APPENDIX I

ALTERNATIVES

TRAVEL DEMAND FORECAST (LOWER DENSITY ALTERNATIVE)

Land Use:	**Local Retail**	**Residential**	**Supermarket**	**PS school**	**PS Staff**	**Warehouse**		Total After 25% Retail/ Supermarket Linked Trips
Size/Units:	84,470 gsf	1,256 DU	25,000 gsf	456 Outside student	35 staff	-194,700 gsf	Total	
Peak Hour Trips:								
AM	518	1,016	220	412	35	NA	2,201	2,018
MD	3,290	508	264	0	0	NA	4,062	3,174
PM	1,732	1,116	438	42	35	NA	3,363	2,822
Sat MD	2,028	966	520	0	0	NA	3,514	2,878

Person Trips:

		Local Retail		Residential		Supermarket		PS school Off-site		PS school On-site Student		PS Staff		Warehouse		Total		Total After 25% Retail/ Supermarket Linked Trips	
		In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
AM	**Auto**	5	5	66	263	76	58	21	0	0	0	20	0	NA	NA	188	326	168	310
	Taxi	8	8	1	4	0	0	0	0	0	0	0	0	NA	NA	9	12	7	10
	Subway	16	16	113	450	1	1	0	0	0	0	6	0	NA	NA	136	467	132	463
	Bus	16	16	7	26	6	6	0	0	0	0	4	0	NA	NA	33	48	28	43
	Schoolbus							20	0	0	0			NA	NA	20	0	20	0
	Walk/Other	214	214	17	69	41	31	21	0	350	0	5	0	NA	NA	648	314	584	253
	Total	259	259	204	812	124	96	62	0	350	0	35	0	NA	NA	1,034	1,167	939	1,079
		In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
MD	**Auto**	33	33	82	82	90	90	0	0	0	0	0	0	NA	NA	205	205	174	174
	Taxi	49	49	1	1	0	0	0	0	0	0	0	0	NA	NA	50	50	38	38
	Subway	99	99	141	141	0	0	0	0	0	0	0	0	NA	NA	240	240	215	215
	Bus	99	99	8	8	7	7	0	0	0	0	0	0	NA	NA	114	114	88	88
	Schoolbus							0	0	0	0			NA	NA	0	0	0	0
	Walk/Other	1,365	1,365	22	22	35	35	0	0	0	0	0	0	NA	NA	1,422	1,422	1,072	1,072
	Total	1,645	1,645	254	254	132	132	0	0	0	0	0	0	NA	NA	2,031	2,031	1,587	1,587
		In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
PM	**Auto**	17	17	235	127	153	141	0	3	0	0	0	20	NA	NA	405	308	363	269
	Taxi	26	26	4	2	0	0	0	0	0	0	0	0	NA	NA	30	28	24	22
	Subway	52	52	402	216	0	0	0	0	0	0	0	6	NA	NA	454	274	441	261
	Bus	52	52	23	12	7	6	0	0	0	0	0	4	NA	NA	82	74	67	60
	Schoolbus							0	0	0	0			NA	NA	0	0	0	0
	Walk/Other	719	719	62	33	68	63	0	3	0	36	0	5	NA	NA	849	859	651	664
	Total	866	866	726	390	228	210	0	6	0	36	0	35	NA	NA	1,820	1,543	1,546	1,276

Vehicle Trips :

		Local Retail		Residential		Supermarket		PS school Off-site		PS school On-site Student		PS Staff		Warehouse		Total		Total After 25% Retail/ Supermarket Linked Trips	
		In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
AM	**Auto (Total)**	3	3	59	237	68	52	16	16	0	0	17	0	-18	-8	145	300	127	286
	Taxi	4	4	1	3	0	0	0	0	0	0	0	0	0	0	5	7	4	6
	Taxi Balanced	8	8	4	4	0	0	0	0	0	0	0	0	0	0	12	12	10	10
	Shuttle/Schoolbus			9	9			3	3	0	0			0	0	12	12	12	12
	Truck	1	1	5	5	1	1	0	0	0	0	0	0	-2	0	5	7	5	7
	Total	12	12	77	255	69	53	19	19	0	0	17	0	-20	-8	174	331	154	315
		In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
MD	**Auto (Total)**	17	17	74	74	68	68	0	0	0	0	0	0	-11	-15	148	144	127	123
	Taxi	25	25	1	1	0	0	0	0	0	0	0	0	0	0	26	26	20	20
	Taxi Balanced	50	50	2	2	0	0	0	0	0	0	0	0	0	0	52	52	40	40
	Shuttle/Schoolbus			0	0			0	0					0	-1	0	-1	0	-1
	Truck	2	2	3	3	1	1	0	0	0	0	0	0	-2	-2	4	4	3	3
	Total	69	69	79	79	69	69	0	0	0	0	0	0	-13	-18	204	199	170	165
		In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
PM	**Auto (Total)**	9	9	212	114	114	105	2	2	0	0	0	17	-5	-16	332	231	301	203
	Taxi	13	13	3	1	0	0	0	0	0	0	0	0	0	0	16	14	13	11
	Taxi Balanced	26	26	4	4	0	0	0	0	0	0	0	0	0	0	30	30	24	24
	Shuttle/Schoolbus			9	9			0	0					-3	0	6	9	6	9
	Truck	0	0	1	1	0	0	0	0	0	0	0	0	-1	0	0	1	0	1
	Total	35	35	226	128	114	105	2	2	0	0	0	17	-9	-16	368	271	331	237

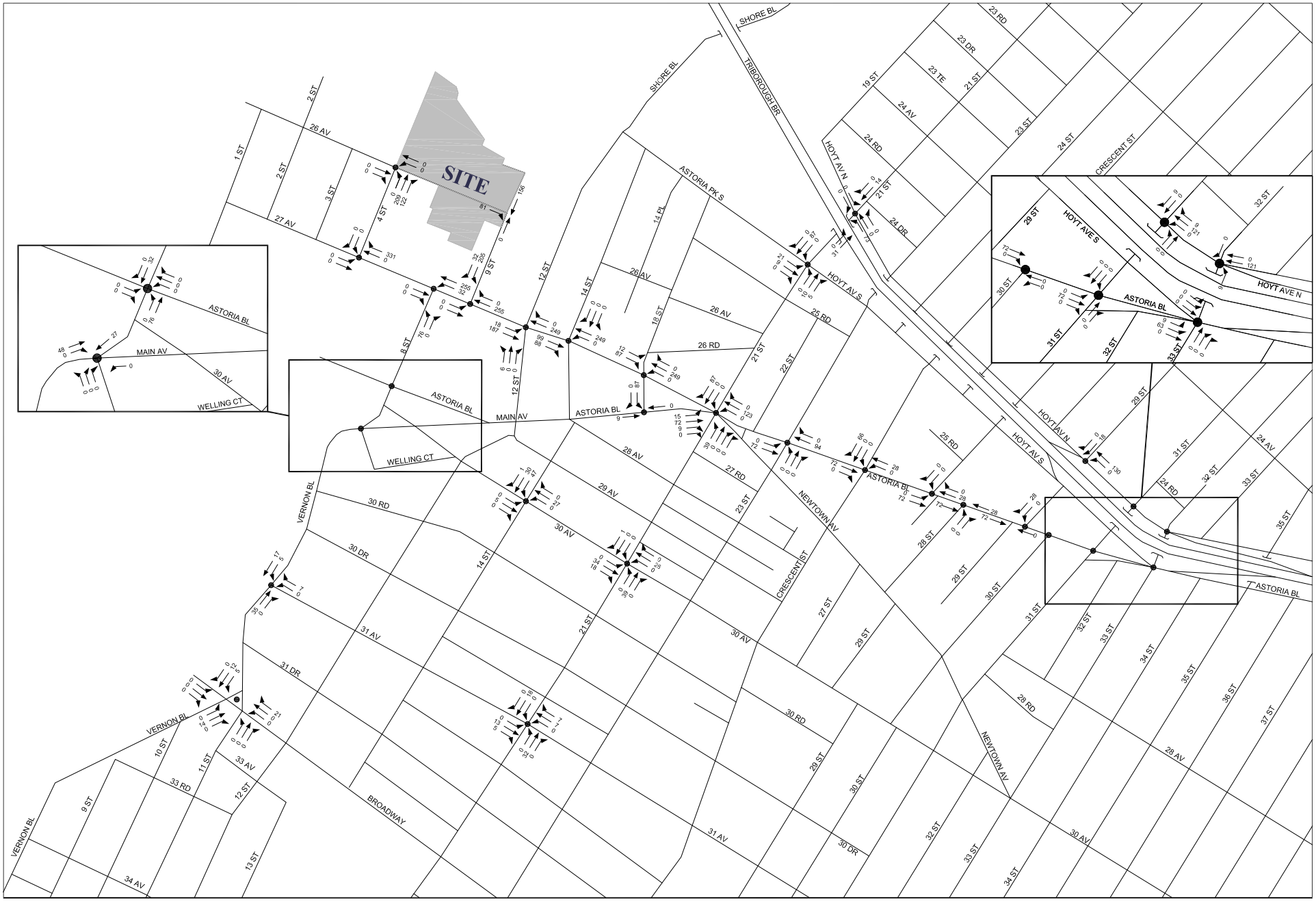
	Total			Total After Linked Trips			Q103 Bus-to-Subway Transfer*		
Total Vehicle	In	Out	Total	In	Out	Total	In	Out	Total
AM	174	331	505	154	315	469	35	107	142
MD	204	199	403	170	165	335	72	72	144
PM	368	271	639	331	237	568	110	72	182
Sat MD	306	300	606	263	257	520	85	85	170

Notes : 25% link trips applied to Retail and Supermarket Uses.

80% of resident subway users will be shuttled to subway station at 30th Ave and 31st Street

10% Absentee rate is applied for students of the public school.

* 20% of subway demand added to 1/3 of bus users that would utilize Q103.

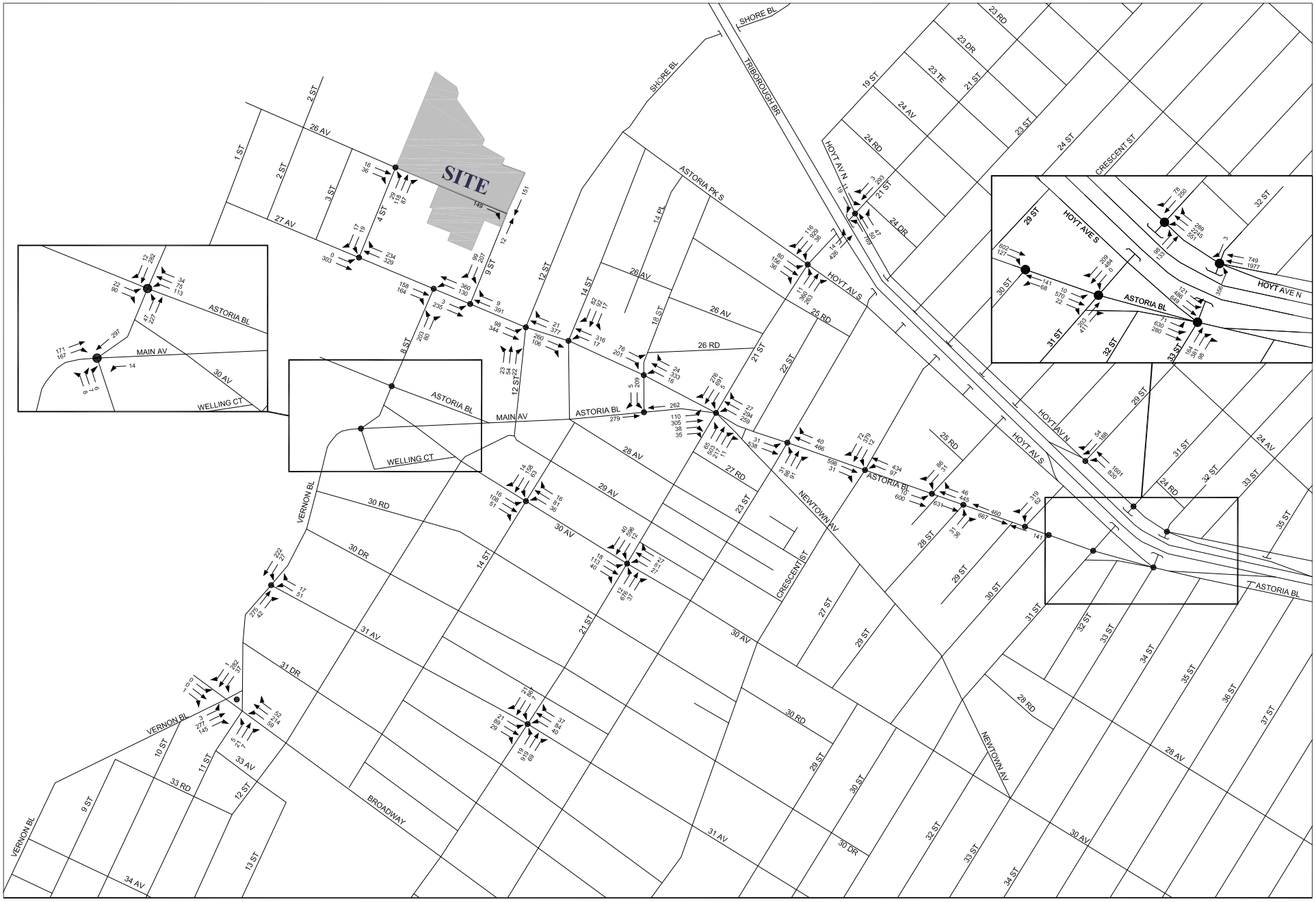


● Analyzed Locations

Astoria Cove

Figure XX-XX

Lower Density Alternative Increment Volumes - PM Peak Hour

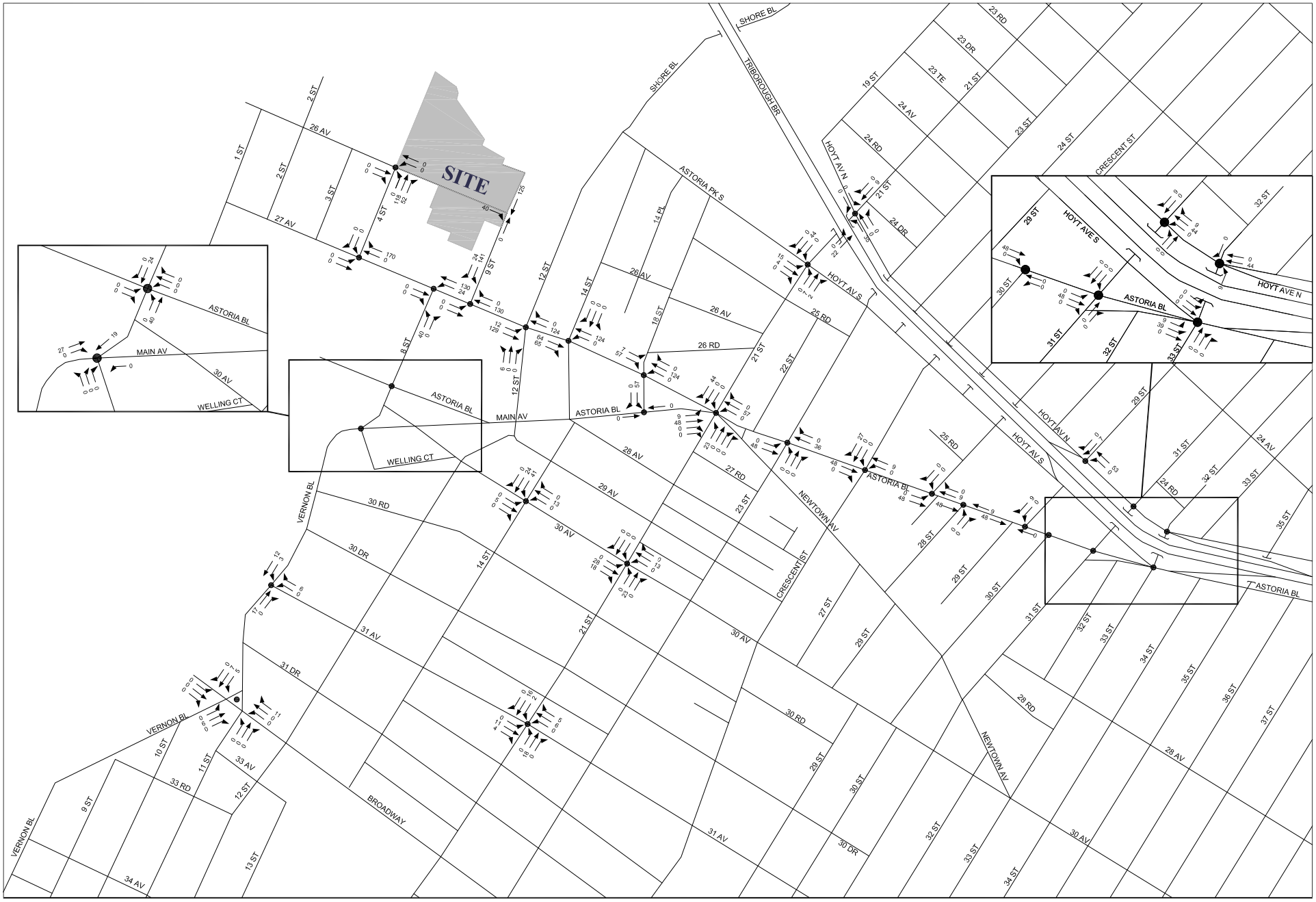


● Analyzed Locations

Astoria Cove

Figure XX-XX

Lower Density Alternative Volumes - Midday Peak Hour

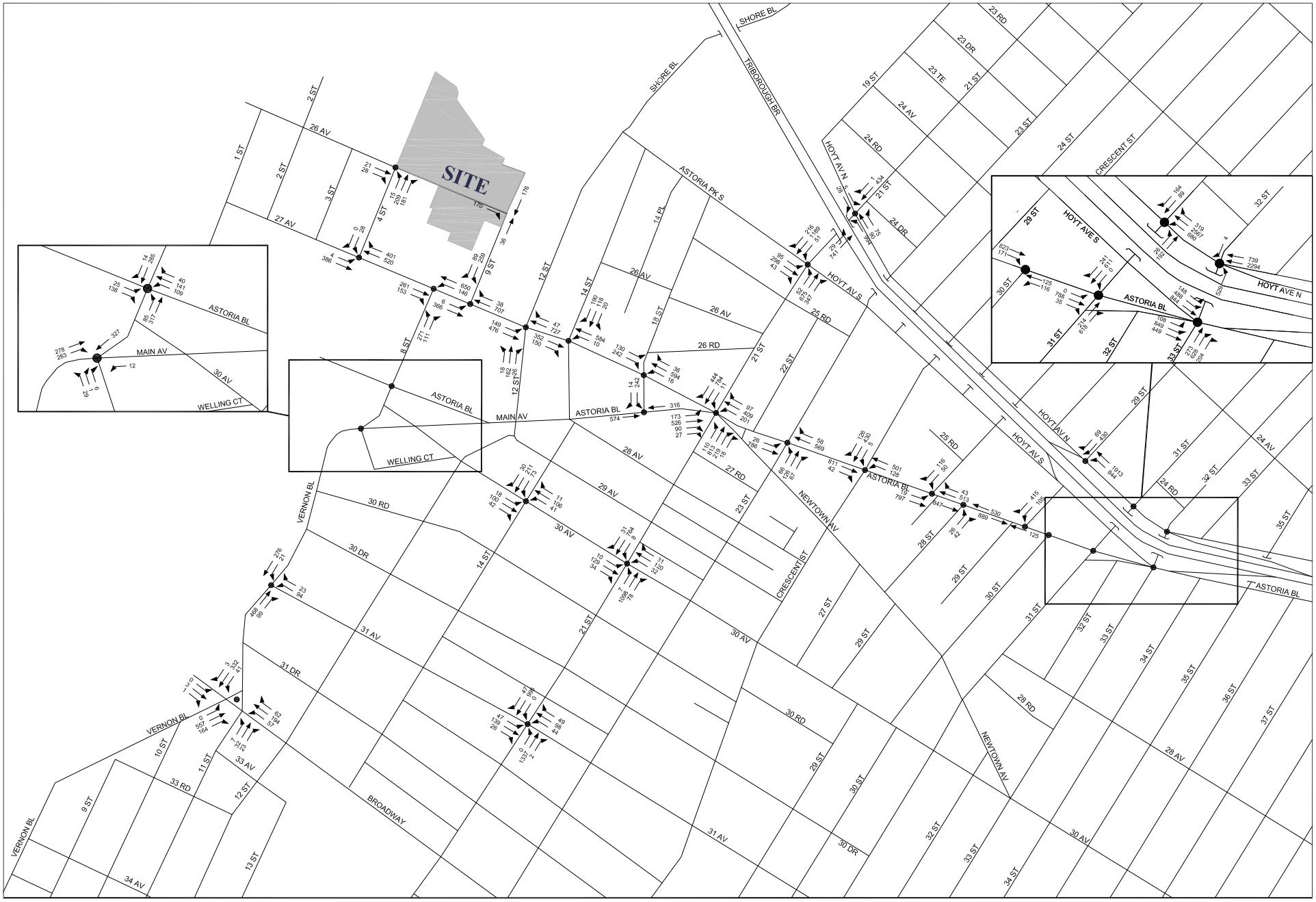


● Analyzed Locations

Astoria Cove

Figure XX-XX

Lower Density Allternative Increment Volumes - Midday Peak Hour

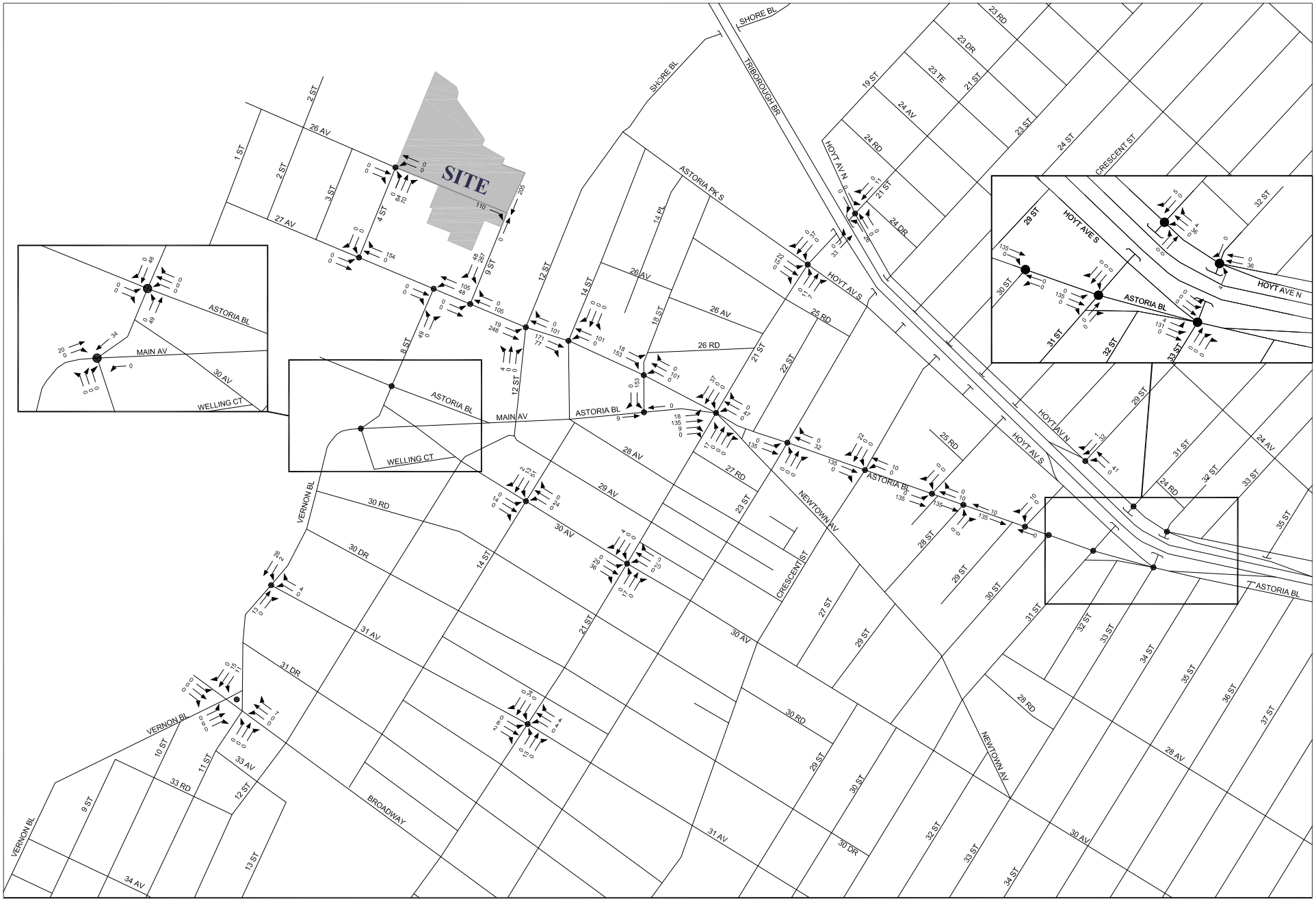


● Analyzed Locations

Astoria Cove

Figure XX-XX

Lower Density Alternative Volumes - PM Peak Hour

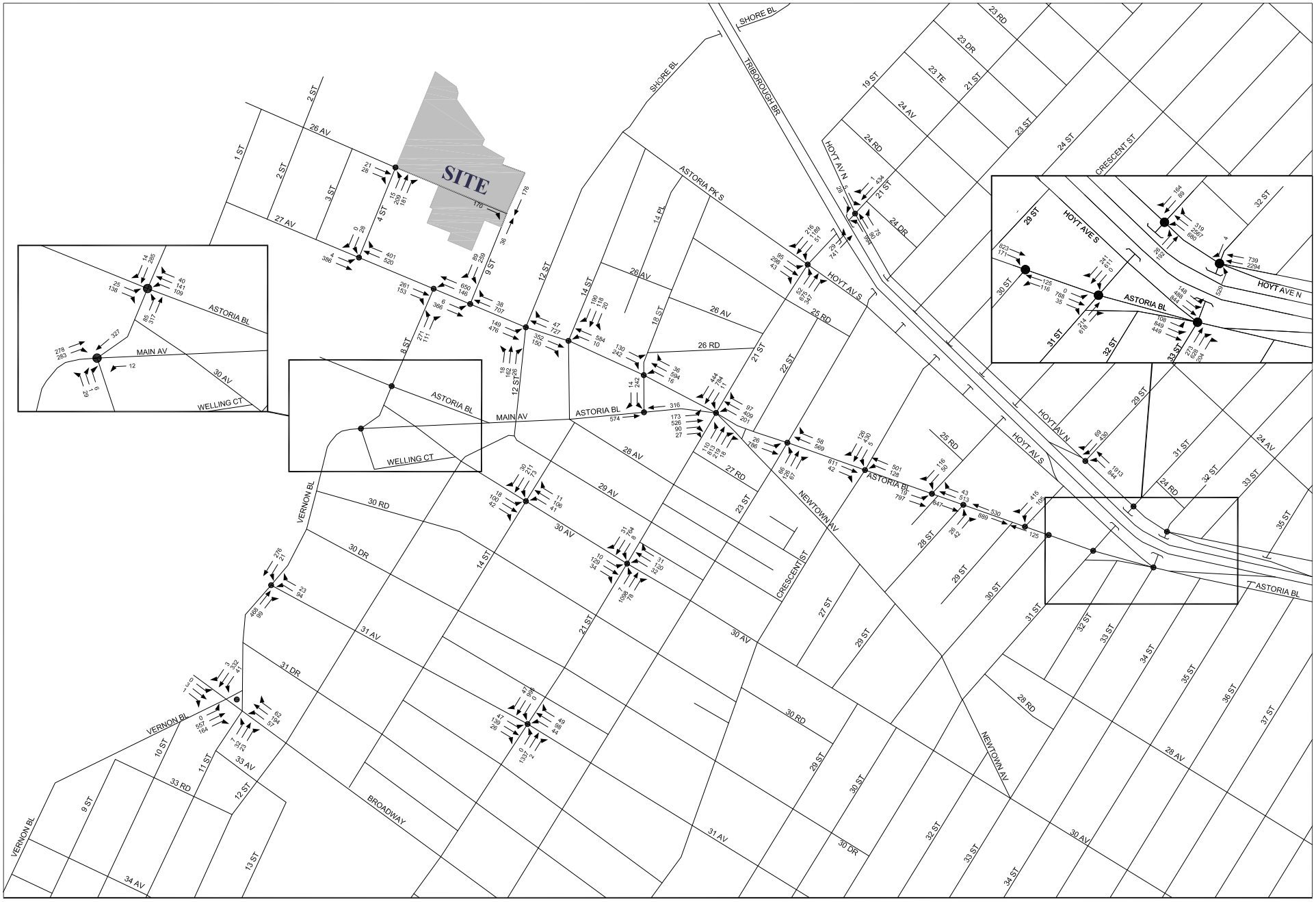


● Analyzed Locations

Astoria Cove

Figure XX-XX

Lower Density Alternative Increment Volumes - AM Peak Hour



● Analyzed Locations

Astoria Cove

Figure XX-XX

Lower Density Alternative Volumes - PM Peak Hour

2023 Lower Density Alternative With Halletts Point Project - Traffic Levels of Service

Intersection	Lane Group	AM PEAK HOUR							MIDDAY PEAK HOUR							PM PEAK HOUR						
		NO-ACTION (2)			LDA				NO-ACTION (2)			LDA				NO-ACTION (2)			LDA			
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	
1. 26th Avenue & 4th Street	EB-LTR	-	-	-	NA	7.8	A		-	-	-	NA	7.6	A		-	-	-	NA	8.0	A	
(Unsignalized-Two Way Stop)	NB-LR	0.11	9.7	A	NA	9.2	A		0.08	9.4	A	NA	8.9	A		0.09	9.3	A	NA	10.9	B	
A. 26th Avenue & 9th Street	EB-R	0.09	8.9	A	0.32	12.3	B		0.13	8.9	A	0.22	10.4	B		0.10	8.8	A	0.26	11.0	B	
(Unsignalized-Two Way Stop)																						
2. 27th Avenue & 4th Street	EB-LT	0.78	22.4	C	0.78	22.4	C		0.45	14.1	B	0.45	14.1	B		0.56	15.0	B	0.56	15.0	B	
(Existing Unsignalized-All Way Stop)	WB-T	0.44	13.7	B	0.44	13.7	B		0.43	13.1	B	0.43	13.1	B		0.65	15.6	B	0.65	15.6	B	
(No-Action Signalized)	WB-R	0.25	12.2	B	0.64	20.6	C		0.27	12.5	B	0.83	32.3	C		0.29	11.8	B	1.28	159.8	F	*
	SB-LR	0.10	20.4	C	0.10	20.4	C		0.09	20.3	C	0.09	20.3	C		0.08	21.6	C	0.08	21.6	C	
3. 27th Avenue & 8th Street	EB-T	0.53	14.9	B	0.53	14.9	B		0.24	11.9	B	0.24	11.9	B		0.36	13.2	B	0.36	13.2	B	
	EB-R	0.66	21.2	C	0.66	21.2	C		0.61	22.5	C	0.61	22.5	C		0.42	15.9	B	0.42	15.9	B	
	WB-LT	1.32	179.6	F	1.80	387.4	F	*	1.25	151.3	F	1.68	336.1	F	*	1.22	138.6	F	1.83	400.4	F	*
	NB-L	0.52	28.4	C	0.70	34.6	C		0.36	23.3	C	0.45	25.0	C		0.48	25.8	C	0.66	31.2	C	
	NB-R	0.57	34.6	C	0.57	34.6	C		0.73	47.7	D	0.73	47.7	D		0.75	47.4	D	0.75	47.4	D	
26. 27th Avenue & 9th Street	EB-LT	0.02	8.5	A	0.01	8.9	A		0.01	8.1	A	0.00	8.6	A		0.01	8.8	A	0.01	9.8	A	
(Unsignalized-Two Way Stop)	SB-LR	0.56	29.6	D	2.06	521.3	F	*	0.43	15.9	C	0.93	61.6	F	*	0.60	31.2	D	2.23	606.7	F	*
4. 27th Avenue & 12th Street	EB-LT	0.64	9.9	A	1.04	50.4	D	*	0.47	11.2	B	0.74	18.0	B		0.54	8.2	A	0.94	30.0	C	
(Existing Unsignalized-Two Way Stop)	WB-TR	0.47	6.2	A	0.58	7.3	A		0.41	10.4	B	0.59	13.4	B		0.66	8.8	A	0.96	25.3	C	
(No-Action Signalized)	NB-LTR	0.57	43.1	D	0.59	44.1	D		0.28	27.3	C	0.30	27.7	C		0.86	65.8	E	0.90	70.6	E	*
5. 27th Avenue & 14th Street	EB-TR	0.61	19.4	B	1.08	64.7	E	*	0.33	11.5	B	0.52	13.9	B		0.45	15.7	B	0.75	20.5	C	
(Existing Unsignalized-All Way Stop)	WB-LT	0.66	22.9	C	1.18	117.7	F	*	0.29	11.0	B	0.45	12.8	B		0.57	16.6	B	0.97	28.1	C	
(No-Action Signalized)	SB-LTR	0.89	41.0	D	0.89	41.0	D		0.52	28.5	C	0.52	28.5	C		0.79	36.0	D	0.79	36.0	D	
6. 27th Avenue & 18th Street	EB-LTR	0.10	9.5	A	0.12	9.6	A		0.06	8.3	A	0.08	8.9	A		0.12	9.1	A	0.18	10.9	B	
(Unsignalized-Two Way Stop)	WB-LTR	0.02	7.8	A	0.02	8.2	A		0.01	7.7	A	0.01	7.8	A		0.01	7.8	A	0.01	8.0	A	
7. Astoria Boulevard & 21st Street	EB-L	1.20	156.4	F	1.21	160.0	F	*	0.33	36.9	D	0.36	37.5	D		0.61	46.8	D	0.67	48.8	D	
	EB-TR	1.70	365.9	F	2.00	503.3	F	*	0.61	41.5	D	0.68	43.6	D		1.13	118.0	F	1.27	174.5	F	*
	WB-L	1.01	69.0	E	1.01	69.0	E		0.86	53.2	D	0.86	53.2	D		0.92	68.3	E	0.91	66.7	E	
	WB-TR	0.82	45.2	D	0.89	47.7	D		0.46	36.4	D	0.54	37.9	D		0.99	73.3	E	1.22	156.2	F	*
	NB-LT	0.71	31.5	C	0.79	34.6	C		0.79	38.2	D	0.94	43.6	D		1.10	80.8	F	1.26	152.5	F	*
	NB-R	0.37	24.7	C	0.37	24.7	C		0.65	36.1	D	0.65	36.1	D		0.44	22.9	C	0.44	22.9	C	
	SB-LT	0.86	30.8	C	0.85	30.7	C		0.76	38.1	D	0.76	38.1	D		0.77	29.6	C	0.77	29.6	C	
	SB-R	0.59	26.9	C	0.66	28.2	C		0.75	39.7	D	0.90	46.6	D	*	0.80	33.1	C	0.99	54.5	D	*
8. Astoria Boulevard & 23rd Street	EB-LT	1.21	127.5	F	1.43	224.3	F	*	0.81	23.1	C	0.88	27.8	C		0.95	35.5	D	1.04	58.0	E	*
	WB-TR	0.91	29.7	C	0.94	33.4	C		0.77	17.4	B	0.83	18.8	B		0.84	22.7	C	0.98	32.7	C	
	NB-LTR	0.50	33.5	C	0.50	33.5	C		0.56	28.5	C	0.56	28.5	C		0.61	37.4	D	0.61	37.4	D	

2023 Lower Density Alternative With Halletts Point Project - Traffic Levels of Service

Intersection	Lane Group	AM PEAK HOUR							MIDDAY PEAK HOUR							PM PEAK HOUR						
		NO-ACTION (2)			LDA				NO-ACTION (2)			LDA				NO-ACTION (2)			LDA			
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	
9. Astoria Boulevard & Crescent Street	EB-TR	1.28	159.6	F	1.49	252.6	F	*	0.83	25.1	C	0.90	30.8	C		1.11	88.2	F	1.21	128.8	F	*
	WB-LT	1.24	139.4	F	1.38	201.4	F	*	1.27	143.1	F	1.34	175.3	F	*	1.53	267.6	F	1.71	347.5	F	*
	SB-LTR	1.11	89.1	F	1.18	120.4	F	*	1.09	73.8	E	1.17	111.4	F	*	1.07	74.4	E	1.29	171.5	F	*
10. Astoria Boulevard & 27th Street	EB-LT	0.96	38.2	D	1.12	87.3	F	*	0.59	16.2	B	0.64	17.3	B		0.79	22.1	C	0.86	26.4	C	
	WB-TR	0.84	23.0	C	0.85	23.6	C		0.71	18.3	B	0.72	18.7	B		0.65	16.8	B	0.68	17.6	B	
	SB-LR	0.83	41.1	D	0.83	41.1	D		0.53	34.9	C	0.53	34.9	C		0.88	42.7	D	0.88	42.7	D	
11. Astoria Boulevard & 28th Street (Unsignalized-Two Way Stop)	NB-LR	0.70	68.0	F	0.91	126.0	F		0.42	28.3	D	0.47	32.9	D		0.41	30.1	D	0.48	38.0	E	
12. Astoria Boulevard & 29th Street	EB-T	1.63	328.2	F	1.89	439.8	F	*	0.97	48.8	D	1.05	69.0	E	*	1.30	179.5	F	1.42	229.4	F	*
	WB-T	0.44	27.5	C	0.44	27.5	C		0.23	13.5	B	0.23	13.5	B		0.22	20.3	C	0.22	20.3	C	
	SB-L	0.18	17.0	B	0.18	17.0	B		0.12	18.1	B	0.12	18.1	B		0.16	19.5	B	0.16	19.5	B	
	SB-R	0.75	31.3	C	0.77	32.2	C		0.70	30.5	C	0.72	31.4	C		0.66	30.4	C	0.70	32.5	C	
13. Astoria Boulevard & 30th Street (Unsignalized-Two Way Stop)	WB-LT	0.00	12.9	B	0.00	14.6	B		0.10	10.1	B	0.11	10.5	B		0.23	12.6	B	0.25	13.5	B	
14. Astoria Boulevard & 31st Street	EB-LTR	0.83	37.5	D	0.97	47.4	D	*	0.57	22.4	C	0.62	23.1	C		0.75	34.8	C	0.82	36.5	D	
	NB-T	0.52	41.8	D	0.52	41.8	D		0.54	33.7	C	0.54	33.7	C		0.52	41.6	D	0.52	41.6	D	
	NB-R	0.67	16.5	B	0.67	16.5	B		0.53	8.9	A	0.53	8.9	A		0.84	24.2	C	0.84	24.2	C	
	SB-T	1.10	85.7	F	1.10	85.7	F		0.65	19.8	B	0.65	19.8	B		0.69	22.8	C	0.69	22.8	C	
	SB-R	0.30	14.9	B	0.30	14.9	B		0.31	14.3	B	0.31	14.3	B		0.31	15.1	B	0.31	15.1	B	
15. Hoyt Avenue S./Astoria Boulevard & 33rd Street	Astoria Blvd (EB-LT)	1.32	192.2	F	1.46	256.5	F	*	1.02	62.4	E	1.08	80.7	F	*	1.17	121.1	F	1.23	149.1	F	*
	NB-TR	1.09	94.2	F	1.09	94.2	F		0.81	38.6	D	0.81	38.6	D		1.09	86.7	F	1.09	86.7	F	
	NB-R	1.08	92.9	F	1.08	92.9	F		0.79	42.6	D	0.79	42.6	D		1.08	86.6	F	1.08	86.6	F	
	Hoyt Ave (EB-LT)	0.63	27.1	C	0.63	27.1	C		0.78	30.4	C	0.78	30.4	C		0.87	41.3	D	0.87	41.3	D	
16. Hoyt Ave N. & 29th Street	WB-L	0.80	14.6	B	0.80	14.6	B		0.57	12.0	B	0.57	12.0	B		0.45	12.7	B	0.45	12.7	B	
	WB-LT	0.82	14.6	B	0.84	15.1	B		0.58	11.7	B	0.60	11.9	B		0.74	17.5	B	0.80	19.0	B	
	SB-R	1.03	98.5	F	1.11	125.2	F	*	0.53	35.5	D	0.55	35.9	D		0.85	54.2	D	0.88	57.0	E	
17. Hoyt Ave N. & 31st Street	WB-L	1.06	101.1	F	1.06	101.1	F		1.05	95.0	F	1.05	95.0	F		0.44	16.3	B	0.44	16.3	B	
	WB-T	1.01	37.4	D	1.02	40.9	D		0.80	19.5	B	0.82	20.1	C		0.85	25.4	C	0.90	27.7	C	
	WB-R	0.34	10.4	B	0.34	10.5	B		0.66	21.5	C	0.68	22.3	C		0.72	26.8	C	0.74	28.0	C	
	NB-DefL	-	-	-	-	-	-		0.54	31.1	C	0.54	31.1	C		-	-	-	-	-	-	
	NB-T	-	-	-	-	-	-		0.23	21.2	C	0.23	21.2	C		-	-	-	-	-	-	
	NB-LT	0.30	35.9	D	0.30	35.9	D			26.0	C		26.0	C		0.29	28.3	C	0.29	28.3	C	
	SB-T	0.28	36.3	D	0.28	36.3	D		0.46	24.4	C	0.46	24.4	C		0.15	26.6	C	0.15	26.6	C	
	SB-R	0.74	57.8	E	0.77	60.1	E		0.26	22.2	C	0.29	22.7	C		0.49	34.6	C	0.52	35.5	D	

2023 Lower Density Alternative With Halletts Point Project - Traffic Levels of Service

Intersection	Lane Group	AM PEAK HOUR							MIDDAY PEAK HOUR							PM PEAK HOUR						
		NO-ACTION (2)			LDA				NO-ACTION (2)			LDA				NO-ACTION (2)			LDA			
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	
18. Astoria Boulevard N. & 32nd Street	WB(Main)-T	0.53	8.9	A	0.53	8.9	A		0.37	7.9	A	0.37	7.9	A		0.32	9.2	A	0.32	9.2	A	
	WB(Ramp)-T	1.17	127.2	F	1.19	134.9	F	*	1.03	45.5	D	1.06	53.3	D	*	1.13	84.7	F	1.19	111.0	F	*
	NB-L	0.66	45.3	D	0.67	45.4	D		0.38	29.0	C	0.39	29.1	C		0.57	39.2	D	0.58	39.3	D	
	SB-R	0.03	38.0	D	0.03	38.0	D		0.02	25.9	C	0.02	25.9	C		0.02	33.3	C	0.02	33.3	C	
19. Astoria Boulevard & 8th Street	EB-L	0.16	24.6	C	0.16	24.6	C		0.09	26.1	C	0.09	26.1	C		0.17	29.0	C	0.17	29.0	C	
	EB-R	0.77	44.4	D	0.77	44.4	D		0.27	29.0	C	0.27	29.0	C		0.66	40.6	D	0.66	40.6	D	
	WB-L	0.32	26.9	C	0.32	26.9	C		0.36	30.6	C	0.36	30.6	C		0.31	31.0	C	0.31	31.0	C	
	WB-TR	0.34	27.3	C	0.34	27.3	C		0.34	30.3	C	0.34	30.3	C		0.50	35.3	D	0.50	35.3	D	
	NB-LT	0.52	20.2	C	0.65	23.3	C		0.46	17.2	B	0.52	18.5	B		0.87	27.7	C	1.03	53.8	D	*
	SB-TR	0.74	27.0	C	0.83	31.7	C		0.40	16.3	B	0.43	16.8	B		0.39	15.1	B	0.43	15.8	B	
20. 30th Avenue & 14th Street	EB-LTR	NA	13.0	B	NA	15.1	C		NA	9.1	A	NA	9.6	A		NA	9.6	A	NA	10.4	B	
(Unsignalized-All Way Stop)	WB-LTR	NA	13.4	B	NA	16.1	C		NA	9.1	A	NA	9.7	A		NA	9.5	A	NA	10.6	B	
	SB-LTR	NA	28.5	D	NA	56.0	F	*	NA	9.5	A	NA	10.9	B		NA	11.4	B	NA	15.2	C	
21. 30th Avenue & 21st Street	EB-LTR	0.52	39.0	D	0.73	48.8	D	*	0.35	34.5	C	0.47	37.6	D		0.37	35.1	D	0.53	39.4	D	
	WB-LTR	0.48	38.0	D	0.55	40.1	D		0.39	35.6	D	0.42	36.5	D		0.50	38.8	D	0.58	41.3	D	
	NB-LTR	0.53	15.0	B	0.55	15.2	B		0.53	14.9	B	0.54	15.2	B		0.78	21.7	C	0.81	22.9	C	
	SB-LTR	0.75	19.8	B	0.75	19.9	B		0.42	13.0	B	0.42	13.0	B		0.48	13.9	B	0.48	13.9	B	
22. Vernon Boulevard & Welling Court/	EB-LT	1.18	116.5	F	1.25	149.0	F	*	0.91	45.7	D	0.98	57.7	E	*	1.43	229.6	F	1.57	292.1	F	*
8th Street	WB-TR	0.04	21.1	C	0.04	21.1	C		0.04	21.1	C	0.04	21.1	C		0.06	21.3	C	0.06	21.3	C	
	NB-LTR	0.33	36.1	D	0.33	36.1	D		0.17	31.0	C	0.17	31.0	C		0.18	29.5	C	0.18	29.5	C	
	SB-R	1.01	68.7	E	1.10	95.3	F	*	0.71	35.1	D	0.76	37.6	D		0.72	37.9	D	0.79	41.8	D	
23. Astoria Boulevard & 18th Street	EB-T	0.91	39.6	D	0.92	41.0	D		0.41	23.1	C	0.41	23.1	C		0.76	31.5	C	0.77	32.0	C	
(Existing Unsignalized-Two Way Stop)	WB-T	0.66	27.1	C	0.66	27.1	C		0.41	22.9	C	0.41	22.9	C		0.44	22.2	C	0.44	22.2	C	
(No-Action Signalized)	SB-LR	0.46	25.0	C	0.78	37.2	D		0.32	22.1	C	0.43	24.3	C		0.32	22.0	C	0.48	25.2	C	
24. Hoyt Avenue N. & 21st Street	EB-L	0.02	40.4	D	0.02	40.4	D		0.12	44.0	D	0.12	44.0	D		0.11	43.9	D	0.11	43.9	D	
	EB-R	0.37	47.5	D	0.37	47.5	D		0.15	44.5	D	0.15	44.5	D		0.19	45.3	D	0.19	45.3	D	
	WB-L	1.07	78.5	E	1.09	89.6	F	*	0.81	41.3	D	0.85	43.3	D		0.97	58.9	E	1.04	78.4	E	*
	WB-TR	0.25	14.8	B	0.25	14.8	B		0.17	14.2	B	0.17	14.2	B		0.30	16.9	B	0.30	16.9	B	
	NB-L	0.31	32.3	C	0.32	32.9	C		0.12	25.4	C	0.12	25.5	C		0.17	24.7	C	0.17	24.8	C	
	NB-T	1.20	143.8	F	1.29	180.0	F	*	0.81	46.3	D	0.86	50.7	D		1.12	99.0	F	1.16	118.8	F	*
	SB-TR	1.04	65.0	E	1.06	73.1	E	*	0.60	34.1	C	0.61	34.6	C		0.77	37.9	D	0.80	39.2	D	

2023 Lower Density Alternative With Halletts Point Project - Traffic Levels of Service

Intersection	Lane Group	AM PEAK HOUR							MIDDAY PEAK HOUR							PM PEAK HOUR						
		NO-ACTION (2)			LDA				NO-ACTION (2)			LDA				NO-ACTION (2)			LDA			
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	
25. Hoyt Avenue S./Astoria Park S. & 21st Street	EB-LTR	0.84	41.9	D	0.92	44.3	D		0.36	32.0	C	0.40	32.6	C		0.58	37.9	D	0.63	39.0	D	
	NB-LT	-	-	-	-	-	-		-	-	-	-	-	-		0.72	16.8	B	0.75	17.6	B	
	NB-R	-	-	-	-	-	-		-	-	-	-	-	-		0.51	13.3	B	0.52	13.4	B	
	NB-LTR	0.60	14.2	B	0.63	14.7	B		0.48	15.0	B	0.48	15.1	B			15.7	B		16.3	B	
	SB-LTR	1.11	75.4	E	1.14	89.2	F	*	0.73	19.8	B	0.76	20.7	C		0.99	38.1	D	1.04	53.5	D	*
27. Vernon Boulevard & 31st Avenue (Unsignalized-Two Way Stop)	WB-LR	0.66	38.2	E	0.71	44.5	E	*	0.25	17.7	C	0.28	18.5	C		0.51	29.2	D	0.58	35.1	E	*
	SB-LT	0.02	8.3	A	0.02	8.3	A		0.03	8.1	A	0.03	8.2	A		0.02	8.9	A	0.03	9.0	A	
28. Vernon Boulevard & Broadway/11th Street	EB-LTR	0.01	28.2	C	0.01	28.2	C		0.02	25.4	C	0.02	25.4	C		0.03	33.2	C	0.03	33.2	C	
	WB-LT	0.87	38.9	D	0.87	38.9	D		-	-	-	-	-	-		0.77	47.0	D	0.77	47.0	D	
	WB-R	0.21	29.9	C	0.25	30.3	C		-	-	-	-	-	-		0.24	35.8	D	0.36	37.8	D	
	WB-LTR	0.00	37.7	D		37.6	D		0.96	55.5	E	1.01	66.3	E	*	0.00	45.1	D		44.9	D	
	NB (Vernon Blvd)-LT	0.28	8.2	A	0.29	8.2	A		0.29	9.0	A	0.30	9.1	A		0.52	10.1	B	0.54	10.3	B	
	NB (Vernon Blvd)-R	0.11	6.8	A	0.11	6.8	A		0.21	8.3	A	0.21	8.3	A		0.18	6.7	A	0.18	6.7	A	
	NB (11th Street)-LTR	0.38	41.1	D	0.38	41.1	D		0.22	32.8	C	0.22	32.8	C		0.33	38.2	D	0.33	38.2	D	
	SB-LTR	1.36	195.9	F	1.45	234.1	F	*	0.67	31.5	C	0.71	33.2	C		0.88	45.4	D	0.99	65.6	E	*
29. 31st Avenue & 21st Street	EB-LTR	0.67	45.6	D	0.70	47.3	D		0.34	34.5	C	0.38	35.4	D		0.57	41.2	D	0.63	43.3	D	
	WB-LTR	0.58	41.1	D	0.61	42.0	D		0.42	35.9	D	0.45	36.7	D		0.48	37.7	D	0.52	38.9	D	
	NB-TR	0.50	14.2	B	0.51	14.3	B		0.64	17.0	B	0.65	17.3	B		0.74	19.3	B	0.75	19.9	B	
	SB-TR	0.89	26.8	C	0.90	28.0	C		0.57	15.5	B	0.58	15.8	B		0.61	16.3	B	0.63	16.5	B	

Note:

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound

L-Left, T-Through, R-Right, Dfl-Analysis considers a Defacto Left Lane on this approach

V/C Ratio - Volume to Capacity Ratio, sec. - Seconds

LOS - Level of Service

* - Denotes a congested movement (LOS E or F, or V/C ratio greater than or equal to 0.9)

Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

2023 Lower Density Alternative With Halletts - Mitigation

Intersection	Lane Group	No-Action (2) V/C Ratio	No-Action (2) Delay (sec.)	No-Action (2) LOS	LDA V/C Ratio	LDA Delay (sec.)	LDA LOS	LDA V/C Ratio	LDA Delay (sec.)	LDA LOS	
AM PEAK HOUR											
3. 27th Avenue & 8th Street	EB-T	0.53	14.9	B	0.53	14.9	B	0.51	13.4	B	Partially Mitigated.
	EB-R	0.66	21.2	C	0.66	21.2	C	0.63	18.5	B	Modify signal timing: Shift 2s of green from the NB phase to the EB/WB phase [NB phase green shifts from 30s to 28s; EB/WB phase green shifts from
	WB-LT	1.32	179.6	F	1.80	387.4	F	1.68	334.7	F	50s to 52s].
	NB-L	0.52	28.4	C	0.70	34.6	C	0.75	39.3	D	
	NB-R	0.57	34.6	C	0.57	34.6	C	0.65	42.0	D	
4. 27th Avenue & 12th Street	EB-LT	0.64	9.9	A	1.04	50.4	D	1.01	42.2	D	Modify signal timing: Shift 1s of green from the NB phase to the EB/WB phase [NB phase green shifts from 16s to 15s; EB/WB phase green shifts from
(Existing Unsignalized-Two Way Stop)	WB-TR	0.47	6.2	A	0.58	7.3	A	0.58	6.7	A	64s to 65s].
(No-Action Signalized)	NB-LTR	0.57	43.1	D	0.59	44.1	D	0.63	47.5	D	
5. 27th Avenue & 14th Street	EB-TR	0.61	19.4	B	1.08	64.7	E	1.01	34.8	C	Install "No Standing 7AM - 10AM Mon-Fri" regulations along the WB approach for 250 feet and along the SB approach on the west side for 250 feet.
(Existing Unsignalized-All Way Stop)	WB-LT	0.66	22.9	C	1.18	117.7	F	0.86	29.9	C	Modify signal timing: shift 3s of green from the SB phase to the EB/WB phase [SB phase green shifts from 40s to 37s; EB/WB phase green shifts from
(No-Action Signalized)	SB-LTR	0.89	41.0	D	0.89	41.0	D	0.77	31.0	C	40s to 43s].
7. Astoria Boulevard & 21st Street	EB-L	1.20	156.4	F	1.21	160.0	F	1.07	106.2	F	Partially Mitigated
	EB-TR	1.70	365.9	F	2.00	503.3	F	1.78	401.1	F	Modify signal timing: Shift 3s of green from the NB/SB phase to the EB phase [NB/SB phase green shifts from 51s to 48s; EB phase green shifts from
	WB-L	1.01	69.0	E	1.01	69.0	E	1.01	69.0	E	24s to 27s; WB phase green time remains the same].
	WB-TR	0.82	45.2	D	0.89	47.7	D	0.89	47.7	D	
	NB-LT	0.71	31.5	C	0.79	34.6	C	0.86	41.0	D	
	NB-R	0.37	24.7	C	0.37	24.7	C	0.40	27.1	C	
	SB-LT	0.86	30.8	C	0.85	30.7	C	0.91	34.0	C	
	SB-R	0.59	26.9	C	0.66	28.2	C	0.71	31.0	C	
8. Astoria Boulevard & 23rd Street	EB-LT	1.21	127.5	F	1.43	224.3	F	1.18	112.1	F	Install "No Standing 7AM - 10AM, 4PM - 7PM Mon-Fri" regulations along the EB approach for 100 feet to daylight the approach.
	WB-TR	0.91	29.7	C	0.94	33.4	C	0.91	29.2	C	Modify signal timing: Shift 2s of green from the NB phase to the EB/WB phase [NB phase green shifts from 43s to 41s; EB/WB phase green shifts from
	NB-LTR	0.50	33.5	C	0.50	33.5	C	0.52	35.6	D	67s to 69s].
9. Astoria Boulevard & Crescent Street	EB-TR	1.28	159.6	F	1.49	252.6	F	1.23	136.2	F	Partially Mitigated
	WB-LT	1.24	139.4	F	1.38	201.4	F	1.38	201.4	F	Install "No Standing 7AM - 10AM, 4PM - 7PM Mon-Fri" regulations along the EB approach for 250 feet to daylight the approach. Install "No Standing
	SB-LTR	1.11	89.1	F	1.18	120.4	F	-	-	-	4PM - 7PM Mon-Fri" regulations along the WB approach for 250 feet to daylight the approach. Install "No Standing Anytime" regulations along the SB
	SB-LT	-	-	-	-	-	-	1.06	70.0	E	approach for 250 feet on the west side to allow for two moving lanes at the approach. Restripe the SB approach from one 30-foot wide travel lane with
	SB-R	-	-	-	-	-	-	0.19	26.6	C	parking on both sides to one 11-foot wide right-turn lane, and one 19-foot wide left-through lane with parking for 250 feet.
10. Astoria Boulevard & 27th Street	EB-LT	0.96	38.2	D	1.12	87.3	F	1.09	74.4	E	Partially Mitigated.
	WB-TR	0.84	23.0	C	0.85	23.6	C	0.83	21.3	C	Modify signal timing: Shift 2s of green from the SB phase to the EB/WB phase [SB phase green shifts from 37s to 35s; EB/WB phase green shifts from
	SB-LR	0.83	41.1	D	0.83	41.1	D	0.89	44.5	D	73s to 75s].
12. Astoria Boulevard & 29th Street	EB-T	1.63	328.2	F	1.89	439.8	F	1.59	304.6	F	Install "No Standing 7AM-10AM, 4PM - 7PM Mon-Fri" regulations along the EB approach for 200 feet to daylight the approach. Modify signal timing:
	WB-T	0.44	27.5	C	0.44	27.5	C	0.43	25.8	C	Shift 2s of green from the SB phase to the EB/WB phase [SB phase green shifts from 60s to 58s; EB/WB phase green shifts from 50s to 52s].
	SB-L	0.18	17.0	B	0.18	17.0	B	0.19	18.2	B	
	SB-R	0.75	31.3	C	0.77	32.2	C	0.80	35.5	D	
14. Astoria Boulevard & 31st Street	EB-LTR	0.83	37.5	D	0.97	47.4	D				Unmitigatable.
	NB-T	0.52	41.8	D	0.52	41.8	D				
	NB-R	0.67	16.5	B	0.67	16.5	B				
	SB-T	1.10	85.7	F	1.10	85.7	F				
	SB-R	0.30	14.9	B	0.30	14.9	B				
15. Hoyt Avenue S./Astoria Boulevard &	Astoria Blvd (EB-LT)	1.32	192.2	F	1.46	256.5	F	1.28	172.6	F	Install "No Standing 7AM-10AM" regulations along the EB Astoria Boulevard approach for 250 feet to daylight the approach. Modify signal timing:
33rd Street	NB-TR	1.09	94.2	F	1.09	94.2	F	1.09	94.2	F	Shift 3s of green time from the EB Hoyt Avenue S. phase to the EB Astoria Boulevard phase [EB Hoyt Avenue phase green time shifts from 52s to 49s;
	NB-R	1.08	92.9	F	1.08	92.9	F	1.08	92.9	F	EB Astoria Boulevard phase green time shifts from 31s to 34s; NB phase green time remains the same].
	Hoyt Ave (EB-LT)	0.63	27.1	C	0.63	27.1	C	0.67	29.6	C	
16. Hoyt Ave N. & 29th Street	WB-L	0.80	14.6	B	0.80	14.6	B	0.82	16.2	B	Modify signal timing: Shift 2s of green time from the WB phase to the SB phase [WB phase green time shifts from 82s to 80s; SB phase green time shifts
	WB-LT	0.82	14.6	B	0.84	15.1	B	0.86	16.8	B	from 21s to 23s; the bus queue jump phase green time remains the same].
	SB-R	1.03	98.5	F	1.11	125.2	F	1.02	91.8	F	
18. Astoria Boulevard N. & 32nd Street	WB(Main)-T	0.53	8.9	A	0.53	8.9	A	0.53	8.4	A	Modify signal timing: Shift 1s of green time from the NB/SB phase to the WB phase [NB/SB phase green time shifts from 25s to 24s; WB phase green
	WB(Ramp)-T	1.17	127.2	F	1.19	134.9	F	1.17	128.2	F	time shifts from 85s to 86s].
	NB-L	0.66	45.3	D	0.67	45.4	D	0.69	46.7	D	
	SB-R	0.03	38.0	D	0.03	38.0	D	0.03	38.8	D	

Intersection	Lane Group	No-Action (2) V/C Ratio	No-Action (2) Delay (sec.)	No-Action (2) LOS	LDA V/C Ratio	LDA Delay (sec.)	LDA LOS	LDA V/C Ratio	LDA Delay (sec.)	LDA LOS	
20. 30th Avenue & 14th Street (Unsignalized-All Way Stop)	EB-LTR	NA	13.0	B	NA	15.1	C				Unmitigatable.
	WB-LTR	NA	13.4	B	NA	16.1	C				
	SB-LTR	NA	28.5	D	NA	56.0	F				
21. 30th Avenue & 21st Street	EB-LTR	0.52	39.0	D	0.73	48.8	D	0.68	43.0	D	Modify signal timing: Shift 3s of green time from the NB/SB phase to the EB/WB phase [NB/SB phase green time shifts from 73s to 70s; EB/WB phase green time shifts from 37s to 40s].
	WB-LTR	0.48	38.0	D	0.55	40.1	D	0.50	36.3	D	
	NB-LTR	0.53	15.0	B	0.55	15.2	B	0.57	17.2	B	
	SB-LTR	0.75	19.8	B	0.75	19.9	B	0.79	22.9	C	
22. Vernon Boulevard & Welling Court/ 8th Street	EB-LT	1.18	116.5	F	1.25	149.0	F	1.13	96.2	F	Modify signal timing: Shift 3s of green time from the NB phase to the EB/SB phase [NB phase green time shifts from 17s to 14s; EB/SB phase green time shifts from 29s to 32s; WB phase green time remains the same].
	WB-TR	0.04	21.1	C	0.04	21.1	C	0.04	21.1	C	
	NB-LTR	0.33	36.1	D	0.33	36.1	D	0.41	42.0	D	
	SB-R	1.01	68.7	E	1.10	95.3	F	1.00	60.8	E	
24. Hoyt Avenue N. & 21st Street	EB-L	0.02	40.4	D	0.02	40.4	D	0.02	42.1	D	Partially Mitigated
	EB-R	0.37	47.5	D	0.37	47.5	D	0.41	50.9	D	Modify signal timing: Shift 1s of green time from the EB/WB phase to the NB/SB phase; Shift 1s of green time from the EB/WB phase to the WB lag phase [BE/WB phase green time shifts from 22s to 20s; NB/SB phase green time shifts from 45s to 46s; WB lag phase green time shifts from 38s to 39s].
	WB-L	1.07	78.5	E	1.09	89.6	F	1.07	78.0	E	
	WB-TR	0.25	14.8	B	0.25	14.8	B	0.25	15.4	B	
	NB-L	0.31	32.3	C	0.32	32.9	C	0.30	31.3	C	
	NB-T	1.20	143.8	F	1.29	180.0	F	1.26	167.1	F	
	SB-TR	1.04	65.0	E	1.06	73.1	E	1.04	64.1	E	
25. Hoyt Avenue S./Astoria Park S. & 21st Street	EB-LTR	0.84	41.9	D	0.92	44.3	D				Unmitigatable.
	NB-LT	-	-	-	-	-	-				
	NB-R	-	-	-	-	-	-				
	NB-LTR	0.60	14.2	B	0.63	14.7	B				
	SB-LTR	1.11	75.4	E	1.14	89.2	F				
26. 27th Avenue & 9th Street (Unsignalized-Two Way Stop)	EB-LT	0.02	8.5	A	0.01	8.9	A	0.63	20.2	C	Install a traffic signal with 90-second cycle length and two phases. [EB/WB phase green time is 45s; SB phase green time is 35s; all phases have 3s of amber and 2s of all red time. Install "No Standing Anytime" regulations along the total western length of 9th Street and along the east curb of 9th Street for 150 to allow for two-way traffic. Restripe the SB approach from one 16.5-foot wide travel lane with parking and one 15.5 foot wide NB receiving lane with parking to one 10-foot wide right-turn lane, one 10-foot wide left-turn lane, and one 12-foot wide NB receiving lane for 100 feet.
	WB-TR	-	-	-	-	-	-	0.83	30.0	C	
	SB-LR	0.56	29.6	D	2.06	521.3	F	-	-		
	SB-L	-	-	-	-	-	-	0.67	28.4	C	
	SB-R	-	-	-	-	-	-	0.26	20.0	B	
27. Vernon Boulevard & 31st Avenue (Unsignalized-Two Way Stop)	WB-LR	0.66	38.2	E	0.71	44.5	E				Unmitigatable.
	SB-LT	0.02	8.3	A	0.02	8.3	A				
28. Vernon Boulevard & Broadway/11th Street	EB-LTR	0.01	28.2	C	0.01	28.2	C	0.01	29.0	C	Modify signal timing: Shift 1s of green time from the EB/WB phase to the NB/SB Vernon Boulevard phase; Shift 2s of green time from the NB 11th Street phase to the NB/SB Vernon Boulevard phase [EB/WB phase green time shifts from 25s to 24s; NB/SB Vernon Boulevard phase green time shifts from 43s to 46s; NB 11th Street phase green time shifts from 17s to 15s].
	WB-LT	0.87	38.9	D	0.87	38.9	D	0.91	41.3	D	
	WB-R	0.21	29.9	C	0.25	30.3	C	0.27	31.1	C	
	WB-LTR		37.7	D		37.6	D		39.8	D	
	NB (Vernon Blvd)-LT	0.28	8.2	A	0.29	8.2	A	0.28	7.8	A	
	NB (Vernon Blvd)-R	0.11	6.8	A	0.11	6.8	A	0.11	6.4	A	
	NB (11th Street)-LTR	0.38	41.1	D	0.38	41.1	D	0.43	44.7	D	
	SB-LTR	1.36	195.9	F	1.45	234.1	F	1.34	184.2	F	
MIDDAY PEAK HOUR											
3. 27th Avenue & 8th Street	EB-T	0.24	11.9	B	0.24	11.9	B				Unmitigatable.
	EB-R	0.61	22.5	C	0.61	22.5	C				
	WB-LT	1.25	151.3	F	1.68	336.1	F				
	NB-L	0.36	23.3	C	0.45	25.0	C				
	NB-R	0.73	47.7	D	0.73	47.7	D				
7. Astoria Boulevard & 21st Street	EB-L	0.33	36.9	D	0.36	37.5	D	0.36	37.5	D	Modify signal timing: shift 1s of green from the WB phase to the NB/SB phase [WB phase green shifts from 34s to 33s; NB/SB phase green shifts from 38s to 39s; EB phase green time remains the same].
	EB-TR	0.61	41.5	D	0.68	43.6	D	0.68	43.6	D	
	WB-L	0.86	53.2	D	0.86	53.2	D	0.88	56.6	E	
	WB-TR	0.46	36.4	D	0.54	37.9	D	0.56	38.9	D	
	NB-LT	0.79	38.2	D	0.94	43.6	D	0.91	41.7	D	
	NB-R	0.65	36.1	D	0.65	36.1	D	0.63	35.1	D	
	SB-LT	0.76	38.1	D	0.76	38.1	D	0.74	37.0	D	
	SB-R	0.75	39.7	D	0.90	46.6	D	0.87	44.0	D	
9. Astoria Boulevard & Crescent Street	EB-TR	0.83	25.1	C	0.90	30.8	C	0.86	26.0	C	Install "No Standing 7AM - 10AM, 4PM - 7PM Mon-Fri" regulations along the EB approach for 250 feet to daylight the approach. Install "No Standing 4PM - 7PM Mon-Fri" regulations along the WB approach for 250 feet to daylight the approach. Install "No Standing Anytime" regulations along the SB approach for 250 feet on the west side to allow for two moving lanes at the approach. Restripe the SB approach from one 30-foot wide travel lane with parking on both sides to one 11-foot wide right-turn lane, and one 19-foot wide left-through lane with parking for 250 feet. Modify signal timing: Shift 2s of green time from the SB phase to the EB/WB phase [SB phase green time shifts from 31s to 29s; EB/WB phase green time shifts from 49s to 51s].
	WB-LT	1.27	143.1	F	1.34	175.3	F	1.24	128.2	F	
	SB-LTR	1.09	73.8	E	1.17	111.4	F	-	-	-	
	SB-LT	-	-	-	-	-	-	1.08	71.2	E	
	SB-R	-	-	-	-	-	-	0.25	22.7	C	

Intersection	Lane Group	No-Action (2) V/C Ratio	No-Action (2) Delay (sec.)	No-Action (2) LOS	LDA V/C Ratio	LDA Delay (sec.)	LDA LOS	LDA V/C Ratio	LDA Delay (sec.)	LDA LOS	
12. Astoria Boulevard & 29th Street	EB-T	0.97	48.8	D	1.05	69.0	E	0.98	48.7	D	Install "No Standing 7AM-10AM, 4PM - 7PM Mon-Fri" regulations along the EB approach for 200 feet to daylight the approach. Modify signal timing: Shift 3s of green from the SB phase to the EB/WB phase [SB phase green shifts from 35s to 32s; EB/WB phase green shifts from 45s to 48s].
	WB-T	0.23	13.5	B	0.23	13.5	B	0.22	11.7	B	
	SB-L	0.12	18.1	B	0.12	18.1	B	0.13	20.1	C	
	SB-R	0.70	30.5	C	0.72	31.4	C	0.79	39.0	D	
15. Hoyt Avenue S./Astoria Boulevard & 33rd Street	Astoria Blvd (EB-LT)	1.02	62.4	E	1.08	80.7	F	1.00	53.0	D	Install "No Standing 7AM-10AM Mon-Fri" regulations along the EB Astoria Boulevard approach for 250 feet to daylight the approach. Modify signal timing: Shift 2s of green time from the EB Hoyt Avenue S. phase to the EB Astoria Boulevard phase [EB Hoyt Avenue phase green time shifts from 29s to 27s; EB Astoria Boulevard phase green time shifts from 24s to 26s; NB phase green time remains the same].
	NB-TR	0.81	38.6	D	0.81	38.6	D	0.81	38.6	D	
	NB-R	0.79	42.6	D	0.79	42.6	D	0.79	42.6	D	
	Hoyt Ave (EB-LT)	0.78	30.4	C	0.78	30.4	C	0.84	33.6	C	
18. Astoria Boulevard N. & 32nd Street	WB(Main)-T	0.37	7.9	A	0.37	7.9	A	0.36	7.0	A	Modify signal timing: Shift 2s of green time from the NB/SB phase to the WB phase [NB/SB phase green time shifts from 22s to 20s; WB phase green time shifts from 58s to 60s].
	WB(Ramp)-T	1.03	45.5	D	1.06	53.3	D	1.02	40.7	D	
	NB-L	0.38	29.0	C	0.39	29.1	C	0.43	31.0	C	
	SB-R	0.02	25.9	C	0.02	25.9	C	0.02	27.5	C	
22. Vernon Boulevard & Welling Court/ 8th Street	EB-LT	0.91	45.7	D	0.98	57.7	E	0.92	44.3	D	Modify signal timing: Shift 2s of green time from the WB phase to the EB/SB phase [WB phase green time shifts from 29s to 27s; EB/SB phase green time shifts from 28s to 30s; NB phase green time remains the same].
	WB-TR	0.04	21.1	C	0.04	21.1	C	0.05	22.6	C	
	NB-LTR	0.17	31.0	C	0.17	31.0	C	0.17	31.0	C	
	SB-R	0.71	35.1	D	0.76	37.6	D	0.71	33.4	C	
26. 27th Avenue & 9th Street (Unsignalized-Two Way Stop)	EB-LT	0.01	8.1	A	0.00	8.6	C	0.36	15.0	B	Install a traffic signal with 90-second cycle length and two phases. [EB/WB phase green time is 45s; SB phase green time is 35s; all phases have 3s of amber and 2s of all red time. Install "No Standing Anytime" regulations along the total western length of 9th Street and along the east curb of 9th Street for 150 to allow for two-way traffic. Restripe the SB approach from one 16.5-foot wide travel lane with parking and one 15.5 foot wide NB receiving lane with parking to one 10-foot wide right-turn lane, one 10-foot wide left-turn lane, and one 12-foot wide NB receiving lane for 100 feet.
	WB-TR	-	-	-	-	-	-	0.69	22.4	C	
	SB-LR	0.43	15.9	C	0.93	61.6	F	-	-	-	
	SB-L	-	-	-	-	-	-	0.40	21.7	C	
	SB-R	-	-	-	-	-	-	0.26	19.9	B	
28. Vernon Boulevard & Broadway/11th Street	EB-LTR	0.02	25.4	C	0.02	25.4	C	0.02	24.7	C	Modify signal timing: Shift 1s of green time from the NB 11th Street phase to the EB/WB phase [NB 11th Street phase green time shifts from 20s to 19s; EB/WB phase green time shifts from 26s to 27s; NB/SB Vernon Boulevard phase green time remains the same].
	WB-LT	-	-	-	-	-	-	-	-	-	
	WB-R	-	-	-	-	-	-	-	-	-	
	WB-LTR	0.96	55.5	E	1.01	66.3	E	0.97	56.3	E	
	NB (Vernon Blvd)-LT	0.29	9.0	A	0.30	9.1	A	0.30	9.6	A	
	NB (Vernon Blvd)-R	0.21	8.3	A	0.21	8.3	A	0.21	8.7	A	
	NB (11th Street)-LTR	0.22	32.8	C	0.22	32.8	C	0.23	33.9	C	
	SB-LTR	0.67	31.5	C	0.71	33.2	C	0.71	33.2	C	
PM PEAK HOUR											
2. 27th Avenue & 4th Street (Existing Unsignalized-All Way Stop) (No-Action Signalized)	EB-LT	0.56	15.0	B	0.56	15.0	B	0.53	12.7	B	Partially Mitigated; Modify signal timing: Shift 3s of green time from the SB phase to the EB/WB phase [SB phase green time shifts from 29s to 26s; EB/WB phase green time shifts from 51s to 54s].
	WB-T	0.65	15.6	B	0.65	15.6	B	0.61	13.2	B	
	WB-R	0.29	11.8	B	1.28	159.8	F	1.17	111.4	F	
	SB-LR	0.08	21.6	C	0.08	21.6	C	0.09	23.8	C	
3. 27th Avenue & 8th Street	EB-T	0.36	13.2	B	0.36	13.2	B				Unmitigatable.
	EB-R	0.42	15.9	B	0.42	15.9	B				
	WB-LT	1.22	138.6	F	1.83	400.4	F				
	NB-L	0.48	25.8	C	0.66	31.2	C				
	NB-R	0.75	47.4	D	0.75	47.4	D				
4. 27th Avenue & 12th Street (Existing Unsignalized-Two Way Stop) (No-Action Signalized)	EB-LT	0.54	8.2	A	0.94	30.0	C	0.97	36.5	D	Modify signal timing: Shift 1s of green time from the EB/WB phase to the NB phase [EB/WB phase green time shifts from 64s to 63s; NB phase green time shifts from 16s to 17s].
	WB-TR	0.66	8.8	A	0.96	25.3	C	0.98	29.1	C	
	NB-LTR	0.86	65.8	E	0.90	70.6	E	0.84	60.6	E	
7. Astoria Boulevard & 21st Street	EB-L	0.61	46.8	D	0.67	48.8	D				Unmitigatable.
	EB-TR	1.13	118.0	F	1.27	174.5	F				
	WB-L	0.92	68.3	E	0.91	66.7	E				
	WB-TR	0.99	73.3	E	1.22	156.2	F				
	NB-LT	1.10	80.8	F	1.26	152.5	F				
	NB-R	0.44	22.9	C	0.44	22.9	C				
	SB-LT	0.77	29.6	C	0.77	29.6	C				
	SB-R	0.80	33.1	C	0.99	54.5	D				
8. Astoria Boulevard & 23rd Street	EB-LT	0.95	35.5	D	1.04	58.0	E	0.88	28.0	C	Install "No Standing 7AM - 10AM, 4PM - 7PM Mon-Fri" regulations along the EB approach for 100 feet to daylight the approach.
	WB-TR	0.84	22.7	C	0.98	32.7	C	0.98	32.7	C	
	NB-LTR	0.61	37.4	D	0.61	37.4	D	0.61	37.4	D	
9. Astoria Boulevard & Crescent Street	EB-TR	1.11	88.2	F	1.21	128.8	F	1.00	48.8	D	Install "No Standing 7AM - 10AM, 4PM - 7PM Mon-Fri" regulations along the EB approach for 250 feet to daylight the approach. Install "No Standing 4PM - 7PM Mon-Fri" regulations along the WB approach for 250 feet to daylight the approach. Install "No Standing Anytime" regulations along the SB approach for 250 feet on the west side to allow for two moving lanes at the approach. Restripe the SB approach from one 30-foot wide travel lane with parking on both sides to one 11-foot wide right-turn lane, and one 19-foot wide left-through lane with parking for 250 feet.
	WB-LT	1.53	267.6	F	1.71	347.5	F	1.45	231.2	F	
	SB-LTR	1.07	74.4	E	1.29	171.5	F	-	-	-	
	SB-LT	-	-	-	-	-	-	0.94	41.3	D	
	SB-R	-	-	-	-	-	-	0.42	29.3	C	

Intersection	Lane Group	No-Action (2) V/C Ratio	No-Action (2) Delay (sec.)	No-Action (2) LOS	LDA V/C Ratio	LDA Delay (sec.)	LDA LOS	LDA V/C Ratio	LDA Delay (sec.)	LDA LOS	
12. Astoria Boulevard & 29th Street	EB-T	1.30	179.5	F	1.42	229.4	F	1.24	152.1	F	Install "No Standing 7AM-10AM, 4PM - 7PM Mon-Fri" regulations along the EB approach for 200 feet to daylight the approach.
	WB-T	0.22	20.3	C	0.22	20.3	C	0.22	20.3	C	
	SB-L	0.16	19.5	B	0.16	19.5	B	0.16	19.5	B	
	SB-R	0.66	30.4	C	0.70	32.5	C	0.70	32.5	C	
15. Hoyt Avenue S./Astoria Boulevard & 33rd Street	Astoria Blvd (EB-LT)	1.17	121.1	F	1.23	149.1	F	1.17	122.7	F	Install "No Standing 7AM-10AM" regulations along the EB Astoria Boulevard approach for 250 feet to daylight the approach. Modify signal timing: Shift 2s of green time from the EB Hoyt Avenue S. phase to the EB Astoria Boulevard phase [EB Hoyt Avenue phase green time shifts from 40s to 38s; EB Astoria Boulevard phase green time shifts from 34s to 36s; NB phase green time remains the same].
	NB-TR	1.09	86.7	F	1.09	86.7	F	1.09	86.7	F	
	NB-R	1.08	86.6	F	1.08	86.6	F	1.08	86.6	F	
	Hoyt Ave (EB-LT)	0.87	41.3	D	0.87	41.3	D	0.91	44.5	D	
18. Astoria Boulevard N. & 32nd Street	WB(Main)-T	0.32	9.2	A	0.32	9.2	A	0.31	7.9	A	Partially Mitigated. Modify signal timing: Shift 3s of green time from the NB/SB phase to the WB phase [NB/SB phase green time shifts from 31s to 28s; WB phase green time shifts from 79s to 82s].
	WB(Ramp)-T	1.13	84.7	F	1.19	111.0	F	1.15	90.8	F	
	NB-L	0.57	39.2	D	0.58	39.3	D	0.64	42.2	D	
	SB-R	0.02	33.3	C	0.02	33.3	C	0.02	35.6	D	
19. Astoria Boulevard & 8th Street	EB-L	0.17	29.0	C	0.17	29.0	C	0.17	29.0	C	Install "No Standing 4PM - 7PM Mon-Fri" regulations along the NB approach for 70 feet to daylight the approach.
	EB-R	0.66	40.6	D	0.66	40.6	D	0.66	40.6	D	
	WB-L	0.31	31.0	C	0.31	31.0	C	0.31	31.0	C	
	WB-TR	0.50	35.3	D	0.50	35.3	D	0.50	35.3	D	
	NB-LT	0.87	27.7	C	1.03	53.8	D	0.90	29.1	C	
	SB-TR	0.39	15.1	B	0.43	15.8	B	0.43	15.8	B	
22. Vernon Boulevard & Welling Court/ 8th Street	EB-LT	1.43	229.6	F	1.57	292.1	F	1.41	218.7	F	Modify signal timing: Shift 3s of green time from the WB phase to the EB/SB phase [WB phase green time shifts from 29s to 26s; EB/SB phase green time shifts from 26s to 29s; NB phase green time remains the same].
	WB-TR	0.06	21.3	C	0.06	21.3	C	0.07	23.5	C	
	NB-LTR	0.18	29.5	C	0.18	29.5	C	0.18	29.5	C	
	SB-R	0.72	37.9	D	0.79	41.8	D	0.71	34.4	C	
24. Hoyt Avenue N. & 21st Street	EB-L	0.11	43.9	D	0.11	43.9	D	0.13	47.3	D	Partially Mitigated. Modify signal timing: Shift 3s of green time from the EB/WB phase to the WB lag phase [EB/WB phase green time shifts from 20s to 17s; WB lag phase green time shifts from 38s to 41s; NB/SB phase green time remains the same].
	EB-R	0.19	45.3	D	0.19	45.3	D	0.23	49.1	D	
	WB-L	0.97	58.9	E	1.04	78.4	E	0.97	56.4	E	
	WB-TR	0.30	16.9	B	0.30	16.9	B	0.30	16.9	B	
	NB-L	0.17	24.7	C	0.17	24.8	C	0.17	24.8	C	
	NB-T	1.12	99.0	F	1.16	118.8	F	1.16	118.8	F	
	SB-TR	0.77	37.9	D	0.80	39.2	D	0.80	39.2	D	
25. Hoyt Avenue S./Astoria Park S. & 21st Street	EB-LTR	0.58	37.9	D	0.63	39.0	D	0.69	42.5	D	Modify signal timing: Shift 3s of green time from the EB phase to the NB/SB phase [EB phase green time shifts from 35s to 32s; NB/SB phase green time shifts from 75s to 78s].
	NB-LT	0.72	16.8	B	0.75	17.6	B	0.71	15.0	B	
	NB-R	0.51	13.3	B	0.52	13.4	B	0.50	11.7	B	
	NB-LTR		15.7	B		16.3	B		13.9	B	
	SB-LTR	0.99	38.1	D	1.04	53.5	D	0.99	37.4	D	
26. 27th Avenue & 9th Street (Unsignalized-Two Way Stop)	EB-LT	0.01	8.8	A	0.01	9.8	A	0.44	10.7	B	Install a traffic signal with 90-second cycle length and two phases. [EB/WB phase green time is 55s; SB phase green time is 25s; all phases have 3s of amber and 2s of all red time. Install "No Standing 4PM - 7PM Mon - Fri" regulation along the WB approach for 250 feet. Install "No Standing Anytime" regulations along the total western length of 9th Street and along the east curb of 9th Street for 150 to allow for two-way traffic. Restripe the SB approach from one 16.5-foot wide travel lane with parking and one 15.5 foot wide NB receiving lane with parking to one 10-foot wide right-turn lane, one 10-foot wide left-turn lane, and one 12-foot wide NB receiving lane for 100 feet.
	WB-TR	-	-	-	-	-	-	0.90	27.3	C	
	SB-LR	0.60	31.2	D	2.23	606.7	F	-	-	-	
	SB-L	-	-	-	-	-	-	0.72	38.9	D	
	SB-R	-	-	-	-	-	-	0.34	28.7	C	
27. Vernon Boulevard & 31st Avenue (Unsignalized-Two Way Stop)	WB-LR	0.51	29.2	D	0.58	35.1	E				Unmitigatable.
	SB-LT	0.02	8.9	A	0.03	9.0	A				
28. Vernon Boulevard & Broadway/11th Street	EB-LTR	0.03	33.2	C	0.03	33.2	C	0.03	33.2	C	Modify signal timing: Shift 3s of green time from the NB 11th Street phase to the NB/SB Vernon Boulevard phase [NB 11th Street phase green time shifts from 25s to 22s; NB/SB Vernon Boulevard phase green time shifts from 45s to 48s; EB/WB phase green time remains the same].
	WB-LT	0.77	47.0	D	0.77	47.0	D	0.77	47.0	D	
	WB-R	0.24	35.8	D	0.36	37.8	D	0.36	37.8	D	
	WB-LTR		45.1	D		44.9	D		44.9	D	
	NB (Vernon Blvd)-LT	0.52	10.1	B	0.54	10.3	B	0.54	10.4	B	
	NB (Vernon Blvd)-R	0.18	6.7	A	0.18	6.7	A	0.18	6.7	A	
	NB (11th Street)-LTR	0.33	38.2	D	0.33	38.2	D	0.38	41.9	D	
	SB-LTR	0.88	45.4	D	0.99	65.6	E	0.90	46.8	D	

2023 Lower Density Alternative Subway Stair Level Of Service

Station	Stairway	Total Width (feet)	Effective Width (feet)	Peak 15-Minute Volumes		Surging Factor		Friction Factor	V/C Ratio	LOS	WIT	Result
				Up	Down	Up	Down					
Weekday AM Peak Hour												
venue (N,C	S3 (NW)	5.0	4.0	345	155	0.90	0.8	0.9	1.07	D	3.30	No Impact
	P5 (NW)	5.0	4.0	519	7	0.95	0.75	1.0	0.93	C	N/A	N/A
	P1 (SW)	5.0	4.0	663	17	0.95	0.75	1.0	1.20	D	4.22	No Impact
Weekday PM Peak Hour												
venue (N,C	S3 (NW)	5.0	4.0	126	474	0.90	0.8	0.9	1.36	E	17.11	Impacted
	P7 (NE)	5.0	4.0	14	396	0.95	0.75	1.0	0.90	C	N/A	N/A
	P3(SE)	5.0	4.0	15	461	0.95	0.75	1.0	1.05	D	2.44	No Impact

Notes:

Methodology based on *2014 CEQR Technical Manual* guidelines.

Volumes based on data collected in October 2012, June 2013 and March 2014, annual background growth rates, the Halletts Point FEIS, and projected No-With-Action Upland Site and project increments.

2023 Lower Density Alternative Fare-Array Analysis

Station	Direction	Control Element	Quantity	Peak 15-Minute		Surging Factor		Friction Factor	V/C Ratio	LOS	Result
				In	Out	In	Out				
Weekday AM Peak Hour											
ue Station	Northbound	Two-way Turnstile	3	61	203	0.95	0.80	0.9	0.20	A	No Impact
	Southbound	Two-way Turnstile	3	1182	24	0.95	0.80	1.0	1.00297	D	Impacted
Weekday AM Peak Hour											
ue Station	Northbound	Two-way Turnstile	3	29	857	0.95	0.80	1.0	0.58	B	No Impact
	Southbound	Two-way Turnstile	3	396	40	0.95	0.80	0.9	0.40	A	No Impact

Notes:

Methodology based on *2014 CEQR Technical Manual* guidelines.

Volumes based on data collected in October 2012 and June 2013, annual background growth rates, the Halletts Point FEIS, and project increr

"In" refers to system entries.

"Out" refers to system exits.

2012 Existing Conditions: Bus Line-Haul Analysis

Route	Direction	Peak Load Point	Hourly Volumes	Buses per Hour	Average passengers per bus
AM Peak Hour					
Q103	Northbound	40th Avenue & 12th Street	36	2	**18**
	Southbound	Vernon Boulevard & 31st Avenue	78	2	**39**
PM Peak Hour					
Q103	Northbound	40th Avenue & 12th Street	42	3	**14**
	Southbound	40th Avenue & 12th Street	33	3	**11**

Note: Data provided by MTA Bus Company
Guideline Capacity = 54 passengers per bus.

2023 No-Build Conditions: Bus Line-Haul Analysis

Route	Direction	Peak Load Point	Hourly Volumes	Buses per Hour	Average passengers per bus	Bus Demand at Guideline Capacity	New Bus Capacity	Available Capacity
AM Peak Hour								
Q103	Northbound	40th Avenue & 12th Street	113	2	**57**	3	162	49
	Southbound	Vernon Boulevard & 31st Avenue	369	2	**185**	7	378	9
PM Peak Hour								
Q103	Northbound	40th Avenue & 12th Street	314	3	**105**	6	324	10
	Southbound	40th Avenue & 12th Street	190	3	**64**	4	216	26

Note: Data provided by MTA Bus Company.
Guideline Capacity = 54 passengers per bus.

Background Growth
AM
2
4
PM
2
2

ASSUMPTIONS

Halletts Existing	Halletts Background growth	Halletts No-Build Total	Halletts No-Build Increment	Halletts Build Volumes	Halletts Build Increment	166 Dus Upland Site
AM Peak Hour						
35	2	**72**	35	**144**	72	3
38	2	**162**	122	**436**	274	13
PM Peak Hour						
41	2	**168**	125	**426**	258	12
11	1	**89**	77	**237**	148	7

Note: **Bolded numbers are as shown in the FEIS**

2023 Lower Density Alternative Conditions: Bus Line-Haul Analysis

Route	Direction	Peak Load Point	Hourly Volumes	Buses per Hour	Average passengers per bus	Bus Demand at Guideline Capacity	New Bus Capacity	Available Capacity
AM Peak Hour								
Q103	Northbound	40th Avenue & 12th Street	149	3	**50**	3	162	13
	Southbound	Vernon Boulevard & 31st Avenue	476	7	**68**	9	486	10
PM Peak Hour								
Q103	Northbound	40th Avenue & 12th Street	425	6	**71**	8	432	7
	Southbound	40th Avenue & 12th Street	262	4	**66**	5	270	8

Note: Data provided by MTA Bus Company.
Guideline Capacity = 54 passengers per bus.

Astoria Cove

LDA Increment
AM
36
107
PM
111
72