PARKING OVERSUPPLY IN EAST HARLEM:

AN ANALYSIS OF PARKING OCCUPANCY AND MODE USAGE AT EAST RIVER PLAZA IN NEW YORK CITY

Kyle Gebhart
San Francisco County Transportation Authority
1455 Market Street, 22nd Floor
San Francisco, CA 94103
Tel: (415) 593-1664
Fax: (415) 522-4829
kyle.gebhart@sfcta.org

Submission Date: August 1, 2012

5,057 words + 1 table (250 x 1) + 5 figures (250 x 5) = 6,557 words
ABSTRACT

East River Plaza is a recently constructed mall in the East Harlem section of Manhattan. The development contains big box stores including Target, Costco, and Best Buy along with a 1,248 space parking garage. This paper evaluates the assumptions and methodology of the analysis determining the large parking supply, measures current parking usage, and determines modal splits through an intercept survey. The project’s Environmental Impact Statement assumed 67% to 68% of all trips arriving to East River Plaza would be by automobile. Parking accumulation was calculated using parking studies conducted at Home Depots in the Bronx, Queens, and Port Chester, NY and a Costco in Staten Island, all of which are less dense and have higher vehicle trip rates and vehicle ownership rates. These calculations resulted in a peak parking accumulation of 1,190 vehicles for a Saturday afternoon. Actual parking occupancy observations revealed only 371 vehicles (34% occupancy) on a Tuesday afternoon in late November, and 426 vehicles (39% occupancy) on a Saturday afternoon in December. The intercept survey revealed 48% and 37% of respondents arrived by foot and 27% and 33% drove on Tuesday and Saturday, respectively. Thus, the parking supplied has resulted in an underutilized land use and lost opportunity for additional development. Future big box developments in dense urban areas should not use suburban models for auto trip generation and parking accumulation and instead consider the provision of trips being made by walking and public transportation, reducing the need for unnecessary parking.
INTRODUCTION
The impact of parking on transportation and land use is of growing interest in the field of urban planning (1). Parking supply impacts both car-ownership rates and vehicle-miles traveled (VMT) (1). With new development, the parking supply typically increases due to new parking construction, either from a zoning ordinance with minimum parking requirements or by the assessed parking need at peak demand by the developer (1). These are both often based on rates in the Parking Generation report published by the Institute of Transportation Engineers (ITE) (1). As a result, car-travel is often induced and there is an arguable loss in urban vitality through space reserved for parking instead of another use. This paper aims to understand the challenge of achieving accurate estimates for parking requirements within a dense urban area through a case study of the 1,248 space parking garage at East River Plaza, a recent shopping center development in the East Harlem section of New York City. The shopping center is distinctive due to both its dense, urban location and high amount of parking supplied. The parking garage has anecdotally been underused (2). This case study will show that the parking structure was built with excess capacity due to the methods used for estimating parking demand and an underestimation of shoppers who would arrive by foot. The result is a misuse of land—a suburban-style project forced into an urban context.

LITERATURE REVIEW
Research criticizing the current practice of planning for parking has been largely spearheaded by Donald Shoup and is best documented in his comprehensive book The High Cost of Free Parking (1). From every possible perspective, Shoup demonstrates the lack of science in planning for parking. In regards to off-street parking supply for new developments, parking demand is regularly calculated from ITE’s Parking Generation, which gives a fitted curve equation relating parking demand to building square footage or number of employees (1). These equations are derived from parking surveys, typically at low density suburban sites with little transit and free parking (1). Additionally, many of these rates do not show a statistically significant relationship between the peak parking occupancy and square footage, resulting in “low $R^2$” warnings (1). Therefore, due to planners and developers misapplication on parking generation rates, developments often result in poor estimations of parking demand and the consequence is in an oversupply of parking.

Further research on parking supply is scarce but growing. More documentation has emerged as to the oversupply of parking due to misapplication of ITE data. For example, Rowe et al. observed the relationship between residential parking demand and transit service in King County Washington (3). Parking utilization counts were conducted at two urban centers, one in downtown with transit service and a mixed-use suburban location without transit. The urban center resulted in parking demand of 50% less than ITE data and 50% less than the mixed-use suburban center. Additionally, Wilson and Roberts found required parking to exceed free demand at suburban Inland Empire residential developments (4). Researchers and planners often call for lowering or removing existing minimum parking requirements. Engel-Yan therefore explored the likelihood of developers to respond to decreased parking requirements in Toronto, Canada and predicted that general office, medical office, and general retail uses would likely respond with fewer parking spaces, but bank and large grocery store developments would not (5). Finally, through exploring the broader challenges of successful transportation demand management (TDM) integration into the land development process, Sara Hendricks identifies the...
reliance of trip and parking generation rates as a significant barrier to successful integration of
TDM and land use (6).

PROJECT OVERVIEW AND BACKGROUND
East River Plaza opened in November 2009 and contains approximately 485,000 square feet of
retail space and is home to Costco, Target, Best Buy, Old Navy, PetSmart, and Bob’s Discount
Furniture, among others. The development is situated west of FDR Drive along the East River
between East 116th Street and East 119th Street in East Harlem. The site was originally the
Washburn water factory which was dormant when the project was first proposed in the early
1990s (7). East 118th Street dead-ends into the project and East 117th Street turns into a roadway
servicing the mall, facilitating pickups and drop-offs and dividing the retail outlets from the
parking garage. The mall contains a series of vertically-stacked big-box stores totaling five
levels: PetSmart below ground, Costco on the ground floor, Target and Kidstown on level 2, Best
Buy and Old Navy on level 3, and Marshalls and Bob’s Discount Furniture on level 4. Nearby
bus service includes the M116 bus operating on E 116th Street and Pleasant Avenue and Select
Bus Service on 1st and 2nd Avenues. The 4-5-6 train is the nearest subway, a half-mile away on
Lexington Avenue. The parking garage charges parkers using a pricing scheme to encourage
only shoppers to park: $5 for up to two hours, $11 for up to three hours, and $18 for up to 24-
hours.

The project was in development by the Blumenfeld Development Group, Ltd. since the
early 1990s. Additional investment came from the Canyon Capital Realty Advisers of Beverly
Hills, California, who eventually sold to Forest City Ratner in 2004 (7). The environmental
impact statement was released and approved by the city planning commission in 1999 via the
Empire State Development Corporation (8). The project took an especially long time to build,
even to New York City standards. Much of this could be attributed to the unfamiliarity of
placing large superstores in dense, urban settings. While this has recently become a growing
phenomenon (Atlantic Center in Brooklyn, Home Depot on 34th Street, etc.), it was still
pioneering when first proposed in the 1990s.

METHODOLOGY
A thorough review of project documents was conducted to obtain background information of the
project and determine how site design and transportation decisions were made. Specifically, the
trip generation rates prepared for the project’s Environmental Impact Statement (EIS) were
analyzed to determine if assumptions, methods, and therefore results, were appropriate.

Following the EIS analysis, a parking inventory was conducted on two occasions
determined to be peak shopping times: a weekday late afternoon and Saturday early afternoon
(on November 22, 2011 and December 3, 2011). The number of cars parked was counted
throughout the entire garage, by floor, in addition to a parking inventory totaling the actual
number of parkable spaces.

Concurrently, an intercept survey was conducted as shoppers entered and exited Target to
calculate modal splits to and from East River Plaza. (Therefore, data from the intercept survey is
only representative of Target shoppers and may not be applicable to Costco or other retail
shoppers. Surveying in front of Target was chosen in order to randomly capture shoppers using
all modes as those entering from the parking garage or from the street enter at the same location.
This is not the case when entering Costco, and thus surveying in front of Target was deemed
more appropriate.) Additionally, drivers were asked their parking location and transit riders and
pedestrians were asked questions regarding accessibility perception, vehicle ownership, and
motivations for modal choice. Zip codes were recorded for all respondents to get a sense of how far shoppers were from home.

A qualitative assessment of pedestrian flows and transit access was analyzed through photo documentation to determine how friendly and intuitive it is to navigate as a pedestrian. Finally, U.S. Census and American Community Survey data were consulted to determine journey to work modal splits and vehicle ownership rates of residential zip codes of the majority of survey respondents.

RESULTS AND FINDINGS

EIS Review

The East River Plaza EIS contains a full analysis of project impacts to the transportation network, including trip generation and parking accumulation projections. What follows is a description of the methodology used and reported findings as related to trip generation and parking accumulation.

The trip generation forecast was calculated by assessing each of the three original project components: Home Depot (assumed to be the projects anchor tenant, later replaced by Target), Costco, and the remaining mixed retail. To calculate generated trips at Home Depot and Costco, surveys were conducted at existing New York City locations. This included Home Depots located at Gun Hill Road in the Bronx, Avery Avenue in Queens, and Hamilton Avenue in Brooklyn. Costcos were surveyed on Richmond Avenue in Staten Island and Third Avenue in Brooklyn (8). Vehicle trip rates were calculated based on trips per 1,000 square feet, and then factored up to a 100% vehicle trip rate (by assuming an 85% vehicle modal split). Trip rates for all Home Depots and all Costcos were then averaged for each peak period.

Trip generation for the remaining retail was calculated using the ITE Trip Generation Handbook, 6th Edition (8). Distinct trip generation characteristics were assumed for each project component. The modal split assumption was “based on surveys conducted at various retail projects in New York City, as well as travel characteristics of the area based on the 1990 census” (8). This attributed 67% to 68% of all trips arriving to Home Depot, Costco, and mixed retail to autos and 35% of all office trips arriving by auto. Only 6% to 8% were forecasted to arrive by subway, 10% to 12% by bus and 10% to 11% by walking (8). As a result of these projected vehicle trips added to the roadway network, the project was expected to have “significant” (as defined by the New York City Environmental Quality Review (CEQR) Manual) level of service (LOS) impacts at three locations in the weekday midday peak hour, six locations in the weekday PM peak hour, and three in the Saturday midday peak hour. Thus, mitigation measures were proposed in signal timing and turn-lane restriping (8).

For the analysis of off-street parking need, parking accumulation was calculated again by dividing the project into three components: Home Depot, Costco, and a combined “retail” category. The accumulation patterns for Home Depot were based on “planning assumptions” used in parking studies conducted at Home Depot locations on Gun Hill Road in the Bronx, Woodhaven Boulevard in Queens, and in Port Chester, NY (8). Costco was calculated via surveys conducted at a Staten Island location. The remaining retail category referenced data from the ITE Trip Generation Handbook, 6th Edition. These calculations resulted in a peak parking accumulation of 1,190 between 2:00 PM and 3:00 PM on a Saturday afternoon (8). Thus, the 1,248 parking garage is justified to ensure no spillover onto adjacent on-street parking spaces.
Parking Garage Survey
Since opening in November 2009, it is now possible to test the transportation parking demand forecasts based on actual utilization rates. The survey results can be seen in Table 1. The overall parking occupancy was 34% on Tuesday afternoon and 39% on Saturday afternoon. Levels 1a and 1b had much higher occupancy rates (51% to 89%) due to their direct connections to Costco. However, the upper levels, notably 3a and 4a, had hardly any vehicles parked on them (1% to 6%). It should also be noted that these occupancy rates were calculated based on the observed capacity—a parking inventory taken on site which yielded a total of 1,103 spaces. The official capacity as reported in the site floor plans calculated a higher number of spaces (1,176), and the original parking garage plans as described in the EIS had an even higher number of parking spaces (1,248). Thus, if parking occupancy is calculated against the latter two figures, occupancy rates would be even lower.

TABLE 1: Parking Occupancy Rates in East River Plaza Garage

<table>
<thead>
<tr>
<th>Level</th>
<th>fdr</th>
<th>1a</th>
<th>1b</th>
<th>2a</th>
<th>2b</th>
<th>3a</th>
<th>3b</th>
<th>4a</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday, Nov 22, 2011 3:50 p.m. - 4:50 p.m.</td>
<td>57</td>
<td>79</td>
<td>70</td>
<td>54</td>
<td>55</td>
<td>9</td>
<td>1</td>
<td>371</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50%</td>
<td>89%</td>
<td>51%</td>
<td>34%</td>
<td>35%</td>
<td>6%</td>
<td>37%</td>
<td>1%</td>
<td>34%</td>
</tr>
<tr>
<td>Saturday, Dec 3, 2011 12:30 p.m. - 1:15 p.m.</td>
<td>61</td>
<td>62</td>
<td>110</td>
<td>61</td>
<td>53</td>
<td>9</td>
<td>60</td>
<td>10</td>
<td>426</td>
</tr>
<tr>
<td></td>
<td>54%</td>
<td>70%</td>
<td>80%</td>
<td>39%</td>
<td>34%</td>
<td>6%</td>
<td>48%</td>
<td>6%</td>
<td>39%</td>
</tr>
<tr>
<td>Observed Capacity</td>
<td>114</td>
<td>89</td>
<td>137</td>
<td>157</td>
<td>156</td>
<td>154</td>
<td>125</td>
<td>171</td>
<td>1,103</td>
</tr>
<tr>
<td>Official Capacity</td>
<td>107</td>
<td>101</td>
<td>140</td>
<td>157</td>
<td>165</td>
<td>162</td>
<td>166</td>
<td>178</td>
<td>1,176</td>
</tr>
</tbody>
</table>

Note: Observed Capacity consists of a count of the number of parkable spaces on each level. Official capacity is the number of spots as detailed on the floor plans found at http://www.eastriverplaza.com/html/floorplans/planGr.html

Intercept Survey
After 90-minutes of surveying on each day, there were 52 respondents on Tuesday and 49 on Saturday with response rates of 30% and 24% respectively. The response rate is based on shoppers who were directly asked to take the survey, which was a limited sample due to heavy pedestrian flows.

Figure 1 reveals the modal splits of arrival mode and planned departure mode on Tuesday and Saturday (note: some multi-modal trips may have not been captured as it is probable that respondents may have only reported the most recently used mode—e.g. a subway rider who walked the last half-mile may have reported to have simply “walked”). On Tuesday, 27% arrived by car, while almost half (48%) arrived by walking, as many shoppers were neighborhood residents. No respondents reported cycling, though a few cyclists were observed at the mall. Some transit riders and pedestrians planned to leave by taxi to more easily take purchases home. Saturday revealed similar results yet with a small increase in driving (33%), a few subway riders (6%) and a decrease in walking (37%). Taxis saw a slight increase as well in the “leaving” modal split. These results are to be expected as larger shopping ventures are more likely on a Saturday as opposed to a weekday.
For those who did drive to East River Plaza, not all of them parked in the attached garage. From both Tuesday and Saturday, only 21 of the 32 (66%) drivers parked in facility. Many who parked on-street cited the $5 charge as the reason for not parking in the garage. For those who walked or took transit, a vast majority (78%) responded that they did not drive due to not owning a car, followed by convenience (10%), parking cost (0.7%), and exercise (0.3%).

Zip code data revealed that many shoppers were traveling from close-by. A majority of respondents (52%) were from the 10026, 10029, and 10035 zip codes in Harlem and East Harlem. 43% of respondents were from the two closest zip codes to East River Plaza (10029 and 10035) in East Harlem. A map representing home zip codes of respondents is shown in Figure 2.
ANALYSIS OF RESULTS

Trip Generation
The travel demand forecasting compiled in the EIS contained the key justifications for traffic impact mitigations and building the 1,248 space parking garage. However, the methodologies and assumptions to generate the forecasted travel demand numbers were flawed in a variety of ways. First, trip generation was based on vehicle trip rates observed at Costcos and Home Depots which were all located in the outer boroughs. This is inappropriate due to the drastically different levels of density, car ownership, and driving habits surrounding these store locations in Brooklyn, the Bronx, Queens, and most notably, Staten Island. Only 22% of Manhattanites own personal vehicles, lower than all other boroughs—Bronx (40%), Brooklyn (42%), Queens (63%), and Staten Island (85%). The majority of survey respondents reside in zip codes 10026, 10029, and 10035 (see Figure 2). Only 20% of these residents own personal vehicles (based on American Community Survey 2006-2010 5-year estimates using census tracts approximately matching zip codes). American Community Survey Journey to Work trends mirror this pattern of limited car use by those in Manhattan, with only 8.7% commuting to work by vehicle (and 9.2% in majority-respondent zip codes), significantly lower than Brooklyn (23.5%), Bronx (28.4%), Queens (40.0%), and Staten Island (64.6%) (9). Additionally, these surveyed locations...
are often in portions of the outer boroughs which are more difficult to access via foot or public transportation. East River Plaza is situated with easy pedestrian access from the neighborhood, making driving a less-desired option.

Once these rates were determined at different locations, they were then simply averaged together, with no weights or adjustments given. Some locations varied significantly including a Saturday midday vehicle trip rate of 6.99 for the Home Depot and Queens compared to 3.90 in Brooklyn. It is odd to somehow presume that a Manhattan Home Depot would generate an average number of trips from these locations. A clear pattern emerges from the vehicle trip generation surveys which can be correlated to density or vehicle ownership for each location, yet this is lost when it is assumed that the Manhattan Home Depot will simply generate the same number of trips.

The surveys were also flawed because they were conducted at Home Depot stores which never became a tenant at East River Plaza. Whether Target would generate fewer or greater auto trips is unclear, but it is reasonable to assume that home furnishing purchases tend to be larger and bulkier than many goods bought at Target, and thus would result in more vehicle trips.

Trip generation for the remaining mixed retail simply used ITE trip generation rates. The flawed application of these rates has become fairly apparent as chronicled by Donald Shoup in *The High Cost of Free Parking*. Notably, trip generation rates for given land uses are typically based on the average vehicle trips observed from a small sample of suburban locations, with plenty of free parking, and no public transit (1). The ITE manual calculates trip ends based on square footage, yet the surveys that these rates are typically based on often show no statistically significant relationship between square footage and trips generated. Nonetheless, the fitted curve equation is given, allowing engineers and developers to calculate the precise number of trips to be generated. In the case of East River Plaza, the result is vehicle trip rates of 4.52, 4.86, and 6.69 trips per 1,000 square feet during the weekday midday, weekday PM, and Saturday midday peaks (8). Applying ITE trip generation rates produces inaccurate results, especially in this project context in Manhattan.

Perhaps the most surprising assumption in the travel forecast demand is the 67% to 68% auto modal split for all three site components. The only explanation given for this is that they “were based on surveys conducted at various retail projects in New York City, as well as travel characteristics of the area based on the 1990 census” (8). Further explanation as to the nature of these surveys is not given. Also, information regarding what census characteristics were considered or a definition of the area is not given. Judging from the low car ownership rates and low percentage of vehicle commute trips in the area, a more-than-two-thirds auto mode share would seem unlikely. The weekday PM peak survey conducted for this case study observed a drive mode share far less than half (27% compared to 67%) of the EIS assumptions. The Saturday midday peak drive mode share was also less than half (33% compared to 67%). Correcting these assumptions would result in less than half of the vehicle trips forecasted to be added to the roadway network.

**Parking Accumulation**

While trip generation was used to determine the number of additional trips added to the roadway network, and thus, mitigations necessary to handle said trips, the expected parking accumulation patterns justified the need for the 1,248-car parking garage. Like trip generation, parking accumulation is based on observations on outer borough locations. However, instead of surveying these locations, the accumulation figures are instead based on “planning assumptions
used in Home Depot parking studies” (8). However, these assumptions are never explicitly stated. Additionally, one of the studies referenced is from a Home Depot in a New York City suburb, in Port Chester, NY in West Chester County near Connecticut, which is even more auto-dependent than the Bronx or Queens locations, as 94% of households own at least one vehicle (9).

The accumulation rates calculated for Costco were based on one accumulation survey in Staten Island. This is therefore measuring the amount of parking in the most car-dependent borough and applying it to the most car-free borough. The total parking accumulation is then calculated by summing the accumulations of Home Depot, Costco, and mixed retail (which is calculated using the ITE Trip Generation Handbook, 6th Edition).

An additional problem is that all of the parking accumulation patterns are based on locations in which parking is free. The East River Plaza garage charges a minimum of $5 to park. As would be expected, the demand for priced parking is lower than the demand for free parking. Evidence for this exists from intercept survey results where car owners cited the parking cost as their reason to not drive.

Planning for Parking

Beyond poor assumptions and methodologies in the parking accumulation calculations, there is an even more fundamentally faulty assumption of planning a parking garage to supply more than enough spaces to satisfy peak parking occupancy. Even if the trip generation rates and parking accumulation rates were accurate, the garage was projected to be more than half-empty before 10:00 a.m. and after 6:00 p.m. on Saturdays (8). This results in an extremely inefficient land use in a location where land is quite valuable. Because drivers do not pay the full market rate at the garage, it in turn raises the cost of everything else. It is an area where few people drive, yet the costs of parking are spread broadly.

The virtue of satisfying peak free parking demand (when the parking ultimately will not be free) should be questioned as it results in underutilized land use most of the time. Instead of designing the garage for sufficient supply for the peak hour, the garage could instead be designed for slightly less than that. The Parsons Transportation Group did just this when conducting a parking study for Home Depot and recommending a “design day” for parking supply—the fifth busiest day of the year. Parsons explained that the negative implications “would mean that some customers may not be able to find a parking space immediately during the peak hour of busiest four or five days of the year; however, they should have no problem finding a parking space in the lot at any other time” (1). Likewise, it may have been appropriate to design the parking garage supply to satisfy free demand at a point less than the Saturday peak hour, especially when pricing was to be instituted.

Pedestrian Facilitation

As shown in Figure 1, a high number of pedestrians enter and leave the site. However, the mall was designed assuming most shoppers would be arriving via automobile. Thus, much of the design was based around facilitating pedestrian flows from the parking garage. Figure 3 shows the walkways built to connect each level of the parking garage to the shopping center providing easy access and sufficient capacity for movement to and from the garage. However, the same care was not taken to facilitate pedestrians coming from the street. The project required some of the sidewalk on East 117th Street to be narrowed, while the roadway was widened, reducing pedestrian capacity. Additionally, navigating the space as a pedestrian can be confusing as it is
often overrun by vehicles. Multiple vehicles were observed standing on crosswalks and sidewalks.

**FIGURE 3: Pedestrian Walkways Connecting Parking Garage to Retail Entrances**

Now that the lack of driving trips and high number of walk trips is realized, the heavy pedestrian flows should be better accommodated into the mall. As 117th Street runs into the mall, much of the space is currently used for chaotically facilitating pickups and drop-offs with narrow sidewalks and temporary barriers separating pedestrians from vehicle space (see Figure 4). Instead, this could be established as a “pedestrian priority zone” with a combination of textured pavement, paint, and signage indicating to vehicles the heavy pedestrian volumes moving in all directions.

**FIGURE 4: Pedestrians at Intersection of 117th Street Entering East River Plaza**
CONCLUSIONS

In a July 20, 2010 post on Streetsblog, Noah Kazis stated “It’s safe to say that East River Plaza will go down as an urban planning disaster for the ages” (2). Why did East River Plaza provide such an oversupply of parking using valuable land and adding significant costs? Lead developer David Blumenfeld suggested large parking supply desires from the big-box tenants: “I don’t think the tenants were ever ready to build it without parking,” Blumenfeld stated (10). He also noted that there was no pushback from the city to limit parking capacity (10).

While the garage remains, evidence of exploring other possibilities for the garage exists. Between the two survey dates, a portion of floor 3b was fenced off and filled with storage boxes, as discovered on the December 3, 2011 survey date (see Figure 5). Taking a cue from this creative re-use, other possibilities should be explored as well. The garage could be used for events, such as a farmer’s market or craft fair. Open space for such events can be difficult to come by in Manhattan and such events could then benefit tenants of East River Plaza, by attracting more visitors to the mall.

FIGURE 5: Re-use of a Portion of Level 3b for Storage

When questioned about the future of the garage, Rachel Weinberger of the University of Pennsylvania posited that the top floor will likely become reserved for monthly parking for residents (10). By increasing the parking supply in East Harlem, increased car-ownership and induced driving are likely to occur. If new residential development occurs in the neighborhood, the parking supply will further increase due to minimum residential parking requirements (parking maximums do exist for Manhattan south of 96th Street on the East Side and south of 110th Street on the West Side, but do not extend up to East Harlem) (13). As Shoup proposes, eliminating these minimums is an appropriate first step. Then, for developments such as East River Plaza, the city should work more closely with the developer to limit excess parking from
being built. David Blumenfeld, the project’s lead developer stated in a July 8th Streetsblog article, “None of these things had ever been built in an urban market before. There was no model to go off of; there was only the suburban model” (10). However, now as more big-box stores are locating in urban environments, other models are being developed to follow. The Home Depot on 23rd Street in Manhattan has no dedicated parking spaces (10). Thus, an oversupply of parking is not inevitable when big box stores locate in urban environments.
ACKNOWLEDGMENTS

The author would like to acknowledge and thank Robert B. Noland at Rutgers, the State University of New Jersey for serving as an advisor to this research, the Empire State Development Corporation for providing the apparently-only copy in existence of the EIS for the East River Plaza Project, and the East River Plaza security staff for allowing the intercept survey to be conducted.
REFERENCES


13. Manhattan Core: Public Parking Study. UPWP Project # PTCP08D00.G06. NYC Department of City Planning, Transportation Division, 2011.