

**Appendix C**  
**Traffic and Parking**



## TECHNICAL MEMORANDUM

**TO:** Files

**FROM:** Stuart Gewirtzman

**DATE:** May 4, 2006

**PROJECT:** Atlantic Yards Arena and Redevelopment (PHA No. 0343E)

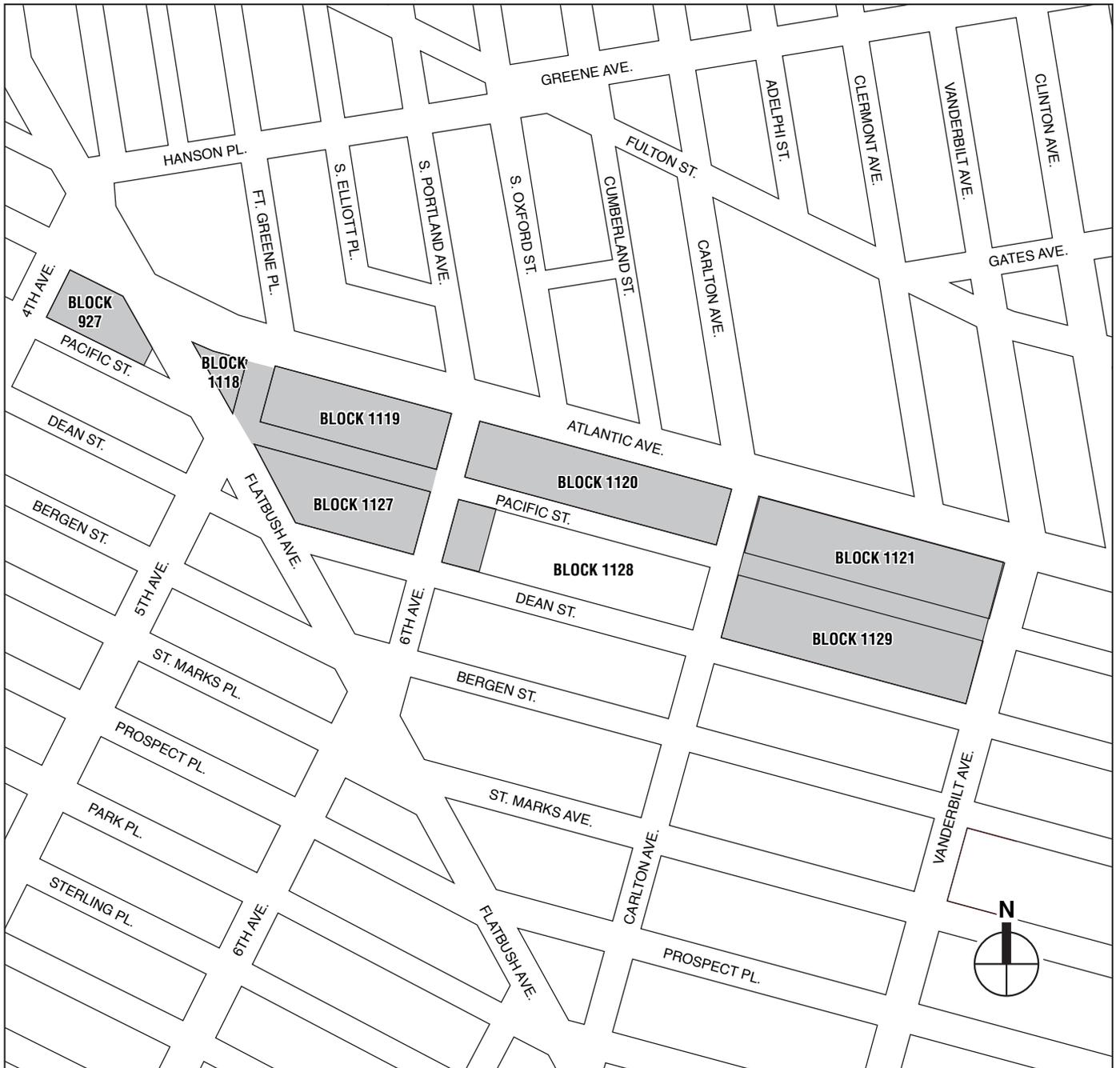
**RE:** Transportation Planning Assumptions

This memorandum summarizes the transportation planning assumptions to be used for the analysis of traffic, parking, transit and pedestrian conditions for the proposed Atlantic Yards Arena and Redevelopment project. Estimates of the proposed project's peak hour travel demand and trip assignment patterns are provided, along with discussions of the traffic, parking, transit and pedestrian study areas for the impact analyses.

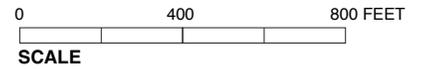
### PROJECT PROGRAM

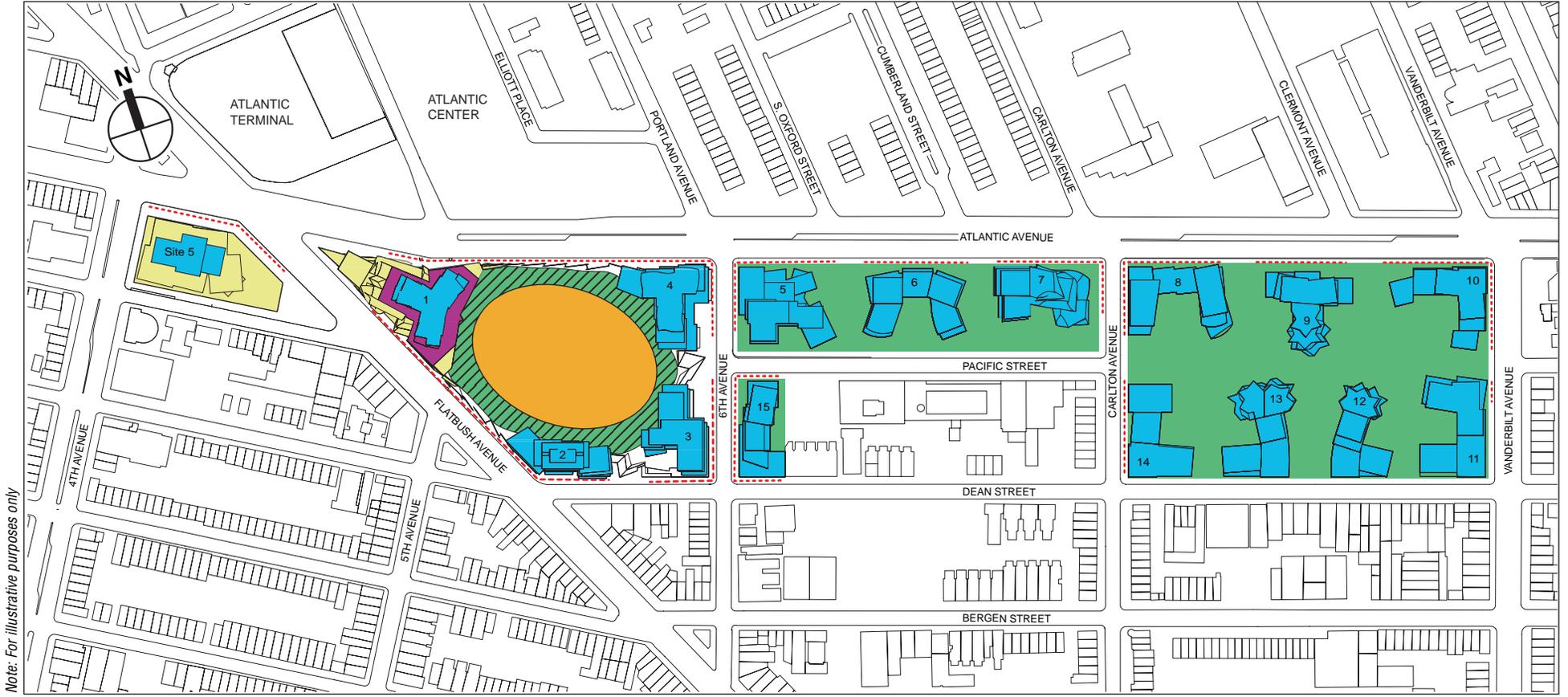
The proposed Atlantic Yards Arena and Redevelopment project would be located on an approximately 22-acre site in the Atlantic Terminal area of Brooklyn, roughly bounded by Flatbush and Fourth Avenues on the west, Vanderbilt Avenue on the east, Atlantic Avenue on the north, and Dean Street on the south (see Figure 1). In addition to an approximately 850,000 gross-square-foot (gsf) arena for use by the Nets professional basketball team and other sporting and cultural events, it is anticipated that the proposed project would include residential, office, hotel, and local retail uses, approximately seven acres of publicly accessible open space, approximately 3,800 parking spaces, and an improved Long Island Rail Road (LIRR) yard. In addition to the arena, a total of 16 buildings would be constructed on the eight blocks comprising the project site. These buildings are referred to as Site 5 and Buildings 1 through 15.

The proposed development considers two program variations: residential mixed-use and commercial mixed-use (shown in Figures 2a and 2b, respectively). The variations reflect the fact that the programs for three of the project's 17 buildings are not fixed and could be



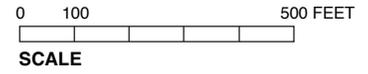
 Project Site

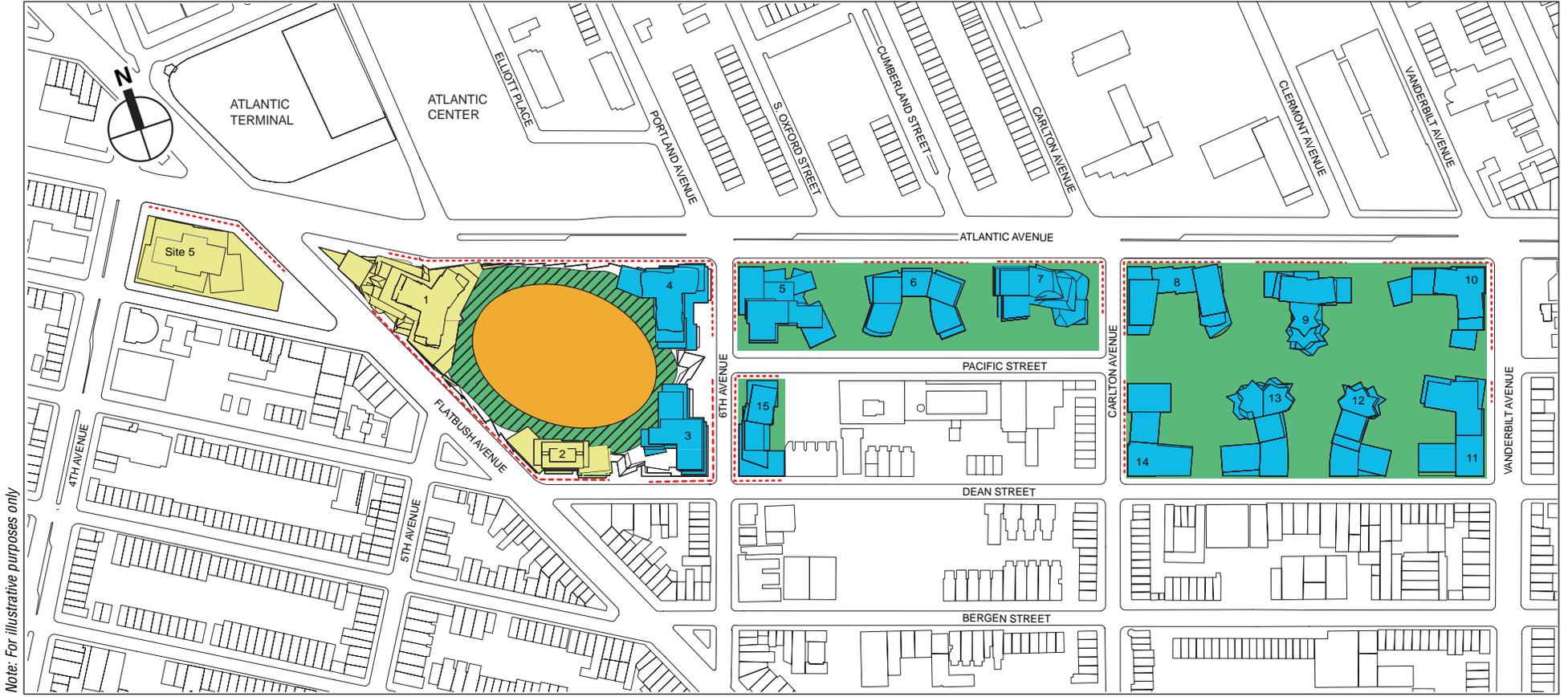




Note: For illustrative purposes only

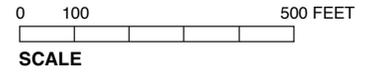
- Arena
- Residential Building
- Commercial Building
- Public Open Space
- Private Open Space
- Hotel
- Street-Level Retail





Note: For illustrative purposes only

- Arena
- Residential Building
- Commercial Building
- Public Open Space
- Private Open Space
- Street-Level Retail



used for a mixture of residential and commercial uses. Under the commercial mixed-use variation additional commercial space would substitute for the hotel use and a majority of the residential space in Buildings 1 and 2 on the arena site (blocks 1118, 1119, and 1127) and on Site 5 (Block 927). The other buildings and uses on the project site (the arena and Buildings 3 through 15) would remain the same under both the residential mixed-use and commercial mixed-use variations. Table 1 compares the development programs for the proposed project's two variations. As shown in Table 1, along with the 18,000-seat arena (for basketball), the residential mixed-use variation would consist of a total of approximately 6,860 dwelling units, 606,000 gsf of commercial office space, a 180-room hotel, and 247,000 gsf of ground floor local retail space that would be distributed among Site 5 and Buildings 1 through 15. A total of approximately 3,800 parking spaces would also be provided in on-site parking garages. By contrast, the commercial mixed-use variation would include approximately 5,790 dwelling units, 1,829,000 gsf of commercial office space, and no hotel use, as well as a total of approximately 3,800 parking spaces. The arena and local retail uses would remain the same under both scenarios.

**Table 1  
Project Development Program**

<b>Component</b>	<b>Residential Mixed-Use Variation</b>	<b>Commercial Mixed-Use Variation</b>
Arena	850,000 gsf (18,000 seats)	850,000 sf (18,000 seats)
Residential	6,860 D.U.	5,790 D.U.
Office	606,000 gsf	1,829,000 gsf
Local Retail	247,000 gsf	247,000 gsf
Hotel	165,000 gsf (180 rooms)	0 gsf
Parking	3,800 spaces	3,800 spaces

Both the residential mixed-use and the commercial mixed-use variations are expected to include community facility uses, including a health care center and an intergenerational community center offering child care and youth and senior activities. Community facilities built as part of the proposed project would occupy some portion of the 247,000 gsf of space included as local retail in Table 1. For the purposes of the travel demand forecast, all of this space is assumed to be local retail (i.e., retail establishments serving the needs of workers and residents in the neighborhood).

It is anticipated that the proposed project would be developed in two phases. Phase I, to be completed in 2010, would include the arena, Site 5, Buildings 1 through 4, and a new on-site entrance to the Atlantic Avenue/Pacific Street subway station complex on Block 1118

at the intersection of Flatbush and Atlantic Avenues. Two parking garages located on Site 5 and the Arena Block would be constructed, along with interim parking elsewhere on the project site. Also included in this phase would be the closure of the existing LIRR yard at the west end of the site and the development of an improved LIRR yard at the east end of the site along with a new portal for direct train access between the new yard and the LIRR's Atlantic Terminal. The remainder of the project, which includes construction of Buildings 5 through 15 and additional permanent parking, would be completed by 2016.

In addition to the development program outlined above, the proposed project would entail a number of permanent roadway closures and changes in street direction, including:

- the closure of Pacific Street between Flatbush Avenue and Sixth Avenue, and between Carlton and Vanderbilt Avenues;
- the closure of Fifth Avenue between Flatbush and Atlantic Avenues;
- the conversion of Sixth Avenue between Atlantic and Flatbush Avenues from one-way southbound to two-way operation (partly in response to the closure of Fifth Avenue); and
- the conversion of Carlton Avenue from one-way northbound to two-way operation between Atlantic Avenue and Pacific Street.

## **SELECTION OF PEAK HOURS FOR ANALYSIS**

On weekdays, the proposed project's residential, office and local retail components are expected to generate their highest demand during the traditional 8-9 AM and 5-6 PM commuter periods as well as the 12-1 PM midday (lunch time) period. By contrast, a Nets basketball game at the arena would generate much of its travel demand during the weekday evening and nighttime periods and on weekends. On weekdays, for example, it is anticipated that a Nets basketball game or other event at the arena would typically start at 7:30 PM or 8 PM. A 7-8 PM peak hour was therefore selected for the analysis of weekday pre-game conditions as it is during this period that residual commuter demand and peak demand en route to a basketball game or other event at the arena would most likely overlap. The 10-11 PM peak hour was selected for the weekday nighttime period to coincide with the peak demand generated at the end of a basketball game or other event at the arena. For the weekend period, the 1-2 PM and 4-5 PM peak hours on a Saturday were selected for analysis to coincide with the start and end times of a weekend afternoon basketball game, respectively, as well as peak retail-based travel demand from on-site and other nearby retail uses in Downtown Brooklyn (Atlantic Center, for example).

The EIS traffic analyses will examine conditions in all seven peak hours identified above. Transit (subway and bus) analyses generally examine conditions during the weekday AM and PM peak commuter periods as it is during these times that overall transit demand (and the potential for significant adverse impacts) is typically greatest. As there would be some overlap between trips en route to the arena and commuter demand during the 7-8 PM pre-

game period, this peak hour will also be analyzed to identify potential impacts at subway station processors (e.g., entrance stairways, fare arrays, etc.). In addition to the weekday AM and PM peak commuter hours, the pedestrian analysis will also focus on the 7-8 PM pre-game and Saturday 1-2 PM midday peak hours as it is during these periods that trips en route to the arena would coincide with elevated demand on study area pedestrian facilities (from commuters and shoppers, respectively).

## **TRANSPORTATION PLANNING ASSUMPTIONS**

The transportation planning assumptions used to forecast travel demand from the project's residential, office, hotel, local retail and arena components are summarized in Table 2 and discussed below. The trip generation rates, temporal distributions and mode choice assumptions shown in Table 2 were based on accepted CEQR criteria, standard professional references, and studies that have been done for similar uses in Downtown Brooklyn and Manhattan. These sources were supplemented by data from the 2000 Census, and Employee Commute Options survey data from firms and governmental/educational institutions in Downtown Brooklyn.

### **Residential**

The forecasts of travel demand from the project's residential components were based on trip rates from *Urban Space for Pedestrians* (Pushkarev & Zupan, 1975) and *Trip Generation, 7<sup>th</sup> Edition* (ITE), and vehicle occupancy and temporal and directional distribution data from the *Downtown Brooklyn Development FEIS* (April 2004). The weekday modal split assumed for the residential components reflects journey-to-work data from the 2000 Census. Although residential-based trips in the midday would likely be more local in nature than in the peak commuter hours (and therefore have a higher walk share, for example), the modal split based on census journey-to-work data is conservatively assumed for all analyzed weekday peak periods. The modal split for the Saturday peak periods was adjusted to reflect anticipated higher walk and auto shares compared to the weekday periods.

### **Office**

The travel demand forecasts for the project's office components were based on trip rates and temporal distributions from *Urban Space for Pedestrians* and the *Coliseum Redevelopment FSEIS* (July 1997). The estimated modal split and vehicle occupancies were derived from NYCDOT Employee Commute Options survey data from office firms and governmental/educational institutions in Downtown Brooklyn, as well as data from the *Downtown Brooklyn Development FEIS*.

### **Hotel**

The travel demand forecast for the hotel that would be developed under the residential mixed-use variation (but not the commercial mixed-use variation) was based on data from the *Renaissance Plaza Expansion EAS* (March 2003) and from the *Marriott Hotel Transportation*

**Table 2**  
**Transportation Planning Assumptions for Project Components**

Land Use:		Arena	Residential	Office	Hotel	Local Retail					
		(1)	(3,6)	(6,11)	(4)	(6,7)					
<b>Trip Generation:</b> (Person-trips)	<b>Weekday</b>	2.00	8.075	18.00	5.82	205					
	<b>Saturday</b>	2.00	7.679	0.90	8.61	205					
		(trips/seat)	(trips/dwelling unit)	(trips/1,000 gsf)	(trips/room)	(trips/1,000 gsf)					
<b>Temporal Distribution:</b>		(8,9)	(2,23)	(2)	(4,5)	(2,10)					
	<b>AM (8-9)</b>	1.0%	9.1%	11.8%	6.6%	3.1%					
	<b>MD (12-1)</b>	1.0%	4.7%	14.5%	8.3%	19.0%					
	<b>PM (5-6)</b>	5.0%	10.7%	13.7%	7.7%	9.6%					
	<b>Pre-game (7-8 PM)</b>	37.5%	8.3%	4.0%	6.6%	3.0%					
	<b>Post-game (10-11 PM)</b>	42.5%	3.3%	0.5%	2.0%	1.0%					
	<b>Saturday (1-2 PM)</b>	37.5%	7.0%	15.0%	7.5%	9.5%					
	<b>Saturday (4-5 PM)</b>	42.5%	7.2%	15.0%	7.5%	9.5%					
<b>Modal Split:</b>		(12)	(22)	(14,15)	(4)	(13)					
		<b>Weekday</b>	<b>Sat</b>								
		<b>In</b>	<b>All Periods</b>	<b>Weekday</b>	<b>Sat</b>	<b>AM/PM/EVE</b>	<b>MD/Sat MD</b>	<b>All Periods</b>	<b>All Periods</b>		
	<b>Auto</b>	34.8%	35.9%	40.0%	14.0%	20.0%	12.0%	2.0%	30.1%	2.0%	
	<b>Taxi</b>	3.0%	3.0%	3.0%	1.0%	1.0%	1.0%	1.0%	12.3%	3.0%	
	<b>Subway</b>	49.7%	46.7%	44.0%	72.0%	45.0%	65.0%	7.0%	18.8%	20.0%	
	<b>LIRR</b>	7.7%	9.6%	8.0%	1.0%	1.0%	12.0%	0.0%	0.0%	0.0%	
	<b>Bus</b>	2.1%	2.1%	2.0%	3.0%	3.0%	6.0%	7.0%	5.5%	5.0%	
	<b>Walk</b>	2.7%	2.7%	3.0%	9.0%	30.0%	4.0%	83.0%	33.3%	70.0%	
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
<b>Vehicle Occupancy:</b>		(16)	(16)	(13,22)	(14)	(4)	(13)				
		<b>Weekday</b>	<b>Sat</b>	<b>All Periods</b>	<b>All Periods</b>	<b>All Periods</b>	<b>All Periods</b>				
	<b>Auto</b>	2.35	2.75	1.18	1.42	1.60	2.00				
	<b>Taxi</b>	2.35	2.75	1.40	1.42	1.40	2.00				
<b>Directional Distribution:</b>		(13,17)	(5,13)	(2,5,13)	(4,18)	(10)					
		<b>In</b>	<b>Out</b>	<b>In</b>	<b>Out</b>	<b>In</b>	<b>Out</b>	<b>In</b>	<b>Out</b>		
	<b>AM (8-9)</b>	96%	4%	20%	80%	96%	4%	41%	59%	50%	50%
	<b>MD (12-1)</b>	39%	61%	51%	49%	39%	61%	68%	32%	50%	50%
	<b>PM (5-6)</b>	85%	15%	65%	35%	5%	95%	59%	41%	50%	50%
	<b>Pre-game (7-8 PM)</b>	99%	1%	70%	30%	20%	80%	60%	40%	50%	50%
	<b>Post-game (10-11 PM)</b>	1%	99%	95%	5%	20%	80%	95%	5%	50%	50%
	<b>Saturday (1-2 PM)</b>	99%	1%	50%	50%	60%	40%	56%	44%	55%	45%
	<b>Saturday (4-5 PM)</b>	1%	99%	50%	50%	15%	85%	56%	44%	45%	55%
<b>Daily Truck Trip Generation:</b>		(21)	(5,13)	(5,20)	(5,19)	(5,19)					
	<b>Weekday</b>	0.07	0.07	0.16	0.06	0.35					
	<b>Saturday</b>	0.02	0.01	0.01	0.01	0.02					
		(trips/1,000 gsf)	(trips/dwelling unit)	(trips/1,000 gsf)	(trips/1,000 gsf)	(trips/1,000 gsf)					
<b>Truck Trip Temporal Distribution:</b>		(21)	(19)	(5,20)	(5,19)	(5,19)					
	<b>AM (8-9)</b>	12%	12%	7%	12%	8%					
	<b>MD (12-1)</b>	14%	9%	7%	9%	11%					
	<b>PM (5-6)</b>	3%	2%	3%	0%	2%					
	<b>Pre-game (7-8 PM)</b>	0%	0%	2%	0%	0%					
	<b>Post-game (10-11 PM)</b>	0%	0%	2%	0%	0%					
	<b>Saturday (1-2 PM)</b>	20%	9%	11%	9%	11%					
	<b>Saturday (4-5 PM)</b>	0%	0%	3%	0%	2%					

**Notes:**

- (1) Although a sell-out basketball game typically has 90% attendance, a trip rate of 2 trips/seat for all 18,000 seats is assumed in order to account for trips by spectators as well as employees, players, coaches, team staff and other visitors.
- (2) Source: Pushkarev & Zupan, *Urban Space for Pedestrians*.
- (3) Saturday residential trip rate based on ratio of weekday/Saturday trip rates from *ITE Trip Generation, 7th Edition*, Land Use: 220 (Apartment).
- (4) Source: *Renaissance Plaza Expansion EAS*, March 2003 and data from *Marriott Hotel Transportation Survey*, AKRF, August 1999.
- (5) Based on Saturday data from *Coliseum Redevelopment FSEIS*, July 1997.
- (6) Source: *City Environmental Quality Review (CEQR) Technical Manual*, Appendix 3, 2001.
- (7) Weekday trip generation rate assumed for Saturday as per *Coliseum Redevelopment FSEIS*, July 1997.
- (8) Based on data from *Madison Square Garden Modal Split Analysis*, August 26, 2003.
- (9) Post-game arena temporal distribution based on MTA data on subway ridership patterns at stations serving Madison Square Garden.
- (10) Source: *Coliseum Redevelopment FSEIS*, July 1997.
- (11) Saturday trip generation assumed to be 5% of weekday generation, consistent with assumptions in the *Coliseum Redevelopment FSEIS*, July 1997.
- (12) Reflects the anticipated origin/destination distribution of arena spectators and the accessibility by transit of the proposed arena site in Downtown Brooklyn.
- (13) Source: *Downtown Brooklyn Development FEIS*, April 2004.
- (14) Source: NYCDOT ECO Survey data for Downtown Brooklyn.
- (15) Source for midday modal split data: *Downtown Brooklyn Development FEIS*, April 2004. Weekday midday modal split assumed for Saturday midday.
- (16) Based on data from *Madison Square Garden Modal Split Analysis* and data from a PHA parking survey prior to a Knicks game at MSG on March 9, 2003.
- (17) PM and pre-game directional distribution for arena trips assumed to be predominantly inbound; post-game predominantly outbound.
- (18) Weekday 10-11 PM directional distribution assumed based on pattern for residential uses.
- (19) Source: *Curbside Pickup & Delivery Operations & Arterial Traffic Impacts*, FHWA, February 1981.
- (20) Weekday office truck trip rate and temporal distribution based on PHA June 10, 2004 survey at existing office buildings in Midtown and Lower Manhattan.
- (21) Based on FCRC projections for Arena loading dock usage.
- (22) Based on 2000 Census journey-to-work data. Saturday modal split adjusted to reflect anticipated higher walk and auto shares compared to a weekday.
- (23) Saturday 4-5 PM based on Sunday 4-5 PM data from the *No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FGEIS*, Nov. 2004.

*Survey* (AKRF, August 1999). Saturday temporal distribution and truck trip generation assumptions were based on data from the *Coliseum Redevelopment FSEIS*.

## **Local Retail**

The retail uses developed under both the residential mixed-use variation and the commercial mixed-use variation would be local (or “neighborhood”) retail, attracting trips primarily from the residential and worker populations on-site and in surrounding neighborhoods. It is therefore anticipated that the majority of these trips would be via the walk mode, and that many would be “linked” trips (e.g., a trip with multiple purposes, such as stopping at a retail store while commuting to or from work) and would therefore not represent the addition of new discrete trips to the study area transportation systems. For the purposes of the travel demand forecast, it is conservatively assumed that 40 percent of retail trips would be such “linked” trips, consistent with the rates assumed for other retail developments in New York City. The travel demand forecasts for local retail uses were based on data from a variety of sources, including the *City Environmental Quality Review (CEQR) Technical Manual* (2001), *Coliseum Redevelopment FSEIS*, and *Downtown Brooklyn Development FEIS*.

## **Arena**

The proposed 850,000 gsf Atlantic Yards Arena would accommodate 18,000 to 20,500 seats, depending on the event. The capacity for a basketball game, for example, would be 18,000 seats, whereas for a concert, ethnic event or religious/motivational show, additional space for seating could be available on the arena floor. As a reasonable worst case for the EIS transportation analyses, the weekday and Saturday travel demand forecasts examine the demand that would be generated by a Nets basketball game at the arena. A Nets basketball game was selected as a reasonable worst case scenario based on both the frequency of home games and the relatively high level of travel demand that such games are expected to generate compared to most other uses. Using the 2005-2006 season as a guide, approximately 41 games would occur at the arena during a typical basketball season from early November to late April (not including playoff games which could continue through June). Approximately 26 of these games would occur on a weekday, four on a weekend afternoon (Saturday or Sunday) and 11 on a weekend evening. Non-basketball events, such as concerts, ethnic shows, general fixed fee rentals (graduations, receptions, job fairs, etc.), religious/motivational shows, other sporting events, family shows and community events, are each expected to occur with less frequency, would often attract fewer spectators, and would typically generate a lower level of travel demand than a Nets basketball game.

The travel demand forecast for the arena assumes a sold-out game with 100 percent attendance for all 18,000 seats, and a daily trip generation rate of two trips per seat. It should be noted, however, that the actual number of spectators at a game is typically fewer than the number of tickets distributed, and that even a sold-out game typically has about 90 percent attendance. The daily trip generation rate of two trips per seat for all 18,000 seats therefore also accounts for trips by employees, players, coaches, team staff and other such non-spectator demand.

Data on the arrival patterns for spectators at a Knicks basketball game at Madison Square Garden reported in the August 26, 2003 *Madison Square Garden Modal Split Analysis* study was utilized to estimate the temporal distribution for trips to the Atlantic Yards Arena. Based on these data, it is estimated that approximately 75 percent of spectators en route to a basketball game would arrive in the peak one-hour period. The temporal distribution of post-game peak hour trips was estimated based on MTA subway ridership data for stations serving Madison Square Garden. Using a comparison of the subway ridership on both game days and non-game days, and the hourly variation in the demand attributable to Madison Square Garden, it is estimated that approximately 85 percent of spectators would typically depart the Atlantic Yards Arena in the peak one hour at the end of a basketball game.

In addition to trips by spectators before and after a Nets basketball game, it is anticipated that arena employees, players, coaches, team staff and other non-spectator visitors to the arena would generate trips outside of the immediate pre-game and post-game periods. As shown in the temporal distribution in Table 2, it is assumed that one percent of daily trips generated by the arena would occur in each of the weekday AM and midday peak hours, and five percent during the weekday 5-6 PM peak hour.

Trip origin and modal split assumptions for the Atlantic Yards Arena reflect the anticipated origin/destination distribution of arena spectators and the accessibility by transit of the proposed arena site in Downtown Brooklyn. The assumptions were developed from trip origin and modal split data reported in the *Madison Square Garden Modal Split Analysis* study, along with data specific to Downtown Brooklyn developed for other studies such as the *Downtown Brooklyn Development FEIS*. The derivations of the trip origin/destination and modal split assumptions for both a weekday and weekend sporting event at the proposed arena are presented in Appendix A. For example, it is anticipated that there would be a higher percentage of trips en route to the Atlantic Yards Arena from Brooklyn than for Madison Square Garden (30 percent versus 7 percent, respectively), and a lower percentage of trips with Manhattan origins (25 percent versus 36 percent, respectively). With its proximity to Penn Station, the Port Authority Bus Terminal, the PATH terminal at West 33<sup>rd</sup> Street and the Lincoln Tunnel, a sporting event at Madison Square Garden likely attracts a higher percentage of spectators from New Jersey than would be the case for an arena located in Downtown Brooklyn. The analysis therefore assumes that 13 percent of trips would be en route from New Jersey compared to 21 percent for Madison Square Garden.

As with trip origins, modal splits were correspondingly adjusted to reflect both the anticipated trip origins and the differences in transit access. For example, the combined weekday auto share from all origins was increased to 34.8 percent from the 29.7 percent experienced at Madison Square Garden, while the taxi share (which includes livery or “black” cars) was reduced (from 7.5 percent to 3.0 percent) in part to reflect the generally higher availability and usage of taxis in Manhattan. Trips from the northern and western suburbs served by PATH, NJ Transit and Metro-North were assumed to complete their journeys via the subway mode, accounting in part for a higher subway mode share than for Madison Square Garden (49.7 percent versus 23.6 percent on weekdays). A smaller percentage of trips were assumed to travel to the Atlantic Yards Arena via Long Island Rail Road compared to Madison Square Garden as there is no direct access to the LIRR’s Brooklyn terminus from the Port Washington Branch. Walk-only trips were also assumed to be lower compared to Madison Square Garden

given the higher concentration of office space and overall employment in the Garden's midtown Manhattan location compared to Downtown Brooklyn.

Based on discussions with MTA New York City Transit concerning the anticipated travel characteristics of arena patrons, separate trip origin/destination and modal split assumptions have been assumed for persons arriving and departing the arena. On weekdays it is likely that some spectators would travel to the arena from workplaces in one borough or county, and then depart en route to residences in a different borough or county at the conclusion of a game, sometimes by a different mode of travel. For example, it is likely that some spectators would travel to the arena from Manhattan by subway, and then to homes on Long Island via the Long Island Rail Road's Atlantic Terminal. Others may walk from workplaces in Downtown Brooklyn and then drive home to New Jersey. These work-based trips en route to the arena are more likely to be made by transit (primarily subway) than would be the case for post-game trips en route home which are more likely to have higher auto and commuter rail shares. The trip destination and modal split assumptions shown in Appendix A for persons departing the arena on a weekday therefore reflect a lower Manhattan share than for trips en route to the arena (20 percent versus 25 percent), and a lower subway share (46.7 percent versus 49.7 percent). The auto mode share is slightly higher for trips departing the arena (35.9 percent versus 34.8 percent) as is the LIRR share (9.8 percent versus 7.8 percent), reflecting the expected higher percentage of trips with end points outside of Manhattan in the post-game period. As work-based trips would be minimal on weekends, the travel demand forecast assumes a general balance of trip origins and destinations for the Saturday peak hours.

### **Truck Trips**

Truck trip generation rates and temporal distributions for the project's residential, hotel and local retail components were based on data from the *Coliseum Redevelopment FSEIS* and from *Curbside Pick-Up & Delivery Operations and Arterial Traffic Impacts* (FHWA, February 1981). Truck travel demand for the project's office component was based on data from surveys at existing office buildings in Midtown and Lower Manhattan. The truck trip generation forecast for the arena was derived from projections for arena loading dock usage provided by the project sponsors. These truck trips include deliveries of food and supplies, general deliveries (e.g., UPS, Fed Ex, etc.), and trucks associated with television broadcasts.

### **TRIP GENERATION**

Tables 3 and 4 show the trip generation in peak hour person trips that would result in 2016 from the full build-out of the residential mixed-use and commercial mixed-use variations, respectively. A comparison of the total peak hour person trips generated by each scenario is presented in Table 5 along with the total numbers of peak hour vehicle trips (auto, taxi and truck) and person trips by transit (subway, bus and LIRR).

It should be noted that the residential mixed-use variation and the commercial mixed-use variation would both displace existing land uses on the project site, such as the 46,913 square feet of retail (a Modell's Sporting Goods store and a P.C. Richards consumer electronics

**Table 3**  
**Travel Demand Forecast for the Residential Mixed-Use Variation - 2016**  
**(Person Trips)**

Person Trips by Mode:	Site 5			Arena Block						Residential Blocks <sup>(1)</sup>			Total Trips		
	Residential/ Office/Local Retail			Arena			Residential/ Office/Hotel/Local Retail			Residential/Local Retail					
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
<b>AM (8-9)</b>															
Auto	74	29	103	120	5	125	135	186	321	99	378	477	428	598	1,026
Taxi	9	5	14	10	0	10	16	20	36	16	35	51	51	60	111
Subway	407	156	563	172	7	179	684	913	1,597	537	1,969	2,506	1,800	3,045	4,845
LIRR	66	5	71	27	1	28	85	15	100	7	26	33	185	47	232
Bus	38	10	48	7	0	7	56	44	100	35	95	130	136	149	285
Walk	89	79	168	9	0	9	122	183	305	289	448	717	489	710	1,199
<b>Total</b>	<b>683</b>	<b>284</b>	<b>967</b>	<b>345</b>	<b>13</b>	<b>358</b>	<b>1,098</b>	<b>1,361</b>	<b>2,459</b>	<b>963</b>	<b>2,951</b>	<b>3,914</b>	<b>3,089</b>	<b>4,609</b>	<b>7,698</b>
<b>MD (12-1)</b>															
Auto	24	28	52	49	79	128	91	82	173	160	153	313	324	342	666
Taxi	20	21	41	4	7	11	29	27	56	64	64	128	117	119	236
Subway	170	179	349	70	103	173	424	420	844	994	969	1,963	1,658	1,671	3,329
LIRR	1	1	2	11	21	32	4	4	8	9	9	18	25	35	60
Bus	48	59	107	3	5	8	65	76	141	118	118	236	234	258	492
Walk	617	746	1,363	4	6	10	701	848	1,549	1,354	1,352	2,706	2,676	2,952	5,628
<b>Total</b>	<b>880</b>	<b>1,034</b>	<b>1,914</b>	<b>141</b>	<b>221</b>	<b>362</b>	<b>1,314</b>	<b>1,457</b>	<b>2,771</b>	<b>2,699</b>	<b>2,665</b>	<b>5,364</b>	<b>5,034</b>	<b>5,377</b>	<b>10,411</b>
<b>PM (5-6)</b>															
Auto	33	94	127	532	97	629	185	196	381	374	210	584	1,124	597	1,721
Taxi	10	15	25	46	8	54	26	26	52	54	41	95	136	90	226
Subway	195	529	724	760	126	886	919	1,016	1,935	2,010	1,168	3,178	3,884	2,839	6,723
LIRR	6	77	83	118	26	144	17	100	117	26	13	39	167	216	383
Bus	21	55	76	32	6	38	53	81	134	122	88	210	228	230	458
Walk	210	227	437	41	7	48	304	280	584	873	768	1,641	1,428	1,282	2,710
<b>Total</b>	<b>475</b>	<b>997</b>	<b>1,472</b>	<b>1,529</b>	<b>270</b>	<b>1,799</b>	<b>1,504</b>	<b>1,699</b>	<b>3,203</b>	<b>3,459</b>	<b>2,288</b>	<b>5,747</b>	<b>6,967</b>	<b>5,254</b>	<b>12,221</b>
<b>Pre-game (7-8 PM)</b>															
Auto	26	29	55	4,651	48	4,699	155	91	246	301	132	433	5,133	300	5,433
Taxi	4	6	10	401	4	405	17	11	28	30	18	48	452	39	491
Subway	140	160	300	6,642	63	6,705	749	444	1,193	1,583	712	2,295	9,114	1,379	10,493
LIRR	6	20	26	1,029	13	1,042	16	27	43	21	9	30	1,072	69	1,141
Bus	10	15	25	281	3	284	38	30	68	78	42	120	407	90	497
Walk	75	72	147	361	4	365	160	111	271	391	282	673	987	469	1,456
<b>Total</b>	<b>261</b>	<b>302</b>	<b>563</b>	<b>13,365</b>	<b>135</b>	<b>13,500</b>	<b>1,135</b>	<b>714</b>	<b>1,849</b>	<b>2,404</b>	<b>1,195</b>	<b>3,599</b>	<b>17,165</b>	<b>2,346</b>	<b>19,511</b>
<b>Post-game (10-11 PM)</b>															
Auto	12	4	16	53	5,438	5,491	81	8	89	162	11	173	308	5,461	5,769
Taxi	2	1	3	5	454	459	8	1	9	15	3	18	30	459	489
Subway	62	22	84	76	7,074	7,150	387	41	428	842	64	906	1,367	7,201	8,568
LIRR	2	2	4	12	1,454	1,466	6	3	9	12	0	12	32	1,459	1,491
Bus	3	2	5	3	318	321	18	3	21	39	7	46	63	330	393
Walk	27	21	48	4	409	413	73	22	95	171	72	243	275	524	799
<b>Total</b>	<b>108</b>	<b>52</b>	<b>160</b>	<b>153</b>	<b>15,147</b>	<b>15,300</b>	<b>573</b>	<b>78</b>	<b>651</b>	<b>1,241</b>	<b>157</b>	<b>1,398</b>	<b>2,075</b>	<b>15,434</b>	<b>17,509</b>
<b>Saturday (1-2 PM)</b>															
Auto	22	21	43	5,346	54	5,400	137	130	267	263	258	521	5,768	463	6,231
Taxi	10	8	18	401	4	405	22	19	41	43	38	81	476	69	545
Subway	97	85	182	5,881	59	5,940	319	305	624	747	710	1,457	7,044	1,159	8,203
LIRR	1	1	2	1,069	11	1,080	6	6	12	13	13	26	1,089	31	1,120
Bus	19	15	34	267	3	270	37	33	70	86	77	163	409	128	537
Walk	252	208	460	401	4	405	409	360	769	1,065	938	2,003	2,127	1,510	3,637
<b>Total</b>	<b>401</b>	<b>338</b>	<b>739</b>	<b>13,365</b>	<b>135</b>	<b>13,500</b>	<b>930</b>	<b>853</b>	<b>1,783</b>	<b>2,217</b>	<b>2,034</b>	<b>4,251</b>	<b>16,913</b>	<b>3,360</b>	<b>20,273</b>
<b>Saturday (4-5 PM)</b>															
Auto	22	26	48	61	6,059	6,120	140	140	280	265	270	535	488	6,495	6,983
Taxi	8	10	18	5	454	459	21	20	41	38	43	81	72	527	599
Subway	85	98	183	67	6,665	6,732	318	348	666	725	762	1,487	1,195	7,873	9,068
LIRR	1	1	2	12	1,212	1,224	7	11	18	13	13	26	33	1,237	1,270
Bus	14	19	33	3	303	306	33	36	69	77	86	163	127	444	571
Walk	202	261	463	5	454	459	354	387	741	950	1,077	2,027	1,511	2,179	3,690
<b>Total</b>	<b>332</b>	<b>415</b>	<b>747</b>	<b>153</b>	<b>15,147</b>	<b>15,300</b>	<b>873</b>	<b>942</b>	<b>1,815</b>	<b>2,068</b>	<b>2,251</b>	<b>4,319</b>	<b>3,426</b>	<b>18,755</b>	<b>22,181</b>

**Notes:**

<sup>(1)</sup> Includes blocks 1120, 1121, 1128, 1129.

**Table 4**  
**Travel Demand Forecast for the Commercial Mixed-Use Variation - 2016**  
**(Person Trips)**

Person Trips by Mode:	Site 5			Arena Block						Residential Blocks <sup>(1)</sup>			Total Trips		
	Office/Local Retail			Arena			Residential/Office/ Local Retail			Residential/Local Retail					
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
<b>AM (8-9)</b>															
Auto	139	8	147	120	5	125	339	120	459	99	378	477	697	511	1,208
Taxi	14	3	17	10	0	10	31	11	42	16	35	51	71	49	120
Subway	758	49	807	172	7	179	1,836	626	2,462	537	1,969	2,506	3,303	2,651	5,954
LIRR	137	6	143	27	1	28	313	20	333	7	26	33	484	53	537
Bus	72	7	79	7	0	7	165	32	197	35	95	130	279	134	413
Walk	109	65	174	9	0	9	180	130	310	289	448	717	567	643	1,210
<b>Total</b>	<b>1,229</b>	<b>138</b>	<b>1,367</b>	<b>345</b>	<b>13</b>	<b>358</b>	<b>2,864</b>	<b>939</b>	<b>3,803</b>	<b>963</b>	<b>2,951</b>	<b>3,914</b>	<b>5,401</b>	<b>4,041</b>	<b>9,442</b>
<b>MD (12-1)</b>															
Auto	22	29	51	49	79	128	70	83	153	160	153	313	301	344	645
Taxi	22	25	47	4	7	11	30	37	67	64	64	128	120	133	253
Subway	150	172	322	70	103	173	371	415	786	994	969	1,963	1,585	1,659	3,244
LIRR	0	0	0	11	21	32	2	2	4	9	9	18	22	32	54
Bus	67	89	156	3	5	8	124	175	299	118	118	236	312	387	699
Walk	855	1,121	1,976	4	6	10	1,457	2,061	3,518	1,354	1,352	2,706	3,670	4,540	8,210
<b>Total</b>	<b>1,116</b>	<b>1,436</b>	<b>2,552</b>	<b>141</b>	<b>221</b>	<b>362</b>	<b>2,054</b>	<b>2,773</b>	<b>4,827</b>	<b>2,699</b>	<b>2,665</b>	<b>5,364</b>	<b>6,010</b>	<b>7,095</b>	<b>13,105</b>
<b>PM (5-6)</b>															
Auto	14	163	177	532	97	629	124	416	540	374	210	584	1,044	886	1,930
Taxi	9	21	30	46	8	54	17	42	59	54	41	95	126	112	238
Subway	100	905	1,005	760	126	886	669	2,264	2,933	2,010	1,168	3,178	3,539	4,463	8,002
LIRR	8	157	165	118	26	144	26	361	387	26	13	39	178	557	735
Bus	18	92	110	32	6	38	43	204	247	122	88	210	215	390	605
Walk	197	246	443	41	7	48	252	336	588	873	768	1,641	1,363	1,357	2,720
<b>Total</b>	<b>346</b>	<b>1,584</b>	<b>1,930</b>	<b>1,529</b>	<b>270</b>	<b>1,799</b>	<b>1,131</b>	<b>3,623</b>	<b>4,754</b>	<b>3,459</b>	<b>2,288</b>	<b>5,747</b>	<b>6,465</b>	<b>7,765</b>	<b>14,230</b>
<b>Pre-game (7-8 PM)</b>															
Auto	12	41	53	4,651	48	4,699	108	126	234	301	132	433	5,072	347	5,419
Taxi	4	6	10	401	4	405	10	12	22	30	18	48	445	40	485
Subway	69	226	295	6,642	63	6,705	565	676	1,241	1,583	712	2,295	8,859	1,677	10,536
LIRR	10	39	49	1,029	13	1,042	28	91	119	21	9	30	1,088	152	1,240
Bus	9	23	32	281	3	284	33	56	89	78	42	120	401	124	525
Walk	64	74	138	361	4	365	118	109	227	391	282	673	934	469	1,403
<b>Total</b>	<b>168</b>	<b>409</b>	<b>577</b>	<b>13,365</b>	<b>135</b>	<b>13,500</b>	<b>862</b>	<b>1,070</b>	<b>1,932</b>	<b>2,404</b>	<b>1,195</b>	<b>3,599</b>	<b>16,799</b>	<b>2,809</b>	<b>19,608</b>
<b>Post-game (10-11 PM)</b>															
Auto	2	6	8	53	5,438	5,491	49	14	63	162	11	173	266	5,469	5,735
Taxi	1	1	2	5	454	459	4	2	6	15	3	18	25	460	485
Subway	13	32	45	76	7,074	7,150	252	76	328	842	64	906	1,183	7,246	8,429
LIRR	1	5	6	12	1,454	1,466	6	11	17	12	0	12	31	1,470	1,501
Bus	2	3	5	3	318	321	12	7	19	39	7	46	56	335	391
Walk	20	22	42	4	409	413	49	25	74	171	72	243	244	528	772
<b>Total</b>	<b>39</b>	<b>69</b>	<b>108</b>	<b>153</b>	<b>15,147</b>	<b>15,300</b>	<b>372</b>	<b>135</b>	<b>507</b>	<b>1,241</b>	<b>157</b>	<b>1,398</b>	<b>1,805</b>	<b>15,508</b>	<b>17,313</b>
<b>Saturday (1-2 PM)</b>															
Auto	7	6	13	5,346	54	5,400	76	74	150	263	258	521	5,692	392	6,084
Taxi	9	7	16	401	4	405	12	11	23	43	38	81	465	60	525
Subway	63	51	114	5,881	59	5,940	218	205	423	747	710	1,457	6,909	1,025	7,934
LIRR	0	0	0	1,069	11	1,080	3	3	6	13	13	26	1,085	27	1,112
Bus	18	14	32	267	3	270	31	27	58	86	77	163	402	121	523
Walk	249	198	447	401	4	405	386	322	708	1,065	938	2,003	2,101	1,462	3,563
<b>Total</b>	<b>346</b>	<b>276</b>	<b>622</b>	<b>13,365</b>	<b>135</b>	<b>13,500</b>	<b>726</b>	<b>642</b>	<b>1,368</b>	<b>2,217</b>	<b>2,034</b>	<b>4,251</b>	<b>16,654</b>	<b>3,087</b>	<b>19,741</b>
<b>Saturday (4-5 PM)</b>															
Auto	6	14	20	61	6,059	6,120	78	93	171	265	270	535	410	6,436	6,846
Taxi	7	10	17	5	454	459	11	13	24	38	43	81	61	520	581
Subway	56	102	158	67	6,665	6,732	221	310	531	725	762	1,487	1,069	7,839	8,908
LIRR	1	8	9	12	1,212	1,224	7	21	28	13	13	26	33	1,254	1,287
Bus	13	19	32	3	303	306	25	34	59	77	86	163	118	442	560
Walk	173	214	387	5	454	459	269	310	579	950	1,077	2,027	1,397	2,055	3,452
<b>Total</b>	<b>256</b>	<b>367</b>	<b>623</b>	<b>153</b>	<b>15,147</b>	<b>15,300</b>	<b>611</b>	<b>781</b>	<b>1,392</b>	<b>2,068</b>	<b>2,251</b>	<b>4,319</b>	<b>3,088</b>	<b>18,546</b>	<b>21,634</b>

**Notes:**

<sup>(1)</sup> Includes blocks 1120, 1121, 1128, 1129.

**Table 5**  
**Comparison of 2016 Peak Hour Travel**  
**Residential Variation vs. Commercial Variation**

**Person Trips**

Peak Hour	Residential Variation	Commercial Variation	Net Difference	% Difference
8-9 AM	7,698	9,442	(1,744)	(23%)
12-1 PM (midday)	10,411	13,105	(2,694)	(26%)
5-6 PM	12,221	14,230	(2,009)	(16%)
7-8 PM (pre-game)	19,511	19,608	(97)	(1%)
10-11 PM (post-game)	17,509	17,313	196	1%
Saturday 1-2 PM	20,273	19,741	532	3%
Saturday 4-5 PM	22,181	21,634	547	3%

**Vehicle Trips (Auto/Taxi/Truck)**

Peak Hour	Residential Variation	Commercial Variation	Net Difference	% Difference
8-9 AM	972	1,099	(127)	(13%)
12-1 PM (midday)	718	728	(10)	(1%)
5-6 PM	1,331	1,489	(158)	(12%)
7-8 PM (pre-game)	3,020	2,989	31	1%
10-11 PM (post-game)	2,981	2,952	29	1%
Saturday 1-2 PM	3,050	2,919	131	4%
Saturday 4-5 PM	3,380	3,251	129	4%

**Transit Trips (Subway/Bus/LIRR)**

Peak Hour	Residential Variation	Commercial Variation	Net Difference	% Difference
8-9 AM	5,362	6,904	(1,542)	(29%)
12-1 PM (midday)	3,881	3,997	(116)	(3%)
5-6 PM	7,564	9,342	(1,778)	(24%)
7-8 PM (pre-game)	12,131	12,301	(170)	(1%)
10-11 PM (post-game)	10,452	10,321	131	1%
Saturday 1-2 PM	9,860	9,569	291	3%
Saturday 4-5 PM	10,909	10,755	154	1%

store) currently located on Block 927 (Site 5). However, the travel demand forecast conservatively assumes no credit for the travel demand from these existing uses that would be displaced in the Build condition.

As shown in Table 5, the number of person trips generated by the residential mixed-use variation (inbound and outbound combined) would range from 7,698 in the AM peak hour to 22,181 in the Saturday 4-5 PM post-game peak hour. The commercial mixed-use variation, would generate from 9,442 peak hour person trips (in the AM) to 21,634 (in the Saturday 4-5 PM post-game). The commercial mixed-use variation would generate 1,744 more trips than the proposed project in the weekday AM peak hour, 2,694 more trips in the midday, 2,009 more trips in the PM peak hour. By contrast, the residential mixed-use variation would generate 532 more person trips than the commercial mixed-use variation during the Saturday 1-2 PM pre-game peak hour, and 547 more trips in the Saturday 4-5 PM post-game peak hour. During the weekday 7-8 PM pre-game and 10-11 PM post-game periods, the travel demand from the two variations would differ by roughly one percent (fewer than 200 trips).

The numbers of peak hour vehicle trips that would be generated by the residential mixed-use variation and the commercial mixed-use variation are also summarized in Table 5, and are shown in detail in Tables 6 and 7, respectively. As was the case for person trips, the commercial mixed-use variation would generate more vehicle trips (from 10 to 158 more) in the AM, midday and PM peak hours, while the residential mixed-use variation would generate a higher number of trips in the Saturday pre-game and post-game peak hours (131 and 129 more, respectively). During the weekday 7-8 PM pre-game and 10-11 PM post-game periods, the number of vehicle trips generated by the two variations are virtually the same, differing by roughly one percent (31 and 29 trips, respectively).

As demonstrated by the data in Table 5, the commercial mixed-use variation would generate a substantially higher level of total travel demand (from 16 to 26 percent higher) compared to the residential mixed-use variation in the key weekday AM, midday and PM peak hours. During the weekday 7-8 PM and 10-11 PM periods, the demand from the two variations would be roughly equivalent, differing by approximately one percent. By contrast, on Saturdays the residential mixed-use variation would generate approximately three percent more trips than the commercial mixed-use variation during the 1-2 PM and 4-5 PM peak hours. The commercial mixed-use variation was therefore selected as the reasonable worst case scenario (RWCS) for the weekday transportation analyses, while the residential mixed-use variation is analyzed as the RWCS for the two Saturday peak hours.

As shown in Table 4, under the commercial mixed-use variation, new trips by subway are expected to total 5,954, 8,002 and 10,536 during the analyzed weekday 8-9 AM, 5-6 PM and 7-8 PM peak hours, respectively. New bus trips would total 413 and 605 during the weekday 8-9 AM and 5-6 PM peak hours analyzed for potential bus impacts. New weekday peak hour trips on the Long Island Rail Road would range from 54 (in the midday) to 1,501 (in the 10-11 PM post-game peak hour). As shown in Table 7, the commercial mixed-use variation is expected to add between 438 and 2,581 autos to the study area street system in each weekday peak hour, and from 120 to 412 new taxi trips. Peak hour truck trips would increase by from 6 to 84 in each weekday peak hour. In general, the highest numbers of new weekday vehicle trips would occur during the 7-8 PM (pre-game) and 10-11 PM (post-

**Table 6**  
**Travel Demand Forecast for the Residential Mixed-Use Variation - 2016**  
**(Vehicle Trips)**

Peak Hour Vehicle Trips		Site 5			Arena Block						Residential Blocks <sup>(2)</sup>			Total Trips		
		Residential/ Office/Local Retail			Arena			Residential/ Office/Hotel/Local Retail			Residential/Retail					
		In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
AM (8-9)	Auto	53	23	76	51	2	53	100	154	254	81	318	399	285	497	782
	Taxi <sup>(1)</sup>	5	5	10	3	3	6	18	18	36	27	27	54	53	53	106
	Truck	4	4	8	4	4	8	13	13	26	21	21	42	42	42	84
	<b>Total</b>	<b>62</b>	<b>32</b>	<b>94</b>	<b>58</b>	<b>9</b>	<b>67</b>	<b>131</b>	<b>185</b>	<b>316</b>	<b>129</b>	<b>366</b>	<b>495</b>	<b>380</b>	<b>592</b>	<b>972</b>
MD (12-1 PM)	Auto	16	17	33	21	34	55	68	63	131	122	117	239	227	231	458
	Taxi <sup>(1)</sup>	16	16	32	4	4	8	26	26	52	50	50	100	96	96	192
	Truck	4	4	8	4	4	8	9	9	18	17	17	34	34	34	68
	<b>Total</b>	<b>36</b>	<b>37</b>	<b>73</b>	<b>29</b>	<b>42</b>	<b>71</b>	<b>103</b>	<b>98</b>	<b>201</b>	<b>189</b>	<b>184</b>	<b>373</b>	<b>357</b>	<b>361</b>	<b>718</b>
PM (5-6 PM)	Auto	25	66	91	227	41	268	152	149	301	309	170	479	713	426	1,139
	Taxi <sup>(1)</sup>	12	12	24	16	16	32	22	22	44	39	39	78	89	89	178
	Truck	1	1	2	1	1	2	2	2	4	3	3	6	7	7	14
	<b>Total</b>	<b>38</b>	<b>79</b>	<b>117</b>	<b>244</b>	<b>58</b>	<b>302</b>	<b>176</b>	<b>173</b>	<b>349</b>	<b>351</b>	<b>212</b>	<b>563</b>	<b>809</b>	<b>522</b>	<b>1,331</b>
Pre-Game (7-8 PM)	Auto	20	21	41	1,979	21	2,000	127	71	198	255	110	365	2,381	223	2,604
	Taxi <sup>(1)</sup>	3	3	6	165	165	330	18	18	36	20	20	40	206	206	412
	Truck	1	1	2	0	0	0	1	1	2	0	0	0	2	2	4
	<b>Total</b>	<b>24</b>	<b>25</b>	<b>49</b>	<b>2,144</b>	<b>186</b>	<b>2,330</b>	<b>146</b>	<b>90</b>	<b>236</b>	<b>275</b>	<b>130</b>	<b>405</b>	<b>2,589</b>	<b>431</b>	<b>3,020</b>
Post-Game (10-11 PM)	Auto	9	2	11	23	2,314	2,337	67	5	72	136	7	143	235	2,328	2,563
	Taxi <sup>(1)</sup>	1	1	2	191	191	382	6	6	12	10	10	20	208	208	416
	Truck	0	0	0	0	0	0	1	1	2	0	0	0	1	1	2
	<b>Total</b>	<b>10</b>	<b>3</b>	<b>13</b>	<b>214</b>	<b>2,505</b>	<b>2,719</b>	<b>74</b>	<b>12</b>	<b>86</b>	<b>146</b>	<b>17</b>	<b>163</b>	<b>444</b>	<b>2,537</b>	<b>2,981</b>
Saturday (1-2 PM)	Auto	16	15	31	1,944	20	1,964	109	106	215	214	214	428	2,283	355	2,638
	Taxi <sup>(1)</sup>	8	8	16	137	137	274	23	23	46	33	33	66	201	201	402
	Truck	0	0	0	2	2	4	1	1	2	2	2	4	5	5	10
	<b>Total</b>	<b>24</b>	<b>23</b>	<b>47</b>	<b>2,083</b>	<b>159</b>	<b>2,242</b>	<b>133</b>	<b>130</b>	<b>263</b>	<b>249</b>	<b>249</b>	<b>498</b>	<b>2,489</b>	<b>561</b>	<b>3,050</b>
Saturday (4-5 PM)	Auto	16	20	36	22	2,203	2,225	111	112	223	219	219	438	368	2,554	2,922
	Taxi <sup>(1)</sup>	9	9	18	161	161	322	24	24	48	35	35	70	229	229	458
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>25</b>	<b>29</b>	<b>54</b>	<b>183</b>	<b>2,364</b>	<b>2,547</b>	<b>135</b>	<b>136</b>	<b>271</b>	<b>254</b>	<b>254</b>	<b>508</b>	<b>597</b>	<b>2,783</b>	<b>3,380</b>

**Notes:**

<sup>(1)</sup> Balanced taxi trips shown.

<sup>(2)</sup> Includes blocks 1120, 1121, 1128, 1129.

**Table 7**  
**Travel Demand Forecast for the Commercial Mixed-Use Variation - 2016**  
**(Vehicle Trips)**

Peak Hour Vehicle Trips		Site 5			Arena Block			Arena Block			Residential Blocks <sup>(2)</sup>			Total Trips		
		Office/Local Retail			Arena			Residential/Office/ Local Retail			Residential/Local Retail					
		In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
AM (8-9)	Auto	97	5	102	51	2	53	242	99	341	81	318	399	471	424	895
	Taxi <sup>(1)</sup>	9	9	18	3	3	6	21	21	42	27	27	54	60	60	120
	Truck	4	4	8	4	4	8	13	13	26	21	21	42	42	42	84
	<b>Total</b>	<b>110</b>	<b>18</b>	<b>128</b>	<b>58</b>	<b>9</b>	<b>67</b>	<b>276</b>	<b>133</b>	<b>409</b>	<b>129</b>	<b>366</b>	<b>495</b>	<b>573</b>	<b>526</b>	<b>1,099</b>
MD (12-1 PM)	Auto	13	18	31	21	34	55	52	61	113	122	117	239	208	230	438
	Taxi <sup>(1)</sup>	20	20	40	4	4	8	34	34	68	50	50	100	108	108	216
	Truck	4	4	8	4	4	8	12	12	24	17	17	34	37	37	74
	<b>Total</b>	<b>37</b>	<b>42</b>	<b>79</b>	<b>29</b>	<b>42</b>	<b>71</b>	<b>98</b>	<b>107</b>	<b>205</b>	<b>189</b>	<b>184</b>	<b>373</b>	<b>353</b>	<b>375</b>	<b>728</b>
PM (5-6 PM)	Auto	9	113	122	227	41	268	101	301	402	309	170	479	646	625	1,271
	Taxi <sup>(1)</sup>	15	15	30	17	17	34	29	29	58	39	39	78	100	100	200
	Truck	1	1	2	1	1	2	4	4	8	3	3	6	9	9	18
	<b>Total</b>	<b>25</b>	<b>129</b>	<b>154</b>	<b>245</b>	<b>59</b>	<b>304</b>	<b>134</b>	<b>334</b>	<b>468</b>	<b>351</b>	<b>212</b>	<b>563</b>	<b>755</b>	<b>734</b>	<b>1,489</b>
Pre-Game (7-8 PM)	Auto	8	28	36	1,979	21	2,000	87	93	180	255	110	365	2,329	252	2,581
	Taxi <sup>(1)</sup>	4	4	8	164	164	328	13	13	26	20	20	40	201	201	402
	Truck	1	1	2	0	0	0	2	2	4	0	0	0	3	3	6
	<b>Total</b>	<b>13</b>	<b>33</b>	<b>46</b>	<b>2,143</b>	<b>185</b>	<b>2,328</b>	<b>102</b>	<b>108</b>	<b>210</b>	<b>275</b>	<b>130</b>	<b>405</b>	<b>2,533</b>	<b>456</b>	<b>2,989</b>
Post-Game (10-11 PM)	Auto	1	3	4	23	2,314	2,337	40	10	50	136	7	143	200	2,334	2,534
	Taxi <sup>(1)</sup>	0	0	0	193	193	386	3	3	6	10	10	20	206	206	412
	Truck	1	1	2	0	0	0	2	2	4	0	0	0	3	3	6
	<b>Total</b>	<b>2</b>	<b>4</b>	<b>6</b>	<b>216</b>	<b>2,507</b>	<b>2,723</b>	<b>45</b>	<b>15</b>	<b>60</b>	<b>146</b>	<b>17</b>	<b>163</b>	<b>409</b>	<b>2,543</b>	<b>2,952</b>
Saturday (1-2 PM)	Auto	4	2	6	1,944	20	1,964	62	61	123	214	214	428	2,224	297	2,521
	Taxi <sup>(1)</sup>	7	7	14	141	141	282	12	12	24	33	33	66	193	193	386
	Truck	0	0	0	2	2	4	2	2	4	2	2	4	6	6	12
	<b>Total</b>	<b>11</b>	<b>9</b>	<b>20</b>	<b>2,087</b>	<b>163</b>	<b>2,250</b>	<b>76</b>	<b>75</b>	<b>151</b>	<b>249</b>	<b>249</b>	<b>498</b>	<b>2,423</b>	<b>496</b>	<b>2,919</b>
Saturday (4-5 PM)	Auto	3	8	11	22	2,203	2,225	64	75	139	219	219	438	308	2,505	2,813
	Taxi <sup>(1)</sup>	7	7	14	163	163	326	14	14	28	35	35	70	219	219	438
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>10</b>	<b>15</b>	<b>25</b>	<b>185</b>	<b>2,366</b>	<b>2,551</b>	<b>78</b>	<b>89</b>	<b>167</b>	<b>254</b>	<b>254</b>	<b>508</b>	<b>527</b>	<b>2,724</b>	<b>3,251</b>

**Notes:**

<sup>(1)</sup> Balanced taxi trips shown.

<sup>(2)</sup> Includes blocks 1120, 1121, 1128, 1129.

game) peak hours, primarily as a result of demand en route to and from the arena. As shown in Table 6, on Saturdays, the residential mixed-use variation (the RWCS for the Saturday analyses) would add an estimated 2,638 auto, 402 taxi and 10 truck trips to the street system in the 1-2 PM peak hour, and 2,922 auto, 458 taxi and no truck trips in the 4-5 PM peak hour.

## **PARKING DEMAND**

Based on the travel demand assumptions discussed above, the proposed arena is expected to generate a daily parking demand of approximately 2,800 spaces on a typical Nets weekday game day, and approximately 2,600 spaces on weekends. Although some of this parking demand would be generated by arena employees and non-spectator visitors over the course of a day, the majority of the demand would occur during game times on weekday evenings, as well as on weekends.

Parking demand generated by new residential development will be forecast assuming a rate of 0.4 spaces per dwelling unit based on auto ownership data from the 2000 Census for neighborhoods in the vicinity of the site. (This rate is also consistent with the rate assumed for the residential component of the Downtown Brooklyn Development project.) The rate assumed for parking demand from new hotel space – 0.20 spaces per room overnight – is based on data from the *Renaissance Plaza Expansion EAS*. Parking demand from new office and retail space will be derived from the forecasts of daily auto trips for these uses.

To accommodate projected parking demand, it is anticipated that both the residential mixed-use variation and the commercial mixed-used variation would include approximately 3,800 spaces in parking garages located on Site 5, the Arena Block and blocks 1120, 1128 and 1129. These shared parking facilities would service demand from all project components – arena, residential and commercial. Office and retail demand would peak in the midday period and decline during the afternoon and evening, allowing for additional capacity to be used for residential and hotel demand (which typically peak in the overnight) and for demand from the arena. With the exception of the arena, parking demand generated under either variation would be fully accommodated in the off-street parking facilities that would be developed on-site. Accounting for commercial and residential demand, it is anticipated that approximately 1,100 spaces would be available on-site on weekdays to accommodate the parking needs of the arena, while the remaining arena demand (totaling approximately 1,700 spaces) would be accommodated at public off-street parking facilities located in the vicinity. The analysis of off-street parking will therefore examine conditions at public off-street parking facilities within a 1/2-mile radius of the arena. On-street parking conditions within 1/4-mile of the site will also be examined to determine the effects of street closures and other changes in on-street parking supply in the vicinity of the project site.

## **TRIP ASSIGNMENT**

### **Auto/Taxi**

The distribution of auto and taxi trips for each project component (office, residential, hotel, local retail and arena) by borough/county or region is shown in Table 8. The distributions for office, residential and hotel uses were based on data from the 2000 Census, while the assignment for the arena component was based on data from both the Downtown Brooklyn Development project and the expected geographical distribution of demand to the arena (see "Transportation Planning Assumptions," above). Given the differences in their travel demand characteristics, each project component is expected to have a unique trip assignment pattern. For example, a majority of the auto trips generated by the residential and hotel components are expected to have endpoints in Manhattan (60%) and Brooklyn (33%), while office trips are expected to be more widely dispersed, with five percent en route to/from Manhattan, 53 percent to/from Brooklyn, 17 percent to/from Queens, eight percent to/from Long Island and five percent to/from New Jersey. The arena is expected to draw not only from Brooklyn, Queens and Manhattan, but also from New Jersey and Long Island. As previously discussed, separate assignments for trips arriving and departing the arena on weekdays are assumed in order to reflect the fact that on weekdays some spectators would likely travel to the arena from their workplaces, and then depart to residences in a different borough or county at the conclusion of a game. As the project's retail component is expected to consist primarily of local retail uses serving the surrounding worker and residential populations, all of its trips are expected to be local Brooklyn-based.

Auto and taxi trips will be assigned to the primary corridors providing access to and from the project site based on their origin or destination as well as the most direct routes to major access points such as the Brooklyn-Queens Expressway and Brooklyn and Manhattan bridges. The auto and taxi trip assignment patterns along the corridors providing access to Site 5 and the Arena Block are illustrated in Appendix B, while the assignments for auto and taxi trips en route to and from Blocks 1120, 1121, 1128 and 1129 are provided in Appendix C. The assignments of auto and taxi (as well as truck) trips will take into account changes to the study area traffic network that are expected to occur by the 2010 and 2016 Build years as a result of No Build developments and initiatives by NYCDOT and other agencies. These include street closures and changes in street directions proposed as mitigation for the Downtown Brooklyn Development project.

As discussed above, it is anticipated that approximately 1,100 spaces would be available on-site to accommodate the parking needs of the arena, while the remaining arena demand (totaling approximately 1,700 spaces on weekdays) would be accommodated at public off-street facilities located in the vicinity. The assignment of arena auto trips will therefore reflect this distribution of trips to both on-site parking facilities and directly to off-site parking facilities.

### **Truck**

Truck trips en route to and from the site will be assigned to designated local and through truck routes in Downtown Brooklyn. These include Atlantic, Flatbush, Third, and Fourth Avenues, and portions of Fifth Avenue and Bergen Street.

**Table 8**  
**Project Increment Auto and Taxi Trip Assignment Patterns**

<b>Auto Trips</b>									
Land Use	Bronx	Brooklyn	Manhattan	Queens	Staten Isl.	Long Island	West/Put/Duc Rock/Orange Connecticut	New Jersey	Total
Office <sup>1</sup>	5.0%	53.0%	5.0%	17.0%	5.0%	8.0%	2.0%	5.0%	100.0%
Residential/Hotel <sup>1</sup>	1.0%	33.0%	60.0%	2.5%	0.5%	1.0%	0.5%	1.5%	100.0%
Local Retail	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Arena weekday (inbound)	5.5%	34.5%	8.6%	10.1%	10.5%	9.7%	5.0%	16.1%	100.0%
Arena weekday (outbound)	5.4%	33.4%	6.7%	9.8%	10.2%	11.6%	4.9%	18.0%	100.0%
Arena weekend (in/out)	4.1%	29.9%	6.0%	8.5%	10.0%	15.0%	6.0%	20.5%	100.0%

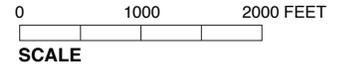
<b>Taxi/Black Car Trips</b>									
Land Use	Bronx	Brooklyn	Manhattan	Queens	Staten Isl.	Long Island	West/Put/Duc Rock/Orange Connecticut	New Jersey	Total
Office <sup>1</sup>	5.0%	53.0%	5.0%	17.0%	5.0%	8.0%	2.0%	5.0%	100.0%
Residential/Hotel <sup>1</sup>	1.0%	33.0%	60.0%	2.5%	0.5%	1.0%	0.5%	1.5%	100.0%
Local Retail	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Arena - weekday (inbound)	1.0%	40.3%	33.6%	3.0%	3.4%	8.0%	2.0%	8.7%	100.0%
Arena - weekday (outbound)	1.0%	41.7%	27.8%	3.1%	3.5%	10.4%	2.1%	10.4%	100.0%
Arena - weekend	1.0%	40.4%	26.9%	6.1%	3.4%	10.1%	2.0%	10.1%	100.0%

**Notes:**

<sup>1</sup>Source: 2000 Census data.



- Project Site
- Intersections Analyzed (Signalized)
- Intersections Analyzed (Unsignalized)



## **Diverted Traffic**

In addition to the project's generating new travel demand by autos, taxis and trucks, permanent roadway closures and changes in street direction associated with the proposed project would alter traffic flows in the vicinity of the project site in the 2010 and 2016 analysis years. These would include the permanent closure of Pacific Street between Flatbush and Sixth Avenues, and between Carlton and Vanderbilt Avenues; and the permanent closure of Fifth Avenue between Flatbush and Atlantic Avenues. Sixth Avenue would be converted from one-way southbound to two-way operation between Atlantic and Flatbush Avenues both to facilitate access to and from the project site and to provide an alternative route for some of the traffic diverted off of Fifth Avenue. Carlton Avenue would be converted from one-way northbound to two-way operation between Atlantic Avenue and Pacific Street, also to provide for local circulation. The analysis of 2010 and 2016 Build traffic conditions will assume that No Build traffic diverted off of Fifth Avenue would be distributed among parallel north-south corridors, including Fourth Avenue, Flatbush Avenue and Sixth Avenue. As the segments of Pacific Street to be closed primarily provide access to adjacent land uses, diversions as a result of these closures are expected to be localized.

## **Transit/Pedestrian**

The distribution of project-generated subway trips for each project component by borough/county or region is shown in Table 9. As was the case for auto and taxi trips, these assignment patterns were based on Census data and data from the Downtown Brooklyn Development project and the arena demand distribution. They differ from the assignment of auto trips primarily with respect to the project's arena component. As shown in Table 9, from 36 to 43 percent of subway trips generated by the arena are expected to be en route to or from Manhattan, 24 to 26 percent en route to or from Brooklyn and 10 to 12 percent en route to or from Queens. Arena spectators en route to or from New Jersey via PATH or NJ Transit trains and buses would account for approximately 14 to 18 percent of subway trips.

Project-generated bus and walk trips are assumed to be local within Brooklyn. Trips by commuter rail (i.e., Long Island Rail Road) are assumed to have origins or destinations primarily in Nassau or Suffolk counties.

## **TRAFFIC STUDY AREA**

As shown in Figure 3, the traffic study area, which extends upwards of 1.2 miles from the project site, is bounded on the north by Tillary Street/Park Avenue, on the south by Eastern Parkway/Union Street, on the east by Grand Avenue, and on the west by Hicks Street. The study area encompasses a total of 93 intersections along local streets proximate to the project site or that would likely be affected by project-related changes to the street network, as well as along arterials that would provide access to or from the site. Given the numerous corridors providing access to the project site, including Atlantic, Flatbush, Carlton, Vanderbilt, Washington, Third, Fourth, Fifth and Sixth avenues, project-generated traffic is expected to be widely dispersed to the north, south, east and west, and is expected to become rapidly

**Table 9**  
**Project Increment Subway Trip Assignment Patterns**

<b>Land Use</b>	<b>Bronx</b>	<b>Brooklyn</b>	<b>Manhattan</b>	<b>Queens</b>	<b>Staten Isl.</b>	<b>Long Island</b>	<b>West/Put/Duc Rock/Orange Connecticut</b>	<b>New Jersey</b>	<b>Total</b>
Office <sup>1</sup>	5.0%	53.0%	5.0%	17.0%	5.0%	8.0%	2.0%	5.0%	100.0%
Residential/Hotel <sup>1</sup>	1.0%	33.0%	60.0%	2.5%	0.5%	1.0%	0.5%	1.5%	100.0%
Local Retail	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Arena - weekday (inbound)	2.1%	24.2%	42.3%	10.9%	2.5%	1.2%	2.4%	14.4%	100.0%
Arena - weekday (outbound)	2.2%	25.7%	36.0%	11.6%	2.7%	1.5%	2.6%	17.7%	100.0%

**Notes:**

<sup>1</sup>Source: 2000 Census data.

less concentrated with increasing distance from the project site. The traffic study area therefore focuses on locations where new traffic is expected to be most concentrated, and does not include more distant locations along regional access corridors such as the BQE, Brooklyn-Battery Tunnel or across the East River Bridges to Manhattan. The study area does, however, include key intersections along corridors connecting these regional access routes and the project site (including all intersections along Flatbush Avenue Extension as far north as Tillary Street).

## **SUBWAY STATIONS SELECTED FOR ANALYSIS**

As part of the proposed project, improvements to the Atlantic Avenue/Pacific Street subway station complex would provide direct access between the project site and the subway routes serving this facility (the B, D, M, N, Q, R and Nos. 2, 3, 4 and 5 trains). The large majority of project-generated subway trips are therefore expected to utilize this station complex. However, some trips are also expected to occur at other stations that are either served by trains not accessible at Atlantic Avenue/Pacific Street or that would also provide reasonably convenient access to the project site. For example, some trips by Nos. (2) and (3) trains would likely use the Bergen Street station given its proximity to the proposed buildings along Sixth Avenue and on blocks to the east. The Fulton Street (G) station, the Lafayette Avenue (C) station, and the Washington-Clinton Avenues (C) station would also be used by project-generated trips as neither (C) train nor (G) train service is available at Atlantic Avenue/Pacific Street.

Table 10 shows the numbers of new entering and exiting subway trips that would be generated by the commercial mixed-use variation at each of these stations in the three peak hours analyzed for subway station impacts (weekday AM, PM and 7-8 PM pre-game). The *CEQR Technical Manual* typically requires a detailed analysis of a subway station when the incremental increase in peak hour trips totals 200 persons per hour or more. As shown in Table 10, new subway trips generated by the commercial mixed-use variation would exceed this threshold in one or more analyzed peak hours at the Atlantic Avenue/Pacific Street station complex (upwards of 9,549 new trips in each peak hour), Bergen Street station (upwards of 346 new trips in each analyzed peak hour), the Lafayette Avenue station (upwards of 467 new trips in each peak hour), and the Fulton Street station (246 and 254 new trips in the 5-6 PM and 7-8 PM peak hours, respectively). These stations were therefore selected for quantitative analysis in the EIS.

The analysis of subway station conditions will examine key station elements, including stairways, escalators, walkways and fare arrays, under peak 15-minute flow conditions. As subway demand generated by the arena is expected to be heavily surged, especially at the conclusion of an event such as a Nets basketball game, the analysis will incorporate peaking factors of 1.36 for arena subway trips during the 7-8 PM pre-game period and 1.84 for trips during the 10-11 PM post-game period. These factors were derived from data in the *Madison Square Garden Modal Split Analysis* study and MTA ridership data from stations serving Madison Square Garden.

**Table 10**  
**2016 Peak Hour Trips Generated by the**  
**Commercial Mixed-Use Variation at Area Subway Stations**

Subway Station	8-9 AM Peak Hour			5-6 PM Peak Hour			7-8 PM (Pre-Game) Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Atlantic Ave (2,3,4,5)	1,241	1,334	2,575	1,794	1,671	3,465	716	4,737	5,453
Atlantic Ave (B,Q)	515	567	1,082	783	694	1,477	306	1,782	2,088
Pacific St (D,M,N,R)	501	915	1,416	1,202	698	1,900	402	1,606	2,008
Bergen St (2,3)	157	107	264	178	168	346	79	129	208
Lafayette Ave (C)	122	236	358	305	162	467	101	354	455
Clinton-Wash. Aves (C)	60	17	77	38	64	102	22	48	70
Fulton St (G)	56	126	182	163	83	246	52	202	254
<b>Total</b>	<b>2,652</b>	<b>3,302</b>	<b>5,954</b>	<b>4,463</b>	<b>3,540</b>	<b>8,003</b>	<b>1,678</b>	<b>8,858</b>	<b>10,536</b>

### ASSIGNMENT OF PROJECT-GENERATED BUS TRIPS

Downtown Brooklyn is well served by numerous bus routes operated by MTA New York City Transit (NYC Transit), and many of these routes operate in close proximity to the project site along Atlantic, Flatbush, Third, Fifth and Vanderbilt Avenues, and Dean, Bergen and Fulton Streets. Bus patrons en route to and from the project site would therefore likely find it unnecessary to walk substantial distances to access a needed bus service. Consequently, the analysis of project-generated bus trips focuses on the 12 routes located within 1/4-mile of the site, as it is on these routes that project trips would be most heavily concentrated. These routes include the B25, B26, B37, B38, B41, B45, B52, B63, B65, B67, B69 and B103. Assignment of project increment bus trips to individual routes will be based on existing demand patterns and the relative proximity of each route to the proposed development blocks.

### ASSIGNMENT OF PROJECT-GENERATED PEDESTRIAN TRIPS

Figure 4 shows the sidewalk, corner area and crosswalk locations selected for analysis of potential pedestrian impacts. These locations were selected as they serve as key links between the project site and the surrounding street system, and/or would be used by concentrations of project-generated pedestrian demand linked to other modes (i.e., en route to subway stations, bus stops or off-site parking garages). The majority of subway-linked



Not To Scale

 Project Site

Analyzed Pedestrian Facility

-  C1 Corner and Adjacent Crosswalks
-  S2 Sidewalk
-  X3 Crosswalk

pedestrian trips would be assigned to the proposed new on-site entrance to the Atlantic Avenue/Pacific Street station complex. Additional subway-linked pedestrian trips would be assigned to corridors connecting the site to other nearby stations. Pedestrians linked to the bus mode are expected to be most concentrated along Flatbush and Atlantic Avenues where stops for many of the routes are located. Some pedestrian trips are also expected to cross Atlantic Avenue to access bus routes operating along Fulton Street. Pedestrians walking between off-site parking facilities and the arena are expected to be most concentrated at the crosswalks at the intersection of Flatbush and Atlantic Avenues as the majority of off-site parking facilities are located to the north and west of the project site. Parking demand from the project's commercial and residential components would be fully accommodated at on-site facilities, and are not expected to generate substantial walk trips outside of the project site. Walk-only trips (i.e., walk trips not associated with other modes) would be widely dispersed among links between the project site and the surrounding street system.

## **APPENDIX A**

**TRIP ORIGIN AND MODAL SPLIT ASSUMPTIONS FOR WEEKDAY AND WEEKEND  
SPORTING EVENTS AT THE PROPOSED ATLANTIC YARDS ARENA**

**Atlantic Yards Arena and Redevelopment Project**  
**Atlantic Yards Arena Trip Origin/Destination and Modal Split Assumptions**  
**Weekday Sporting Event (Arriving)**

<b>Madison Square Garden (MSG) Trip Origins <sup>(1)</sup></b>		<b>Atlantic Yards Arena Estimated Range</b>		<b>Trip O/D Assumed for Atlantic Yards Arena</b>
Manhattan	36%	15%-25%		25%
Bronx	4%	2%-4%		3%
Brooklyn	7%	25%-35%		30%
Queens	6%	8%-10%		9%
Staten Island	3%	4%-6%		5%
Nassau/Suffolk	12%	12%-18%		12%
Westchester	5%	2%-4%		3%
New Jersey	21%	10%-20%		13%
Other	6%	0%		0%
<b>Total</b>	<b>100%</b>			<b>100%</b>

**MSG: Modal Split by Origin <sup>(1)</sup>**

Origin	Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
Manhattan	9%	18%	41%	3%	29%	0%	0%	100%
Bronx	58%	0%	37%	4%	0%	0%	1%	100%
Brooklyn	51%	3%	42%	1%	3%	0%	0%	100%
Queens	37%	0%	45%	5%	0%	13%	0%	100%
Staten Island	72%	2%	16%	10%	0%	0%	0%	100%
Nassau/Suffolk	21%	0%	2%	0%	0%	77%	0%	100%
Westchester	56%	2%	4%	0%	0%	0%	38%	100%
New Jersey	38%	2%	1%	0%	0%	0%	59%	100%
Other	48%	3%	9%	3%	3%	15%	19%	100%

**MSG: Trip Distribution by Origin and Mode**

Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
3.2%	6.5%	14.8%	1.1%	10.4%	0.0%	0.0%	36%
2.3%	0.0%	1.5%	0.2%	0.0%	0.0%	0.0%	4%
3.6%	0.2%	2.9%	0.1%	0.2%	0.0%	0.0%	7%
2.2%	0.0%	2.7%	0.3%	0.0%	0.8%	0.0%	6%
2.2%	0.1%	0.5%	0.3%	0.0%	0.0%	0.0%	3%
2.5%	0.0%	0.2%	0.0%	0.0%	9.2%	0.0%	12%
2.8%	0.1%	0.2%	0.0%	0.0%	0.0%	1.9%	5%
8.0%	0.4%	0.2%	0.0%	0.0%	0.0%	12.4%	21%
2.9%	0.2%	0.5%	0.2%	0.2%	0.9%	1.1%	6%
<b>29.7%</b>	<b>7.5%</b>	<b>23.6%</b>	<b>2.1%</b>	<b>10.8%</b>	<b>10.9%</b>	<b>15.5%</b>	<b>100.0%</b>

**Atlantic Yards Arena: Modal Split by Origin/Destination <sup>(2)</sup>**

Origin/Destination	Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
Manhattan	12%	4%	84%	0%	0%	0%	0%	100%
Bronx	64%	1%	35%	0%	0%	0%	0%	100%
Brooklyn	40%	4%	40%	7%	9%	0%	0%	100%
Queens	39%	1%	60%	0%	0%	0%	0%	100%
Staten Island	73%	2%	25%	0%	0%	0%	0%	100%
Nassau/Suffolk	28%	2%	5%	0%	0%	65%	0%	100%
Westchester	58%	2%	40%	0%	0%	0%	0%	100%
New Jersey	43%	2%	55%	0%	0%	0%	0%	100%

**Atlantic Yards Arena: Distribution by Origin/Destination and Mode**

Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
3.0%	1.0%	21.0%	0.0%	0.0%	0.0%	0.0%	25.0%
1.9%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	3.0%
12.0%	1.2%	12.0%	2.1%	2.7%	0.0%	0.0%	30.0%
3.5%	0.1%	5.4%	0.0%	0.0%	0.0%	0.0%	9.0%
3.7%	0.1%	1.3%	0.0%	0.0%	0.0%	0.0%	5.0%
3.4%	0.2%	0.6%	0.0%	0.0%	7.8%	0.0%	12.0%
1.7%	0.1%	1.2%	0.0%	0.0%	0.0%	0.0%	3.0%
5.6%	0.3%	7.2%	0.0%	0.0%	0.0%	0.0%	13.0%
<b>34.8%</b>	<b>3.0%</b>	<b>49.7%</b>	<b>2.1%</b>	<b>2.7%</b>	<b>7.8%</b>	<b>0.0%</b>	<b>100.0%</b>

**MSG: Total Modal Split**

<b>Auto</b>	<b>29.7%</b>
<b>Taxi</b>	<b>7.5%</b>
<b>Subway</b>	<b>23.6%</b>
<b>Bus</b>	<b>2.1%</b>
<b>Walk</b>	<b>10.8%</b>
<b>LIRR</b>	<b>10.9%</b>
<b>Other <sup>(3)</sup></b>	<b>15.5%</b>
<b>Total</b>	<b>100.0%</b>

**Atlantic Yards Arena: Total Modal Split**

<b>Auto</b>	<b>34.8%</b>
<b>Taxi</b>	<b>3.0%</b>
<b>Subway</b>	<b>49.7%</b>
<b>Bus</b>	<b>2.1%</b>
<b>Walk</b>	<b>2.7%</b>
<b>LIRR</b>	<b>7.8%</b>
<b>Other <sup>(3)</sup></b>	<b>0.0%</b>
<b>Total</b>	<b>100.0%</b>

**Atlantic Yards Arena: Trip Assignment by Mode**

Origin/Destination	Auto	Taxi	Subway	Bus	Walk	LIRR
Manhattan	8.6%	33.6%	42.3%	0.0%	0.0%	0.0%
Bronx	5.5%	1.0%	2.1%	0.0%	0.0%	0.0%
Brooklyn	34.5%	40.3%	24.2%	100.0%	100.0%	0.0%
Queens	10.1%	3.0%	10.9%	0.0%	0.0%	0.0%
Staten Island	10.5%	3.4%	2.5%	0.0%	0.0%	0.0%
Nassau/Suffolk	9.7%	8.1%	1.2%	0.0%	0.0%	100.0%
Westchester	5.0%	2.0%	2.4%	0.0%	0.0%	0.0%
New Jersey	16.1%	8.7%	14.4%	0.0%	0.0%	0.0%
	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

**Notes:**

<sup>(1)</sup> Source: Madison Square Garden Modal Split Analysis, August 26, 2003.

<sup>(2)</sup> Based on data developed for the Downtown Brooklyn Development project.

<sup>(3)</sup> "Other" category for MSG includes: PATH, Metro-North, NJ Transit.

Patrons attending Atlantic Yards Arena events who use these "Other" transit modes are assumed to arrive/depart Downtown Brooklyn via subway.

**Atlantic Yards Arena and Redevelopment Project**  
**Atlantic Yards Arena Trip Origin/Destination and Modal Split Assumptions**  
**Weekday Sporting Event (Departing)**

<b>Madison Square Garden (MSG) Trip Origins <sup>(1)</sup></b>		<b>Atlantic Yards Arena Estimated Range</b>		<b>Trip O/D Assumed for Atlantic Yards Arena</b>
Manhattan	36%	15%-25%		20%
Bronx	4%	2%-4%		3%
Brooklyn	7%	25%-35%		30%
Queens	6%	8%-10%		9%
Staten Island	3%	4%-6%		5%
Nassau/Suffolk	12%	12%-18%		15%
Westchester	5%	2%-4%		3%
New Jersey	21%	10%-20%		15%
Other	6%	0%		0%
<b>Total</b>	<b>100%</b>			<b>100%</b>

**MSG: Modal Split by Origin <sup>(1)</sup>**

Origin	Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
Manhattan	9%	18%	41%	3%	29%	0%	0%	100%
Bronx	58%	0%	37%	4%	0%	0%	1%	100%
Brooklyn	51%	3%	42%	1%	3%	0%	0%	100%
Queens	37%	0%	45%	5%	0%	13%	0%	100%
Staten Island	72%	2%	16%	10%	0%	0%	0%	100%
Nassau/Suffolk	21%	0%	2%	0%	0%	77%	0%	100%
Westchester	56%	2%	4%	0%	0%	0%	38%	100%
New Jersey	38%	2%	1%	0%	0%	0%	59%	100%
Other	48%	3%	9%	3%	3%	15%	19%	100%

**Atlantic Yards Arena: Modal Split by Origin/Destination <sup>(2)</sup>**

Origin/Destination	Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
Manhattan	12%	4%	84%	0%	0%	0%	0%	100%
Bronx	64%	1%	35%	0%	0%	0%	0%	100%
Brooklyn	40%	4%	40%	7%	9%	0%	0%	100%
Queens	39%	1%	60%	0%	0%	0%	0%	100%
Staten Island	73%	2%	25%	0%	0%	0%	0%	100%
Nassau/Suffolk	28%	2%	5%	0%	0%	65%	0%	100%
Westchester	58%	2%	40%	0%	0%	0%	0%	100%
New Jersey	43%	2%	55%	0%	0%	0%	0%	100%

**MSG: Total Modal Split**

Auto	29.7%
Taxi	7.5%
Subway	23.6%
Bus	2.1%
Walk	10.8%
LIRR	10.9%
Other <sup>(3)</sup>	15.5%
<b>Total</b>	<b>100.0%</b>

**Atlantic Yards Arena: Total Modal Split**

Auto	35.9%
Taxi	2.9%
Subway	46.7%
Bus	2.1%
Walk	2.7%
LIRR	9.8%
Other <sup>(3)</sup>	0.0%
<b>Total</b>	<b>100.0%</b>

**MSG: Trip Distribution by Origin and Mode**

Origin	Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
Manhattan	3.2%	6.5%	14.8%	1.1%	10.4%	0.0%	0.0%	36%
Bronx	2.3%	0.0%	1.5%	0.2%	0.0%	0.0%	0.0%	4%
Brooklyn	3.6%	0.2%	2.9%	0.1%	0.2%	0.0%	0.0%	7%
Queens	2.2%	0.0%	2.7%	0.3%	0.0%	0.8%	0.0%	6%
Staten Island	2.2%	0.1%	0.5%	0.3%	0.0%	0.0%	0.0%	3%
Nassau/Suffolk	2.5%	0.0%	0.2%	0.0%	0.0%	9.2%	0.0%	12%
Westchester	2.8%	0.1%	0.2%	0.0%	0.0%	0.0%	1.9%	5%
New Jersey	8.0%	0.4%	0.2%	0.0%	0.0%	0.0%	12.4%	21%
Other	2.9%	0.2%	0.5%	0.2%	0.2%	0.9%	1.1%	6%
<b>Total</b>	<b>29.7%</b>	<b>7.5%</b>	<b>23.6%</b>	<b>2.1%</b>	<b>10.8%</b>	<b>10.9%</b>	<b>15.5%</b>	<b>100.0%</b>

**Atlantic Yards Arena: Distribution by Origin/Destination and Mode**

Origin/Destination	Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
Manhattan	2.4%	0.8%	16.8%	0.0%	0.0%	0.0%	0.0%	20.0%
Bronx	1.9%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	3.0%
Brooklyn	12.0%	1.2%	12.0%	2.1%	2.7%	0.0%	0.0%	30.0%
Queens	3.5%	0.1%	5.4%	0.0%	0.0%	0.0%	0.0%	9.0%
Staten Island	3.7%	0.1%	1.3%	0.0%	0.0%	0.0%	0.0%	5.0%
Nassau/Suffolk	4.2%	0.3%	0.8%	0.0%	0.0%	9.8%	0.0%	15.0%
Westchester	1.7%	0.1%	1.2%	0.0%	0.0%	0.0%	0.0%	3.0%
New Jersey	6.5%	0.3%	8.3%	0.0%	0.0%	0.0%	0.0%	15.0%
<b>Total</b>	<b>35.9%</b>	<b>2.9%</b>	<b>46.7%</b>	<b>2.1%</b>	<b>2.7%</b>	<b>9.8%</b>	<b>0.0%</b>	<b>100.0%</b>

**Atlantic Yards Arena: Trip Assignment by Mode**

Origin/Destination	Auto	Taxi	Subway	Bus	Walk	LIRR
Manhattan	6.7%	27.8%	36.0%	0.0%	0.0%	0.0%
Bronx	5.4%	1.0%	2.2%	0.0%	0.0%	0.0%
Brooklyn	33.5%	41.7%	25.7%	100.0%	100.0%	0.0%
Queens	9.8%	3.1%	11.6%	0.0%	0.0%	0.0%
Staten Island	10.2%	3.5%	2.7%	0.0%	0.0%	0.0%
Nassau/Suffolk	11.7%	10.4%	1.6%	0.0%	0.0%	100.0%
Westchester	4.9%	2.1%	2.6%	0.0%	0.0%	0.0%
New Jersey	18.0%	10.4%	17.7%	0.0%	0.0%	0.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

**Notes:**

<sup>(1)</sup> Source: Madison Square Garden Modal Split Analysis, August 26, 2003.

<sup>(2)</sup> Based on data developed for the Downtown Brooklyn Development project.

<sup>(3)</sup> "Other" category for MSG includes: PATH, Metro-North, NJ Transit.

Patrons attending Atlantic Yards Arena events who use these "Other" transit modes are assumed to arrive/depart Downtown Brooklyn via subway.

**Atlantic Yards Arena and Redevelopment Project**  
**Atlantic Yards Arena Trip Origin/Destination and Modal Split Assumptions**  
**Weekend Sporting Event (Arriving and Departing)**

Madison Square Garden (MSG) Trip Origins <sup>(1)</sup>		Atlantic Yards Arena Estimated Trip O/D Assumed for Atlantic Yards Arena	
		Range	
Manhattan	30%	15%-25%	20%
Bronx	3%	2%-4%	3%
Brooklyn	9%	25%-35%	30%
Queens	7%	8%-10%	9%
Staten Island	1%	4%-6%	5%
Nassau/Suffolk	14%	12%-18%	15%
Westchester	7%	2%-4%	3%
New Jersey	23%	10%-20%	15%
Other	6%	0%	0%
<b>Total</b>	<b>100%</b>		<b>100%</b>

**MSG: Modal Split by Origin <sup>(1)</sup>**

Origin	Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
Manhattan	14%	23%	28%	2%	33%	0%	0%	100%
Bronx	50%	0%	41%	8%	0%	0%	1%	100%
Brooklyn	51%	3%	46%	0%	0%	0%	0%	100%
Queens	54%	4%	28%	0%	0%	14%	0%	100%
Staten Island	83%	0%	17%	0%	0%	0%	0%	100%
Nassau/Suffolk	33%	2%	0%	0%	0%	65%	0%	100%
Westchester	92%	0%	0%	0%	0%	0%	8%	100%
New Jersey	54%	0%	0%	0%	0%	0%	46%	100%
Other	61%	6%	8%	0%	0%	6%	19%	100%

**MSG: Trip Distribution by Origin and Mode**

Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
4.2%	6.9%	8.4%	0.6%	9.9%	0.0%	0.0%	30%
1.5%	0.0%	1.2%	0.2%	0.0%	0.0%	0.0%	3%
4.6%	0.3%	4.1%	0.0%	0.0%	0.0%	0.0%	9%
3.8%	0.3%	2.0%	0.0%	0.0%	1.0%	0.0%	7%
0.8%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	1%
4.6%	0.3%	0.0%	0.0%	0.0%	9.1%	0.0%	14%
6.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	7%
12.4%	0.0%	0.0%	0.0%	0.0%	0.0%	10.6%	23%
3.7%	0.4%	0.5%	0.0%	0.0%	0.4%	1.1%	6%
<b>42.0%</b>	<b>8.1%</b>	<b>16.4%</b>	<b>0.8%</b>	<b>9.9%</b>	<b>10.4%</b>	<b>12.3%</b>	<b>100.0%</b>

**Atlantic Yards Arena: Modal Split by Origin <sup>(2)</sup>**

Origin/Destination	Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
Manhattan	12%	4%	84%	0%	0%	0%	0%	100%
Bronx	55%	1%	44%	0%	0%	0%	0%	100%
Brooklyn	40%	4%	40%	6%	10%	0%	0%	100%
Queens	38%	2%	58%	2%	0%	0%	0%	100%
Staten Island	80%	2%	18%	0%	0%	0%	0%	100%
Nassau/Suffolk	40%	2%	4%	0%	0%	54%	0%	100%
Westchester	80%	2%	18%	0%	0%	0%	0%	100%
New Jersey	55%	2%	43%	0%	0%	0%	0%	100%

**Atlantic Yards Arena: Distribution by Origin/Destination and Mode**

Auto	Taxi	Subway	Bus	Walk	LIRR	Other <sup>(3)</sup>	Total
2.4%	0.8%	16.8%	0.0%	0.0%	0.0%	0.0%	20.0%
1.7%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	3.0%
12.0%	1.2%	12.0%	1.8%	3.0%	0.0%	0.0%	30.0%
3.4%	0.2%	5.2%	0.2%	0.0%	0.0%	0.0%	9.0%
4.0%	0.1%	0.9%	0.0%	0.0%	0.0%	0.0%	5.0%
6.0%	0.3%	0.6%	0.0%	0.0%	8.1%	0.0%	15.0%
2.4%	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%	3.0%
8.2%	0.3%	6.5%	0.0%	0.0%	0.0%	0.0%	15.0%
<b>40.1%</b>	<b>3.0%</b>	<b>43.8%</b>	<b>2.0%</b>	<b>3.0%</b>	<b>8.1%</b>	<b>0.0%</b>	<b>100.0%</b>

**MSG: Total Modal Split**

Auto	42.0%
Taxi	8.1%
Subway	16.4%
Bus	0.8%
Walk	9.9%
LIRR	10.4%
Other <sup>(3)</sup>	12.3%
<b>Total</b>	<b>100.0%</b>

**Atlantic Yards Arena: Total Modal Split**

Auto	40.1%
Taxi	3.0%
Subway	43.8%
Bus	2.0%
Walk	3.0%
LIRR	8.1%
Other <sup>(3)</sup>	0.0%
<b>Total</b>	<b>100.0%</b>

**Atlantic Yards Arena: Trip Assignment by Mode**

Origin/Destination	Auto	Taxi	Subway	Bus	Walk	LIRR
Manhattan	6.0%	26.9%	38.3%	0.0%	0.0%	0.0%
Bronx	4.1%	1.0%	3.0%	0.0%	0.0%	0.0%
Brooklyn	29.9%	40.4%	27.4%	90.9%	100.0%	0.0%
Queens	8.5%	6.1%	11.9%	9.1%	0.0%	0.0%
Staten Island	10.0%	3.4%	2.1%	0.0%	0.0%	0.0%
Nassau/Suffolk	15.0%	10.1%	1.4%	0.0%	0.0%	100.0%
Westchester	6.0%	2.0%	1.2%	0.0%	0.0%	0.0%
New Jersey	20.5%	10.1%	14.7%	0.0%	0.0%	0.0%
	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

**Notes:**

<sup>(1)</sup> Source: Madison Square Garden Modal Split Analysis, August 26, 2003.

<sup>(2)</sup> Based on data developed for the Downtown Brooklyn Development project.

<sup>(3)</sup> "Other" category for MSG includes: PATH, Metro-North, NJ Transit.

Patrons attending Atlantic Yards Arena events who use these "Other" transit modes are assumed to arrive/depart Downtown Brooklyn via subway.