5. PEDESTRIAN AND BICYCLE ANALYSES

5.1 Introduction

Person trips generated by land uses within the study area contain a walking component either at the beginning or end of each trip. Each of these person trips can contribute to the pedestrian volumes on sidewalks and in crosswalks. In general, the trips are dispersed in residential and industrial areas but tend to be more concentrated where there are significant commercial/retail activities, office or institutional facilities, or transportation hubs. This is evident in the study area where there is significant pedestrian activity along Brighton Beach Avenue (between Ocean Parkway and Coney Island Avenue) and 86th Street (between Bay Parkway and Stillwell Avenue) where a concentration of commercial/retail enterprises exists. It is also evident at the intersections of Coney Island Avenue/Brighton Beach Avenue, McDonald Avenue/Kings Highway, Surf Avenue/Stillwell Avenue, 86th Street/Bay Parkway, and McDonald Avenue/86th Street/Avenue X where there are major transit stops and transfer points.

5.2 Existing Pedestrian Analysis

To assess pedestrian activities in the study area, pedestrian counts were conducted during the AM (8:00 – 9:00), midday (1:00 – 2:00 PM), and PM (5:00 – 6:00 PM) peak hours during weekdays; as well as during the weekend (Saturday) peak hour. Additional counts were conducted in Coney Island during the summer months (weekdays and weekends from 7:00 – 9:00 PM) to evaluate pedestrian activity in the recreational areas of the peninsula. The summer weekday and weekend counts were conducted during late evening hours with the assumption that amusement area activities would peak during these hours. Counts were conducted at 32 intersections - regular weekday counts were conducted at 24 intersections and weekend counts were conducted at 11 of these intersections; summer counts were conducted at eight intersections. The count locations are listed below and shown in Figure 5-1.

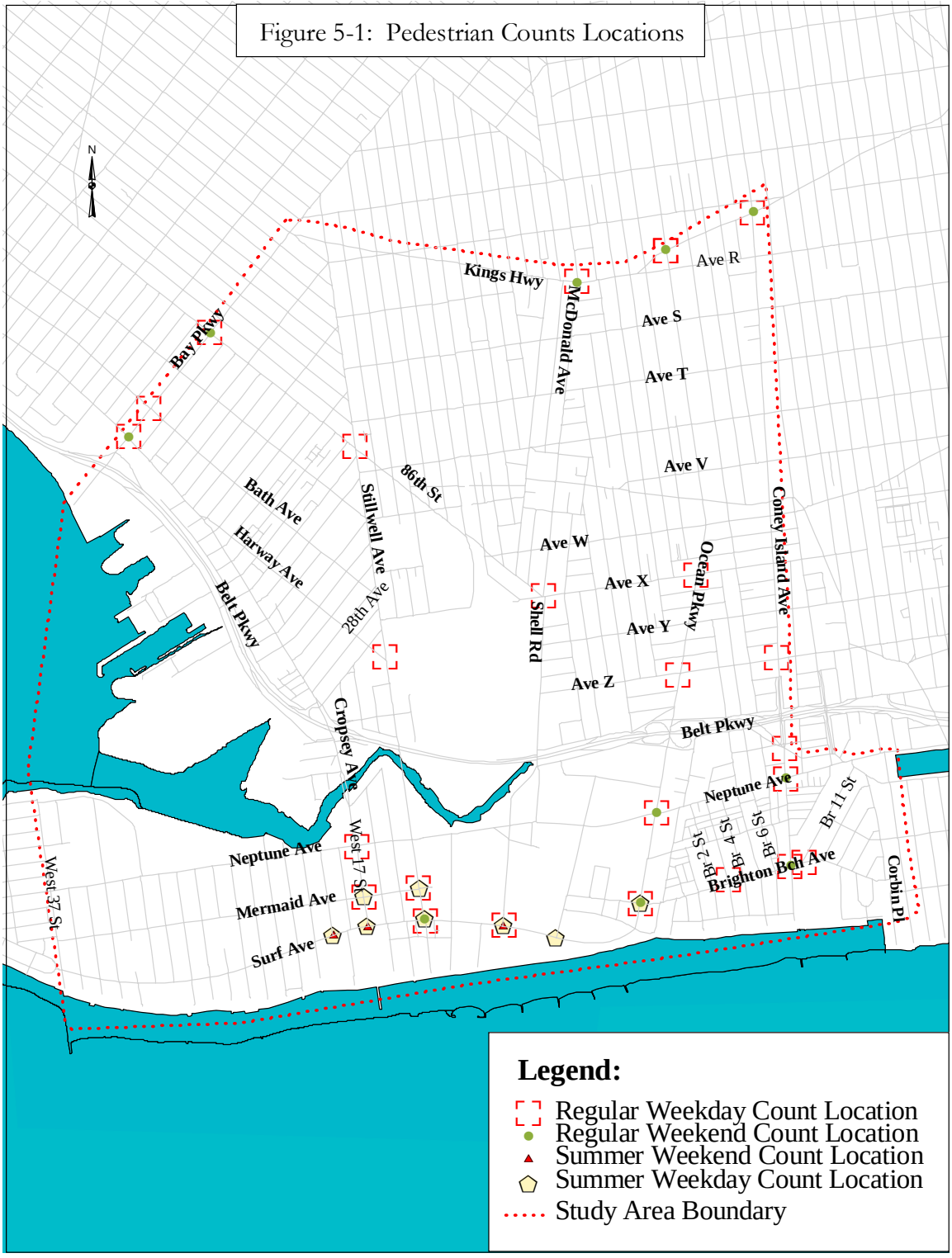


Figure 5-1: Pedestrian Counts Locations
N
Kings Hwy
McDonald Ave
Ave R
Ave S
Ave T
Ave V
Ave W
Ave X
Ave Y
Ave Z
Bay Pkwy
Bath Ave
Harway Ave
Belt Pkwy
Stillwell Ave
86th St
28th Ave
Shell Rd
Ocean Pkwy
Coney Island Ave
Belt Pkwy
Cropsey Ave
Neptune Ave
West 17 St
West 37 St
Mermaid Ave
Surf Ave
Neptune Ave
Br 11 St
Br 6 St
Br 4 St
Br 2 St
Brighton Bch Ave
Corbin Pl
Legend:
Regular Weekday Count Location
Regular Weekend Count Location
Summer Weekend Count Location
Summer Weekday Count Location
Study Area Boundary

Pedestrian Count Locations

Regular Weekday

1. Kings Highway/Ocean Parkway
2. Kings Highway/McDonald Avenue
3. Kings Highway/Coney Island Avenue
4. Bay Parkway/86th Street
5. Harway Avenue/Stillwell Avenue
6. McDonald Avenue/86th Street/Avenue X/Shell Road
7. Ocean Parkway/Avenue X
8. Ocean Parkway/Avenue Z
9. Coney Island Avenue/Neptune Avenue
10. Cropsey Avenue/Neptune Avenue/West 17th Street
11. Mermaid Avenue/Stillwell Avenue
12. Surf Avenue/Stillwell Avenue
13. West 8th Street/Surf Avenue
14. West 17th Street/Mermaid Avenue
15. Coney Island Avenue/Guider Avenue (Belt Parkway Entrance)
16. Coney Island Avenue/Brighton Beach Avenue
17. Ocean Parkway/Brighton Beach Avenue
18. Brighton Beach Avenue/Brighton 11 Street
19. 86th Street/Stillwell Avenue
20. Bay Parkway/Bath Avenue
21. Bay Parkway/Cropsey Avenue
22. Neptune Avenue/Ocean Parkway
23. Coney Island Avenue/Avenue Z
24. Brighton Beach Avenue/Brighton 4 Street

Regular Weekend

1. Coney Island Avenue/Brighton Beach Avenue
2. Coney Island Avenue/Neptune Avenue
3. Coney Island Avenue/Kings Highway
4. Ocean Parkway/Kings Highway
5. Ocean Parkway/Neptune Avenue
6. Ocean Parkway/Brighton Beach Avenue

7. Bay Parkway/86th Street
8. Bay Parkway/Cropsey Avenue
9. McDonald Avenue/Kings Highway
10. Surf Avenue/Stillwell Avenue

Summer Weekday

1. Surf Avenue/West 8th Street
2. Stillwell Avenue/Surf Avenue
3. West 17th Street/Mermaid Avenue
4. Ocean Parkway/Brighton Beach Avenue
5. Stillwell Avenue/Mermaid Avenue
6. Surf Avenue/West 5th Street
7. Surf Avenue/West 21st Street
8. Surf Avenue/West 17th Street

Summer Weekend

1. Surf Avenue/West 17th Street
2. Surf Avenue/West 21st Street
3. Surf Avenue/West 8th Street

The following intersections had the highest crosswalk pedestrian volumes during the AM, midday, and PM peak hours for regular weekdays:

1. Kings Highway/Coney Island Avenue (730, 1,139, 1,331)
2. Bay Parkway/86th Street (1,177, 1,303, 2,610)
3. McDonald Avenue/86th Street/Avenue X (1,572, 654, 889)
4. Surf Avenue/Stillwell Avenue (535, 587, 1,030)
5. Coney Island Avenue/Brighton Beach Avenue (1,373, 1,398, 1,474)
6. Brighton Beach Avenue/Brighton 11 Street (947, 1,372, 1,152)
7. Brighton Beach Avenue/Brighton 4 Street (956, 1,757, 1,438)
8. Ocean Parkway/Neptune Avenue (628, 551, 569)
9. Coney Island Avenue/Avenue Z (749, 555, 480)
10. Ocean Parkway/Brighton Beach Avenue (400, 593, 497)

Table 5-1 provides a summary of the crosswalk and corner volumes for the 24 intersections analyzed on weekdays. Additionally, Figures 5-2, 5-3, 5-4 show the existing weekday pedestrian volumes during the

Table 5-1: Existing Condition (Weekdays)
Pedestrian Crosswalk Volume

	Intersection	AM		MD		PM	
		Cross Walk (Ped/Hr)	Corner (Ped/Hr)	Cross Walk (Ped/Hr)	Corner (Ped/Hr)	Cross Walk (Ped/Hr)	Corner (Ped/Hr)
1	Kings Highway/Ocean Parkway	422	74	347	67	473	51
2	Kings Highway/McDonald Avenue	497	485	426	202	596	431
3	Kings Highway/Coney Island Avenue	730	256	1139	239	1331	324
4	Bay Parkway/86th Street	1177	1022	1303	818	2610	847
5	Harway Avenue/Stillwell Avenue	175	46	311	129	34	18
6	McDonald Avenue/86th Street & Avenue X	1572	65	654	31	889	38
7	Ocean Parkway/Avenue X	194	63	144	31	146	36
8	Ocean Parkway/Avenue Z	326	48	257	65	214	46
9	Coney Island Avenue/Neptune Avenue	345	125	287	69	460	160
10	Cropsey Avenue/Neptune Avenue/West 17th Street	58	10	112	21	84	24
11	Memaid Avenue/Stillwell Avenue	373	141	377	84	605	118
12	Surf Avenue/Stillwell Avenue	535	492	587	469	1030	302
13	West 8th Street/Surf Avenue	94	42	172	106	135	33
14	West 17th Street/Mermaid Avenue	423	37	526	52	540	52
15	Coney Island Avenue/Guider Avenue (Belt Pkwy Entrance)	163	42	131	12	180	17
16	86th Street/Stillwell Avenue.	250	344	202	138	255	163
17	Coney Island Avenue/Brighton Beach Avenue	1373	190	1398	226	1474	148
18	Ocean Parkway/Brighton Beach Avenue	400	125	593	303	497	180
19	Bay Parkway/Bath Avenue	222	58	301	62	321	68
20	Bay Parkway/Cropsey Avenue	255	36	210	28	263	36
21	Brighton Beach Avenue/Brighton 11	947	126	1372	107	1152	115
22	Brighton Beach Avenue/Brighton 4 Street	956	103	1757	154	1438	138
23	Ocean Parkway/Neptune Avenue	628	318	551	179	569	196
24	Coney Island Avenue/Avenue Z	749	134	555	281	480	230

Figure 5-2: Pedestrian Volume (AM Peak Hour)

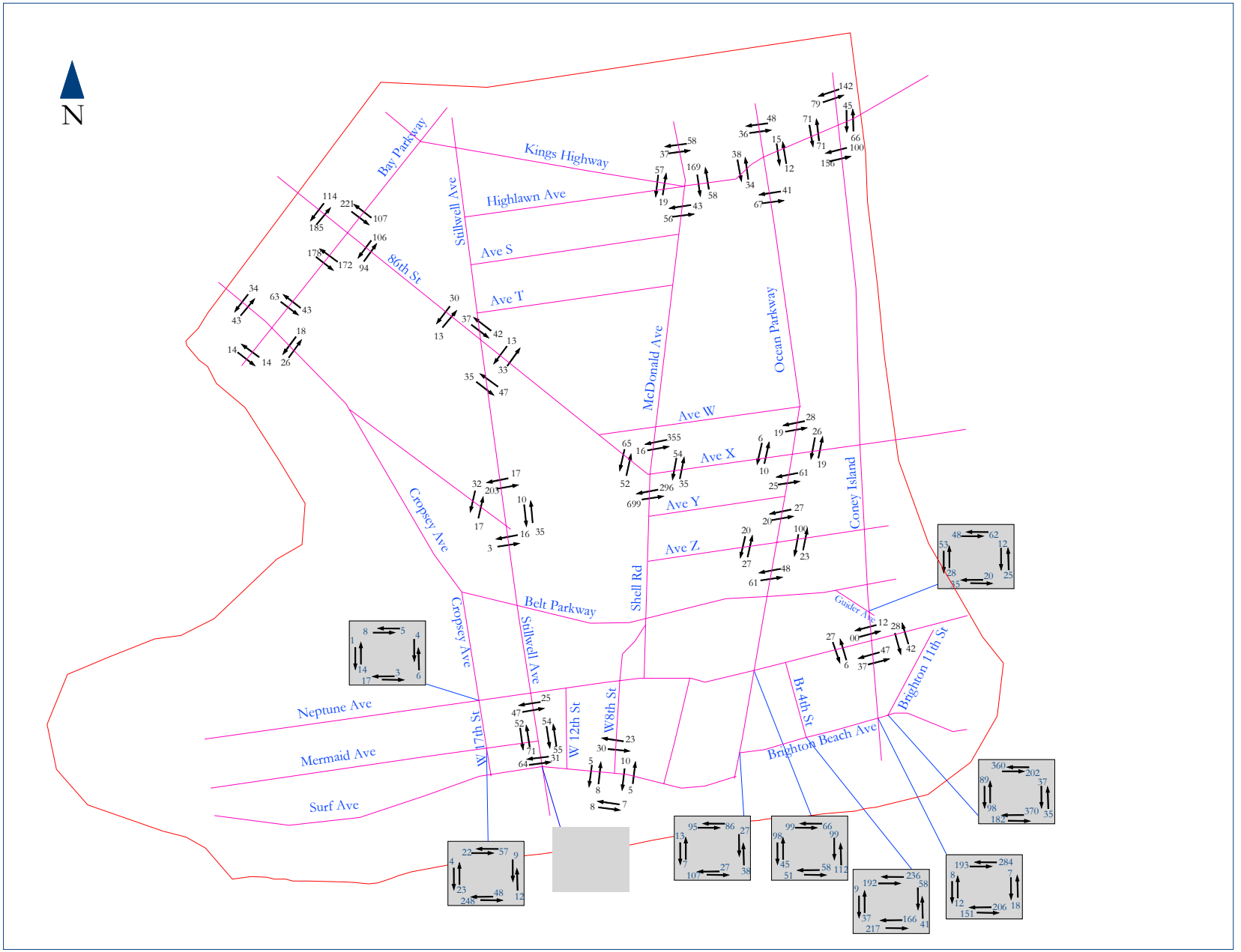


Figure 5-3: Pedestrian Volume (Midday Peak Hour)

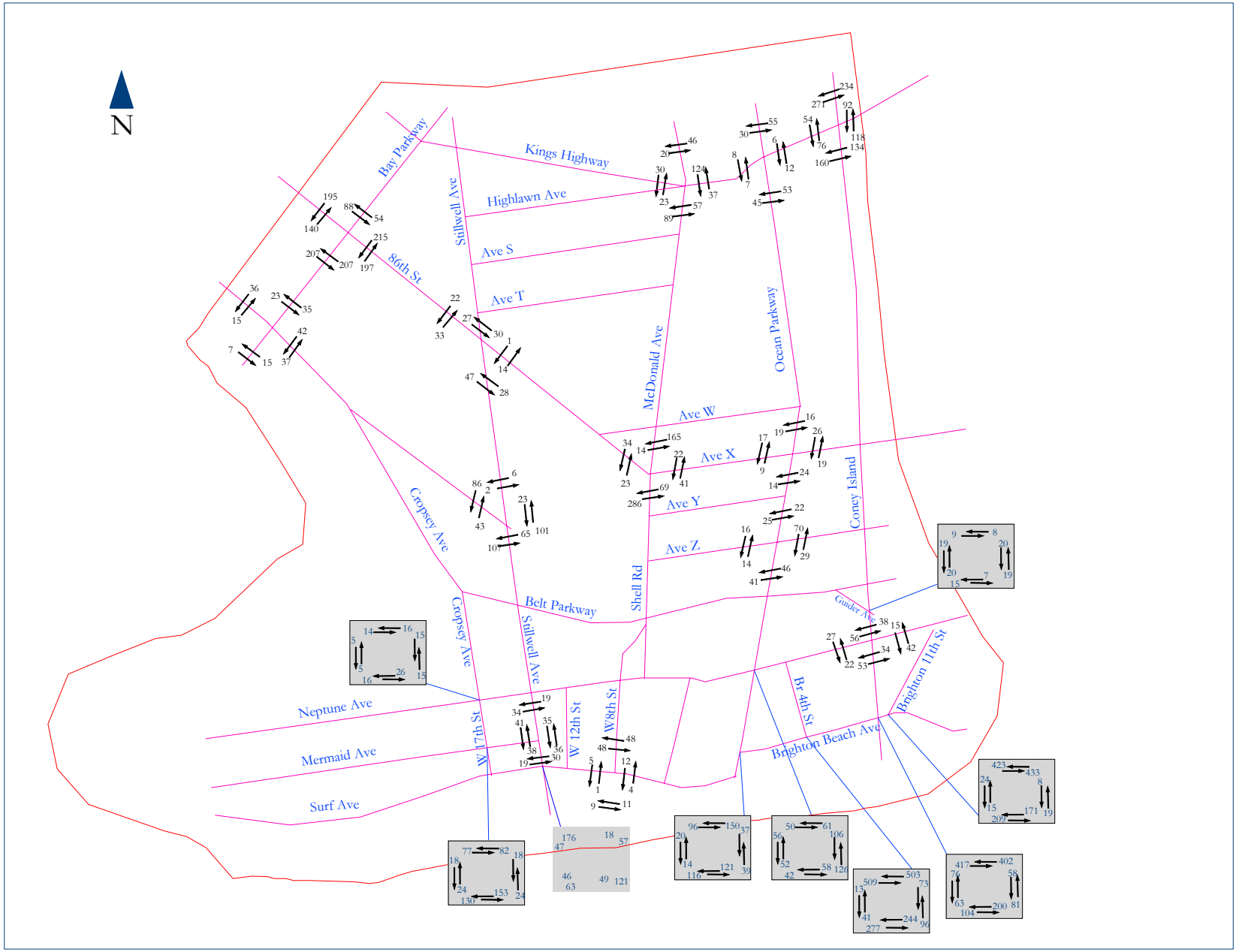
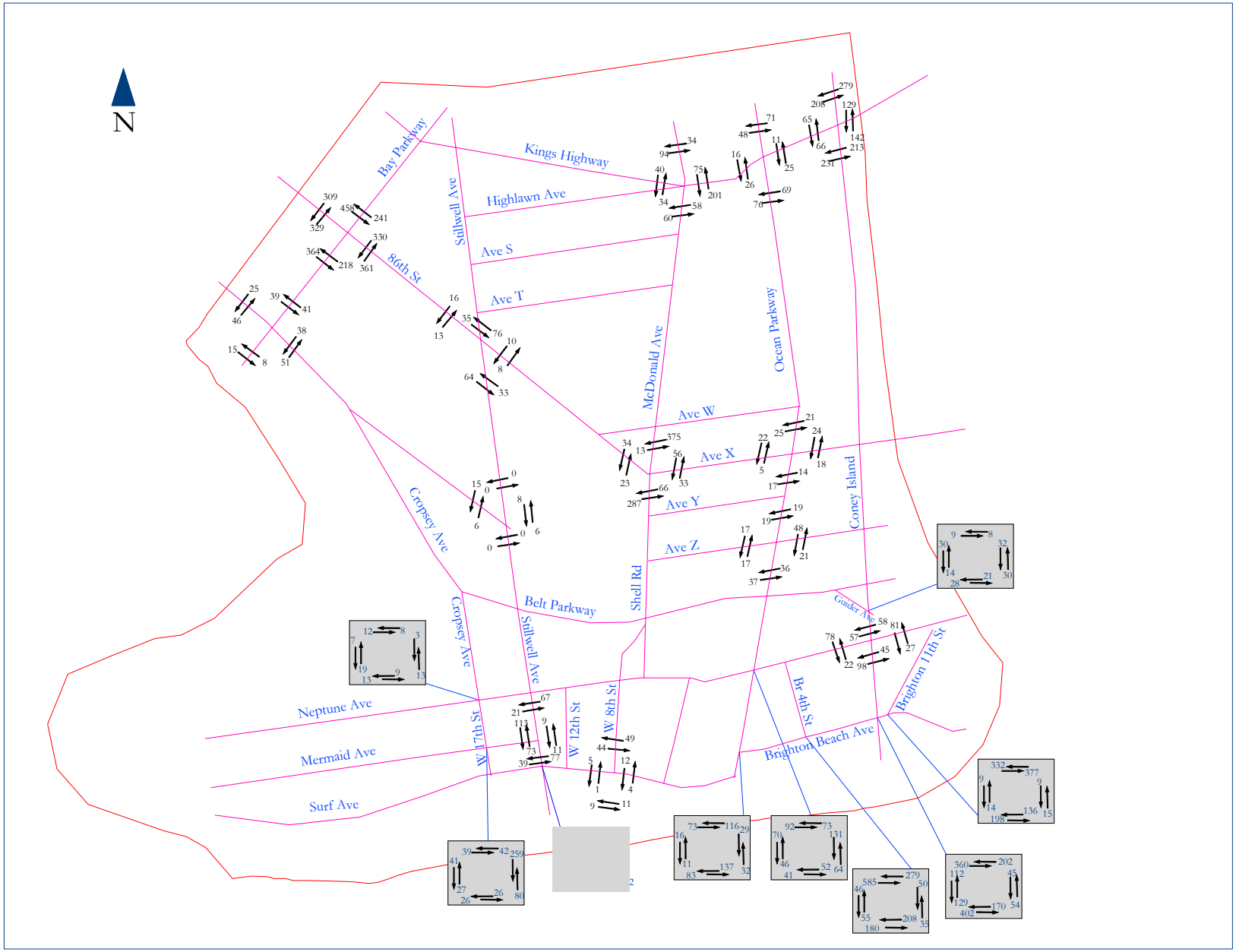


Figure 5-4: Pedestrian Volume (PM Peak Hour)



AM, midday, and PM peak hours at the selected intersections. Table 5-2 shows the existing pedestrian volumes for those intersections where counts were performed in the summer.

The Bay Parkway/86th Street intersection recorded the highest pedestrian volumes followed by the Coney Island Avenue/Brighton Beach Avenue intersection, then by the Brighton Beach Avenue/Brighton 4 Street and the Brighton Beach Avenue/Brighton 11 Street intersections with the third and fourth highest pedestrian volumes. The high pedestrian volumes at these locations are due to a combination of transit stops, transfer points, and the presence of commercial/retail activities.

The Highway Capacity Manual (2000) was used to determine pedestrian capacity at the crosswalks and corners of the intersections being studied. The analysis examined the level of service (LOS) for the AM, midday, and PM peak hours of crosswalks and corners for the 2002 existing condition. Both the crosswalk and corner analysis showed that the intersections operated at an acceptable LOS of C or better. Appendix B provides a summary of the crosswalk and corner analysis for both the weekday and summer weekday and weekend analysis. Figure 5-5 shows the criteria for analyzing pedestrian level of service as defined by the Highway Capacity Manual.

Table 5-2: Existing Condition (Summer Weekday & Weekend)
Pedestrian Crosswalk Volume

		Weekday		Weekend - Saturday		Weekend - Sunday	
	Intersection	**PM**		**PM**		**PM**	
		Cross Walk (Ped/Hr)	**Corner (Ped/Hr)**	**Cross Walk (Ped/Hr)**	**Corner (Ped/Hr)**	**Cross Walk (Ped/Hr)**	**Corner (Ped/Hr)**
1	Memaid Avenue/Stillwell Avenue	378	92			755	146
2	Surf Avenue/Stillwell Avenue	1077	548				
3	West 8th Street/Surf Avenue	128	40	824	152		
4	West 17th Street/Mermaid Avenue	268	48	394	87		
5	Ocean Parkway/Brighton Beach Avenue	1224	341				
6	West 17th Street/Surf Avenue	102	47	139	106	180	117
7	West 5th Street/Surf Avenue	339	39	142	35		
8	West 21st Street/Surf Avenue	191	75	222	114	285	102

Figure 5-5: Pedestrian Level of Service (LOS)

LEVEL OF SERVICE A

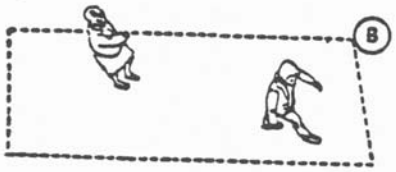
Pedestrian Space: ≥ 130 sq ft/ped Flow Rate: ≤ 2 ped/min/ft

At walkway LOS A, pedestrians basically move in desired paths without altering their movements in response to other pedestrians. Walking speeds are freely selected, and conflicts between pedestrians are unlikely.

LEVEL OF SERVICE B

Pedestrian Space: ≥ 40 sq ft/ped Flow Rate: ≤ 7 ped/min/ft

At LOS B, sufficient area is provided to allow pedestrians to freely select walking speeds, to bypass other pedestrians, and to avoid crossing conflicts with others. At this level, pedestrians begin to be aware of other pedestrians, and to respond to their presence in the selection of walking path.



LEVEL OF SERVICE C

Pedestrian Space: ≥ 24 sq ft/ped Flow Rate: ≤ 10 ped/min/ft

At LOS C, sufficient space is available to select normal walking speeds, and to bypass other pedestrians in primarily unidirectional streams. Where reverse-direction or crossing movements exist, minor conflicts will occur, and speeds and volume will be somewhat lower.

LEVEL OF SERVICE D

Pedestrian Space: ≥ 15 sq ft/ped Flow Rate: ≤ 15 ped/min/ft

At LOS D, freedom to select individual walking speed and to bypass other pedestrians is restricted. Where crossing or reverse-flow movements exist, the probability of conflict is high, and its avoidance requires frequent changes in speed and position. The LOS provides reasonably fluid flow; however, considerable friction and interaction between pedestrians is likely to occur.

LEVEL OF SERVICE E

Pedestrian Space: ≥ 6 sq ft/ped Flow Rate: ≤ 25 ped/min/ft

At LOS E, virtually all pedestrians would have their normal walking speed restricted, requiring frequent adjustment of gait. At the lower range of this LOS, forward movement is possible only by "shuffling." Insufficient space is provided for passing of slower pedestrians. Cross- or reverse-flow movements are possible only with extreme difficulties. Design volumes approach the limit of walkway capacity, with resulting stoppages and interruptions to flow.

LEVEL OF SERVICE F

Pedestrian Space: ≤ 6 sq ft/ped Flow Rate: variable

At LOS F, all walking speeds are severely restricted, and forward progress is made only by "shuffling." There is frequent, unavoidable contact with other pedestrians. Cross- and reverse-flow movements are virtually impossible. Flow is sporadic and unstable. Space is more characteristic of queued pedestrians than of moving pedestrian streams.

5.3 Existing Bicycle Analysis

According to the 2000 Census the use of bicycle as an alternative mode of transportation is limited in the study area and tends to be more for recreational purpose. According to the 2000 Census only a small percent (8% of the population walked or biked to work) of the population in the study area used bicycles as a mode of transportation. The data is supported by observations in the study area that showed a limited number of persons using bicycles. Although bicycle use in the study area appears to be low, efforts are underway to improve bicycle facilities in the study area due to its proximity to the waterfront and other recreational areas.

Currently, there are no on-street bike lanes in the study area. However, there are existing off-street greenway paths along the Coney Island Boardwalk, where cycling is permitted from 5-10 AM only, and along the medians of Ocean Parkway. Additionally, the current New York City Cycling Map identifies several recommended routes in the study area. These routes include:

- Surf Avenue (between West 36th and Ocean Parkway)
- Cropsey Avenue (between Bay Parkway and Neptune Avenue)
- West 17th Street (between Neptune and Surf Avenues)
- Bath Avenue (between Bay Parkway and Stillwell Avenue)
- Stillwell Avenue (between 86th Street and Surf Avenue)
- Neptune Avenue (between Stillwell Avenue and West End Avenue)
- Avenue T (between Stillwell Avenue and Coney Island Avenue)
- 26th Avenue (between Bath Avenue and Stillwell Avenue)
- Bay Parkway (between Bath Avenue and Cropsey Avenue)

The routes along Cropsey Avenue, West 17th Street, Surf Avenue (between West 17th Street and Ocean Parkway), and Neptune Avenue (between Ocean Parkway and West End Avenue) are greenway connector routes (on-street, signed routes). The existing greenway, recommended, and other bicycle routes are shown in Figure 5-6.

Figure 5-6: Greenways and Bicycle Routes

The Department of City Planning is currently conducting Shore Parkway Greenway (Connector Master Plan) study of bicycle routes in southern Brooklyn which includes portions of the study area. The study is exploring ways to link the Shore Parkway Greenway, which currently stops at Bay Parkway/Shore Parkway, with greenways in Coney Island.

5.4 Safety - Accidents Involving Pedestrians and Bicyclists

The accident data for 1996-2000 showed that approximately ten intersections in the study area qualified as a high accident pedestrian location for pedestrians (five or more pedestrian accidents) for one or more of the years analyzed. Table 5-3 shows the pedestrian accident history in the study area. The top ten pedestrian accident locations were:

1. Bay Parkway/86th Street
2. Coney Island Avenue/Kings Highway

Table 5-3: Pedestrian Accidents (1996-2000)

Node #	Intersection		1996	1997	1998	1999	2000	TOTAL
7059/ 7064/ 7069	Neptune Ave	Ocean Parkway	6	1	4	2	1	**14**
6907	Coney Island Ave	Guider Ave (Ramp to Belt Parkway)	1	0	0	1	0	**2**
7931	Neptune Ave	W 17th Street	0	0	2	0	1	**3**
8200	Avenue Z	Coney Island Ave	3	3	1	5	3	**15**
7927	Neptune Av	W 8th Street	0	2	0	2	0	**4**
7073/ 7099/ 7120	Ocean Parkway	Avenue Z	1	3	0	2	2	**8**
8255	Avenue U	Coney Island Ave	3	0	1	6	1	**11**
7086/ 7107/ 7134	Avenue S	Ocean Parkway	0	2	2	2	2	**8**
8044	Coney Island Ave	Neptune Ave	4	4	5	2	0	**15**
6839	Cropsey Ave	Bay Parkway	2	1	1	2	2	**8**
7442	Bath Ave	Bay Parkway	1	2	0	4	2	**9**
8074	Brighton Beach Ave	Coney Island Ave	2	4	2	2	0	**10**
7076/ 7100/ 7123	Avenue Y	Ocean Parkway	0	0	0	0	0	**0**
7101/ 7126/ 7079	Ocean Parkway	Avenue X	1	1	0	0	1	**3**
7440	86th Street	Bay Parkway	3	5	4	5	7	**24**
8269	Avenue V	Coney Island Ave	0	1	0	0	0	**1**
7088/ 7136/ 7109	Ocean Parkway	Kings Highway	0	0	2	2	2	**6**
8032	Neptune Ave	W 5th Street	5	3	1	2	3	**14**
7021	Shore Boulevard	Emmons Ave	1	1	1	1	0	**4**
8241	Avenue S	Coney Island Ave	0	1	1	0	0	**2**
7084/ 7105/ 7132	Avenue U	Ocean Parkway	0	1	2	3	1	**7**
8316	Avenue Y	Coney Island Ave	0	2	0	0	1	**3**
7441	Bay Parkway	Benson Ave	1	2	1	1	1	**6**
7770	86th Street	Avenue X	1	0	0	1	1	**3**
7085/ 7106/ 7133	Avenue T	Ocean Parkway	0	0	2	0	1	**3**
8376	Kings Highway	Coney Island Ave	2	5	5	1	5	**18**

3. Ocean Parkway/Neptune Avenue
4. Neptune Avenue/West 8th Street
5. Brighton Beach Avenue/Brighton 5th Street
6. Coney Island Avenue/Neptune Avenue
7. Kings Highway/East 13th Street
8. Avenue Z/Coney Island Avenue
9. Avenue U/Coney Island Avenue
10. Kings Highway/West 6th Street

Table 5-4 shows the accident history for cyclists at the 27 locations selected for detailed accident analysis in the study area between 1996 and 2000 as well as other locations that had two or more accidents involving cyclists.

5.5 Pedestrian and Bicycle Issues in the Public Participation Process

At public meetings held in June and November residents expressed some of their concerns and desires regarding pedestrian and bicycle issues in the study area. Residents identified the following pedestrian or bicycle issues:

- Neptune Avenue is not pedestrian friendly.
- The intersection of Neptune Avenue/West 6th Street is a difficult location for pedestrians to cross, especially the elderly.
- Existing subway stations should be made handicapped accessible.
- The pedestrian bridge over Surf Avenue at West 8th Street needs to be repaired.
- Sidewalks along Cropsey, Stillwell, and Neptune Avenues are blocked by activities related to auto repair shops.
- A refuge island should be added to wide streets such as Surf Avenue and Neptune Avenue.
- The intersection of Cropsey Avenue/Canal Street is unsafe for pedestrian to cross.
- Pedestrian crosswalks are needed at intersections adjacent to Keyspan Park.
- Bike amenities are needed.
- Handicapped access to the beach from the boardwalk is needed.
- Better mid-block pedestrian access is needed to Luna Park.
- Faulty pedestrian signals need to be repaired speedily and regularly maintained.

Table 5-4: Bicycle Accidents (1996-2000)

Node #	Intersection		1996	1997	1998	1999	2000	TOTAL
7059/ 7064/ 7069	Neptune Ave	Ocean Parkway	2	0	0	1	1	**4**
6907	Coney Island Ave	Guider Ave (Ramp to Belt Pkwy)	1	0	1	0	1	**3**
7931	Neptune Ave	W 17th Street	1	0	0	0	0	**1**
8200	Avenue Z	Coney Island Ave	0	1	0	0	2	**3**
7927	Neptune Av	W 8th Street	0	0	1	0	1	**2**
7073/ 7099/ 7120	Ocean Parkway	Avenue Z	1	0	0	0	1	**2**
8255	Avenue U	Coney Island Ave	0	0	0	1	0	**1**
7086/ 7107/ 7134	Avenue S	Ocean Parkway	2	1	0	0	0	**3**
8044	Coney Island Ave	Neptune Ave	0	1	0	0	4	**5**
6839	Cropsey Ave	Bay Parkway	1	2	2	1	1	**7**
7442	Bath Ave	Bay Parkway	1	0	0	1	0	**2**
8074	Brighton Beach Ave	Coney Island Ave	1	1	0	1	1	**4**
7076/ 7100/ 7123	Avenue Y	Ocean Parkway	1	0	1	2	0	**4**
7101/ 7126/ 7079	Ocean Parkway	Avenue X	1	2	1	0	0	**4**
7440	86th Street	Bay Parkway	1	0	0	0	0	**1**
8269	Avenue V	Coney Island Ave	0	0	1	0	0	**1**
7088/ 7136/ 7109	Ocean Parkway	Kings Highway	1	0	0	1	1	**3**
8032	Neptune Ave	W 5th Street	0	0	2	0	0	**2**
7021	Shore Boulevard	Emmons Ave	0	1	1	0	0	**2**
8241	Avenue S	Coney Island Ave	0	0	1	0	0	**1**
7084/ 7105/ 7132	Avenue U	Ocean Parkway	4	0	2	0	2	**8**
8316	Avenue Y	Coney Island Ave	1	0	1	0	0	**2**
7441	Bay Parkway	Benson Ave	1	1	1	1	0	**4**
7770	86th Street	Avenue X	1	1	0	0	0	**2**
7085/ 7106/ 7133	Avenue T	Ocean Parkway	1	2	0	0	0	**3**
8376	Kings Highway	Coney Island Ave	1	0	1	1	0	**3**