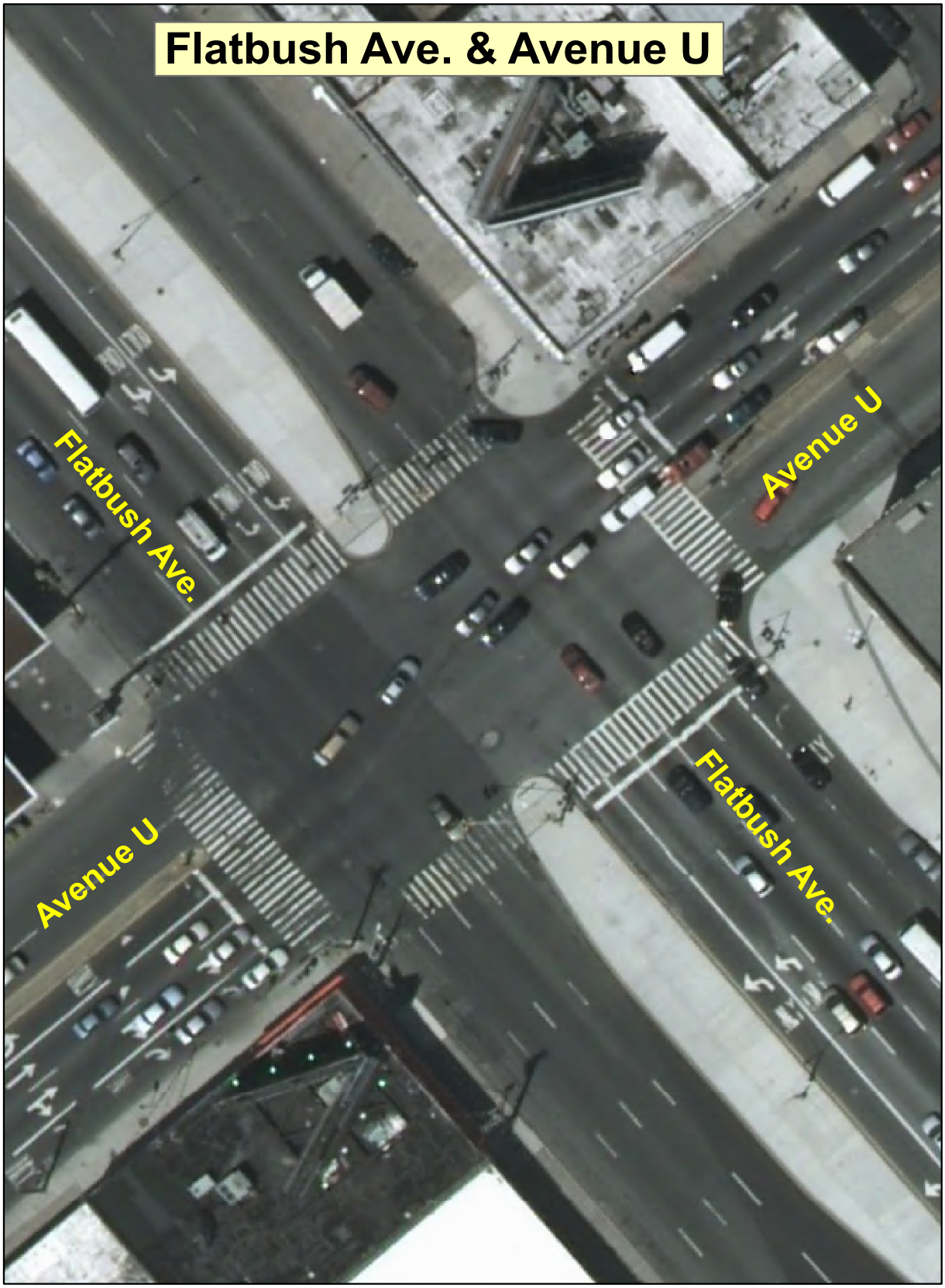
Location: Flatbush Avenue and Avenue U



Intersection of Flatbush Avenue and Avenue U

Description of Existing Conditions

Flatbush Avenue is very wide at this location with a width of 145 ft and six travel lanes, in each direction of traffic. Dedicated left and right turning lanes are provided (two lanes for each type of turn in the northbound and southbound directions). The sidewalks along this main arterial are 13 – 14 ft wide. However at the southeast corner the sidewalk is 42 ft wide then merges into a plaza in front of the shopping mall.

Avenue U on the other hand is 85 ft wide with four travel lanes in each direction which are divided into a left turn lane, one through lane, one through-right turn lane and a right turn lane. The sidewalks on Avenue U are 10 - 14 f t wide.

Medians are located in the middle of the roadway for both arterials.

The vehicular volumes are heavy on both streets at this intersection while pedestrian volumes are light but with a steady flow. This location can be considered more of a destination with the Kings Plaza shopping mall and a concentration of big retail stores in the area. Many of the pedestrians observed on the sidewalks come in general from the buses and vans that unload/load passengers heading to/from the shopping mall and the retail stores in the area.

Level of Service Analysis (LOS)

- Vehicle Analysis

The capacity analysis shows that all approaches at this intersection operate at LOS C or worse for all peak hours. However the intersection approaches operating at LOS D or worse have more than 35 seconds of delay (See Table C-11- Intersection LOS).

- Pedestrian Analysis

An analysis of the sidewalks at Flatbush Avenue and Avenue U indicates that the pedestrian LOS generally operates at a comfortable LOS A during all peak periods. Table C-12: “Sidewalks Level of Service” presents a summary of the LOS results and Appendix D-1 “LOS Methodology and Vehicular and Pedestrian Traffic Volumes” has a diagram showing the numbering system for the walkways analyzed at this intersection.

The corners and crosswalks of this intersection operate at LOS A for the four peak periods analyzed (See Table C-13: Crosswalks Level of Service and Table C-14: Corners Level of Service).

Table C-11 - Sidewalks Level of Service

Intersection	Lane Approach	AM			MD			PM			SAT MD		
Flatbush Avenue and Avenue U		V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
	Eastbound												
	L	0.75	52.2	D	0.67	45.5	D	1.00	90.7	F	0.74	48.0	D
	TR	0.50	34.5	C	0.62	39.3	D	0.56	35.8	D	0.44	35.3	D
	R	0.27	30.8	C	0.30	33.4	C	0.28	31.0	C	0.21	32.0	C
	Westbound												
	L	0.89	59.7	E	0.70	44.6	D	1.00	78.3	E	0.46	35.5	D
	TR	0.53	34.6	C	0.57	37.5	D	0.70	38.7	D	0.49	35.8	D
	Northbound												
	L	0.34	31.9	C	0.32	31.4	C	0.36	35.7	D	0.35	32.0	C
	T	1.00	64.1	E	0.82	44.4	D	1.01	63.6	E	0.64	38.0	D
	R	0.94	69.1	E	0.83	55.2	E	0.99	75.8	E	0.80	50.7	D
	Southbound												
	L	0.27	37.9	D	0.31	33.2	C	0.29	41.4	D	0.36	33.2	C
	TR	0.68	38.5	D	0.71	39.3	D	0.95	52.9	D	0.62	37.1	D
		Inters. Delay = 48.3		LOS = D	Inters. Delay = 41.2		LOS = D	Inters. Delay = 56.2		LOS = E	Inters. Delay = 38.0		LOS = D

Table C-12 - Sidewalks Level of Service

Intersection	Walkway	AM 15 Min Vol. Two-Way	AM Effective Walkway Width	AM Pedestrian Flow Rate p/m/f	AM Pedestrian Flow Rate LOS	MD 15 Min Vol.	MD Pedestrian Flow Rate p/m/f	MD Pedestrian Flow Rate LOS	PM 15 Min Vol.	PM Pedestrian Flow Rate p/m/f	PM Pedestrian Flow Rate LOS	SAT 15 Min Vol.	SAT Pedestrian Flow Rate p/m/f	SAT Pedestrian Flow Rate LOS
Flatbush Avenue and Avenue U	1	63	13.9	0.3	A	86	0.4	A	77	0.4	A	79	0.4	A
	2	141	15.2	0.6	A	150	0.7	A	131	0.6	A	127	0.6	A
	3	91	12.9	0.5	A	141	0.7	A	116	0.6	A	121	0.6	A
	4	113	13.4	0.6	A	116	0.6	A	93	0.5	A	86	0.4	A
	5	151	43	0.3	A	233	0.4	A	281	0.5	A	294	0.6	A
	6	38	13.8	0.2	A	55	0.3	A	48	0.2	A	30	0.1	A
	7	80	14.8	0.4	A	36	0.2	A	60	0.3	A	60	0.3	A
	8	49	10	0.3	A	38	0.3	A	36	0.2	A	23	0.2	A

Table C-13- Crosswalks Level of Service

Intersection	Crosswalk	AM Crosswalk Space SF/P	AM Crosswalk Space LOS	MD Crosswalk Space SF/P	MD Crosswalk Space LOS	PM Crosswalk Space SF/P	PM Crosswalk Space LOS	SAT Crosswalk Space SF/P	SAT Crosswalk Space LOS
Flatbush Avenue and Avenue U	North	136.8	A	92.1	A	118.9	A	99.8	A
	East	60.8	A	81.9	A	71.8	A	80.7	A
	South	119.0	A	88.6	A	130.6	A	208.1	A
	West	175.6	A	277.7	A	275.4	A	354.2	A

Table C-14 - Corners Level of Service

Intersection	Corner	AM SF/P	AM LOS	MD SF/P	MD LOS	PM SF/P	PM LOS	SAT SF/P	SAT LOS
Flatbush Avenue and Avenue U	Northwest	152.1	A	119.8	A	132.7	A	193.1	A
	Northeast	106.6	A	81.8	A	78.7	A	121.6	A
	Southeast	96.1	A	74.1	A	75.5	A	137.3	A
	Southwest	196.9	A	162.8	A	186.2	A	411.2	A

Pedestrian Accident Data 2004 -2006
14 pedestrian accidents

Table: C-15 – Summary of Pedestrian Accidents

Accident Location	Year	Time	Pedestrian Action	Pedestrian Location	Vehicle Action
Avenue U	8/23/2004	daylight	crossing with signal	at intersection	making a right turn
Avenue U	9/28/2004	night, rain	crossing with signal	at intersection	making a left turn
Avenue U	11/2/2004	night	crossing with signal	at intersection	making a left turn
Avenue U	1/11/2005	night, wet surface	crossing with signal	at intersection	making a left turn
Avenue U	5/31/2005	daylight	crossing with signal	at intersection	making a right turn
Avenue U	10/22/2005	daylight, wet	emerged from behind parked vehicle	at intersection	going straight ahead
Avenue U	2/4/2006	daylight, rain	crossing against signal	at intersection	going straight ahead
Avenue U	6/2/2006	daylight, wet surface	crossing against signal	at intersection	making a left turn
Avenue U	9/17/2006	daylight	crossing with signal	at intersection	making a left turn
Avenue U (2 peds injured)	10/6/2006	daylight, rain	other actions in roadway	at intersection	stopped in traffic
Avenue U	9/1/2006	daylight	crossing against signal	at intersection	making a left turn
Avenue U	11/24/2006	dusk	crossing with signal	at intersection	making a right turn

Problems and Opportunities

- Pedestrian conflicts with left turning vehicles
  Vehicles located in the dedicated left turning lanes make their turn during a protected left turn signal phase for 10 – 13 seconds. However left turning vehicles are also allowed to make a left turn when the traffic light is green for through traffic. During this phase the left turn arrow is not lit. This creates conflicts between pedestrians crossing and vehicles turning left. In this situation, drivers do not always yield to pedestrians and often speed up as they rush to make the left turn as heavy volumes of vehicles in the opposite direction arrive at the intersection which represents a dangerous situation for pedestrians (See Appendix D-1 for traffic volumes at this intersection).

  In addition 50% of the pedestrian accidents that occurred at this intersection from 2004 - 2006 happened as pedestrians were crossing with the signal while a vehicle was making a left or right turn (see above pedestrian accident data).

- Pavement Markings
  In general they are in good condition, but the markings of the northbound travel lanes south of the intersection have faded markings.

- Pedestrian Amenities
  There are no trees along the medians and on the sidewalks at all approaches of the intersection

- Pedestrian refuge/median
  The medians or pedestrian refuge on Avenue U stop just before the crosswalk. They are 4ft wide and are not ADA (American Disability Act) accessible which leave pedestrians and wheelchair users stranded in the crosswalk waiting for the next green phase to cross.

Recommendations

- Future Restriction of Turns
  Due to major vehicular and pedestrian conflicts affecting pedestrian's safety at this intersection, it is possible that left turns by vehicles may have to be restricted in the future, especially on Flatbush Avenue. This would require reconfiguration of the intersection and new signal timing.

- Increase Enforcement
  An increase in police presence is recommended for this location for enforcement of traffic regulations.

- Improve Pavement Markings
  Repair and restripe pavement markings of the northbound travel lanes south of the intersection

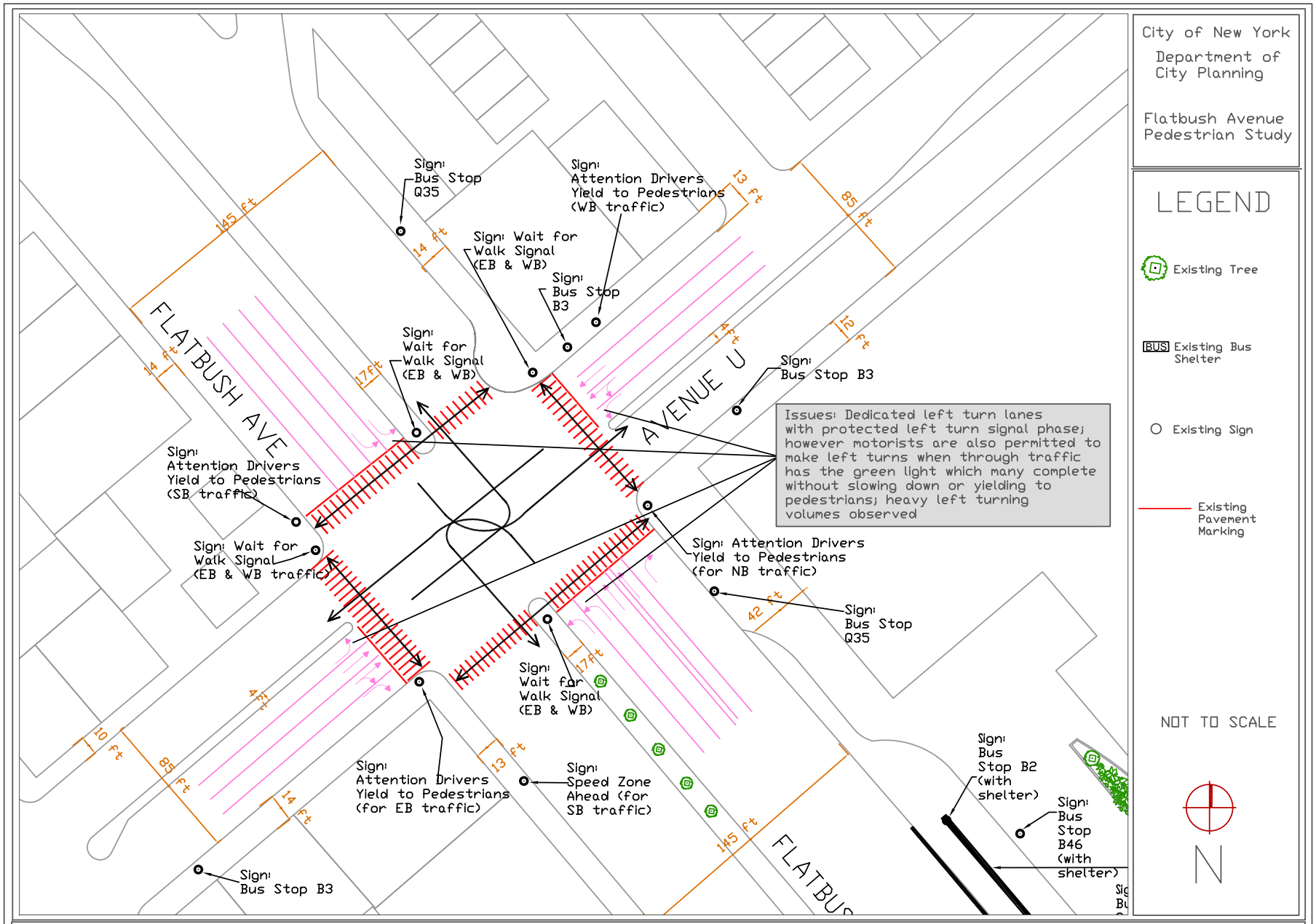
- Provide Additional Pedestrian Amenities
  Have trees/planters and landscaping along the medians and on the sidewalks where possible.

Consideration for the Future

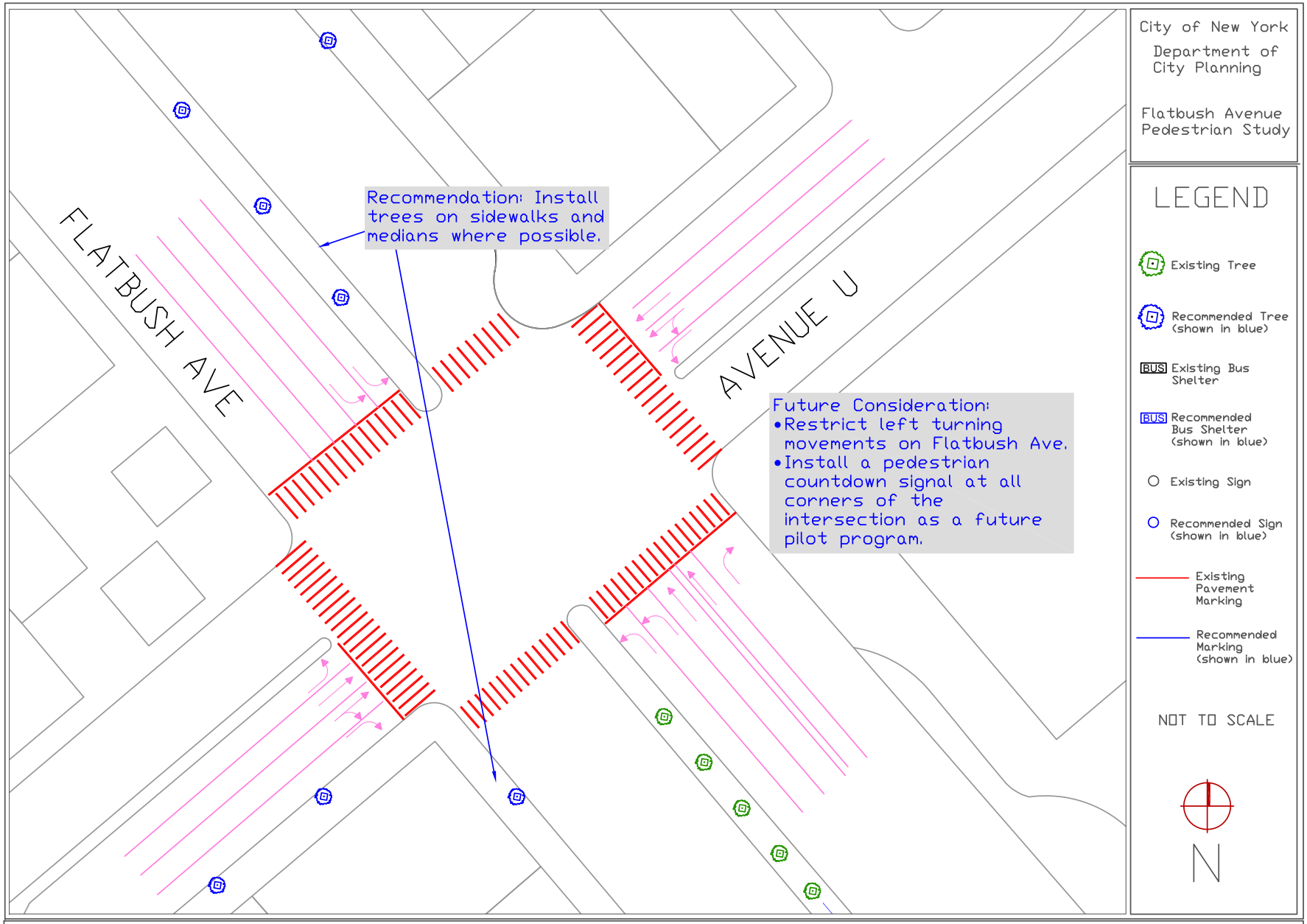
Recommendation for a Countdown Pedestrian Signal

The installation of a countdown pedestrian signal is recommended for consideration at Flatbush Avenue and Avenue U, to reduce conflicts between pedestrians crossing and vehicles making turns. This type of traffic signal can provide pedestrians with information about the amount of time remaining in a crossing interval and can improve pedestrian signal compliance. This pedestrian countdown signal is recommended as a future pilot program.

Currently New York City Department of Transportation (NYCDOT) is conducting a study and a pilot program of countdown pedestrian signals at 24 intersections. This pilot program has been expanded and will also take place along selected busy corridors in all five boroughs. This study is to be completed in the fall of 2008 (Source: DOT Press Release on 11/8/07).



Flatbush Avenue and Avenue U
Existing Conditions - Figure: C-3a



Flatbush Avenue and Avenue U
Recommendations - Figure: C-3b