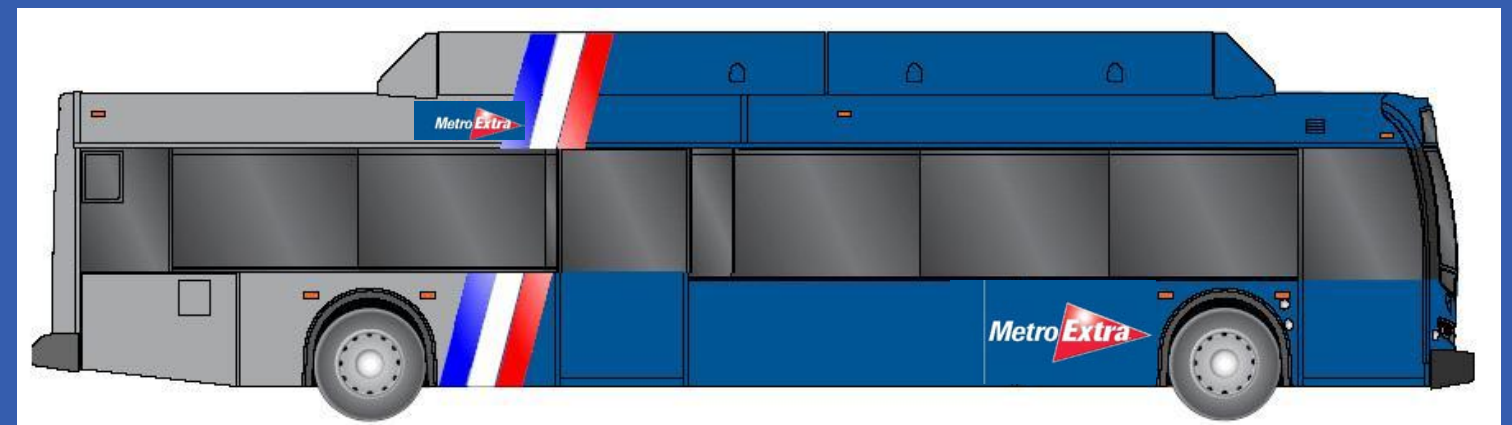




Metro *EXTRA* Service Plan

Georgia Avenue – 7th Street Corridor

District of Columbia Rapid Bus Study



November 2006

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Section 1: Existing Conditions

The Georgia Avenue-7th Street Corridor is defined as the following streets:

- 7th Street NW between Pennsylvania Avenue NW and Florida Avenue NW
- 9th Street NW between M Street NW and Pennsylvania Avenue NW
- Georgia Avenue NW between Florida Avenue NW and Eastern Avenue NW
- A possible extension via Georgia Avenue and Wayne Avenue to Silver Spring Metro

Roadway Configuration

Roadways in the study corridor are primarily 2-way, although 9th Street is a one way (southbound) street between Mount Vernon Place NW and Pennsylvania Avenue NW.

Land uses along 7th Street and Georgia Avenue are primarily commercial, and vary from high density in the downtown area (roughly south of Mount Vernon Place) to small-scale, neighborhood commercial in the northern sections of the alignment. Major trip attractors along the corridor include:

- Downtown Washington
 - Chinatown
 - The Verizon Center
- The Washington Convention Center
- Howard University
- The Howard University Medical Center
- Walter Reed Medical Center
- Downtown Silver Spring

The alignment crosses six Metrorail stations:

- Archives-Navy Memorial-Penn Quarter (Green & Yellow Line)
- Gallery Place-Chinatown (Green, Yellow & Red Line)
- Mount Vernon Square-Convention Center (Green & Yellow Line)
- Shaw-Howard U (Green Line)
- Georgia Avenue-Petworth (Green Line)
- Silver Spring (Red Line)

The alignment is shown in **Exhibit 1**.

Exhibit 2 shows that there is curbside parking in at least some time periods for most of the corridor. This curbside parking is primarily utilized by the small-scale businesses that line Georgia Avenue and 7th Street for most of their lengths. Larger businesses like supermarkets tend to have their own parking lots located off-street. There is limited residential development, which mostly has access to rear alleys for parking. Much of the on-street parking is metered, with two-hour time limits.

Traffic Conditions

Exhibit 2 shows the roadway configuration in terms of the number of lanes, right of way widths, and parking regulations along the corridor. **Exhibit 3** shows the average daily traffic volumes in the corridor. The exhibit shows that the highest volumes are in the northernmost part of the corridor, where it crosses into the District from Montgomery County. South of Piney Branch Road, the traffic volume begins to drop as traffic diverts onto other major north-south roadways, including Piney Branch Road, 13th Street, and New Hampshire / Sherman Avenue. By the time 7th Street reaches downtown Washington, traffic volumes are relatively light, as the roadway operates in a grid street network with numerous parallel alternative routes; and as the level of service on Metrobus and Metrorail modes increase.

This traffic pattern is reflected in the roadway Level of Service (LOS), shown in **Exhibit 4**. The northernmost segment of Georgia Avenue – north of Piney Branch Road – has a LOS F, as this segment carries the heaviest traffic on the roadway. Traveling south, the roadway functions at LOS D or better on all segments north of the downtown area. In downtown Washington, even though the traffic counts are relatively low, the LOS returns to F, reflecting the relatively narrow roadway and the impacts of signalized intersections at every block.

Exhibit 1: Georgia Avenue-7th Street Corridor



Exhibit 2: Roadway Width and Lane Configuration, Georgia Avenue-7th Street Corridor

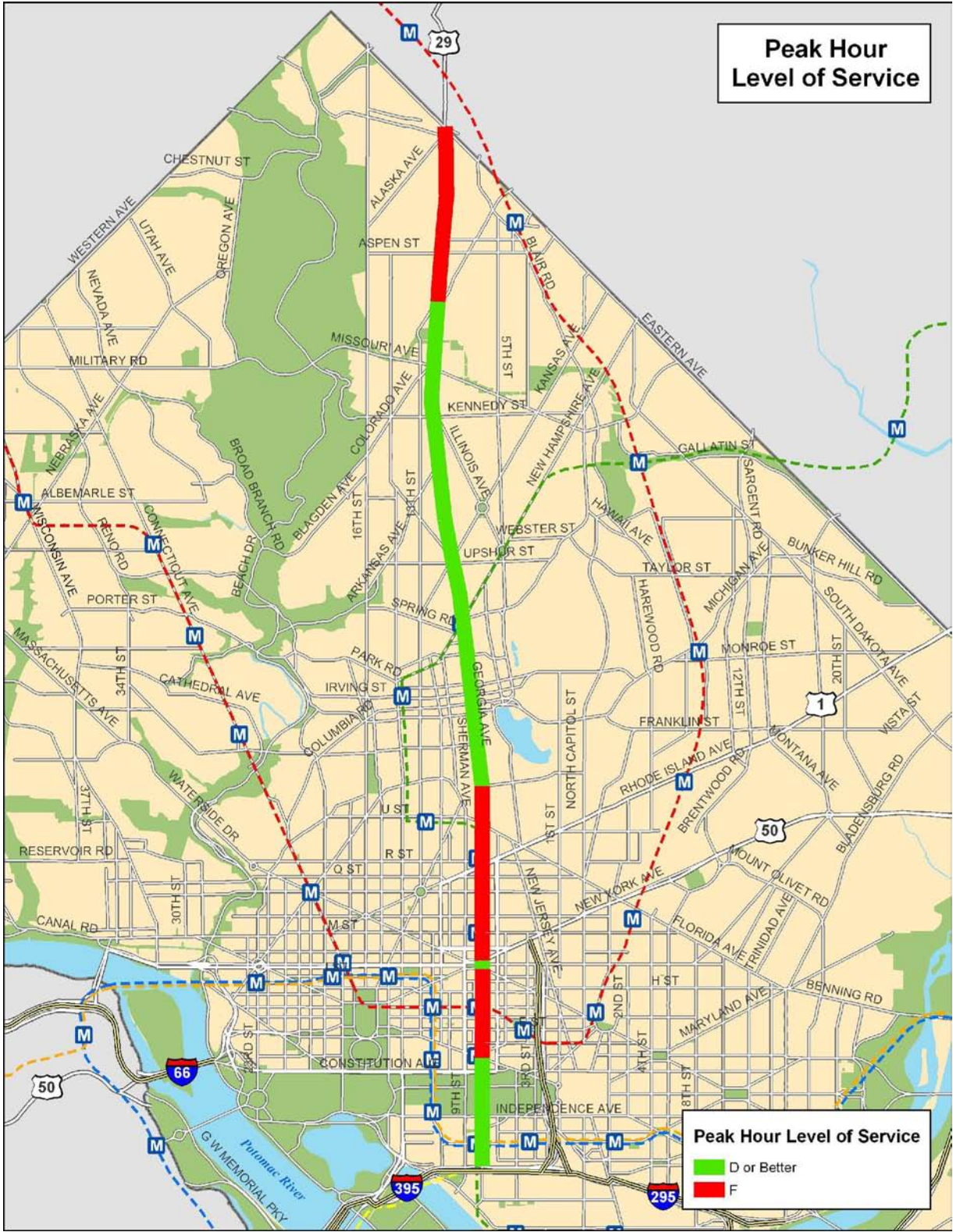
Street	Segment		ROW Width (Ft)	Curb to Curb (Ft)	One Way? (Y/N)	Travel Lanes		Parking Lanes		Parking Restrictions		1998 AWDT	Peak Hour Volume	Peak Hr LOS
	Begin	End				NB	SB	NB	SB	NB	SB			
Georgia Ave. NW	Eastern Avenue	Shepherd Road	90	60	N	3	3	-	-	No Parking	No Parking	30,900	1,724	F
Georgia Ave. NW	Shepherd Road	Piney Branch Road	90	60	N	2	2	1	1	Metered	Metered	30,900	1,724	F
Georgia Ave. NW	Piney Branch Road	Missouri Avenue	90	60	N	2	2	1	1	Metered	Metered	24,100	1,345	D
Georgia Ave. NW	Missouri Avenue	Buchanan Street	90	60	N	2	2	1	1	Metered	Metered	22,700	1,267	D
Georgia Ave. NW	Buchanan Street	Quincy Street	90	56	N	2	2	1	1	Metered	Metered	22,500	1,256	D
Georgia Ave. NW	Quincy Street	Irving Street	90	60	N	2	2	1	1	Metered	Metered	23,000	1,283	D
Georgia Ave. NW	Irving Street	Harvard Street	90	56	N	2	2	1	1	Metered	Metered	21,600	1,205	D
Georgia Ave. NW	Harvard Street	Bryant Street	90	54	N	2	2	1	1	Metered	Metered	15,500	865	D
Georgia Ave. NW	Bryant Street	Florida Avenue	90	49	N	1	1	1	1	AM/PM	AM/PM	18,200	1,016	F
Seventh St. NW	Florida Avenue	Rhode Island Avenue	85	50	N	1	1	1	1	AM/PM	AM/PM	15,100	843	F
Seventh St. NW	Rhode Island Avenue	Q Street	85	50	N	1	1	1	1	Metered	AM/PM	15,100	843	F
Seventh St. NW	Q Street	N Street	85	50	N	1	1	1	1	Metered	Metered	15,100	843	F
Seventh St. NW	N Street	Mt Vernon Place	85	50	N	2	1	1	1	Metered	Metered	22,700	1,267	F
Seventh St. NW	Mt. Vernon Place	Mass Avenue	85	62	N	4	1	-	-	No Parking	No Parking	17,900	999	D
Seventh St. NW	Mass. Avenue	D Street	85	50	N	1+1 transit	1	1	1	Metered	AM/PM	14,500	809	F
Seventh St. NW	D Street	Penn Avenue	85	51	N	1+1 transit	1	1	1	Metered	AM/PM	14,100	787	F
Seventh St. NW	Penn Avenue	Constitution Avenue	85	70	N	2	2	1	1	AM/PM	AM/PM	13,900	776	D
Seventh St. SW	Constitution Avenue	Independence Avenue	132	76	N	3	3	1	1	AM/PM	AM/PM	21,400	1,194	D
Seventh St. SW	Independence Avenue	C Street	85	64	N	2	2	1	1	Metered	Metered	13,600	759	D
Ninth St. NW	N Street	Mt. Vernon Place	No Data	No Data	Y	2	2	1	1	Metered	Metered	No Data	No Data	No Data
Ninth St. NW	Mt. Vernon Place	New York Avenue	No Data	No Data	Y	-	2+1 transit	-	4+1 transit	Metered	Metered	No Data	No Data	No Data
Ninth St. NW	New York Avenue	Pennsylvania Avenue	No Data	No Data	Y	-	2+1 transit	-	2+1 transit	Metered	Metered	No Data	No Data	No Data

Exhibit 3: Weekday Traffic Volumes



Source: 1998 Traffic Counts cited in the DC Transit Development Study

Exhibit 4: Level of Service



Source: 1998 Traffic Counts cited in the DC Transit Development Study; LOS Calculation: ITE traffic Manual

Existing Transit Service

Transit in the Georgia Avenue-7th Street Corridor is primarily provided by Metrobus Route 70-71. Route 70-71 is shown in **Exhibit 5**.

Route 70-71 operates between Silver Spring Metro in the north and four different southern terminals:

- L’Enfant Plaza
- Maine Avenue / 9th Street SW
- Pennsylvania Avenue / 9th Street NW
- Half Street / O Street SW

Service operates 7 days a week between 4:00 a.m. and 2:00 a.m. Trunk line headways are about 7-10 minutes in the peak (when both the 70 and the 71 routes operate) and about 10 minutes in the midday period (when just the 70 runs).

Route 70-71 is one of the busiest and most crowded Metrobus routes:

- There are about 17,000 daily boardings between Eastern Avenue and Archives
- There are about 22,000 daily boardings between Silver Spring and Buzzard’s Point
- The highest load factor on the route is about 0.89, at Georgia Avenue / Irving Street

Challenges:

The purpose of the Rapid Bus Implementation Plan is to address several of the challenges faced by existing transit operations in the Georgia Avenue-7th Street Corridor, including:

- Long travel times due to slow travel speeds and intersection signal delay
 - The roadway operates at level of service F south of Florida Avenue and north of Piney Branch Road
 - Between Petworth and Irving, transit speeds are below 8 mph all day
 - The total trip average speed is below 10mph for all southbound midday and PM peak trips, and all northbound AM peak, midday, PM peak and evening trips
- Poor schedule adherence (reliability)
 - 22% of southbound trips are more than 5 minutes late
 - 33% of northbound trips are more than 5 minutes late
- Insufficient capacity
 - Peak period, peak direction load factors exceed 0.8 in both directions
 - The most crowded point is Irving Street, with a load factor of 0.89
- Imbalance of service between the northern and southern ends of the existing 70-71 routes
 - There are too many trips to Buzzard’s Point for the service demand in the area
- Limited passenger amenities at stops
 - Most stops lack shelters and benches; no stops have real time bus arrival information

Exhibit 5: Bus Routes 70, 71

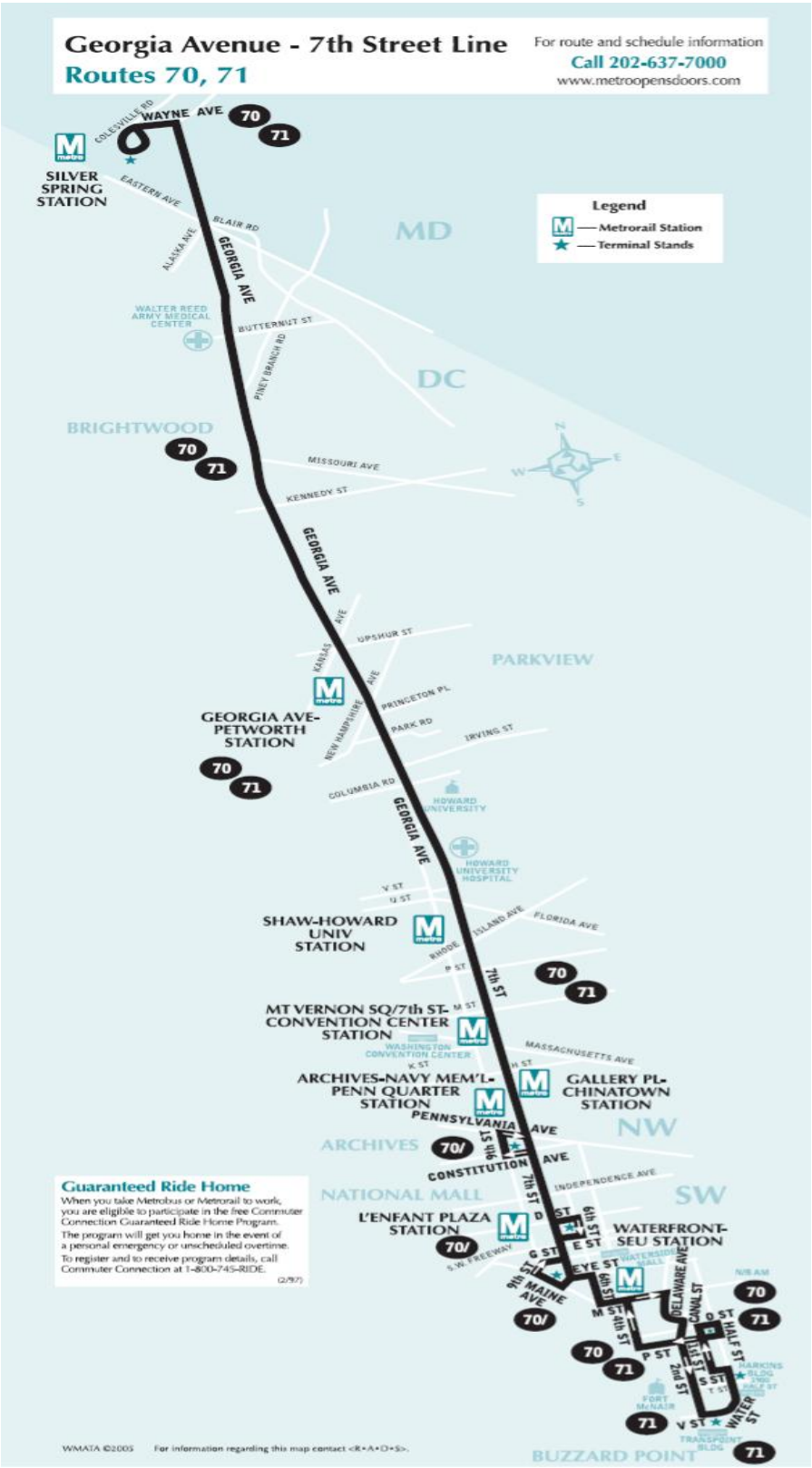
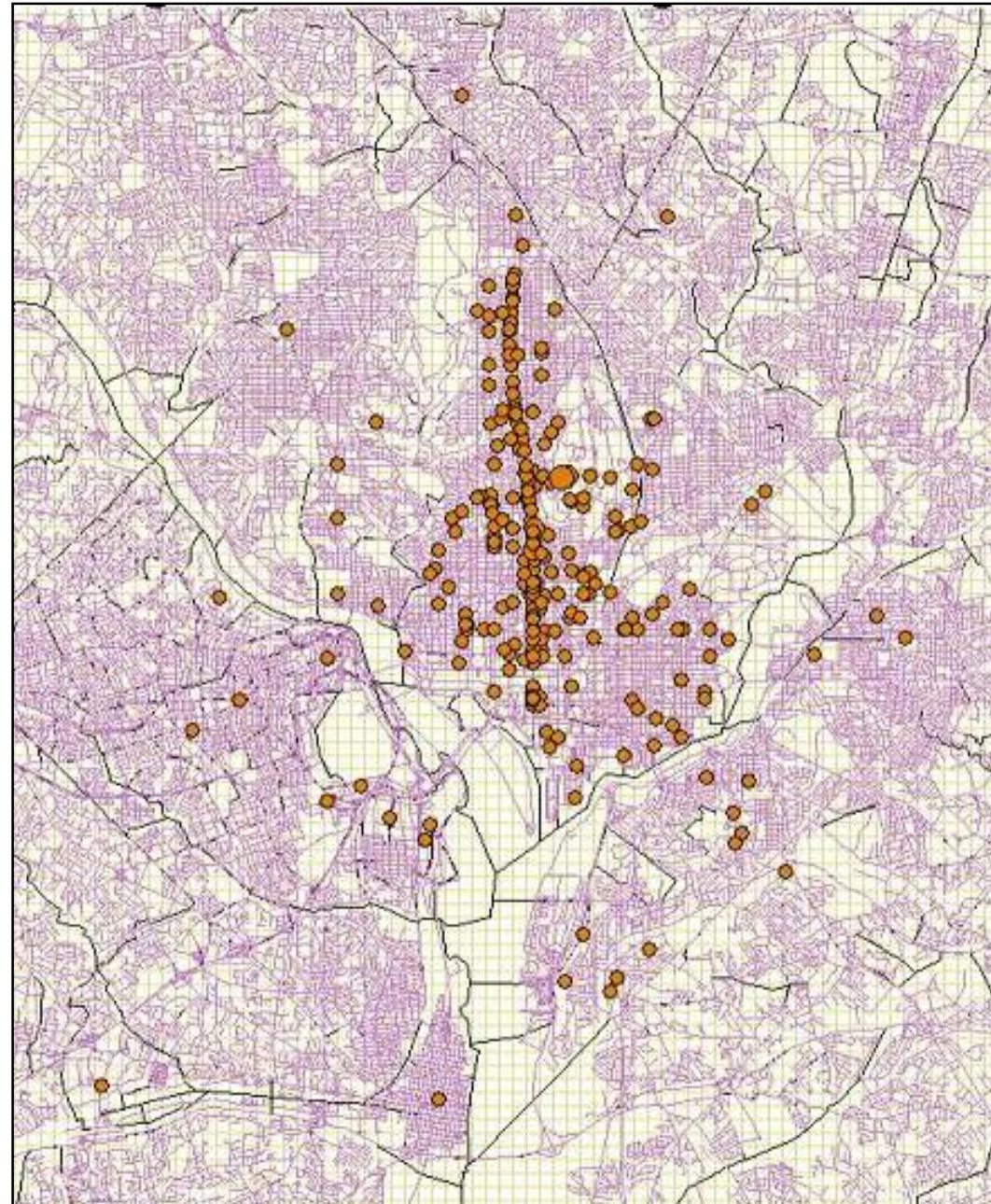
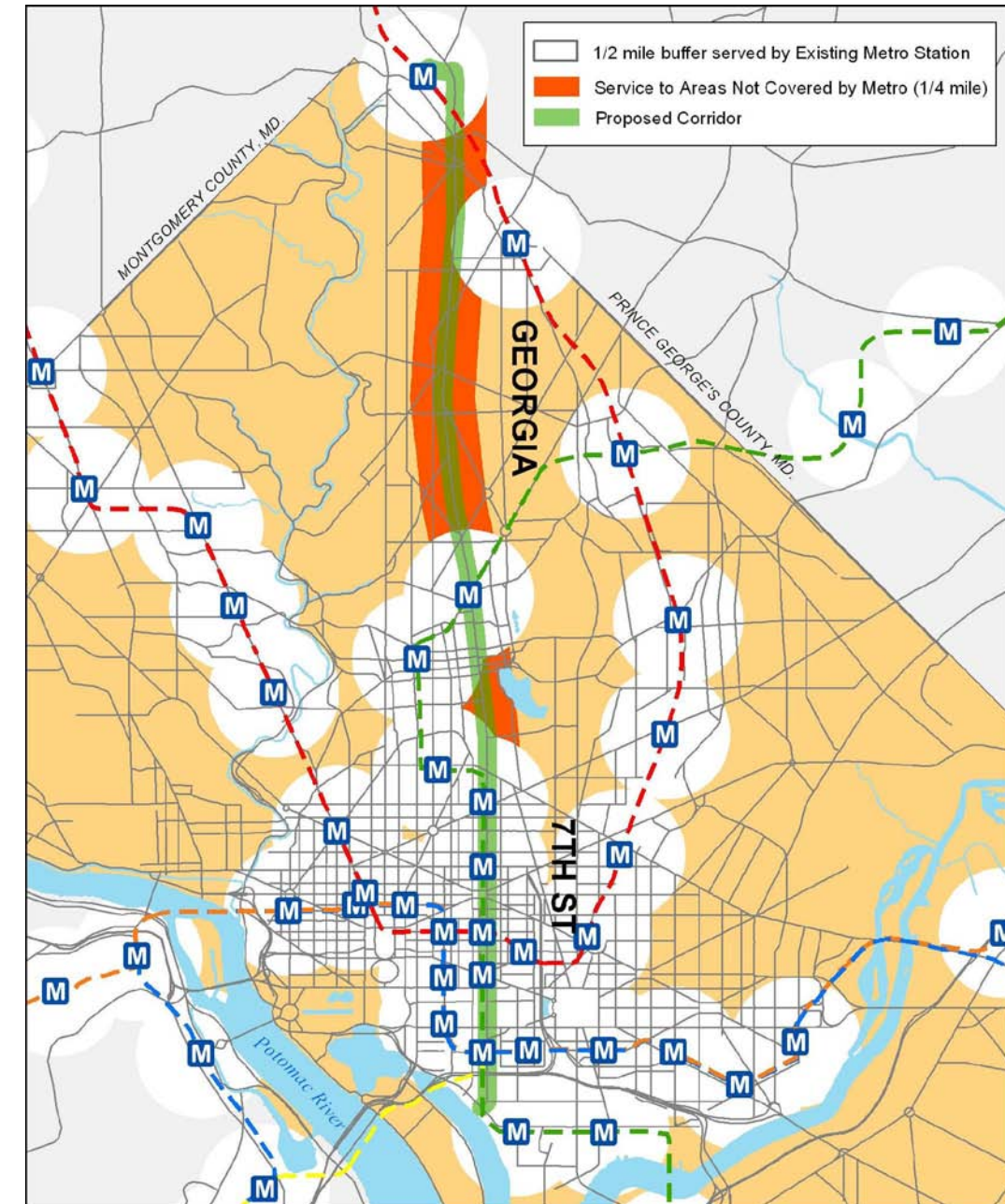


Exhibit 6: Existing Boardings and Destinations



Existing origin and destination data for the Georgia Avenue-7th Street Corridor are shown in **Exhibit 6**. The pattern suggests lots of short trips within the corridor, rather than the longer trips characteristic of Metrorail lines. Many of the trips may be between areas unserved by Metrorail and one of the stops along the route; much of the northern end of Georgia Avenue NW is unserved by Metrorail, as shown in **Exhibit 7**.

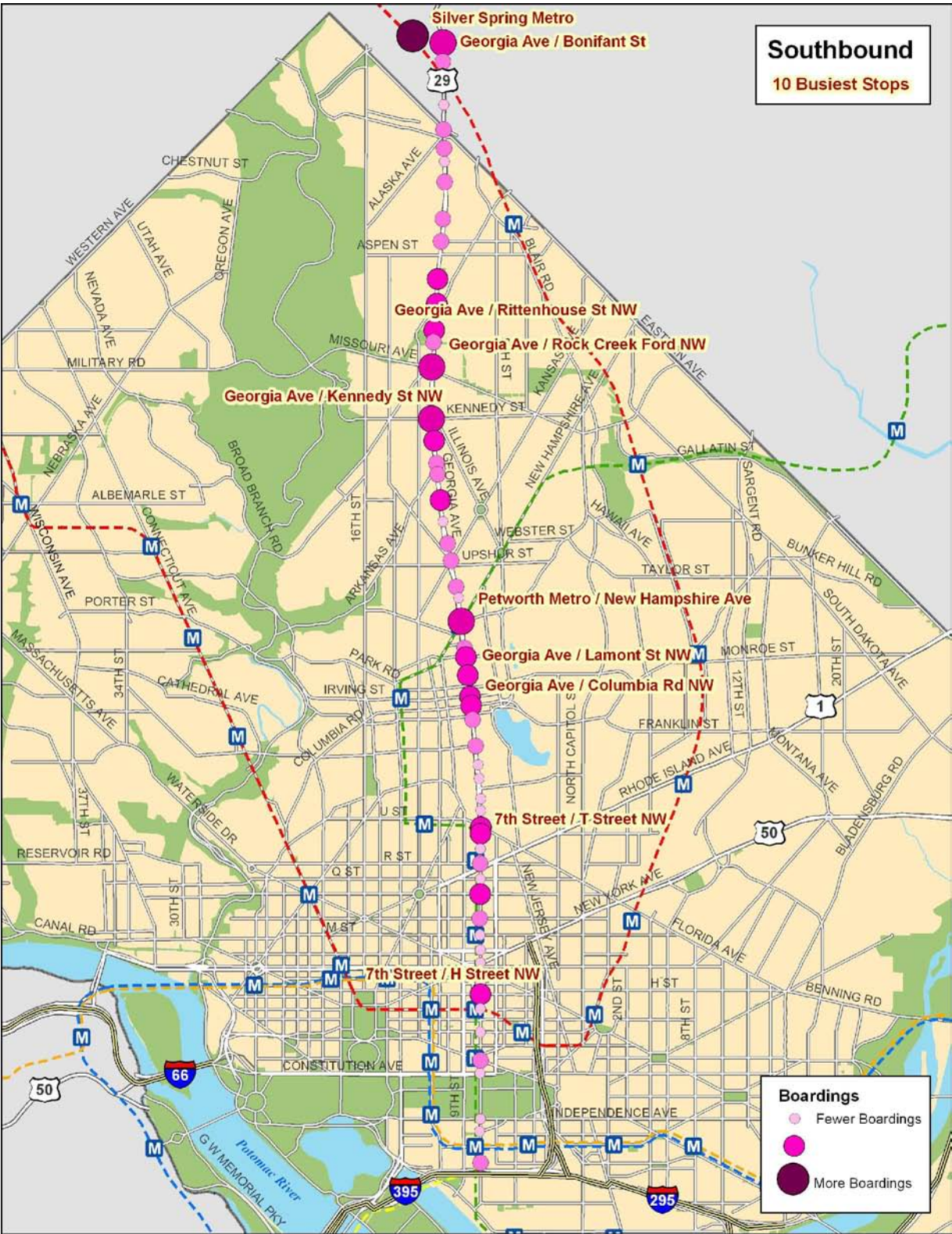
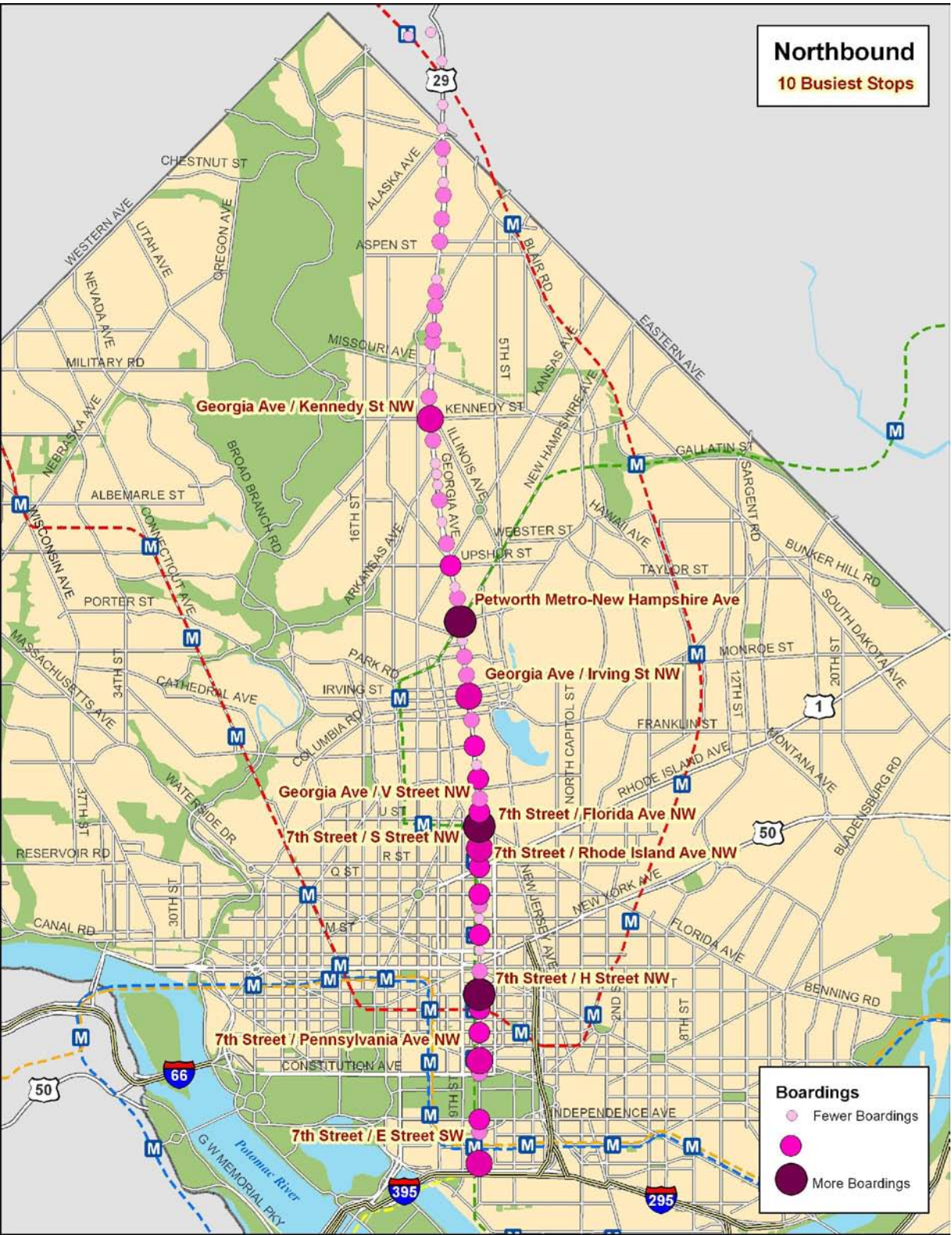
Exhibit 7: Area Not Served by Existing Metro



The following exhibits show current conditions for transit service along Route 70-71:

- **Exhibit 8** graphically shows the locations of the busiest boarding locations along the route
- **Exhibit 9 and 10** lists all of the stops along the route and the total number of boardings and alightings at each location
- **Exhibit 11** shows the bus load levels during the peak period
- **Exhibit 12** shows the weekday transit travel speeds for Route 70-71
- **Exhibits 13 and 14** show the travel time and speed between time points along the route

Exhibit 8: Weekday Boardings by Stop, Route 70-71



Source: WMATA Ride check 2005

Exhibit 9: Boarding and Alighting Activity, Route 70-71 (Northbound)

On Street	Cross Street	Total Weekday		Boardings+ Alightings		Rank		Boardings+ Alightings
		Boardings	Alightings	Boardings	Alightings	Boardings	Alightings	
V ST SW	BET 2 ND & 1 STS (TP-71 PM)	39	-	-	39	58	72	67
WATER ST SW	BET HALF & T STS (PM)	-	-	-	-	77	72	78
WATER ST SW	BET T & S STS (TP-71)	14	-	14	14	72	72	75
FIRST ST SW	Q ST	11	-	-	11	75	72	77
FIRST ST SW	P ST	42	1	1	43	55	68	64
HALF ST SW	O ST (TP-70)	170	6	6	176	18	63	41
P ST SW	FIRST ST	29	6	6	35	65	63	69
P ST SW	CANAL ST	34	4	4	38	62	65	68
P ST SW	3 RD ST	20	1	1	21	69	68	72
P ST SW	4 TH ST	33	9	9	42	64	62	65
4 TH ST SW	O ST (S)	17	1	1	18	70	68	73
4 TH ST SW	N ST	12	1	1	13	74	68	76
4 TH ST SW	M ST	64	61	61	125	44	50	55
M ST SW	6 TH ST	29	3	3	32	65	66	70
6 TH ST SW	K ST	23	17	17	40	68	59	66
I ST SW	7 TH ST	36	12	12	48	61	61	62
MAINE AVE SW	9 TH ST (TP-70)	65	-	-	65	43	72	61
G ST SW	7 TH ST	-	-	-	-	77	72	78
7 TH ST SW	G ST	26	3	3	29	67	66	71
D ST SW	7 TH ST (TP-70)	46	-	-	46	51	72	63
7 TH ST SW	E ST (1 ST STOP) (TP)	426	53	53	479	6	53	9
7 TH ST SW	MARYLAND AVE	118	14	14	132	28	60	50
7 TH ST SW	INDEPENDENCE AVE	165	58	58	223	19	52	36
7 TH ST NW	CONSTITUTION AVE	80	23	23	103	38	58	58
9 TH ST NW	CONSTITUTION AVE (TP)	15	-	-	15	71	72	74
7 TH ST NW	PENNSYLVANIA AVE (TP)	643	100	100	742	4	37	8
7 TH ST NW	E ST	161	67	67	227	20	48	35
7 TH ST NW	G ST	188	45	45	232	14	54	33
7 TH ST NW	H ST (TP)	1,320	398	398	1,718	1	5	1
7 TH ST NW	MASSACHUSETTS AVE	129	30	30	159	23	57	45
7 TH ST NW	L ST	43	37	37	80	52	55	59
7 TH ST NW	M ST	190	80	80	270	13	41	29
7 TH ST NW	N ST	58	69	69	127	46	45	53
7 TH ST NW	O ST	72	115	115	187	41	34	40
7 TH ST NW	P ST	220	200	200	420	12	20	13
7 TH ST NW	RHODE ISLAND AVE	253	175	175	428	10	23	10
7 TH ST NW	S ST	341	59	59	399	9	51	14
7 TH ST NW	FLORIDA AVE (TP)	963	372	372	1,334	2	6	3
GEORGIA AVE NW	V ST X	227	122	122	349	11	32	18
GEORGIA AVE NW	W ST	96	68	68	163	31	47	43
GEORGIA AVE NW	BARRY PL X	182	136	136	318	15	27	25
GEORGIA AVE NW	HOWARD PL	42	33	33	75	55	56	60
GEORGIA AVE NW	EUCLID ST	179	243	243	422	16	13	12
GEORGIA AVE NW	GRESHAM PL X	119	182	182	301	26	22	26
GEORGIA AVE NW	IRVING ST	488	415	415	903	5	4	6
GEORGIA AVE NW	LAMONT ST X	128	214	214	341	24	16	21
GEORGIA AVE NW	PARK RD	144	205	205	349	21	18	17
GEORGIA AVE NW	OTIS PL X	57	79	79	136	47	42	49
GEORGIA AVE NW	N. HAMPSHIRE AVE (N/N) (TP)	349	568	568	917	8	2	5
GEORGIA AVE NW	N. HAMPSHIRE AVE (N/F)	798	250	250	1,048	3	12	4
GEORGIA AVE NW	RANDOLPH ST	136	128	128	264	22	29	30
GEORGIA AVE NW	SHEPHERD ST	51	75	75	126	49	43	54
GEORGIA AVE NW	UPSHUR ST	173	253	253	426	17	11	11
GEORGIA AVE NW	WEBSTER ST	83	129	129	212	35	28	37
GEORGIA AVE NW	BUCHANAN ST	40	124	124	164	57	31	42
GEORGIA AVE NW	DECATUR ST	81	201	201	282	36	19	28
GEORGIA AVE NW	EMERSON ST	43	81	81	124	52	40	56
GEORGIA AVE NW	FARRAGUT ST	34	95	95	129	62	38	51
GEORGIA AVE NW	GALLATIN ST	60	68	68	128	45	46	52
GEORGIA AVE NW	INGRAHAM ST	77	214	214	291	40	16	27
GEORGIA AVE NW	KENNEDY ST (TP)	350	538	538	888	7	3	7
GEORGIA AVE NW	MADISON ST	85	170	170	254	34	25	32
GEORGIA AVE NW	MISSOURI AVE	37	298	298	335	60	9	23
GEORGIA AVE NW	QUACKENBOS ST	88	256	256	344	33	10	19
GEORGIA AVE NW	RITTENHOUSE ST	100	242	242	342	30	14	20
GEORGIA AVE NW	TUCKERMAN ST	127	226	226	353	25	15	16
GEORGIA AVE NW	UNDERWOOD ST	89.5	171	171	261	32	24	31
GEORGIA AVE NW	VAN BUREN ST	46	116	116	162	50	33	44
GEORGIA AVE NW	BUTTERNUT ST X	81	108.5	108.5	190	36	35	39
GEORGIA AVE NW	DAHLIA ST	119	200	200	319	26	20	24
GEORGIA AVE NW	FERN ST (W) X	77.5	65	65	143	39	49	48
GEORGIA AVE NW	GERANIUM ST X	42.5	101	101	144	54	36	47
GEORGIA AVE NW	HEMLOCK ST	66	90	90	156	42	39	46
GEORGIA AVE NW	JUNIPER ST	104	128	128	232	29	29	33
GEORGIA AVE MC	BLAIR RD (TP)	51	149.5	149.5	201	48	26	38
GEORGIA AVE MC	BURLINGTON AVE	38	70.5	70.5	109	59	44	57
GEORGIA AVE MC	SILVER SPRING AVE	13.5	325.5	325.5	339	73	8	22
WAYNE AVE MC	DIXON AVE	2	355.5	355.5	358	76	7	15
SILVER SPRING STA. MC	BUS BAY A/B (TP)	0	1678.5	1678.5	1,679	77	1	2
TOTAL NORTHBOUND STOP ACTIVITY		11,185	11,185	11,185	22,369			
TOTAL NORTHBOUND ACTIVITY, ARCHIVES TO BLAIR ROAD		9,620	8,483	18,102	18,102			

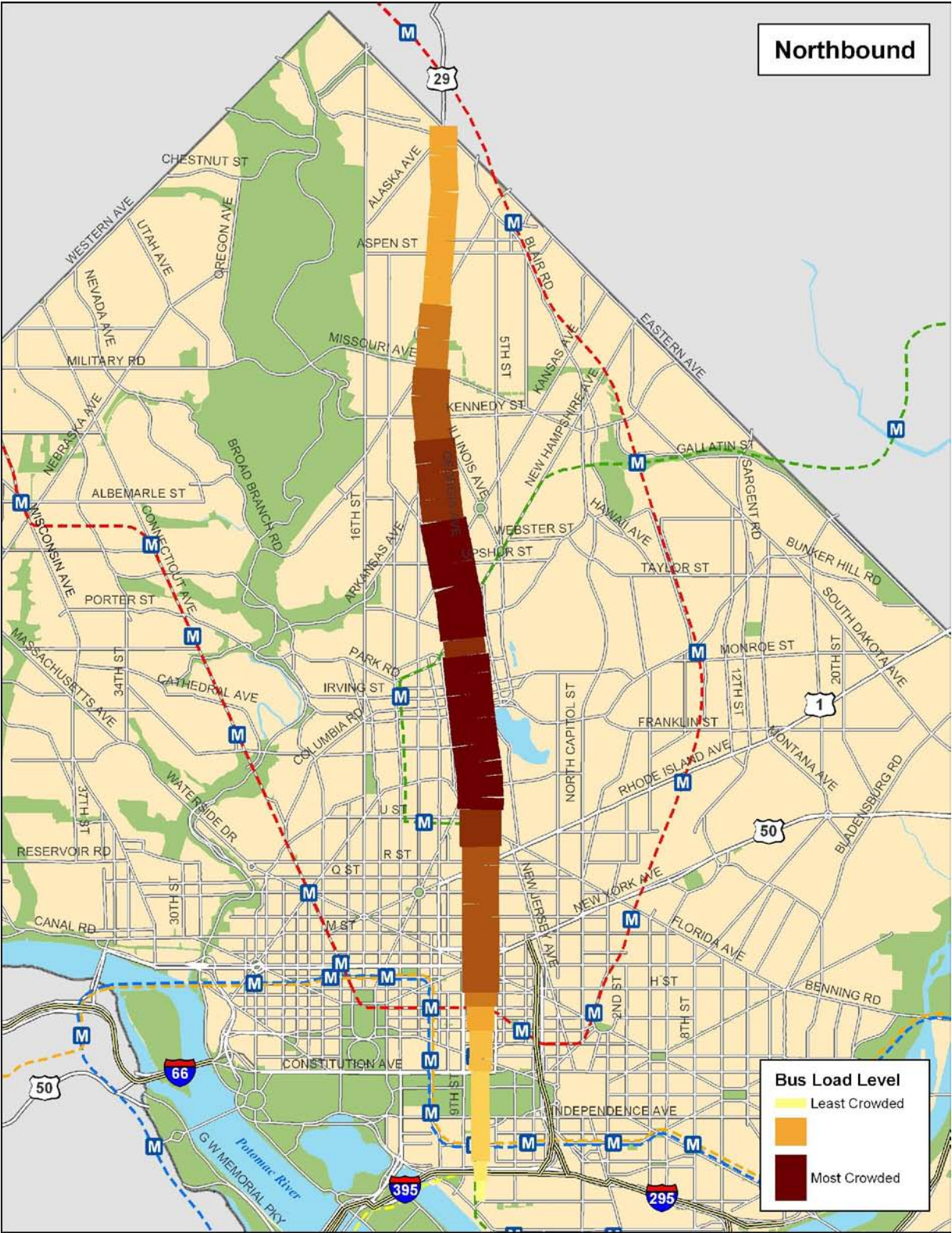
Source: WMATA Ridecheck 2005

Exhibit 10: Boarding and Alighting Activity, Route 70-71 (Southbound)

On Street	Cross Street	Total Weekday		Boardings+ Alightings	Rank		Boardings+ Alightings
		Boardings	Alightings		Boardings	Alightings	
SILVER SPRING STA. MC	BUS BAY J (TP)	1,953	-	1,953	1	82	1
GEORGIA AVE MC	BONIFANT ST	406	13	419	5	71	10
GEORGIA AVE MC	SILVER SPRING AVE	80	42	122	39	60	54
GEORGIA AVE MC	13TH ST	56	75	130	46	44	48
GEORGIA AVE MC	EASTERN AVE (TP)	122	137	259	27	17	24
GEORGIA AVE NW	JUNIPER ST X	133	73	206	23	45	31
GEORGIA AVE NW	HEMLOCK ST X	76	39	115	40	61	55
GEORGIA AVE NW	GERANIUM ST	119	80	199	28	41	34
GEORGIA AVE NW	DAHLIA ST	116	167	282	30	12	19
GEORGIA AVE NW	BUTTERNUT ST.	125	80	205	25	40	32
GEORGIA AVE NW	VAN BUREN ST	205	123	328	13	22	16
GEORGIA AVE NW	PINEY BRANCH RD	204	118	322	15	23	17
GEORGIA AVE NW	RITTENHOUSE ST	279	126	405	8	21	11
GEORGIA AVE NW	QUACKENBOS ST	102	63	165	34	51	42
GEORGIA AVE NW	ROCK CREEK FORD RD	418	147	564	3	15	7
GEORGIA AVE NW	MADISON ST	112	77	188	31	43	36
GEORGIA AVE NW	KENNEDY ST (TP)	407	309	716	4	5	6
GEORGIA AVE NW	INGRAHAM ST	209	68	277	11	47	21
GEORGIA AVE NW	GALLATIN ST	144	43	187	22	59	37
GEORGIA AVE NW	FARRAGUT ST	128	57	185	24	56	38
GEORGIA AVE NW	DECATUR ST	206	95	300	12	33	18
GEORGIA AVE NW	BUCHANAN ST	70	58	128	41	55	49
GEORGIA AVE NW	WEBSTER ST	123	95	217	26	33	28
GEORGIA AVE NW	KANSAS AVE	146	102	248	21	29	26
GEORGIA AVE NW	SHEPHERD ST	81	65	146	38	49	46
GEORGIA AVE NW	RANDOLPH ST	38	86	124	49	37	53
GEORGIA AVE NW	PETWORTH METRO	676	795	1,471	2	3	2
GEORGIA AVE NW	N. HAMPSHIRE AVE (TP)	119	58	177	29	54	41
GEORGIA AVE NW	NEWTON PL	82	112	194	37	25	35
GEORGIA AVE NW	PARK RD	191	153	344	18	13	14
GEORGIA AVE NW	LAMONT ST	234	98	332	10	31	15
GEORGIA AVE NW	IRVING ST	205	228	433	14	7	9
GEORGIA AVE NW	COLUMBIA RD	265	136	401	9	19	12
GEORGIA AVE NW	GRESHAM PL	154	111	265	20	26	23
GEORGIA AVE NW	EUCLID ST	91	148	238	35	14	27
GEORGIA AVE NW	BANNEKER REC CTR	8	18	26	60	66	68
GEORGIA AVE NW	BARRY PL	64	137	201	45	17	33
GEORGIA AVE NW	W ST X	56	72	127	46	46	50
GEORGIA AVE NW	V ST	37	144	181	50	16	39
GEORGIA AVE NW	FLORIDA AVE (TP)	195	1,045	1,240	17	2	4
7TH ST NW	T ST	291	93	383	7	35	13
7TH ST NW	S ST	46	79	124	48	42	52
7TH ST NW	R ST	157	109	265	19	28	22
7TH ST NW	Q ST	66	111	177	43	26	40
7TH ST NW	P ST	204	272	475	16	6	8
7TH ST NW	N ST	104	61	164	33	53	43
7TH ST NW	M ST	68	96	164	42	32	43
7TH ST NW	L ST	13	34	47	58	62	64
7TH ST NW	MT VERNON PL	5	54	59	63	57	62
7TH ST NW	I ST	7	81	88	61	39	58
7TH ST NW	H ST (TP)	296	1,164	1,460	6	1	3
7TH ST NW	G ST	35	114	148	51	24	45
7TH ST NW	E ST	66	190	256	43	10	25
7TH ST NW	PENNSYLVANIA AVE (TP)	108	668	776	32	4	5
7TH ST NW	CONSTITUTION AVE	25	62	87	53	52	59
9TH ST NW	CONSTITUTION AVE(TP-70)	3	6	9	67	76	77
7TH ST SW	INDEPENDENCE AVE	25	101	125	55	30	51
7TH ST SW	C ST	10	135	145	59	20	47
D ST SW	7TH ST (TP-70)	1	52	53	71	58	63
7TH ST SW	E ST X (TP)	89	190	279	36	10	20
7TH ST SW	G ST X	-	16	16	73	68	70
7TH ST SW	I ST X	16	196	212	56	9	30
I ST SW	7TH ST	2	17	19	69	67	69
7TH ST SW	MAINE AVE	-	82	82	73	38	60
MAINE AVE SW	9TH ST (TP)	2	4	6	69	78	79
6TH ST SW	K ST X	0	15	15	73	70	72
6TH ST SW	ARENA STAGE	3	10	13	67	74	74
M ST SW	6TH ST	5	26	31	63	64	66
M ST SW	BET 3RD & 4TH STS	29.5	66.5	96	52	48	57
DELAWARE AVE SW	M ST	25	88	113	53	36	56
DELAWARE AVE SW	#1301-1311	0	30.5	31	73	63	67
DELAWARE AVE SW	CANAL ST	0	16	16	73	68	70
CANAL ST SW	P ST (AM ONLY)	1	4	5	71	78	80
O ST SW	FIRST ST	4.5	10.5	15	65	73	72
HALF ST SW	O ST (TP)	6	207	213	62	8	29
P ST SW	FIRST ST (PM ONLY)	14	20	34	57	65	65
2ND ST SW	Q ST X	4.5	5	10	65	77	76
2ND ST SW	S ST X	0	1	1	73	81	82
2ND ST SW	T ST X	0	3	3	73	80	81
V ST SW	BET 2ND & 1ST STS(TP-71)	0	64.5	65	73	49	61
WATER ST SW	BET HALF & T STS (AM)	0	8	8	73	75	78
WATER ST SW	BET T & S STS (TP-71 AM)	0	11	11	73	72	75
TOTAL SOUTHBOUND STOP ACTIVITY					10,153	10,153	20,305
TOTAL SOUTHBOUND ACTIVITY, EASTERN AVE TO ARCHIVES					7,274	8,440	15,713

Source: WMATA Ridecheck 2005

Exhibit 11: Peak Hour, Peak Direction Bus Load Levels, Route 70-71



Source: WMATA Ride check, Collected 2005

Exhibit 12: Weekday Transit Travel Speed, Route 70-71



Source: WMATA Passenger & Time Report, 2004- 2005

Transit Travel Time and Speed between Time Points

The WMATA Passenger and Time Report from 2004-2005 was used to calculate transit travel time and speed between time points. The Passenger and Time Report lists the scheduled and actual time of arrival at time points along the route for every trip in the day in each direction. These were aggregated by time period to show the change in travel speed by direction by time of day; and to show where delays were resulting in very slow travel times between certain points.

In addition, delay was also measured by comparing the scheduled and actual arrival times at each time point by direction and by time of day. Because there was significant variation in the amount of delay – from early arrival to 20+ minutes of day – the *median* delay at time points was measured.

The results of this analysis are shown in **Exhibit 13** (Northbound trips) and **Exhibit 14** (Southbound).

Exhibit 13: Travel Time between Timepoints and Travel Speed by Time of Day (Northbound)

Travel Time (Min)	7 th /PA-7 th /H	7 th /H-GA/FL	GA/FL-GA/Irving	GA/Irving-Petworth	Petworth-GA/Kennedy	GA/Kennedy-GA/Blair	Total Trip
Early AM	2	6	3	3	6	10	30
AM Peak	4	10	7	4	8	11	44
Midday	5	11	8	6	11	14	55
PM Peak	5	10	7	5	10	13	50
Evening	3	8	6	4	8	10	39
After 12	3	6	5	4	7	9	34
Travel Speed (mph)	7 th /PA-7 th /H	7 th /H-GA/FL	GA/FL-GA/Irving	GA/Irving-Petworth	Petworth-GA/Kennedy	GA/Kennedy-GA/Blair	Total Trip
Early AM	11.0	11.3	15.6	10.0	12.9	11.7	12.6
AM Peak	6.6	6.8	7.6	7.5	9.8	10.2	8.6
Midday	5.3	6.2	6.7	5.0	7.6	8.1	6.9
PM Peak	5.3	6.8	7.6	6.0	8.3	9.0	7.6
Evening	8.8	8.5	8.9	7.5	10.4	11.7	9.7
After 12	8.8	11.3	10.7	7.5	11.9	13.0	11.1
Median Delay (Min)	7 th /PA	7 th /H	GA/FL	GA/Irving	Petworth	GA/Kennedy	GA/Blair
Early AM	1.0	0.5	1.0	1.0	0.5	0.5	2.5
AM Peak	1.0	1.0	2.0	2.0	2.0	2.0	4.0
Midday	2.0	2.5	2.0	2.5	2.0	4.0	5.5
PM Peak	2.0	3.0	4.0	5.0	5.0	6.0	4.0
Evening	2.0	2.0	2.0	3.0	4.0	4.0	4.0
After 12	3.0	4.0	4.0	4.0	4.0	4.0	6.0

Exhibit 14: Travel Time between Timepoints and Travel Speed by Time of Day (Southbound)

Travel Time (Min)	GA/Eastern-GA/Kennedy	GA/Kennedy-Petworth	Petworth-GA/Irving	GA/Irving-GA/FL	GA/FL-7 th /H	7 th /H-7 th /PA	Total Trip
Early AM	9	6	4	4	8	3	34
AM Peak	11	8	4	6	10	4	43
Midday	13	8	5	7	12	4	49
PM Peak	12	9	5	6	9	4	45
Evening	9	7	4	6	8	2	36
After 12	8	5	3	5	6	2	29
Travel Speed (mph)	GA/Eastern-GA/Kennedy	GA/Kennedy-Petworth	Petworth-GA/Irving	GA/Irving-GA/FL	GA/FL-7 th /H	7 th /H-7 th /PA	Total Trip
Early AM	13.0	13.9	7.5	13.4	8.5	8.8	12.7
AM Peak	10.6	10.4	7.5	8.9	6.8	6.6	10.0
Midday	9.0	10.4	6.0	7.6	5.7	6.6	8.8
PM Peak	9.8	9.3	6.0	8.9	7.5	6.6	9.6
Evening	13.0	11.9	7.5	8.9	8.5	13.2	12.0
After 12	13.8	16.7	8.7	10.7	10.5	11.0	14.8
Median Delay (Min)	GA/Eastern	GA/Kennedy	GA/Petworth	GA/Irving	GA/FL	7 th /H	7 th /PA
Early AM	2.0	1.0	1.0	1.0	2.0	2.0	2.0
AM Peak	1.0	2.5	2.5	2.5	2.0	3.0	4.0
Midday	2.0	3.0	3.0	4.0	4.0	6.0	7.0
PM Peak	1.0	2.0	2.0	3.0	2.0	3.0	3.0
Evening	2.0	3.0	4.0	4.0	5.0	6.0	6.0
After 12	5.0	5.5	5.5	6.5	6.5	7.0	8.0

Based on the results shown in **Exhibits 13 and 14**:

- Although there is consistent delay across all time points and time of day, the delay is on the whole fairly minor
- The slowest travel times are during the midday period in both directions, and travel speed does not appear to follow peak period travel patterns; this is representative of a roadway that carries lots of local trips and not a lot of commuting traffic
- The slowest travel is between the timepoints at Georgia and Irving and Petworth Metro, while the second slowest times were in the downtown area

Section 2: Metro *EXTRA* Service Plan for Georgia Ave-7th Street NW Corridor

The following section describes the Rapid Bus (**Metro *EXTRA***) service concept for the Georgia Avenue-7th Street NW Corridor and provides preliminary operating and capital costs associated with the plan.

Service Concept

The Rapid Bus Implementation Plan addresses the challenges faced by transit in the corridor through the recommendation of a new bus route, referred to in this document as the Georgia Avenue Rapid route. The service concept for the Georgia Avenue Rapid route is as follows:

- Limited stop bus service between Archives and Silver Spring
- High frequencies of service
- Service only during peak travel times during weekdays
 - Peak only service for immediate implementation
 - All-day service for eventual service expansion
- Improved passenger facilities
- Running way improvements to improve travel speed and reliability
- Extensive branding for corridor service
- No reduction in underlying (existing) local bus service in the corridor

The service plan for the recommended service is shown in **Exhibit 15**.

Exhibit 15: Georgia Avenue-7th Street Corridor Metro *EXTRA* Service Plan

Service Type	Limited stop “Rapid Bus” service called “ Metro <i>EXTRA</i> ”	
Corridor Length	7.4 miles (Archives to Silver Spring)	
Number of Stops	15 (northbound) 14 (southbound)	
<u>Weekday Service Plan</u>	<u>Peak Only</u>	<u>All-Day Service</u>
AM Peak (5:30 a.m. – 9:30 a.m.)	10 minute headway	10 minute headway
Midday (9:30 a.m. – 3:00 p.m.)	No service	10 minute headway
PM Peak (3:00 p.m. – 7:00 p.m.)	10 minute headway	10 minute headway
Evening (7:00 p.m. – 10:00 p.m.)	No service	15 minute headway
Weekend Service Plan	No Weekend Service	

The proposed route is shown in **Exhibit 16**. Although the route would run at a 10-minute headway schedule during peak hours, printed schedules would not be necessary, at least in the beginning of service. Instead, drivers would start at the route ends every 10 minutes, and would be encouraged to make the best time possible to the end of the routes.

Vehicles

The proposed service would use low floor 40’ buses, comparable to recent new vehicles purchased for Metrobus service. Vehicles would be some type of alternative fuel, either CNG or diesel-hybrid. Buses would be “branded” – specially painted or otherwise marked to distinguish them from Metrobuses already operating in the corridor.

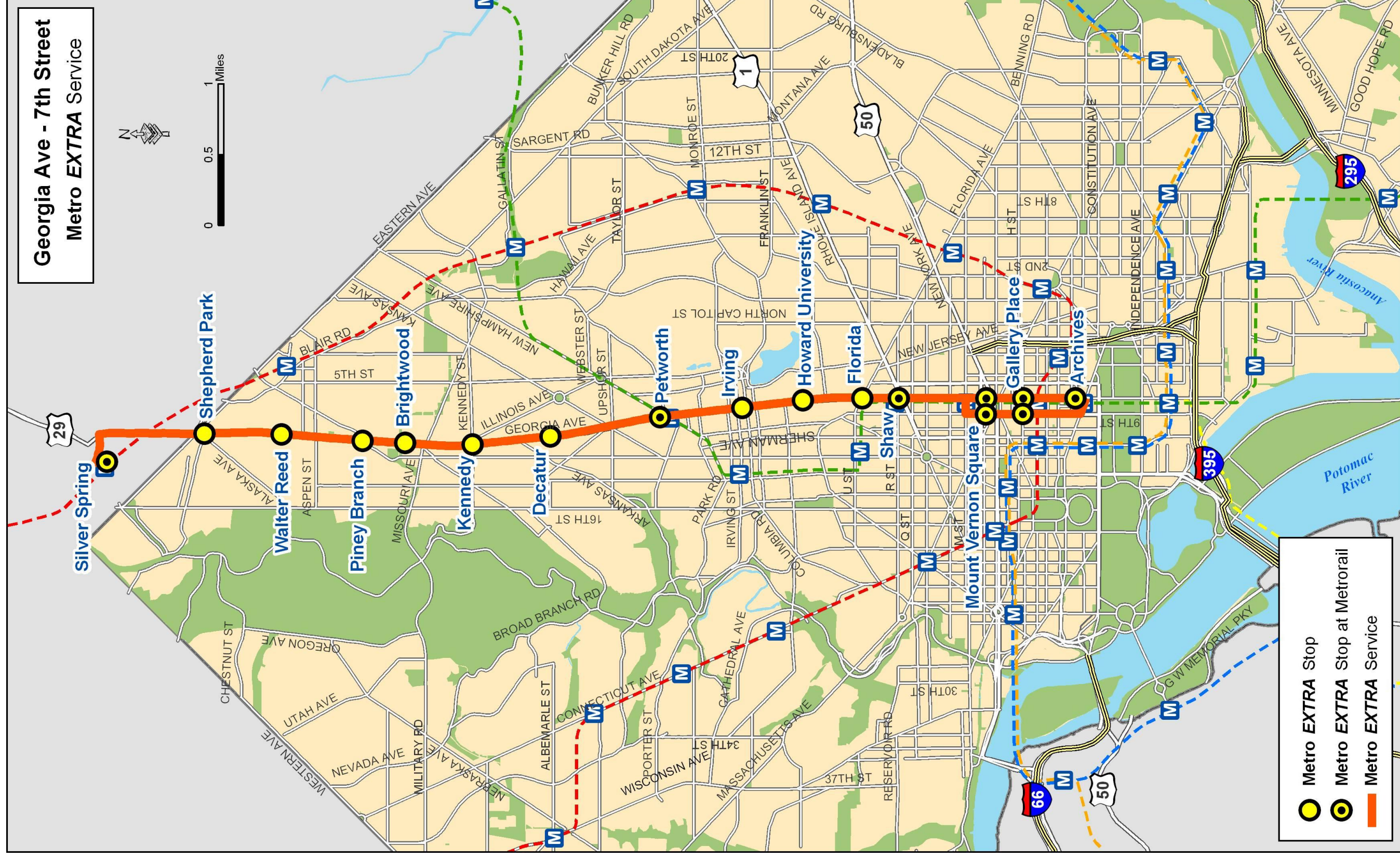
The number of buses required for the service is a function of the service frequency and travel speed of the new service. In the peak period only service plan, the number of vehicles is driven by the travel speeds in the p.m. peak period (speeds are higher in the a.m. peak). In service between Archives and Eastern Avenue, a round trip requires 80 minutes in the p.m. peak period. Given 10-minute headways and a 10% recovery period, this would require 9 vehicles. Between Archives and Silver Spring, 89 minutes are required, which would call for 10 vehicles. Capital costs assume a 20% spare ratio (2 buses), which is consistent with existing WMATA Metrobus spare ratios.

For the all-day service plan, the vehicles required are driven by the midday period travel times, when speeds are slowest. Round trip travel time between Archives and Eastern Avenue is 89 minutes in the midday period. Given 10-minute headways and a 10% recovery period, this would require 10 vehicles. Between Archives and Silver Spring, 98 minutes are required, or 12 vehicles. The capital costs also assume a 20% spare ratio (2 buses), which is consistent with existing WMATA Metrobus spare ratios.

Metro *EXTRA*
Rapid Bus
service would
use distinctive
colors to make it
easy to identify
vehicles.



Exhibit 16: Georgia Avenue - 7th Street Proposed Metro *EXTRA* Service



Stop Locations

Stops were spaced similarly to light rail stops, or to Metrorail stops in the central part of the District: about one stop every ½ mile. Over the 7.4 mile corridor, this works out to about 28 stops (14 in each direction). Once the original set of stops was placed evenly spaced over the corridor, stops were shifted based on the following methodology:

Wherever feasible, stops should be located adjacent to Metrorail entrances:

- Archives
- Gallery Place
- Shaw-Howard U
- Petworth
- Silver Spring

In addition, stops should be located at major Metrobus transfer locations and Downtown Circulator transfer locations:

- Mount Vernon Square
- Florida Avenue
- Irving
- Kennedy
- Walter Reed
- Shepherd Park

Stops should be located at existing major boarding and alighting locations:

- Decatur
- Brightwood
- Piney Branch

Finally, even where none of the above conditions exist, stops should be located at major landmarks or potential trip attractors:

- Howard University

Passenger amenities vary by stop. A full amenity package would include the following elements:

- A bus “flag” (a distinct sign for the **Metro EXTRA** service)
- A passenger shelter, which would include a concrete pad, bench, map, and schedule
- An “ITS” feature: a screen showing real-time bus arrival information.

New stops are assumed to be obtained via the “Ad Shell” program, and no costs are assumed for these stops. The Ad Shell stops would include ITS real time arrival signs that work with GPS transmitters already present on most Metrobuses.

Generally, stops can be categorized as either major boarding locations or alighting locations. For example, the Piney Branch stop is a major boarding location in the southbound direction in the A.M. and midday time period. The northbound stop would be a major alighting location in the midday, P.M. peak, and evening time periods, but is not a major boarding location at any time. Because passengers are typically

leaving their alighting locations immediately to walk to their final destinations, as opposed to waiting for another bus, the full amenity package is not necessary at major alighting locations, just the major boarding locations.

In some cases, the existing local bus stops would be relocated to share shelters and stops with the proposed **Metro EXTRA** stops. In other cases, the stops could be separate, and located across the street or down the block from one another.

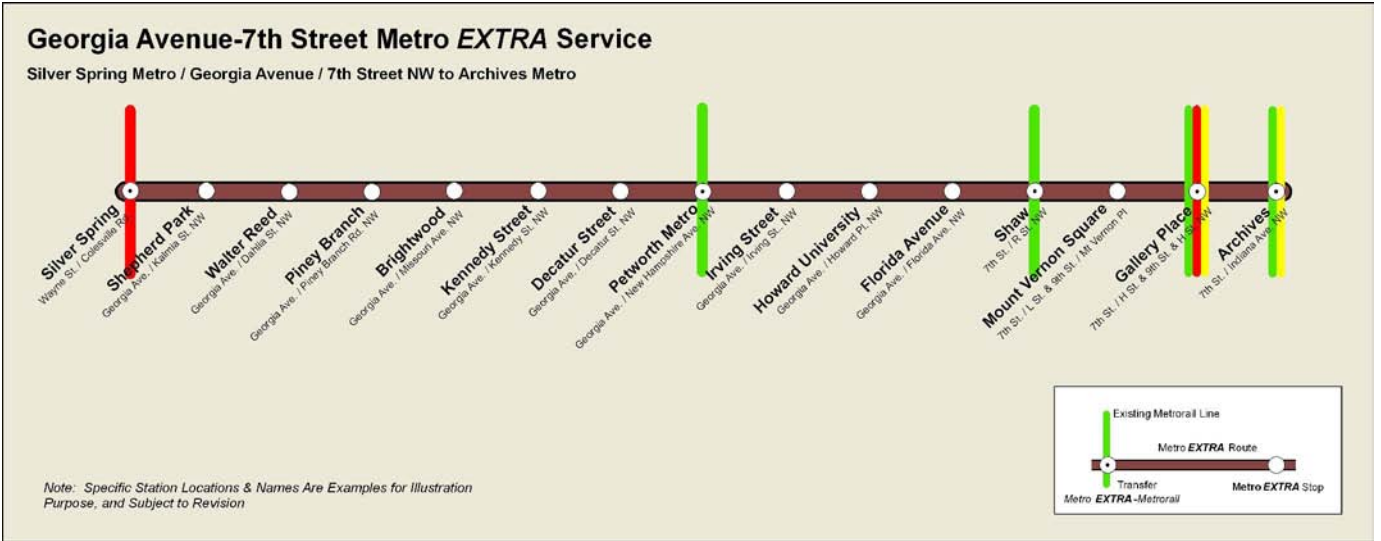
In the downtown area, stops already exist where there is sufficient sidewalk space to accommodate shelters, and in these locations, the **Metro EXTRA** Service would share the existing shelters.

Parking displacement is a major concern when locating stops. On a street with curbside parking, any new stop will displace 4-5 parking spaces. In some cases, stops can be located in areas that do not currently allow parking. In other cases, if the existing local bus stop is combined with a new **Metro EXTRA** stop, the old bus zone can be replaced with curbside parking to replace that lost at the new **Metro EXTRA** stop.

Corridor-wide, as many as 30 spaces in the northbound direction and 40 spaces in the southbound direction could be affected by the service plan for the Georgia Avenue-7th Street **Metro EXTRA** service. As many as 40 new spots could be created to offset the 70-space reduction if the existing nearside bus stops were relocated to share with the new farside **Metro EXTRA** stops.

Exhibit 17 shows a “strip map” of **Metro EXTRA** stops for the route. Strip maps would be located on vehicles and at all **Metro EXTRA** stops, and resemble the maps used on rail transit systems. The maps could be distributed as part of a marketing effort for the new service.

Exhibit 17: Georgia Avenue-7th Street NW Corridor Metro EXTRA “Strip Map”



Detailed information about stop location and passenger amenities at each proposed stop is shown in **Exhibit 18** and **Exhibit 19**.

Exhibit 18: Georgia Avenue-7th Street Corridor, Proposed Metro *EXTRA* Stops

Map Index	Station Name	Station Location	Existing Weekday Boardings (Route 70-71)	Curb Type	Passenger Infrastructure	Notes
Northbound						
N01	Archives	Eastside of 7 th Street NW between Indiana Ave & Pennsylvania Ave (Mid-Block)	7 th / Penn-643 7 th / E-161	Entire block is no parking; short block is primarily taken up by bus stop and right-turning traffic	Existing passenger shelter at stop; add flag and ITS elements only	Existing Rte 70-71 and Downtown Circulator stop
N02	Gallery Place	<i>Short Term:</i> Eastside of 7 th Street just south of H Street (Nearside)	7 th / G-188 7 th / H-1,320	Stop at existing curbside bus zone; Proposed Bulbout in long term	Covered area at Metro entrance serves as passenger shelter at stop; add flag and ITS elements only	Existing Rte 70-71 and Circulator stop
		<i>Long Term:</i> Add Bulbout at this location				
N03	Mount Vernon Square (Washington Convention Center)	<i>Short Term:</i> Eastside of 7 th Street NW just south of L Street (Nearside)	7 th / Mass-129 7 th / M-190	Stop at existing curbside bus zone	No shelter, flag and ITS element	Share with existing Circulator stop
		<i>Long Term:</i> Add Bulbout at this location		Add Bulbout		
N04	Shaw	Eastside of 7 th Street NW on the southside of Rhode Island Avenue (Nearside)	7 th / Rhode Island-253 7 th / S-341	Stop at existing curbside bus zone	Existing passenger shelter at stop; add flag and ITS elements only	Share with existing Rte 70-71 stop
N05	Howard University Medical Center	Eastside of Georgia Avenue NW just north of Florida Avenue (Farside)	7 th / Florida-963 GA / V-227	Add No Parking (Bus) Zone at curb	Add new shelter, flag, ITS	Need to coordinate with Howard University Hospital. New shelter encroaches on parking lot.
N06	Howard University	<i>Short Term:</i> Eastside of Georgia Avenue NW just south of Howard Place (Nearside)	GA / Barry-182 GA / Howard-42 GA / Euclid-179	Stop at existing curbside bus zone	Add new shelter, flag, ITS; work with Howard University on shelter placement and design	Share with existing Rte 70-71 stop
		<i>Long Term:</i> Add Bulbout at this location		Add Bulbout		
N07	Irving	<i>Short Term:</i> Eastside of Georgia Avenue NW just south of Irving Street (Nearside)	GA / Irving-488	Stop at existing curbside bus zone	No shelter, add flag and ITS elements only	Share with existing Rte 70-71 stop
		<i>Long Term:</i> Add Bulbout at this location		Add Bulbout. Add No Parking (Bus) Zone at curb for entire block	Add new shelter	On-street parking lane will remain. Entire block will be bus zone, keep separate from existing 70-71 stop at Irving (nearside)

Map Index	Station Name	Station Location	Existing Weekday Boardings (Route 70-71)	Curb Type	Passenger Infrastructure	Notes
N08	Petworth	Eastside of Georgia Avenue NW just north of New Hampshire Avenue (Farside)	GA / New Hampshire-1,147 GA / Randolph-136	Stop at existing curbside bus zone	Replace existing shelter with new shelter; flag and ITS element	Use existing transfer facility
N09	Decatur	Eastside of Georgia Avenue NW just north of Decatur Street (Farside)	GA / Decatur-81 GA / Emerson-43	Add no parking (bus) zone at curb	Add new shelter, flag and ITS element	Existing 70-71 stop is nearside at same intersection
N10	Kennedy	<i>Short Term:</i> Eastside of Georgia Avenue NW just south of Kennedy Street (Nearside)	GA / Kennedy-350	Stop at existing curbside bus zone	No shelter, add flag and ITS elements	Share with existing 70-71 stop
		<i>Long Term:</i> Eastside of Georgia Avenue NW just north of Kennedy Street (Farside)		Add Bulbout	Add new shelter and move flag and ITS elements from nearside stop	Existing 70-71 stop is nearside at same intersection
N11	Brightwood	<i>Short Term:</i> Eastside of Georgia Avenue NW just south of Missouri Ave (Nearside)	GA / Missouri-37	Stop at existing curbside bus zone	Add new shelter at stop; add flag and ITS elements only	Share with existing 70-71stop
		<i>Long Term:</i> Possible move to eastside of Georgia Avenue NW just north of Peabody St (Farside)			Add new shelter and move flag and ITS elements from short term stop	Possible move; parking spaces need to be removed
N12	Piney Branch	<i>Short Term:</i> Eastside of Georgia Avenue NW just south of Tuckerman Road (Nearside)	GA / Tuckerman-127 GA / Underwood-90	Stop at existing curbside bus zone	Existing shelter, add flag and ITS elements	Share with existing 70-71 stop
		<i>Long Term:</i> Eastside of Georgia Avenue NW just north of Underwood Street (Farside)			Add new shelter and move flag and ITS elements from nearside stop	Share with existing 70-71 stop
N13	Walter Reed	Eastside of Georgia Avenue NW just south of Dahlia Street (Nearside)	GA / Dahlia-119	Stop at existing curbside bus zone	No shelter, add flag and ITS elements	Share with existing 70-71 stop
N14	Shepherd Park	Eastside of Georgia Avenue just south of Blair Road (Nearside)	GA / Juniper-104 GA / Blair-51	Add No Parking (Bus) Zone at curb	No shelter, flag and ITS element	No existing stop at this location
--	Silver Spring	Silver Spring Metro Station		Share existing bus bay and stop	Add flag and ITS element	Destination point

Map Index	Station Name	Station Location	Existing Weekday Boardings (Route 70-71)	Curb Type	Passenger Infrastructure	Notes
Southbound						
--	Silver Spring	Silver Spring Metro Station	Silver Spring- 1953	Share existing bus bay and stop	Add flag	Origin point
S01	Shepherd Park	Westside of Georgia Avenue NW just south of Eastern Ave (Farside)	GA / Eastern-122	Add No Parking (Bus) Zone at curb	Add new shelter, flag and ITS element	
S02	Walter Reed	Westside of Georgia Avenue NW just north of Dahlia Street (Nearside)	GA / Dahlia-116	Stop at existing curbside bus zone	No existing shelter, add new shelter, flag and ITS element	Share with existing 70-71 stop
S03	Piney Branch	<i>Short Term:</i> Westside of Georgia Avenue NW just north of Piney Branch Road(Nearside)	GA / Piney Branch-204	Stop at existing curbside bus zone	No existing shelter, add flag and ITS element	Share with existing 70-71 stop
		<i>Long Term:</i> Westside of Georgia Avenue NW just north of Piney Branch Rd (Nearside)			Add very narrow new shelter	
S04	Brightwood	<i>Short Term:</i> Westside of Georgia Avenue NW just north of Rock Creek Ford Road (Nearside)	GA / Rock Creek Ford-418	Stop at existing curbside bus zone	Add flag and ITS element	Share with existing 70-71 stop
		<i>Long Term:</i> Westside of Georgia Avenue NW just south of Quackenbos St (Farside)		Add No Parking (Bus) Zone at curb	Add new shelter and move flag and ITS elements from Rock Creek Ford Rd stop	Existing 70-71 stop is nearside at same intersection
S05	Kennedy	<i>Short Term:</i> Westside of Georgia Avenue NW just north of Kennedy St (Nearside)	GA / Kennedy-407	Stop at existing curbside bus zone	No Shelter, add flag and ITS element	Share with existing 70-71 stop
		<i>Long Term:</i> Add bulbout at this location		Add Bulbout	Add new shelter	
S06	Decatur	Westside of Georgia Avenue NW just north of Decatur Street (Nearside)	GA / Decatur-206	Stop at existing curbside bus zone	Existing passenger shelter at stop; add flag and ITS elements only	Share with existing 70-71 stop
S07	Petworth	<i>Short Term:</i> Westside of Georgia Avenue NW just north of Quincy Street (Nearside)	Petworth Metro-676 GA / New Hampshire-795	Add No Parking (Bus) Zone at curb	No existing shelter, add flag and ITS element	Existing 70-71 stop is farside at same intersection
		<i>Long Term:</i> Westside of Georgia Ave NW just north of New Hampshire Avenue (Whole Block)		Existing sawtooth bays at Metro	Use existing transfer center and move flag and ITS element from short term location	Share with existing transfer center at Petworth Metro

Map Index	Station Name	Station Location	Existing Weekday Boardings (Route 70-71)	Curb Type	Passenger Infrastructure	Notes
S08	Irving-Columbia	<i>Short Term:</i> Westside of Georgia Avenue NW just north of Columbia Road (Nearside)	GA / Irving-205 GA / Columbia-265	Stop at existing curbside bus zone	Existing passenger shelter at stop; add flag and ITS elements only	Share with existing 70-71 stop
		<i>Long Term:</i> Westside of Georgia Avenue NW just south of Irving St (Farside)		No Parking (Bus) Zone entire block between Irving & Columbia	Add new shelter and move flag and ITS elements from end of block	Existing 70-71 stop at end of block (has shelter)
S09	Howard University	<i>Short Term:</i> Westside of Georgia Avenue NW between Euclid St and Howard Place (Mid Block)	GA / Euclid-91 GA / Howard-8	Stop at existing curbside bus zone	No existing shelter, add flag and ITS element	Share with existing 70-71 stop
		<i>Long Term:</i> Westside of Georgia Avenue NW just north of Howard Place (nearside)		Add Bulbout	Add new shelter, flag and ITS element; work with university on design, placement	Existing 70-71 stop is midblock between Euclid St and Howard Place
S10	Howard University Medical Center	Westside of Georgia Avenue NW just north of T Street (Nearside)	GA / Florida-195 GA / T-291	Stop at existing curbside bus zone	Existing passenger shelter at stop; add flag and ITS elements only	Share with existing 70-71 stop
S11	Shaw	Westside of 7 th Street NW just north of R Street (Nearside)	7 th / R-157 7 th / Q-66	Stop at existing curbside bus zone	Existing passenger shelter at stop; add flag and ITS elements only	Share with existing 70-71 stop
S12	Mount Vernon Square (Washington Convention Center)	Westside of 9 th Street NW just north of Massachusetts Ave (Nearside)		Stop at existing curbside bus zone	No existing shelter; add flag only	Share with Downtown Circulator stop
S13	Gallery Place	Westside of 9 th Street NW just north of H Street (Nearside)		Stop at existing curbside bus zone	Existing passenger shelter at stop; add flag only	Share with Downtown Circulator stop

Exhibit 19 shows the features and potential impacts at each stop location. The table includes the type of shelter provided, passenger information, parking implication and needed infrastructure improvements at each stop.

Exhibit 19: Georgia Avenue - 7th Street Proposed Metro *EXTRA* Stop Requirements for Short Term

Stop	Location	Existing Shelter Replaced By Clear Channel	Request an Additional Shelter from Clear Channel	Request an Additional "Narrow" Shelter from Clear Channel	No Shelter Provided	Flag/Schedule/Map on Shelter	Flag/Schedule/Map on Pole	Flag/Schedule/Map on Temp Pole Until Shelter is Installed	Flag/Schedule/Map on Existing Shelter Until New Shelter is Installed	Next Bus Screen in Clear Channel Shelter	Remove Parking Spaces at Stop	Request DDOT To Add Concrete Pad for Shelter	Request DDOT To Expand Sidewalk to Curb Edge at Stop
N01	Eastside of 7 th Street between Indiana Avenue and Pennsylvania Avenue	●				●			●	●			
N02	Eastside of 7 th Street just south of H Street at Gallery Place Metro Entrance				●		●						
S13	Westside of 9th Street just north of H Street	●				●			●	●			
N03	Eastside of 7 th Street just south of L Street				●		●						
S12	Westside of 9th Street just north of Massachusetts Ave at Mt Vernon Square				●		●						
N04	Eastside of Georgia Avenue just south of Rhode Island Avenue near Shaw/Howard Metro Station	●				●			●	●			
S11	Westside of 7th Street just north of R Street at Shaw/Howard Metro Station	●				●			●	●			
N05	Eastside of Georgia Avenue just north of Florida Avenue (Adjacent to Howard University Hospital Parking Lot)		●			●		●		●	●	●	
S10	Westside of 7 th Street just north of T street	●				●			●	●			
N06	Eastside of Georgia Avenue just south of Howard Place		●			●		●		●			
S09	Westside of Georgia Avenue between Euclid Street and Howard Place				●		●						●
N07	Eastside of Georgia Avenue just south of Irving Street				●		●						
S08	Westside of Georgia Avenue just north of Columbia Road	●				●			●	●			
N08	Eastside of Georgia Avenue just north of New Hampshire Avenue at Petworth Metro Station	●				●			●	●			
S07	Westside of Georgia Avenue just north of Quincy Street				●		●						●
N09	Eastside of Georgia Avenue just north of Decatur Street			●		●		●		●	●		
S06	Westside of Georgia Avenue just north of Decatur Street	●				●			●	●			
N10	Eastside of Georgia Avenue just south of Kennedy Street				●		●						
S05	Westside of Georgia Avenue just north of Kennedy Street				●		●						
N11	Eastside of Georgia Avenue just south of Missouri Avenue			●		●		●		●			
S04	Westside of Georgia Avenue just north of Rock Creek Ford Road	●				●			●	●			
N12	Eastside of Georgia Avenue just south of Tuckerman Street	●				●			●	●			
S03	Westside of Georgia Avenue just north of Piney Branch Road				●		●						
N13	Eastside of Georgia Avenue just south of Dahlia Street (at Walter Reed Entrance)				●		●						
S02	Westside of Georgia Avenue just north of Dahlia Street (at Walter Reed Entrance)				●		●						●
N14	Eastside of Georgia Avenue just south of Blair Road (Eastern Avenue)				●		●						
S01	Westside of Georgia Avenue just south of Eastern Avenue		●			●		●		●			
TOTAL		10	3	2	12	15	12	5	10	15	2	1	3



Metro *EXTRA* Rapid Bus stops would include ITS “Real Time” bus arrival information

Metro *EXTRA* Rapid Bus stops would feature distinct stops signs, which could be added to existing stops



Running Way Improvements

Running way improvements provide ways to increase vehicle travel speed and reliability. For the purposes of this project, the need to complete construction in a short time and to minimize disruption of existing traffic flow and parking meant that only a limited array of potential running way improvements was feasible. The Service will start immediately with very minimum short-term improvements and eventually all the improvements planned for the service are completed in long-term. Running way improvements are shown in the **Appendix A: Georgia Avenue-7th Street Corridor Proposed Rapid Bus Service**. These improvements include:

Curb Bulbouts(long-term)

Curb Bulbouts – curb bulbouts extend the curb to the edge of the lane in which buses are operating. In doing so, the provide advantages for transit operations:

- Passengers do not have to squeeze between parked cars to reach the bus
- Buses do not have to pull into and out of traffic
- There is a reduced accident risk from buses pulling unexpectedly away from curbs into traffic, or from cars trying to squeeze past buses that are only partially pulled over

Curb extensions also preserve sidewalk space.

The negative impacts of curb extensions are that stopped buses interrupt traffic flow and they potentially block a right turn lane for traffic. Therefore, curb extensions are only recommended in the following cases:

- Where the curb lanes are used *full time* for parking

- Where stopped buses would not cause substantial intersection congestion problems by blocking traffic

For the purposes of this corridor, curb extensions were recommended at the following locations:

- 7th Street / H Street NW (northbound direction, near side of intersection)
- 7th Street / L Street NW (northbound direction, near side of intersection)
- Georgia Avenue / Howard Place NW (northbound direction, far side of intersection)
- Georgia Avenue / Howard Place NW (southbound direction, far side of intersection)
- Georgia Avenue / Irving Street (both directions, south side of intersection)
- Georgia Avenue / Kennedy Street (both directions, south side of intersection)

Bus Zones

In order to preserve curb space so buses can stop flush with the curbs, bus zones do not allow parking at bus stops. The length of a bus zone varies, but must be long enough to allow a bus to stop completely out of traffic, and to allow a bus to pull in and / or out depending on where the stop is located. Bus zones located on the far side of intersections can be slightly shorter because buses can use the width of the intersection to pull into the curb lane.

Where there is no bulbout, bus zones are necessary because parked cars blocking stops would prevent passengers with mobility-related disabilities from reaching buses.

In some cases, the recommended Rapid service can use existing zones and share a stop with the existing local service in the corridor. In other cases, new bus zones are recommended.

Signal Priority

The Georgia Avenue-7th Street **Metro *EXTRA*** Rapid service is designed to take advantage of the on-going Georgia Avenue signal priority project. This project should increase travel speeds and reliability by providing transit vehicles with extended green signals (either starting the green cycle early or extending a cycle). The system is based on *conditional priority*, which means signals can be set to extend greens only when buses are running behind schedule.

The signal priority system requires special controllers and software to be located within the intersection signal control cases. Controllers are already proposed for all signalized intersections between Rhode Island Avenue and Eastern Avenue except for Rhode Island Avenue and Kansas Avenue. The Georgia Avenue / 7th Street **Metro *EXTRA*** Rapid plan calls for the signal priority system to be extended southward to N Street NW.

Travel Speed and Travel Time

Travel speed estimates were based on existing Metrobus travel speeds. Travel speeds were calculated based on the WMATA Metrobus Passenger and Time Report (collected November 2004-April 2005) for Route 70-71. The existing speeds were then adjusted to take into account the impact of the new stop spacing and of running way improvements.

A peer review of Rapid Bus-type service in other cities was conducted to determine the relationship between travel speed of local service and of Rapid Bus service in the same corridors. The review revealed a wide range of impacts on travel speed. In Los Angeles, the Metro Rapid service showed an increase of 12% to 29% versus local service in the same corridors. In Oakland, AC Transit’s San Pablo Rapid route showed a speed increase of 13%. In Chicago, the “X” Crosstown Express routes showed speed increases of 15% to 40%. In order to be conservative, the speed increase for the proposed Georgia Avenue / 7th Street service was set at 15% to account for the impact of reduced stops, reduced boarding times, and the impact of the signal priority system and other running way improvements.

This travel speed estimate was verified by calculating the travel time for the route based on the maximum possible speed, with delay added for traffic congestion, signal delay, dwell times, and vehicle acceleration and deceleration characteristics. The travel speeds in the calculation were consistent with existing speeds adjusted by 15%, as described above.

Exhibit 20 shows the estimated travel times for the Georgia Avenue-7th Street **Metro EXTRA** Rapid Bus route.

Exhibit 20: Estimated Rapid Bus Speed and Travel Time

Speed and Travel Time	Northbound	Southbound
<u>Average Speed</u>		
AM Peak	9.9 mph	11.5 mph
Midday	7.9 mph	10.1 mph
PM Peak	8.7 mph	11.0 mph
Evening	11.2 mph	13.8 mph
<u>1-Way Travel Time – to Eastern Avenue</u>		
AM Peak	39 minutes	35 minutes
Midday	49 minutes	40 minutes
PM Peak	44 minutes	36 minutes
Evening	35 minutes	29 minutes
<u>1-Way Travel Time – to Silver Spring</u>		
AM Peak	44 minutes	38 minutes
Midday	55 minutes	43 minutes
PM Peak	50 minutes	39 minutes
Evening	39 minutes	32 minutes

Ridership

Ridership projections were made for the full-day service plan. As a conservative ridership estimate, ridership projections from the Regional Bus Study (2003) were used. The Regional Bus Study recommended a Rapid Bus route along Georgia Avenue / 7th Street that was similar to that proposed in this study, albeit with a lower level of service. Forecast ridership in that study was 2,007 daily riders on the Rapid Bus service, partially offset by a loss of 134 daily riders on the local service.

A more aggressive methodology proposed an overall ridership increase in the corridor of 8% (this increase was based on the Regional Bus Plan regional ridership increase due to implementation of Rapid Bus service). Increasing the corridor ridership by 8% increases boardings to 23,760 per day. These boardings were then re-allocated based on the proportion of corridor revenue hours provided by local service (Route 70-71) and by Rapid Service. Thus, because Rapid Bus service accounts for 34% of revenue hours in the corridor on a weekday, 34% of 23,760 equals 8,000 daily riders. Under this methodology, ridership on local service would decrease to 15,750 daily riders.

If service is operating only during the peak periods, ridership would be lower than on the all-day service. According to April 2005 Ridecheck data, 51 percent of all boardings take place in the a.m. and p.m. peak periods for Route 70-71. Using a 51 percent factor for the all-day ridership estimates yields an estimate peak period ridership of 1,024 (conservative method) or 4,080 (aggressive method).

Operating Costs

Operating costs were based on estimated annual revenue hours of service. Revenue hours were generated based on the service plan shown in **Exhibit 15** and the travel speeds shown in **Exhibit 20**. These data were used to estimate daily revenue hours and revenue miles of service. Given that service is assumed only on non-holiday weekdays, daily data was annualized based on the assumption of 255 annual weekdays.

Operating and maintenance (O&M) costs were determined by multiplying the annual revenue hours of service by the WMATA incremental cost for adding a new revenue hour of service. The incremental cost was derived from a WMATA incremental cost for a new platform hour of service. Platform hours were converted to revenue hours based on the ratio of platform to revenue hours for all local Metrobus routes during summer, 2005.

The incremental cost includes all costs related directly to operating service, but does not include some fixed costs that do not change based on additional hours of service being added to the system. The incremental cost per new revenue hour of service is \$90.86.

Exhibit 21 shows the operating statistics for the Georgia Avenue-7th Street route.

Exhibit 21: Operating Statistics for Georgia Avenue-7th Street Metro *EXTRA* Rapid Bus Service

Statistic	Archives-Silver Spring
<i>Peak Period Only Service</i>	
Daily Revenue Miles	695
Annual Revenue Miles	177,000
Daily Revenue Hours	68
Annual Revenue Hours	17,400
Cost / Revenue Hour	\$90.86
Annual O&M Cost	\$1,600,000
<i>All-Day Service</i>	
Daily Revenue Miles	1,300
Annual Revenue Miles	343,000
Daily Revenue Hours	136
Annual Revenue Hours	35,000
Cost / Revenue Hour	\$90.86
Annual O&M Cost	\$3,200,000

Capital Costs

Capital costs include running way improvements (curb bulbouts, signal priority), new bus stops and ITS features, and new buses. The costs included in this section include a full implementation of the recommended service plan. However, while some capital components are necessary for implementation of the service, other projects can be added later.

Components that must be included at the project outset include the following:

- Low-floor buses painted, wrapped, or otherwise distinctively marked to separate them from the existing local service buses
- Bus stops with a distinct flag placed in their ultimate locations
- Marketing materials, including maps

Once service has started, other components can be added as they are ready, including:

- New passenger shelters and ITS features at stops
- Relocation of some local bus stops to the new Rapid stops
- Installation of curb bulb-outs and curb no parking zones
- Activation of the existing Georgia Avenue signal priority system
- Addition of new signalized intersections to the signal priority system

- A more aggressive or extensive marketing and branding strategy

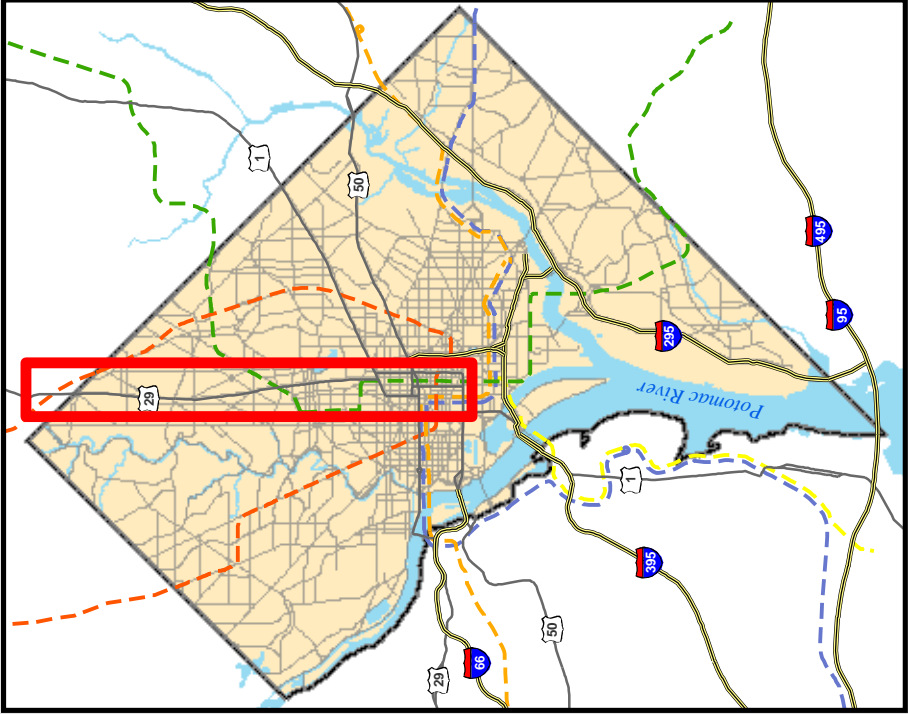
Exhibit 22 shows the capital costs associated with the Georgia Avenue-7th Street **Metro *EXTRA*** Rapid bus corridor.

Exhibit 22: Georgia Avenue-7th Street Metro *EXTRA* Capital Costs

Item	Unit Type	Unit Cost	Number of Units	Total Cost	Cost Source
Archives to Eastern Avenue					
<u>Vehicles</u> Peak Vehicles Spare Vehicles	Bus Bus	\$500,000 \$500,000	10 2	\$5,000,000 \$1,000,000	Recent WMATA bid price for 40', low-floor, alt-fuel (CNG or hybrid) vehicle
<u>Signal Priority</u> Convert intersection to Phased Timing Receivers / Controllers Opticom Transmitters Signal One-Time Costs	Intersection Intersection Bus Lump Sum	\$10,000 \$6,000 \$5,000 \$30,000	4 (N, O, P and Q Streets) 4 (N, O, P and Q Streets) 0 (covered under GA signal priority plan) 0 (covered under GA signal priority plan)	\$40,000 \$24,000 \$0 \$0	Cost estimates provided by DDOT for on-going Georgia Avenue Signal Priority project
<u>Stop Features</u> Curb Bulbouts ITS Features Improved Shelters Stop Flags Striping / Signage	Stop Stop Stop Stop Mile	\$50,000 \$5,000 \$6,000 \$250 \$10,000	4 0 (covered under Ad Shell program) 0 (covered under Ad Shell program) 27 1	\$200,000 \$0 \$0 \$6,750 \$10,000	Regional Bus Study costs used in WMATA Unit Cost Estimates
Total Capital Cost				\$6,280,000	
Archives to Silver Spring					
<u>Vehicles</u> Peak Vehicles Spare Vehicles	Bus Bus	\$500,000 \$500,000	12 2	\$6,000,000 \$1,000,000	Recent WMATA bid price for 40', low-floor, alt-fuel (CNG or hybrid) vehicle
<u>Signal Priority</u> Convert intersection to Phased Timing Receivers / Controllers Opticom Transmitters Signal One-Time Costs	Intersection Intersection Bus Lump Sum	\$10,000 \$6,000 \$5,000 \$30,000	4 (N, O, P and Q Streets) 4 (N, O, P and Q Streets) 0 (covered under GA signal priority plan) 0 (covered under GA signal priority plan)	\$40,000 \$24,000 \$0 \$0	Cost estimates provided by DDOT for on-going Georgia Avenue Signal Priority project
<u>Stop Features</u> Curb Bulbouts ITS Features Improved Shelters Stop Flags Striping / Signage	Stop Stop Stop Stop Mile	\$50,000 \$5,000 \$6,000 \$250 \$10,000	4 0 (covered under Ad Shell program) 0 (covered under Ad Shell program) 28 1	\$200,000 \$0 \$0 \$7,000 \$10,000	Regional Bus Study costs used in WMATA Unit Cost Estimates
Total Capital Cost				\$7,280,000	

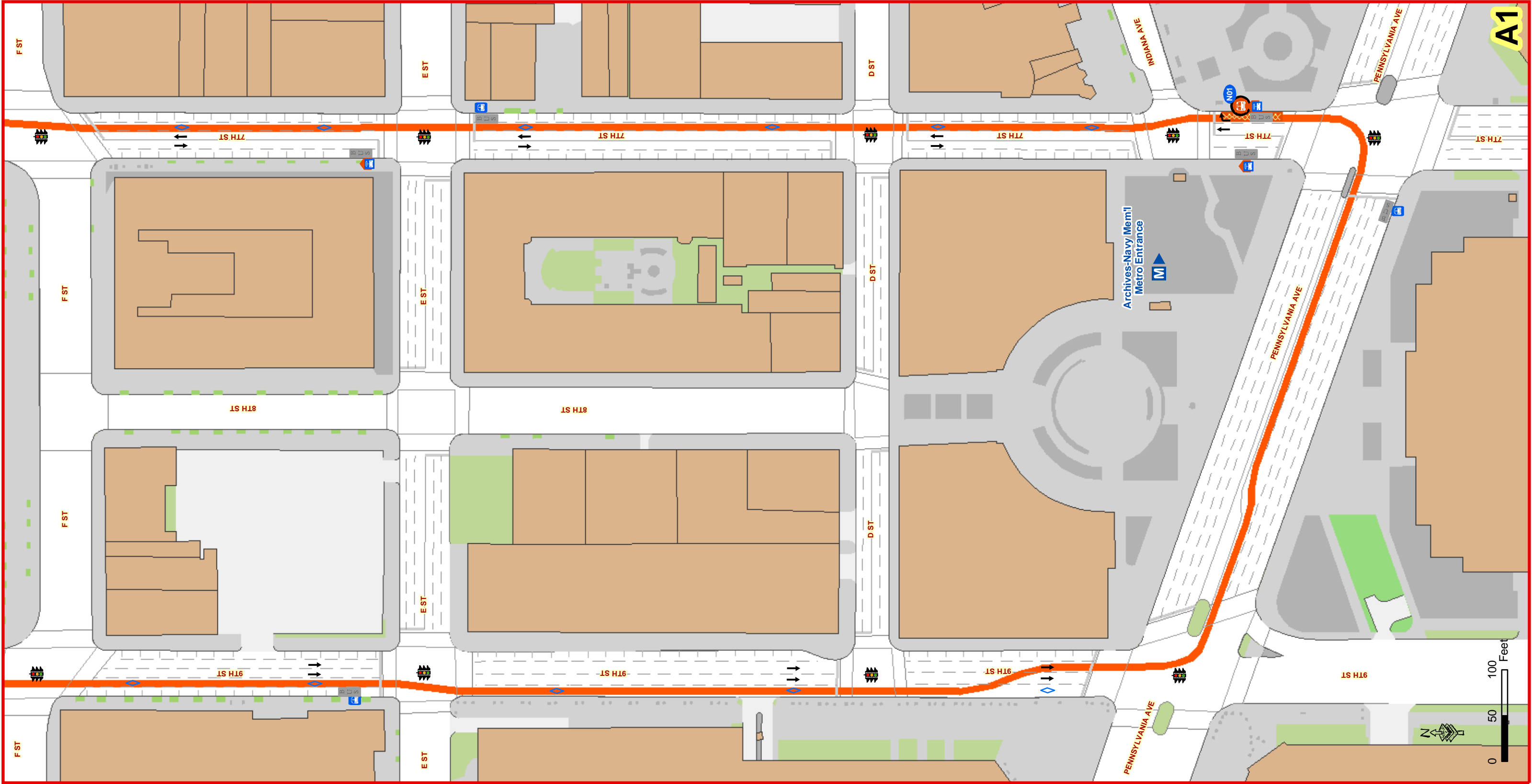
Appendix A

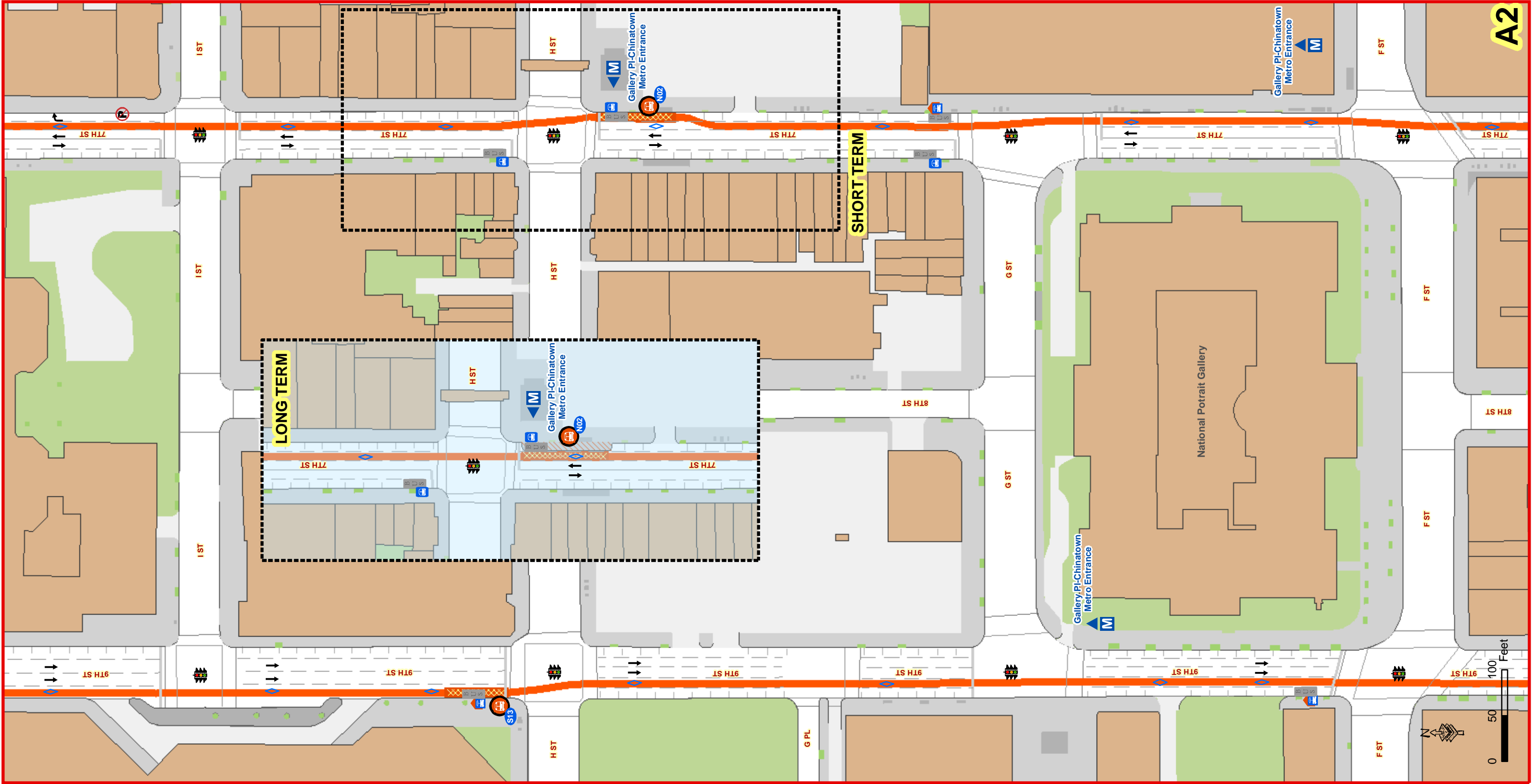
Georgia Avenue-7th Street Corridor
Proposed Rapid Bus Service

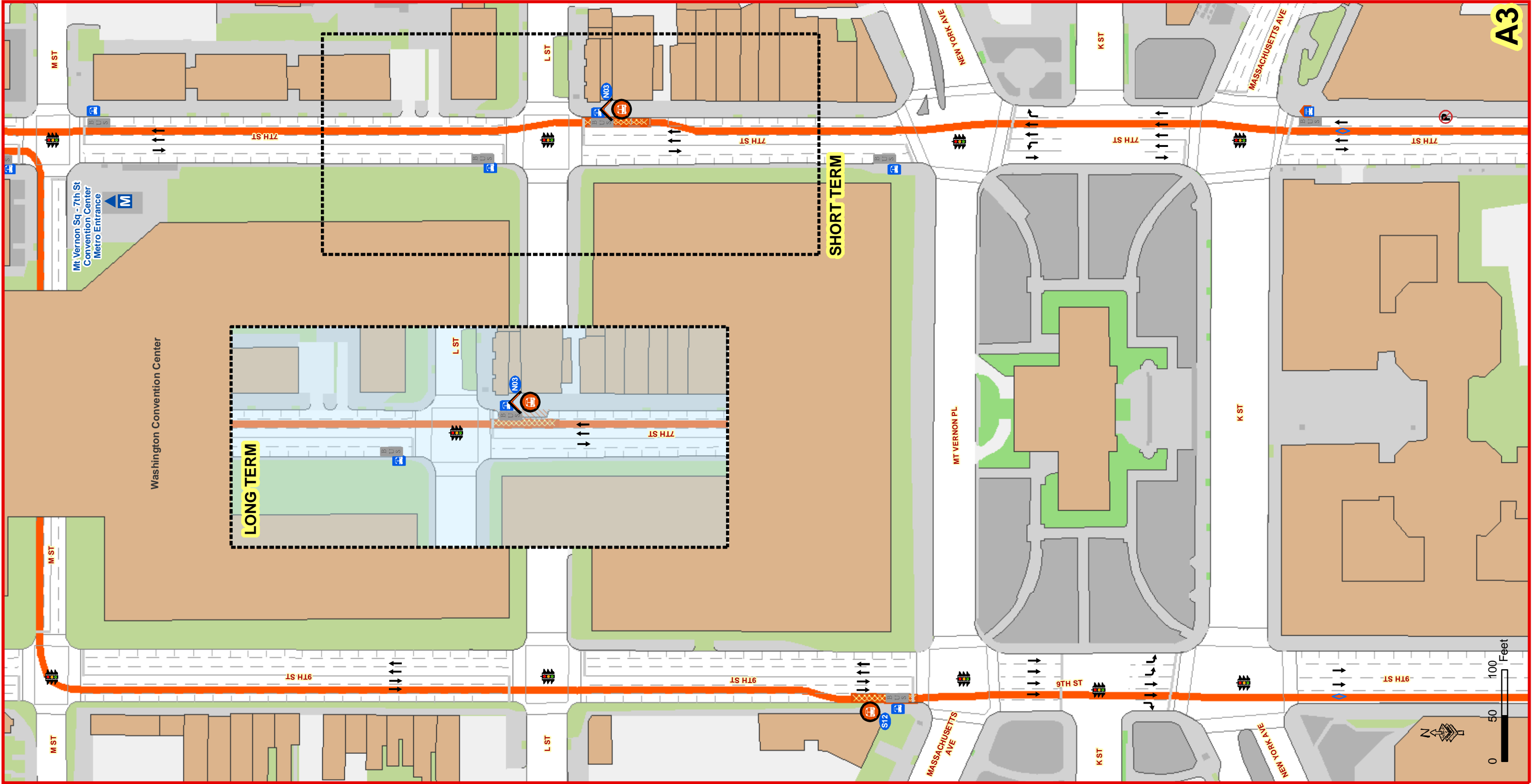


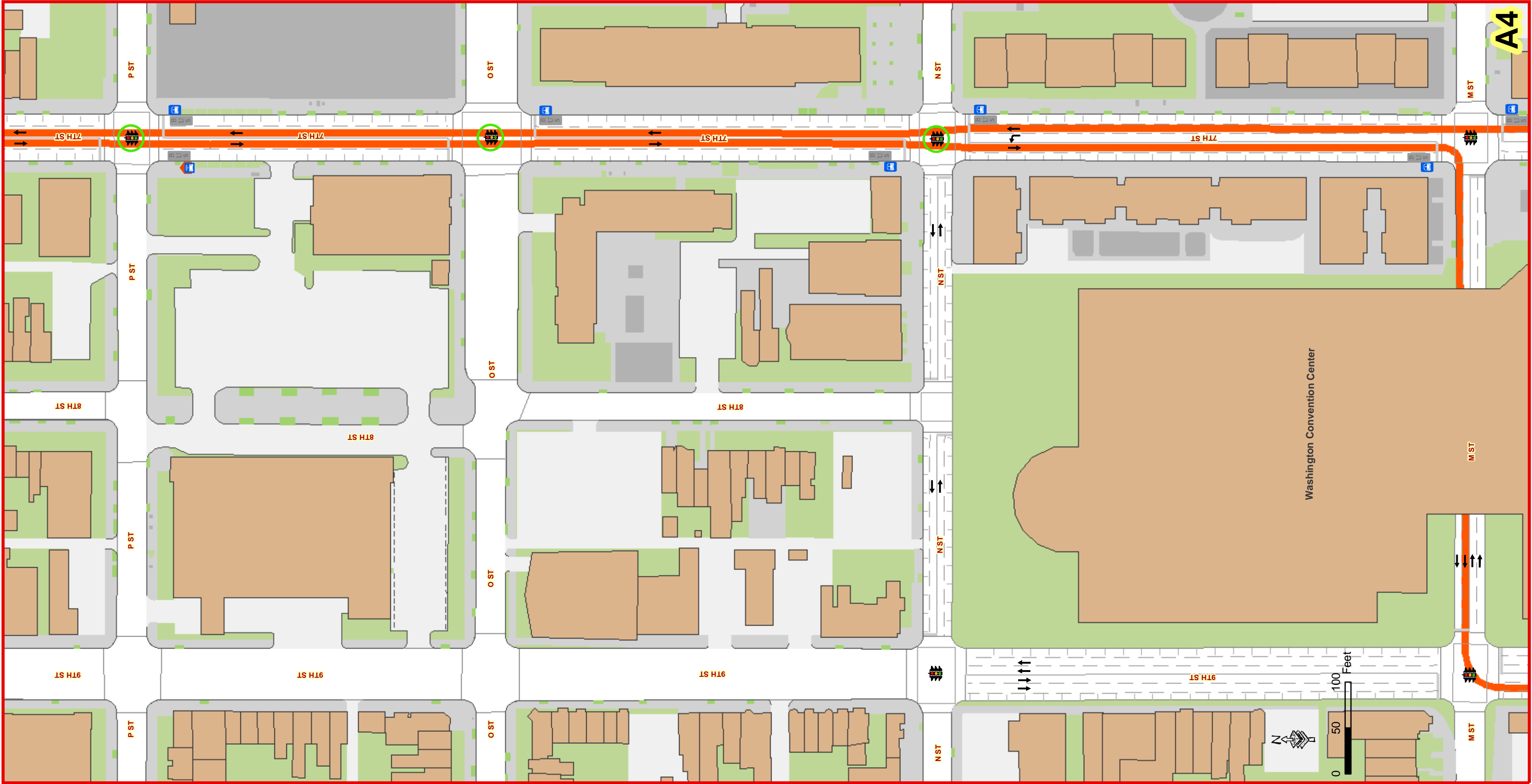
Legend

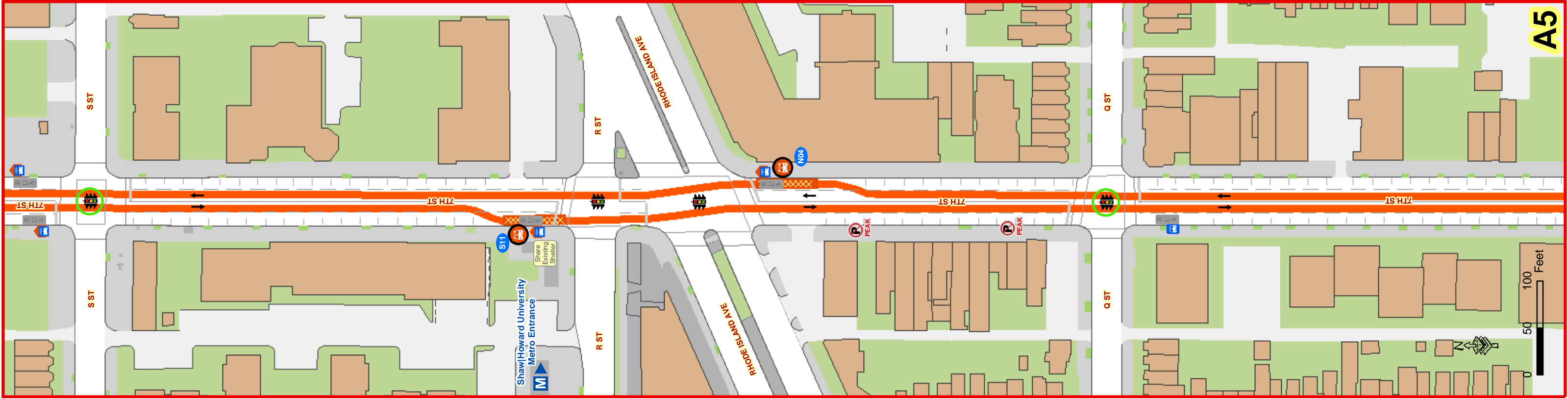
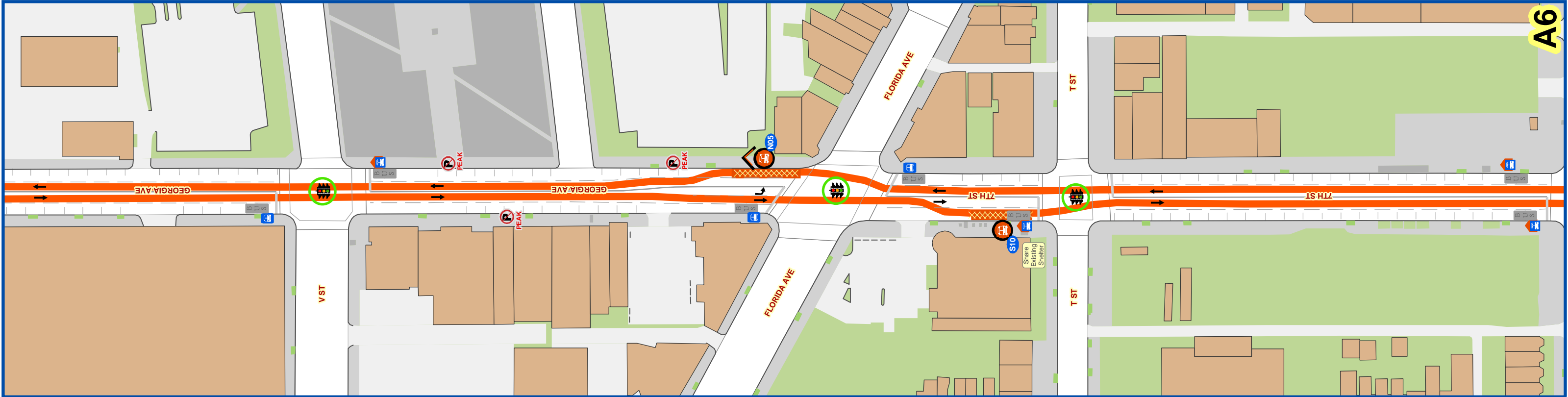
- Proposed Rapid Bus Stop
- Proposed Rapid Bus Stop with Shelter
- Proposed Rapid Bus Route
- Proposed Rapid Bus Stop BusZone
- Proposed Rapid Bus Stop Bulbout
- Existing Bus Stop
- Existing Bus Stop with Shelter
- Existing Bus Zone (No Parking)
- Traffic Signal
- Proposed Signal Priority
- Metro Entrance
- Building
- Sidewalk (public)
- Exclusive Bus Lane
- No Parking at Any Time
- No Parking in Peak Hours
- Rapid Bus Stop Index Number

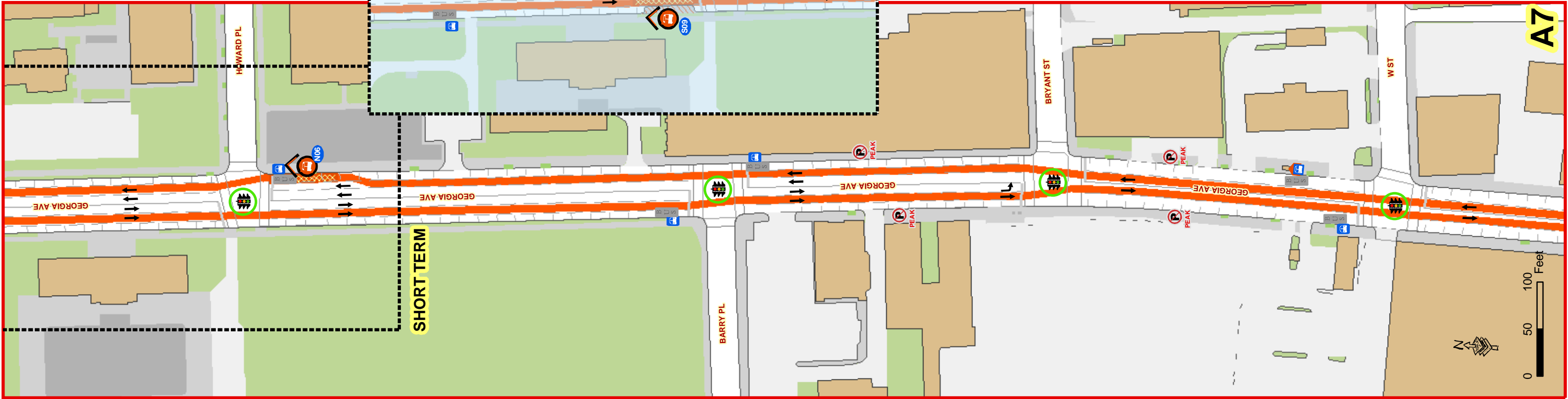
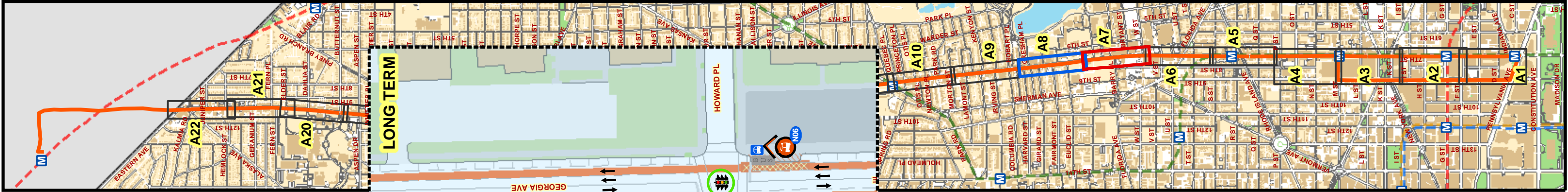
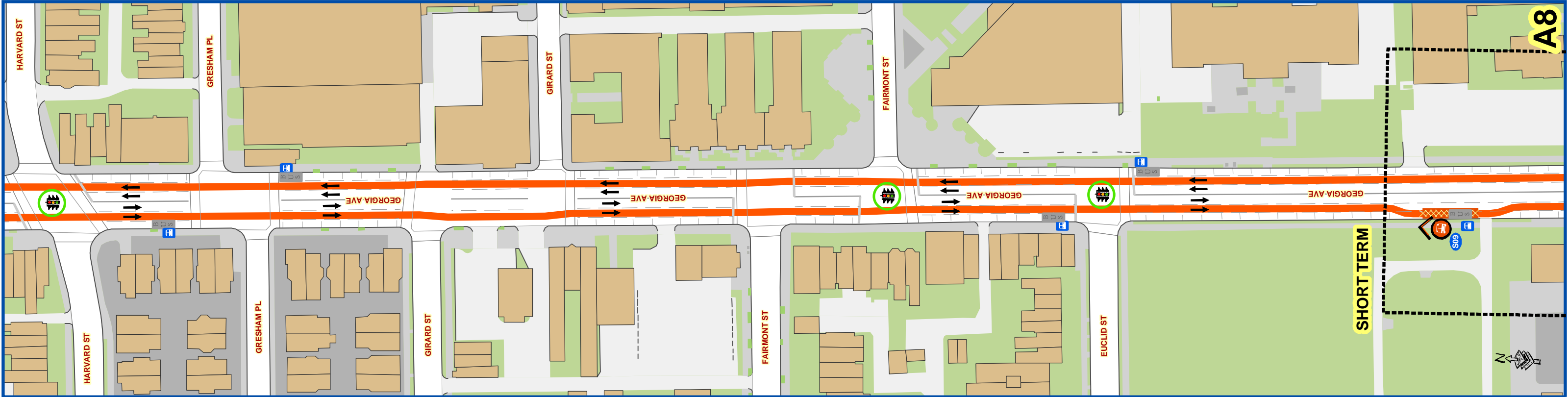


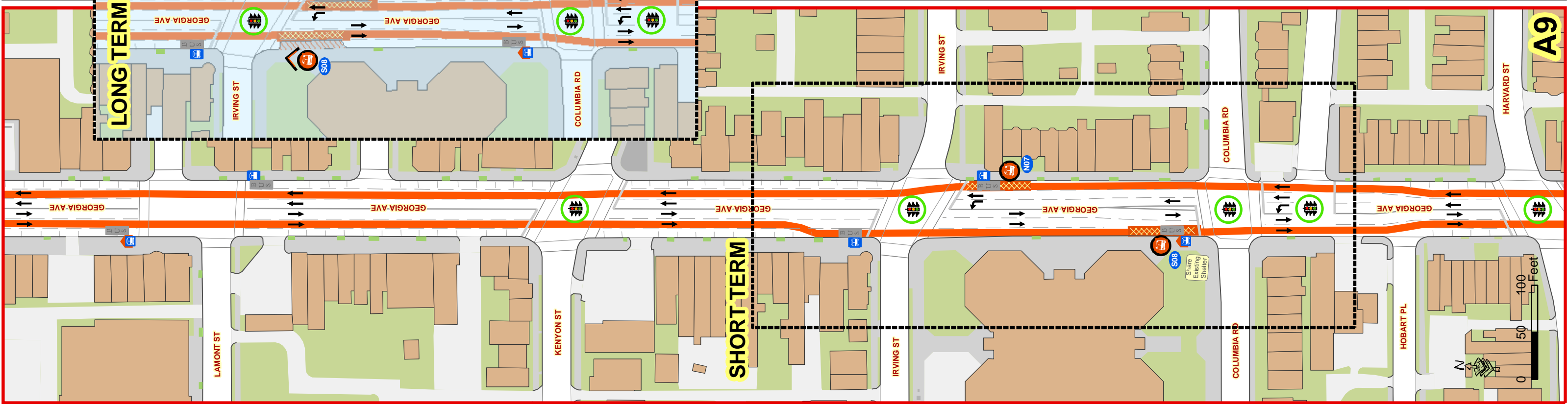
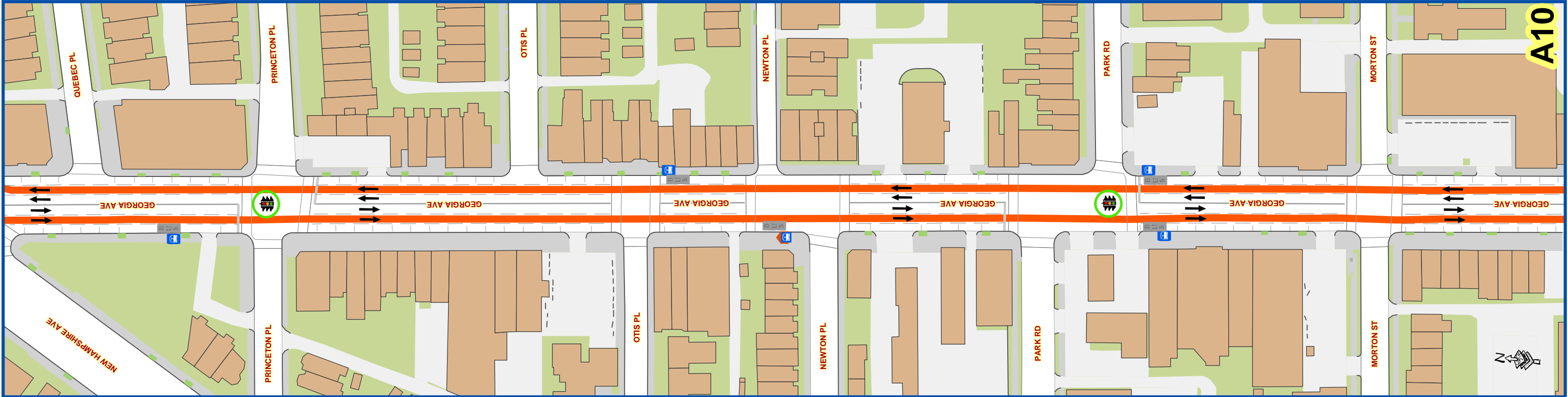


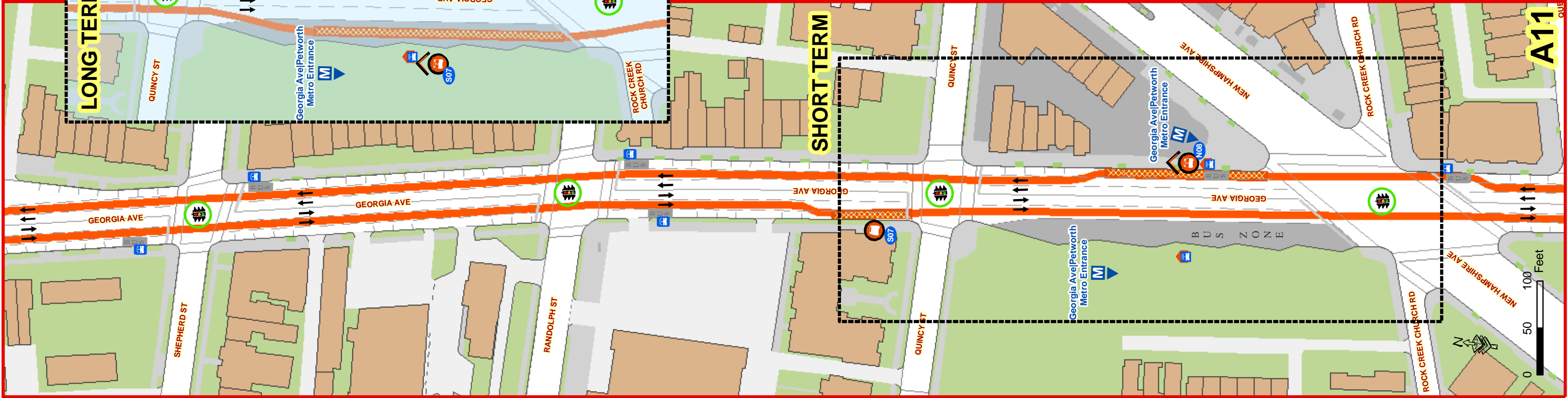
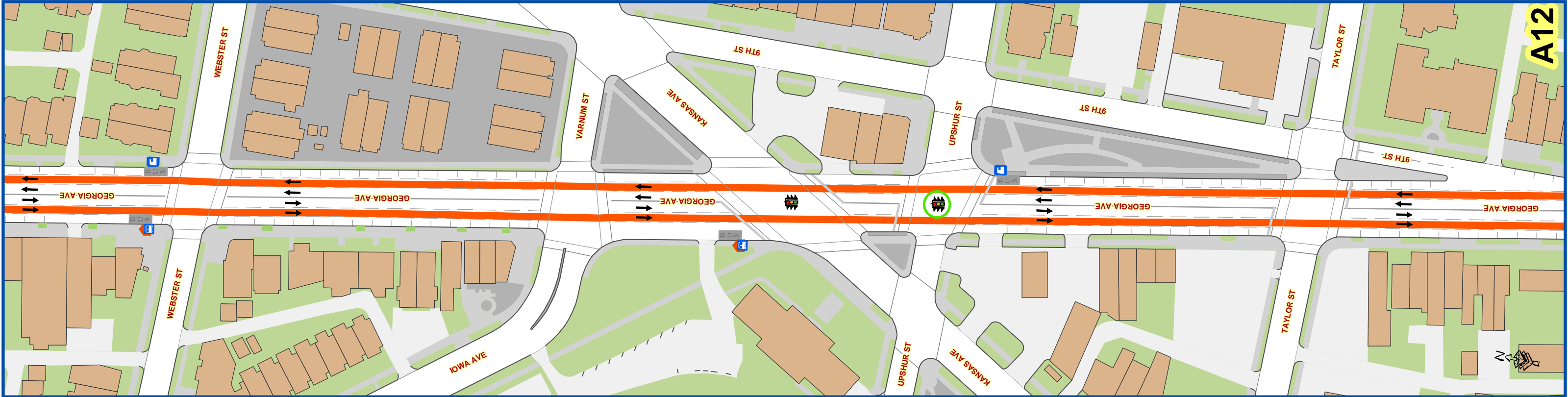


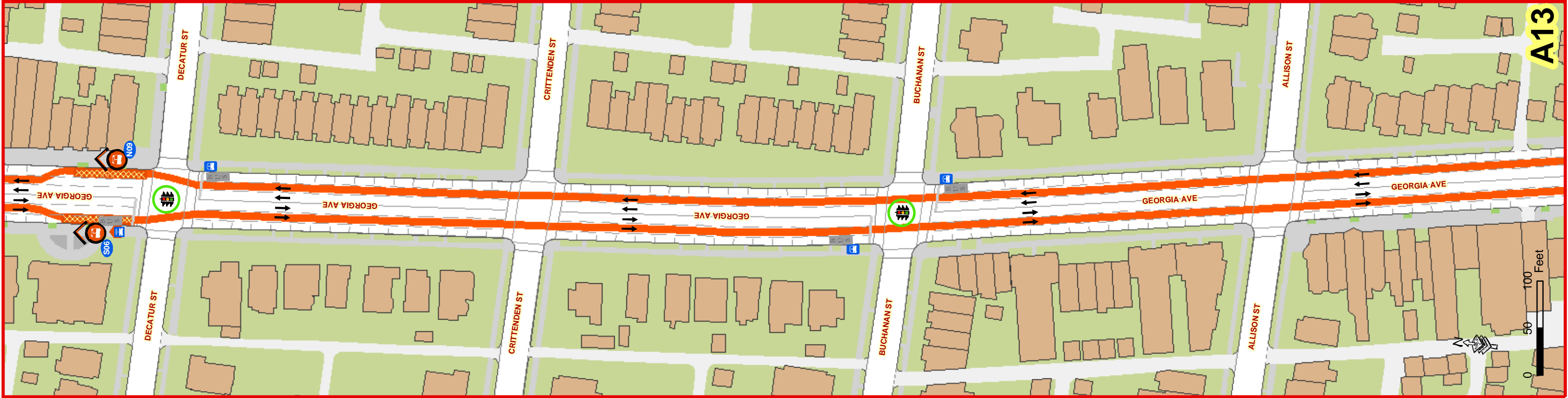
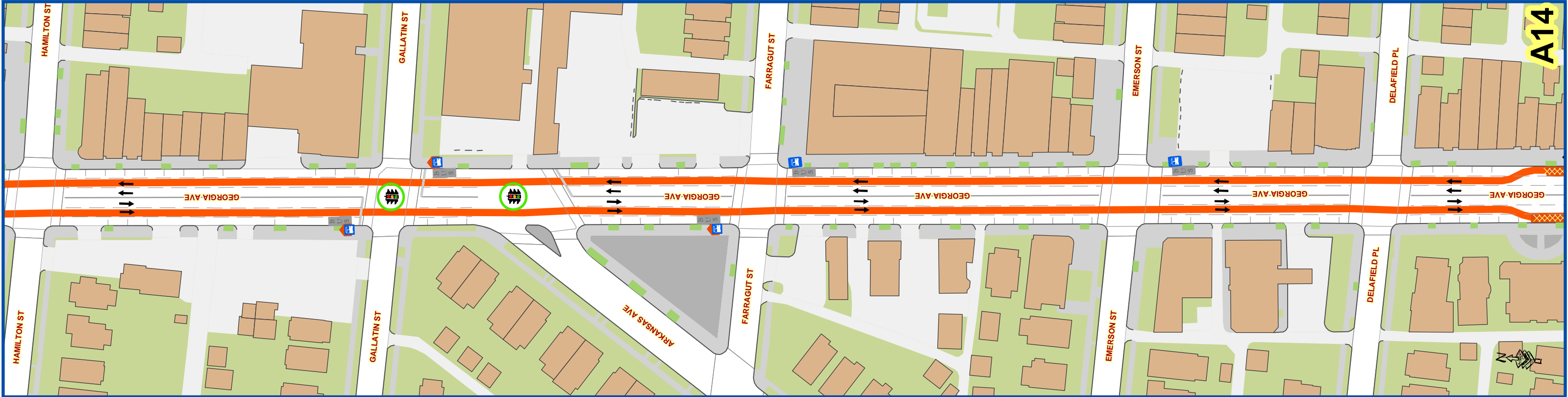


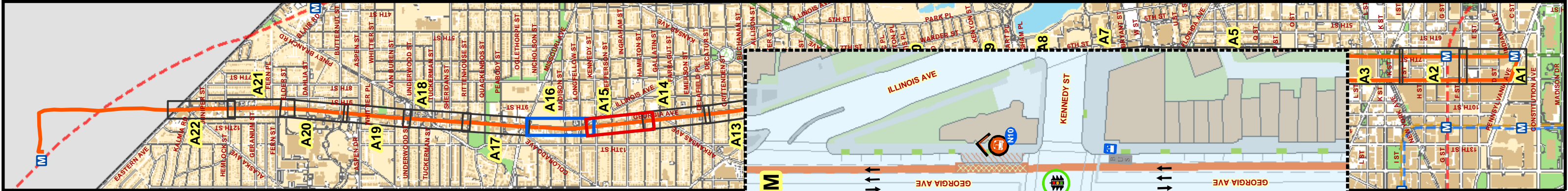
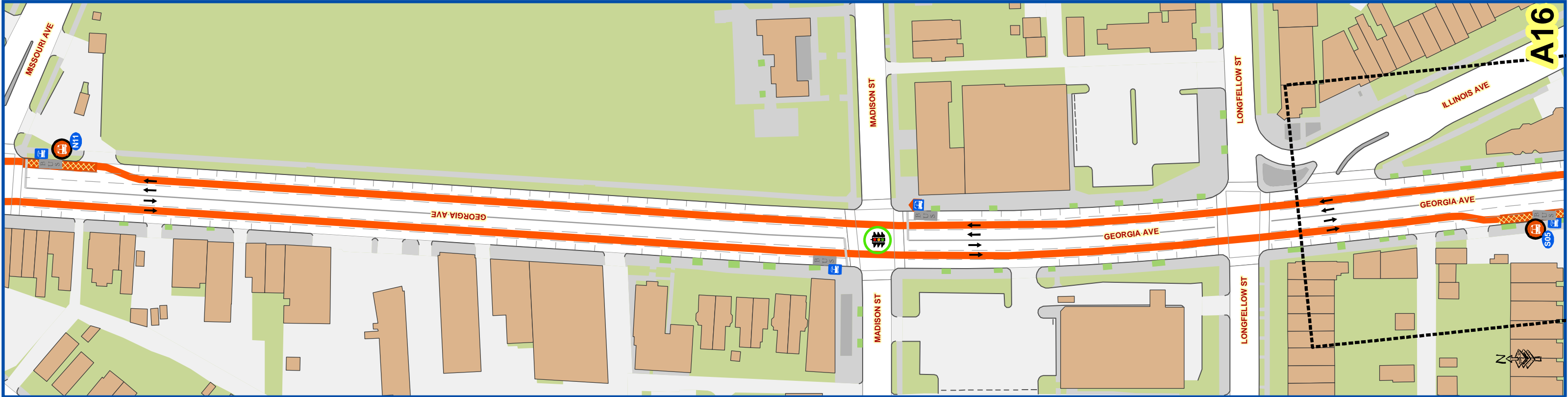


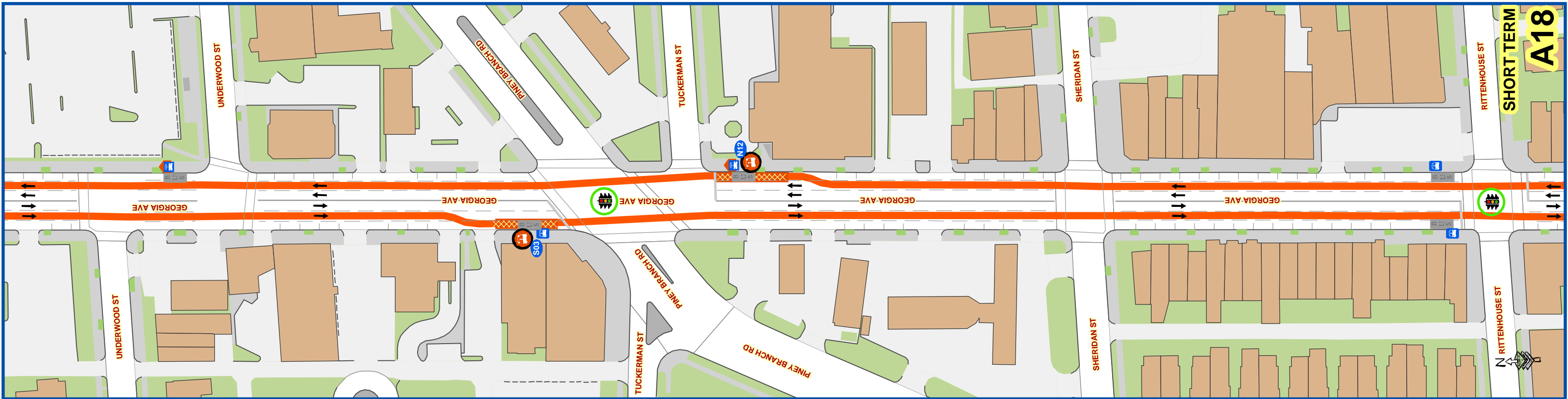
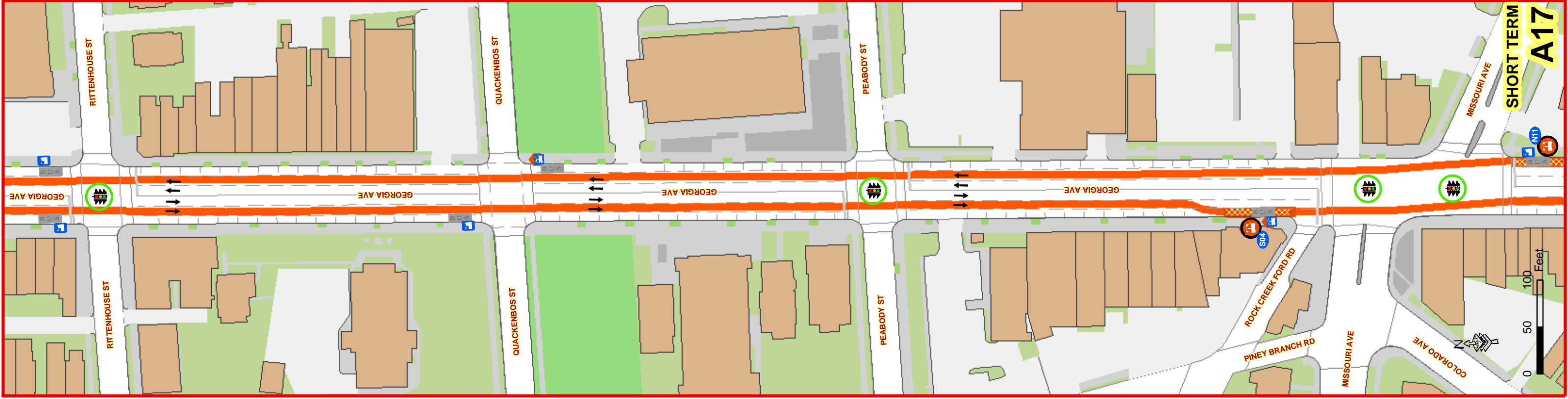


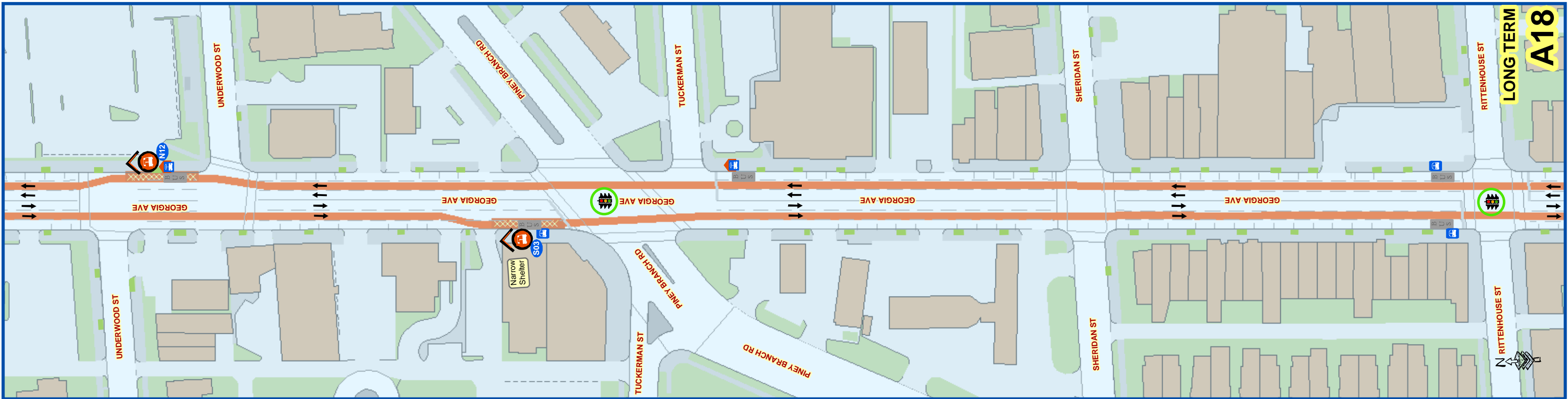
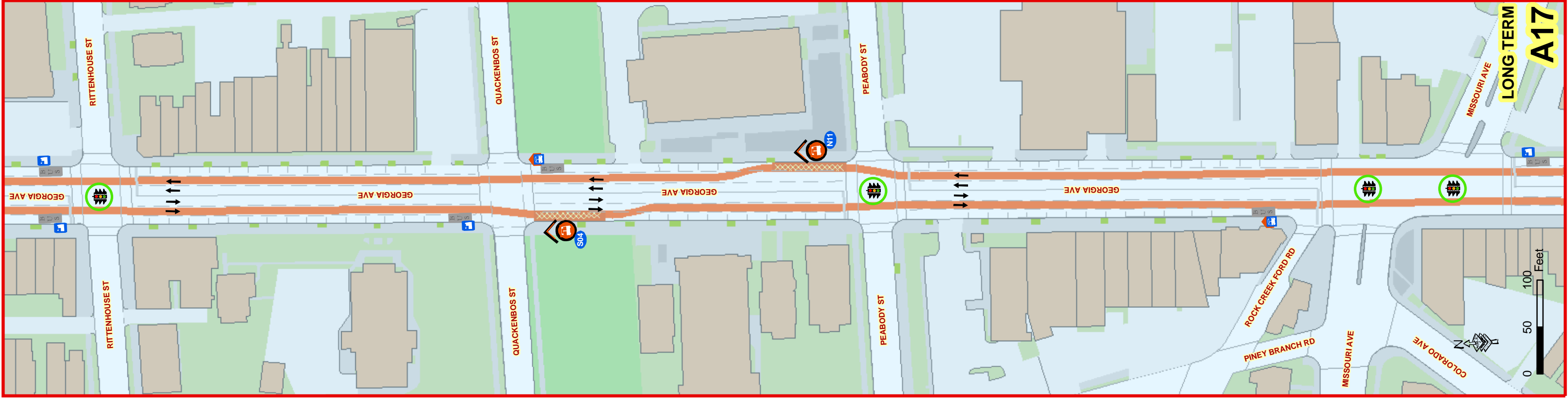


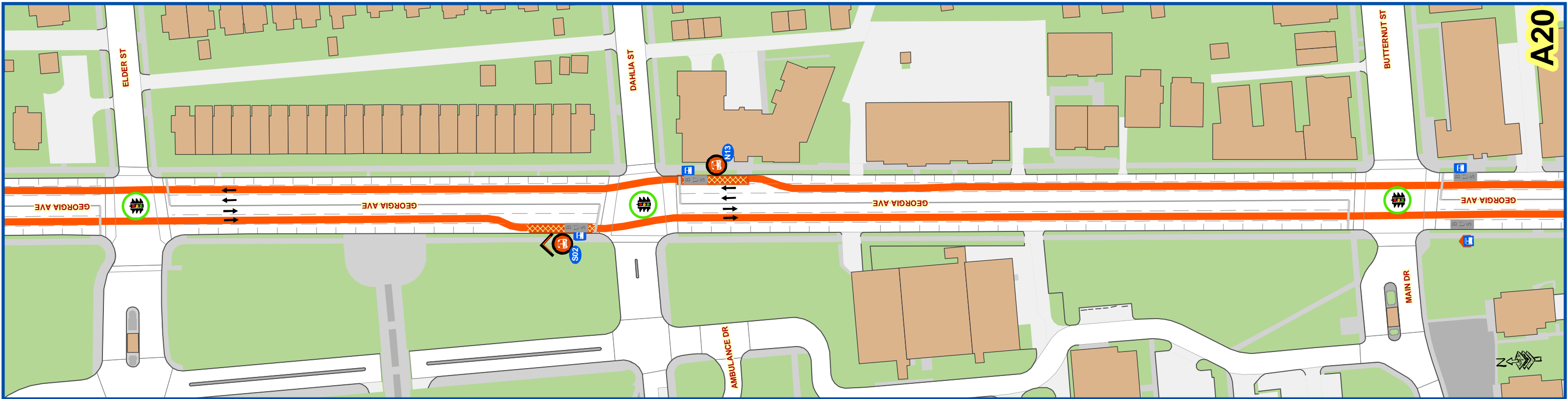
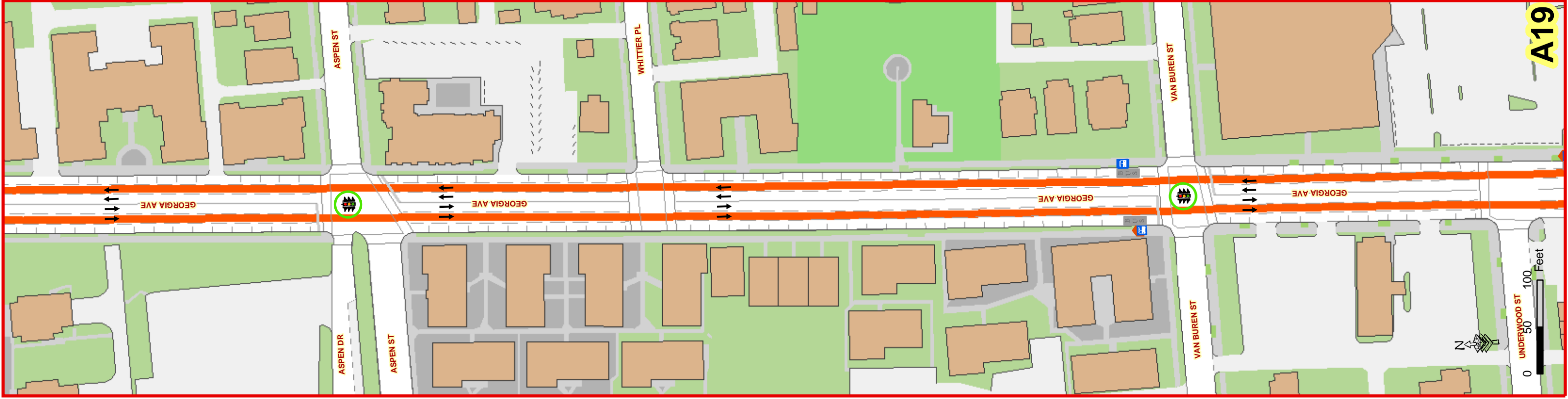


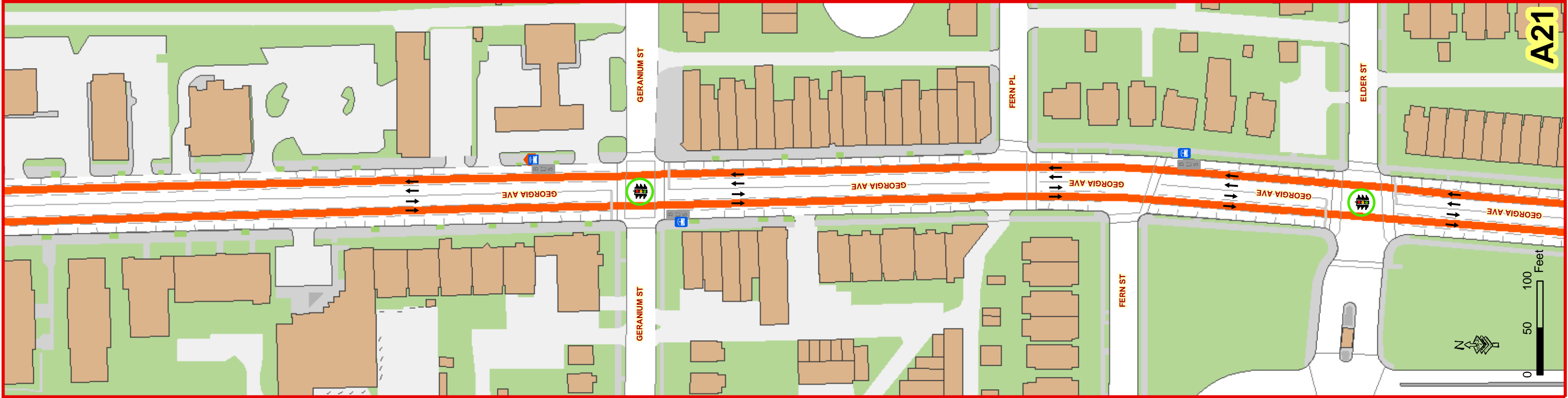
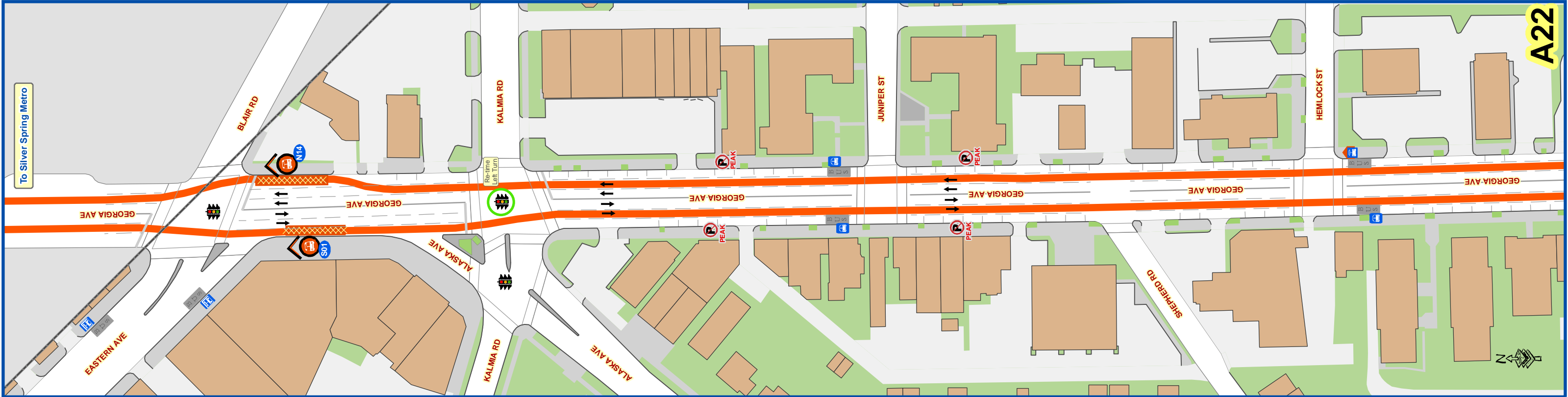












Appendix B

Georgia Ave-7th Street Corridor

Pictures of Existing Conditions

at

Rapid Bus Stop Locations



S13

Gallery Place

Southbound Stop at 9th St just north of H Street.

Existing Shelter: 5'0" x 13'0"

Sidewalk width: 15'6"



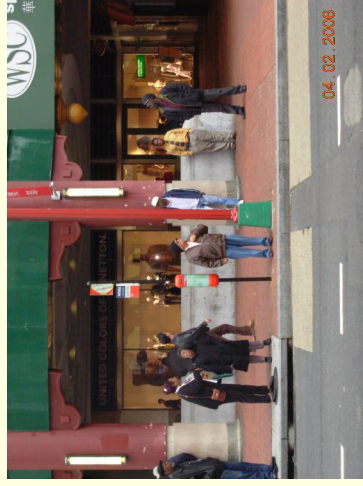
N02

Gallery Place

Northbound Stop on 7th Street just south of H Street.

No Existing Shelter

Sidewalk width: 17'0"



N01

Archives

Northbound Stop on 7th St btw Pennsylvania and Indiana Ave.

Existing Shelter: 5'6" x 9'0"

Sidewalk width: 39'0"



S11

Shaw

Southbound Stop on 7th St just north of R St.

Existing Shelter: 5'6" x 13'0"

Sidewalk Width: 17'9"



S12

Mount Vernon Sq.

Southbound Stop on 9th St just north of Massachusetts Ave

Mount Vernon Sq.

No Existing Shelter



N04

Shaw

Northbound Stop on 7th St just south of Rhode Island Ave.

Existing Shelter: 6'0" x 13'0"

Sidewalk Width: 18'6"



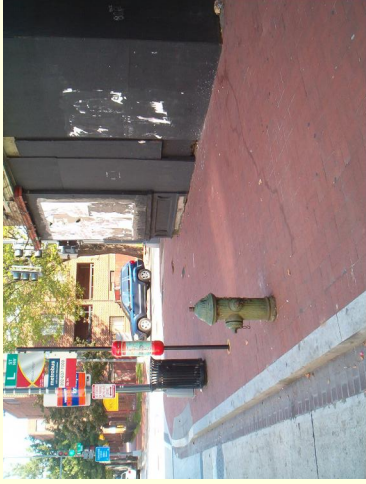
N03

Mount Vernon Sq.

Northbound Stop on 7th St just south of L Street.

No Existing Shelter

Sidewalk Width: 14'6"



S09

Howard University.

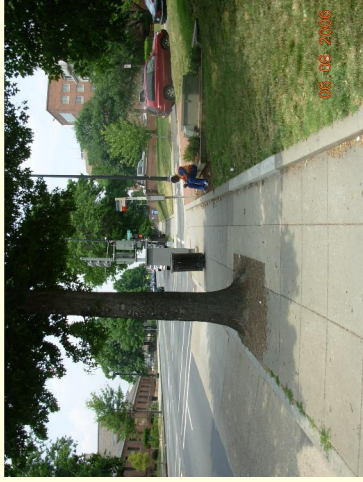
Southbound Stop on Georgia Ave
south of Euclid St.



N06

Howard University.

Northbound Stop on Georgia Ave
just south of Howard Pl.
No Existing Shelter
Sidewalk Width: 9'10"



S10

Florida Ave.

Southbound Stop on 7th St just north
of T St.

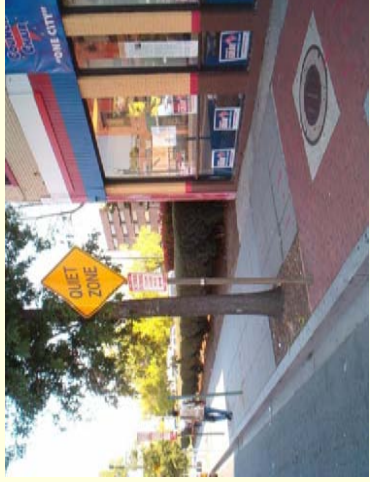
Existing Shelter: 5'0" x 9'0"
Sidewalk Width: 17'9"



N05

Florida Ave.

Northbound Stop on Georgia Ave
just north of Florida Ave.
Sidewalk Width: 11'2" - 14'9"



S07

Petworth

Southbound Stop on Georgia Ave
just north of Quincy St
No Existing Shelter
Sidewalk Width: 11'8"



N08

Petworth

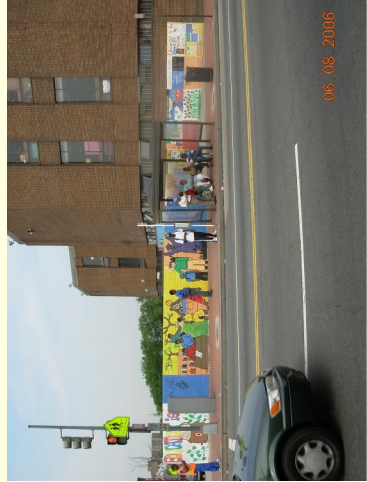
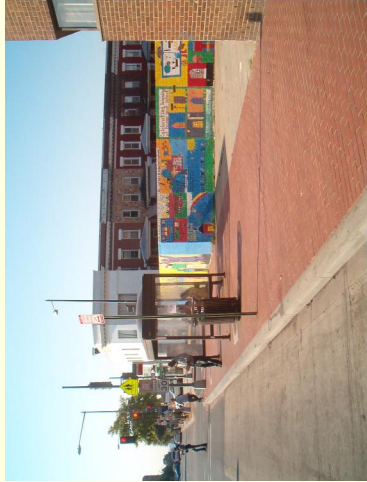
Northbound Stop on Georgia Ave
just north of New Hampshire Ave at
Petworth Metro Station
Sidewalk Width: 15'0"



S08

Irving

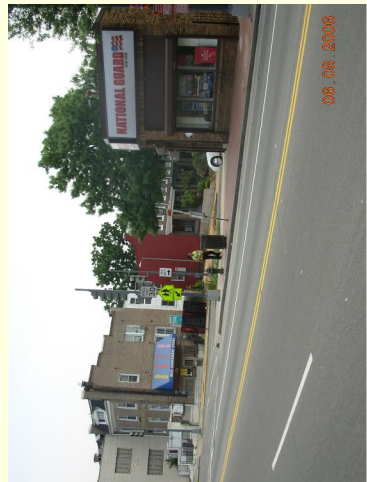
Southbound Stop on Georgia Ave
just north of Columbia Rd.
Existing Shelter: 6'0" x 12'0"
Sidewalk Width: 15'0"



N07

Irving

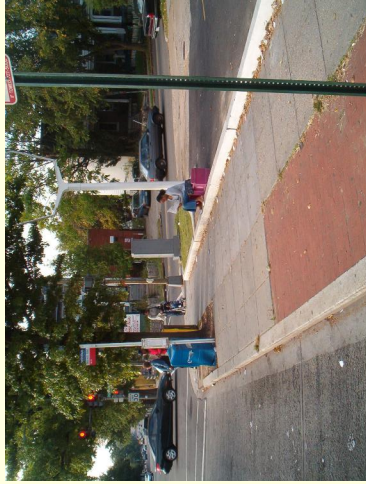
Northbound Stop on Georgia Ave
just south of Irving St
No Existing Shelter
Sidewalk Width: 10'0"



S05

Kennedy

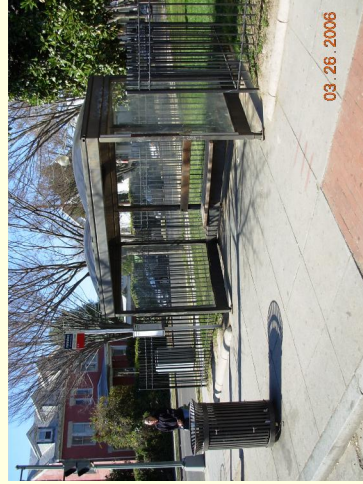
Southbound Stop on Georgia Ave
just north of Kennedy St
No Existing Shelter
Sidewalk Width: 12'0"



S06

Decatur

Southbound Stop on Georgia Ave
just north of Decatur St
Existing Shelter: 6'0" x 12'0"
Sidewalk Width: 12'0"



N10

Kennedy

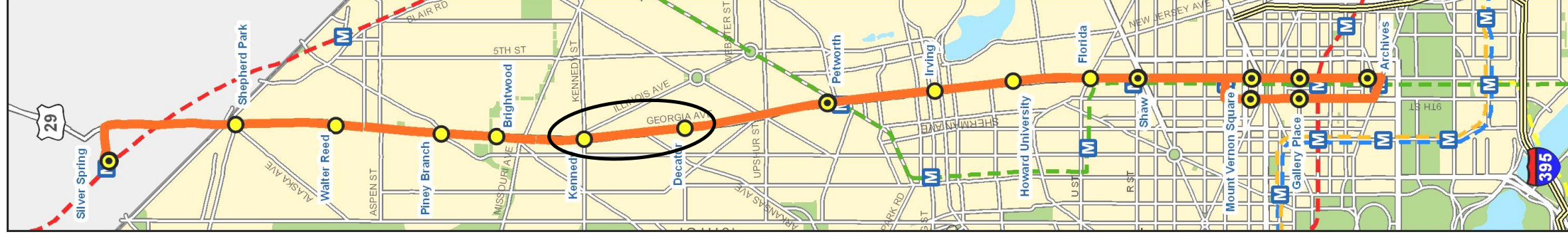
Northbound Stop on Georgia Ave
just south of Kennedy St.
No Existing Shelter
Sidewalk Width: 11'11"



N09

Decatur

Northbound Stop on Georgia Ave
just north of Decatur St
No Existing Shelter
Sidewalk Width: 18'10"



S03

Piney Branch

Southbound Stop on Georgia Ave
just north of Piney Branch Rd.
Sidewalk Width: 14'10"



S04

Brightwood

Southbound Stop on Georgia Ave
just north of Rock Creek Ford Rd.
Existing Shelter: 4'0" x 12'0"
Sidewalk Width: 14'6"



N12

Piney Branch

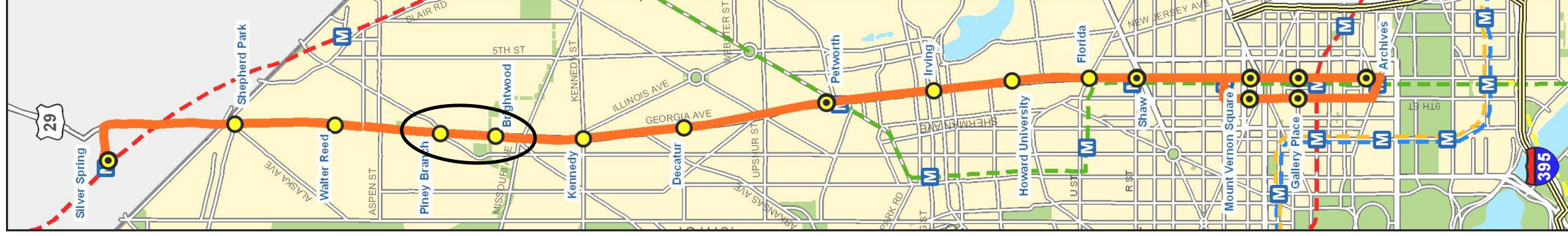
Northbound Stop on Georgia Ave
just south of Tuckerman Rd.
Sidewalk Width: 14'8"



N11

Brightwood

Northbound Stop on Georgia Ave
just south of Missouri Ave.
No Existing Shelter
Sidewalk Width: 14'0"



S01

Sheppard Park

Southbound Stop on Georgia Ave
just south of Eastern Ave.

No Existing Shelter
Sidewalk Width: 23'0"



N14

Sheppard Park

Northbound Stop on Georgia Ave
just south of Blair Rd.

No Existing Shelter
Sidewalk Width: 12'0"



S02

Walter Reed

Southbound Stop on Georgia Ave
just north of Dahlia St

No Existing Shelter
Sidewalk Width: 12'0"



N13

Walter Reed

Northbound Stop on Georgia Ave
just south of Dahlia St.

No Existing Shelter
Sidewalk Width: 11'10"



Appendix C

Metro *EXTRA*

Georgia Ave-7th Street Corridor

Requested DDOT Improvements at
Rapid Bus Stop Locations

