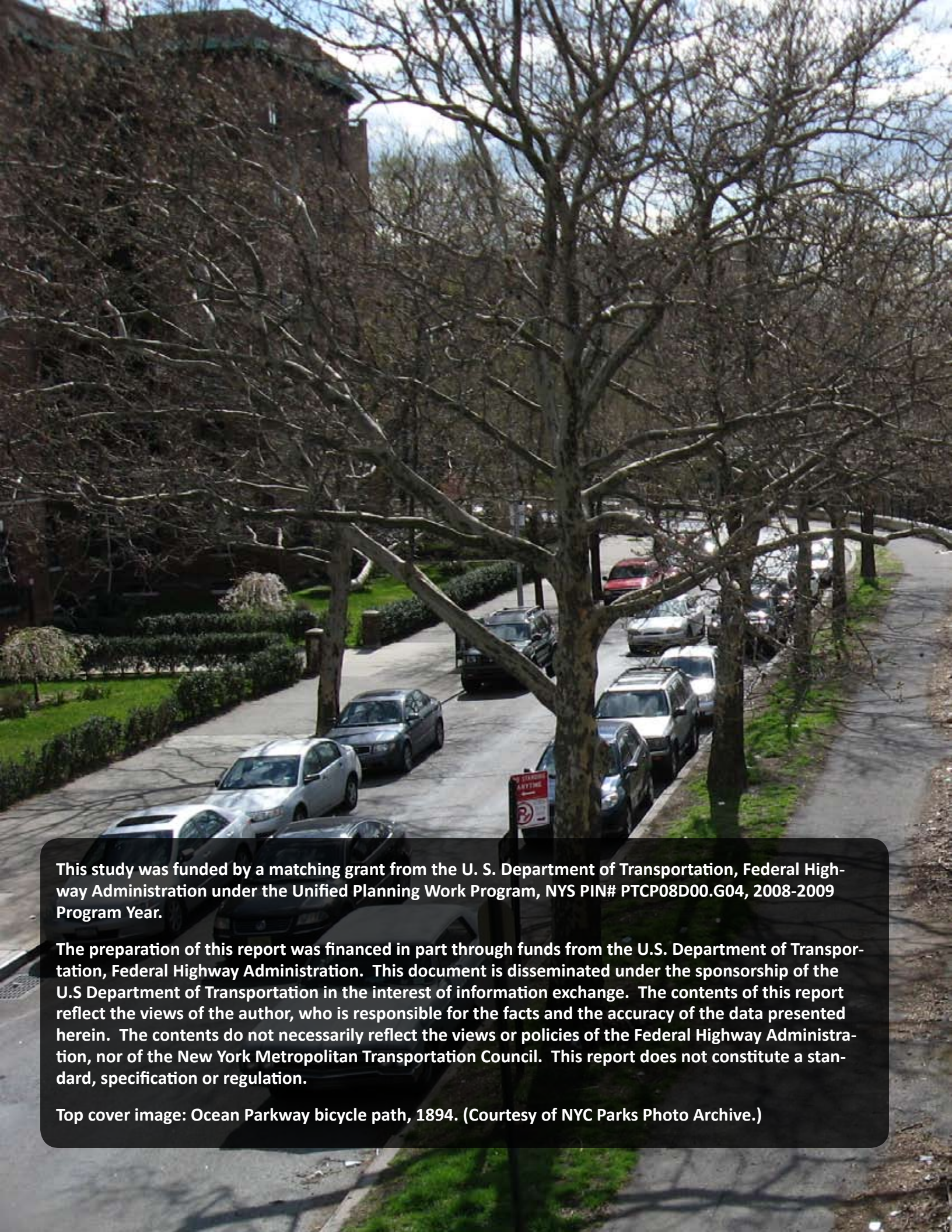
PROSPECT PARK - OCEAN PARKWAY
GREENWAY STUDY

NYC DEPT OF CITY PLANNING | JULY 2009



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Top cover image: Ocean Parkway bicycle path, 1894. (Courtesy of NYC Parks Photo Archive.)

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0 EXECUTIVE SUMMARY

When Ocean Parkway was originally constructed in the 1870s, it was intended to link Prospect Park with the Atlantic Ocean, and in so doing, make the journey to the park part of the park experience. However, the Prospect Expressway, built between 1954 and 1962, ruptured Ocean Parkway's link with Prospect Park at Park Circle. Decades of haphazard bicycle and pedestrian access between Church Avenue and Prospect Park have followed. The Prospect Park-Ocean Parkway Greenway Study was created to seek out ways to improve this access between Ocean Parkway at Church Avenue, and Ocean Parkway and Prospect Park via Park Circle. Loss of this 3,000-foot-link reduces access not only to Prospect Park but Eastern Parkway and major Class 2 (striped on-street) bikeways like the 2nd/3rd Street corridors. Restoring this link can promote safe, continuous bicycle access spanning large stretches of Brooklyn.

The study team found several elements which inhibited easy, intuitive travel to and from Prospect Park via Ocean Parkway. To the south, the transition between the historic Class 1 bikeway along the parkway's west mall south of Church Avenue and the greenway adjacent to the east mall north of Church Avenue lacks clear guidance for pedestrians or cyclists. The parkway's east service road remained intact through construction of the Prospect Expressway, and the Class 1 greenway parallels this roadway for most of the distance between Church Avenue and the park.[1] However, the placement of signage, missing curb cuts, unaccommodating crosswalks, and a park entrance with little separation between cyclists and motorists, also makes the short trip from Church Avenue to Prospect Park difficult to navigate – especially in light of the City's recent efforts to expand and improve conditions for cyclists and pedestrians. Horseback riders traveling to and from Prospect Park continue to use the streets near Park Circle; this study also addresses their needs.

Park Circle itself presents a unique set of challenges. For example, no crosswalk exists along part of its west side, probably due to the presence of a pedestrian overpass to the west. Yet the lack of a crosswalk does not prevent people from crossing here anyway, as pedestrian and cyclist counts conducted in July 2008 found. The circle's four lanes of traffic discourage use of the green space in the center of the circle. Even horses, which have a well-signed route and bridle path through the area, have to cross the circle's traffic lanes twice to get to and from Prospect Park. However, Park Circle is built to ample dimensions and creates opportunities to explore its reconfiguration, especially in light of unused paved areas along some of its perimeter.

Similarly, the eight lanes of roadway that enter and exit the western edge of Park Circle – the two one-lane Ocean Parkway service roads, the two-lane Exit 5 off of the Prospect Expressway, and a four-lane westbound flyover which carries traffic to Ocean Parkway and Fort Hamilton Parkway – are operating far below their carrying capacity. Opportunities exist to put at least two of these eight travel lanes to other uses, which would improve the pedestrian, cyclist and equestrian experience west

[1]A Class 1 bicycle path is separated from general traffic by a physical barrier or runs along an entirely distinct right-of-way which is not used by motor vehicles. A Class 2 bicycle path is located on the same street bed as general traffic, but is delineated by lane striping or other visible markings. A Class 3 bicycle path shares the roadway with general traffic and is unmarked, though it may be signed.

of Park Circle without inhibiting vehicular traffic.

In July of 2008, the study team conducted a series counts to learn more about of bicycle and pedestrian circulation within the study area. Based on this data (which appears in Section 2.3) and site visits conducted April through June of that year, the study team developed several short- and long-term recommendations.

Among the short-term recommendations are the following:

- Install clearer wayfinding signage at the intersection of Church Avenue and Ocean Parkway.
- Install new crosswalk striping across Church Avenue between Ocean Parkway's east mall to the south and the greenway to the north to go along with the existing curb cuts which currently suggest that such a maneuver is sanctioned. Install similar striping across Caton Avenue.
- Remove a curb cut at the northern edge of the Ocean Parkway west mall at Church Avenue, which empties out into a busy roadway without any clear and corresponding destination; and place a pedestrian fence along the curb edge.
- Extend the Sunset Park Class 2 bikeways along Caton Avenue across the Prospect Expressway overpass to the Ocean Parkway Greenway using some other method then thermoplastic, which doesn't adhere to the concrete-decked roadway.
- Reconfigure the tree pits that cut into the greenway south of Caton Avenue by removing cobblestones to their north and south and paving the areas protruding into the greenway.
- At East 8th Street and Ocean Parkway, replace the existing greenway sign (which has an arrow that leaves the intended direction of travel open to interpretation) with a clearer one, and analyze the viability of a stop sign and crosswalks at this intersection.
- Install curb cuts and a crosswalk across Sherman Street at Ocean Parkway.
- Install a Class 1 bikeway along sidewalks of Park Circle's southeast and southwest quadrants.

Long-term, more capital-intensive recommendations are also made. They are more conceptual, and some of them would require detailed traffic modeling analysis to establish their feasibility. They include the following:

- Reverse the roles of the two Ocean Parkway Malls along the one block between Beverly Road and Church Avenue, allowing a transition for cyclists between the west and east malls at a simpler intersection which has had far fewer reportable accidents in recent years.
- As an alternative to Ocean Parkway, install a bikeway or bridle path along Caton Place, which lies immediately south of Ocean Parkway, is lightly trafficked, and is over 6 feet wider than the standard side street.[2]
- Close the northeast quadrant of Park Circle entirely and graft the circle interior to Prospect Park, ensuring that pedestrians, horses and cyclists will only need to cross one road to access the park from any adjacent location. Convert the remainder of the circle to two-way operation divided by a median.
- Implement the "Stable Brooklyn" option: Slightly regrade Exit 5, install an at-grade pedestrian crossing and signal between East 8th Street and Sherman Street, and dismantle Sherman Overpass.
- Condense Exit 5 to one lane; fill excess space to street level and create side-by-side bike & bridle paths.
- Condense the flyover to two lanes by eliminating and landscaping the southernmost lane and converting the northernmost lane to a Class 1 bikeway.

The New York City Department of Transportation (NYCDOT) is also working on short-term initiatives to improve mobility for all of the different travel modes which use Park Circle; some of these initiatives overlap with our own recommendations. NYCDCP welcomes this additional attention to the

[2]A Class 1 bikeway or bridle path are long-term recommendations, but these options are grouped with the short-term recommendations due to their similarities to each other.

study area and hopes to continue working with both the community and other City agencies in this effort.

1

OVERVIEW

1 OVERVIEW

The Prospect Park-Ocean Parkway Greenway Study was created to seek out ways to improve bicycle and pedestrian access between the Ocean Parkway west mall Class 1 bicycle lane which has its northern limit at Church Avenue and Ocean Parkway, and Prospect Park, via Park Circle.

When Ocean Parkway was originally conceived of by Frederick Law Olmsted and Calvert Vaux and constructed in the 1870s, it was intended to link Prospect Park and the Atlantic Ocean, creating the experience of traveling to and from Prospect Park in a park-like setting. The 2.2 mile-long Eastern Parkway was built first, from the northern tip of Prospect Park to Ralph Avenue, at what was then the boundary of the City of Brooklyn. It was constructed between 1870 and 1874. In fact, Eastern Parkway was the world's first "parkway," a term created by Olmstead and Vaux to describe a landscaped road built especially for pleasure driving.[3]

Eastern Parkway's main carriage road was surrounded by a tree-lined mall on each side and then a service road, a pattern copied when the 5.5-mile long Ocean Parkway was completed in 1876. Originating at Park Circle at the southwest corner of Prospect Park, Ocean Parkway briefly traveled roughly west by southwest before curving south to its ultimate southern endpoint at Coney Island. A generation later, in 1894, Ocean Parkway's western mall became home to the first bicycle path in the United States. (The parkway's eastern mall had a bridle path.)

Although on-street horse traffic eventually gave way to the automobile, Ocean Parkway's uses and physical footprint remained essentially unchanged for the next 60 years. However, the Prospect Expressway, built between 1954 and 1962, significantly altered the northernmost part of the parkway. North of Church Avenue, the parkway's main roadway was depressed and converted into a limited-access highway. Ocean Parkway's western malls were destroyed, and the parkway's western (southbound) service road from Prospect Avenue to south of Fort Hamilton Parkway was severed. While a paved pathway was built along the partially remaining eastern mall to East 8th Street, the expressway severely compromised the historic, seamless link that Olmsted and Vaux intended to Prospect Park.[4]

Decades of haphazard bicycle and pedestrian access between Church Avenue and Prospect Park have followed, in no small part due to additional conditions that exist near Park Circle itself. As this report will show, placement of signage, missing curb cuts, unaccommodating crosswalks, a park entrance with little separation between cyclists and motorists, and an overbuilt vehicular flyover to Ocean Parkway and Fort Hamilton Parkway also make the short trip from Church Avenue to Prospect Park unintuitive – especially in light of the City's recent efforts to expand and improve conditions for cyclists and pedestrians. Horseback riders traveling to and from Prospect Park continue to use the streets near Park Circle too; this study has also been developed with them in mind.

Loss of this relatively short link (about 3,000 feet long) has an impact out of proportion to its size:

[3]Source: NYCDPR Eastern Parkway historical sign: http://www.nycgovparks.org/sub_your_park/historical_signs/hs_historical_sign.php?id=196

[4]Source: NYCDPR Eastern Parkway historical sign: http://www.nycgovparks.org/sub_your_park/historical_signs/hs_historical_sign.php?id=10787

it reduces access not only to Prospect Park but Eastern Parkway and major Class 2 bikeways like the 2nd/3rd Street corridors. Restoring this link can promote safe, continuous bicycle access spanning whole stretches of Brooklyn. This study will seek solutions that would better connect this historic Class 1 Greenway to Prospect Park via Park Circle.

This report provides historical and recent context with a literature review (Appendix A) describing the study area. Land use, zoning, census and accident data are also included, in an attempt to provide a complete picture of the area. A bicycle count, conducted in late July 2008, provides new data about the riding patterns of cyclists in the study area.

FIGURE 1-A: STUDY AREA

2

EXISTING CONDITIONS

2.0 ISSUES FOUND WITHIN THE STUDY AREA

Between April and June of 2008, the project team conducted site visits to the study area to get a better sense of the conditions cyclists and pedestrians face as they attempt to navigate the short distance between Church Avenue and Prospect Park.

Any cyclist or pedestrian with a basic knowledge of the neighborhood can make their way between Church Avenue/Ocean Parkway and Prospect Park. However, conditions for doing so are not ideal. Ambiguous curb cuts, striping and signage send mixed signals to cyclists and pedestrians. Entering Prospect Park, cyclists must travel on a poorly-delineated bikeway immediately adjacent to contraflow traffic during the hours when motor vehicles are allowed on the park roadway.

Park Circle itself presents a unique set of challenges to anyone trying to navigate it. The crosswalk to the north, at the end of Prospect Park Southwest, is laid out at an odd angle to avoid interfering with an exit road from the park. The west side of the circle is particularly difficult for pedestrians and cyclists. No crosswalk exists along part of the west side, probably due to the presence of a pedestrian overpass to the west. Yet the lack of a crosswalk does not prevent people from crossing here anyway. The circle's four lanes of traffic, though well regulated by signals, discourage use of the actual green space in the center of the circle. Only horses, which have a well-signed route and bridle path through the area, tend to make use of the circle's center, but they also have to cross the circle's traffic lanes twice to get to and from Prospect Park.

However, Park Circle also carries with it much potential. The northeastern and northwestern quadrants of the circle have unused roadbed which could be put to other uses. The circle itself is built to ample dimensions and creates opportunities to explore its reconfiguration. Finally, the circle's location at the southwestern corner of Prospect Park offers interesting opportunities to make a more inviting gateway between the park and the adjacent neighborhoods of Flatbush, Kensington and Windsor Terrace.

Eight lanes of roadway enter and exit the western edge of Park Circle – the two one-lane Ocean Parkway service roads, the two-lane Exit 5 off of the Prospect Expressway, and a four-lane westbound flyover which carries traffic to Ocean Parkway (southbound) and Fort Hamilton Parkway.

Figure 2-A shows the current greenway route on Ocean Parkway between Beverly Road and Park Circle. From Ocean Parkway's southern terminus at Coney Island to south of Church Avenue, the parkway's west malls contain a bench-lined pedestrian walkway and a Class 1 bikeway, divided by a railing. The east mall is a bench-lined pedestrian only walkway from Church Avenue to Coney Island. North of Church Avenue, the west mall disappears entirely, while a paved pathway continues north along the eastern mall to East 8th Street. Cyclists who wish to continue to Prospect Park from there must ride on-street along the Ocean Parkway east service road and then with the flow of traffic through Park Circle. Cyclists from the park are supposed to travel with the flow of traffic through Park Circle and then along the disconnected northern remnant of the Ocean Parkway west service road to an overpass, where they are supposed to dismount and walk their bikes to the other end, across the street from the paved pathway's northern endpoint.

Pedestrian counts were not taken along Ocean Parkway, but bicycle counts conducted by DCP in

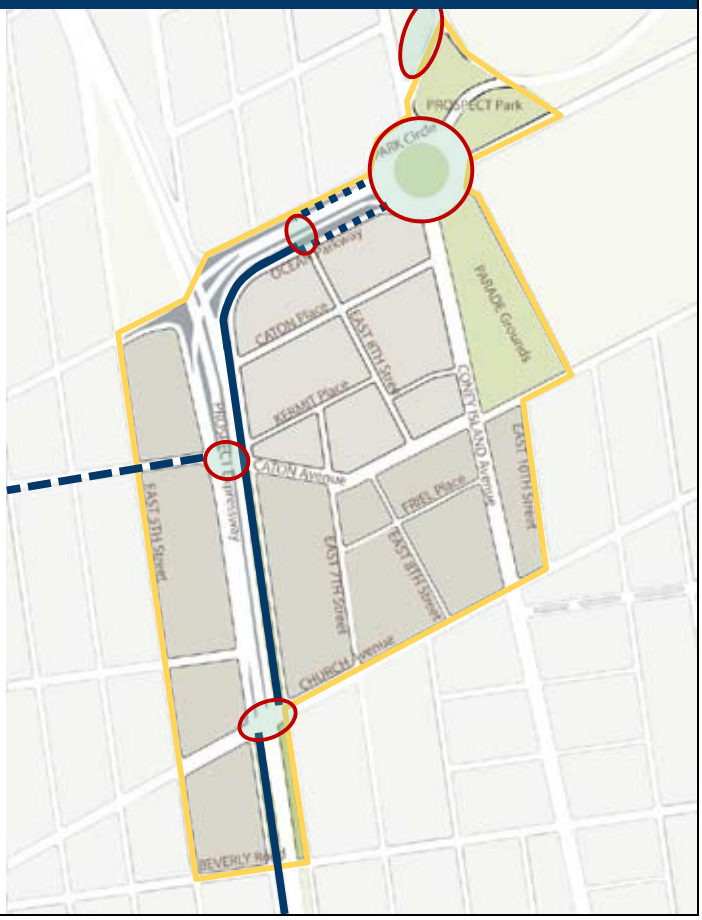
FIGURE 2-A EXISTING GREENWAYS

CLASS 1
(OFF-STREET) GREENWAY

CLASS 2
(STRIPED, ON-STREET) GREENWAY

CLASS 3
(UNSTRIPED, ON-STREET GREENWAY)

UNSIGNED OR AMBIGUOUS
GREENWAY SEGMENTS



July 2008 show moderately low cyclist volumes for such a high-capacity facility. Over a total of 8 hours (2 hours each during the weekday AM peak, mid-day and PM peak; plus 2 hours on a Sunday from 9:15 am to 11:15 am), 306 cyclists were counted along all portions of Ocean Parkway south of Church Avenue – an average of 38.25 cyclists per hour. Contrast this with Manhattan greenway data collected in the fall of 2008, when 1,937 cyclists utilized Route 9A at West 11th Street in Manhattan during a 6-hour period. Ocean Parkway's bicyclist utilization lies somewhere between that of East River Park and Houston Street (460 in 6 hours) and East River Park at 90th Street (120 in 6 hours.)[5]

Clear potential exists to improve bicycle utilization of this historic 115-year-old greenway. A more intuitive link between Prospect Park and Church Avenue could establish a more solid tie between parkway and park, thus plugging the parkway into other major components of Brooklyn's bicycle network (such as the 2nd/3rd Street Class 2 bikeway and the Eastern Parkway Class 1 bikeway). The catchment area that would have direct access to and from the Ocean Parkway Greenway would then be greatly expanded, which could encourage more cyclists to use it. (Bicylist utilization levels of Ocean Parkway are discussed later in this report.)

What follows is a point-by point description of nine issues (mapped in Figure 2-B) found along the Ocean Parkway corridor from Church Avenue to Prospect Park which affect cyclists, pedestrians, and horse traffic.

[5]Source: NYCDCP annual bicycle network counts, fall 2008.

FIGURE 2-B: EXISTING ISSUES

1. Church Avenue + Ocean Parkway intersection
2. Church + Caton Avenues' curb cuts + striping
3. East service road bikeway widths
4. Indistinct bikeway widths
5. Sherman Overpass Park
6. Park Circle
7. Ocean Pkwy – Ft. Hamilton Pkwy flyover
8. Horse riders through Park Circle
9. Contraflow bike access at Prospect Park

ISSUE 1 – CHURCH AVENUE INTERSECTION

The intersection of Church Avenue and Ocean Parkway marks the point where the parkway's main roadway to the south transitions into the Prospect Expressway to the north. The northbound and southbound service roads, which are separated from the main road south of Church Avenue by tree-lined malls, continue at ground level as the Prospect Expressway descends below grade.

Both malls have pathways along them. Along the majority of Ocean Parkway, the west mall is divided by a railing into a Class 1 bikeway to the east and a bench-lined pedestrian walkway to the west. At the intersection of Beverly Road and Ocean Parkway – the northernmost intersection with this configuration – the bikeway is 9' 8" wide and the pedestrian walkway is 5' 10" wide. However, north of Beverly Road, this division ends, and the nearly 16-foot-wide pathway tapers to a shared-use path 11' 6" inches wide at Church Avenue. Given the relatively low pedestrian and cyclist volumes at this

location, the tapered shared-use pathway is generally suitable as is. However, a significant increase in cyclist traffic would eventually warrant a reanalysis of this location.

The east mall is 10’ 3” inches wide, but several chess tables and benches protrude into the mall from the east, reducing the mall’s effective width to 6’ 4”. Bicycling is prohibited on the east mall.

While this arrangement of uses along the malls is consistent along most of the parkway’s length to Coney Island, the pattern breaks down north of Church Avenue, where the west mall disappears entirely. The eastern half of the east mall, which partially survived the construction of the Prospect Expressway, contains a shared-use bicycle and pedestrian path. See Figure 2-C.

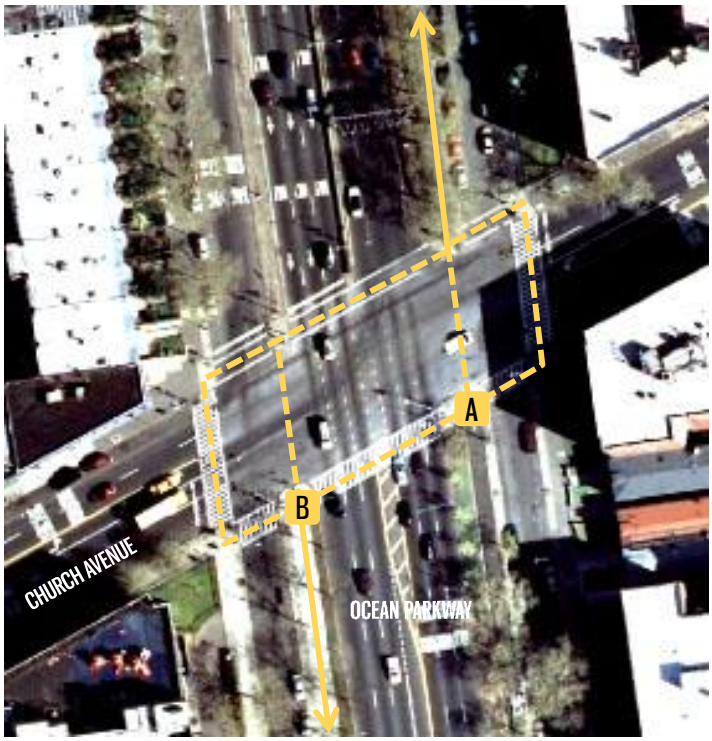
The transition along Ocean Parkway between the bicycle paths north and south of Church Avenue is not intuitive. Some wayfinding signage appears southbound, but little guidance is offered northbound. Striped crosswalks guide cyclists and pedestrians around the south, east and west sides of the intersection; an unstriped crosswalk traverses the north end, where the Prospect Expressway ends. Greenways are designated by solid green lines; potential ways to get from one to the other are shown with dotted green lines.

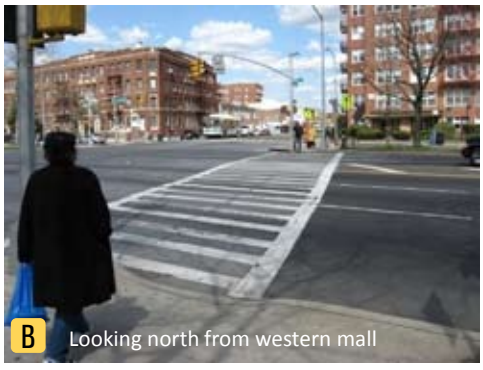
Further compounding this hard-to-navigate intersection is the fact that it lies at the intersection of two NYCDOT-designated through truck routes. Trucks having neither an origin nor a destination within Brooklyn are restricted to these street segments.[6] Church Avenue from McDonald Avenue to Flatbush Avenue is a through truck route, as is the whole length of the Prospect Expressway.

[6]New York City Traffic Rules and Regulations, http://www.nyc.gov/html/dot/downloads/pdf/trafrule.pdf, page 73.

FIGURE 2-C: ISSUE 1 - CHURCH AVENUE & OCEAN PARKWAY INTERSECTION

+ **Unintuitive bike/ped transition from East Mall to West Mall.** The solid green lines represent the existing greenway, while the dotted lines represent possible ways to get from one part of the greenway to the other. During traffic counts done for this study, cyclists were observed making all of the movements shown by the dotted lines.





ISSUE 2 – CURB CUTS AND STRIPING

An overlapping issue also applies both to the Church Avenue intersection and the juncture of Ocean Parkway and Caton Avenue, one block to the north: The existing curb cuts and crosswalk striping do not complement each other. At Church Avenue and Ocean Parkway (shown below in the photo to the left) , curb cuts at both the north and south sides of the east malls clearly empty into the street bed, implying that cyclists and pedestrians should cross from north to south at this location. However, no crosswalk exists. North-south crosswalks do exist east of the east service road at the Ocean Parkway-Church Avenue intersection. If one were guided by the crosswalks alone, the implication would be that bicycle and foot traffic heading from south to north along the greenway should cross to the east mall, keep going across the east service road to the far eastern sidewalk, cross Church Avenue, and then turn west, crossing back to the east mall before proceeding north.

At Caton Avenue (shown below in the Figure 2-D in the middle and to the right), the crosswalk-curb cut situation is more ambiguous. The curb cuts are offset on a diagonal, encouraging crossing the intersection either north-south or east-west. However, a direct striped crosswalk connecting the greenway from north to south does not exist. The other three sides of the intersection do have striped crosswalks, encouraging the same circuitous movement that is implied at Church Avenue.

FIGURE 2-D: ISSUE 2 - CURB CUTS & STRIPING SEND MIXED SIGNALS

+ **At Church Avenue and Caton Avenue, curb cuts empty into streets without striped crosswalks.**

+ **Existing striping implies a circuitous route.** The solid green lines represent the existing greenway, while the dotted lines represent possible ways to get from one part of the greenway to the other. During traffic counts done for this study, cyclists were observed making all of the movements shown by the dotted lines. Further guidance for cyclists could help alleviate this condition.

Looking south from eastern mall at Church Ave

Looking north from eastern mall at Caton Ave

ISSUE 3 – INCONSISTENT BIKEWAY WIDTHS

As shown in the Figure 2-E, the width of the greenway varies. Most of the east mall shared-use path is in the 7'3"-7'10" range, and tree pits south of Caton Avenue cut into the greenway, reducing it to a width of 6'0"-6'4". Farther north, at the Sherman Overpass, the width again fans out to 8'10"-9'10".

Much of the bikeway north of Church Avenue fails to meet the guidelines as outlined in the 1999 AASHTO Guide for the Development of Bicycle Facilities. While generally recommending a paved width for a two-directional shared use path of 3.0 m (10 feet), low-traffic paths with minimal pedestrian use, adequate passing capabilities and few maintenance vehicle impediments could have a width of 2.4 m (8 feet).[7] Yet even the reduced-width AASHTO guidelines are not met along much of the bikeway north of Church Avenue.

[7]6pp. 35-36.

FIGURE 2-E: ISSUE 3 – INCONSISTENT BIKEWAY WIDTHS

+ **The width of the bikeway fluctuates throughout the study area**
+ **Tree pits cut into the designated bikeway**

ISSUE 4 – INDISTINCT GREENWAY WEST OF PARK CIRCLE

North of Caton Place, Ocean Parkway's east mall and service road curve to the east for their final approach into Park Circle. At East 8th Street, the greenway abruptly ends and is replaced by a bridle path for the remainder of the distance to the circle. The greenway ends just west of an overpass (named "Sherman Overpass" in this study, due to its northern endpoint near Sherman Street) which carries users over several lanes of roadway.[8]

In lieu of the greenway, cyclists are directed via greenway signage east of Sherman Overpass to proceed on-street with the flow of traffic along Ocean Parkway eastbound to Park Circle. However, it would be understandable if many cyclists never saw this sign, because before they get to it, another bikeway sign with a diagonal arrow appears to directs cyclists onto Sherman Overpass itself. Cyclists are thus given two ways to get to Park Circle and Prospect Park. (See Figure 2-F.) This would not be a problem except for the fact that directing cyclists onto the overpass compounds other problems with bicycle access to Prospect Park, which are discussed later in this report.

Further complicating matters is the fact that existing signage coming from Prospect Park fairly clearly directs westbound cyclists along the northern edge of Park Circle to westbound Ocean Parkway and then over Sherman Overpass to the east mall greenway. (Cyclists are supposed to dismount and walk their bikes along the overpass, but no sign tells them to do so.) In and of itself, routing cyclists to a road where they travel with the flow of traffic and then onto a pedestrian overpass is better than forcing them into contraflow traffic along Ocean Parkway's eastbound roadway. However, it does reinforce the ambiguous arrangement eastbound cyclists have. See Figure 2-G.

[8]The roadway, discussed later in the report, is a four-lane one-way flyover which conveys traffic from Park Circle to both Fort Hamilton Parkway and Ocean Parkway/the Prospect Expressway. See Issue 7.

FIGURE 2-F: ISSUE 4 – INDISTINCT BIKE ROUTES WEST OF PARK CIRCLE

+ **Ambiguous signage implies two possible eastbound routes**

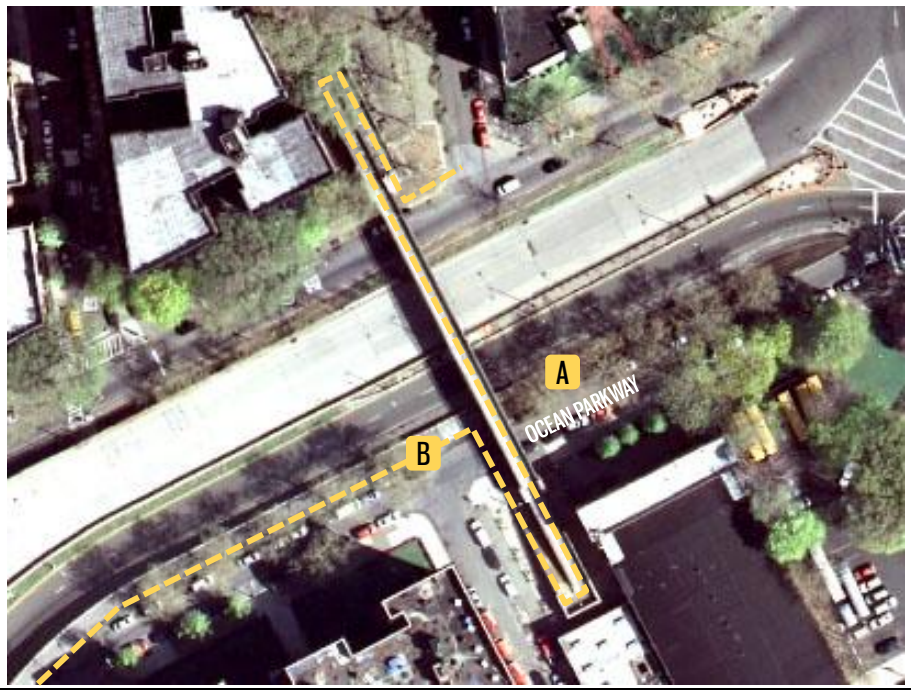
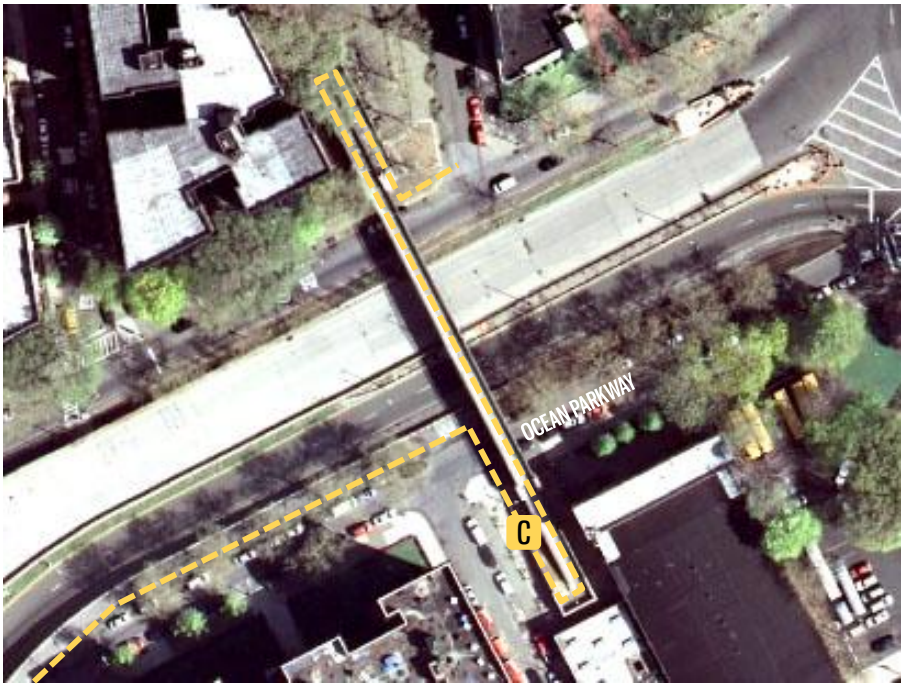


FIGURE 2-G: ISSUE 4 – INDISTINCT BIKE ROUTES WEST OF PARK CIRCLE

+ **Westbound route uses Ocean Parkway and Sherman Overpass**



ISSUE 5 – SHERMAN OVERPASS PARK AREA

The northern end of Sherman Overpass accesses street level at a small, unnamed park on the northeast corner of Sherman Street and Ocean Parkway. The park is located at Block 5286, Lot 42[9], and is identified by the New York City Department of Parks and Recreation as park number B255(M). For the purposes of this study, this location will be identified as "Sherman Overpass Park."

The most conspicuous problem with the intersection at Sherman Overpass Park is that it has no curb cuts, which makes the intersection harder to cross for both mobility-impaired pedestrians and bicyclists wishing to enter/exit the sidewalk en route to/from Sherman Overpass. (See Figure 2-H.) It also lacks a striped crosswalk, although since the road being crossed is a one-lane, one-way, lightly trafficked street, a crosswalk may not be a high priority. (Cyclists would be riding on-street up to the point where they are entering or exiting the overpass.)

A more serious issue is tied to the signage discussed in Issue 4. Those eastbound cyclists who heed the sign directing them to cross Sherman Overpass from the south find themselves coming off an uncut curb into a busy stretch of contraflow traffic: the westbound Ocean Parkway segment that brings vehicles to the Prospect Expressway and Prospect Avenue. According to automatic traffic recorder (ATR) counts conducted by NYCDOT in May 2008, midday weekday and weekend traffic generally falls in the range of about 325 to 440 vehicles per hour, while peak-hour weekday traffic (the 8:00am hour) generally reaches about 700 to 800 vehicles per hour.[10]

[9]Source: NYCDPR Planning Division

[10]Source: NYCDOT. See Chapter 9 for a fuller discussion of NYCDOT's May 2008 vehicular counts

FIGURE 2-H: ISSUE 5 – SHERMAN OVERPASS PARK AREA

+ **Lack of curb cuts creates potential hazard for cyclists and mobility-impaired in either direction**
+ **Greenway sign at south end of on-ramp implies contraflow cycling**
+ **No striped crosswalk**

ISSUE 6 – PARK CIRCLE

Park Circle is designed with a wide circular roadbed. The original six-lane-wide main roadway, two malls and two one-lane service roads entering the circle from the west forced Park Circle to be large enough to accommodate all entering and exiting traffic from Ocean Parkway. By 1962, Ocean Parkway's main road had been replaced with the two-lane Exit 5 of the Prospect Expressway and a four-lane flyover.[11]

Park Circle's roadbed, as shown in Figure 2-I, ranges from 97 to 100 feet wide; eight lanes of traffic could conceivably envelop the circle, a width comparable to large interstate highways. This is particularly true in the circle's northeast and northwest quadrants. The aerial photograph of the circle above clearly shows "desire lines," or places where the pavement has been repeatedly driven over. The lack of vehicular activity along the outer reaches of the circle's northeast quadrant is implicitly acknowledged by striping the area, making it off limits to cars. Along the northwestern edge, the difference between used and unused roadbed is more obvious. Lighter pavement indicates places where tire rubber has not accreted to the pavement surface. Unrealized potential exists throughout the circle to make it easier to navigate for cyclists and pedestrians. The actual parkland at the center of the circle is also relatively inaccessible, although a bridle path does run through it.

The western edge of the circle is particularly difficult for pedestrians and cyclists. The Sherman Overpass a block to the west was intended to intercept non-vehicular traffic and allow it to move north-south, allowing drivers at the western edge of Park Circle to move to and from without having to concern themselves with foot and bike traffic. Yet pedestrians and cyclists continue to cross the street here. As discussed in Section 2.3, midday weekday counts conducted in July 2008 actually found that more people crossed at grade than via Sherman Overpass. The Sherman Overpass is not a

[11]See following page for a detailed breakdown of what currently constitutes these eight lanes.

direct, short or flat way to get from south to north. The west edge of the circle is.

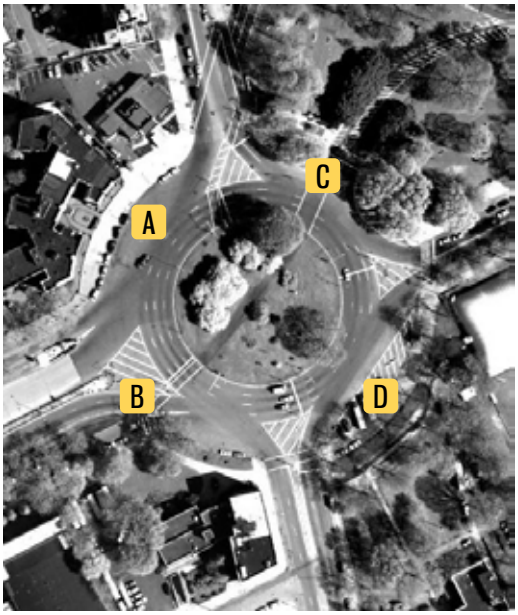
Foot and cyclist traffic that chooses to avoid the Sherman Overpass and cross this part of Park Circle at grade, though, must navigate past the following:

- the Ocean Parkway east service road (east-bound traffic, one lane);
- Exit 5 of the Prospect Expressway (eastbound traffic, two lanes);
- the Fort Hamilton Parkway/Ocean Parkway fly-over (westbound traffic, four lanes), and
- the severed segment of the Ocean Parkway west service road which provides access to the Prospect Expressway and Prospect Avenue (westbound traffic, one lane).

Crosswalks do exist across the Ocean Parkway east service road and Exit 5, but they are angled northeast towards the middle of Park Circle instead of north towards the Ocean Parkway west service road. Foot and bicycle traffic going north then proceeds along a large funnel-shaped area of striped pavement to the eastern tip of a long traffic island. Once they get across the four lanes of the flyover, another island provides space to wait until proceeding across the Ocean Parkway west service road.

FIGURE 2-I: ISSUE 6 – PARK CIRCLE (BIKE AND PEDESTRIAN ACCESS)

+ **Excess space in northeast and northwest quadrants**
+ **Western edge of Park Circle very difficult to navigate**



ISSUE 7 – OCEAN PARKWAY-FORT HAMILTON PARKWAY FLYOVER

To compensate for the loss of access caused by construction of the Prospect Expressway, a four-lane flyover was constructed from the western edge of Park Circle. (See Figure 2-J.) All traffic on the flyover travels westbound before the flyover splits near the Prospect Expressway overpass. The two southern lanes split off to briefly join the Prospect Expressway southbound before it becomes the mainline road of Ocean Parkway. (These two lanes merge into one before reaching the expressway). The two northern lanes proceed to the western edge of Fort Hamilton Parkway, which remains a one-way, two-lane street until west of Dahill Road.

Peak hour volumes on these four lanes of roadway (generally in the 5:00pm hour) are less than the volumes on the one lane of the westbound Ocean Parkway service road. An average of about 675 vehicles per hour use the flyover, compared with the 700 to 800 vehicles per hour on Ocean Parkway westbound. Midday weekday volumes on the flyover are slightly higher than on Ocean Parkway, generally by about 70 vehicles per hour (about 450vph for the flyover and about 380vph on Ocean Parkway) , but this still results in a roadway with significant excess capacity.

Like Park Circle, potential exists to reallocate space on this roadway for other uses.

FIGURE 2-J: ISSUE 7 – OCEAN PARKWAY/FORT HAMILTON PARKWAY FLYOVER + EXIT 5

+ **Traffic levels on the flyover do not justify four lanes and traffic levels on Exit 5 do not justify two lanes.**
+ **Potential to accommodate other modes**

ISSUE 8 – HORSE TRAFFIC MUST NAVIGATE PARK CIRCLE

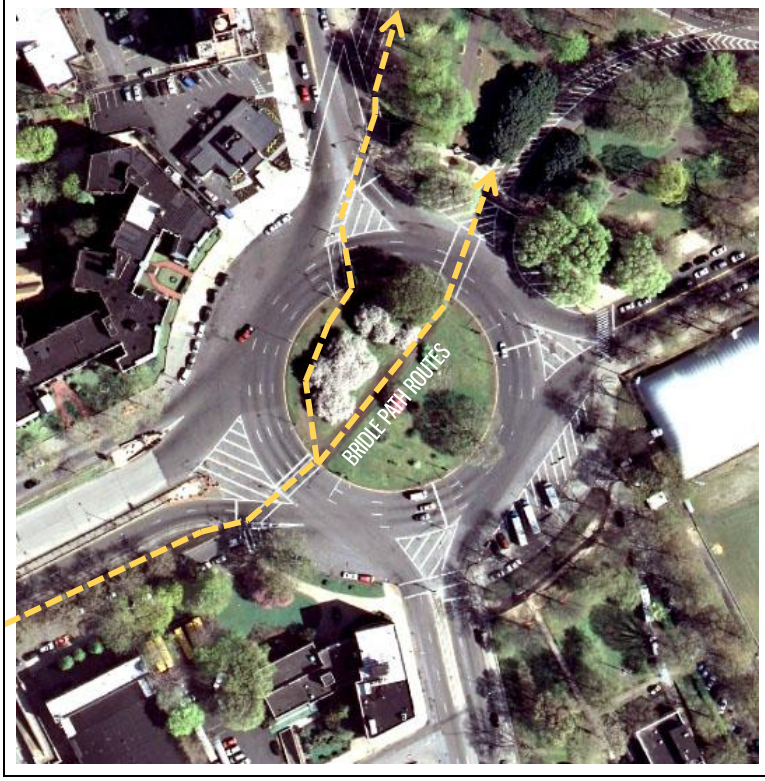
Kensington Stables is the last of what were once several stables remaining in the area. It is located on East 8th Street and Caton Place, a block southwest of Park Circle and a short block from Ocean Parkway. Until 1967, when they were replaced with the current pedestrian walkway, the eastern malls contained a bridle path south to Coney Island. The surviving stable's major remaining destination, Prospect Park, continues to draw horse traffic through Park Circle.

Intervals of horse traffic in Park Circle make this intersection different from most within the City. A bridle path occupies the space north of the Ocean Parkway eastern service road from just west of the Sherman Overpass to Park Circle. Two bridle paths cut through the center of the circle, as seen in Figure 2-K. One heads northeast to the Prospect Park loop entrance. The other cuts north, hugging the western rim of the circle's hub until heading towards the park loop exit road.

Signage within and around Park Circle alerting drivers to the presence of horses are generally plentiful and well-placed. However, since equestrians cut through the circle, they have to cross the vehicular traffic twice to get to and from the park. The more southerly route through the center of the circle crosses the northeastern portion of Park Circle at a location relatively far from the nearest traffic signal – a situation which presents less than ideal sight lines for both equestrians and motorists.

FIGURE 2-K: ISSUE 8 – PARK CIRCLE (HORSE ACCESS)

+ **Bridle paths are well-signed but cross Park Circle traffic twice**




Approaching Park Circle


Park Circle – Northwest

ISSUE 9 – CONTRAFLOW BIKE ACCESS AT PROSPECT PARK

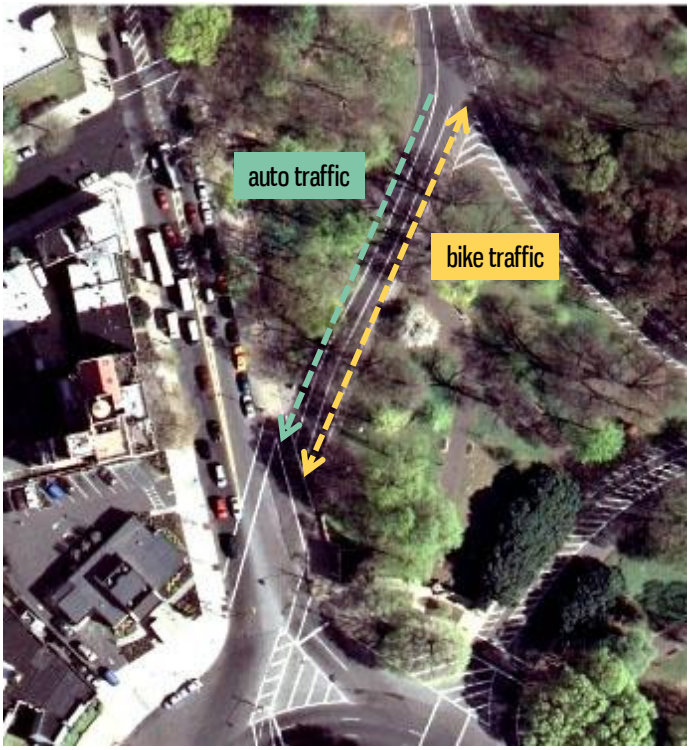
Vehicular access between Park Circle and Prospect Park is provided via two roadways. An entrance road intersects the circle's northeast quadrant, roughly equidistant from Parkside Avenue and Prospect Park Southwest. A three-lane exit road from the park intersects with Prospect Park Southwest just north of the circle.

Immediately adjacent to the easternmost lane of the exit road – and separated from the travel lane by a single, worn white stripe – is a bidirectionally-signed bicycle lane, as seen in Figure 2-L. During most of the day, when the park drive is closed to motor vehicles, the juxtaposition of these lanes is not a problem. However, the western part of the Prospect Park exit roadway is open to traffic from 5:00pm to 7:00pm weekdays. According to May 2008 ATR counts conducted by NYCDOT, an average of approximately 535-565 vehicles per hour exit the drive during the peak (5:00pm) hour, against the flow of park-bound bicycle traffic.

FIGURE 2-L: ISSUE 9 – CONTRAFLOW BIKE ACCESS AT PROSPECT PARK

+ **Bi-directionally signed bike lane immediately parallels exit-only park roadway, without buffer**
+ **Cyclists exiting the park are divided from traffic by a very worn stripe**

Image showing faded street markings



2.1 ZONING AND POPULATION CHARACTERISTICS

Several land uses can be found within the study area. Ocean Parkway tends to have the tallest, most high-density buildings, although recent construction of a multistory apartment building at the north end of Coney Island Avenue has also taken place. The study area's character is overwhelmingly residential, but commercial strips exist on Coney Island Avenue and Church Avenue.

East Windsor Terrace Rezoning

When this project started in the spring of 2008, eight zoning classifications existed within the study area. However, in response to community concerns about out-of-scale development overwhelming the study area, DCP proposed a zoning map amendment for approximately five blocks within the East Windsor Terrace neighborhood of Brooklyn's Community District 7. The rezoning area is generally bounded by Ocean Parkway to the west, Coney Island Avenue to the east, Caton Place to the north and Caton Avenue to the south, and is referred to as "Stable Brooklyn" by some community members because of its proximity to the Kensington Stables at East 8th Street and Caton Place.

Figure 2-M shows the new zoning now in effect.

The rezoning aims to protect portions of the East Windsor Terrace neighborhood characterized by one- and two-family residences, and to ensure that future residential development reflects this existing lower density context. In addition, the rezoning establishs a new commercial overlay on the primary corridor of Caton Avenue to provide opportunities for local retail in the area.

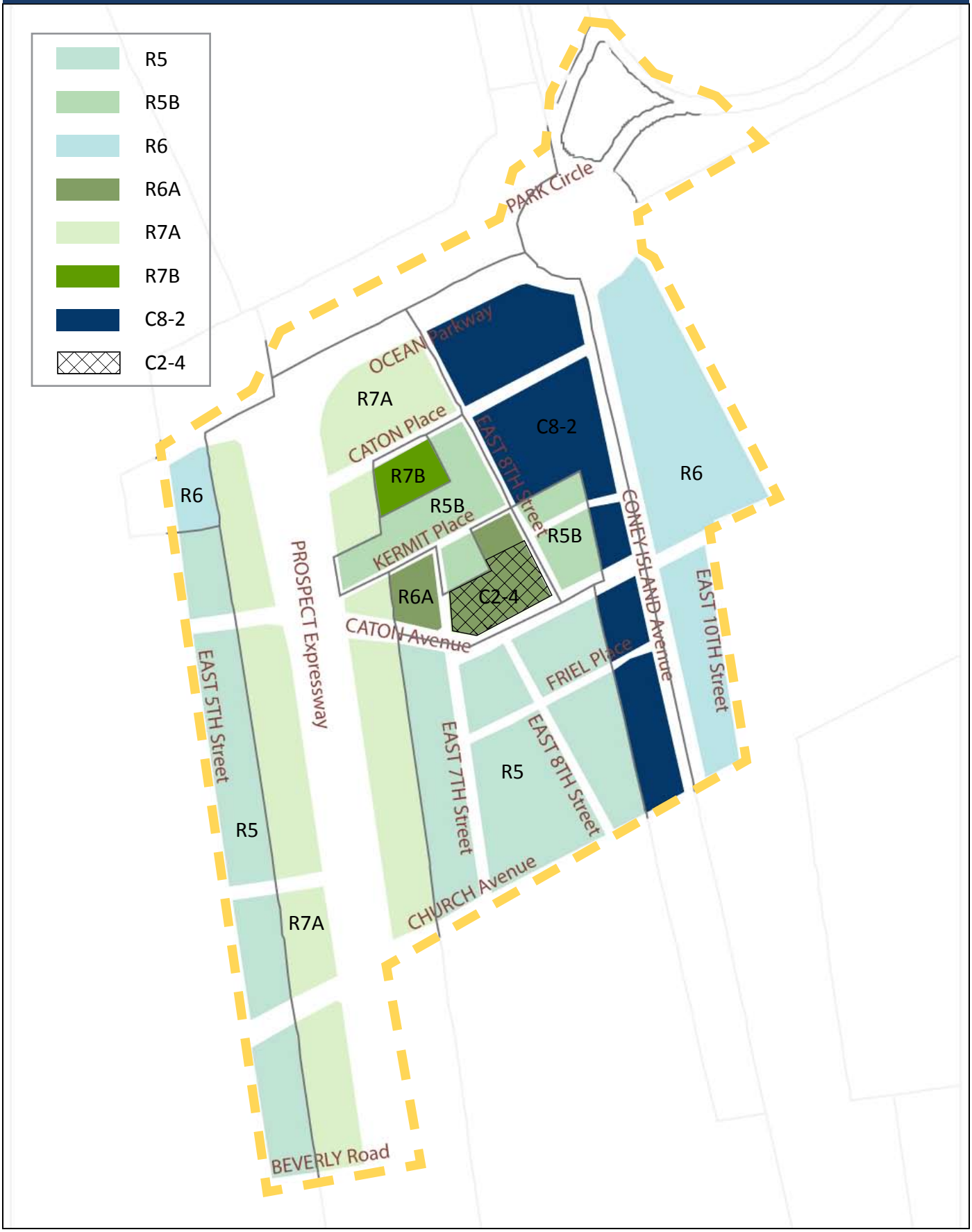
DCP certified the Uniform Land Use Review Procedure (ULURP) application for the rezoning on November 17, 2008, andthe City Council approved the rezoning on March 11, 2009.

Table 2-A summarizes the progress of the proposed rezoning through the ULURP process.

TABLE 2-A: PROGRESS OF EAST WINDSOR TERRACE REZONING

Milestone	*Date*
Department of City Planning Certification	November 17, 2008
Community Board 7 Approval	December 10, 2008
Brooklyn Borough President Approval	December 30, 2008
City Planning Commission Hearing	January 21, 2009
City Planning Commission Review	February 4, 2009
City Council Approval	March 11, 2009

FIGURE 2-M: STUDY AREA ZONING



Zoning Classifications Found Within Study Area

Residential

R5

Areas zoned R5 have a maximum allowable FAR of 1.25, and typically result in three-story attached houses and small apartment houses. Building heights are limited to 40 feet, with a 30-foot street wall maximum. A minimum of 85 percent of all dwelling units must have parking for one vehicle per dwelling unit.

R5B

R5B districts permit a maximum FAR of 1.35 and a maximum building height of 33 feet with a maximum street wall height of 30 feet. The required minimum lot width and area for detached homes is 25 feet and 2,375 square feet respectively, and for other housing types is 18 feet and 1,700 square feet respectively. Curb cuts are prohibited on lots less than 40 feet wide. The required minimum front yard is 5 feet and must be as deep as an adjacent front yard. Detached residences require two side yards with a total width of 13 feet. Zero lot line buildings require one 8-foot side yard and all other buildings require one 4-foot side yard. When parking is required, on-site spaces must be provided for two-thirds of the dwelling units.

R5 Infill

Areas zoned R5 Infill have a maximum allowable FAR of 1.65, and tend to result in more attached housing than in R4 districts. Building heights are limited to 33 feet, with a 30-foot street wall maximum. A minimum of 66 percent of all dwelling units must have parking for one vehicle per dwelling unit.

R6

In an R6 zone, allowed FARs range from .78-2.43, or 2.20-3.00 if the higher lot coverage for Quality Housing is chosen. (Quality Housing maximum building heights are either 55 or 70 feet, depending on how wide the facing street is.) Off-street parking is generally required for 70 percent of conventional R6 dwelling units or 50 percent for Quality Housing R6 dwelling units. Although this is the lowest residential classification which allows "tower-in-the-park" style housing, none exist here.

R6A

R6A is a contextual district that would ensure that new construction would be compatible with existing buildings. R6A has a maximum FAR of 3.0 for residential and community facility uses. Above a base heightof 40 to 60 feet, the building must provide a setback of 10 feet on a wide street and 15 feet on a narrow street before rising to a maximum height of 70 feet. Off-street parking is required for 50 percent of the units.

R7A

Areas zoned R7A have a maximum allowable FAR of 4.0. Building heights are limited to 80 feet, with a 40-foot base height minimum and 65-foot base height maximum. This typically results in seven- and eight-story apartment buildings. The area between the street wall and street line must be landscaped, and any new buildings must match the street lines of any buildings (up to a depth of 15 feet) within 150 feet on the same block. A minimum of 50 percent of all dwelling units must have parking for one vehicle per dwelling unit, but if the zoning lot is 10,000 square feet or less the requirement drops to 30 percent. (If 15 or fewer spaces are required, the parking regulation is waived entirely.) Quality Housing bulk regulations are mandatory for R7A districts.

R7B

Areas zoned R7B have a maximum allowable FAR of 3.0. Building heights are limited to 75 feet, with a 40-foot base height minimum and 60-foot base height maximum. The front wall of any new buildings up to 50 feet wide must be as deep as one adjacent lot but no deeper than the other one. For buildings 50 feet or wider, front walls cannot be closer to the street line than those of an adjacent building (up to a depth of 15 feet). Curb cuts are prohibited in front of lots 40 feet or narrower. A minimum of 50 percent of all dwelling units must have parking for one vehicle per dwelling unit, but the regulation is waived if five or fewer spaces are required. Quality Housing bulk regulations are mandatory for R7B districts.

R8B

Areas zoned R8B have a maximum allowable FAR of 4.0. Building heights are limited to 75 feet, with

a 55-foot base height minimum and 60-foot base height maximum. The front wall of any new buildings up to 50 feet wide must be as deep as one adjacent lot but no deeper than the other one. For buildings 50 feet or wider, front walls cannot be closer to the street line than those of an adjacent building (up to a depth of 15 feet). Curb cuts are prohibited in front of lots 40 feet or narrower. In Brooklyn, a minimum of 40 percent of all dwelling units must have parking for one vehicle per dwelling unit, but the regulation is waived if 15 or fewer spaces are required. Quality Housing bulk regulations are mandatory for R8B districts.

Commercial Overlays

Commercial designations in the C1 and C2 groups are overlays, meaning that they are superimposed upon existing residential zones. Usually this means that retail exists on the ground floor or first two floors of a residential building. The C1-3 and C2-3 zones described below are commercial overlays.

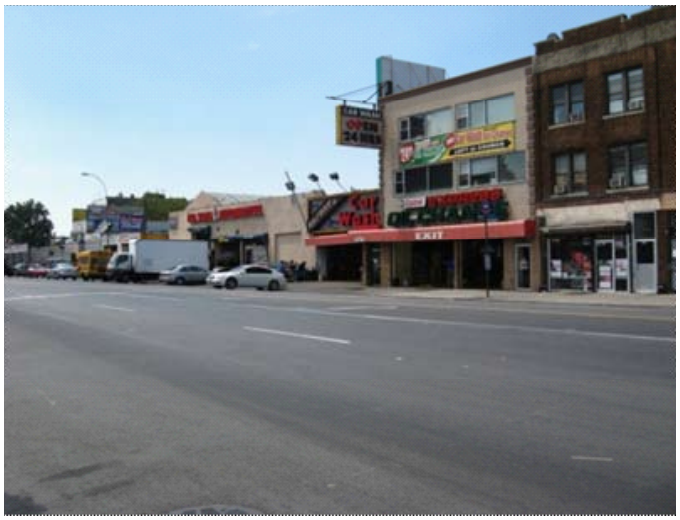
C1-3

The overlay serves local retail needs (such as grocery stores, beauty parlors and Laundromats), and is limited to a commercial FAR of 1.0. The district is 150 feet deep.

A C1-3 commercial district overlays an R5 district on the north side of Church Avenue between East 7th and East 8th streets.

The study area's sole C2-3 overlay, in an R6 district on the north side of Church Avenue between Coney Island Avenue and East 10th Street.

A typical stretch of C8-2-zoned automotive uses on Coney Island Avenue south of Church Avenue.



Housing in an R5 district, on East 8th Street south of Friel Place.

C2-3

This district can accommodate a slightly wider range of uses than a C1 district. Upholsterers, appliance retailers and business services can appear in C2 overlays.

C2-4

Commercial uses in C2-4 districts have a maximum FAR of 2.0. Permitted uses in C2-4 district include drug stores, restaurants, beauty parlors and bike repair services. Residential, mixed commercial/residential and community facility uses in C2 commercial overlay districts are regulated by the underlying residential districts. Commercial uses in mixed use buildings cannot be located above the first floor.

C8-2

C8-2-zoned areas are meant for automobile-related uses and other large commercial facilities which require a lot of land. The maximum allowed FAR in a C8-2 district is 2.0. All commercial uses and some community facilities are allowed in a C8-2 district, but residential uses are not permitted.

A typical six-story apartment buildings on Ocean Parkway.

A typical six-story apartment buildings on Ocean Parkway.

An apartment building along Park Circle's northwest quadrant, in the R8B district along the westbound Ocean Parkway stub.

Although zoned R7A, some lower-density housing along the parkway survives.

Census Data

The 2000 Census counted 6,611 people in the 20 blocks of the study area, including the entirety of the three blocks which front the westbound Ocean Parkway stub from Park Circle to Prospect Avenue.[12] Figure 2-N breaks down the population by block. It should be noted that some additional residential construction has taken place in the study area since 2000.

Just over three quarters of the population lived on the blocks bordering Ocean Parkway.

A total of 2,835 housing units were found within the study area. At the time of the Census, 2,729 were occupied, making for a 3.7 percent vacancy rate. The majority – 2,177, or 79.8 percent – of the units were renter-occupied. The remaining 552 units (20.2 percent) were owner-occupied.

Tables 2-B and 2-C respectively show the primary mode of travel for workers who lived in the study area and workers who commuted to the study area in 2000. Because this journey-to-work data is sample data and only available down to the block group level, mode splits are estimated, and several blocks beyond the study area are unavoidably included in this data. A comparison with primary modes for all commuters to and from all of Brooklyn is also included.

As seen in Table 2-B, in 2000 the majority of the 4,954 workers living in the study area commuted to their jobs by subway (53.1 percent), while an additional 10.5 percent commuted primarily by bus. The proportion of subway commuters was above the boroughwide share of 44.8 percent. Drivers commuting alone were a distant second to subway commuters, at 18.7 percent. Six-tenths of one percent bicycled to work, but only 4.4 percent walked – half the percentage of Brooklyn as a whole that walks to work (8.8 percent). The remaining 13.5 percent either worked at home or commuted by carpool, taxi, railroad, or other means.

The travel profile of commuters to the study area, shown in Table 2-C, was considerably different. More people drove alone to the study area than used any other mode, including subway. However, while this mode split was also true for Brooklyn as a whole, the margin between solo drivers and subway commuters was smaller in the study area (30.6 percent vs. 23.8 percent) than boroughwide (34.9 percent vs. 22.8 percent). Walkers notably made up the third largest group of commuters to the study area, and with a 14.8 percent share of all commuters, walkers outpaced the borough as a whole by 3.2 percent. Though data from a relatively small sample size should be used with caution, the estimated 19 cyclists comprised 1.1 percent of all commuters to the area, compared to 0.5 percent for the entire borough. (The proximity of Prospect Park may induce some commuters from the north and east to walk or bike to work.) Also notable is the high proportion of respondents who said they worked from home.

[12] The smallest divisible unit in Census data is block level. The study team was not able to subdivide these blocks to separate out the dwellings north of the study area on these three blocks. Therefore, for the purposes of this chapter, all of these three blocks will be included as part of the study area's Census data.

FIGURE 2-N: 2000 CENSUS TRACTS AND POPULATION (TRACT-BLOCK NUMBER)

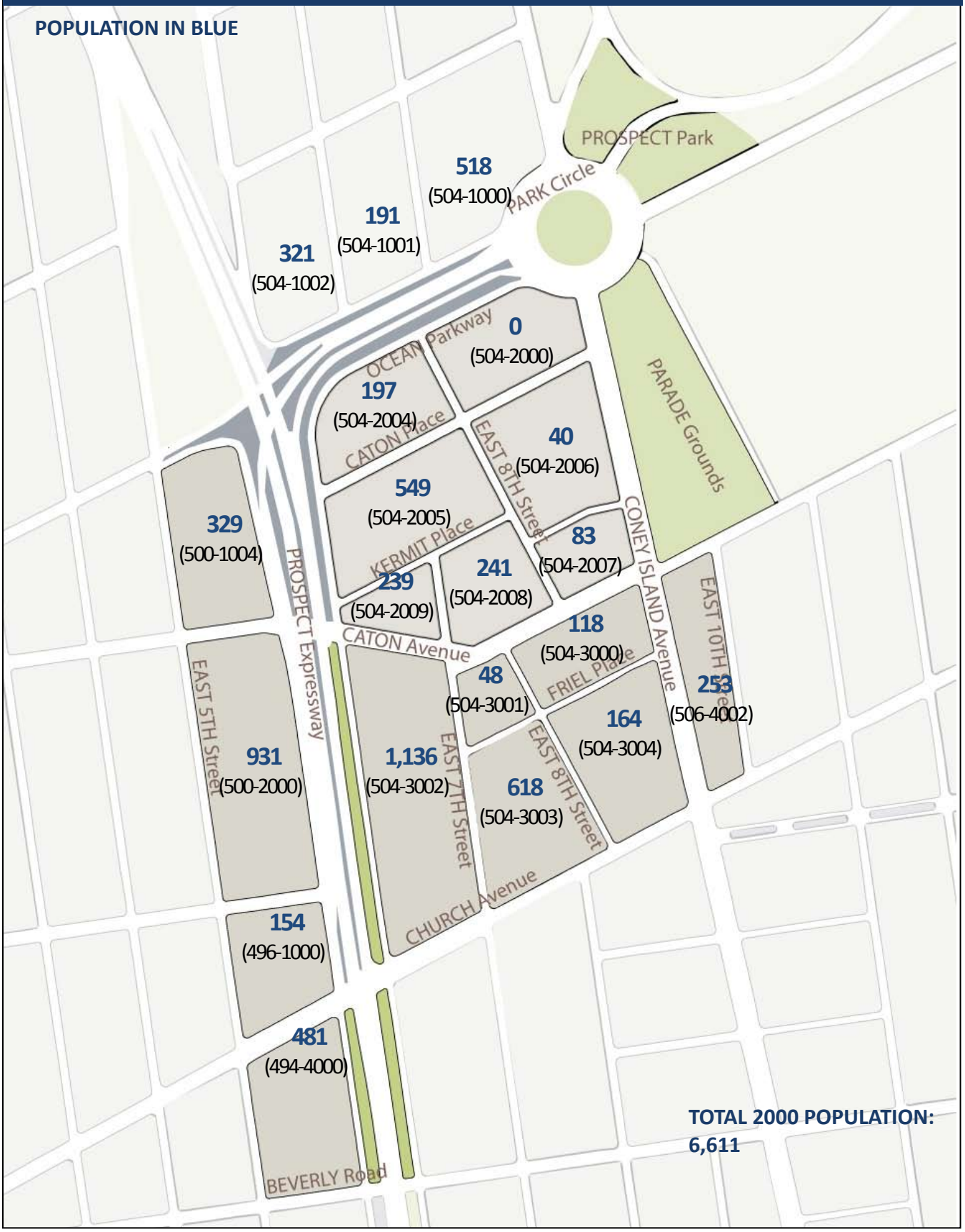


TABLE 2-B: PRIMARY TRAVEL MODE FOR COMMUTERS FROM STUDY AREA (2000 CENSUS SAMPLE DATA)

Mode	*Study Area*		*Brooklyn-wide*		*difference*
Subway	2,630	53.1%	403,325	44.8%	8.3%
Drove alone	925	18.7%	202,070	22.4%	-3.8%
Bus	520	10.5%	93,765	10.4%	0.1%
Walked	220	4.4%	78,935	8.8%	-4.3%
Worked at home	170	3.4%	20,665	2.3%	1.1%
2-person carpool	148	3.0%	49,025	5.4%	-2.5%
Railroad	120	2.4%	12,170	1.4%	1.1%
3-person carpool	70	1.4%	12,180	1.4%	0.1%
4+ person carpool	55	1.1%	11,035	1.2%	-0.1%
Taxicab	54	1.1%	6,150	0.7%	0.4%
Bicycle	30	0.6%	4,845	0.5%	0.1%
Other means*	12	0.2%	6,875	0.8%	-0.5%
Total	**4,954**	**100.0%**	**901,025**	**100.0%**	**0.0%**

TABLE 2-C: PRIMARY TRAVEL MODE FOR COMMUTERS TO STUDY AREA (2000 CENSUS SAMPLE DATA)

Mode	*Study Area*		*Brooklyn-wide*		*difference*
Drove alone	540	30.6%	232,715	34.9%	-4.3%
Subway	420	23.8%	152,185	22.8%	1.0%
Walked	260	14.7%	76,570	11.5%	3.2%
Bus	174	9.8%	81,895	12.3%	-2.4%
Worked at home	170	9.6%	20,665	3.1%	6.5%
2-person carpool	119	6.7%	50,440	7.6%	-0.8%
4+ person carpool	29	1.6%	8,815	1.3%	0.3%
Bicycle	19	1.1%	3,660	0.5%	0.5%
Other means*	18	1.0%	5,860	0.9%	0.1%
3-person carpool	14	0.8%	11,775	1.8%	-1.0%
Railroad	4	0.2%	17,265	2.6%	-2.4%
Taxicab	0	0.0%	5,635	0.8%	-0.8%
Total	**1,767**	**100.0%**	**667,475**	**100.0%**	**0.0%**

*"Other means" includes streetcar, trolley, ferry, motorcycle and others not individually listed on Census forms.

2.2 ON-STREET PARKING REGULATIONS AND STREET WIDTHS

In June of 2008, the study team walked all streets in the study area to inventory all on-street parking regulations to provide baseline existing conditions that could be used in future analyses or activity.

There are a wide variety of on-street regulations in the area – 36 different regulation types were found. Alternate side parking, metered parking (especially on Church Avenue), no standing regulations, bus stops, truck loading areas, and authorized parking restrictions all exist within the area. Regulations cover either a specific time of the day or a specific day of the week. The most common form of curbside regulations is alternate side parking, which is necessary for street cleaning once or twice per week.

On-street parking is permitted within the study area, except at locations where the traffic flow would be adversely affected, particularly during the AM and PM peak periods, or where curb space is needed for trucks and/or other authorized vehicles (such as police, fire, or transit vehicles). See Table 2-D for a list of the different curb regulations and Figure 2-O for their locations.

Additional, highly localized observed conditions found within the study area appear in Appendix B.

TABLE 2-D: KEY TO ON-STREET PARKING REGULATIONS

#	*type*	*day*	*time*	*Exemptions*
1	No Parking	Anytime		
2	No Parking	Tu	9:30am-11:00am	
3	No Parking	We	9:30am-11:00am	
4	No Parking	Mo	11:30am-1:00pm	
5	No Parking	Tu	11:30am-1:00pm	
6	No Parking	We	11:30am-1:00pm	
7	No Parking	Th	11:30am-1:00pm	
8	No Parking	Fr	11:30am-1:00pm	
9	No Parking	Mo,Th	9:30am-11:00am	
10	No Parking	Tu,Fr	9:30am-11:00am	
11	No Parking	Mo,We,Fr	12:00am-3:00am	
12	No Parking	Tu,Th,Sa	12:00am-3:00am	
13	No Parking	Mo-Fr	8:00am-6:00pm	
14	No Parking	Mo-Sa	8:00am-7:00pm	
15	No Parking	School Days	7:00am-4:00pm	
16	No Parking	School Days	7:00am-4:00pm	Except Board of Education
17	No Parking	School Days	8:00am-6:00pm	Except Faculty Vehicles
18	No Parking	Mo-Sa	7:00am-7:00pm	
19	No Parking	Mo-Sa	7:30am-8:00am	
20	No Parking	Mo-Sa	8:00am-8:30am	
21	1 Hour Parking	Mo-Sa	8:00am-7:00pm	
22	1 Hour Parking	Mo-Sa	8:30am-7:00pm	
23	1 Hour Parking	Mo-Sa	10:00am-7:00pm	
24	2 Hour Parking	Mo-Sa	8:00am-7:00pm	
25	2 Hour Parking	Mo-Sa	9:00am-7:00pm	
26	2 Hour Parking	Mo-Sa	10:00am-7:00pm	
27	No Standing	Anytime		
28	Bus Stop -- No Standing	Anytime		
29	No Standing	Mo-Fr	7:00am-10:00am	
30	No Standing	School Days	7:00am-4:00pm	
31	No Standing	Mo-Fr	4:00pm-7:00pm	
32	No Standing	Mo-Sa	4:00pm-7:00pm	
33	No Standing	Mo-Fr	7:00am-4:00pm	Except Trucks Loading and Unloading
34	No Standing	Mo-Sa	6:00am-4:00pm	Except Trucks Loading and Unloading
35	No Standing			Except Authorized Vehicles (none posted)
36	No Standing			Except Authorized Vehicles (NYPD Permits Only)
37	unsigned			used by official NYPD vehicles
38	unsigned			

FIGURE 2-O: ON-STREET PARKING REGULATIONS

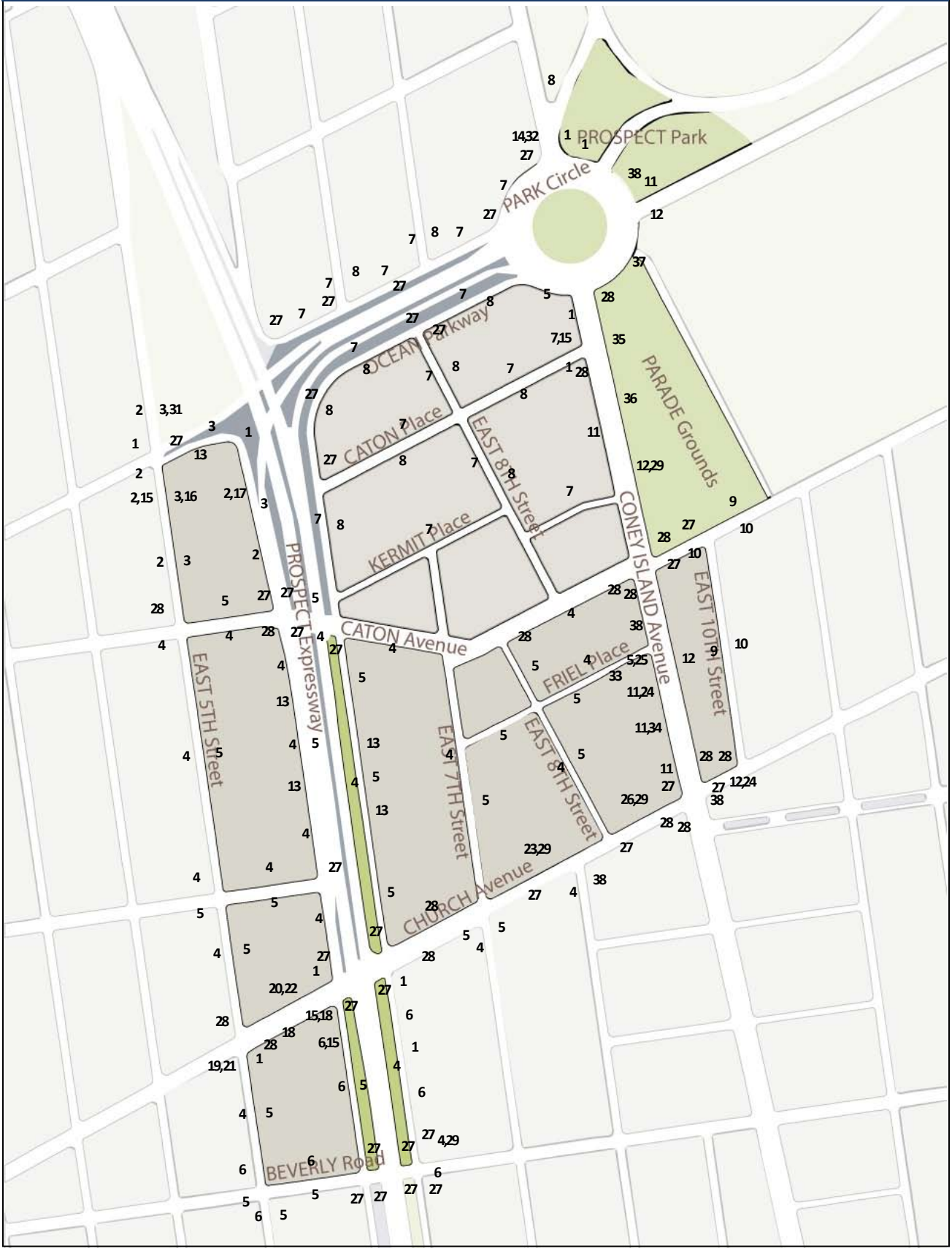
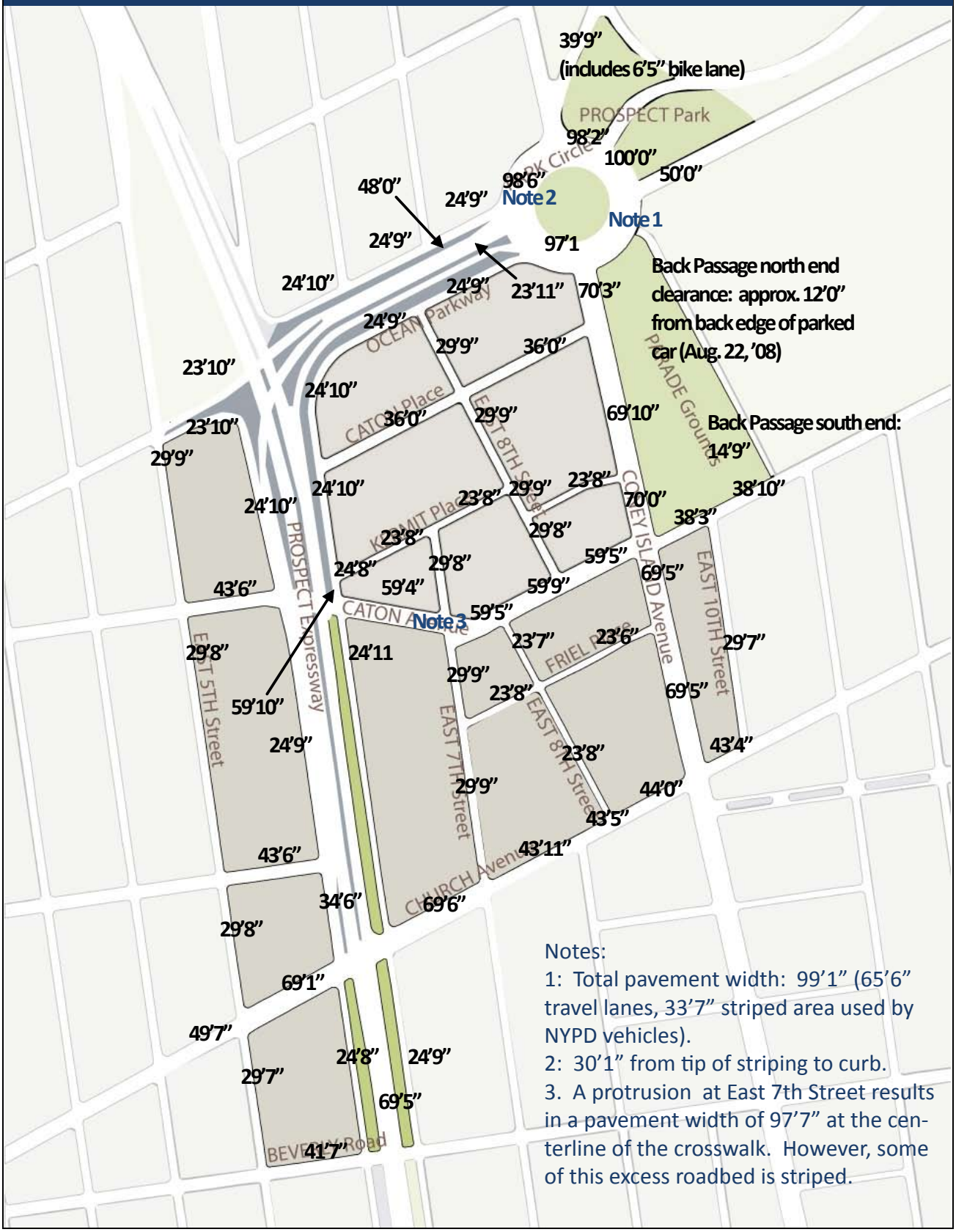


FIGURE 2-P: STREET WIDTHS



Street Widths

In August of 2008, the study team walked all streets in the study area to measure the widths of their street beds from curb to curb. This was done to provide data that the study team and the Technical Advisory Committee could use for developing alternative bicycle, pedestrian and equestrian path alignments throughout the study area, if desired.

Figure 2-P provides the street widths for each block, which should be regarded as accurate to within 3 to 6 inches.

Of note are the following observations:

- *Caton Place is unusually wide for a side street.* At 36 feet, the Caton Place roadbed is over 6 feet wider than standard side streets in the study area and fully 50 percent wider than Friel Place, Kermit Place and the segment of East 8th Street south of Caton Avenue. Motor vehicles are not using Caton Place in abundance – AM and PM peak hour eastbound volumes near Coney Island Avenue in May 2006 were 41 and 42 respectively. (See Section 3.2.)
- *Park Circle's roadbed ranges from 97 to 100 feet wide.* This is approximately 20-25 feet wider than the six-lane Brooklyn-Queens Expressway is in the trench bracketed by Hicks Street. The circle's exceptionally wide paved perimeter represents both an unusually large impediment and an equally large opportunity for imaginative new uses that could coexist with motor vehicles.

Additional notes about street widths within the study area appear in Appendix B.

2.3 CYCLIST AND VEHICULAR TRAFFIC DATA

In July of 2008, the DCP Transportation Division conducted bicycle and pedestrian counts along Ocean Parkway between Church Avenue and Park Circle. Most of these counts were exclusively of bicyclists, but pedestrians were also counted at the Sherman Overpass and a vehicular count was conducted at the flyover to determine the traffic split between vehicles heading to Fort Hamilton Parkway and to Ocean Parkway.

The counts were conducted over four 2-hour periods:

- A weekday AM peak (7:30am-9:30am)
- A weekday midday (12:00pm-2:00pm)
- A weekday PM peak (5:00pm-7:00pm)
- A Sunday morning (9:15am-11:15am)

The results of the counts are grouped by location, and then analyzed as a whole. Figure 2-Q shows the five locations discussed in this section.

Church Avenue and Ocean Parkway/Prospect Expressway

This intersection marks the southern limit of the Prospect Expressway. As discussed in Section 2.0, several factors inhibit the ability of cyclists move from north to south through the intersection, such as the switch of the bicycle path between the east and west malls and incomplete signage.

An analysis of the count data yields several noteworthy results:

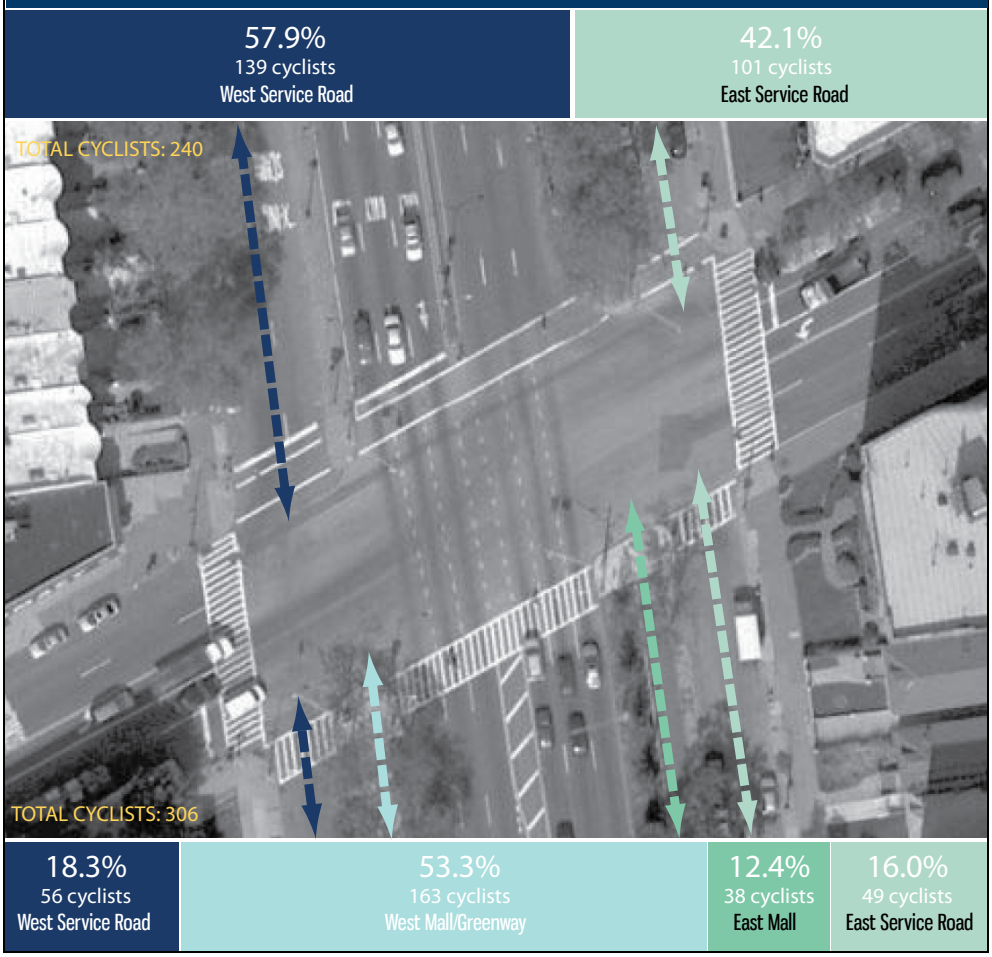
- *A significant portion of bicycle traffic is coming from Church Avenue.* Some cyclists passed completely though the intersection from east to west or west to east, but others turned onto Ocean Parkway, either northbound or southbound.
    - Of the 347 cyclists counted during the four count periods in the western half of the intersection, 136 (or 39.1 percent) were coming from or going to Church Avenue west of the intersection.
    - Of the 326 cyclists counted during the four count periods in the eastern half of the intersection, 173 (or 53.1 percent) were coming from or going to Church Avenue east of the intersection.[13]

- *Bicycle traffic is heavier during peak periods, but peak-directional flows are ambiguous.* An understandable assumption would be that more northbound cyclists use the intersection in the morning and more southbound use it in the evening. However, this is not the case. For example, in the AM peak south of Church Avenue, 46 cyclists traveled northbound along Ocean Parkway and 30 southbound. In the PM peak 59 traveled northbound and 59 southbound. (All data includes cyclists going to and from Church Avenue.) If traffic only along the west side of Ocean Parkway is considered (including the bikeway and the adjacent service road and sidewalk), peak directional flows were nonexistent: 24 northbound cyclists and 22 southbound in the AM peak and 49 northbound and 48 southbound in the PM peak.

- *Most cyclists are using the bikeway south of Church Avenue, but a significant minority is not.* Figure 2-R above breaks down the percentages of all north-south cyclists on Ocean Parkway during the combined 8 hours of counts (AM, midday, PM, Sunday). Some of the cyclists on the service roads, especially the eastern one, continued north of Church Avenue. The 38 cyclists on the east mall are there even though pavement markings explicitly prohibit cycling on this part of the parkway.

- *North of Church Avenue, most cyclists are not using the greenway.* For the eastern service road – the one portion of Ocean Parkway which still runs continuously to Park Circle – the combined total of cyclists from all four count periods was 139. Of these, 64 (46.0 percent) used the greenway, while 75 (54.0 percent) used either the street or the eastern (residential) sidewalk.[14]

FIGURE 2-R: BREAKDOWN OF N-S CYCLISTS BY PATHWAY ON OCEAN PARKWAY



[13]Adding up the cyclists from the western and eastern halves of the intersection would greatly overestimate the total number of cyclists at this location, since many cyclists crossed between both halves of the intersection. The intent of this count was not to measure east-west traffic, but the findings clearly warrant further investigation of bicycle traffic along Church Avenue at a later date.

[14]A discrepancy of one cyclist exists between the combined total (138) and the split between greenway and street (139).

- *A significant minority of cyclists is using the western service road.* A total of 101 cyclists were counted on the west service road, compared to 139 on the eastern one, despite the fact that the west road is truncated at Fort Hamilton Parkway; the east road has separate bikeway while the west road does not; an exit from the Prospect Expressway empties onto the service road just north of Church Avenue, and the western service road reverses direction at Caton Avenue, meaning that all cyclists using the entire stretch of the western service road will be riding contraflow for some part of their journey. The counts did not attempt to track the cyclists on this part of the parkway, so some of them may be entering the west service road from Albemarle Road or Caton Avenue. Others might get to the north end of the service road and loop onto the flyover pedestrian walkway.

- *Some bicyclists ignored the striped crosswalks and crossed in a straight north-south line to and from the malls south of Church Avenue.* Out of the 163 total north-south cyclists counted on the greenway south of Church Avenue, 49 of them (or 30.1 percent) kept going due north as if the greenway were continuing in a straight line, either turning east onto the unstriped crosswalk along the northern edge of the intersection or proceeding north. On the east side of the parkway, 40 more cyclists took advantage of one of the curb cuts that empty in to the non-crosswalk described in Section 2.0. Many of these cyclists proceeded directly from north to south, despite the fact that bicycling is forbidden on the east mall south of Church Avenue.

Caton Avenue and Ocean Parkway (East Service Road)

This intersection marks the eastern endpoint of a mostly-Class 2 striped on-street bicycle lane to Sunset Park and Bay Ridge. The striping, however, ends at Ocean Parkway's west service road instead of proceeding across the overpass to the Class 1 bikeway along the western edge of the east service road. (The Prospect Expressway is in an open cut below and between the perimeter service roads.) Bicycle lanes exist between both the eastbound and westbound lanes and their respective parking lanes.

Caton Avenue is a two-way, two-lane road officially designated by NYCDOT as a local truck route, meaning that any truck with an origin or destination within Brooklyn is permitted to use this road. It is heavily used by trucks.[15]

Based on the count data, the following observations can be made:[16]

- *Most cyclist traffic came from, went to, or passed through the intersection via Caton Avenue.* Of the 261 cyclists counted during weekday count periods, 198 (75.9 percent) had at least one origin or destination on Caton Avenue, a higher ratio than at Church Avenue.

- *Most cyclists were avoiding the Ocean Parkway bikeway, especially north of Caton Avenue.* See Table 2-E. Fewer cyclists were on the whole breadth of the eastern Ocean Parkway Service road (including the bikeway) south of Caton, resulting in a relative increase in the proportion of on-bikeway cyclists. However, on both sides of Caton Avenue, bikeway users were in the minority.

Ambiguous curb cuts at Caton Avenue and Ocean Parkway eastern

[15]New York City Traffic Rules and Regulations, http://www.nyc.gov/html/dot/downloads/pdf/trafrule.pdf, page 73.

[16]Sunday counts data for this intersection is incomplete.

TABLE 2-E: CYCLIST USE OF BICYCLE PATH AT OCEAN PKWY AND CATON AVE, JULY 2008		
Count period	*Total cyclists north of Caton Avenue/ total using bikeway (percent)*	*Total cyclists south of Caton Avenue/ total using bikeway (percent)*
AM Peak (7:30am-9:30am)	66 / 13 (19.7%)	47 / 15 (31.9%)
Midday (12:00pm-2:00pm)	31 / 6 (19.4%)	18 / 5 (27.8%)
PM Peak (5:00pm-7:00pm)	54 / 19 (35.2%)	45 / 23 (51.1%)
TOTAL	*151 / 38 (25.2%)*	*110 / 43 (39.1%)*

- *Only 28 of the above cyclists traveled straight along the bikeway through the intersection. As discussed in Section 2.0, no striped crosswalk exists here. The existing crosswalk striping traversing the other three sides of the intersection implicitly directs bicyclists onto the residential sidewalk, across Caton Avenue, and back to the greenway, even though a legal bicycle path lies both to the north and south of Caton Avenue. The awkward location of the curb cuts at this intersection – they are not quite aligned either north-south or east-west (see photo below) – only adds additional uncertainty.*

Fort Hamilton Parkway/Ocean Parkway Flyover

This multipurpose overpass above the Prospect Expressway consists of three elements: a four-lane westbound-only road which splits into a two-lane ramp to the tail end of the southbound Prospect Expressway, allowing motorists to travel south on Ocean Parkway; and a two-lane ramp to the beginning of Fort Hamilton Parkway, which continues as a two-lane, one-way street until west of Dahill Road, where it becomes bidirectional. (A traffic signal marks the beginning of the parkway, at its intersection with East 5th Street.) The third element is a pedestrian and bicycle overpass between a linear park east of Fort Hamilton Parkway and East 5th Street, and the westbound stub of Ocean Parkway at East 7th Street.

Along with measuring bicycle and pedestrian traffic on the overpass, this was the sole location where vehicular counts were conducted – the study team wanted to obtain both general traffic volumes and what the split was between Ocean Parkway- and Fort Hamilton Parkway-bound traffic. Based upon these counts, the following observations can be made:

- *The flyover has excess capacity.* Even during peak periods, four travel lanes are not necessary to process the amount of traffic using the flyover. The peak 15-minute period observed was at the Fort Hamilton Parkway ramp between 8:30 and 8:45am. During that time, 95 vehicles used the ramp. This is about one vehicle per 9.5 seconds. Even if the red signal at East 5th Street were to last for 60 seconds, ample room exists for the queuing of six to seven cars. A more typical range of 40 to 80 vehicles per 15 minutes was observed on each of the two ramps during weekdays, or about one vehicle per 11 to 22 seconds. It should be noted, though, that this is only an average. Much of the traffic entering the flyover does so in platoons, due to traffic signals in Park Circle. Sunday morning traffic levels per ramp were in the 20-30 vehicle range per 15 minutes.

- *Except for the AM peak, slightly more traffic was destined for Ocean Parkway than Fort Hamilton Parkway*, as is seen in Table 2-F below. Coincidentally, AM and PM peak volumes were identical for the Fort Hamil-

ton Parkway ramp, which allows a baseline comparison with the expected shift towards higher Ocean Parkway-bound (i.e. southbound) volumes in the PM peak.

TABLE 2-F: TRAFFIC VOLUMES ON FLYOVER, JULY 2008			
Count period	*Total motor vehicles on flyover*	*To Fort Hamilton Parkway*	*To Ocean Parkway*
AM Peak (7:30am-9:30am)	969	545 (56.2%)	424 (43.8%)
Midday (12:00pm-2:00pm)	877	401 (45.7%)	476 (54.3%)
PM Peak (5:00pm-7:00pm)	1,122	545 (48.6%)	577 (51.4%)
Sunday (9:15am-11:15am)	379	167 (44.1%)	212 (55.9%)

TABLE 2-G: CYCLISTS USING FLYOVER PEDESTRIAN PATH VS. ROADWAY, JULY 2008			
Count period	*Total cyclists*	*Via pedestrian path*	*Via roadway*
AM Peak (7:30am-9:30am)	40	26 (65.0%)	14 (35.0%)
Midday (12:00pm-2:00pm)	33	20 (60.6%)	13 (39.4%)
PM Peak (5:00pm-7:00pm)	56	37 (66.1%)	19 (33.9%)
Sunday (9:15am-11:15am)	33	14 (42.4%)	19 (57.6%)

- *A significant fraction of cyclists were using the flyover road itself instead of the parallel pedestrian overpass immediately north of the flyover roadway.* See Table 2-G. Most of these 65 on-road cyclists were traveling with the flow of traffic to Fort Hamilton Parkway, but 10 of them were riding from Fort Hamilton Parkway contraflow. Three of the 65 cyclists went down the ramp to Ocean Parkway, meaning that for a brief period they were on the Prospect Expressway, a highly risky maneuver which may have its allure in the fact that the expressway ends and the west mall greenway begins one block to the south of the offramp's merge with mainline traffic. Regardless, the fact that 40 percent of cyclists bypass the pedestrian walk indicates a latent demand for a pathway more conducive to cycling.

Sherman Overpass and western Park Circle

The Sherman Overpass provides a bicycle- and pedestrian-only north-south link one block west of Park Circle. It makes landfall at the southeast corner of East 8th Street and the Ocean Parkway east service road to the south and then, from south to north, crosses over the following:

- the Ocean Parkway east service road (eastbound traffic, one lane);
- Exit 5 of the Prospect Expressway (eastbound traffic, two lanes);
- the Fort Hamilton Parkway/Ocean Parkway flyover (westbound traffic, four lanes), and
- the severed segment of the Ocean Parkway west service road which provides access to the Prospect Expressway and Prospect Avenue (westbound traffic, one lane).

This cyclist eventually veered left onto the ramp to Ocean Parkway via the Prospect Expressway.

A cyclist rides contraflow from Fort Hamilton Parkway.

The overpass makes its northern landfall at the northwest corner of the Ocean Parkway west service road and Sherman Street, immediately west of a small unnamed park.

Although the overpass's purpose is partially to keep people from making the hazardous ground-level crossing of the eight lanes of traffic listed above, a significant minority of pedestrians and the majority of cyclists are crossing at street level anyway. See Table 2-H.

While 42 cyclists (41.2 percent) were counted on the overpass, 60 (58.8 percent) crossed at street level. The pedestrian ratio is somewhat more favorable to the overpass – 195 to 147 (57.0 percent to 43.0 percent), but a significant minority stayed on the ground. Excluding people whose origins or destinations are affected by the one-block difference, crossing at street level is simply faster and more direct. The overpass is positioned west of Park Circle, requires two hairpin turns (one at each onramp), and is not level. While the western edge of Park Circle largely lacks crosswalks, none of the above conditions apply to crossing at street level.

A breakdown of overpass vs. street-level cycling by direction, though, offers an important clue about cyclists' choices to use one path over the other, as is seen in Table 2-I. The ratio of northbound vs. southbound cyclists using the overpass (27 northbound, 15 southbound) is markedly different than those crossing at street level (22 northbound vs. 38 southbound). At its western edge, Park Circle traffic runs southbound. It is possible that some cyclists use the overpass instead of attempting to ride against the flow of traffic making along the circle perimeter. However, a larger sample size would be needed to corroborate this.

TABLE 2-H: USE OF SHERMAN OVERPASS VS. GROUND-LEVEL CROSSING, JULY 2008

Count period	*Cyclists using Sherman Overpass*	*Cyclists crossing at street level*	*Pedestrians using Sherman Overpass*	*Pedestrians crossing at street level*
AM Peak (7:30am-9:30am)	5 (33.3%)	10 (66.7%)	49 (62.0%)	30 (38.0%)
Midday (12:00pm-2:00pm)	10 (50.0%)	10 (50.0%)	48 (53.9%)	41 (46.1%)
PM Peak (5:00pm-7:00pm)	22 (64.7%)	12 (35.3%)	63 (67.0%)	31 (33.0%)
Sunday (9:15am-11:15am)	5 (15.2%)	28 (84.8%)	35 (43.8%)	45 (56.2%)

TABLE 2-I: CYCLIST USE OF SHERMAN OVERPASS VS. GROUND-LEVEL CROSSING BY DIRECTION, JULY 2008				
Count period	*NB cyclists using Sherman Overpass*	*SB cyclists using Sherman Overpass*	*NB Cyclists crossing at street level*	*SB Cyclists crossing at street level*
AM Peak (7:30am-9:30am)	4 (80.0%)	1 (20.0%)	6 (60.0%)	4 (40.0%)
Midday (12:00pm-2:00pm)	8 (80.0%)	2 (20.0%)	4 (40.0%)	6 (60.0%)
PM Peak (5:00pm-7:00pm)	11 (50.0%)	11 (50.0%)	5 (41.7%)	7 (58.3%)
Sunday (9:15am-11:15am)	4 (80.0%)	1 (20.0%)	7 (25.0%)	21 (75.0%)

Between two-thirds and four-fifths of cyclists traveled in the same direction as traffic on each of the one-way service roads, as Table 2-J shows. This consistency across both time and service road is particularly striking when considering how different the two service roads are. The east service road provides an unbroken connection to Ocean Parkway to the south. It has a Class 1 bike lane that in theory would invite bidirectional use. Yet at the parkway's northern end, this doesn't seem to be the case. The west service road is cut off by the Prospect Expressway; vehicular traffic turns onto the also-truncated south end of Prospect Avenue.

Cyclists and pedestrians wanting to continue along Ocean Parkway and avoid contraflow traffic could use the Sherman Overpass to get from the western to eastern service roads, but as Table 2-I shows, they are not doing so in great numbers. An origin-destination study of cyclists through the area was not done, but most of them appear to be continuing west along the flyover pedestrian walkway. Whether some of them were heading west into Sunset Park or down towards Ocean Parkway is unknown. Roughly identical amounts of cyclists were counted along each service road over the 8 hours of counts (164 eastbound, 152 westbound).

TABLE 2-J: CYCLIST TRAVEL ALONG OCEAN PARKWAY SERVICE ROADS BY DIRECTION, JULY 2008				
Count period	*Ocean Parkway east service road, with traffic*	*Ocean Parkway east service road, contraflow*	*Ocean Parkway west service road, with traffic*	*Ocean Parkway west service road, contraflow*
AM Peak (7:30am-9:30am)	45 (78.9%)	12 (21.1%)	23 (67.6%)	11 (32.4%)
Midday (12:00pm-2:00pm)	14 (70.0%)	6 (30.0%)	17 (68.0%)	8 (32.0%)
PM Peak (5:00pm-7:00pm)	24 (61.5%)	15 (38.5%)	33 (67.3%)	16 (32.7%)
Sunday (9:15am-11:15am)	42 (77.8%)	12 (22.2%)	35 (79.5%)	9 (20.5%)

Park Circle

Cyclists have seven different locations to enter or exit Park Circle, making it a complicated location to analyze. They are:

1. Coney Island Avenue
2. Ocean Parkway northbound/eastbound service road
3. Ocean Parkway westbound service road
4. Prospect Park Southwest
5. Prospect Park
6. Parkside Avenue
7. The "back passage" through the Parade Grounds, which passes west of the athletic fields and east of the police station house en route to Caton Avenue between East 10th Street and Stratford Road.

Vehicles may also use the Fort Hamilton Parkway/ Ocean Parkway flyover between the two service roads, and Exit 5 of the Prospect Expressway brings traffic into the circle.

Figures 2-S through 2-V provide an overview of the counts results by time of day. Figure 2-W is a composite of all four 2-hour count periods (7:30am-9:30am weekday, 12:00pm-2:00pm weekday, 5:00pm-7:00pm weekday and 9:15am-11:15am Sunday), along with the percentages of cyclists using each access point to and from Park Circle. Since 790 were counted entering the circle and 856 were counted leaving it, the data in Figure 2-W has been proportionally balanced to an estimate of 823 cyclists entering and leaving the circle., and should be regarded as accurate to within 4 percent.[17]

Prospect Park clearly acts as the circle's "engine," generating more than twice the bicycle activity as the roadway next most heavily used by cyclists, Prospect Park Southwest

With the exception of Parkside Avenue, the weekday counts also show a moderate but consistent peak directional shift. AM traffic flows tend to favor "inbound" (i.e. towards Downtown Brooklyn and Manhattan) movement, while PM traffic flows are more "outbound." See Table 2-K.

[17]Thirty-three additional cyclists were added to the total amount entering the circle in proportion percentage of the 790 cyclists counted which entered the circle from each roadway. The inverse was done for cyclists leaving the circle.

TABLE 2-K: PEAK-DIRECTIONAL WEEKDAY CYCLIST TRAFFIC THROUGH PARK CIRCLE, JULY 2008

Count period	*To Downtown Brooklyn*	*From Downtown Brooklyn*
AM Peak (7:30am-9:30am)	243 (55.9%)	192 (44.1%)
PM Peak (5:00pm-7:00pm)	234 (47.2%)	262 (52.8%)

In general, there appears to be a bias towards Downtown Brooklyn-bound traffic – midday flows were lighter than peak traffic but more heavily skewed inbound by 123 to 83 (59.7 percent to 40.3 percent.) Note the contraflow traffic on the Ocean Parkway westbound service road actually surpasses the amount of cyclists riding with the flow of traffic.

* Cyclist traffic for one 15-minute interval – from 8:00am to 8:15am – was not counted. An estimate for this period was determined by calculating the average movements for the other seven 15-minute intervals.

FIGURE 2-S: PARK CIRCLE AM BICYCLE TRAFFIC FLOWS, JULY 2008

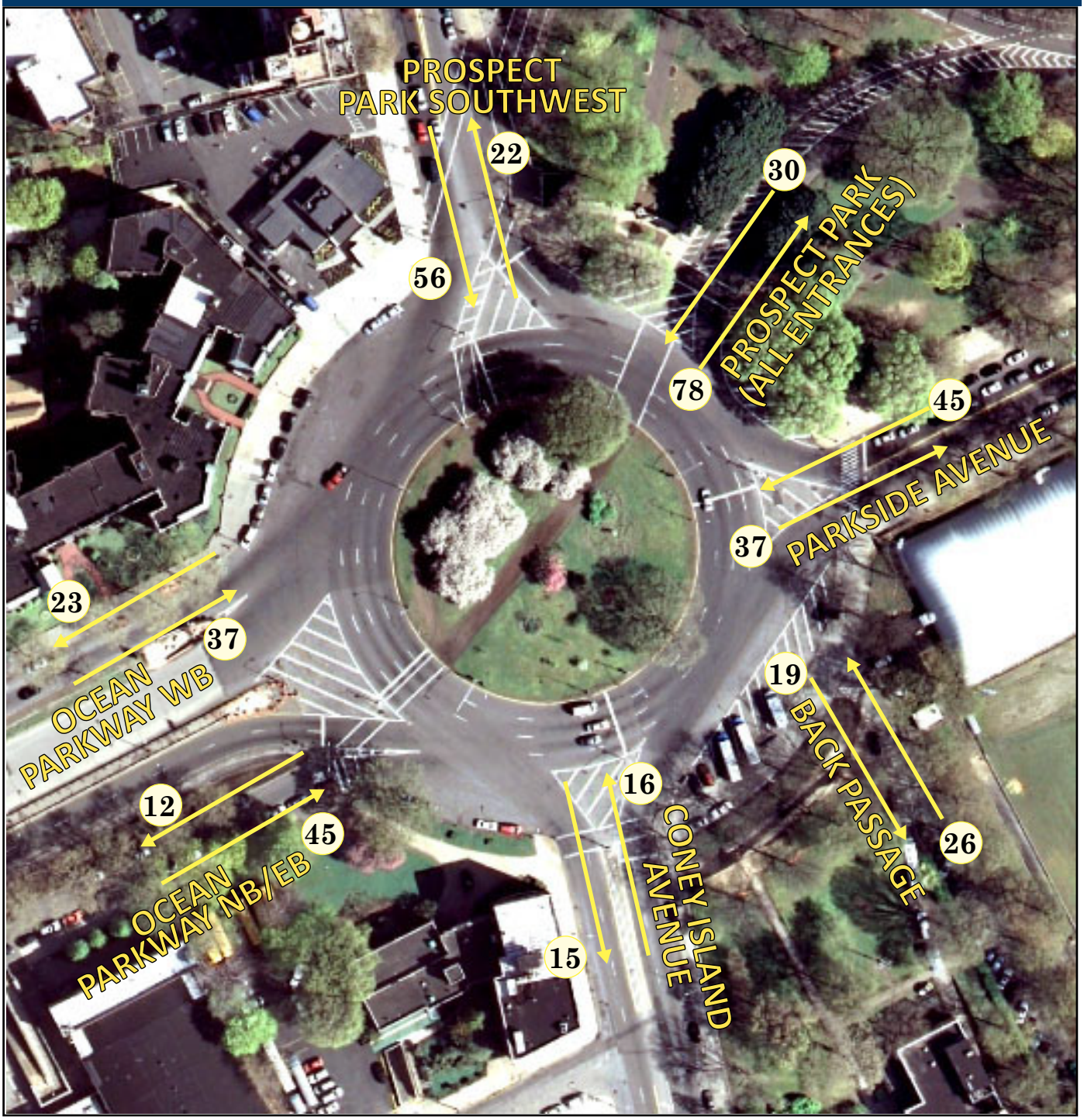


FIGURE 2-T: PARK CIRCLE MIDDAY BICYCLE TRAFFIC FLOWS, JULY 2008

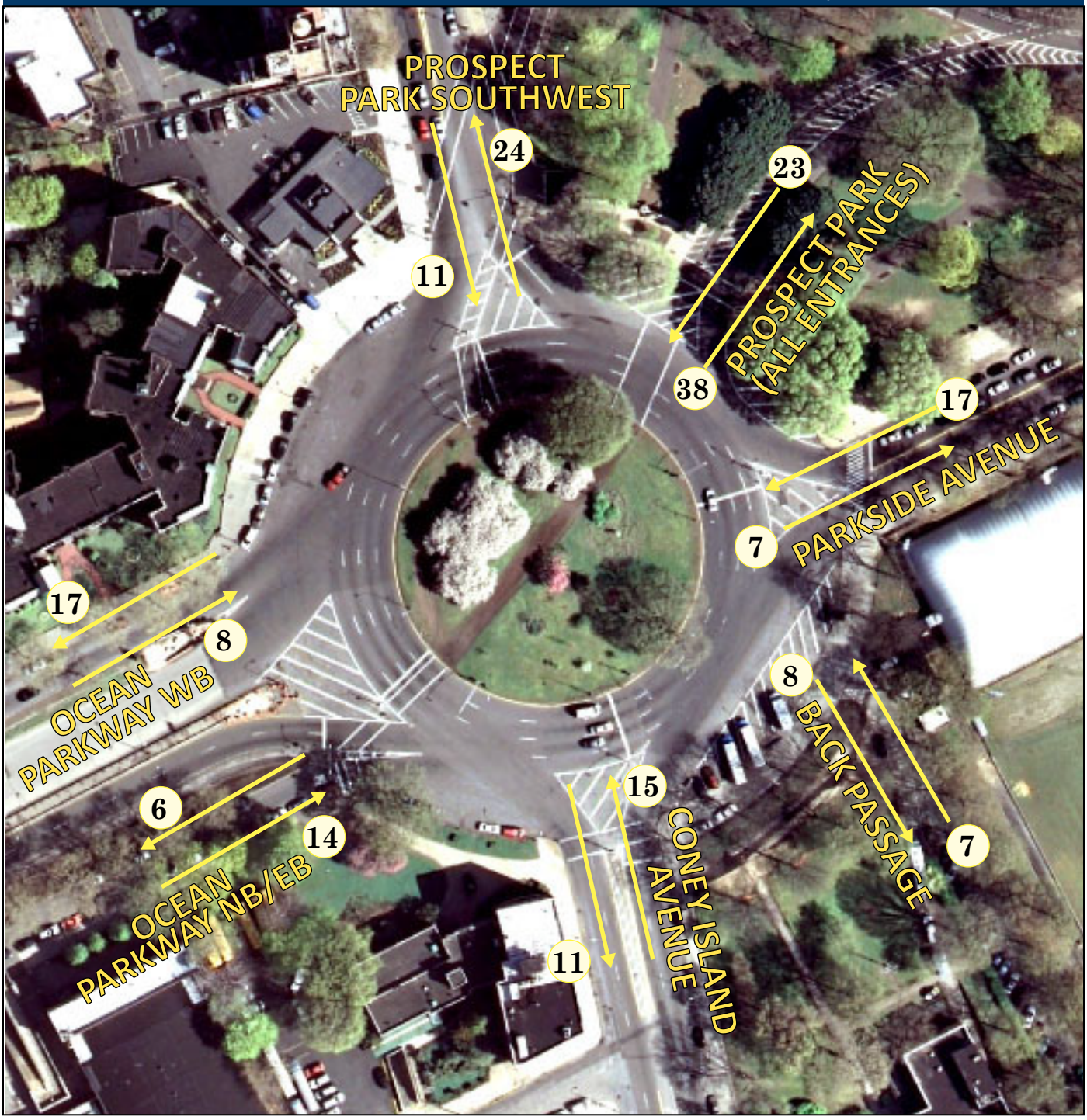


FIGURE 2-U: PARK CIRCLE PM BICYCLE TRAFFIC FLOWS, JULY 2008

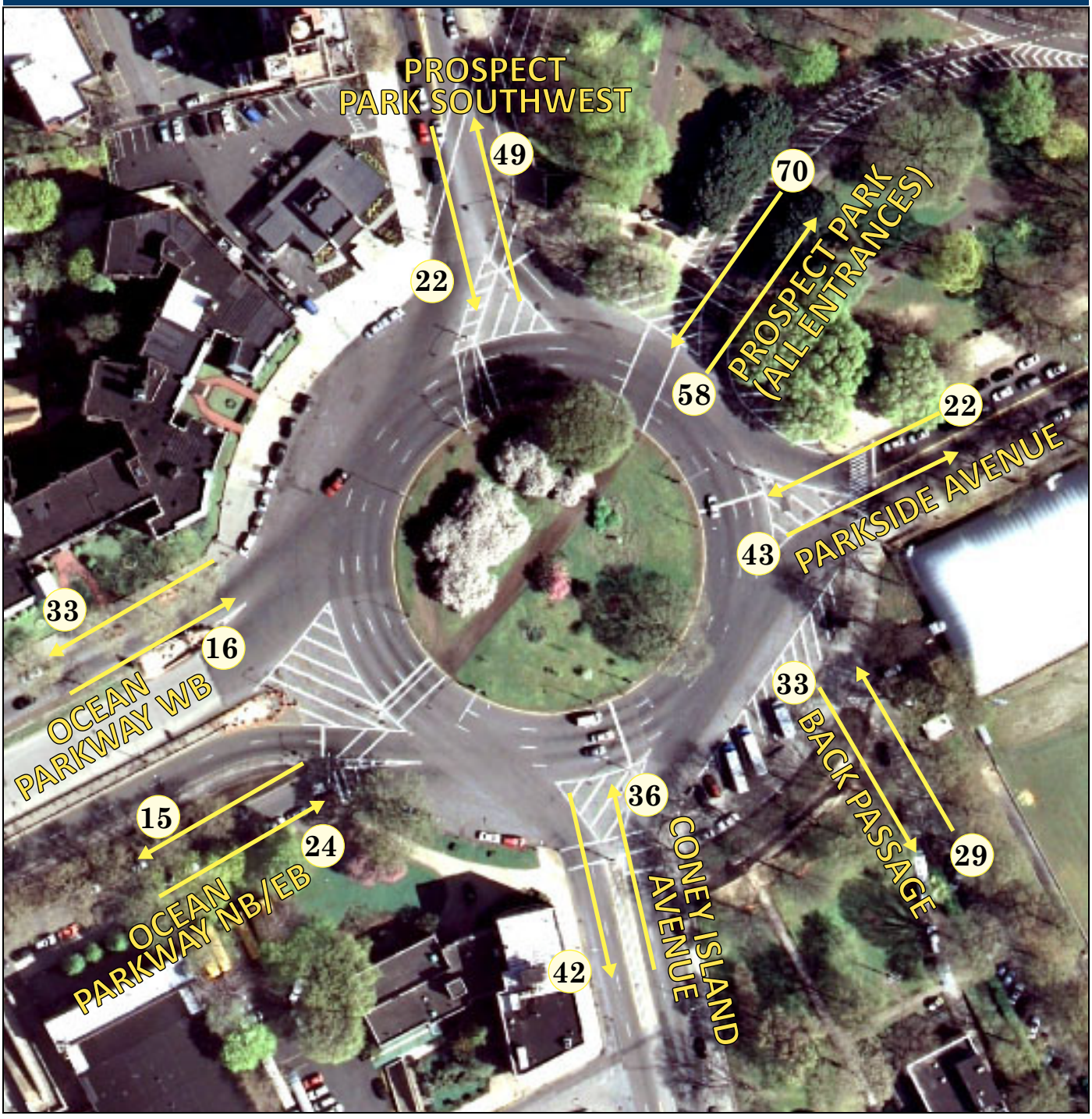


FIGURE 2-V: PARK CIRCLE SUNDAY AM BICYCLE TRAFFIC FLOWS, JULY 2008

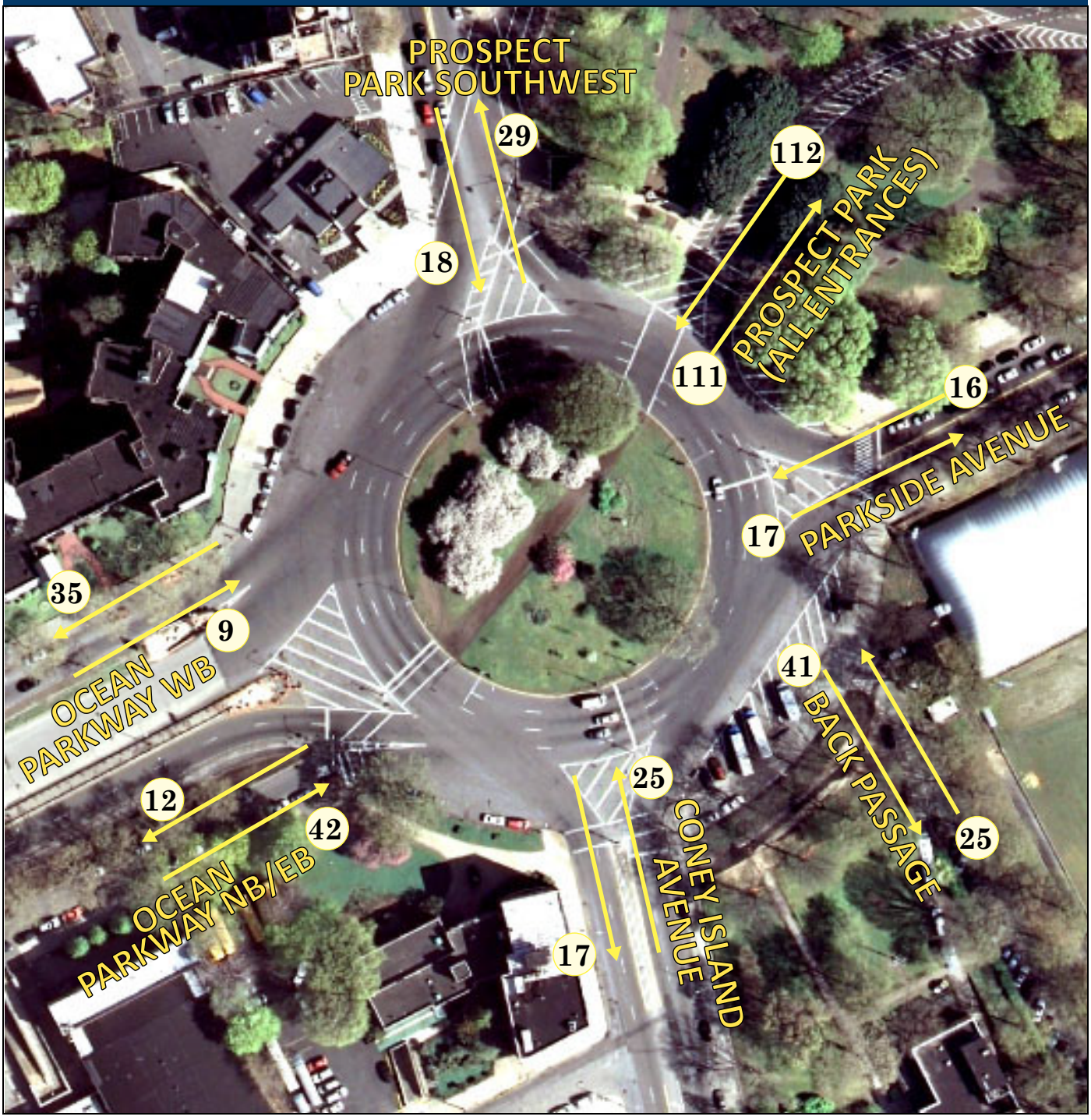
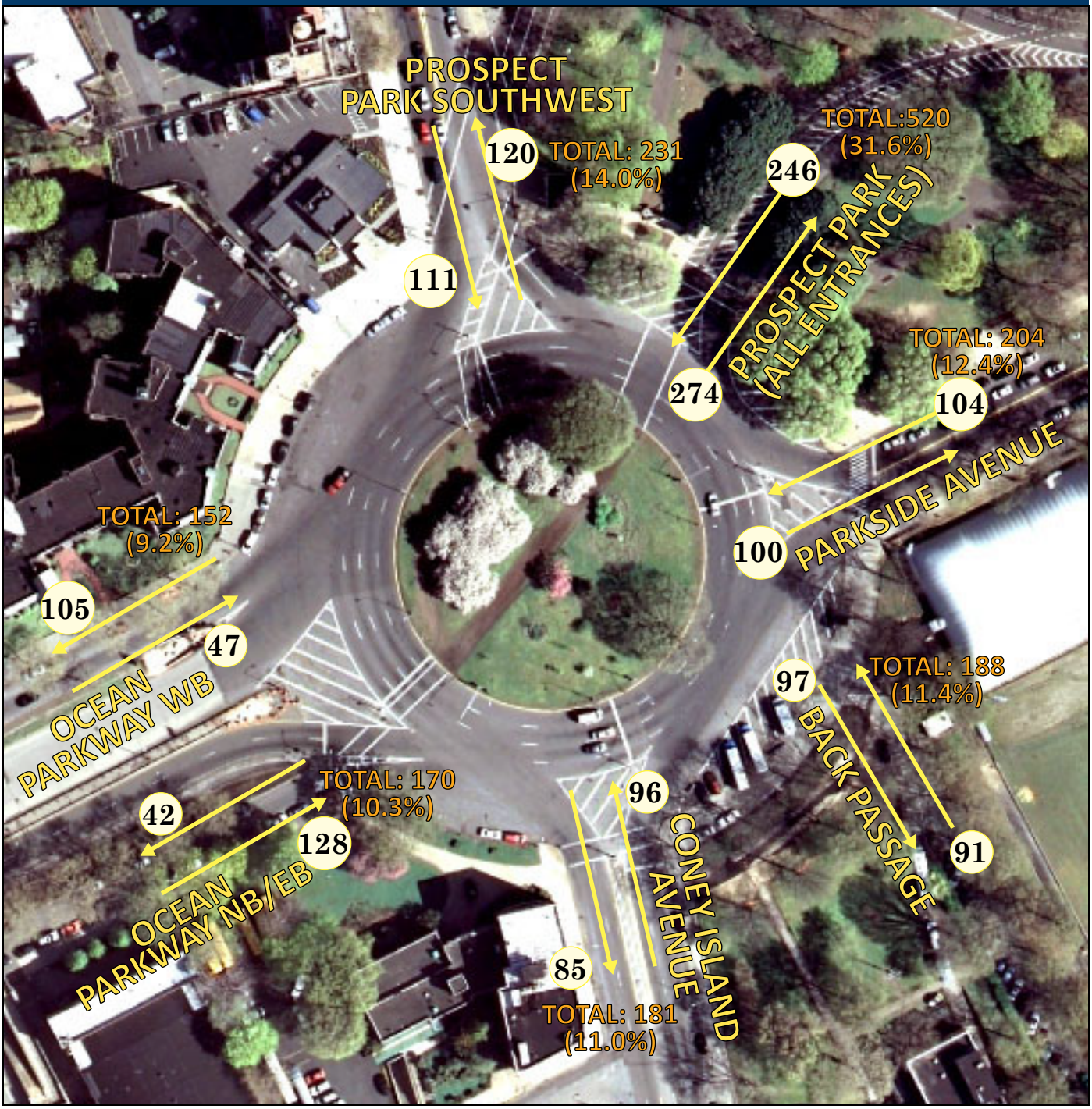


FIGURE 2-W: PARK CIRCLE TOTAL ADJUSTED 8 HOUR BICYCLE TRAFFIC FLOWS AND PERCENTAGES OF TOTAL MOVEMENTS, JULY 2008



The total traffic levels shown in Figure 2-W are notable for several reasons:

1) Prospect Park itself dominates cyclist traffic through the circle. It is the primary destination and origin – or is at least a conduit for cyclists who are heading to or from points beyond the park boundaries.

2) Aside from Prospect Park, bicycle traffic to and from the other roadways was fairly evenly distributed, although it consistently increased counterclockwise from the Ocean Parkway westbound service road.

3) When balanced across all 8 hours of counts, bicycle traffic in each direction was fairly evenly distributed by roadway. If the two Ocean Parkway service roads are regarded as a matching pair, 175 cyclists were counted heading eastbound and 147 westbound. Such volumes could be considered light. Forty-five cyclists were counted during Ocean Parkway's peak 2-hour bicycle flow (eastbound in the AM peak on the parkway's east service road), or an average of one cyclist every 2 minutes and 40 seconds.

4) Although the Ocean Parkway westbound service road had the smallest share of cyclists, bicycle volumes were nearly equal to the northbound/eastbound service road, which ostensibly is supposed to be the one with the greenway.

5) The back passage through the Parade Grounds carried more bicycle traffic than Coney Island Avenue. This passage, which is slanted at northwest-to-southeast angle, may be regarded as a more attractive option for cyclists from easterly Caton Avenue and Victorian Flatbush than Coney Island Avenue, despite the avenue's relatively low traffic volumes north of Church Avenue.

6) Prospect Park Southwest was the roadway with the most bicycle traffic. This may be due to it providing an easily navigable route for commuters headed to Park Slope and ultimately Downtown Brooklyn or Lower Manhattan, or for cyclists wishing to reach more northerly areas in Prospect Park. This roadway is flanked to the east by a wide, mostly uninterrupted sidewalk that runs almost continuously to Bartel-Pritchard Square.

Based upon the above data, bicycle access to and from the park should be a primary consideration when developing design recommendations for Park Circle that would be conducive to cyclists.

2008 NYCDOT Traffic Counts

In May of 2008, the New York City Department of Transportation (NYCDOT) conducted automatic traffic recording device (ATR) counts throughout the northern half of the study area.

AM and PM peak-hour traffic flows are shown in Figures 2-X and 2-Y. Note that this is not a snapshot of a specific hour. All data is averaged from two dates: Wednesday, May 14 and Thursday, May 15, 2008. Furthermore, the peak hour traffic volumes were averaged for both of these days, regardless of whether the peak fell at the same time on both days. In general, peak flows occurred between 8:00am and 9:00am and between 5:00pm and 6:00pm, but considerable fluctuation occurred during these two days. All volumes are averages and rounded to the nearest whole number.

One set of traffic volumes shows a large discrepancy between two intersections: the ATRs on Coney Island between Park Circle and Caton Avenue. It is exceedingly unlikely that Kermit Place, Caton Place and traffic from the police station on the east side of Coney Island Avenue is causing such an imbalance. Until this discrepancy can be explained, it should be assumed that the larger volumes are correct. Utility work at the northern edge of Coney Island Avenue was taking place at least as early as the summer of 2008; if it started in mid-May or earlier, it is possible that some traffic was diverted away from where the ATRs could record it.

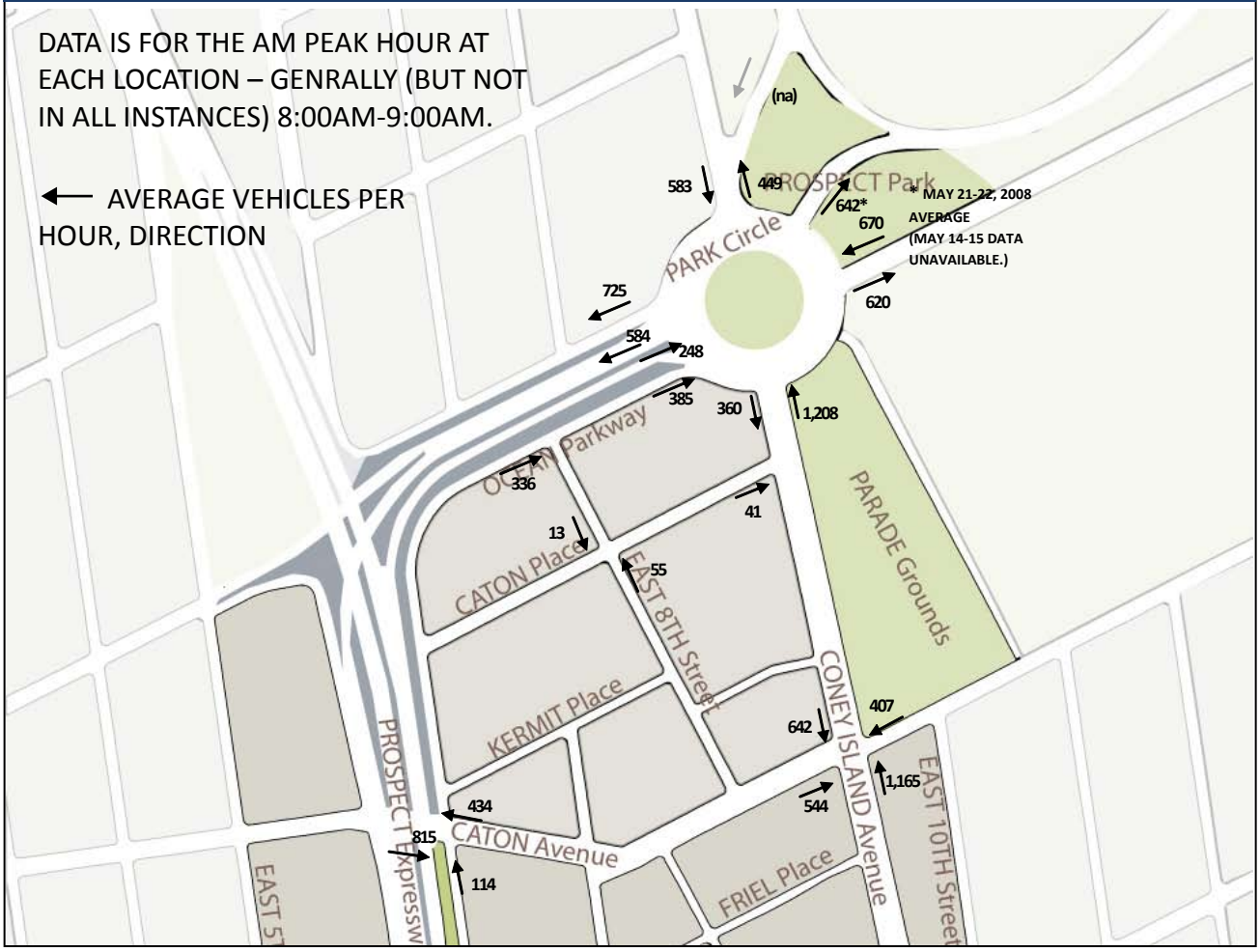
Notwithstanding this discrepancy, a brief analysis follows of the volumes counted by three major concentrations of ATRs.

Caton Avenue/Ocean Parkway east service road
A pronounced imbalance between westbound and eastbound traffic existed throughout the day on Caton Avenue. Eastbound traffic was greater than westbound by a more than two-to-one margin. This may be due in part to the presence of the one-way westbound flyover to Fort Hamilton Parkway and Ocean Parkway to the north. Some of the eastbound Caton Avenue traffic was clearly turning north onto the Ocean Parkway east service road. In the PM peak 949 vehicles traveled eastbound on Caton Avenue at Ocean Parkway, but only 650 were counted to the east at Coney Island Avenue. Meanwhile, northbound traffic on the service road was 91 south of Caton Avenue but 272 at East 8th Street to the north.

Caton Avenue/Coney Island Avenue
Greater daylong eastbound Caton Avenue volumes continued to exist here, but by a considerably smaller margin than at Ocean Parkway. In the AM peak the eastbound-to-westbound Caton Avenue traffic ratio was 815 to 434 at Ocean Parkway, but 544 to 407 at Coney Island Avenue. Coney Island Avenue traffic showed a pronounced and expected emphasis towards northbound travel in the AM peak and southbound in the PM, though the discrepancy between the two directions was wider in the PM.

Park Circle
Traffic on both the Ocean Parkway northbound/eastbound service road and Exit 5 of the Prospect Expressway was relatively light. The Exit 5 ramp had conspicuously low volumes. At its peak – on a day not used in Figures 2-X and 2-Y due to it falling on the week prior to Memorial Day – 344 vehicles used the exit in one hour, or less than one vehicle per 10 seconds. Volumes during most of the day were closer to half that amount. The flyover and Ocean Parkway westbound service road both recorded higher volumes, though as noted in Issue

FIGURE 2-X: AVERAGE AM PEAK HOUR TRAFFIC FLOWS, MAY 14-15, 2008 (NYCDOT)

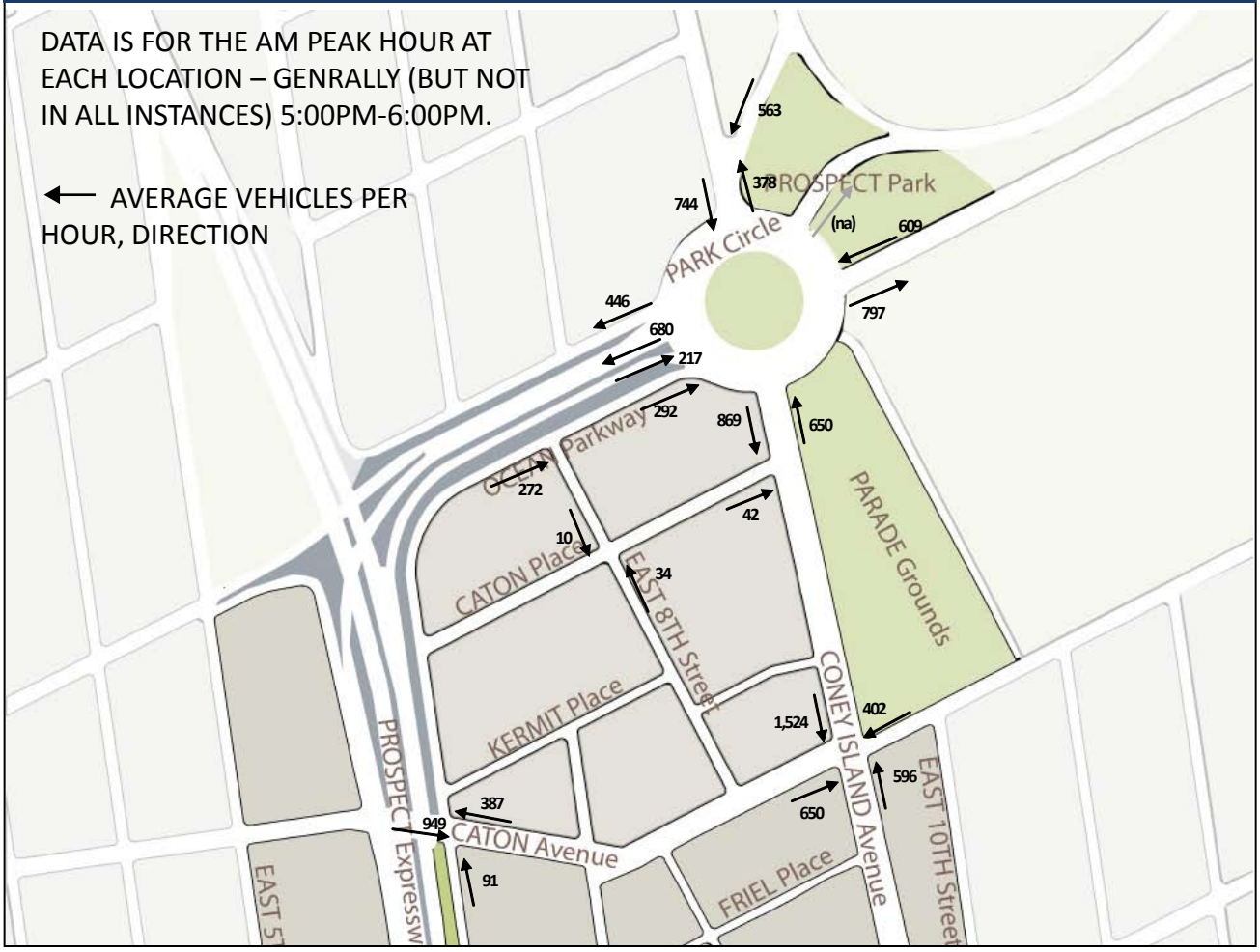


7 of Chapter 2, these volumes do not fully use the four lanes on the flyover while the more heavily used westbound service road makes do with one lane. Much of the westbound service road traffic is headed towards an onramp to the Prospect Expressway to the north.
Though a noticeable slant towards northbound traffic occurs in the AM peak and southbound traffic in the PM peak, southbound traffic volumes on Prospect Park Southwest are consistently greater than northbound ones. This may be due to easy access to the northbound Prospect Expressway.

The entrance and exit to and from Prospect Park Drive is only open in the peak direction. Six hundred forty-two vehicles entered the drive in the AM peak while 563 exited in the PM. The exit has three striped motor vehicle lanes, but as discussed in Section 2.0 a bidirectional bike lane immediately parallels these traffic lanes. With a modest increase in green signal time for exiting traffic.existing volumes may not require three lanes of roadbed.

Compared to other roads counted in the study area, volumes on Parkside Avenue are relatively equal throughout the day in both directions, though total 24-hour volumes slightly favor eastbound traffic.

FIGURE 2-Y: AVERAGE PM PEAK TRAFFIC FLOWS, MAY 14-15, 2008 (NYCDOT)



2.4 ACCIDENT DATA

Accident data, provided by the New York State Department of Motor Vehicles, (NYSDMV) provides one measurement of how safe specific roads are.

Since 2002, the NYSDMV has only provided data for "reportable accidents." These are accidents which result in at least one of the following three conditions: 1) a death, 2) an injury, or 3) property damage valued at more than $1,000 which affects at least one person.[18] Accidents which do not meet these thresholds are not included in the data contained in this section.

Accidents on the Prospect Expressway itself are not included in the following data.

One exception was made to allow accident data technically outside the study area to be included. Accidents at the intersection of Coney Island Avenue and Church Avenue include data from Coney Island Avenue between Church Avenue and Albemarle Road because Albemarle Road's western endpoint is approximately 65 feet south of Church Avenue. The three roads can safely be considered part of the same intersection.

Figure 2-Z shows all total reportable accidents within the study area for the 3 years from January 1, 2005 to December 31, 2007, and Figure 2-AA is a similar graphic showing only accidents involving pedestrians and bicycles. A total of 235 reportable accidents resulted in 248 injuries within the study area during the three year period – an average of three accidents every 2 weeks.

Almost a third of these accidents and injuries occurred at the intersection of Church Avenue, the Prospect Expressway and Ocean Parkway. For such a hectic intersection, the amount of cyclists involved in reportable accidents is fairly low, at two. However, 10 pedestrians were involved in these incidents over the same period – four more than at the next most frequent location.

One block to the south is the intersection of Beverly Road and Ocean Parkway, which is effectively in a three-way tie with Park Circle and Coney Island Avenue/Caton Avenue as the second most accident-prone location in the study area. This intersection is more typical of those along the length of Ocean Parkway, with the bikeway on the west mall and pedestrian walk on the east mall.

While specific point-by point accident data is not available for Ocean Parkway and Church Avenue or Beverly Road, at Park Circle we are able to get a more fine-grained picture of just where the accidents are happening, as seen in Figure 2-AB.[19]

[18]State of New York Department of Motor Vehicles, Police Accident Report Manual, with Truck and Bus Supplement, p.2. http://www.nydmv.state.ny.us/forms/p33Part01.pdf

[19]Specific location data also was not available for Ocean Parkway and Caton Avenue, making it difficult to determine how many of these accidents occurred closer to the western or eastern service road.

FIGURE 2-Z: TOTAL REPORTABLE ACCIDENTS/INJURIES, 2005-2007

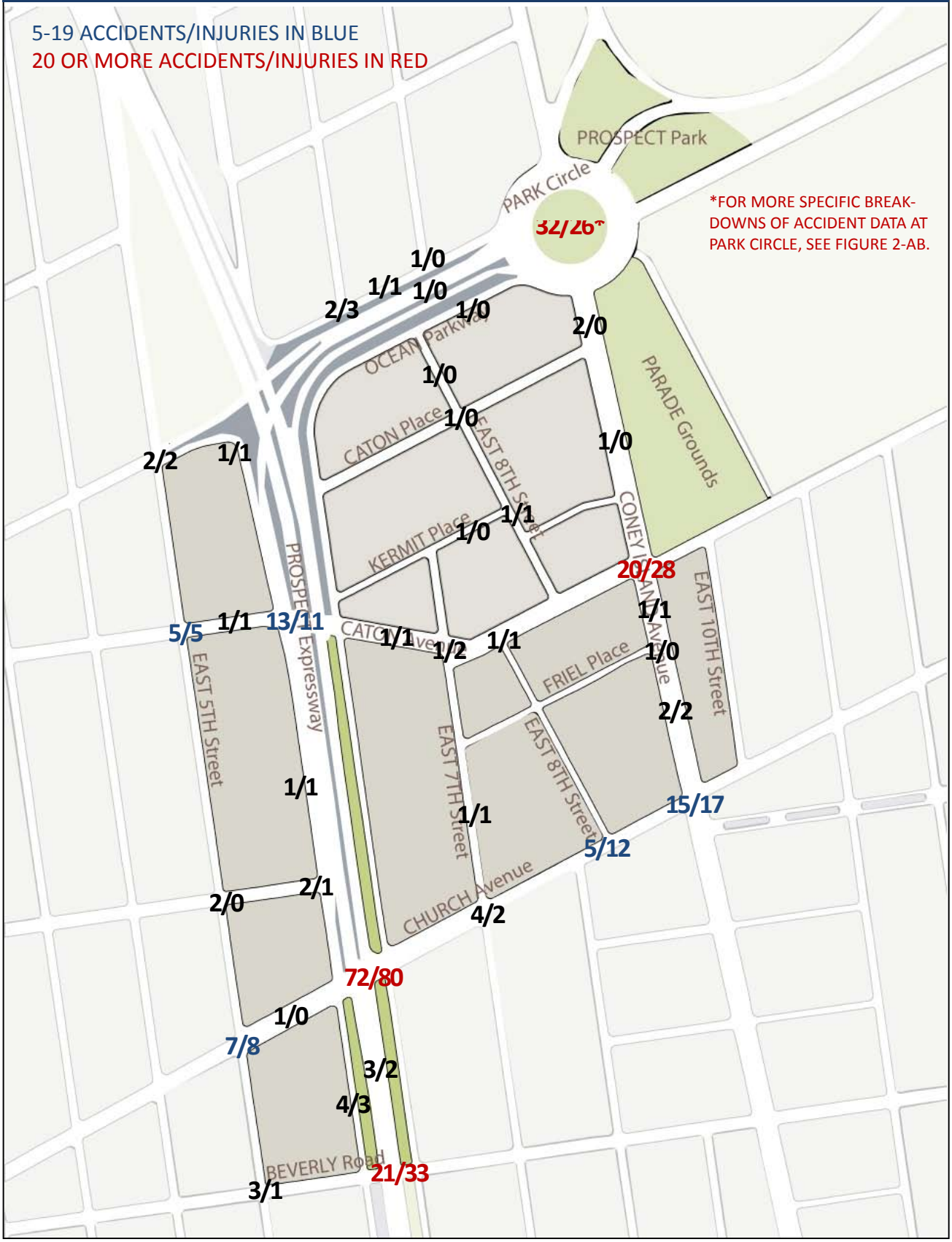
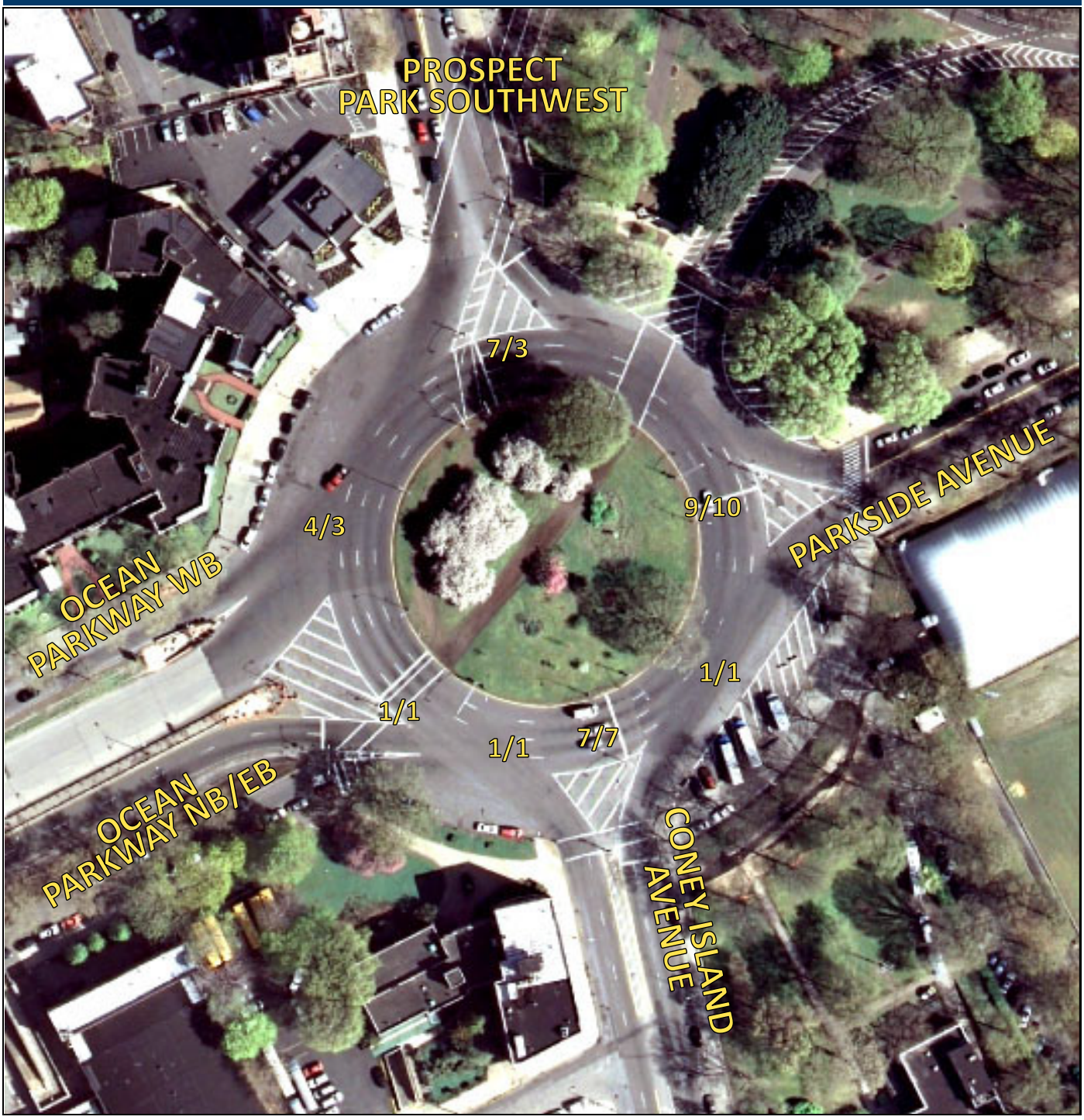


FIGURE 2-AA: TOTAL REPORTABLE PEDESTRIAN/BICYCLE ACCIDENTS, 2005-2007

FIGURE 2-AB: DISTRIBUTION OF REPORTABLE ACCIDENTS THROUGHOUT PARK CIRCLE, 2005-2007 (ACCIDENTS/INJURIES)



During this period, one cyclist was involved in a reportable accident at Prospect Park Southwest, and another had a reportable accident between Coney Island Avenue and Parkside Avenue.

More reportable accidents took place at Parkside Avenue than at any of the other locations throughout the circle, although both Coney Island Avenue and Prospect Park Southwest also had several. Of note is that more accidents took place at the westbound service road than the northbound/eastbound one.

2.5 LEVEL OF SERVICE (LOS) ANALYSIS

As part of this study, DCP conducted LOS analyses for three intersections

- Ocean Parkway and Beverly Road
- Ocean Parkway and Church Avenue/Prospect Expressway
- East 5th and the western endpoint of the Fort Hamilton Parkway flyover ramp

The operation of signalized intersections within the study area was analyzed applying the methodologies presented in the 2000 *Highway Capacity Manual* (HCM2000). These procedures evaluate signalized intersections for average delay per vehicle and LOS.

The capacity analysis methodology separates an intersection approach into lane groups on the basis of the movements occurring during each signal phase. The lane groups are then analyzed to determine the specific vehicular capacity and LOS. This analysis requires the following input parameters: intersection geometry, lane utilization, number of travel lanes, width of travel lanes, on-street parking conditions, locations of bus stops, number of buses stopping per hour, vehicle turning movements, vehicle classification, conflicting pedestrian movements, traffic signal cycle length, and allocation of green time.

The operating characteristics of signalized intersections can be estimated and evaluated by analyzing capacity and performance. The capacity of an intersection represents the throughput of a facility (i.e., the maximum number of vehicles that can be served in one hour). Capacity analysis results in the volume-to-capacity ratio (v/c ratio), which presents the proportion of capacity (supply) utilized by the existing traffic volume (demand). High v/c ratios (>0.85) indicate some traffic congestion, and low v/c ratios (<0.60) indicate smooth traffic flow.

The performance of an intersection is based on the estimated average delay time (i.e., the average stopped time per vehicle) for each vehicle utilizing a roadway segment. Delay time is determined by the capacity of a lane group, the amount of green time allotted to a lane group, and the signal cycle length. Delay time is the factor which determines the LOS for a lane group.

Short delays receive a good LOS while long delays receive a poor LOS. For example, an average delay of up to 10 seconds per vehicle corresponds to LOS A, while an average delay of 45 seconds corresponds to LOS D. Table 2-L describes the LOS definitions for signalized intersections.

TABLE 2-L: LEVEL OF SERVICE DEFINITIONS FOR SIGNALIZED INTERSECTIONS	
flow quality	*description*
A	Describes operation with very low delay, i.e., less than or equal to 10 seconds per vehicle. This occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Describes operation with delay in the range of >10-20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Describes operation with delay in the range of >20-35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although some may still pass through the intersection without stopping.
D	Describes operation with delay in the range of >35-55 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, longer cycle lengths, or high v/c ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Describes operation with delay in the range of >55-80 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	Describes operation with delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.
Source: *Highway Capacity Manual,* Transportation Research Board, National Research Council, Washington, DC, 2000	

Both Ocean Parkway intersections were analyzed "as is" – no alterations to any of the roadways at these intersections were analyzed. However, since two of the long-term recommendations in Section 3.3 propose removing a travel lane from the flyover, the potential exists for removing or converting one of the two travel lanes which currently feed into Fort Hamilton Parkway. In this instance, an LOS analysis was done of East 5th Street/Fort Hamilton Parkway both as is and how it would function with only one lane bringing traffic to the parkway from Park Circle.

Table 2-M summarizes the LOS analysis for the East 5th Street/Fort Hamilton Parkway intersection under existing conditions and with the proposed lane reduction.

Data for the Ocean Parkway and Beverly Road/ Church Avenue intersections are available upon request.

TABLE 2-M: EXISTING VS. PROPOSED LEVEL OF SERVICE COMPARISON: EAST 5TH STREET/FORT HAMILTON PARKWAY FLYOVER			
Intersection	*Volumes*	*v/c ratio and delay time*	*LOS*
E. 5th Street/ Fort Hamilton Parkway/ flyover as is (with 2 lanes)	AM PEAK HOUR: E.5: 195 thru 80 right FHP: 10 left 350 thru	 E.5: 0.44 14.0 second delay FHP: 0.25 11.3 second delay	 E.5: B B FHP: B B
	MD PEAK HOUR: E.5: 165 thru 150 right FHP: 10 left 200 thru	 E.5: 0.53 15.4 second delay FHP: 0.16 10.7 second delay	 E.5: B B FHP: B B
	PM PEAK HOUR: E.5: 515 thru 235 right FHP: 15 left 330 thru:	 E.5: 0.56 14.3 second delay FHP: 0.27 11.5 second delay	 E.5: B B FHP: B B
E. 5th Street/ Fort Hamilton Parkway/ flyover (with 1 lane)	AM PEAK HOUR: E.5: 195 thru 80 right FHP: 10 left 350 thru	 E.5: 0.44 14.0 second delay FHP: 0.48 14.4 second delay	 E.5: B B FHP: B B
	MD PEAK HOUR: E.5: 165 thru 150 right FHP: 10 left 200 thru	 E.5: 0.53 15.4 second delay FHP: 0.31 12.3 second delay	 E.5: B B FHP: B B
	PM PEAK HOUR: E.5: 515 thru 235 right FHP: 15 left 330 thru	 E.5: 0.56 14.3 second delay FHP: 0.51 14.9 second delay	 E.5: B B FHP: B B

3

RECOMMEN-DATIONS

3.1 DEVELOPMENT OF ALTERNATIVES

After the completion of the Existing Conditions Report, the study team turned its attention to using the compiled data up to that point to develop recommendations for improving bicycle and pedestrian connectivity. These recommendations were divided into short-term and long-term windows. The study team was guided by the following principles:

- *Physical viability*. The short-term recommendations must be easily achievable within a reasonable time frame. Generally, this resulted in actions that could improve mobility and safety through the use of pavement striping, improved signage and curb cut modifications. The longer-term concepts involve more substantial changes to the study area, which, while physically possible, would involve a larger political and capital commitment.

- *Ease of use.* The primary purpose of this project is to make the short journey between Ocean Parkway/Church Avenue and Prospect Park easier and more intuitive for cyclists and pedestrians. While the study area continues beyond the bounds of Ocean Parkway, the historic path of the bikeway remains the simplest, most direct route to and from Prospect Park. However, in some cases, an alternate route – Caton Place – was examined as a potential travel option due to its unusual width and potential for connectivity for cyclists, pedestrians and horse traffic.

- *Aesthetic appeal*. With its historic nature and malls, Ocean Parkway south of Church Avenue provides green space to nearby communities. North of Church Avenue, the Prospect Expressway eliminated much of the parkway's original intention and roadway design. None of the short-term recommendations can seriously remedy this condition, and only a complete rethinking of the Prospect Expressway's southern end could restore part of Ocean Parkway's northern end to its original purpose. However, some of the long-term possibilities for the flyover, Caton Place and Park Circle could transform this part of the study in attractive new ways.

- *Cost.* Specific cost estimates are beyond the scope of this study. However, the project team was acutely aware of both the immediate economic crisis faced by the City and the long-term costs of maintaining any proposed improvements. The short-term improvements discussed in Section 3.2 are meant to yield immediate and inexpensive improvements. Section 3.3, however, contains recommendations which are more ambitious and expensive, but could more significantly improve bicycle, pedestrian and equestrian circulation while benefitting the surrounding communities.

As DCP was concluding this study, the New York City Department of Transportation (NYCDOT) developed plans for improving Park Circle and its immediate environs in the short term for motorists, equestrians, bicyclists and pedestrians. NYCDOT intends to implement these strategies sometime in the fall of 2009. Ultimately NYCDOT, in conjunction with the New York City Department of Parks and Recreation, is responsible for implementing any improvements at Park Circle. DCP will work with both NYCDOT and NYCDPR in coordinating these efforts.

3.2 SHORT-TERM RECOMMENDATIONS

This section contains descriptions of a variety of recommendations that can improve connectivity along the corridor relatively quickly and at low cost. In general, the alterations described within these recommendations are limited to moving, removing or installing signage; new pavement striping or markings; or alteration of curb cuts.

While many of these recommendations are grouped together graphically, they are not intended to be an "all or nothing" set of options. Each one can be implemented independently of the others, if desired.

Church Avenue

Clearer wayfinding signage at the intersection of Church Avenue and Ocean Parkway

Cyclists and pedestrians entering, exiting or passing through the intersection of Church Avenue and Ocean Parkway have little signage to guide them along the greenway.

Greenway directional signage should be installed at the following five locations:

1. On the bikeway immediately south of the intersection of Church Avenue and Ocean Parkway, upon the grassy strip between the bike path and the Ocean Parkway main road.
2. On the east mall immediately south of the intersection of Church Avenue and Ocean Parkway, upon the lamppost immediately south of the western curb cut.
3. On the east mall immediately north of the intersection of Church Avenue and the Prospect Expressway, upon the cobblestoned strip between the bike path and the Ocean Parkway service road.
4. On Church Avenue immediately west of Ocean Parkway.
5. On Church Avenue immediately east of Ocean Parkway, at the bus stop

Signage at the first three of the above locations would be bidirectional, i.e. northbound signs would occupy the west side of sides of a pole, while southbound cyclists would be guided by signage on the north side of the same pole. See Figure 3-A.

Installation of "Watch for Bicyclists Ahead" signs on Church Avenue and the Prospect Expressway

Motorists along Church Avenue should be alerted the presence of cyclists at this intersection – especially since a sizeable percentage of cyclists are entering, exiting or passing through the area on Church Avenue itself. During 8 hours of bicycle counts conducted in July 2008, of the 347 cyclists counted in the western half of the intersection, 136 (or 39.1 percent) were coming from or going to Church Avenue west of the intersection. Of the 326 cyclists counted during the four count periods in the eastern half of the intersection, 173 (or 53.1 percent) were coming from or going to Church Avenue east of the intersection.

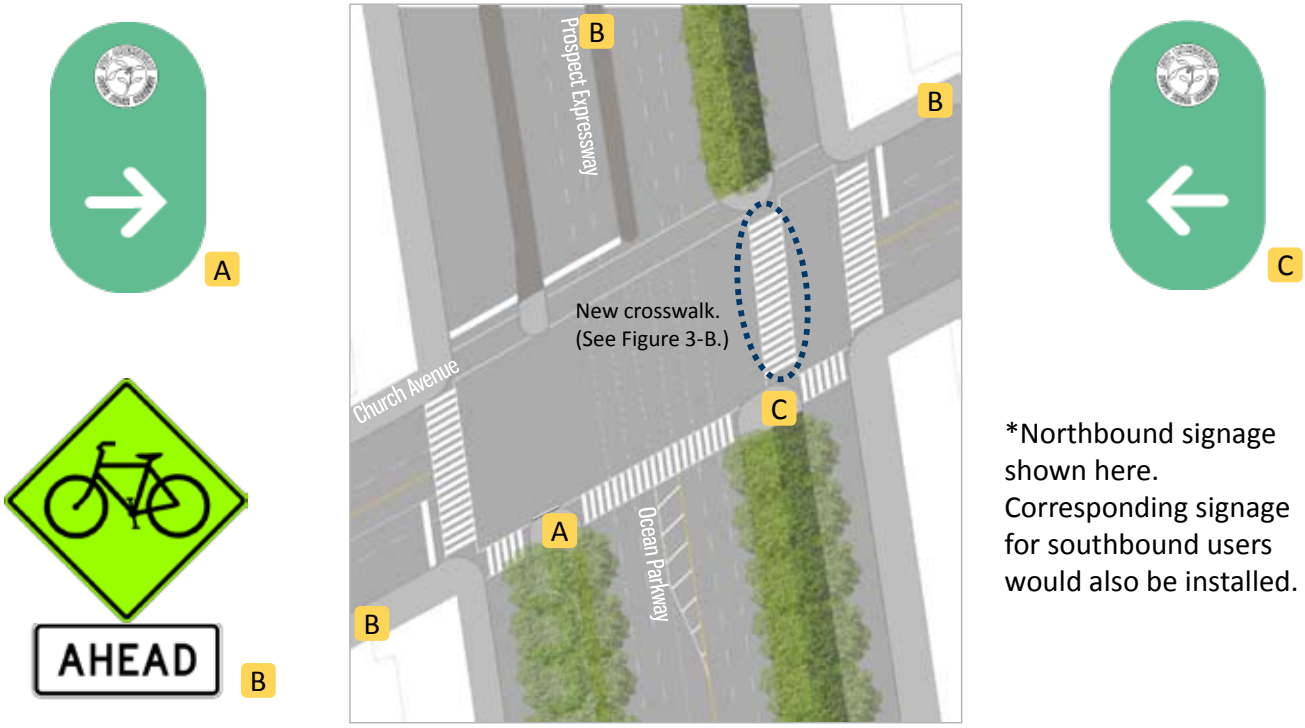
Yellow "Watch for Bicyclists Ahead" signs which include bicycle iconography should be installed at Church Avenue and East 5th Street; at Church Avenue and East 7th Street; and at the south end of the Prospect Expressway and Church Avenue.

New crosswalk striping across Church Avenue between east mall to south and greenway to north

No matter what recommendations are chosen south of Church Avenue, cyclists will have to access the east mall to continue north towards Prospect

FIGURE 3-A: CHURCH AVENUE AND OCEAN PARKWAY INTERSECTION SIGNAGE

+ Clearer wayfinding signage
+ "Watch for Bicyclists" signage on Church Avenue and Prospect Expressway



Park. Right now, no crosswalk exists connecting the east malls north and south of Church Avenue. If existing crosswalk striping is any indication, the expectation is that, from south to north, cyclists are supposed to cross from the west to east mall along the southern Church Avenue crosswalk, continue east to the main service road sidewalk, cross Church Avenue, then turn west to access the east mall. The presence of east mall curb cuts that empty out onto Church Avenue from both the north and south undercuts this implied path.

A laddered north-south crosswalk connecting the east malls north and south of Church Avenue would be installed. See Figure 3-B. Eastbound turns onto Church Avenue from either Ocean Parkway northbound or the Prospect Expressway southbound already are not permitted.

Caton Avenue

New Caton Avenue crosswalk striping connecting greenway paths

A similar situation to the Church Avenue/Ocean Parkway intersection exists a block to the north, at Caton Avenue. From south to north, cyclists are supposed to cross from the west to east mall along the southern Caton Avenue crosswalk, continue east to the main service road sidewalk, cross Caton Avenue, then turn west to access the east mall. The curb cut at this intersection is more ambiguously placed than it is at Church Avenue, spilling out on a diagonal that partially accommodates both north-south and east-west bike/pedestrian traffic. However, a clearly striped stop line for eastbound Caton Avenue traffic already acts as a safeguard for motorized traffic at this signalized intersection.

A laddered crosswalk should be installed connecting the east malls north and south of Caton Avenue. See Figure 3-B.

Removal of west mall curb cut at Church Avenue, and placement of barrier dividing curb edge and street bed

Curb cuts serve a beneficial purpose, easing the transition from sidewalk to street bed and crosswalk for cyclists, pedestrians, those with pushcarts and strollers, and the mobility impaired. However, the curb cut at the north end of Ocean Parkway's

west mall, on the south side of Church Avenue serves no obvious purpose (except to allow Parks Department maintenance vehicles to access this mall from the north) and encourages unsafe bicycle and pedestrian movements across an accident-prone location. This curb cut simply empties out into a busy intersection, without a crosswalk or a corresponding mall at the opposite end of the intersection to guide walkers and cyclists.

This curb cut should be eliminated. To further discourage north-south crossings at this location, a decorative fence, similar to the ones used to discourage pedestrian crossings at some Midtown Manhattan intersections, would be erected across the northern edge of the west mall. Parks Department maintenance vehicles would continue to be able to access this mall from Beverly Road, but would have to back out of the mall once their work is completed. See Figure 3-B.

Removal of curb cut at Caton Avenue north of the more westerly intersection with East 8th Street*

Similar to the Ocean Parkway west mall and Church Avenue, a pair of curb cuts at Caton Avenue and the westerly intersection with East 8th Street encourage an unsafe pedestrian movement.[20] Caton Avenue angles northward just west of this location, and while the intersection with East 7th Street is controlled by a traffic signal, sight lines for westbound motorists are not ideal for a crosswalk at this location. Both pedestrians and motorists are not well served by this crosswalk.

These curb cuts should be removed.

Reorientation of Caton Avenue curb cuts to align them with the crosswalks

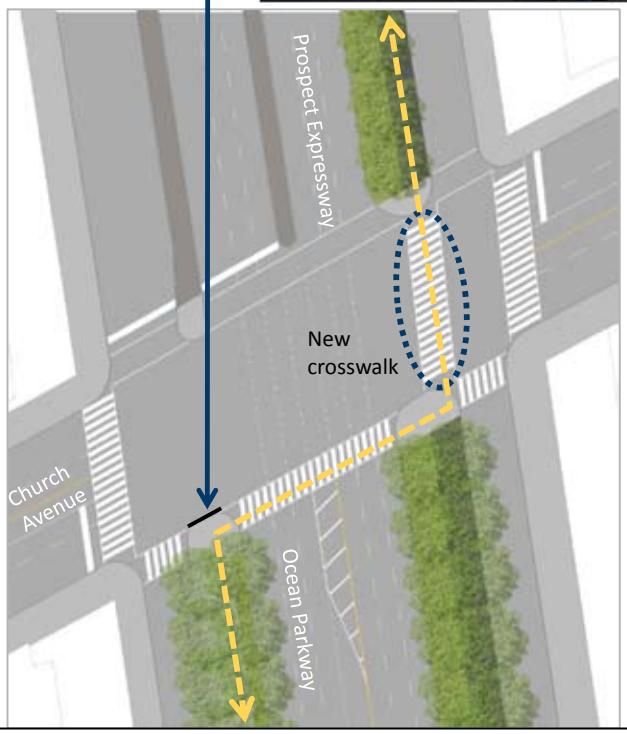
The curb cuts at Caton Avenue and the Ocean Parkway east service road spill out into the intersection on a diagonal that partially accommodates both

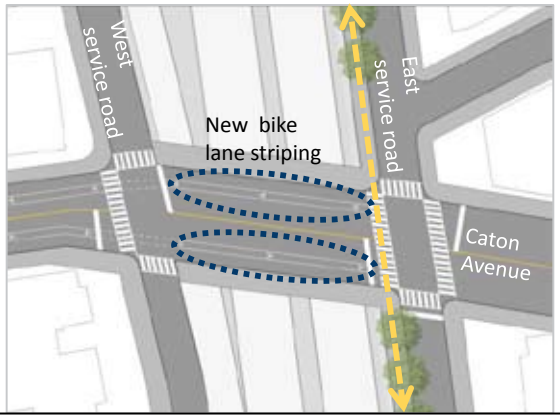
[20]At this location, East 8th Street runs at an angle to most north-south roads in this street grid. From south to north, East 8th Street is tilted west north of Church Avenue, so much so that north of Caton Avenue this version of East 8th Street ends and a road to the east is designated with the same name.

FIGURE 3-B: CURB CUTS AND STRIPING

+ Crosswalk connecting East malls at Church Avenue and Caton Avenue
+ Extension of Caton Avenue bikeways across overpass
+ Removal of unnecessary curb cuts at north end of the West Mall and East 8th Street/Caton Avenue
+ Decorative fencing at north edge of West Mall to discourage crossing Church Avenue at that location

Decorative fencing, Broome and Chrystie Streets, Manhattan (Image: NYCDOT)





north-south and east-west bike/pedestrian traffic. They should either be extended so that they allow cyclists and pedestrians to cross the intersection in a straight line or replaced with two curb cuts per corner that accomplish the same thing. See Figure 3-B.

Extension of Sunset Park Class 2 bikeways along Caton Avenue to Ocean Parkway Greenway

The Sunset Park Greenway is a Class 2 bikeway. Striped bicycle paths exist along both sides of Caton Avenue as it approaches Ocean Parkway from the west. Although the greenway's eastern endpoint is the intersection of Ocean Parkway's east service road with Caton Avenue, striping for the bikeway inexplicably ends at the intersection with the west service road, and does not continue along the concrete-decked Caton Avenue overpass across the Prospect Expressway.

NYCDOT has informed the project staff that thermoplastic striping does not stick to a concrete deck, but to encourage connectivity throughout the bicycle network, the Class 2 bikeway lanes should be extended in some other way along the deck to the Ocean Parkway eastern service road. Some substitute material – such as abrasive or adhesive-coated markings, or a set of shallow inlaid brick pavers – might successfully delineate these bike lanes. See Figure 3-B. Marking design and materials selection for the extended greenway will require coordination with NYCDOT Bicycle Program.

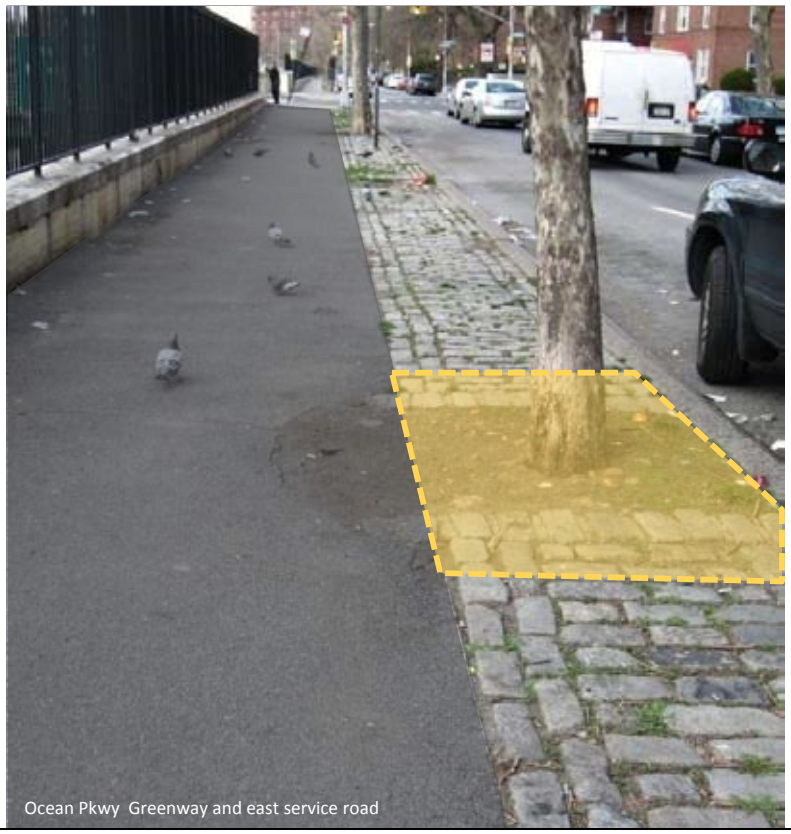
Ocean Parkway east service road

Reconfiguring of tree pits

At some locations, especially south of Caton Avenue, tree pits cut into the greenway. Since the pits provide room for the existing trees to grow, paving over the portions of the pits not occupied by the tree trunks could be a dubious short-term benefit which could jeopardize the long-term health of these plants. In the long run, as these trees mature, this new pavement could break up anyway. Reconfiguring the tree pits to make them rectangular could provide the same amount of rainwater absorption while maintaining the greenway at a more consistent width. One to two feet of the cobblestone adjacent to the tree pits can be removed in exchange for filling the parts of the pits

FIGURE 3-C: INCONSISTENT BIKEWAY WIDTHS ON EAST SERVICE ROAD

+ Lengthen existing tree pits by removing adjacent cobblestones
+ Place cautionary signs for cyclists



Ocean Pkwy Greenway and east service road

that protrude into the bikeway. See Figure 3-C.

Cautionary signs for cyclists on Ocean Parkway Greenway north of Church Avenue

Even excluding the tree pits, the greenway width along the Ocean Parkway east mall north of Church Avenue fluctuates from 7'3" to 8'0". (The accepted minimum standard width for a low-traffic Class 1 greenway is 8'0".) The tree pits further reduce the available bikeway width to 6'0" to 6'4". Standard bikeway signage would be used where appropriate to advise cyclists of narrow greenway widths, with language to the effect of "Caution: Narrow Greenway. Pass With Care." See Figure 3-C.

Enhanced Class 2 bikeway with specific signage directing cyclists onto Ocean Parkway's east service road

The Class 1 greenway path ends west of Sherman Overpass. (A bridle path runs along the east mall to Park Circle.) At the bicycle path's endpoint, a greenway sign near the curb directs park-bound cyclists with a diagonal arrow. It is not clear where this arrow is supposed to point. While the bicycle route is clearly signed east of the overpass as continuing on-street, the sign west of the overpass could also be interpreted as pointing cyclists onto the Sherman Overpass. Park-bound cyclists crossing the overpass then find themselves riding contraflow along the Ocean Parkway west service road fragment and Park Circle to reach Prospect Park.

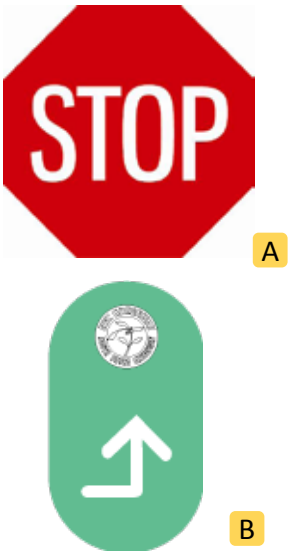
The existing sign would be removed. A new sign would be located at the Class 1 bikeway endpoint's centerline, and would direct cyclists with a zig-zag arrow and text to the effect of "Caution: On-Street Bikeway." NYCDOT, as part of its short-term Park Circle improvement plan, is proposing a striped, painted, two-way on-street bikeway in the roadbed adjacent to the Ocean Parkway east service road's northern curb. See Figure 3-D.

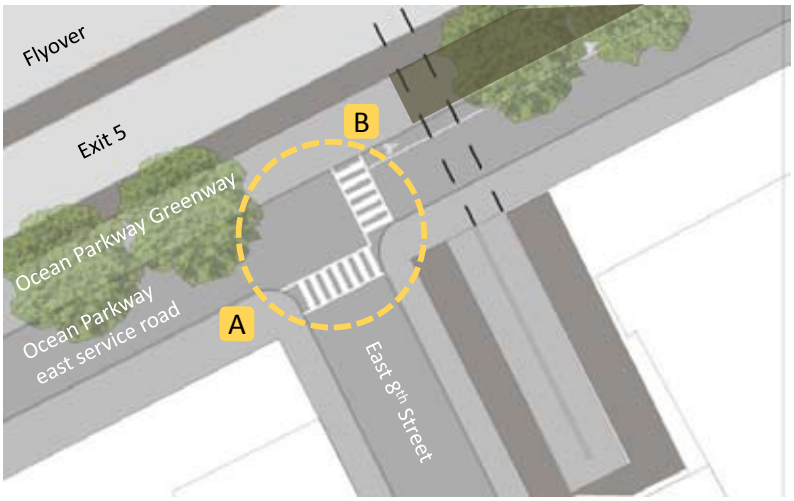
Analysis of proposed crosswalks and stop signs at Ocean Parkway east service road and East 8th Street

A miniature stop sign is posted beneath the ambiguous greenway sign described above, but this intersection has no crosswalks or stop signs, despite greenway signage clearly directing southbound cyclists coming off of the Sherman Overpass across

FIGURE 3-D: INDISTINCT BIKEWAY WEST OF PARK CIRCLE

+ Replace ambiguous Greenway sign with Sign B below, specifically directing cyclists onto Ocean Parkway east service road Class 3 bikeway
+ Perform analysis investigating viability of striped crosswalks and stop sign at Ocean Parkway east service road and East 8th Street





the street and onto the Class 1 Greenway. Motorists using the Ocean Parkway east service road face no traffic signals, flashing lights, stop signs or crosswalks between Caton Avenue and Park Circle, which encourages travel at relatively higher speeds. Equestrian traffic also frequently crosses the east service road at this intersection. A stop sign does exist for northbound traffic on East 8th Street.

NYCDOT should conduct an analysis of this intersection to determine whether it should be equipped with all-way stop signs for park-bound vehicular traffic on the east service road and for northbound traffic on East 8th Street. The need for laddered crosswalks along the southern and eastern edges of this intersection should also be analyzed. If NYCDOT determines that this intersection meets the standards for stop sign and crosswalk placement at this intersection, then they should be installed. See Figure 3-D.

As an alternative to stop signs and crosswalks, a speed hump could be installed on the service road.

Placement of curb cuts and a non-laddered crosswalk at south end of Sherman Street

Cyclists and pedestrians crossing the intersection of Sherman Street and the Ocean Parkway west service road encounter an intersection without curb cuts. Since Sherman Overpass makes its northern landfall next to this intersection, the absence of curb cuts is particularly conspicuous.

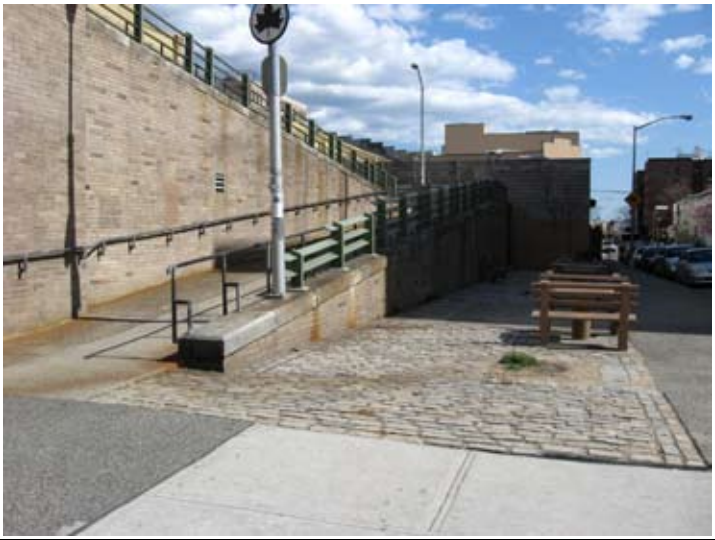
The northeast and northwest corners of this intersection would be provided with curb cuts.

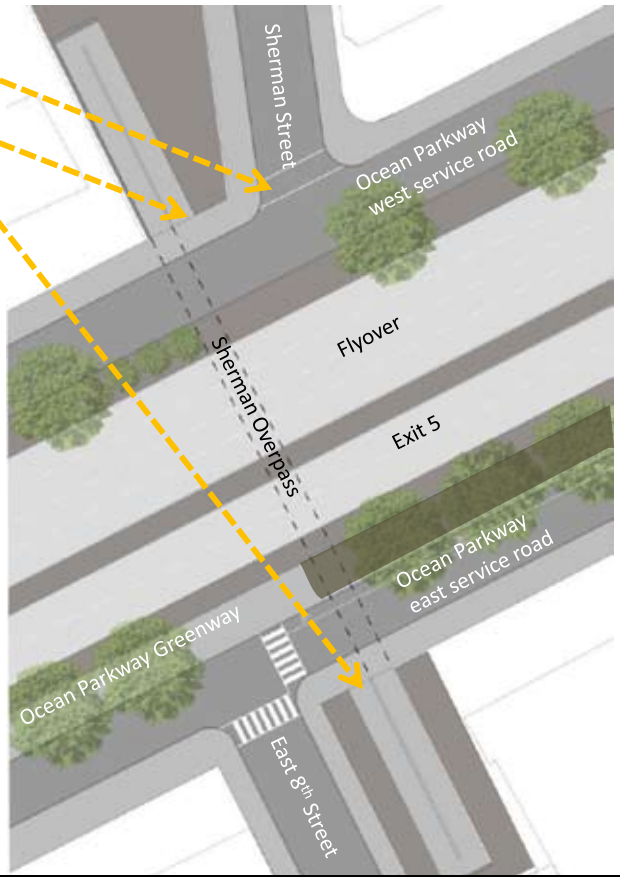
Sherman Street operates one way northbound from Ocean Parkway. A laddered crosswalk would serve little purpose here, but a standard crosswalk would provide an effective visual cue for westbound drivers on Ocean Parkway turning right onto Sherman Street to watch for pedestrians.

A standard crosswalk running east-west would be created at the southern end of Sherman Street. See Figure 3-E. However, some sort of traffic control for the intersection (a stop sign, speed hump, or button activated signal like the on a block to the west at East 7th Street) would be needed to allow

FIGURE 3-E: SHERMAN OVERPASS

+ Install curb cuts and crosswalks at Sherman Street
+ Install "Cyclists Dismount" signs at both ends of overpass





a safe crosswalk. This would require analysis by NYCDOT.

Installation of "Cyclists Dismount" signs at both ends of overpass

Cyclists are not supposed to be riding on the overpass, since the crossing is primarily meant for pedestrians.

Signs asking cyclists to dismount would be installed at both ends of Sherman overpass. See Figure 3-E.

Caton Place

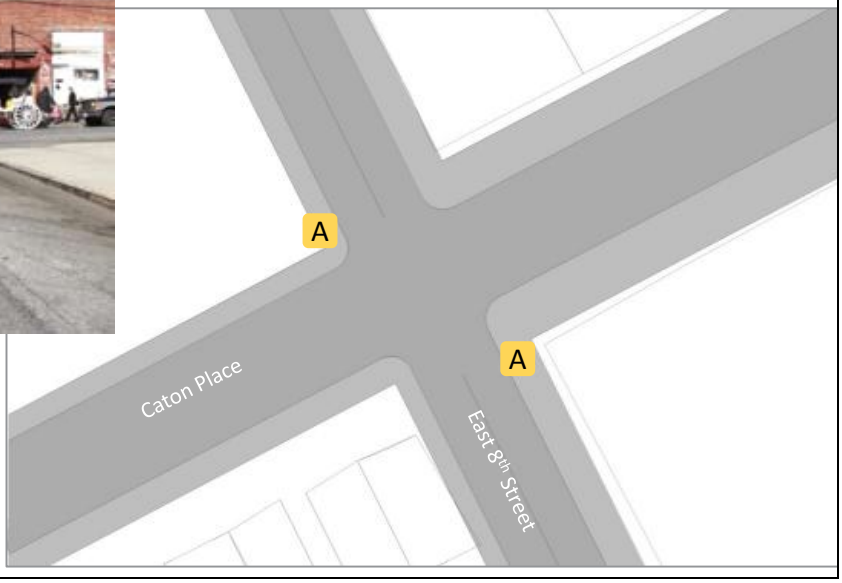
Analysis of proposed four-way stop signs at Caton Place and East 8th Street

Although lightly trafficked, this intersection has the unusual distinction in 21st century Brooklyn of being located at an active horse stable. Caton Place is regulated by stop signs in both directions, but East 8th Street is not.

NYCDOT should conduct an analysis of this intersection to determine whether it should be equipped with stop signs regulating north-south traffic along East 8th Street. If NYCDOT determines that this intersection meets the standards for four-way stop signs, then they should be installed. See Figure 3-F.

FIGURE 3-F: CATON PLACE

+ Perform analysis examining the viability of placing four-way stop signs at Caton Place and East 8th Street



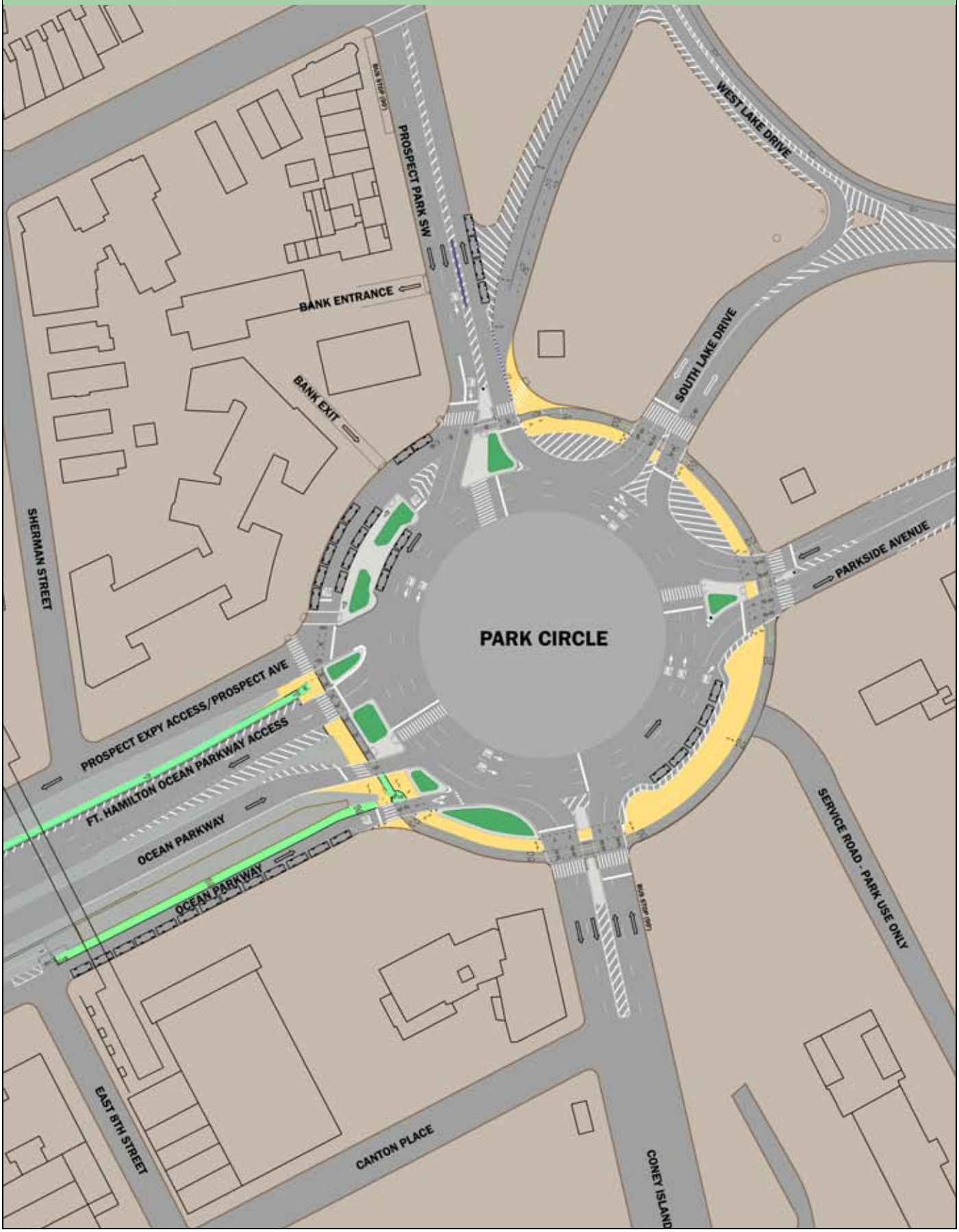
Planned NYCDOT Short-Term Changes to Park Circle

NYCDOT is undertaking efforts to make short-term improvements to Park Circle that can be implemented in the fall of 2009. These short-term plans for improving the circle and its immediate surroundings, where presented to the community by NYCDOT at a June 2009 meeting. The improvements, shown in Figure 3-G, include the following:

1. *A 10-foot-wide painted Class 1 bidirectional bikeway around the outermost perimeter of the circle's southwest, southeast and northeast quadrants;*
2. *A mixed Class 1/Class 3 counterclockwise-only bikeway along the circle's northwest quadrant;*
3. *A 12-foot-wide painted bidirectional equestrian path immediately adjacent to the bikeway around the circle's southwest, southeast and northeast quadrants;*
4. *Several striped and planted areas to be installed around much of the circle's perimeter, to better channel vehicular traffic;*
5. *A new, signal-protected crosswalk along the entire western perimeter of the circle, along with wider pedestrian medians (See #17 below);*
6. *Realignment of the crosswalk at the circle's north end to a route that approximates a standard perpendicular crosswalk;*
7. *Conversion of the original main entrance of the park (at the middle of the circle's northeast quadrant) to two-way traffic operation;*
8. *Closing of the exit-only roadway that merges with Prospect Park Southwest immediately north of the circle to vehicular traffic (but not to bicyclists, pedestrians and horses);*
9. *Signal placement and timing modifications within the circle;*
10. *New striped crosswalks from the west, north and east to the circle's center;*
11. *A separate travel lane for local traffic and parking along the northwest quadrant, separated from the rest of the circle by concrete islands;*
12. *A divider along the median of Prospect Park Southwest preventing northbound traffic from crossing the road's southbound lanes to access the bank;*
13. *A new, one-way traffic plan for the bank;*
14. *A new signage plan for the circle, making it easier for drivers to navigate;*
15. *Striping and "No Standing" regulations creating two lanes of traffic in each direction on Parkside Avenue immediately east of the circle;*
16. *A bidirectional "enhanced Class 2" bikeway (striped and painted but unseparated by barriers from the street) along the northern edge of the Ocean Parkway east service road from the Sherman Overpass to Park Circle;*
17. *Tapering of Exit 5 to one lane and the flyover to two lanes at the western edge of the circle, creating wider, more sharply-defined pedestrian refuges; and*
18. *Conversion of the northernmost flyover lane to a Class 1 bikeway.*

NYCDCP is coordinating its long-term recommendations related to Park Circle with NYCDOT's short-term efforts.

FIGURE 3-G: ANTICIPATED NYC DOT PARK CIRCLE IMPROVEMENTS, 2009



3.3 LONG-TERM RECOMMENDATIONS

Unlike the short-term options described in Section 3.2, the following scenarios are more capital-intensive and involve a more comprehensive rethinking of how the roadway system within the study area functions. These scenarios generally provide a greater, more secure benefit to bicycle, pedestrian and equine mobility than the short-term options by removing, regrading, separating or reconfiguring travel lanes. Overbuilt portions of the roadway system, which are not carrying traffic at levels that justify their outlays of space, would be partially removed or dedicated to other purposes such as Class 1 bicycle lanes or bridle paths.

While most of these scenarios can be implemented independent of other options described here, an alternate plan for bicycle access west of Park Circle to the existing Ocean Parkway Greenway via Caton Place is presented here. Implementing this option makes other improvements along the east service road of Ocean Parkway redundant. Other scenarios would supersede short-term remedies described in Section 3.2.

Ocean Parkway

Reverse Ocean Parkway Mall functions between Beverly Road and Church Avenue.
North of Church Avenue, the Ocean Parkway Greenway continues along the east mall service road. South of Church Avenue, cyclists use the west mall. This option would allow cyclists to transition between Ocean Parkway's east and west malls at Beverly Road, one block south from where they currently do. The west mall would be converted to pedestrian-only use – essentially reversing the functions of the two malls along the block between Beverly Road and Church Avenue.

According to NYCDOT's accident data, 80 reportable accidents resulting in 72 injuries occurred at Ocean Parkway and Church Avenue/Prospect Expressway between 2005 and 2007. However, a block to the south, 21 reportable accidents resulting in 33 injuries occurred at Ocean Parkway and Beverly Road during the same period. For bicycles and pedestrians, 10 reportable accidents resulting in two injuries occurred at Ocean Parkway and Church Avenue; five reportable accidents resulting in no injuries occurred at the intersection with Beverly Road. See Figure 3-H.

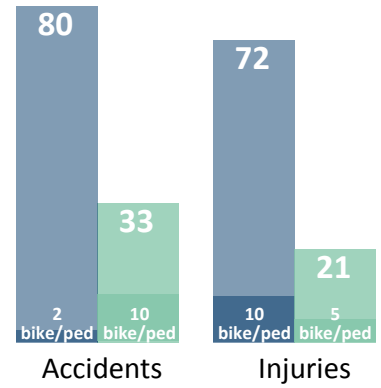
While the accident rate at Beverly Road is relatively high, it is markedly lower than at Church Avenue. Ocean Parkway and Beverly Road is also a less complicated intersection to navigate than the crossing to the north, which includes the endpoint of an expressway and a major east-west commercial strip and truck route.[21]

If this recommendation is implemented, cyclists traveling up the west mall bikeway from south to north would be guided to the east mall by signage. Removable bollards would be placed immediately to the north of the northern east-west crosswalk on the west mall to discourage cyclists and encourage pedestrians to use the west mall north to Church Avenue. Similarly, bollards would be placed immediately to the south of the southern east-west

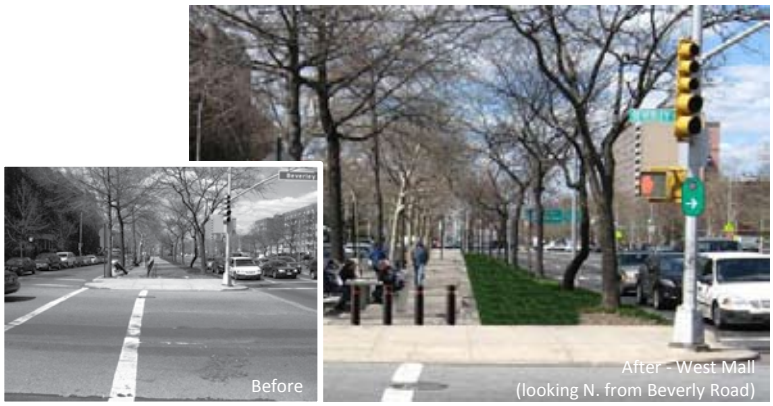
[21]While the intersection of Ocean Parkway and Church Avenue processes more motor vehicles than the intersection of Ocean Parkway and Beverly Road, it is unlikely that there is a significant difference between the amount of north-south cyclists along Ocean Parkway at these two intersections. Similarly, it is unlikely that moving the transition between the east and west malls from Church Avenue to Beverly Road would profoundly alter the ratio of accidents between the two intersections, especially since the vast majority of these accidents solely involve motor vehicles.

FIGURE 3-H: REVERSE MALL FUNCTIONS BETWEEN BEVERLY ROAD AND CHURCH AVENUE

2005-2007 accident data (NYCDOT)



+ The transition for cyclists between the East and West malls could take place at Beverly Road
+ Removable bollards and bike signage could guide cyclists between the malls at Beverly Road



crosswalk on the east mall to guide southbound cyclists to the west mall. Signage would also guide southbound cyclists from the east mall to the west.

In all other respects, the relocated east mall bicycle path would be identical to the west mall bike paths to the south, with a 9'8" bike path and a 5'10" pedestrian lane, possibly separated by a 2-inch-thick railing.

The presence of several chess tables and benches, which jut out into the east mall pedestrian walkway, creates an additional complication. These tables and benches are 5'1.5" wide – exactly half of the path's lateral walkway clearance of 10'3". Under this option, the chess tables would all be relocated to the west mall. See Figure 3-I.

The total paved width of the west mall bikeway and pedestrian path is 15'10," but this path tapers to 11'6" at Church Avenue. To encourage bicycle use along this block on the east mall and discourage cyclists on the west mall, the east mall pathway would be widened from 10'3" to 15'10" and the west mall pathway reduced to 10'3" along the entire block length.

Inverting the roles of these two malls along this one block would create a simpler, more intuitive route for cyclists crossing Church Avenue, and would encourage a simpler transition between east and west at a safer intersection than the one currently used for this purpose.

FIGURE 3-I: REVERSE MALL FUNCTIONS BETWEEN BEVERLY ROAD AND CHURCH AVENUE

+ From Church Avenue to Beverly Road the roles of the two malls would be reversed
  East Mall – bike and pedestrian access
  West Mall – pedestrians only (including chess tables and outer benches)

Caton Place

Caton Bypass option – Class 1 bikeway

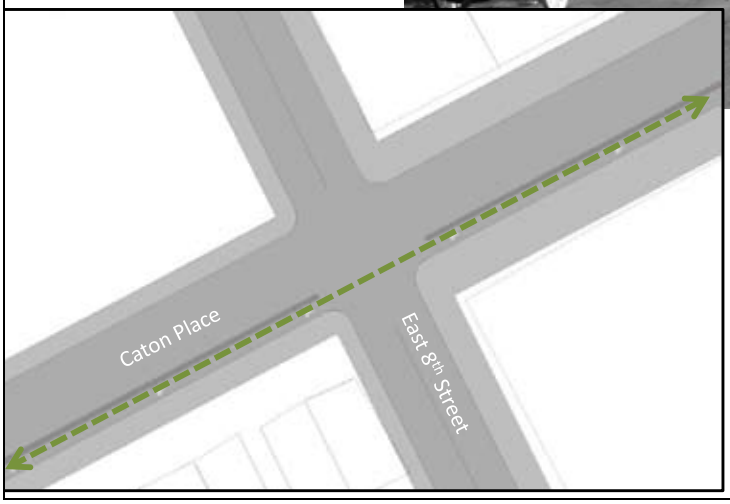
The standard side street roadbed within the study area is approximately 29'8". Some narrower streets (such as Friel Place) have roadbeds approximately 6 feet narrower. However, Caton Place – one block south of the north end of the Ocean Parkway east service road, and home to Kensington Stables – has a roadbed width of 36'0". The reasons for this are unknown.

Caton Place is lightly traveled – its average AM and PM eastbound peak traffic flows in May 2008 were 41-42 vehicles per hour. Potential exists to make use of this excess width by sequestering a southern strip of roadbed immediately north of the parking lane and creating a Class 1 bicycle path to Coney Island Avenue.

To provide sufficient room for the Class 1 bikeway, Caton Place would be made one-way eastbound along its entire length.

At Coney Island Avenue, a new signal would be installed at Caton Place to provide safe crossing to the Parade Grounds. Any signal would have to be in phase with the existing traffic light at Coney Island Avenue and Park Circle, immediately to the north. Crosswalks and a stop sign would need to be installed at the Ocean Parkway east service road for this option to be viable. See Figure 3-J.

FIGURE 3-J: CATON PLACE CLASS 1 GREENWAY ALTERNATIVE



+ Install Class 1 bikeway along southern edge of Caton Place
+ Convert Caton Place to one-way eastbound operation
+ Install additional crosswalks at Ocean Parkway and Coney Island Avenue, plus a traffic signal synchronized with the main Park Circle-Coney Island Avenue signal

Park Circle

Close northeast quadrant of Park Circle; convert remainder to two-way traffic; sod excess roadbed and graft Park Circle to Prospect Park.
The most capital-intensive – and transformational – alternative for Park Circle would eliminate most of Park Circle's northeast quadrant roadbed, completely integrating the circular green space at the center of the circle into Prospect Park, in effect adding to the park's acreage. Doing this would allow pedestrians, cyclists and equestrians to cross only a single street to enter or exit Prospect Park, no matter where their origin or destination is. See Figure 3-K.

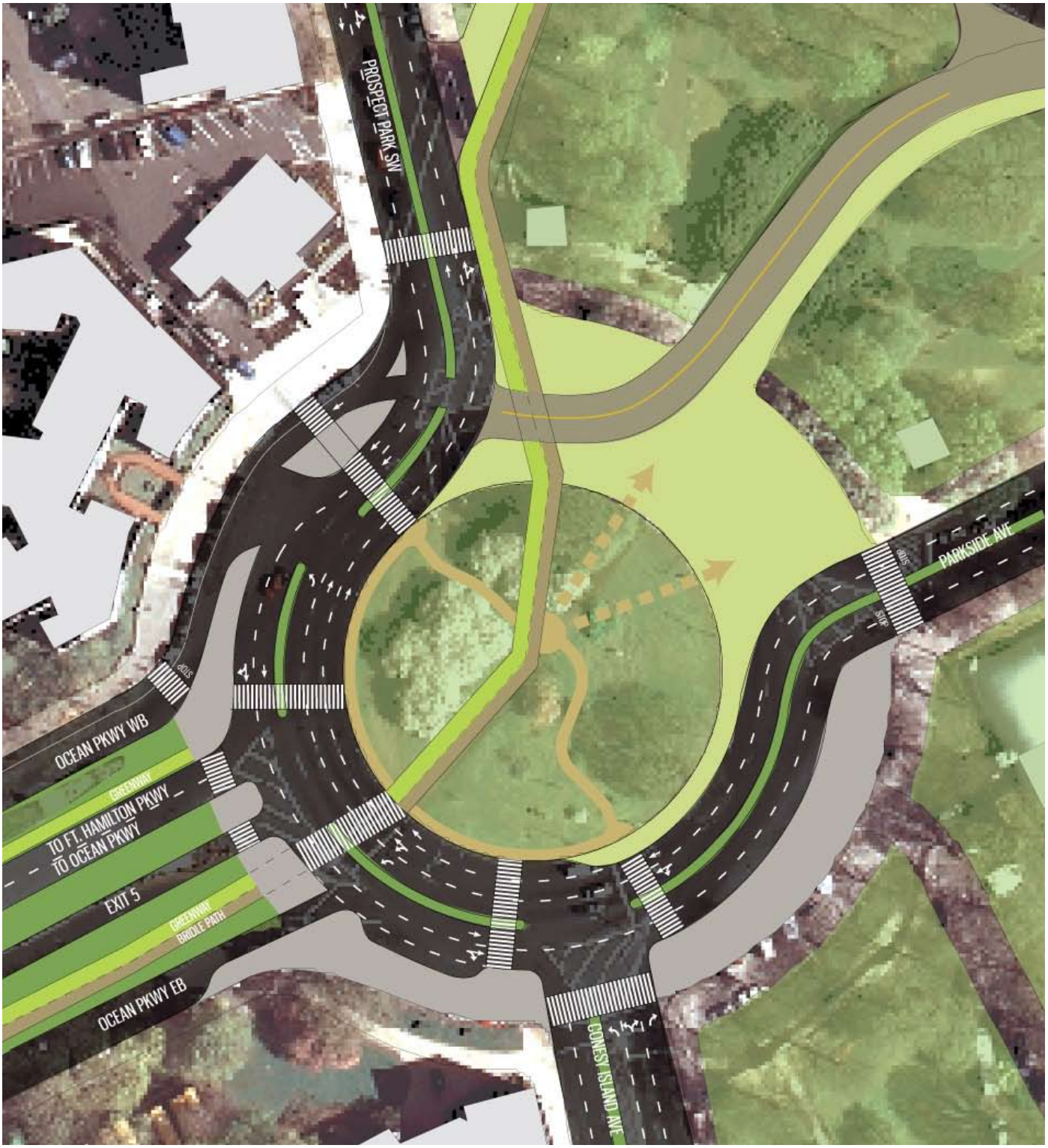
To compensate for this significant change in traffic flow, the remaining three-fourths of Park Circle would be converted to two-way traffic, with two lanes in each direction. Medians would divide the two directions of traffic, except at locations where traffic would need to cross them for access to and from intersecting roads.

Using the existing circle's roadbed, the Ocean Parkway west service road approach would be separated from the mainline roadway for nearly half of the distance to Prospect Park Southwest. An exit from the bank parking lot in the northwest quadrant would be channeled onto a westbound service road. Access to and from the mainline at this location would be protected by stop lines and flashing red lights.

The peripheral bicycle and horse lanes resulting from the NYCDOT short-term improvements would be maintained. Crosswalks to and from the expanded park would be located at the east and west sides of Coney Island Avenue, south of the Ocean Parkway east service road, north of the flyover, and at a new pedestrian island southwest of the endpoint of Prospect Park Southwest. The crosswalk at Prospect Park Southwest realigned as part of NYCDOT's short-term initiatives would be retained. The existing exit-only road from the park drive would be largely torn up, with one paved lane remaining for a bicycle path and an additional lane converted to a

FIGURE 3-K: INTEGRATION OF PARK CIRCLE INTO PROSPECT PARK

+ Only one crossing needed to enter and exit Prospect Park
+ Northeast quadrant of Park Circle closed and center of Park Circle integrated into Prospect Park
+ Remaining portions of Park Circle would become two-way traffic with medians, additional crosswalks and signage
+ Center of Park Circle landscaping would continue to be done by community
+ Further study and traffic modeling needed



dirt bridle path. A two-way park access road would continue to exist in the northeast quadrant.

Figure 3-K also incorporates of the elimination of two flyover lanes and one Exit 5 travel lane approaching Park Circle from the west.

Traffic signals would be repositioned to protect the crosswalks and reprogrammed to provide a reasonable balance between keeping vehicular speeds manageable and preventing queuing.

While the net addition of one traffic lane could be interpreted as an expansion of vehicular capacity, this scenario would add medians, which, in conjunction with the repositioned traffic signals, would reduce traffic speeds and create a safer pedestrian, cyclist and equestrian environment.

The design in Figure 3-K is conceptual and would require detailed traffic modeling to test its feasibility. In light of the imminent changes at Park Circle, the long-term recommendations included in this report deserve further study. The proposal should be revisited following the implementation of the NYCDOT's redesign of Park Circle.

Sherman Overpass

"Stable Brooklyn" option: Slight regrading of Exit 5; at-grade pedestrian crossing & signal between East 8th Street and Sherman Street; dismantle Sherman Overpass

This option is largely identical to one proposed by the *Stable Brooklyn* report, which is discussed in Appendix A: Literature Review.

The area south and east of Ocean Parkway bounded by Caton Avenue to the south and Coney Island Avenue to the east has limited access to the surrounding neighborhoods of Kensington and Windsor Terrace to the north and west. A pedestrian overpass across Ocean Parkway and the flyover at East 8th Street and Sherman Street partially mitigates this isolation, but as the data described elsewhere in this report points out, many cyclists and pedestrians instead cross the western edge of Park Circle, despite it being a substandard intersection for walking and cycling. (NYCDOT's proposed short-

FIGURE 3-L: REMOVE SHERMAN OVERPASS (STABLE BROOKLYN OPTION)

+ The flyover from Park Circle to Ocean and Ft. Hamilton Parkways is a barrier to north-south travel
+ DCP counts in July 2008 found that approx **59%** of cyclists and **43%** of pedestrians were ignoring Sherman Overpass and crossing at street level near Park Circle
+ This barrier could be overcome by:
  - Re-grading Exit 5
  - Installing a signalized, striped crosswalk between East 8th Street and Sherman Street
  - Dismantling the overpass

Image: *Stable-Izing Brooklyn* report 2006

term redesign of Park Circle would, however, create a signal-protected crosswalk along the circle's western perimeter.)

To improve connectivity, Exit 5 would be slightly regraded to allow for a level pedestrian crossing between East 8th Street to the south and Sherman Street to the north. A pedestrian crosswalk, protected by traffic signals, would span both Ocean Parkway service roads, the Exit 5 ramp and the flyover. The Sherman Overpass would then be demolished. See Figure 3-L.

The design in Figure 3-L is conceptual and would require detailed traffic modeling to test its feasibility.

Condense Exit 5 to one lane; use space to create side-by-side bike & bridle paths

The Exit 5 ramp off of the northbound Prospect Expressway fans out from one lane to two as it curves east towards Park Circle. NYCDOT traffic counts conducted in May 2008 found that an average of 248 vehicles used the exit during the AM peak hour, or just over four vehicles a minute. (The PM peak hour had an average of 217 vehicles.) The greenway path, which is divided from Exit 5 by a copiously wide cobblestone lane and a retaining wall, abruptly ends to the west of Sherman Overpass, and a short bridle path follows in its place from East 8th Street to Park Circle. This bridle path narrows appreciably near the edge of the circle.

Existing traffic volumes on Exit 5 do not require two lanes. The space where one of those lanes now is could be put to other uses.

In this alternative, the southerly 8 feet of Exit 5's southern lane would be closed; the remainder of the lane would be converted to a shoulder. The retaining wall would be demolished above surface level, and the cobblestoned strip would be filled to match the grade of the Ocean Parkway east service road and landscaped. At the western end of the two-lane section of Exit 5, the grassy area would form a slope from the grade of the existing Ocean Parkway east service road to the grade of the exit lane, but approaching Park Circle the slope would level out as Exit 5 approaches the surface. Near Park Circle, where the exit is level with the surrounding land, the median would be contoured in the shape of a berm, except at its extreme eastern edge (to allow cyclists and pedestrians to cross the western edge of the circle). Optional decorative fencing could keep pedestrians and cyclists off of the exit road. See Figure 3-M.

On the approach to Park Circle, two options are possible: the existing greenway would angle over to the area where the cobblestones are today, eventually running immediately north of the existing bridle path; or the greenway would stay where it is, and the bridle path would cross the greenway at East 8th Street and run north of the greenway to Park Circle.

Either way, the surviving, more northerly Exit 5 lane would curve into Park Circle at a location approximately 20 feet east of where it now does, prolonging the straightaway and reducing the need to narrow the bikeway/bridle path as it approaches Park Circle.

At Park Circle, elimination of a lane benefits cyclists, pedestrians and horse traffic by narrowing a road and widening a median which can be used when crossing the western edge of the circle.

Condense flyover to two lanes by converting northernmost lane to Class 1 bikeway and eliminating southernmost lane

NYCDOT traffic counts conducted in May 2008 found that an average of 680 vehicles used the four-lane flyover to Ocean Parkway and Fort Hamilton Parkway during the PM peak hour, or approximately 2.83 vehicles per lane per minute. (The AM peak hour had an average of 584 vehicles.) In contrast, the one-lane Ocean Parkway west service road, which provides access to the Prospect Expressway, carried an average of 725 vehicles in the AM peak (and and average of 446 in the PM peak.)

The flyover is overbuilt for the traffic it carries. Two of its lanes can be eliminated. (See Figure 3-N.) At Park Circle, elimination of these lanes benefits cyclists and pedestrians by narrowing a road and widening a median which can be used when crossing the western edge of the circle.

Traffic volumes counted by NYCDCP in July 2008 are roughly equally split between vehicles destined for Ocean Parkway and Fort Hamilton Parkway, though there is some fluctuation in these proportions based on time of day. One lane of traffic each

FIGURE 3-M: CONDENSE EXIT 5 TO ONE LANE

+ Traffic levels on the Exit 5 offramp do not justify two lanes. In May 2008, **248** vehicles used the ramp in the AM peak hour
+ The southern two-thirds of the ramp's southern lane would be closed; the remainder would become a shoulder
+ The area between shoulder and retaining wall would be re-graded to the level of Ocean Parkway, creating room for expanded bikeway, bridle path and plantings

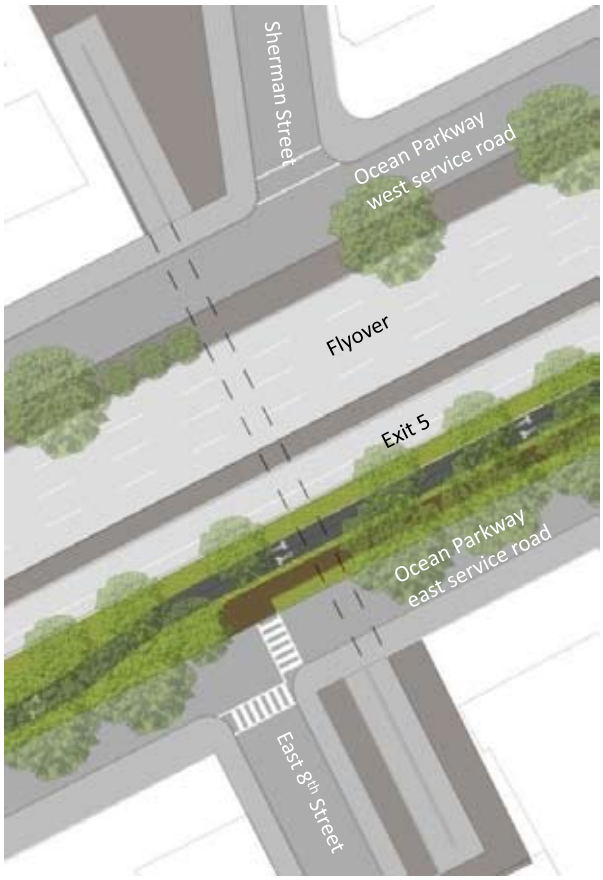
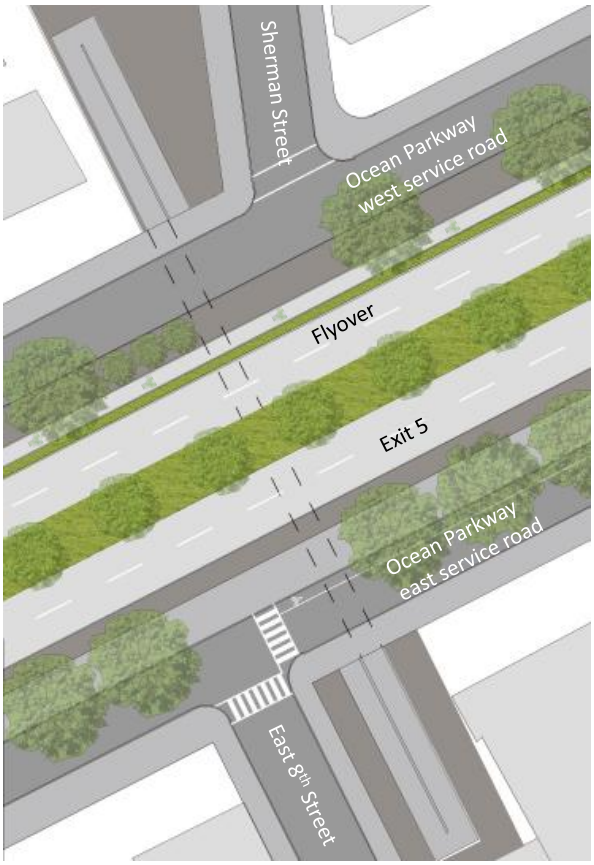


FIGURE 3-N: TWO LANE FLYOVER

+ Traffic levels on the flyover do not justify four lanes. In May 2008, **680** vehicles used the ramp in the PM peak hour
+ The southern flyover lane would be eliminated and re-graded to provide a slope to Exit 5, and planted
+ The northern flyover lane would be converted to a dedicated Class I bikeway and separated from traffic by a planted median
+ In July 2008, **40%** of cyclists on the flyover used the roadway
+ DCP projects that vehicles would still encounter a B level of service to Fort Hamilton Parkway



would continue to access Fort Hamilton Parkway and Ocean Parkway. As seen in Section 2.5, removing one of the two lanes to Fort Hamilton Parkway would not materially affect motorists. The flyover would continue to operate at LOS B, and drivers would experience delays of approximately 3 seconds at the signalized intersection with East 5th Street during peak hours.

Closing the southernmost lane would have fewer direct traffic impacts than closing the northernmost one, since the Ocean Parkway entrance ramp transitions from two lanes to one anyway southwest of the flyover. Planting, landscaping and regarding of the closed lane could also replace the existing retaining wall with a softer, more sloped transition between the flyover and Exit 5, and could reduce stormwater runoff. However, since the closed section of roadway would simply peter out in midair near the Prospect Expressway, opportunities for active reuse of the lane would be extremely limited.

NYCDOT is planning to convert the northernmost flyover lane from Park Circle to East 5th Street into a Class 1 bicycle lane as part of its short-term Park Slope improvements. In the longer term, a planted, 4-foot-wide median could separate the repurposed 8-foot-wide bicycle lane from the flyover's remaining two traffic lanes. The median immediately north of the flyover retaining wall could also be used to extend the pedestrian overpass that currently ends at East 7th Street back towards Park Circle.

Caton Place

Alternate Caton Place bridle path plus bridle path along inner edge of southeast quadrant of Park Circle

This option would take advantage of Caton Place's unusually wide roadbed not for cyclists but for equestrians. Unlike the Class 1 and Class 2 bicycle paths discussed earlier in the report, the bridle path would be located along the northernmost edge of the roadbed (the side of Caton Place where Kensington Stables is located), and run only from East 8th Street to Coney Island Avenue. The roadbed would be sequestered from the main roadway in a manner similar to the new bicycle path on 9th Avenue in Manhattan. Appropriate surfacing for the bridle path would need to balance the needs of horses and pedestrians, who would be crossing the path to reach parked vehicles.

To provide sufficient room for the bridle path, Caton Place would be made one-way eastbound along its entire length.

At Coney Island Avenue, a new signal would be installed at Caton Place to provide safe crossing to the Parade Grounds. This signal could be a full, two-phase traffic light, a flashing red/yellow signal, or a button-activated hybrid. Any signal, however, would have to be in phase with the existing traffic light at Coney Island Avenue and Park Circle, immediately to the north.

Other Long-Term Scenarios for Further Study

The easternmost endpoints of both the Ocean Parkway east service road, Exit 5, and the existing bridle path also provide opportunities to examine other creative reworkings. The east service road could be angled north and merged with a one-lane Exit 5 at the western edge of Park Circle. This consolidated roadway could serve the dual purpose of simplifying north-south pedestrian travel along the western edge of Park Circle, and opening up considerable space in the existing east service road's alignment for realigning the bridle path, extending the Class 1 greenway, and new landscaping.

3.4 CONCLUSION AND NEXT STEPS

Although reconfigured almost beyond recognition by the early 1960s, the portion of Ocean Parkway between Church Avenue and Park Circle nonetheless holds great potential. While the recommendations contained in this study are primarily geared towards making bicycle, pedestrian and equestrian travel easier and more intuitive, motor vehicles would also benefit from signage that alerts them to the presence of other roadway users, and a more easily navigable study area, particularly at Park Circle.

NYCDCP, along with our partners at NYCDOT, and NYCDPR, looks forward to being active partners in the improvement of conditions for all of the study area's uses and users.

A

APPENDICES

A LITERATURE REVIEW

Introduction

This appendix summarizes reports and descriptions of the study area done over several decades. Each selection provides historical context, but from the differing vantage points of municipal agencies, community groups and individual researchers. Some of the following excerpts also include recommendations (both proposed and implemented) for improving various aspects of traffic flow. Over time, the definition of "improvement" shifted from enhancing bicycle access to making motor vehicle traffic through the study area more efficient. In recent years, this emphasis has come full circle, with a renewed focus on improving the bicycle, pedestrian and equestrian travel experience through the area.

These reports are included in reverse chronological order.

A.1: Excerpts from Prospect Expressway, Historic Overview, www.nycroads.com

(as stated on website)

The Prospect Expressway, which links central Brooklyn with I-278 and the Brooklyn Battery-Tunnel (I-478), marks the beginning of the 120-mile long Route 27. The six-lane limited access route with flanking service roads runs parallel to Prospect Avenue, ending at Ocean Parkway (an at-grade surface boulevard) just southwest of Prospect Park. The route of NY 27 continues east through Brooklyn along Linden Boulevard.

The expressway was first proposed in 1941 by the New York City Planning Department. In 1944, the New York State Department of Public Works (NYSDPW) added the Prospect Expressway to its postwar program. The actual construction of the expressway began in 1953 at the junction of the Gowanus Expressway. The expressway was mostly complete by 1960, with the exception of the interchange at Fort Hamilton Parkway and Ocean Parkway. Two years later, this interchange was completed. The 2.1-mile long Prospect Expressway took nine years and $28 million to construct.

According to the NYSDOT, the Prospect Expressway handles approximately 85,000 vehicles per day (AADT).

Prospect Expressway Unbuilt: An Extension to Southern Brooklyn

In 1963, New York City Arterial Coordinator Robert Moses proposed a $10.5 million conversion of the existing Ocean Parkway into an expressway. The 4.2-mile long project would have provided a six-lane expressway with flanking service roads between Prospect Park and Coney Island. Future connections were to be provided with the east-west Cross-Brooklyn Expressway.

In its 1966 report *Transportation 1985: A Regional Plan*, the Tri-State Transportation Commission recommended a Prospect Expressway extension along a different route, along Flatbush Avenue southeast to the Marine Parkway-Gil Hodges Memorial Bridge. The Commission stated the purpose and benefits of the Prospect Expressway extension as follows:

"The proposed Prospect Expressway Extension, a north-south route through Brooklyn to the Rockaways, will fill the need for highway access in a large, unserved area. It will extend an existing stub-end route, better utilizing existing capacity. When completed, it will assist in the development

of industrial sites in Brooklyn and recreational areas in the Rockaways."

"Both expressway proposals were scheduled for completion by 1975. However, in the wake of disruption caused by expressway construction elsewhere in New York City, neither proposal to extend the Prospect Expressway was approved. With the departure of Robert Moses from his official posts in the late 1960's, attention shifted toward improving transit in the region."

A.2: New York City Bicycle Lane and Trail Inventory (3rd Edition), NYCDCP, October 2007.

This document was a comprehensive inventory of New York City's Class II on-street bike lanes and Class I off-street bike trails. It was meant to be used to assist with the planning and implementation of a networked system of on-street and off-street bicycle facilities. The report included existing conditions data collected from June 2006 to March 2007 for all New York City bike lanes and trails; Manhattan bike lane counts; 2005 bicycle lane accident data, and a photographic inventory of all lanes and trails. An assessment was included of the pavement condition, lane striping, signs and pavement symbols for the bicycle lanes and trails.

For the Ocean Parkway trail from Caton Avenue to Seabreeze Avenue (5.3 miles), 16 bicycle accidents were reported along the Ocean Parkway trail in 2005. Two each were reported at the Foster Avenue and Avenue W intersections, and one reported at 12 other intersections.

Eighteen signs were located along the entire trail. Seventy-nine percent of signage along the trail was reported to be in good condition, 15 percent in fair condition, and 6 percent in poor condition. A sign was deemed in "good" condition if it had no graffiti, was not vandalized bent, or worn, and was clearly visible. "Fair" signage had minor defects, was slightly worn, or had a small amount of graffiti on its surface that did not obstruct the text. Signage graded "poor" was bent, distorted, vandalized, worn, or had graffiti covering over 25 percent of its surface.

A total of 231 symbols, or on-pavement markings, were located throughout the trail. These symbols' conditions were graded as either "acceptable" (in good condition, clearly visible), or "poor" (worn, incomplete, distorted, or indistinguishable). Forty-nine percent of symbols along the trail were graded "acceptable," while 51 percent were graded "poor." Borough-wide, 62 percent of symbols were graded "acceptable" and 38 percent "poor."

The trail's pavement condition fared better than its symbols did. Fifty-eight percent of the trail had pavement in "good" condition and 42 percent was in "fair" condition, but none of the trail's pavement was graded "poor." "Good" pavement was regarded to have a smooth surface and in excellent condition, resulting in a comfortable ride. A segment was deemed "fair" if less than a quarter of the section contained potholes, bumps, uneven pavement, wide and/or deep cracks, or utility covers/grates not flush with the pavement surface. However, the relatively isolated, infrequent nature of these defects resulted in a "fair" instead of a "poor" rating.

A.3: Stable-izing Brooklyn: Making the Links to Stable Brooklyn, Hunter College Center for Community Planning & Development (CCPD), July 2006.

In 2005, the Stable Brooklyn Community Group was formed to address the issues associated with the growing development in the Stable Brooklyn neighborhood in Brooklyn. In response to the development of a new wave of residential condos, the community realized the necessity of being proactive in the planning process. They came together out of concern that many of the new residential buildings were inconsistent with the existing scale of development. In workshops, residents discussed land use and zoning policy and strengthening connections with Prospect Park and Windsor Terrace. This planning document summarizes the results of the two workshops and includes specific proposals developed by the planning team at the Hunter College Center for Community Planning and Development.

Stable Brooklyn Today

The area defined as "Stable Brooklyn" (due to the presence of one current and several former horse stables in the area) is the seven-block area surrounded by Windsor Terrace to the north, Kensing-

ton to the south and west, and Flatbush to the east. It is bounded by major roadways on four sides; the Ocean Parkway service road to the north and west, Caton Avenue to the south, and Coney Island Avenue to the east. Before The Prospect Expressway and the flyover to the Ocean Parkway west service road were built, the area's ties to Windsor Terrace to the north were much stronger. Now, a pedestrian bridge spans eight lanes of roadway (including two lanes of service road), which make access to the north difficult. The expressway to the west is a deep cut separating the neighborhood from other residential blocks. Caton Avenue to the south is a major two-lane east-west truck route that limits ties to Kensington. Coney Island Avenue and Park Circle separate the neighborhood from Prospect Park.

Population and Land Use

The total population of the neighborhood was 1,349, as reported in the 2000 U.S. Census. The predominant land use is residential. There are two major housing types in the neighborhood: two- and three-story row houses, and large apartment houses. Until recently, all of the multifamily buildings were three to six stories. A new building on Coney Island Avenue has nine stories. In addition to the residential uses are Kensington Stables (the only such business remaining), a small warehouse adjacent to the stables, two large church facilities, and two schools on Coney Island Avenue. All of the non-residential uses are concentrated in the northeastern end of the area. There are no retail or service facilities in the area.

The report listed the following stabilizing forces:

- The area is within walking distance of Prospect Park and Parade Grounds.
- The stable gives it a unique identity.
- The interior streets are safe and pleasant places to walk through.
- On-street parking is often adequate, though at times difficult.

The report listed the following issues that the residents are concerned about:

- The effects of traffic and out of scale development on the Kensington Stables. Poor traffic controls on local streets and Park Circle create unsafe conditions for riders. Growing development pressures limit space available for expansion and parking.
- Out-of-scale development. New speculative high-rise development was being encouraged by developer-initiated rezoning and variances, and by the existing R6 and C8-2 zoning. There were concerns about preserving the existing low-rise housing, and the development of new affordable and low-income housing.
- Three major traffic issues were identified.
  1. <u>Speeding Traffic on Ocean Parkway Service Road</u>. This narrow one-way street has parking on both sides and has a lot of cars taking a shortcut between Ocean Parkway and Park Circle. This is perceived as dangerous. In particular, the intersection of East 8th Street and the service road is dangerous because it is where drivers speed up after making the turn at the same location where horses enter traffic to reach the bridle path.
  2. <u>Park Circle</u>. This large circle presents an obstacle for pedestrians, bicyclists, and horses going to Prospect Park. Traffic patterns within the circle are confusing to motorists, and pathways through the circle and onto the surrounding streets are not clear.
  3. <u>Truck Traffic and Parking on Caton Avenue</u>. While Caton Avenue is a major truck route, the volume and speed of trucks can sometimes create difficult conditions for pedestrians. Trucks often double-park on Caton Avenue, obstructing and slowing traffic. Trucks also take away parking spaces from local residents.
- Bus Service. Bus service is important but not frequent enough.
- Parking. The lack of on-street parking is increasingly a problem, especially with new residential development in the area. This is complicated by the lack of retail and services in the neighborhood, which stimulates more driving. For every parking space in the neighborhood there are about two resident-owned cars.

Recommendations for Traffic and Transportation

<u>Short-Term Changes:</u> To improve safety and traffic circulation in the neighborhood, four-way stop

signs should be installed at Caton Place and the Ocean Parkway Service Road, and at Caton Place and East 8th Street. Speed humps and speed tables should be installed on streets with significant problems of speeding through traffic, including the Ocean Parkway Service Road and East 8th Street, especially near the Stables. Also, there should be a left turning lane from eastbound Caton Avenue to Coney Island Avenue to help mitigate congestion.

NYCDOT should consider ways to deter or prevent through traffic on the Ocean Parkway Service Road. This may include signage at Caton Avenue, speed humps, and other traffic calming devices.

Long-Term Changes: (These measures could be undertaken independently from each other.)

1. Permanently close the service road between East 8th Street and Park Circle.
2. Convert the roadway to pedestrian and cycle paths, and a small park.
3. A sign at the intersection of Caton Avenue and the service road should state "Not a Thru Street to Park Circle."
4. The marked bikeway/greenway on the southern sidewalk should be improved so that it is easier for cyclists to locate the entrance. This bikeway connects the Ocean Parkway Greenway with Prospect Park.

Redesign of Park Circle

Park Circle needs to be redesigned to channelize traffic and facilitate safety. More space needs to be dedicated to pedestrian, bicycle and horse crossings. Redesign of the circle would best be part of a more comprehensive redesign of the access roads to Ocean Parkway and Fort Hamilton Parkway, as proposed in the final section of the report, but could also be done independently of that larger project. The redesign of Bartel-Pritchard Circle at the west entrance to Prospect Park, planned by NYCEDC, offers many positive examples of what could be done.

Redesign of Park Circle should incorporate the following elements:

1. An expanded central rotary and corresponding reduction of traffic lanes.
2. A clearly marked bridle path through the circle using appropriate surface materials, on-demand crossing signals, and appropriate signage for motorists and riders.
3. Wider pedestrian crossings with textured pavements.
4. A landscaped median on Coney Island Avenue between Park Circle and Caton Avenue. Many pedestrians cross Coney Island Avenue at the Circle and at Caton Avenue to reach the renovated Parade Grounds facilities. Upgrading the crosswalks and installing a median would enhance pedestrian safety.
5. Improvement of pedestrian and bicycle entrances to Prospect Park so they are more clearly separated from vehicular access.
6. Special priority to improving crosswalks on Coney Island Avenue.
7. Reengineering of the Commerce Bank entrance at the north end of Park Circle to improve safety, and development of excess pavement for open space.
8. Use of the open spaces in front of the bank and church for activities such as greenmarkets or passive open space.

A.4: New York City Bicycle Master Plan, NYCDCP, NYCDOT, May 1997.

This document was the final report of the first phase of the Bicycle Network Development (BND) Project, a joint Department of City Planning (DCP) and Department of Transportation (DOT) effort. The goal of the BND project was to increase bicycle ridership in New York City, and the purpose of the *Plan* was to articulate the City's action plan. The BND Project was partially financed through the Congestion Mitigation Air Quality (CMAQ) program of the federal Intermodal Surface Transportation Efficiency Act (ISTEA).

The objective of the *New York City Bicycle Master Plan* is to encourage cycling as a mode of transportation. The goals of the *Plan* are as follows:

- Implement and maintain the city's bicycle network and greenway system
- Improve bicycle safety
- Provide bicycle parking and support facilities
- Improve bicycle access on bridges and mass transit facilities
- Institutionalize cycling in public agencies and private organizations

Consistent with these goals, the *Plan* identifies a 909 mile, city-wide bicycle network and proposes design guidelines to assist in the implementation of the network.

The *Bicycle Master Plan* is divided into nine sections:

- The Benefits of Cycling
- Cycling in New York City
- The On-Street Network
- Bridges
- The Greenway System
- Access to Mass Transit
- A Comprehensive Bicycle Program
- Design Guidelines
- Next Steps

A brief description of each section follows.

The Benefits of Cycling
The bicycle is one of the most environmentally efficient and economic modes of transportation, using much less space than an automobile, and is considerably more quiet than other modes of transportation. The bicycle also has tremendous health benefits. By using it regularly one can maintain an acceptable level of fitness. Cycling can be informative and pleasurable. While traveling, the rider becomes part of the environment, getting to know different neighborhoods and attractions that could be missed in an automobile.

Cycling in New York City
There were approximately 119 miles of bicycle facilities in New York City when the *Plan* was published, which were distributed among all five boroughs, ranging from multi-use park paths to on-street lanes and signed routes. Bicycle use in New York City had increased substantially since 1980 when DOT began monitoring bicycle travel across a screenline at several key locations. Statistics show that daily bicycle use in 1995 had increased by 124% over the 1980 levels. However, despite the increase in cycling in New York City, the comparative number of cyclists remains low. The low number is due in large part to the difficult cycling conditions and absence of sufficient facilities.

A 1990 survey conducted by DOT indicates significant potential bicycle ridership. According to the survey, nearly 50% of the 688 Manhattan office workers living within 10 miles of their job and responding to the survey would cycle to work if provided with the following amenities:

- On-street bicycle lanes
- Building access for secure bicycle parking
- Facilities to shower and change clothes

Developing comprehensive bicycle programs, including investing in bicycle facilities are key elements for the promotion of cycling within the city. New York City's comprehensive bicycle program is proposed in the final section of this *Plan*.

The On-Street Network
In an effort to increase the level of cycling by improving bicycle facilities, the BND Project has developed a proposal for a city-wide network of 900 miles, including existing and proposed network components. Listed under the existing facilities, the seasonal bicycle paths/lanes include Central and Prospect Park Loop Roads (11.5) miles.

The BND Project has identified priority routes based on the following criteria.

- Potential for connecting to and expanding an existing system
- Potential for a high volume of use because of proximity to major employment, retail, cultural or educational centers, or regional parks
- Geographic balance throughout the city
- Reasonable implementation cost, funded through existing capital projects or agency operational budgets.

The following priorities in Brooklyn were included in the study, with the potential for implementation by the BND Project: Prospect Park to Brooklyn Bridge and Sunset Park Connector which entails the construction of an on-street link between Prospect Park, Sunset Park and the Shore Parkway bicycle path.

Bridges
New York City has 43 major water crossings. Bicycle access over the bridges is critical to the establishment of a successful bicycle network. Existing

access over the bridges ranges from safe and scenic to dangerous and difficult to non-existent. A number of the major bridges are under reconstruction, and bicycle/pedestrian access improvements have been included in these efforts. The BND Project has identified a number of potential capital projects to create or enhance bridge access that is described in the report.

The Greenway System

A greenway is generally defined as a multi-use pathway for non-motorized transportation along natural and manmade linear spaces such as rail and highway rights-of-way, river corridors, waterfront spaces, parklands and, where necessary, city streets. In 1993, DCP released *A Greenway Plan* for New York City, which identifies a city-wide greenway system. Since the completion of the DCP plan, over $61 million has been allocated by federal, state and city agencies for the implementation of the greenway system. These individual projects have been included in the 900 mile network. The Ocean Parkway bicycle/pedestrian corridor was included in the New York City Funded Greenway Projects. Improved access to Prospect Park at Park Circle, the Park's southern terminus is included.

Access to Mass Transit

Improving bicycle access to, from and on mass transit can increase both bicycle and mass transit ridership. When combined, bicycles and transit provide a more flexible, inexpensive, environmentally-friendly, and often faster alternative to the auto. With certain restrictions, subways, ferries and commuter rail lines in New York City provide cyclists with a range of transit options.

A Comprehensive Bicycle Program

The overall aim of the Comprehensive Bicycle Program is to encourage cycling in New York City through promotional literature and events, develop and maintain appropriate facilities, enhance bicycle safety and respect for the cyclist's rightful place on the road, and the prevention of theft and policing of bicycle facilities. Implementation of a comprehensive program is required if cycling is to become a significant component of the city's transportation system.

Design Guidelines

Design standards are a critical component in the Network implementation process. They help ensure a consistent, safe level of service for users and protect local government agencies from liability issues in the event of injury. At the time of this study, NYC DOT was in the process of developing Bicycle Facility Standards. Most local design guidelines have been based in whole or in part on national and state standards. They are: *Guide to the Development of Bicycle Facilities,* AASHTO, *Manual on Uniform Traffic Control Devices* (MUTCD), *Guidelines for Greenways*, *Design & Maintenance Manual for Multi-use Trails*, and *Guidelines for Establishing In-Line Skate Trails in Park and Recreation Areas*. The design standards for bicycle facilities are divided into the following three categories: multi-use path, on-street bicycle lane, and signed bicycle route.

Next Steps

A long-range vision for New York City as a place of increased bicycle use and less motorized vehicle use would result in quieter streets, enhanced parks and open space, cleaner air and more pedestrian-friendly neighborhoods. Building on the momentum of increased bicycle use in New York City, the BND Project (two years old at the time of this report) made significant inroads toward the goal of increased cycling. In addition, the project was scheduled to distribute the *New York City Cycling Map*, the City's first bicycle map, in conjunction with the release of the *Plan*. The map will encourage cycling for recreation and commuting and inform users on regulations and appropriate behavior.

There has been opposition expressed by some of the city's communities to proposals for on-street bicycle lanes. However, with the New York City Bicycle Master Plan, the city can follow a logical, cohesive plan in its efforts to increase cycling. (Appendix A of the report has a summary list of the *Plan's* recommendations.) New York City is committed to making cycling part of the City's transportation system and encourages individuals and communities to participate in the implementation of this *Plan*.

A.5: Program - Centennial Celebration for the Ocean Parkway Bicycle Path, June 15, 1995, sponsored by the New York City Department of Parks and Recreation.

A Historical Perspective

Ocean Parkway established a new concept in road building. The road is about 6 miles long and stretches from Coney Island to just south of Prospect Park. It evolved from an idea expressed by Frederick Law Olmstead and Calvert Vaux in their 1866 report to the park commissioners of Brooklyn on their plans for Prospect Park. Under the section entitled "Suburban Connections," they suggested that the shaded "pleasure" drive on the western side of Prospect Park be extended from the park to the ocean. The road should be "of a picturesque character ... neither very straight nor very level, and should be bordered by a small belt of trees and shrubbery."

This very simple scheme was further elaborated two years later in the 1868 report by Olmsted and Vaux in which they coined the word "parkway." Their parkway plan was, to a certain extent, influenced by Barron Haussmann's Avenue Foch in Paris and Unter den Linden in Berlin, but they considered their parkway an advance over these boulevards. Olmsted and Vaux proposed that a mall, similar to the one on Unter den Linden, be divided down the center by a road to be used for "pleasure-riding and driving." The normal traffic roads which provided access to the houses fronting the parkway were to run along outside the malls. There were to be walks with spaces for benches and rows of trees along both sides of each road.

On May 11, 1869, an act was passed in the New York State Legislature and amended in 1872 to give authority to the Brooklyn Parks Commissioners to "lay out, open and improve a public highway or avenue from Prospect Park, in the City of Brooklyn, towards Coney Island."

The 210 foot-wide parkway was divided into a central roadway 70 feet wide, two malls 20 feet wide, two side roads both 25 feet wide and two sidewalks each 15 feet wide. Originally, the Brooklyn Parks Commission had control over an extra 30 feet on either side of the parkway. The parkway is lined with maple, oak, sycamore, elm and some ginkgo trees and is provided with benches, playing tables and a bicycle path, all of which are heavily used by nearby residents. A bridle path on the western mall provided pleasure for countless citizens for many years. While the central roadway can no longer be considered a "pleasure drive," the original intention of a promenade and green belt for the residents of the neighboring communities has been realized.

The Ocean Parkway bicycle path was the first of its kind constructed in the United States. It was laid in the fall of 1894, and formally opened on June 15, 1895. Ten thousand cyclists attended the opening celebration, cheered on by huge crowds along the route.

A.6: The Brooklyn-Queens Greenway Guide, New York City Department of Parks and Recreation.

The Brooklyn-Queens Greenway (BQG) is a 40-mile, continuous pedestrian and cyclist route from Coney Island in Brooklyn to Fort Totten on the Long Island Sound in Queens. The BQG presents the cyclist or pedestrian with a wide range of amenities, cultural offerings, and urban experiences – linking 13 parks, two botanical gardens, the New York Aquarium, the Brooklyn Museum, the New York Hall of Science, two environmental education centers, four lakes, and numerous ethnic and historic neighborhoods.

The Brooklyn-Queens Greenway is part of the larger New York City Greenway System, an interconnected network of bicycle and pedestrian pathways linking parks and communities throughout the five boroughs. The Department of City Planning's 1993 publication *A Greenway Master Plan for New York City*, which outlined 350 miles of potential trails, noted that greenways are "... at once the parks for the 21st century and a part of the transportation infrastructure, providing for pleasant, efficient, healthful and environmentally sound travel by foot, bicycle or skates." New York City Department of Parks & Recreation worked closely with the NYCDOT and NYCDCP on the planning and implementation of the City's Greenway Network.

The guide described the nine segments that form the Brooklyn-Queens Greenway from Coney Island in Brooklyn to Alley Pond Park to Fort Totten in Queens. Below is a trip description of the two seg-

ments in the guide – Ocean Parkway and Prospect Park – that pertain to this study.

Ocean Parkway
The length of this segment of the greenway is 5.9 miles (one way). Biking takes 45 minutes and walking takes 2 hours to complete it. Ocean Parkway starts a block away from the Coney Island Boardwalk. The bike path runs along the western mall of the parkway, with the eastern side reserved for pedestrians only. Olmsted and Vaux designed Ocean Parkway to extend all the way to the entrance to Prospect Park but with the construction of the Prospect Expressway during the Robert Moses era, Ocean Parkway (as a parkway) ends abruptly at Church Avenue. At Church Avenue, it is necessary to cross to the eastern side of the parkway and turn north across Church Avenue. The path continues on the eastern service road of Ocean Parkway, running alongside the Prospect Expressway. The bike path ends near the pedestrian bridge at East 8th Street, but the service road continues to Park Circle, which if followed counter-clockwise leads to the Prospect Park entrance.

Prospect Park
The length of this segment is 1.6 miles for half of the loop, and 3.2 miles for the entire park loop. Biking takes 15 minutes and walking takes one hour to complete. When traveling the Greenway from the south, the entrance into Prospect Park is at Park Circle. For the half loop that ends at Grand Army Plaza, a right turn onto South Lake Drive is required, which flows into the East Lake Drive. If traveling the Greenway from north to south, enter the Park at Grand Army Plaza, turn onto the West Drive, and follow the West Drive to the Park Circle exit.

A.7: A Greenway Plan for New York City, NYCDCP, Fall 1993.

This report presented the city's vision for the nation's most ambitious urban greenway system – 350 miles of landscaped bicycle and pedestrian paths crisscrossing New York City. It marked the beginning of a multi-year effort to create new public recreational opportunities, increase the mobility of cyclists, walkers, and joggers, and enrich the lives of New Yorkers. A preliminary planning framework for an integrated greenway system was developed through the cooperative efforts of city, state and federal agencies, borough president's offices, and open space, pedestrian and bicycle constituency groups. Priority routes were identified and funding was secured to advance some of them.

The plan built on New York's substantial legacy of greenways, which were part of every era of open space development in the city. Frederick Law Olmsted, architect of Central and Prospect parks, was the first to design a "parkway" for scenic carriage drives and bicycles in the late 19th century pre-automotive era. Olmstead planned Eastern and Ocean parkways as boulevards linking the great new urban green space of Brooklyn's Prospect Park with its surrounding communities and the beaches and open spaces beyond.

In the 1930s Robert Moses vastly expanded the park system, and also built bicycle paths along many roadways, such as Shore Parkway in Brooklyn, to satisfy those petitioning for bicycle tracks, exclusive lanes, and use of roadways during hours when automobile traffic is very light. Use as an alternative transportation option was an extra dividend during the World War II years when gasoline was rationed.

In the 1980s the Neighborhood Open Space Coalition saw an opportunity to develop a 40-mile Brooklyn- Queens Greenway for walkers and cyclists. Their detailed plan would connect Brooklyn's Coney Island with Fort Totten in Queens, using Ocean and Eastern parkways and a series of 12 parks along the way. The route passed a myriad of cultural institutions, including the Brooklyn Museum and the Brooklyn Botanic Garden, Shea Stadium and many of the city's parks.

The other Greenway routes cited in the report for improvements included the Hudson River Greenway Trail, East River Esplanade, Staten Island Railroad Trail, Putnam Railroad Trail, Mosholu-Pelham Greenway, Hutchinson River Parkway Trail, Shore Parkway Bikeway, Rockaway-Gateway Greenway, Brooklyn Queens Greenway, Queens East River Greenway, and Verrazano-Narrows Bridge/North and South Shore Greenways.

A.8: The Brooklyn/Queens Greenway: A Design Study, by Tom Fox & Anne McClellan, 1988.

In 1987, the Neighborhood Open Space Coalition released a proposal to create a 40-mile bicycle/pedestrian path from Coney Island to Fort Totten, connecting major parks and cultural facilities in Brooklyn and Queens. The Brooklyn/Queens Greenway was in a way the continuation of the work begun by Frederick Law Olmstead and Calvert Vaux and expanded by Robert Moses with the creation of Flushing Meadow-Corona Park, Kissena Park and the corridors connecting these two facilities to Cunningham Park.

The design study identified 18 different sections of the route that required special attention to create the Brooklyn/Queens Greenway. The recommendations were design solutions that were examined from a social, political and technical perspective with contributions from planners, landscape architects, engineers, park administrators, transportation experts and urban designers. An overview and design recommendations for section 3 (Ocean Parkway to Park Circle), Section 4 (Park Circle), and Section 5 (Prospect Park) – the sections that pertain to this study – are described below.

Section 3: Ocean Parkway to Park Circle
Ocean Parkway, was designed to bring people to Prospect Park via a park like setting. (A historical overview of the parkway similar to others in this literature review is included in this study.) Until 1974 there was a bridle path on the East Mall. The pedestrian lanes on the east and west malls are lined with benches at regular intervals and provide a place to stroll.

Before the Prospect Expressway, Ocean Parkway was intact through Park Circle, but with the construction of the expressway, the historic link was severed at Church Avenue. The bicycle link created at that time is circuitous, confusing, and poorly marked.

Recommendations: All bicycle and pedestrian paths would meet at the northern terminus of the Mall. Pedestrians would use the existing sidewalks and crosswalks. Bicycles would cross to the easternmost side of the Prospect Expressway entrance. Existing traffic lights would ensure safety, and appropriate curb cuts would facilitate access. Proper stenciling and signage would be necessary in this area.

There was a one-foot-wide grass strip between the curb and an 8-foot-tall wrought iron fence at the Prospect-Expressway. The area had trees located close to the curb and an area covered with grass and weeds which was currently unused. The installation of an 8-foot-wide asphalt path would accommodate a two-way Class I bicycle path. Although this is tight space for a two-way path, it meets minimum requirements. Planting new trees in barren areas along this half mile route would enhance it greatly. Climbing vines along the fence would reduce the noise on the Prospect Expressway for BQE users and residents across the Ocean Parkway Service Road.

Section 4: Park Circle
Park Circle was acquired in 1867 and built in conjunction with Prospect Park and Ocean Parkway. It was a heavily trafficked area, with Ocean Parkway, Fort Hamilton Parkway, Coney Island Avenue, Prospect Park Drive, Parkside Avenue and Prospect Park Southwest intersecting here.

The 30-acre Parade Grounds, used for a variety of sports, was located east of the Circle, directly south of Prospect Park. Prospect Park South, constructed around 1898, was one of the country's first suburban developments. The Culmitt stables were located on the corner of Caton Place and East 8th Street, where horses could be rented or boarded for use in Prospect Park.

The northbound service road was narrow, with one traffic lane. There was a parking lane on either side of the street and a sidewalk on the east side of the roadway.

Recommendations: The bicycle trail from Church Avenue would continue on the east shoulder of Ocean Parkway until the intersection of East 8th Street, one block from Park Circle. Parking adjacent to the equestrian trail would be prohibited and an eight-foot-wide two-way bicycle path would replace the parking lanes. Striping and logo stenciling would be used to designate the path. Equestrian use of the existing path would be continued.

Park Circle presented an obstacle for bicyclists and equestrians entering and exiting Prospect Park. The center of Park Circle was a grassy area unofficially used by equestrians to access the park. Pedestrians used the sidewalks and crosswalks around the perimeter on the Circle's roadbed. A bicycle/equestrian traffic light would be added at both sides of the circle. As an interim measure, the equestrian path would remain, and four-foot-wide paths installed on either side of it to accommodate separated bicycle lanes. The trees in the circle would be pruned to accommodate this slight widening. Pedestrians would use the existing crosswalks and sidewalks. As a permanent treatment, the New York City Department of Parks and Recreation was developing plans to incorporate a recreational lane for bicyclists, equestrians and pedestrians that would run along the Circle's outermost lane.

Section 5: Prospect Park
Frederick Law Olmsted considered Prospect Park, with its 526 acres of woods, water, and meadows, his finest achievement. The Park not only offered bicyclists a scenic ride, but provided an opportunity for boating, bird-watching, horseback riding, kite flying, ice skating, fishing, and picnicking, as well as a myriad of other outdoor activities. It contains a zoo, a carousel, and the Tennis Center, which is the home of the Prospect Park Environmental Center. At the time of this report Prospect Park had been undergoing a renewal with $17 million in capital improvements and recent reconstruction of several facilities within the Park. The Prospect Park Alliance, a nonprofit organization, was formed to support the revitalization of the park.

A 3.25-mile Park Drive provided a circular route within the park. Two vehicular lanes and one permanent Class II bicycle lane ran counterclockwise. Motor vehicles were allowed on the drive only during weekday rush hours. An informal dirt path, along the edge of the road, had been created by joggers adjacent to the bicycle lane. A variety of pedestrian paths were located throughout the park.

Recommendations: The existing system for bicycling on Park Drive functioned well, but the roadway would be repaved and stenciled. It was suggested that a narrow jogging trail be formalized on the dirt path next to the curb to provide joggers with an all-season, resilient and water-permeable running surface. Various pedestrian paths would be upgraded, with special attention to the stairs.

There were many ways to walk to and from Grand Army Plaza. Bicycles, however, had no way of exiting from the inner bicycle lane, especially when there were motor vehicles in the Park. The pedestrian paths leading from the park would be restored and appropriate signage would discourage use by bicycles. Any solution to the bicycle exit would have required New York City Landmarks Preservation Commission review and approval. It was recommended that the center median of the Park Drive entrance be expanded to create a two-way Class I bicycle path (12'). The roadbed would be narrowed to create two inbound and two outbound lanes for motor vehicles (the Drive has two lanes). The existing traffic light would allow bicyclists safe passage from the Park Drive bicycle lane to the newly created bicycle lane.

A.9: Landmark Designation of Ocean Parkway, Borough of Brooklyn by the Landmarks Preservation Commission, January 28, 1975.

On January 28, 1975 The Landmarks Preservation Commission designated Ocean Parkway as a landmark. This account of the designation is as stated in LP-0871.

The property bounded on the north by the south side of Church Avenue, on the west by the western curb line of the western side of the road of Ocean Parkway, on the south by the north side of Seabreeze Avenue, and on the east by the eastern curb line of the eastern side road of Ocean Parkway.

The Parkway is lined with deciduous trees and is provided with benches, playing tables and a bicycle path, all of which are heavily used by nearby residents. A bridle path on the western mall provided pleasure for many. For many people in Brooklyn, Ocean Parkway is the only large, open space with trees and grass that is available to them.

Because Prospect Expressway merges with Ocean Parkway at Church Avenue, the central roadway can no longer be considered a "pleasure drive."

But the original intention that the parkway should also serve as a promenade and greenbelt for the residents of the neighboring communities has, to a degree, been realized.

In the Findings and Designation portion of the report it is stated that The Commission further finds that, among its important qualities, Ocean Parkway was the first road of its kind built in the United States, that it established a new concept in road building, and that it is a large open space with grass and trees that serves many residents of Brooklyn as a promenade and greenbelt.

A.10: Landmark Designation of Prospect Park, Borough of Brooklyn by the Landmarks Preservation Commission, November 25, 1975.

On November 25, 1975 The Landmarks Preservation Commission designated Prospect Park as a landmark. This account of the designation is as stated in LP-0901.

The Prospect Park Scenic Landmark consists of the property bounded by the eastern curb line of Prospect Park West, Bartel-Pritchard Circle roadway, the inner curb line of Bartel-Pritchard Circle enclosing the central island, Bartel-Pritchard Circle roadway, the northern and eastern curb lines of Prospect Park Southwest, Park Circle roadway, the inner curb line of Park Circle enclosing the central island, Park Circle roadway, the northern curb line of Parkside Avenue, the western curb line of Ocean Avenue, the western curb line of Flatbush Avenue, Grand Army Plaza roadway, the inner curb lines of the outer roadway enclosing the raised mall area of Grand Army Plaza, Grand Army Plaza roadway, to the eastern curb line of Prospect Park West.

Prospect Park consisting of 526 acres was designed in 1865 by Frederick Law Olmstead and Calvert Vaux. It was Brooklyn's answer to New York's Central Park, as well as a response to the needs of the people in the City of Brooklyn.

The growth of the public park movement in this country was a reaction to increasing urbanization and industrialization of American cities in the 19th century. These cities had originally made no provision for open green space or recreational areas. England and other parts of Europe already had experienced the effects of industrialization before the United States.

Olmstead and Vaux believed that the future health of society and our cities depended on the spiritual health of the people which could be insured by re-establishing their link with nature that had been broken by rapid growth and industrialization of urban centers. Moreover, Olmstead felt it was the obligation of a democratic society to provide facilities to re-establish such a link with nature.

The success of Central Park spurred interest among prominent citizens of Brooklyn for a similar facility for their city. By 1855, Brooklyn, with over 200,000 inhabitants, was the third largest city in the United States. There was a desire to compete with New York as well as to attract more people to the advantages of Brooklyn living, and to bring relief from the urban environment for many city dwellers. The first part of the park was completed in October of 1867, and allowed the first park visitors to be admitted to the eastern section of the park.

Olmstead and Vaux devised a carefully planned circulation system as they had in Central Park, keeping carriage drives, bridle paths, and walks completely separate from each other. Unlike Central Park, Prospect Park has no transverse roads. Instead, the park is surrounded by drives connected to parkways leading one section of Brooklyn to another.

A.11: New York City Arterial Progress, Triborough Bridge and Tunnel Authority, February 23, 1965.

This report discussed the arterial progress that took place in the 1950s and 1960s in New York and New Jersey. It cited the official opening of the Verrazano-Narrows Bridge on November 21, 1964, which connected Staten Island with the rest of the City and provided a new route to New Jersey. The approach highways to the Verrazano-Narrows Bridge within the City extended from the Brooklyn-Battery Tunnel to the Goethals Bridge connection with New Jersey. In Brooklyn, the Shore Parkway and BQE now led to the Verrazano-Narrows Bridge. Three of the arterials in Brooklyn (and part of the study area for the Prospect Park-Ocean Parkway Greenway Study) mentioned in The Arterial Highway Program

include:

- Brooklyn-Queens Expressway Extension: This link between the Verrazano-Narrows Bridge and the Brooklyn-Battery Tunnel, including widening of exiting viaduct sections (formerly Gowanus Parkway) and a new route along 7th Avenue and Fort Hamilton Parkway, was opened November, 1964.
- Prospect Expressway: This connection was completed in stages between 1953 and 1962.
- Ocean Parkway: Ultimate reconstruction of the parkway to provide grade separations of major cross streets has been proposed.
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A.12: Thirty-Fifth Annual Report of the Department of Parks of the City of Brooklyn and of the County of Kings for the Year 1895, printed for the Commissioner, 1896.

The Bicycle Pathway (As stated in the report)
The Bicycle pathway, constructed during the fall of 1894, was formally opened, from the Park to Coney Island, on the fifteenth day of June of this year. The event awakened great interest among bicycle riders, as this was a historic event, the road being the first one constructed in the United States exclusively for the use of wheelmen. A reviewing stand was built at Parkville, where were gathered the city officials.

The parade was composed of three divisions: The Long Island Clubs, the New York, New Jersey and Visiting Clubs and Members of Good Roads Association, Members of L.A.W., and Unattached Wheelmen. The Procession attracted thousands of people, who lined the route and warmly applauded the wheelmen.

When the parade reached the end of Eastern Parkway and swept across the Park Plaza beside the Memorial Arch and into the main entrance of the Park it was a most imposing spectacle. The route was along the West Drive to the Coney Island Gate, thence to the Bicycle Pathway, past the reviewing stand at Parkville, where Foh's regimental band was stationed to cheer the riders on to Coney Island, where the parade terminated

The celebration was a decided success in every particular. The pathway has been very popular since its construction. Many of the wheelmen have urged the building of a return pathway on the eastern side of the Parkway. That, however is a subject for careful consideration. While a return pathway is desirable, if the pastime of wheeling continues to be as popular as it now is, it would be really well for the city authorities to take into consideration the advisability of constructing it, so as not to encroach too much upon the rights of pedestrians, by arranging for a flagged sidewalk on each side of the Parkway in front of the courtyard line.

B ON-STREET PARKING AND STREET WIDTH NOTES

B.1: On-Street Parking Notes

The following notes describe specific conditions observed in the study area.

- *Southeast corner of the eastern Ocean Parkway service road and Beverly Road:* The presence of a hydrant and yellow curb striping implies that no standing is allowed, but the area is unsigned.
- *East side of the eastern Ocean Parkway service road between Church Avenue and Beverly Road:* No sign delineates the northern limit of the No Parking Anytime regulation posted to the south.
- *West side of the western Ocean Parkway service road between Caton Avenue and Albemarle Road:* The No Parking from 8:00am to 6:00pm Mondays through Fridays regulation specifically exists in front of 120 Ocean Pkwy. and 160 Ocean Pkwy.
- *East side of the eastern Ocean Parkway service road between Caton Avenue and Church Avenue:* The No Parking from 8:00am to 6:00pm Mondays through Fridays regulation specifically exists in front of the northernmost quarter of 135 Ocean Pkwy. and between the front doors of 175 and 179 Ocean Pkwy.
- *In front of PS 130, on both East 5th Street and Ocean Parkway:* The southerly signs delineating the boundaries of school day-only parking restrictions post exemptions for faculty vehicles or the Board of Education; the northerly signs do not.
- *South side of Friel Place, immediately west of Coney Island Avenue:* A "Meters Are Not In Effect Above Times" sign is posted below the No Parking from 11:30am to 1:00pm Tuesdays sign, but it is not clear whether this exemption applies only to this sign or also to the one above it, which delineates the eastern limit of a No Standing Anytime Except Truck Loading and Unloading regulation from 7:00am to 4:00pm Mondays Through Fridays.
- *South Side of Kermit Place, between East 7th Street and East 8th Street:* From west to east:
    - No Standing Anytime: East 7th Street to west edge of 46 Kermit Pl.
    - No Parking 11:30am to 1:00pm Fridays: to the midpoint of 52 Kermit Pl.
    - No Standing Anytime: to about 10 feet east of the edge of the driveway for 70 East 8th St.
    - No Parking 11:30am to 1:00pm Fridays: to the corner of East 8th Street.

B.2: Street Width Notes

- *The Ocean Parkway service road widths are essentially identical to each other*. All of them, however, are narrower than the standard width of a side road within the study area. (See below.)
- *The two blocks of Church Avenue between East 5th and East 7th streets are significantly wider than the rest of the avenue in the study area*. This is due to a trolley tunnel beneath Ocean Parkway which was in use until 1956 and subsequently filled in.
- *Caton Avenue is significantly wider between Ocean Parkway and Coney Island Avenue than it is to the east and west.* One particular location (identified as Note 3 in Figure

2-P) bulbs out to nearly 100 feet wide.

- *The roadbeds of three streets within the study area are considerably narrower than a standard side street.* While East 5th, East 7th, East 8th (north of Caton Avenue), and East 10th streets all are just under 30 feet wide, Friel Place, Kermit Place, and East 8th Street south of Caton Avenue are all approximately 23 feet, 7 inches wide. The narrowness of these streets could be seen as either an impediment to cycling or an asset, since vehicles navigating them are naturally slowed down by the need to safely pass cars parked on both sides of these streets.
- *The Coney Island Avenue roadbed is approximately 70 feet wide.* This avenue sees busy peak-directional traffic, but its width and relative lack of activity north of Church Avenue may be an untapped multi-use asset.

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