

Figure 38: Phase 1 Site-Generated Peak Hour Volumes (1 of 3)

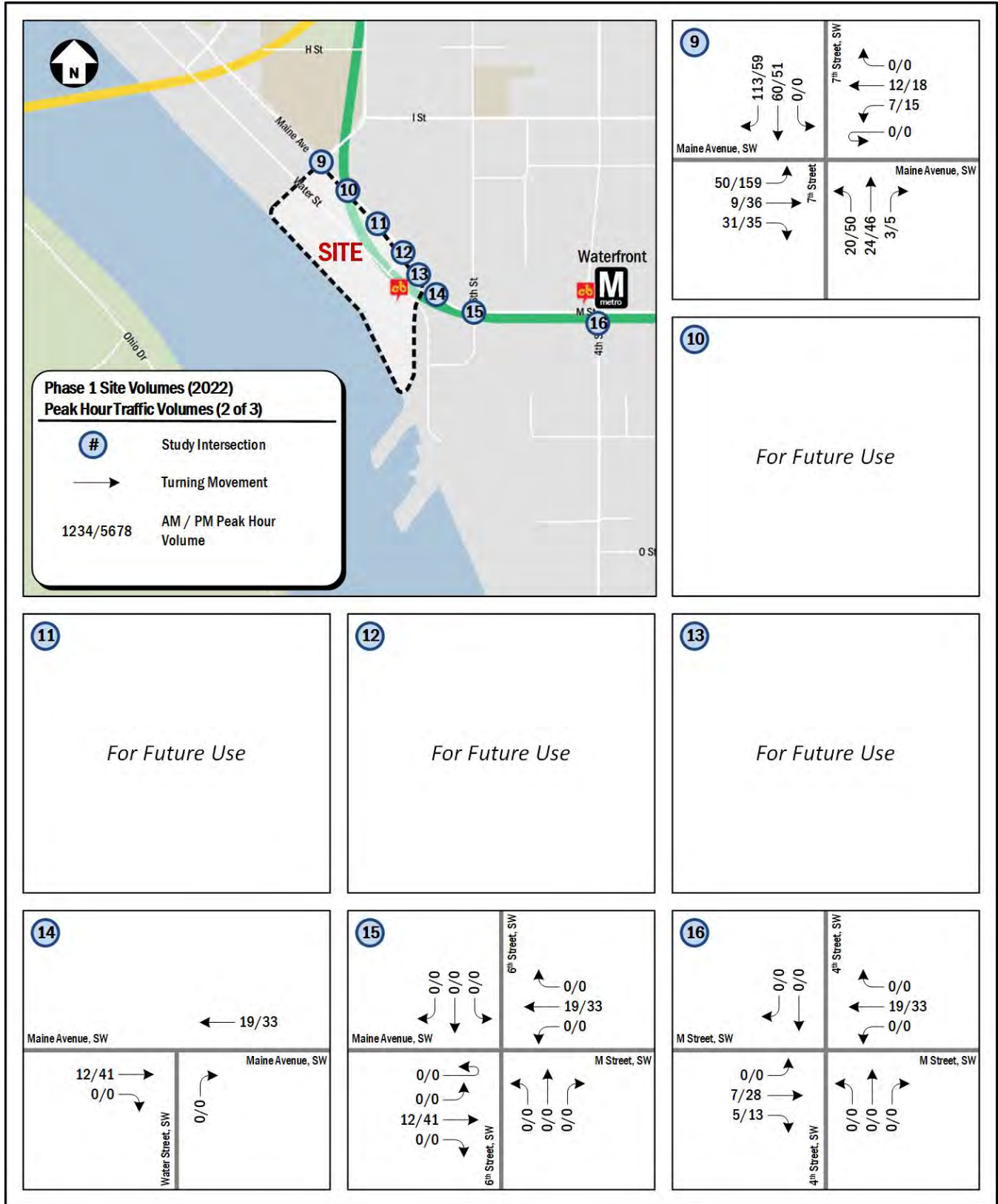


Figure 39: Phase 1 Site-Generated Peak Hour Volumes (2 of 3)

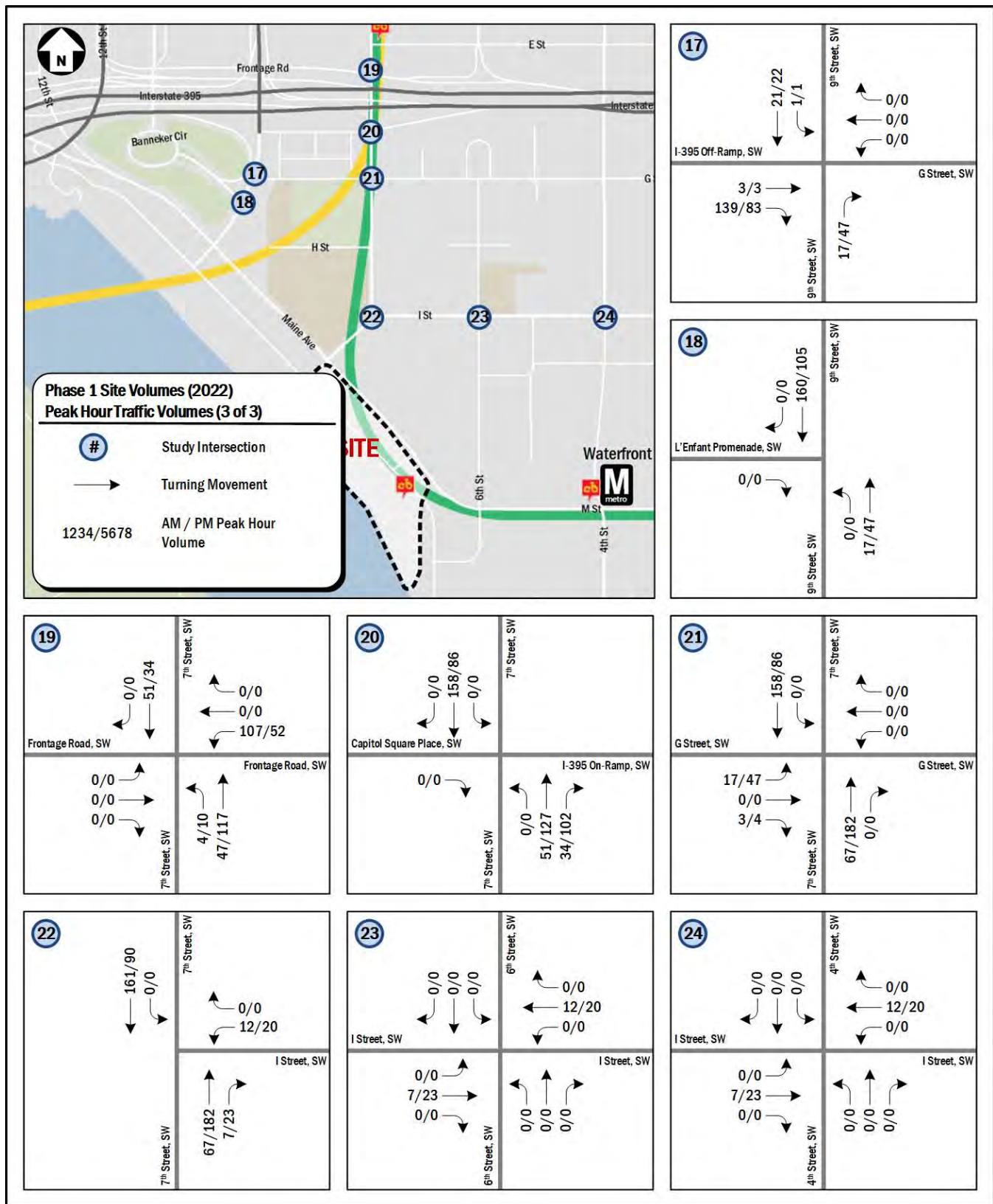


Figure 40: Phase 1 Site-Generated Peak Hour Volumes (3 of 3)



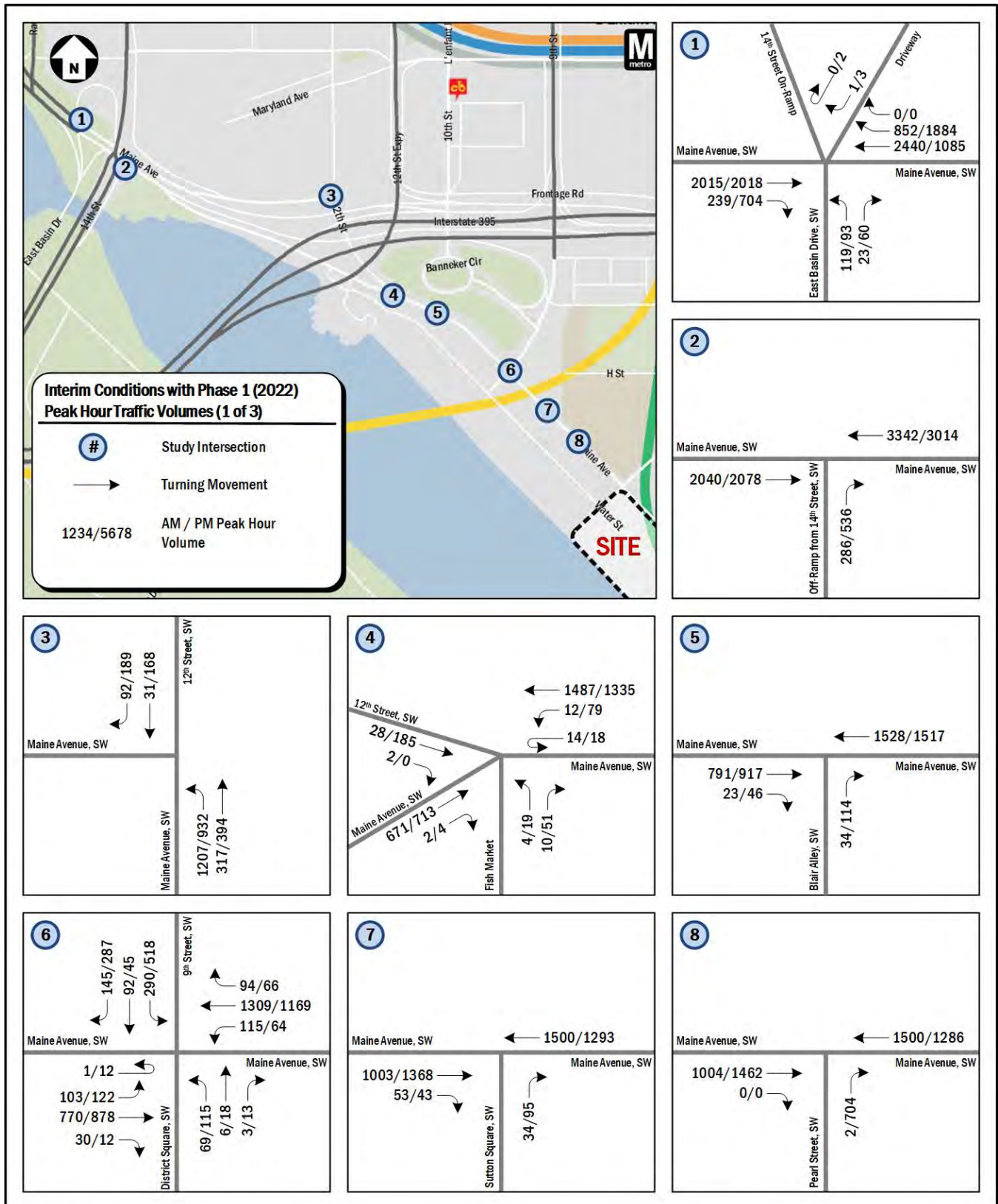


Figure 41: 2022 Interim (with Phase 1) Peak Hour Traffic Volumes (1 of 3)

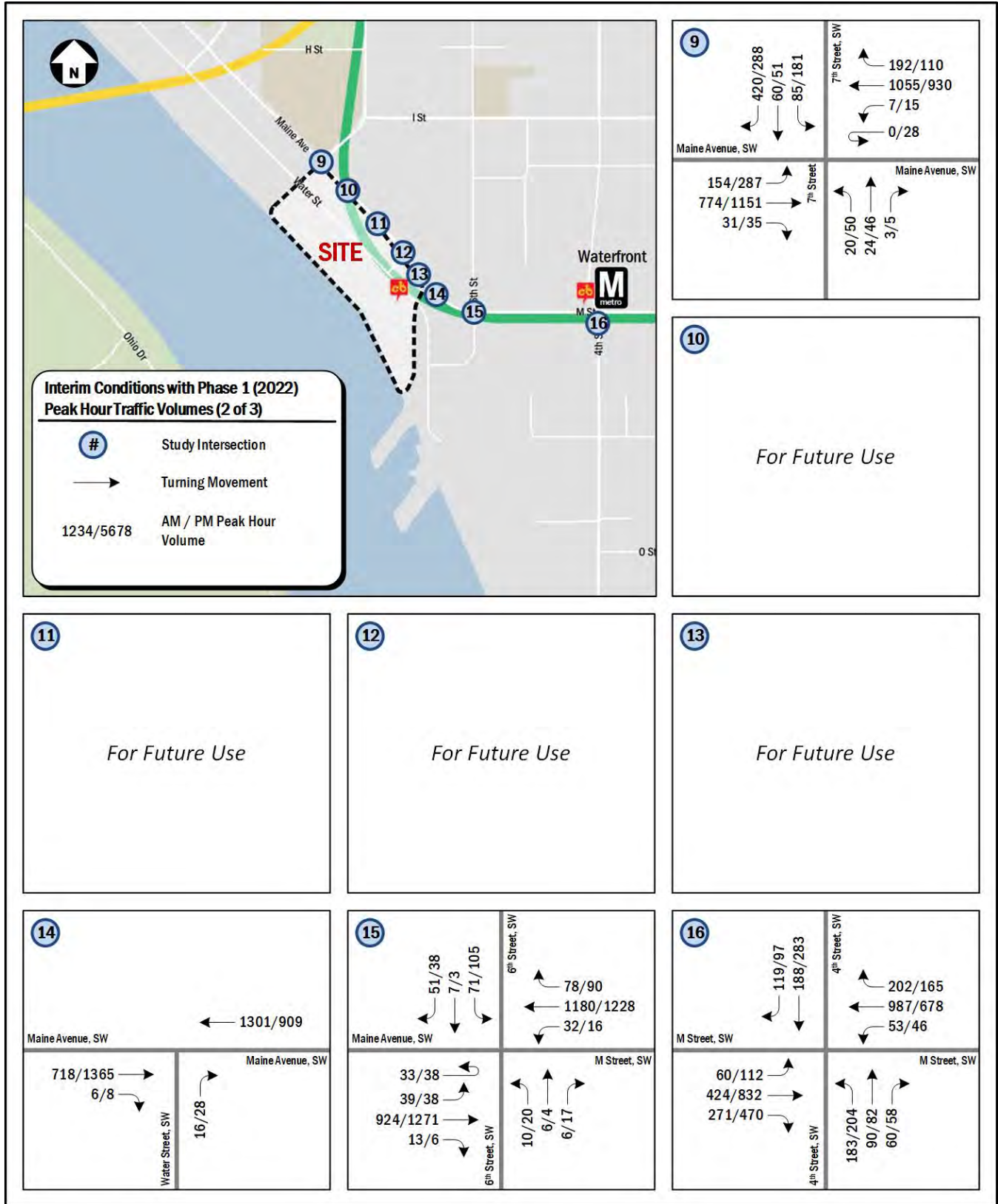


Figure 42: 2022 Interim (with Phase 1) Peak Hour Traffic Volumes (2 of 3)

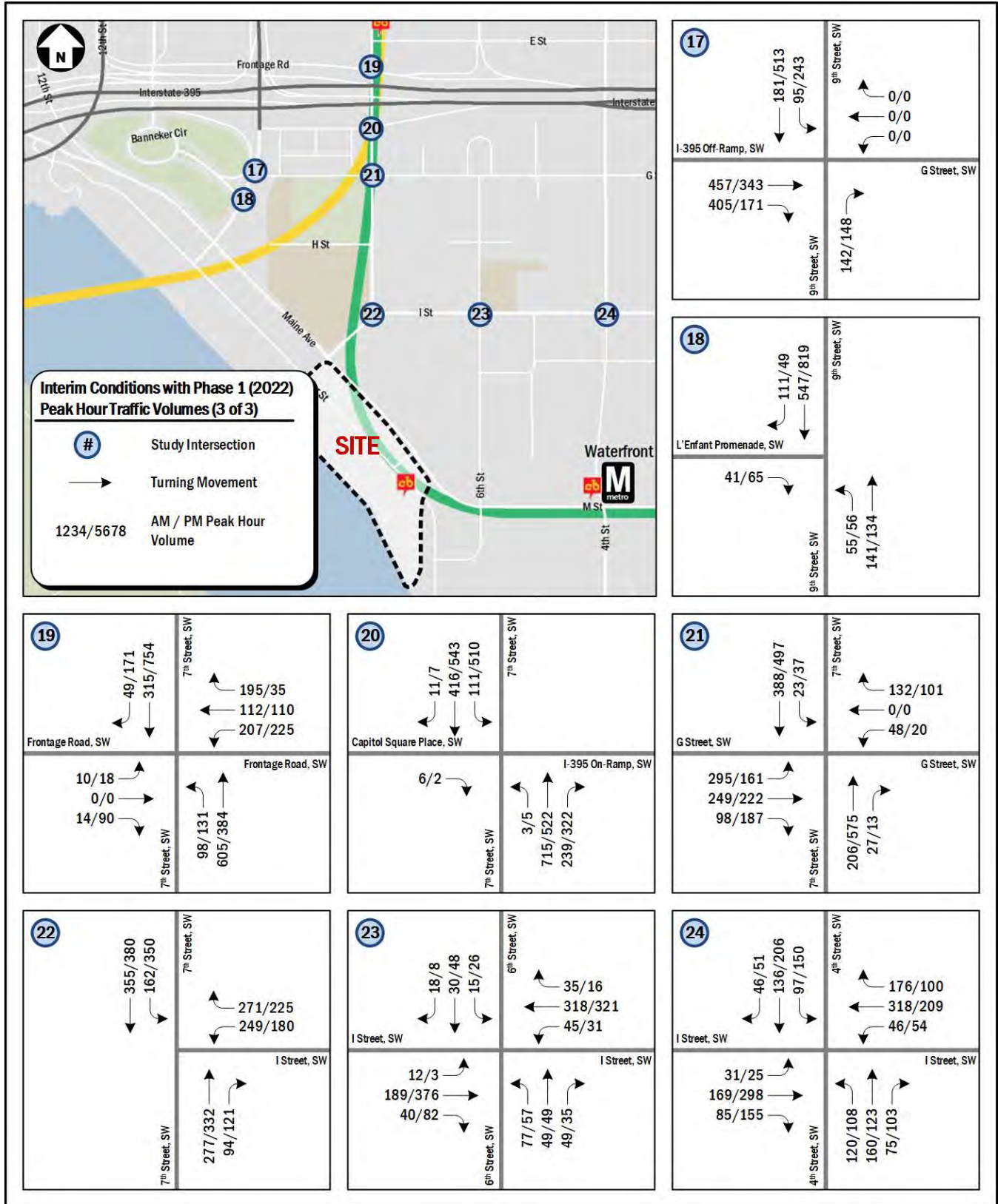


Figure 43: 2022 Interim (with Phase 1) Peak Hour Traffic Volumes (3 of 3)



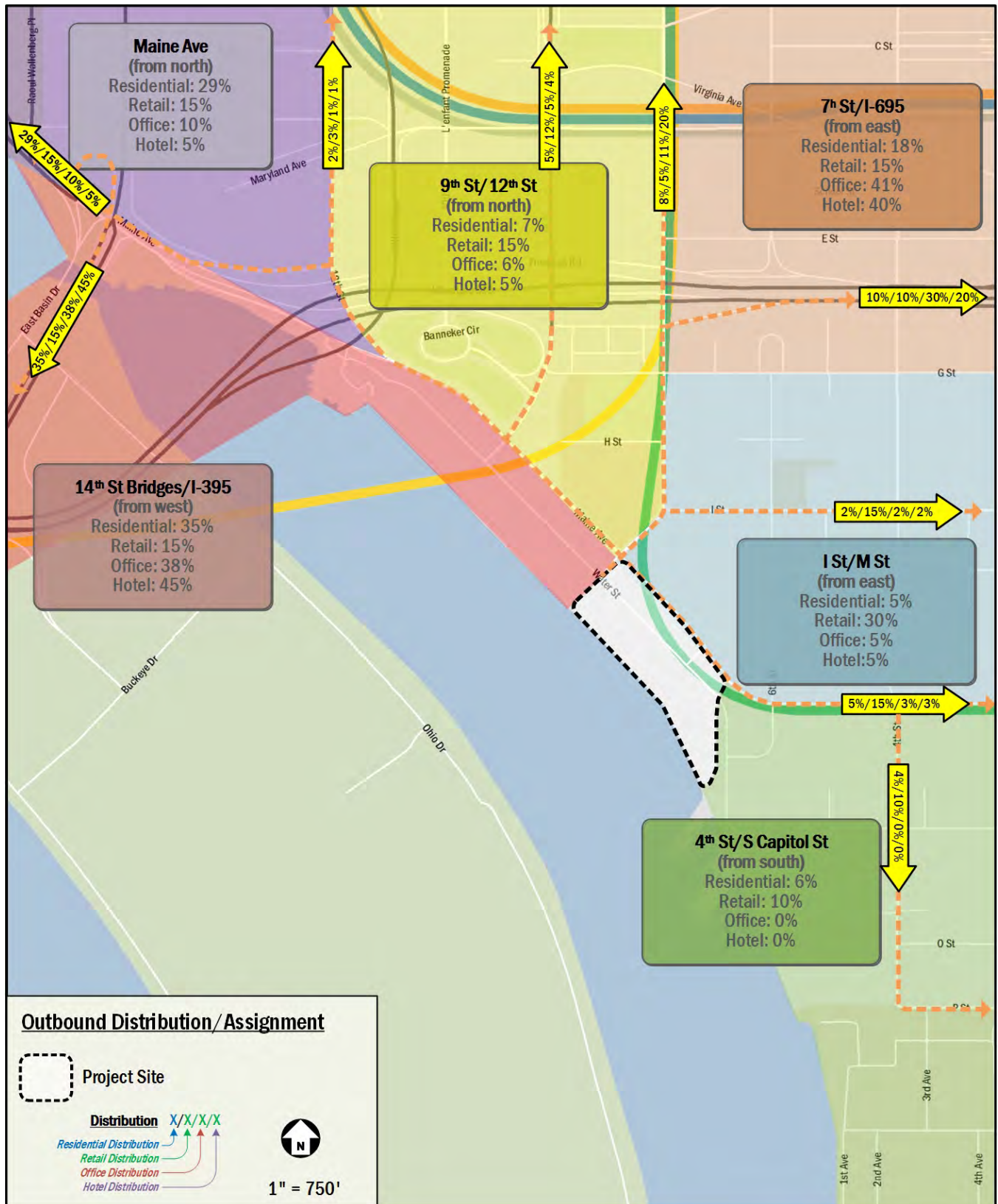


Figure 44: Outbound Trip Distribution and Routing

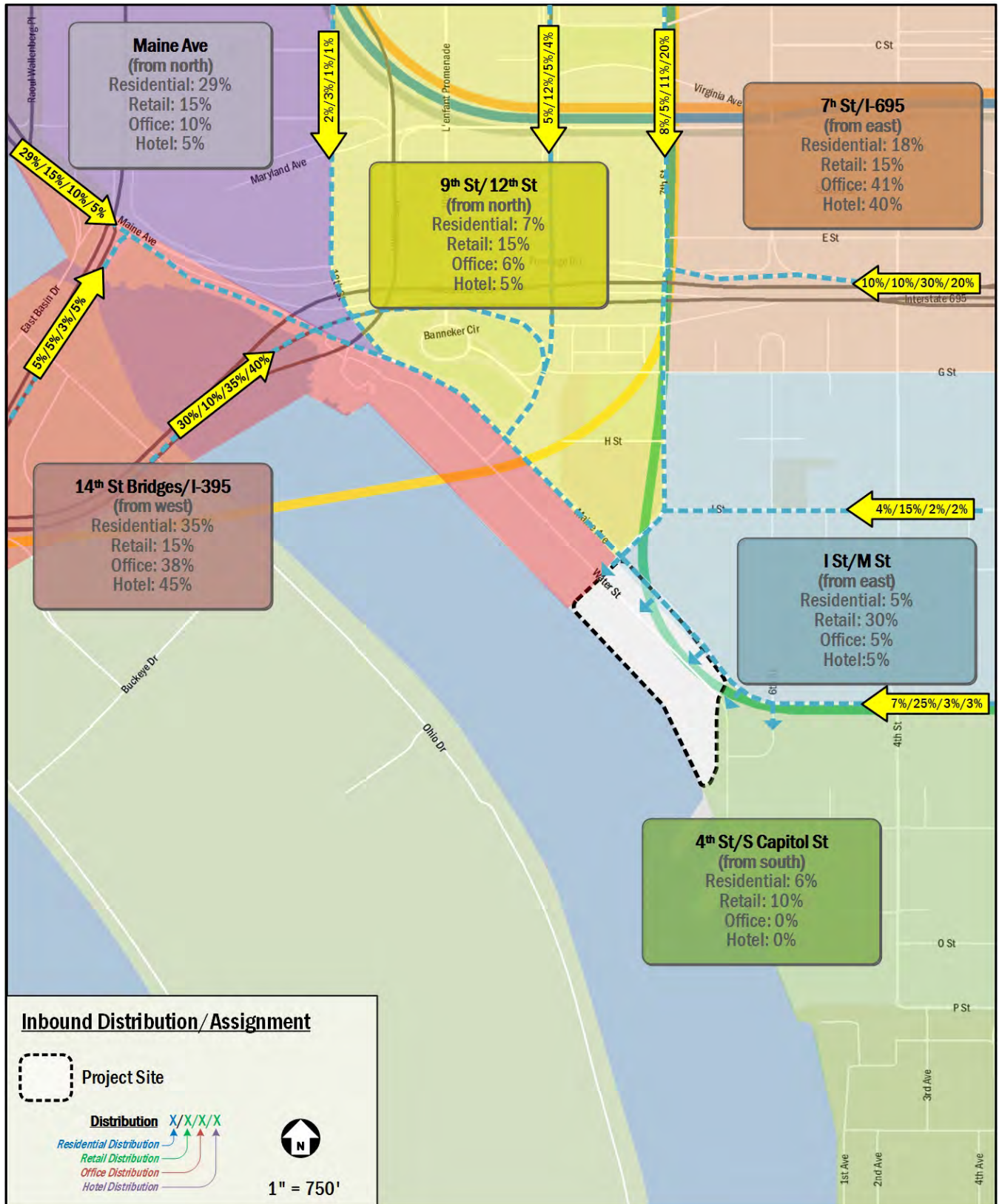


Figure 45: Inbound Trip Distribution and Routing



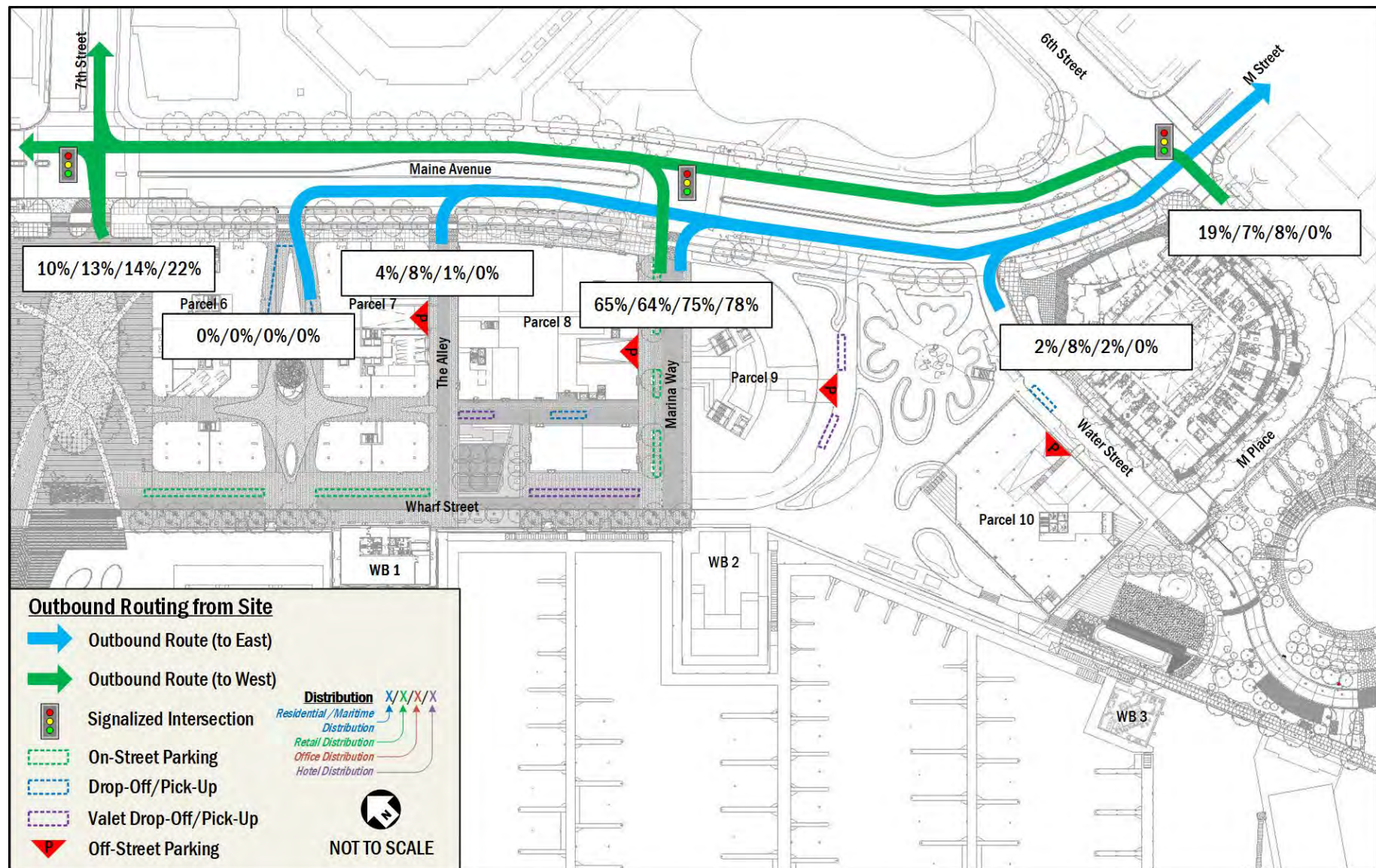


Figure 46: Phase 2 Access Specific Outbound Trip Distribution and Routing



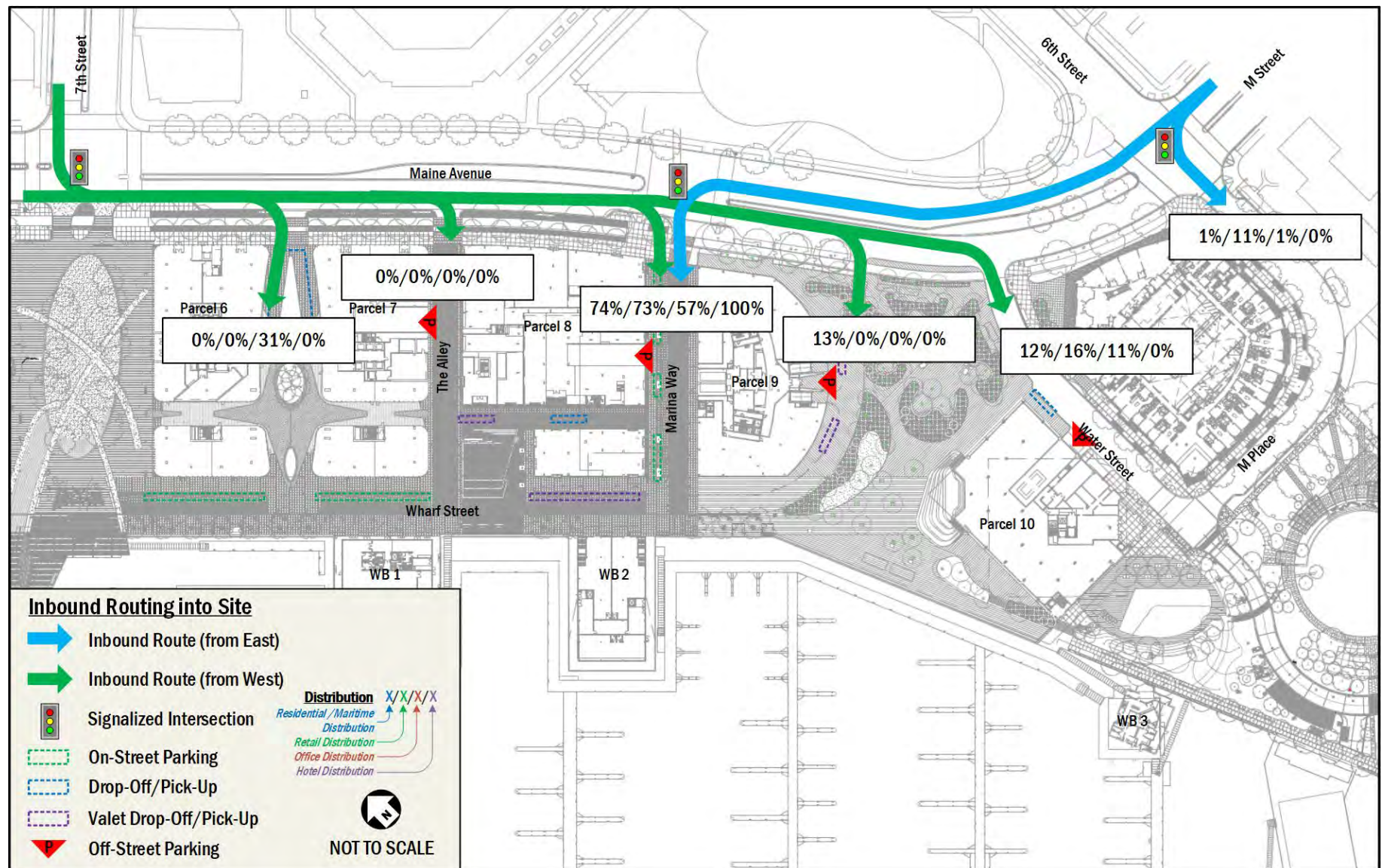


Figure 47: Phase 2 Access Specific Inbound Trip Distribution and Routing

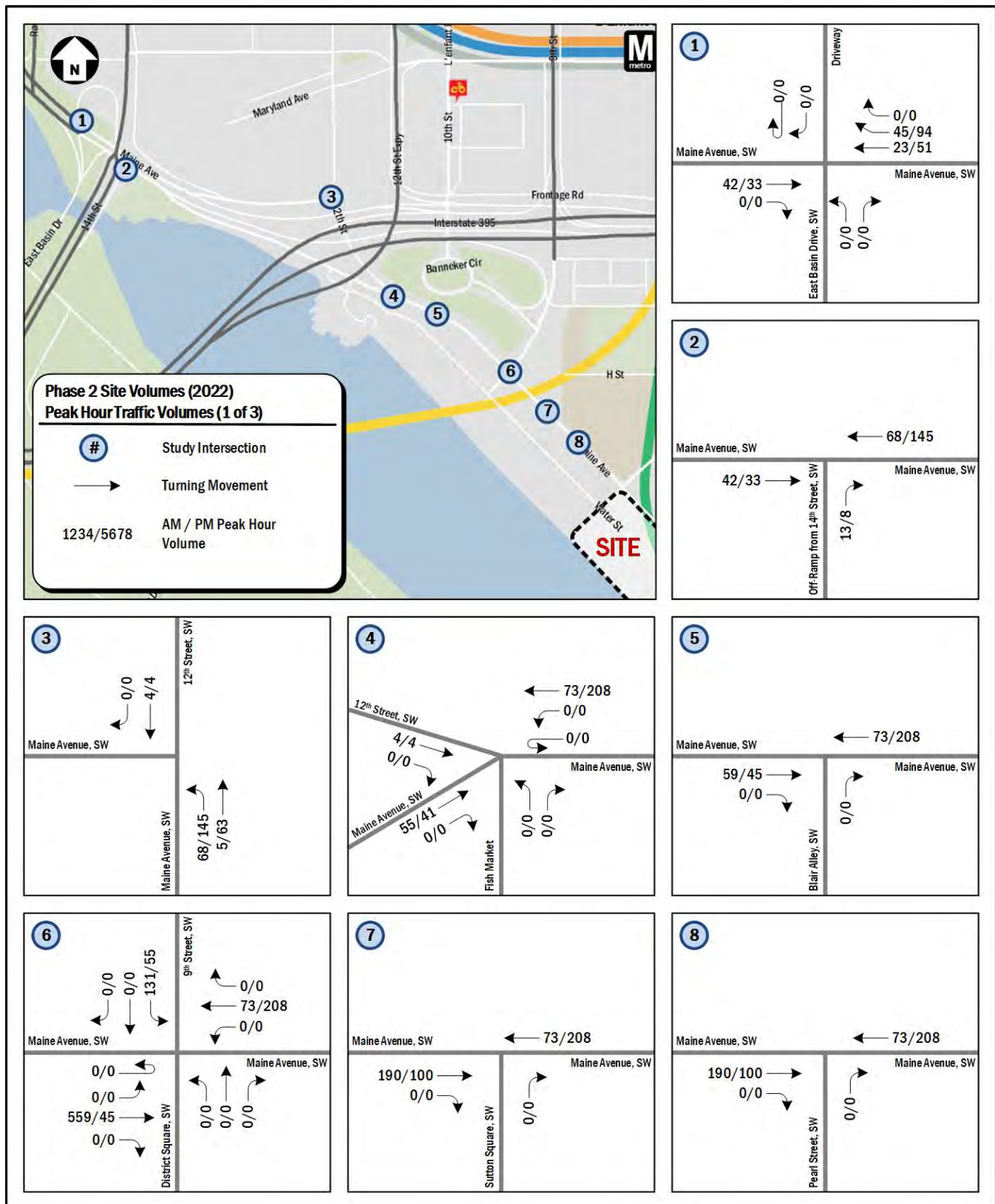


Figure 48: Phase 2 Site-Generated Peak Hour Volumes (1 of 3)



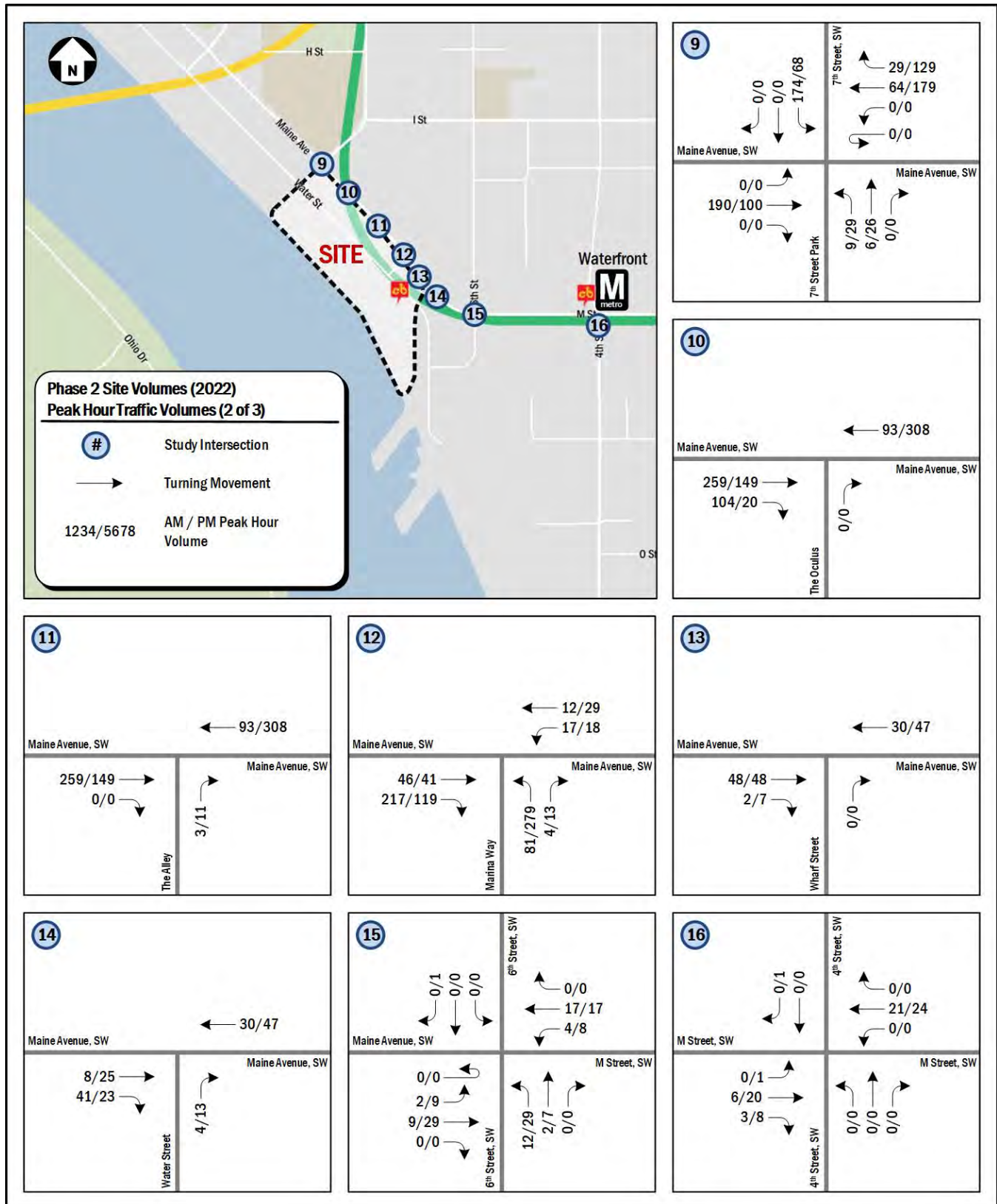


Figure 49: Phase 2 Site-Generated Peak Hour Volumes (2 of 3)

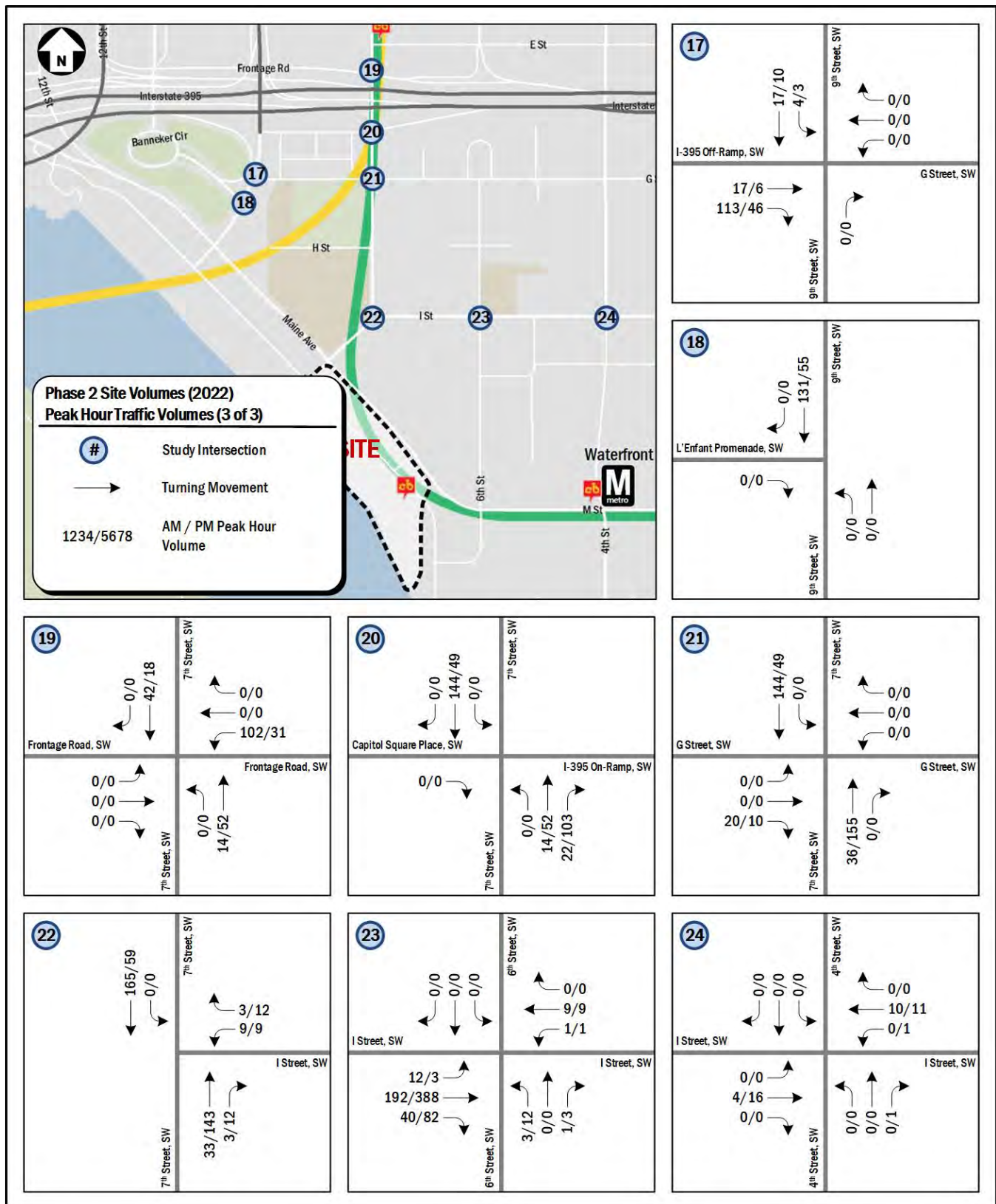


Figure 50: Phase 2 Site-Generated Peak Hour Volumes (3 of 3)

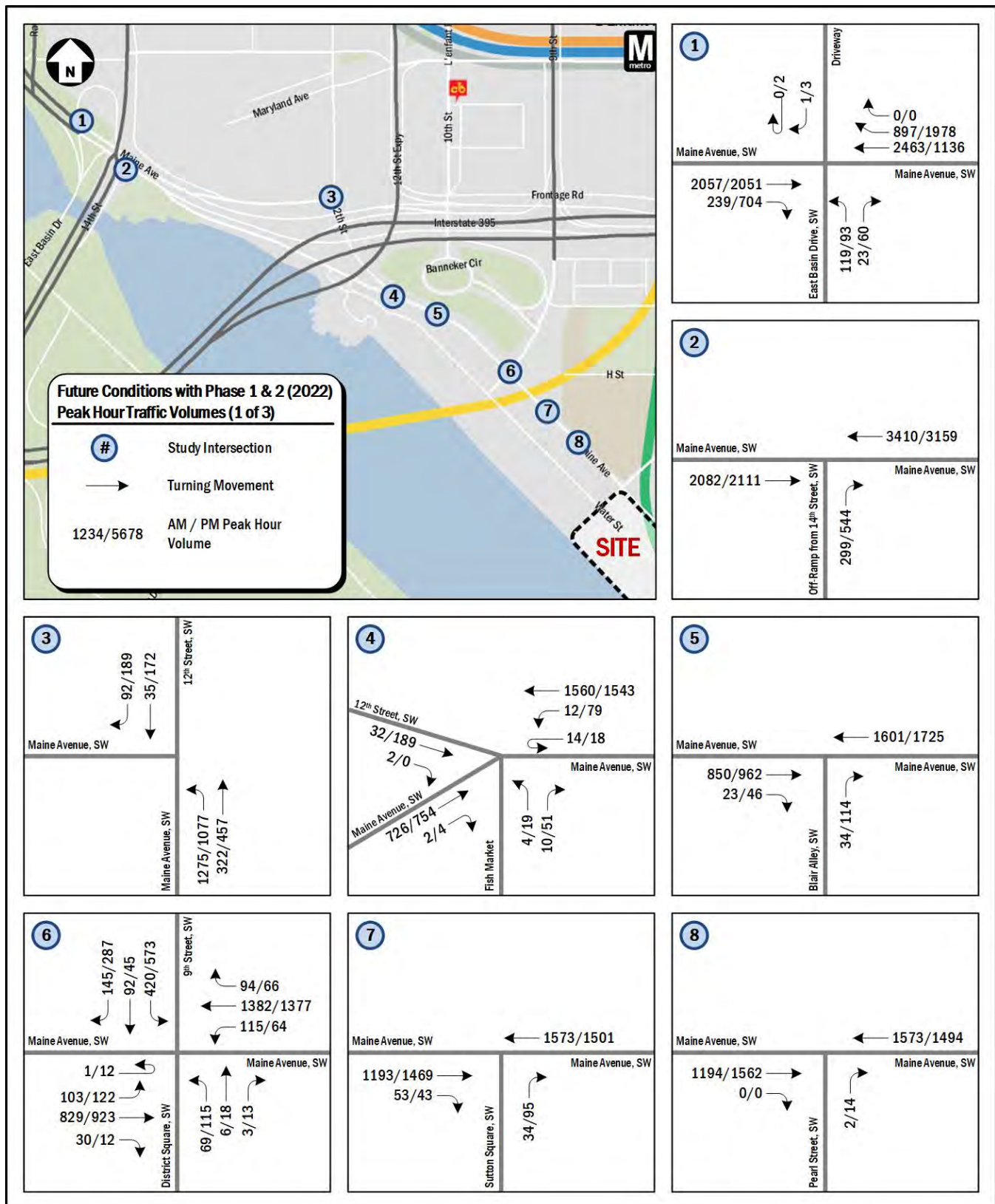


Figure 51: 2022 Future (with Phase 1 and Phase 2) Peak Hour Traffic Volumes (1 of 3)



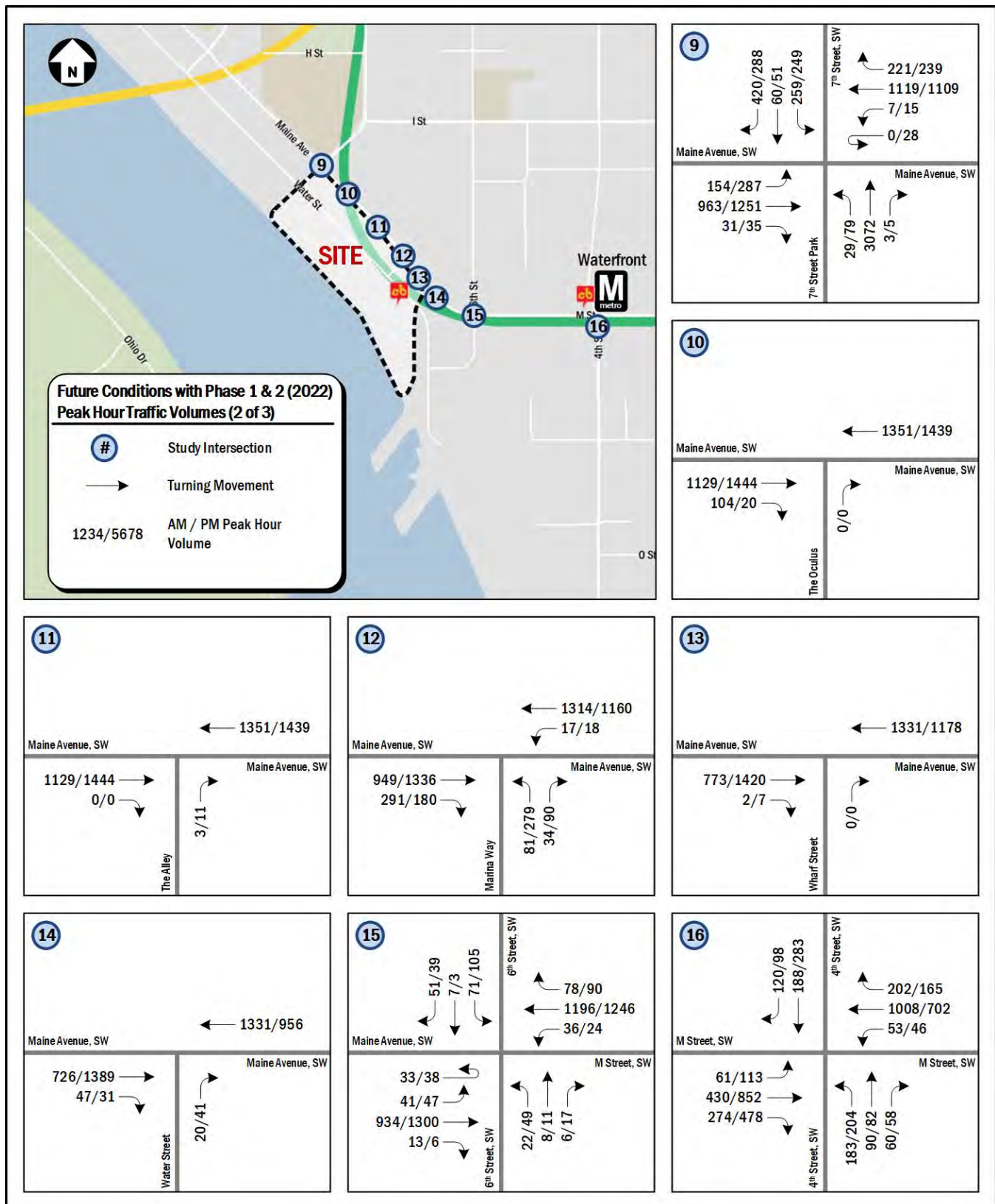


Figure 52: 2022 Future (with Phase 1 and Phase 2) Peak Hour Traffic Volumes (2 of 3)

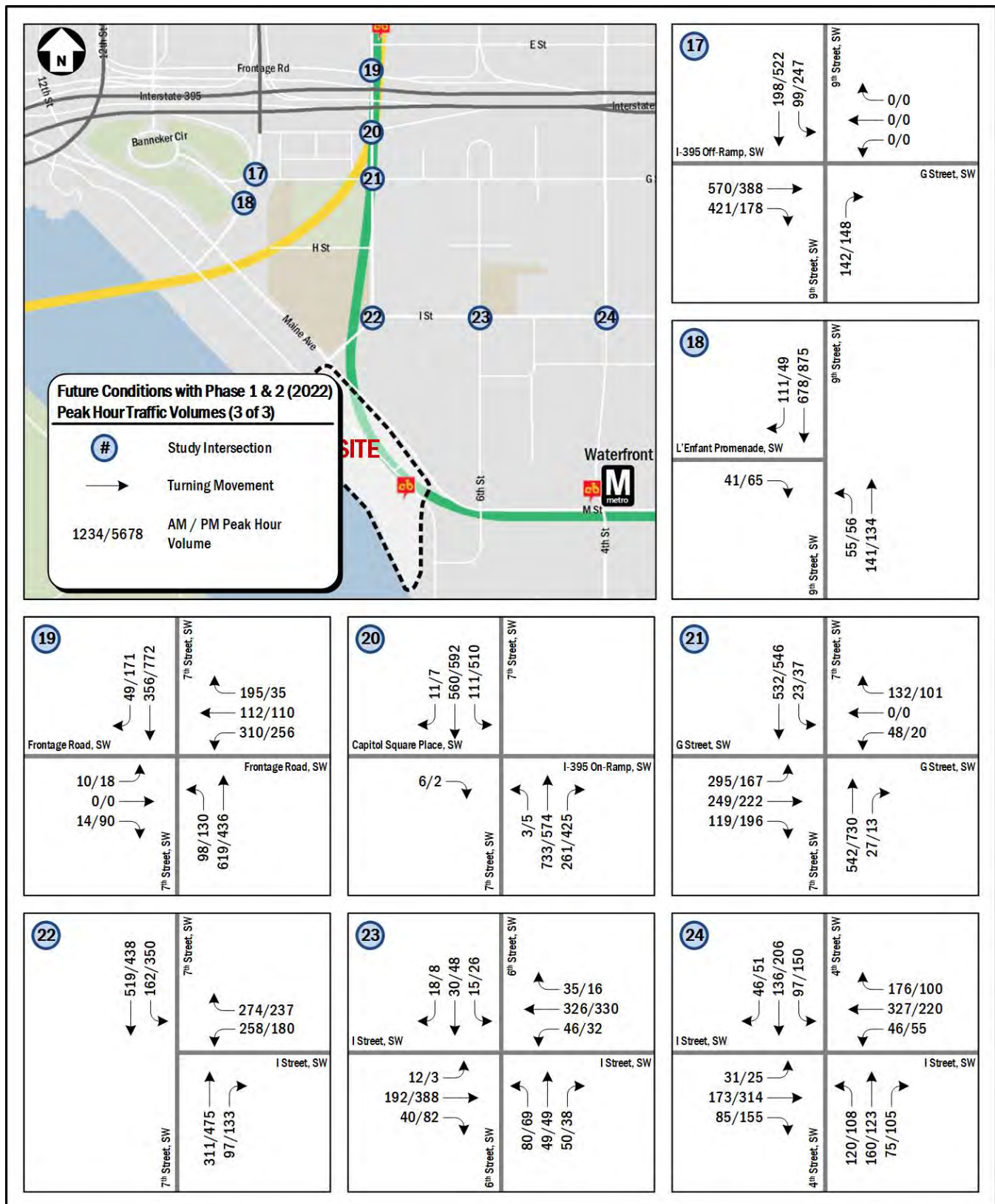


Figure 53: 2022 Future (with Phase 1 and Phase 2) Peak Hour Traffic Volumes (3 of 3)

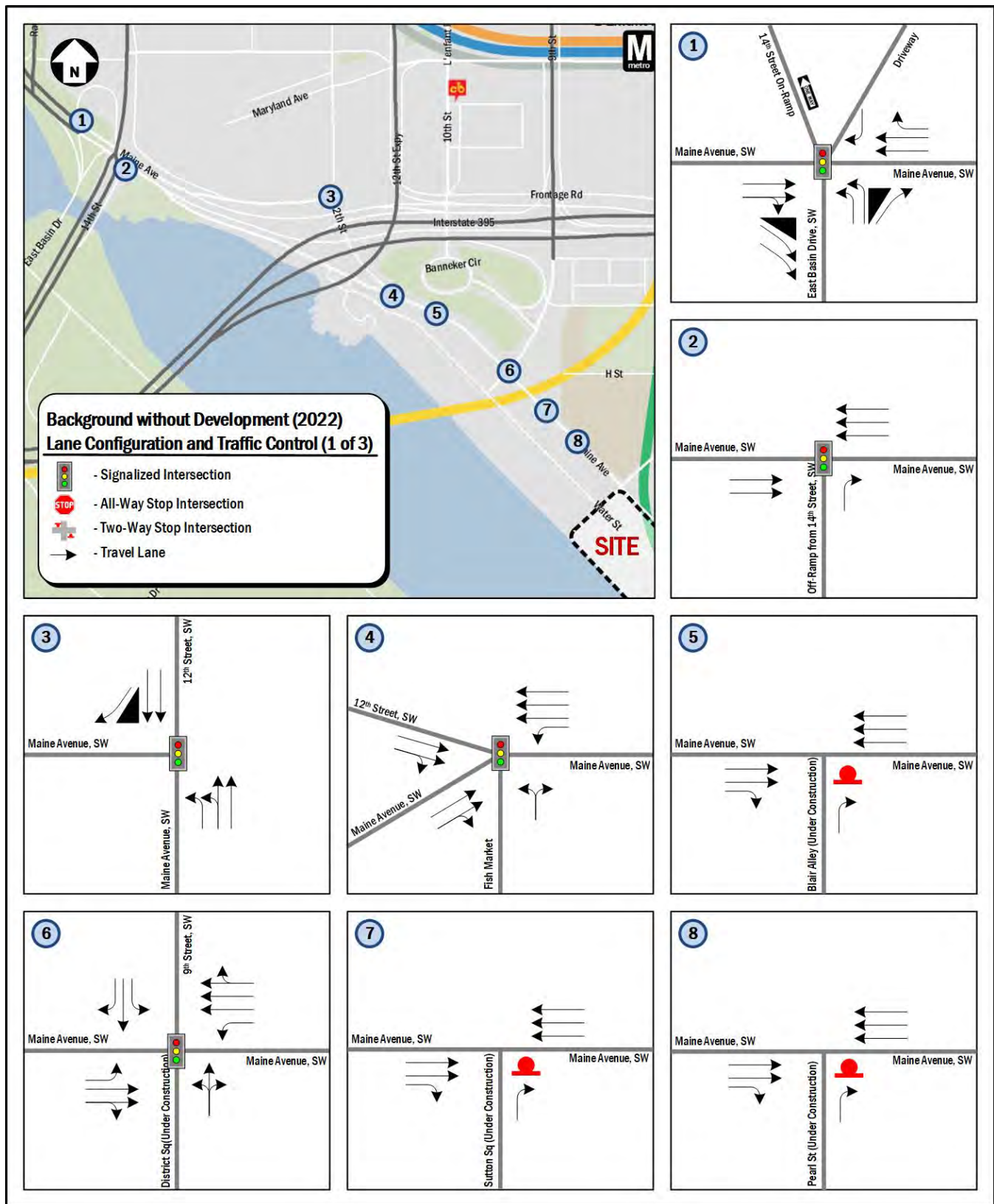


Figure 54: 2022 Background without Development Lane Configurations and Traffic Controls (1 of 3)



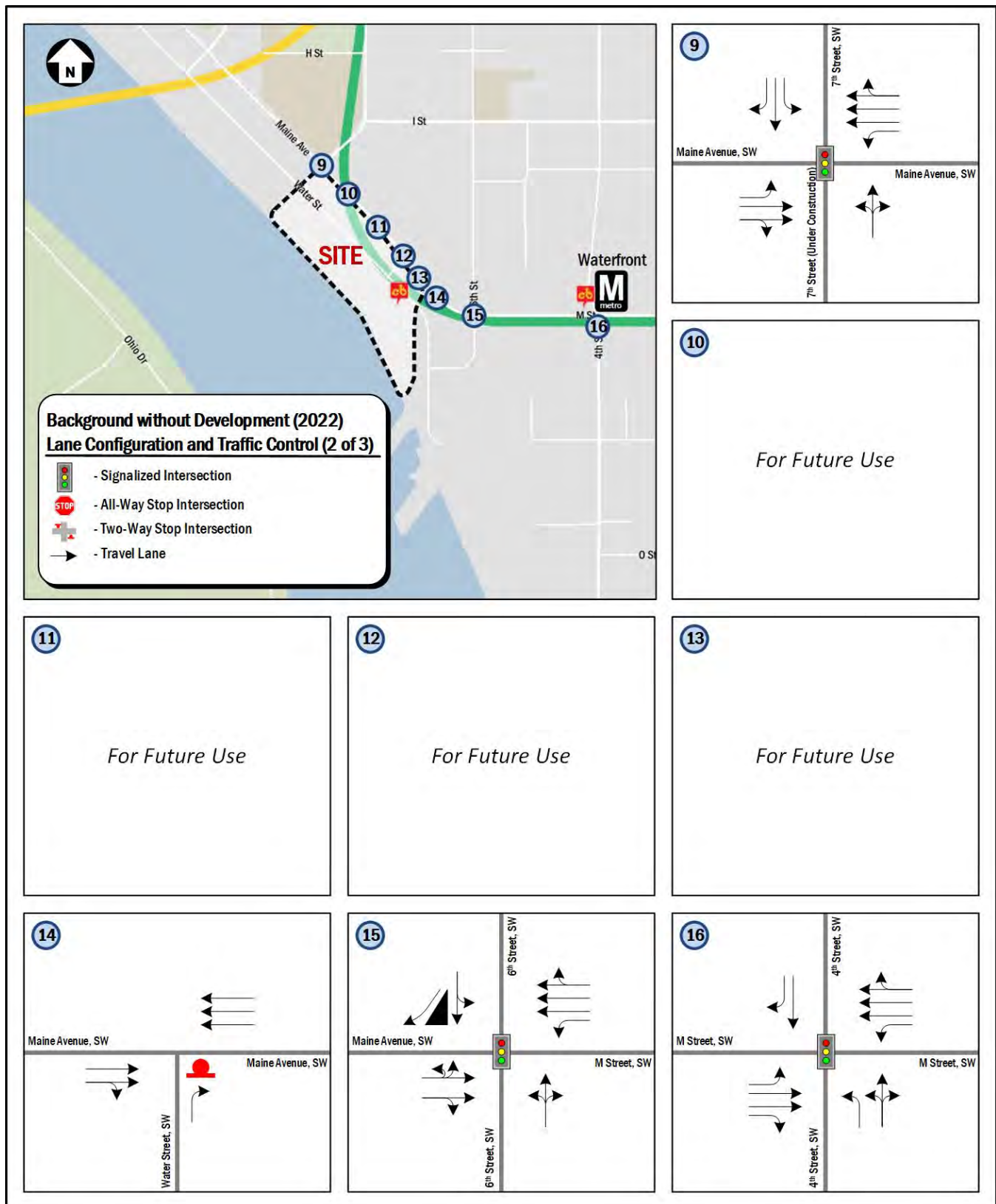


Figure 55: 2022 Background without Development Lane Configurations and Traffic Controls (2 of 3)

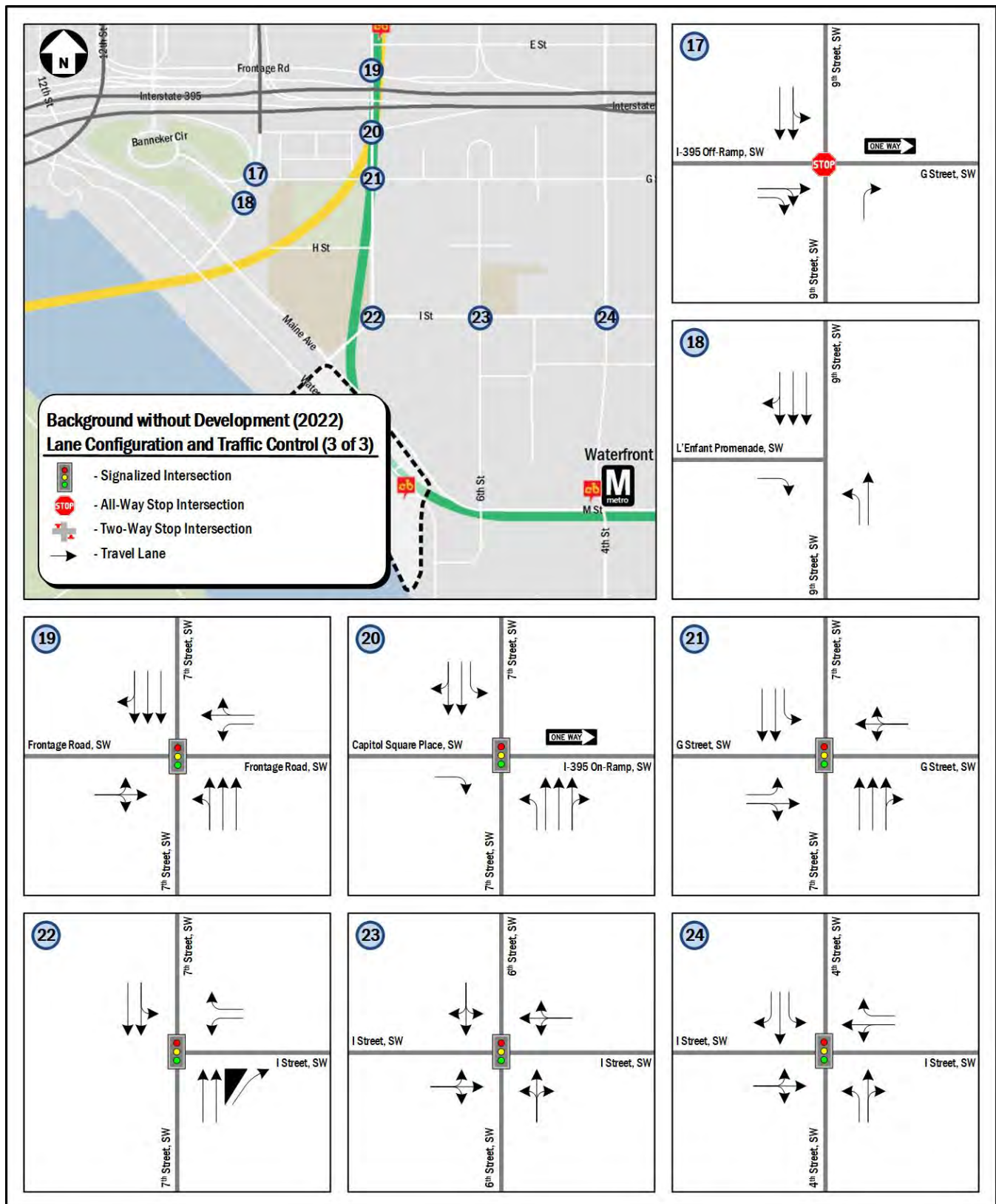


Figure 56: 2022 Background without Development Lane Configurations and Traffic Controls (3 of 3)

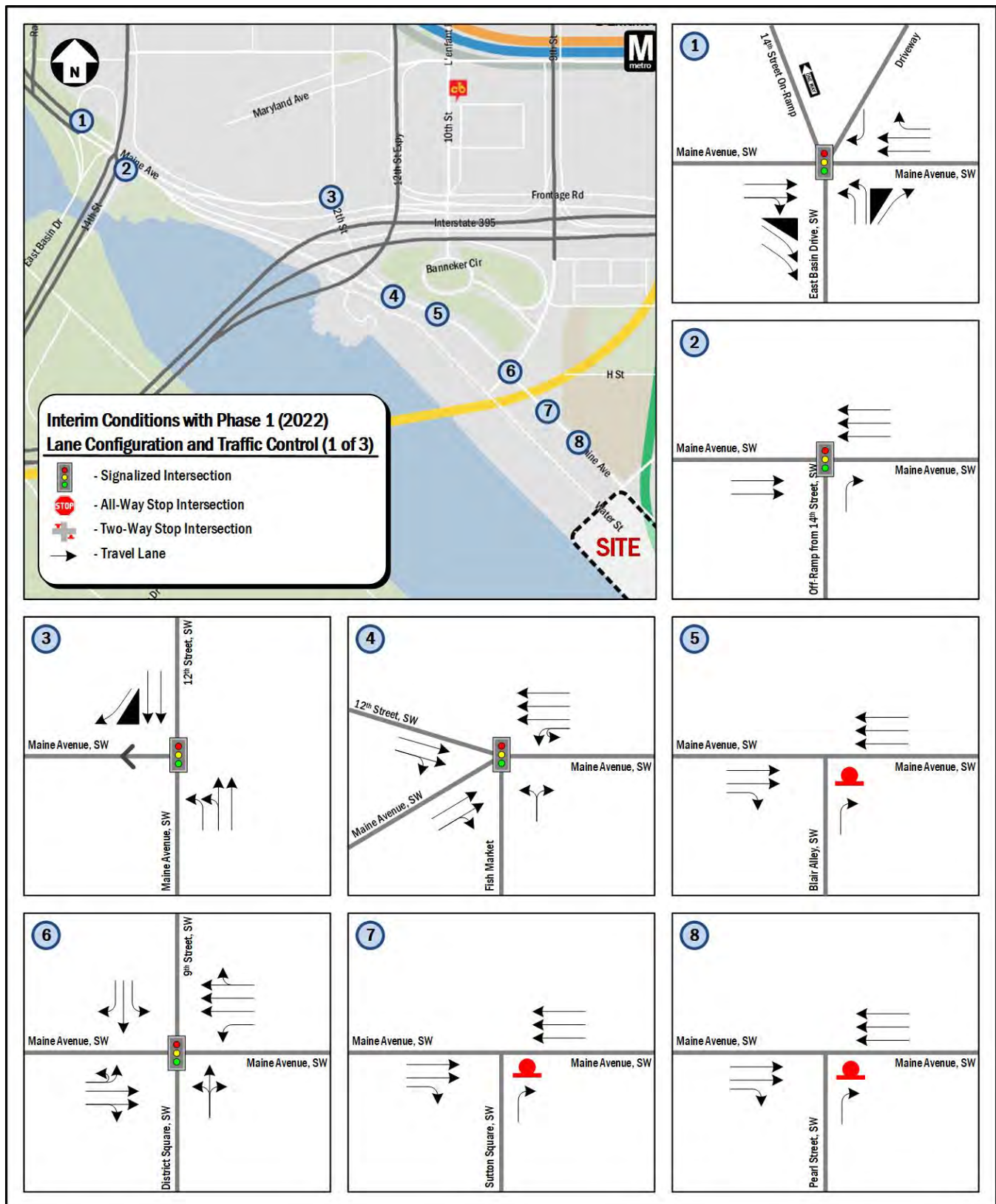


Figure 57: 2022 Interim with Phase 1 Lane Configurations and Traffic Controls (1 of 3)



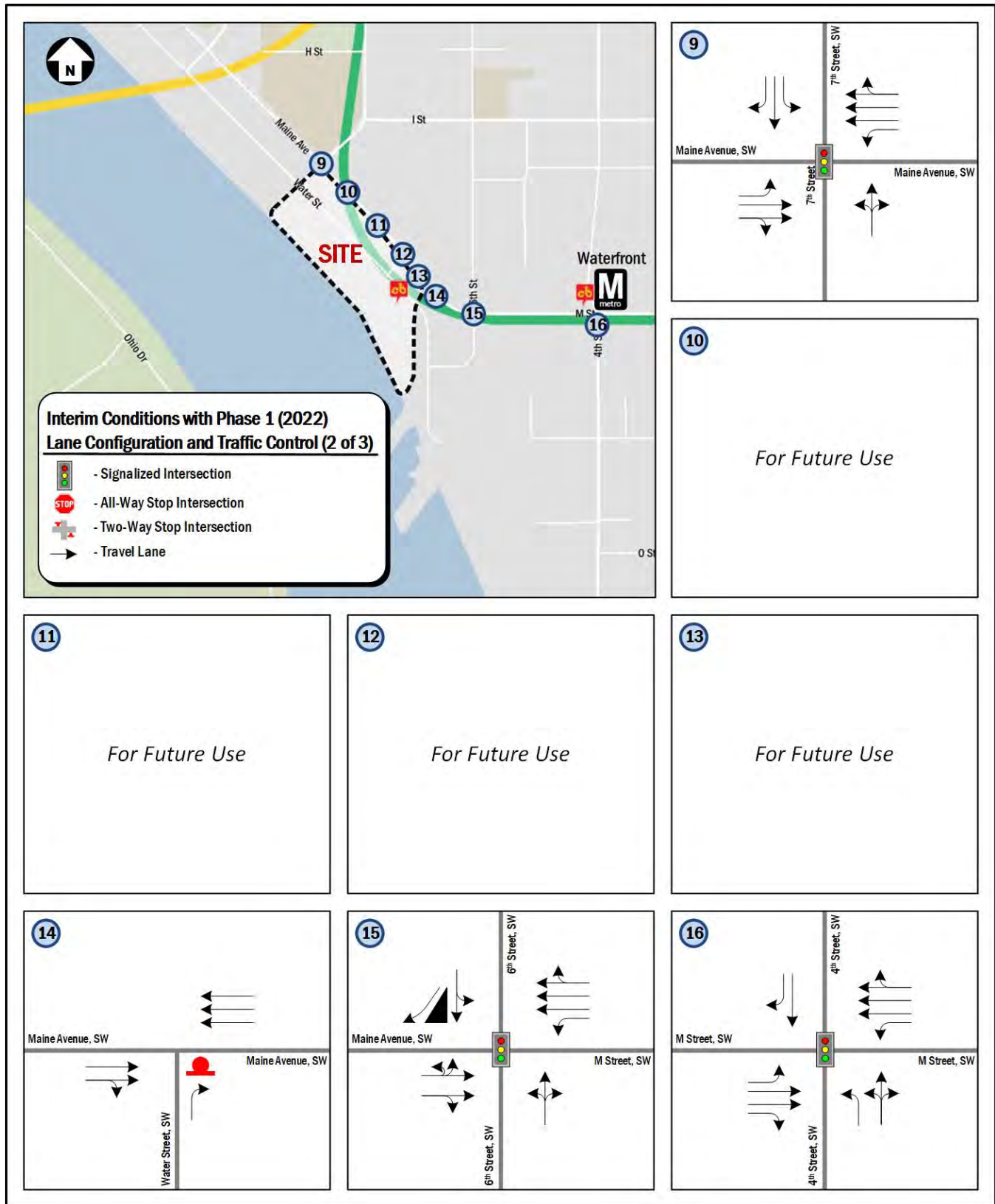


Figure 58: 2022 Interim with Phase 1 Lane Configurations and Traffic Controls (2 of 3)

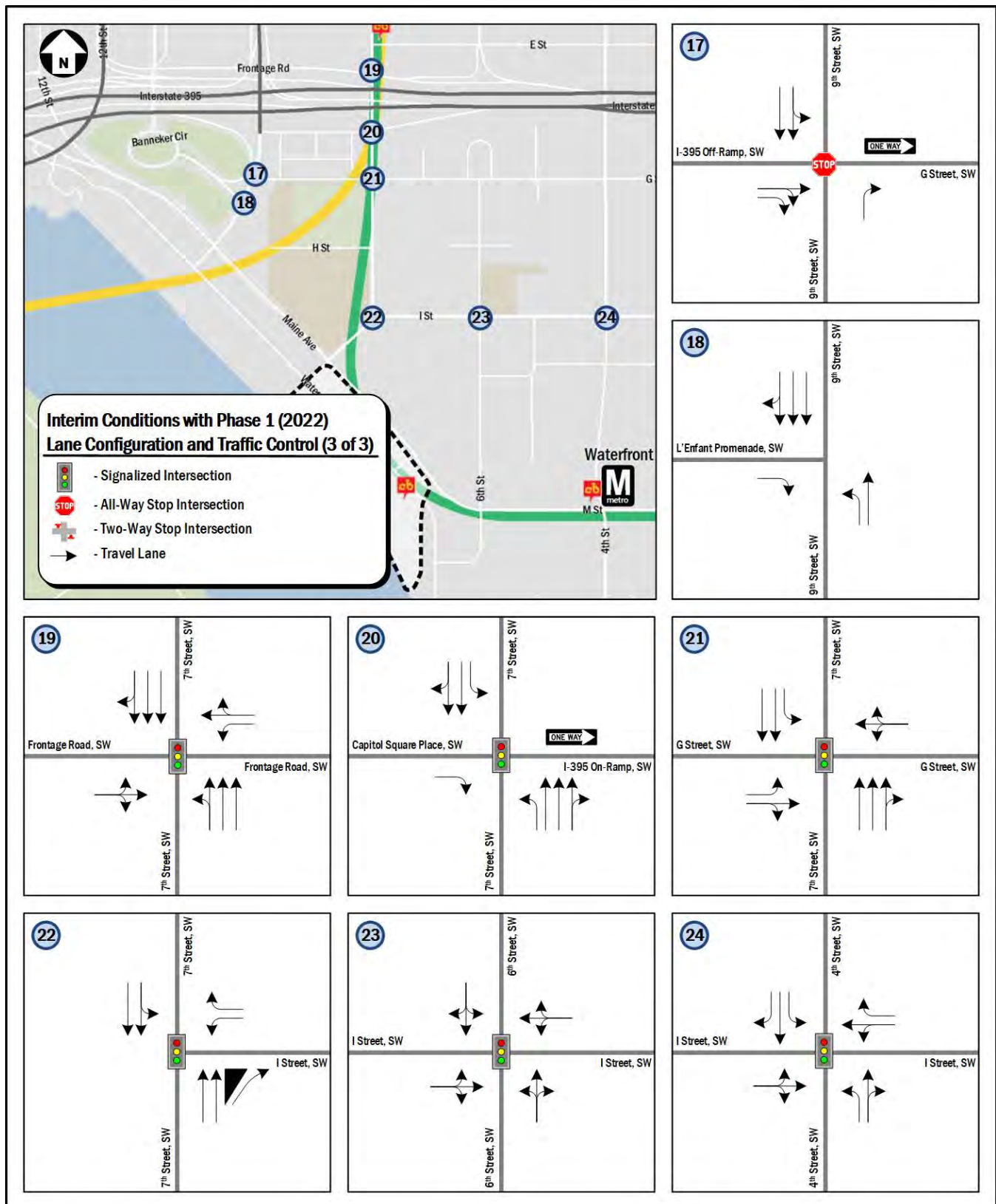


Figure 59: 2022 Interim with Phase 1 Lane Configurations and Traffic Controls (3 of 3)



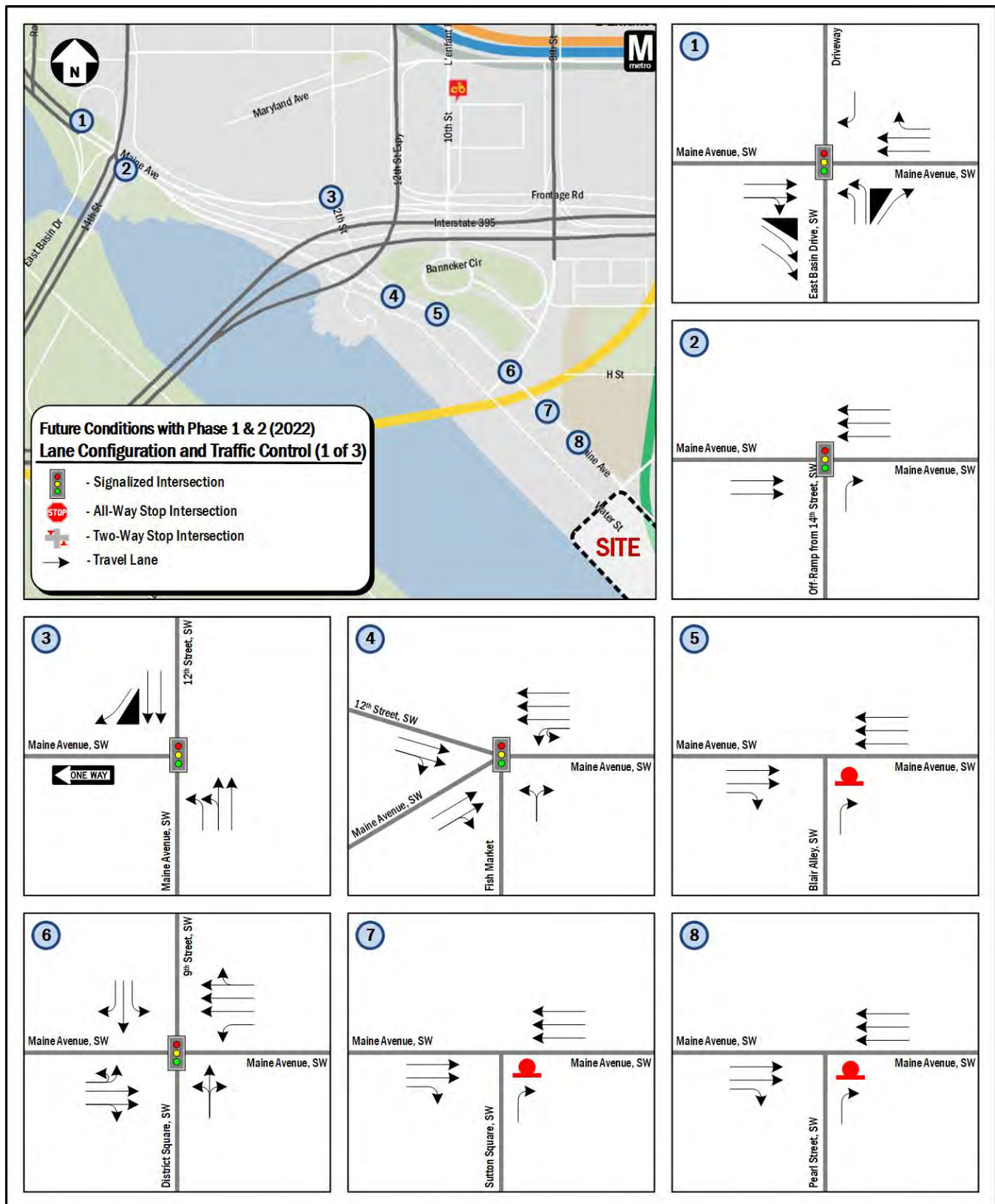


Figure 60: 2022 Future with Phase 1 and Phase 2 Lane Configurations and Traffic Controls (1 of 3)

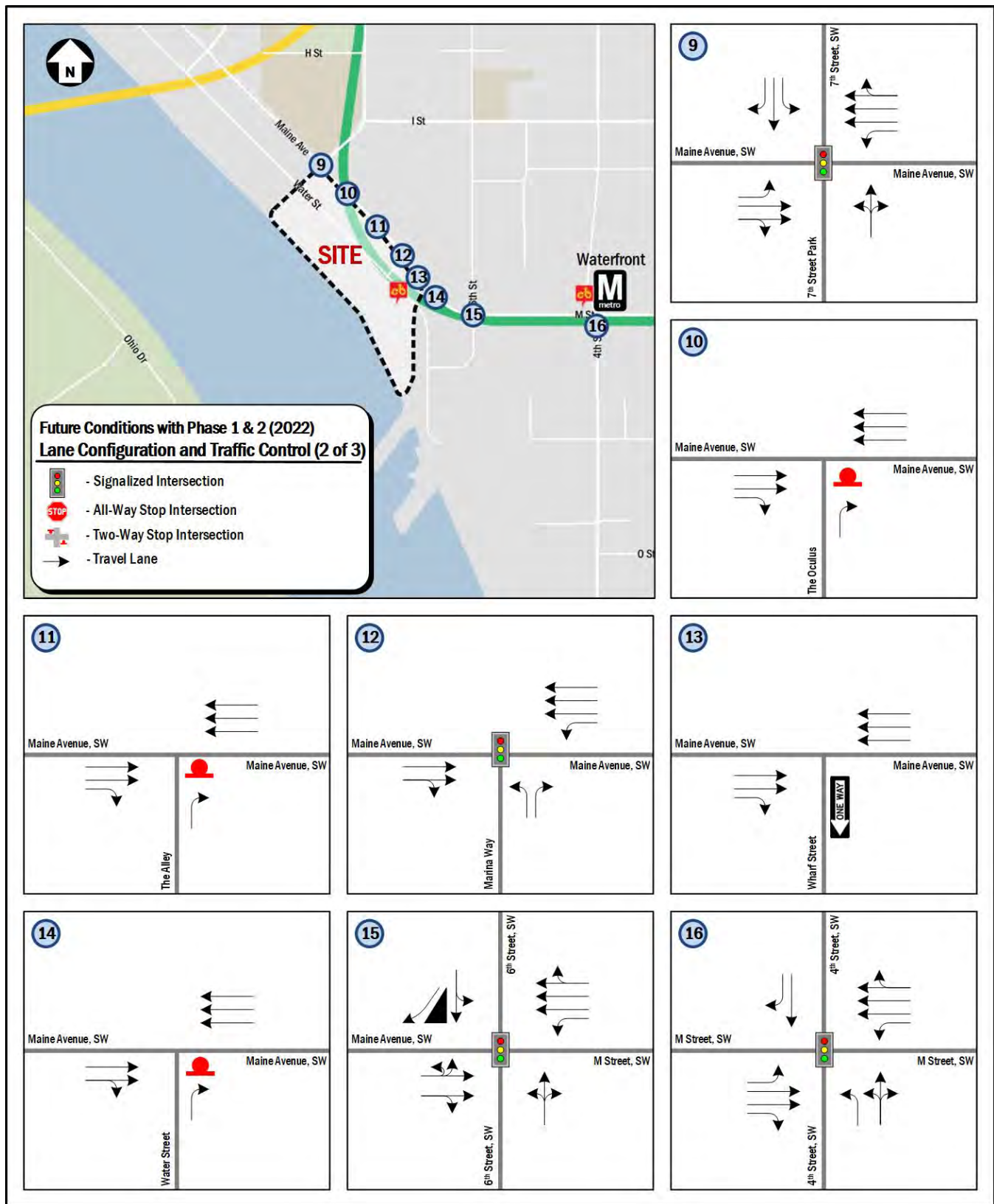


Figure 61: 2022 Future with Phase 1 and Phase 2 Lane Configurations and Traffic Controls (2 of 3)



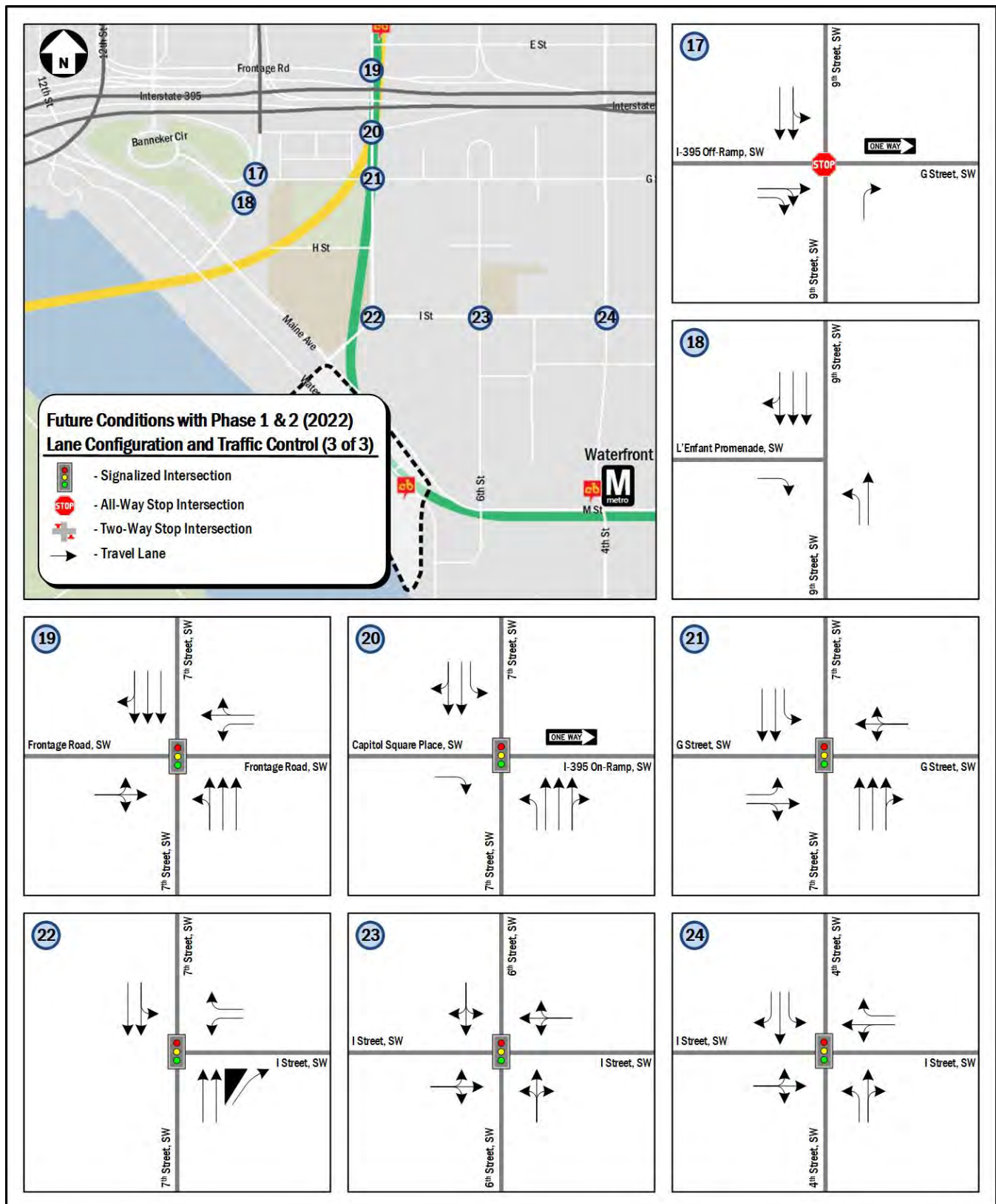


Figure 62: 2022 Future with Phase 1 and Phase 2 Lane Configurations and Traffic Controls (3 of 3)



**Table 11: LOS Results**

Intersection	Approach	Background Conditions without Phase 1 (2022)				Interim Conditions with Phase 1 (2022)				Future Conditions with Phase 1 and 2 (2022)			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Maine Avenue & 14th Street On-Ramp/East Basin Drive	<b>Overall</b>	<b>42.7</b>	<b>D</b>	<b>68.7</b>	<b>E</b>	<b>45.6</b>	<b>D</b>	<b>82.9</b>	<b>F</b>	<b>47.7</b>	<b>D</b>	<b>95.2</b>	<b>F</b>
	Eastbound	16.2	B	32.5	C	17.4	B	38.2	C	19.0	B	42.6	D
	Westbound	60.8	E	107.5	F	65.0	E	129.3	F	67.5	E	148.0	F
	Northbound	43.5	D	37.5	D	43.5	D	37.5	D	43.5	D	37.5	D
	Southbound	54.7	D	62.1	E	54.7	D	62.1	E	54.7	D	62.1	E
Maine Avenue & 14th Street Off-Ramp	<b>Overall</b>	<b>8.7</b>	<b>A</b>	<b>37.8</b>	<b>D</b>	<b>10.0</b>	<b>B</b>	<b>38.9</b>	<b>D</b>	<b>11.8</b>	<b>B</b>	<b>39.4</b>	<b>D</b>
	Eastbound	17.8	B	18.0	B	21.2	C	16.9	B	25.8	C	17.4	B
	Westbound	0.7	A	0.5	A	0.8	A	0.5	A	0.8	A	0.6	A
	Northbound	36.5	D	302.8	F	37.7	D	321.9	F	39.0	D	331.5	F
	Southbound	36.5	D	302.8	F	37.7	D	321.9	F	39.0	D	331.5	F
Maine Avenue & 12th Street	<b>Overall</b>	<b>14.0</b>	<b>B</b>	<b>16.0</b>	<b>B</b>	<b>14.5</b>	<b>B</b>	<b>16.4</b>	<b>B</b>	<b>15.0</b>	<b>B</b>	<b>17.0</b>	<b>B</b>
	Eastbound	12.4	B	11.0	B	13.0	B	11.8	B	13.5	B	12.9	B
	Westbound	30.8	C	31.5	C	31.2	C	32.6	C	31.5	C	33.3	C
Maine Avenue & Market Square	<b>Overall</b>	<b>32.9</b>	<b>C</b>	<b>18.7</b>	<b>B</b>	<b>35.5</b>	<b>D</b>	<b>22.5</b>	<b>C</b>	<b>40.7</b>	<b>D</b>	<b>27.6</b>	<b>C</b>
	Eastbound	11.8	B	26.5	C	13.5	B	28.6	C	13.8	B	29.3	C
	Westbound	41.6	D	8.8	A	44.7	D	15.0	B	52.6	D	23.8	C
	Northbound	45.3	D	38.8	D	45.3	D	38.8	D	45.3	D	38.8	D
	Southbound	53.8	D	47.2	D	53.9	D	47.3	D	54.1	D	47.4	D
Maine Avenue & Blair Alley	<b>Overall</b>	<b>0.0</b>	<b>A</b>	<b>0.0</b>	<b>A</b>	<b>0.1</b>	<b>A</b>	<b>0.4</b>	<b>A</b>	<b>0.1</b>	<b>A</b>	<b>0.4</b>	<b>A</b>
	Eastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Westbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Northbound	0.0	A	0.0	A	9.8	A	9.6	A	9.8	A	9.7	A
Maine Avenue & 9th Street/District Square	<b>Overall</b>	<b>19.9</b>	<b>B</b>	<b>45.4</b>	<b>D</b>	<b>37.9</b>	<b>D</b>	<b>69.7</b>	<b>E</b>	<b>68.4</b>	<b>E</b>	<b>81.7</b>	<b>E</b>
	Eastbound	18.1	B	25.0	C	18.5	B	30.5	C	18.4	B	31.1	C
	Westbound	10.5	B	12.3	B	30.0	C	21.6	C	29.4	C	22.5	C
	Northbound	0.0	A	0.0	A	42.7	D	35.3	D	42.7	D	35.3	D
	Southbound	56.5	E	121.5	F	89.0	F	196.8	F	226.5	F	248.3	F
Maine Avenue & Sutton Square	<b>Overall</b>	<b>0.0</b>	<b>A</b>	<b>0.0</b>	<b>A</b>	<b>0.1</b>	<b>A</b>	<b>0.4</b>	<b>A</b>	<b>0.1</b>	<b>A</b>	<b>0.3</b>	<b>A</b>
	Eastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Westbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Northbound	0.0	A	0.0	A	10.2	B	11.2	B	10.9	B	11.5	B
Maine Avenue & Pearl Street	<b>Overall</b>	<b>0.0</b>	<b>A</b>	<b>0.0</b>	<b>A</b>	<b>0.0</b>	<b>A</b>	<b>0.1</b>	<b>A</b>	<b>0.0</b>	<b>A</b>	<b>0.1</b>	<b>A</b>
	Eastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Westbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Northbound	0.0	A	0.0	A	10.1	B	11.0	B	10.8	B	11.2	B





Maine Avenue & 7th Street	Overall	14.9	B	20.5	C	16.7	B	24.5	C	22.6	C	38.1	D
	Eastbound	12.2	B	13.8	B	14.5	B	16.7	B	17.5	B	19.6	B
	Westbound	6.0	A	18.7	B	6.3	A	22.9	C	8.7	A	33.6	C
	Northbound	0.0	A	0.0	A	38.4	D	41.7	D	39.3	D	46.5	D
	Southbound	49.1	D	44.6	D	42.2	D	45.8	D	54.7	D	94.7	F
Maine Avenue & The Oculus	Overall	--	--	--	--	--	--	--	--	0.0	A	0.0	A
	Eastbound	--	--	--	--	--	--	--	--	0.0	A	0.0	A
	Westbound	--	--	--	--	--	--	--	--	0.0	A	0.0	A
	Northbound	--	--	--	--	--	--	--	--	0.0	A	0.0	A
Maine Avenue & The Alley	Overall	--	--	--	--	--	--	--	--	0.0	A	0.0	A
	Eastbound	--	--	--	--	--	--	--	--	0.0	A	0.0	A
	Westbound	--	--	--	--	--	--	--	--	0.0	A	0.0	A
	Northbound	--	--	--	--	--	--	--	--	9.4	A	9.6	A
Maine Avenue & Marina Way	Overall	0.2	A	0.4	A	0.2	A	0.4	A	12.6	B	23.9	C
	Eastbound	0.0	A	0.0	A	0.0	A	0.0	A	19.0	B	29.4	C
	Westbound	0.0	A	0.0	A	0.0	A	0.0	A	3.1	A	11.1	B
	Northbound	11.4	B	12.7	B	11.3	B	12.4	B	38.1	D	39.4	D
Maine Avenue & Wharf Street	Overall	--	--	--	--	--	--	--	--	0.0	A	0.0	A
	Eastbound	--	--	--	--	--	--	--	--	0.0	A	0.0	A
	Westbound	--	--	--	--	--	--	--	--	0.0	A	0.0	A
Maine Avenue & Water Street	Overall	0.1	A	0.2	A	0.1	A	0.2	A	0.1	A	0.2	A
	Eastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Westbound	0.0	B	0.0	A	0.0	B	0.0	A	0.0	A	0.0	A
	Northbound	10.6	B	12.4	B	10.7	B	12.1	B	12.5	B	12.7	B
Maine Avenue/M Street & 6th Street	Overall	13.9	B	27.9	C	13.8	B	30.7	C	11.5	B	34.1	C
	Eastbound	22.9	C	45.5	D	22.8	C	51.6	D	17.0	B	58.9	E
	Westbound	5.3	A	10.4	B	5.3	A	10.4	B	5.3	A	10.3	B
	Northbound	34.9	C	36.2	D	34.9	C	36.2	D	35.7	D	38.9	D
	Southbound	23.8	C	33.4	C	23.8	C	33.4	C	23.9	C	33.2	C
M Street & 4th Street	Overall	50.6	D	52.4	D	51.4	D	53.2	D	51.8	D	52.6	D
	Eastbound	45.3	D	56.7	E	45.6	D	57.9	E	43.3	D	56.4	E
	Westbound	50.1	D	41.8	D	51.7	D	42.5	D	53.8	D	43.0	D
	Northbound	66.5	E	55.5	E	66.5	E	55.5	E	66.5	E	55.5	E
	Southbound	48.0	D	58.0	E	48.0	D	58.0	E	48.1	D	58.0	E
G Street/I-395 Off-Ramp & 9th Street	Overall	14.9	B	14.3	B	17.7	C	15.0	B	23.4	C	15.7	C
	Eastbound	16.6	C	10.3	B	20.0	C	10.7	B	27.1	D	11.2	B
	Northbound	13.8	B	12.2	B	14.3	B	13.0	B	14.7	B	13.2	B
	Southbound	10.3	B	16.8	C	10.8	B	18.1	C	11.4	B	19.3	C



<b>9th Street &amp; L'Enfant Plaza</b>	<b>Overall</b>	<b>1.2</b>	<b>A</b>	<b>1.3</b>	<b>A</b>	<b>1.0</b>	<b>A</b>	<b>1.2</b>	<b>A</b>	<b>1.0</b>	<b>A</b>	<b>1.2</b>	<b>A</b>
	Eastbound	10.0	A	11.0	B	10.5	B	11.5	B	11.0	B	11.7	B
	Northbound	2.6	A	4.1	A	2.6	A	3.3	A	2.9	A	3.5	A
	Southbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
<b>7th Street &amp; Frontage Road</b>	<b>Overall</b>	<b>28.7</b>	<b>D</b>	<b>22.1</b>	<b>C</b>	<b>30.6</b>	<b>C</b>	<b>23.6</b>	<b>C</b>	<b>34.0</b>	<b>C</b>	<b>24.7</b>	<b>C</b>
	Eastbound	26.2	C	31.3	C	26.2	C	31.3	C	26.2	C	31.3	C
	Westbound	35.1	D	38.8	D	36.7	D	44.6	D	44.1	D	51.1	D
	Northbound	28.6	C	18.9	B	31.3	C	19.6	B	32.4	C	18.7	B
	Southbound	20.1	C	17.1	B	20.5	C	17.3	B	20.7	C	17.5	B
<b>7th Street &amp; Capitol Square Place/I-395 On-Ramp</b>	<b>Overall</b>	<b>11.5</b>	<b>B</b>	<b>17.5</b>	<b>B</b>	<b>10.9</b>	<b>B</b>	<b>20.7</b>	<b>C</b>	<b>10.4</b>	<b>B</b>	<b>25.7</b>	<b>C</b>
	Eastbound	43.9	D	47.4	D	43.9	D	47.4	D	43.9	D	47.4	D
	Northbound	12.1	B	31.8	C	12.7	B	36.1	D	13.2	B	44.5	D
	Southbound	9.5	A	7.8	A	7.1	A	7.8	A	6.1	A	7.7	A
<b>7th Street &amp; G Street</b>	<b>Overall</b>	<b>21.0</b>	<b>C</b>	<b>20.2</b>	<b>C</b>	<b>21.6</b>	<b>C</b>	<b>20.7</b>	<b>C</b>	<b>21.9</b>	<b>C</b>	<b>21.2</b>	<b>C</b>
	Eastbound	22.3	C	25.7	C	22.9	C	25.9	C	23.1	C	26.2	C
	Westbound	17.7	B	19.0	B	18.0	B	19.2	B	18.2	B	19.7	B
	Northbound	22.0	C	18.0	B	22.5	C	19.0	B	22.8	C	20.0	B
	Southbound	18.2	B	16.4	B	20.1	C	17.5	B	20.8	C	18.4	B
<b>7th Street &amp; I Street</b>	<b>Overall</b>	<b>21.6</b>	<b>C</b>	<b>16.3</b>	<b>B</b>	<b>21.0</b>	<b>C</b>	<b>17.8</b>	<b>B</b>	<b>21.8</b>	<b>C</b>	<b>19.9</b>	<b>B</b>
	Westbound	28.8	C	22.8	C	29.0	C	24.7	C	29.2	C	23.5	C
	Northbound	16.5	B	8.9	A	14.3	B	9.7	A	14.1	B	10.5	B
	Southbound	16.3	B	15.1	B	18.4	B	18.8	B	21.0	C	25.0	C
<b>6th Street &amp; I Street</b>	<b>Overall</b>	<b>14.6</b>	<b>B</b>	<b>17.5</b>	<b>B</b>	<b>14.4</b>	<b>B</b>	<b>16.7</b>	<b>B</b>	<b>14.6</b>	<b>B</b>	<b>16.6</b>	<b>B</b>
	Eastbound	7.6	A	20.5	C	7.7	A	19.0	B	7.7	A	18.1	B
	Westbound	7.3	A	6.7	A	7.2	A	6.6	A	7.1	A	6.5	A
	Northbound	36.5	D	28.7	C	36.5	D	28.7	C	37.3	D	30.3	C
	Southbound	23.7	C	24.2	C	23.7	C	24.2	C	23.7	C	24.2	C
<b>4th Street &amp; I Street</b>	<b>Overall</b>	<b>19.9</b>	<b>B</b>	<b>24.4</b>	<b>C</b>	<b>20.1</b>	<b>C</b>	<b>24.5</b>	<b>C</b>	<b>20.2</b>	<b>C</b>	<b>24.7</b>	<b>C</b>
	Eastbound	14.0	B	9.9	A	14.3	B	11.1	B	14.5	B	11.8	B
	Westbound	19.5	B	13.2	B	19.8	B	13.5	B	20.1	C	13.7	B
	Northbound	24.2	C	30.5	C	24.2	C	30.5	C	24.2	C	30.6	C
	Southbound	21.6	C	43.9	D	21.6	C	43.9	D	21.6	C	44.3	D





**Table 12: Queueing Results (in feet)**

Intersection	Lane Group	Storage Length (ft)	Background Conditions without Phase 1 (2022)				Interim Conditions with Phase 1 (2022)				Future Conditions with Phase 1 and 2 (2022)			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %
Maine Avenue & 14th Street On-Ramp/East Basin Drive	Eastbound TR	225	556	702	~842	#1054	588	746	~952	#1097	623	793	~982	#1127
	Eastbound Right	200	0	0	0	0	0	0	0	0	0	0	0	0
	Westbound Thru	650	~946	#1293	156	258	~1015	#1320	172	278	~1034	#1340	184	296
	Westbound Right	400	0	426	~1226	#2029	0	483	~1378	#2192	0	528	~1532	#2335
	Northbound Left	600	45	71	33	55	45	71	33	55	45	71	33	55
	Northbound Right	125	0	0	0	14	0	0	0	14	0	0	0	14
	Southbound TR	75	1	6	4	17	1	6	4	17	1	6	4	17
Maine Avenue & 14th Street Off-Ramp	Eastbound Thru	245	747	#956	836	m856	787	#992	857	m824	~892	#1028	871	m825
	Westbound Thru	--	15	1	0	0	13	0	0	0	11	0	0	0
	Northbound Right	450	176	271	~566	#779	188	286	~589	#804	199	301	~601	#817
Maine Avenue & 12th Street	Northbound Left	575	240	351	143	214	267	390	187	275	291	425	234	341
	Northbound Thru	575	163	208	143	184	177	225	168	214	188	239	208	262
	Southbound Thru	175	8	20	51	81	10	21	53	84	11	24	54	85
	Southbound Right	25	7	44	5	62	15	53	39	105	21	61	62	134
Maine Avenue & Market Square	Eastbound TR	500	135	217	214	271	189	241	241	305	208	263	258	327
	Westbound Left	100	0	m1	4	m28	2	m6	14	m54	2	m5	12	m42
	Westbound Right	500	47	55	7	0	64	54	7	5	97	74	19	1
	Northbound LR	100	0	0	0	9	0	0	0	9	0	0	0	9
	Southbound LR	500	10	24	74	110	12	28	77	113	14	30	79	116
Maine Avenue & Blair Alley	Eastbound Thru	--	--	--	--	--	--	0	--	0	--	0	--	0
	Eastbound Right	40	--	--	--	--	--	0	--	0	--	0	--	0
	Westbound Thru	--	--	--	--	--	--	0	--	0	--	0	--	0
	Northbound Right	100	--	--	--	--	--	4	--	12	--	4	--	12
Maine Avenue & 9th Street/District Square	Eastbound Left	150	75	131	87	143	85	145	123	#230	86	147	124	#231
	Eastbound TR	450	96	116	156	198	108	131	188	257	117	138	196	281
	Westbound Left	200	--	--	--	--	~123	m#232	54	m57	~122	m#232	54	m48
	Westbound TR	740	94	108	96	112	138	187	202	m149	158	203	273	m139
	Northbound LTR	100	--	--	--	--	59	103	101	157	59	103	101	157
	Southbound Left	225	191	#333	~517	#709	~283	#467	~642	#838	~517	#725	~742	#941
	Southbound Thru	225	--	--	--	--	66	117	28	57	66	117	28	57
	Southbound Right	25	0	0	37	110	9	66	128	216	10	68	128	216



Maine Avenue & 7th Street	Eastbound Left	185	37	m57	41	m54	60	m81	108	m126	66	m79	158	m185
	Eastbound TR	725	175	209	324	m308	196	m217	350	m288	265	m257	384	m322
	Westbound Left	225	--	--	--	--	4	m11	--	--	5	m14	--	--
	Westbound TR	600	41	46	282	m329	40	45	~464	m#560	73	80	~693	#792
	Northbound LTR	100	--	--	--	--	31	66	70	125	42	83	115	188
	Southbound Left	225	67	121	143	#260	65	119	144	#273	218	#397	~254	#425
	Southbound Thru	225	--	--	--	--	45	89	34	71	44	m74	34	71
	Southbound Right	225	122	229	88	155	130	269	129	211	269	236	129	211
Maine Avenue & The Oculus	Eastbound Thru	--	--	--	--	--	--	--	--	--	--	0	--	0
	Eastbound Right	40	--	--	--	--	--	--	--	--	--	0	--	0
	Westbound Thru	--	--	--	--	--	--	--	--	--	--	0	--	0
	Northbound Right	100	--	--	--	--	--	--	--	--	--	0	--	0
Maine Avenue & The Alley	Eastbound Thru	--	--	--	--	--	--	--	--	--	--	0	--	0
	Eastbound Right	40	--	--	--	--	--	--	--	--	--	0	--	0
	Westbound Thru	--	--	--	--	--	--	--	--	--	--	0	--	0
	Northbound Right	100	--	--	--	--	--	--	--	--	--	0	--	1
Maine Avenue & Marina Way	Eastbound Thru	600	--	--	--	--	--	--	--	--	254	m285	393	m434
	Westbound LT	350	--	--	--	--	--	--	--	--	--	--	--	--
	Westbound Left	40	--	--	--	--	--	--	--	--	8	m21	12	m28
	Westbound Thru	350	--	--	--	--	--	--	--	--	14	19	268	m270
	Northbound Left	300	--	--	--	--	--	--	--	--	60	103	219	298
	Northbound Right	300	--	--	--	--	--	--	--	--	0	26	3	39
Maine Avenue & Wharf Street	Eastbound Left	--	--	--	--	--	--	--	--	--	--	0	--	0
	Eastbound Right	--	--	--	--	--	--	--	--	--	--	0	--	0
	Westbound Thru	--	--	--	--	--	--	--	--	--	--	0	--	0
Maine Avenue & Water Street	Eastbound TR	200	--	0	--	0	--	0	--	0	--	0	--	0
	Westbound Thru	--	--	0	--	0	--	0	--	0	--	0	--	0
	Northbound Right	50	--	2	--	5	--	2	--	5	--	4	--	8
Maine Avenue/M Street & 6th Street	Eastbound LTR	400	304	383	619	#727	311	391	642	m#763	187	273	~661	#749
	Westbound Left	185	4	m5	4	m8	4	m5	4	m8	5	m6	6	m11
	Westbound TR	540	58	m62	238	200	59	m61	254	203	58	m60	246	202
	Northbound LTR	125	11	33	16	48	11	33	16	48	21	49	45	92
	Southbound LT	585	49	96	86	141	49	96	86	141	49	96	86	141
	Southbound Right	50	0	0	0	0	0	0	0	0	0	0	0	0





<b>M Street &amp; 4th Street</b>	Eastbound Left	175	37	m58	76	m85	37	m57	77	m82	38	m57	78	m78
	Eastbound Thru	550	184	227	357	m388	188	231	371	m389	191	235	381	m372
	Eastbound Right	100	174	275	351	m390	182	281	367	m389	192	284	377	m364
	Westbound Left	200	29	55	25	52	29	55	25	52	29	55	25	52
	Westbound TR	565	372	409	227	277	380	417	238	290	389	#436	246	300
	Northbound Left	150	150	222	149	227	150	222	149	227	150	222	149	227
	Northbound LTR	525	157	#260	150	230	157	#260	150	230	157	#260	150	230
	Southbound Thru	150	142	222	229	#369	142	222	229	#369	142	222	229	#369
	Southbound Right	90	89	153	71	127	89	153	71	127	90	155	72	129
<b>G Street/I-395 Off-Ramp &amp; 9th Street</b> <div>HCM 2000 is unable to analyze All Way Stop Controlled (AWSC) Intersections</div>														
<b>9th Street &amp; L'Enfant Plaza</b>	Eastbound Right	350	--	5	--	10	--	5	--	10	--	6	--	11
	Northbound Left	215	--	5	--	7	--	6	--	8	--	6	--	9
	Northbound Thru	250	--	0	--	0	--	0	--	0	--	0	--	0
	Southbound TR	75	--	0	--	0	--	0	--	0	--	0	--	0
<b>7th Street &amp; Frontage Road</b>	Eastbound LTR	525	0	0	0	39	0	0	0	39	0	0	0	39
	Westbound Left	100	59	106	110	186	136	216	151	#265	226	#375	179	#322
	Westbound TR	450	158	256	78	137	158	256	78	137	158	256	78	137
	Northbound LT	175	130	171	115	151	147	189	157	169	153	194	143	m144
	Southbound TR	65	44	65	149	173	55	78	158	183	64	89	162	188
<b>7th Street &amp; Capitol Square Place/I-395 On-Ramp</b>	Eastbound Right	100	0	0	0	0	0	0	0	0	0	0	0	0
	Northbound Left	65	2	m6	3	m15	2	m6	3	m12	2	m5	3	m9
	Northbound TR	160	142	168	159	205	163	192	235	291	175	206	295	#372
	Southbound Left	175	56	102	92	384	60	117	103	391	67	m108	109	m389
	Southbound TR	200	3	4	37	39	5	6	45	46	6	m20	50	m49



**Table 13: Mitigated LOS Results**

Intersection	Approach	Future Conditions with Phase 1 and 2 (2022)				Future Conditions with Phase 1 and 2 (2022) with Mitigations			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Maine Avenue & 14th Street On-Ramp/East Basin Drive	<b>Overall</b>	<b>47.7</b>	<b>D</b>	<b>95.2</b>	<b>F</b>	<b>44.1</b>	<b>D</b>	<b>No Mitigations</b>	
	Eastbound	19.0	B	42.6	D	17.5	B		
	Westbound	67.5	E	148.0	F	62.4	E		
	Northbound	43.5	D	37.5	D	44.7	D		
	Southbound	54.7	D	62.1	E	54.7	D		
Maine Avenue & 14th Street Off-Ramp	<b>Overall</b>	<b>11.8</b>	<b>B</b>	<b>39.4</b>	<b>D</b>	<b>No Mitigations</b>		<b>36.7</b>	<b>D</b>
	Eastbound	25.8	C	17.4	B			17.5	B
	Westbound	0.8	A	0.6	A			0.6	A
	Northbound	39.0	D	331.5	F			304.5	F
	Southbound								
Maine Avenue & 9th Street/District Square	<b>Overall</b>	<b>68.4</b>	<b>E</b>	<b>81.7</b>	<b>E</b>	<b>40.9</b>	<b>D</b>	<b>57.7</b>	<b>E</b>
	Eastbound	18.4	B	31.1	C	52.9	D	59.4	E
	Westbound	29.4	C	22.5	C	31.8	C	57.4	E
	Northbound	42.7	D	35.3	D	45.5	D	67.3	E
	Southbound	226.5	F	248.3	F	44.6	D	54.8	D
Maine Avenue & 7th Street	<b>Overall</b>	<b>22.6</b>	<b>C</b>	<b>38.1</b>	<b>D</b>	<b>No Mitigations</b>		<b>34.8</b>	<b>C</b>
	Eastbound	17.5	B	19.6	B			39.4	D
	Westbound	8.7	A	33.6	C			21.8	C
	Northbound	39.3	D	46.5	D			38.0	D
	Southbound	54.7	D	94.7	F			53.6	D
Maine Avenue/M Street & 6th Street	<b>Overall</b>	<b>11.5</b>	<b>B</b>	<b>34.1</b>	<b>D</b>	<b>12.5</b>	<b>B</b>	<b>16.8</b>	<b>B</b>
	Eastbound	17.0	B	58.9	E	19.1	B	23.7	C
	Westbound	5.3	A	10.3	B	5.9	A	7.6	A
	Northbound	35.7	D	38.9	D	31.0	C	37.0	D
	Southbound	23.9	C	33.2	C	20.4	C	31.2	C



**Table 14: Mitigated 95<sup>th</sup> Percentile Queuing Results**

Intersection	Lane Group	Storage Length (ft)	Future Conditions with Phase 1 and 2 (2022)				Future Conditions with Phase 1 and 2 (2022) with Mitigations			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %
<b>7th Street &amp; Frontage Road</b>	Eastbound LTR	525	0	0	0	39	0	0	<b>No Mitigations</b>	
	Westbound Left	100	226	#375	179	#322	194	294		
	Westbound TR	450	158	256	78	137	127	210		
	Northbound LT	175	153	194	143	m144	27	45		
	Southbound TR	65	64	89	162	188	80	111		
<b>7th Street &amp; Capitol Square Place/I-395 On-Ramp</b>	Eastbound Right	100	0	0	0	0	<b>No Mitigations</b>		0	0
	Northbound Left	65	2	m5	3	m9			4	m10
	Northbound TR	160	175	206	295	#372			237	302
	Southbound Left	175	67	m108	109	m389			317	m439
	Southbound TR	200	6	m20	50	m49			113	m138



## TRANSIT

This section discusses the existing and proposed transit facilities in the vicinity of the site, accessibility to transit, and evaluates the overall transit impacts of the Wharf Phase 2 project.

The following conclusions are reached within this chapter:

- The development has excellent access to transit.
- The development is near two Metrorail stations serving five lines and near four Metrobus routes that travel along multiple primary corridors.
- Two Metrobus routes are planned to be rerouted to service the site.
- One Circulator route is expected to be rerouted and extended to service the site.
- One new Streetcar line is expected to travel along Maine Avenue/M Street corridor in the vicinity of the site
- A Southwest Neighborhood Shuttle is planned to service the site, providing an additional connection to/from the site and L'Enfant Metrorail Station.
- The site is expected to generate a large number of transit trips, and the existing service is capable of handling these new trips.

### EXISTING TRANSIT SERVICE

The study area is well served by Metrobus and has access to Metrorail. Combined, these transit services provide local, city wide, and regional transit connections and link the site with major cultural, residential, employment, and commercial destinations throughout the region. Figure 63 identifies the major transit routes, stations, and stops in the study area.

The Waterfront Metrorail station is located 0.25 miles from the development site and is served by the Green Line, which provides direct connections to areas in the District and Maryland along with access to Virginia via connecting lines. The Green Line connects Greenbelt with Branch Avenue in Suitland while providing access to the District core through Downtown to the north and Anacostia to the south. Additionally, the Green line connects to the Yellow, Orange, Blue, and Silver lines at L'Enfant Plaza station which is also located near the site (0.5 miles), and connects to the Red line at Gallery Place Station. This network provides access to the District from Prince George's County, Montgomery County, Fairfax County,

Arlington County, and Alexandria. Green line trains run approximately every eight minutes during the morning and afternoon peak hours. The Green line runs about every 12 minutes during weekday non-peak hours, every 20 minutes on weekday evenings after 9:30 pm and 12 to 20 minutes on the weekends.

The site is serviced by four Metrobus routes along multiple primary corridors. These bus routes connect the site to the downtown core and other areas of the District, including Metrorail stations which provide further connections to Virginia and Maryland. The site is also served by one regional commuter bus, OmniRide (operated by PRTC). Table 15 shows a summary of the bus route information for the routes that serve the site, including service hours, headway, and distance to the nearest bus stop.

Figure 63 shows a detailed inventory of the existing Metrobus stops within a quarter-mile walkshed of the site. Each stop is evaluated based on the guidelines set forth by WMATA's *Guidelines for the Design and Placement of Transit Stops*, as detailed in Table 16. A detailed breakdown of individual bus stop amenities and conditions is included in the Technical Appendix.

### PLANNED TRANSIT SERVICE

#### MoveDC

Due to growth of population, jobs, and retail in several neighborhoods in the District and the potential for growth in other neighborhoods, the District's infrastructure is challenged with the need for transportation investments to support the recent growth and to further strengthen neighborhoods. In order to meet these challenges and capitalize on future opportunities, DDOT has developed a plan to identify transit challenges and opportunities and to recommend investments. *MoveDC* is a long-range plan that provides a vision for the future of DC's transportation system, specifically in a way that expands transportation choices while improving the reliability of all transportation modes.

The MoveDC report outlines recommendations by mode with the goal of having them complete by 2040. The plan hopes to achieve a transportation system for the District that includes:

- 70 miles of high-capacity transit (streetcar or bus)



- 200 miles of on-street bicycle facilities or trails
- Sidewalks on at least one side of every street
- New street connections
- Road management/pricing in key corridors and the Central Employment Area
- A new downtown Metrorail loop
- Expanded commuter rail
- Water taxis

One transit related improvement outlined in the MoveDC plan that could impact the proposed development is the placement of one streetcar route. This route would run between the Takoma Metrorail Station and Buzzard Point, creating a north-south transit connection. This travels near the site along 7<sup>th</sup> Street, Maine Avenue, and M Street.

The Applicant has worked with DDOT to ensure that there is a zone that is free of utilities in the median along Maine Avenue to help facilitate any future streetcar route that would operate on Maine Avenue abutting the development.

#### **WMATA and DDOT Transit Studies and Initiatives**

WMATA studied capacity of Metrorail stations in its *Station Access & Capacity Study (2008)*. The study analyzed the capacity of Metrorail stations for their vertical transportation, for example the capacity of the station at elevators, stairs, and escalators to shuttle patrons between the street, mezzanine, and platforms. The study also analyzed stations capacity to process riders at fare card gates. For both analyses, vertical transportation and fare card gates, volume-to-capacity ratios were calculated for existing data (from 2005) and projections for the year 2030. According to the study, the Waterfront station can currently accommodate future growth at all access points. The L'Enfant Plaza station in this study was noted as needing improvement to handle capacity of 2030 rider volumes in the vertical direction. Both the East and West mezzanines had volume-to-capacity ratios of more than 0.75 for the year 2030, which means that the station requires improvement. The study calls for the addition of platform-to-platform vertical capacity. One recommendation is to reduce the number of L'Enfant Plaza transfers by building a pedestrian tunnel between Gallery Place and Metro Center stations. Additionally, the study recommends more farecard vendors be installed.

In 2013, WMATA initiated the *2013-2025 Strategic Plan*. Within the Strategic Plan are the Metro 2025 Initiatives, one of which is *Core Station Improvements*. According to WMATA, this

is a program that provides improvements and expansion at stations that experience a high volume of Metrorail riders. These improvements are put in place to ensure safe and efficient operation of Metrorail, street-to-platform movements, and transfers. According to this program, Waterfront station does not need to be improved to handle the volume of riders in 2025. L'Enfant Plaza however was cited as requiring improvements to be able to handle 2025 demand. The improvements that the program requires L'Enfant Plaza station to have by 2025 include the addition of vertical circulation and faregates, the expansion of mezzanines, bridges above tracks, the addition of internal transfer points, and new entrances. Additionally, the program lists L'Enfant Plaza as having an ongoing study, *L'Enfant Plaza Capacity Study* (ongoing, 2013).

Due to growth of population, jobs, and retail in several neighborhoods in the District and the potential for growth in other neighborhoods, the District's infrastructure is challenged with the need for transportation investments to support the recent growth and to further strengthen neighborhoods. In order to meet the challenges and capitalize on future opportunities, DDOT has developed a plan to identify transit challenges and opportunities and to recommend investments. This is also outlined in DC's *Transit Future System Plan* report published by DDOT in April 2010, which includes the reestablishment of streetcar service in the District. The previously mentioned proposed streetcar route from Takoma station to Buzzard Point travels within the site study area.

WMATA has also studied capacity along Metrobus routes. DC's *Transit Future System Plan* (2010) lists the bus routes with the highest load factor (a ratio of passenger volume to bus capacity). A load factor is considered unacceptable if it is over 1.2 during peak periods or over 1.0 during off-peak or weekend periods. According to this study Metrobus routes that travel near the site operate at a load factor that is at or below its capacity during peak periods of the day. As it is expected that the majority of new trips will be made via the Metrorail, site-generated transit trips will not cause detrimental impacts to Metrobus or Metrorail service.

#### **Transit Related Improvements**

Consistent with the First-Stage PUD and subsequent approvals, the development will fund the construction of three bus stops along Maine Avenue to facilitate better and more comfortable access to transit. The Applicant will continue their coordination with the SWBID, DDOT, and WMATA on matters regarding the



addition and rerouting of Metrobus and Circulator routes to better service the site, especially along Maine Avenue.

#### *Metrobus*

As currently proposed, two (2) Metrobus and one (1) Circulator route will be rerouted to service the site. WMATA has proposed a restructuring of the 52 and 74 bus routes that would allow for increased public transit access to the Wharf and other parts of Southwest. The proposed changes to the 52 bus route would add a direct connection between the Wharf and 14<sup>th</sup> Street NW, while the proposed changes to the 74 bus route would allow for a direct connection to Gallery Place and the Convention Center via 7<sup>th</sup> Street. One of the proposed changes to the 74 route would provide service to the new DC United Stadium via 2<sup>nd</sup> Street SW. As shown on Figure 64, the 52 route would extend to the Wharf via 12<sup>th</sup> Street and Maine Avenue to L'Enfant Plaza Metrorail Station. The proposed rerouting of the 74 route is shown on Figure 65. The 74 reroute would extend service to 7<sup>th</sup> Street and Maine Avenue to serve the Wharf, and 1<sup>st</sup> Street SW and V Street SW to service the new DC soccer stadium. Service along segments of 4<sup>th</sup> Street, P Street, 6<sup>th</sup> Street, and I Street would be discounted.

These proposed changes could have meaningful and positive impact on Southwest, increasing connectivity for residents, while also allowing others to more easily access the Wharf's new amenities. These service changes are anticipated to go into effect on December 2017.

#### *SW Neighborhood Shuttle*

Coinciding with the opening of Phase 1 of the Wharf, The Wharf will offer a SW Neighborhood Shuttle that is free and open to the public. The shuttle will have daily service and 10-minute headways, connecting The Wharf, L'Enfant Metrorail/VRE station, the National Mall, and L'Enfant Plaza on 10<sup>th</sup> Street SW (the International Spy Museum). The low-emission Compressed Natural Gas (CNG) buses are sponsored by The Wharf, SWBID, JBG, and the International Spy Museum. Figure 66 shows the planned route of the SW Neighborhood Shuttle. The planned hours of operation are:

- Monday - Thursday: 7:30am – 10pm
- Friday: 7:30am – 12am
- Saturday: 9am – 12am
- Sunday: 9am – 10pm

Figure 67 shows a detailed inventory of future transit surrounding the site.

## **SITE-GENERATED TRANSIT IMPACTS**

### **Transit Trip Generation**

The proposed development is projected to generate 828 transit trips (586 inbound, 244 outbound) during the morning peak hour and 1,346 transit trips (535 inbound, 809 outbound) during the afternoon peak hour.

US Census data was used to determine the distribution of those taking Metrorail and those taking Metrobus. The site lies in two TAZ's, 20384 and 20386 and data shows that approximately 78 percent of transit riders used Metrorail and the remainder use Metrobus. That said, approximately 646 people will use Metrorail and 183 people will use Metrobus during the morning peak hour; approximately 1,050 people will use Metrorail and 296 people will use Metrobus during the afternoon peak hour.



**Table 15: Metrobus/Regional Bus Route Information**

Route Number	Route Name	Service Hours	Headway	Walking Distance to Nearest Bus Stop
74	Convention Center-Southwest Waterfront Line	Weekdays: 4:45AM – 12:14AM Weekends: 4:50AM – 12:21AM	10-25 min	<0.1 miles, 2 minutes
V1	Benning Heights-M Street Line	Weekday AM WB: 5:04AM – 9:33AM Weekday PM EB: 2:55PM – 7:44PM	16-22 min	0.1 miles, 3 minutes
A9	Martin Luther King Jr. Avenue Limited Line	Weekday AM NB: 5:55AM – 9:44AM Weekday PM SB: 3:35PM – 7:38PM	12-21 min	0.2 miles, 4 minutes
W9	South Capitol Street Limited Line	Weekday AM SB: 6:20AM – 9:22AM Weekday PM NB: 3:15PM – 6:35PM	16-34 min	0.2 miles, 4 minutes
OmniRide D300	Dale City-Washington Navy Yard	Weekday AM NB: 4:38AM – 6:45AM Weekday PM SB: 12:15PM – 7:42PM	18-104 min	0.1 miles, 3 minutes

**Table 16: Transit Stop Requirements**

Feature	Basic Stop	Enhanced Service Bus Stop	Transit Center
Bus Stop Sign	Yes	Yes	Yes
ADA 5'x8' Landing Pad - at a minimum, a clear, unobstructed, paved boarding area that is 8 feet deep (perpendicular to the curb) by 5 feet wide (parallel to the curb) and compliant with the ADA Accessibility Guidelines (ADAAG)	Yes	Yes	Yes
Sidewalk - connected by a paved sidewalk that is at least 4 feet wide	Yes	Yes	Yes
Lighting - adequate lighting either from street lights, lights from an adjacent business, or shelter lighting (particularly stops that are served in the evenings)	Evening Service	Yes	Yes
Seating	Trip Generator Based	Yes	Yes
Information Case - detailed schedule information on services	Yes	Yes	Yes
Trash Receptacle - trash receptacle (particularly at locations that are close to fast food establishments and convenient stores)	Site Specific	Yes	Yes
Shelter(s) - shelter with interior seating if there are 50 or more boardings per day (including transfers)	1 (50+ boardings/day)	1	2+
System Map	Contingent on Shelter	Yes	Yes
Real-time Display (LED + Audio)	Optional	Yes	Yes
Interactive Phone System On-Site - real time bus arrival information through an interactive phone and push button audio system	No	No	Yes
Expanded Boarding & Alighting Area (Rear-door Access)	No	Site Specific	Yes
Bus Bay (Pull Off)	No	Site Specific	Yes



Figure 63: Existing Transit Service

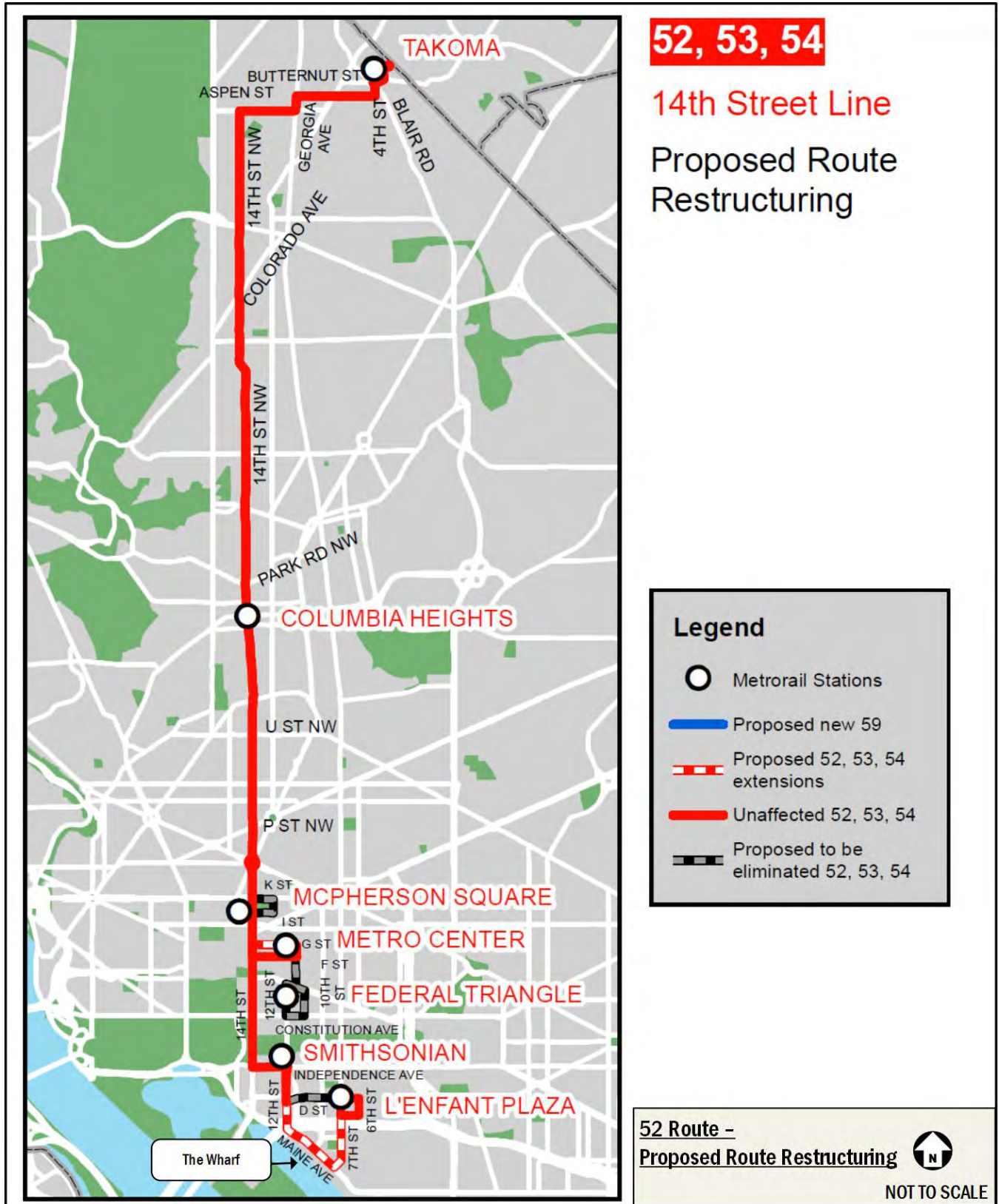


Figure 64: WMATA 52 Route – Proposed Route Restructuring



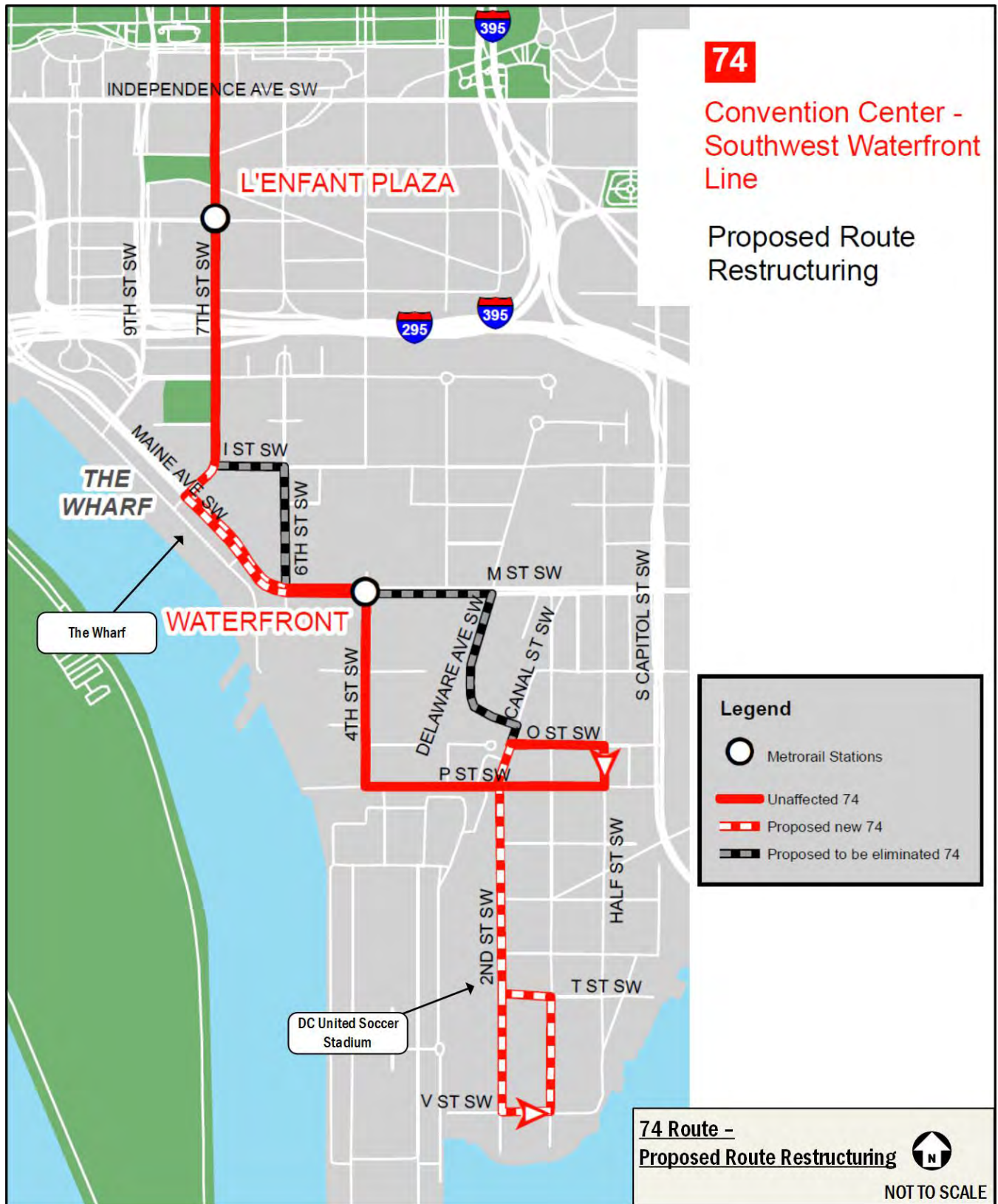


Figure 65: WMATA 74 Route – Proposed Route Restructuring

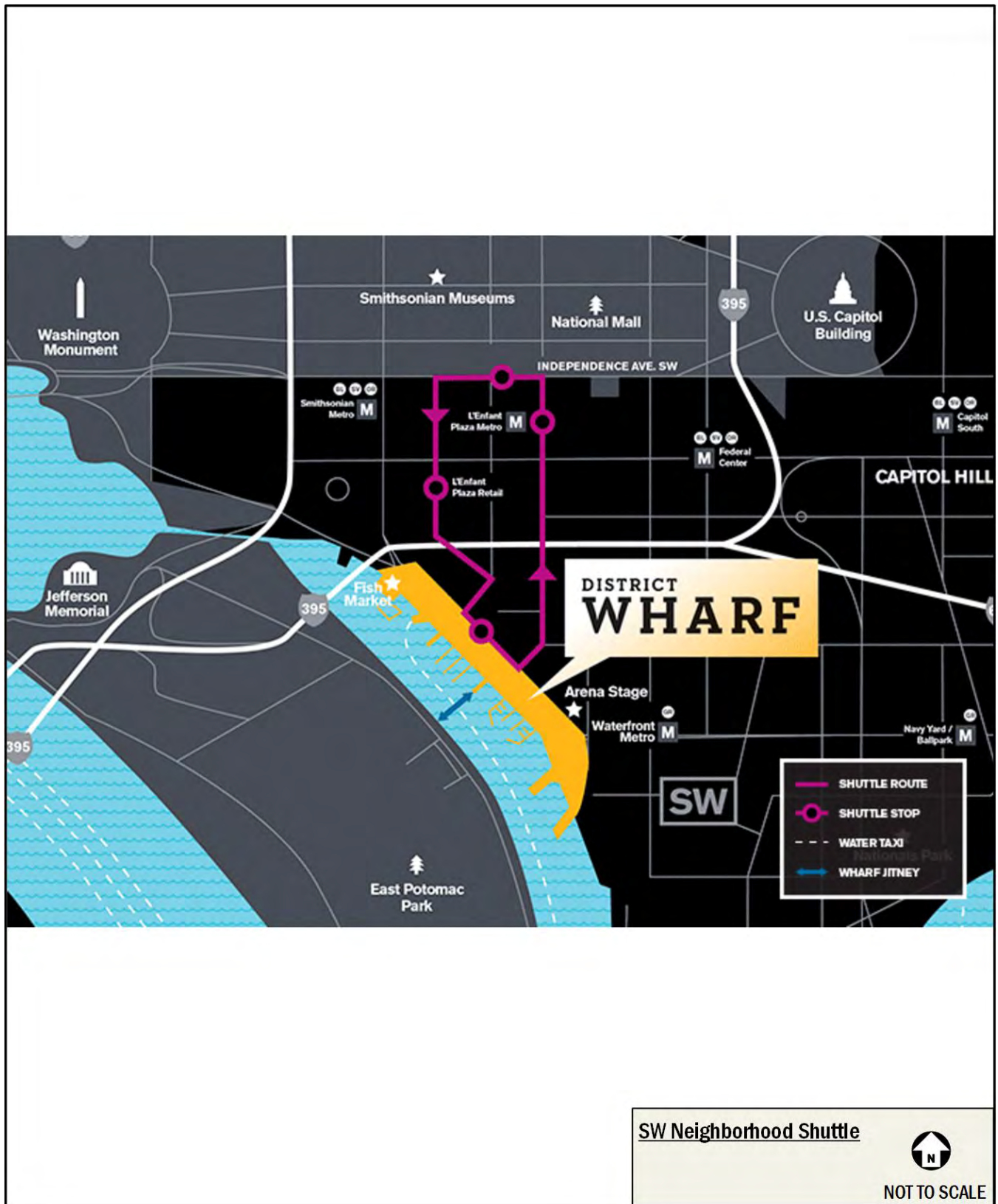
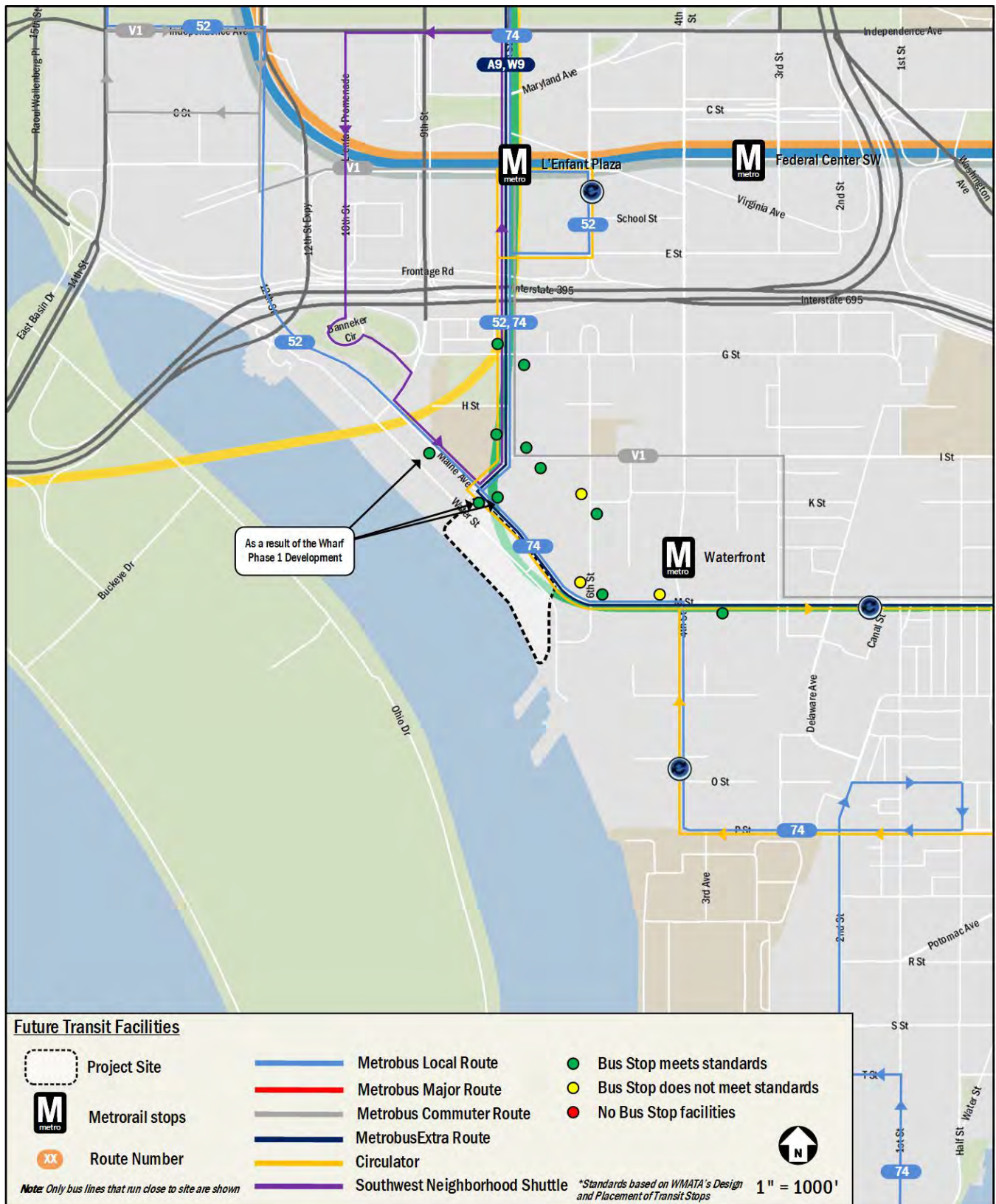


Figure 66: Southwest Neighborhood Shuttle Route





**Figure 67: Future Transit Facilities**





# PEDESTRIAN FACILITIES

This section summarizes the existing and future pedestrian access to the site and reviews walking routes to and from the site.

The following conclusions are reached within this chapter:

- The existing pedestrian infrastructure surrounding the site provides an adequate walking environment. There are some gaps in the system, but there are sidewalks along most primary routes to pedestrian destinations.
- Some sidewalks are temporarily closed due to the construction of developments near the site. Pedestrian detours have been provided and marked.
- During weekday commuter peak hours, the site is not expected to generate a significant number of pedestrian trips; however, the pedestrian trips generated by walking to and from transit stops will be more substantial, particularly along Maine Avenue and M Street.
- At other times, especially during weekends and special events, pedestrian trips to and from the site are expected to be substantial. Pedestrian facilities were designed to accommodate this demand
- As part of the project, sidewalk facilities will be improved along Maine Avenue.

## PEDESTRIAN STUDY AREA

Facilities within a quarter-mile of the site were evaluated as well as routes to nearby transit facilities and prominent retail and neighborhood destinations. The site is easily accessible to transit options such as bus stops along 7<sup>th</sup> Street, M Street and the Waterfront Metrorail Station. There are some barriers and areas of concern within the study area that negatively impact the quality of and attractiveness of the walking environment. This includes roadway conditions that reduce the quality of walking conditions, narrow or nonexistent sidewalks, incomplete or insufficient crossings at busy intersections, the Interstate that limits connectivity to the north, and the Washington Channel that limits connectivity to the southwest.

Table 17: Sidewalk Requirements

Street Type	Min. Buffer Width	Min. Sidewalk Unobstructed Width	Total Min. Sidewalk Width
Low- to Moderate-Density Residential	4-6 ft	6 ft	10 ft
High-Density Residential	4-8 ft	8 ft	13 ft
Central DC and Commercial Areas	4-10 ft	10 ft	16 ft

Figure 68 shows predicted pedestrian pathways, walking time and distances, and barriers and areas of concern.

## PEDESTRIAN INFRASTRUCTURE

This section outlines the existing and proposed pedestrian infrastructure within the pedestrian study area.

### Existing Conditions

A review of pedestrian facilities surrounding the proposed development shows that most facilities meet DDOT standards and provide a quality walking environment. Figure 69 shows a detailed inventory of the existing pedestrian infrastructure surrounding the site. Sidewalks, crosswalks, and curb ramps are evaluated based on the guidelines set forth by DDOT’s *Design and Engineering Manual (2017)* in addition to ADA standards. Sidewalk widths and requirements for the District are shown below in Table 18.

Within the area shown, many of the roadways are considered residential with a low to moderate density. Main corridors such as Maine Avenue and M Street are considered non-downtown commercial on some blocks. Most of the sidewalks surrounding the site to the north and east comply with DDOT standards; however, to the north there are areas which have inadequate sidewalks or no sidewalks at all, with insufficient or no buffer. All primary pedestrian destinations are accessible via routes with sidewalks, most of which meet DDOT standards.

ADA standards require that curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, curb ramps shared between two crosswalks are not desired. As shown in Figure 69, under existing conditions crosswalks and curb ramps are mostly present near the site.

In addition, a review of pedestrian crossings surrounding the proposed development shows that the majority of pedestrian crossings have the appropriate crosswalk treatment as set forth in DDOT’s *Design and Engineering Manual (2017)*. Depending on the roadway configuration and traffic volumes, certain treatments are necessary to enhance pedestrian safety. The

crossing treatment selection criteria for the District are shown in Table 18. Figure 70 shows a detailed inventory of pedestrian crossings surrounding the proposed development, and Table 19 shows a breakdown of each crosswalk at each intersection, including the recommended crosswalk treatment.

### **Pedestrian Related Improvements**

Consistent with the First-Stage PUD and subsequent approvals, the Phase 2 of the development will result in new or improved sidewalks along the interior and perimeter of the site. This will be particularly impactful along Maine Avenue, where sidewalks do not meet DDOT standards and along the internal roadways of the site, where few pedestrian facilities currently exist. New pedestrian facilities are expected to meet or exceed DDOT requirements with an emphasis on pedestrian safety and comfort. This includes sidewalks that meet or exceed the width requirements, crosswalks at all necessary locations, curb ramps with detectable warnings, and additional design elements such as curb extensions and room for outdoor seating. In addition, the construction of parks, gathering places, consisting of both active and passive open spaces, piers, docks, plazas, and square will further improve pedestrian connectivity. Pedestrian are seen as the primary users of The Wharf's internal streets, such that automobiles will travel at lower speeds and yield to pedestrians. The combination of low speeds and aesthetically-pleasing design elements creates a pedestrian environment that is safe, functional, and visually appealing.

Additionally, background developments within the study area will also provide improvements to the surrounding pedestrian facilities. Sidewalks, crosswalks, and curb ramps will be improved mainly along Maine Avenue and M Street.

The Benjamin Banneker Park Pedestrian Access Improvements will add a safe, functional, and aesthetically pleasing pedestrian connection between the overlook at Banneker Park and southwest waterfront. The addition of ADA compliant sidewalks, curb ramps, and crosswalks, new stairs and transition areas from Banneker Circle down to Maine Avenue, and a new ADA compliant path will improve urban connectivity by providing greater accessibility between the waterfront, Banneker Park, the National Mall, and surrounding areas. Figure 71 shows the planned Benjamin Banneker Park Pedestrian Access Improvements.

Figure 72 shows a detailed inventory of the future pedestrian infrastructure surrounding the site.

## **SITE IMPACTS**

### **Peak Hour Pedestrian Trip Generation**

The Wharf Phase 2 development is expected to generate 121 walking trips (66 inbound, 55 outbound) during the morning peak hour and 228 walking trips (110 inbound, 117 outbound) during the afternoon peak hour. The origins and destinations of these trips are likely to be:

- Employment opportunities where residents can walk to work;
- Employees and patrons of the development;
- Retail locations outside of the site; and
- Neighborhood destinations and attractions such as schools, parks, and entertainment in the vicinity of the site.

While the amount of peak hour pedestrian trips might seem low, transit trips generated by the site will also generate pedestrian demand between the site and nearby transit stops.

**Table 18: Crossing Treatment Selection Criteria**

Roadway Configuration	Crossing Treatment Selection				
	< 1,500 Vehicles Per Day	1,500-9,000 VPD	9,000-12,000 VPD	12,000-15,000 VPD	>15,000 VPD
2 Lanes <sup>1</sup>	Standard Crosswalk	A	A	A or B	B or C
2 Lanes with Channelized Turn Lanes <sup>1</sup>	Standard Crosswalk	A	A	B	B or C
2 Lanes One Way	Standard Crosswalk	B	B	C	C
3 Lanes No Median <sup>2</sup>	Standard Crosswalk	B	B	C	C
4 Lanes with Raised Median <sup>3</sup>	Standard Crosswalk	B	B	C	C
5 Lanes with Raised Median <sup>3</sup>	Standard Crosswalk	B	B	C	C
6 Lanes with Raised Median <sup>4</sup>	Standard Crosswalk	B	B	C	D
4 Lanes No Median <sup>4</sup>	Standard Crosswalk	B	B or C	C	D
5 Lanes No Median <sup>3</sup>	Standard Crosswalk	B	B or C	D	D
6 Lanes No Median <sup>4</sup>	Standard Crosswalk	B	B or C	D	D

**Notes**

1. This assumes a two-way road with 1 lane in each direction at the crossing location
2. The road may be one-way or two-way with unbalanced lanes at the crossing location
3. The road may be one-way or two-way at the crossing location
4. The relationship of traffic volume, number of lanes, and speed for "C" treatments require additional evaluation to determine their effectiveness, as these features are relatively new devices
5. Lane configurations should be determined at peak hour vehicular volume conditions

**Crossing Treatment Types:**

Treatment A – High Visibility Crosswalk and Side of Street Pedestrian Law Sign

Treatment B – In-Street Stop for Pedestrians Sign and/or Traffic Calming. Advance Stop Sign should be used for all Multi-Lane Crossings

Treatment C – Activated Pedestrian Device (Rapid Flash Beacon, Flashing Beacon, In-Roadway Lights)

Treatment D – Signal (Pedestrian Hybrid, Full Signal) or Grade Separation





**Table 19: Pedestrian Crossing Treatments Surrounding Site**

Intersection	Crossing(s)	Existing Roadway Configuration	Vehicles per Day*	Crossing Treatment per DEM	Does Existing Crossing Treatment meet DEM Standards
Maine Avenue and 9th Street SW	Northern Leg	5 Lanes No Median	9191	B or C	Yes
	Eastern Leg	6 Lanes w/ Raised Median	23816	D	Yes
	Southern Leg	Under Construction	NA	NA	Yes
	Western Leg	6 Lanes w/ Raised Median	25129	D	Yes
Maine Avenue and 7th Street SW	Northern Leg	5 Lanes No Median	7950	B	Yes
	Eastern Leg	6 Lanes w/ Raised Median	24232	D	Yes
	Southern Leg	Under Construction	NA	NA	Yes
	Western Leg	6 Lanes w/ Raised Median	24889	D	Yes
Maine Avenue and Marina Way SW	Eastern Leg	5 Lanes w/ Raised Median	24369	C	No
	Southern Leg	2 Lanes	1573	A	Yes
	Western Leg	5 Lanes w/ Raised Median	24551	C	No
Maine Avenue and 6th Street SW	Northern Leg	2 Lanes w/ CTL	2574	A	Yes
	Eastern Leg	7 Lanes No Median	23205	D	Yes
	Southern Leg	2 Lanes	910	None	Yes
	Western Leg	5 Lanes No Median	23231	D	Yes
Maine Avenue and 4th Street SW	Northern Leg	3 Lanes No Median	5603	B	Yes
	Eastern Leg	7 Lanes No Median	18389	D	Yes
	Southern Leg	3 Lanes No Median	10868	B	Yes
	Western Leg	7 Lanes No Median	23108	D	Yes
L'Enfant Promenade and L'Enfant Plaza SW (North)	Northern Leg	2 Lanes	4400	A	No (planned)
	Eastern Leg	1 Lane	NA	NA	NA
L'Enfant Promenade and L'Enfant Plaza SW (South)	Eastern Leg	1 Lane	NA	NA	NA
	Southern Leg	2 Lanes	4400	A	No (planned)
L'Enfant Plaza SW and Banneker Circle	Eastern Leg	2 Lanes	2451	A	No (planned)
	Western Leg	2 Lanes	2451	A	No (planned)
9th Street and G Street SW	Eastern Leg	2 Lanes One Way	6851	B	No
9th Street and F Street/L'Enfant Plaza SW	Northern Leg	4 Lanes w/ Raised Median	8827	B	No
D Street and 9th Street SW	Northern Leg	2 Lanes One Way	NA	NA	NA
	Eastern Leg	5 Lanes No Median	9200	B or C	Yes
	Southern Leg (E)	2 Lanes One Way	NA	NA	NA
	Southern Leg (W)	2 Lanes One Way	NA	NA	NA
	Western Leg	5 Lanes No Median	9200	B or C	Yes
D Street and 7th Street SW	Northern Leg	6 Lanes No Median	12700	D	Yes
	Eastern Leg	4 Lanes No Median	9200	B or C	Yes
	Southern Leg	6 Lanes No Median	12700	D	Yes
	Western Leg	4 Lanes No Median	9200	B or C	Yes



Intersection	Crossing(s)	Existing Roadway Configuration	Vehicles per Day*	Additional Crossing Treatment per DEM	Does Existing Crossing Treatment meet DEM Standards
D Street and 6th Street SW	Northern Leg	4 Lanes No Median	5600	B	Yes
	Eastern Leg	3 Lanes No Median	9200	B	Yes
	Southern Leg	2 Lanes	5600	A	Yes
	Western Leg	3 Lanes No Median	9200	B	Yes
7th Street and E Street SW	Northern Leg	6 Lanes No Median	12700	D	Yes
	Eastern Leg	2 Lanes	NA	NA	Yes
	Southern Leg	6 Lanes No Median	12700	D	Yes
7th Street and Frontage Road SW	Northern Leg	6 Lanes No Median	13507	D	Yes
	Eastern Leg	2 Lanes One Way	4206	B	Yes
	Western Leg	2 Lanes	4589	A	Yes
7th Street and I-395 On-Ramp/Capitol Square Place SW	Eastern Leg	2 Lanes One Way	6234	B	Yes
	Western Leg	1 Lane	6234	NA	Yes
7th Street and G Street SW	Northern Leg	6 Lanes No Median	11349	B or C	Yes
	Eastern Leg	2 Lanes	5642	A	Yes
	Southern Leg	6 Lanes No Median	8808	B	Yes
	Western Leg	2 Lanes One Way	6754	B	Yes
7th Street and I Street SW	Northern Leg	4 Lanes No Median	9055	B or C	Yes
	Eastern Leg	3 Lanes No Median	6838	B	Yes
	Southern Leg	5 Lanes No Median	7742	B	Yes
6th Street and I Street SW	Northern Leg	2 Lanes	1911	A	Yes
	Eastern Leg	2 Lanes	6624	A	Yes
	Southern Leg	2 Lanes	3081	A	Yes
	Western Leg	2 Lanes	6572	A	Yes
6th Street and K Street SW	Northern Leg	2 Lanes	1911	A	Yes
	Eastern Leg	2 Lanes	NA	NA	NA
	Southern Leg	2 Lanes	3081	A	Yes
4th Street and I Street SW	Northern Leg	4 Lanes No Median	7956	B	Yes
	Eastern Leg	3 Lanes No Median	10212	B	Yes
	Southern Leg	3 Lanes No Median	6253	B	Yes
	Western Leg	2 Lanes	7651	A	Yes
900 Block of 4th Street (mid-block)	Northern Leg	2 Lanes	6253	A	Yes
	Southern Leg	2 Lanes	6253	A	Yes
1000 Block of 4th Street (mid-block)	Only Leg	2 Lanes	6253	A	Yes
1100 Block of 4th Street (mid-block)	Northern Leg	2 Lanes	6253	A	Yes
	Southern Leg	2 Lanes	6253	A	Yes
4th Street and N Street SW	Northern Leg	3 Lanes No Median	11900	B	Yes
	Eastern Leg	2 Lanes	NA	NA	Yes
	Southern Leg	4 Lanes No Median	11900	B or C	Yes
	Western Leg	2 Lanes	NA	NA	Yes

\* Volumes estimated based on turning movement count data and DDOT AADT where turning movement data was not available

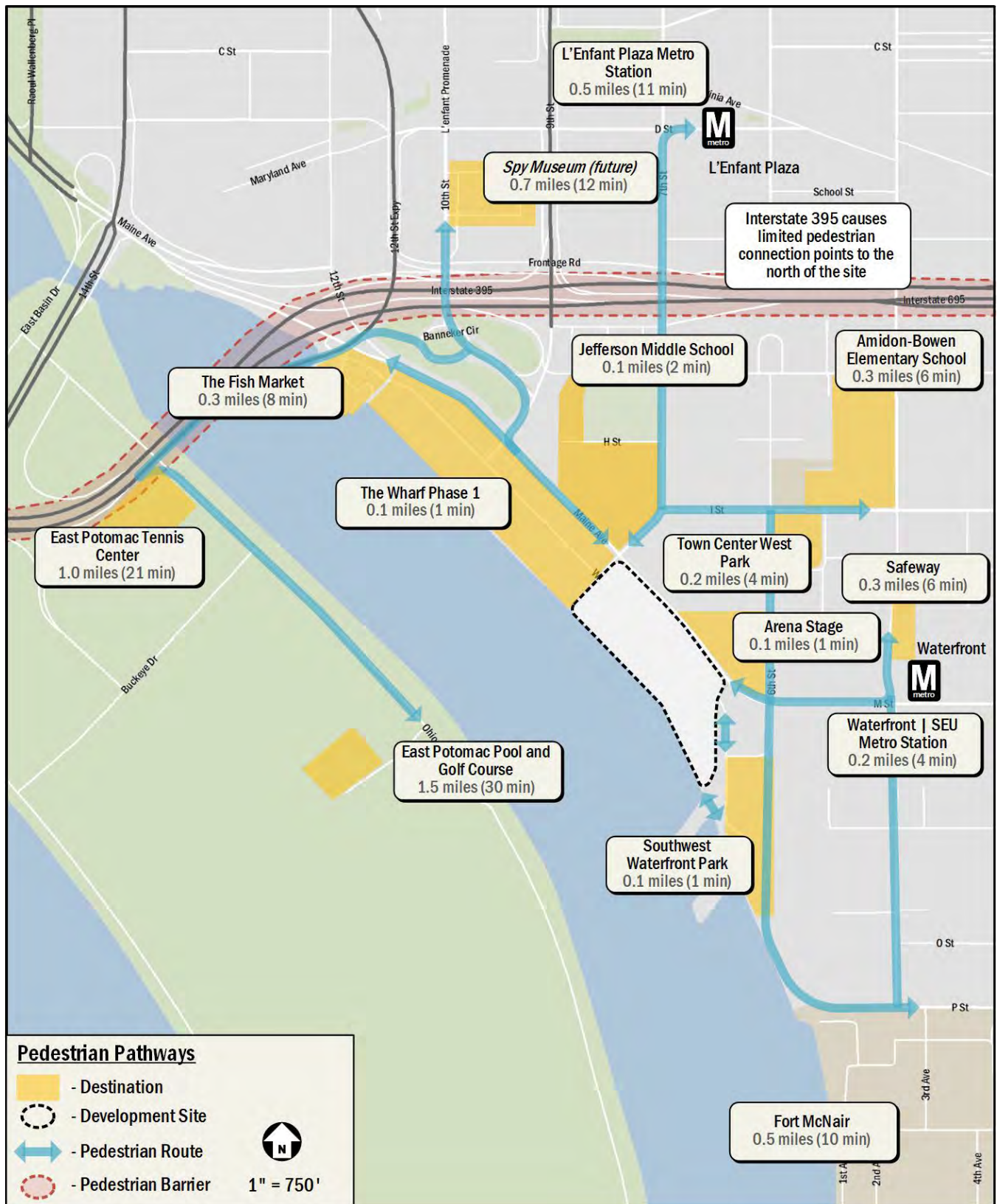


Figure 68: Pedestrian Pathways



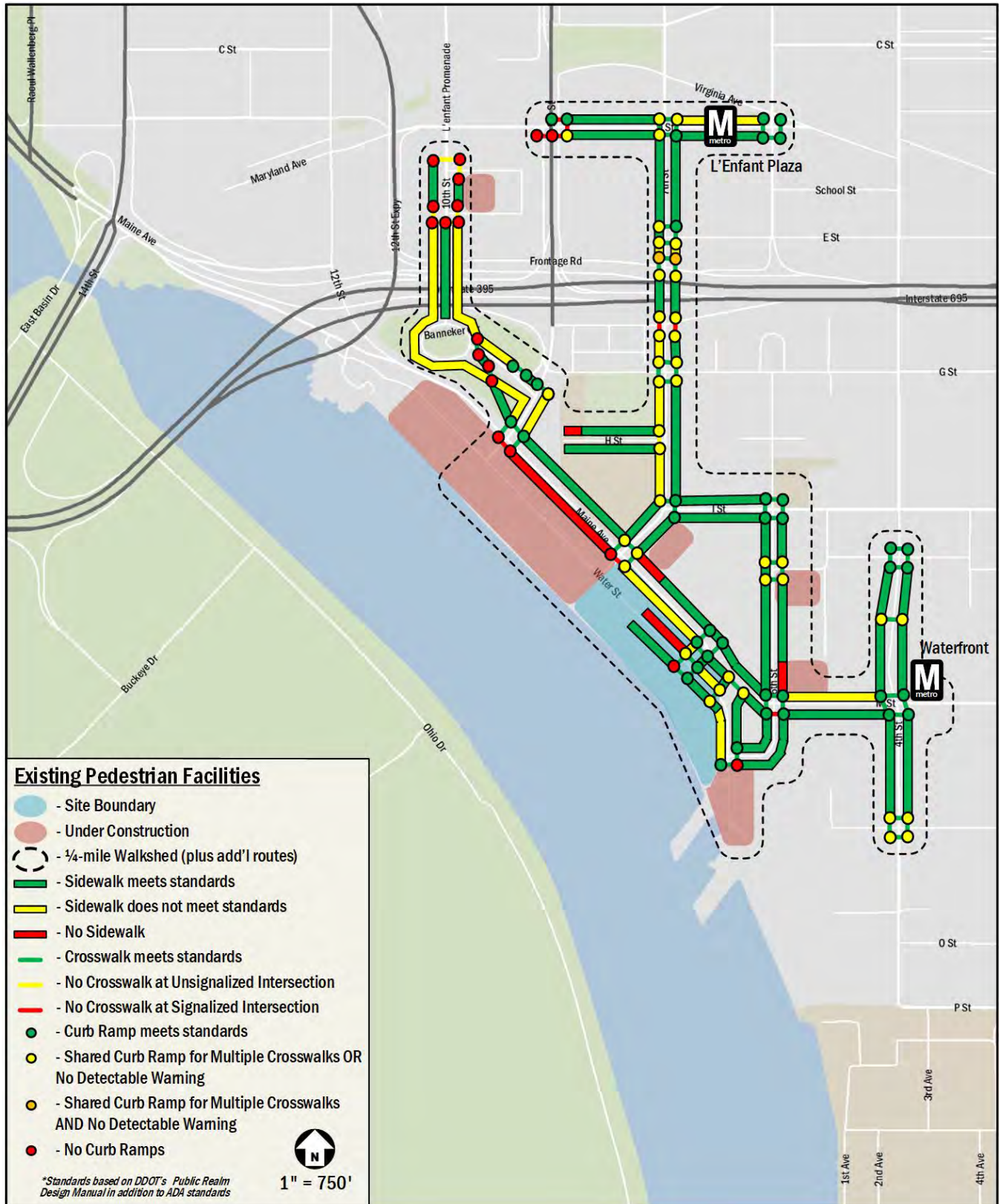


Figure 69: Existing Pedestrian Infrastructure

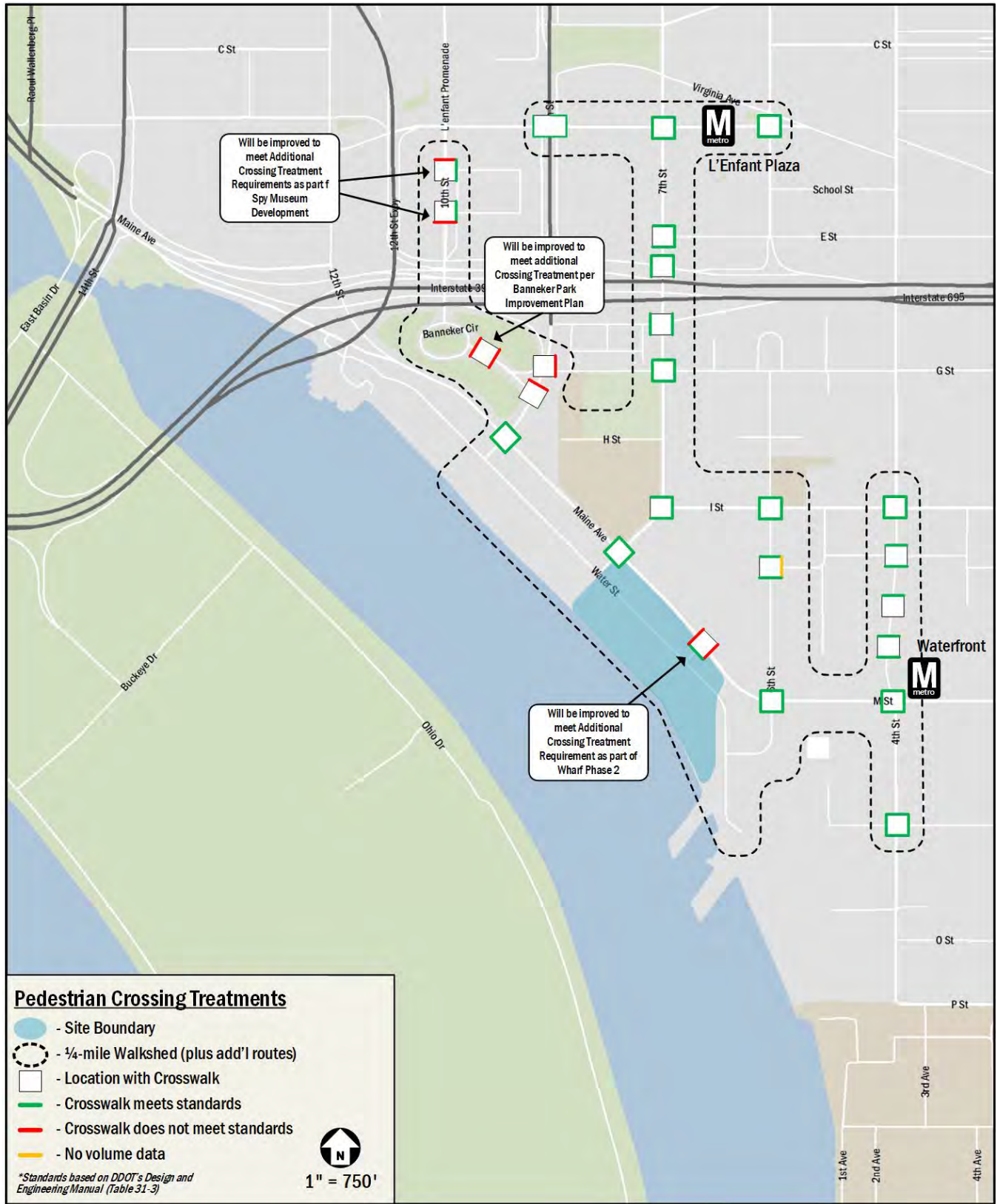


Figure 70: Pedestrian Crossing Treatment





Figure 71: Benjamin Banneker Park Pedestrian Access Improvements



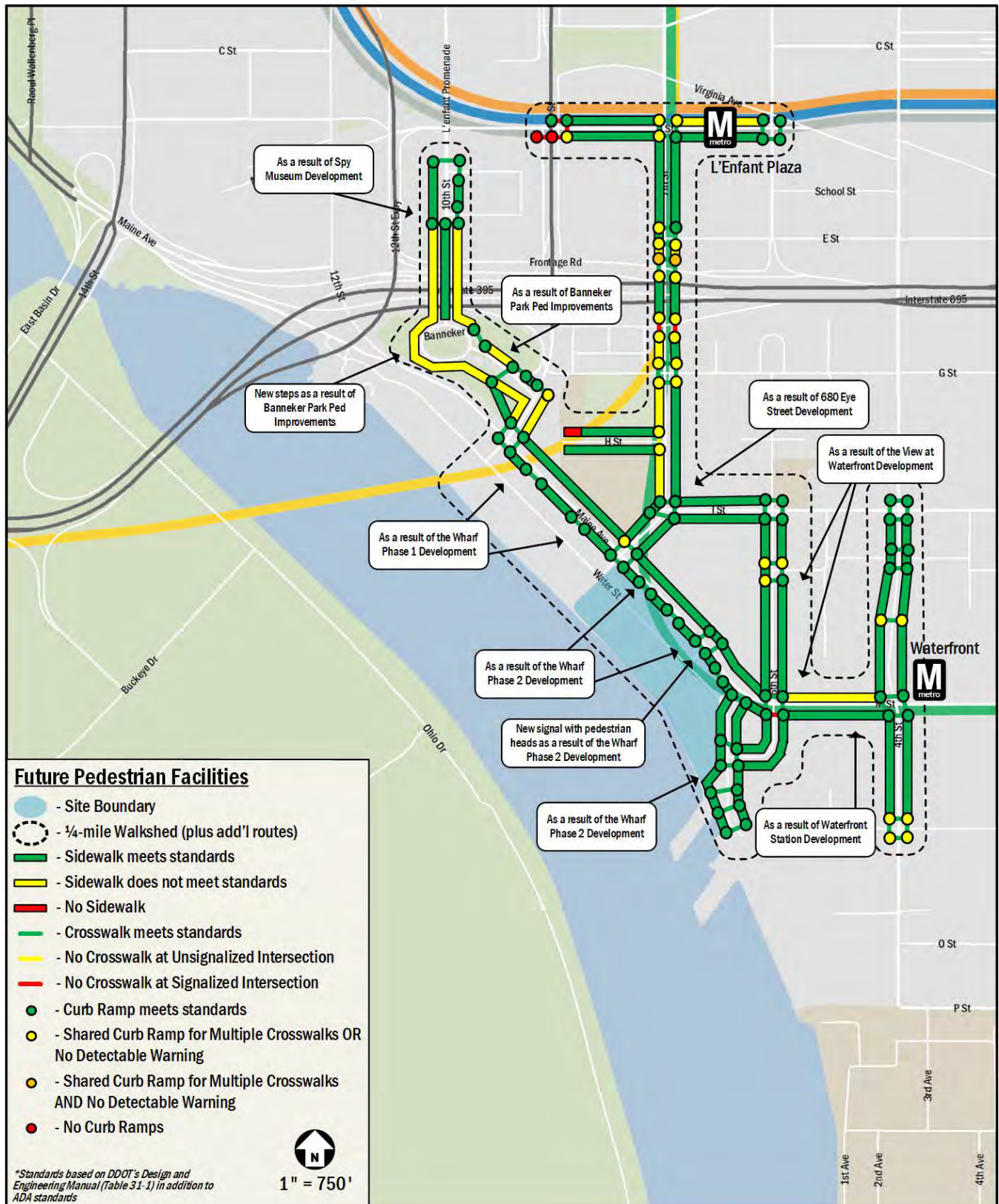


Figure 72: Future Pedestrian Facilities



## BICYCLE FACILITIES

This section summarizes existing and future bicycle access, reviews the quality of cycling routes to and from the site, and presents recommendations.

The following conclusions are reached within this chapter:

- The site has access to several bike trails, bike lanes, and signed bike routes in addition to multiple nearby Capital Bikeshare stations.
- Consistent with the First-Stage PUD and subsequent approvals, the Phase 2 development will extend the Maine Avenue cycle track from 7<sup>th</sup> Street to Water Street.
- As part of the Phase 2 development, the Applicant has proposed adding Shared Lane markings to Water Street, 6<sup>th</sup> Street, and M Place, which will connect the Maine Avenue cycle track to the Anacostia Riverwalk Trail.
- During weekday commuter peak hours, the site is not expected to generate a significant amount of bicycle trips, therefore all site-generated bike trips can be accommodated on existing infrastructure.
- At other times, especially during weekends and special events, bicycle trips to and from the site are expected to be substantial. Bicycle facilities were designed to accommodate this demand.
- On-site bicycle facilities were designed to encourage bicycle use and increase the bicycle mode share beyond what was predicted in this report. The development site will include secure and short-term bicycle parking in both garages and short-term bicycle racks at grade.

### EXISTING BICYCLE FACILITIES

The site has good connectivity to existing on- and off-street bicycle facilities. North-south connectivity is provided along the along bike lanes on 4<sup>th</sup> Street SW. East-west connectivity is provided along I Street and P Street SE/SW. Figure 73 illustrates the existing bicycle facilities in the area.

Some short-term bicycle parking exists in the vicinity of the site, particularly surrounding recently developed structures such as 525 Water/St. Augustine's Church and Waterfront Metro Station. However, no bike parking is provided along the perimeter of the site under existing conditions.

In addition to personal bicycles, the Capital Bikeshare program provides additional cycling options for residents, employees,

and patrons of the planned development. The Bikeshare program has placed over 400 Bikeshare stations across Washington, DC, Arlington, and Alexandria, VA, Montgomery County, MD, and most recently Fairfax, VA, with over 3,500 bicycles provided. Within a quarter-mile of the site, there are two Bikeshare stations that house a total of 41 bikes. Figure 73 illustrates the existing Capital Bikeshare facilities in the area.

### PLANNED BICYCLE FACILITIES

#### MoveDC

The MoveDC plan outlines several bicycle improvements in the vicinity of the site. These improvements are broken up into four tiers that rank the priority for implementation. The four tiers are broken down as follows:

- *Tier 1*  
Investments should be considered as part of DDOT's 6-year Transportation Improvement Program (TIP) and annual work program development, if they are not already included. Some projects may be able to move directly into construction, while others become high priorities for advancement through the Project Development Process.  
  
There are three tier 1 additions that will positively affect bicycle connectivity to and from the site. A bicycle trail from Maine Avenue SW to the Virginia line along Long Bridge that spans the Potomac River and improvements to 4<sup>th</sup> Street and P Street SW south of M Street are planned. These facilities will greatly improve the bicycle connectivity near the site.
- *Tier 2*  
Investments within this tier are not high priorities in the early years of MoveDC implementation. These investments could begin moving through the Project Development Process if there are compelling reasons for their advancement.  
  
There are two tier 2 additions that will positively affect bicycle connectivity to and from the site. A bicycle trail/bridge extending from Water Street to Ohio Drive SW at Hains Point spanning the Washington Channel, and improvements to 4<sup>th</sup> Street SW/NW between I Street SW and Pennsylvania Avenue NW are planned. This facility will greatly improve the bicycle connectivity near the site.
- *Tier 3*  
Investments within this tier are not priorities for DDOT-led advancement in the early years of MoveDC's



implementation. They could move forward earlier under circumstances, such as real estate development initiatives and non-DDOT partnerships providing the opportunity for non-District-led completion of specific funding.

▪ **Tier 4**

Generally, investments within this tier are not priorities for DDOT-led advancement and are lower priority for project development in the early years of implementation.

Due to the timeline of the proposed development, this report will focus on the Tier 1 and Tier 2 recommendations within the vicinity of the site.

Although these projects are discussed in the MoveDC plan, they are not currently funded nor included in DDOT's Transportation Improvement Plan thus they will not be assumed as complete for this analysis.

**7<sup>th</sup> Street Improvements**

As part of the 680 Eye Street SW development (ZC No 15-05), which is improving the intersection of I Street and 7<sup>th</sup> Street SW, a bicycle lane from Maine Avenue SW to I Street SW will be added where none exists today. These bicycle lanes (one in each direction) will add a significant connection from the I Street bicycle lanes to the cycle track being constructed as part of the Wharf development. PN Hoffman and ER Bacon Development, both members of the Wharf Development team are Applicants of the 680 Eye Street SW PUD, and are responsible for implementing this improvement.

**The Wharf Related Improvements**

Consistent with the First-Stage PUD and subsequent approvals, the Wharf will make significant bicycle related improvements over existing conditions in and around the site. Figure 74 shows the planned bicycle related improvements as it relates to The Wharf development. Figure 75 shows a detailed inventory of the future bicycle infrastructure surrounding the site.

*On-Street Bicycle Facilities*

The Maine Avenue cycle track will extend from the Fish Market to Water Street, with the section from the Fish Market to 7<sup>th</sup> Street coinciding with Phase 1 and the section from 7<sup>th</sup> Street to Water Street planned as part of Phase 2. The cycle track will be 10-foot wide, bi-directional, and grade-separated.

In addition, the Applicant has proposed adding Shared Lane ("Sharrow") markings on Water Street, 6<sup>th</sup> Street, and M Place, which will connect the Maine Avenue cycle track to the

Anacostia Riverwalk Trail via Waterfront Park. The conceptual signing and marking plan for the Maine Avenue cycle track to Anacostia Riverwalk Trail connection is included in the Technical Appendix.

*Capital Bikeshare*

In addition to the two (2) Capital Bikeshare stations that the Applicant agreed to install as part of prior approvals, the Applicant will fund the relocation of the Capital Bikeshare station that is currently on the Phase 2 site, as well as fund the installation of two (2) additional Capital Bikeshare stations along the perimeter of the site. The Applicant is working with DDOT to identify the exact location of the four (4) new and one (1) relocated Capital Bikeshare stations.

As the plan currently stands, the Capital Bikeshare stations are planned at the following locations:

1. Maine Avenue and Market Square
2. Maine Avenue and 9<sup>th</sup> Street
3. Maine Avenue and 7<sup>th</sup> Street
4. Maine Avenue and M Street Landing
5. Waterfront Park

*Bicycle Parking*

Consistent with the First-Stage PUD and subsequent approvals, Phase 2 of The Wharf will include 129 short-term bicycle spaces, 65 at street level along the perimeter of the site and within the site, and 64 within the first level of the below-grade parking garage. These short-term spaces will include inverted U-racks and other bike racks placed in high-visibility areas. The Applicant is coordinating with DDOT to select locations for these racks in public space.

The project will also include secure long-term bicycle parking. The plans identify a total of 610 long-term spaces located in the first and second levels of the below-grade parking garage. The first garage level is planned to house 402 long-term bicycle spaces in seven (7) different storage spaces, and the second garage level house 208 long-term bicycle spaces in two (2) separate storage spaces. These long-term storage spaces are provided for residents and employees of office/retail so that they may store their bicycles securely.

The 610 secure long-term bicycle parking spaces will exceed the amount of bicycle parking that is required by Zoning Regulations.



## SITE IMPACTS

### **Peak Hour Bicycle Trip Generation**

The Wharf Phase 2 development is expected to generate 158 bicycle trips (110 inbound, 49 outbound) during the morning peak hour and 298 bicycle trips (125 inbound, 173 outbound) during the afternoon peak hour. Although bicycling will be an important mode for getting to and from the site, with significant facilities located on site and existing and planned routes to and from the site, the impacts from bicycling will be relatively less than impacts to other modes. On-site bicycle facilities were designed to encourage bicycle use and increase the bicycle mode share beyond what was predicted in this report. On-site bicycle facilities were designed to accommodate an increase in bicycle mode share.

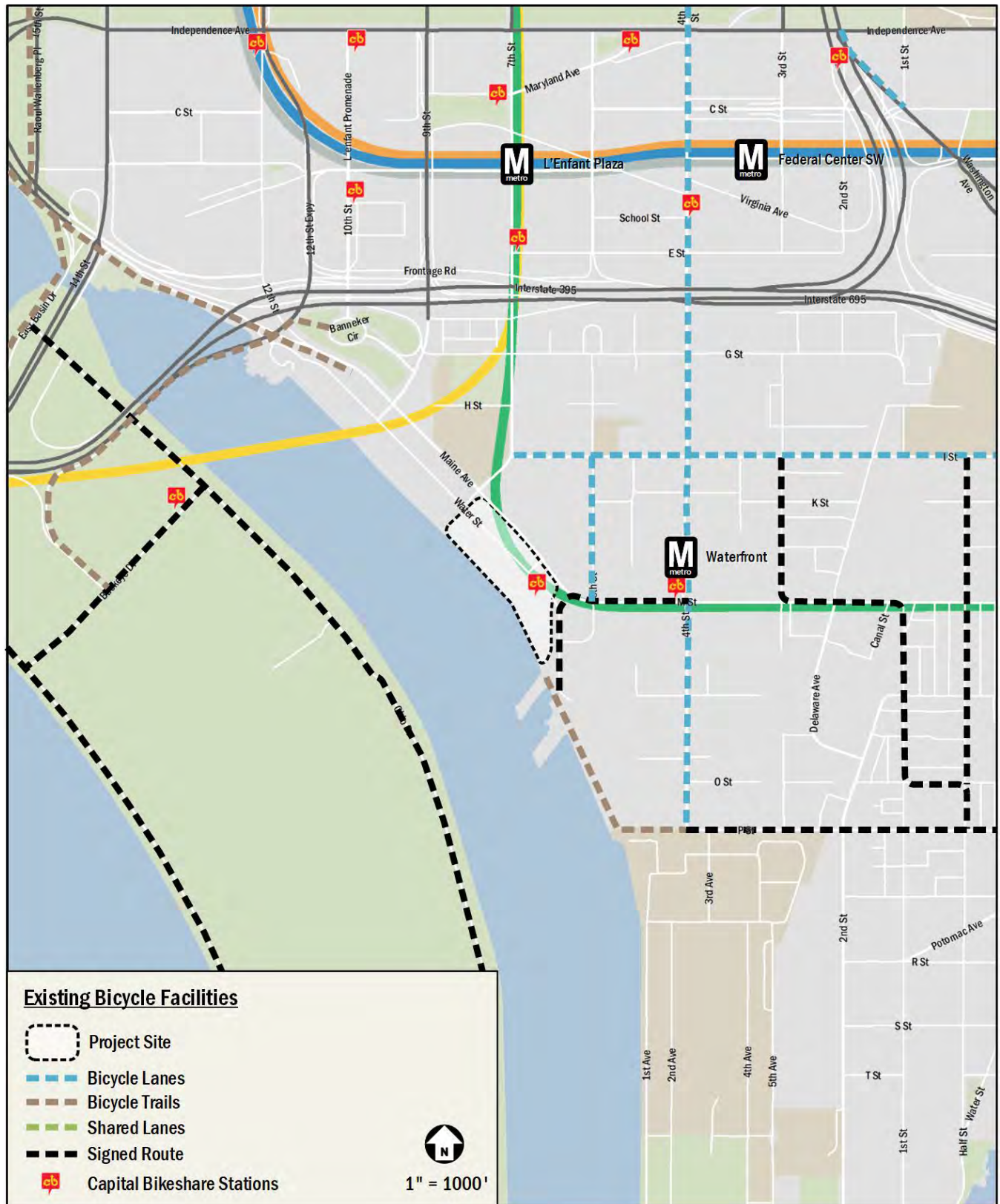


Figure 73: Existing Bicycle Facilities



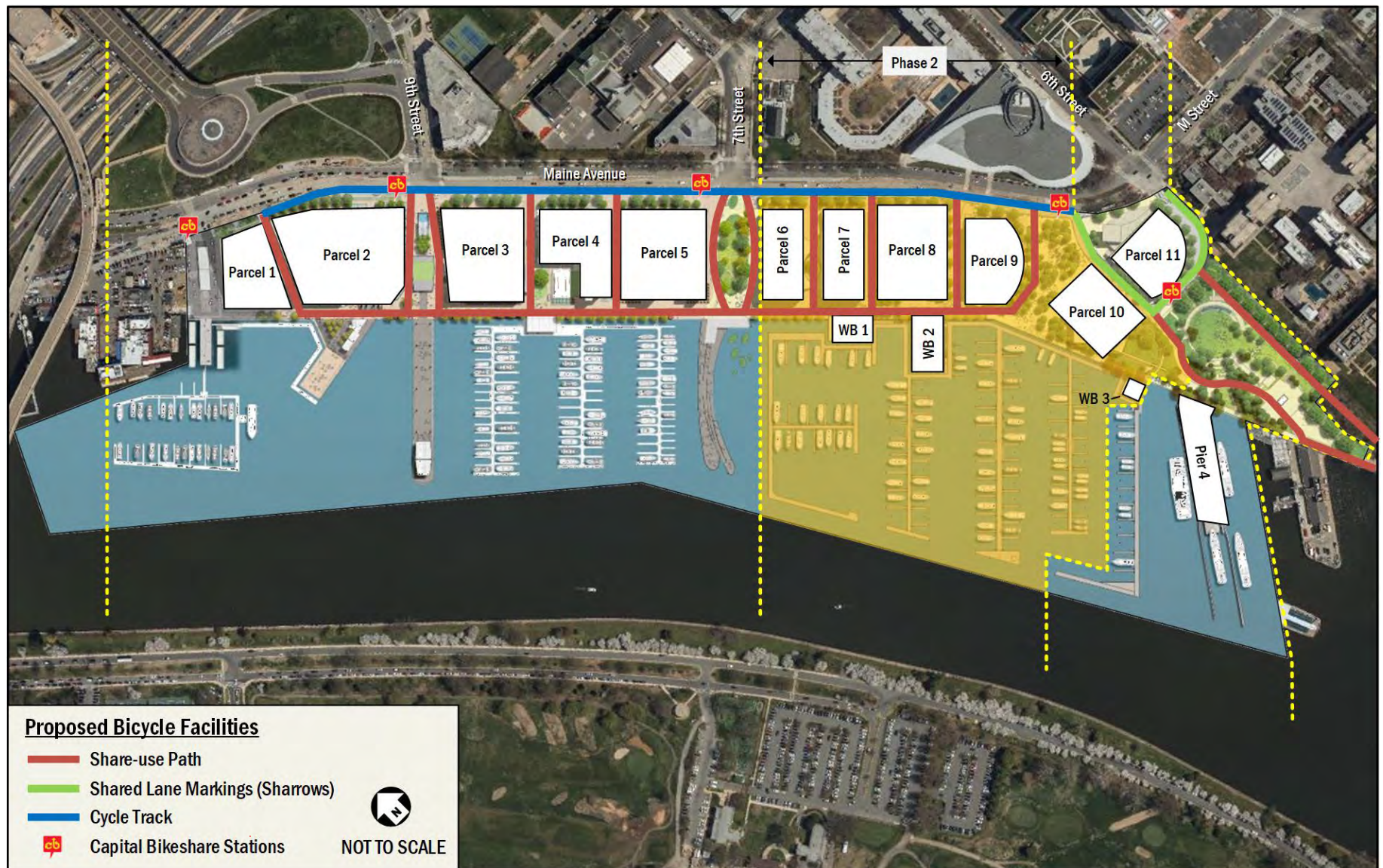


Figure 74: Proposed Bicycle Facilities





Figure 75: Future Bicycle Facilities



## CRASH DATA ANALYSIS

This section of the report reviews available crash data within the study area, reviews potential impacts of proposed development on crash rates, and makes recommendations for mitigation measures where needed.

### SUMMARY OF AVAILABLE CRASH DATA

A crash analysis was performed to determine if there was an abnormally high crash rate at any study area intersection. DDOT provided the last three years of intersection crash data, from 2013 to 2015 for the study area. This data was reviewed and analyzed to determine the crash rate at each location. For intersections, the crash rate is measured in crash per million-entering vehicles (MEV). The crash rates per intersections are shown in Table 21.

According to the Institute of Transportation Engineers' *Transportation Impact Analysis for Site Development*, a crash rate of 1.0 or higher is an indication that further study is required. One intersection in this study area meets this criterion (as shown in red in Table 21 and detailed in Table 21). The Wharf Phase 2 development should be developed in a

manner to help alleviate, or at minimum not add to, the conflicts at this intersection.

A rate over 1.0 does not necessarily mean there is a significant problem at an intersection, but rather it is a threshold used to identify which intersections may have higher crash rates due to operational, geometric, or other deficiencies. Additionally, the crash data does not provide detailed location information. In some cases, the crashes were located near the intersections and not necessarily within the intersection.

For that intersection, the crash type information from the DDOT crash data was reviewed to see if there is a high percentage of certain crash types. Generally, the reasons for why an intersection has a high crash rate cannot be derived from crash data, as the exact details of each crash are not represented. However, some summaries of crash data can be used to develop general trends or eliminate possible causes. Table 21 contains a breakdown of crash types reported for the one intersection with a crash rate over 1.0 per MEV.

**Table 20: Intersection Crash Rates**

Intersection	Total Crashes	Ped Crashes	Bike Crashes	Rate per MEV*
Maine Avenue & East Basin Drive	1	0	0	0.01
Maine Avenue & 14th Street Off-Ramp	18	1	1	0.25
Maine Avenue & 12th Street	25	0	2	<b>1.26</b>
Maine Avenue & Fish Market^				
Maine Avenue & 9th Street	20	3	1	0.63
Maine Avenue & 7th Street	15	0	0	0.49
Maine Avenue & Connector Road	6	2	1	0.22
Maine Avenue & Water Street^				
Maine Avenue/M Street & 6th Street	11	3	0	0.41
4th Street & M Street	45	3	0	<b>1.42</b>
9th Street & G Street	6	0	0	0.39
9th Street & L'Enfant Promenade	5	0	0	0.45
7th Street & Frontage Road	10	1	1	0.53
7th Street & I-395 On-Ramp	2	0	0	0.12
7th Street & G Street	11	2	0	0.68
7th Street & I Street	5	0	0	0.39
6th Street & I Street	6	1	0	0.60
4th Street & I Street	13	2	2	0.74

\* - Million Entering Vehicles; Volumes estimated based on turning movement count data

^ - Crash Data unavailable



## POTENTIAL IMPACTS

This section reviews the two locations with existing crash rates over 1.0 MEV and reviews potential impacts of the proposed development.

### ■ Maine Avenue & 12<sup>th</sup> Street SW

This intersection is over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.26 crashes per MEV. The majority of crashes at this intersection side-swiped vehicles and rear end crashes.

Elevated side-swiped crashes are likely the result of southbound vehicles making a right turn on red onto Maine Avenue simultaneously with Northbound left turning vehicles. The side swipe crashes would occur if the right turning vehicles are not paying attention to the left. The majority of crashes at this intersection side-swiped vehicles and rear end crashes.

Elevated side-swiped crashes are likely the result of on-street parking on both sides of the eastern, northern, and southern legs of the intersection. Side-swipe crashes can often occur when a parked vehicle attempts to merge into the travel lane. Side-swipe crashes could also be the result of road geometry of the eastbound approach combined with the volume of vehicles turning right. Elevated rear end crashes are likely the result of the sudden braking of vehicles at the intersection during peak volume times.

The safety concerns at this intersection are primarily due to the existing lane configurations and operations. The site-generated traffic at this intersection is not expected to degrade the safety; thus, no improvements are recommended as part of the proposed development

turning vehicles or the right turners roll through the red light. Elevated rear end crashes are likely the result of the sudden braking of vehicles at the intersection during peak volume times.

### ■ 4<sup>th</sup> Street & M Street SW

This intersection is over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.42 crashes per MEV.

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**Table 21: Crash Type Breakdown**

Intersection	Rate per MEV	Right Angle	Left Turn	Right Turn	Rear End	Side Swiped	Head On	Parked	Fixed Object	Ran Off Road	Ped. Involved	Backing	Non-Collision	Under/Over Ride	Unspecified	Total
Maine Avenue & 12th Street	<b>1.26</b>	0 0%	2 8%	1 4%	7 28%	8 32%	0 0%	1 4%	2 8%	0 0%	0 0%	1 4%	0 0%	0 0%	3 12%	<b>25</b>
4th Street & M Street	<b>1.42</b>	1 2%	2 4%	1 2%	7 16%	19 42%	2 4%	4 9%	2 4%	0 0%	2 4%	4 9%	0 0%	0 0%	1 2%	<b>45</b>





## SUMMARY AND CONCLUSIONS

This report presents the findings of a Comprehensive Transportation Review (CTR) for the Second-Stage approvals for Phase 2 of the Wharf Planned Unit Development (PUD). The Zoning Commission Case Number is 11-03J.

The purpose of this study is to evaluate whether the project will generate a detrimental impact on the surrounding transportation network. This evaluation is based on a technical comparison of the existing conditions, background conditions, and future conditions. This report concludes that **the project will not have a detrimental impact** on the surrounding transportation network assuming that all planned site design elements are implemented.

### First-Stage PUD Approvals

The Southwest Waterfront redevelopment project ("The Wharf") is located between Maine Avenue and the Washington Channel along the Southwest Waterfront, and is broken up into 11 principal building parcels, a number of smaller landside and waterside structures, four major plazas, one large park, a waterfront promenade/shared space, as well as public and private piers stretching between the existing Maine Avenue Municipal Fish Market and 6<sup>th</sup> Street SW. A First-Stage PUD application covering the entire project site received Zoning Commission approval on October 11, 2011 (ZC Case 11-03).

A multi-modal traffic study was performed for the First-Stage approvals, and reviewed by DDOT during the PUD process. The study analyzed the impacts of the entire build-out of The Wharf.

With respect to parking facilities, the Commission authorized the construction of one or more below grade parking structures that would provide approximately 2, 100 - 2,650 parking spaces on two to three levels. The Applicant is also required to provide parking or storage for approximately 1,500 - 2,200 bicycles and sufficient loading facilities to accommodate the mix of uses on the PUD Site. Pursuant to Order No. 11-03, the precise amount of parking and loading facilities required for each Second-Stage development shall be specified by the Commission in each Second-Stage order.

### Approved Second-Stage PUD Approvals

Since approving the First-Stage PUD, the Commission has granted Second-Stage PUD approvals to Parcel 1 (Order No. 11-

03C), Parcels 2, 3, 4, and 11 (Order No. 11-03A, as modified by Order No. 11-03G and 11-03H), Parcel 5 (Order No. 11-03B, as modified by Order No. 11-03D and 11-03I), the 7th Street Recreation Pier (Z.C. Order No. 11-03E), and Pier 4 (Order No. 11-03F). Many of these Second-Stage approvals also include approval of components of the waterside development; piers, parks and open spaces; ancillary buildings; and other adjacent spaces.

Collectively, these parcels (1, 2, 3, 4, 5, 11 and Pier 4) are referred to as Phase 1 of The Wharf. All of them are either constructed or currently under construction.

A multi-modal traffic study was performed for each Stage 2 approval, and reviewed by DDOT during the PUD process. A large study was performed for the approvals of Parcels 2, 3, 4, and 11, which focused primarily on those parcels, but also included an analysis of the impacts of the entire build-out of The Wharf.

### Proposed Second-Stage PUD ("Phase 2")

Phase 2 of The Wharf includes Parcels 6 to 10, as well as three additional structures (the Water Buildings) that will include retail and Marina related space. The resulting development of Phase 2 of The Wharf will be a mixed-use development consisting of seven (7) buildings with a total of approximately 547,504 square feet of office space, 317 residential dwelling units, 119,059 square feet of retail, 116 hotel rooms, and 250 boat slips, as follows:

- Parcel 6 of the development will include approximately 275,049 square feet of office space and approximately 16,866 square feet of retail.
- Parcel 7 of the development will include approximately 212,312 square feet of office space and approximately 19,543 square feet of retail.
- Parcel 8 of the development will include approximately 235 residential dwelling units, approximately 26,316 square feet of retail, and approximately 116 hotel rooms.
- Parcel 9 of the development will include approximately 82 residential condo dwelling units and approximately 16,080 square feet of retail.
- Parcel 10 of the development will include approximately 60,143 square feet of office space and approximately 16,171 square feet of retail.



- Water Building 1 will include approximately 11,033 square feet of retail and approximately 853 square feet of maritime support services.
- Water Building 2 will include approximately 13,050 square feet of retail and approximately 3,100 square feet of maritime support services.
- Water Building 3 will include approximately 5,175 square feet of maritime support services.
- Wharf Marina will include approximately 250 boat slips.

#### **Proposed Modification from First-Stage PUD**

The proposed second stage PUD for Phase 2 follows the First-Stage PUD closely with a few modifications.

First, Parcel 8 had a change in use. The First-Stage PUD approved Parcel 8 for either residential or office use above ground-floor retail. As proposed, Parcel 8 includes residential and hotel uses above ground-floor retail, thus the Applicant is requesting to modify the First-Stage PUD to add hotel use as an approved use on Parcel 8.

Second, site access along Maine Avenue has been improved. The locations of the intersections where new internal streets meet Maine Avenue are slightly different, and the location of the traffic signal for Phase 2 has been shifted from the Wharf street to the new roadway between Parcels 8 and 9 (the Stage 1 PUD had two traffic signals for Phase 2). Although there are slight changes, the overall access plan fits within the First-Stage access plan. The new location of the traffic signal is an improvement over the First-Stage plan because it is spaced more equally between adjacent intersections (and simplifies operations by removing one of the two proposed signals).

#### **Transportation Elements of Phase 2**

The transportation elements of Phase 2 fit within the Master Plan set in the First-Stage PUD. This includes a highly multi-modal design accommodating all modes of transportation.

As part of the development, the internal roadway network will be reconfigured. The existing site was auto-focused and included a parallel roadway to Maine Avenue, Water Street, which lead to a heavily-automobile designed transportation network and limited development. In contrast, The Wharf includes many modern transportation planning principles in its design, including multimodal shared internal streets, a cycletrack along Maine Avenue, a shuttle bus connection to metro, water taxi service, DDOT/WMATA bus service, Capital Bikeshare Stations, car sharing/ride sharing accommodations,

shared parking in underground garages, curb extensions and pedestrian improvements along Maine Avenue, and a robust Transportation Demand Management (TDM) plan.

Within the site, the Phase 2 of the development will result in new or improved sidewalks along the interior and perimeter of the site. This will be particularly impactful along Maine Avenue, where sidewalks do not meet DDOT standards and along the internal roadways of the site, where few pedestrian facilities currently exist. New pedestrian facilities are expected to meet or exceed DDOT requirements with an emphasis on pedestrian safety and comfort. This includes sidewalks that meet or exceed the width requirements, crosswalks at all necessary locations, curb ramps with detectable warnings, and additional design elements such as curb extensions and room for outdoor seating. In addition, the construction of parks, gathering places, consisting of both active and passive open spaces, piers, docks, plazas, and squares will further improve pedestrian connectivity. Pedestrians are seen as the primary users of The Wharf's internal streets, such that automobiles will travel at lower speeds and yield to pedestrians. The combination of low speeds and aesthetically-pleasing design elements creates a pedestrian environment that is safe, functional, and visually appealing.

Vehicular and loading access for Phase 2 will take place from a network of internal streets, accessed from Maine Avenue. Similar to Phase 1, Phase 2 includes Wharf Street, a shared space street adjacent to the water. In addition, a series of mews, alley-like streets, will connect Maine Avenue to parking and loading access points and Wharf Street. All internal roadways are designed to operate with all modes of traffic going at slow speeds.

Phase 2 will provide approximately 843 parking spaces in two below-grade parking garages. One below-grade parking garage will provide 499 parking spaces under Parcels 6, 7, and 8, and a second below-grade parking garage will provide 344 parking spaces under Parcels 9 and 10; parking is planned to be priced at the market-rate. This amount of parking is appropriate for an urban, multi-modal site. The location and design of The Wharf allow for such a reduction while still providing sufficient parking. A parking demand analysis, detailed within the report, shows that typical demand can be accommodated by on-site parking.



All major loading activity, including service dock access, will take place within internal streets. Some loading is planned curbside in front of building lobbies. No back-up maneuvers from Maine Avenue or other external streets will be necessary for trucks to access their loading docks. The loading facilities provided by Phase 2 of the development will be sufficient to accommodate expected loading demand.

The development will supply long-term bicycle parking within both garages of Phase 2, and short-term bicycle parking in and around the perimeter of the site. As part of Phase 2 of the Wharf, the Applicant will fund the relocation or installation of two (2) Capital Bikeshare stations. This is in addition to the three (3) Capital Bikeshare stations that the Applicant funded to be installed/relocated as part of Phase 1 of the Wharf. A total of four (4) Capital Bikeshare stations will be conveniently placed along Maine Avenue, with an additional Capital Bikeshare station near Waterfront Park. As the plan currently stands, the Capital Bikeshare stations are planned at the following locations:

6. Maine Avenue and Market Square
7. Maine Avenue and 9<sup>th</sup> Street
8. Maine Avenue and 7<sup>th</sup> Street
9. Maine Avenue and M Street Landing
10. Water Street and M Place

The Maine Avenue cycle track will extend from the Fish Market to Water Street, with the section from the Fish Market to 7<sup>th</sup> Street coinciding with Phase 1 and the section from 7<sup>th</sup> Street to Water Street planned as part of Phase 2. The cycle track will be 10-foot wide, bi-directional, and grade-separated.

## **Multi-Modal Impacts and Recommendations**

### *Transit*

The site is served by regional and local transit services via Metrobus and Metrorail. The site is 0.25 miles from the Waterfront Metrorail Station entrance at M Street and 4<sup>th</sup> Street, and 0.5 miles from the L'Enfant Metrorail Station entrance at D Street and 7<sup>th</sup> Street. Existing Metrobus stops are located near the site along M Street and 7<sup>th</sup> Street, and future Circulator and Metrobus stops are planned adjacent to the site on Maine Avenue.

Coinciding with the opening of Phase 1 of the Wharf, two (2) WMATA Metrobus routes (routes 52 and 74) and one Circulator

route are proposed to be re-routed to further increase transit connectivity.

Although the development will be generating new transit trips, existing transit facilities have enough capacity to handle the new trips.

### *Pedestrian*

The site is surrounded by a well-connected pedestrian network. Most roadways within a quarter-mile radius provide sidewalks and acceptable crosswalks and curb ramps, particularly along the primary walking routes. There are areas to the north of the site which lack buffers, curb ramps, or crosswalks that meet DDOT and ADA standards.

As a result of the development, pedestrian facilities along the perimeter of the site will be improved such that they meet or exceed DDOT requirements and provide an improved pedestrian environment.

### *Bicycle*

The site has access to existing on- and off-street bicycle facilities. The Anacostia Riverwalk Trail, and bicycle lanes along 6<sup>th</sup> Street, I Street, and 4<sup>th</sup> Street near the site provide excellent connection to and from the site for those traveling by bicycle.

The Applicant will install a cycle track along Maine Avenue, extending from the Fish Market to Water Street, where shared-lane markings will link the new Maine Avenue cycle track to the Anacostia Riverwalk Trail, providing a publicly accessible amenity which will greatly improve bicycle connectivity in the area.

The development will supply long-term bicycle parking within both garages of Phase 2, and short-term bicycle parking in and around the perimeter of the site. The Applicant will also fund installation of four (4) Capital Bikeshare station along Maine Avenue and one (1) Capital Bikeshare station in Waterfront Park.

### *Vehicular*

The proposed development is well-connected to regional roadways such as I-395, I-695, and I-295, primary and minor arterials such as South Capitol Street, M Street, and I Street, and an existing network of collector and local roadways.

In order to determine the potential impacts of the proposed development on the transportation network, this report





projects future conditions with and without development of the site and performs analyses of intersection delays and queues.

In completing the technical capacity analyses, this report noticed several overall trends. The growth in traffic volumes projected within the study area do not overlap where volumes were highest earlier this decade (i.e. compared to the traffic counts from the Stage 1 Traffic Study which were collected in 2010). There has been significant growth in volumes in the intervening years on other movements. This makes sense, as the regional traffic passing through the study area is generally going in different directions than the new local traffic serving the study area and nearby locations like the Capitol Riverfront. The end result are traffic volumes that are more bi-directional than before.

The majority of vehicular capacity concerns in the study area can be alleviated through signal timing changes that adapt of the changes in volume patterns, but at some locations, operational changes alone cannot mitigate the potential for future delays.

As has been stated in prior reports done throughout this area of the District, an essential component for good traffic operations in this area will be to minimize the vehicular trip generation of new development, thus reducing the overlap between new local traffic and regional traffic. The Wharf has been planned from the beginning to be a heavily multi-modal development with a low vehicular trip generation. Instead of investing in widening roadways to alleviate capacity concerns, the strategy has been to minimize volumes to avoid capacity problems. This is also because widening roadways of adding more vehicular capacity is not feasible nor desirable (due to the negative impact it can have on other modes).

As such, the multi-modal improvements described in this report are indirectly mitigating traffic operations impacts. One notable improvement is the new traffic signal at Marina Way and Maine Avenue. The new traffic signal provides a good location for Phase 2 traffic to enter on and off Maine Avenue. Based on the technical analysis results, the placement of the new traffic signal will have capacity benefits for the intersections of 9<sup>th</sup>, 7<sup>th</sup> and 6<sup>th</sup> Streets with Maine Avenue, as it will help avoid making any of these issues worse by limiting the amount of Phase 2 related traffic turning at those intersections.

In addition to these improvements, this report recommends DDOT review several mitigations measures for traffic operations:

- Adjusting signal timings throughout the study area to adapt to changes in volumes.
- Exploring creating a double-left turn southbound at 9<sup>th</sup> Street's approach to Maine Avenue.
- Restricting parking along Maine Avenue during the afternoon peak hour at its eastbound approach to 6<sup>th</sup> Street in order to create a short through/right turn lane.

The Applicant is willing to provide these improvements as part of its Zoning Order commitments, given DDOT agreement on their implementation.

#### *Summary and Recommendations*

This report concludes that **the proposed development will not have a detrimental impact on the surrounding transportation network assuming that the proposed site design elements are implemented.**

The development has several positive elements contained within its design that minimize potential transportation impacts, including:

- The site's close proximity to Metrorail.
- The removal of existing internal roadways and subsequent replacing with new internal roadways provides an upgrade in the urban fabric of the network, fits future planning efforts, and significantly increases the site's porosity for all modes of travel.
- Parking is right-sized to demand, and can accommodate all demand on site while not encouraging driving as a mode
- The installation of a new signal at Marina Way and Maine Avenue. This new traffic signal will help distribute traffic bound to and from the site in a manner that alleviates existing issues at adjacent intersections. In addition, the installation of a new signal at Marina Way and Maine Avenue will provide another signalized pedestrian crossing point along Maine Avenue, significantly improving pedestrian infrastructure in the area.
- The inclusion of secure long-term bicycle parking spaces within the development that meet or exceed zoning requirements.

- The installation of short-term bicycle parking spaces around the perimeter of the site and in the garage, that meet or exceed zoning requirements.
- The creation of wide pedestrian sidewalks that meet or exceed DDOT and ADA requirements.
- The inclusion of publicly accessible plazas and parks, gathering places, consisting of both active and passive open spaces, piers, docks, plazas, and squares that improve pedestrian circulation.
- The installation of a grade-separated bi-directional cycle track along Maine Avenue.
- The installation of Shared Lane markings (“Sharrows”) along 6<sup>th</sup> Street, M Place, and Water Street, that will connect the Maine Avenue cycle track to the Anacostia Riverwalk Trail.
- The Applicant will fund the installation of two (2) new Capital Bikeshare stations, one (1) along Maine Avenue and one (1) near Waterfront Park.
- A robust Transportation Demand Management (TDM) plan that reduces the demand of single-occupancy, private vehicles during peak period travel times or shifts single-occupancy vehicular demand to off-peak periods.
- The Applicant has provided water taxi docks in Phase 1, and is working with providers to have them in place when Phase 1 opens.
- The Applicant coordinated with NPS and NCPC on pedestrian improvements to Banneker Park which include stairs and ADA accessible paths between Banneker Park and The Wharf. The Applicant has contributed significantly towards the construction of these improvements.