43.0%	5298	77.1%	1.79	79.9%	1010	5298	2144	3385	4367	3469	3786
EB Right	75	10.7%	601	15.8%	497	7.2%	0.46	4.9%	60	497	532	542	527	562	585
	700		3795		6875		1.812	1.000	1270						
WB Left	25	9.3%	387	8.9%	310	4.4%	0.50	4.6%	20	310	310	318	348	372	370
WB Thru	175	64.8%	3623	83.0%	6341	90.4%	1.09	78.8%	340	6341	3975	3287	6292	5854	5536
WB Right	70	25.9%	355	8.1%	366	5.2%	0.64	16.6%	70	366	252	151	193	200	210
	270		4365		7017		1.608	1.000	430						
NB Left	100	22.5%	0	0.0%	0	0.0%	1.00	22.5%	30	0	0	0	0	0	0
NB Thru	320	71.9%	2910	88.7%	623	66.3%	0.75	53.8%	70	623	597	675	615	708	716
NB Right	25	5.6%	370	11.3%	316	33.7%	2.98	23.8%	30	316	315	310	346	362	361
	445		3280		939		0.286	1.000	130						
SB Left	75	16.9%	1044	23.0%	554	25.6%	1.00	16.9%	40	554	756	474	2003	935	752
SB Thru	185	41.6%	3049	67.1%	588	27.2%	0.41	16.9%	40	588	577	591	583	761	821
SB Right	185	41.6%	453	10.0%	1018	47.1%	4.73	66.3%	140	1018	149	197	349	472	476
	445		4546		2160		0.475	1.000	210						

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

#19 **NH 102 at Tsienneto Rd**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	**2040 Alt A** ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NBld Model
1882	1883	2062	EB Left	15	8.3%	404	7.9%	173	4.2%	0.53	4.4%	10	173	601	495	202	325	282
		1884	EB Thru	165	91.7%	4687	92.1%	3917	95.8%	1.04	95.4%	130	3917	1895	1639	3497	3962	3825
				180		5091		4090		0.803	1.00	140						
1884	1883	1882	WB Thru	320	51.6%	3861	55.7%	2954	34.2%	0.61	31.7%	240	2954	1706	2079	3185	3075	2811
		2062	WB Right	300	48.4%	3071	44.3%	5681	65.8%	1.49	68.3%	530	5681	7788	7145	5545	5011	4751
				620		6932		8635		1.246	1.00	770						
2062	1883	1884	SB Left	95	100.0%	1934	88.3%	4803	96.7%	1.09	100.0%	220	4803	7507	7450	5441	3682	3867
		1882	SB Right	0	0.0%	256	11.7%	166	3.3%	0.29	0.0%	0	166	431	439	174	173	172
				95		2190		4969		2.269	1.00	220						

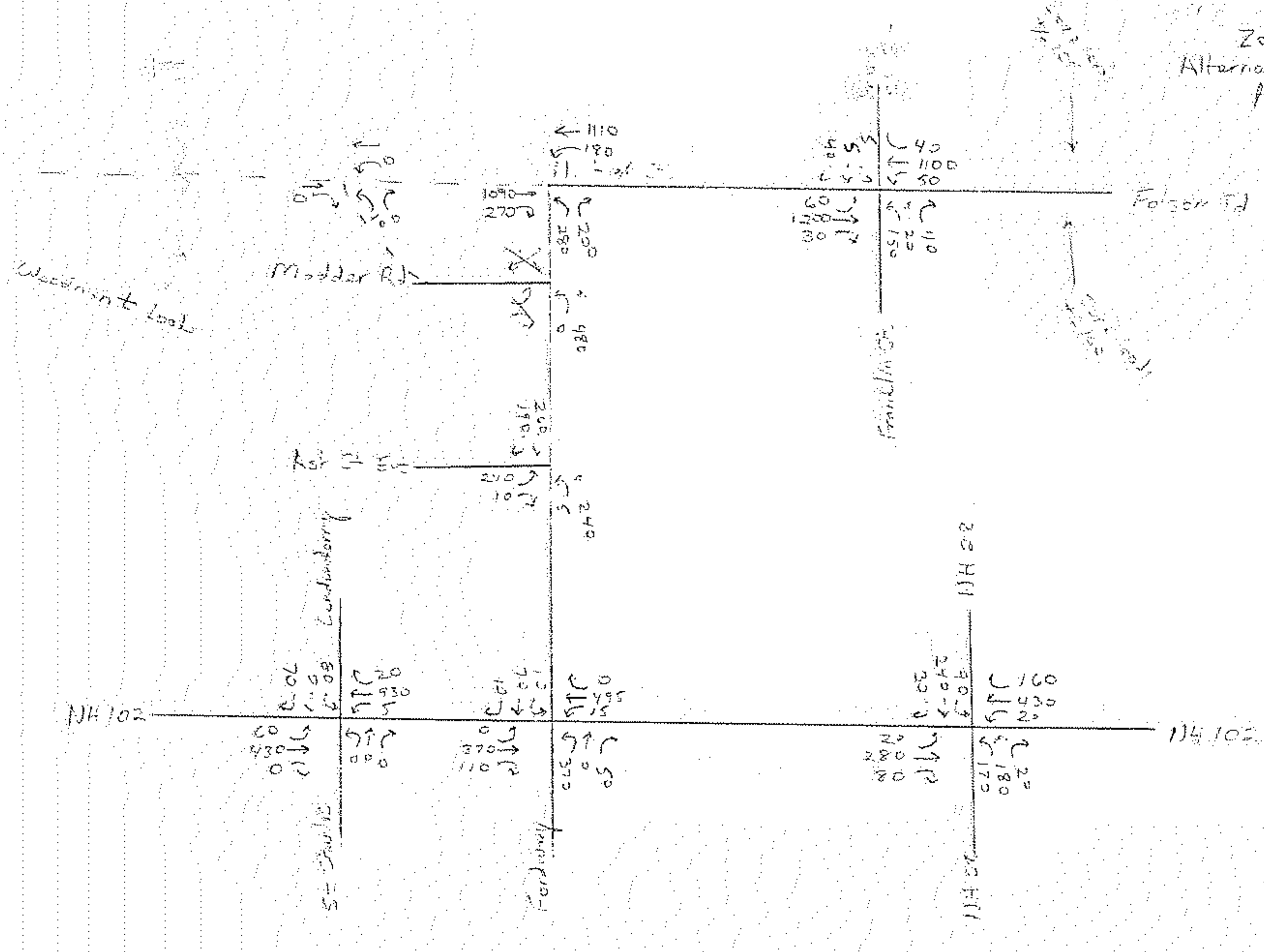
#19 **NH 102 at Tsienneto Rd**

PM Traffic

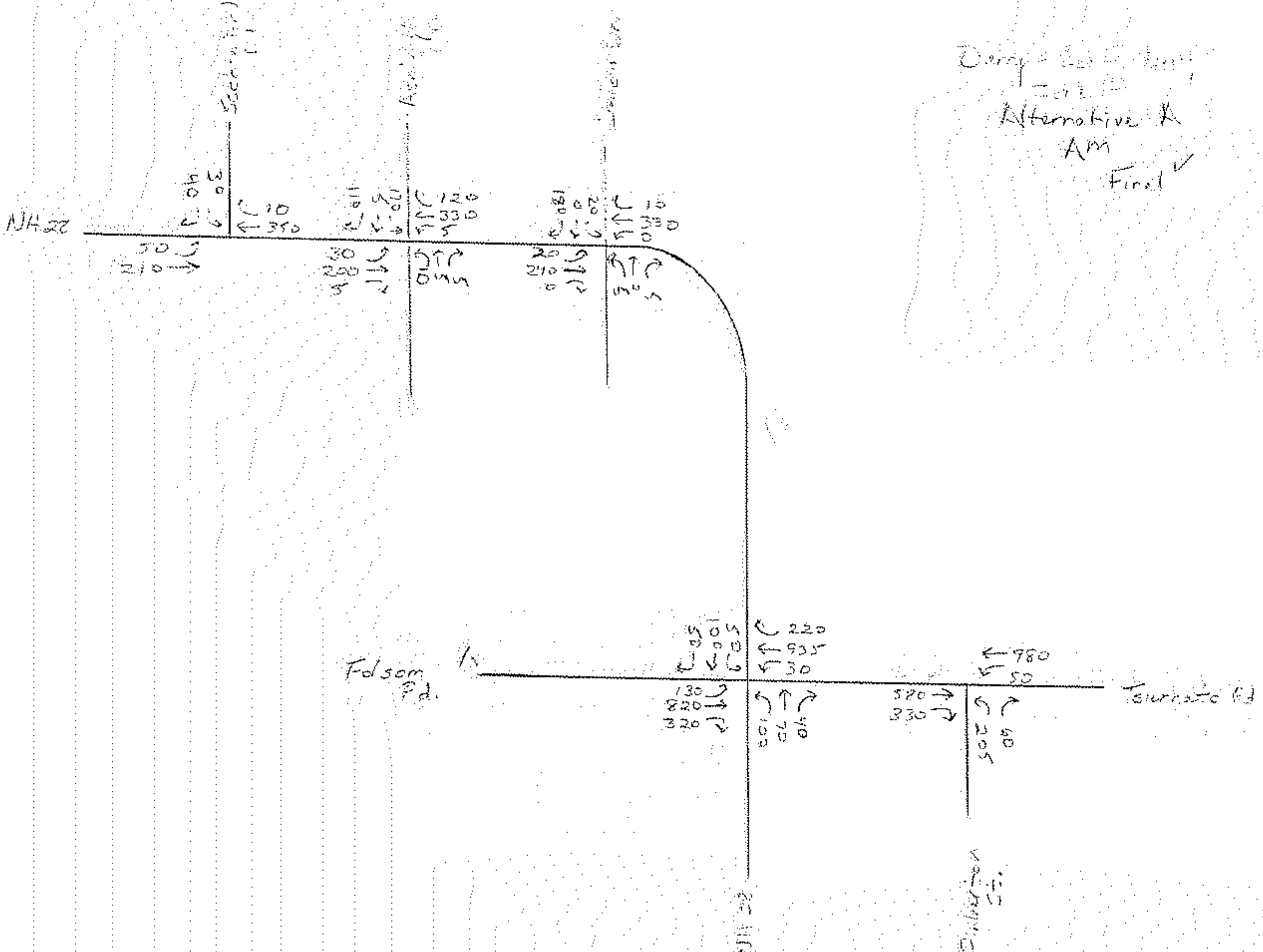
	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	**2040 Alt A** ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NBld Model
EB Left	15	4.0%	404	7.9%	173	4.2%	0.53	2.1%	10	173	601	495	202	325	282
EB Thru	360	96.0%	4687	92.1%	3917	95.8%	1.04	97.9%	290	3917	1895	1639	3497	3962	3825
	375		5091		4090		0.803	1.00	300						
WB Thru	235	55.3%	3861	55.7%	2954	34.2%	0.61	34.0%	180	2954	1706	2079	3185	3075	2811
WB Right	190	44.7%	3071	44.3%	5681	65.8%	1.49	66.0%	350	5681	7788	7145	5545	5011	4751
	425		6932		8635		1.246	1.00	530						
SB Left	270	98.2%	1934	88.3%	4803	96.7%	1.09	99.5%	620	4803	7507	7450	5441	3682	3867
SB Right	5	1.8%	256	11.7%	166	3.3%	0.29	0.5%	0	166	431	439	174	173	172
	275		2190		4969		2.269	1.00	620						

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

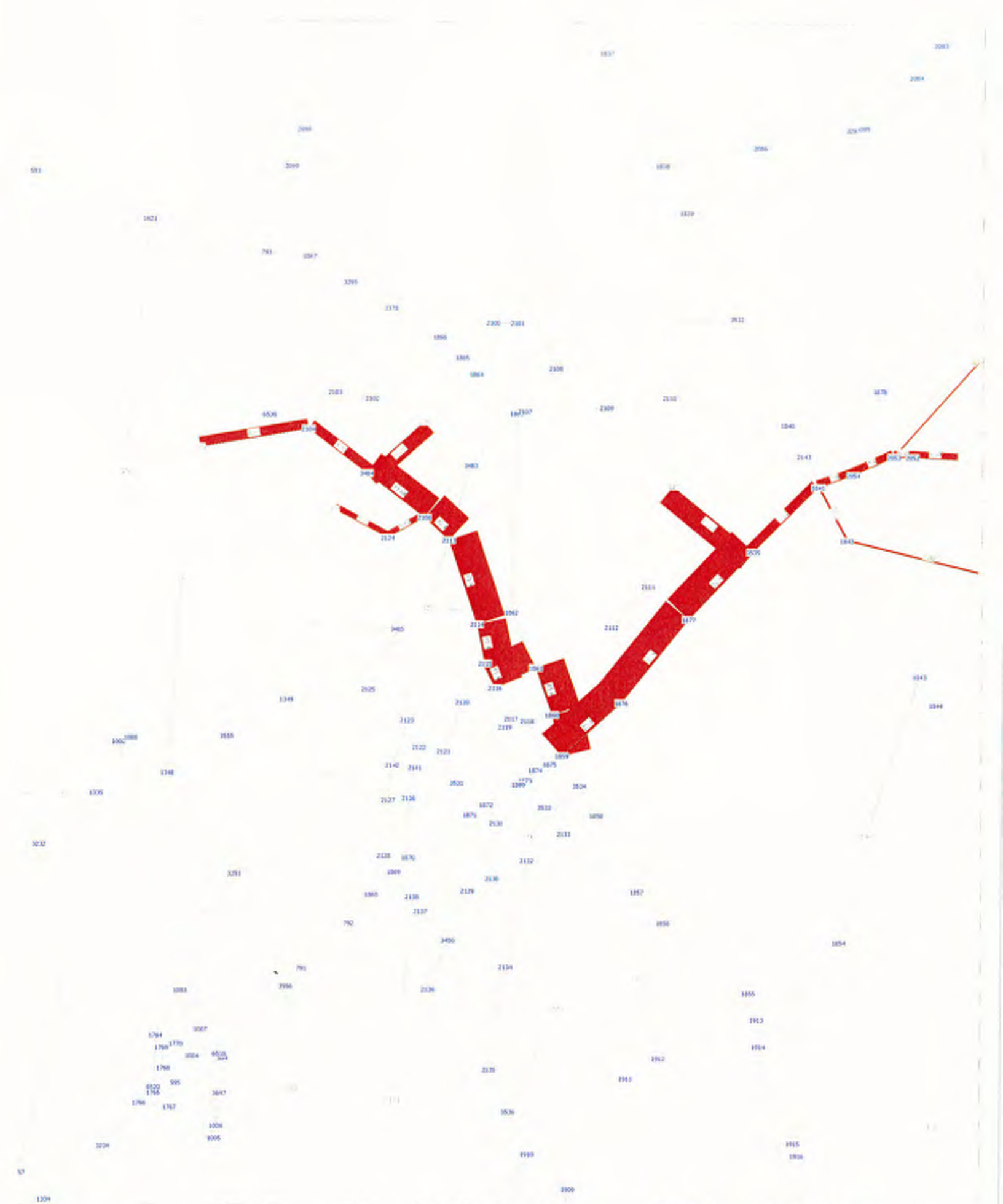
Zone 3
Alternative A
AM
Final ✓



Alternative A
AM
Final



Alternative A
AM
Final



WB1876-1859 - 2040 No Build

cube

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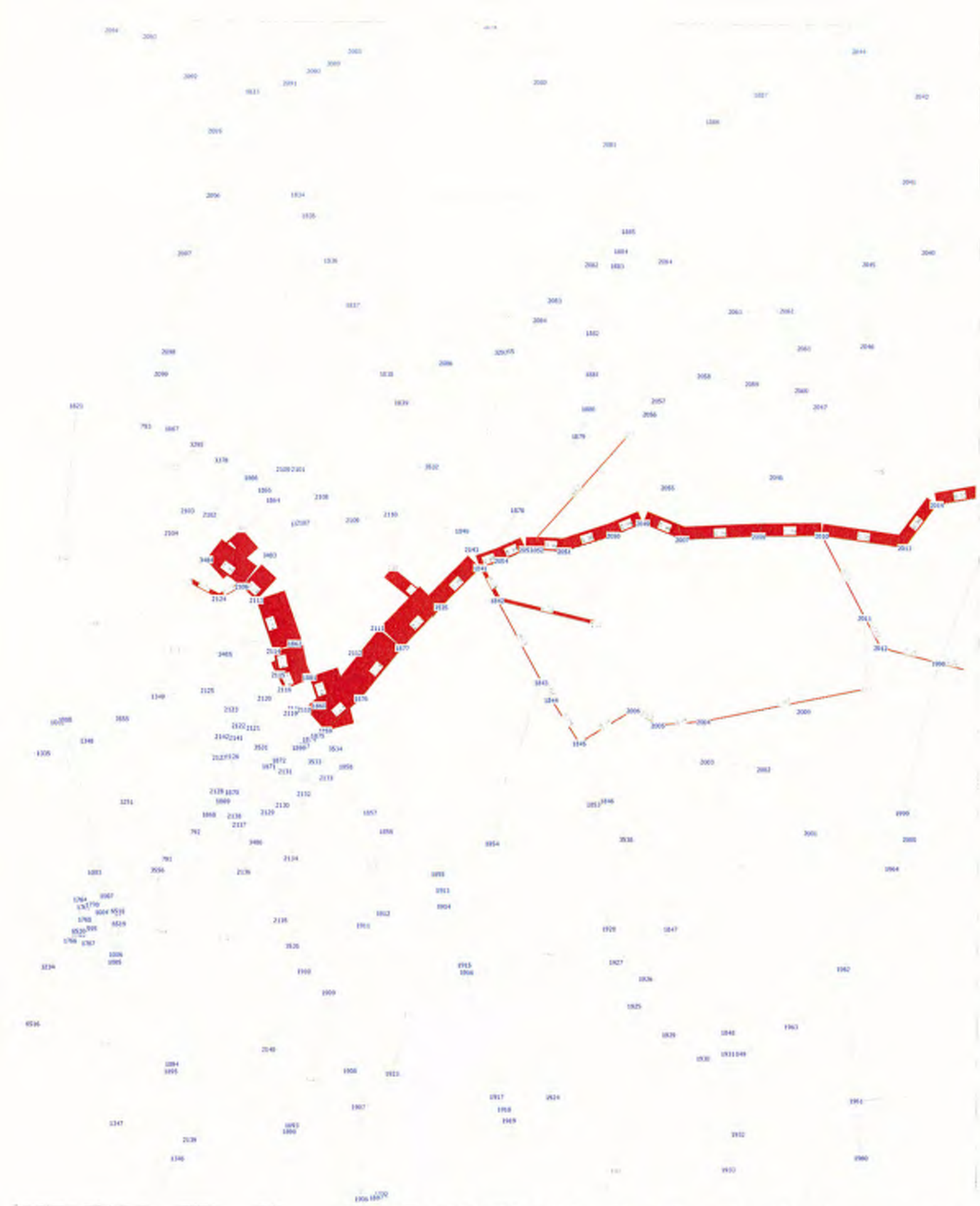
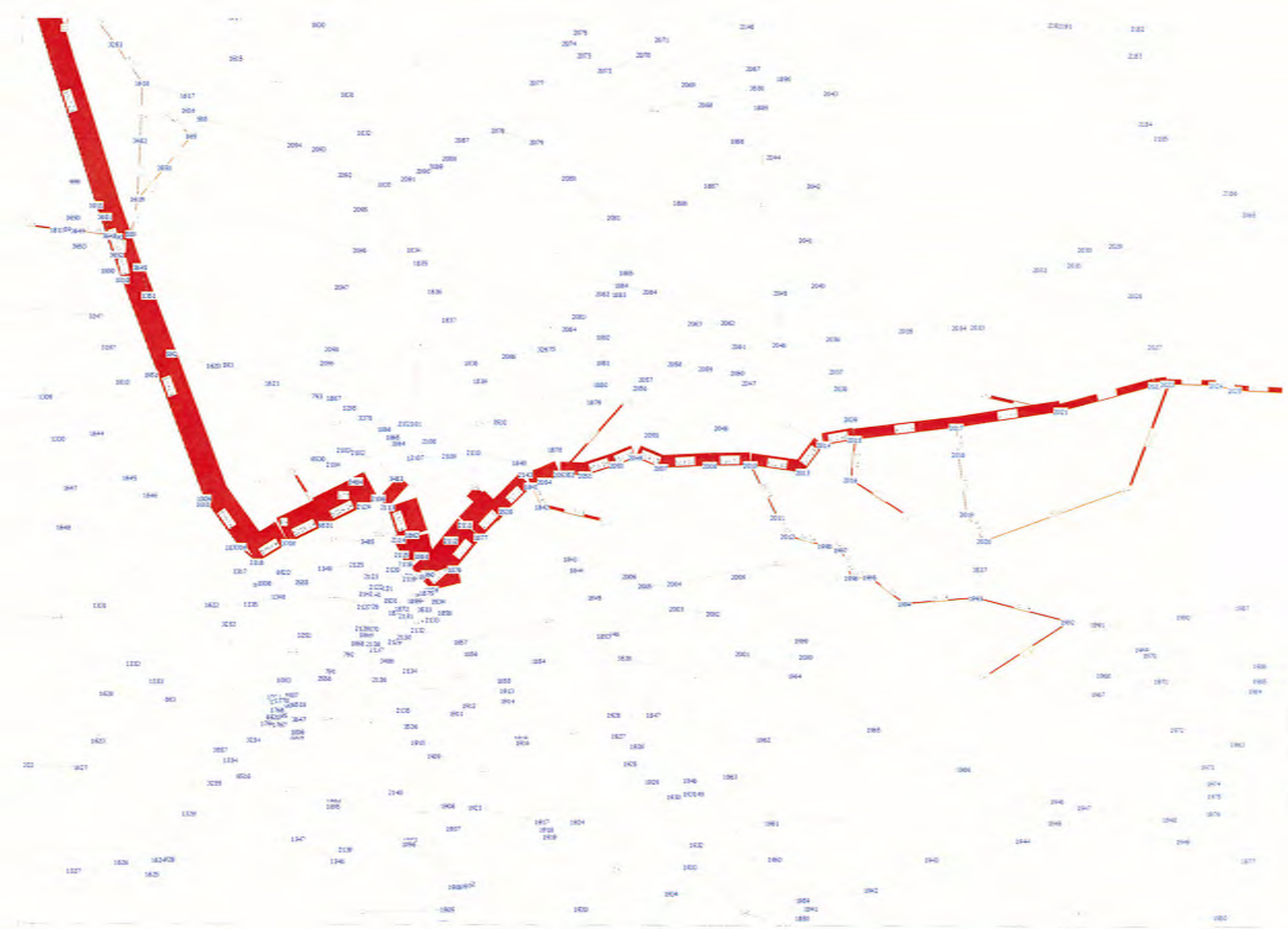


WB1876-1859 - 2015

cube



2040 Alt A WB 1859-1876

cube

APPENDIX L: HCS FREEWAY FACILITY APPENDIX

19-Jun-17

TABLE 10

HCS 2010 - FREEWAY FACILITIES ANALYSIS - 2040 NO-BUILD AND BUILD (South Interchange) CASES - AM and PM PEAK HOURS

Segment	Northbound Direction	2040 No Build						4A Alternative A						4A Alternative B					
		AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)		
		BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE
1	I-93 Mainline south of Exit 4	B/0.37			C/0.63			B/0.38			C/0.66			B/0.38			C.0.66		
2	Exit 4 NB off-ramp		A/0.26			B/0.61			A0.23			B/0.67			A/0.23			B/0.67	
3	I-93 Mainline between Exit 4 ramps	A/0.28			B/0.37			A/0.30			B/0.42			A/0.30			B/0.42		
4	Exit 4 NB on-ramp			C/1.25			C/0.99			B/0.89			C/0.70			C/1.03			C/0.81
5	I-93 Mainline between Exit 4 on-ramp and Exit 4A off-ramp							B/0.49			C/0.56			C/0.52			C/0.59		
6	Exit 4A NB off-ramp								C/0.48			C/0.41			C/0.52			C/0.44	
7	I-93 Mainline between Exit 4A ramps							B/0.40			B/0.48			B/0.43			B/0.50		
8	Exit 4A NB on-ramp									C/0.84			C/0.72			C/0.73			B/0.50
9	I-93 Mainline between Exit 4(4A) NB on- and Exit 5 NB off-ramps	B/0.55			C/0.57			C/0.56			C/0.62			C/0.56			C/0.62		
10	Exit 5 NB off-ramp		C/0.37			C/0.49			C/0.43			D/0.58			C/0.41			D/0.54	
11	I-93 Mainline between Exit 5 ramps	B/0.48			B/0.49			B/0.49			C/0.53			B/0.49			C/0.54		
12	Exit 5 NB on-ramp			C/0.83			C/0.62			C/0.67			C0.50			C/0.65			C/0.48
13	I-93 Mainline north of Exit 5	C/0.64			C/0.62			C/0.62			C/0.65			C/0.62			C/0.65		
	Facility operations	B			C			B			C			B			C		
	Space Mean Speed (mph)	68.4			68.6			68.5			67.9			67.6			67.9		
	Density (veh/mi/hr)	15.8			19.2			16.4			20.2			17.3			20.4		
Segment	Southbound Direction																		
1	I-93 Mainline north of Exit 6	C/0.59			C/0.64			C/0.62			C/0.62			C/063			C/0.62		
2	Exit 5 SB off-ramp		D/0.73			D/0.74			C/0.41			C/0.62			C/0.32			C/033	
3	I-93 Mainline between Exit 5 ramps	B/0.46			B/0.49			C/0.55			C/0.53			C/0.57			C/0.55		
4	Exit 5 SB on-ramp			C/0.45			C/0.38			C/0.52			B/0.44			B/0.40			B/0.34
5	I-93 Mainline between Exit 5 SB on- and Exit 4A SB off-ramps							C/0.65			C/0.61			C/0.65			C/0.62		
6	Exit 4A SB off-ramp								D/1.07			D/0.89			D/1.09			D/0.91	
7	I-93 Mainline between Exit 4A ramps							B/0.46			B/0.44			B/0.45			B/0.44		
8	Exit 4A SB on-ramp									C/0.60			C/0.51			C/0.70			C/0.58
9	I-93 Mainline between Exit 5(4A) SB on- and Exit 4 SB off-ramps	C/0.55			C/0.56			C/0.57			D/0.54			C/0.58			D/055		
10	Exit 4 SB off-ramp		C/0.84			D/1.10			C/0.76			C/0.91			C/0.81			D/0.98	
11	I-93 Mainline between Exit 4 SB off- and SB on ramp from east	B/0.36			B/0.33			B/0.43			B/0.36			B/0.43			B/0.36		
12	Exit 4 SB on-ramp from east			B/0.66			B/0.30			B/0.49			A/0.16			B/0.37			A/0.17
13	I-93 Mainline between Exit 4 SB on-ramps	B/0.48			B/0.38			B/0.49			B/0.39			B/0.49			B/0.39		
14	Exit 4 SB on-ramp from west			C/0.85		B/0.40				C/0.93			B/0.44			C/0.92		B/0.43	
15	I-93 Mainline south of Exit 5	C/0.64			B/0.46			C/0.66			B/0.47			C/0.66			B/0.47		
	Facility operations	C			C			C			C			C			C		
	Space Mean Speed (mph)	68.5			68.3			67.4			68.6			67.3			68.4		
	Density (veh/mi/hr)	18.8			19.1			20.6			18.4			20.9			18.9		

N/A

19-Jun-17

TABLE 10 (cont.)

HCS 2010 - FREEWAY FACILITIES ANALYSIS - 2040 NO-BUILD AND BUILD (North or No Interchange) CASES - AM and PM PEAK HOURS

		2040 No Build						4A Alternative C						4A Alternative D						4A Alternative F					
		AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)		
Segment	Northbound Direction	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE
1	I-93 Mainline south of Exit 4	B/0.37			C/0.63			B/0.37			C/0.64			B/0.37			C/0.64			B/037			C/0.64		
2	Exit 4 NB off-ramp		A/0.26			B/0.61			A/0.24			B/0.56			A/0.25			B/0.59			A/0.26			B/0.62	
3	I-93 Mainline between Exit 4 ramps	A/0.28			B/0.37			A/0.28			B/0.39			A/0.28			B/0.38			A/0.28			B/037		
4	Exit 4 NB on-ramp			C/1.25			C/0.99			B/0.93			B/0.73			B/0.90			B/0.71			C/1.25			C/0.99
5	I-93 Mainline between Exit 4 on-ramp and Exit 4A off-ramp	N/A						B/0.49			C/0.54			B/0.48			B/0.52			B/0.55			C/0.57		
6	Exit 4A NB off-ramp								B/0.15			C/0.13			B/0.08			B/0.07								
7	I-93 Mainline between Exit 4A ramps							B/0.46			B/0.51			B/0.46			B/0.51								
8	Exit 4A NB on-ramp									C/0.74			C/0.63			C/0.76			C/0.64						
9	I-93 Mainline between Exit 4(4A) NB on- and Exit 5 NB off-ramps	B/0.55			C/0.57			C/0.60			C/0.64			C/0.60			C/0.64								
10	Exit 5 NB off-ramp		C/0.37			C/0.49			C/0.40			C/0.51			C/0.41			D/0.55			C/0.36			C/0.48	
11	I-93 Mainline between Exit 5 ramps	B/0.48			B/0.49			C/0.53			C/0.56			C/0.53			C/0.55			B/0.49			B/0.49		
12	Exit 5 NB on-ramp			C/0.83			C/0.62			C/0.48			C/0.36			C/0.49			C/0.39			C/0.82			C/0.62
13	I-93 Mainline north of Exit 5	C/0.64			C/0.62			C/0.63			C/0.63			C/0.63			C/0.63			C/0.65			C/0.62		
	Facility operations	B			C			B			C			B			C			B			C		
	Space Mean Speed (mph)	68.4			68.6			68.4			68.3			68.6			68.4			68.4			68.6		
	Density (veh/mi/hr)	15.8			19.2			16.4			19.7			16.4			19.5			15.8			19.2		
Segment	Southbound Direction																								
1	I-93 Mainline north of Exit 6	C/0.59			C/0.64			C/0.62			C/0.61			C/0.62			C/0.61			C/0.58			C/064		
2	Exit 5 SB off-ramp		D/0.73			D/0.74			C/0.31			C/0.31			C/0.31			C/0.32			C/0.66			C/0.67	
3	I-93 Mainline between Exit 5 ramps	B/0.46			B/0.49			C/0.57			C/0.55			C/0.57			C/0.55			B/0.47			B/0.50		
4	Exit 5 SB on-ramp			C/0.45			C/0.38			C/0.45			C/0.38			C/0.44			C/0.38			B/0.45			B/0.38
5	I-93 Mainline between Exit 5 SB on- and Exit 4A SB off-ramps	N/A						C/0.66			C/0.63			C/0.66			C/0.62			C/0.55			C/0.57		
6	Exit 4A SB off-ramp								D/0.92			D/0.79			D/0.91			D/0.78								
7	I-93 Mainline between Exit 4A ramps							B/0.48			B/0.46			B/0.48			B/0.46								
8	Exit 4A SB on-ramp									B/0.27			B/0.23			B/0.25			B/0.21						
9	I-93 Mainline between Exit 5(4A) SB on- and Exit 4 SB off-ramps	C/0.55			C/0.56			B/0.52			B/0.51			B/0.52			B/0.50								
10	Exit 4 SB off-ramp		C/0.84			D/1.10			C/0.64			C/0.76			C/0.63			C/0.75			C/0.85			D/1.12	
11	I-93 Mainline between Exit 4 SB off- and SB on ramp from east	B/0.36			B/0.33			B/0.40			B/0.34			B/0.40			B/0.34			B/0.36			B/0.33		
12	Exit 4 SB on-ramp from east			B/0.66			B/0.30			B/0.46			B/0.21			B/0.46			B/0.21			B/0.67			B/0.30
13	I-93 Mainline between Exit 4 SB on-ramps	B/0.48			B/0.38			C/0.48			B/0.38			B/0.48			B/0.38			B/0.48			B/0.38		
14	Exit 4 SB on-ramp from west			C/0.85		B/0.40				C/0.86			B/0.40			C/0.85			B/0.40			C/0.84			B/0.39
15	I-93 Mainline south of Exit 5	C/0.64			B/0.46			C/0.64			B/0.46			C/0.64			B/0.46			C/0.64			B/0.46		
	Facility operations	C			C			C			C			C			C			C			B		
	Space Mean Speed (mph)	68.5			68.3			67.9			68.5			67.9			68.6			68.5			68.4		
	Density (veh/mi/hr)	18.8			19.1			19.9			17.8			19.8			17.8			18.8			19.1		

4A 2015 Freeway Facility - Northbound

Station	Length	Node	Description	Accel/Decel		Lanes	FFS	%Trucks/RV	PHF		
1526+70		a									
	5280	1	Basic Highway			1 lanes	70 mph	4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4	
1579+50		b							0.94	Default Value for all Mainline Segments per NHDOT	
	1500	2	Diverge- Exit 4 off Ramp	Decel	814	1 lane	50 mph	7.4	0.77	AM	NB Right and Left intersection turning movements
1594+50	PVM	c						1.8	0.92	PM	
	3275	3	Basic Highway					4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4	
1627+25	PVM	d									
	1500	4	Merge - Exit 4 on Ramp	Accel	1400	1 lane	50 mph	3.4	0.90	AM	WB Right intersection turning movements
1642+25		e						2.5	0.87	PM	
	13025	5	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B	
1772+50		f						3 / 0.3		PM From Noise Study Counts Location A-B	
	1500	6	Diverge- Exit 5 off Ramp	Decel	480	1 lane	50 mph	9.1	0.75	AM	NB Right and Left intersection turning movements
1787+50		g						7.5	0.67	PM	
	4100	7	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B	
1828+50		h						3 / 0.3		PM From Noise Study Counts Location A-B	
	1500	8	Merge - Exit 5 on Ramp	Accel	750	1 lane	50 mph	5.7	0.83	AM	WB Right intersection turning movements
1843+50		i						2.4	0.89	PM	
	5280	9	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B	
1896+30		j						3 / 0.3		PM From Noise Study Counts Location A-B	

4A 2015 Freeway Facility - Southbound

Station	Length	Node	Description	Accel/Decel		Lane	FFS	%Trucks/%RV	PHF		
3892+80		a						6.2 / 0.1		AM - From Noise Study Counts Location A-B	
	5280	1	Basic Highway			2 lanes	70 mph	3.62 / 0.3		PM - From Noise Study Counts Location A-B	
3840+00		b							0.94	AM & PM Default Value for all Mainline	
	1500	2	Diverge- Exit 5 off Ramp	Decel	520	1 lane	50 mph	5.77	0.74	AM	SB Right and Left Intersection turning movements
3825+00		c						4.28	0.885	PM	
	3920	3	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B	
3785+80		d						3.62 / 0.3		PM - From Noise Study Counts Location A-B	
	1500	4	Merge - Exit 5 on Ramp	Accel	880	1 lane	50 mph	9.81	0.84	AM	EB right & WB Left intersection turning movements
3770+80		e						4.41	0.81	PM	
	11730	5	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B	
3653+50		f						3.62 / 0.3		PM - From Noise Study Counts Location A-B	
	1500	6	Diverge- Exit 4 off Ramp	Decel	739	1 lane	50 mph	5.2	0.95	AM	
3638+50	PVM	g						2.85	0.92	PM	
	2550	7	Basic Highway					3.78 / 0.62			AM & PM From Permanent Recorder Station South of Exit 4
3613+00	PVM	h							0.94	AM/PM	Default Value
	1500	8	Merge - Exit 4 on Ramp	Accel	1612	1 lane	30 mph	6.20	0.82	AM	Default value
3598+00		i	30 mph					4.0	0.82	PM	Default value
	600	9	Basic Highway						0.94	AM/PM	Default Value
3592+00	PVM	j						3.78 / 0.62			AM & PM From Permanent Recorder Station South of Exit 4
	1500	10	Merge - Exit 4 on Ramp	Accel	1400	1 lane	50 mph	6.2	0.82	AM	Default Value
3577+00		k						4.0	0.82	PM	Default Value
	5280	11	Basic Highway					3.78 / 0.62	0.94		AM & PM From Permanent Recorder Station South of Exit 4
3524+20		l									

4A 2040 Freeway Facility - No Build - Northbound

Station	Length	Node	Description		Accel/Decel		Lanes	FFS
1526+20		a						
	5280	1	Basic Highway					70 mph
1579+00		b						
	1500	2	Diverge- Exit 4 off Ramp		Decel	814	2 lanes	50 mph
1594+00	PVM	c		2 Lane				
	4525	3	Basic Highway					
1639+25	PVM	d						
	1500	4	Merge - Exit 4 on Ramp		Accel	1400	1 lane	50 mph
1654+25		e						
	11825	5	Basic Highway					
1772+50		f						
	1500	6	Diverge- Exit 5 off Ramp		Decel	480	1 lane	50 mph
1787+50	PVM	g						
	4100	7	Basic Highway					
1828+50	PVM	h						
	1500	8	Merge - Exit 5 on Ramp		Accel	900	1 lane	50 mph
1843+50		i						
	5280	000+09	Basic Highway					
1896+30		j						

Use same Truck% and PHF as Existing

Contract D

1594+00 PVM for Exit 4 off ramp

1639+25 PMV for Exit 4 on ramp

Contract I

1787+50 PVM for Exit 5 off ramp

1828+50 PCM for Exit 5 on ramp

4A 2040 Freeway Facility - No Build - Southbound

Station	Length	Node	Description	Accel/Decel		Lanes	FFS
3892+80		a					
	5280	1	Basic Highway				
3840+00		b					
	1500	2	Diverge- Exit 5 off Ramp	Decel	750	1 lane	50 mph
3825+00		c					
	3920	3	Basic Highway				
3785+80		d					
	1500	4	Merge - Exit 5 on Ramp	Accel	1420	1 lane	50 mph
3770+80		e					
	11730	5	Basic Highway				
3653+50		f					
	1500	6	Diverge- Exit 4 off Ramp	Decel	738	1 lane	50 mph
3638+50	PVM	g					
	2550	7	Basic Highway				
3613+00	PVM	h					
	1500	8	Merge - Exit 4 on loop Ramp	Accel	1376	1 lane	30 mph
3598+00		i					0
	600	9	Basic Highway				
3592+00	PVM	j					
	1500	10	Merge - Exit 4 on Ramp	Accel	1390	1 lane	50 mph
3577+00		k					
	5280	11	Basic Highway				
3524+20		l					

Use same Truck% and PHF as Existing

4A 2040 Freeway Facility - Alts A&B - Northbound

Station	Length	Node	Description	Accel/Decel		Lanes	FFS	%Trucks/RV	PHF	
1526+20		a								
	5280	1	Basic Highway				70 mph	4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4
1579+00		b							0.94	Default Value for all Mainline Segments per NHDOT
	1500	2	Diverge- Exit 4 off Ramp	Decel	814	2 Lane	50 mph	7.4	0.77	AM
1594+00	PVM	c						1.8	0.92	PM
	4525	3	Basic Highway					4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4
1639+25	PVM	d								
	1500	4	Merge - Exit 4 on Ramp	Accel	1400	1 Lane	50 mph	3.4	0.90	AM
1654+25		e						2.5	0.87	PM
	-700	5	Overlap					7.5 / 0.0		
1647+25		f						3 / 0.3		PM From Noise Study Counts Location A-B
	1500	6	Diverge- Exit 4A off ramp	Decel	750	1 Lane	50 mph	6.41	0.81	AM
1662+25	PVM	g						3.53	0.84	PM
	3310	7	Basic Highway		4A Ramps			7.5 / 0.0		
1695+35	PVM	h						3 / 0.3		
	1500	8	Merge - Exit 4A on Ramp	Accel	890	1 Lane	50 mph	6.41	0.81	AM
1710+35		i						3.53	0.84	PM
	6215	9	Basic Highway					7.5 / 0.0		
1772+50		j						3 / 0.3		
	1500	10	Diverge- Exit 5 off Ramp	Decel	480	1 Lane	50 mph	9.1	0.75	AM
1787+50	PVM	k						7.5	0.67	PM
	4100	11	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B
1828+50	PVM	l						3 / 0.3		PM From Noise Study Counts Location A-B
	1500	12	Merge - Exit 5 on Ramp	Accel	750	1 Lane	50 mph	5.7	0.83	AM
1843+50		m						2.4	0.89	PM
	5280	13	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B
1896+30		n						3 / 0.3		PM From Noise Study Counts Location A-B

4A 2040 Freeway Facility - Alts A&B - Southbound

Station	Length	Node	Description	Accel/Decel		Lane	FFS	%Trucks/%RV	PHF	
3892+80		a						6.2 / 0.1		AM - From Noise Study Counts Location A-B
	5280	1	Basic Highway			4 lanes	70 mph	3.62 / 0.3		PM - From Noise Study Counts Location A-B
3840+00		b							0.94	AM & PM Default Value for all Mainline
	1500	2	Diverge- Exit 5 off Ramp	Decel	750	1 lane	50 mph	5.77	0.74	AM
3825+00		c						4.28	0.885	PM
	3920	3	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B
3785+80		d						3.62 / 0.3		PM - From Noise Study Counts Location A-B
	1500	4	Merge - Exit 5 on Ramp	Accel	1420	1 lane	50 mph	9.81	0.84	AM
3770+80		e						4.41	0.81	PM
	7615	5	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B
3709+65		f						3.62 / 0.3		PM - From Noise Study Counts Location A-B
	1500	6	Diverge- Exit 4A off Ramp	Decel	500	1 lane	50 mph	7.26	0.80	AM Average of known ramps
3694+65		g						4.23	0.84	PM Average of known ramps
	3165	7	Basic Highway		4A Ramps			6.2 / 0.1	0.94	
		h						3.62 / 0.3		
3663+00	PVM	8	Merge	Accel	815	1 lane	50 mph	7.26	0.80	AM Average of known ramps
	1500	i						4.23	0.84	PM Average of known ramps
	-650	9	Overlap							
	1500	j								
3639+50	PVM	10	Diverge	Decel	735	1 lane	50 mph	7.26	0.80	AM Average of known ramps
		k						4.23	0.84	PM Average of known ramps
	2650	11	Basic Highway						0.94	AM/PM Default Value
3613+00	PVM	l						3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
	1500	12	Merge - Exit 4 on Ramp (loop)	Accel	1376	1 lane	30 mph	6.20	0.82	AM Default Value
3598+00		m						4.0	0.82	PM Default Value
	600	13	Basic Highway						0.94	AM/PM Default Value
3592+00	PVM	n						3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
	1500	14	Merge - Exit 4 on Ramp	Accel	1390	1 lane	50 mph	6.2	0.82	AM Default Value
3577+00		o						4.0	0.82	PM Default Value
	5280	15	Basic Highway					3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
3524+20		p								

4A 2040 Freeway Facility - Alts C&D - Northbound

Station	Length	Node	Description	Accel/Decel		Lanes	FFS	%Trucks/RV	PHF	
1526+20		a								
	5280	1	Basic Highway					4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4
1579+00		b							0.94	Default Value for all Mainline Segments per NHDOT
	1500	2	Diverge- Exit 4 off Ramp	Decel	814	2 Lane	50	7.4	0.77	AM
1594+00	PVM	c						1.8	0.92	PM
	4525	3	Basic Highway					4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4
1639+25	PVM	d								
	1500	4	Merge - Exit 4 on Ramp	Accel	1400	1 Lane	50	3.4	0.90	AM
1654+25		e						2.5	0.87	PM
	4497	5	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B
1699+22		f						3 / 0.3		PM From Noise Study Counts Location A-B
	1500	6	Diverge- Exit 4A off ramp	Decel	734	1 Lane	50	6.41	0.81	AM Average of known ramps
1714+22		g			4A Ramps			3.53	0.84	PM Average of known ramps
	2702	7	Basic Highway					7.5 / 0.0		
1741+24		h						3 / 0.3		
	1500	8	Merge - Exit 4A on Ramp	Accel	1400	1 Lane	50	6.41	0.81	AM Average of known ramps
1756+24		i						3.53	0.84	PM Average of known ramps
	1626	9	Basic Highway					7.5 / 0.0		
1772+50		j						3 / 0.3		
	1500	10	Diverge- Exit 5 off Ramp	Decel	480	1 Lane	50	9.1	0.75	AM
1787+50	PVM	k						7.5	0.67	PM
	4100	11	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B
1828+50	PVM	l						3 / 0.3		PM From Noise Study Counts Location A-B
	1500	12	Merge - Exit 5 on Ramp	Accel	750	1 Lane	50	5.7	0.83	AM
1843+50		m						2.4	0.89	PM
	5280	13	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B
1896+30		n						3 / 0.3		PM From Noise Study Counts Location A-B

4A 2040 Freeway Facility - Alts C&D - Southbound

Station	Length	Node	Description	Accel/Decel		Lanes	FFS	Trucks/%R	PHF	
3892+80		a						6.2 / 0.1		AM - From Noise Study Counts Location A-B
	5280	1	Basic Highway					3.62 / 0.3		PM - From Noise Study Counts Location A-B
3840+00		b							0.94	AM & PM Default Value for all Mainline
	1500	2	Diverge- Exit 5 off Ramp	Decel	750	1 lane	50 mph	5.77	0.74	AM
3825+00		c						4.28	0.885	PM
	3920	3	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B
3785+80		d						3.62 / 0.3		PM - From Noise Study Counts Location A-B
	1500	4	Merge - Exit 5 on Ramp	Accel	1420	1 lane	50 mph	9.81	0.84	AM
3770+80		e						4.41	0.81	PM
	2705	5	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B
3758+75		f						3.62 / 0.3		PM - From Noise Study Counts Location A-B
	1500	6	Diverge- Exit 4A off Ram	Decel	485	1 lane	50 mph	6.74	0.84	AM Average of known ramps
3743+75		g						3.89	0.86	PM Average of known ramps
	2850	7	Basic Highway		4A Ramps			6.2 / 0.1		
3715+25		h						3 / 0.3		
	1500	8	Merge - Exit 4A on Ramp	Accel	1400	1 lane	50 mph	6.74	0.84	AM Average of known ramps
3700+25		i						3.89	0.86	PM Average of known ramps
	4675	9	Basic Highway						0.94	AM/PM - Default Value
3653+50		j						3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
	1500	10	Diverge- Exit 4 off Ramp	Decel	738	1 lane	50 mph	5.2	0.95	AM
3638+50	PVM	k						2.85	0.92	PM
	2550	11	Basic Highway					3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
3613+00	PVM	l							0.94	AM/PM - Default Value
	1500	12	Merge - Exit 4 on Ramp	Accel	1376	1 lane	30 mph	6.20	0.82	AM
3598+00		m						4.0	0.82	PM
	600	13	Basic Highway						0.94	AM/PM - Default Value
3592+00	PVM	n						3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
	1500	14	Merge - Exit 4 on Ramp	Accel	1390	1 lane	50 mph	6.2	0.82	AM Default Value
3577+00		o						4.0	0.82	PM Default Value
	5280	15	Basic Highway					3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
3524+20		p								

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB
Analysis Year	2040 No Build - AM	Date	6/8/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	9
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11825	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	4100	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3537	9600	0.37	70.0	12.6	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3537	1098	9600	4200	0.37	0.26	68.0	60.7	13.0	-2.7	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	2439	9600	0.28	70.0	8.7	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.94	0.90	0.979	0.983	4539	2617	9600	2100	0.55	1.25	53.3	61.7	45.0	21.9	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4539	9600	0.55	70.0	16.2	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.75	0.964	0.956	4539	774	9600	2100	0.55	0.37	67.7	61.5	16.8	20.7	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	3765	9600	0.48	70.0	13.4	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.964	0.972	5513	1748	9600	2100	0.66	0.83	63.1	60.3	21.8	25.3	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5513	9600	0.64	69.6	19.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	16.3	15.8	6.1	B

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	15.8
Average Travel Time, min	6.1		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 - No Build AM	Date	6/8/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	11
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11730	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	2550	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	600	4
10	Merge	Merge	j->k	1500	4
11	Basic	Basic	l->m	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5659	9600	0.59	69.5	20.4	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5659	1536	9600	2100	0.59	0.73	65.5	59.6	21.6	28.2	D

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	4447	9600	0.46	70.0	15.9	B

Segment 4: Merge

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period					(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.953	5384	937	9600	2100	0.56	0.45	64.3	61.8	20.9	20.7	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5270	9600	0.55	69.8	18.9	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.95	0.970	0.975	5270	1754	9600	2100	0.55	0.84	64.7	59.1	20.4	25.9	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3452	9600	0.36	70.0	12.3	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4772	1320	9600	2000	0.50	0.66	64.4	61.9	18.5	16.5	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4592	9600	0.48	70.0	16.4	B

Segment 10: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6377	1785	9600	2100	0.66	0.85	63.3	60.8	25.2	24.1	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6133	9600	0.64	68.7	22.3	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.5	19.3	18.8	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.5	Density, veh/mi/ln	18.8
Average Travel Time, min	6.1		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB
Analysis Year	2040 No Build PM - NB	Date	6/8/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	9
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11825	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	4100	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6085	9600	0.63	68.8	22.1	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.979	0.991	6085	2561	9600	4200	0.63	0.61	63.7	57.0	23.9	12.3	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3548	9600	0.37	70.0	12.7	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.94	0.87	0.979	0.988	5619	2071	9600	2100	0.59	0.99	63.7	61.3	22.1	23.0	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5449	9600	0.57	69.7	19.5	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.985	0.964	5449	1037	9600	2100	0.57	0.49	66.9	60.9	20.4	25.4	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4725	9600	0.49	70.0	16.9	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.985	0.988	6033	1308	9600	2100	0.63	0.62	63.3	60.5	23.8	25.1	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5967	9600	0.62	69.0	21.6	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.6	19.6	19.2	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	19.2
Average Travel Time, min	6.1		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 No Build - PM	Date	6/10/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	11
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11730	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	2550	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	600	4
10	Merge	Merge	j->k	1500	4
11	Basic	Basic	l->m	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	6186	9600	0.64	68.6	22.5	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.982	0.979	6186	1555	9600	2100	0.64	0.74	65.4	59.6	23.6	30.3	D

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	4631	9600	0.49	70.0	16.5	B

Segment 4: Merge

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period					(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.982	0.978	5426	795	9600	2100	0.57	0.38	64.3	61.9	21.1	20.2	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5426	9600	0.56	69.7	19.5	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.982	0.986	5426	2315	9600	2100	0.56	1.10	53.3	57.7	45.0	29.2	D

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3111	9600	0.33	70.0	11.1	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	3715	604	9600	2000	0.39	0.30	65.5	62.8	14.2	10.2	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3715	9600	0.38	70.0	13.3	B

Segment 10: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4549	834	9600	2100	0.47	0.40	65.7	63.8	17.3	14.4	B

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4549	9600	0.46	70.0	16.2	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.3	19.4	19.1	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.3	Density, veh/mi/ln	19.1
Average Travel Time, min	6.1		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB w/Overlap
Analysis Year	2040 4A South Alt. A - AM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a>b	5280	4
2	Diverge	Diverge	b>c	1500	4
3	Basic	Basic	c>d	4525	4
4	Merge	Merge	d>e	1500	4
5	Overlap	Basic	e>f	700	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3310	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	6215	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	4100	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3662	9600	0.38	70.0	13.1	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3662	977	9600	4200	0.38	0.23	68.7	61.0	13.3	-3.2	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	2874	9600	0.30	70.0	10.3	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.90	0.979	0.983	4733	1859	9600	2100	0.49	0.89	64.8	62.7	18.3	19.3	B

Segment 5: Overlap

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	4662	9600	0.49	64.8	18.3	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	4734	1013	9600	2100	0.49	0.48	67.0	60.9	17.7	20.2	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	3857	9600	0.40	70.0	13.8	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	5628	1771	9600	2100	0.59	0.84	63.2	60.5	22.3	24.9	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5391	9600	0.56	69.7	19.3	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.75	0.964	0.956	5391	907	9600	2100	0.56	0.43	67.3	61.2	20.0	24.5	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4674	9600	0.49	70.0	16.7	B

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.964	0.972	6081	1407	9600	2100	0.63	0.67	63.1	60.2	24.1	25.7	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5926	9600	0.62	69.1	21.4	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.5	16.9	16.4	6.4	B

Facility Overall Results

Space Mean Speed, mi/h	68.5	Density, veh/mi/ln	16.4
Average Travel Time, min	6.4		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 - 4A South Alt. A AM - SB Overlap	Date	6/30/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	7615	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3165	4
8	Merge	Merge	h>i4A on ramp	1500	4
9	Overlap	Basic	i>j	650	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2650	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	1580	4
14	Merge	Merge	l>m	1500	4
15	Basic	Basic	m>n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5994	9600	0.62	69.0	21.7	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5994	869	9600	2100	0.62	0.41	67.3	61.3	22.3	24.2	C

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		5125		9600		0.55		69.9		18.3		C
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.970	0.953	6218	1093	9600	2100	0.67	0.52	64.3	62.5	24.2	20.6	C
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		6218		9600		0.65		68.5		22.7		C
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	6218	2241	9600	2100	0.65	1.07	53.3	57.8	45.0	33.9	D
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		3977		9600		0.46		70.0		14.2		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5246	1269	9600	2100	0.59	0.60	64.0	61.3	20.5	22.2	C
Segment 9: Overlap															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		5246		9600		0.57		64.0		20.5		C
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5246	1587	9600	2100	0.57	0.76	65.3	59.5	20.1	24.4	C
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		3659		9600		0.43		70.0		13.1		B
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4350	691	9600	2000	0.49	0.35	65.1	62.6	16.7	12.6	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4350	9600	0.49	70.0	15.5	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6311	1961	9600	2100	0.69	0.93	63.1	60.5	25.0	24.7	C

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6311	9600	0.66	68.3	23.1	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.4	21.1	20.6	6.9	C

Facility Overall Results

Space Mean Speed, mi/h	67.4	Density, veh/mi/ln	20.6
Average Travel Time, min	6.9		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 - 4A South Alt. A AM - SB Overlap	Date	6/30/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	7615	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3165	4
8	Merge	Basic	h>i4A on ramp	1500	3
9	Overlap	Basic	i>j	650	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2650	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	1580	4
14	Merge	Merge	l>m	1500	4
15	Basic	Basic	m>n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5994	9600	0.62	69.0	21.7	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5994	869	9600	2100	0.62	0.41	67.3	61.3	22.3	24.2	C

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		5308		9600		0.55		69.8		19.0		C
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.970	0.953	6401	1093	9600	2100	0.67	0.52	64.1	62.3	25.0	21.2	C
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		6268		9600		0.65		68.4		22.9		C
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	6268	2241	9600	4200	0.65	0.53	64.8	57.8	24.2	16.3	B
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		4398		9600		0.46		70.0		15.7		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5639	1269	7200	2100	0.61	0.60	69.2	57.9	21.1	30.2	C
Segment 9: Overlap															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		5445		9600		0.57		69.2		21.1		C
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5445	1587	9600	2100	0.57	0.76	65.3	59.5	20.8	25.2	C
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		4102		9600		0.43		70.0		14.7		B
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4751	691	9600	2000	0.49	0.35	64.9	62.4	18.3	13.8	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4657	9600	0.49	70.0	16.6	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6618	1961	9600	2100	0.69	0.93	62.6	59.9	26.4	25.6	C

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6350	9600	0.66	68.3	23.3	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.0	21.0	20.4	6.8	C

Facility Overall Results

Space Mean Speed, mi/h	68.0	Density, veh/mi/ln	20.4
Average Travel Time, min	6.8		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB Overlap
Analysis Year	2040 4A South Alt. A - PM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d>e	1500	4
5	Overlap	Basic	e>f	700	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g > h	3310	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	6215	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6303	9600	0.66	68.4	23.0	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	6303	2809	9600	4200	0.66	0.67	63.0	56.4	25.0	14.4	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	4037	9600	0.42	70.0	14.4	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.87	0.979	0.988	5509	1472	9600	2100	0.57	0.70	64.6	62.6	21.3	20.1	C

Segment 5: Overlap

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	5412	9600	0.56	64.6	21.3	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.979	0.983	5412	860	9600	2100	0.56	0.41	67.4	61.3	20.1	24.3	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4612	9600	0.48	70.0	16.5	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	1.000	0.983	6045	1502	9600	2100	0.63	0.72	63.2	60.5	23.9	25.1	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5951	9600	0.62	69.0	21.6	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.964	0.964	6081	1215	9600	2100	0.63	0.58	66.3	60.4	22.9	28.6	D

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5103	9600	0.53	69.9	18.3	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.964	0.988	6266	1052	9600	2100	0.65	0.50	63.3	60.6	24.7	24.8	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	6235	9600	0.65	68.5	22.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.9	20.6	20.2	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	67.9	Density, veh/mi/ln	20.2
Average Travel Time, min	6.4		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 - 4A South Alt. A PM - SB Overlap	Date	6/30/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	7615	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3165	4
8	Merge	Merge	h>i	1500	4
9	Overlap	Basic	i>j	650	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2650	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5931	9600	0.62	69.1	21.5	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.982	0.979	5931	883	9600	2100	0.62	0.42	67.2	61.3	22.1	24.0	C

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.982		5102		9600		0.53		69.9		18.3		C
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.81	0.970	0.978	6094	928	9600	2100	0.63	0.44	64.5	62.8	23.6	19.5	B
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		5899		9600		0.61		69.1		21.3		C
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5899	1879	9600	2100	0.61	0.89	64.4	58.7	22.9	31.0	D
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		4225		9600		0.44		75.3		14.0		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5289	1064	9600	2100	0.55	0.51	64.2	61.6	20.6	21.4	C
Segment 9: Overlap															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		5173		9600		0.54		64.2		20.6		C
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5173	1921	9600	2100	0.54	0.91	64.0	58.6	20.2	26.4	C
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.980		3468		9600		0.36		70.0		12.4		B
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	3785	317	9600	2000	0.39	0.16	65.7	62.9	14.4	9.2	A

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3745	9600	0.39	70.0	13.4	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4660	915	9600	2100	0.49	0.44	65.2	62.9	17.9	15.1	B

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4543	9600	0.47	70.0	16.2	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.6	18.8	18.4	6.6	C

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	18.4
Average Travel Time, min	6.6		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB w/Overlap
Analysis Year	2040 4A South Alt. B - AM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a>b	5280	4
2	Diverge	Diverge	b>c	1500	4
3	Basic	Basic	c>d	4525	4
4	Merge	Merge	d>e	1500	4
5	Overlap	Basic	e>f	700	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3310	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	6215	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	4100	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3673	9600	0.38	70.0	13.1	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3673	983	9600	4200	0.38	0.23	68.7	61.0	13.4	-3.1	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	2690	9600	0.30	70.0	9.6	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.90	0.979	0.983	4790	2165	9600	2100	0.53	1.03	53.3	62.2	45.0	20.8	C

Segment 5: Overlap

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	4790	9600	0.52	53.3	45.0	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	4790	1102	9600	2100	0.52	0.52	66.7	60.7	18.0	23.2	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	3688	9600	0.43	70.0	13.2	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	5223	1535	9600	2100	0.59	0.73	63.9	61.3	20.4	22.7	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5223	9600	0.56	69.9	18.7	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.75	0.964	0.956	5223	851	9600	2100	0.56	0.41	67.4	61.3	19.4	23.6	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4372	9600	0.49	70.0	15.6	B

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.964	0.972	5729	1357	9600	2100	0.64	0.65	63.5	60.7	22.6	24.4	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5729	9600	0.62	69.4	20.6	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.6	17.8	17.3	6.5	B

Facility Overall Results

Space Mean Speed, mi/h	67.6	Density, veh/mi/ln	17.3
Average Travel Time, min	6.5		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 - 4A South Alt. B AM - SB Overlap	Date	6/30/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	7615	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3165	4
8	Merge	Merge	h>i4A on ramp	1500	4
9	Overlap	Basic	i>j	650	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2650	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	l>m	1500	4
15	Basic	Basic	m>n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	6043	9600	0.63	68.9	21.9	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	6043	681	9600	2100	0.63	0.32	67.7	61.8	22.3	23.5	C

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		5362		9600		0.57		69.8		19.2		C
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.970	0.953	6211	849	9600	2100	0.66	0.40	64.4	62.8	24.1	19.5	B
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		6211		9600		0.65		68.6		22.6		C
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	6211	2293	9600	2100	0.65	1.09	53.3	57.7	45.0	34.2	D
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		3918		9600		0.45		70.0		14.0		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5388	1470	9600	2100	0.60	0.70	63.7	61.0	21.1	23.5	C
Segment 9: Overlap															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		5388		9600		0.58		63.7		21.1		C
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5388	1697	9600	2100	0.58	0.81	64.9	59.2	20.8	25.5	C
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		3691		9600		0.43		70.0		13.2		B
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4426	735	9600	2000	0.50	0.37	65.0	62.5	17.0	13.0	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4426	9600	0.49	70.0	15.8	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6356	1930	9600	2100	0.69	0.92	63.1	60.5	25.2	24.7	C

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6356	9600	0.66	68.2	23.3	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.3	21.5	20.9	6.7	C

Facility Overall Results

Space Mean Speed, mi/h	67.3	Density, veh/mi/ln	20.9
Average Travel Time, min	6.7		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB Overlap
Analysis Year	2040 4A South Alt. B - PM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d>e	1500	4
5	Overlap	Basic	e>f	700	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g > h	3310	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	6215	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6324	9600	0.66	68.3	23.1	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	6324	2822	9600	4200	0.66	0.67	63.0	56.4	25.1	14.5	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	4048	9600	0.42	70.0	14.5	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.87	0.979	0.988	5758	1710	9600	2100	0.60	0.81	64.1	61.9	22.5	21.9	C

Segment 5: Overlap

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	5645	9600	0.59	64.1	22.5	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.979	0.983	5645	933	9600	2100	0.59	0.44	67.1	61.1	21.0	23.2	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4779	9600	0.50	70.0	17.1	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	1.000	0.983	6009	1302	9600	2100	0.63	0.62	63.5	60.9	23.7	24.1	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5940	9600	0.62	69.1	21.5	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.964	0.964	6070	1138	9600	2100	0.63	0.54	66.6	60.6	22.8	28.2	D

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5146	9600	0.54	69.9	18.4	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.964	0.988	6276	1018	9600	2100	0.65	0.48	63.2	60.6	24.8	24.6	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	6246	9600	0.65	68.5	22.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.9	20.8	20.4	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	67.9	Density, veh/mi/ln	20.4
Average Travel Time, min	6.4		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 - 4A South Alt. B PM - SB Overlap	Date	6/30/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	7615	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3990	4
8	Merge	Basic	h>i	1500	3
9	Overlap	Basic	i>j	650	4
10	Diverge	Diverge	j>k	1500	3
11	Basic	Basic	k>l	2325	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5947	9600	0.62	69.0	21.6	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.982	0.979	5947	693	9600	2100	0.62	0.33	67.6	61.7	22.0	23.2	C

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.982		5297		9600		0.55		69.8		19.0		C
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.81	0.970	0.978	6083	720	9600	2100	0.63	0.34	64.6	63.1	23.5	18.6	B
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		5915		9600		0.62		69.1		21.4		C
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5915	1915	9600	2100	0.62	0.91	64.4	58.7	23.0	31.2	D
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		4209		9600		0.44		70.0		15.0		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5437	1228	7200	2100	0.58	0.58	69.5	58.6	20.2	29.1	C
Segment 9: Overlap															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		5303		9600		0.55		62.2		28.4		D
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5303	2055	7200	2100	0.74	0.98	62.2	58.3	28.4	30.2	D
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.980		3479		9600		0.36		70.0		12.4		B
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	3815	336	9600	2000	0.40	0.17	65.6	62.9	14.5	9.4	A

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3772	9600	0.39	70.0	13.5	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4674	902	9600	2100	0.49	0.43	65.1	62.9	17.9	15.1	B

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4559	9600	0.47	70.0	16.3	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	19.3	18.9	6.7	C

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	18.9
Average Travel Time, min	6.7		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB
Analysis Year	2040 4A North Alt. C - AM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	4497	4
6	Diverge	Diverge	f > g	1500	4
7	Basic	Basic	g > h	2702	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	1626	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3548	9600	0.37	70.0	12.7	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3548	1017	9600	4200	0.37	0.24	68.4	60.9	13.0	-3.2	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	2727	9600	0.28	70.0	9.7	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.90	0.979	0.983	4677	1950	9600	2100	0.49	0.93	64.7	62.6	18.1	19.5	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4674	9600	0.49	70.0	16.7	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	4674	325	9600	2100	0.49	0.15	69.0	62.7	16.9	19.0	B

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4392	9600	0.46	70.0	15.7	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	5953	1561	9600	2100	0.62	0.74	64.1	61.9	23.2	21.9	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5744	9600	0.60	69.4	20.7	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.95	0.75	0.964	0.956	5684	802	9600	2000	0.59	0.40	63.9	56.0	22.2	25.1	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5109	9600	0.53	69.9	18.3	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.964	0.972	6125	1016	9600	2100	0.64	0.48	63.3	60.6	24.2	24.2	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	6014	9600	0.63	68.9	21.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	17.0	16.4	6.1	B

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	16.4
Average Travel Time, min	6.1		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 4A North Alt C AM - SB	Date	7/6/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	2705	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	2850	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	4675	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2550	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5994	9600	0.62	69.0	21.7	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5994	646	9600	2100	0.62	0.31	67.8	61.9	22.1	25.2	C

Segment 3: Basic

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period			(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
1	0.94		0.970		5484		9600		0.57		69.7		19.7	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.953	6421	937	9600	2100	0.67	0.45	63.4	61.0	25.3	23.9	C

Segment 5: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		6306		9600		0.66		68.4		23.0		C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.967	6306	1939	9600	2100	0.66	0.92	64.3	58.6	24.5	32.9	D

Segment 7: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		4579		9600		0.48		70.0		16.4		B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	1.000	0.967	5007	566	9600	2100	0.52	0.27	65.5	63.8	19.1	14.7	B

Segment 9: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		5031		9600		0.52		70.0		18.0		B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.95	0.970	0.975	5083	1215	9600	1900	0.53	0.64	59.7	51.3	21.3	22.5	C

Segment 11: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		3810		9600		0.40		70.0		13.6		B

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4728	918	9600	2000	0.49	0.46	64.7	62.1	18.3	15.5	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4603	9600	0.48	70.0	16.4	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6401	1798	9600	2100	0.67	0.86	63.3	60.8	25.3	24.3	C

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6155	9600	0.64	68.7	22.4	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.9	20.4	19.9	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	67.9	Density, veh/mi/ln	19.9
Average Travel Time, min	6.4		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB
Analysis Year	2040 4A North Alt. C - PM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	4497	4
6	Diverge	Diverge	f > g	1500	4
7	Basic	Basic	g > h	2702	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	1626	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6112	9600	0.64	68.8	22.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.979	0.991	6112	2369	9600	4200	0.64	0.56	64.4	57.5	23.7	11.1	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3765	9600	0.39	70.0	13.4	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.87	0.979	0.988	5306	1541	9600	2100	0.55	0.73	64.7	62.6	20.5	19.8	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5173	9600	0.54	69.9	18.5	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.985	0.983	5173	279	9600	2100	0.54	0.13	68.9	62.8	18.8	20.6	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4925	9600	0.51	70.0	17.6	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.985	0.983	6245	1320	9600	2100	0.65	0.63	64.1	62.0	24.4	21.8	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	6102	9600	0.64	68.8	22.2	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.985	0.964	6102	1068	9600	2100	0.64	0.51	66.7	60.8	22.9	28.0	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5357	9600	0.56	69.8	19.2	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.985	0.988	6119	762	9600	2100	0.64	0.36	63.6	61.1	24.1	23.1	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	6081	9600	0.63	68.8	22.1	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.3	20.0	19.7	6.2	C

Facility Overall Results

Space Mean Speed, mi/h	68.3	Density, veh/mi/ln	19.7
Average Travel Time, min	6.2		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 4A North Alt C PM - SB	Date	7/6/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	2705	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	2850	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	4675	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2550	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5877	9600	0.61	69.2	21.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.982	0.979	5877	658	9600	2100	0.61	0.31	67.7	61.8	21.7	24.8	C

Segment 3: Basic

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period			(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
1	0.94		0.982		5260		9600		0.55		69.8		18.8	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.982	0.978	6055	795	9600	2100	0.63	0.38	63.8	61.5	23.7	22.2	C

Segment 5: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		6016		9600		0.63		68.9		21.8		C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.86	0.982	0.981	5942	1665	9600	2100	0.62	0.79	65.1	59.3	22.8	30.2	D

Segment 7: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.982		4420		9600		0.46		70.0		15.8		B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.86	0.982	0.981	4906	486	9600	2100	0.51	0.23	65.5	63.9	18.7	14.1	B

Segment 9: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		4874		9600		0.51		70.0		17.4		B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.980	0.986	4874	1598	9600	2100	0.51	0.76	65.0	59.4	18.7	23.6	C

Segment 11: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		3300		9600		0.34		70.0		11.8		B

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	3723	423	9600	2000	0.39	0.21	65.5	62.7	14.2	10.2	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3669	9600	0.38	70.0	13.1	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4509	840	9600	2100	0.47	0.40	65.7	63.8	17.2	14.3	B

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4402	9600	0.46	70.0	15.7	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.5	18.2	17.8	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	68.5	Density, veh/mi/ln	17.8
Average Travel Time, min	6.4		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB
Analysis Year	2040 4A North Alt D - AM - NB	Date	6/20/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	4497	4
6	Diverge	Diverge	f > g	1500	4
7	Basic	Basic	g > h	2702	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	1626	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3548	9600	0.37	70.0	12.7	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3548	1058	9600	4200	0.37	0.25	68.2	60.8	13.0	-2.9	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.94		0.979		2695		9600		0.28		70.0		9.6		A
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.90	0.979	0.983	4583	1888	9600	2100	0.48	0.90	64.8	62.8	17.7	19.0	B
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		4580		9600		0.48		70.0		16.4		B
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.81	0.964	0.969	4580	172	9600	2100	0.48	0.08	69.4	63.1	16.5	17.9	B
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		4431		9600		0.46		70.0		15.8		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.81	0.964	0.969	6017	1586	9600	2100	0.63	0.76	64.0	61.8	23.5	22.2	C
Segment 9: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		5805		9600		0.60		69.3		20.9		C
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.75	0.964	0.956	5805	851	9600	2100	0.60	0.41	67.3	61.3	21.6	25.8	C
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		5132		9600		0.53		69.9		18.4		C
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	

1	0.94	0.83	0.964	0.972	6167	1035	9600	2100	0.64	0.49	63.4	60.7	24.3	24.4	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	6053	9600	0.63	68.9	22.0	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.6	17.0	16.4	6.1	B

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	16.4
Average Travel Time, min	6.1		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 4A North Alt D AM - SB	Date	7/6/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	2705	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	2850	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	4675	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2550	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5994	9600	0.62	69.0	21.7	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5994	653	9600	2100	0.62	0.31	67.7	61.8	22.1	25.2	C

Segment 3: Basic

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period			(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
1	0.94	0.970	5478		9600		0.57		69.7		19.7		C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.953	6409	931	9600	2100	0.67	0.44	63.4	61.0	25.3	23.9	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	6295	9600	0.66	68.4	23.0	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.967	6295	1908	9600	2100	0.66	0.91	64.4	58.7	24.4	32.7	D

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	4595	9600	0.48	70.0	16.4	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	1.000	0.967	4974	517	9600	2100	0.52	0.25	65.5	63.8	19.0	14.4	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	5004	9600	0.52	70.0	17.9	B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.95	0.970	0.975	5056	1188	9600	1900	0.53	0.63	59.9	51.4	21.1	22.3	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3810	9600	0.40	70.0	13.6	B

Segment 12: Merge

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4728	918	9600	2000	0.49	0.46	64.7	62.1	18.3	15.5	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4603	9600	0.48	70.0	16.4	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6388	1785	9600	2100	0.67	0.85	63.3	60.8	25.2	24.2	C

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6144	9600	0.64	68.7	22.4	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.9	20.3	19.8	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	67.9	Density, veh/mi/ln	19.8
Average Travel Time, min	6.4		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB
Analysis Year	2040 4A North Alt D - PM-NB	Date	6/20/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	4497	4
6	Diverge	Diverge	f > g	1500	4
7	Basic	Basic	g > h	2702	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	1626	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6112	9600	0.64	68.8	22.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.979	0.991	6112	2468	9600	4200	0.64	0.59	64.1	57.3	23.8	11.6	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3667	9600	0.38	70.0	13.1	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.87	0.979	0.988	5162	1495	9600	2100	0.54	0.71	64.8	62.8	19.9	19.1	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5033	9600	0.52	70.0	18.0	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.985	0.983	5033	145	9600	2100	0.52	0.07	69.2	63.1	18.2	19.5	B

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4903	9600	0.51	70.0	17.5	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.985	0.983	6247	1344	9600	2100	0.65	0.64	64.0	62.0	24.4	21.9	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	6102	9600	0.64	68.8	22.2	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.985	0.964	6102	1146	9600	2100	0.64	0.55	66.5	60.6	22.9	28.4	D

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5303	9600	0.55	69.8	19.0	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.985	0.988	6132	829	9600	2100	0.64	0.39	63.5	61.0	24.1	23.4	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	6037	9600	0.63	68.9	21.9	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	19.8	19.5	6.2	C

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	19.5
Average Travel Time, min	6.2		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 4A North Alt D PM - SB	Date	7/6/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	2705	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	2850	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	4675	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2550	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5872	9600	0.61	69.2	21.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.982	0.979	5872	664	9600	2100	0.61	0.32	67.8	61.8	21.7	24.8	C

Segment 3: Basic

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period			(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
1	0.94		0.982		5249		9600		0.55		69.9		18.8	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.982	0.978	6038	789	9600	2100	0.63	0.38	63.8	61.5	23.7	22.1	C

Segment 5: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		5999		9600		0.62		69.0		21.7		C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.86	0.982	0.981	5926	1636	9600	2100	0.62	0.78	65.2	59.4	22.7	30.0	D

Segment 7: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.982		4431		9600		0.46		70.0		15.8		B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.86	0.982	0.981	4875	444	9600	2100	0.51	0.21	65.6	63.9	18.6	13.8	B

Segment 9: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		4847		9600		0.50		70.0		17.3		B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.980	0.986	4847	1565	9600	2100	0.50	0.75	65.1	59.5	18.6	23.4	C

Segment 11: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		3305		9600		0.34		70.0		11.8		B

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	3728	423	9600	2000	0.39	0.21	65.5	62.7	14.2	10.3	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3675	9600	0.38	70.0	13.1	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4515	840	9600	2100	0.47	0.40	65.7	63.8	17.2	14.3	B

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4407	9600	0.46	70.0	15.7	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.6	18.2	17.8	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	17.8
Average Travel Time, min	6.4		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB
Analysis Year	2040 Alternative F - AM-NB	Date	6/8/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	9
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11825	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	4100	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3542	9600	0.37	70.0	12.7	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3542	1105	9600	4200	0.37	0.26	68.0	60.7	13.0	-2.6	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	2437	9600	0.28	70.0	8.7	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.94	0.90	0.973	0.983	4537	2622	9600	2100	0.55	1.25	53.3	61.7	45.0	21.9	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4537	9600	0.55	70.0	16.2	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.75	0.964	0.956	4537	753	9600	2100	0.55	0.36	67.8	61.6	16.7	20.6	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	3784	9600	0.49	70.0	13.5	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.964	0.972	5513	1729	9600	2100	0.67	0.82	63.1	60.3	21.8	25.3	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5513	9600	0.65	69.6	19.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	16.3	15.8	6.1	B

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	15.8
Average Travel Time, min	6.1		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 - Alternative F AM-SB	Date	6/18/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	11
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11730	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	2550	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	600	4
10	Merge	Merge	j->k	1500	4
11	Basic	Basic	l->m	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5582	9600	0.58	69.6	20.1	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5582	1383	9600	2100	0.58	0.66	65.9	60.0	21.2	25.1	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	4491	9600	0.47	70.0	16.0	B

Segment 4: Merge

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period					(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.953	5428	937	9600	2100	0.57	0.45	64.8	62.9	20.9	17.5	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5314	9600	0.55	69.8	19.0	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.95	0.970	0.975	5314	1792	9600	2100	0.55	0.85	64.6	59.0	20.6	26.2	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3457	9600	0.36	70.0	12.3	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4796	1339	9600	2000	0.50	0.67	64.3	61.7	18.6	17.5	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4614	9600	0.48	70.0	16.5	B

Segment 10: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6387	1773	9600	2100	0.67	0.84	62.8	60.1	25.4	24.2	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6144	9600	0.64	68.7	22.4	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.5	19.3	18.8	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.5	Density, veh/mi/ln	18.8
Average Travel Time, min	6.1		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB
Analysis Year	2040 Alternative F PM - NB	Date	6/27/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	9
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11825	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	4100	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6102	9600	0.64	68.8	22.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.979	0.991	6102	2583	9600	4200	0.64	0.62	63.7	57.0	23.9	12.5	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3542	9600	0.37	70.0	12.7	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.94	0.87	0.979	0.988	5613	2071	9600	2100	0.58	0.99	63.7	61.3	22.0	23.0	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5443	9600	0.57	69.7	19.5	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.985	0.964	5443	1014	9600	2100	0.57	0.48	66.9	60.9	20.3	25.3	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4736	9600	0.49	70.0	16.9	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.985	0.988	6032	1296	9600	2100	0.63	0.62	63.5	60.9	23.7	24.1	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5967	9600	0.62	69.0	21.6	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.6	19.6	19.2	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	19.2
Average Travel Time, min	6.1		

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 Alternative F - PM	Date	6/18/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	11
Total Time Periods	3	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11730	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	2550	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	600	4
10	Merge	Merge	j->k	1500	4
11	Basic	Basic	l->m	5230	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	6099	9600	0.64	68.8	22.2	C
2	0.94	0.982	6099	9600	0.64	68.8	22.2	C
3	0.94	0.982	6099	9600	0.64	68.8	22.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.980	0.979	6099	1400	9600	2100	0.64	0.67	65.8	59.9	23.2	27.2	C
2	0.94	0.89	0.980	0.979	6099	1400	9600	2100	0.64	0.67	65.8	59.9	23.2	27.2	C
3	0.94	0.89	0.980	0.979	6099	1400	9600	2100	0.64	0.67	65.8	59.9	23.2	27.2	C

Segment 3: Basic

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period			(pc/h)	(pc/h)	Ratio	(mi/h)	(pc/mi/ln)	
1	0.94	0.982	4699	9600	0.50	70.0	16.8	B
2	0.94	0.982	4699	9600	0.50	70.0	16.8	B
3	0.94	0.982	4699	9600	0.50	70.0	16.8	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.982	0.978	5488	789	9600	2100	0.58	0.38	65.1	63.4	21.1	17.0	B
2	0.94	0.81	0.980	0.978	5488	789	9600	2100	0.58	0.38	65.1	63.4	21.1	17.0	B
3	0.94	0.81	0.980	0.978	5488	789	9600	2100	0.58	0.38	65.1	63.4	21.1	17.0	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5488	9600	0.57	69.7	19.7	C
2	0.94	0.982	5488	9600	0.57	69.7	19.7	C
3	0.94	0.982	5488	9600	0.57	69.7	19.7	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.980	0.986	5488	2359	9600	2100	0.57	1.12	53.3	57.5	45.0	29.6	D
2	1.00	0.92	0.980	0.986	5488	2359	9600	2100	0.54	1.12	53.3	57.5	45.0	29.6	D
3	1.00	0.92	0.980	0.986	5488	2359	9600	2100	0.54	1.12	53.3	57.5	45.0	29.6	D

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3129	9600	0.33	70.0	11.2	B
2	0.94	0.980	3129	9600	0.33	70.0	11.2	B
3	0.94	0.980	3129	9600	0.33	70.0	11.2	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.90	0.82	0.978	0.980	3739	610	9600	2000	0.41	0.30	65.4	62.6	14.3	11.1	B
2	0.90	0.82	0.978	0.980	3739	610	9600	2000	0.41	0.30	65.4	62.6	14.3	11.1	B
3	0.90	0.82	0.978	0.980	3739	610	9600	2000	0.41	0.30	65.4	62.6	14.3	11.1	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3739	9600	0.38	70.0	13.4	B
2	0.94	0.980	3739	9600	0.38	70.0	13.4	B

3	0.94	0.980	3739	9600	0.38	70.0	13.4	B

Segment 10: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4567	828	9600	2100	0.47	0.39	65.7	63.8	17.4	14.5	B
2	0.94	0.82	0.980	0.980	4567	828	9600	2100	0.47	0.39	65.7	63.8	17.4	14.5	B
3	0.94	0.82	0.980	0.980	4567	828	9600	2100	0.47	0.39	65.7	63.8	17.4	14.5	B

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4567	9600	0.46	70.0	16.3	B
2	0.94	0.980	4567	9600	0.46	70.0	16.3	B
3	0.94	0.980	4567	9600	0.46	70.0	16.3	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	19.5	19.1	6.1	C
2	68.4	19.5	19.1	6.1	C
3	68.4	19.5	19.1	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	19.1
Average Travel Time, min	6.1		

APPENDIX M: ESTIMATE OF CONTRIBUTION OF WOODMONT COMMONS TRAFFIC TO EXITS 4 AND 4A

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TO: File

FROM: Paul Konieczka, AICP PK
Linda C. Greer, PE, PTOE LCG

DATE: February 5, 2018

RE: Traffic Technical Memo
Estimate of Contribution of Woodmont Commons Traffic to Exits 4 and 4A
CLD | Fuss & O'Neill Reference No. 05-0244

The Freeway Facilities analysis for the Exit 4A project showed a few cases, such as the Exit 4A SB off-ramp under Alternative A, where a single lane on- or off-ramp would not provide an acceptable operating condition, or Level of Service (LOS). Ameliorating this condition would require either a two-lane ramp or a reduction in volume that would improve the LOS. The NHDOT requested that the project team investigate the potential contribution of traffic from the proposed Woodmont Commons development to the various Exit 4 and Exit 4A ramps for the various interchange alternatives under consideration. This information should provide some guidance as to the sensitivity of these analyses to the assumed development scenarios for Woodmont Commons, especially since the full traffic impact of that development project has been assigned to the Exit 4A modeling network without any consideration for the 23% of potential internally captured trips estimated in the Woodmont Commons master transportation study. This approach was agreed upon between CLD | Fuss and O'Neill and the NHDOT per an email dated March 8, 2017.

It should be restated that the 2040 land use scenarios for the Woodmont Commons development vary by alternative. The southerly interchange alternatives (A and B) assume the maximum potential development scenario as allowed by the proposed zoning and the conditional use permit issued by the Town of Londonderry. The No-Build case as well as the remaining Build alternatives, either with or without an interchange (C, D and F), have assumed a less intense development scenario for the Woodmont Commons project.

To develop these traffic estimates, we worked with the Southern New Hampshire Planning Commission (SNHPC) to provide information on the allocation of trips to the various Exit 4 and 4A ramps from the various traffic zones in their network, including the Woodmont Commons traffic zones (Zone 277 on the west side of I-93 and Zones 69 and 375 on the east side), from the regional travel demand model that was used for this project. We requested this information for the 2015 base year to set a pre-Woodmont development condition as well as the 2040 design year for the No-Build alternative and two of the five 4A Build alternative interchange/connector road configurations (Alternative A with a southerly interchange, and Alternative C with a northerly interchange). This model only provides Average Weekday Traffic volumes (AWDTs) so a percentage of the projected daily traffic assignments attributable to these three zones could be calculated. Color plots of the trip assignments to the existing and proposed ramps were provided by

SNHPC for all the ramps and scenarios requested, which are attached to this memo. This information was also summarized in tabular form, which is also attached to this memo.

Findings

The data shows that the 2015 development of the three subject zones has only a small contribution to the Exit 4 ramps, mostly from the Zone 277 area (Garden Lane), and totals only about 12.7% of daily traffic on all Exit 4 ramps. The two zones to the east have minimal existing development and contribute few trips to Exit 4.

By the 2040 No-Build case, assumed the lesser Woodmont Commons development scenario, traffic from the three zones contribute almost 27% of total daily ramp traffic at Exit 4. The total number of trips assigned to the ramps by the model would more than double by 2040, and the contribution of Woodmont traffic from the three zones to each individual ramp would increase by approximately a factor of 2 over 2015 conditions. Woodmont-related trips would account for almost 40% of the total increase in ramp traffic at Exit 4 in the 2040 No-Build case. Except for the SB on-ramp from the east, Woodmont traffic accounts for between 24-44% of the traffic assigned to any one ramp on a daily basis.

With Alternative A in place, total ramp assignments at Exit 4 are reduced by about 20% to 62,773 trips per day. However, because that the Woodmont development scenario is maximized with a southerly interchange in place, the traffic assignments from the three Woodmont zones make up a larger proportion of total ramp traffic at Exit 4, to about 36% of the total, even with Exit 4A in place. The NB on-ramp and SB off-ramp see increases in traffic over the No-Build case with Alternative A in place, while the SB on-ramp traffic sees modest reductions. The NB off-ramp sees a small increase in traffic with Alternative A over the 2040 No-Build case.

At Exit 4A, Woodmont-related traffic assignments account for roughly the same percentage of total ramp traffic (36.3%) as they do at Exit 4 (36.2%). Woodmont-related traffic contributions range from between 26% (4,887 of the 18,996 total daily trips assigned to the SB Off-ramp) to 55% (4,795 of the 8,732 total daily trips assigned to the NB off-ramp) of total traffic on any one ramp at Exit 4A. The sensitivity analysis of the operations of the Exit 4A SB off-ramp as a single-lane off-ramp, as presented in the Traffic Technical Report, indicated that a reduction of 200 AM peak hour trips at this ramp would allow it to operate below capacity under 2040 conditions, so if the Woodmont development does not generate as much external traffic as projected in the SDEIS, this ramp may function acceptably as a single-lane off-ramp.

With a northerly interchange and a new roadway in Derry, as provided in Alternative C, the potential impacts of Woodmont-related traffic assignments on Exit 4A ramp volumes are much less in 2040 as compared to Alternative A. For one thing, the Woodmont development scenario is similar to the No-Build case, so it is not as intense as with a southerly interchange (Alternatives A or B). Furthermore, the interchange is further north of Exit 4, and not directly proximate to the Woodmont development itself, so its attractiveness as an alternate route from I-93 is diminished. As the table shows, Woodmont-related traffic comprises only 1% of total ramp traffic or individual ramp traffic at a northerly interchange. At Exit 4, there is slightly less total ramp traffic than under Alternative A, and Woodmont-related traffic accounts for just under a third of the total. The Exit 4

NB on-ramp and SB off-ramp see the greatest increases in traffic assignments with Alternative C in place, as compared to the 2040 No-Build condition, but not to the same degree as with Alternative A in place.

Summary

In summary, based on the SNHPC traffic model, the different development scenarios for the Woodmont Commons project have varying effects on projected 2040 traffic assignments at both Exits 4 and 4A, depending on the location of the interchange. In the 2040 No-Build case, Woodmont traffic is projected to comprise about 27% of total daily ramp traffic at Exit 4, but will be a larger share (36%) of Exit 4 traffic with Alternative A and the maximum projected development scenario that was assumed for this case. Woodmont-related traffic will also account for more than a third of ramp traffic at Exit 4A with Alternative A, but substantially less with a northerly interchange (Alternative C).

It should be stressed that these are raw model assignments only to provide a broad-brush, order of magnitude level of impact on ramp traffic without any consideration of possible 'internally captured trips' within the mixed-use development itself that may not be assigned to the local street network per the 'live, work, play' design intent of the Woodmont project. Consideration of a 'credit' for any internally captured trips would also not directly translate into a similar reduction in any particular ramp volume (i.e., using a 10% capture rate does not necessarily mean that all ramps would see a 10% reduction in volumes) since the characteristics of the 'captured' trips may be different. The NHDOT and the developer are and will continue to coordinate efforts to monitor traffic conditions and the need for any additional improvements as the Woodmont project progresses and actual traffic volumes are realized.

PK:LCG:ams

Attachments
- Table – Contribution of Woodmont Commons Traffic Zones to Exit 4 and 4A Ramp Volumes
- SNHPC Traffic Assignments – Selected Links at Exit 4 and 4A Interchange Ramps – 2015 Base Case, 2040 No-Build, 2040 Alternative A, and 2040 Alternative C

CONTRIBUTION OF WOODMONT COMMONS TRAFFIC ZONES TO EXIT 4 AND 4A RAMP VOLUMES

2/1/2018

Scenario:
2015 No-Build

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total
Exit 4						
NB Off-ramp	10,389	1,053	10	-	1,063	10.2%
NB On-ramp	9,550	1,171	3	-	1,174	12.3%
SB On-ramp fr/ East	3,637	-	10	-	10	0.3%
SB On-ramp fr. West	4,907	1,087	-	-	1,087	22.2%
SB Off-ramp	8,157	1,306	-	-	1,306	16.0%
Total	36,640				4,640	12.7%

Scenario:
2040 No-Build

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total	Diff from 2015 NoBd
Exit 4							
NB Off-ramp	20,215	4,670	163	98	4,931	24.4%	14.2%
NB On-ramp	21,343	5,292	150	90	5,532	25.9%	13.6%
SB On-ramp fr/ East	7,402	-	151	94	245	3.3%	3.0%
SB On-ramp fr. West	10,778	4,724	-	-	4,724	43.8%	21.7%
SB Off-ramp	18,349	5,375	140	57	5,572	30.4%	14.4%
Total	78,087				21,004	26.9%	14.2%

Scenario:
2040 Build - Alternative A

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total	Diff from 2040 NoBd
Exit 4							
NB Off-ramp	18,073	5,062	-	-	5,062	28.0%	3.6%
NB On-ramp	15,150	5,823	485	325	6,633	43.8%	17.9%
SB On-ramp fr/ East	3,879	-	-	-	-	0.0%	-3.3%
SB On-ramp fr. West	11,836	5,093	-	-	5,093	43.0%	-0.8%
SB Off-ramp	13,795	5,919	-	-	5,919	42.9%	12.5%
Total	62,733				22,707	36.2%	9.3%

Scenario:
2040 Build - Alternative A

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total
Exit 4A						
NB Off-ramp	8,732	-	2,833	1,962	4,795	54.9%
NB On-ramp	15,240	-	2,940	2,063	5,003	32.8%
SB Off-ramp	18,996	-	2,864	2,023	4,887	25.7%
SB On-ramp	10,752	-	2,831	1,996	4,827	44.9%
Total	53,720				19,512	36.3%

Scenario:
2040 Build - Alternative C

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total	Diff from 2040 NoBd
Exit 4							
NB Off-ramp	18,728	4,589	163	95	4,847	25.9%	1.5%
NB On-ramp	15,903	5,309	146	-	5,455	34.3%	8.4%
SB On-ramp fr/ East	5,140	-	152	92	244	4.7%	1.4%
SB On-ramp fr. West	10,850	4,618	-	-	4,618	42.6%	-1.3%
SB Off-ramp	12,694	5,347	-	-	5,347	42.1%	11.8%
Total	63,315				20,511	32.4%	5.5%

Scenario:
2040 Build - Alternative C

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total
Exit 4A						
NB Off-ramp	2,795	23	-	-	23	0.8%
NB On-ramp	13,410	-	-	89	89	0.7%
SB Off-ramp	17,920	-	132	113	245	1.4%
SB On-ramp	5,021	43	-	-	43	0.9%
Total	39,146				400	1.0%

2015 Exit 4 SB On Ramp from West

cube

2015 Exit 4 SB Off Ramp

cube

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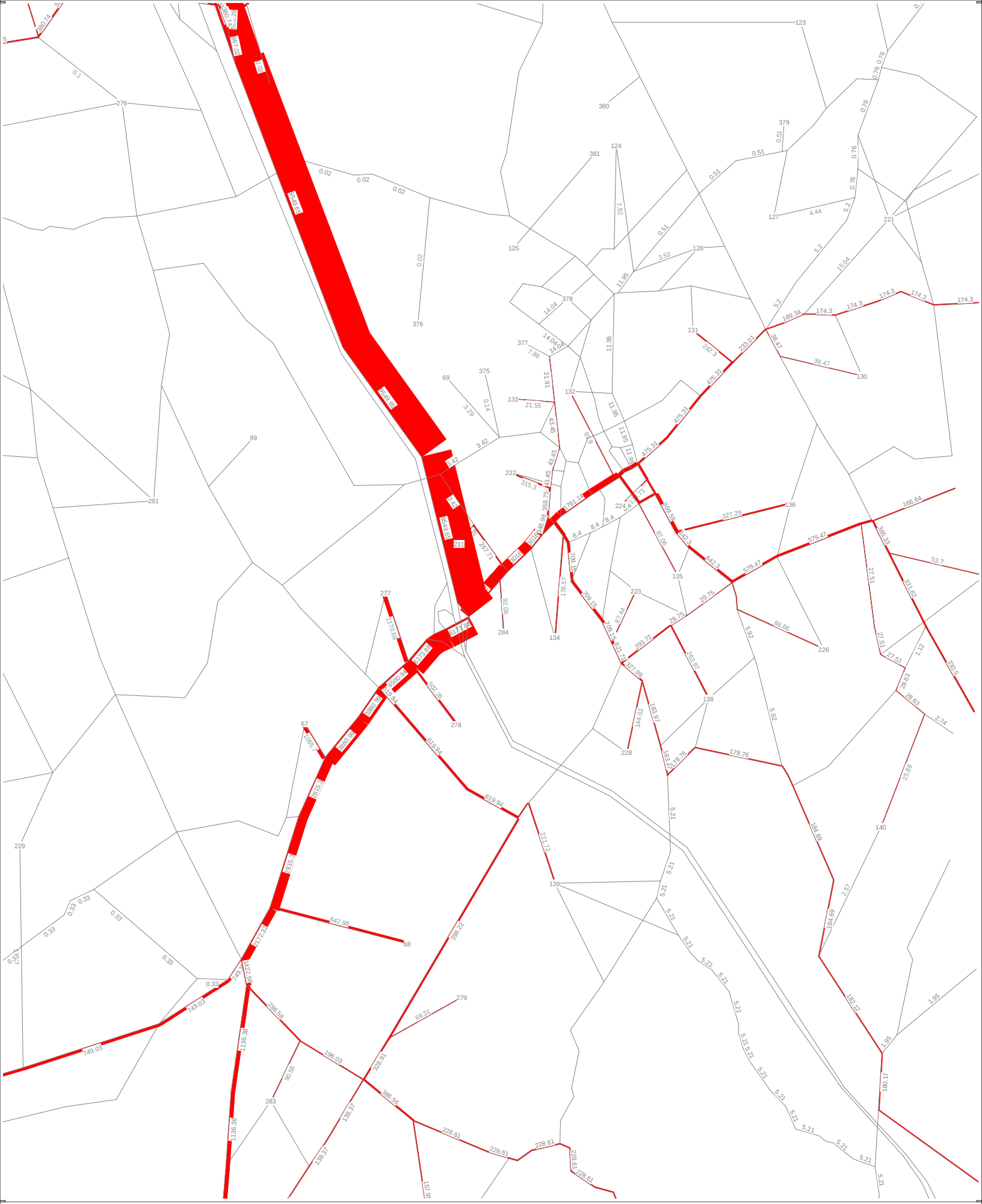
2015 Exit 4 NB Off Ramp



2015 Exit 4 NB On Ramp

cube

2015 Exit 4 SB On Ramp From East

2015NB Exit 4 SB on Ramp from East

cube

2040NB Exit 4 SB on Ramp from West

cube

2040NB Exit 4 SB off Ramp

2040NB Exit 4 NB off Ramp

2040NB Exit 4 NB on Ramp

cube

2040 Alt A Exit 4A NB off Ramp

2040 Alt A Exit 4A NB on Ramp

2040 Alt A Exit 4A SB off Ramp

2040 Alt A Exit 4A SB on Ramp

2040 Alt A Exit 4 NB Off Ramp


2040 Alt A Exit 4 NB On Ramp
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(Licensed to Southern New Hampshire Planning Commission)

2040 Alt A Exit 4 SB On Ramp from East

2040 Alt A Exit 4 SB On Ramp from West

2040 Alt A Exit 4 SB Off Ramp

2040 Alt C Exit 4 NB on Ramp

2040 Alt C Exit 4 SB on Ramp from East

2040 Alt C Exit 4 SB on Ramp from West

2040 Alt C Exit 4 SB off Ramp

2040 Alt C Exit 4A off Ramp

2040 Alt C Exit 4A NB on Ramp

2040 Alt C Exit 4A SB off Ramp

2040 Alt C Exit 4A SB on Ramp

2040 Alt C Exit 4 NB off Ramp

APPENDIX N-1: 2040 NO-BUILD INTERSECTION CAPACITY ANALYSES – HCS PRINTOUTS – AM PEAK HOUR

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1260	1320	0	925	1175
Future Volume (vph)	0	1260	1320	0	925	1175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1355	1500	0	1039	1320
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1355	1500	0	1039	1320
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		21.0	21.0		27.0	27.0
Effective Green, g (s)		21.0	21.0		27.0	27.0
Actuated g/C Ratio		0.35	0.35		0.45	0.45
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)		1214	1192		868	1206
v/s Ratio Prot		0.39	c0.44		c0.54	0.49
v/s Ratio Perm						
v/c Ratio		1.12	1.26		1.20	1.09
Uniform Delay, d1		19.5	19.5		16.5	16.5
Progression Factor		1.44	1.52		1.00	1.00
Incremental Delay, d2		59.3	116.9		99.8	55.7
Delay (s)		87.4	146.7		116.3	72.2
Level of Service		F	F		F	E
Approach Delay (s)		87.4	146.7		91.7	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	106.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1265	0	1070	0	0	1000	1185	0	0	540	780
Future Volume (vph)	1265	0	1070	0	0	1000	1185	0	0	540	780
Ideal Flow (vphpl)	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	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	1438	0	1216	0	0	1064	1261	0	0	587	848
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1438	0	1216	0	0	1064	1261	0	0	587	848
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	44.0		44.0			32.0	64.0			26.0	120.0
Effective Green, g (s)	44.0		44.0			32.0	64.0			26.0	120.0
Actuated g/C Ratio	0.37		0.37			0.27	0.53			0.22	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	1188		965			889	1833			759	1568
v/s Ratio Prot	0.44		c0.46			c0.32	0.37			c0.17	
v/s Ratio Perm											0.54
v/c Ratio	1.21		1.26			1.20	0.69			0.77	0.54
Uniform Delay, d1	38.0		38.0			44.0	20.6			44.2	0.0
Progression Factor	1.00		1.00			0.86	1.02			1.00	1.00
Incremental Delay, d2	102.7		125.5			89.7	0.2			7.5	1.3
Delay (s)	140.7		163.5			127.6	21.2			51.8	1.3
Level of Service	F		F			F	C			D	A
Approach Delay (s)		151.2		0.0			69.9			22.0	
Approach LOS		F		A			E			C	

Intersection Summary			
HCM 2000 Control Delay	92.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	935	390	240	550	0	0	0	0	820	0	535
Future Volume (vph)	0	935	390	240	550	0	0	0	0	820	0	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3471	1553	1719	3438					3367		1553
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3471	1553	1719	3438					3367		1553
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	1075	448	279	640	0	0	0	0	901	0	588
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	189
Lane Group Flow (vph)	0	1075	448	279	640	0	0	0	0	901	0	399
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		35.3	100.0	17.7	59.0					29.0		29.0
Effective Green, g (s)		35.3	100.0	17.7	59.0					29.0		29.0
Actuated g/C Ratio		0.35	1.00	0.18	0.59					0.29		0.29
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		1225	1553	304	2028					976		450
v/s Ratio Prot		c0.31		c0.16	0.19					c0.27		0.26
v/s Ratio Perm			0.29									
v/c Ratio		0.88	0.29	0.92	0.32					0.92		0.89
Uniform Delay, d1		30.3	0.0	40.4	10.3					34.4		33.9
Progression Factor		1.00	1.00	0.12	0.00					1.00		1.00
Incremental Delay, d2		9.0	0.5	16.0	0.2					13.8		18.6
Delay (s)		39.4	0.5	20.7	0.2					48.2		52.5
Level of Service		D	A	C	A					D		D
Approach Delay (s)		27.9			6.4			0.0			49.9	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	605	1150	0	0	495	545	295	0	375	0	0	0
Future Volume (vph)	605	1150	0	0	495	545	295	0	375	0	0	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	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1752	3505			3505	1568	1703		1524			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1752	3505			3505	1568	1703		1524			
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Adj. Flow (vph)	658	1250	0	0	544	599	440	0	560	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	69	0	0	0
Lane Group Flow (vph)	658	1250	0	0	544	599	440	0	491	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	35.0	58.0			17.0	100.0	30.0		30.0			
Effective Green, g (s)	35.0	58.0			17.0	100.0	30.0		30.0			
Actuated g/C Ratio	0.35	0.58			0.17	1.00	0.30		0.30			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	613	2032			595	1568	510		457			
v/s Ratio Prot	c0.38	0.36			c0.16		0.26		c0.32			
v/s Ratio Perm						0.38						
v/c Ratio	1.07	0.62			0.91	0.38	0.86		1.08			
Uniform Delay, d1	32.5	13.7			40.8	0.0	33.1		35.0			
Progression Factor	0.20	0.41			1.00	1.00	1.00		1.00			
Incremental Delay, d2	46.9	0.6			20.9	0.7	14.0		63.8			
Delay (s)	53.5	6.1			61.7	0.7	47.1		98.8			
Level of Service	D	A			E	A	D		F			
Approach Delay (s)		22.5			29.7			76.0			0.0	
Approach LOS		C			C			E			A	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	0	295	0	0	0	955	1260	0	5	1160	10
Future Volume (vph)	5	0	295	0	0	0	955	1260	0	5	1160	10
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	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770	1583				1770	3539		1770	3535	
Flt Permitted		1.00	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583				1770	3539		1770	3535	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	0	321	0	0	0	1038	1370	0	5	1261	11
RTOR Reduction (vph)	0	0	207	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	5	114	0	0	0	1038	1370	0	5	1271	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom				Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		1.3	35.1				44.1	78.3		0.9	35.1	
Effective Green, g (s)		1.3	35.1				44.1	78.3		0.9	35.1	
Actuated g/C Ratio		0.01	0.36				0.45	0.79		0.01	0.36	
Clearance Time (s)		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	
Lane Grp Cap (vph)		24	564				792	2813		16	1259	
v/s Ratio Prot							c0.59	0.39		0.00	c0.36	
v/s Ratio Perm		c0.00	0.07									
v/c Ratio		0.21	0.20				1.31	0.49		0.31	1.01	
Uniform Delay, d1		48.1	22.0				27.2	3.4		48.5	31.7	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.3	0.2				148.8	0.1		10.9	27.8	
Delay (s)		52.4	22.2				176.0	3.5		59.4	59.5	
Level of Service		D	C				F	A		E	E	
Approach Delay (s)		22.6			0.0			77.9			59.5	
Approach LOS		C			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	67.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	98.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	30	0	230	0	50	0	860	215	5	555	0
Future Volume (vph)	5	30	0	230	0	50	0	860	215	5	555	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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.98			0.97			1.00	
Flt Protected		0.99			0.96			1.00			1.00	
Satd. Flow (prot)		1850			1729			1712			1809	
Flt Permitted		0.96			0.72			1.00			0.75	
Satd. Flow (perm)		1782			1304			1712			1364	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	8	50	0	240	0	52	0	966	242	6	645	0
RTOR Reduction (vph)	0	0	0	0	29	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	58	0	0	263	0	0	1198	0	0	651	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		18.0			18.0			60.4			60.4	
Effective Green, g (s)		18.0			18.0			60.4			60.4	
Actuated g/C Ratio		0.20			0.20			0.67			0.67	
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)		354			259			1143			911	
v/s Ratio Prot								c0.70				
v/s Ratio Perm		0.03			c0.20						0.48	
v/c Ratio		0.16			1.02			1.05			0.71	
Uniform Delay, d1		30.0			36.2			15.0			9.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			60.1			40.2			2.7	
Delay (s)		30.2			96.3			55.2			12.2	
Level of Service		C			F			E			B	
Approach Delay (s)		30.2			96.3			55.2			12.2	
Approach LOS		C			F			E			B	

Intersection Summary			
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	90.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	105	180	35	135	180	160	100	470	60	70	335	65
Future Volume (vph)	105	180	35	135	180	160	100	470	60	70	335	65
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	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1800		1752	1845	1568	1787	1849		1787	1835	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1800		1752	1845	1568	1787	1849		1787	1835	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	115	198	38	145	194	172	105	495	63	74	356	69
RTOR Reduction (vph)	0	9	0	0	0	118	0	5	0	0	8	0
Lane Group Flow (vph)	115	227	0	145	194	54	105	553	0	74	417	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Actuated Green, G (s)	8.4	16.9		8.9	17.4	26.9	9.5	29.1		6.1	25.7	
Effective Green, g (s)	8.4	16.9		8.9	17.4	26.9	9.5	29.1		6.1	25.7	
Actuated g/C Ratio	0.10	0.20		0.10	0.20	0.32	0.11	0.34		0.07	0.30	
Clearance Time (s)	6.0	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	3.0	
Lane Grp Cap (vph)	173	357		183	377	606	199	633		128	554	
v/s Ratio Prot	0.07	c0.13		c0.08	0.11	0.01	c0.06	c0.30		0.04	0.23	
v/s Ratio Perm						0.02						
v/c Ratio	0.66	0.64		0.79	0.51	0.09	0.53	0.87		0.58	0.75	
Uniform Delay, d1	36.9	31.2		37.1	30.0	20.4	35.6	26.2		38.2	26.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.3	3.7		20.5	1.2	0.1	2.5	15.4		6.2	5.8	
Delay (s)	46.2	34.9		57.6	31.2	20.5	38.1	41.6		44.4	32.5	
Level of Service	D	C		E	C	C	D	D		D	C	
Approach Delay (s)		38.6			35.1			41.1			34.3	
Approach LOS		D			D			D			C	

Intersection Summary					
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.79				
Actuated Cycle Length (s)	85.0	Sum of lost time (s)		24.0	
Intersection Capacity Utilization	86.2%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1145	0	0	195	170	455
Future Volume (vph)	1145	0	0	195	170	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.902	
Flt Protected	0.950					
Satd. Flow (prot)	1787	0	0	1863	1697	0
Flt Permitted	0.950					
Satd. Flow (perm)	1787	0	0	1863	1697	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	249	
Travel Time (s)	7.3			7.0	5.7	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%
Adj. Flow (vph)	1272	0	0	224	195	523
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1272	0	0	224	718	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 111.3%		ICU Level of Service H	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1145	0	0	195	170	455
Future Volume (Veh/h)	1145	0	0	195	170	455
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	1272	0	0	224	195	523
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	680	456	718			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	680	456	718			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	100			
cM capacity (veh/h)	418	606	883			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	1272	224	718
Volume Left	1272	0	0
Volume Right	0	0	523
cSH	418	883	1700
Volume to Capacity	3.04	0.00	0.42
Queue Length 95th (ft)	Err	0	0
Control Delay (s)	Err	0.0	0.0
Lane LOS	F		
Approach Delay (s)	Err	0.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	5744.7		
Intersection Capacity Utilization	111.3%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	0	0	1173	625	5
Future Volume (vph)	5	0	0	1173	625	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.999	
Flt Protected	0.950					
Satd. Flow (prot)	1703	0	0	1881	1879	0
Flt Permitted	0.950					
Satd. Flow (perm)	1703	0	0	1881	1879	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.50	0.50	0.93	0.93	0.86	0.86
Heavy Vehicles (%)	6%	6%	1%	1%	1%	1%
Adj. Flow (vph)	10	0	0	1261	727	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	0	0	1261	733	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 78.2%		ICU Level of Service D	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	0	0	1173	625	5
Future Volume (Veh/h)	5	0	0	1173	625	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.50	0.50	0.93	0.93	0.86	0.86
Hourly flow rate (vph)	10	0	0	1261	727	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1991	730	733			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1991	730	733			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	85	100	100			
cM capacity (veh/h)	65	416	876			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	10	1261	733
Volume Left	10	0	0
Volume Right	0	0	6
cSH	65	876	1700
Volume to Capacity	0.15	0.00	0.43
Queue Length 95th (ft)	13	0	0
Control Delay (s)	70.2	0.0	0.0
Lane LOS	F		
Approach Delay (s)	70.2	0.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (vph)	50	1145	5	0	480	0	0	10	155	5	10	25
Future Volume (vph)	50	1145	5	0	480	0	0	10	155	5	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	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		0.999						0.873			0.916	
Flt Protected		0.998									0.994	
Satd. Flow (prot)	0	1876	0	0	1863	0	0	1659	0	0	1730	0
Flt Permitted		0.998									0.994	
Satd. Flow (perm)	0	1876	0	0	1863	0	0	1659	0	0	1730	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.67	0.67	0.67	0.82	0.82	0.82
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	53	1218	5	0	545	0	0	15	231	6	12	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1276	0	0	545	0	0	246	0	0	48	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 106.4%		ICU Level of Service G	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	50	1145	5	0	480	0	0	10	155	5	10	25
Future Volume (Veh/h)	50	1145	5	0	480	0	0	10	155	5	10	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.67	0.67	0.67	0.82	0.82	0.82
Hourly flow rate (vph)	53	1218	5	0	545	0	0	15	231	6	12	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	545			1223			1908	1874	545	1879	1872	1220
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	545			1223			1908	1874	545	1879	1872	1220
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			100	78	57	76	83	86
cM capacity (veh/h)	1029			570			38	69	542	25	69	222

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total	1276	545	246	48
Volume Left	53	0	0	6
Volume Right	5	0	231	30
cSH	1029	570	382	88
Volume to Capacity	0.05	0.00	0.64	0.55
Queue Length 95th (ft)	4	0	108	61
Control Delay (s)	1.9	0.0	29.9	87.0
Lane LOS	A		D	F
Approach Delay (s)	1.9	0.0	29.9	87.0
Approach LOS			D	F

Intersection Summary				
Average Delay	6.6			
Intersection Capacity Utilization	106.4%	ICU Level of Service	G	
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	235	135	495	310	0	115	520	0	165	400	300
Future Volume (vph)	0	235	135	495	310	0	115	520	0	165	400	300
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	6.0
Lane Util. Factor		0.95	1.00	0.97	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		3539	1583	3433	1863		1770	1863		1787	1881	1599
Flt Permitted		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		3539	1583	3433	1863		1770	1863		1787	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Adj. Flow (vph)	0	255	147	527	330	0	120	542	0	174	421	316
RTOR Reduction (vph)	0	0	116	0	0	0	0	0	0	0	0	138
Lane Group Flow (vph)	0	255	31	527	330	0	120	542	0	174	421	178
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2			6			4			8
Actuated Green, G (s)		24.5	24.5	23.5	54.0		13.1	34.0		9.0	29.9	53.4
Effective Green, g (s)		24.5	24.5	23.5	54.0		13.1	34.0		9.0	29.9	53.4
Actuated g/C Ratio		0.21	0.21	0.20	0.47		0.11	0.30		0.08	0.26	0.46
Clearance Time (s)		6.0	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	3.0
Lane Grp Cap (vph)		753	337	701	874		201	550		139	489	825
v/s Ratio Prot		0.07		c0.15	c0.18		0.07	c0.29		c0.10	0.22	0.04
v/s Ratio Perm			0.02									0.07
v/c Ratio		0.34	0.09	0.75	0.38		0.60	0.99		1.25	0.86	0.22
Uniform Delay, d1		38.4	36.3	43.0	19.7		48.4	40.3		53.0	40.6	18.3
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		1.2	0.5	4.6	0.3		4.7	34.4		159.1	14.4	0.1
Delay (s)		39.6	36.9	47.6	19.9		53.1	74.6		212.1	54.9	18.5
Level of Service		D	D	D	B		D	E		F	D	B
Approach Delay (s)		38.6			36.9			70.7			72.3	
Approach LOS		D			D			E			E	

Intersection Summary				
HCM 2000 Control Delay	56.4	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	79.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	60	110	785	370	95	775
Future Volume (vph)	60	110	785	370	95	775
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	150		0	0	
Storage Lanes	0	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950					0.995
Satd. Flow (prot)	1787	1599	1881	1599	0	3556
Flt Permitted	0.950					0.995
Satd. Flow (perm)	1787	1599	1881	1599	0	3556
Link Speed (mph)	30		30			30
Link Distance (ft)	403		387			233
Travel Time (s)	9.2		8.8			5.3
Peak Hour Factor	0.86	0.86	0.96	0.96	0.85	0.85
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	70	128	818	385	112	912
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	128	818	385	0	1024
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 78.8%		ICU Level of Service D	
Analysis Period (min) 15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	60	110	785	370	95	775
Future Volume (Veh/h)	60	110	785	370	95	775
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.85	0.85
Hourly flow rate (vph)	70	128	818	385	112	912
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type			None			None
Median storage veh)						
Upstream signal (ft)			387			
pX, platoon unblocked	0.74	0.74			0.74	
vC, conflicting volume	1498	818			818	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1497	581			581	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	3	62			85	
cM capacity (veh/h)	72	341			739	

Direction, Lane #	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	198	818	385	416	608
Volume Left	70	0	0	112	0
Volume Right	128	0	385	0	0
cSH	204	1700	1700	739	1700
Volume to Capacity	0.97	0.48	0.23	0.15	0.36
Queue Length 95th (ft)	207	0	0	13	0
Control Delay (s)	83.7	0.0	0.0	4.3	0.0
Lane LOS	F			A	
Approach Delay (s)	83.7	0.0		1.8	
Approach LOS	F				

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	150	1050	0	0	605	80	0	0	0	25	0	350
Future Volume (vph)	150	1050	0	0	605	80	0	0	0	25	0	350
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
Lane Util. Factor	1.00	0.95			0.95						1.00	1.00
Frt	1.00	1.00			0.98						1.00	0.85
Flt Protected	0.95	1.00			1.00						0.95	1.00
Satd. Flow (prot)	1787	3574			3512						1787	1599
Flt Permitted	0.95	1.00			1.00						0.76	1.00
Satd. Flow (perm)	1787	3574			3512						1424	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	155	1082	0	0	637	84	0	0	0	31	0	438
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	0	353
Lane Group Flow (vph)	155	1082	0	0	713	0	0	0	0	0	31	85
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA				Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Actuated Green, G (s)	13.5	72.6			53.1						10.4	10.4
Effective Green, g (s)	13.5	72.6			53.1						10.4	10.4
Actuated g/C Ratio	0.14	0.76			0.56						0.11	0.11
Clearance Time (s)	6.0	6.0			6.0						6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0						3.0	3.0
Lane Grp Cap (vph)	253	2731			1963						155	175
v/s Ratio Prot	c0.09	c0.30			0.20							
v/s Ratio Perm											0.02	c0.05
v/c Ratio	0.61	0.40			0.36						0.20	0.49
Uniform Delay, d1	38.3	3.8			11.6						38.5	39.8
Progression Factor	0.84	1.80			1.00						1.00	1.00
Incremental Delay, d2	3.7	0.4			0.5						0.6	2.1
Delay (s)	35.9	7.2			12.1						39.2	41.9
Level of Service	D	A			B						D	D
Approach Delay (s)		10.8			12.1			0.0			41.7	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	815	5	5	530	255	35	10	10	350	5	135
Future Volume (vph)	115	815	5	5	530	255	35	10	10	350	5	135
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	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.95		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	3467	3571		1770	3367		1805	1758		1715	1721	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	3467	3571		1770	3367		1805	1758		1715	1721	1615
Peak-hour factor, PHF	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Adj. Flow (vph)	137	970	6	6	589	283	45	13	13	407	6	157
RTOR Reduction (vph)	0	0	0	0	59	0	0	12	0	0	0	112
Lane Group Flow (vph)	137	976	0	6	813	0	45	14	0	208	205	45
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases		2			6							
Actuated Green, G (s)	7.7	52.4		1.0	45.7		4.0	4.0		13.6	13.6	27.3
Effective Green, g (s)	7.7	52.4		1.0	45.7		4.0	4.0		13.6	13.6	27.3
Actuated g/C Ratio	0.08	0.55		0.01	0.48		0.04	0.04		0.14	0.14	0.29
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)	281	1969		18	1619		76	74		245	246	464
v/s Ratio Prot	c0.04	c0.27		0.00	0.24		c0.02	0.01		c0.12	0.12	0.03
v/s Ratio Perm												
v/c Ratio	0.49	0.50		0.33	0.50		0.59	0.18		0.85	0.83	0.10
Uniform Delay, d1	41.8	13.1		46.7	16.9		44.7	43.9		39.7	39.6	24.8
Progression Factor	1.00	1.00		1.38	0.82		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.9		9.2	0.2		11.8	1.2		23.0	20.8	0.1
Delay (s)	43.1	14.0		73.8	14.1		56.5	45.1		62.7	60.4	24.9
Level of Service	D	B		E	B		E	D		E	E	C
Approach Delay (s)		17.6			14.5			52.3			51.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	40	630	515	20	40	90
Future Volume (vph)	40	630	515	20	40	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995		0.906	
Flt Protected	0.950				0.985	
Satd. Flow (prot)	1770	1863	1853	0	1646	0
Flt Permitted	0.950				0.985	
Satd. Flow (perm)	1770	1863	1853	0	1646	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.91	0.91	0.90	0.90	0.75	0.75
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Adj. Flow (vph)	44	692	572	22	53	120
Shared Lane Traffic (%)						
Lane Group Flow (vph)	44	692	594	0	173	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	630	515	20	40	90
Future Volume (Veh/h)	40	630	515	20	40	90
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.90	0.90	0.75	0.75
Hourly flow rate (vph)	44	692	572	22	53	120
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	594				1363	583
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	594				1363	583
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				66	76
cM capacity (veh/h)	982				155	510

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	44	692	594	173
Volume Left	44	0	0	53
Volume Right	0	0	22	120
cSH	982	1700	1700	300
Volume to Capacity	0.04	0.41	0.35	0.58
Queue Length 95th (ft)	4	0	0	84
Control Delay (s)	8.8	0.0	0.0	32.2
Lane LOS	A			D
Approach Delay (s)	0.5		0.0	32.2
Approach LOS				D

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	NBR2	SBL	SBT	SBR	NET	NER
Lane Configurations												
Traffic Volume (vph)	10	365	195	10	95	75	10	300	135	50	240	420
Future Volume (vph)	10	365	195	10	95	75	10	300	135	50	240	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	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		0.954			0.940				0.986		0.908	
Flt Protected		0.968			0.997				0.970			
Satd. Flow (prot)	0	1737	0	0	1746	0	0	0	1799	0	1708	0
Flt Permitted		0.968			0.997				0.970			
Satd. Flow (perm)	0	1737	0	0	1746	0	0	0	1799	0	1708	0
Link Speed (mph)		30			30				30		30	
Link Distance (ft)		449			456				370		390	
Travel Time (s)		10.2			10.4				8.4		8.9	
Peak Hour Factor	0.91	0.91	0.91	0.87	0.87	0.87	0.87	0.92	0.92	0.92	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	1%	1%	1%	1%	1%
Adj. Flow (vph)	11	401	214	11	109	86	11	326	147	54	267	467
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	626	0	0	217	0	0	0	527	0	834	0
Sign Control		Yield			Yield				Yield		Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 127.5%		ICU Level of Service H	
Analysis Period (min) 15			

Lane Group	NER2	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	90	35	130
Future Volume (vph)	90	35	130
Ideal Flow (vphpl)	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00
Frt			
Flt Protected			0.990
Satd. Flow (prot)	0	0	1844
Flt Permitted			0.990
Satd. Flow (perm)	0	0	1844
Link Speed (mph)			30
Link Distance (ft)			523
Travel Time (s)			11.9
Peak Hour Factor	0.90	0.91	0.91
Heavy Vehicles (%)	1%	2%	2%
Adj. Flow (vph)	100	38	143
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	0	181
Sign Control			Yield

Movement	WBL2	WBL	WBR	NBL	NBT	NBR	NBR2	SBL	SBT	SBR	NET	NER
Right Turn Channelized												
Traffic Volume (veh/h)	10	365	195	10	95	75	10	300	135	50	240	420
Future Volume (veh/h)	10	365	195	10	95	75	10	300	135	50	240	420
Peak Hour Factor	0.91	0.91	0.91	0.87	0.87	0.87	0.87	0.92	0.92	0.92	0.90	0.90
Hourly flow rate (vph)	11	401	214	11	109	86	11	326	147	54	267	467
Approach Volume (veh/h)		626			217				527		834	
Crossing Volume (veh/h)		473			1060				604		522	
High Capacity (veh/h)		954			593				859		917	
High v/c (veh/h)		0.66			0.37				0.61		0.91	
Low Capacity (veh/h)		773			457				688		740	
Low v/c (veh/h)		0.81			0.47				0.77		1.13	

Intersection Summary					
Maximum v/c High		0.91			
Maximum v/c Low		1.13			
Intersection Capacity Utilization		127.5%	ICU Level of Service		H

Movement	NER2	SWL	SWT
Right Turn Channelized			
Traffic Volume (veh/h)	90	35	130
Future Volume (veh/h)	90	35	130
Peak Hour Factor	0.90	0.91	0.91
Hourly flow rate (vph)	100	38	143
Approach Volume (veh/h)			181
Crossing Volume (veh/h)			746
High Capacity (veh/h)			766
High v/c (veh/h)			0.24
Low Capacity (veh/h)			607
Low v/c (veh/h)			0.30

Intersection Summary

Intersection	
Intersection Delay, s/veh	74.4
Intersection LOS	F

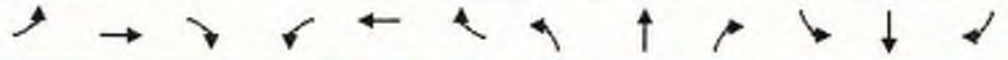
Approach	WB	NB	SB	NE
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	626	217	527	834
Demand Flow Rate, veh/h	632	221	532	843
Vehicles Circulating, veh/h	480	1071	612	527
Vehicles Exiting, veh/h	812	299	327	617
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	38.9	24.2	37.2	151.2
Approach LOS	E	C	E	F

Lane	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	632	221	532	843
Cap Entry Lane, veh/h	699	387	613	667
Entry HV Adj Factor	0.990	0.981	0.990	0.990
Flow Entry, veh/h	626	217	527	834
Cap Entry, veh/h	692	380	606	660
V/C Ratio	0.904	0.571	0.868	1.264
Control Delay, s/veh	38.9	24.2	37.2	151.2
LOS	E	C	E	F
95th %tile Queue, veh	12	3	10	32

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Approach	SW
Entry Lanes	1
Conflicting Circle Lanes	1
Adj Approach Flow, veh/h	181
Demand Flow Rate, veh/h	185
Vehicles Circulating, veh/h	754
Vehicles Exiting, veh/h	358
Follow-Up Headway, s	3.186
Ped Vol Crossing Leg, #/h	0
Ped Cap Adj	1.000
Approach Delay, s/veh	12.3
Approach LOS	B

Lane	Left
Designated Moves	LTR
Assumed Moves	LTR
RT Channelized	
Lane Util	1.000
Critical Headway, s	5.193
Entry Flow, veh/h	185
Cap Entry Lane, veh/h	532
Entry HV Adj Factor	0.979
Flow Entry, veh/h	181
Cap Entry, veh/h	521
V/C Ratio	0.348
Control Delay, s/veh	12.3
LOS	B
95th %tile Queue, veh	2



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	350	0	0	0	120	150	0	0	130	10
Future Volume (vph)	5	0	350	0	0	0	120	150	0	0	130	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	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			0.850								0.990	
Flt Protected		0.950						0.978				
Satd. Flow (prot)	0	1770	1583	0	1900	0	0	1840	0	0	1862	0
Flt Permitted		0.950						0.978				
Satd. Flow (perm)	0	1770	1583	0	1900	0	0	1840	0	0	1862	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		113			453			475			436	
Travel Time (s)		2.6			10.3			10.8			9.9	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	6	0	398	0	0	0	129	161	0	0	143	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	396	0	0	0	0	290	0	0	154	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.8%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	350	0	0	0	120	150	0	0	130	10
Future Volume (Veh/h)	5	0	350	0	0	0	120	150	0	0	130	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.91	0.91	0.91
Hourly flow rate (vph)	6	0	398	0	0	0	129	161	0	0	143	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	568	568	148	966	573	161	154			161		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	568	568	148	966	573	161	154			161		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	56	100	100	100	91			100		
cM capacity (veh/h)	404	394	898	122	393	889	1433			1424		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	6	398	0	290	154
Volume Left	6	0	0	129	0
Volume Right	0	398	0	0	11
cSH	404	898	1700	1433	1424
Volume to Capacity	0.01	0.44	0.00	0.09	0.00
Queue Length 95th (ft)	1	58	0	7	0
Control Delay (s)	14.0	12.2	0.0	3.9	0.0
Lane LOS	B	B	A	A	
Approach Delay (s)	12.2		0.0	3.9	0.0
Approach LOS	B		A		

Intersection Summary				
Average Delay	7.1			
Intersection Capacity Utilization	35.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	80	25	55	50	195	195	800	75	25	265	40
Future Volume (vph)	100	80	25	55	50	195	195	800	75	25	265	40
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	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1797		1787	1881	1599	1805	1876		1805	1863	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1797		1787	1881	1599	1805	1876		1805	1863	
Peak-hour factor, PHF	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	101	81	25	58	53	205	219	899	84	27	285	43
RTOR Reduction (vph)	0	14	0	0	0	109	0	4	0	0	6	0
Lane Group Flow (vph)	101	92	0	58	53	96	219	979	0	27	322	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Actuated Green, G (s)	7.1	17.6		4.8	15.3	35.5	14.2	30.4		3.2	19.4	
Effective Green, g (s)	7.1	17.6		4.8	15.3	35.5	14.2	30.4		3.2	19.4	
Actuated g/C Ratio	0.09	0.22		0.06	0.19	0.44	0.18	0.38		0.04	0.24	
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)	157	395		107	359	709	320	712		72	451	
v/s Ratio Prot	c0.06	c0.05		0.03	0.03	0.06	c0.12	c0.52		0.01	0.17	
v/s Ratio Perm												
v/c Ratio	0.64	0.23		0.54	0.15	0.14	0.68	1.38		0.38	0.71	
Uniform Delay, d1	35.2	25.6		36.5	26.9	13.2	30.8	24.8		37.4	27.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.7	0.3		5.5	0.9	0.1	5.9	177.7		3.3	5.3	
Delay (s)	43.9	26.0		42.0	27.8	13.3	36.7	202.5		40.7	33.1	
Level of Service	D	C		D	C	B	D	F		D	C	
Approach Delay (s)		34.7			21.0			172.3			33.6	
Approach LOS		C			C			F			C	

Intersection Summary			
HCM 2000 Control Delay	112.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	540	0	10	295	170	295
Future Volume (vph)	540	0	10	295	170	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.914	
Flt Protected	0.950			0.998		
Satd. Flow (prot)	1787	0	0	1859	1686	0
Flt Permitted	0.950			0.998		
Satd. Flow (perm)	1787	0	0	1859	1686	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	348			709	425	
Travel Time (s)	7.9			16.1	9.7	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.89	0.89
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Adj. Flow (vph)	600	0	11	339	191	331
Shared Lane Traffic (%)						
Lane Group Flow (vph)	600	0	0	350	522	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.6%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	540	0	10	295	170	295
Future Volume (Veh/h)	540	0	10	295	170	295
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.89	0.89
Hourly flow rate (vph)	600	0	11	339	191	331
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	718	356	522			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	718	356	522			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	99			
cM capacity (veh/h)	393	690	1044			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	600	350	522
Volume Left	600	11	0
Volume Right	0	0	331
cSH	393	1044	1700
Volume to Capacity	1.53	0.01	0.31
Queue Length 95th (ft)	818	1	0
Control Delay (s)	274.7	0.4	0.0
Lane LOS	F	A	
Approach Delay (s)	274.7	0.4	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	112.1		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX N-2: 2040 NO-BUILD INTERSECTION CAPACITY ANALYSES – HCS PRINTOUTS – PM PEAK HOUR

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1315	670	0	790	835
Future Volume (vph)	0	1315	670	0	790	835
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1414	761	0	888	938
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1414	761	0	888	938
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		23.0	23.0		25.0	25.0
Effective Green, g (s)		23.0	23.0		25.0	25.0
Actuated g/C Ratio		0.38	0.38		0.42	0.42
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)		1330	1305		804	1117
v/s Ratio Prot		c0.41	0.22		c0.46	0.35
v/s Ratio Perm						
v/c Ratio		1.06	0.58		1.10	0.84
Uniform Delay, d1		18.5	14.7		17.5	15.7
Progression Factor		1.03	0.90		1.00	1.00
Incremental Delay, d2		34.1	0.2		64.3	5.7
Delay (s)		53.2	13.4		81.8	21.4
Level of Service		D	B		F	C
Approach Delay (s)		53.2	13.4		50.8	
Approach LOS		D	B		D	

Intersection Summary			
HCM 2000 Control Delay	44.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	460	0	355	0	0	1190	915	0	0	1260	1125
Future Volume (vph)	460	0	355	0	0	1190	915	0	0	1260	1125
Ideal Flow (vphpl)	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	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	523	0	403	0	0	1266	973	0	0	1370	1223
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	523	0	403	0	0	1266	973	0	0	1370	1223
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	17.0		17.0			41.0	91.0			44.0	120.0
Effective Green, g (s)	17.0		17.0			41.0	91.0			44.0	120.0
Actuated g/C Ratio	0.14		0.14			0.34	0.76			0.37	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	459		372			1139	2607			1285	1568
v/s Ratio Prot	c0.16		0.15			c0.38	0.28			c0.39	
v/s Ratio Perm											0.78
v/c Ratio	1.14		1.08			1.11	0.37			1.07	0.78
Uniform Delay, d1	51.5		51.5			39.5	4.9			38.0	0.0
Progression Factor	1.00		1.00			0.86	1.15			1.00	1.00
Incremental Delay, d2	86.1		70.8			51.6	0.0			44.8	3.9
Delay (s)	137.6		122.3			85.6	5.7			82.8	3.9
Level of Service	F		F			F	A			F	A
Approach Delay (s)		130.9		0.0			50.9			45.6	
Approach LOS		F		A			D			D	

Intersection Summary			
HCM 2000 Control Delay	61.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	810	360	390	650	0	0	0	0	550	0	555
Future Volume (vph)	0	810	360	390	650	0	0	0	0	550	0	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3167	1417	1687	3374					3303		1524
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3167	1417	1687	3374					3303		1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	0	880	391	534	890	0	0	0	0	743	0	750
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	106
Lane Group Flow (vph)	0	880	391	534	890	0	0	0	0	743	0	644
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		40.0	140.0	38.0	84.0					44.0		44.0
Effective Green, g (s)		40.0	140.0	38.0	84.0					44.0		44.0
Actuated g/C Ratio		0.29	1.00	0.27	0.60					0.31		0.31
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		904	1417	457	2024					1038		478
v/s Ratio Prot		c0.28		c0.32	0.26					0.22		c0.42
v/s Ratio Perm			0.28									
v/c Ratio		0.97	0.28	1.17	0.44					0.72		1.35
Uniform Delay, d1		49.5	0.0	51.0	15.2					42.5		48.0
Progression Factor		1.00	1.00	0.36	0.10					1.00		1.00
Incremental Delay, d2		24.2	0.5	92.9	0.3					2.4		169.5
Delay (s)		73.6	0.5	111.5	1.8					44.8		217.5
Level of Service		E	A	F	A					D		F
Approach Delay (s)		51.1			42.9			0.0			131.6	
Approach LOS		D			D			A			F	

Intersection Summary			
HCM 2000 Control Delay	77.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	635	725	0	0	650	775	390	0	165	0	0	0
Future Volume (vph)	635	725	0	0	650	775	390	0	165	0	0	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	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1641	3282			3438	1538	1656		1482			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1641	3282			3438	1538	1656		1482			
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	730	833	0	0	722	861	500	0	212	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	120	0	0	0
Lane Group Flow (vph)	730	833	0	0	722	861	500	0	92	0	0	0
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	56.0	90.0			28.0	140.0	38.0		38.0			
Effective Green, g (s)	56.0	90.0			28.0	140.0	38.0		38.0			
Actuated g/C Ratio	0.40	0.64			0.20	1.00	0.27		0.27			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	656	2109			687	1538	449		402			
v/s Ratio Prot	c0.44	0.25			c0.21		c0.30		0.06			
v/s Ratio Perm						0.56						
v/c Ratio	1.11	0.39			1.05	0.56	1.11		0.23			
Uniform Delay, d1	42.0	12.0			56.0	0.0	51.0		39.6			
Progression Factor	0.22	0.02			1.00	1.00	1.00		1.00			
Incremental Delay, d2	58.7	0.3			48.5	1.5	77.2		0.3			
Delay (s)	67.9	0.6			104.5	1.5	128.2		39.9			
Level of Service	E	A			F	A	F		D			
Approach Delay (s)		32.0			48.5			101.9			0.0	
Approach LOS		C			D			F			A	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	0	240	0	0	0	250	690	5	5	1755	5
Future Volume (vph)	5	0	240	0	0	0	250	690	5	5	1755	5
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	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770	1583				1770	3536		1770	3538	
Flt Permitted		1.00	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583				1770	3536		1770	3538	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	0	261	0	0	0	272	750	5	5	1908	5
RTOR Reduction (vph)	0	0	98	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	5	163	0	0	0	272	755	0	5	1913	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom				Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		1.2	61.1				17.7	77.9		0.9	61.1	
Effective Green, g (s)		1.2	61.1				17.7	77.9		0.9	61.1	
Actuated g/C Ratio		0.01	0.62				0.18	0.79		0.01	0.62	
Clearance Time (s)		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	
Lane Grp Cap (vph)		22	986				319	2810		16	2205	
v/s Ratio Prot							c0.15	0.21		0.00	c0.54	
v/s Ratio Perm		c0.00	0.10									
v/c Ratio		0.23	0.17				0.85	0.27		0.31	0.87	
Uniform Delay, d1		47.9	7.7				38.9	2.6		48.2	15.1	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.2	0.1				19.2	0.1		10.9	3.9	
Delay (s)		53.2	7.8				58.1	2.7		59.1	19.0	
Level of Service		D	A				E	A		E	B	
Approach Delay (s)		8.7			0.0			17.4			19.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	15	5	345	0	35	0	453	180	5	790	0
Future Volume (vph)	0	15	5	345	0	35	0	453	180	5	790	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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.96			1.00	
Flt Protected		1.00			0.96			1.00			1.00	
Satd. Flow (prot)		1802			1743			1692			1809	
Flt Permitted		1.00			0.72			1.00			1.00	
Satd. Flow (perm)		1802			1315			1692			1802	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	0	25	8	359	0	36	0	509	202	6	919	0
RTOR Reduction (vph)	0	6	0	0	25	0	0	16	0	0	0	0
Lane Group Flow (vph)	0	27	0	0	370	0	0	695	0	0	925	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type		NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		26.1			26.1			49.1			49.1	
Effective Green, g (s)		26.1			26.1			49.1			49.1	
Actuated g/C Ratio		0.30			0.30			0.56			0.56	
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)		539			393			952			1014	
v/s Ratio Prot		0.02						0.41				
v/s Ratio Perm					c0.28						c0.51	
v/c Ratio		0.05			0.94			0.73			0.91	
Uniform Delay, d1		21.7			29.8			14.1			17.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.0			30.6			2.8			12.1	
Delay (s)		21.8			60.4			17.0			29.2	
Level of Service		C			E			B			C	
Approach Delay (s)		21.8			60.4			17.0			29.2	
Approach LOS		C			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	87.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	235	90	35	520	80	90	160	40	70	125	115
Future Volume (vph)	80	235	90	35	520	80	90	160	40	70	125	115
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	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1671		1703	1757		1719	1755		1703	1792	1524
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1656	1671		1703	1757		1719	1755		1703	1792	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	83	245	94	37	553	85	106	188	47	77	137	126
RTOR Reduction (vph)	0	16	0	0	6	0	0	12	0	0	0	102
Lane Group Flow (vph)	83	323	0	37	632	0	106	223	0	77	137	24
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	4.6	29.7		3.4	28.5		4.0	14.4		4.0	14.4	14.4
Effective Green, g (s)	4.6	29.7		3.4	28.5		4.0	14.4		4.0	14.4	14.4
Actuated g/C Ratio	0.06	0.39		0.05	0.38		0.05	0.19		0.05	0.19	0.19
Clearance Time (s)	6.0	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	3.0
Lane Grp Cap (vph)	100	657		76	663		91	334		90	341	290
v/s Ratio Prot	c0.05	0.19		0.02	c0.36		c0.06	c0.13		0.05	0.08	
v/s Ratio Perm												0.02
v/c Ratio	0.83	0.49		0.49	0.95		1.16	0.67		0.86	0.40	0.08
Uniform Delay, d1	35.1	17.2		35.2	22.8		35.8	28.3		35.5	26.8	25.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	40.8	0.6		4.8	23.8		145.5	5.0		50.6	0.8	0.1
Delay (s)	75.9	17.8		40.0	46.7		181.2	33.3		86.1	27.6	25.2
Level of Service	E	B		D	D		F	C		F	C	C
Approach Delay (s)		29.2			46.3			79.3			40.0	
Approach LOS		C			D			E			D	

Intersection Summary				
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	75.5	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	71.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	490	0	0	85	175	395
Future Volume (vph)	490	0	0	85	175	395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.906	
Flt Protected	0.950					
Satd. Flow (prot)	1719	0	0	1827	1688	0
Flt Permitted	0.950					
Satd. Flow (perm)	1719	0	0	1827	1688	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	249	
Travel Time (s)	7.3			7.0	5.7	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles (%)	5%	5%	4%	4%	2%	2%
Adj. Flow (vph)	551	0	0	93	188	425
Shared Lane Traffic (%)						
Lane Group Flow (vph)	551	0	0	93	613	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.3%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	490	0	0	85	175	395
Future Volume (Veh/h)	490	0	0	85	175	395
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Hourly flow rate (vph)	551	0	0	93	188	425
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	494	400	613			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	494	400	613			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	100			
cM capacity (veh/h)	530	643	957			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	551	93	613
Volume Left	551	0	0
Volume Right	0	0	425
cSH	530	957	1700
Volume to Capacity	1.04	0.00	0.36
Queue Length 95th (ft)	394	0	0
Control Delay (s)	78.0	0.0	0.0
Lane LOS	F		
Approach Delay (s)	78.0	0.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	34.2		
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	0	0	520	565	15
Future Volume (vph)	5	0	0	520	565	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.996	
Flt Protected	0.950					
Satd. Flow (prot)	1008	0	0	1827	1785	0
Flt Permitted	0.950					
Satd. Flow (perm)	1008	0	0	1827	1785	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.44	0.44	0.95	0.95	0.96	0.96
Heavy Vehicles (%)	79%	79%	4%	4%	6%	6%
Adj. Flow (vph)	11	0	0	547	589	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	0	547	605	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	0	0	520	565	15
Future Volume (Veh/h)	5	0	0	520	565	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.44	0.44	0.95	0.95	0.96	0.96
Hourly flow rate (vph)	11	0	0	547	589	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1144	597	605			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1144	597	605			
tC, single (s)	7.2	7.0	4.1			
tC, 2 stage (s)						
tF (s)	4.2	4.0	2.2			
p0 queue free %	93	100	100			
cM capacity (veh/h)	158	386	963			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	547	605
Volume Left	11	0	0
Volume Right	0	0	16
cSH	158	963	1700
Volume to Capacity	0.07	0.00	0.36
Queue Length 95th (ft)	6	0	0
Control Delay (s)	29.5	0.0	0.0
Lane LOS	D		
Approach Delay (s)	29.5	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	40	465	5	0	490	0	0	5	65	10	5	20
Future Volume (vph)	40	465	5	0	490	0	0	5	65	10	5	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	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		0.999						0.875			0.922	
Flt Protected		0.996									0.986	
Satd. Flow (prot)	0	1767	0	0	1810	0	0	1630	0	0	1727	0
Flt Permitted		0.996									0.986	
Satd. Flow (perm)	0	1767	0	0	1810	0	0	1630	0	0	1727	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	45	522	6	0	510	0	0	8	100	15	7	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	573	0	0	510	0	0	108	0	0	52	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	40	465	5	0	490	0	0	5	65	10	5	20
Future Volume (Veh/h)	40	465	5	0	490	0	0	5	65	10	5	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Hourly flow rate (vph)	45	522	6	0	510	0	0	8	100	15	7	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	510			528			1158	1128	510	1129	1125	525
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	510			528			1158	1128	510	1129	1125	525
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	96	82	89	96	95
cM capacity (veh/h)	1030			1024			154	195	563	141	198	556

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total	573	510	108	52
Volume Left	45	0	0	15
Volume Right	6	0	100	30
cSH	1030	1024	494	266
Volume to Capacity	0.04	0.00	0.22	0.20
Queue Length 95th (ft)	3	0	21	18
Control Delay (s)	1.2	0.0	14.3	21.8
Lane LOS	A		B	C
Approach Delay (s)	1.2	0.0	14.3	21.8
Approach LOS			B	C

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	71.5%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	150	120	295	160	0	65	276	0	135	525	295
Future Volume (vph)	0	150	120	295	160	0	65	276	0	135	525	295
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	6.0
Lane Util. Factor		0.95	1.00	0.97	0.95		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		3471	1553	3335	3438		1752	1845		1752	1845	1568
Flt Permitted		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		3471	1553	3335	3438		1752	1845		1752	1845	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Adj. Flow (vph)	0	179	143	373	203	0	76	321	0	136	530	298
RTOR Reduction (vph)	0	0	101	0	0	0	0	0	0	0	0	169
Lane Group Flow (vph)	0	179	42	373	203	0	76	321	0	136	530	129
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6	6		4	Free		8	
Actuated Green, G (s)		26.7	26.7	15.1	32.8		6.4	16.2		8.0	17.8	38.9
Effective Green, g (s)		26.7	26.7	15.1	32.8		6.4	16.2		8.0	17.8	38.9
Actuated g/C Ratio		0.30	0.30	0.17	0.36		0.07	0.18		0.09	0.20	0.43
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)		1029	460	559	1252		124	332		155	364	677
v/s Ratio Prot		0.05		c0.11	c0.06		0.04	0.17		c0.08	c0.29	0.08
v/s Ratio Perm			0.03									
v/c Ratio		0.17	0.09	0.67	0.16		0.61	0.97		0.88	1.46	0.19
Uniform Delay, d1		23.5	22.9	35.1	19.3		40.6	36.6		40.5	36.1	15.8
Progression Factor		1.00	1.00	1.20	0.56		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.4	0.4	2.9	0.3		8.7	40.1		38.7	220.0	0.1
Delay (s)		23.8	23.3	45.1	11.0		49.3	76.8		79.2	256.1	15.9
Level of Service		C	C	D	B		D	E		E	F	B
Approach Delay (s)		23.6			33.1			71.5			156.9	
Approach LOS		C			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	91.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	75	70	500	220	65	775
Future Volume (vph)	75	70	500	220	65	775
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	150		0	0	
Storage Lanes	0	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950					0.996
Satd. Flow (prot)	1770	1583	1845	1568	0	3525
Flt Permitted	0.950					0.996
Satd. Flow (perm)	1770	1583	1845	1568	0	3525
Link Speed (mph)	30		30			30
Link Distance (ft)	408		387			233
Travel Time (s)	9.3		8.8			5.3
Peak Hour Factor	0.83	0.83	0.86	0.86	0.81	0.81
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	90	84	581	256	80	957
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	84	581	256	0	1037
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.8%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	75	70	500	220	65	775
Future Volume (Veh/h)	75	70	500	220	65	775
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.86	0.86	0.81	0.81
Hourly flow rate (vph)	90	84	581	256	80	957
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			387			
pX, platoon unblocked	0.86	0.86			0.86	
vC, conflicting volume	1220	581			581	
vC1, stage 1 conf vol	581					
vC2, stage 2 conf vol	638					
vCu, unblocked vol	1176	437			437	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	83			92	
cM capacity (veh/h)	363	490			968	

Direction, Lane #	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	174	581	256	399	638
Volume Left	90	0	0	80	0
Volume Right	84	0	256	0	0
cSH	701	1700	1700	968	1700
Volume to Capacity	0.25	0.34	0.15	0.08	0.38
Queue Length 95th (ft)	24	0	0	7	0
Control Delay (s)	16.1	0.0	0.0	2.6	0.0
Lane LOS	C			A	
Approach Delay (s)	16.1	0.0		1.0	
Approach LOS	C				

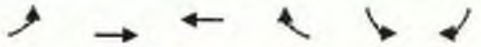
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	63.8%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	45	595	0	0	465	30	0	0	0	25	0	400
Future Volume (vph)	45	595	0	0	465	30	0	0	0	25	0	400
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
Lane Util. Factor	1.00	0.95			0.95						1.00	1.00
Frt	1.00	1.00			0.99						1.00	0.85
Flt Protected	0.95	1.00			1.00						0.95	1.00
Satd. Flow (prot)	1687	3374			3507						1787	1599
Flt Permitted	0.95	1.00			1.00						0.76	1.00
Satd. Flow (perm)	1687	3374			3507						1424	1599
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	54	717	0	0	505	33	0	0	0	28	0	444
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	0	269
Lane Group Flow (vph)	54	717	0	0	534	0	0	0	0	0	28	175
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA				Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Actuated Green, G (s)	5.2	62.9			51.7						15.1	15.1
Effective Green, g (s)	5.2	62.9			51.7						15.1	15.1
Actuated g/C Ratio	0.06	0.70			0.57						0.17	0.17
Clearance Time (s)	6.0	6.0			6.0						6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0						3.0	3.0
Lane Grp Cap (vph)	97	2358			2014						238	268
v/s Ratio Prot	c0.03	c0.21			0.15							
v/s Ratio Perm											0.02	c0.11
v/c Ratio	0.56	0.30			0.27						0.12	0.65
Uniform Delay, d1	41.3	5.2			9.6						31.8	35.0
Progression Factor	1.01	1.33			1.34						1.00	1.00
Incremental Delay, d2	6.4	0.3			0.1						0.2	5.6
Delay (s)	48.1	7.2			12.9						32.0	40.6
Level of Service	D	A			B						C	D
Approach Delay (s)		10.0			12.9			0.0			40.1	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	630	5	5	405	215	10	5	5	180	5	100
Future Volume (vph)	105	630	5	5	405	215	10	5	5	180	5	100
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	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.95		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3303	3402		1736	3291		1805	1758		1665	1674	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3303	3402		1736	3291		1805	1758		1665	1674	1568
Peak-hour factor, PHF	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	127	759	6	5	418	222	15	7	7	200	6	111
RTOR Reduction (vph)	0	0	0	0	81	0	0	7	0	0	0	79
Lane Group Flow (vph)	127	765	0	5	559	0	15	7	0	102	104	32
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Actuated Green, G (s)	8.8	49.1		1.3	41.6		4.1	4.1		11.5	11.5	26.3
Effective Green, g (s)	8.8	49.1		1.3	41.6		4.1	4.1		11.5	11.5	26.3
Actuated g/C Ratio	0.10	0.55		0.01	0.46		0.05	0.05		0.13	0.13	0.29
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)	322	1855		25	1521		82	80		212	213	458
v/s Ratio Prot	c0.04	c0.22		0.00	0.17		c0.01	0.00		0.06	c0.06	0.02
v/s Ratio Perm												
v/c Ratio	0.39	0.41		0.20	0.37		0.18	0.09		0.48	0.49	0.07
Uniform Delay, d1	38.1	12.0		43.8	15.7		41.3	41.2		36.5	36.5	23.0
Progression Factor	1.00	1.00		1.17	0.60		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1		3.6	0.6		1.1	0.5		1.7	1.8	0.1
Delay (s)	38.9	12.1		55.1	10.1		42.4	41.7		38.2	38.3	23.1
Level of Service	D	B		E	B		D	D		D	D	C
Approach Delay (s)		15.9			10.4			42.1			32.9	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	15	720	645	40	80	35
Future Volume (vph)	15	720	645	40	80	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.992		0.959	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1687	1776	1812	0	1661	0
Flt Permitted	0.950				0.966	
Satd. Flow (perm)	1687	1776	1812	0	1661	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.84	0.84	0.89	0.89	0.83	0.83
Heavy Vehicles (%)	7%	7%	4%	4%	6%	6%
Adj. Flow (vph)	18	857	725	45	96	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	857	770	0	138	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	720	645	40	80	35
Future Volume (Veh/h)	15	720	645	40	80	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.89	0.89	0.83	0.83
Hourly flow rate (vph)	18	857	725	45	96	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	770				1640	748
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	770				1640	748
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	98				9	90
cM capacity (veh/h)	823				105	406

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	18	857	770	138
Volume Left	18	0	0	96
Volume Right	0	0	45	42
cSH	823	1700	1700	136
Volume to Capacity	0.02	0.50	0.45	1.01
Queue Length 95th (ft)	2	0	0	183
Control Delay (s)	9.5	0.0	0.0	144.7
Lane LOS	A			F
Approach Delay (s)	0.2		0.0	144.7
Approach LOS				F

Intersection Summary			
Average Delay	11.3		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	NBR2	SBL	SBT	SBR	NET	NER
Lane Configurations												
Traffic Volume (vph)	10	305	205	15	85	45	10	95	110	85	120	140
Future Volume (vph)	10	305	205	15	85	45	10	95	110	85	120	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150	0		150		0		0		150
Storage Lanes		1	0	0		0		0		0		0
Taper Length (ft)		25		25				25				
Lane Util. Factor	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		0.947			0.952				0.961		0.907	
Flt Protected		0.971			0.995				0.984			
Satd. Flow (prot)	0	1696	0	0	1747	0	0	0	1679	0	1596	0
Flt Permitted		0.971			0.995				0.984			
Satd. Flow (perm)	0	1696	0	0	1747	0	0	0	1679	0	1596	0
Link Speed (mph)		30			30				30		30	
Link Distance (ft)		465			456				371		400	
Travel Time (s)		10.6			10.4				8.4		9.1	
Peak Hour Factor	0.91	0.91	0.91	0.86	0.86	0.86	0.86	0.80	0.80	0.80	0.60	0.60
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	7%	7%	7%	8%	8%
Adj. Flow (vph)	11	335	225	17	99	52	12	119	138	106	200	233
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	571	0	0	180	0	0	0	363	0	641	0
Sign Control		Yield			Yield				Yield		Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 107.7%		ICU Level of Service G	
Analysis Period (min) 15			

Lane Group	NER2	SWL	SWT
Lane Configurations			↕
Traffic Volume (vph)	125	45	210
Future Volume (vph)	125	45	210
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)		150	
Storage Lanes		0	
Taper Length (ft)		25	
Lane Util. Factor	1.00	1.00	1.00
Frt			
Flt Protected			0.991
Satd. Flow (prot)	0	0	1760
Flt Permitted			0.991
Satd. Flow (perm)	0	0	1760
Link Speed (mph)			30
Link Distance (ft)			530
Travel Time (s)			12.0
Peak Hour Factor	0.60	0.83	0.83
Heavy Vehicles (%)	8%	7%	7%
Adj. Flow (vph)	208	54	253
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	0	307
Sign Control			Yield

Intersection Summary

Intersection	
Intersection Delay, s/veh	24.3
Intersection LOS	C

Approach	WB	NB	SB	NE
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	571	180	363	641
Demand Flow Rate, veh/h	588	186	388	693
Vehicles Circulating, veh/h	390	595	703	344
Vehicles Exiting, veh/h	391	442	334	747
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	22.9	10.0	24.5	31.9
Approach LOS	C	A	C	D

Lane	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	588	186	388	693
Cap Entry Lane, veh/h	765	623	559	801
Entry HV Adj Factor	0.971	0.968	0.936	0.925
Flow Entry, veh/h	571	180	363	641
Cap Entry, veh/h	743	603	524	741
V/C Ratio	0.769	0.298	0.694	0.865
Control Delay, s/veh	22.9	10.0	24.5	31.9
LOS	C	A	C	D
95th %tile Queue, veh	7	1	5	10

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Approach	SW
Entry Lanes	1
Conflicting Circle Lanes	1
Adj Approach Flow, veh/h	307
Demand Flow Rate, veh/h	329
Vehicles Circulating, veh/h	708
Vehicles Exiting, veh/h	270
Follow-Up Headway, s	3.186
Ped Vol Crossing Leg, #/h	0
Ped Cap Adj	1.000
Approach Delay, s/veh	19.4
Approach LOS	C

Lane	Left
Designated Moves	LTR
Assumed Moves	LTR
RT Channelized	
Lane Util	1.000
Critical Headway, s	5.193
Entry Flow, veh/h	329
Cap Entry Lane, veh/h	557
Entry HV Adj Factor	0.934
Flow Entry, veh/h	307
Cap Entry, veh/h	520
V/C Ratio	0.591
Control Delay, s/veh	19.4
LOS	C
95th %tile Queue, veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	150	0	0	0	145	135	0	0	110	30
Future Volume (Veh/h)	5	0	150	0	0	0	145	135	0	0	110	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.70	0.70	0.70	0.75	0.75	0.75	0.71	0.71	0.71
Hourly flow rate (vph)	6	0	183	0	0	0	193	180	0	0	155	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			1									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	742	742	176	834	763	180	197			180		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	742	742	176	834	763	180	197			180		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	79	100	100	100	86			100		
cM capacity (veh/h)	289	289	852	199	284	855	1370			1384		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	189	0	373	197
Volume Left	6	0	193	0
Volume Right	183	0	0	42
cSH	880	1700	1370	1384
Volume to Capacity	0.21	0.00	0.14	0.00
Queue Length 95th (ft)	20	0	12	0
Control Delay (s)	10.6	0.0	4.8	0.0
Lane LOS	B	A	A	
Approach Delay (s)	10.6	0.0	4.8	0.0
Approach LOS	B	A		

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	36.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	55	20	20	55	270	85	230	80	75	415	55
Future Volume (vph)	0	55	20	20	55	270	85	230	80	75	415	55
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		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96		1.00	1.00	0.85	1.00	0.96		1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1772		1736	1827	1553	1770	1790		1787	1848	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1772		1736	1827	1553	1770	1790		1787	1848	
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Adj. Flow (vph)	0	67	24	25	68	333	125	338	118	96	532	71
RTOR Reduction (vph)	0	15	0	0	0	143	0	15	0	0	6	0
Lane Group Flow (vph)	0	76	0	25	68	190	125	441	0	96	597	0
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Actuated Green, G (s)		21.6		3.2	30.8	45.6	8.8	23.7		7.5	22.4	
Effective Green, g (s)		21.6		3.2	30.8	45.6	8.8	23.7		7.5	22.4	
Actuated g/C Ratio		0.27		0.04	0.39	0.57	0.11	0.30		0.09	0.28	
Clearance Time (s)		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	
Lane Grp Cap (vph)		478		69	703	885	194	530		167	517	
v/s Ratio Prot		0.04		0.01	0.04	c0.12	c0.07	0.25		0.05	c0.32	
v/s Ratio Perm												
v/c Ratio		0.16		0.36	0.10	0.21	0.64	0.83		0.57	1.16	
Uniform Delay, d1		22.3		37.4	15.7	8.4	34.1	26.3		34.7	28.8	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2		3.2	0.3	0.1	7.1	10.8		4.7	90.0	
Delay (s)		22.4		40.6	16.0	8.5	41.2	37.0		39.4	118.8	
Level of Service		C		D	B	A	D	D		D	F	
Approach Delay (s)		22.4			11.6			38.0			107.9	
Approach LOS		C			B			D			F	

Intersection Summary			
HCM 2000 Control Delay	58.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	190	0	10	135	235	465
Future Volume (Veh/h)	190	0	10	135	235	465
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.82	0.82
Hourly flow rate (vph)	202	0	11	148	287	567
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	740	570	854			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	740	570	854			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	47	100	99			
cM capacity (veh/h)	378	521	748			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	202	159	854
Volume Left	202	11	0
Volume Right	0	0	567
cSH	378	748	1700
Volume to Capacity	0.53	0.01	0.50
Queue Length 95th (ft)	76	1	0
Control Delay (s)	24.9	0.8	0.0
Lane LOS	C	A	
Approach Delay (s)	24.9	0.8	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX N-3: 2040 NO-BUILD INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTOUTS – AM PEAK HOUR

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1315	670	0	790	835
Future Volume (vph)	0	1315	670	0	790	835
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1414	761	0	888	938
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1414	761	0	888	938
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		29.0	29.0		31.0	31.0
Total Split (%)		48.3%	48.3%		51.7%	51.7%
Maximum Green (s)		23.0	23.0		25.0	25.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		23.0	23.0		25.0	25.0
Actuated g/C Ratio		0.38	0.38		0.42	0.42
v/c Ratio		1.06	0.58		1.10	0.84
Control Delay		55.2	13.5		85.5	24.7
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		55.2	13.5		85.5	24.7
LOS		E	B		F	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach Delay		55.2	13.5		54.3	
Approach LOS		E	B		D	
Queue Length 50th (ft)		~332	95		~378	165
Queue Length 95th (ft)		m#347	m85		#566	#275
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1330	1305		804	1117
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		1.06	0.58		1.10	0.84

Intersection Summary

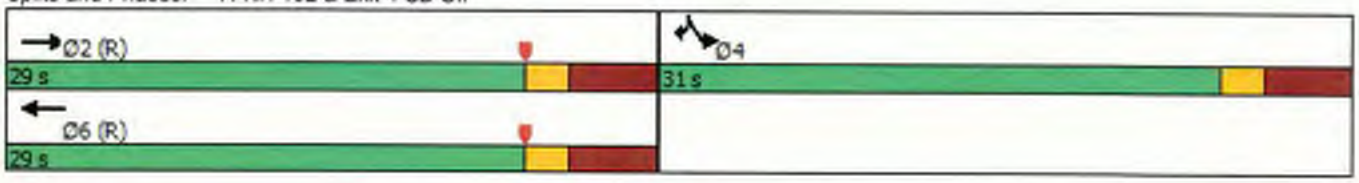
Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 46.9 Intersection LOS: D
Intersection Capacity Utilization 92.1% ICU Level of Service F
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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	460	0	355	0	0	1190	915	0	0	1260	1125
Future Volume (vph)	460	0	355	0	0	1190	915	0	0	1260	1125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											560
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	523	0	403	0	0	1266	973	0	0	1370	1223
Shared Lane Traffic (%)											
Lane Group Flow (vph)	523	0	403	0	0	1266	973	0	0	1370	1223
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	23.0		23.0			47.0	97.0			50.0	
Total Split (%)	19.2%		19.2%			39.2%	80.8%			41.7%	
Maximum Green (s)	17.0		17.0			41.0	91.0			44.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	17.0		17.0			41.0	91.0			44.0	120.0
Actuated g/C Ratio	0.14		0.14			0.34	0.76			0.37	1.00
v/c Ratio	1.14		1.08			1.11	0.37			1.07	0.78
Control Delay	132.3		119.1			84.7	5.7			81.8	3.9
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Total Delay	132.3		119.1			84.7	5.7			81.8	3.9
LOS	F		F			F	A			F	A
Approach Delay		126.5					50.4			45.1	
Approach LOS		F					D			D	
Queue Length 50th (ft)	~243		~198			~569	118			~616	0
Queue Length 95th (ft)	#342		#300			m#492	m107			#755	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	459		372			1139	2607			1285	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.14		1.08			1.11	0.37			1.07	0.78

Intersection Summary

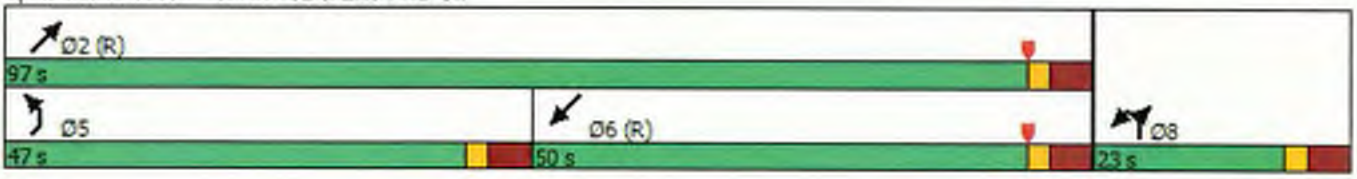
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 13 (11%), Referenced to phase 2:NET and 6:SWT, Start of Yellow
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 60.2 Intersection LOS: E
Intersection Capacity Utilization 97.9% ICU Level of Service F
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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	810	360	390	650	0	0	0	0	550	0	555
Future Volume (vph)	0	810	360	390	650	0	0	0	0	550	0	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			326									155
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Adj. Flow (vph)	0	880	391	534	890	0	0	0	0	743	0	750
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	880	391	534	890	0	0	0	0	743	0	750
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		46.0		44.0	90.0					50.0		50.0
Total Split (%)		32.9%		31.4%	64.3%					35.7%		35.7%
Maximum Green (s)		40.0		38.0	84.0					44.0		44.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		40.0	140.0	38.0	84.0					44.0		44.0
Actuated g/C Ratio		0.29	1.00	0.27	0.60					0.31		0.31
v/c Ratio		0.97	0.28	1.17	0.44					0.72		1.28
Control Delay		73.4	0.5	111.0	1.8					47.1		171.4
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		73.4	0.5	111.0	1.8					47.1		171.4
LOS		E	A	F	A					D		F
Approach Delay		51.0			42.7						109.5	
Approach LOS		D			D						F	
Queue Length 50th (ft)		418	0	423	16					308		~765
Queue Length 95th (ft)		#558	0	m208	m13					295		#716
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		904	1417	457	2024					1038		585
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.97	0.28	1.17	0.44					0.72		1.28

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 75 (54%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.28
Intersection Signal Delay: 69.1 Intersection LOS: E
Intersection Capacity Utilization 89.8% 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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	635	725	0	0	650	775	390	0	165	0	0	0
Future Volume (vph)	635	725	0	0	650	775	390	0	165	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						635			165			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	730	833	0	0	722	861	500	0	212	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	730	833	0	0	722	861	500	0	212	0	0	0
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		10.0		10.0			
Total Split (s)	62.0	96.0			34.0		44.0		44.0			
Total Split (%)	44.3%	68.6%			24.3%		31.4%		31.4%			
Maximum Green (s)	56.0	90.0			28.0		38.0		38.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	56.0	90.0			28.0	140.0	38.0		38.0			
Actuated g/C Ratio	0.40	0.64			0.20	1.00	0.27		0.27			
v/c Ratio	1.11	0.39			1.05	0.56	1.11		0.41			
Control Delay	71.9	0.6			101.6	1.5	123.6		13.1			
Queue Delay	0.4	0.0			0.0	0.0	0.0		0.0			
Total Delay	72.3	0.6			101.6	1.5	123.6		13.1			
LOS	E	A			F	A	F		B			
Approach Delay		34.1			47.1			90.7				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			D			F				
Queue Length 50th (ft)	~291	2			~376	0	~520		32			
Queue Length 95th (ft)	m#267	m2			#504	0	#588		68			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	656	2109			687	1538	449		522			
Starvation Cap Reductn	38	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.18	0.39			1.05	0.56	1.11		0.41			

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 49.9 Intersection LOS: D
Intersection Capacity Utilization 89.8% 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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Exit 5 NB Off & NH 28

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	0	240	0	0	0	250	690	5	5	1755	5
Future Volume (vph)	5	0	240	0	0	0	250	690	5	5	1755	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850					0.999				
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1770	1583	0	1900	0	1770	3536	0	1770	3539	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	1583	0	1900	0	1770	3536	0	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			261					1				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	5	0	261	0	0	0	272	750	5	5	1908	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	261	0	0	0	272	755	0	5	1913	0
Turn Type	Perm	NA	custom				Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	62.0	24.0	24.0		24.0	75.0		11.0	62.0	
Total Split (%)	21.8%	21.8%	56.4%	21.8%	21.8%		21.8%	68.2%		10.0%	56.4%	
Maximum Green (s)	18.0	18.0	56.0	18.0	18.0		18.0	69.0		5.0	56.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	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	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		6.1	56.2				17.7	82.9		5.0	56.2	
Actuated g/C Ratio		0.07	0.64				0.20	0.94		0.06	0.64	
v/c Ratio		0.04	0.24				0.77	0.23		0.05	0.85	
Control Delay		41.2	1.7				50.1	1.8		43.0	18.6	
Queue Delay		0.0	0.0				0.0	0.0		0.0	0.0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay		41.2	1.7				50.1	1.8		43.0	18.6	
LOS		D	A				D	A		D	B	
Approach Delay		2.5						14.6			18.6	
Approach LOS		A						B			B	
Queue Length 50th (ft)		3	0				138	0		3	365	
Queue Length 95th (ft)		15	33				#305	110		15	#772	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		381	1102				362	3322		100	2253	
Starvation Cap Reductn		0	0				0	0		0	0	
Spillback Cap Reductn		0	0				0	0		0	0	
Storage Cap Reductn		0	0				0	0		0	0	
Reduced v/c Ratio		0.01	0.24				0.75	0.23		0.05	0.85	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 88.2
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 16.0 Intersection LOS: B
Intersection Capacity Utilization 85.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	15	5	345	0	35	0	453	180	5	790	0
Future Volume (vph)	0	15	5	345	0	35	0	453	180	5	790	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	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		0.967			0.988			0.962				
Flt Protected					0.957							
Satd. Flow (prot)	0	1801	0	0	1744	0	0	1692	0	0	1810	0
Flt Permitted					0.722						0.996	
Satd. Flow (perm)	0	1801	0	0	1316	0	0	1692	0	0	1802	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			36			37				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	0	25	8	359	0	36	0	509	202	6	919	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	395	0	0	711	0	0	925	0
Turn Type		NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	33.0	33.0		33.0	33.0			57.0		57.0	57.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%			63.3%		63.3%	63.3%	
Maximum Green (s)	27.0	27.0		27.0	27.0			51.0		51.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		26.1			26.1			49.2			49.2	
Actuated g/C Ratio		0.30			0.30			0.56			0.56	
v/c Ratio		0.06			0.94			0.73			0.91	
Control Delay		18.9			61.7			19.1			32.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.9			61.7			19.1			32.3	
LOS		B			E			B			C	
Approach Delay		18.9			61.7			19.1			32.3	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		B			E			B			C	
Queue Length 50th (ft)		10			201			264			437	
Queue Length 95th (ft)		20			#384			399			#665	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		564			434			1007			1057	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.06			0.91			0.71			0.88	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 87.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 33.2 Intersection LOS: C
Intersection Capacity Utilization 86.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	235	90	35	520	80	90	160	40	70	125	115
Future Volume (vph)	80	235	90	35	520	80	90	160	40	70	125	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.958			0.980			0.970				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1670	0	1703	1757	0	1719	1755	0	1703	1792	1524
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1656	1670	0	1703	1757	0	1719	1755	0	1703	1792	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			10			13				182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			530			361			411	
Travel Time (s)		11.5			12.0			8.2			9.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)			0									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	83	245	94	37	553	85	106	188	47	77	137	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	339	0	37	638	0	106	235	0	77	137	126
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0		4.0	10.0		4.0	9.0	9.0
Minimum Split (s)	10.0	30.0		10.0	30.0		10.0	25.0		10.0	25.0	25.0
Total Split (s)	11.0	41.0		12.0	42.0		12.0	25.0		12.0	25.0	25.0
Total Split (%)	12.2%	45.6%		13.3%	46.7%		13.3%	27.8%		13.3%	27.8%	27.8%
Maximum Green (s)	5.0	35.0		6.0	36.0		6.0	19.0		6.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		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	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Recall Mode	None	Min		None	Min		Min	None		Min	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		10			10			0			10	10
Act Effct Green (s)	5.1	37.3		5.9	32.9		6.1	15.3		6.1	15.3	15.3
Actuated g/C Ratio	0.06	0.45		0.07	0.39		0.07	0.18		0.07	0.18	0.18
v/c Ratio	0.83	0.45		0.31	0.92		0.85	0.71		0.63	0.42	0.29
Control Delay	97.8	19.2		46.5	44.1		92.7	43.1		63.9	35.0	3.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	97.8	19.2		46.5	44.1		92.7	43.1		63.9	35.0	3.4
LOS	F	B		D	D		F	D		E	C	A
Approach Delay		34.7			44.2			58.6			29.8	
Approach LOS		C			D			E			C	
Queue Length 50th (ft)	46	125		20	309		59	115		42	67	0
Queue Length 95th (ft)	#136	215		51	#545		#148	179		#113	121	17
Internal Link Dist (ft)		425			450			281			331	
Turn Bay Length (ft)												
Base Capacity (vph)	100	758		123	770		124	412		123	411	490
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.83	0.45		0.30	0.83		0.85	0.57		0.63	0.33	0.26

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 42.0 — Intersection LOS: D
Intersection Capacity Utilization 71.4% — ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Birch St/Crystal Ave & NH 102 (E Broadway)

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	150	120	295	160	0	65	275	0	135	530	295
Future Volume (vph)	0	150	120	295	160	0	65	275	0	135	530	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	0		0	0		0	0		0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1827	3471	1553	3335	3438	1810	1752	1845	1845	1752	1845	1568
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1827	3471	1553	3335	3438	1810	1752	1845	1845	1752	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			255									298
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			394			532			387	
Travel Time (s)		14.5			9.0			12.1			8.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	179	143	373	203	0	76	320	0	136	535	298
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	179	143	373	203	0	76	320	0	136	535	298
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6	6		4	Free		8	
Detector Phase	5	2	2	1	6	6	7	4		3	8	8 1
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	6.0	8.0		7.0	8.0	
Minimum Split (s)	14.0	31.0	31.0	14.0	40.0	40.0	12.0	21.0		13.0	21.0	
Total Split (s)	14.0	33.0	33.0	22.0	41.0	41.0	12.0	22.0		13.0	23.0	
Total Split (%)	15.6%	36.7%	36.7%	24.4%	45.6%	45.6%	13.3%	24.4%		14.4%	25.6%	
Maximum Green (s)	8.0	27.0	27.0	16.0	35.0	35.0	6.0	16.0		7.0	17.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	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	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	Max	C-Max	C-Max	None	Max	Max	None	None		None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0			5.0	
Flash Dont Walk (s)		10.0	10.0		10.0	10.0		10.0			10.0	
Pedestrian Calls (#/hr)		0	0		0	0		0			0	
Act Effct Green (s)		28.6	28.6	14.4	35.0		6.0	16.0		7.0	19.4	39.8
Actuated g/C Ratio		0.32	0.32	0.16	0.39		0.07	0.18		0.08	0.22	0.44
v/c Ratio		0.16	0.21	0.70	0.15		0.66	0.98		1.00	1.35	0.35
Control Delay		23.1	0.7	51.0	9.6		68.3	82.9		122.0	204.2	3.2
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		23.1	0.7	51.0	9.6		68.3	82.9		122.0	204.2	3.2
LOS		C	A	D	A		E	F		F	F	A
Approach Delay		13.2			36.4			80.1			130.9	
Approach LOS		B			D			F			F	
Queue Length 50th (ft)		38	0	120	25		43	183		79	~431	0
Queue Length 95th (ft)		60	0	112	3		#102	#324		#195	#626	45
Internal Link Dist (ft)		559			314			452			307	
Turn Bay Length (ft)			150									
Base Capacity (vph)		1104	668	592	1337		116	328		136	397	882
Starvation Cap Reductn		0	0	0	0		0	0		0	0	0
Spillback Cap Reductn		0	0	0	0		0	0		0	0	0
Storage Cap Reductn		0	0	0	0		0	0		0	0	0
Reduced v/c Ratio		0.16	0.21	0.63	0.15		0.66	0.98		1.00	1.35	0.34

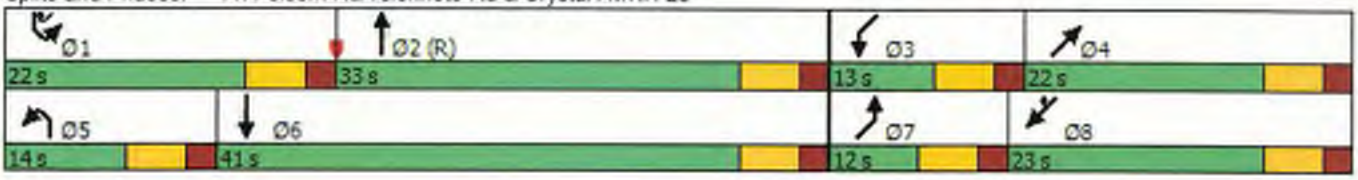
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.35
Intersection Signal Delay: 81.2 Intersection LOS: F
Intersection Capacity Utilization 68.0% ICU Level of Service C
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: 11: Folsom Rd/Tsienneto Rd & Crystal Av/NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	45	595	0	0	465	30	0	0	0	25	0	400
Future Volume (vph)	45	595	0	0	465	30	0	0	0	25	0	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	75		0	150		150	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.991							0.850
Flt Protected	0.950										0.950	
Satd. Flow (prot)	1687	3374	0	1863	3507	0	0	1900	1900	0	1787	1599
Flt Permitted	0.950										0.757	
Satd. Flow (perm)	1687	3374	0	1863	3507	0	0	1900	1900	0	1424	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9							323
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			755			218			433	
Travel Time (s)		6.3			17.2			5.0			9.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	54	717	0	0	505	33	0	0	0	28	0	444
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	717	0	0	538	0	0	0	0	0	28	444
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Turn Type	Prot	NA		Prot	NA				Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												

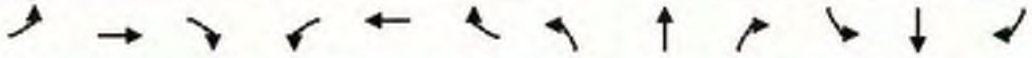
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	8.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	15.6%	51.1%		12.2%	47.8%		36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Maximum Green (s)	8.0	40.0		5.0	37.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	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	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	8.4	62.9			54.1						15.1	15.1
Actuated g/C Ratio	0.09	0.70			0.60						0.17	0.17
v/c Ratio	0.35	0.30			0.25						0.12	0.83
Control Delay	44.8	8.9			15.0						28.3	22.9
Queue Delay	0.0	0.0			0.0						0.0	0.0
Total Delay	44.8	8.9			15.0						28.3	22.9
LOS	D	A			B						C	C
Approach Delay		11.4			15.0						23.3	
Approach LOS		B			B						C	
Queue Length 50th (ft)	32	52			101						14	63
Queue Length 95th (ft)	66	214			175						31	152
Internal Link Dist (ft)		197			675			138			353	
Turn Bay Length (ft)	75											
Base Capacity (vph)	156	2356			2111						427	705
Starvation Cap Reductn	0	0			0						0	0
Spillback Cap Reductn	0	0			0						0	0
Storage Cap Reductn	0	0			0						0	0
Reduced v/c Ratio	0.35	0.30			0.25						0.07	0.63

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 63 (70%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 15.6 Intersection LOS: B
Intersection Capacity Utilization 48.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 13: Applebees/Linlew Dr & NH 28

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	630	5	5	405	215	10	5	5	180	5	100
Future Volume (vph)	105	630	5	5	405	215	10	5	5	180	5	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		150	0		0	0		0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (ft)	200			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.999			0.948			0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (prot)	3303	3402	0	1736	3291	0	1805	1758	0	1665	1674	1568
Flt Permitted	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (perm)	3303	3402	0	1736	3291	0	1805	1758	0	1665	1674	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			151			7				111
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		412			486			151			343	
Travel Time (s)		9.4			11.0			3.4			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	127	759	6	5	418	222	15	7	7	200	6	111
Shared Lane Traffic (%)										49%		
Lane Group Flow (vph)	127	765	0	5	640	0	15	14	0	102	104	111
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Detector Phase	5	2		1	6		3	3		4	4	4 5
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	
Minimum Split (s)	14.0	53.0		11.0	50.0		11.0	11.0		15.0	15.0	
Total Split (s)	14.0	53.0		11.0	50.0		11.0	11.0		15.0	15.0	
Total Split (%)	15.6%	58.9%		12.2%	55.6%		12.2%	12.2%		16.7%	16.7%	
Maximum Green (s)	8.0	47.0		5.0	44.0		5.0	5.0		9.0	9.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	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	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	Min		None	C-Min		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	8.8	56.3		5.9	44.0		6.3	6.3		11.5	11.5	26.3
Actuated g/C Ratio	0.10	0.63		0.07	0.49		0.07	0.07		0.13	0.13	0.29
v/c Ratio	0.39	0.36		0.04	0.38		0.12	0.11		0.48	0.49	0.21
Control Delay	41.3	11.5		46.8	8.4		40.8	30.0		43.5	43.7	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	41.3	11.5		46.8	8.4		40.8	30.0		43.5	43.7	5.2
LOS	D	B		D	A		D	C		D	D	A
Approach Delay		15.7			8.7			35.6			30.1	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	35	105		3	53		8	4		57	58	0
Queue Length 95th (ft)	56	206		m8	77		20	16		104	106	33
Internal Link Dist (ft)		332			406			71			263	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	336	2212		113	1856		127	130		215	216	525
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.38	0.35		0.04	0.34		0.12	0.11		0.47	0.48	0.21

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.49
Intersection Signal Delay: 16.0 Intersection LOS: B
Intersection Capacity Utilization 49.0% ICU Level of Service A
Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: VIP Dr/Ashleigh Dr & NH 28

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	55	20	20	55	270	85	230	80	75	415	55
Future Volume (vph)	100	55	20	20	55	270	85	230	80	75	415	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.960				0.850		0.961			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1771	0	1736	1827	1553	1770	1790	0	1787	1847	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1771	0	1736	1827	1553	1770	1790	0	1787	1847	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				148		23			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	122	67	24	25	68	333	125	338	118	96	532	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	91	0	25	68	333	125	456	0	96	603	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	20.0		14.0	20.0		14.0	20.0		14.0	20.0	
Total Split (s)	14.0	20.0		14.0	20.0		14.0	32.0		14.0	32.0	
Total Split (%)	17.5%	25.0%		17.5%	25.0%		17.5%	40.0%		17.5%	40.0%	
Maximum Green (s)	8.0	14.0		8.0	14.0		8.0	26.0		8.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	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	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	8.0	22.4		8.0	14.0	28.0	8.0	28.8		8.0	26.0	
Actuated g/C Ratio	0.10	0.28		0.10	0.18	0.35	0.10	0.36		0.10	0.32	
v/c Ratio	0.70	0.18		0.14	0.21	0.52	0.71	0.69		0.54	1.00	
Control Delay	57.5	21.6		35.1	30.3	14.5	58.0	28.9		46.3	64.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	57.5	21.6		35.1	30.3	14.5	58.0	28.9		46.3	64.3	
LOS	E	C		D	C	B	E	C		D	E	
Approach Delay		42.2			18.2			35.2			61.8	
Approach LOS		D			B			D			E	
Queue Length 50th (ft)	60	24		12	29	67	62	193		46	293	
Queue Length 95th (ft)	#119	64		31	58	118	86	202		80	#399	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	150			150		150	150			150		
Base Capacity (vph)	175	510		173	319	639	177	659		178	606	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.70	0.18		0.14	0.21	0.52	0.71	0.69		0.54	1.00	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 41.9 Intersection LOS: D
Intersection Capacity Utilization 63.6% ICU Level of Service B
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp S/NH 28 Byp N