Mr. David J. Coviello
Partner – Shutts & Bowen LLP
200 South Biscayne Boulevard
Suite 4100
Miami, Florida 33131

July 15, 2019

Re: Valet Operations and TDM for Essex House, Miami Beach

Dear David:

Traf Tech Engineering, Inc. has prepared a valet-operations plan for a proposed hotel-expansion (+31 rooms) project located at the northeast corner of the intersection of Collins Avenue and 10th Street within the limits of the City of Miami Beach in Miami-Dade County, Florida. Figure 1 on the following Page shows the location of the subject hotel property. The figure also locates the location of the off-site parking facility designated for valet vehicles. This report documents the projected trip generation of the hotel expansion project, provides proposed valet operation details and addresses Transportation Demand Management (TDM) opportunities. The following is a summary of our findings.

TRIP GENERATION

A trip generation analysis was performed for the hotel building using trip generation rates published in the Institute of Transportation Engineer's (ITE) report *Trip Generation Manual* (10th Edition). The trip generation analysis was undertaken for both daily and peak hour of the generator scenarios. According to ITE's *Trip Generation Manual* (10th Edition), trip generation rates appropriate for the existing and proposed uses are:

<u>HOTEL (ITE Land Use 310)</u>

Daily Trip Generation (Weekday)
T = 8.36 (X)
Where T = number of daily trips, X = number of rooms

Peak Hour of the Generator (Weekday)
T = 0.61 (X) (58% inbound and 42% outbound)
Where T = number of peak hour trips, X = number of rooms

Peak Hour of the Generator (Saturday)
T = 0.72 (X) (56% inbound and 44% outbound)
Where T = number of peak hour trips, X = number of rooms

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EXISTING HOTEL LOCATION MAP and Off-Site Valet Parking Garage

FIGURE 1
Essex House
Miami Beach, Florida

Using the above-listed trip generation rates from the ITE document, a trip generation analysis was undertaken for the existing and proposed hotel intensities. The results of this effort are documented in Table 1 on the following page.

VALET OPERATION

The Essex House currently provide valet parking at 1027 Collins Avenue. The entrance to the valet parking garage is located approximately 150 feet from the valet station for parking trips and approximately 1,500 feet from the parking structure back to the valet station around the block (right-turns out of the parking garage onto Collins Avenue, right-turns on 11th Street, right-turn on Ocean Drive, right-turn on 10th Street and right-turn on Collins Avenue). Therefore, the average travel distance (for parking and retrieval trips) is approximately 825 feet. Additionally, 1,600 feet of travel distance within the parking garage is required to access the farthest parking stall (5 stories x 400 feet per floor). Hence, the average travel distance is approximately 2,500 feet.

To determine the number of valet runners associated with the valet operation, a queuing analysis was undertaken. The length of queue anticipated at the drop-off/pick-up area was established using information contained in ITE's *Transportation and Land Development*, Chapter 8 – Drive-In Facilities[1]. For this analysis, the following input variables were used:

- Service Rate: The average distance between the valet station and the valet parking garage located at 1027 Collins Avenue plus the travel distance within the parking garage is approximately 2,500 feet. As documented in Appendix A, the service rate for valet purposes is approximately 8 vehicles per hour.

- Demand Rate- Scenario 1: As indicated in Table 1, a maximum of 73 inbound/outbound vehicles will arrive/depart during the highest hour. For valet purposes, 35% (26 customers) were assumed to use the valet service during the peak hour of the hotel, based on current valet usage. The 35% is based on valet usage information provided by Park One, a fully diversified professional parking company serving over 150 properties (refer to Appendix A).

[1] By Vergil G. Stover and Frank J. Koepke.

TABLE 1 Trip Generation Summary Essex House								
Land Use	**Size**	**Daily Trips**	**Weekday Peak Hour of Generator**			**Saturday Peak Hour of Generator**		
			Total Trips	**Inbound**	**Outbound**	**Total Trips**	**Inbound**	**Outbound**
Existing Land Use (1)								
Hotel LUC 310	70 rooms	585	43	25	18	50	28	22
Existing External Trips		**585**	**43**	**25**	**18**	**50**	**28**	**22**
Proposed Land Use (1)								
Hotel LUC 310	101 rooms	844	62	36	26	73	41	32
Future External Trips		**844**	**62**	**36**	**26**	**73**	**41**	**32**
Net New Trips (Proposed - Existing)	**31 rooms**	**259**	**19**	**11**	**8**	**23**	**13**	**10**

Source: ITE Trip Generation Manual (10th Edition)

(1) 56 Existing rooms at the main building + 14 rooms at the annex building. The 31 new rooms will be at the annex building.

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Using equation 8-9b and Table 8-11 of ITE's *Transportation and Land Development*, the maximum length of queue anticipated at the valet station, at the 95% confidence level, is one (1) vehicles. Therefore, the on-site valet station should provide parking for at least two (2) vehicles and have up to six (6) valet runners during peak times in order to prevent spillage onto the through lane of Collins Avenue. The results of the ITE queuing procedure for the 35% valet usage scenario is contained in Appendix A.

According to the valet operator, their peak period is Saturday between 3:00 PM and 8:00 PM. During this peak period, they valet-park between 2 and 4 vehicles per hour and operate with two valet runners. Hence, the recommended six (6) valet runners appears to be conservative for the proposed hotel expansion project.

- <u>Demand Rate- Scenario 2</u>: As indicated in Table 1, a maximum of 73 inbound/outbound vehicles will arrive/depart during the highest hour. For valet purposes, 80% (58 customers) were assumed to use the valet service during the peak hour of the hotel, for a conservative approach.

Using equation 8-9b and Table 8-11 of ITE's *Transportation and Land Development*, the maximum length of queue anticipated at the valet station, at the 95% confidence level, is three (3) vehicles. Therefore, the on-site valet station should provide parking for at least three (3) vehicles and have up to 12 valet runners during peak times in order to prevent spillage onto the through lane of Collins Avenue. The results of the ITE queuing procedure for the 80% valet usage scenario is contained in Appendix B.

TRANSPORTATION DEMAND MANAGEMENT (TDM)

Traf Tech Engineering, Inc. prepared a Transportation Demand Management (TDM) plan for the Essex House expansion project.

<u>Introduction</u>
Travel Demand Management plans (TDM) establish policies and mechanisms to reduce automobile trips to and from designated facilities. TDM plans usually use several approaches to address all modes of transportation likely to be used to provide access to a facility such as single occupant driving, carpooling, transit, bicycling and walking. The goal of TDM plans is to increase the use of alternatives modes to single occupant driving, i.e., to reduce the number of automobile trips to and from the facility and consequently, minimizing automobile traffic impacts on the street system.

Successful TDM plans not only address all modes of transportation, but also use policies such as inducements for alternative modes (subsidies), physical enhancements (bike lockers, preferential parking for carpools) and disincentives for automobile use (no free parking for employees).

Potential measures for each mode are addressed below. Use of an employee transportation subsidy is also presented.

Pedestrian Access

Walking not only reduces automobile trips and their contribution to congestion and emissions, it also provides health benefits to the employees who use this mode of transportation. It is, however, the mode that is least likely to be used for a number of reasons. It is unlikely that employees of the restaurant/bar use will reside within a reasonable walking distance (within ¼ - ½ mile) of the subject facility. However, the area near the subject project is a high pedestrian traffic area and therefore, many future customers of the Essex House development are expected to be walking trips. Sidewalks exist on the west and south sides of project as well as safe pedestrian crosswalks (with ramps and pedestrian signals) at the adjacent signalized intersection of Collins Avenue and 10th Street.

Bicycling

The site of the Essex House offers two potential approaches to encourage cycling, the use of the Citi Bike program and use of retail employee-owned bicycles. Use of Citi Bike could be supported by providing monthly passes to employees. Monthly passes are $15.00 for unlimited 30-minute rides and $25.00 for unlimited 60-minute rides. Within the immediate area of the project, there are two convenient Citi Bike rental station (Station 118 located on the beach side of Ocean Drive between 10th Street and 11th Street and Station 119 located at Washington Avenue and 11th Street) and employees will be informed of the Citi Bike Stations. Secondly, provide short-term bicycle parking at the site.

(Goal: Offer 2 free City Bike passes to employees. Integrate bikeshare information into communication materials for commuters and visitors). Provide bicycle parking at the site and reflect it on the site plan.

Mass Transit

There is a wealth of transit options for the Essex House Expansion project. These transit routes include Route 120, Route 150 and Route C. The nearest bus stop for these services is located on Washington Avenue between 11th Street and 12th Street. These transit routes provide frequent service and access to Miami-Dade County as well as connections to other destinations outside of the County. Employers of the hotel can provide a significant inducement to employees to use public transportation (Miami-Dade Transit, MDT) through a transit subsidy. Transit subsidies can also provide tax benefits to both employees and employers.

MDT offers three methods to provide transit subsidies:
The employee uses pre-tax dollars from their salary to purchase monthly transit passes. There is no income tax on the portion of their salary used for transit passes. The pre-tax funds also reduce the employees' taxable salary, reducing the total amount of income tax paid by the employees. The employer pays the total cost of a monthly transit pass using a tax-deductible (to the employer) subsidy. The employer receives a tax deduction equivalent to the value of the transit subsidies provided to the employees. The transit subsidy is a fringe benefit to employees and is not taxable income.

Both the employer and employees share the cost of transit passes, paying for them with pre-tax dollars. The employer reduces his/her payroll taxes. Employees do not pay income tax on the money used for transit passes.

MDT monthly passes if purchased by an individual are $112.50. Corporate discounts are available based on the number of participating employees. For 4 – 99 employees, monthly passes are $101.25 per employee, for 100 or more employees, the cost is $95.65 per employee.

Goal: Offer free transit passes to employees, through coordination with South Florida Commuter Services. Request employee origin/destination information from commercial employers & Identify opportunities).

Carpooling
Carpooling is historically the least effective alternative transportation mode, even when implemented on a regional basis. Given that no on-site parking is provided for this facility, it is unlikely that carpooling will provide a significant amount of trip reduction. However, preferential parking could be made available to employees that carpool.

Goal: 2 free valet passes to carpool riders.

TRAF TECH ENGINEERING, INC.

Joaquin E. Vargas, P.E.
Senior Transportation Engineer

JOAQUIN E. VARGAS
LICENSE
No 44174
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

July 15, 2019

APPENDIX A

Valet Analyses for
Essex House – Scenario 1 with 35% Valet Usage and Park One Valet Usage Documentation

Queuing Analysis based on ITE Procedures
Essex House

q = 26 veh/hr (demand rate)

Q = 8 veh/hr (service rate*)

$$p = \frac{q}{NQ} = 0.5417 \text{ (N = 6 valet runner)}$$

$Q_M = 0.1397$ (for N=6)

Using Acceptable Probability of 5% (95% Confidence Level)

$$M = \left(\frac{\text{Ln}(x > M) - \text{Ln}(Q_M)}{\text{Ln}(p)}\right) - 1$$

$$M = \left(\frac{\text{Ln}(0.05) - \text{Ln}(0.1397)}{\text{Ln}(0.5417)}\right) - 1$$

$$M = \left(\frac{-2.9957 - (-1.9683)}{-0.6130}\right) - 1$$

M = 1.7 – 1 = 0.7, say 1 vehicle

- Ticket processing time = **60 sec**. + vehicle travel time at 15 mph (2,500 feet) = **113 sec**. + 2 traffic signals at 30 seconds each = **60 sec.** + parking time = **30 sec**. + walking/running time at 10 ft/sec for 1,750 feet = **175 sec.** for a total time of 438 sec, say **<u>480 sec (8 veh per hour).</u>** NOTE; for purposes of this analysis, used 2 traffic signals as an average (no signals for parking trips and 4 signals for retrieval trips)

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location, a 5% probability of back-up onto the adjacent street is judged to be acceptable. Demand on the system for design is expected to be 110 vehicles in a 45-minute period. Average service time was expected to be 2.2 minutes. Is the queue storage adequate?

Such problems can be quickly solved using Equation (8–9b) given in Table 8-10 and repeated below for convenience.

$$M = \left[\frac{\ln P(x > M) - \ln Q_M}{\ln \rho}\right] - 1$$

where:

M = queue length which is exceeded p percent of the time
N = number of service channels (drive-in positions)
Q = service rate per channel (vehicles per hour)
$\rho = \dfrac{\text{demand rate}}{\text{service rate}} = \dfrac{q}{NQ}$ = utilization factor
q = demand rate on the system (vehicles per hour)
Q_M = tabled values of the relationship between queue length, number of channels, and utilization factor (see Table 8.11)

TABLE 8-11
Table of Q_M Values

	N = 1	2	3	4	6	8	10
0.0	0.0000	0.0000	0.0000	0.0000			
0.1	.1000	.0182	.0037	.0008	.0000	0.0000	0.0000
.2	.2000	.0666	.0247	.0096	.0015	.0002	.0000
.3	.3000	.1385	.0700	.0370	.0111	.0036	.0011
.4	.4000	.2286	.1411	.0907	.0400	.0185	.0088
.5	.5000	.3333	.2368	.1739	.0991	.0591	.0360
.6	.6000	.4501	.3548	.2870	.1965	.1395	.1013
.7	.7000	.5766	.4923	.4286	.3359	.2706	.2218
.8	.8000	.7111	.6472	.5964	.5178	.4576	.4093
.9	.9000	.8526	.8172	.7878	.7401	.7014	.6687
1.0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

$\rho = \dfrac{q}{NQ} = \dfrac{\text{arrival rate, total}}{\text{(number of channels) (service rate per channel)}}$

N = number of channels (service positions)

0.5 = 0.0991
0.5417 = X
0.6 = 0.1965

$\dfrac{0.0417}{0.1} = \dfrac{Y}{0.0974}$

Y = 0.0406

0.0991 + 0.0406 = 0.1397

Solution

Step 1: $Q = \dfrac{60\ \text{min/hr}}{2.2\ \text{min/service}} = 27.3$ services per hour

Step 2: $q = (110\ \text{veh}/45\ \text{min}) \times (60\ \text{min/hr}) = 146.7$ vehicles per hour

Step 3: $\rho = \dfrac{q}{NQ} = \dfrac{146.7}{(6)(27.3)} = 0.8956$

Step 4: $Q_M = 0.7303$ by interpolation between 0.8 and 0.9 for $N = 6$ from the table of Q_M values (see Table 8-11).

Step 5: The acceptable probability of the queue, M, being longer than the storage, 18 spaces in this example, was stated to be 5%. $P(x > M) = 0.05$, and:

$$M = \left[\frac{\ln 0.05 - \ln 0.7303}{\ln 0.8956}\right] - 1 = \left[\frac{-2.996 - (-0.314)}{-0.110}\right] - 1$$

$$= 24.38 - 1 = 23.38, \text{ say 23 vehicles.}$$

As Submitted

Land Use	Size		Pkg Rate	Total Parking Spaces	Employee/Resident %	Employee/Resident Spaces	Customer/Visitor %	Customer/Visitor Spaces
Office	99,569	Sq. Ft.	300	332	92%	305	8%	27
Retail	140,554	Sq. Ft.	300	469	20%	94	80%	375
1 Bed RM	504	Units	1.25	630				
2 + Bed RM	223	Units	1.75	390				
Guest 1-20	20	Units	0.5	10				
Guest 21-50	30	Units	0.3	9				
Guest 51+	677	Units	0.2	135				
Total Resid.	727	Units		1,175		1,020		154
Live/Work	73	Units	2	146	90%	131	10%	15
Hotel (Rooms)	280	Rooms	1	280		-		
Hotel (BallRoom)	10,326	Sq. Ft.	300	34				
Hotel (Meeting Room	3,776	Sq. Ft.	300	13				
Hotel (Total)	280	Rooms		327	20%	65	80%	262
			Total	2,448		1,616		832

Revised

Land Use	Size		Pkg Rate	Total Parking Spaces	Employee/Resident %	Employee/Resident Spaces	Customer/Visitor %	Customer/Visitor Spaces
Office	99,569	Sq. Ft.	3/1k	299	110%	329	8%	24
Retail	140,554	Sq. Ft.	4.5/1k	632	25%	158	75%	474
1 Bed RM	504	Units	1	504		504		
2 + Bed RM	223	Units	2	446		446		
Resident 2nd Veh.	727		25%	182		182		
Guest	727	Units	0.2	145		145		
		Units		-				
		Units		-				
Total Resid.	727	Units		1,277		1,020		154
Live/Work	73	Units	2	146	90%	131	10%	15
Hotel (Rooms)	280	Rooms	1	280		-		
Hotel (BallRoom)	10,326	Sq. Ft.	300	34				
Hotel (Meeting Room	3,776	Sq. Ft.	300	13				
Hotel (Total)	280	Rooms		327	20%	65	80%	262
			Total	2,681		2,981		928

10/7/2015

Self Park/Valet	Residential 1st Cars	Self Park	Valet	Total
Self Park	Peak Demand	950	-	950
100%	Avg. Turnover	1.00	1.00	
Valet	Avg. Rate	$ -	$ -	
0%	Monthly Rev.	-	-	-
	Annual Rev.	$ -	$ -	$ -

Self Park/Valet	Residential 2nd +	Self Park	Valet	Total
Self Park	Peak Demand	-	182	182
0%	Avg. Turnover	1.00	1.00	
Valet	Avg. Rate	$ -	$ 75.00	
100%	Monthly Rev.	-	13,631	-
	Annual Rev.	$ -	$ 163,575	$ 163,575

Self Park/Valet	Office Prem. Valet	Self Park	Valet	Total
Self Park	Peak Demand	312	16	329
95%	Avg. Turnover	1.00	1	
Valet	Avg. Rate	$ -	$ 100.00	
5%	Monhtly Rev.	-	1,643	
	Annual Rev.	$ -	$ 19,715	$ 19,715

Self Park/Valet	Office Monthly Extra	Self Park	Valet	Total
Self Park	Peak Demand	13	-	13
100%	Avg. Turnover	1.00	1	
Valet	Avg. Rate	$ 75.00	$ 75.00	
0%	Monthly Rev.	1,008	-	
	Annual Rev.	$ 12,098	$ -	$ 12,098

Self Park/Valet	Office Visitors	Self Park	Valet	Total
Self Park	Peak Demand	17	7	24
70%	Avg. Turnover	1.25	1.25	
Valet	Avg. Rate	$ 8.00	$ 10.00	
30%	Weekly Rev.	836	448	1,284
	Annual Rev.	$ 43,492	$ 23,299	$ 66,791

Self Park/Valet	Retail Monthly	Self Park	Valet	Total
Self Park	Peak Demand	158	-	158
100%	Avg. Turnover	1.00	1	
Valet	Avg. Rate	$ -	$ 100.00	
0%	Monthly Rev.	-	-	
	Annual Rev.	$ -	$ -	$ -

Self Park/Valet	Retail Visitors	Self Park	Valet	Total
Self Park	Peak Demand	356	119	474
75%	Avg. Turnover	0.70	0.7	
Valet	Avg. Rate	$ 8.00	$ 10.00	
25%	Weekly Rev.	13,946	5,811	
	Annual Rev.	$ 725,216	$ 302,174	$ 1,027,390

Self Park/Valet	LiveWork	Self Park	Valet	Total
Self Park	Peak Demand	131	0	131
100%	Avg. Turnover	1.00	1	
Valet	Avg. Rate	$ -	$ -	
0%	Monthly Rev.	-	-	
	Annual Rev.	$ -	$ -	$ -

Self Park/Valet	Retail Visitors	Self Park	Valet	Total
Self Park	Peak Demand	11	4	15
75%	Avg. Turnover	0.70	0.7	
Valet	Avg. Rate	$ 8.00	$ 10.00	
25%	Weekly Rev.	307	128	
	Annual Rev.	$ 15,943	$ 6,643	$ 22,586

10/7/2015

Hotel Revenue			
Hotel Room Nights (rooms*365)		280	102,200
Occupancy			80%
Driving Adjustment			40%
Total Annual Hotel Vehicles			32,704
Valet Parking Ratio		24%	7,849
Valet Parking Hotel Revenue	$	20	$ 156,979
Self Park Hotel		76%	24,855
Self Park Hotel Revenue	$	15	$ 372,826
Est. Annual Hotel Revenue			$ 529,805

Banquet and Event Revenue			
Daily Demand (Mon.-Thur.)		25	-
Daily Rate	$	10	-
Daily Turns		1	
Daily Revenue (Mon.-Thur.)			1,000
Weekend Demand (Fri.-Sun.)		50	
Weekend Rate	$	10	
Weekend Turns		1.00	
Weekend Revenue (Thur.-Sun.)			$ 2,000
Est. Weekly Pool/Bar Revenue			$ 3,000
Est. Annual Banquet and Event Revenue			$ 156,000

10/7/2015

Hotel Operating Schedule	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total Hrs.	Rate	Salary
Parking Manager	1	1	1	1	1			40	20.00	800
Valet Day	3	3	3	3	3	3	3	168	8.00	1,344
Valet Evening	3	3	3	3	3	3	3	168	8.00	1,344
Valet Midnight	1	1	1	1	1	1	1	56	8.00	448
Flex Valet					1	1	1	24	8.00	192
Subtotal Total Parking Hours								416	Total	$ 4,128
Total Annual Parking Payroll										$ 214,656

North Tower Residential	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total Hrs.	Rate	Salary
Valet Manager	1	1	1	1	1			40	15.00	600
Valet Day	3	3	3	3	3	4	4	184	8.00	1,472
Valet Evening	4	4	4	4	4	4	4	224	8.00	1,792
Valet Midnight	2	2	2	2	2	2	2	112	9.00	1,008
Subtotal Total Parking Hours								560	Total	$ 4,872
Total Annual Parking Payroll										$ 253,344

South Tower Residential	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total Hrs.	Rate	Salary
Valet Manager	1	1	1	1	1			40	15.00	600
Valet Day	3	3	3	3	3	4	4	184	8.00	1,472
Valet Evening	4	4	4	4	4	4	4	224	8.00	1,792
Valet Midnight	2	2	2	2	2	2	2	112	9.00	1,008
Subtotal Total Parking Hours								560	Total	$ 4,872
Total Annual Parking Payroll										$ 253,344

Retail	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total Hrs.	Rate	Salary
Valet Day	3	3	3	3	4	5	6	216	8.00	1,728
Valet Evening	3	3	3	4	4	5	6	224	8.00	1,792
Valet Midnight								0	9.00	-
Subtotal Total Parking Hours								440	Total	$ 3,520
Total Annual Parking Payroll										$ 183,040

Office	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total Hrs.	Rate	Salary
Valet Day	1	1	1	1	1			40	8.00	320
Valet Evening	0.5	0.5	0.5	0.5	0.5			20	8.00	160
Valet Midnight								0	8.00	-
Subtotal Total Parking Hours								60	Total	$ 480
Total Annual Parking Payroll										$ 24,960

pk1 PARK ONE

600 Hallandale														10/7/2015
Revenue	note	**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**	**Annual**
Transient														
Hotel Overnight		44,150	44,150	44,150	44,150	44,150	44,150	44,150	44,150	44,150	44,150	44,150	44,150	529,805
Hotel Banquet and Events		13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	156,000
Residential 2nd + Vehicles		13,631	13,631	13,631	13,631	13,631	13,631	13,631	13,631	13,631	13,631	13,631	13,631	163,575
Office Monthly Over and Valet Prem.		2,651	2,651	2,651	2,651	2,651	2,651	2,651	2,651	2,651	2,651	2,651	2,651	31,812
Office Visitors		5,566	5,566	5,566	5,566	5,566	5,566	5,566	5,566	5,566	5,566	5,566	5,566	66,791
Retail Visitors		85,616	85,616	85,616	85,616	85,616	85,616	85,616	85,616	85,616	85,616	85,616	85,616	1,027,390
LiveWork Visitors		1,882	1,882	1,882	1,882	1,882	1,882	1,882	1,882	1,882	1,882	1,882	1,882	22,586
Less Allowances		-	-	-	-	-	-	-	-	-	-	-	-	-
Gross Receipts		**166,497**	**166,497**	**166,497**	**166,497**	**166,497**	**166,497**	**166,497**	**166,497**	**166,497**	**166,497**	**166,497**	**166,497**	**1,997,959**
Sales Tax	7%	(10,892)	(10,892)	(10,892)	(10,892)	(10,892)	(10,892)	(10,892)	(10,892)	(10,892)	(10,892)	(10,892)	(10,892)	(130,708)
Total Revenue		**155,604**	**155,604**	**155,604**	**155,604**	**155,604**	**155,604**	**155,604**	**155,604**	**155,604**	**155,604**	**155,604**	**155,604**	**1,867,252**

Expenses	note	**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**	**Annual**
Hotel Payroll		17,888	17,888	17,888	17,888	17,888	17,888	17,888	17,888	17,888	17,888	17,888	17,888	214,656
North Tower Residential		21,112	21,112	21,112	21,112	21,112	21,112	21,112	21,112	21,112	21,112	21,112	21,112	253,344
South Tower Residential		21,112	21,112	21,112	21,112	21,112	21,112	21,112	21,112	21,112	21,112	21,112	21,112	253,344
Retail Payroll		15,253	15,253	15,253	15,253	15,253	15,253	15,253	15,253	15,253	15,253	15,253	15,253	183,040
Office Payroll		2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	24,960
Payroll Taxes and Burden		17,812	17,812	17,812	17,812	17,812	17,812	17,812	17,812	17,812	17,812	17,812	17,812	213,749
Sub-Total Payroll &Related		95,258	95,258	95,258	95,258	95,258	95,258	95,258	95,258	95,258	95,258	95,258	95,258	1,143,093
License		1,150	-	-	-	-	-	-	-	-	-	-	-	1,150
Credit Card Processing and Bank Fee		1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772	21,264
Supplies		75	75	75	75	75	75	75	75	75	75	75	75	900
Signs		125	125	125	125	125	125	125	125		-	-	-	1,000
Tickets & Printing		1,150	-	-	-	-	-	1,150	-	750	-	-	-	3,050
Valet Equipment and Software		1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	13,200
Telephone		300	300	300	300	300	300	300	300	300	300	300	300	3,600
Liability Insurance		2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	28,200
Claims		800	-	800	-	800	-	800	-	800	-	800	-	4,800
Uniforms		2,250	-	-	-	-	-	2,250	-	-	-	-	-	4,500
Management Fee		2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	28,800
Sub-Total Operating Exp.		13,472	8,122	8,922	8,122	8,922	8,122	12,322	8,122	9,547	7,997	8,797	7,997	110,464
Total Valet Expenses		**108,730**	**103,380**	**104,180**	**103,380**	**104,180**	**103,380**	**107,580**	**103,380**	**104,805**	**103,255**	**104,055**	**103,255**	**1,253,557**
Net Profit		**46,875**	**52,225**	**51,425**	**52,225**	**51,425**	**52,225**	**48,025**	**52,225**	**50,800**	**52,350**	**51,550**	**52,350**	**613,694**

APPENDIX B

Valet Analyses for
Essex House – Scenario 2 with 80% Valet Usage

Queuing Analysis based on ITE Procedures
Essex House

q = 58 veh/hr (demand rate)

Q = 8 veh/hr (service rate*)

$$p = \frac{q}{NQ} = 0.6042 \text{ (N = 12 valet runner)}$$

Q_M = 0.2781 (for N=10, highest value on Table)

Using Acceptable Probability of 5% (95% Confidence Level)

$$M = \left(\frac{\text{Ln}(x > M) - \text{Ln}(Q_M)}{\text{Ln}(p)}\right) - 1$$

$$M = \left(\frac{\text{Ln}(0.05) - \text{Ln}(0.2781)}{\text{Ln}(0.6042)}\right) - 1$$

$$M = \left(\frac{-2.9957 - (-1.2798)}{-0.5039}\right) - 1$$

M = 3.4 – 1 = 2.4, say 3 vehicles

- Ticket processing time = **60 sec**. + vehicle travel time at 15 mph (2,500 feet) = **113 sec**. + 2 traffic signals at 30 seconds each = **60 sec.** + parking time = **30 sec**. + walking/running time at 10 ft/sec for 1,750 feet = **175 sec.** for a total time of 438 sec, say **480 sec (8 veh per hour).** NOTE; for purposes of this analysis, used 2 traffic signals as an average (no signals for parking trips and 4 signals for retrieval trips)

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location, a 5% probability of back-up onto the adjacent street is judged to be acceptable. Demand on the system for design is expected to be 110 vehicles in a 45-minute period. Average service time was expected to be 2.2 minutes. Is the queue storage adequate?

Such problems can be quickly solved using Equation (8–9b) given in Table 8-10 and repeated below for convenience.

$$M = \left[\frac{\ln P(x > M) - \ln Q_M}{\ln \rho}\right] - 1$$

where:

M = queue length which is exceeded p percent of the time
N = number of service channels (drive-in positions)
Q = service rate per channel (vehicles per hour)
$\rho = \dfrac{\text{demand rate}}{\text{service rate}} = \dfrac{q}{NQ}$ = utilization factor
q = demand rate on the system (vehicles per hour)
Q_M = tabled values of the relationship between queue length, number of channels, and utilization factor (see Table 8.11)

TABLE 8-11
Table of Q_M Values

	N = 1	2	3	4	6	8	10
0.0	0.0000	0.0000	0.0000	0.0000	.0000	0.0000	0.0000
0.1	.1000	.0182	.0037	.0008	.0015	.0002	.0000
.2	.2000	.0666	.0247	.0096	.0111	.0036	.0011
.3	.3000	.1385	.0700	.0370	.0400	.0185	.0088
.4	.4000	.2286	.1411	.0907	.0991	.0591	.0360
.5	.5000	.3333	.2368	.1739	.1965	.1395	.1013
.6	.6000	.4501	.3548	.2870	.3359	.2706	.2218
.7	.7000	.5766	.4923	.4286	.5178	.4576	.4093
.8	.8000	.7111	.6472	.5964	.7401	.7014	.6687
.9	.9000	.8526	.8172	.7878	1.0000	1.0000	1.0000
1.0	1.0000	1.0000	1.0000	1.0000			

$\rho = \dfrac{q}{NQ} = \dfrac{\text{arrival rate, total}}{\text{(number of channels) (service rate per channel)}}$
N = number of channels (service positions)

0.7 = 0.2218
0.73 = X
0.8 = 0.4093

$\dfrac{0.03}{0.10} = \dfrac{Y}{0.1875}$

Y = 0.0563

0.2218 + 0.0563 =
$\boxed{0.2781}$

Solution

Step 1: $Q = \dfrac{60 \text{ min/hr}}{2.2 \text{ min/service}} = 27.3$ services per hour

Step 2: $q = (110 \text{ veh}/45 \text{ min}) \times (60 \text{ min/hr}) = 146.7$ vehicles per hour

Step 3: $\rho = \dfrac{q}{NQ} = \dfrac{146.7}{(6)(27.3)} = 0.8956$

Step 4: $Q_M = 0.7303$ by interpolation between 0.8 and 0.9 for $N = 6$ from the table of Q_M values (see Table 8-11).

Step 5: The acceptable probability of the queue, M, being longer than the storage, 18 spaces in this example, was stated to be 5%. $P(x > M) = 0.05$, and:

$$M = \left[\frac{\ln 0.05 - \ln 0.7303}{\ln 0.8956}\right] - 1 = \left[\frac{-2.996 - (-0.314)}{-0.110}\right] - 1$$
$$= 24.38 - 1 = 23.38, \text{ say 23 vehicles.}$$