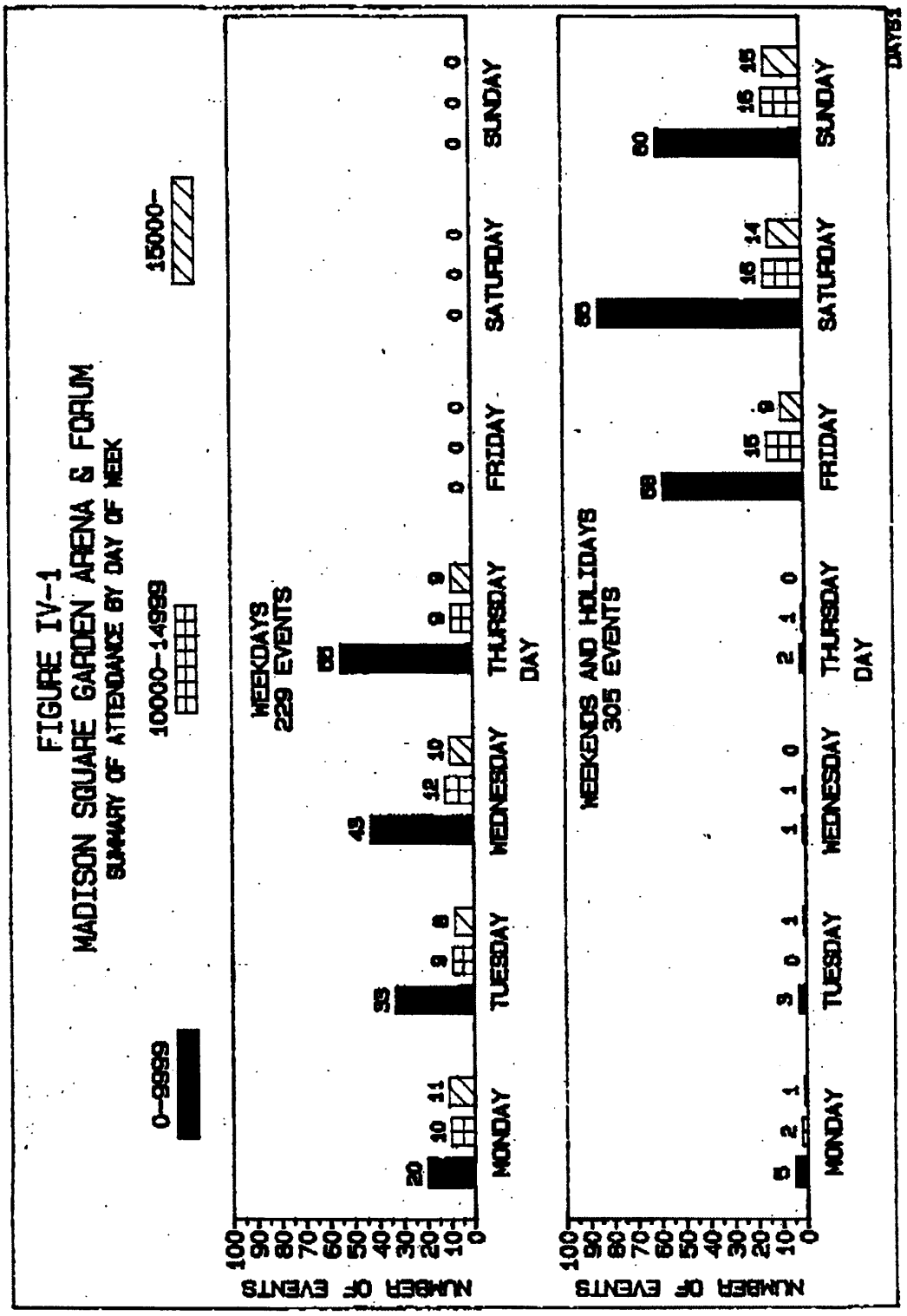


FIGURE IV-1
MADISON SQUARE GARDEN ARENA & FORUM
SUMMARY OF ATTENDANCE BY DAY OF WEEK
0-9999
10000-14999
15000-
WEEKDAYS
229 EVENTS
WEEKENDS AND HOLIDAYS
305 EVENTS
NUMBER OF EVENTS
MONDAY
TUESDAY
WEDNESDAY
THURSDAY
FRIDAY
SATURDAY
SUNDAY
DAY

IV-3

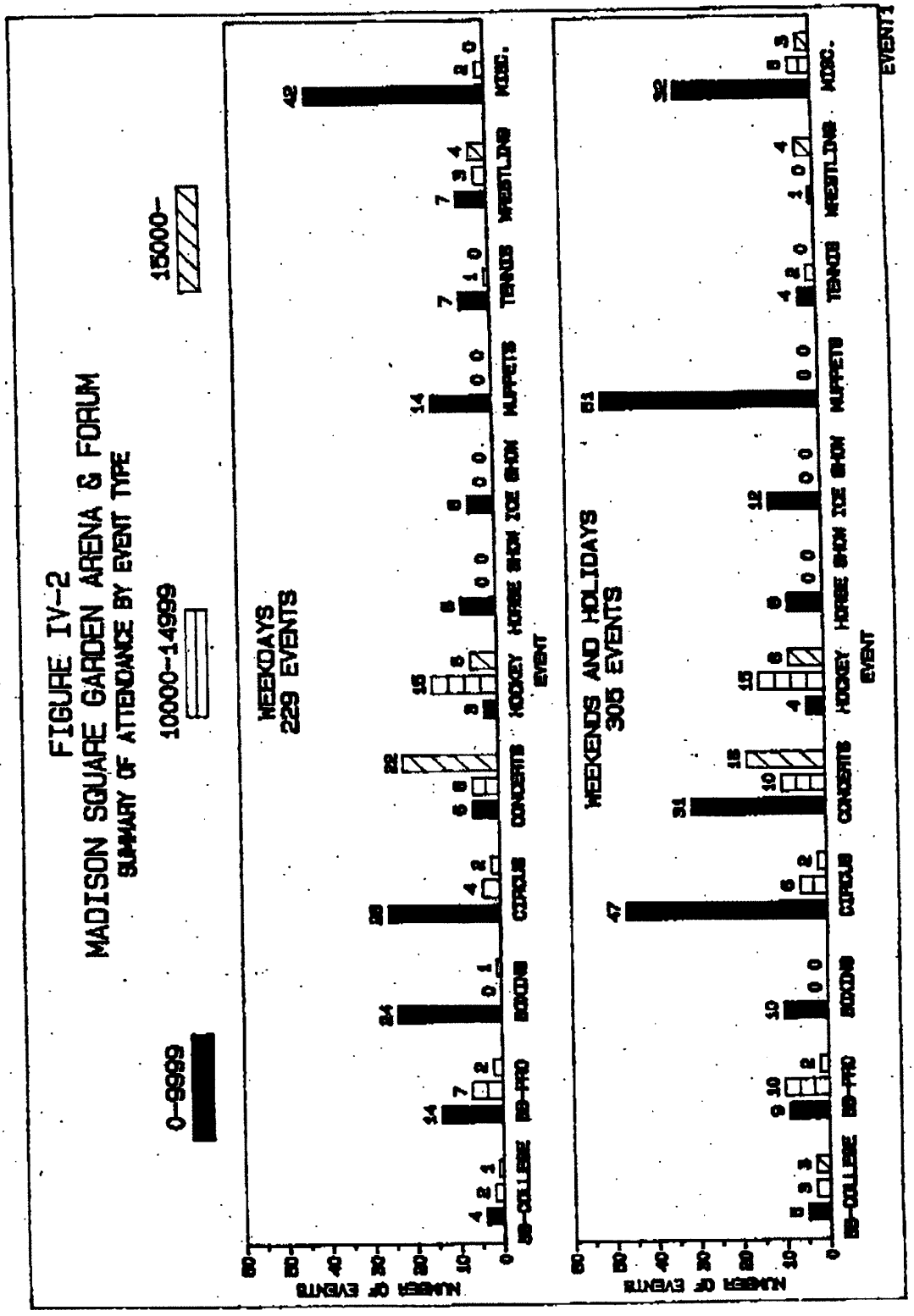


FIGURE IV-2
MADISON SQUARE GARDEN ARENA & FORUM
SUMMARY OF ATTENDANCE BY EVENT TYPE
0-9999
10000-14999
15000-
WEEKDAYS
229 EVENTS
WEEKENDS AND HOLIDAYS
305 EVENTS
NUMBER OF EVENTS
EVENT
BB-COLLEGE
BB-PRO
BOXING
CIRCUS
CONCERTS
HOCKEY
HORSE SHOW
ICE SHOW
MUPPETS
TENNIS
WRESTLING
MISC.

IV-4

Some overlapping occurs between events held at the Arena and Forum. Events were defined as overlapping if their start times were within one hour of each other. Table IV-1 Summarizes the interfacing for events with the same start time, a one-half hour difference, and a one hour difference. A total of 56 overlaps occurred during the analysis year.

TABLE IV-1

ARENA/FORM INTERFACING

Total Volume Range[1]	Equal Start Times	1/2 Hour Difference	1 Hour Difference	Total
9 - 9,999	3	4	1	8
10,000 - 14,999	6	9	5	20
15,000 - 19,999	7	12	1	20
20,000 - 24,999	5	2	1	8
Total	21	27	8	56

1. Total volume equals Arena Volume plus Forum Volume.

Design Day Event Attendance

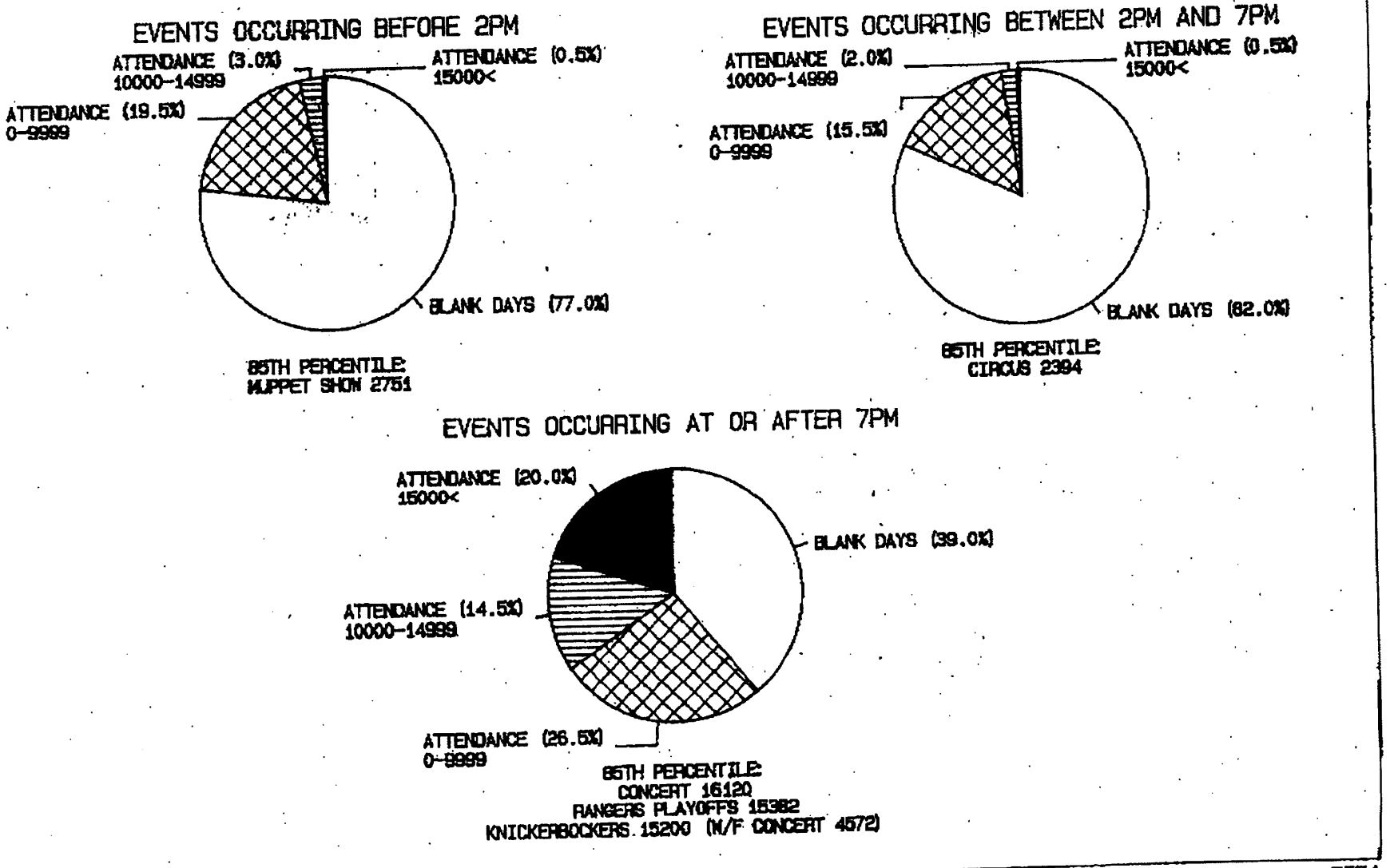
For analysis purposes a design day event must be chosen. An 85 percentile event has been selected which represents a level of attendance that occurs frequently but is higher in attendance than the great majority of events. Since attendance throughout each day and week may vary widely, the analysis year has been divided into six time periods:

before 2 PM on a weekday
before 2 PM on a weekend
between 2 PM and 7 PM on a weekday
between 2 PM and 7 PM on a weekend
7 PM and later on a weekday
7 PM and later on a weekend

Total attendance was sorted for these time periods and events which began within one hour of each other at the Arena and Forum were combined, with their combined attendance considered as one event.

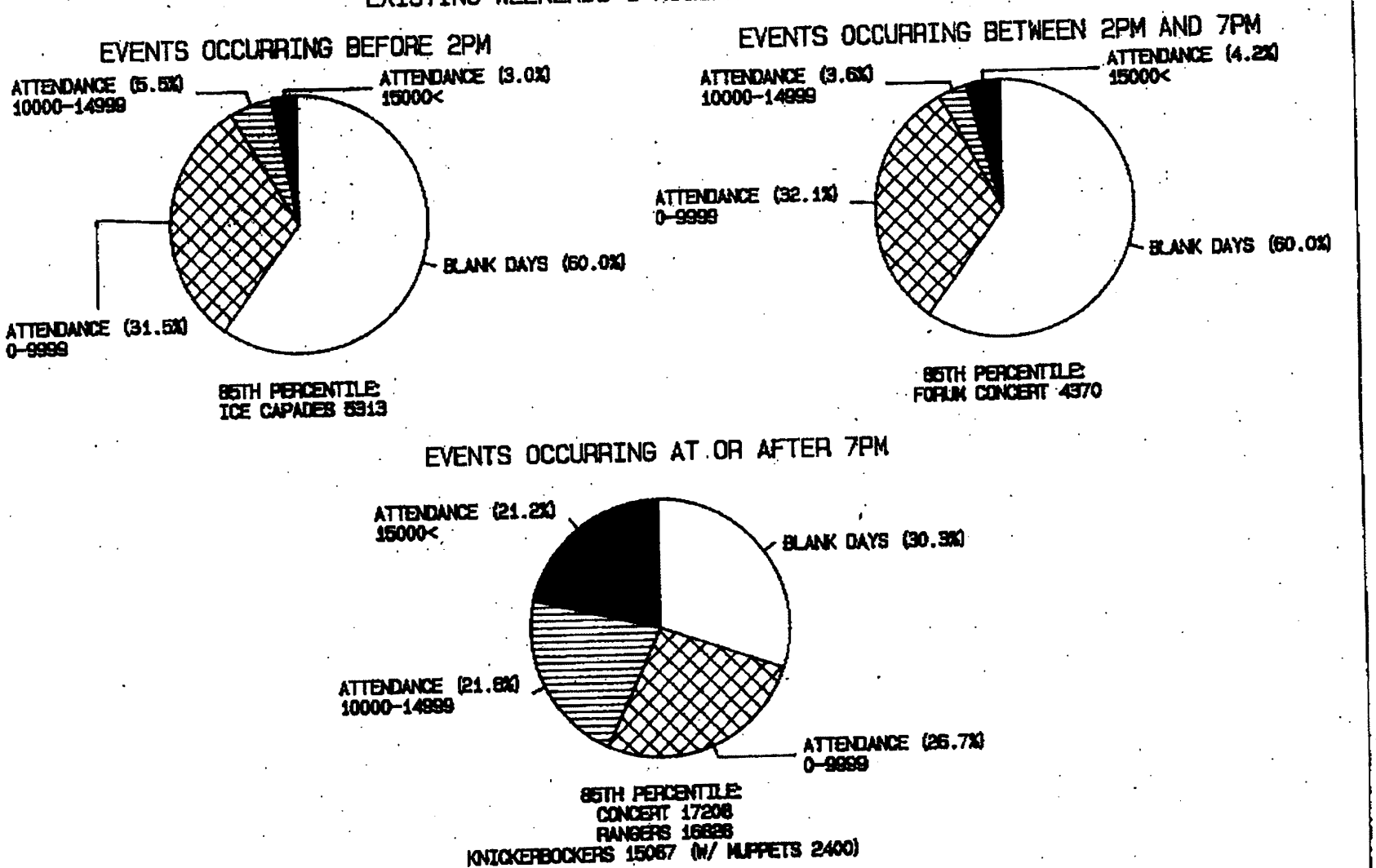
The 85th percentile for each time period was then determined. Figures IV-3 and IV-4 show the distribution of attendance and the 85th percentile events for each weekday and weekend time period. For the 7 PM and later weekday and weekend time periods, in addition to identifying the 85th percentile event, the concert, Ranger hockey game and Knickerbocker basketball game nearest in attendance was selected. These data are summarized in Table IV-2.

FIGURE IV-3
MADISON SQUARE GARDEN ARENA & FORUM
EXISTING WEEDAYS - 200 DAYS



PIE1

FIGURE IV-4
MADISON SQUARE GARDEN ARENA & FORUM
EXISTING WEEKENDS & HOLIDAYS - 165 DAYS



PIE2

Table IV-2

Summary of 85th Percentile Events at the
Existing MSG Arena & Felt Forum

Time Period	Day Type	Attendance	Event
Before 2 PM	Weekday	2,751	Muppet Show
2 PM - 7 PM	Weekday	2,394	Circus
7 PM and after	Weekday	16,120	Concert
	Weekday	15,382	Ranger Hockey
	Weekday	15,200	Knickerbocker Basketball
Before 2 PM	Weekend	5,313	Ice Capades
2 PM - 7 PM	Weekend	4,370	Forum Concert
7 PM and later	Weekend	17,208	Concert
	Weekend	16,828	Ranger Hockey
	Weekend	15,087	Knickerbocker Basketball (with Muppet Show 2,400)

Volumes Surveys

Based on examination of the attendance data, it is clear that the most significant events, those with the highest attendance, are concerts, Ranger hockey games, and Knickerbocker basketball games. Since the arrival and departure patterns, modal split, and origin/destination patterns had been based on estimates rather than actual data, several surveys were undertaken to determine these factors.

Three events were surveyed by Vollmer Associates: the "Cars" concert on October 29, 1987, the Knickerbockers vs. Celtics basketball game on November 9, 1987, and the Rangers vs. Devils hockey game on November 10, 1987. Table IV-3 shows the start and end times and the actual attendance of each of these events. Figure IV-5 shows a sample of the questionnaire that interviewers filled out. Interviews were conducted before the event and during intermission.

Table IV-3

DESCRIPTION OF EVENTS SURVEYED BY VOLLMER ASSOCIATES

Event	Scheduled Date	Start Time	End Time	Total Attendance
"Cars" Concert	10/29/87	8:00 PM	11:00 PM	9,262
Knickerbockers vs. Celtics	11/09/87	7:30 PM	10:00 PM	17,452
Rangers vs. Devils	11/10/87	7:35 PM	10:30 PM	14,199

FIGURE IV-5
MADISON SQUARE GARDEN ARENA EVENT QUESTIONAIRE

	How did you get here tonight?		How many people arrived with you?	Where are you coming from?	What time did you arrive here tonight?	Will you go home the same way?	
	Vehicle	Transit				Vehicle	Transit
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
	A=AUTO T=TAXI L=LIMO	LIRR NJT PATH SUBWAY-LINE? BUS-LINE?	ONLY SAME TRAVEL MODE	INTERSECTION IN MANHATTAN OR COUNTY OUTSIDE OF MANHATTAN	TO NEAREST QUARTER OF THE HOUR	A=AUTO T=TAXI L=LIMO	LIRR NJT PATH SUBWAY-LINE? BUS-LINE?

The event arrival distribution is summarized in Table IV-4. The "Cars" concert was a typical concert with a warm-up band opening the show at 8:00 p.m. and the main band beginning at about 9:15 p.m. Attendance at this concert was atypical since the Arena was at only 46 percent of its maximum capacity. This volume is considerably below the average concert attendance of 15,833 which is 78 percent of maximum capacity. Approximately 60 percent of the audience arrived before 8:00 p.m. while about 40 percent arrived after 8:00 p.m.

Modal split for arrival at the "Cars" concert is summarized in Table IV-5. Total vehicle usage is about 42 percent. Seven percent walked and about 51 percent used some form of mass transit. Table IV-6 summarizes the origin distribution of the audience surveyed at the "Cars" concert. Approximately 21 percent came from Manhattan with a total of about 54 percent having arrived from the five boroughs.

Survey responses for both the Knickerbocker and the Ranger games were very similar with approximately 75-80 percent of the audience arriving before the start of the game.

Modal split and origin distribution for the Knickerbocker basketball game are summarized in Tables IV-7 and IV-8. Approximately 39 percent arrived by vehicle, 10 percent walked, and 51 percent used mass transit. A higher percentage of trips to the Knickerbocker game than the "Cars" concert originated in Manhattan with about 39 percent. A total of about 64 percent originated from the five boroughs.

Tables IV-9 and IV-10 summarize the modal split and origin distribution of the Rangers game. Approximately 44 percent arrived by vehicle, 10 percent walked, and 46 percent used mass transit. The Rangers game attracted 35 percent of its audience from Manhattan and a total of 55 percent from the five boroughs.

Table IV-11 compares arrival and departure modal splits for the three events surveyed. Departure patterns for the "Cars" concert show a 6% increase in vehicles trips, a 2% decrease in walk trips, and a 4% decrease in mass transit trips over arrival patterns. The Knicks game shows a similar shift in modal split with a 10% increase in vehicle trips, a 4% decrease in walk trips, and a 6% decrease in mass transit trips. No change occurs in the mass transit trips at the Rangers game. The 5% increase that occurs for vehicle trips is offset by a 5% decrease in walk trips.

TABLE IV-4
EVENT ARRIVAL DISTRIBUTION
WEEKDAY

Time	The "Cars" Concert		Knickerbockers vs. Celtics		Rangers vs. Devils	
	Survey Results	Turnstile Counts (1)	Survey Results	Turnstile Counts	Survey Results	Turnstile Counts
5 PM	2%	-	1%	-	1%	-
5:00	1%	-	1%	-	1%	-
5:15	-	-	0%	-	1%	-
5:30	1%	-	1%	-	3%	-
5:45	-	-	1%	-	0%	-
5-6 PM	2%	-	3%	-	5%	-
6:00	4%	-	3%	1%	5%	0%
6:15	1%	-	2%	3%	2%	5%
6:30	3%	-	10%	6%	10%	3%
6:45	1%	-	11%	9%	9%	9%
6-7 PM	9%	-	26%	19%	26%	17%
7:00	10%	-	27%	22%	22%	20%
7:15	7%	-	22%	34%	22%	25%
7:30	19%	-	13%	17%	16%	25%
7:45	14%	-	5%	8%	5%	13%
7-8 PM	50%	-	67%	81%	65%	83%
8:00	17%	-	2%	-	2%	-
8:15	8%	-	1%	-	1%	-
8:30	5%	-	0%	-	0%	-
8:45	3%	-	0%	-	0%	-
8-9 PM	33%	-	3%	-	3%	-
9 PM	4%	-	0%	-	0%	-
Total	100%		100%	100%	100%	100%

(1) Not Surveyed.

TABLE IV-5
MODAL DISTRIBUTION BY ORIGIN
THE "CARS" CONCERT 10/29/87

Mode	North Bronx	South Brooklyn	North Conn.	East L.I.	Manhattan	West N.J.	East Queens	North Rockland	South S.I.	North Westchester	Total %
Auto	46%	44%	39%	22%	12%	42%	49%	83%	72%	18%	32%
Taxi	9%	3%	5%	2%	28%	1%	1%	-	10%	8%	9%
Limo	-	1%	-	2%	1%	1%	2%	-	-	-	1%
Walk	3%	-	34%	-	21%	2%	1%	-	-	8%	7%
Bus	3%	-	-	-	4%	1%	-	17%	-	60%	10%
Subway	39%	52%	22%	2%	34%	2%	37%	-	18%	6%	22%
LIRR	-	-	-	72%	-	-	10%	-	-	-	12%
NJT	-	-	-	-	-	35%	-	-	-	-	5%
Path	-	-	-	-	-	16%	-	-	-	-	2%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Volume [1]	99 (36) 4.6%	250 (96) 11.7%	41 (13) 1.9%	331 (116) 15.4%	447 (188) 20.8%	299 (111) 13.9%	301 (116) 14.0%	18 (7) .8%	57 (19) 2.7%	305 (46) 14.2%	2,148 (748)

1. Total Group Volume
(Survey Response Volume)

North: 21.5%
South: 14.4%
East: 29.4%
West: 13.9%
Manhattan: 20.8%

NYC 53.8%

TABLE IV-6
ORIGIN DISTRIBUTION BY MODE
THE "CARS" CONCERT 10/29/87

Mode	Bronx	Brooklyn	Conn.	L.I.	Manhattan	N.J.	Queens	Rockland	S.I.	West-chester	Total %	Volume[1]
Auto	7%	16%	2%	11%	8%	18%	22%	2%	6%	8%	100%	681 (249)
Taxi	6%	4%	1%	3%	67%	2%	1%	-	3%	13%	100%	186 (69)
Limo	-	16%	-	32%	16%	8%	28%	-	-	-	100%	25 (8)
Walk	2%	-	10%	-	65%	4%	1%	-	-	18%	100%	142 (59)
Bus	1%	-	-	-	8%	2%	-	1%	-	88%	100%	208 (19)
Subway	8%	27%	2%	1%	32%	1%	23%	-	2%	4%	100%	482 (192)
LIRR	-	-	-	89%	-	-	11%	-	-	-	100%	270 (99)
NJT	-	-	-	-	-	100%	-	-	-	-	100%	105 (34)
PATH	-	-	-	-	-	100%	-	-	-	-	100%	49 (19)
Total	4%	12%	2%	15%	21%	14%	14%	1%	3%	14%	100%	2,148 (748)

1. Total Group Volume
(Survey Response Volume)

TABLE IV-7
MODAL DISTRIBUTION BY ORIGIN
KNICKERBOCKERS VS. CELTICS 11/9/87

Mode	Bronx	Brooklyn	Conn.	L.I.	Manhattan	N.J.	Queens	Rockland	S.I.	West-chester	Total %
Auto	36%	50%	34%	30%	11%	62%	37%	15%	78%	30%	28%
Taxi	-	2%	2%	-	20%	3%	4%	-	8%	11%	9%
Limo	-	-	4%	2%	3%	-	1%	-	11%	-	2%
Walk	-	-	9%	-	24%	1%	-	2%	-	8%	10%
Bus	2%	-	39%	-	1%	-	-	83%	-	38%	11%
Subway	62%	48%	12%	5%	41%	1%	52%	-	3%	13%	30%
LIRR	-	-	-	63%	-	-	6%	-	-	-	6%
NJT	-	-	-	-	-	25%	-	-	-	-	3%
PATH	-	-	-	-	-	8%	-	-	-	-	1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Volume[1]	84 (32) 3.7%	188 (78) 8.2%	125 (26) 5.4%	207 (83) 9.0%	891 (386) 38.8%	221 (88) 9.6%	272 (87) 11.8%	170 (16) 7.4%	36 (13) 1.6%	105 (31) 4.5%	2,299 (840)

1. Total Group Volume
(Survey Response Volume)

TABLE IV-8
ORIGIN DISTRIBUTION BY MODE
KNICKERBOCKERS VS. CELTICS 11/9/87

Mode	Bronx	Brooklyn	Conn.	L.I.	Manhattan	N.J.	Queens	Rockland	S.I.	West-chester	Total %	Volume[1]
Auto	5%	14%	6%	10%	16%	21%	15%	4%	4%	5%	100%	651 (239)
Taxi	-	1%	1%	1%	82%	3%	6%	-	1%	5%	100%	208 (95)
Limo	-	-	12%	10%	58%	-	10%	-	10%	-	100%	42 (9)
Walk	-	-	5%	-	90%	-	-	2%	-	3%	100%	237 (106)
Bus	1%	-	20%	-	5%	-	-	57%	-	17%	100%	246 (17)
Subway	7%	13%	2%	2%	54%	-	20%	-	-	2%	100%	696 (281)
LIRR	-	-	-	88%	-	-	12%	-	-	-	100%	145 (62)
NJT	-	-	-	-	-	100%	-	-	-	-	100%	56 (22)
PATH	-	-	-	-	-	100%	-	-	-	-	100%	18 (9)
Total	3%	8%	5%	9%	39%	10%	12%	7%	2%	5%	100%	2,299 (840)

1. Total Group Volume
(Survey Response Volume)

TABLE IV-9
MODAL DISTRIBUTION BY ORIGIN
RANGERS VS. DEVILS 11/10/87

Mode	Bronx	Brooklyn	Conn.	L.I.	Manhattan	N.J.	Queens	Rockland	S.I.	West-chester	Total %
Auto	60%	65%	53%	20%	14%	45%	46%	76%	81%	73%	36%
Taxi	4%	-	16%	-	14%	3%	1%	-	-	3%	6%
Limo	-	-	3%	-	4%	-	-	-	-	-	2%
Walk	-	-	7%	1%	23%	3%	2%	8%	-	10%	10%
Bus	5%	1%	-	-	2%	10%	2%	16%	3%	-	4%
Subway	31%	34%	21%	3%	43%	4%	37%	-	16%	14%	24%
LIRR	-	-	-	76%	-	-	12%	-	-	-	11%
NJT	-	-	-	-	-	25%	-	-	-	-	5%
Path	-	-	-	-	-	10%	-	-	-	-	2%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Volume [1]	58 (30)	159 (66)	70 (27)	290 (124)	766 (358)	486 (210)	182 (82)	25 (10)	37 (16)	125 (51)	2,198 (974)

1. Total Group Volume
(Survey Response Volume)

TABLE IV-10
ORIGIN DISTRIBUTION BY MODE
RANGERS VS. DEVILS 11/10/87

Mode	Bronx	Brooklyn	Conn.	L.I.	Manhattan	N.J.	Queens	Rockland	S.I.	West-chester	Total %	Volume[1]
Auto	4%	13%	5%	8%	13%	28%	11%	2%	4%	12%	100%	780 (342)
Taxi	1%	-	8%	-	75%	12%	1%	-	-	3%	100%	138 (64)
Limo	-	-	6%	-	94%	-	-	-	-	-	100%	35 (11)
Walk	-	-	2%	1%	82%	6%	2%	1%	-	6%	100%	213 (101)
Bus	4%	3%	-	-	20%	63%	4%	5%	1%	-	100%	80 (24)
Subway	3%	10%	3%	1%	62%	4%	13%	-	1%	3%	100%	538 (250)
LIRR	-	-	-	91%	-	-	9%	-	-	-	100%	243 (101)
NJT	-	-	-	-	-	100%	-	-	-	-	100%	120 (58)
PATH	-	-	-	-	-	100%	-	-	-	-	100%	51 (23)
Total	3%	7%	3%	13%	35%	22%	8%	1%	2%	6%	100%	2,198 (974)

1. Total Group Volume
(Survey Response Volume)

TABLE IV-11
ARRIVAL/DEPARTURE MODAL SPLITS OF VOLLMER SURVEYS

Mode	The "Cars" Concerts		Knickerbockers vs. Celtics		Rangers vs. Devils	
	Arrival Patterns	Departure Patterns	Arrival Patterns	Departure Patterns	Arrival Patterns	Departure Patterns
Auto	32%	36%	28%	32%	36%	39%
Taxi	9%	11%	9%	16%	6%	9%
Limo	1%	1%	2%	1%	2%	1%
Walk	7%	5%	10%	6%	10%	5%
Bus	10%	2%	11%	2%	4%	3%
Subway	22%	23%	30%	29%	24%	21%
LIRR	12%	14%	6%	9%	11%	13%
NJT	5%	5%	3%	4%	5%	6%
PATH	2%	3%	1%	1%	2%	3%
Total	100%	100%	100%	100%	100%	100%
Volume 1/	2,148		2,299		2,198	
Responses 2/	(748)	(748)	(840)	(840)	(974)	(974)

1/ Total Group Volume

2/ (Survey Response Volume)

Other Surveys

Additional surveys of events held at Madison Square Garden were surveyed by Madison Square Garden Corporation and by Parsons Brinckerhoff Quade and Douglas ("PBQ&D") as part of the MTA's master planning efforts of the Caemmerer East and West Rail Yards.

On weekdays, additional surveys were conducted by PBQ&D at a Squeeze concert, a Knickerbocker basketball game, a tennis event and a wrestling event. The resulting mode split for arrivals at each of these events is summarized in the following table. Madison Square Garden Corporation also has conducted surveys of mode split at various events held at MSG. For the most part these surveys were limited in nature and focused most often at Hall of Fame box users. The three surveys of most use, two Saturday Knickerbocker basketball games and a Ranger Hockey Game, are also presented on the following table.

Summary of Existing MSG Modal Split

For weekday events, based on the data summarized in Tables IV-12, IV-13 and IV-14, modal split by origin was performed. Data for the concert, Knick and Ranger surveys were combined by borough/county of trip origin resulting in a weighted average mode split by trip origin.

Table IV-12
Weighted Average Mode Split by Trip Origin
(Percentage)

Origin	Weekday Weighted Average Auto Percent	Weekday Taxi/Limo Percent	Trip Origin For Weekday Concert	Knicks	Rangers
Bronx	46	5	4	10	5
Brooklyn	51	2	12	9	9
Connecticut	41	10	2	5	3
Long Island	23	2	15	7	13
Manhattan	12	23	21	38	37
New Jersey	48	2	14	13	16
Queens	44	3	14	9	8
Rockland	28	0	1	3	1
Staten Island	76	10	3	1	2
Other	33	7	14	5	6
	29.4%	11.0%	100	100	100

As shown in the following summary table, the auto percent ranged between a low of 12 percent for Manhattan to a high of 76 percent for Staten Island. For taxi/limo the highest share, as expected was Manhattan origins with 23 percent of arrivals coming by these modes. All other origins showed values of 5 percent or less except the Staten Island, Connecticut and 'Other' origins which have taxi/limo percents of 10, 10 and 7, respectively.

Trip origins for weekday concerts, Knick and Ranger games are also summarized on the following page. These averages were determined using Vollmer and MSG survey data trip origin. For concerts, Manhattan was the most common destination with 21 percent. All five NYC Boroughs accounted for 54 percent. For Knick games, 38 percent of the trip origins were Manhattan with all five boroughs accounting for 67 percent of all origins. For weekday Ranger games, Manhattan was once again the highest origin with 37 percent. All five NYC Boroughs accounted for 61 percent of all origins.

Using the above, the estimated mode split for a weekday concert, Knickerbocker basketball and Ranger hockey game was determined. These estimates are presented in the attached table.

For weekend events the available database is not as detailed as the weekday information and, therefore, only the average overall modal split could be determined. Based on all the available survey data, these estimated auto and taxi/limo percentages are presented alongside the weekday mode split information.

IV-13
Existing Arrival/Departure
Auto-Taxi Mode Split for MSG Events
(Percentage)

	Weekday						Saturday		Sunday	
	Concert		Knicks		Rangers		Knicks		Rangers	
Mode	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.
Auto	35	39	31	35	31	35	39	39	55	55
Taxi/Limo	8	11	11	14	11		9	7	7	5

Estimated Future New MSG Modal Split

Future trips to new MSG will increase slightly since the garden will be relocated two-and-one-half blocks to the west and, therefore, not as well situated with respect to mass transit.

For weekday auto trips, it is estimated that auto arrivals will increase by two basis percentage points resulting in a new arrival share closer to the existing departure share. The departure share, which for existing is four basis points higher than the arrival share is expected to increase by only one basis percentage point since average trips lengths would be increased by fewer than ten minutes.

For weekday taxi/limo trips, the Manhattan share of trips is expected to increase from 23 percent to 26 percent (an absolute increase of 15 percent). This increase, weighted by trip origin, results in a basis percentage increase of

one point for concerts, Knick and Ranger games. For departure, since the project will be further from midtown activity, the percentage of taxi users are expected to decrease. It is expected that one-half of the persons arriving by taxi will leave by taxi.

Weekend arrival and departure auto shares are estimated to increase by two basis percentage points. For taxis, an increase of two basis percentage points (twice the weekday arrival increase) is estimated. As on weekdays, since taxis would continue to be less available, the taxi departures are estimated at half of the arrival percentage.

Table IV-14
Future Estimate Arrival/Departure
Auto-Taxi Mode Split for New MSG Events
(Percentage)

Mode	Weekday						Saturday		Sunday	
	Concert		Knicks		Rangers		Knicks		Rangers	
	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.
Auto	37	40	33	36	33	36	41	41	57	57
Taxi	9	5	12	6	12	6	10	5	7	4

New Arena and Forum Attendance

The new Madison Square Garden Arena will have an increased seating capacity for all events. Table IV-12 compares the new Arena with the existing facility.

Table IV-15

Capacity Comparison of Existing Facilities and Future Facilities

	Concert	Rangers Hockey	Knickerbocker Basketball	Forum
Existing	15,000-20,250 seats	17,690 seats	19,190 seats	5,000 seats
Future	16,500-21,500 seats	20,000 seats	21,000 seats	7,000 seats
% Increase(1)	6.2%	13.1%	9.4%	40.0%

(1) Concert capacity varies depending on the stage and set configuration for the person/group performing. This figure represents the maximum capacity percent increase.

Table IV-16

Summary of MSG
Arrival Modal Split
Surveys Conducted by Others
(in percent)

Mode	Weekday Friday Concert (1)	Weekday Friday Knicks (1)	Weekday Tennis (1)	Weekday Wrestling (1)	Weekend Saturday Knicks (1)	Weekend Saturday Knicks (2)	Weekend Sunday Knicks (2)	Weekend Sunday Rangers (1)	Weekend Sunday Rangers (2)
Auto	29	22	25	37	39	25	43	37	53
Taxi/Limo	6	7	6	6	9	11	3	9	4
Bus	3	1	6	3	3	19	11	3	3
Subway/rail	57	57	47	51	43	40	42	27	33
Walk	5	13	16	3	6	5	1	4	7
Total	100	100	100	100	100	100	100	100	100

NOTES: (1) Conducted by PBQ & D.
(2) Conducted by MSG Corporation.

The increased seating capacity will have no effect on over 80 percent of the events at the Arena. If an event is not a sellout today, it is not expected to sell any more tickets at the new facility. Only events whose ticket sales approach the maximum seating will change.

In order to estimate future attendance, a sellout was defined as an event at the Arena whose ticket sales were greater than or equal to 95 percent of the existing Arena capacity and an event at the Forum whose attendance reached 90 percent or more of the maximum 5,000 seats. Future ticket sales were calculated by prorating existing sales based on the increased seating capacity for each type of event. Future attendance was calculated by applying the ratio of existing attendance to existing ticket sales to the future ticket sales.

Table IV-17 shows all events from the analysis year whose attendance would increase at the new Arena and Forum. The 83 events shown represent approximately 15 percent of the total event schedule. Of the 67 events at the Arena, more than half are Ranger hockey games whose audience has a large portion of season ticket holders causing ticket sales to be consistently high. The remainder of the Arena events is comprised of concerts, Knickerbocker basketball, wrestling, and the circus. A total of 16 events are expected to increase at the Forum.

TABLE IV-17

ESTIMATED CHANGES IN ATTENDANCE & TICKET SALES FOR THE NEW ARENA & FORUM

Event	Existing Attendance	Existing Ticket Sales	Future Attendance	Future Ticket Sales	
Concert:	16,917	19,609	17,961	20,819	
	17,819	19,639	18,919	20,851	
	17,938	19,531	19,045	20,737	
	18,092	19,528	19,209	20,733	
	18,289	19,874	19,418	21,101	
	18,340	19,429	19,472	20,628	
	18,373	19,823	19,507	21,047	
	18,387	19,523	19,522	20,728	
	18,561	19,639	19,707	20,851	
	18,805	19,788	19,966	21,009	
	18,814	19,498	19,975	20,702	
	18,882	19,623	20,048	20,834	
	19,029	19,525	20,204	20,730	
	19,082	19,813	20,260	21,036	
Ranger Hockey:	8,158	17,070	9,223	19,299	
	10,571	17,334	11,951	19,598	
	10,659	17,385	12,051	19,655	
	11,226	17,284	12,692	19,541	
	11,227	17,310	12,693	19,570	
	11,305	17,339	12,781	19,603	
	11,339	16,959	12,820	19,174	
	11,388	16,932	12,875	19,143	
	11,647	16,828	13,168	19,025	
	11,832	17,324	13,377	19,586	
	12,033	17,359	13,604	19,626	
	12,057	17,941	13,631	20,284	
	12,246	17,337	13,845	19,601	
	12,383	17,348	14,000	19,613	
	12,520	17,377	14,155	19,646	
	12,673	17,300	14,328	19,559	
	12,747	17,326	14,412	19,588	
	13,702	17,311	15,491	19,572	
	14,225	17,239	16,083	19,490	
	14,265	17,320	16,128	19,582	
	14,483	17,289	16,374	19,547	
	14,520	17,285	16,416	19,542	
	14,694	17,333	16,613	19,596	
	15,145	17,317	17,123	19,578	
	15,382	17,209	17,391	19,456	P
	15,919	17,557	17,998	19,850	P
	16,587	17,242	18,753	19,493	P
	16,641	17,246	18,814	19,498	P
	17,337	17,337	19,601	19,601	
	17,464	17,134	19,744	19,371	
	17,589	17,351	19,886	19,617	
	17,589	17,362	19,886	19,629	
	17,589	17,355	19,886	19,621	
	17,589	17,351	19,886	19,617	
	17,589	17,316	19,886	19,577	
	17,589	17,351	19,886	19,617	

TABLE IV-17
ESTIMATED CHANGES IN ATTENDANCE & TICKET SALES FOR THE NEW ARENA & FORUM
(continued)

Event	Existing Attendance	Existing Ticket Sales	Future Attendance	Future Ticket Sales
Knickerbocker Basketball:	13,822	18,353	15,126	20,084
	14,909	18,430	16,315	20,168
	15,060	18,236	16,480	19,956
	15,087	18,722	16,510	20,488
College Basketball:	14,648	18,938	16,030	20,724
	14,745	18,938	16,136	20,724
	15,107	18,938	16,532	20,724
	16,384	18,544	17,929	20,293
	16,752	18,938	18,332	20,724
	17,283	18,938	18,913	20,724
Wrestling:[1]	15,599	19,732	16,799	21,250
	18,207	19,731	19,608	21,249
	18,933	19,621	20,390	21,131
	19,283	19,742	20,767	21,261
	19,286	19,740	20,770	21,259
Circus:[2]	16,993	17,464	18,944	19,469
	17,020	17,530	18,974	19,543
Forum:	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,500	4,500	6,300	6,300
	4,572	4,917	6,401	6,884
	4,921	4,581	6,889	6,413

1. Existing Wrestling seating capacity is 20,428. The new capacity will be approximately 22,000.
2. Existing Circus seating capacity is 17,940. The new capacity will be approximately 20,000.

P = Ranger Hockey Playoffs.

Future Design Day Event Attendance

Future design day event data were determined using the same procedure as described earlier with the future attendance data derived above. The 85th percentile event was identified for each time period and has been presented on Table IV-18, along with projected data for the new facility.

Table IV-18

Summary of 85th Percentile Events at the Existing and Future MSG Arena and Forum Facilities

		Existing		Future	
Time Period	Day Type	Attendance	Event	Attendance	Event
Before 2 PM	Weekday	2,751	Muppet Show	2,751	Muppet Show
2 PM - 7 PM	Weekday	2,394	Circus	2,394	USSR Moiseyev Dance
7 PM and later	Weekday	16,120	Concert	16,597	Concert
	Weekday	15,382	Ranger Hockey	16,374	Ranger Hockey
	Weekday	15,200	Knickerbocker Basketball (w/F Concert 4,572)	15,200	Knickerbocker Basketball (w/F Concert 4,572)
Before 2 PM	Weekend	5,313	Ice Capades	5,501	Circus
2 PM - 7 PM	Weekend	4,370	Circus	5,045	Circus
7 PM and later	Weekend	17,208	Concert	17,208	Concert
	Weekend	16,828	Ranger Hockey	16,828	Ranger Hockey
	Weekend	15,087	Knickerbocker Basketball (w/Muppet Show 2,400)	16,510	Knickerbocker Basketball (w/Muppet Show 2,400)

In addition Figures IV-6 and IV-7 have been prepared illustrating the breakdown of event sizes on weekdays and weekends. As indicated through review of the attendance data, the only events which now approach capacity and whose attendance is therefore expected to increase are held 7 PM or later when future 85th percentile attendance is expected to reach 16,597 on weekdays and 17,208 on weekends. Since MSG's greatest impact will be exhibited for events held at 7 PM or later, only this analysis period will be examined. During other times, minimal, or no increase is expected with little change in existing traffic and pedestrian activity. It is not expected that any significant change in modal choice or arrival/departure patterns will occur with the new facility.

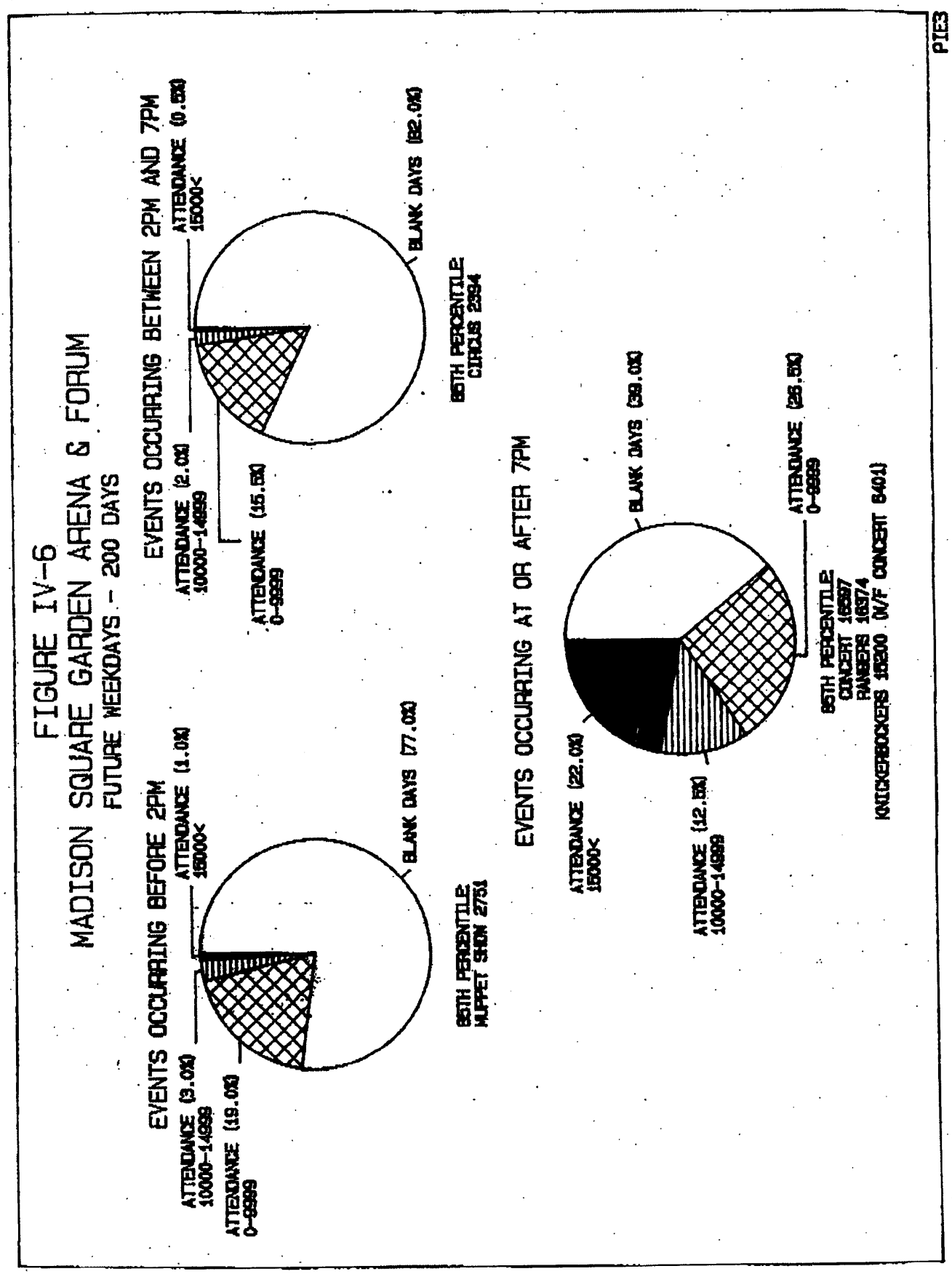


FIGURE IV-6
MADISON SQUARE GARDEN ARENA & FORUM
FUTURE WEEKDAYS - 200 DAYS
EVENTS OCCURRING BEFORE 2PM
ATTENDANCE (3.0%) 10000-14999
ATTENDANCE (19.0%) 0-9999
ATTENDANCE (1.0%) 15000<
BLANK DAYS (77.0%)
85TH PERCENTILE MUPPET SHOW 2751
EVENTS OCCURRING BETWEEN 2PM AND 7PM
ATTENDANCE (2.0%) 10000-14999
ATTENDANCE (15.5%) 0-9999
ATTENDANCE (0.5%) 15000<
BLANK DAYS (82.0%)
85TH PERCENTILE CIRCUS 2394
EVENTS OCCURRING AT OR AFTER 7PM
ATTENDANCE (22.0%) 15000<
ATTENDANCE (12.5%) 10000-14999
BLANK DAYS (39.0%)
ATTENDANCE (26.5%) 0-9999
85TH PERCENTILE CONCERT 16997 RANGERS 16374 KNICKERBOCKERS 15200 N/F CONCERT 8401
PIE3

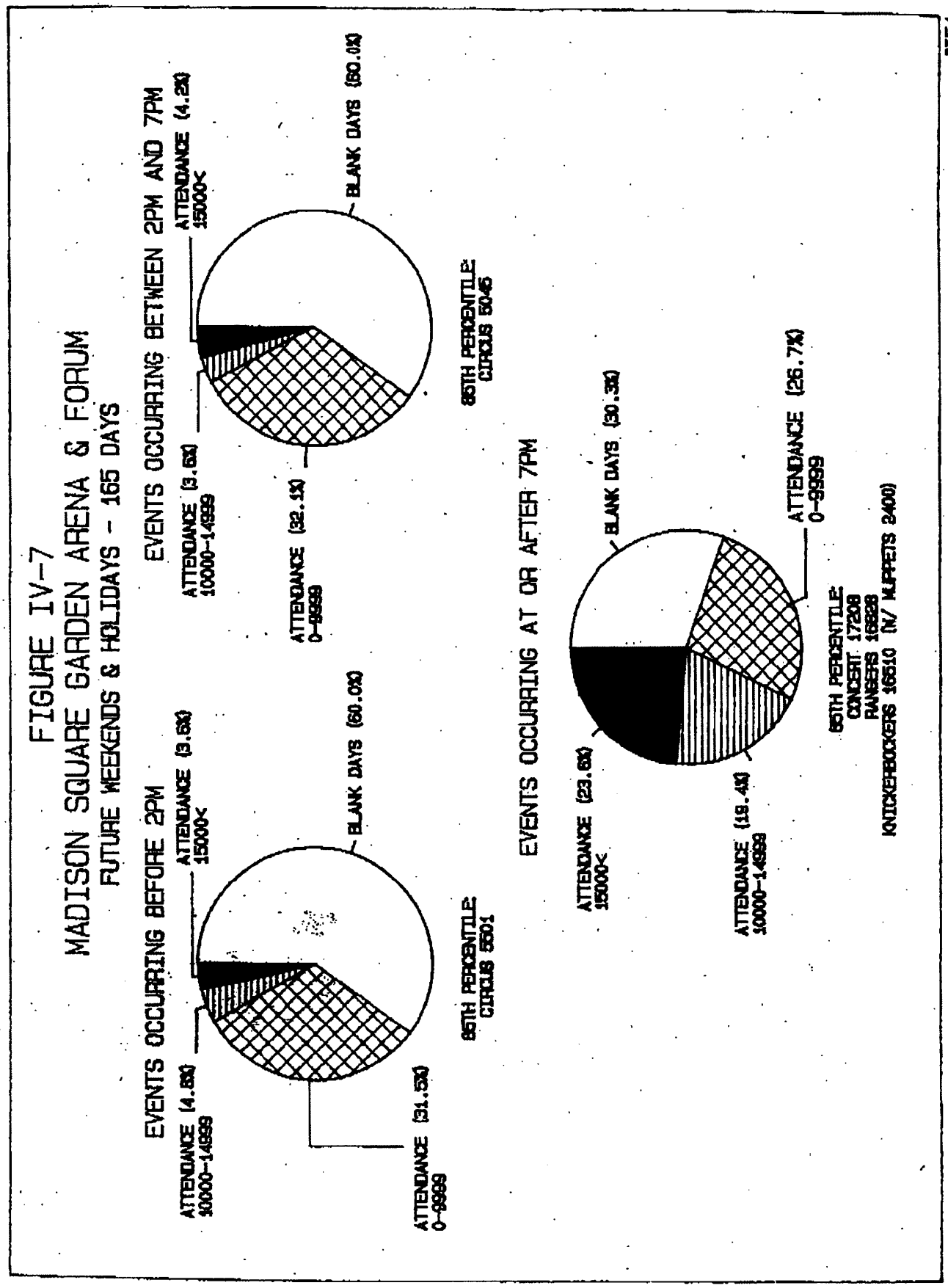


FIGURE IV-7
MADISON SQUARE GARDEN ARENA & FORUM
FUTURE WEEKENDS & HOLIDAYS - 165 DAYS
EVENTS OCCURRING BETWEEN 2PM AND 7PM
ATTENDANCE (4.2%) 15000<
ATTENDANCE (3.6%) 10000-14999
ATTENDANCE (32.1%) 0-9999
BLANK DAYS (60.0%)
85TH PERCENTILE: CIRCUS 5045
EVENTS OCCURRING BEFORE 2PM
ATTENDANCE (3.6%) 15000<
ATTENDANCE (4.8%) 10000-14999
ATTENDANCE (31.5%) 0-9999
BLANK DAYS (60.0%)
85TH PERCENTILE: CIRCUS 5501
EVENTS OCCURRING AT OR AFTER 7PM
ATTENDANCE (23.6%) 15000<
ATTENDANCE (19.4%) 10000-14999
ATTENDANCE (26.7%) 0-9999
BLANK DAYS (30.3%)
85TH PERCENTILE: CONCERT 17208 RANGERS 16828 KNICKERBOCKERS 16510 (W/ MUPPETS 2400)
PIE4

TABLE IV-20

MADISON SQUARE GARDEN - CONVENTION CENTER SCHEDULING ANALYSIS
MSG EVENTS - PROJECTED CONVENTION CENTER SHOWS (APRIL-DECEMBER 1986)[1]

DAYS WITH EVENT OVERLAPPING[2]

Month	MSG[3]		Conv. Center[4]	Overlapping MSG Event Days[5]	
	With Circus	Without Circus		With Circus	Without Circus
January	-	-	N.A.	-	-
February	-	-	N.A.	-	-
March	-	-	N.A.	-	-
April	29	9	12	10	1
May	28	1	17	14	0
June	14	11	21	2	1
July	3	3	21	0	0
August	5	5	16	0	0
September	16	16	21	3	3
October	21	21	18	4	4
November	25	25	16	5	5
December	22	22	16	7	7
TOTAL	163	113	158	45	21

TABLE IV-21

MADISON SQUARE GARDEN - CONVENTION CENTER SCHEDULING ANALYSIS
MSG EVENTS - SCHEDULED NEW YORK COLISEUM SHOWS (1984-1985)[1]

EVENT OVERLAPPING[2]

Month	MSG[3] With Circus	MSG[3] Without Circus	Coliseum[4]	Overlapping[5] MSG Events With Circus	Overlapping[5] MSG Events Without Circus
January	29	29	21	16	16
February	38	38	19	13	13
March	35	35	18	11	11
April	33	9	19	20	3
May	28	1	8	9	0
June	17	11	31	2	0
July	3	3	12	0	0
August	5	5	16	0	0
September	20	20	17	5	5
October	29	29	18	7	7
November	32	32	26	8	8
December	22	22	6	0	0
TOTAL	291	234	211	91	63

TABLE IV-22

MADISON SQUARE GARDEN - CONVENTION CENTER SCHEDULING ANALYSIS
MSG EVENTS - SCHEDULED NEW YORK COLISEUM SHOWS (1984-1985)[1]

DAYS WITH EVENT OVERLAPPING[2]

Month	MSG[3]		Coliseum[4]	Overlapping[5] MSG Event Days	
	With Circus	Without Circus		With Circus	Without Circus
January	25	25	21	14	14
February	26	26	17	8	8
March	30	30	17	8	8
April	29	9	13	11	3
May	28	1	8	6	0
June	14	11	20	2	0
July	3	3	11	0	0
August	5	5	15	0	0
September	16	16	15	3	3
October	21	21	13	4	4
November	25	25	16	4	4
December	22	22	5	0	0
TOTAL	244	194	171	60	44

MADISON SQUARE GARDEN - CONVENTION CENTER
SCHEDULING ANALYSES

FOOTNOTES

1. The analysis set forth in Tables IV-15 and IV-16 utilizes (i) Madison Square Garden's actual event schedule for arena events from September 1984 - July 1985 and (ii) all shows (trade and public) "booked into" the Convention Center as of July 1, 1985 for its inaugural year of operations (April - December 1986). The analysis set forth in Tables IV-17 and IV-18 utilizes the same Garden events with the actual shows appearing at the N.Y. Coliseum during its 1984-85 season.

To provide compatibility, the 1986 Convention Center events are listed on the same day of the week (and date) as if such events occurred in 1984-85. This causes the days of 1986 events to change 1-3 days (i.e., June 4, 1986 is a Wednesday, June 4, 1985 is a Tuesday -- this schedule lists the events as occurring on Tuesday).

2. Events and Event Days. Both the Convention Center and Madison Square Garden might have more than one event during a 24-hour day. The Convention Center seeks to book several shows simultaneously, since only the 2-3 largest national shows will utilize the entire facility. The Garden might have tennis in the afternoon and a hockey game at night. Additionally, circus and tennis tournaments have multiple events in a day. The Circus, for example, might have 2 or 3 shows per day. For purposes of this table, each show is considered a separate event.

Event Days set forth the number of days during which one or more events might be open to the public.

3. MSG Events. MSG Events include all arena events except for 6 "filler events" -- Pace University commencement, Police Graduation and its rehearsal, an evangelist meeting, a union meeting and a high school basketball game.

4. Convention Center Shows. Convention Center (and Coliseum) shows are of two types -- trade and public. Trade shows are projected to begin at 9-10 A.M. and continue to 4-5 P.M., with peak arrivals at the beginning time and departures from 4-6 P.M. Arrivals and departures for public shows, which are normally on weekends, continue throughout the day and evenings, with peak arrivals and departures on Saturday and Sunday being in daytime.

5. Events. "Overlapping" Events and Event Days are listed when a Convention Center (Coliseum) show (trade show departures ending at 6 P.M.; public shows arrivals and departures assumed to be throughout the day and evening until 11 P.M.) overlap with a Garden event (arrivals at an event projected to begin one hour prior to the starting time of an event).

REVIEW
of

NO.7 SUBWAY EXTENSION
HUDSON YARDS REZONING and
DEVELOPMENT PROGRAM

DRAFT
GENERIC ENVIRONMENTAL IMPACT
STATEMENT

Prepared by

ORA
Orth - Rodgers & Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

October 4, 2004

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Executive Summary

A traffic engineering and parking analysis of the **No. 7 Subway Extension - Hudson Yards Rezoning and Development Program Draft Generic Environmental Impact Statement** ("DGEIS") was conducted by Orth-Rodgers & Associates, Inc (ORA). The details of this study are contained in the body of this report. The key findings of this analysis follow:

- The number of cars generated by a Jets football game is underestimated by a factor of more than two. The DGEIS estimates 7,500 cars; ORA estimates 17,400 vehicles after correcting for unreasonably high projections of transit usage and vehicle occupancy rates.
- The number of Jets fans projected to use transit is 70%. This is not a realistic projection. No other sports arena in the country comes close to that share. In fact, at Madison Square Garden (MSG), which has better access to mass transit than any other sports facility in the country, only about half the patrons arrive by transit. A realistic transit share for the Jets stadium is 42%. This accounts for the fact that the Jets stadium would be served by one rail line (when and if the No. 7 Train Extension is completed), not the more than a dozen subways and commuter lines that service MSG, and reflects the actual arrival characteristics of MSG patrons.
- The number if Jets fans per car is too high. The DGEIS estimated 3.0 persons per car. ORA recommends using 2.5 persons per car, which is the average for a Sunday sports event at the Garden.
- The DGEIS identifies numerous failing intersections, with delays in excess of five minutes, but fails to take the obvious next step of studying the street network to show the full traffic impacts as gridlock cascades from one failing intersection to another. The DGEIS, even with its flawed assumptions, discloses over 100 failing intersections at various peak hours and indicates that some intersections would have traffic volumes at five to ten times their capacity. Standard traffic engineering practice dictates that with this level of congestion, the DGEIS should include an evaluation of traffic in the entire area rather than merely an assessment of individual intersections. This report uses a street-network-based model to show that the failure at these intersections causes gridlock and that the DGEIS mitigation measures fail to prevent network-wide congestion – even if the flawed assumptions in the DGEIS are used.
- An analysis of the street network, using accurate projections of the number of cars generated by a Jets game, shows that gridlock would extend from SOHO to 70th Street for two hours after a game and congestion would extend from the Battery to the George Washington Bridge and from the East River Crossings to the Hudson River.
- While Broadway theaters can post Standing Room Only signs for oversold shows there is no equivalent for parking lots. There will be no available parking in the

Theater District for theatergoers on game days. Hotels, restaurants and other entertainment venues will only be able to accommodate walkers and transit riders. Drivers looking for spaces will contribute to gridlock conditions. In fact, if reasonable assumptions of auto usage by Jets fans are used, some 6,000 fans will be looking for a parking space outside a reasonable walking distance in the theater district, in Chelsea, as far north as Times Square and as far east as Madison Avenue.

- Pedestrians will be less safe at all times, crossing the West Side Highway (Twelfth Avenue) as the sidewalk bulges built to protect pedestrians are removed at 42nd Street, 48th Street, and 50th Street. In addition to a longer crossing distance they will face one more lane of faster moving traffic.

- There are basic mathematical errors in the DGEIS that render its findings meaningless. For example, the capacities at the East River bridges and Harlem River bridges are double their actual capacities as calculated by the New York City Department of Transportation. In fact, one conclusion that can be drawn from the DGEIS tables is that there is no congestion at any bridge or tunnel to Manhattan even during the peak hours. Another mathematical error that appears several times is that hundreds of taxis arrive at the stadium but never leave.

- The reasonable worst-case combination of events was not studied. For example, in the peak hours during a Jets game, the DGEIS fails to include the traffic generated by the Convention Center ballroom (the largest in New York City), the busiest Javits shows that occur during the football season like the Boat Show, and the passenger ship terminal, which is bustling on Sunday afternoons.

- There are many omissions that render the DGEIS invalid. Charter buses, estimated to carry 5,000 fans, disappear -- no boarding or staging areas are provided. The platform from the stadium over the West Street (Twelfth Avenue), which is needed to avoid conflicts between thousands of fans and thousand of cars, is considered only as an alternative in the DGEIS.

- The Jets stadium would curtail street activities that are part of the fun and fabric of city life. Major street fairs, mass bike rides, the marathon and other events occur on every Sunday from September through November. The DGEIS assumes full capacity of all roads during game days, meaning no closures for other events.

- The transit system will require massive capital investments and operating subsidies to make the stadium traffic work. Subway station entrances and staircases would have to be widened and platforms modified. Extra commuter rail would have to be drawn into service, according to the DGEIS, just to carry one load of passengers in the pre-game and one out post-game. The extra capital and operating costs are not presented in the DGEIS.

- The wrong data was used. June traffic volumes and parking data were used as the background condition even though football, hockey and NBA basketball are all played in the fall and winter. Old data is used, such as 1998 bridge and tunnel volumes even through more recent data (and higher volumes reflecting the economy and tourism increase since 1998) are readily available. Some traffic

counts were more than three years old – typically EISs are required to use data that is not more than three years old.

- It is not reasonable to assume that all the infrastructure construction needed to make the project work could be completed by 2010 as predicted in the DGEIS. Even if it were, it would cripple the west side neighborhoods for years with simultaneous road and sidewalk construction and massive storage areas required for equipment, materials and debris. Final designs are not even completed for the 7 Train extension, Route 9A, the Javits Expansion, pedestrian underpasses, subway stair and station modifications, the Highline, pedestrian bridges, and stadium-related infrastructure. Considering government procurement practices and history, it is doubtful that the No. 7 Train extension could be built by 2015, let alone 2010.

- The DGEIS assumes that on Jets game days, every lane of every road will be available, every bridge and tunnel will be construction-free, there will be no accidents, no transit delays and no sleet, snow or ice. There is no margin for error. Overburdening the transportation system in this way is imprudent. The DGEIS does not consider the effects that the gridlock from Jets games would have on the response times of police, fire and other vehicles responding to emergencies.

In conclusion, the transportation analysis in the DGEIS does not meet professional standards for a study of a major development project, has serious omissions and errors, does not present a reasonable worst case analysis, seriously underestimates transportation impacts, and does not provide a reasonable basis for a decision on whether to proceed with the Hudson Yards Development.

I. Introduction and Purpose

Orth-Rodgers & Associates, Inc. (ORA) has been retained by Madison Square Garden to assess the traffic and parking impacts of the proposal to develop the Hudson Yards area of Manhattan, and to review the traffic transportation sections of the Draft Generic Environmental Impact Statement (DGEIS) for the project. The proposed development plan is a major undertaking that will permanently alter the transportation and parking situation in Midtown Manhattan and the West Side.

The development proposal for the Hudson Yards Area, described in the DGEIS, includes the following elements:

- Extension of the No. 7 Subway Line from Times Square to serve the Hudson Yards Area;
- 29 million square feet of office space;
- 12,600 housing units;
- Expansion of the Javits Convention Center to include construction of more than one million square feet of new exhibition space, meeting rooms, banquet halls, and other facilities;
- Development of a new headquarters hotel with up to approximately 1,500 rooms;
- A new Multi-Use Facility with approximately 30,000 square feet of permanent meeting room space and the capability to convert into a number of different uses and configurations, including a stadium configuration with a seating capacity of approximately 75,000 (the new home for the New York Jets Football Team) , an exposition configuration including 180,000 square feet of exhibition space, or a plenary hall configuration that provides a maximum seating capacity of approximately 40,000; and,
- Accommodations for other facilities, new or replacement transportation facilities for pedestrian movement, vehicle storage, and other public purposes.

The DGEIS established a primary and secondary study area for the traffic and parking analysis. The primary area consists of the area bounded generally by West 57th Street, West 47th Street and West 42nd Street on the north, West 28th Street on the south, Sixth Avenue on the east and Route 9A, 12th Street on the west. The primary study area consists of 180 intersections and five unsignalized study intersections. A secondary study area extends the northern boundary to West 59th Street on the north, Chambers Street on the south, and Second Avenue on the east. The secondary study area was established to include the approach routes to the primary study area. In fact, overall system-wide traffic operations in both the study areas were largely ignored to concentrate on individual intersections without regard to the impact of congested intersections backing up to and blocking other intersections in the street grid.

Orth-Rodgers has conducted a detailed assessment of the traffic, transit and parking impacts of the proposed development. This study uses data presented in the DGEIS and other readily available data. Corrections were made to the DGEIS analysis, including

changes to faulty assumptions and corrections to mathematical and other errors. Orth-Rodgers and Associates, Inc. (ORA) used traffic engineering tools and other analytical methods that are the industry standards and that are commonly used in similar studies throughout the country to analyze transportation systems in major cities. In many cases, the analysis in the DGEIS failed to use these standard, established techniques in concert with sound engineering judgment for disclosing the traffic and parking impacts of major development projects in a major city like New York City.

In performing this review, ORA completed the following tasks:

- Field views of current traffic and parking conditions on a typical weekday and on a weekend;
- Review of the Hudson Yards Environmental Impact Study including the Scoping Document and all publicly available appendices;[1]
- Development of a base map using Geographic Information Systems technology for the entire study area to assess the impact upon parking supply;
- Construction of a SIMTRAFFIC Simulation Model to assess performance of the street network;
- Assessment mode of transportation of patrons and customers of the proposed development;
- Test the conclusions of the DGEIS against the findings of this analysis and prepare conclusions.
- Review of modal split analysis at other relevant sports facilities.

[1] A FOIA request for technical information has been submitted by counsel for Madison Square Garden but as of this writing has not been fully complied with by the Project Sponsors.

II. Deficiencies and Errors of Note in the DGEIS

A. Introduction

The traffic, transit and parking analysis in the Hudson Yards DGEIS contains significant deficiencies and errors. This section is not an all-encompassing checklist; but it describes the issues that affect the ability of an independent observer to make an impartial assessment of the Plan and the findings in the DGEIS and its impacts. Many of the items noted in this chapter are investigated further in the chapters of this report that follow and form the basis of our conclusion that the DGEIS is not an acceptable document upon which to make a well-founded decision.

B. Fundamental Errors

Transit share and vehicle occupancy as predicted in the DGEIS for the Multi-Use Facility – the Jets Stadium – are based upon a very optimistic scenario. Of the 75,000 fans that would see a Jets game, the DGEIS estimates that some 52,500 fans would arrive by public transit and some 22,500 fans would arrive in 7,500 automobiles, assuming that on average, each automobile carries an average of 3 people. These assumptions represent wishful thinking. They are not the basis for a worst-case analysis.

If the experiences of stadiums elsewhere are taken into consideration, the number of vehicles added to the streets of Manhattan would be more than three times the volume predicted in the DGEIS. This is a fundamental issue and it drives all of the calculations of impact prepared by the Project Sponsors. The document contains no sensitivity analyses to test its assumptions (a standard practice for planners) and relies upon this untested and unrealized projection repeatedly throughout the document. Consider the following:

- A 70% transit share has never been achieved for any football event anywhere in the United States or Canada. In fact, it has never been achieved for any sporting event in New York City, including the Knicks and Rangers at Madison Square Garden. The data from other football stadiums and New York City venues indicate that transit share could be too high by a factor of two as outlined in this report. Yet if the Project Sponsors claim that it is reasonable for the modal split to improve another 10 percentage points to 80% with the No. 7 Line extension project, it is also reasonable to discount the MSG modal split by the same 10% to say that 42% will arrive by transit to account for the increased walking distance to be covered by Jets fans in the absence of the No. 7 Line. (Note that this report considers the transit share as routinely achieved by events at MSG, adjusted to account for the distance from the proposed stadium to Penn Station to be a reasonable worst case scenario as it is based upon data collected from attendees at actual events, not Jets fans asked how they would arrive at a game at a stadium not build yet).
- The occupancy of 3.0 people per car has not been achieved at Giants Stadium. At Madison Square Garden, where parking costs are exorbitantly high, encouraging car-pooling, the Sunday sports occupancy rate averaged 2.5. Assuming an

occupancy rate of 2.5 passengers per vehicle and a transit share rate of 42%, the amount of vehicles generated by the stadium would be 17,400.

- The Jets study assumes that 80% of the vehicles will depart in the one hour following the game (the critical hour for traffic analysis) while 90% was cited in an earlier Jets report prepared by Eng-Wong Taub. Using the 90% number would increase the peak hour generation shown in the EIS by 12 ½%.

C. Gross Omissions

The DGEIS for a project as complex as Hudson Yards should be able to address all impacts at the draft document stage rather than leave major decisions to the Final EIS. Areas where further analysis is needed include the following:

- Transit: In 2025, subway station mitigation measures, such as widening of subway station elements (staircases, passageways and corridors), as well as providing additional bus service, are identified "conceptually" but require further analysis.
- Traffic: In 2010 and 2025, traffic improvement measures to mitigate stadium-generated traffic, such as standard traffic engineering improvements, lane channelization improvements, the elimination of on-street parking, corridor operational changes, and implementation of turn restrictions or intelligent transportation systems would need to be "further evaluated between the Draft and Final GEIS." In addition, all mitigation measures would require agency cooperation and are not guaranteed, in which case impacts would remain unmitigated. The DGEIS promises to "return delay to future without the proposed action levels" but fails to show how this can be done.
- Charter bus and taxi loading/unloading and drop off/pick up areas are not accounted for at the proposed stadium.
- No consideration is given to the circulation of fans on the streets of Manhattan or traffic resulting from fans searching for parking spaces as close as possible to the proposed facility. When the usage of available parking approaches 90% as predicted in the DGEIS for a football Sunday, parkers circulate and this results in additional congestions. The DGEIS assumes parkers know exactly where to park and do not circulate or off passengers at the stadium.

D. Reasonable Worst Case Not Used

When considering the attendance at other venues that hold events at the same time as a Jets game, the DGEIS meticulously calculates the 85th percentile event claiming it to be a reasonable worst-case scenario. It does not consider that the attendance used is not reasonable and minimizes the potential impacts of multiple events. Javits Center events are particularly important because the Javits Center is active on 38 Sundays every year.

- The DGEIS analyzed sold out conditions at the proposed Jets Stadium, but used 85th percentile attendance for Javits Center. The 85th percentile may be valid for normal distributions but when it leads to values that are 60% less than the peak

attendance it should not be used. We suggest using the industry standard of 90% of the peak flow for a Javits event.

- By picking the 85th percentile, an event with 28,000 daily patrons was studied. Yet, in excess of 60,000 a day attended the Boat Show, which spans two weekends during the Jets season. The Auto Show with 100,000 people in attendance could occur at the same time as a basketball game with 40,000 people in attendance. The build projected 85th percentile Sunday at Javits is lower than the lowest weekend recorded for the Auto Show in 1999.
- A 6,000-person ballroom at the proposed expanded Javits Center is not analyzed as part of traffic analysis nor is the passenger ship terminal and other events and venues. The DGEIS seems to ignore the 6,000-person ballroom, estimating that just 97 people would leave the convention center between 8:00 PM and 9:00 PM. Certainly for a 6:00 PM on a weeknight start, there would be a few thousand at least leaving or even arriving between 8:00 PM to 9:00 PM. Curiously, no taxi traffic is generated for the Convention Center ballroom between 8:00 PM and 9:00 PM.
- Page 1 of the Traffic Chapter quotes: "Highly conservative combinations of events and vehicular trip assumptions were factored into the analysis methodology to ensure the analysis determined potential impacts of the reasonable worse case scenario." In fact, "highly conservative combination of events" would actually include: Boat Show, Jets game, other venues having holiday shows, Javits' ballroom packed etc.

Table II. 1 Potential Worst Case Attendance Hudson Yards Area

Venue	DGEIS Attendance	True Worst Case Attendance
Javits	28,000	*68,000 (Boat Show)*
Jets	70,000	75,000
Javits Ballroom	0	6,000
MSG	19,000 (Knicks)	23,000 (with Xmas Show)
TOTAL	117,000	172,000 (+47%)

As shown in Table II.1, the attendance for a reasonable worst-case scenario is 47% higher than what was assumed in the DGEIS.

- During the weeknight event "No Convention Center Events are expected to occur at that time." No evening events for a trade show or even evening hours at a public show is far from a reasonable expectation. A ban on evening banquets, evening exhibit hours or meetings would be quite a burden on event planners.

E. Network Wide Impacts/Spectacular Impacts Not Identified Or Glossed Over

- The DGEIS identifies many critical intersections as having delays exceeding 300 seconds (5 minutes). A five-minute delay clearly will impact other intersections in the network yet this is not analyzed. The authors claim that delays calculated at greater than 300 seconds are unreliable yet they do not say why. The simple fact is that these delays are indicative of gridlock and the document ignores that fact.

- If greater than 80 seconds delay is "saturation.... unacceptable to most drivers" what is greater than 300 seconds? It should be described as a cascading gridlock. No attempt was made in the document to determine this system-wide issue.
- The West 34th Street corridor between 8th to 11th Avenues would be at a standstill. Even in the DGEIS, every 34th Street intersection from 8th to 12th Avenues would be level of service "F" – effectively creating a ¾ mile long wall of traffic blocking north-south movement. This would create a wall of traffic certain to spillover to adjacent intersections causing a cascade of gridlock throughout midtown, Chelsea, the theater district, Upper West Side and blocking traffic into and out of the Lincoln Tunnel.
- Second Ave. southbound at 60th St. will get 9% less green time (5 seconds) each signal cycle. Traffic backs already up for blocks on Second Ave. today (page 68).
- The DGEIS does not consider that the streets of Manhattan are a vital component of city life and used by citizen groups, civic and ethnic associations for parades, races, street fairs and other activities. Every week and during the football season, Manhattan streets and avenues are closed to traffic for these events. The following are the scheduled activities for Manhattan for the weekend of September 12, 2004. These illustrates a number of the kind of events that have major traffic implications that are not considered in the DGEIS:

  Events Scheduled for September 12th, 2004 in New York Metropolitan Area

  1. Jets game at 1 pm
  2. Mets game at 1 pm
  3. Broadway on Broadway at 11:30 am
     Broadway and Seventh Avenue, between West 43rd Street and West 48th Street
  4. Transportation Alternatives NYC Bike Tour 6am – 6 pm
  5. US Open Tennis starting at noon in Flushing Meadows
  6. 4 Cruises
  7. Big Apple Fest (various locations)
  8. Central Park Summerstage at 1 pm
  9. Celebrate 350 years of Jews in America Festival at South Street Seaport starting at 1 pm
  10. Washington Square Outdoor Exhibit at noon
  11. NY Liberty game at Radio City Music Hall at 4 pm
  12. National Merchandise Trade Show at Javits Center from 9:30 - 5:30 pm
  13. Pathways to Beauty and Well Being Public show at Javits Center from 10:30 am - 5 pm

14. Interdependence Day Festival 2004 – Kick off of 11 Days of Global Unity at the CUNY Graduate Center from noon – 6:30 pm
15. Race for the Cure

    9:30 AM – 2:00 PM

    Starts at Central Park West and West 77th Street; proceeds north on CPW to West 90th Street, then enters Central Park
16. Friends of Dag Hammarskjold Plaza Festival

    11:00 AM – 6:00 PM

    Second Avenue, between East 43rd Street and East 53rd Street
17. Washington Heights BID Children's Health Festival

    11:00 AM – 6:00 PM

    St. Nicholas Avenue, between West 181st Street and West 191st Street
18. International Immigrants Parade

    2:00 PM – 6:00 PM

    Formation: East 39th Street through East 41st Street, between Park Avenue and Fifth Avenue

    Route: East 41st Street/Madison Avenue; south on Madison Avenue to East 27th Street

In ignoring the normal level of City-approved street activities, the DGEIS Sunday peak analysis is flawed. The DGEIS does not commit the City to deny activities such as those listed above when they conflict with the Jets. This is a key issue given the amount of new traffic the proposed development plan and the proposed stadium will add to not only the far west side but to the entire midtown section of Manhattan.

F. Parking and Impacts to Other Uses/Users

In addition to the added congestion, the proposed Jets Stadium will change the parking picture significantly. Earlier in this chapter, the discussion of modal split described an undercount of traffic, which will extend beyond the study area. This underestimation by a factor of two to three times will have a similar impact on the number of parking spaces required for Jets fans. The increased demands on the parking supply driven by the underestimation of demand will cause parkers to search far beyond the study area for a parking space in evening traffic congestion and using all available spaces. This will impact the theater district and residential neighborhoods far beyond the study area.

According to the DGEIS, 91% of parking will be utilized by Jets fans during a Sunday afternoon game in an area from the Village to 59th Street; from the Hudson River to 5th Avenue. In fact, parking facilities will be at capacity in a larger area and there will be virtually no parking available for the Sunday theater matinees and events at Madison Square Garden later in the afternoon or for restaurant goers. Thus, both area businesses and the visitors who frequent them would suffer – and this does not include the underestimation of vehicles due to the utilization of a very optimistic modal split and vehicle occupancy.

The DGEIS relies on June parking data, even though the Jets will not play in June, the theater district is relatively quiet in June and events at Madison Square Garden do not sell out as often in June. The DGEIS should have used the data collected during the football season when traffic is heavier and parking in shorter supply.

Further, the parking usage data was collected at different times so it is not possible to determine what events were taking place, a major defect in the underpinnings of any parking study.

No new parking spaces are allocated for the Convention Center Expansion or for the proposed Jets Stadium. No other stadium designed to host the NFL has been constructed without some dedicated on-site parking. DGEIS fails to consider the possibility of constructing parking facilities that would be dedicated to Jets fans and Convention visitors during peak periods.

G. Inadequacy of study area

The study area intersections analyzed for the weeknight and Sunday special events conditions are far too limited to account for potential impacts. Although the DGEIS analyzes impacts at 239 intersections for the rezoning action, it studies only a fraction of the intersections (50 locations) for the proposed Stadium. Most of these intersections are located within the immediate proximity of the proposed Stadium and the Javits Center, while only a handful of intersections are analyzed at critical locations south of 30th Street, east of 8th Avenue and north of 41st Street.

H. Old/Outdated Data

The DGEIS made use of data that is old or outdated and for which more up-to-date data is available. The failure to use accurate, available, recent data results in an underestimation of traffic and other impacts. Some of the major examples follow:

- The river crossing numbers in the DEIS are not up-to-date. The DGEIS uses 1998 Manhattan River Crossing data from the New York City Department of Transportation when the 2000 report had been available since July of 2001 (New York City Bridge Traffic Volumes 2000). Had the DGEIS used the more up-to-date numbers they would have found a significant increase at the Hudson River Crossings during the critical time periods; P.M. peak outbound and weeknight peak inbound.
- 1987 MSG Survey for modal split cited but MSG did a 2003 survey, which was made available to the EIS team and is even cited in the report for other statistics.
- Traffic counts are from 2000 or earlier. CEQR requires data be within three years – some updates were made but still most data is old.
- 1999 data from the Javits Center was used instead of more recent data from 2000 or later.
- The DGEIS states that 2000 Census data is not available. The 2000 Census Journey to Work data has been available since 2003 and has been in use by transportation planners in other areas.

- DGEIS modal split data is old, outdated, or erroneous. Table II.2 shows the modal split information presented in the DGEIS compared against the independent verification performed by ORA. There are significant differences between the DGEIS data and the data collected by ORA. In each case, the transit usage data shown in the DGEIS is significantly higher than the reality.

Table II. 2 Modal Split Comparison, DGEIS versus ORA

Team	Facility	Capacity	Modal Split (DGEIS)	Modal Split (ORA)
Baltimore Ravens	M&T Bank Stadium	68,915	23%	13% to 16%
Boston Red Sox	Fenway park	34,218	34% to 56%	20%
Atlanta Falcons	Georgia Dome	71,228	50% to 55%	25%
St. Louis Cardinals	Busch Stadium	50,000	35%	14.3%
St. Louis Rams	Trans World Dome	65,321	30%	22.5%
Toronto Blue Jays	Skydome	51,500	55% to 60%	28%

I. Wrong Peak Hours

The DGEIS studies an 8pm to 9pm peak hour for a Monday night football game. A Jets game starting at 9pm on a Monday or Friday (historically some Jet pre-season games take place on Friday nights at 7pm) would mean many arrivals prior to 7pm and even for pre-game dinner by 6pm. The simultaneous events nearby MSG - the Ballrooms at Javits, Chelsea Piers, and the theaters – start between 6:30pm and 8pm. The 6pm – 7pm or 7pm – 8pm Monday and Friday night periods must be studied if the DGEIS is to consider peak traffic volumes. Events at the study area venues combine in various manners and that impacts traffic and parking.

J. Tenuous Infrastructure

The DEIS assumes that a number of infrastructure projects will be completed by the project build year of 2010. However it is unlikely that many, if not all, of the cited projects will be in service by the build year. These include the following:

- No. 7 Line Extension – without the No. 7 Line Extension, there would be decreased transit usage and increased congestion.
- Pedestrian Bridge over Route 9A – without the bridges there would be a negative impact on pedestrian safety and considerable reduction in capacity of an already overcrowded artery.
- The relocation of the tow pound (truck activity would be busiest on game days). Tow truck queues are not accounted for in EIS. The tow pound would be moved to 29th and 30th Streets between 11th and 12th Avenues. In addition, District 6 and District 5 Sanitation facilities would be combined onto this block. This would significantly affect traffic as trucks queue up for entry to a secure (in tow pound case) facility. However, the DGEIS states on p31, "no additional traffic volumes or traffic-related impacts are associated with this element."
- 2nd Avenue Subway. This project, while separate, is competing for the same funds as the No. 7 Line Extension. The purpose of this project is to reduce overcrowding on the Lexington Avenue line.

The most significant of these infrastructure improvements in terms of its effects on traffic and parking issue is the No. 7 Line. It is also the most unlikely to be completed in the five-year period assumed in the DGEIS. The 7 Train Extension would involve construction of a tunnel and a new station. It has been a while since the MTA has extended a subway line in a project of this scope. The duration of those projects indicate that the 7 Train Extension will likely take at least 10 to 15 years to complete:

- 63rd Street Extension started in 1969 and opened in 1989 – 20 years of construction
- Archer Avenue Connection started in 1972 and opened in 1988 – 16 years of construction.

K. Mathematical Errors

The following items relate to errors that have a significant impact on the calculations of the DGEIS. They are illustrated of the kinds of mistakes that recur in the DGEIS

- Taxi trip assignment does not make sense: 732 taxis arrive at the stadium during a weeknight from 8pm to 9pm but 0 leave.
- Growth rate calculation does not appear to be calculated correctly on page 28. The correct growth rate should be 11.60 % for 2025, not 11.32%. The DGEIS grows it to 2010 correctly, rounds it off, and then starts growing it again. The difference becomes significant at the high volume rates and saturation flow rates. Essentially for every thousand vehicles, the DGEIS underestimates by about 25 vehicles by year 2025.
- Page 68, Table 19-32: Madison Avenue southbound traffic will get 3 seconds less green. THERE IS NO SOUTHBOUND TRAFFIC ON MADISON AVENUE! If this refers to northbound, traffic is already jammed on Madison Ave. at 34th Street, reducing the available green time by 3 seconds or 7% will worsen traffic flow back to Madison Square Park.
- In the DGEIS analysis, 41st St. is considered open between 8th and 9th Avenues. In reality it is closed.
- 11th Avenue was converted from 2-way to one-way southbound between 44th Street and 42nd Street in October 2003. But, this change is not reflected in the DGEIS
- Table 19-4. Earlier on P16 it says, "Visitation of all other shows is expected to increase by 84 percent-approximately the same factor as the increase in exhibition floor space." But, in Table 19-4 net increases are just 52.9% on weekdays and 63.8% on weekends. The DGEIS uses statistics to reduce the impact of the large shows at the Javits and as a result seriously underestimates the potential impact of a Jets Game and a major show at the Javits. The DGEIS states that in 1999, there were 38 shows on Sunday and one of the shows, the PC Show had a Sunday attendance of over 95,000 people.

- Due to the location of the Javits, taxis are a significant mode of transportation relied on by attendees. Yet, the DGEIS appears to assume no increase in taxi trips to the Javits Center as a result of its doubling in size.
- According to the DGEIS, by 2010 there will be no traffic jams at any of Manhattan's bridges and tunnels during the a.m. and p.m. peak hours or at any other time. In fact, according to Table 19-28 on page 19-60, traffic will be free-flowing at the Manhattan, Williamsburg and Queensboro bridges and even moving well at the Lincoln, Holland and Midtown tunnels. This is due to an across-the-board mathematical error in calculating capacities at the river crossings. Further investigation shows that they ignored the agreed upon capacity of the river crossings as maintained by the New York City Department of Transportation (NYCDOT). This is described fully in the next section below.

L. River Crossing Capacities

East River 'Free' Bridges, AM – To Manhattan

The inbound capacities shown for the East River Bridges are more than double those calculated by NYCDOT in 1977. Since 1977 the capacity at the Queensboro Bridge has been reduced with one fewer lane on the main roadway and one outer roadway reserved for bikes and pedestrians. The other three bridges are unchanged. The DGEIS understates the capacities of the East River Free Bridges into Manhattan by 107%.

Table II. 3 East River "Free" Bridges, AM – To Manhattan

	A.M. Traffic (To Manhattan)			
Facility	NYCDOT	DEIS	Difference	% Difference
Brooklyn Bridge	4595	6600	+2005	+43.6%
Manhattan Bridge	4175	11000	+6825	+163.5%
Williamsburg Bridge	2910	8800	+5890	+202.4%
Queensborough Bridge	7450	13200	+5750	+77.2%
Total	**19130**	**39600**	**+20470**	**+107.0%**

East River 'Free' Bridges, PM – From Manhattan

The outbound capacities at the East River Bridges, as shown in the DEIS, were under estimated by almost 78%.

Table II. 4 East River "Free" Bridges, PM – From Manhattan

	P.M. (From Manhattan)			
Facility	NYCDOT	DEIS	Difference	% Difference
Brooklyn Bridge	4320	6600	+2280	+52.8%
Manhattan Bridge	4650	11000	+6350	+136.6%
Williamsburg Bridge	4510	8800	+4290	+95.1%
Queensborough Bridge	7570	11000	+3430	+45.3%
Total	**21050**	**37400**	**+16350**	**+77.7%**

Harlem River 'Free' Bridges, AM – To Manhattan

Similarly, at the nine Harlem River Bridges, capacities have been overestimated by a factor of nearly three.

Table II. 5 Harlem River "Free" Bridges, AM – To Manhattan

	A.M. Traffic (To Manhattan)				
Facility	NYCDOT	Combined Total	DEIS	Difference	% Difference
Willis Avenue Bridge	---	3715	8800	+5085	+136.9%
Third Avenue Bridge	3715				
Madison Avenue Bridge	1610	4505	13200	+8695	+193.0%
145th Street Bridge	1325				
Macombs Dam Bridge	1570				
Washington Bridge	1350	1350	6600	+5250	+388.9%
Alexander Hamilton Bridge	3980	3980	8800	+4820	+121.1%
University Heights Bridge	1605	2980	11000	+8020	+269.1%
Broadway Bridge	1375				
Total	**16530**		**48400**	**+31870**	**+192.8%**

Harlem River 'Free' Bridges, PM – From Manhattan

Outbound capacities at the Harlem River bridges have been over-estimated by a factor of two.

Table II. 6 Harlem River "Free" Bridges, PM – From Manhattan

	P.M. (From Manhattan)				
Facility	NYCDOT	Combined Total	DEIS	Difference	% Difference
Willis Avenue Bridge	5430	5430	8800	+3370	+62.1%
Third Avenue Bridge	---				
Madison Avenue Bridge	1680	5270	13200	+7930	+150.5%
145th Street Bridge	1560				
Macombs Dam Bridge	2030				
Washington Bridge	3130	3130	6600	+3470	+110.9%
Alexander Hamilton Bridge	6260	6260	8800	+2540	+40.6%
University Heights Bridge	1550	3370	11000	+7630	+226.4%
Broadway Bridge	1820				
Total	**23460**		**48400**	**+24940**	**+106.3%**

Tolled Crossing Bridges and Tunnels, AM – To Manhattan

The capacities for the 'tolled' facilities could not be reached even if all toll plazas were removed. A reasonable lane capacity at the tunnels is about 1,600 vehicles per hour, and at the bridges 1,700 vehicles per hour. The DGEIS overestimates capacity of these crossings by over 87%.

Table II. 7 Tolled Crossing Bridges and Tunnels, AM – To Manhattan

	A.M. Traffic (To Manhattan)			
Facility	*Estimated Capacity 2004	DEIS	Difference	% Difference
Battery Tunnel	4800	6600	+1800	+37.5%
Midtown Tunnel	4800	6600	+1800	+37.5%
Triborough Bridge	5100	8800	+3700	+72.5%
Henry Hudson Bridge	6800	8800	+2000	+29.4%
George Washington Bridge	11900	15400	+3500	+29.4%
Lincoln Tunnel	6400	8800	+2400	+37.5%
Holland Tunnel	3200	4400	+1200	+37.5%
Total	**43000**	**59400**	**+16400**	**+38.1%**
Total AM Inbound Traffic	***78660***	***147400***	***68740***	***87.4%***

*The estimated capacity is maximum achievable with no tolls

Tolled Crossing Bridges and Tunnels, PM – From Manhattan

The DGEIS overestimates the capacity of this direction by over 64%.

Table II. 8 Tolled Crossing Bridges and Tunnels, PM – From Manhattan

	P.M. Traffic (From Manhattan)			
Facility	*Estimated 2004 Capacities	DEIS	Difference	% Difference
Battery Tunnel	3200	4400	+1200	+37.5%
Midtown Tunnel	3200	4400	+1200	+37.5%
Triborough Bridge	6800	8800	+2000	+29.4%
Henry Hudson Bridge	5100	6600	+1500	+29.4%
George Washington Bridge	11900	15400	+3500	+29.4%
Lincoln Tunnel	6400	8800	+2400	+37.5%
Holland Tunnel	3200	4400	+1200	+37.5%
Total	**39800**	**52800**	+13000	+32.7%
Total PM Outbound Traffic	***84310***	***138600***	***+54290***	***+64.4%***

*The estimated capacity is maximum achievable with no tolls.

M. Impacts on Vital City Operations

The DGEIS fails to consider the effect of the action on a number of facilities and municipal operations that are critical to the functioning of the City's commercial core and neighborhoods, including the following:

- There is no assessment in the peak hour analysis of how gridlock conditions in Midtown will effect the response time of police, fire and other emergency response vehicles, including ambulances.
- There is no analysis of the impact of relocating the Federal Express Facility on 34th Street between 10th and 11th Avenues to another location. This facility provides an essential service to the central Midtown business district. No Manhattan location has been identified for a replacement facility. The likely result will be a relocation of the facility to a New Jersey to a site closer to the Newark Airport. There is no analysis of how substantial numbers of FedEx vehicles crossing the Hudson River during the morning rush hour would affect traffic conditions.

- There is no analysis of where the buses now parked on the lot between 29th and 30th Streets along West Street would be parked when they are displaced by new uses.
-

N. Transit Impacts

- The DGEIS fails to adequately disclose the capacity and impacts of the proposed action on the transit system. In particular, there is no accurate assessment of the cost and extent of the enhancement to Sunday afternoon mass transit service necessary to accommodate Jets fans attending a game. Significant investments would be required for subway, commuter rail, bus and ferry service. Chapter V of this report details the many defects in the DGEIS transit analysis

Evaluation of Errors and Omissions

Taken together, these major errors and omissions strike to the heart of whether this DGEIS is adequate for review and adequate for public evaluation. The fundamental errors and omissions outlined above do not balance high side versus low side. Together they all serve to reduce the magnitude of the impact. The DGEIS does not disclose the true impacts and does not describe a reasonable worst case.

This is not a document from which a reasonable decision can be made. This is not a document that describes the true picture of what will occur if the Plan goes through.

The remainder of this report uses the data assembled to paint a more realistic picture of what the Project's impacts and how it would affect the lives of New Yorkers.

III. Transportation Characteristics of the Proposed Development Program

The proposed development program includes 29 million square feet of new office space; 12,600 housing units; expansion of the Javits Convention Center to include construction of more than one million square feet of new exhibition space, meeting rooms, banquet halls, and other facilities; development of a new headquarters hotel with up to approximately 1,500 rooms; a new Multi-Use Facility with approximately 30,000 square feet of permanent meeting room space and the capability to convert into a number of different uses and configurations, including a stadium configuration with a seating capacity of approximately 75,000 (the new home for the New York Jets Football Team) that can be converted to an exposition configuration including 180,000 square feet of exhibition space or a plenary hall configuration that provides a maximum seating capacity of approximately 40,000.

During the weekday peak hours, according to the DGEIS, some 7,250 peak hour trips are generated by the development with little or no traffic generated by the Convention Center or the proposed stadium. According to the DGEIS, during the evening peak hour, the convention center is estimated to add only 30 new trips even though the projected attendance will increase in excess of 50%.

The DGEIS used the 85th Percentile as the basis to establish the reasonable worst-case scenario for estimating the traffic generation of event traffic for Madison Square Garden, the Javits Convention Center and the proposed Jets Stadium. At first blush, this seems reasonable as traffic engineers typically project future traffic based upon the 30th highest hour of traffic or the 85th percentile traffic volume. This is usually acceptable from an economics of construction point of view but not from a point of view of an event planner. For example, The Knicks and Rangers – and the Jets typically sell out. Yet the DGEIS discounts a Jets game attendance to 70,000 from 75,000. While 5,000 fans may not seem significant, it is when considering the Javits Center where the largest current event has an attendance of 95,000 yet the 85th percentile event has a 28,000 person attendance. Reviewing the venues in some detail, it will be shown that the DGEIS fails to provide a reasonable worst-case scenario as it purports to do.

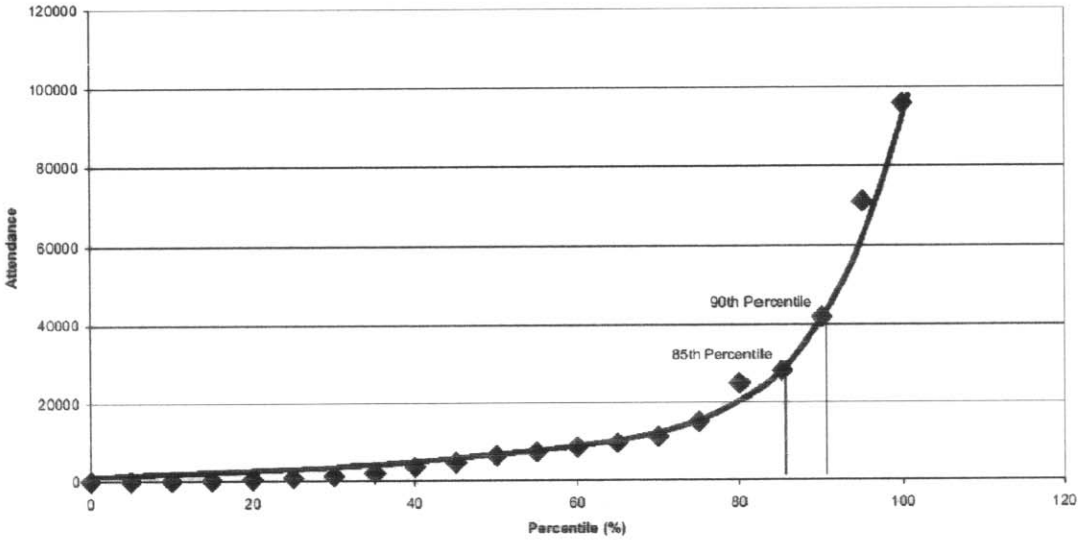
A. Convention Center Expansion

Currently of the 365 events[2] analyzed by the DGEIS at the existing convention center, the 85th percentile event for the calendar year of 1999 would have an attendance of 28,233. Of the 36 events with an attendance greater than that event, it is noted that Event No. 1 had an attendance over 95,700. When planning for parking demand (unlike traffic demand), the most commonly used reasonable worst case is the 90th percentile – typically used in Shopping Center studies to represent the Christmas shopping season and in office buildings to represent the ratio of parking demand to floor area[3]. The reason the 90th percentile parking demand was selected was not economic; rather, it was based upon the

[2] Appendix S.1, October 24, 2003 Memorandum from E. Metzger. Convention Center Expansion Transportation Planning Assumptions, Table 1, Ranked Daily Attendance of 1999 Convention Center Events, October 24, 2003 Memorandum from E. Metzger.
[3] ULI – the Urban Land Institute, Shared Parking, Washington, D.C., 1983, pp 13, 16, 17.

ability of a patron or office worker to find a parking space. It does not represent the maximum parking demand but it represents a reasonable worst case for parking. The 90th percentile demand level describes the condition in which a motorist attempting to find a parking space does not find a space immediately upon arrival. ORA believes that the 90th percentile attendance should be used to assess event attendance.

Figure III.1 – Percentile Analysis for Javits Center



Sunday will be a key day to assess cumulative impacts of the proposed development plan for Hudson Yards. On Sundays in 1999, there were 38 events. Of the 38 events, there were five public shows and 33 trade shows. The event with the greatest attendance was the International Auto Show, a public show. Sunday attendance was 81,056. The 85th percentile attendance was 36,041. The 90th percentile attendance was 43,113, not an insignificant increase of 20%.

The Boat Show, a public show that occurs over a two-weekend period during football season, attracts 67,000 people on a Saturday and 43,000 people on a Sunday. This event, one that is well attended would be a reasonable worst-case scenario. It is very close to the 90th percentile event for a Sunday. It should also be noted that on a Saturday, the 90th percentile event had an attendance of almost 37,000. The DGEIS reports two Saturday attendance figures for the Boat Show – 67,516 and 36,821. Again, the Boat Show, at the lower attendance, is very close to the 90th percentile show and at the upper attendance figure, is close to the 93rd percentile show.

When the 90th percentile attendance is factored to the future using the 63.8% growth factor, the projected design attendance becomes 70,619, an increase in attendance of over the projected 85th percentile design attendance in the DGEIS of 62,684 people, an increase of 13%.

On a weekday, there were 167 events, of which only 20 were public shows. The highest attendance was a public show, the PC Expo with an attendance of 62,126 people. The DGEIS establishes the 85th percentile attendance at 26,550 people. The 90th percentile attendance, however, would be 31,337 people, an increase of 4,787 people but still about

half of the highest attendance. If the 85th and 90th percentile attendance was projected to the future using the factor of 52.9%, the projected attendance is 43,107 and 47,914 people. The difference is about 4,800 people.

The use of the 90th percentile design event as the reasonable worst-case scenario represents a solid foundation to design the required parking and attendance. It is based upon how commercial sites are actually designed for the people that use and expect a reasonably convenient use of the site. In the case of the Javits, the 90th percentile mirrors the Boat Show and the characteristics of that show should have been considered as the design show.

B. Madison Square Garden

Madison Square Garden (MSG) hosts the New York Knicks and the New York Rangers. It serves as a home to the Ringling Brothers circus and many concerts shows and Christmas events. During the summer, it also is home to the New York Liberty. In 2003 and early 2004, surveys were conducted of MSG patrons, who were asked about their mode of travel to and from MSG. Ten (10) interviewers per event conducted the intercepts and completed at least 50 interviews each. A total of 5,046 interviews were conducted at nine events between March 16, 2003 and February 22, 2004. An industry standard of a 4.4% margin of error for a sample of approximately 500 was achieved by each individual event survey. All margins of error fell within the acceptable ranges for surveys of this type. For this sample of approximately 500 surveyed attendees per event, the accuracy is within $\pm$ 4.1% at a 95% Confidence Level. The findings were compiled in a report prepared by the Sam Schwartz Company, LLC[4]. This report represents the statistically strongest set of data that Orth-Rodgers & Associates, Inc. has worked with in this subject area. The DGEIS did not use this data even though it is the most accurate and relevant data available for use in predicting the modal split for a Jets game.

The results of these interviews lead to the conclusions in the paragraphs below.

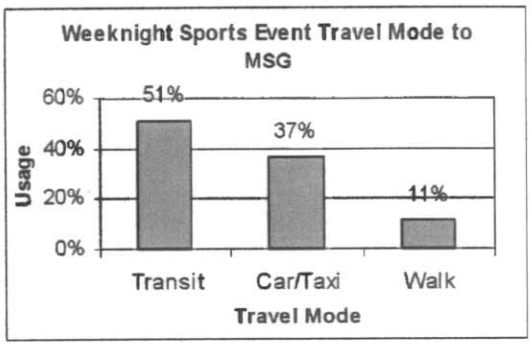
1. Mode of Travel to MSG

How the patrons of Madison Square Garden arrive and depart the venue is instructive when considering the proposed Jets Stadium.

Surveys at two of the Rangers games took place on weekday evenings (Wednesday, March 26, 2003 at 7:30 pm against the Pittsburgh Penguins and Friday, April 4, 2003 at 7:30 pm against the New Jersey Devils), and one took place on a Sunday (November 23, 2003 at 5:00 pm against the Ottawa Senators). Knicks surveys were performed on two Sundays (March 16, 2003 at 7:00 pm against the Milwaukee Bucks and February 22, 2004 at 1:00 pm against the Cleveland Cavaliers) and on two weekday evenings (Monday, March 24, 2003 at 7:30 pm against the Toronto Raptors and Friday, March 28, 2003 at 8:00 pm against the New Jersey Nets). The circus survey was conducted on a Saturday afternoon (March 29, 2003 at 3:30 pm) and the concert survey occurred on a weekday evening (Tuesday, May 20, 2003 at 8:00 pm).

[4] Sam Schwartz Company, LLC, Madison Square Garden Modal Split Analysis, June 22, 2004. Permission was received from the authors and MSG to excerpt extensively from the text.

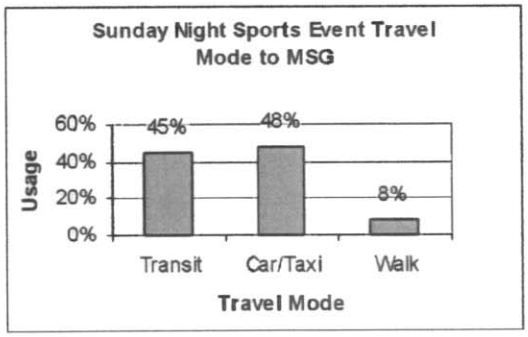
Figure III.2 – Weeknight Travel Mode to MSG



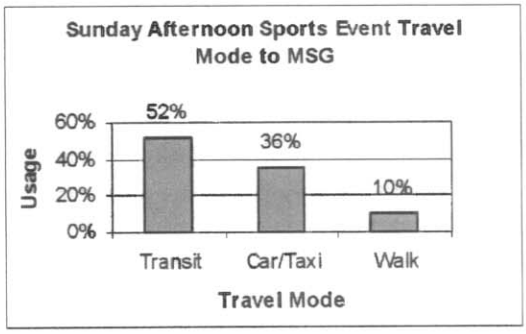
Sample size: 2,318[5]

At a Sunday night event, transit usage drops to 45%, while car/taxi usage rises to 48%, and walking comprises 8%. At a Sunday afternoon event, transit usage increases to 52%, while car/taxi usage drops to 36%, and walking comprises 10%.

Figure III.3 – Sunday Travel Mode to MSG



Sample size: 1,049

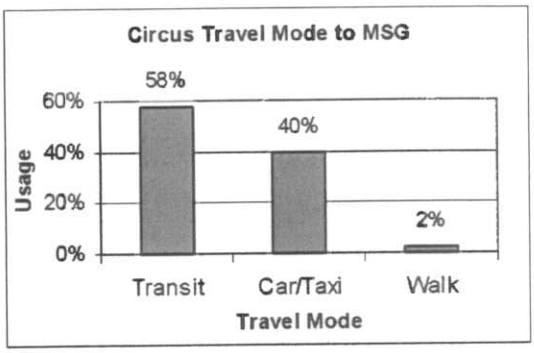


Sample size: 622

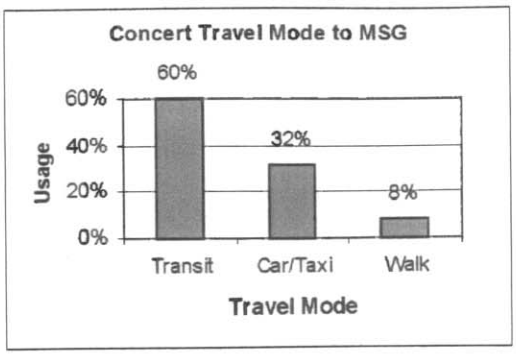
At non-sports events, the circus and concert drew the most people by transit (59%) and, in the case of the circus, a high number by car (40%). This seeming contradiction is explained by the fact that almost no one, just 2%, walked to the circus. The concert has just under a third arriving by car/taxi.

[5] Totals will not add to 100% due to rounding.

Figure III.4 – Circus Travel Mode to MSG



Sample size: 527



Sample size: 530

MSG attendees average a 52% transit share to all events. Public transit was the most popular mode of travel to MSG at every event except a weekend evening Knicks game (March 16, 2003). The Knicks average transit use on weeknights is 50%, Rangers fans average 53%, and concert attendees average 60%. On average, 22% of event attendees used the subway system to travel to MSG, 12% used the Long Island Rail Road, 9% used New Jersey Transit, 4% used Metro North Rail Road, and 3% used PATH trains. Significant portions of weekday event attendees walk directly to MSG. An average of 13% of Knicks fans walk to weeknight events, 10% of Rangers fans, and 8% of concert attendees. Just 2% of circus goers walked to the event.

Less than half of all weeknight event attendees use private vehicles or taxis for transportation to and from MSG. However, private automobile and taxi usage was highest for weekend sporting events. The only surveyed event that drew a minority of transit users was a Sunday evening Knicks game (March 16, 2003) that had a transit usage of 40% and a private automobile/taxi usage rate of 51%. In contrast, weekday Knicks games average 37% automobile usage. It is likely that higher rate of attendees arriving at MSG directly from their workplaces in Manhattan on weekdays account for the higher transit share for the weekday evening Knicks games.

Table III.1 Modal Split Breakdown by Event and Time of Day

TRAVEL MODE				Sample Size	Margin of Error (+/-)	Transit	Walk	Car/Taxi	Other
Rangers	Wednesday	7:30 pm	3/26/2003	569	4.1%	51%	12%	36%	1%
	Friday	7:30 pm	4/4/2003	597	4.0%	54%	8%	37%	1%
	Sunday	5:00 pm	11/23/2003	595	4.0%	50%	5%	44%	2%
Knicks	Monday	7:30 pm	3/24/2003	566	4.1%	50%	13%	36%	1%
	Friday	8:00 pm	3/28/2003	586	4.0%	50%	12%	38%	0%
	Sunday	7:00 pm	3/16/2003	454	4.6%	40%	10%	51%	0%
	Sunday	1:00 pm	2/22/2004	622	3.9%	52%	10%	36%	2%
Circus	Saturday	3:30 pm	3/29/2003	527	4.3%	58%	2%	40%	1%
Concert	Tuesday	8:00 pm	5/20/2003	530	4.3%	60%	8%	32%	1%
Overall Average				561	4.1%	52%	9%	39%	1%

Slightly more than 50% of Madison Square Garden patrons use public transit to arrive at the arena, making it the most common mode of travel. This is so for a number of reasons, the primary reason being MSG's unique and convenient location above

Pennsylvania Station, a major regional transit hub. However, the transit and auto/taxi shares tend to fluctuate based on the following factors: type of event, geographic origin of attendees, time of day, and weeknight/weekend event occurrence. Even with such good transit access, almost 40% of fans still use a car or taxi as their mode of travel to MSG. Given this long history of data, a reasonable conclusion would be that any major venue within a short distance and with similar event types would more than likely have a mode of arrival similar to Madison Square Garden.

2. Trip Origins of MSG Attendees

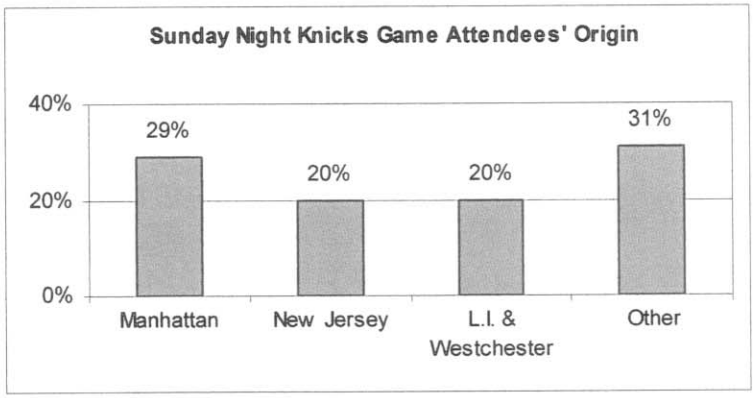
Weeknight Sports Events

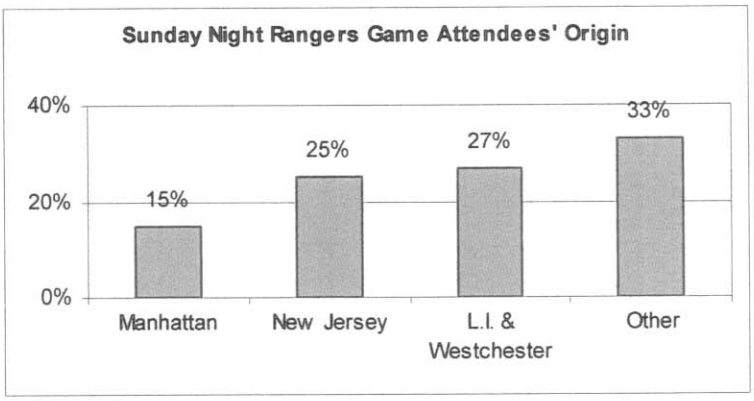
Over 40% of Knicks fans and about a third of Rangers fans come from Manhattan. After Manhattan, New Jersey is the single largest origin of trips with 15% of Knicks fans and 24% of Rangers fans crossing the Hudson River. More than half the sports fans are from New York City's five boroughs.

Sunday Sports Events

On a weekend night 29% of Knicks fans and 15% of Rangers fans come from Manhattan. One-fifth of Sunday night Knicks fans and more than one-fourth of Sunday Rangers fans come from New Jersey. Long Island and Westchester contribute another 20% of Knicks attendees and 27% of Rangers fans.

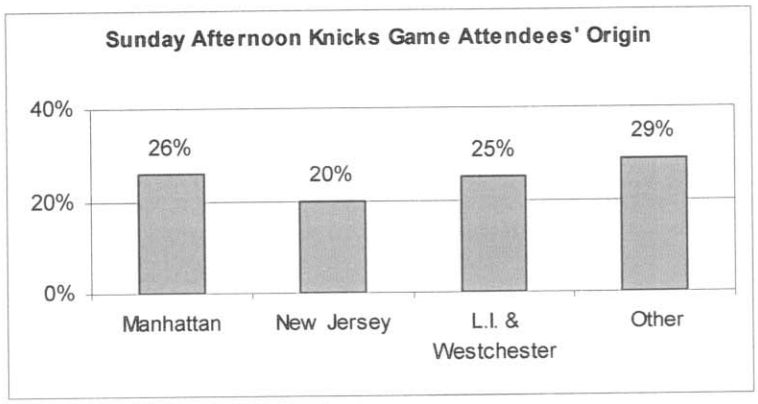
Figure III.5 – Sunday Night Sports Events Origin





During a Sunday afternoon game, 26% of Knicks fans come from Manhattan. Almost one-fifth of Sunday afternoon Knicks fans come from New Jersey. Long Island and Westchester contribute another 25% of Knicks attendees.

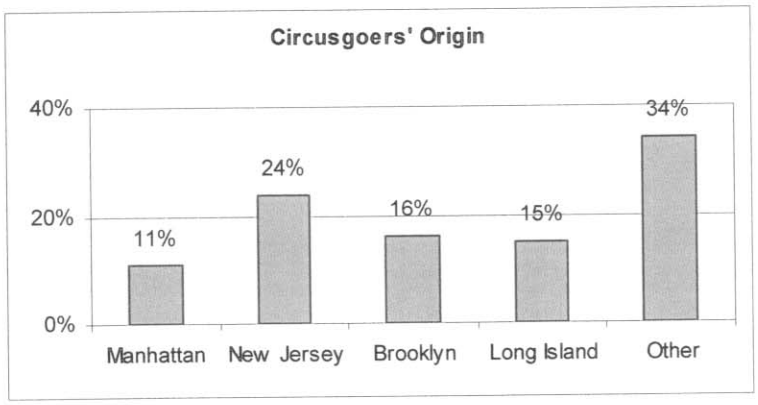
Figure III.6 – Sunday PM Sports Events Origin



Non-Sports Events

29% of concertgoers start out in Manhattan. Only 11% of circus goers originate in Manhattan. The single largest origin for circus goers is New Jersey with 24%. Brooklyn is second at 16% just ahead of Long Island with 15%.

Figure III.7 – Non-Sports Event Origins

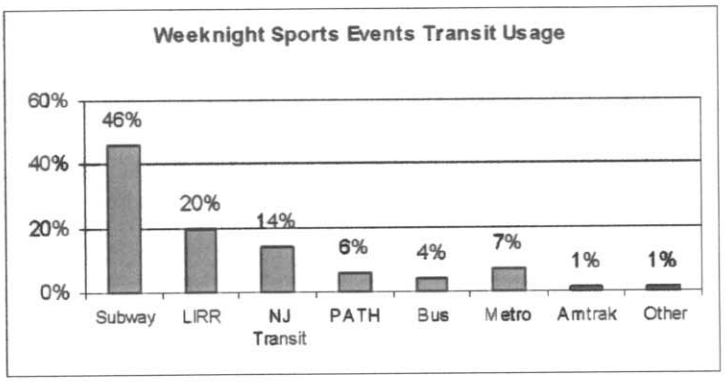


3. Transit Usage by MSG Attendees

Weeknight Sports Events

For those arriving by transit, 46% take the subway, 20% take the Long Island Railroad (LIRR), 14% take New Jersey Transit, 6% take Port Authority Trans-Hudson (PATH) trains, 4% take the bus, 7% take Metro-North, 1% take Amtrak and 1% take other transit.

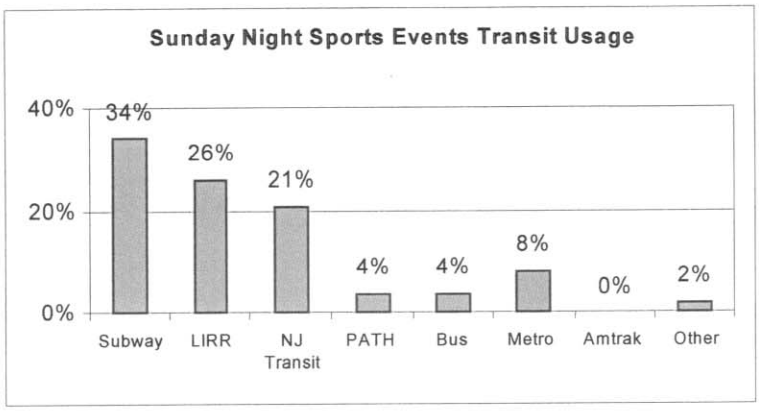
Figure III.8 – Weeknight Sports Events Transit Usage

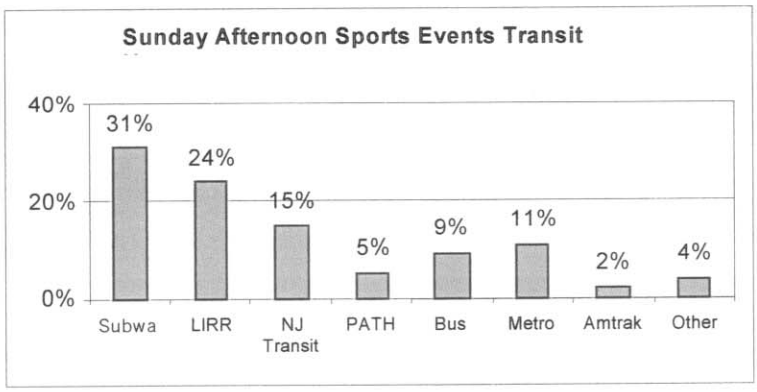


Sunday Sports Events

On Sunday nights, 34% of transit users take the subway to get to MSG, 26% use the LIRR, 21% take New Jersey Transit, 4% take PATH trains, 4% take the bus, 8% take Metro-North, 0% take Amtrak and 2% take other. During a Sunday afternoon event, 31% of transit users take the subway to get to MSG, 24% use the LIRR, 15% take New Jersey Transit, 5% take PATH trains, 9% take the bus, 11% take Metro-North, 2% take Amtrak and 4% take other.

Figure III.9 – Sunday Sports Events Transit Usage

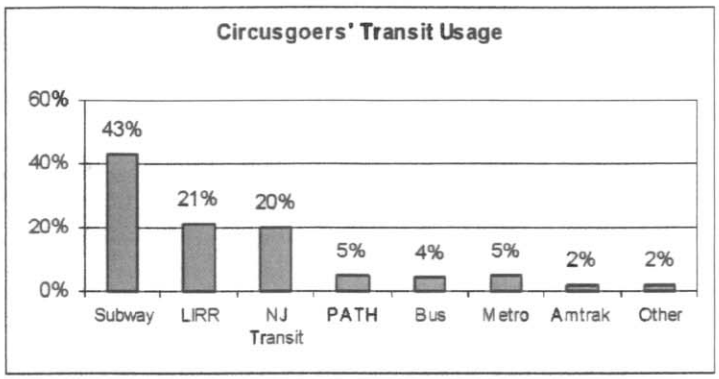


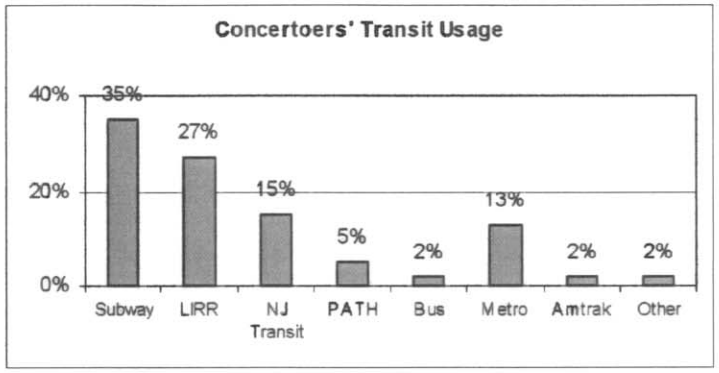


Non-Sports Events

Of Circus attendees, 43% of transit users use the subway, while 21% use the LIRR, 20% use New Jersey Transit, 5% use PATH trains, 4% take the bus, 5% take Metro-North, 2% take Amtrak and 2% take other. Concertgoers who use transit take the subway at a rate of 35%, the LIRR at a rate of 27%, New Jersey Transit at a rate of 15%, PATH trains at a rate of 5%, the bus at a rate of 2%, Metro-North at a rate of 13%, Amtrak at a rate of 2% and other at a rate of 2%.

Figure III.10 – Non-sport Events Transit Usage





4. Comparisons with Previous Studies

In 1987 there were three separate survey efforts conducted of MSG patrons. Vollmer, retained by MSG, conducted surveys as part of a study to consider relocating MSG, Parsons, Brinkerhoff, Quade and Douglas (PB) surveyed attendees on behalf of the Metropolitan Transportation Authority (MTA) in its analysis of potential uses for the West Side Rail Yards.

Vollmer surveyed three events in 1987: the "Cars" concert on Thursday, October 29 at 8:00 pm, a Knicks game against the Boston Celtics on Monday, November 9 at 7:30 pm, and a Rangers game against the New Jersey Devils on Tuesday, November 10 at 7:35 pm. Interviews were conducted before the event and during intermission.

Parsons Brinkerhoff surveyed six events in 1987: a "Squeeze" concert on a Friday night, two Knicks games (one weeknight game and weekend game), a weeknight tennis match, a weeknight wrestling match and a Sunday Rangers game.

MSG itself performed surveys on three events in 1987: a Saturday Knicks game, a Sunday Knicks game and a Sunday Rangers game. No weeknight events were analyzed. It should be noted that MSG's surveys were limited in nature and focused most often at Hall of Fame Box users.

Tables III.2 and III.3 summarize the results. The principal findings of those studies are as follows:

- Weeknight sports patrons in 2003-4 vs. 1987 used transit at similar levels to arrive at MSG: 50-53% in 2003-4 and 46-58% in 1987. Auto usage in 2003-4 was 37%; in 1987 it ranged from 39-44%.
- On weekends 46-50% of sports fans in 2003-4 used transit to go to MSG while in 1987 the range was 30-53%. Auto usage in 2003-4 was 44% while in 1987 it was 46-66%.
- In 2003-4, 60% of concertgoers used transit to arrive at MSG; transit rates were 51-60% in 1987.
- The highest transit share for any Sunday sports event was 53% reported by MSG in 1987 for a Knicks game. The highest car share was 66% reported by PB in 1987 for a Rangers game.
- On weeknights the highest transit share for a sports event was 58% reported by PB in 1987 for a Knicks game. The highest auto share on a weeknight was 44% reported by Vollmer in 1987.
- The surveys from the 1980's and the 2003-2004 show a remarkable consistency over time in the modal split for MSG patrons. They all record a significantly higher automobile share and a lower transit share than is projected in the DGEIS for fans going to Jets games.

Table III.2 Comparison Between 2003-04 and 1987 Surveys
Transit usage by attendees at an MSG event

Event	MSG 2003-4	Vollmer 1987	PB 1987	MSG 1987
Knicks Weeknight	50%	51%	58%	–*
Rangers Weeknight	53%	46%	–	–
Knicks Weekend	46%	–	46%	–
Knicks Sunday	46%	–	–	53%
Rangers Sunday	50%	–	30%	36%
Concert	60%	51%	60%	–

* Indicates that no survey was performed for such event.

Table III.3 Comparison Between 2003-4 and 1987 Surveys
Auto usage by attendees at an MSG event

Event	MSG 2003-4	Vollmer 1987	PB 1987	MSG 1987
Knicks Weeknight	37%	39%	29%	–*
Rangers Weeknight	37%	44%	–	–
Knicks Weekend	44%	–	48%	–
Knicks Sunday	44%	–	–	46%
Rangers Sunday	44%	–	66%	57%
Concert	32%	42%	35%	–

* Indicates that no survey was performed for such event.

5. Vehicle Occupancy

The most relevant source for an analysis of vehicle occupancy are those from a nearby sports venue with similar characteristics – a sports event at MSG.

The average vehicle occupancy for the Knicks is 2.24 persons per vehicle and the average for the Rangers is 2.54 persons per vehicle. The highest vehicle occupancy is on a Sunday for both the Knicks and the Rangers at 2.76 persons per vehicle. These numbers are all significantly less than the 3.0 vehicle occupancy rate used in the DGEIS.

Table III.4 Vehicle Occupancy Rates by Event

Event	Date / Time			Total Attendance	% of Users	Total Users	Average Occupancy	Estimated Vehicles
Rangers	Wed	7:30 pm	3/26/2003	18,284	36%	6,582	2.40	2,745
	Fri	7:30 pm	4/4/2003	18,283	37%	6,765	2.48	2,731
	Sun	5:00 pm	11/23/2003	19,605	44%	8,626	2.76	3,121
Knicks	Mon	7:30 pm	3/24/2003	19,074	36%	6,867	1.85	3,708
	Fri	8:00 pm	3/28/2003	20,003	38%	7,601	2.17	3,499
	Sun	7:00 pm	3/16/2003	19,605	51%	9,999	2.76	3,624
	Sun	1:00 pm	2/22/2004	18,581	36%	6,689	2.19	3,055
Circus	Sat	3:30 pm	3/29/2003	12,802	40%	5,121	3.72	1,377
Concert	Tue	8:00 pm	5/20/2003	20,000	32%	6,400	2.46	2,599

*Taxi and limo drivers are not factored into vehicle occupancy rates.

C. Multi-Use Facility – The Jets Stadium

The Modal Split, or the how Jets fans will arrive at the proposed Multi-Use Facility is a key element in the DGEIS. The DGEIS relies upon two telephone surveys of Jets season ticket holders in which 600 fans were asked how they would travel to a game at a stadium to be located at a West Midtown Manhattan site. The DGEIS does not provide a copy of the survey instrument or the "cross tabulations" so that ORA could not independently analyze the surveys.

The surveys conducted for the DGEIS inquired as to what someone *would* do several years hence. The DGEIS discounts all other evidence as not applicable – including the far more extensive surveys of attendees at events at Madison Square Garden that inquired as to how attendees *actually* traveled to the facility.

The best data for planning a new venue near an existing venue is to use the existing venue as a starting point in the analysis. The multiple surveys conducted for nine events at MSG between March 2003 and February 2004 include, among the events surveyed three sporting events on Sunday. The results told a consistent story of how people traveled to MSG:

- For a weeknight sports event – by transit – 37%
- For a Sunday afternoon sports event – by transit – 52%

- For a Sunday evening sports event – by transit – 45%
- Even non-sports events registered transit arrivals at 59% for the circus and at 60% for a concert.

Despite this base of knowledge, the DGEIS assumed a transit arrival rate of 70% -- 18% higher than a Sunday afternoon sports event at MSG, the highest transit percentage of an event at MSG. The DGEIS simply ignores the fact that MSG sits immediately atop one of the busiest transit hubs in the country. For many years after it opens, and until the No. 7 Line is extended, the proposed Jets Stadium will be one half mile away from the nearest public transportation hub – Penn Station. It is only logical that a stadium one half mile away from a major transit hub would not generate a higher percentage of transit ridership than an arena located atop the transit hub. In fact common sense should dictate a significantly lower transit ridership rate.

In the face of this evidence, the DGEIS then projects an increase to 80% transit usage after the No. 7 Line is extended to a point adjacent to the Multi-Purpose Facility. It should be noted that the stadium would be open years in advance of the No. 7 Line Extension. Similar transit projects in New York City take years, if not decades to construct. The Second Avenue Subway is a prime example, having been on the drawing boards for more than two decades. The construction documents for the No. 7 Line Extension have not even been started and even when they are, the design process is long and arduous. Similarly, the actual construction would take years. The staging of the construction must minimize disruption to New Yorkers and this typically adds years to the construction effort.

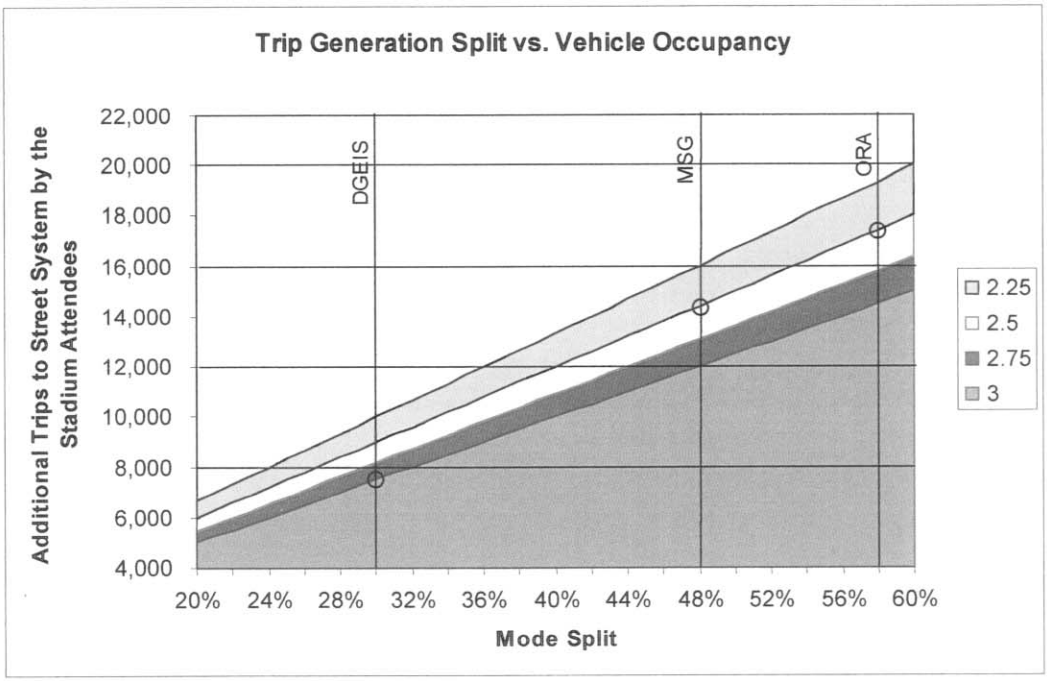
While it is fair to argue that there is no other city in the world like New York City and that the "transit mentality" of New Yorkers may be unique in the U. S., it is instructive to look at the experience of stadiums within other large cities. Table III.5 illustrates the experience of other cities. As noted earlier, ORA staff contacted many of the venues in the DGEIS and found that the data in the DGEIS for several of the venues to be old or incorrect. Accordingly, this table contains only the results that are up to date and verified. None of the venues in the table have approached the modal split estimates in the DGEIS and few have approached the modal splits actually experienced by Madison Square Garden.

Table III.5 Modal Split in Other Cities for Sports Venues

Team	Facility	Capacity	Modal Split	Data Source
Baltimore Ravens	M&T Bank Stadium	68,915	13% to 16% (transit)	Rich Sollin from Maryland Transit Administration
Atlanta Falcons	Georgia Dome	71,228	25% (transit)	George Saunders @ MARTA – (404) 848-5188
Cincinnati Bengals	Paul Brown Stadium	60,389	4% (transit)	EWT Jets Study
Cleveland Browns	Cleveland Browns Stadium	72,000	17% (transit) 83% (auto)	EWT Jets Study, Regional Transportation Study
Pittsburgh Steelers	Heinz Field	65,000	14% (transit)	EWT Jets Study
Seattle Seahawks	Qwest Field	67,000	18% (transit) 2002 Sunday noon game: 20% (transit) 80% (auto)	Mobilizing The Region Issue 464, June 28, 2004, EWT Jets Study Seattle DOT, Transportation Solutions Incorporated
Philadelphia Eagles	Lincoln Financial Field	68,532	15% (transit)	EWT Jets Study
Oakland Raiders	Network Coliseum	63,026	18-25% (transit)	BART, Metropolitan Transportation Commission
Boston Red Sox	Fenway Park	34,218	20% (transit)	MBTA
New England Patriots	Gillette Stadium	68,000	0.6% (transit)	MBTA
San Francisco Giants	SBC Park	41,059	52% (transit) 46% (auto)	Mobilizing The Region Issue 464, June 28, 2004
St. Louis Cardinals	Busch Stadium	50,000	14.3% (transit)	Dave Beal @ METRO (314) 982-1400 x 1535
St. Louis Rams	Trans World Dome	65,321	22.5% (transit)	National Association of Regional Councils "Bi-State Development Agency Metro link Light Rail System"
Toronto Blue Jays	Skydome	51,500	28% (transit0 72% (auto)	David Kauffman @Works and Emergency Services (416) 397-9292
Toronto Maple Leafs	Air Canada Centre	18,800	30% (transit) 70% (auto)	David Kauffman @Works and Emergency Services (416) 397-9292
US Open	Arthur Ashe Stadium	22,547	44.8% (transit) 41% (auto) 1.3% (rental car) 12.9% (taxi/limo)	Mobilizing The Region Issue 464, June 28, 2004
New York Mets	Shea Stadium	55,601	16-17% (transit) 14% (transit) 82% (auto)	Mobilizing The Region Issue 464, June28, 2004, Mets EIS1996 Mets Patron Modal Split
New York Yankees	Yankee Stadium	57,545	30% (transit)	Mobilizing The Region Issue 464, June 28, 2004
New York Jets/Giants	Giants Stadium	80,242	4% (transit)	EWT Jets Study
New York Knicks/Rangers	Madison Square Garden	19,763/ 18,200	50% (transit) 40% (auto/taxi) 10% (walk)	SSC Madison Square Garden Modal Split Study, 2004

The proposed stadium is to be constructed one half mile from Penn Station. This means that the modal split would be *lower* by about the difference the DGEIS claims for the *improvement* in transit ridership of the No. 7 Line Extension. In short, it is the opinion of Orth-Rodgers & Associates, Inc. that 42% of the Jets fans (approx. 10% less than Knicks or Rangers fans) would take public transportation to the game, not 70%. This means that about 58% of the fans will arrive by car with a modal split of 2.5 persons per vehicle – about what the Knicks and Rangers fans average. In short, the number of vehicles on the streets of Manhattan will be about 17,400 vehicles – more than twice the number of vehicles projected in the DGEIS.

Figure III.11 – Parking Demand-Mode Split and Vehicle Occupancy



The figure shows that a one percent change in modal split causes a 250-vehicle change in trip generation. If the vehicle occupancy is changed from 3.0 to 2.75, an additional 682 spaces are required and a change to 2.5 vehicle occupancy from 3.0 persons per vehicle causes a 1,500 vehicle change. It is no wonder why the project sponsors chose an overly optimistic set of traffic characteristics unmatched by another arena for the analysis. Even a small change in modal split or in vehicle occupancy has a dramatic impact on how many vehicles come to the proposed stadium. Failure to examine the impact of the a range of modal splits and vehicle occupancies is a major omission that, as seen in the subsequent chapters, hides the actual impact of the proposed stadium.

IV. Street Traffic Analysis

The data used for the traffic analysis was either collected by the DGEIS team in June and July of 2003 or data from the Far West Midtown Transportation Study and was collected during November 2000. Some data was collected between January and March 2001. The DGEIS corrects this data to 2003 and collects Sunday during data during June 2003 at some 50 intersections.

A. Peak Periods Analyzed

The DGEIS analyzed four weekday peak periods – AM (8:00 AM to 9:00 AM), Midday (Noon to 1:00 PM), PM 5:00 PM to 6:00 PM) and Weeknight Special Event (8:00 PM to 9:00 PM). In addition, a Sunday Special Event Peak (4:00 PM to 5:00 PM) was also analyzed. The Sunday peak was chosen as the end or the beginning of a Jets game. It also coincides with the beginning of either a Knicks or a Rangers game and exiting activity at the Javits Convention Center. For the purposes of this review, two cases were examined in detail – the weekday PM peak hour and the Sunday Event Peak.

The purpose of performing this work was to determine the extent of the traffic impact on the network of the proposed development program. During weekday and weekend field reviews of the study area, there were numerous long back-ups of traffic not noted in the traffic analysis in the DGEIS. For example, during a Sunday afternoon field view, southbound backups extending several blocks on West Avenue (12th Avenue) were observed from 34th Street. In addition, 34th Street was congested between 6th Avenue and 10th Avenue in the eastbound direction. 42nd Street was congested between Times Square and 11th Avenue in both directions. In the cases of 34th and 42nd Streets, the causes were not just the amount of traffic but the presence of pedestrians, a fact not acknowledged in the DGEIS. Where there were mid-block entrances to parking facilities, access was by means of "courtesy" gaps. A courtesy gap occurs when another motorist stops and permits a motorist to enter the traffic stream.

On the Avenues, 11th Avenue and 10th Avenue were congested in the vicinity of 34th Street. The short blocks and friction from the parked vehicles reduced the capacity of the lanes adjacent to the curbs – also a fact not acknowledged in the DGEIS.

B. Background Growth Rate

In working with the counted volumes and assessing the background growth rate, it is noted that there are inconsistencies as to how the background growth rate was applied. These inconsistencies manifest in two ways. First, the rate is calculated incorrectly. Rather than applying the 0.5% annual growth rate by compounding it to 2025, the authors compounded it to 2010 and then rounded it off before continuing the growth to 2025. The net result is a difference in the net growth rate of 0.3%. This may appear to be small but the error reduces traffic by 25 vehicles for every 1,000 vehicles on the streets.

C. Hudson River Crossings

One of the key approach routes to the study area is the Lincoln Tunnel. The river crossing numbers in the DDGEIS are not up-to-date. For some unknown reason the DGEIS used 1998 Manhattan River Crossing data from the New York City Department of Transportation when the 2000 report had been available since July of 2001 (New York City Bridge Traffic Volumes 2000).

Had more up-to-date numbers been used, the analysis would have found a significant increase at the Hudson River Crossings during the critical time periods; weeknight peak inbound and P.M. peak outbound.

Table IV.1 Weeknight Peak Inbound Hudson River Crossings

Facility	1998	2000	Difference	%Difference
George Washington Bridge	5,597	5,598	1	0.018%
Lincoln Tunnel	1,911	2,292	381	19.9%
Holland Tunnel	1,854	2,151	297	16.0%
Total	9,362	10,041	679	7.3%

During the weeknight peak 7.3% more vehicles entered Manhattan in 2000 than 1998 for a total of 679 vehicles. However, a review of the Lincoln Tunnel in isolation reveals almost a 20% difference.

Table IV.2 PM Peak Outbound Hudson River Crossings

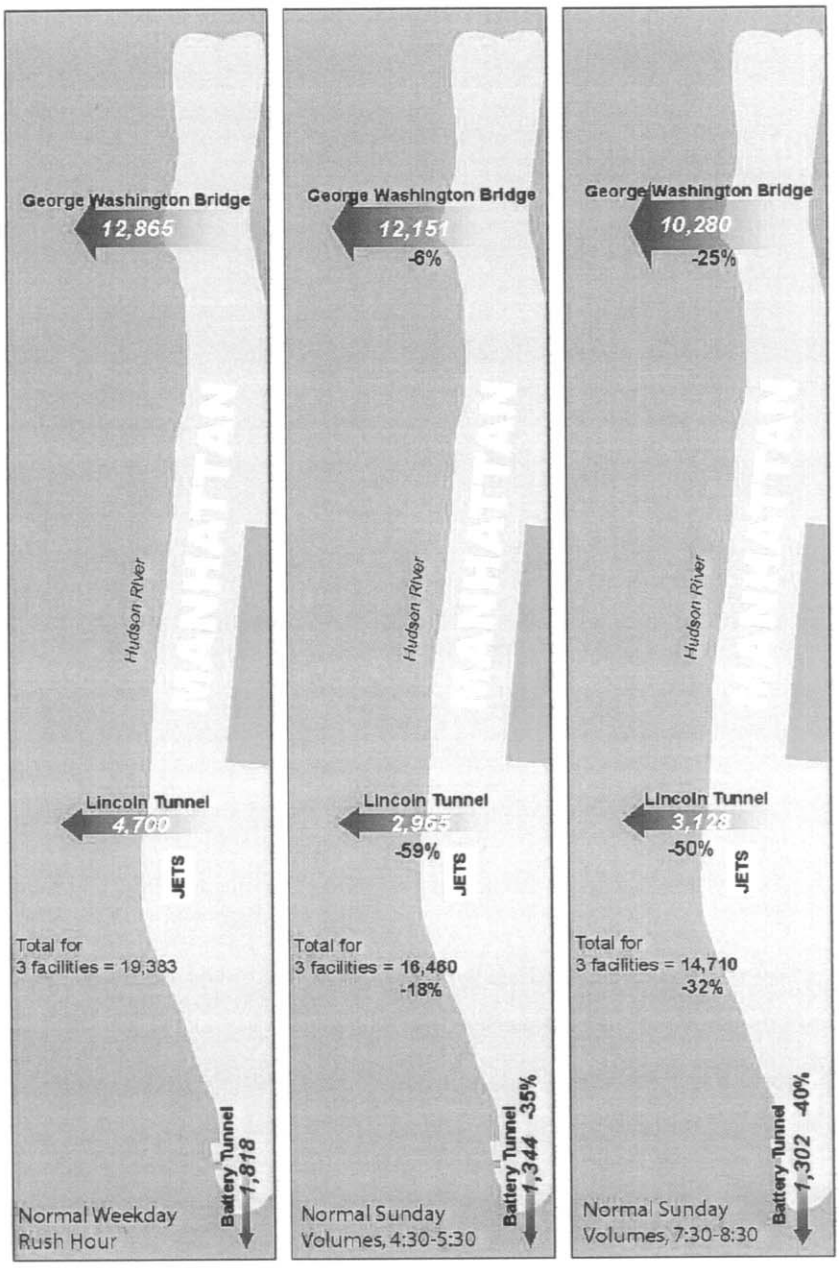
Facility	1998	2000	Difference	%Difference
George Washington Bridge	10,774	12,636	+1,862	+17.3%
Lincoln Tunnel	5,020	5,545	+525	+10.5%
Holland Tunnel	2,901	2,828	-73	2.5%
Total	18,695	21,009	+2,314	+12.4%

As shown above, outbound flow during the P.M. peak was 12.4% higher in 2000 than 1998 with 2,314 more vehicles crossing the Hudson River.

D. Impacts on River Crossings

The Jets Study only depicted volumes at three facilities: the George Washington Bridge (GWB), the Lincoln Tunnel and the Brooklyn Battery Tunnel (BBT) are estimated to carry 1,680 vehicles per hour (vph), 1,280 vph, and 800 vph, respectively. Shown below are typical weekday rush hour volumes and the existing Sunday traffic volumes for the likely post-game peak hours.

Figure IV.1 – Normal Weekday Existing Rush Hour vs. Normal Sunday Volumes 4:30-5:30 pm and 7:30-8:30 pm



However, even if the Jets' numbers were used and 90% of all vehicles were assigned to a one-hour period post-game, traffic demand at the river crossings (with the exception of the Lincoln Tunnel during both periods and the Brooklyn Battery Tunnel from 4:30 pm to 5:30 pm) would exceed the weekday peak hour by thousands of vehicles, translating into long queues of vehicles waiting to get to the tunnels or bridge (see Tables IV.3 and IV.4).

Table IV.3 Volumes at River Crossings for Sunday Westside Jets Games Ending at 4 pm (4:30-5:30 pm) - vehicles/hour

Facility	Weekday Rush Hour Volumes	Existing Sunday Volumes	Jets Estimated Vehicles	Total (Jets & Sunday Volumes)	Difference
GW Bridge	12,865	12,151	1,680	13,831	+966
Lincoln Tunnel	4,700	2,965	1,280	4,245	-455
Brooklyn Battery Tunnel	1,818	1,344	800	2,144	+326

Table IV.4 Volumes at River Crossings for Sunday Westside Jets Games Ending at 7 pm (7:30-8:30 pm) - vehicles/hour

Facility	Weekday Rush Hour Volumes	Existing Sunday Volumes	Jets Estimated Vehicles	Total (Jets & Sunday Volumes)	Difference
GW Bridge	12,865	10,280	1,680	11,960	-905
Lincoln Tunnel	4,700	3,128	1,280	4,408	-292
Brooklyn Battery Tunnel	1,818	1,302	800	2,102	+284

If MSG traffic characteristics were applied, using a 2.19 vehicle occupancy and 36% auto use rate for a Jets' game ending at 4 pm and a 2.76 vehicle occupancy and 48% auto use rate for a Jets' game ending at 7 pm, the peak hour demand at the GW Bridge would exceed weekday rush hour traffic by 2,006 vph from 4:30 to 5:30 pm and 293 vph from 7:30 and 8:30 pm. Game day volumes at the Lincoln Tunnel and BBT would exceed rush hour volumes by three hundred vehicles or more for both periods. In addition, construction activities usually reserved for weekends would further reduce capacity at critical crossings.

Table IV.5 Volumes at River Crossings for Sunday Westside Jets Games Ending at 4 pm (4:30-5:30 pm) - vehicles/hour (MSG Estimates)

Facility	Weekday Rush Hour	Existing Sunday Volumes	ORA Estimated Vehicles	Total (ORA & Sunday Volumes)	Difference
GW Bridge	12,865	12,151	3,835	15,986	+3,121
Lincoln Tunnel	4,700	2,965	2,921	5886	+1,186
Brooklyn Battery Tunnel	1,818	1,344	1,825	3,169	+1,351

Table IV.6 Volumes at River Crossings for Sunday Westside Jets Games Ending at 7 pm (7:30-8:30 pm) - vehicles/hour (MSG Estimates)

Facility	Weekday Rush Hour	Existing Sunday Volumes	ORA Estimate Vehicles	Total (ORA & Sunday Volumes)	Difference
GW Bridge	12,865	10,280	3,828	14,108	+1,243
Lincoln Tunnel	4,700	3,128	2,915	6,043	+1,343
Brooklyn Battery Tunnel	1,818	1,302	1,822	3,124	+1,822

Sources: Manhattan River Crossings 2000 for weekday rush hour; review of Port Authority 2002 and 2003 data for GWB and Lincoln Tunnel; and MTA Bridges and Tunnel for 2003 data for BB

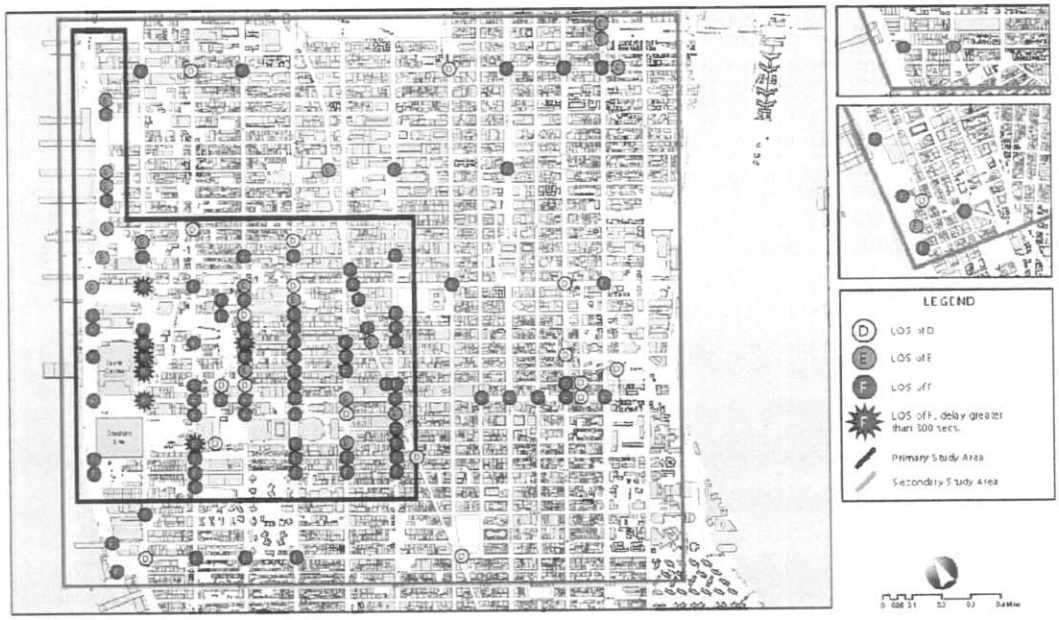
Even using the estimates from the Jets Study, post-game traffic will exceed a normal weekday hour by 837 vehicles. However, if MSG traffic characteristics are used, normal weekday peak hour traffic volumes are exceeded by 2,327 vehicles.

Using the estimates from the Jets Study, Post-game River crossing traffic will be less than a normal weekday hour by 913 vehicles. However, if MSG traffic characteristics are used, normal weekday peak hour traffic volumes are exceeded by 1,767 vehicles.

E. Levels of Service Analysis

The presentation of the levels of service (LOS) in the DGEIS illustrates a series of intersections operating poorly today and in the future. Overall, however, the location and pattern of intersections operating at an unacceptable level within the immediate study area is startling when considering the importance of the study area as a location where motorists enter and leave the city as well as the location of existing and proposed entertainment and cultural venues. Figures IV.2, IV.3, IV.4, and IV.5 illustrate the levels of service for intersections within the study area, as depicted in the DGEIS.

Figure IV.2 – Study Area Levels of Service
AM Peak Hour
Build Option

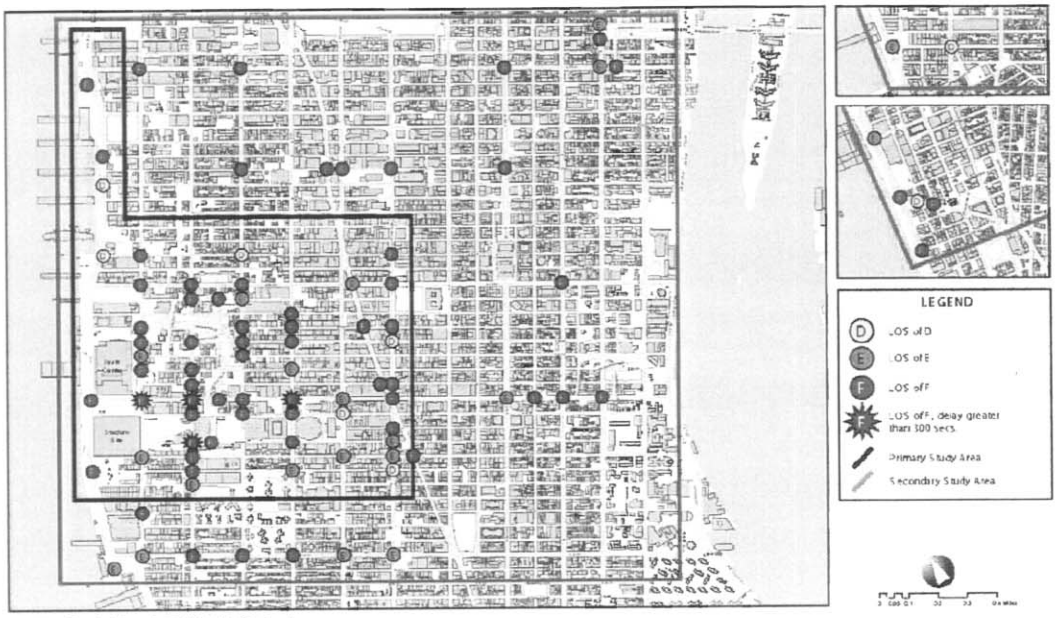


AM Peak Hour LOS (Build Option)

As shown in this figure, on West Avenue, 16 intersections operate at LOS E or F. On 34th Street, 13 intersections will operate at LOS E or F with one location in excess of 300 seconds of delay. On 42nd Street, seven intersections will operate at LOS E or F. On the Avenues, Sixth Avenue will have 10 intersections operating at LOS E or F and In all, 88

intersections will operate at LOS D, E and F in the AM Peak Hour in the study area.

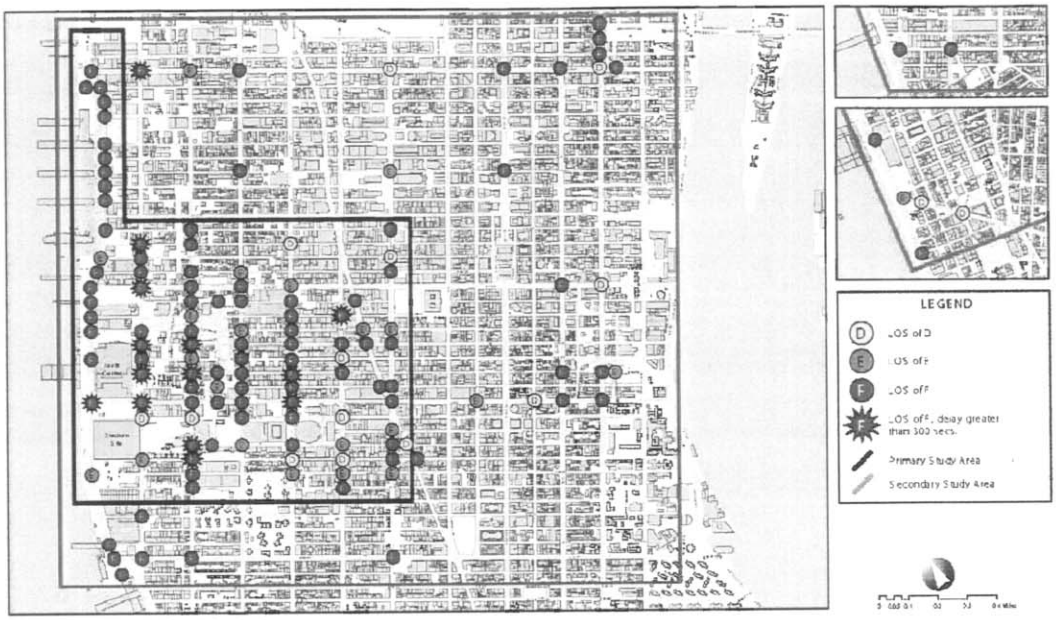
Figure IV.3 – Study Area Levels of Service
Midday Peak Hour
Build Option



Midday Peak Hour LOS (Build Option)

In the Midday Peak, 61 intersections are projected to operate at LOS D, E, or F in the study area. Four of the intersections are proposed to operate with delays in excess of 300 seconds. 34th Street is still a concern with 10 intersections projected to operate at LOS F, where at three locations the delays are over 300 seconds.

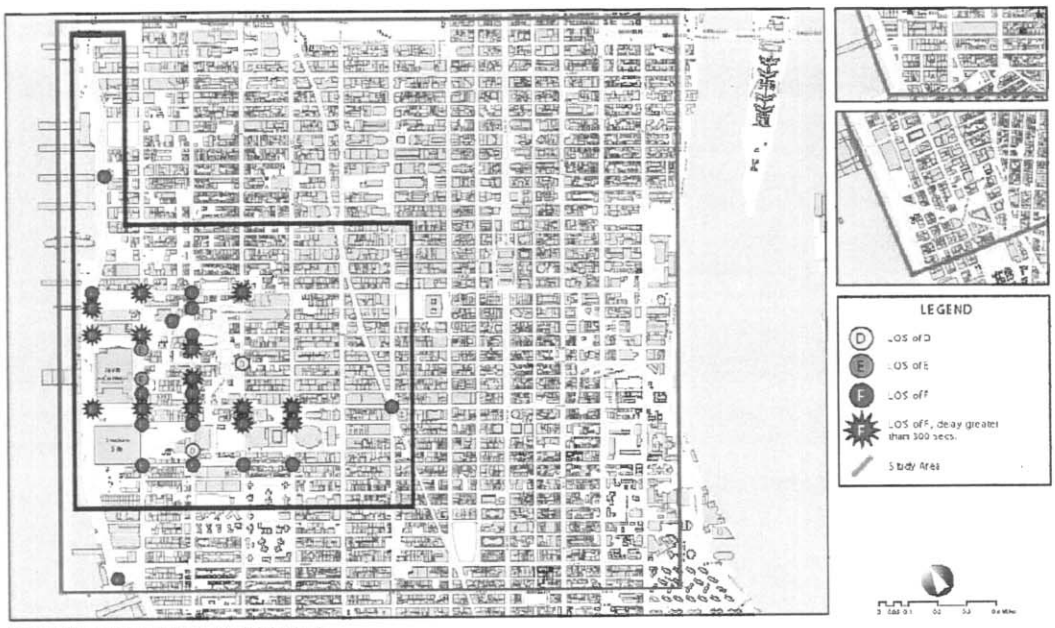
Figure IV.4 – Study Area Levels of Service
PM Peak Hour
Build Option



PM Peak Hour LOS (Build Option)

During the PM Peak, some 104 intersections are projected to operate at LOS D, E, and F in the study area. 13 critical intersections are projected to operate at LOS F with an excess of 300 seconds of delay. Majority of the avenues are projected to operate under unacceptable conditions. In particular 10th Avenue has 14 LOS-F intersections. In the east-west direction, all of the 34th street's intersections operate under LOS-F, with three of them are expected to have delays in excess of 300 seconds.

Figure IV.5 – Study Area Levels of Service
Sunday Special Event Peak Hour
Build Option



Sunday Special Event LOS (Build Option)

The Sunday Special Event Peak as shown in the figure assumes a Jets Game, an event at MSG and an event at the Javits Center. It should be noted that far fewer intersections were studied for this peak than for the others. However, the results are striking in their relevance. 14 intersections are projected to operate at LOS F with in excess of 300 seconds of delay. In addition, 15 more intersections are projected to operate at LOS F with delays less than 300 seconds. All but four of the impacted intersections for the Sunday Special Event Peak are projected to operate at unacceptable levels of service.

F. Analysis of the Street Grid as a System

The number of congested intersections should have been a clue to the authors of the DGEIS. It is well known to traffic engineers practicing in dense urban areas that street grids operate like an interconnected system, congest one intersection and the effects ripple throughout the street grid. As a result, traffic engineers have developed tools such as the cross-town arterial program in Manhattan to keep traffic flowing in a congested grid network and have installed sophisticated traffic signal control systems and intelligent transportation systems to manage congestion. It is also known that when volume to capacity ratios exceed 90% (typically LOS E and F conditions), vehicles begin to spill back extended distances, and in closely spaced grid systems, into and across upstream intersections. One such clue in the DGEIS is the number of congested intersections shown in the preceding figures.

While the City of New York's Environmental Quality Review Technical Manual does not *require* an analysis of the street grid as a system, it does not *discourage* it either. It simply suggests an intersection based approach yet it also suggests a travel time study be conducted (one apparently conducted for the project but not reported in the DGEIS). The purpose of travel time studies are, in part, to assess how traffic flows through the grid, in short, provide an analysis of how groups of intersection perform currently. While it is not possible to project the travel times to the future in congested grids as delays are not directly proportional to increases in traffic volumes, there are several methods commonly in use today by traffic engineers all over the world that perform such analyses. These tools are called micro-simulations. We see the failure to perform a micro-simulation of the study area to be a serious omission and have prepared a simulation of a portion of the study area for the build condition. The tool utilized by ORA is SIMTRAFFIC, a widely used micro-simulation model.

Because the DGEIS did not develop the data necessary to prepare a micro-simulation, ORA analyzed the data collected and observed traffic operations in the study area prior to constructing the micro-simulation model. The following paragraphs describe how the micro-simulation models were constructed and the results of the analysis.

1. Year 2025 Base Traffic Volumes

Sunday traffic volume data was not collected for all of the intersections of the study area. As such, ORA engineers analyzed the Sunday traffic count data included in the DGEIS and weekday traffic data to identify common traffic patterns. Accordingly, year 2025 traffic volumes were obtained using the Hudson Yards Rezoning and Development Program DGEIS Sunday Special Event Peak Period Figures 19-32, 19-55, and 19-126 (existing traffic volumes, 2010 future without the proposed action traffic volumes, and 2025 future without the proposed action traffic volumes respectively) as a base.

In order to obtain the missing Sunday Special Event Peak Period turning volumes the available turning movements provided in the Hudson Yards Rezoning and Development Program DGEIS were used to identify trends between weekday and weekend volumes.

2. Year 2025 Traffic Volumes with the Proposed Action

Year 2025 traffic volumes were obtained by adding the base Year 2025 traffic volumes obtained previously and the 2025 Future With The Proposed Action Incremental Traffic Volumes for a Sunday Special Event Peak Hour (Hudson Yards Rezoning and Development Program DGEIS Figure 19-148).

3. Pedestrian Distribution

The streets adjacent to the proposed stadium would face severe pedestrian congestion unless appropriate improvements are implemented. All exiting trips from the proposed stadium begin as pedestrian trips. This means that some 75,000 (10% of attendees) fans will leave the stadium immediately after the end of a close game. Assuming all fans desire to leave the stadium as fast as possible, these fans would probably be able to leave in a 30 minute period. According to the DGEIS, some 7,500 will exit and walk west to the ferry. That means that 67,500 fans will walk east to the subways, parking lots and to Pennsylvania Station, north to parking lots and the Port Authority Bus Terminal and south to parking lots. As the fans proceed away from the stadium, many will find their next mode of travel. It is instructive to review the number of pedestrians crossing the intersections surrounding Madison Square Garden.

Table IV.7 Weekday PM Peak Hour Pedestrian Volumes at Intersections Adjacent to Madison Square Garden

Location	Pedestrians per Hour
34th and 8th Ave	6,082
33rd and 8th Ave	3,341
31st and 8th Ave	5,060
33rd and 7th Ave	9,404
31st and 7th Ave	6,285
30th and 8th Ave	1,924
34th and 7th Ave	9,506
32nd and 7th Ave	2,218
30th and 7th Ave	2,671
TOTAL	24,090

As shown in the table, the total number of fans exiting the stadium west across Twelfth Avenue is 7,500 in the 30 minutes following the game. There are five intersections on Eleventh Avenue that will bear the brunt of the pedestrians leaving the stadium – 30th Street, 31st Street, 33rd Street and 34th Street as well as the Boulevard. Between the intersections, if the 67,500 fans are divided equally, some 13,500 fans will cross each intersection. Compared with Table IV.8, these pedestrian volumes are substantially higher and will detrimentally impact traffic.

The pedestrian distribution was based on the pedestrian flow maps developed by ORA. The distribution was based upon the shortest distance to the transit hubs (Port Authority Bus Terminal, Pennsylvania Station and the subways as based upon the distribution in the DGEIS, and to the parking lots. Pedestrians destined to their autos were distributed based upon the availability of parking facilities and the parking analysis described in the next section of this report. The pedestrian distribution assumes a sold-out game at the stadium

(i.e., 75,000 attendees) and exiting the stadium to the following destinations at the following percentage distributions:

Table IV.8 Pedestrian Distribution

To/From	Percentage
Penn Station Commuter Rail	21.0%
Port Authority Buses	2.7%
7th and 8th Avenues Subways: including those who need to get to the Staten Island Ferry)	3.5%
New York Waterway Ferry	10.6%
New York City Transit Buses	2.0%
#7 Subway Extension	22.3%
Other Subways (6th Avenue and Broadway lines)	0.5%
PATH	5.6%
Auto	28.8%
Taxis/Charter Buses	3.0%

Pedestrians exiting the Stadium were routed to their respective destinations using the shortest path from the Stadium to their destinations. Pedestrians traveling in a given direction were distributed evenly between the two crosswalks in the travel path (i.e., pedestrians crossing 10th Avenue in the West-East direction were evenly split between the north and south crosswalks).

4. Pedestrian Timings

In order to simulate the impact of crowds of pedestrians on intersection operations in the SIMTRAFFIC environment, pedestrian timings were calculated based on their distributions. An exclusive pedestrian phase was added into the timings of the intersection that would be affected. This was done as a way to mimic a police officer directing traffic at the intersection (i.e., police officer overriding the traffic signal to stop vehicles and allow pedestrians to cross freely). The DGEIS used the same convention.

The discharge rate of a crosswalk or how many pedestrians walking abreast can cross in any one green period or as directed by a traffic control officer is calculated based on the crosswalk width, walking speed, and pedestrian density. The total amount of dedicated pedestrian time is distributed evenly into each cycle. This allowed calculating the exclusive pedestrian timing.

5. Analysis of Sequential Impacts on Network Operation

In order to mimic what would happen during the exit hours of the proposed multi-use facility; the study area network is analyzed through a series of different parameters to reflect the conditions on the street network. Therefore, a Sunday Event Day in 2025 is analyzed. The proposed street network used in the analyses assumed implementation of the mitigations as stated in the DGEIS. The analysis was then conducted through four different successive periods of time. Therefore, it was possible to mimic the impact of the stadium-generated traffic on the street network within the study area.

The following are the four successive periods:

- **Period A (Minutes before people start exiting the venue):** This analysis period reflects the conditions when the stadium is still full. The study area street

network carries the base volumes and the phasing/timing of the signals operate as on a typical Sunday afternoon in 2025 (with mitigation). The impact of the stadium traffic on the street network is non-existent. This period is a prologue to what will happen right after people start exiting the venue. It serves the purpose of creating the base conditions that will be impacted by the stadium generated traffic elements (pedestrians and vehicles). This analysis period lasts for 30 minutes.

- **Period B (People start exiting the venue):** This analysis period covers the first 15 minutes of people exiting the venue. The vehicular traffic on the street network is kept at base level (same as the previous period) but the intersections impacted by pedestrians are modified to operate under new timing/phasing schemes. It mimics the presence of a police officer at those locations where traffic should be stopped in all directions to be able to accommodate the mass exodus of 75,000 people in 30 minutes. As stated previously, this situation is mimicked by introducing an all-pedestrian phase at these locations.
- **Period C (People exiting the venue and exiting the parking lots):** This analysis period also lasts for 15 minutes and it covers the second half of the 30 minutes exit time from the venue. Those who left during the previous period had sufficient time to reach their destination depending on their mode of travel (public transportation or private vehicle). Therefore it is appropriate to introduce additional vehicular traffic to the street network. However pedestrians are still present (people are still exiting the venue). To reflect these conditions the street network is loaded with what is referred as "the stadium traffic" but the pedestrian timing/phasing is kept operating at select locations.
- **Period D (The venue is emptied):** During this analysis period, people have exited the stadium, and the remnant quantity of pedestrians on the street is deemed negligible. Therefore the signal timing is modified back to what it was before the exiting started with mitigation. However, stadium traffic is kept on the street since the traffic exiting the parking lots and the ones that have already would still be on the street network.

6. Sequential Comparative Analyses of the Street Network

All four periods as explained above are analyzed from two different perspectives: Individual Intersections Level of Service and Network Wide Congestion Analysis. Figures IV-6 through IV-9 depict the network conditions during the period when pedestrian impact is the greatest.

In the following section, these two approaches of analysis explained in detail for each time period.

Period A:

During this period, the base volumes and base timing are in effect. The mitigations are implemented. There are parts of the network that show spillback conditions: It is mainly confined to the east side of the island around MSG. A spillback condition occurs when an intersection approaches and/or exceeds its operational capacity. Consequently, it is

not capable of processing the demand volume. Those vehicles that are not serviced through a cycle or two (depending on the timing and the size of the block) starts backing up into the upstream intersection. This situation causes the failure of those upstream intersections by hindering their operation. When this situation starts occurring at more than one approach at a particular intersection, spillbacks turn into gridlocks. A gridlock condition is when a network of intersections becomes impotent of operating and processing traffic. From intersection LOS perspective, Period A does not show major failure.

Period B:

This period encompasses a time period when people start exiting the venue. There is a mass exodus of attendees to the street network. The base volume is used to model the vehicular load on the street network. However, to account for the pedestrians, pedestrian timing is in effect. The impact of the pedestrian timing is immediate. There are a number of intersections that operate at LOS-F at least for one of the approaches. Within 15 minutes of applying the new timing scheme, spillbacks start to form, that later turn into gridlock. The failure of intersections along 34th Street and 9th Avenue are particularly striking. As the pedestrians proceed to their final destination in accordance with their distribution, the entire study area starts experiencing unprecedented operational failures. 12th Avenue is completely backed up at this point, as the spillbacks on other avenues start forming in the southbound and northbound directions. Out of 22 LOS-F intersections, six are experiencing in excess of 300 seconds of delay.

Period C:

This period is modeled by using the pedestrian timing and stadium volumes. People are still exiting the venue, and the impact of the pedestrians on the network is as evident as ever. Some of the event attendees who are destined to the parking lots have reached their destination and the street network is subject to full-scale stadium traffic. The ingress and egress to Lincoln Tunnel is blocked due to the complete operational failure of the surrounding intersections. Traffic is at standstill for the major part of the network while pedestrians reach their vehicles and transit stations. The number of intersections under LOS-F has increased to 30, eight of which are experiencing 300 second or more delay. The effect of the prolonged pedestrian movement on the network is obvious. All avenues in the study are not stopped in gridlock and not moving.

Period D:

During this period, the model goes back to base timing. Pedestrians have reached their destination and are no longer impacting the street network as in periods B and C. It should be noted that for the purposes of this model, the pedestrians are forced to exit and reach their destination within 30 minutes after the event ends. This, by any means, is a very conservative approach. Should this amount of time be stretched to further, the impact of the pedestrians would last and the gridlock would expand further. The model still employs the stadium traffic during this period. Going back to base timing betters the

operational aspect of individual intersections. The number of LOS-F intersections is reduced to 16. However, it should be noticed that the gridlock is worse than Period C, extending further south to 13th Street and eastward to Park Avenue and congestion all the way from the George Washington Bridge to the Battery, and across to the East River Crossings. This is a clear demonstration of how individual intersection analysis fails to demonstrate system wide failures. The gridlock that has formed with the start of Period A is present and has expanded further from Period C to Period D. Although the vehicular traffic are being served with larger temporal capacity (more green time for individual movements) at individual intersections, it will take about 5 times longer to dissipate the congested traffic than it took to form it. The preceding analysis clearly demonstrates the failure of the DGEIS to accurately describe the traffic conditions following a Jets game.

7. Analyses of the Street Network (Weekday PM Peak Period)

The analysis provided in the DGEIS depicts a number of intersections that are failing to operate under acceptable levels of service. This report took the individual intersection analyses a step further and provided with a model that shows that the failure at these predicted locations causes a serious gridlock. It should be noted that the SIMTRAFFIC model has the mitigations measures, as suggested in the DGEIS, integrated. Nevertheless, these measures fail to prevent the network-wide congestion/gridlock. Figure IV.10 illustrates the location of failing intersections and the extent of the gridlock/congestion during a typical weekday PM peak hour in 2025. Gridlock is projected to extend from 10th Street to 70th Street and east to Madison Avenue, with the Lincoln Tunnel entrances and exits blocked.

8. Summary of the SIMTRAFFIC Analysis

Upon first reading of the DGEIS, it became clear that the traffic analysis of individual intersections did not accurately describe the degree of failure because it ignored the interaction of the failing intersections on the adjacent intersections and on the entire street system. In running the SIMTRAFFIC model of the study area, the affect of the interaction of the failing intersections became obvious. Gridlock began almost immediately and spread rapidly throughout the entire study area with the unrealistic assumptions in the DGEIS. Because the availability of data was limited, particularly for the Sunday model, only the immediate study area could be modeled. But this area was enough to assess the street network beyond the immediate study area and combined with field views and observations of others, it was possible to extrapolate by extending the jammed streets block by block until the end of the gridlock was identified and then use the observations of others to identify the congested network that feeds into the gridlock streets.

Using its projections of automobile trips that would be generated by a Jets game (see Chapter 3, Section C), ORA has been able to extrapolate the congestion along the West Side Highway to the George Washington Bridge. The combination of the increased traffic from the study area and the typical Sunday conditions at the tight ramp alignments at the bridge is a recipe for congestion. Similarly, the gridlock extends into SOHO with

its narrow streets and tightly spaced blocks as vehicles travel south beyond the wide avenues.

Worst of all was the gridlock along 34th Street forcing vehicles to other parallel streets to travel cross-town to the East River Crossings and tunnels, congesting the remaining parts of the routes to the crossings.

In conclusion, the SIMTRAFFIC Analysis was revealing, providing concrete evidence of gridlock throughout the Hudson Yards study area, beyond the individual intersection failures documented in the DGEIS, as well as clear evidence that serious congestion would extend for a prolonged period far beyond the undersized study area in the DGEIS.

G. Emergency Vehicle Access

The proposed Hudson Yards development and, especially the proposed Jets Stadium will cause substantial levels of congestion and gridlock. This will impact the ability of emergency vehicles to respond to incidents and emergencies. This is particularly important as the Hudson Yards is a transportation hub for the entire northeast as evidenced by the recent tunnel fires and the type of events destined to make use of the venues. The DGEIS does not address the issue of emergency access to the proposed stadium or the impact of the congestion on emergency service to the existing established business and venues.

Figure IV.6

Period A: Minutes before people start exiting the venue

Legend

- Congestion
- LOS –F
- LOS – F > 300 sec.

Figure IV.7

Period B: People start exiting the venue

Legend

- Congestion
- LOS –F
- LOS – F > 300 sec.

Figure IV.7

Period B: People start exiting the venue

Legend

- Congestion
- LOS –F
- LOS – F > 300 sec.

Figure IV.8

Period C: People exiting the venue and exiting the parking lots

Legend

- Congestion
- LOS –F
- LOS – F > 300 sec.

Figure IV.9

Period D: The venue is emptied

Legend

- Congestion
- LOS –F
- LOS – F > 300 sec.

Figure IV.10

Weekday PM Peak Hour

Legend

- Congestion
- LOS –F
- LOS – F > 300 sec.

V. Transit

A. Methodology

The methodology employed in the DGEIS discounts significant demands on the transit system that would otherwise have to be addressed or mitigated. On page 19-17, it states that modal splits were divided into primary and secondary modes of transportation. For example, someone taking the railroad to Penn Station, and then a bus to the stadium would be classified as Primary: railroad, Secondary: bus. It appears that the DGEIS, having done that, then discards any further consideration of secondary travel. Evidence of this is found on Table 20-91, which assigns only 424 additional riders to route M34. If none of these were Manhattan residents, it would comprise less than 4% of rail commuters, an improbable number. Failure to consider secondary travel is a major omission, the impact of which is to undercount impacts on the transit system.

B. Subway

Table 20-5 depicts the capacities used in the subway calculations. It shows the No.7 Line as operating 11-car trains. That was true in the base year of 2000, but it is no longer true today, nor will it be in 2025. Nevertheless, Appendix S 4-2 continues to calculate capacities on this line based on 11-car trains. The effect of this is that projected capacities are all overstated by 9%, and the volume/capacity ratios are all understated. The reason for the reduced train length is that service on this route was provided in the past by "World's Fair" cars. That fleet uniquely contained a sufficient number (about 30) of self-contained single unit cars. The entire remainder of NYCT's subway fleet consists of "married pairs", two cars that share common components and are incapable of operating singly. On the No.7 Line, the single cars were joined to sets of 5 married pairs to make 11-car trains. With the well-publicized (and recently-completed) scrapping of the Redbirds, those single cars no longer exist. At this time, NYCT has no plan for replacing them, nor is there a mention in the DGEIS of a plan for this as a remediation. Hence, the capacity calculations for the No.7 Line are seriously flawed.

In 2025, there would be many station elements with significant adverse impacts resulting in serious congestion. Some stairways would operate at volume/capacity ratios well over 2.0.(primarily the stairways at Times Sq-42nd Street and at Grand Central-42nd Street.) In the AM, three stairways could not be mitigated. In the PM, two stairways could not be mitigated and in the Sunday Event condition, there will be no unmitigated adverse impacts. The mitigation consists mainly of stairway widening, new stairways, new escalators or upgrade to high-speed escalators. However, as stated in the DGEIS, "These mitigation measures have been identified conceptually but would still require further analyses to determine their feasibility." In other words, they have not yet been deemed feasible. Some require stairway widening of 4 feet.

C. Commuter Rail

Although the DGEIS assigns 13,971 people to commuter rail service in the one hour after a Sunday special event, it fails to address the ability of the rail system (existing levels of train service) to accommodate these additional riders. In Table 20-87, the ability of the stations to handle these people is considered; not surprisingly, this is easily done with the low level of Sunday service. However, the omission of analysis of available train capacity may be significant, as suggested by the DGEIS's projection of additional rail riders. Applying the geographical split from the No.7 Line Project (E. Metzger, 12/1/03) to the DGEIS projection of rail use suggests 7,726 additional NJ Transit customers in an hour when 10 trains operate, 3,577 LIRR additional passengers in an hour when 7 trains operate, and 2,668 additional Metro North passengers in an hour when 9 trains operate. These impacts are too large to avoid review.

There is no discussion of line haul or scheduling/operational impacts to NJ Transit service or LIRR service. Stations are mentioned as having adequate capacity. Are they assuming the 3rd Hudson River tunnel is built? There is no mention of this.

The Final Scope (pages 28-29) states that the DGEIS will provide a transit assessment that will examine commuter rail impacts. It states that assessments of Sunday afternoon peak periods will be included and that estimates of rail riders will be made for these periods. In addition, it states that project passenger volumes will be determined and significant impacts identified and mitigated. Although the Traffic Analysis relies on the assumption that the majority of Jet's fans will use transit, there is no assessment of the commuter rail lines on a Sunday afternoon peak. The Long Island Railroad, NJ Transit and Metro North commuter rail lines are not examined at all under this condition. No assessment or analysis of the number of project passengers and the operating capacity was provided in the DGEIS for the Sunday afternoon peak to evaluate the impacts to the operations or the ability of these lines to accommodate these project passengers.

D. Bus Issues

In 2025, the DGEIS states that no unmitigated significant adverse impacts would occur to bus service if additional vehicles are added to the impacted routes. There are about five impacted routes in (in the AM, PM, Weeknight Special Event and Sunday Special Event conditions) both directions many times. The mitigation on some routes requires the addition of up to 28 additional vehicles on that route. Also, conversion to articulated buses is another mitigation. The DGEIS states that it is the NYCT general policy to provide additional bus service where demand warrants, taking into account financial and operational constraints. It states that these improvements and expansion of service would be developed as part of the MTA NYCT's capital program. No discussion is included on the operational impacts of adding these busses or the effects of additional articulated busses to the roadway network.

On page 20-109, the DGEIS considers the impact of a new Port Authority bus facility, but discounts it because it will be directly connected to the Bus Terminal, and not involve operation of buses on city streets. However, NYC Transit operates Quill Depot at 40th Street and 11th Avenue, adjacent to the Javits Center, and no consideration is given to

impacts on it. Quill Depot houses approx 270 buses, including most of those that will serve the new development. During peak study hours, as many as 37 buses pull in and out of that depot. Although it is due to be razed for the Javits expansion, current plans have it being relocated beneath the site, i.e. it will remain in the heart of the development. This is an omission from the DGEIS.

Baseline current ridership is derived from 2000-2002 Ride Check Surveys (Table 20-15). But this period includes 9/11 and the months thereafter when ridership levels were depressed, but schedules were not reduced. The result of this may be to show higher available capacity than really exists. Since that baseline is used for the DGEIS's 2025 ridership projections, it is possible that available capacity is overstated there, as well.

Available bus capacity is based off NYC Transit scheduling guidelines of 65 passengers per regular bus, and 93 per articulated bus. Yet a review of average load data on Tables 20-15 through 20-18 shows that current service levels are designed to provide loading generally at 70% or less of guidelines. This raises two major issues. First, if the actual practice of NYC Transit is considerably lower bus loading than its published guideline, is it reasonable for the DGEIS to use the guideline number, which is much more favorable to its consideration of impacts? Second, if the guidelines are real, then is it not likely that NYC Transit will reduce current service levels (thereby significantly reducing available capacity), as it has already stated it is prepared to do in order to close projected revenue shortfalls in 2005 and 2006?

On Table 20-91, and every other related table in the DGEIS, bus capacity along 34th Street is shown as a combined total of routes M16 and M34. However, because route M16 travels no further west than 8th Avenue, it really offers no service to the new stadium. Thus, the available service levels and capacities on 34th Street are overstated by 50% throughout the DGEIS. This is a major concern, because 34th Street is the corridor most subject to additional demand for bus service (Table 20-111).

On Table 20-111, the DGEIS shows that to accommodate additional demand in the PM peak period, a total of 87 additional buses will be required. All of the routes contributing to this currently operate from Quill Depot, in the heart of the study area. Even allowing for availability of 28 buses that are currently used in the morning, but not the evening, accommodation would have to be made for 68 more buses (59 plus 9 spares). The DGEIS fails to account for this. In current dollars, this entails an equipment cost of approximately $30 million, and additional depot storage space, estimated at $70 million, for a total of $100 million. The DGEIS fails to address where this money will come from, or any commitment to provide it. Without that, significant impacts of the development go unaddressed.

Related to this, any expansion of the Quill Depot will have a larger impact on traffic in the study area. This has not been considered in the DGEIS. Alternatively, additional buses could be stored elsewhere in Manhattan. However, there is no excess capacity in other Manhattan depots, so expansion would be required anyway. Such work would require an DGEIS of its own. This raises an interesting question; can one DGEIS provide mitigation that cannot occur without another DGEIS, without foreknowledge of whether the second DGEIS will permit the mitigation to occur?

On p19-2, the DGEIS identifies five intersections that have "unmitigated significant adverse impacts during the Sunday special event." On its own, this is critical. However, its impact goes further. Table 19-70 reports that on Sunday afternoon, after mitigation, the intersections along 34th Street at 11th, 10th, 9th, and 8th Avenues will respectively operate at LOS F, F, F, and E, with a cumulative delay of at least 16 minutes and 7 seconds for eastbound buses (as well as other traffic). Yet on Table 20-111, the DGEIS calls for adding 14 more buses to mitigate demand. It is unrealistic to assume that event-goers will endure what is likely to be a 40-minute ride to get from the stadium to Penn Station. It is not acceptable to add more traffic to an unmitigated adverse impact condition. The issue worsens when demand for bus access to Penn Station is increased to accommodate the demand of commuter rail users, which was completely omitted from all calculations in the DGEIS. According to Table 20-8, a total of 13,971 event-goers will seek to use commuter rail in the hour after a Sunday event. Using the geographical split included in Appendix S, 11,303 of them will be seeking to reach Penn Station. If half of them seek to use a bus (a conservative estimate in inclement weather), approximately 87 additional buses would have to travel eastbound along 34th Street during the one-hour peak period. The inability of an LOS F street to handle this, the question of whether NYC Transit could muster the necessary equipment and personnel, and the unanswered question of whether NYC Transit would be willing to assume the high expense and unprofitability of such a service are additional reasons to conclude that this DGEIS has failed to fully identify demand, or find a way to accommodate it, for post-event travel between the stadium and Penn Station.

E. Ferry Issues

As indicated previously, some 7,500 fans would exit the proposed stadium and walk to the Ferry Terminal. There are nine ferry routes from the West 38th Street Terminal, from the north to south in order: Port Imperial, Lincoln Harbor, Hoboken North, Hoboken South, Newport, Harborside, Colgate, Port Liberte, and Belford. Figure V.1 illustrates the routes of the ferries and Table IV.1 illustrates the facilities at each terminal.

Figure V.1 – New York Harbor Ferry Routes

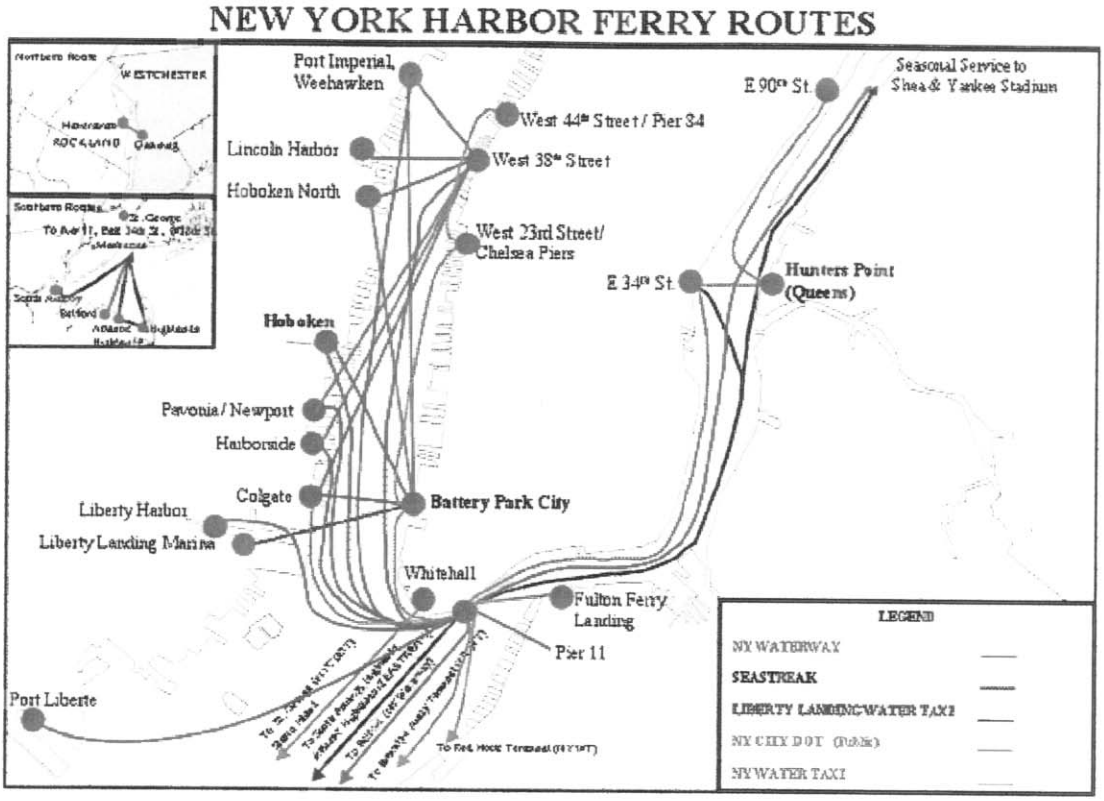


Table V.1 Ferry Service to New Jersey from 38th Street

Ferry Terminal	Days of Operation	Terminal Parking		Public Parking		Transit	Other
		Capacity	Occ. 9/12/04	Capacity	Occ. 9/12/04		
Port Imperial	Every day	3200	600	No	No	Yes	
Lincoln Harbor	Weekdays	No	No	No	No	Yes	Private Terminal
Hoboken North	Everyday	No	No	520	336	Yes	
Hoboken South	Weekends	No	No	240	44	Yes	
Newport	Weekdays	No	No	No	No	Yes	
Harborside	Weekdays	341	NA	No	No	Yes	
Colgate	Weekdays	No	No	189	NA	Yes	
Port Liberte	Weekends	106	6	No	No	Yes	
Belford	Weekdays	500	NA	No	No	Yes	

The table indicates days of operation, and the capacity and occupancy of terminal parking lots and nearby public lots on Sunday, September 12, 2004, between 1 PM and 4 PM. This period was chosen to correspond with the Sunday afternoon parking analysis period shown in the EIS.

As shown, Port Imperial, Hoboken North, Hoboken South, and Port Liberte all offer ferry services on Sundays. Port Imperial has, by far, the largest parking supply of any ferry terminal, with about 3,200 spaces. There were 634 vehicles parked there on September 12, 2004; the parking attendant indicated that on a typical Sunday, about 600 to 1200 vehicles are parked in the lot, although demand can reach close to 2,700 during large public shows in the Convention Center, such as the Auto or Boat Shows. Of the other services operating on Sundays, only the Port Liberte ferry has a dedicated parking lot, with 106 spaces. At Hoboken North and Hoboken South, passengers can park at nearby lots, as shown in the table.

Three cross-Hudson River routes are identified as not having sufficient capacity in 2025. One additional run per hour per route is required to satisfy the deficit. This is at odds with the assessment that 19 passenger ferries would be required to shuttle NJ fans across the river. No discussion of the Sunday Special event impact on Ferry service is provided in the DGEIS and no assessment is made ass to whether the platforms can accommodate the demand of the fans after a Jets game. Figure V.2 is a picture of the ferry platforms after last summer's blackout.

Figure V.2 – Passengers after blackout

Passengers Queue for Ferry Service to New Jersey

A major omission: Unmitigated number of ferries to meet demand

Table 20-8 on p.20-16 lists Project Generated Person Trips. Apparently "ferries" are lumped under "other." The Sunday Special Event outbound figures are as follows:

Project Generated Person Trips 2025

Table 20-8 of DGEIS, Sunday Special Event outbound

Auto	19,586
Taxi	2,451
Bus	5,230
Subway	27,098
Railroad	13,971
Walk	13,737
Other	6,898
Total	88,969

By using the assumptions and number in the DGEIS, it is possible to calculate that 95% of "other" is the number of people to ride the ferries after the game. By comparing the existing "available capacity" of the ferry services, and by assuming 149 passengers per boat, there is a deficiency of 35-38 ferries to haul post-game fans.

This is a significant omission and a major unmitigated condition. Since most ferry users will be using a car on the New Jersey side as their secondary mode (since none of the New York Waterway access buses operate on Sunday), the absence of sufficient ferry capacity makes it likely that event-goers will remain in their cars and travel by car (now as primary mode) to and from Manhattan. This additional traffic and parking demand for 2000 additional vehicles in the stadium vicinity has not been identified in the DEIS, and will likely create more conditions that cannot be mitigated.

VI. Parking Conditions

The parking analysis in this report is based largely upon the data presented in the *No. 7 Subway Extension Hudson Yards Rezoning and Development Program, Draft Generic Environmental Impact Statement*, June 2004. Existing 2003 off-street parking facility capacity and utilization rate is presented in Appendix S.3 of the DGEIS, entitled "Transportation - Parking Analysis."

This report focuses on analyzing existing and future conditions for a Sunday afternoon from 1 PM to 4 PM. This was one of the four time periods analyzed in the DGEIS. As stated in the DGEIS (p. 19-32), "the Sunday afternoon period was analyzed to determine off-street parking conditions prior to a football game at the Multi-Use Facility in conjunction with a public show at the Convention Center and an event at MSG."

The authors of the DGEIS never state the type of event at MSG that was evaluated. However, as acknowledged in the MSG Memorandum, p. 3, "the 85th percentile attendances at WNBA basketball games and circus performances are significantly lower compared to the other major events; for this reason a WNBA basketball game or circus performance would not be expected to constitute the reasonable worst-case scenario for the analysis of transportation-related impacts." Therefore, the parking demand generated by a Rangers or Knicks game should be evaluated as part of this study. The 85th percentile attendance of a Knicks game is 19,023; a Rangers game is 17,380; while a NY Liberty game (on weekends) is 12,126.

Therefore, the parking section of this DGEIS Review Report has the primary purpose of analyzing possible future parking conditions on a Sunday afternoon for a football game at Multi-Use Facility, held in conjunction with a public show at the Convention Center, and a Rangers game at MSG. Unlike the DGEIS, this DGEIS Review Report uses a transparent process in presenting its assumptions of future parking demand. Instead of simply presenting one summary number for future peak periods, this report identifies all individual components of parking demand.

A. Calculation of June 2003 Base Demand

The DGEIS states that the "surveys of off-street commercial parking facilities, which included visual inspection and interviews with site operators, were conducted in June 2003 (p. 19-40)." Of the 154 garages and surface lots in the DGEIS study area, 140 were open on Sunday afternoon, with a total capacity of 22,090 spaces. The demand was 12,862, for a utilization rate of 58%. The DGEIS also states that the Sunday afternoon count includes a "concurrent event at MSG (p. 19-41)." As discussed below, this concurrent event was likely a NY Liberty basketball game.

Since the DGEIS explicitly states that the June 2003 parking count includes a concurrent event at MSG, but does not make a similar claim for a concurrent event at the Convention Center, it is assumed that the DGEIS parking count does not reflect attendance at a public show at the Convention Center. The 85th percentile attendance of a public show is 38,265, as indicated in the DGEIS Appendix.

For an accurate appraisal of future parking, it was first determined to evaluate parking conditions for June 2003 in the absence of any special events. The only special event occurring during the DGEIS parking count was an event at MSG; this must have been a New York Liberty basketball game, since these were the only major events scheduled for Sunday afternoons in June 2003. The attendance for the NY Liberty game on June 1st was 15,045, while the game on June 22nd had an attendance of 12,004. The average attendance of these two games, 13,500, was deducted from the June 2003 parking count, to determine "ambient" parking demand in the study area in the absence of any special events.

It should be noted that the deduction of 13,500 represents a somewhat conservative estimate. This is because the DGEIS June count occurred from 1 PM to 4 PM, and both Liberty games started at 4 PM. Unless the count of parking facilities in the vicinity of MSG occurred at the very end of the 1 PM to 4 PM time period, it would likely not have surveyed all the persons arriving at the Liberty game via automobile.

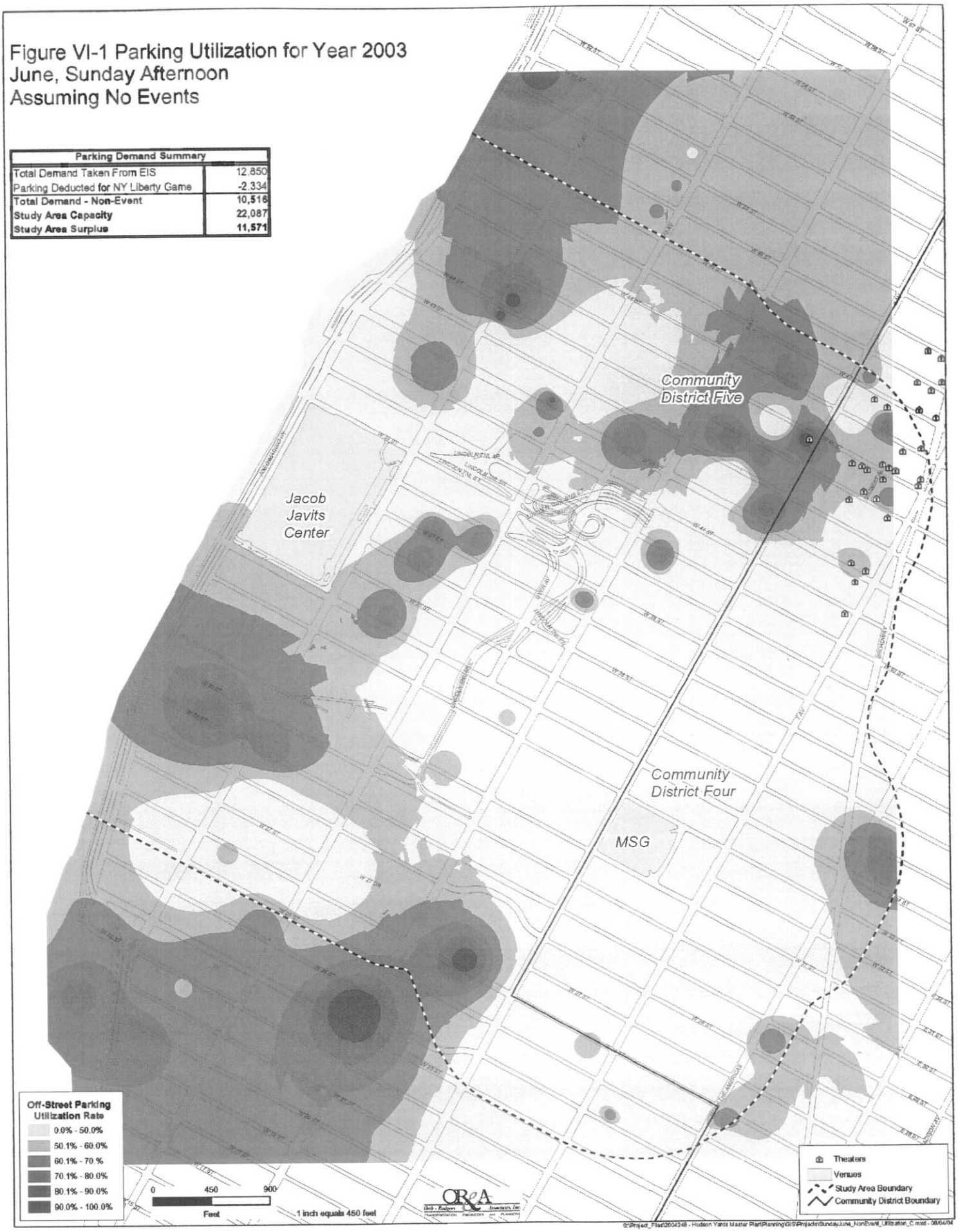
Applying the DGEIS assumptions of a modal split of 48.4%, and a vehicle occupancy rate of 2.8 to Sunday events at MSG, the attendance would result in a parking demand of 2,334 vehicles. The ambient demand in the absence of this parking demand is 10,516 with a study area parking capacity of 22,087 (this figure is slightly different than the 22,090 in the DGEIS, likely due to rounding). Ambient demand thus accounts for slightly less than half of parking capacity in the area. (See Figure VI.1)

Table VI.1 June 2003 Parking Demand Summary

Parking Demand Summary	
Total Demand Taken From EIS	12,850
Parking Deducted for NY Liberty Game	-2,334
Total Demand - Non-Event	10,516
Study Area Capacity	22,087
Study Area Surplus	11,571

Figure VI-1 Parking Utilization for Year 2003
June, Sunday Afternoon
Assuming No Events

Parking Demand Summary	
Total Demand Taken From EIS	12,850
Parking Deducted for NY Liberty Game	-2,334
Total Demand - Non-Event	10,516
Study Area Capacity	22,087
Study Area Surplus	11,571



B. Calculation of December 2003 Parking Demand

To better analyze existing peak parking conditions, a December 2003 parking demand was produced, indicated in Table VI.2. To calculate existing peak parking demand on a Sunday afternoon in December, the 85th percentile attendance for a New York Rangers game was added to the June 2003 base demand (as detailed above, attendance at a NY Liberty basketball game was subtracted from the June count to determine June base demand). In an effort to be conservative, an attendance of 17,000 was chosen for the Rangers, lower than the 85th percentile attendance of 17,380 for Rangers games, but closer to the 85th percentile attendance of 16,476 for concerts. Applying the assumptions of 48.4% modal split and 2.8 vehicle occupancy rate found in the DGEIS, the parking demand would be 2,939.

Table VI.2 December 2003 Parking Demand Summary

Assumptions						
Venue	Event Start	Duration	Attendance	Modal Split	Vehicle Occupancy Rate	Parking Requirements
Base Parking Demand						10,516
Theater District Surcharge						92
Convention Center (Public Show)	9:00 AM	All Day	15,450*	52.9%	3.0	2,724
NY Rangers Game	4:00 PM	3 hours	17,000	48.4%	2.8	2,939
Total Demand						**16,271**
Study Area Capacity						**22,087**
Total Study Area Surplus						**5,816**

**Indicates demand at peak hour. 85th percentile total daily attendance is 38,625*

To calculate parking demand associated with a public show at the Convention Center, the 85th percentile attendance of 38,625 was incorporated. Since a public show may start at 8 or 9 AM, and end at 5 PM or 6 PM, one-time attendance will ebb and flow over the course of the day. Based on analysis of the temporal distribution of attendees to public shows as presented in the DGEIS Convention Center memorandum, up to 35% of the daily attendance is actually present in the Center at peak attendance. It is further assumed that up to 40% of the attendees, or 5,150 persons, actually have vehicles parked in nearby garages at peak attendance, due to the time required to park/unpark a vehicle and walk between the parking facility and Convention Center, and further due to the fact that some attendees are indicated as visiting other sites in the City after a show. With an automobile modal split of 52.9% and vehicle occupancy of 3, as indicated in the DGEIS, up to 2,724 parked vehicles are associated with a public show.

A modest adjustment was made for the increased activity in the Theatre District on Sundays in December. According to the Shubert organization, light attendance months for theatre performances include January and February, and June, July and August. Theatre attendance begins to build in the fall, and increases through December. Based on the actual parking attendance at two proximate parking garages, there appears to be an increase of parking demand by 6% on Sunday afternoons in November over Sunday afternoons in June, corresponding with increased attendance at weekend matinees. Therefore, the base demand for parking garages within ¼ mile of the Theatre District was increased by 6%, or 92. Note that this number is an incremental increase over the summer month theater-goers.

The total parking demand on a Sunday afternoon in December, with both a Rangers game and public show taking place, would thus be 16,271, or slightly less than three-quarters of existing parking garage capacity. The existing peak parking demand on Sunday afternoons is thus 26% higher than the parking demand as shown in the DGEIS. Much of this difference is due to the addition of attendance at a public show.

It is important to establish a more comprehensive picture of parking demand during major events currently, to better understand the possible effects of parking demand at a football game once the Multi-Use Facility is built. Figure VI.2 shows a possible parking utilization scenario for December 2003, with attendees to venues at the Convention Center and MSG assigned to garages in close proximity. It is assumed that facilities within 1/8 mile would be 100% occupied; facilities from 1/8 to ¼ mile would be 90% occupied; and in descending order with increasing distance from the facility.

Walking distances to parking facilities from major venues are shown in Table VI.3.

Table VI.3 December 2003 Walking Distance to Venues

Walking Distance to Venues (feet)		
Venue	50th Percentile	95th Percentile
Madison Square Garden	865	1,384
Convention Center	2,036	3,117

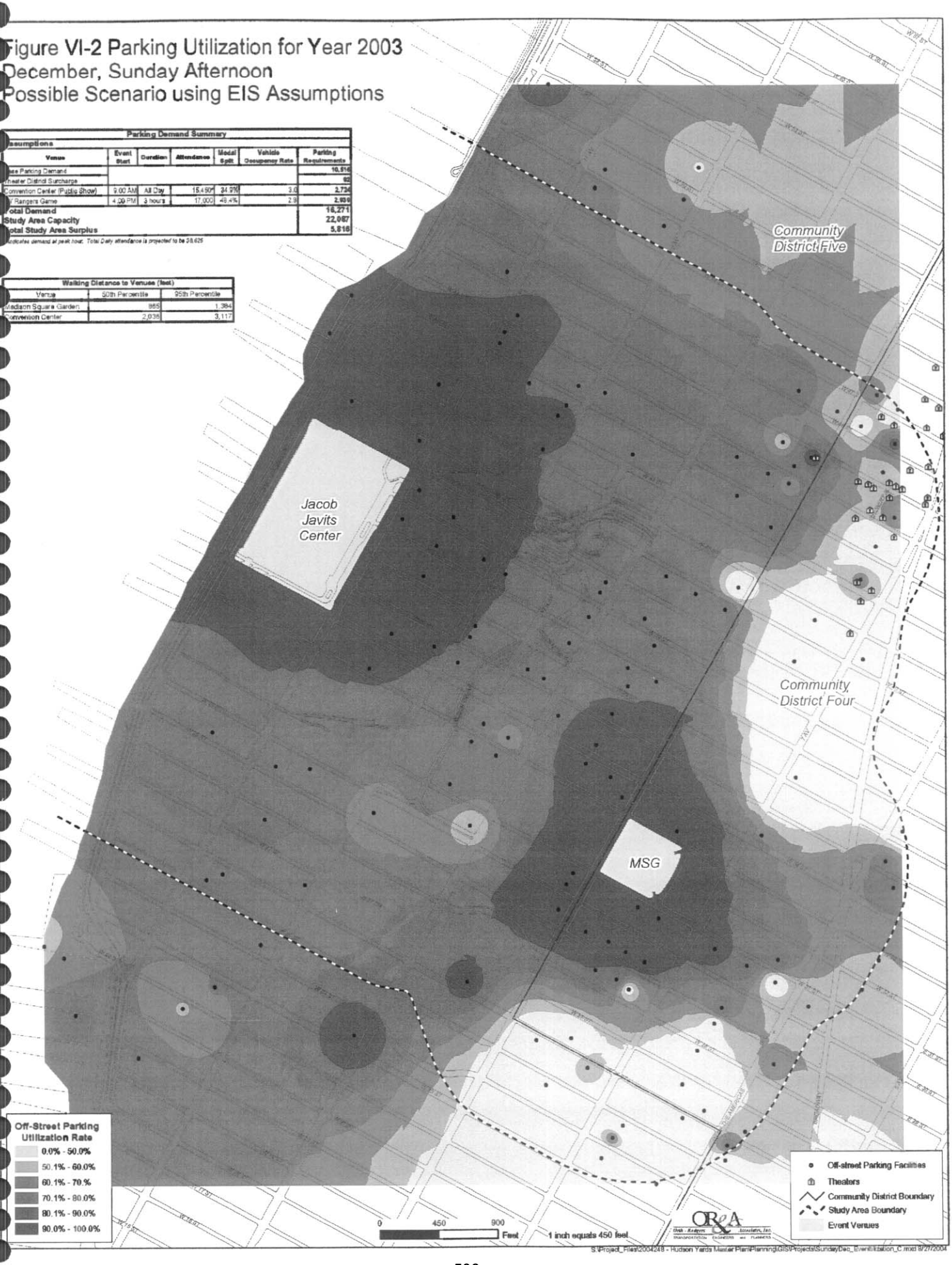
Figure VI-2 Parking Utilization for Year 2003
December, Sunday Afternoon
Possible Scenario using EIS Assumptions

Parking Demand Summary

Assumptions						
Venue	Event Start	Duration	Attendance	Modal Split	Vehicle Occupancy Rate	Parking Requirements
Base Parking Demand						10,516
Theater District Surcharge						62
Convention Center (Public Show)	9:00 AM	All Day	15,450*	34.9%	3.0	2,734
NY Rangers Game	4:00 PM	3 hours	17,000	49.4%	2.9	2,959
Total Demand						16,271
Study Area Capacity						22,087
Total Study Area Surplus						5,816

*Indicates demand at peak hour. Total Daily attendance is projected to be 28,625

Walking Distance to Venues (feet)		
Venue	50th Percentile	95th Percentile
Madison Square Garden	965	1,384
Convention Center	2,036	3,117



C. Projected Development

By 2025, significant new development is planned for the study area. The DGEIS assumes that there will be 29 million square feet of office space, with 2.2 million anticipated to be built by 2010; 1.1 million square feet of retail space, with 91,500 square feet by 2010; and 12,600 housing units, with 2,700 units built by 2010.

By 2010, the Convention Center would be expanded from its current 790,000 square feet of exhibition and meeting space, and one million square feet of support and staging areas, to add about 4 million square feet of exhibition halls, meeting rooms and ballroom space, and hotel space. The hotel would have 1,500 rooms. Also by 2010, the Multi-Use Facility, a 75,000 seat stadium, would be operational.

D. DGEIS Scenario

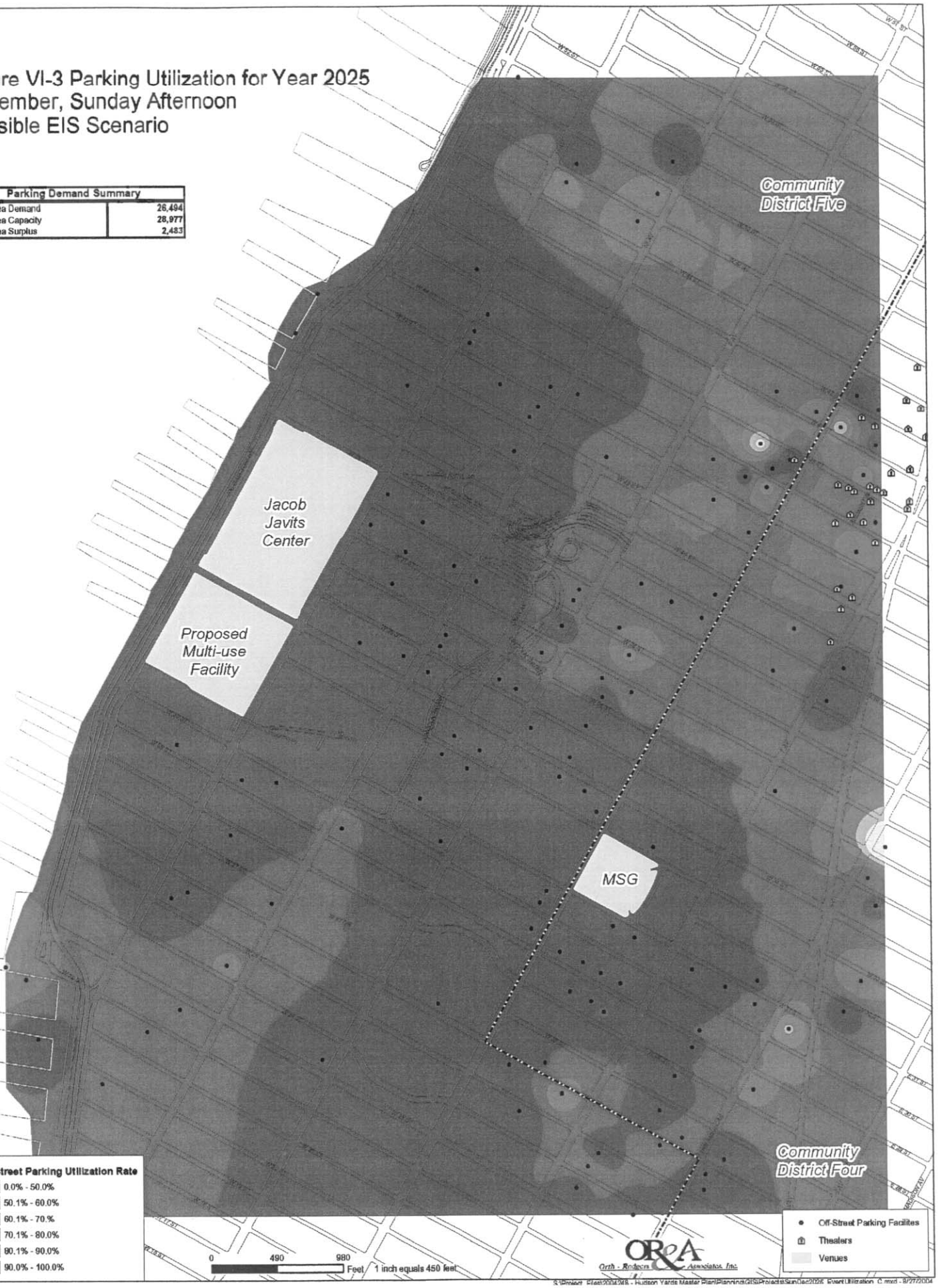
According to the DGEIS, parking demand on a Sunday afternoon in 2025 would be 26,494, or 91% of the projected capacity of 28,977. Figure VI.3, Possible DGEIS Scenario, illustrates how this parking demand might be distributed across the study area. It should be emphasize that this illustration was prepared by ORA, since the DGEIS does not document patterns of likely usage. The total demand, however, is provided by the DGEIS. Table VI.4 summarizes parking demand.

Table VI.4 Parking Demand Summary (2025 DGEIS Scenario)

Parking Demand Summary	
Study Area Demand	26,494
Study Area Capacity	28,977
Study Area Surplus	2,483

Figure VI-3 Parking Utilization for Year 2025
December, Sunday Afternoon
Possible EIS Scenario

Parking Demand Summary	
Study Area Demand	26,494
Study Area Capacity	28,977
Study Area Surplus	2,483



E. Analysis of Parking Components

Unfortunately, the DGEIS does not indicate the individual components of future parking demand. There is a discussion of attendance at major venues in the memoranda comprising the appendix of the DGEIS, but there is no documentation of the actual parking demand for the different venues as part of the year 2025 parking demand scenario. The lack of transparency makes it difficult to evaluate the actual impact of the proposed development program on study area parking facilities. In this section, an effort will be made to document all of the possible individual components of parking need in the year 2025, assuming concurrent events at major venues.

1. Background Growth

To determine increases in parking demand associated with background growth in the area, the DGEIS uses an annual background growth rate of .125% rather than the .5% recommended in the *CEQR Technical Manual* for Parking Analysis. The DGEIS explains that demand for parking is projected to grow at a lower rate than background vehicular traffic in the study area. Assuming that the DGEIS assumption is correct, the background growth rate would increase parking demand by 293 vehicles.

2. Madison Square Garden

To be consistent with the point made in the MSG Memorandum in the DGEIS Appendix on the importance of using the worst case scenario for MSG events, attendance at a Rangers or Knicks game should be used for the future scenario. To be conservative, this DGEIS Review Report uses the attendance of 17,000 for a Garden event (slightly below the 85th percentile attendance for a Rangers game, but slightly above concert attendance). With application of a 2.8 vehicle occupancy and 48.4% automobile modal split, the associated parking demand is 2,939.

3. Theatre District

To be conservative, it is assumed that parking demand for theatres would be the same as in 2003.

4. New Residential/Commercial Development

Although parking standards for residential and commercial development are referred to in the DGEIS, the DGEIS never specifies how many spaces will be needed to accommodate new residential or commercial uses.

Using the brief data found within the DGEIS, it is possible to make assumptions about the number of spaces that would be required to accommodate new residential and commercial uses within the study area. The DGEIS indicates that parking demand on Sunday afternoons in 2010 would be 21,725, and that parking demand in 2025 would be 26,494, or 4,769 more spaces than in 2010. The DGEIS states that the Multi-Use Facility and expanded Convention Center would be operational by 2010, so there should be no new parking demand associated with those facilities between 2010 and 2025. Under Section I., 2025 Future with the Proposed Action, the DGEIS states that new demand for

off-street parking would result from 23 office uses, 36 residential uses, and 2 hotel sites. Therefore, the growth of 4,769 spaces would be associated with new residential and commercial uses, as well as some background growth. Since some residential and commercial development would occur before 2010 - the DGEIS states that 91,500 square feet of retail space and 2,700 residential units would be developed between 2010 and 2025 – some parking demand would be generated by these uses. It is assumed that, in total, 5,100 spaces would be occupied by new residential and commercial uses by 2025.

5. Convention Center

Although assumptions are provided in the DGEIS appendix for modal split and vehicle occupancy for the expanded Convention Center, the DGEIS never specifies how many parking spaces are allotted to accommodate Convention Center public shows at time of peak attendance. The DGEIS estimates that the 85th percentile daily attendance of a public show in 2025 will be 62,684. Because a public show may run from 8AM or 9 AM to 6 PM or later, it is assumed that the peak attendance at any one time would be no more than 40% of the daily attendance, or 25,074. With application of a 3.0 vehicle occupancy and automobile modal split of 34.9%, the associated parking demand would be 2,917. The parking demand increases only modestly from the 2003 scenario since the DGEIS assumes a reduced automobile modal split after extension of the No. 7 subway line.

6. Multi-Use Facility

There is no specific parking garage planned to meet the needs of the Multi-Use Facility. Under the DGEIS scenario, there will be 7,500 parked cars associated with this Facility (assuming 75,000 attendance, 3.0 vehicle occupancy, 30% automobile modal split). These must all be parked at off-street facilities in the study area.

7. Parking Facilities

The EIS states there will be an increase in parking capacity of 6,887 between 2003 and 2025. The EIS mentions two parking sites – the 950 space Midblock Boulevard garage, and a 350 space garage by the Convention Center – but provides few details on other parking sites. We therefore make assumptions on other garage sites needed to accommodate venue parking in 2025. It is assumed that about 1,800 spaces of the increased parking supply will be available to serve major venues on Sunday afternoons. To be conservative, we assume that these will be within convenient walking distance to the Multi-Use Facility, Convention Center, and MSG, and they have been incorporated in Figures VI.4 and VI.5 below (figures to be inserted). As described above, about 5,100 spaces will be needed to serve new residential and commercial uses. Because these will likely be much more diffuse, and they will be 100% occupied by the new uses, garages accommodating these spaces have not been incorporated in the Figures.

F. Assessment of Cumulative Impacts

1. Scenario using DGEIS Assumptions

Table VI.5 summarizes individual components of parking need for the 2025 Scenario per DGEIS Assumptions for a Sunday afternoon, with a public show at the Convention Center, a New York Jets game at the Multi-Use Facility, and an event at MSG. This is consistent with the worst case scenario as stated in the DGEIS. Unlike the DGEIS, however, which indicates that 91% of the parking spaces in the study area would be occupied, this analysis indicates that 100% of the parking spaces in the study area would be occupied, and that there would be a further demand for 370 spaces outside the study area. In summary, there would be a demand for 29,357 spaces, compared to a projected capacity of 28,987. It should be emphasized that assumptions in the DGEIS have been employed to calculate parking demand for all major venues, even where those assumptions were not truly conservative.

Table VI.5 Parking Demand Summary
Assumed Cumulative Impacts
DGEIS Modal Split

Assumptions						
Venue	Event Start	Duration	Attendance	Modal Split	Vehicle Occupancy Rate	Parking Requirements
Base Parking Demand						10,516
Background Growth 2003-2025						293
Theater District Parking Surcharge						92
Increased Residential/ Commercial Parking						5,100
Convention Center (Public Show)	9:00 AM	All Day	25,074*	34.9%	3.0	2,917
NY Rangers Game	4:00 PM	3 hours	17,000	48.4%	2.8	2,939
NY Jets Game	1:00 PM	4 hours	75,000	30.0%	3.0	7,500
Total Demand						**29,357**
Study Area Capacity						**28,987**
Total Study Area Deficit						**370**

** Indicates demand at peak hour. Total daily attendance is projected to be 62,684*

Figure VI.6 shows the parking "area of influence" under a 2025 scenario. This map is different than the parking utilization maps presented earlier in this DGEIS Review Report. Since all parking facilities in the study area will likely be at capacity, a parking utilization map for 2025 would not indicate contours with different parking rates. The figure shows that the cumulative parking demand wild far exceed the study area of the DGEIS for parking, extending northward to 63rd Street, westward to 3rd Avenue and southward to west 12th Street.

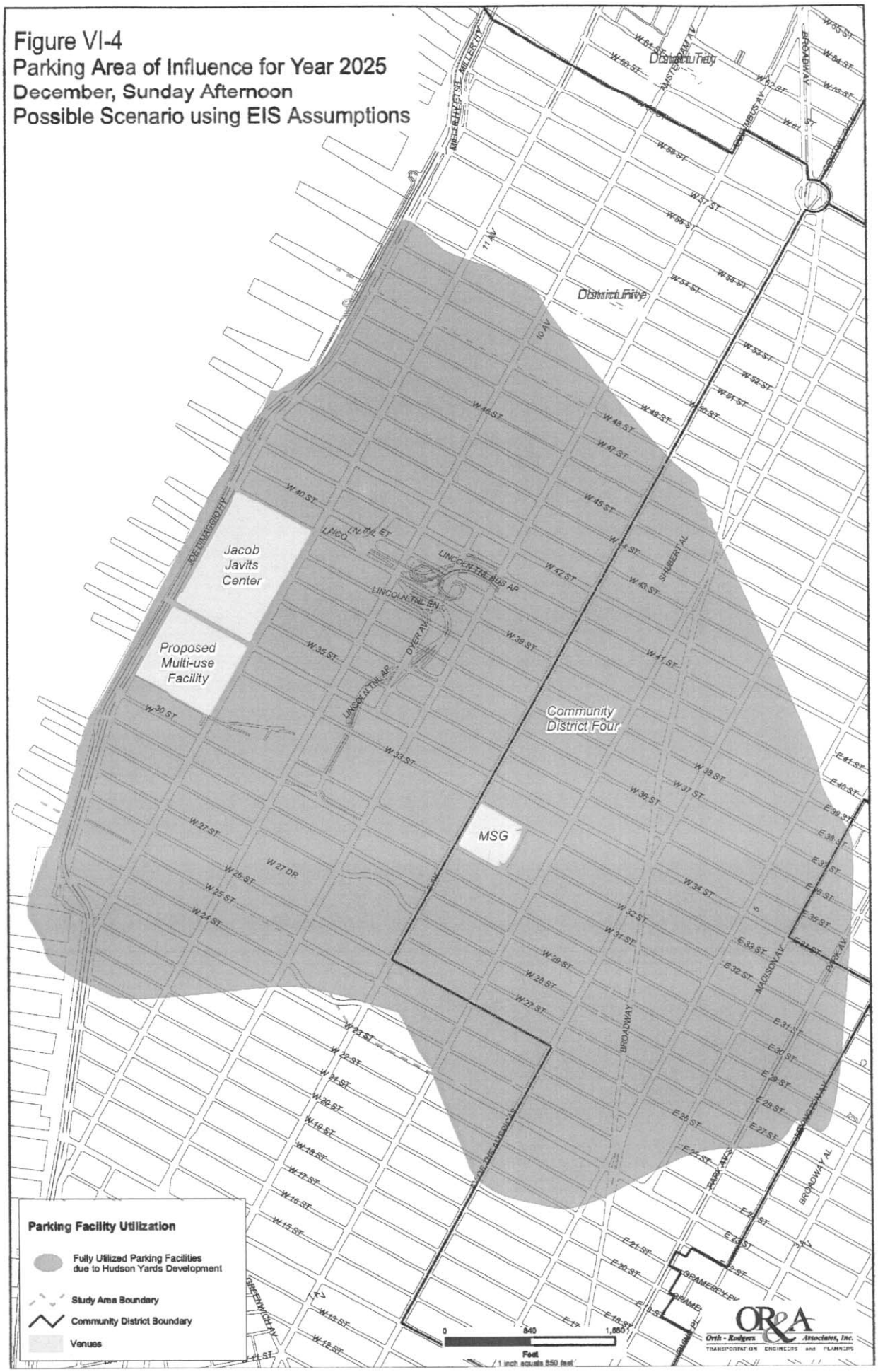


Figure VI-4
Parking Area of Influence for Year 2025
December, Sunday Afternoon
Possible Scenario using EIS Assumptions
Jacob Javits Center
Proposed Multi-use Facility
MSG
Community District Four
Parking Facility Utilization
Fully Utilized Parking Facilities due to Hudson Yards Development
Study Area Boundary
Community District Boundary
Venues
Feet
1 inch equals 850 feet
Orth - Rodgers Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

Conditions will become further exacerbated by an event at MSG on the same day. The flow of Jets fans into parking facilities around Madison Square would, in turn, force people arriving for an event at the Garden to conduct an extensive search for an empty parking space from 24th Street in the south to Times Square in the north. Further conflicts would present themselves in the Theatre District, where, on especially high-attendance days, theatre-goers would be displaced from their normal parking facilities, or visitors to the Garden would be sent to yet other neighborhoods in search of available parking. Because there would be a deficit of parking spaces within the Hudson Yards study area, this Report shows additional facilities in an "extended study area" where Garden visitors would be parking their cars. These facilities are virtually all east of 6th Avenue.

The walking distances for visitors to the Multi-Use Facility and the Garden would be considerable. Half of the parking facilities used by visitors would be over ½ mile from the stadium away. Studies have indicated that most visitors to special events prefer to park no farther than ½ mile from their venue.

Table VI.6 Walking Distance to Venues
Cumulative Impact Scenario
DGEIS Modal Split

Walking Distance to Venues (feet)		
Venue	50th Percentile	95th Percentile
Convention Center	1,475	2,032
Madison Square Garden	2,684	4,430
Multi-Use Facility	3,203	4,455

2. Scenario Using MSG Modal Split

If the modal split from sporting events at MSG is used to project the parking demand generated by the Jets fans, the impacts would be even more significant. Table VI.7 and Figure VI.7 depict a scenario in which the modal split for attendees to a Jets game would be 48% instead of 30%, and in which vehicle occupancy would be 2.75 instead of 3.0. In this event, there would be a parking demand of over 13,000 vehicles for a Jets game. Jets fans would monopolize available parking across the large majority of the study area, and all 1,800 available spaces in the 48 garages of an "extended study area" banding the study area. Even then, over 1,000 Jets fans would not find a space. Visitors to a Knicks or Rangers game would be completely shut out of parking for a 2-mile square area around the Garden. There would be no parking in the theater district for people attending Sunday matinees. There would be a total parking deficit of 4,144 spaces in the study area and extended study area. Table VI.8 indicates the increased walking distance to parking facilities.

Table VI.7 Parking Demand Summary
Cumulative Impact Scenario
48% Auto Usage at 2.75 Persons per Vehicle

						Parking Requirements
						10,516
						293
						92
						5,100
Center (Public Show)	9:00 AM	All Day	25,074*	34.9%	3.0	2,917
NY Rangers Game	4:00 PM	3 hours	17,000	48.4%	2.8	2,939
NY Jets Game	1:00 PM	4 hours	75,000	48.4%	2.8	13,091
Demand						**34,948**
Study Area Capacity						**28,987**
Extended Study Area Capacity						****1,817**
Total Capacity (Study Area + Extended Study Area)						**30,804**
Total Deficit (Study Area + Extended Study Area)						**4,144**

** Indicates demand at peak hour. Total daily attendance is projected to be 62,684*
***Total capacity of Extended Study Area is 3,615; assumed to be 50% occupied*

Table VI.8 Walking Distance to Venues
Cumulative Impact Scenario
48% Auto Usage at 2.75 Persons per Vehicle

Walking Distance to Venues (feet)		
Venue	50th Percentile	95th Percentile
Convention	1,462	2,022
Multi-Use Facility	4,635	7,105


Figure VI-5
Parking Area of Influence for Year 2025
December, Sunday Afternoon
Possible Scenario using MSG Characteristics
Parking Facility Utilization
Fully Utilized Parking Facilities due to Hudson Yards Development
Study Area Boundary
Community District Boundary
Venues
Community District Ten
Community District Five
Community District Four
Jacob Javits Center
Proposed Multi-use Facility
MSG
0
850
1,700
Feet
1 inch equals 850 feet

Reasonable Worst Case Scenario

ORA believes that the reasonable worst case parking scenario which coincides with what is actually likely to occur if the stadium is built and should be based upon the following: a modal split of 58% and vehicle occupancy of 2.5. A Jets game would generate demand for 17,400 parking spaces, or 10,000 more spaces than projected in the DGEIS. On Sundays with a public show at the Convention Center and a Rangers game at the Garden, the total parking demand within the DGEIS study area and the extended study area would be 39,257. Since the available capacity would be 30,804, the total parking deficit would be 8,453 spaces. To provide only one idea of the extent of the deficit, these 8,453 spaces would cover an area larger than 52 football fields.

G. Parking for Visitors to Jets Game Assuming No Convention Center Event

As noted earlier, the DGEIS recommends an analysis of parking conditions for those Sundays in which a football game occurs at the same time as a public show at the Convention Center and an event at the Garden. However, even if there is neither a show at the Convention Center nor an event at the Garden, Jets fans will experience difficulty in finding a parking space within a reasonable walking distance to the game. There are currently a total of 7,855 parking spaces in public facilities within ½ mile of the Multi-Use Facility. (As acknowledged in the DGEIS, ½ mile is the normal yardstick for measuring how far persons are willing to walk after parking their cars for special events.) The DGEIS indicates that parking supply will grow in the future. Under a conservative assumption, about 1,800 parking spaces could be added within the ½ mile radius of the stadium, for a future total of 9,655 spaces.

Using the assumptions in the DGEIS of an automobile modal split of 30% and vehicle occupancy of 3.0, 7,500 spaces would be required to accommodate Jets fans. However, as indicated by the June 2003 parking count in the DGEIS, the ambient demand for parking in facilities within ½ mile, on days with no special events, is 3,670. Under the most conservative assumption – that this ambient demand would remain constant through 2025 - there could be as few as 5,985 parking spaces available within ½ mile of the study area. Under the DGEIS assumption, over 1,515 motorists would need to look for available parking at more than ½ mile distance from the stadium. Using more reasonable assumptions – an auto modal split of 48% and vehicle occupancy of 2.75 for Jets fans, resulting in 13,091 vehicles – over 7,100 motorists would be hunting for parking spaces more than ½ mile from the stadium, even on days with no other special events.

H. Alternative Time Periods

The Sunday afternoon period was chosen for analysis partly because the traffic and parking effects of a football game at the Multi-Use Facility could be much more extensive than indicated in the DGEIS. However, parking capacity could easily be exceeded in other time periods. For example, the EIS indicates that in 2025 on weekdays at midday, demand will be 30,499, with a total capacity of 30,518. This only leaves an available capacity of 19 spaces in the entire study area. The slightest variations in the DGEIS assumptions would lead to situations where demand far exceeds supply. For example, if there is an attendance of 52,440 at a trade show at the Convention Center, the number of parked cars would be 2,191. This would exceed by almost 400 the number of

parked cars associated with the presumed 85th percentile trade show attendance of 43,107.

Even if the DGEIS is correct in its assumptions for the weekday midday, there will be many times where an available parking space will be completely lacking for large portions of the study area, severely inconveniencing resident, merchant, and visitor alike.

I. Contribution to Gridlock

The serious shortfall of parking spaces in close proximity to the Multi-Use Facility would contribute to the congestion on streets in the study area. In the process of circling numerous blocks, vainly searching for an empty parking space, Jets fans would further tie up already congested streets.

J. Parking Conclusions

The DGEIS does not adequately document the parking demand generated by its future scenarios. It is clear that the proposed development will have a major negative impact upon parking availability in the affected neighborhoods. Unlike the DGEIS, this Review Report presents a transparent analysis of future parking demand components assuming that development proceeds as anticipated. The reasonable worst case parking scenario should disclose a shortfall of over 8,000 spaces in 2025, within the DGEIS study. This constitutes a major unmitigated parking impact.

ENVIRON

Received 04 October 04
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October 1, 2004

City Planning Commission
22 Reade Street, 4E
New York, New York 10007
Attn.: Robert Dobruskin, AICP

Metropolitan Transportation Authority (MTA)
2 Broadway, 2nd Floor
New York, New York 10004
Attn.: Emil F. Dul, P.E.

Re: Hudson Yards Draft Generic Environmental Impact Statement
ENVIRON International Corporation's Review and Comments

Dear Mr. Dobruskin and Mr. Dul:

ENVIRON International Corporation (ENVIRON) was retained by Madison Square Garden L.P. to review selected aspects of the Hudson Yards Draft Generic Environmental Impact Statement (DGEIS). ENVIRON's comments on these aspects are provided below. Resumes of senior ENVIRON professionals involved in conducting these reviews and preparing this report are attached.

REVIEW OF FINAL SCOPING DOCUMENT AND CEQR TECHNICAL MANUAL, AND COMPARISON WITH THE DGEIS

ENVIRON compared the methodology/approach for the DGEIS that was outlined in the Final Scoping Document ("Final Scope") with that incorporated into the DGEIS. The objective of ENVIRON's review was to identify major inconsistencies between methodologies and assumptions specified in the Final Scope and those incorporated into the DGEIS. The City Environmental Quality Review (CEQR) Technical Manual (*CEQR Technical Manual*) was also reviewed to assess whether the DGEIS was prepared in accordance with the requirements of the CEQR and the State Environmental Quality Review Act (SEQRA). ENVIRON's review focused on selected elements addressed in the DGEIS that might be expected to cause significant adverse impacts in the Project Area; for example, traffic and noise. Not every section of the DGEIS was reviewed in detail. A summary of major findings is provided below.

Traffic and Parking

- A 0.5 percent annual background growth rate was recommended in the *CEQR Technical Manual* for traffic and parking analyses (CEQR p. 3O-15). It is further stated in the *CEQR Technical Manual* that parking analyses typically use the same background growth rate as traffic analyses since the growth of traffic and parking are closely linked (CEQR p. 3O-15). However, the parking analyses conducted for the DGEIS utilized an annual background

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growth rate of 0.125 percent based on the assumption that the demand for parking will grow at a lower rate than background vehicular traffic in the Project Area (DGEIS p. 19-32). The basis for this assumption has not been provided in the DGEIS.

- Traffic study area selection did not specifically take into consideration high accident locations and intersections that may be problematic from a safety standpoint, as required by the *CEQR Technical Manual* (p. 3O-4).

Air Quality

- The *CEQR Technical Manual* requires that a cumulative air impact assessment be prepared for major stationary sources to analyze the effect of a proposed project's emissions in conjunction with other existing or planned projects' contributions to air impacts at receptor sites (CEQR p. 3Q-16, 3Q-36). Potential air quality impacts associated with the Quill Bus Depot, the Multi-use Facility (MUF), the relocated DSNY Maintenance Garage and NYPD Tow Pound facilities, and the expanded Convention Center were determined individually. However, no assessment was presented in the DGEIS of the cumulative air quality impacts from these major sources, as well as their impacts in combination with other HVAC sources in the Project Area (DGEIS p. 21-36).
- An early-morning period (7:00 am to 8:00 am) was evaluated as part of the air quality analyses to account for the effect of traffic from the relocated Quill Bus Depot, the DSNY Maintenance Garage, and NYPD Tow Pound facilities on mobile source emissions. However, this early morning period was not studied as part of the traffic assessment, even though it was stated in the DGEIS (p. 21-12) that the same time periods were selected for the traffic and air quality assessments.

Noise and Vibration

- The Final Scope stated that noise levels will be measured at receptor sites during six time periods including a "midweek" time (p. 33). Midweek noise level measurements have not been presented in the DGEIS. It was proposed in the Final Scope that L_5, L_{max}, and L_{min} noise levels would be measured (p. 33), but these quantities were not reported in the DGEIS.
- Sensitive existing and proposed buildings and utility locations that could potentially be impacted by vibration and ground-borne noise were not specifically identified, as proposed in the Final Scope (p. 34).

Infrastructure

- The Final Scope (p. 25) proposed to document current maximum monthly flow volumes of stormwater and sanitary discharge to the existing sewer system in the Project Area, but these data were not provided in the DGEIS. There is a potential for the maximum monthly flow volume to be significantly higher than the average flow volumes reported in the DGEIS; for example, during a major rain storm.
- Existing capacity of the water supply distribution system in the Project Area has not been documented in the DGEIS, as proposed in the Final Scope (p. 25).

REVIEW OF THE AIR QUALITY ANALYSIS IN THE DGEIS

ENVIRON reviewed the air quality analysis presented in Chapter 21 and Appendix T in the DGEIS. We also reviewed relevant sections of the DGEIS regarding Energy (Chapter 18), Traffic (Chapter 19), and Construction Impacts (Chapter 23). Our comments are provided below.

General Comments

- The U.S. Environmental Protection Agency (EPA) will designate New York City and the surrounding boroughs as not meeting the national ambient air quality standard (NAAQS) for particulate matter up to 2.5 micrometers in size (PM2.5), which is called fine particulate matter by the EPA. Fine particulate matter is linked with increased asthma, bronchitis, and other acute and chronic respiratory symptoms such as shortness of breath and painful breathing, and premature deaths. EPA identifies cars, diesel powered trucks and buses, power plants, and other combustion sources and industrial processes as sources of fine particulate matter.

  A recent study just published in the New England Journal of Medicine[1] concludes that higher levels of ambient air pollution adversely affect lung development of children as they reach adulthood. This study correlates these adverse impacts to the pollutants nitrogen dioxide, acid vapor, fine particulate matter (PM2.5), and carbon, whose major contributors in the environment, particularly in an urban setting like New York City, are motor vehicles and traffic.

  Because of the projected increases in emissions of particulate matter, the Proposed Action will exacerbate the air quality issues in the City, and contribute to the difficulty of achieving the PM2.5 ambient air quality standard within the City.

- The air quality analysis does not evaluate the cumulative impacts of the project on ambient air. The true impact of the project at street level and at residential and commercial locations is the accumulation of all of the project-related activities, for instance, emissions from traffic, heating and cooling equipment for the new and expanded facilities, and industrial activities. The DGEIS fails to evaluate the cumulative impacts of all project-related activities. As such, the reader is unable to determine whether the project would cause or contribute to a violation of any NAAQS.

Energy (Chapter 18)

- It is not apparent that the air quality modeling accounts for the infrastructure enhancement construction activities that are necessary to provide the projected energy needs (electricity

[1] Gauderman, W. James, et. al., "The Effect of Air Pollution on Lung Development from 10 to 18 Years of Age," The New England Journal of Medicine, September 9, 2004.

and natural gas supply) for the Proposed Action. According to the DGEIS, the Proposed Action would create an increased demand for electricity and gas services. Correspondence from Consolidated Edison Co. (Con Ed) reports the following incremental loads with Hudson Yards (Appendix R):

Year	Incremental Electricity Load Associated with Proposed Project	Incremental Natural Gas Load Associated with Proposed Project
2010	77 MW	500,000 cubic feet/hr
2025	309 MW	4,000,000 cubic feet/hr

Con Ed estimated that one area substation within the Project Area would need to be in operation by 2013 and a second area substation would be needed by 2021. A new transmission substation would be needed by 2025 to service the Project Area and background growth in the surrounding communities (DGEIS p. 18-2).

Con Ed's gas transmission and distribution facilities would require upstream modifications and enhancements to the transmission and distribution system to meet the increased demand. Locally, new gas mains, service lines and metering will need to be constructed to support the new customer load (DGEIS p. 18-2). Construction of this infrastructure would contribute to particulate emissions.

- No analysis or data is provided to evaluate the air quality impacts of the additional generating capacity required for the Proposed Action. The air emissions from the power plant(s) needed to supply incremental electricity for the Proposed Action should be included in the air quality impacts analysis.

Air Quality (Chapter 21)

Mobile Source Analysis

- It does not appear that the emissions from the increased ferry traffic are included in the air quality impact analysis. Ferry traffic to Hudson Yards at Pier 78 is expected to increase with the Proposed Action. For the 2010 Future With the Proposed Action, the increases in peak hour weekday ridership are projected to vary from approximately 1% to 90%. For the 2025 Future With the Proposed Action, the existing capacity of the current New York Waterway ferry services is not anticipated to be sufficient to accommodate the additional demand on three of the six routes (DGEIS p. ES-43).

  The marine diesel engines used in ferries are sources of nitrogen oxide (NOx) and PM2.5 emissions. In fact, in comments to EPA on proposed rule making for marine compression-ignition engines[2], the New York State Department of Environmental Conservation

[2] New York State Department of Environmental Conservation comments on EPA's Advance Notice of Proposed Rule Making (ANPRM), "Control of Emissions of Air Pollution From New Locomotive Engines and New Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder," Carl Johnson, Deputy Commissioner, Office of Air & Waste Management, NYSDEC to EPA Docket Center, EPA, August 26, 2004.

(NYSDEC) recognizes the significance of these emissions, stating that "locomotive and marine compression-ignition engines are significant contributors to NOx and PM2.5 inventories, and ozone and PM2.5 NAAQS non-attainment in New York State and elsewhere." The emissions from the increased ferry traffic should be accounted for in the air quality analysis.

- It does not appear that the emissions from cruise ships docking and leaving from the West Side piers, and the related traffic (including any projected increases in these activities with or without the proposed action) are accounted for in the air quality analysis.

- Refined (Tier II) mobile source modeling for particulate matter up to 10 micrometers in size (PM10) and PM2.5 is required to demonstrate that the traffic associated with the Proposed Action will not adversely impact air quality. However, in the DGEIS, refined modeling is only conducted at a single intersection to conclude that all other intersections will not exceed the applicable standard. It is unreliable to use the results of a Tier II analysis at a single intersection to predict the improvement in ambient impacts from a Tier II analysis at other intersections.

  The DGEIS states that refined calculations will be conducted as part of the Final Generic Environmental Impact Statement (FGEIS) to demonstrate acceptable ambient impacts. Given the extent and nature of the predicted negative impacts from the project, it is appropriate to conduct the refined calculations in time for publication in the DGEIS, so that the public will be able to comment on it.

  Tier I mobile source modeling for PM10 and PM2.5 show exceedances of the NAAQS and significant threshold value (STV) at numerous intersections with the Proposed Action.

Pollutant (Averaging Time)	Number of Intersections Exceeding Standard Using Tier I Analysis	Number of Intersections Modeled Using Tier II Analysis
PM10 NAAQS (annual)	2 (in 2010) 5 (in 2025) 5 (in 2025 with Add'l Bus Service)	1 (in 2025)
PM2.5 STV (annual)	5 (in 2010) 6 (in 2025) 9 (in 2025 with Add'l Bus Service)	1 (in 2025)

Tier I mobile source modeling for 2010 and 2025 Future With the Proposed Action shows exceedances of the PM10 annual NAAQS at two intersections in 2010 and five intersections in 2025 (DGEIS p. 21-19 and 21-22), and exceedances of the PM2.5 annual STV at five intersections in 2010 and six intersections in 2025 (DGEIS p. 21-20 and 21-23). The scenario 2025 Future With Proposed Action With Additional Bus Service exacerbates the exceedances shown for 2025 Future With the Proposed Action, and adds three additional intersections which exceed the PM2.5 annual STV. To address these Tier I modeled exceedances, Tier II (refined) mobile source analysis is conducted at one intersection (Tenth Avenue and West 42nd Street – Analysis Site 13). Based on this single Tier II analysis, the

DGEIS concludes that all of the intersections are expected to comply, and proposes that the refined analysis will be conducted at the selected intersections in the FGEIS.

- According to the DGEIS, the Tier II (refined) mobile source analysis for PM2.5 incorporates application of the MTA bus fleet retrofit technology program for reducing bus PM2.5 emissions (DGEIS p. 21-20, 21-23, and 21-27). Generally, to incorporate credit for an emission reduction program in an air quality analysis, the emission limitations need to be Federally Enforceable and Practicably Enforceable. It is not clear how the MTA bus fleet retrofit technology program meets these criteria.

Stationary Source Analysis

- The use of "E" designations for potential development sites is unusual. The DGEIS states that the "E" designation will be applied to potential development sites to avoid significant adverse impacts to residences or commercial entities. In an air quality analysis, it is highly unusual to require the general public to accept restrictions to avoid an adverse air quality impact. It is normally incumbent on the applicant or, in this case the project proponents, to accept restrictions to avoid adversely impacting the general public.

  The DGEIS uses the screening analysis outlined in the *CEQR Technical Manual* for evaluating impacts from HVAC sources within the Project Area and future residential developments not related to the Proposed Action that were identified within a 400-foot radius of the Project Area. The Project Development Sites pass the screening analysis by imposing limitations on stack locations (at the center of the building roof) and fuel use restrictions (natural gas only versus the flexibility to use fuel oil). These restrictions would be enforced through an "E" Designation on certain development sites (DGEIS p. 21-39).

- The impacts of specific facilities of interest, including the Con Edison Facility, Quill Bus Depot, the MUF, Expanded Convention Center, and the Relocated DSNY Garage and NYPD Tow Pound Facilities, are evaluated individually. Predicted impacts of emissions from each of these facilities, individually, are indicated to be below the NAAQS for NO2, SO2, and PM10 (with fuel sulfur limitations for the Quill Bus Depot Boilers) (DGEIS p. 21-40 to 21-42). The DGEIS made no attempt to ascertain compliance with the NAAQS with these sources combined, and in combination with the other HVAC sources.

  Further, the DGEIS assumes a limitation on fuel oil sulfur content or a modification to the HVAC system's operating cycles to reduce the amount of fuel oil used in the Quill Bus Depot Boilers to avoid a SO2 NAAQS exceedance. It is unclear how these limitations would be enforced by the project sponsors.

- It appears that the HVAC analysis was conducted for receptors at elevations corresponding to windows at major residential and commercial complexes. These emissions were apparently not evaluated for impacts on pedestrians at street level.

Air Toxics Analysis

- The DGEIS "concluded that adverse impacts from industrial sources on most Potential Development Sites would be unlikely. However, some of the commercial development sites are in close proximity to industrial sources. Therefore, to preclude the potential for significant adverse industrial source air quality impacts, an "E" Designation requiring inoperable windows and no air intakes will be placed on the following sites..." (DGEIS p. 21-50). It is unclear how the "E" designation (and the attendant operating limitations) would be enforced by the Proposed Action proponents on specific development sites. It is normally incumbent on the applicant or, in this case the project proponents, to accept restrictions to avoid adversely impacting the general public.

- The DGEIS reports that the modeling analysis of the Quill Bus Depot spray booth indicates that there would be no significant adverse impacts associated with air toxics emissions in 2010, but indicates potential significant adverse impacts in 2025 at certain existing receptors in the vicinity of the relocated facility and projected developments in the West Chelsea Rezoning area (DGEIS p. 21-51). The DGEIS indicates that these adverse impacts "would be eliminated by NYCT commitments to be incorporated in the air permit for the relocated bus depot" (footnote to DGEIS Table 21-32). As the project proponents are not the regulatory agency responsible for issuing the air permit for the facility, it is unclear how these commitments would be enforced or enacted by the proponents. Further, the specific mitigation measures, including any control measures, required to avoid adverse impacts should be reviewed and identified to ensure adverse impacts can be reasonably mitigated.

- The modeling used the Quill Bus Depot's current air permit to establish emission rates and stack parameters. The DGEIS indicates that the relocated Quill Bus Depot would contain facilities for storage and maintenance of up to 350 buses (p. 2-45). It is unclear if the emission rates account for the projected future level of bus service at this facility.

Construction Impacts (Chapter 23)

- In addition to trucks, the DGEIS also anticipates potentially using barges for long-distance transport of tunnel boring machine (TBM) spoils from the Launch Site (p. 23-31). It does not appear that emissions from these potential additional modes of transport were accounted for in the air quality analysis. The DGEIS anticipates that if rock spoils are to be hauled by barge, the spoils would be transferred by truck or another transportation system to barges at one of the West Side piers (Pier 76, located between West 34th Street and West 38th Street, is mentioned in the DGEIS as one such possibility). Barge emissions would be additive to the truck emissions used to transport the rock spoils to the West Side piers. In addition, with the marine transfer scenario, there would be additional fugitive dust emissions from the transfer of rock spoils from truck to barge that would need to be accounted for.

- The modeled impact of PM2.5 from construction activities significantly exceed the 24-hour and annual STVs established by the NYSDEC and the New York City Department of Environmental Protection (NYC DEP) (DGEIS Table 23-29). Even with emission reductions

of 65 percent from diesel powered equipment, and 75 percent from fugitive dust sources, assuming implementation of emission control measures (e.g., diesel oxidation catalyst or diesel particulate filters on diesel equipment, and a comprehensive dust control program), the modeled impact is incrementally below NYC DEP's annual STV (0.098 ug/m3 vs. 0.1 ug/m3) but still shows an exceedance of NYC DEP's 24-hour STV (DGEIS Table 23-31). The DGEIS states that a detailed assessment with the selected measures will be included in the FGEIS. Given the extensive reductions in fine particulate emission controls needed to remain below the PM2.5 STV, the practicability of maintaining the required high level of emission control over the construction site(s) for the entire period of construction should be addressed.

- It does not appear that the construction air quality analysis incorporates impacts from the additional construction vehicle traffic from other construction projects, such as the reconstruction of lower Manhattan. The construction vehicles projected to be generated by the Lower Manhattan Recovery Projects in 2006 need to be added to the 2006 background traffic.

  The Final Environmental Impact Statement for the World Trade Center (WTC) redevelopment indicates that peak period of construction on the WTC site would occur in 2006 (World Trade Center Memorial and Redevelopment Plan FGEIS, p. 21-4), which coincides with the peak construction period projected for the Hudson Yards Project. For the WTC redevelopment, the WTC PATH Terminal, and the Route 9A projects, the primary travel route would be Route 9A (World Trade Center Memorial and Redevelopment Plan GEIS p. 21-39).

REVIEW OF THE NATURAL RESOURCES ANALYSIS IN THE DGEIS

ENVIRON reviewed the natural resource analysis presented in Chapter 13 in the DGEIS with a focus on aquatic impacts related to combined sewer overflows. We also reviewed relevant sections of Chapter 16 of the DGEIS, regarding Infrastructure, and the current discharge permit for the North River wastewater treatment plant, which services the Project Area and is located on the Hudson River from 137th Street to 145th Street. Our comments are provided below.

- In most of New York City and all of the proposed Project Area, rainwater is collected in the same set of sewers that transport human sewage to the City's wastewater treatment plants. The sewer system is not designed to handle all of the additional rain water flow from hard rains. As a result, raw sewage blended with storm water is discharged into the Hudson River and other nearby water bodies during hard rains. The discharged blend of raw sewage and rain water is commonly referred to as combined sewer overflow, or CSO.

- Each CSO event will typically leave a trail of contaminants in the river at each location where the sewer system is designed to discharge its excess water. According to the current permit, there are 52 CSO outfalls in the service area of the North River

wastewater treatment plant, each designed to discharge CSO to the Hudson River. Four of these CSO outfalls are in the Project Area, at West 30th, West 36th, West 40th, and West 43rd Streets (DGEIS p. 16-7).

- The DGEIS acknowledges that the proposed project will increase sewage flows from 1.1 million gallons per day (DGEIS p. 16-6) to 8.6 million gallons per day (DGEIS p. 16-16) from the Project Area. Because of the larger sewage generation rate, discharges of raw sewage into the Hudson River on rainy days can be expected to increase in frequency and severity. The DGEIS acknowledges that discharges of raw sewage into the Hudson River as CSO will likely increase in severity if the proposed project is completed (DGEIS p. 13-22 and 13-23), but it provides no details.

- This DGEIS acknowledges that the existing sewer infrastructure is inadequate to handle the additional wastewater flow that will be generated by the proposed project, particularly during wet weather (DGEIS p. 16-6). The DGEIS claims that the need for additional sewer capacity in the Project Area will be evaluated and addressed by municipal officials during project build-out (DGEIS p. 16-16 and 16-17). The DGEIS does not provide any specific statements regarding when these sewer infrastructure improvements would be constructed, only that needed improvements will be identified. In any event, CSO capture from the Project Area will not reach 100%, as combined sewer systems are designed for a specific finite capacity (twice the dry-weather flow) and supplemental systems will be similarly designed (DGEIS p. 16-17 and p. 13-22).

- Contaminants in CSO include microorganisms that can cause disease in humans and chemical substances that can impair aquatic organisms. CSO can also have indirect effects by contributing to the depletion of dissolved oxygen in the Hudson River. Many aquatic organisms, including most desirable species of fish, require dissolved oxygen to thrive.

- In its discussion of intense rainfall that can give rise to CSO releases, the *2002 New York Harbor Water Quality Report* issued by the NYC DEP says (page 24) rainfall in excess of one-half inch in a 48-hour period provides a good general indicator. This rainfall intensity corresponds to one-quarter inch in a 24-hour period. There were 17 rainfall events in 2003 with one inch or more of rain in a 24-hour period in New York City (Central Park meteorological station, National Oceanic and Atmospheric Administration (NOAA) [http://www.erh.noaa.gov/er/okx/climate/data]) and an additional 48 rainfall events of between one-quarter and one inch. Hence, there were a total of 65 rainfall events with one-quarter inch or more of rain in a 24-hour period. An estimate of approximately 60 CSO events per year, therefore, appears plausible for the New York City area generally.

- The DGEIS does not provide any specific information regarding the greater number or severity of sewage overflow events that can be expected when the project is fully developed. Whatever the number, the proposal will impair the quality of the Hudson

River. The DGEIS acknowledges that CSO discharges will increase in severity. The proposed project, therefore, represents a step backwards in protecting the Hudson River.

REVIEW OF THE HAZARDOUS MATERIALS ANALYSIS IN THE DGEIS

ENVIRON reviewed the hazardous materials analysis presented in Chapter 14 in the DGEIS with a focus on remediation issues. We also reviewed relevant sections of Chapter 23 of the DGEIS, regarding Construction Impacts. Our comments are provided below.

- The *CEQR Technical Manual* defines a hazardous material as any substance that poses a threat to human health or the environment. The DGEIS acknowledges that hazardous materials are known or expected to be present as sub-surface contamination (of soil, groundwater, soil gas, and bedrock) or in surface structures (as asbestos-containing materials, polychlorinated biphenyls (PCBs), lead-based paint, and mercury in building materials and fixtures) on many of the properties that will be purchased and developed under the proposed project (DGEIS p. 14-1 and 14-2).

- The DGEIS states that the City will give 99 properties "E" designations, indicating that there are potential environmental contamination problems (p. 14-43 to 14-47). Designations would be placed on the Zoning Map for these properties. The "E" designation would require a fee owner of each property to conduct testing and sampling and implement environmental protection and management activities to the satisfaction of the NYC DEP before a building occupancy permit can be issued.

- The DGEIS acknowledges that construction activities in the area proposed for re-zoning could disturb hazardous materials and increase pathways for human and environmental exposure (DGEIS page 14-43). As a result, for example, additional dust and potentially toxic emissions could be generated and exacerbate adverse impacts on air quality in and around the West Side during construction-related activities. For each major project element, a Construction Environmental Protection Program (CEPP) will be prepared and implemented to mitigate these emissions and exposures to workers, residents, and the environment, according to the DGEIS.

- Review of testing and sampling plans and data, review and enforcement of CEPP plans, and oversight of sub-surface remediation plans will add administrative and technical burdens on NYC DEP personnel that should be accounted for in estimates of the costs to NYC imposed by the proposed project. The DGEIS has no discussion of these additional burdens or the need for additional NYC DEP resources to ensure timely and authoritative execution of these duties.

- The City will potentially also incur costs to investigate and remediate sub-surface contamination beneath properties that have been or will be acquired for open space and municipal facilities. ENVIRON estimates, based upon a plausible set of assumptions and unit costs, that treatment and disposal of contaminated soil at these parcels could add as

much as 15 to 20 million dollars to the City's project-related costs. The City will also incur additional costs for treatment and disposal of contaminated groundwater that will be encountered during construction (DGEIS p. 14-13) and will need to be handled during dewatering. ENVIRON did not specifically estimate these additional costs, because the volume of groundwater to be treated and disposed is uncertain, given the wide range of geotechnical techniques that could be implemented to limit groundwater seepage into the sub-surface construction area. In ENVIRON's judgment, however, the groundwater treatment and disposal costs could potentially be significant.

INTERNAL INCONSISTENCIES IDENTIFIED IN THE DGEIS

During ENVIRON's review of the DGEIS, certain internal inconsistencies in methodologies and assumptions from one chapter of the DGEIS to another were identified. Provided below is a summary of inconsistencies that were identified.

Construction Impacts

- In Chapter 14, Hazardous Materials, it is stated that construction impacts are assessed in the DGEIS in two analysis years – **2010** and **2025** (p. 14-3). However, as stated in Chapter 23, Construction Impacts, analysis of construction activities during years 2010 and 2025 would not accurately reflect reasonable worst-case construction impacts because much of the construction associated with the Proposed Action is expected to be completed prior to these years. Years **2006** and **2017** were selected to represent the reasonable worst-case peak periods for the construction impact analysis (DGEIS p. 3-20, 23-6).

Land Development

- The number of residential units expected to be developed in the Project Area by 2025 is listed as **10,600** on p. 3-10, **12,800** on p. 4-2, **12,887** on p. 5-2, and **12,600** on p. 19-28 of the DGEIS.
- The square footage of commercial office space to be developed by 2025 is assumed as **29.5 million square feet** on p. 4-2, **29 million square feet** on p. 19-28, and **28 million square feet** on p. 24-14 of the DGEIS.

Employment

- In Chapter 5, Socioeconomic Conditions, the number of direct new jobs (*i.e.*, not including indirect jobs such as those created due to demand for goods and services by activity in the Project Area) generated by the proposed action by 2025 is listed as **127,100** on p. 5-2, but listed as **110,930** on p. 5-6 of the DGEIS.

* * * * *

We appreciate this opportunity to provide comment on the Hudson Yards DGEIS. We would be happy to provide copies of any of the documentation referenced in our letter.

Sincerely,

Richard Kapuscinski, P.E.
Senior Manager

Alan Shimada
Principal

Attachments (3)

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Alan S. Shimada

Education

1981 MBA, Columbia University

1973 B.S. Chemical Engineering, University of Utah

Experience

Mr. Shimada is a Principal at ENVIRON International Corporation. He has nearly thirty years of diversified engineering experience in industry, government, and consulting, including ten years with Exxon and DuPont, several years with the U.S. Environmental Protection Agency, and fourteen years in environmental consulting. He is particularly experienced in addressing air compliance issues in complex manufacturing plants such as chemical, petroleum refining, and pharmaceutical facilities as well as glass manufacturing and surface coating operations. His experience includes the following:

- Managed preparation of two separate PSD permit applications for two major refineries in the Northeast. These projects involved both unit modifications and new installations to address Tier 2 low sulfur gasoline requirements, capacity expansion of a fluid catalytic cracking unit (FCCU), and, for one refinery, installation of a scrubber on the FCCU. The PSD permit applications included emissions quantification, netting analyses, control technology review (BACT), and dispersion modeling analyses evaluating Class I and Class II impacts. The project included determining the applicable state and federal air regulations and conducting extensive permit negotiations with the state regulatory agency.

- Provided technical and regulatory support for a paper mill responding to a Section 114 information request from EPA Region III, which included review of historical projects as they related to potential PSD permitting triggers, including routine maintenance, repair, and replacement (RMRR), and change in the method of operation.

- Developed documentation for a glass manufacturing client to generate emission credits under New Jersey's Open Market Emissions Trading rules for trading in the open market. The project scope included preparing an emissions quantification protocol; quantifying emissions based on strict regulatory requirements; providing notification; registering credits with New Jersey State registry; and obtaining third-party verification of the credits.

- Managed preparation of two separate construction permit application for a refinery – a state construction permit application for implementation of equipment to meet Tier 2 low sulfur gasoline requirements and a PSD permit application for a capacity expansion of a fluid catalytic cracking unit (FCCU). The state construction permit application required conducting a state control technology evaluation on existing and new equipment. The PSD permit application involved conducting a Best Available Control Technology (BACT) review and dispersion modeling analyses evaluating Class I and Class II impacts. Both projects required emissions quantification and netting analyses.

- On behalf of two major Northeast refineries subject to requirements under the Ozone Transport Region (OTR) and Pennsylvania NO_x Budget "Cap-and-Trade" Program, developed and documented monitoring methodology for affected emissions units

consistent with EPA guidance; conducted data reduction for quarterly emissions reports; compiled data reports consistent with strict EPA formatting guidelines; and conducted QA/QC review of final reports.

- Prepared a model Startup, Shutdown, and Malfunction Plan (SSMP) for a Philadelphia refinery to meet the requirements of the Refinery MACT regulations. The project included conducting extensive review of process and instrumentation diagrams, process flow diagrams, and standard operating procedures, and interviews and discussions with unit operators.

- Prepared a Title V permit application for a container glass manufacturing facility that received administrative and technical completeness from the state agency on the first draft without revision. Currently negotiating Title V permit conditions with the state agency.

- Assisted a cogeneration facility in fulfilling its requirements under the Ozone Transport Region (OTR) and New Jersey NOx Budget "Cap-and-Trade" Program. Developed monitoring methodology for the unit consistent with EPA guidance; calculated and compiled quarterly emissions reports based on methodology approved by New Jersey and EPA; and submitted quarterly emissions reports on behalf of client to EPA mainframe computer database. As part of the "Cap-and-Trade" Program, the client was able to sell excess credits for significant financial incentive.

- Negotiated a state construction permit for installation of low-NO_x burners to meet state Reasonably Achievable Control Technology (RACT) requirements at a cogeneration facility. This permit was obtained under EPA's Pollution Control Project (PCP) policy to avoid triggering PSD requirements. This was the first permitting action in the state to use the PCP policy to avoid PSD requirements.

- Managed preparation of all permits—including air, soil erosion and control, Coastal Area Facility Review Act (CAFRA) permit—required for a large new glass manufacturing furnace that was constructed using an innovative new pollution control technology for controlling particulate matter emissions as well as recovering waste heat from the furnace stack. Permitting for the new furnace involved preparing for and attending public hearings, and negotiating innovative and unprecedented permit conditions which allowed client maximum flexibility in operations without triggering PSD or NSR requirements.

- Assisted a Hazardous Organic NESHAPs (HON)-affected facility in developing a Startup, Shutdown, and Malfunction Plan (SSMP). Key technical advisor in internal meetings conducting extensive review of standard operating procedures, conducting review of actual facility operations, and interacting with facility personnel, including environmental, engineering, maintenance, and operations. The project required detailed understanding of regulatory requirements, and ability to integrate facility operational requirements with these regulatory requirements.

- Compiled Maximum Achievable Control Technology (MACT) information and data for three pharmaceutical production facilities in response to a Section 114 information request letter from EPA. Emissions data were developed for process vents, storage tanks, wastewater streams, and fugitives based on observations and other operating data.

- Assisted a major chemical manufacturing facility in determining Hazardous Organic NESHAPs (HON) non-applicability, based on evaluation of production records and operating data.

- Prepared a pollution prevention plan for a major chemical manufacturing facility incorporating technically and economically feasible alternatives. Facilitated the brainstorming sessions among operations, maintenance, and environmental to develop pollution prevention alternatives for evaluations.

- Assisted a pharmaceutical industry trade group in addressing issues with the proposed and promulgated Pharmaceutical MACT standard. Developed background documentation using information from member companies for submitting comments to and negotiating with EPA.

- Obtained a preconstruction permit and operating certificate for a surface coating operation that involved application of a primer and an adhesive mixture to various substrates using roll coaters. The project involved negotiating with the agency for an alternate test method (alternate to Method 24) for determining VOC emissions from the drying operations.

- Prepared an air permit application for a solvent-based, multi-color rotogravure printing operation applying surface coating to a vinyl substrate. The operations included total enclosure and thermal oxidizer for controlling VOC emissions. The project required negotiating special permit conditions for monitoring operations and conducting stack testing for determining and verifying compliance.

- Obtained an air permit for can manufacturing line that included a spray surface coating operation. Used a "24-hour bubble" to address regulatory requirements. Developed monitoring and recordkeeping procedures to be implemented by the facility for documenting compliance.

- Prepared and negotiated numerous Title V permits for various types of facilities, including cogeneration, paper, chemical, refinery, glass manufacturing, and surface coating operations. As part of the Title V permit application, developed equipment inventories (significant and insignificant) and emissions calculations (point and fugitive); conducted rigorous regulatory applicability analyses; and determined compliance status with each applicable regulations.

- Assisted a client in using New Jersey's Open Market Emissions Trading (OMET) Program to pilot test an innovative new NO_x reduction technology on an existing glass manufacturing furnace to meet NOx RACT requirements, without requiring shutdown of furnace and disruption in supply to customer.

- Implemented computerized environmental quality program used to track, monitor, and notify compliance with regulatory requirements for all media for a major petroleum company at operating petroleum refineries corporate-wide. Involved populating database at each refinery with federal, state, and local requirements as well as site-specific requirements. The requirements ranged from regulatory requirements to state permit conditions to negotiated compliance orders.

- Managed implementation of the Compliance Module of an off-the-shelf Environmental Information Management System (EMIS) software at a refinery. This project involved setup and installation of the software, as well as population of the database with regulatory requirements from the refinery Title V air permit to allow submission of the annual certification statement.

- Assisted a polypropylene manufacturing facility in obtaining a facility-wide permit for its entire operations, which incorporated all air, wastewater, and RCRA permits. As part of the facility-wide permit effort, prepared the required pollution prevention plan that identified numerous cost-saving (and emissions-reducing) opportunities that were ultimately implemented at the plant. The facility-wide permit issued by New Jersey was the subject of a widely publicized public relations event sponsored by the state and attended by the Governor.

- Prepared pollution prevention plan for a chemical manufacturer of esterification products. Led brainstorming sessions with plant process engineers, environmental staff, operations, maintenance, and management to identify and develop wide-ranging pollution prevention opportunities. Evaluated the identified opportunities for technical and economic feasibility, with the feasible options incorporated into the pollution prevention plan.

- Prepared a Title V permit application for a batch chemical manufacturing plant. Prior to finalizing the Title V permit application, numerous state permits were updated to capture equipment revisions and modifications and outdated or erroneous permit conditions. This project required extensive effort over one year to identify equipment and manufacturing operations that were inconsistent with current permits, re-estimate batch emissions, prepare and submit revised permit applications, and negotiate permit conditions with permit writers.

- Conducted compliance auditing of numerous industrial facilities, including large chemical plants, pharmaceutical synthesis operations, pharmaceutical R&D facilities, instrument manufacturer, automobile manufacturers, and TSDFs. Audits, which identified deficiencies and recommended corrective action, covered all media, including air, RCRA, SARA, water/waste-water, and pollution prevention.

- Prepared state permit applications for batch specialty chemical and pharmaceutical manufacturing plants using special "non-reactive" and "batch" permitting procedures. These projects sometimes involved development of several hundred "product characterization sheets" with emissions estimates to represent a wide variety of chemical products. These permits allowed great flexibility in operations for the manufacturing plants without requiring permit modifications and the attendant time delay. In addition, these permits often allowed the facilities to operate as "synthetic minor" facilities, avoiding additional regulatory requirements such as Title V and MACT.

Prior to joining ENVIRON, Mr. Shimada held the following positions:

- Managed the New Jersey office of Trinity Consultants, where he was responsible for developing and managing air quality projects in the Northeast U.S.

Alan S. Shimada

- Managed the Engineering Group in the New Jersey office of Environmental Resources Management (ERM), where he developed, managed, and conducted environmental consulting projects for industrial clients.

- Conducted air compliance reviews at industrial facilities, conducted critical review of PSD permits, and reviewed air regulations applicable to Superfund site activities while at EPA Region II.

- Assisted California municipalities in evaluating technical, regulatory, and financial feasibility of implementing alternative energy projects at their facilities, and providing financial assistance while at the California Energy Commission.

- Developed, designed, and planned refinery processes and participated in refinery and chemical plant startups at Exxon and DuPont.

Professional Affiliations

Air and Waste Management Association

Selected Publications And Presentations

Gale, Tom, Dave Land, Alan Shimada, and David Wall, "Permitting Challenges for Modification to Meet Tier 2 Low Sulfur Gasoline Requirements: A Case Study – Valero Refining Company – New Jersey," Poster Session, 2002 NPRA Environmental Conference, New Orleans, LA, September 9-10, 2002.

Shimada, A., James Disario, and David Wall, "Implementation Challenges for the Upcoming NOx SIP Call: Lessons Learned from the Ozone Transport Commission (OTC) NO_x Budget Program and Implications for 2003-2007," 2001 NPRA Environmental Conference, Austin, TX, September 23-25, 2001

Shimada, A., "Trade-in Deals," *Environmental Protection*, March 2000

Shimada, A., "Challenges in Emissions Trading: Smoothing the Road to More Efficient Pollution Control Strategy,"AWMA Environmental Permitting Symposium II, Chicago, IL, November 14-16, 2000.

Shimada, A. and B. Morton, "Regulations Establish Emissions Trading as Key Risk Management Tool," *Power Engineering*, October 1999.

Richard B. Kapuscinski, Ph.D., P.E.

Education

1980 Ph.D., Engineering (Environmental), Harvard University

1977 M.S., Engineering (Environmental), Harvard University

1975 B.S. (with distinction), Civil and Environmental Engineering, Cornell University

Registrations & Affiliations

Licensed Professional Engineer in Maryland, Pennsylvania, and Virginia

Experience

Dr. Kapuscinski has over twenty-three years of progressively responsible, post-doctorate professional experience as an environmental engineer, encompassing:

- consulting, science-based advocacy, and project management on behalf of regulated entities regarding environmental restoration and public health and environmental protection;
- teaching/training regarding ground water remediation, health and ecological risk assessment, waste water treatment and disposal, and water quality modeling; and
- experimental research/testing and related publications and conference presentations regarding environmental restoration, health risk assessment, biological wastewater treatment, and environmental microbiology.

Dr. Kapuscinski has supported legal counsel involved in litigation/disputes pertaining to contaminated sites (e.g., necessity of response action, appropriateness of remedial action objectives and specific technologies, risks created by implementing specific remedies, reasonableness of costs incurred, adequacy of site characterization), causes of environmental contamination (e.g., timing and source of release(s), impacts of specific waste management activities, cost allocation), and claims of adverse health and environmental effects (e.g., hazardous waste de-listing), including preparation of expert reports and direct testimony.

He has also assessed and characterized human exposures and health risks posed by a wide variety of chemical and radioactive substances, resulting from their manufacture (e.g., exposure to workers, waste management practices), intended use, routine or accidental release to the environment, and/or natural occurrence.

Dr. Kapuscinski's project experience includes the following:

Representative Risk-Based Corrective Action Projects

RCRA Corrective Action Sites and Operating Facilities

- **Confidential Chemical Manufacturer, Virginia, Senior Project Manager:** Prepared a Corrective Measures Implementation (CMI) work plan to address soil and ground water contamination at an operating facility pursuant to RCRA. The work plan included

bioventing and biosparging for treatment of soil and perched groundwater, respectively, that contain certain aromatic hydrocarbons and volatile solvents. Site-wide bedrock groundwater is being addressed by a combination of extraction (pumping) and natural attenuation, which will be assessed by an integrated ground water monitoring program. Contributed to evaluating the impact on plume capture caused by changes in pumping regime, including a new production well. Assessed surface water quality impacts potentially caused by discharge of un-captured ground water. Also oversaw development of risk-based Alternative Concentration Limits (ACLs) for constituents in groundwater and discussed these ACLs with experts in the Virginia Department of Environmental Quality (VADEQ).

- **RCRA Corrective Action, Petroleum Fuel Terminal, Manassas, Virginia, Senior Engineer:** Directed the preparation of a Closure Plan for a surface impoundment that is being regulated as a hazardous waste management unit. Met with representatives of the Virginia Department of Environmental Quality (VADEQ) to discuss concerns and regulatory requirements. Prepared a supplemental characterization report to demonstrate the absence of hazardous waste residuals. Prepared a health risk assessment for sediments in the impoundment, which supports "clean closure" for future industrial use.

- **RCRA Corrective Action, Petroleum Fuel Terminal, Fairfax, Virginia, Senior Engineer:** Provided project oversight and quality assurance regarding operations, maintenance, and performance monitoring of a large-scale, integrated system for intercepting, extracting, and treating groundwater and non-aqueous phase liquid (NAPL) hydrocarbons from an extensive plume. Prepared biannual reports summarizing remedial progress and site activities under the RCRA order. Managed the electronic database of groundwater samples (including BTEX and MTBE analyses), NAPL sampling and recovery data, water-level measurements, and treatment system performance samples. Updated the operations and maintenance (O&M) manual, which details standard maintenance and troubleshooting procedures for the remediation system. Worked effectively with multiple contractors.

- **Corrective Action Planning for PCBs in Soils and Drainage-ways, Senior Engineer:** Provided technical assistance and strategic counsel regarding risk-based corrective action at multiple gas transmission pipeline stations in Alabama, Tennessee, and New York, where polychlorinated biphenyls (PCBs) had impacted surface soils, drainage-ways, creeks, and rivers due to historic releases of hydraulic oils from turbo-machinery. Met with client project managers and legal counsel to evaluate cleanup options and regulatory approaches. Reviewed scientific literature on the biodegradability of PCBs and simulated congener-specific biodegradation of PCBs in river sediments to assess the potential for natural attenuation to meet long-term cleanup goals. Researched USEPA decision documents (e.g., RODs) regarding numeric cleanup goals for PCBs in streams and soils. Reviewed work plans and reports regarding the presence of petroleum hydrocarbons, hexavalent chromium, mercury, and PCBs in site soils, surface water, sediments and ground water. Estimated cleanup costs and potential remediation volumes, based upon site characterization data. Assisted client's expert in developing testimony before the Federal Energy Regulatory Commission (FERC) regarding the timing of historic PCB releases.

Superfund Sites

- **Corrective Action Planning, Himco Landfill Superfund Site, Elkhart, Indiana, Senior Engineer**: Reviewed and critiqued the baseline risk assessment, Proposed Remedial Action Plan (PRAP), Record of Decision (ROD), and a revised proposed plan for this closed solid waste landfill. Statistically evaluated groundwater monitoring data to demonstrate that the landfill had a negligible impact relative to up-gradient wells. Interpreted soil gas concentration data and estimated vapor-phase attenuation coefficients to demonstrate that VOCs were not a significant threat to nearby residents via the sub-surface migration pathway. Prepared and reported an alternative risk assessment, which supports a limited, but protective, alternative remedial action at the site. Met with remedial project managers and counsel for USEPA Region 5 and the Indiana Department of Environmental Management (IDEM) to establish remedial action objectives and discuss remedial approaches and ARARs for the site. Prepared work plans for supplemental, post-ROD site characterization and long-term groundwater monitoring. Developed remedial cost estimates for the prospective PRP group. As a result of these efforts, the USEPA is currently considering a ROD amendment to select an alternative remedy, which represents a multi-million dollar savings over the PRAP/ROD.

- **Corrective Action Planning and Risk Assessment, Metcoa Radiation Superfund Site, Pennsylvania, Senior Engineer**: Provided technical assistance to a PRP group regarding site characterization and remediation of this inactive metal recycling site. Critiqued the risk-based cleanup levels proposed by USEPA Region 3. Developed and proposed alternative, risk-based cleanup levels for metals based upon site-specific characteristics. Reviewed data regarding gamma radiation levels, total metal concentrations, and concentrations of thorium- and uranium-chain radionuclides in surface fill materials. Performed statistical calculations to identify sub-areas requiring remedial action. Prepared a work plan for supplemental site characterization during the remedial design phase. Met with USEPA Region 3 technical staff and attorneys in the U.S. Department of Justice (USDOJ) to discuss remedial alternatives and present a technical rationale for limiting excavation and removal of surface soil and fill. Reviewed and critiqued the USEPA's Engineering Evaluation and Cost Analysis (EECA) report. Developed remedial cost estimates for the primary site remediation and waste management options. Worked effectively with multiple contractors and PRP representatives. These efforts contributed towards a more realistic evaluation of remediation costs, which facilitated a settlement among the PRPs and with the USDOJ.

- **Impact Assessment, Inactive Lead Smelter in Indiana, Senior Engineer**: Developed a sampling and analysis plan for surface soils to determine whether a residential area nearby had been impacted by historic smelter emissions of lead. Metals that co-occur in smelter emissions were included in the analysis to help distinguish smelter-derived lead from lead derived from paint and other sources. Met with representatives from the Indiana Department of Environmental Management (IDEM) to discuss their concerns.

Additional MNA Sites

- **Assessment of Biodegradation in Situ, Multiple Petroleum and Solvent Sites, Senior Engineer**: Evaluated and interpreted groundwater monitoring data regarding dissolved-phase concentrations of organic contaminants (e.g., BTEX, tetrachloroethylene, trichloroethylene, trichloroethane (TCA), dichloroethylenes), potential terminal electron

acceptors (TEAs), nutrients, and basic water quality parameters to assess the likelihood and capacity for biodegradation in situ to contribute to groundwater restoration. Implemented USEPA's Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water to support development of a remedial action work plan for a former electronics manufacturing site under New Jersey's Industrial Site Recovery Act. Estimated time of solvent release from concentrations of daughter products to support a cost recovery claim. Developed a conceptual work plan for estimating in-situ rates of BTEX and TEA consumption and documenting anaerobic biodegradation at a petroleum terminal site.

- **Groundwater Remediation, former Electronics Manufacturing Site, Western Maryland, Senior Project Manager**: Supervised operations, maintenance, and monitoring of a ground water extraction and treatment system for remediation of trichloroethylene (TCE) in ground water. Developed a rationale, which was accepted by the Maryland Department of the Environment (MDE) Hazardous Waste Enforcement Division, for turning off these systems and relying upon monitored natural attenuation to attain the cleanup goals sought by the MDE. Evaluated the merits of entering the Maryland Voluntary Cleanup Program (VCP) to obtain a prompt release from further remedial requirements. Oversaw periodic monitoring of natural attenuation of TCE in ground water.

ISRA Sites in New Jersey

- **Corrective Action Plan, Sludge Lagoons, Northwestern New Jersey, Senior Project Manager**: Conducted field and modeling analyses of the surface and groundwater quality impacts of arsenic and zinc in lagoon sediments to provide a rationale for passive remediation (natural attenuation) of two sludge lagoons that had metal concentrations in excess of the New Jersey generic subsurface soil standards. Assessed site-specific partitioning through chemical analyses of pore water and sediment samples, which indicated a high affinity of arsenic and zinc for sludge solids and native soils. Derived a mass balance model to simulate depletion of sediments sources as a result of leaching. Used AT123D modeling program to simulate down-gradient transport and dispersion of arsenic and zinc. Conducted sensitivity analyses for partitioning and dispersion parameters. The New Jersey Department of Environmental Protection (NJDEP) accepted the natural attenuation proposal for metals, resulting in savings of more than $1 million relative to excavation or stabilization-based remedies.

- **Corrective Action Plan and Cleanup Investigation, Former Specialty Chemical Facility, Northwestern New Jersey, Senior Project Manager**: Developed a remedial action work plan for a site with extensive chemical contamination in shallow groundwater, soil and sediments due to benzene, ethylbenzene, toluene, xylenes (BTEX), chlorobenzene, 1,2-dichloroethane, arsenic, zinc and polychlorinated biphenyls (PCBs). Developed a sampling and analysis program to complete site characterization and contaminant delineation after replacing the original contractor on the project. Proposed and implemented several interim remedial measures, including installation and operation of a pilot wellpoint extraction system and operation of a pilot interceptor drain. Designed and implemented field studies to evaluate the performance of the interim groundwater containment systems. Negotiated with the New Jersey Department of Environmental Protection (NJDEP) regarding the extent and schedule of supplemental site characterizations, soil and groundwater cleanup levels, and remedial approaches.

Supervised soil treatability by bioremediation and dual-phase soil vapor extraction. Supervised groundwater treatability by UV/oxidation. Managed and reported a wetlands delineation survey in the areas proposed for remedial action. Worked effectively with multiple contractors and PRPs.

- **Site Characterization and Corrective Action Planning, Multiple Sites in New Jersey, Senior Engineer**: Provided quality assurance reviews of site characterization work plans for several sites impacted with chromium ore processing residues. Helped develop a strategy for identifying site-related impacts in an estuary in a highly industrialized area. Identified and evaluated remedial measures for a residential site. Met with representatives of the New Jersey Department of Environmental Protection (NJDEP) to discuss a ground water Classification Exception Area. Prepared a work plan for site-specific human health and ecological risk assessments. Derived site-specific cleanup levels for hexavalent chromium in sub-surface soils, based upon leaching to ground water and protection of aquatic populations in surface water. Worked effectively with multiple contractors.

Additional Sites in Virginia

- **Stabilization of Lead-impacted Soils, Quantico, Virginia, Senior Project Manager**: Oversaw preparation of the Excavation and Materials Handling Plan (EMHP) regarding on-site stabilization and off-site disposal of approximately 15,000 tons of lead-impacted surface soils at former firing ranges. The Virginia Department of Environmental Quality (VADEQ) approved the EMHP with only minor modifications. Oversaw field personnel engaged in (1) ambient air and personnel monitoring, according to the Site-Specific Health and Safety Plan, (2) sampling and characterization (i.e., lead leachability testing) of the stabilized soils, and (3) confirmatory soil sampling and lab testing of the excavated areas.

- **Independent Review of Cleanup Plans, Defense Supply Center Richmond (DSCR), Virginia, Senior Engineer**: Reviewed remedial investigation and feasibility study reports, prepared by other contractors, addressing soil or ground water contamination in 14 operable units. Identified opportunities for leveraging favorable risk-related information to save remedial costs by pursuing No Further Action decisions from the Virginia Department of Environmental Quality (VDEQ) and/or selecting less intensive remedial approaches. Offered recommendations for risk communication with local citizens.

Additional Sites in Maryland

- **Groundwater Characterization, Brownfields Site, Baltimore, Maryland, Senior Project Manager**: Developed a work plan to address deficiencies in the Phase I and II environmental site assessments that were prepared by another contractor for several parcels that had a long history of varied industrial use. Met with MDE officials in the Maryland Voluntary Cleanup Program to present and win approval of the work plan and initiate discussions regarding the overall Response Action Plan (RAP). Subsequent data collection, groundwater and soil sampling, data analysis, and risk assessments supported a RAP that was protective for the intended land use and was less intensive than projected by the previous contractor.

- **Soil Remediation, Urban Redevelopment Site, Baltimore County, Maryland, Senior Engineer**: Developed a science-based rationale for deferring an excavation remedy for sub-surface soils, which was proposed by a prospective purchaser of a former gasoline station site. Reviewed soil investigation reports by the purchaser's consultant and identified data gaps. Met with representatives of the Maryland Department of the Environment (MDE) Oil Control Program and the purchaser to identify and address their concerns and discuss redevelopment issues. Developed a work plan for addressing data gaps that was approved by MDE OCP.

Representative Risk Assessment Projects

- **Health and Ecological Risk Assessments, Multiple Sites in New Jersey, Senior Engineer**: Assisted a Fortune 50 firm in negotiating the technical basis for site-specific cleanup goals for hexavalent and trivalent chromium in surface and subsurface soils. Met with representatives of the New Jersey Department of Environmental Protection (NJDEP) at all levels to exchange information and perspectives. Prepared critical technical comments regarding NJDEP's proposed cleanup goals for soil and groundwater under the Industrial Site Recovery Act (ISRA). Contributed to the development of a laboratory test to simulate chromium dissolution into surface puddles. Contributed to an experimental design to evaluate the influence of exposure duration on the elicitation threshold for chromium-induced contact dermatitis. These efforts raised the dermatitis-based cleanup goal for hexavalent chromium by 100 times or more, which should yield substantial savings in soil remediation costs.

- **Ecological Risk Assessment, Mining Site, Arkansas, Senior Engineer**: Provided a science-based rationale for No Further Action (NFA) for surface soils that had come into contact with certain waste materials. Oversaw the development of ecologically-based soil screening levels for fluoride and cyanide, using food-chain bioaccumulation models. Demonstrated that levels of arsenic and other metals in surface soils were not elevated relative to background soils. Prepared a risk assessment report for review and acceptance by the Arkansas Department of Environmental Quality (ADEQ).

- **Health Risk Assessment, Vertac Superfund Site, Arkansas, Senior Engineer**: Statistically analyzed sampling data for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in surface soils to develop a relationship between prospective not-to-exceed cleanup goals and average residual concentrations after cleanup. Performed probabilistic simulations of exposure to worker and trespasser populations, using Monte Carlo simulation methods, to develop the rationale for a 50-µg/kg (ppb) cleanup goal. Incorporated the results of a rodent bioassay on oral bioavailability of TCDD in soil. Made presentations and submitted technical reports to the Arkansas Department of Pollution Control & Ecology and USEPA Region 6. Based upon these efforts, USEPA agreed to a precedent-setting cleanup goal for TCDD, which yielded substantial savings in soil remediation costs.

- **Superfund Risk Assessments, Multiple Sites, Senior Engineer**: Assisted PRPs in working towards reasonable and cost-effective cleanups at landfills, mining/milling facilities, former "town gas" manufacturing sites, wood-preserving sites, natural gas transmission stations, "burn pits," a lead recycling site and aluminum manufacturing facilities on the National Priorities List (NPL). Performed baseline health and ecological

risk assessments and negotiated risk assessment work plans with regulatory agencies. Developed alternative cleanup levels for soils, groundwater and sediments using site-specific information. Reviewed health and ecological risk assessments and remedial investigation and feasibility study reports prepared by USEPA and PRP contractors. Negotiated with USEPA remedial project managers in Regions 4 and 5 regarding numeric cleanup objectives, remedy selection and the interpretation of risk assessment results.

Applied quantitative risk assessment techniques to evaluate the health risks of implementing excavation-based remedies. Estimated potential air emissions associated with the excavation, incineration, solidification/stabilization and vitrification of soil. Quantified both direct (e.g., inhalation) and indirect (e.g., food-chain) exposures. At one Superfund site, the health risk assessment helped to overturn a USEPA Record of Decision (ROD).

- **Risk Assessment, Uranium Mill in Colorado, Project Manager**: Conducted a health risk assessment of radioactive and chemical substances (principally uranium-chain radionuclides and molybdenum and selenium, respectively) that migrated from an active uranium mill. Directed the exposure assessment which addressed ten pathways, including direct (e.g., air and groundwater contact) and indirect (e.g., food chain) pathways, and considered both current conditions and future conditions expected to be obtained after completion of a court-mandated Remedial Action Plan (RAP). Evaluated and implemented models for contaminant transport in shallow groundwater, air emission rates, atmospheric dispersion of radon-222 and radioactive particulate, and deposition onto soils and food crops. Participated in meetings and negotiations with representatives of the Colorado Department of Health's Radiation Control Division. Participated in a briefing for interested citizens. Based upon the risk assessment, the site owner was not required to undertake any additional activities beyond the RAP.

- **Site Assessment and Closure, Gasoline Service Station, Falls Church, Virginia, Senior Engineer**: Oversaw ground water monitoring and performance monitoring of an integrated soil vapor extraction and air sparging system at an active gasoline service station. Developed and proposed risk-based, site-specific clean-up levels, above generic state standards, based upon a residential inhalation exposure scenario that could hypothetically result from off-site migration of groundwater contaminants. These cleanup levels and ground water monitoring data provided a rationale for No Further Action (NFA) and site closure.

Representative Litigation Support Projects

- **Proposed Hazardous Waste Rule, Waste Treatment Facility in Arkansas, Senior Engineer**: Prepared two expert reports regarding the characteristics of thermally treated spent potliner, which was de-listed by the USEPA as a RCRA hazardous waste. Reviewed and summarized treatment performance data. Evaluated and critiqued risk assessment and expert reports submitted on behalf of petitioners seeking to have the de-listing revoked. Met with public interest groups in Arkansas. These efforts assisted the client in maintaining a favorable RCRA status.

- **Litigation Support and Expert Testimony, Former Industrial Facility in Maryland, Senior Engineer**: Testified as an expert witness in a dispute regarding residual concentrations of chloroform and chlorinated solvents in ground water and residual

materials in soils and sanitary sewers. Evaluated site data and developed opinions regarding: whether remediation was warranted to protect health and the environment and was required under the Maryland Voluntary Cleanup Program; what role future land use plays in risk-based corrective action decision-making; and whether the groundwater contamination impeded site re-development. Assisted counsel during trial, which addressed a narrow set of issues.

- **Litigation Support, Cost Recovery at Industrial Site in Maryland, Senior Engineer**: Reviewed site characterization and remedial design reports prepared by another firm, which was assisting the owner in remediating the site under the Maryland Voluntary Cleanup Program. Prepared opinions regarding the necessity of remedial action and the technologies chosen, which helped counsel to settle the case on behalf of a previous site owner.

- **Litigation Support, Cost Recovery at Multiple Industrial Sites, Senior Engineer**: Evaluated the adequacy of site characterization and necessity for remedial action, investigated timing of release(s), developed remedial action plans, and identified the potential for third-party (e.g., natural resource damage) claims at several manufacturing sites to assist an industrial company in recovering environmental response costs from its insurance carriers.

- **Litigation Support, Industrial Wastewater Discharges in Pennsylvania, Senior Engineer**: Reviewed data and reports prepared for the Pennsylvania Department of Environmental Protection (PaDEP) regarding potential sources of malodor and indoor air quality problems in residences in a mixed, commercial/residential use area. Assisted counsel for an industrial company in developing a defense against claims that the company's discharges of wastewater into the municipal sewer system were responsible for the malodor. Identified plausible alternative sources for the malodor.

- **Litigation Support and Expert Affidavits, Municipal Landfill Site in California, Senior Engineer**: Evaluated the contribution of lead acid battery wastewater to response costs at a municipal landfill site on the National Priorities List (NPL) site. Simulated potential effects of acid disposal using equilibrium, geochemical models (e.g., MINTEQ). Prepared two expert reports on behalf of a client alleged to have sent acid wastewater to the site. Municipality (plaintiff) settled with the client for several million dollars less than initially sought.

- **Litigation Support, Multiple Superfund Sites, Project Manager or Senior Engineer**: Assisted Potentially Responsible Parties (PRPs) involved in or preparing for litigation regarding remedy selection, claims of adverse health and environmental effects, cost allocation, or cost recovery. Identified and evaluated the potential impacts of organic contamination in soil and groundwater on a proposed excavation and solidification remedy at a lead-recycling site to support a focused Feasibility Study. Evaluated a landfill site for possible Superfund de-listing, using the revised Hazard Ranking Scoring (HRS) system. Evaluated risk assessment and Remedial Investigation (RI) reports for a former lead-mining site with respect to the adequacy of site characterization and consistency with the National Contingency Plan (NCP). Prepared independent estimates of cleanup costs for soil and groundwater to provide background information for settlement.

Richard B. Kapuscinski, Ph.D., P.E.

Representative Environmental Management Projects

Environmental Liability and Compliance Assessments

- **Environmental Site Assessments and Due Diligence Audits, Multiple Commercial and Industrial Facilities, Project Manager**: Conducted or managed environmental due diligence audits and transaction-related environmental site assessments (ESAs) of commercial and industrial facilities in Virginia, Maryland, West Virginia, North Carolina, Florida and New York. Evaluated compliance with environmental regulations regarding hazardous materials storage and manifesting, air emissions, wastewater discharge, tank registration and monitoring, spill containment and toxics release reporting. Made recommendations regarding pollution abatement. Estimated potential liabilities associated with on-site soil and groundwater contamination and off-site disposal. Facilities included copper wire fabricators, plastic extrusion facilities, gasoline service stations, nurseries and a chain of hardware stores and lumberyards. Assisted in a compliance assessment of a uranium enrichment facility that addressed mixed and hazardous waste management and environmental cleanup costs.

- **Environmental Site Assessment, Former Commercial Facility in Virginia, Senior Engineer**: Reviewed site investigation and closure reports regarding solvent-impacted groundwater at a former R&D facility on behalf of a prospective purchaser that was considering developing the property for residential use. Identified technical uncertainties regarding the alleged completeness of remediation and provided counsel regarding the potential for future remedial or monitoring activities. Client ultimately decided that the liability terms offered by the site owner and operator were unacceptable.

  Also provided independent reviews of Phase I and Phase II ESAs and corrective action reports prepared by other contractors and provided independent estimates of remedial costs, including Superfund liabilities, at numerous other sites.

- **Risk Management, Urban Redevelopment Site, Senior Engineer**: Evaluated the potential environmental liabilities associated with redeveloping a former manufacturing site, a potentially valuable urban property that is subject to a RCRA corrective action. Constructed a conceptual fault tree for failure of the remedial components to identify natural and man-made events that might have significant consequences or a high probability of occurrence. Met with remedial contractors to discuss and evaluate the reliability of the planned remedial components. Identified potential exposure pathways for various potential (future) land uses. Conducted a screening-level health risk assessment for construction workers. Prepared a report of findings for consideration by executive management.

- **Toxics Release Reporting, Metal Finishing Facility, Senior Engineer**: Assisted a metal finishing company in reporting releases and transfers of zinc in accordance with Section 313 of the Emergency Planning and Community Right-to-Know Act. Detected and corrected an error by a previous contractor.

Facility Discharge Reporting and Management

- **Environmental Management Services, Petroleum Fuel Terminal, Senior Engineer**: Oversaw preparation of a Storm Water Pollution Prevention Plan for the facility.

Oversaw monthly monitoring of storm water discharges. Managed the electronic database of discharge samples. Prepared a Concept Engineering Report, as required by the facility's NPDES permit, summarizing site-wide water pollution prevention measures and management practices and the performance of an aboveground treatment system for ground water that was extracted as part of a site remediation program. Evaluated the performance of green sand and dolomite treatments for minimizing effluent toxicity.

- **Wastewater Performance Evaluation, Furniture Manufacturing Facility in North Carolina, Senior Engineer**: Reviewed monitoring data and evaluated treatment operations to identify cause(s) of elevated ammonia in wastewater discharges after a tertiary filter was installed. Recommended certain modifications to standard operating procedures for the batch activated sludge system to increase sludge age and stimulate nitrification.

- **Storm Water Toxicity Reduction Studies, Two Facilities, Senior Engineer**: Contributed to the design of a Toxicity Identification Evaluation of on-site storm water at a former specialty chemical manufacturing site and at a truck stop. Evaluated data regarding effluent toxicity and chemical composition to identify potential toxic agent(s).

Professional Activities

- Member, American Chemical Society
- Member, American Society of Civil Engineers
- Member, American Water Works Association
- Member, Chi Epsilon (civil engineering honorary society)
- Member, Society for Risk Analysis
- Member, Water Environment Federation

Selected Publications & Presentations

Refereed Journal Publications:

Kapuscinski, R.B. and R. Mitchell. 1980. Processes controlling virus inactivation in coastal waters. Water Research 14: 363-371.

Kapuscinski, R. B. and R. Mitchell. 1981. Sunlight induces sub-lethal injury in Escherichia coli in seawater. Appl. Environ. Microbiol. 41: 670-674.

Kirchman, D., J. Sigda, R. Kapuscinski and R. Mitchell. 1982. Statistical analysis of the direct count method for enumerating bacteria. Appl. Environ. Microbiol. 44: 376-382.

Kapuscinski, R.B. and R. Mitchell. 1983. Sunlight-induced mortality of viruses and Escherichia coli in coastal seawater. Environ. Sci. Technol. 17: 1-6.

Kapuscinski, R.B., L.E. Katz and D. Grasso. 1984. New activated sludge theory: steady state (Discussion). J. Environ. Engin., ASCE 110: 1214-1219.

Kapuscinski, R. B. and A. J. DeLorme. 1990. On performing experimental studies on transient states of continuous-flow methanogenic reactors. Biotechnol. Bioeng. 35: 746-750.

Richard B. Kapuscinski, Ph.D., P.E.

Book Chapters and Trade Publications:

Hull, S.J. and R. B. Kapuscinski. 1988. Efficacy of bioaugmentation products as predicted by a steady-state model of flocculent cultures. In Proceedings of the Annual Purdue Industrial Waste Conference (5/87), J.M. Bell (editor). West Lafayette, IN: Purdue University.

Harris, R.H. and R.B. Kapuscinski. 1990. Hardage Record of Decision to be overturned. Toxics Law Reporter 4(46): 1336-1337.

Kapuscinski, R., S. Washburn and R. Harris. 1991. The use of risk assessment in selecting among remedial options for soil contamination. In Hydrocarbon Contaminated Soils, Volume I, Chapter 40, E. J. Calabrese and P. T. Kostecki (editors). Chelsea, Michigan: Lewis Publishers.

Harris, R., R. Kapuscinski, C. Kleiman and S. Washburn. 1993. Risk assessment in the remedy selection process at hazardous waste sites. In Hazard Assessment, Volume 8, pp. 1-46, J. Saxena (editor). Washington, DC: Taylor & Francis Publishers.

Kapuscinski, R.B. and S.A. Dielman. 1993. A comparative evaluation of wellpoint systems and interceptor drains for groundwater containment and extraction. In Proceeedings of the Joint CSCE/ASCE National Conference on Environmental Engineering, Volume 2, pp. 361-1368.

Kapuscinski, R.B. and J.P. Crump. 1998. Solid waste and contaminated soil. In Environmental Science Deskbook, Chapter 7, J.W. Conrad, Jr. (editor). New York: West Group. (Clark, Boardman & Callahan environmental law series).

Kapuscinski, R.B., S.A. Dielman and D.H. Errett. 1997. Natural attenuation processes in environmental remediation decision-making: A case study of metals in the subsurface. In Proceedings of the Superfund XVIII Conference. Washington, DC.

Conference Presentations:

Kapuscinski, R.B. and R. Mitchell. 1980. Photooxidative effects of sunlight on fecal coliforms and viruses in seawater. Annual Conference of the American Society for Microbiology.

Kapuscinski, R.B. 1981. Monitoring the microbial quality of drinking water and water supplies. Annual Meeting of the Vermont Water Works Association.

Kapuscinski, R.B. and J.H. Kao. 1985. Analysis of packed-bed biofilm column-reactors: Effects of superficial liquid velocity. Annual Conference of the Water Pollution Control Federation.

Bellen, G.E., R.B. Kapuscinski, M. Anderson, R. Herman and H. Tabak. 1986. Efficacy testing of aerobic bioaugmentation products using bench-scale systems. Annual Conference of the Water Pollution Control Federation.

Hull, S.J. and R. B. Kapuscinski. 1987. Efficacy of bioaugmentation products as predicted by a steady-state model of flocculent cultures. Annual Purdue Industrial Waste Conference.

Kapuscinski, R.B. 1987. Fates and stability of bioaugmentation products in natural and engineered ecosystems. Semi-annual meeting of the American Chemical Society, Division of Environmental Chemistry.

Kapuscinski, R.B., K.P. Olmstead and W.J. Weber, Jr. 1987. Impact of microbial activity on adsorption mass transport parameters. Annual Conference of the Water Pollution Control Federation.

Kapuscinski, R.B. 1990. The use of risk assessment in selecting among remedial options for soil contamination. Fifth Annual Conference on Hydrocarbon Contaminated Soils. (Amherst, Massachusetts, September 24-27).

Kapuscinski, R.B. and S.A. Dielman. 1993. A comparative evaluation of wellpoint systems and interceptor drains for groundwater extraction and containment. Annual Environmental Engineering Conference of the American Society of Civil Engineers. (Montreal, Canada, July 12-14).

Kapuscinski, R.B. 1994. Estimating risks from exposure to airborne dioxins. Fifth Annual Dioxin Conference. (Washington, DC, October 21-22).

Kapuscinski, R.B., S.A. Dielman and D.H. Errett. 1997. Natural attenuation processes in environmental remediation decision-making: A case study of metals in the subsurface. Superfund XVIII Conference (Washington, DC, December 2-4).

Kavitha Subramaniam

Education

2000 Ph.D., Environmental Engineering, Georgia Institute of Technology, Atlanta, Georgia

1996 M.Eng., Environmental Engineering, Memorial University of Newfoundland, St. John's, Canada

1994 B.Tech., Chemical Engineering, Anna University, Madras, India

Certification

40-Hour OSHA Health and Safety Certification

Affiliations

American Chemical Society
American Institute of Chemical Engineers
Society of Women Engineers

Experience

Dr. Subramaniam is a Senior Associate at ENVIRON International Corporation. Her experience at ENVIRON includes the following:

- Served as Project Manager coordinating the review, abstraction and compilation of case studies from technical papers related to contaminated buildings and their remediation; tracking the budget for various project tasks; and preparing monthly budget status reports. Evaluated the feasibility of cleaning building components pervasively contaminated with dust bearing hazardous substances. Performed economic analyses comparing costs of remediation versus demolition scenarios for various building components. Assisted in preparing a remediation assessment report summarizing the findings of the feasibility study and economic analyses.

- Evaluated remedy implementation risks associates with dredging and capping remedies at a Superfund Site in New York. Evaluated risks to on-site construction workers associated with remedial activities at the site. Performed transportation accident analyses to evaluate disposal options for dredged material (on-site consolidation vs. off-site disposal), and also to support low volume dredge alternatives. Co-authored a report summarizing the risk of remedy evaluation for the Site.

- Evaluated remedial alternatives proposed by the USEPA for soils at a Superfund Site in New Jersey. Reviewed and summarized alternative remedial approaches in technical memoranda, provided comments to the National Remedy Review Board on USEPA's proposed remedial alternatives and recommended a more cost-effective remedial approach for inclusion in the feasibility study.

- Prepared estimates of future environmental response costs at four facilities with soil and groundwater contamination to support legal counsel in a cost recovery dispute between two former owner/operators. Reviewed site characterization reports and interim measure work plans to develop to develop remedial action work plans for a reasonable best case

scenario and a reasonable worst case scenario for each site. Reviewed and provided comments on treatability study and groundwater sampling reports prepared by third party consultant.

- Prepared estimates of future environmental response costs at several sites with soil and groundwater contamination.

- Assisted in the development of a pilot test work plan for implementing in situ chemical oxidation at a Superfund Site in New Jersey. Prepared permit applications required for conducting groundwater remediation activities at the site. Prepared a feasibility study work plan for evaluating remedial alternatives for contaminated soils at the site.

- Performed risk-based assessment of interior building contamination at a site located in New Jersey. Prepared a sampling plan and coordinated field sampling activities. Prepared cost estimates for a pilot study of applicable decontamination technologies. Prepared a report summarizing the findings of the building decontamination assessment work.

- Prepared technical bid specifications for demolition of a semi-conductor manufacturing facility in Pennsylvania. Completed a survey of flooring material at the facility to assist in the evaluation of disposal options for demolished floors. Developed a wood floor sampling plan and coordinated and oversaw field sampling activities.

- Evaluated hydrogeologic and geochemical data obtained during field investigations, and prepared ground water quality reports for a landfill site in New Jersey.

- Reviewed the Hazard Ranking System (HRS) documentation package for a chemical manufacturing facility in New Jersey. Provided comments on issues addressed by the USEPA in preparing the HRS documentation record.

- Conducted file reviews and environmental database reviews pertaining to Phase I – due diligence audits of several industrial and non-industrial facilities to estimate potential environmental liabilities. Prepared environmental site assessment reports.

Prior to joining ENVIRON, Dr. Subramaniam held the following positions:

- *Project Environmental Engineer, Golder Associates, Cherry Hill, NJ, July 2001-Feb 2003*
  Worked on the design of environmental remediation systems. Implemented innovative remedial technologies such as bioremediation enhanced by colloidal bimetallic nanoscale particles at client sites. Carried out 3-Dimensional visualization modeling of site geology and contaminant distributions. Process engineering tasks performed included analysis and evaluation of pumping and piping, process hydraulics, calculation of mass and heat balances, and air emissions calculations.

- *Postdoctoral Research Associate, Smith College, Northampton, MA, May 2000-June 2001*
  Developed innovative remediation technology to enhance PAH compound desorption and bioremediation through the use of chelating agents. Tested technology at a former manufactured gas plant facility owned by Northeast Utilities in Connecticut. Set up a colloids and surface chemistry laboratory and an Atomic Microscope facility. Mentored two undergraduate researchers.

Kavitha Subramaniam

Project Experience Prior to ENVIRON

- Site wide remediation of operating facility. Assessment of biogeochemical conditions and plume profiles through 3-D visualization modeling. Environmental Visualization System (EVS) modeling included investigations of chlorinated solvents and other contaminants of concern in groundwater. Evaluation of soil and groundwater remedial alternatives as part of a Corrective Measures Study. Preparation of an underground injection control permit application for bimetallic nanoscale colloid injection as one of the remediation options.

- Evaluated chemical precipitation and well clogging in the vicinity of groundwater treatment plant through computation of metal speciation and reaction in the geochemical environment using PHREEQC model. Recommended the use of alternate coagulants in the treatment plant to minimize metal precipitation.

- Performed characterization and evaluation of natural attenuation mechanisms in groundwater at a Superfund site. Carried out non-parametric statistical analyses to evaluate trends in contaminant concentrations.

- Developed generic performance assessment criteria for determining risk associated with chemical/mixed radioactive waste disposal. Performed fate and transport assessment of various classes of chemicals in the biogeochemical environment.

- Investigated the feasibility of accelerated aerobic biological treatment of chlorinated aromatic compounds including chlorobenzene at a landfill site. Evaluated oxygen requirements and possible precipitation of metallic species during oxygenation in the aquifer matrix.

- Performed 3-D visualization modeling of groundwater flow and drawdown at pumping wells and river boundaries.

- Performed extensive 3-D visualization modeling of site hydrostratigraphy and plume profiles of various contaminants of concern. Calculated volume and mass of soil contamination in various geologic units. Calculated site-specific Tier II soil leaching values for contaminants of potential concern in order to assess impacts to groundwater. Objective was to delineate the extent and amount of contamination to assist in apportioning investigation and remedial costs at the site based on historic chemical usage and transport and cross-media contamination.

- Reviewed Agency's past cost claims to evaluate relevance, timing and reasonableness of expenditures to site-specific investigation and remediation activities.

- Designed leachate vault and collection system relocation based on berm expansion project. Evaluated and provided recommendations on potential effects of relocating sideslope riser pump houses. Calculated pump operating capacities for existing and proposed leachate collection systems. Prepared construction drawings to indicate necessary modifications to mechanical components of the leachate collection and conveyance system.

- Prepared a landfill gas management and recovery plan including blower and flare design, and future use of recovered gas. Calculated landfill gas emission and condensate generation rates using published air pollution emission factors, and evaluated disposal options.

- Prepared an annual emissions statement using RADIUS including inventories of equipment, control devices and batch processes at a landfill site. Process included record review, emissions calculations and form completion.

- Calculated volatile organic compound and hazardous air pollutant emissions from storage tanks using USEPA's TANKS model. Prepared application requesting determination of requirement for plan approval/operating permit.

Publications (Peer-Reviewed)

Subramaniam, K., Vithayaveroj, V., Yiacoumi, S., and Tsouris, C., Copper Uptake by Silica and Iron Oxide under High Surface Coverage Conditions: Surface Charge and Sorption Equilibrium Modeling, accepted for publication in Journal of Colloid and Interface Science, 2003.

Subramaniam, K., Stepp, C., Pignatello, J.J., Smets, B.F., and Grasso, D., Enhancement of Polynuclear Aromatic Hydrocarbon Desorption by Complexing Agents in Weathered Soil, Submitted to Environmental Engineering Science, 2003.

Grasso, D., Subramaniam, K., Butkus, M., Strevett, K., and Bergendahl, J., A Review of Non-DLVO Interactions in Environmental Colloidal Systems, Re/Views in Environmental Science and Bio/Technology, Vol. 1, pp. 17-38, 2002.

Grasso, D., Subramaniam, K., Pignatello, J.J., Yang, Y., and Ratte, D., Micellar Desorption of Polynuclear Aromatic Hydrocarbons from Contaminated Soil, Colloids and Surfaces A, Vol. 194, No. 1-3, pp. 65-74, 2001.

Subramaniam, K. and Yiacoumi, S., Modeling Kinetics of Copper Uptake by Inorganic Colloids Under High Surface Coverage Conditions, Colloids and Surfaces A, Vol. 191, No. 1-2, pp. 145-179, 2001.

Subramaniam, K., Yiacoumi, S., and Tsouris, C., Copper Uptake by Inorganic Particles – Equilibrium, Kinetics and Particle Interactions: Experimental, Colloids and Surfaces A, Vol. 177, pp. 133-146, 2001.

Subramaniam, K., Metal Uptake and Its Effects on Colloidal Particle Interactions: Equilibria and Rates, Ph.D. Dissertation, Georgia Institute of Technology, May 2000.

Subramaniam, K., Yiacoumi, S., and Tsouris, C., Effect of Copper and Cadmium Binding on Flocculation of Ferric Oxide Particles, Separation Science and Technology, Vol. 34, No. 6-7, pp. 1301-1318, 1999.

Subramaniam, K., Yiacoumi, S., and Tsouris, C., A Unified Model for Metal Ion Sorption and Colloidal Particle Flocculation Rates, Fundamentals of Adsorption 6, pp. 951-956, 1998.

Subramaniam, K., Changes in the Physical, Hydraulic and Microstructural Properties of Clays Exposed to Organic Chemicals, Masters Thesis, Memorial University of Newfoundland, August 1996.

Kavitha Subramaniam

Selected Conference Presentations

Subramaniam, K., Grasso, D., Smets, B.F., and Pignatello, J.J., Effect of Chelating Agents on PAH Compound Desorption and Soil Colloid Mobilization, 75th Colloid and Surface Science Symposium, Carnegie Mellon University, Pittsburgh, PA, June 10-13, 2001.

Subramaniam, K., Yiacoumi, S. and Tsouris, C., Copper Sorption and its Effects on Flocculation of Oxide Colloids: Equilibria and Rates, 218th ACS National Meeting, Washington, D.C., August 19-24, 2000.

Subramaniam, K., Yiacoumi, S. and Tsouris, C., Metal Ion Sorption and its Effects on Flocculation of Colloidal Particle Interactions, 74th Colloid and Surface Science Symposium, Lehigh University, Bethlehem, PA, June 19-21, 2000.

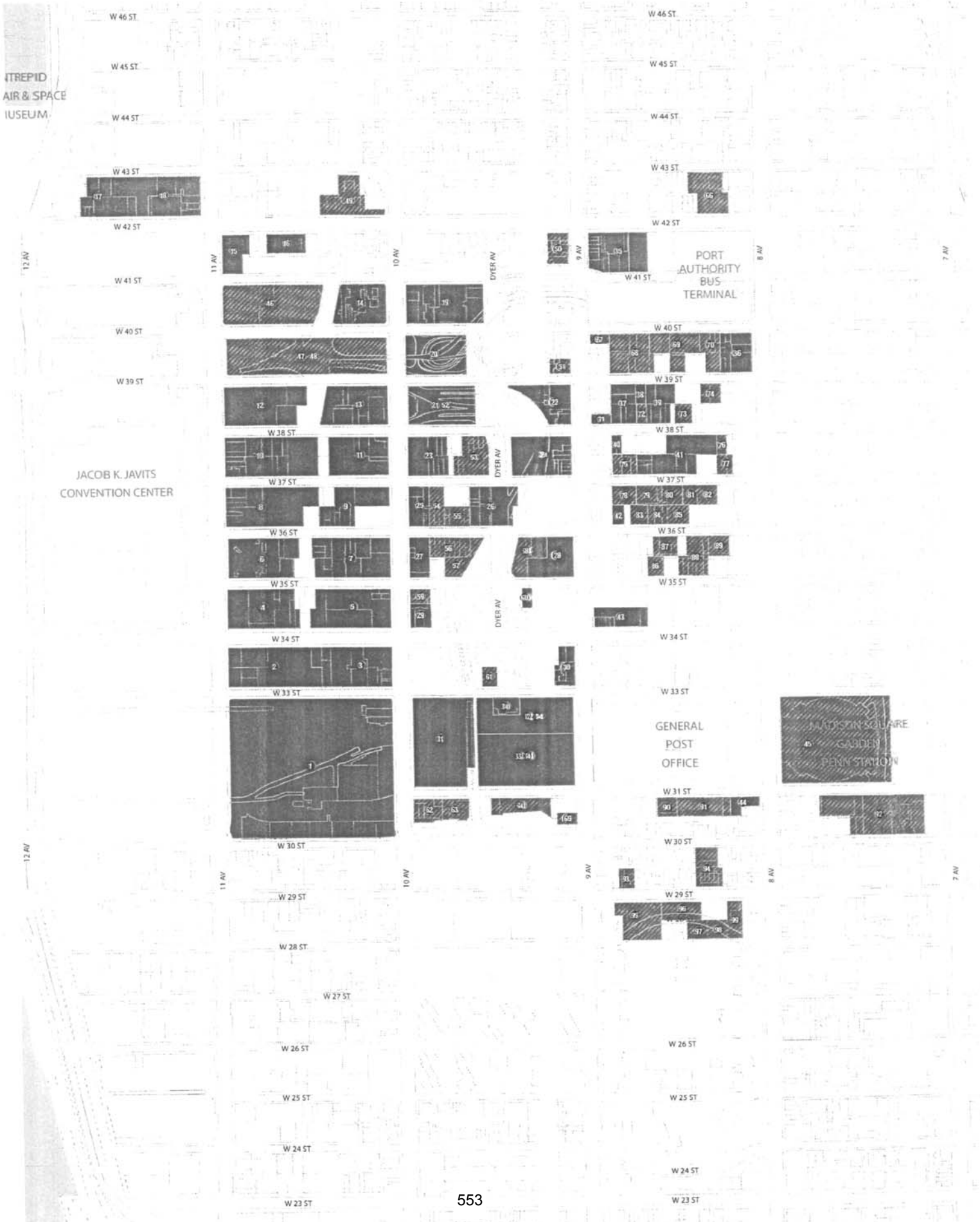
Subramaniam, K., Yiacoumi, S. and Tsouris, C., Copper Adsorption at Hematite- and Silica-Water Interfaces, AIChE Annual Meeting, Dallas, TX, October 31-November 5, 1999.

Subramaniam, K., Sorption Phenomena and Colloidal Particle Interactions, National Science Foundation Workshop for Engineering Educators, WEE '99, Arlington, VA, September 26-29, 1999.

Subramaniam, K., Chin, C.J., Yiacoumi, S. and Tsouris, C., Changes in Particle Flocculation Behavior Due to Adsorption of Metal Ions from Aqueous Solutions, 217th ACS National Meeting, Anaheim, CA, March 21-25, 1999.

Subramaniam, K., Metal Ion Sorption by Oxide Particles: Equilibrium, Kinetics and Particle Interactions, Quadrangle Conference, Virginia Institute of Technology, Blacksburg, VA, February 12-14, 1999.

Subramaniam, K. and Morin, P., Effect of Organic Liquids on the Physical, Hydraulic, and Microstructural Properties of Clays Used in Landfill Liners, Canadian Geotechnical Society Conference, St. John's, NF, Canada, September 1996.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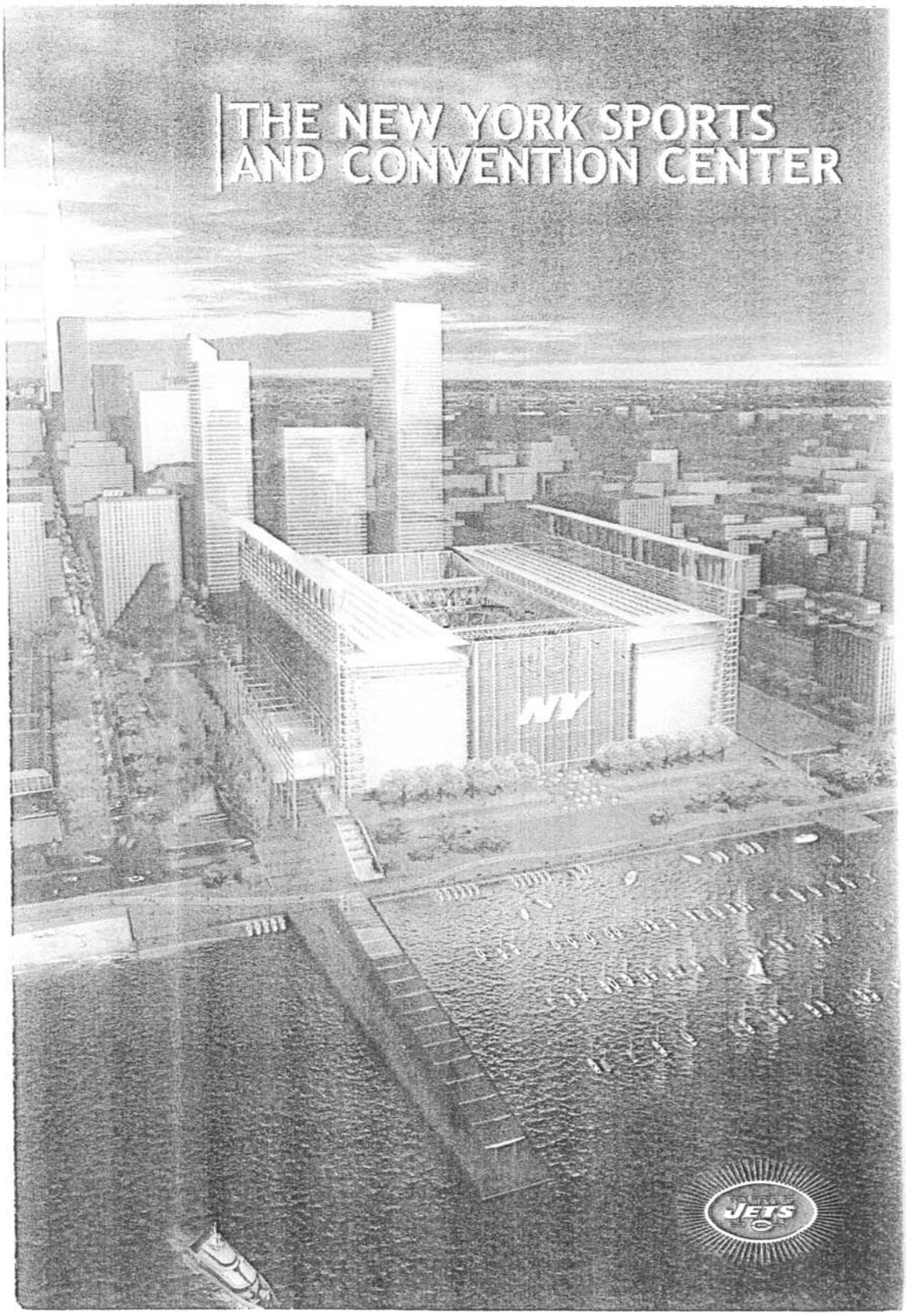
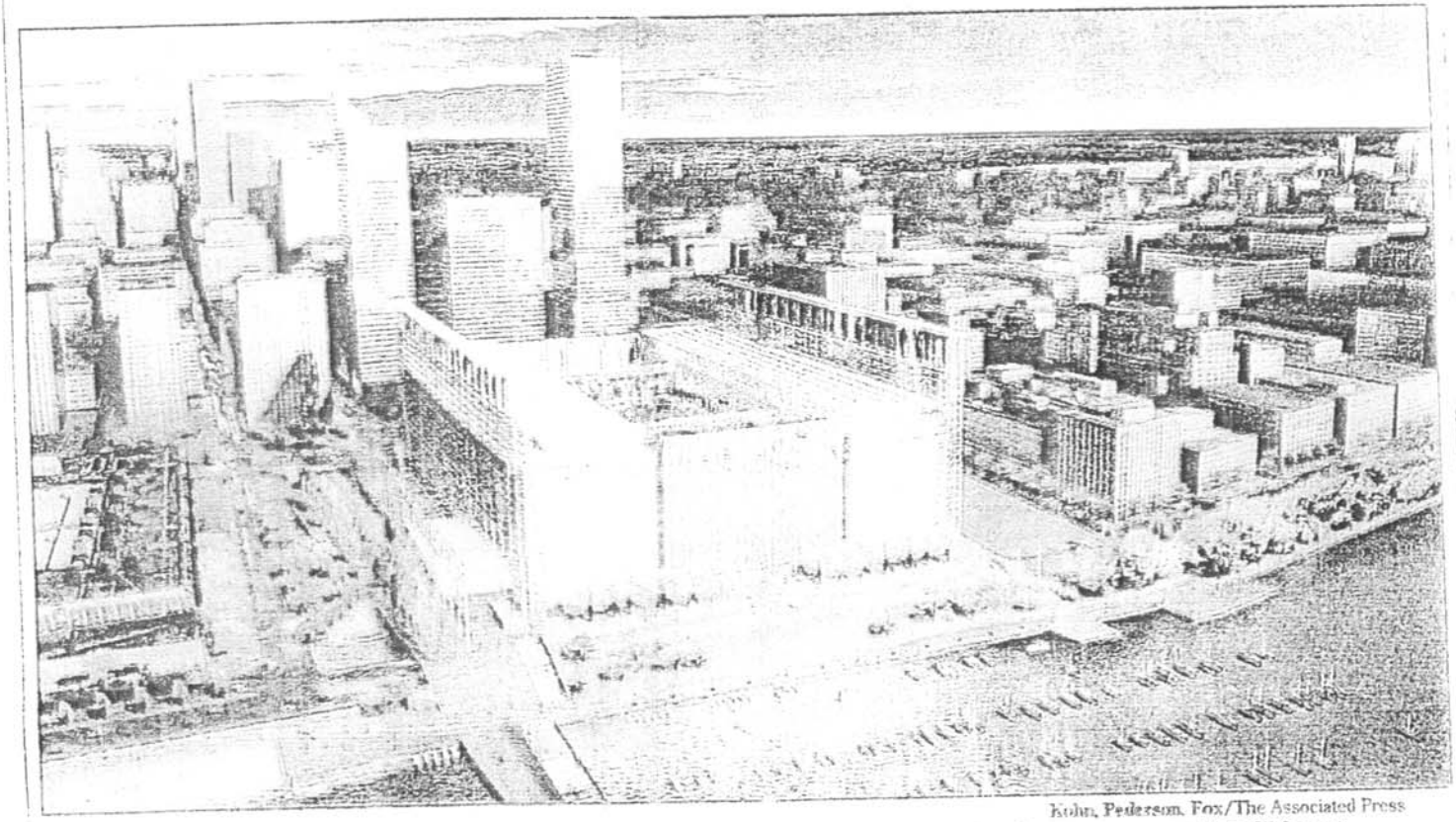


The New York Sports and Convention Center,
Jets Promotional Material

NYC dreams of pro football, 2012 Olympics

Gregory Bull/The Associated Press



Kohn Pedersen Fox/The Associated Press

This rendering shows a proposed 75,000-seat sports and convention center planned for the West Side of Manhattan. **Top:** Gov. George E. Pataki and New York City Mayor Michael Bloomberg unveil the model of the possible home of the New York Jets.

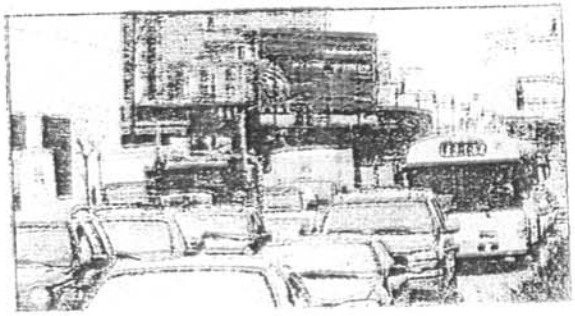
THE PROPOSAL

Manhattan plan includes $1.4B stadium for Jets

Kit Stier
The Journal News

NEW YORK — Fireman Ed, the No. 1 Jets fan, was given front-row VIP status along with quarterback Chad Pennington and coach Herman Edwards yesterday when the governor and mayor of New York they hope will include doubling the size of the Javits Center and construction of a $1.4 billion, 75,000 seat stadium for the Jets to call home and for use if New York is awarded the 2012 Summer Olympics.

"This will transform a community that has been neglected by our city for years and withered in the shad-

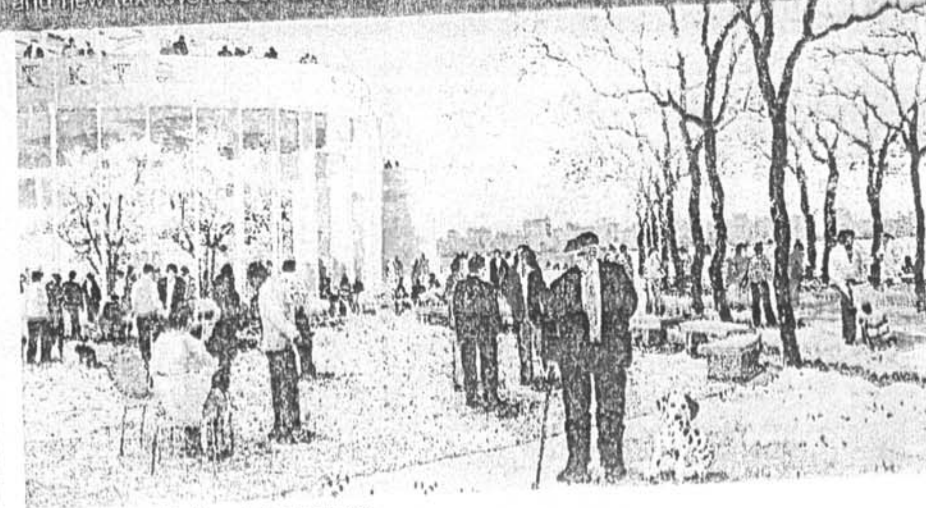


Kit Stier, *NYC Dreams of Pro Football, 2012 Olympics*, The Journal News, March 26, 2004, at 1A

NY SPORTS AND CONVENTION CENTER

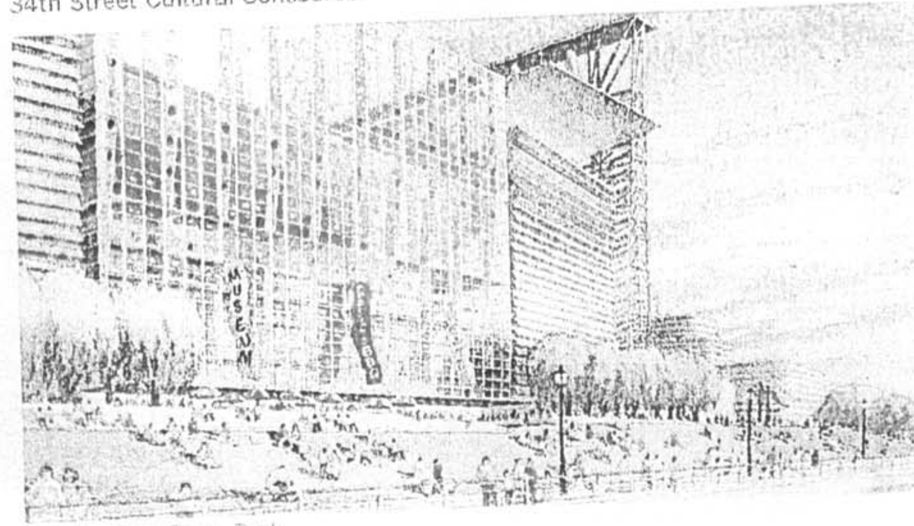
The New York Sports and Convention Center is more than just a football stadium; it is a unique multi-use facility that will attract the best sports, convention, entertainment and cultural events from around the world while offering the community amenities such as shopping, cafes and parks. With an $800 million private investment from the Jets, the NYSCC is a critical component to remake the Hudson Yards into a vibrant mixed-use neighborhood by connecting to the waterfront, expanding the convention center, and spurring new residential and commercial development. The NYSCC will create new jobs and new tax revenues to secure the economic future of New York.

The 11th Avenue Storefront



34th Street Cultural Concourse

The High Line Market



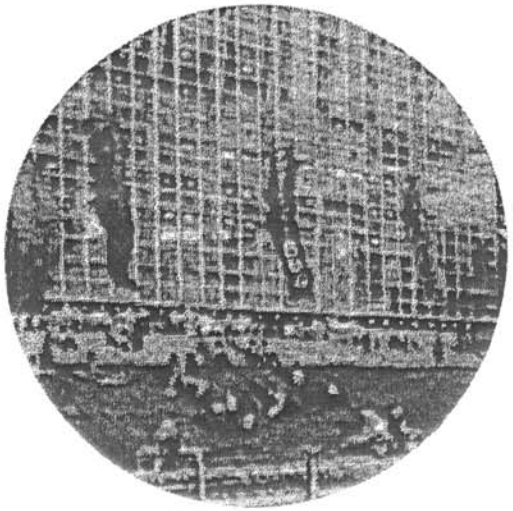
The Hudson River Park

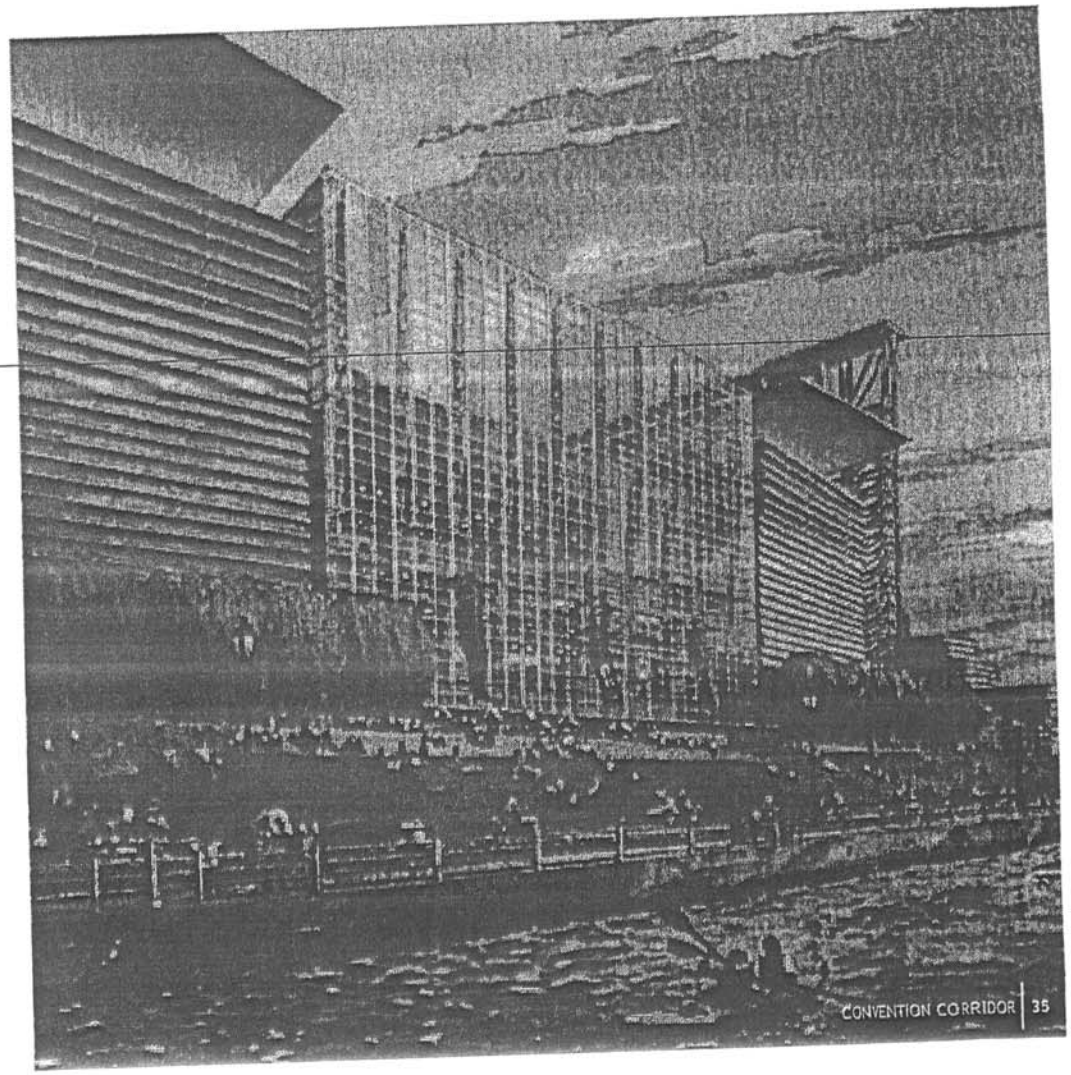
NY Sports and Convention Center, Our Town, Lenox Hill Edition, July 29, 2004, at 40

HUDSON RIVER PARK CONNECTIONS

The NYSCC opens and enlivens the Hudson River Park along its narrowest, most barren stretch between 28th and 40th Streets. A promenade is proposed to be built over 12th Avenue, offering a brief haven from the stream of cars along the highway. This promenade will provide an active edge to the park, with a community theater, a museum and a café reminiscent of the 79th Street Boat Basin in Riverside Park.

The promenade then gently slopes down to meet the Hudson River and the Park. From this point, visitors to the park will have a unique vantage over the Hudson River, and the bikers, kayakers, and boats that stream past.





Jets Presentation, The Convention Corridor, A Strategic Plan, at 34-35

Office of the Deputy Mayor
for Economic Development and Rebuilding

June 7, 2004

To the Members of the Board of Directors of the Regional Plan Association:

I understand that at your May meeting you elected to delay a decision on what stance the RPA should take on the Hudson Yards, in response to my request. I appreciate your willingness to defer judgment on the issue in order to provide the opportunity for a lengthier exchange of facts and ideas. While I had the opportunity to present the plan to you in the fall, since then a great deal of refinement and analysis has taken place. This includes a series of financing announcements, economic analyses, traffic studies, and other reports.

The talented and hard-working RPA staff produced a revised discussion paper that includes a summary of the City/State plan, staff discussion, and 33 specific questions. I hope you will find our enclosed response direct, comprehensive, and thought-provoking.

As always, I admire the dedication and commitment with which the RPA board and staff dedicate themselves to important issues facing the region. I hope you will join me in supporting a plan that, in its entirety, will have an extraordinary impact on the future of New York City and the region.

I look forward to seeing you at your next meeting on June 22nd.

Sincerely,

Daniel L. Doctoroff

CITY RESPONSE TO RPA DISCUSSION PAPER ON THE FAR WEST SIDE

OVERVIEW

In its 80-year history, the Regional Plan Association has put forward three plans for the transformation of the Far West Side of Manhattan from a largely unproductive area into an industrial, commercial, or mixed-use district, respectively. Each of these plans fell victim to inaction and skepticism. Some criticized the plans as too ambitious, and others as not ambitious enough. Some complained of too little development, and others of too much. Each plan suffered the death of a thousand cuts, as the good was sacrificed on the altar of the perfect.

In the years that followed, the Far West Side lay largely fallow, even as New York prospered. As the City boomed over multiple economic cycles, developers and tenants found themselves unable to find the space to grow. They looked instead outside of the five boroughs, and sparked the growth of a string of suburban office campuses and their expansive parking lots. "Smart growth," with its reliance on high-density development and mass transit, lost out to "fast growth," while prime land just blocks from Midtown lay largely unused.

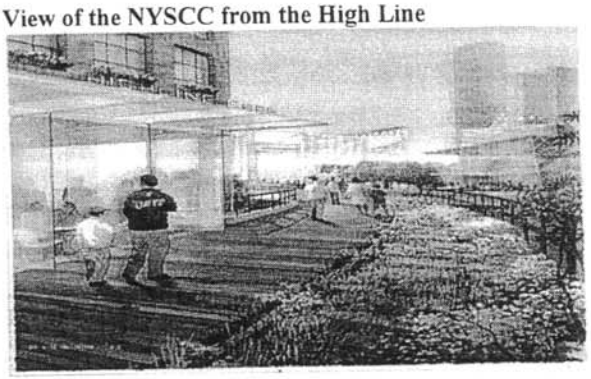
Today, the transformation of the Far West Side is now closer to fruition than ever before, as the City and State move forward with the plan for the Hudson Yards. Years of work and millions of dollars have resulted in a carefully crafted mix of actions that will dedicate the minimum amount of public resources necessary to unleash a wave of private market activity. The Mayor and the Governor have announced their support, along with the leaders of major business, civic, and labor organizations. A private investor stands ready to inject an astonishing $800 million *immediately* – a major infusion of private capital into this area, and a significant catalyst for future development.

This bold plan is the result of one of the most extensive community outreach and input campaigns ever conducted. Over the last several years, dating even to earlier mayoralties, officials have met with thousands of people from a variety of backgrounds and viewpoints, in both public meetings and private sessions. City and State officials have analyzed dozens of alternatives across various dimensions, often making significant alterations in response to new information or community concerns. The resulting plan thus represents the best of both old ideas like the expansion of the Javits Center, and new ideas such as the mechanism to make the investments self-financing.

The result is a program for six critical public sector actions. To the east of 11th Avenue, the City will extend the No. 7 line to provide mass transit access, construct a platform over the MTA's Eastern Rail Yard to remove a blight and create developable land, build a network of parks and open spaces to make the area more attractive, and rezone for higher-density mixed-use development. To the west of 11th Avenue, the City and State will expand the Javits Center and support the construction of the New York Sports and Convention Center (NYSCC) to create a new Convention Corridor.

These six actions, taken together, offer the best hope of finally unlocking the potential of the Far West Side. The removal of any one component endangers both the implementation and impact of the plan, as the long history of unrealized visions for this area demonstrates. Indeed, *every* element of this plan has appeared before in at least one form. There has, for example, been near unanimity on the expansion of Javits for over a decade, without results.

View of the NYSCC from the High Line

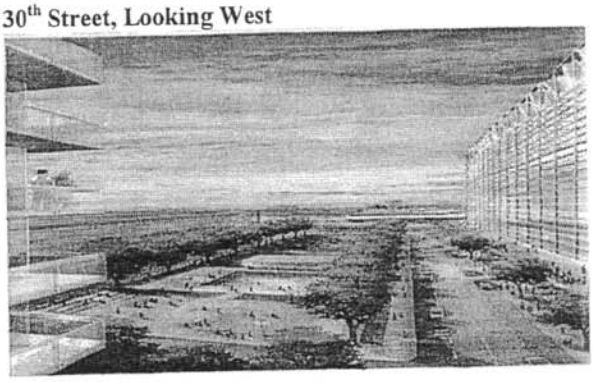


The High Line will integrate gracefully into the southern edge of the facility, with a vibrant market occurring in the space below.

South of the NYSCC: High Line Market

Also to the south of the NYSCC will be a park for active recreation, including potentially a pool, a playground, and ball fields.

30th Street, Looking West

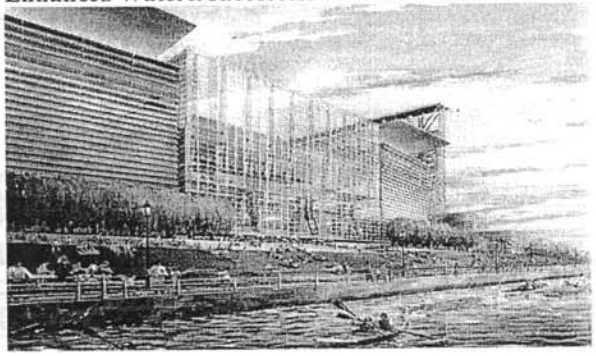


The western edge of the NYSCC will add new life to a section of the Hudson River waterfront that is today largely inaccessible. This will include a terrace café, open to the public, with sweeping views of the water.

West of the NYSCC: Hudson River Park Terrace

Today, the section of the Hudson River Park to the west of the MTA rail yards is among the narrowest and least appealing parts of the entire park. With the construction of the NYSCC, this segment will become one of the park's jewels, with the creation of a deck over Route 9A that will enable a gently-sloping, 120-foot wide waterfront promenade

Enhanced Waterfront Access via the Hudson River Park

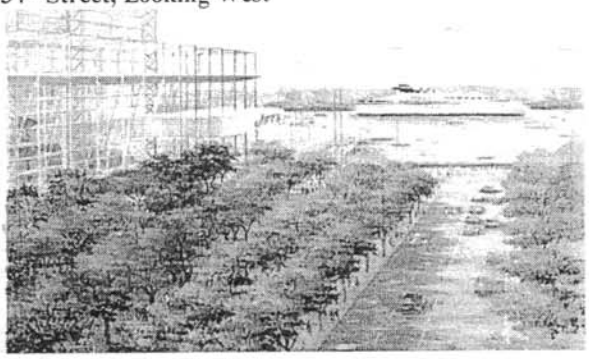


To the north, a retail and restaurant arcade will provide amenities to both residents and visitors, opening up the building to daily indoor/outdoor use.

North of the NYSCC: The Arcade

Also on the north will be another block-long park sloping to the Hudson River waterfront.

34th Street, Looking West



Finally, the building's 11th Avenue storefront will not only offer restaurant and retail usage, but also will face a plaza and open space on the newly-constructed platform over the Eastern Rail Yard. This area, roughly comparable in size to Bryant Park, will be renamed Olympic Plaza if New York is fortunate enough to be selected as the host of the 2012 Olympic Games.

Plaza on the Eastern Rail Yard Platform

By providing cultural and retail uses and by drawing pedestrian traffic early in the development process, including retail activity that can survive and prosper on days when the facility is dark, the NYSCC will play an important role in providing the neighborhood with a sense of place.

Third and perhaps most significantly, the NYSCC is critically important to the *timing* and *sequencing* of development. Our development projections foresee the construction of approximately one million square feet of office space per year, with construction of the first office building in 2010. What if the Western Rail Yard was reserved for mixed-use development? Our zoning plan assumes the development of 28 million square feet of office space at a rate of roughly one million square feet per year over a 30-year period. Additional development on the Western Rail Yard would compete with the rest of the Hudson Yards, and would happen only very slowly. A private developer is highly unlikely to be able to justify a massive investment in the site for many, many years, as the public investments come to fruition and commercial/residential development occurs in the more convenient and less costly areas east of 11th Avenue. In the meantime, there would still be an exposed rail yard west of 11th Avenue, continuing to blight the area, as seen below.

PROMISES MADE INFORMATION SCOPE REQUIRED IN DRAFT EIS	PROMISES BROKEN INFORMATION ACTUALLY INCLUDED IN DRAFT EIS
TRAFFIC	
• "Identif[ication] and evaluat[ion of] feasible measures to mitigate significant adverse traffic impacts." (Final Scope at 27).	• Incomplete assessment acknowledging that conventional mitigation techniques alone will not suffice but saying that additional mitigation measures for significant adverse traffic impacts, such as changing Eleventh Avenue from two-way to one-way traffic and implementing turn restrictions, will only be evaluated between the DGEIS and completion of the FGEIS. (DEIS at 19-61, 19-79). • Despite admitting that at least 17 intersections will ultimately have unmitigated significant adverse traffic impacts at evening peak hours, the DEIS defers until the Final EIS the analysis of mitigation measures to address the unmitigated significant adverse traffic impacts at these many intersections. (DEIS at 19-1 to 19-3; 19-118, Figs. 19-101 to 19-105; 19-172 to 19-176).
• Analysis of traffic conditions under "reasonable worst-case analysis periods," including the traffic impacts from concurrent stadium and convention center events. (Final Scope at 26-27).	• Analysis of conditions assuming below-maximum utilization of the convention center that is not a "worst-case analysis" at all. (DEIS at App. S-1, Memorandum from E. Metzger to DCP (Oct. 24, 2003) at 2, tbls. 1–5).
• Presentation of "travel speed and delay runs," which are conducted by driving vehicles along "selected routes." (Final Scope at 26-27).	• No data presented on travel speed and delay runs.
• Assessment of traffic impacts in a study area "between Sixth and Twelfth Avenues from West 72nd Street to West 14th Street." (Final Scope at 26).	• Assessment of traffic impacts in a 20% smaller area only up to "West 59th Street on the north" that leaves West Side residents from 60th Street to 72nd Street in the dark about traffic impacts and mitigation measures. (DEIS at 19-4).

SEWAGE

• Assessment of the "effects of the incremental demand of the Proposed Action on the sewer system to determine if there will be a significant adverse impact" and "identif[ication of] mitigation strategies, where appropriate and feasible." (Final Scope at 25).	• Reference to a "hydraulic assessment" "being prepared" by the City, presumably to be used to identify the areas of the wastewater infrastructure in need of improvements, meaning mitigation strategies could only be determined thereafter. (DEIS at 16-13; 16-18).
• Maximum monthly sewage flows, which would reveal the frequency and amounts of sewage overflows into the Hudson River during wet weather. (Final Scope at 25).	• Average daily flows, which mask the sewage overflows that occur during wet weather and therefore fail to provide a basis for determining just how much raw sewage will end up in the Hudson River, and when and where the overflows will occur. (DEIS at 16-5 to 16-6).

WATER DISTRIBUTION

• Assessment of the "effects of the incremental demand of the Proposed Action on the water supply system to determine if there would be sufficient capacity to maintain adequate supply and pressure" and identification of strategies to mitigate the effect of the Proposed Action on the capacity of the water supply system. (Final Scope at 25).	• Reference to a "Trunk Plan" being prepared by NYC DEP, presumably to address possible improvements, but omitting information about the location of these "trunks" and, specifically, about whether they would be located under train, subway or vehicular tunnels such that tens of millions of dollars would be required to access them and provide the necessary reinforcements to support such tunnels. (DEIS at 16-18).
• An estimate of "the capacity of the distribution system serving the area." (Final Scope at 25).	• No information about interceptors, elevations, pipe friction, or other factors that bear on capacity. Information only about the width of various pipes and certain limited water pressure data, despite admissions that daily water demand will increase from 1.1 million gallons per day to 8.6 million gallons per day — and up to 13 million gallons per day during peak air conditioning periods. (DEIS at 16-1; 16-3 to 16-5).

AIR QUALITY	
• A "detailed air quality analysis" and an examination of potential impacts and mitigation measures. (Final Scope at 29-32).	• An incomplete assessment that defers until the Final EIS: (i) "a more refined Tier II analysis"; (ii) a "detailed" "assessment" of the impact of specific emission reduction measures; and (iii) full analysis of measures to mitigate the impact of certain air pollutants that will double or triple during construction. (DEIS at 21-1; 21-20; 21-22 to 21-23; 21-28; 23-72 to 23-74; App. V at V-25-V-26). • Despite admitting that more than half a dozen locations will suffer significant adverse air quality impacts under the limited analysis already done, the DEIS defers until the FEIS any further assessment of these impacts until a more detailed analysis is conducted, thereby avoiding any discussion of mitigation measures at these impacted locations. (DEIS at 21-19 to 21-25, tbls. 21-11, 21-15).

NOISE	
• An "examin[ation]" and "detailed analysis" of existing and anticipated noise levels and mitigation measures, including a description "in detail" of "mechanisms to achieve attenuation." (Final Scope at 32-33).	• An incomplete assessment that admits very serious noise impacts but defers until the Final EIS: (i) "more precise" identification of locations that will experience significant impacts; (ii) analysis of adverse impacts on community facilities and residences "throughout the Project Area;" (iii) analysis of the degree of mitigation measures required; and (iv) analysis of "the type of mitigation to be offered by the City." (DEIS at 22-2; 22-4; 22-26; 22-28 to 22-31).

QUOTATIONS FROM THE DEIS ADMITTING THAT CRITICAL INFORMATION CONCERNING SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS IS MISSING AND WILL NOT BE DISCLOSED UNTIL THE FINAL EIS OR LATER

TRAFFIC

- Environmental Impacts of the Proposed Action – Traffic and Parking[1]: "The Proposed Action would have significant adverse traffic impacts in 2010 and 2025; many, but not all, of these impacts could be mitigated through standard traffic engineering improvements. The Co-Lead Agencies will continue to explore the feasibility of additional mitigation measures for incorporation in the FGEIS." (DEIS at ES-38 to ES-39).

- 2010 – AM, Midday, PM Peak Hours: "In the 2010 Future With the Proposed Action, the Proposed Action is expected to have significant adverse traffic impacts at 32 intersections in the AM peak hour, 35 intersections in the Midday peak hour, and 33 intersections in the PM peak hour. Most of these impacts could be mitigated through the implementation of standard traffic engineering improvements, including traffic signal timing changes, lane channelization improvements, and the elimination of on-street parking on intersection approaches. However, some impacts would remain unmitigated: one intersection during the AM peak hour; two intersections during the Midday peak hour; and one intersection during the PM peak hour. Additional mitigation measures will be investigated for these intersections during FGEIS." (DEIS at ES-39; *see also* DEIS at 19-1 to 19-2; DEIS at 19-62).

- 2010 – AM, Midday, PM Peak Hours: "Additional mitigation measures will be investigated" for "one intersection during the AM peak hour; two intersections during the Midday peak hour; and one intersection during the PM peak hour" "during FGEIS preparation." (DEIS at 19-1 to 19-2; *see also* DEIS at ES-39).

- 2010 Proposed Mitigation – Signalized Intersections – AM, Midday, and PM Peak Hours: "As summarized in Table 19-30, implementation of the proposed mitigation measures would mitigate significant adverse impacts during the weekday morning and Midday peak hours. Of the 226 intersections evaluated, one intersection would have an unmitigated significant adverse impact during the AM peak hour (Eleventh Avenue at West 42nd Street), two intersections would have unmitigated significant adverse impacts during the Midday peak hour (Twelfth Avenue at 14th Street and Eleventh Avenue at West 42nd Street), and one intersection would have an unmitigated significant adverse impact during the PM peak hour (Eleventh Avenue at West 42nd Street). Additional mitigation measures will be investigated for these intersections during preparation of the FGEIS." (DEIS at 19-62; *see also* DEIS at ES-39).

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[1] These headings are from the DEIS chapters in which these quotes appear.

- 2010 – Special Event Peak Periods on Weeknights and Sundays: "Of the 51 signalized intersections studied for the Special Event peak periods for 2010, 20 intersections would have significant impacts in the weeknight Special Event peak hour (which would occur approximately 10 to 11 times per year) and 26 intersections would have significant impacts in the Sunday Special Event peak hour (which would occur approximately 8 to 9 times per year between August and January). Most of these impacts could be mitigated through the implementation of standard traffic engineering improvements, including traffic signal timing changes, lane channelization improvements, and the elimination of on-street parking on intersection approaches. However, four intersections would have unmitigated significant impacts during the weeknight Special Event peak hour, while five intersections would have unmitigated significant impacts during the Sunday Special Event peak hour. The intersections with significant impacts which could not be mitigated during the Special Event peak hours would be West 34th Street at Eleventh, Tenth, Ninth, and Eighth Avenues; and Eleventh Avenue at West 42nd Street. Additional mitigation measures will be investigated for these intersections during FGEIS preparation." (DEIS at ES-39).

- 2010 – Special Event Peak Periods on Weeknights and Sundays: "Of the 51 signalized intersections studied for the Special Event peak periods for 2010, 20 intersections would have significant adverse impacts in the weeknight Special Event peak hour (which would occur approximately 10 to 11 times per year) and 26 intersections would have significant adverse impacts in the Sunday Special Event peak hour (which would occur approximately 8 to 9 times per year between August and January). Most of these impacts could be mitigated through the implementation of standard traffic engineering improvements, including traffic signal timing changes, lane channelization improvements, and the elimination of on-street parking on intersection approaches. However, four intersections would have unmitigated significant adverse impacts during the weeknight Special Event peak hour, while five intersections would have unmitigated significant adverse impacts during the Sunday Special Event peak hour. The intersections with significant adverse impacts which could not be mitigated during the Special Event peak hours would be West 34th Street at Eleventh, Tenth, Ninth and Eighth Avenues; and Eleventh Avenue at West 42nd Street (see Figure 19-104 and Figure 19-105). Additional mitigation measures will be investigated for these intersections during FGEIS preparation." (DEIS at 19-2; *see also* DEIS at ES-39; 19-79).

- 2010 – Special Event Peak Periods on Weeknights and Sundays: "Additional mitigation measures will be investigated for these [fifty-one] intersections during preparation of the FGEIS." (DEIS at 19-79; *see also* DEIS at ES-39; 19-2).

- 2025 -AM, Midday, PM Peak Hours: "In the 2025 Future With the Proposed Action, the Proposed Action is expected to have significant adverse impacts at 119 intersections in the AM peak hour; 92 intersections in the Midday peak hour; and 135 intersections in the PM peak hour. Most of these impacts could be mitigated through the implementation of standard traffic engineering improvements, including traffic signal timing changes, lane channelization improvements, and the elimination of on-street parking on intersection approaches. However, eight intersections would have unmitigated significant impacts during the AM peak hour, eight intersections would have unmitigated significant impacts during the Midday peak hours, and 17 intersections would have unmitigated significant impacts during the PM peak hour. Additional mitigation measures will be investigated for these intersections during FGEIS preparation." (DEIS at ES-40).

- 2025 -AM, Midday, PM Peak Hours: "Additional mitigation measures will be investigated" for "eight intersections [that] would have unmitigated significant adverse impacts during the AM peak hour, eight intersections [that] would have unmitigated significant adverse impacts during the Midday peak hours, and 17 intersections [that] would have unmitigated significant adverse impacts during the PM peak hour" "during FGEIS preparation." (DEIS at 19-2; *see also* DEIS at ES-40).

- 2025 Proposed Mitigation – Signalized Intersections – AM, Midday, and Peak Hours: "As summarized in Table 19-60, implementation of the proposed mitigation measures would provide mitigation for nearly all of the anticipated impacts in the AM, Midday, and PM peak hours. Of the 235 intersections evaluated, seven intersections would have unmitigated significant adverse impacts during the AM peak hour, eight intersections would have unmitigated significant adverse impacts during the Midday peak hours, and 17 intersections would have unmitigated significant adverse impacts during the PM peak hour. Additional mitigation measures will be investigated for these intersections during FGEIS preparation. Unmitigated impacts would generally be located along the 34th Street and 42nd Street corridors." (DEIS at 19-118; *see also* DEIS at ES-40; 19-2).

- 2025 – Special Event Peak Periods on Weeknights and Sundays: "Of the 60 signalized intersections studied for the Special Event peak hours for the 2025 Future With the Proposed Action, 26 intersections would have significant impacts in the weeknight Special Event peak hour and 35 intersections would have significant impacts in the Sunday Special Event peak period. As with the 2010 Future With the Proposed Action, these conditions would occur approximately 19 times per year, namely ten to eleven weeknights, and eight to nine Sunday afternoons. Most of these impacts could be mitigated through the implementation of standard traffic engineering improvements, including traffic signal timing changes, lane channelization improvements, and the elimination of on-street parking on intersection approaches. However, four intersections would have unmitigated significant impacts during the weeknight Special Event peak hour, and six intersections would have unmitigated significant impacts during the Sunday Special Event peak hour. Additional mitigation measures will be investigated for these intersections during FGEIS preparation." (DEIS at ES-40).

- 2025 – Special Event Peak Periods on Weeknights and Sundays: "Of the 60 signalized intersections studied in the Special Event peak hours for the 2025 Future With the Proposed Action, 26 intersections would have significant adverse impacts in the weeknight Special Event peak hour and 35 intersections would have significant adverse impacts in the Sunday Special Event peak hour. As with the 2010 Future With the Proposed Action, these conditions would occur approximately 19 times per year, namely 10 to 11 weeknights, and 8 to 9 Sunday afternoons. Most of these impacts could be mitigated through the implementation of standard traffic engineering improvements, including traffic signal timing changes, lane channelization improvements, and the elimination of on-street parking on intersection approaches. However, four intersections would have unmitigated significant adverse impacts during the weeknight Special Event peak hour, and six intersections would have unmitigated significant adverse impacts during the Sunday Special Event peak hour. (The unmitigated impacts that could occur during the Special Event peak hours are illustrated in Figure 19-175 and Figure 19-176). Additional mitigation measures will be investigated for these intersections during FGEIS preparation." (DEIS at 19-2 to 19-3; *see also* DEIS at ES-40; 19-165).

TRAFFIC

- 2025 Proposed Mitigation – Signalized Intersections – Special Event Peak Hours: "Additional mitigation measures will be investigated for these intersections" including "West 34th Street at Eleventh, Tenth, Ninth, and Eighth Avenues, West 35th Street at Eleventh Avenue and Tenth Avenue at West 42nd Street" "during preparation of the FGEIS." (DEIS at 19-165; *see also* DEIS at ES-40; 19-2 to 19-3).

- 2025 – Queens Midtown Tunnel at PM Peak Hour: "In 2025, the Proposed Action would have a significant adverse impact in the PM peak hour at the Queens Midtown Tunnel. The Co-Lead Agencies will continue to explore the feasibility of additional mitigation measures for incorporation in the FGEIS." (DEIS at ES-40).

- 2025 – Queens Midtown Tunnel at PM Peak Hour: "[C]apacity utilization in the outbound direction during the PM peak hour . . . would represent" a "significant adverse impact of the proposed Action in 2025 on river crossings." "Additional mitigation measures will be investigated for [approaches to the outbound Queens Midtown Tunnel] during FGEIS preparation." (DEIS at 19-114; *see also* DEIS at ES-40; 25-2).

- 2025 – Queens Midtown Tunnel at PM Peak Hour: "[C]apacity utilization in the outbound direction of the Queens-Midtown Tunnel would be more than 90 percent during the PM peak hour and thus would represent a significant adverse impact. Additional measures to mitigate potential unavoidable traffic impacts will be investigated between the DGEIS and FGEIS. . . ." (DEIS at 25-2; *see also* DEIS at ES-40; 19-114).

- Methodology - Traffic Data Collection – Utilization of Existing Data: "In Fall 2003 and after data were collected for the current analysis, NYCDOT redesignated Eleventh Avenue for two-way operations between West 42nd and West 44th Street and PANYNJ implemented a Lincoln Tunnel Access pilot program. Additional traffic data will be collected and analyzed to account for new travel patterns, and results will be documented in the FGEIS." (DEIS at 19-25 n. 8).

- Methodology - Traffic Data Collection – Additional Data: "Modifications to signal timings along Route 9A which were implemented in Spring 2004 (after data were collected) will be analyzed and presented in the FGEIS." (DEIS at 19-27 n. 10).

- Existing Conditions – Roadway Network – Grid System: "Prior to 2001, the six lanes of Eleventh Avenue ran one-way, southbound only. In response to the events of September 11, 2001, the NYCDOT and the NYPD converted Eleventh Avenue between West 27th and West 40th Streets to two-way traffic. This modification provides a location for security inspection of trucks with more than three axles entering the Lincoln Tunnel. Signs are posted throughout the roadway network directing trucks to use this approach. As of June 2003, Eleventh Avenue was converted to one-way southbound operation south of West 34th Street. In October 2003, Eleventh Avenue between West 42nd and West 44th Streets was converted from two-way to one-way southbound operation. This change is not reflected in 2003 Existing conditions but will be incorporated into the FGEIS." (DEIS at 19-33).

TRAFFIC

- 2010 Proposed Mitigation – Mitigation Measures: "A number of intersections, described below as unable to be mitigated, would require additional measures to mitigate their impacts. These measures, to be evaluated between the publication of this DGEIS and completion of the FGEIS, could include corridor operational changes (e.g., Eleventh Avenue one-way or two-way), implementation of intersection turn restrictions or *THRU* Streets, or intelligent transportation systems. Options for reducing traffic volumes and/or improving traffic operations during Special Event peak hours would also include combination football (or other event) tickets which provide discounts on transit, and utilization of existing and proposed Intelligent Transportation System infrastructure. These measures have the potential to mitigate many of the remaining traffic impacts, and will be further evaluated between the Draft and Final GEIS, for application where practicable and financially feasible. Where measures are not practicable or financially feasible, impacts would not be mitigated." (DEIS at 19-61).

- 2025 Proposed Mitigation – Mitigation Measures: "A number of intersections, described below as unable to be fully mitigated, would require additional measures to mitigate their impacts. These measures, to be evaluated between the publication of this DGEIS and completion of the FGEIS, could include corridor operational changes (e.g., Eleventh Avenue one-way or two-way), implementation of intersection turn restrictions, *THRU* Streets, or intelligent transportation systems. Options for reducing traffic volumes and/or improving traffic operations during Special Event peak hours would include combination football (or other event) tickets which provide discounts on transit, and utilization of existing and proposed Intelligent Transportation System infrastructure. These measures could mitigate many of the remaining significant traffic impacts, and will be further evaluated between the Draft and Final GEIS, for application where practicable and financially feasible." (DEIS at 19-116 to 19-117).

QUOTATIONS FROM THE DEIS ADMITTING THAT CRITICAL INFORMATION CONCERNING SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS IS MISSING AND WILL NOT BE DISCLOSED UNTIL THE FINAL EIS OR LATER

SEWAGE

- Introduction – Principal Conclusions: "The City is preparing a hydraulic assessment of the Proposed Action to determine the sewer infrastructure improvements that would be necessary to accommodate the Proposed Action. The results of this assessment will be used to identify needed improvements to wastewater infrastructure, and identify those areas that would require amendments to the DEP's existing Manhattan Wastewater Drainage Plan." (DEIS at 16-2).

- 2025 Future With the Proposed Action – Surface Water: "[T]he City is preparing a hydraulic assessment of the existing sewer infrastructure of the Hudson Yards area assuming the full buildout of the Proposed Action. As a result of this assessment, areas of wastewater infrastructure requiring improvements will be identified, and through a review process with DEP, amendments to the Manhattan Drainage Plan will be made (See Chapter 16, 'Infrastructure')." (DEIS at 13-22).

- Conclusion: "At this time, a hydraulic assessment evaluating the sewer requirements of the Proposed Action is being prepared by the City. The results of this assessment will be used to develop an amended Drainage Plan." (DEIS at 16-18).

- Methodology – Wastewater: "The analysis includes an evaluation of whether the increased volume of wastewater flows with the Proposed Action to the North River WPCP would be within the limits of the State Pollutant Discharge Elimination System (SPDES) permit. The SPDES permit is issued by the New York State Department of Environmental Conservation (NYSDEC). An adverse impact would occur if the Proposed Action would result in a volume of wastewater that would exceed the limits of the SPDES permit. North River WPCP's current permitted flow limit is 170 mgd based on a 12-month rolling average, with a maximum acceptable flow of 340 mgd during wet weather events." (DEIS at 16-3).

- 2010 Future With the Proposed Action - Wastewater: "As mentioned previously, the City is currently preparing a hydraulic assessment of the existing sewer infrastructure's capacity to serve the full-build of the Proposed Action. The hydraulic study will identify sewer segments that would not have adequate capacity to serve the Project Area under the Proposed Action. Under the Proposed Action in 2010, a part of the sewer system would likely need an upgrade. The City will prepare an amended drainage plan to upgrade those sewer segments, as well as modifications to the regulators and interceptors, if required, according to the DEP design specifications and sewer guidelines." (DEIS at 16-12).

- 2010 Future With the Proposed Action - Stormwater: "During storm events, there is the potential that the combined sewer system would trigger CSO discharges into the Hudson River. The City is preparing a hydraulic assessment of the existing sewer infrastructure of the Project Area, assuming the full-build based on the proposed rezoning." (DEIS at 16-13).

- 2025 Future With the Proposed Action- Wastewater: "The sewage generated from the Proposed Action would be treated prior to release into the Hudson River, except during major storm events." (DEIS at 16-16)

SEWAGE

- 2025 Future With the Proposed Action- Wastewater: "Sewer segments that would need upgrading to accommodate the estimated wastewater flows of the Proposed Action would be shown on the amended Drainage Plan, which will be prepared by the City. This amended Drainage Plan would identify sewer upgrades and relocations according to the DEP design specifications and sewer guidelines." (DEIS at 16-16 to 16-17).

- Conclusion – Wastewater: "It is anticipated that the operational requirements of the Proposed Action would require modifications to the existing City wastewater system. The City would prepare an amended Drainage Plan necessary for the Rezoning Area. A hydraulic assessment, evaluating the stormwater and sanitary requirements of the full-build of the Proposed Action in 2025, is being prepared by the City. The results of this assessment will be used to identify needed improvements to wastewater infrastructure." (DEIS at 16-18).

- 2025 Future With the Proposed Action - Stormwater: "During storm events, there is the potential that the combined sewer system would trigger CSO discharges into the Hudson River. The City is preparing a hydraulic assessment of the existing sewer infrastructure of the Project Area, assuming the full-build based on the proposed rezoning. As a result of this assessment, areas of wastewater infrastructure (including sewer regulators) requiring improvements will be identified, and through a review process with the DEP, amendments to the Manhattan Drainage Plan will be made." (DEIS at 16-17).

- Conclusion – Stormwater: "If Project Area outlets require modifications to accommodate the street demappings and Drainage Plan amendments of the Proposed Action, the North River WPCP SPDES Permit would need to be modified to reflect these changes." (DEIS at 16-18).

QUOTATIONS FROM THE DEIS ADMITTING THAT CRITICAL INFORMATION CONCERNING SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS IS MISSING AND WILL NOT BE DISCLOSED UNTIL THE FINAL EIS OR LATER

WATER DISTRIBUTION

- 2010 Future With the Proposed Action – Water Supply: "These potential impacts would be addressed through the DEP's Trunk Plan, which would incorporate these needed modifications to the water distribution system to accommodate the Proposed Action in 2010 and 2025. The DEP is currently preparing the Trunk Plan considering the full-build of the Proposed Action in 2025. The Trunk Plan will identify necessary modifications to water supply infrastructure serving the Project Area. " (DEIS at 16-9).

- 2010 Future With the Proposed Action – Water Supply – Rezoning Area: "As mentioned previously, the DEP is developing a new Trunk Plan to provide adequate water supplies to serve the development that would ultimately be in place in 2025." (DEIS at 16-10).

- 2025 Future With the Proposed Action – Water Supply: "Residential and commercial development in the Proposed Action between 2010 and 2025 would require further modifications to existing DEP infrastructure. The Trunk Master Plan currently being prepared by the DEP will consider potential improvements that would accommodate the Proposed Action." (DEIS at 16-15 to 16-16).

- Conclusion – Water Supply: "The DEP is currently preparing the Trunk Plan, which would consider the water supply needs of the Proposed Action in 2025. Currently, it is anticipated that the Trunk Plan would include improvements that would accommodate the Proposed Action." (DEIS at 16-18).

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AIR QUALITY

- Environmental Impacts of the Proposed Action – Air Quality: "In addition, the DGEIS air quality analysis incorporates a further overlay of conservative vehicle operating assumptions and employs conservative models to develop a Tier I estimate of worst-case concentrations of each pollutant being analyzed. Comprehensive Tier II analyses will be performed for the FGEIS and, as explained below, are expected to present more realistic estimates of expected air quality concentrations as a result of the Proposed Action." (DEIS at ES-45).

- Environmental Impacts of the Proposed Action – Air Quality - Mobile Source Analysis – Microscale Intersections – Fine Particulate Matter ($PM_{2.5}$): "Since the results of these analyses predict significant $PM_{2.5}$ impacts and exceedances of the PM10 annual NAAQS, a Tier II analysis will be conducted for the FGEIS. (DEIS at ES-46).

- Environmental Impacts of the Proposed Action – Noise and Vibration: "A revised analysis (using site-specific speeds and vehicle mix rather than posted speeds and New York State Department of Transportation (NYSDOT)-provided vehicle mix) of such potential noise impacts for both 2010 and 2025 will be conducted for the FGEIS to determine the precise extent of such impacts and the level of mitigation required to reduce indoor noise levels to those recommended by the NYCDEP." (DEIS at ES-47).

- Principal Conclusions – Mobile Source Analysis: "A more refined 'Tier II' analysis will be performed for the FGEIS and, as explained below, is expected to present more realistic estimates of expected air quality concentrations as a result of the Proposed Action." (DEIS at 21-1).

- Principal Conclusions – Mobile Source Analysis – Microscale Intersection Analysis: "Since the results of these analyses predict significant $PM_{2.5}$ impacts and exceedances of the PM_{10} annual NAAQS, a Tier II analysis will be conducted for the FGEIS." (DEIS at 21-2).

- Mobile Source Analysis – Microscale Intersection Analysis Methodology - Dispersion Analysis: "A Tier I analysis was conducted using the CAL3QHCR model. This approach used peak hour traffic conditions with the hourly meteorological data to predict the average 8-hour, 24-hour and annual concentrations. The use of the peak hour traffic conditions for every hour of the year is conservative and results in over-prediction of pollutant levels or project impacts. For those analysis sites where the Tier I analysis resulted in exceedances of ambient air quality standards, a more detailed Tier II analysis will be performed for the FGEIS. A Tier II analysis was conducted for the DGEIS of air quality at the intersection for which the Tier I indicated the highest NAAQS exceedance. The results of this Tier II analysis are presented in the DGEIS; the results give an indication of the absolute and relative results that can be expected for the other analysis sites for which Tier II analysis will be performed for the FGEIS." (DEIS at 21-14).

- Mobile Source Analysis – Microscale Intersection Analysis Methodology – Results – 2010 Future With the Proposed Action: "Based on the Tier I analysis, the maximum PM10 annual level of 61.46 μg/m3 was predicted under the 2025 Proposed Action for the PM peak period. Using the Tier II approach, the maximum predicted annual PM10 level would be 40.9 μg/m3 (see Table 21-17). Since the Tier II analysis was conducted at the analysis site with the highest predicted annual PM10 level, sites with lower predicted annual PM10 exceedances in 2010 and 2025 are expected to similarly comply with the annual PM10 standard. The Tier II analysis will be conducted for the

FGEIS at all locations presented in Table 21-11 for 2010." (DEIS at 21-19).

- Mobile Source Analysis – Microscale Intersection Analysis Methodology – Results – 2010 Future With the Proposed Action: "Under the Tier I analysis, the highest annual PM2.5 increment predicted at Analysis Site 13 in 2025 was 0.13 μg/m3, while the Tier II analysis resulted in an annual PM2.5 increment of 0.02 μg/m3, which is below the 0.1 μg/m3 annual significance threshold (see Table 21-17). Application of both the MTA bus fleet retrofit emission factors and the use of the Tier II analysis for the FGEIS at analysis locations with lower PM2.5 incremental increases and incremental PM2.5 concentrations exceeding the annual PM2.5 STV would, therefore, be expected to show no significant adverse PM2.5 impacts. The Tier II analysis and incorporation of MTA bus emissions factors will be conducted for the FGEIS at all locations presented in Table 21-11 for 2010." (DEIS at 21-20).

- Mobile Source Analysis – Microscale Intersection Analysis Methodology – Results – 2025 Future With the Proposed Action: "Since the Tier II analysis was conducted at the analysis site with the highest predicted annual PM10 level, sites with lower predicted annual PM10 exceedances in 2010 and 2025 are expected to comply with the annual PM10 standard. The Tier II analysis will be conducted for the FGEIS at all locations presented in Table 21-15 for 2025." (DEIS at 21-22 to 21-23).

- Mobile Source Analysis – Microscale Intersection Analysis Methodology – Results – 2025 Future With the Proposed Action: "Since the PM2.5 incremental increases in 2025 with the Proposed Action are predicted to be lower than such increases in 2010, application of the MTA bus emission factors and the use of the Tier II analysis for the FGEIS at analysis locations with lower PM2.5 increments and incremental PM2.5 concentrations exceeding the annual PM2.5 STV are expected to have no significant adverse PM2.5 impacts in that analysis year. The Tier II analysis and incorporation of MTA bus emissions factors will be conducted for the FGEIS at all locations presented in Table 21-15 for 2025." (DEIS at 21-23).

- Mobile Source Analysis – Microscale Intersection Analysis Methodology – Results – 2025 Future With the Proposed Action with Additional Bus Service: "Since the Tier II analysis was conducted at the analysis site with the highest predicted annual PM10 level, sites with lower annual PM10 exceedances, as predicted with a Tier 1 analysis , are expected to comply with the annual PM10 standard. The Tier II analysis will be conducted for the FGEIS at all locations presented in Table 21-15 for 2025." (DEIS at 21-27).

- Mobile Source Analysis – Microscale Intersection Analysis Methodology – Results – 2025 Future With the Proposed Action with Additional Bus Service: "Since PM2.5 incremental increases in 2025 with the Proposed Action with Additional Bus Service are predicted to be lower than such increases in 2010, application of both the MTA bus fleet retrofit emission factors and the use of the Tier II analysis for the FGEIS at analysis locations with lower PM2.5 increments are expected to show that the Proposed Action with Additional Bus Service would not exceed the annual PM2.5 STV and would not result in any significant adverse PM2.5 impacts in 2025. The Tier II analysis and incorporation of MTA bus emissions factors will be conducted for the FGEIS at all locations presented in Table 21-18 for 2025." (DEIS at 21-27 to 21-28).

- Construction Impacts – Air Quality -- Results With Emission Reduction Measures: "Between the Draft and Final GEIS the project sponsors will commit to the specific emission reduction measures that will be incorporated into the construction specifications. A detailed assessment of the reduction of $PM_{2.5}$ impacts as a result of the selected measures will be prepared and included in the Final GEIS." (DEIS at 23-74).

AIR QUALITY

- Emission Reduction Measures - Construction Activities Emission Controls: "A detailed assessment of the reduction of PM_{10} and $PM_{2.5}$ impacts as a result of the combination of emission control measures selected will be prepared and included in the FGEIS." (DEIS at App. V p. V-26).

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NOISE

- Principal Conclusions: "A revised analysis (using site-specific speeds and vehicle classifications rather than posted speeds and standard vehicle classifications provided by the New York State Department of Transportation (NYSDOT)) of such potential noise impacts for both 2010 and 2025 will be conducted for the FGEIS to determine the precise extent of such impacts and the level of sound attenuation required to reduce indoor noise levels to those recommended by the DEP." (DEIS at 22-2).

- Airborne Noise - 2010 Future With the Proposed Action Noise Levels Compared to 2010 Future Without the Proposed Action Noise Levels: "Further study will be conducted between the DGEIS and the FGEIS to identify more precisely those locations that would, with link-specific vehicle mix and speed data, be expected to experience significant impacts and to determine the extent of mitigation to be offered by the City." (DEIS at 22-26).

- Airborne Noise – 2025 Future With the Proposed Action Noise Levels Compared to 2025 Future Without the Proposed Action Noise Levels: "Further study will be conducted between the DGEIS and the FGEIS to identify more precisely those locations that would, with link-specific vehicle mix and speed data, be expected to experience significant impacts and to determine the extent type of mitigation to be offered by the City. As discussed later in this Section, sound attenuation measures will either avoid or fully mitigate significant noise impacts associated with the Proposed Action." (DEIS at 22-29 to 22-30).

- Noise Impacts Avoidance and Mitigation: "Based on the results of the analysis of prototype noise receptors N8 and N9 with site specific speeds and vehicle mix, it is expected that the Proposed Action would require building noise attenuation in the range of 30 dBA to 40 dBA at all projected and potential development sites allowing for residential or community facility use. As a result, as a conservative measure, (E) designations for noise attenuation will be placed on all potential and projected development sites as part of the Zoning Action. Further study will be conducted between the DGEIS and the FGEIS to verify whether these locations would have the potential for significant noise impacts and to confirm the degree of sound attenuation measures required to avoid impacts. The (E) Designations would ensure that there would be no significant adverse noise impacts for new development." (DEIS at 22-30 to 22-31).

- Noise Impacts Avoidance and Mitigation: "Further study will be conducted between the DGEIS and the FGEIS to verify whether [existing residential and community facility buildings] would experience significant noise impacts and to determine the type of mitigation to be offered by the City. If it is determined that a building would require mitigation, information would be distributed by the City to landlords/managers/owners of residential properties offering the appropriate mitigation." (DEIS at 22-31).

- Noise Impacts Avoidance and Mitigation: "The precise level of noise attenuation that would be required under the (E) Designations and the specific type of mitigation to be offered by the City will be identified between the DGEIS and FGEIS through the use of more detailed modeling using the FHWA TNM 2.1 noise model based on site-specific projected speed and vehicle mix data." (DEIS at 22-31).

QUOTATIONS FROM THE DEIS ADMITTING THAT CRUCIAL INFORMATION CONCERNING SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS IS MISSING AND WILL NOT BE DISCLOSED UNTIL THE FINAL EIS OR LATER

HAZARDOUS WASTE

- Executive Summary: "Phase II Environmental Site Assessments (ESAs) or other appropriate site investigations have been or will be performed for sites where the AHMSS, Phase I ESAs, or the Geotechnical Boring Screening have revealed the potential presence of hazardous materials. For sites owned by the public agencies sponsoring the Proposed Action, Phase II ESAs or other appropriate site investigations will be reported in the Final Generic Environmental Impact Statement (FGEIS). With respect to other sites, appropriate site investigations would be conducted prior to construction to more fully characterize possible contamination in the area and to identify any further action, investigation, or management that would be required if the Proposed Action were to proceed." (DEIS at ES-35).

- Principal Conclusions: "Phase II ESAs or other appropriate site investigations have been or will be performed for sites where the AHMSS, Phase I ESAs or the Geotechnical Boring Screening have revealed the potential presence of hazardous materials. For sites owned by the public agencies sponsoring the Proposed Action, Phase II ESAs or other appropriate site investigations will be reported in the FGEIS. With respect to other sites, appropriate site investigations would be conducted prior to construction to more fully characterize possible contamination in the area and to identify any further action, investigation or management that would be required if the Proposed Action were to proceed." (DEIS at 14-2).

- Methodology – Determining Whether a Hazardous Materials Assessment is Appropriate: "The results of additional completed Phase II ESAs will be reported in the FGEIS. . . ." (DEIS at 14-6).

- Methodology – Application of Assessment Measures – Properties Owned by the Project Sponsors: "Phase II ESAs or other intrusive investigations, as appropriate, will be carried out for portions of the existing Convention Center, the site of the Proposed Convention Center Marshalling Yard, and the MTA Caemmerer and Corona yards. Extensive Phase II investigation, including sample collection, has already been performed on the existing Quill Bus Depot Site and is being coordinated with NYSDEC. For the remaining properties owned by Project Sponsors, testing protocols are in the process of being prepared for some of the intrusive investigations, and will be done in coordination with the NYSDEC as necessary and appropriate. The results of the intrusive testing will be presented to the NYSDEC and DEP as necessary and appropriate, and will be summarized in the FGEIS. The FGEIS will also include information regarding the proposed management approach for hazardous material situations." (DEIS at 14-8).

- Methodology – Application of Assessment Measures – Alignment Conditions (No. 7 Subway Extension): "The proposed alignment for the No. 7 Subway Extension was evaluated through the area hazardous materials screening study (AHMSS), which provided a broad view of the environmental conditions within the area of the alignment, which aided in the identification of potentially contaminated sites (PCSs). . . . Based on the AHMSS and information from the Phase I ESAs, three environmental alignment borings will be advanced prior to the FGEIS to evaluate potential contaminants (e.g., VOCs, PCBs, and metals). Properties to be acquired as part of the No. 7 Subway Extension are presented on Table 14-1." (DEIS at 14-9).

HAZARDOUS WASTE

- Existing Conditions – Convention Center Expansion Parcels – Existing Convention Center: "The Phase I ESA concluded that there is likely subsurface contamination present beneath the existing Convention Center. Additionally, ACM, LBP, and PCB containing equipment could be present within the Convention Center. Prior to completion of the FGEIS, Phase II ESAs or other appropriate site investigations will be completed to more fully characterize possible contamination in the area and to identify any further action, investigation, or management that would be required if the Proposed Action were to proceed." (DEIS at 14-34).

- Existing Conditions – Convention Center Expansion Parcels – Existing Convention Center: "Prior to completion of the FGEIS, a Phase II ESA or other appropriate site investigation will be completed to more fully characterize possible contamination related to Block 685 and to identify any further action, investigation, or hazardous materials management that would be required if the Proposed Action were to proceed." (DEIS at 14-34).

- Existing Conditions – Convention Center Expansion Parcels – Site of Relocated Quill Bus Depot: "The southern portion of Caemmerer Yard is part of the proposed location for the Quill Bus Depot. The eastern portion of this site, between Tenth and Eleventh Avenues, is the location of the former Metal Purchasing Co. Inc. Based on a review of historical documents, the building formerly housing the plant (presently vacant) was constructed sometime between 1930 and 1950. Operations in this building included sheet metal cutting and coating (varnishing). Since it has historically been used for railroad purposes and a portion has been used for industrial purposes, there is potential that the area could contain contaminants, and further action could be necessary. Prior to completion of the FGEIS, appropriate site investigations will be completed to more fully characterize possible contamination in the area and to identify any further action, investigation, or management that would be required if the Proposed Action were to proceed." (DEIS at 14-36).

- Existing Conditions – Convention Center Expansion Parcels – Truck Marshalling Route (From West 33rd to 41st Street): "Prior to completion of the FGEIS, a Phase II ESA or other appropriate site investigation will be conducted to more fully characterize possible contamination in the [Truck Marshalling Route from West 33rd to 41st Streets] and to identify any further action, investigation, or management that would be required if the Proposed Action were to proceed." (DEIS at 14-38).

- Existing Conditions – Convention Center Expansion Parcels – Convention Center Marshalling Yard (between West 33rd and 34th Streets): "Prior to completion of the FGEIS, a Phase II ESA or other appropriate site investigation will be conducted to more fully characterize possible contamination in the [Convention Center Marshalling Yard (between West 33rd and 34th Streets)] and to identify any further action, investigation, or management that would be required." (DEIS at 14-38).

- Existing Conditions – Convention Center Expansion Parcels – Intervening Streets – West 34th, West 39th, West 40th, and West 41st Streets, and Parts of Eleventh Avenue: "Prior to completion of the FGEIS, a Phase II ESA or other appropriate site investigation will be conducted to more fully characterize possible contamination in the [Intervening Streets - West 34th, West 39th, West 40th, and West 41st Streets, and parts of Eleventh Avenue] and to identify any further action, investigation, or management that would be required if the Proposed Action were to proceed." (DEIS at 14-38).

HAZARDOUS WASTE

- Existing Conditions – Caemmerer Yard – Adjacent Uses – Caemmerer Yard East: "ACM, LBP, and PCB-containing equipment could be encountered should buildings or other structures be deconstructed as a result of the development of the Multi-Use Facility. Prior to completion of the FGEIS, appropriate intrusive site investigations will be completed to characterize possible contamination in [Caemmerer Yard East] and to identify any further action, investigation, or management that would be required if the Proposed Action were to proceed." (DEIS at 14-41).

- 2025 Future With the Proposed Action – Rezoning Area (Projected and Potential Development Sites): "99 Projected and Potential Development Sites would be mapped with (E) Designations." (DEIS at 14-51).

- 2006 Future With the Proposed Action – Impacts and Mitigation – Hazardous Materials: "All private development on projected and potential development sites would receive an (E) Designation and would therefore require Phase I, and if necessary, Phase II investigations, and approved remediation plans prior to commencement of construction activities. The investigations and any necessary remediation and abatement would be implemented prior to or during construction and would be subject to review and approval by the DEP, NYSDEC and NYS Department of Labor." (DEIS at 23-86).

- 2010 Future With the Proposed Action – Operational Issues – Hazardous Materials: "There is potential for significant adverse impacts associated with both the projected and potential developments sites related to hazardous materials resulting from the presence of underground storage tanks, subsurface contamination resulting from on- and off-site sources, ACMs, PCB-containing materials, hazardous waste and lead-based paint (LBP)." (DEIS at 24-10).

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The following comments were sent to MTA Government & Community Relations via email by Jenna Orkin on October 1.

"The DGEIS omits crucial facts and grossly understates the devastating impacts from the number seven extension. --The DGEIS fails to disclose details of proposed financing for $7 billion in public borrowing (through authorities) for the #7 line extension ($2 billion), the stadium etc. Impacts and alternatives must also be addressed. --Fare hikes and service cuts in existing transit are inevitable if the current plans are carried out. Those fare hikes and service cuts will drive riders from mass transit and increase traffic and pollution. --Former MTA Chairman Richard Ravitch warns that poor transit spending priorities choices (e.g. the #7 line extension) will send transit back down a "slippery slope" to its near collapse in the 1970's. Why build the #7 extension when there's no demand and no cash to build it, Ravitch says. --The only reason for the $2 billion-plus subway extension is to subsidize far west side development and thus shift development from better locations (e.g. lower Manhattan, where the subways have already been paid for). --The MTA can't even afford to keep the exisiting subway system in a state of good repair with its current resources. New lines should only be built where demand exists already--e.g. the Second Avenue subway."