

## **PARK DISTRICT VALET OPERATIONAL EXECUTIVE SUMMARY**

This executive summary is intended to set forth the significant findings of the extensive valet parking study recently conducted for The Park District Investment Group. This study focused on day to day operations and parking management to be implemented in the proposed Park District Building A parking structure. The study focused mainly on maximum possible valet traffic using the worst case scenario of full occupancy of the city's parking requirements to determine daily valet interactions, separated by hour and land use. The significant findings of this parking study are as follows:

- **Maximum Daily Valet Interactions**
  - **1167 Interactions** (Based on theoretical maximum occupancy)
    - each time a car enters or leaves is counted as an interaction.
- **Time Frame of Parking and Retrieving Cars**
  - **4 Minutes to park incoming cars, 5 minutes to retrieve cars for outgoing customers.**
- **Peak Valet Service Times**
  - **4 PM - 7 PM,**
- **Maximum Daily Valet Staff Members**
  - **9 staff members,**
    - The highest anticipated hour of demand is 5 PM with a staff demand of 8.80 valet attendants. By having 9 attendants on duty it reduces the possibility of a queue for incoming vehicles and will facilitate shorter wait times.
- **Average Daily Valet Staff Members**
  - **4.20 Staff members**
    - In any given 24 hour period there will be the need for approximately 101 valet hours of work required. Over a 24 hour span this results in an average of 4.2 attendants on duty every hour.
- **Maximum Length of Valet Queue**
  - **5 cars**
    - By having a surplus of staff, the valet queue should be at a minimum at all times. There are opportunities to reduce the staff during peak hours to 7 attendants, resulting in the maximum queue length increasing to 10 spots, still leaving more than adequate space for 9 more cars to be waiting in the underground valet queuing area.
- **Purchase Options-**
  - **Residents** will purchase monthly or annual permits. Residents will have in and out privileges to come and go as often as they please.
  - **Hotel guests** will purchase parking at a discounted daily rate as an incentive to stay and park at the hotel. Hotel guests will have in and out privileges to come and go as often as they please.
  - **Transient retail parking** will have the option of purchasing half day (4 hour) or full day (8 hour) parking. Retail patrons will not have in and out privileges, and will forfeit remaining time left of their half day or full day parking when they leave the valet area.

## PARK DISTRICT VALET OPERATIONAL ANALYSIS

October 1<sup>st</sup>, 2014

This valet parking operational study was conducted to analyze the fully functional operational plan set forth for the valet parking service to be part of the proposed Park District Building A. This valet service, while located in Building A's underground parking structure, will also be available for public use, as well as available to residents of Building B. This analysis is based in part on methodology developed by a valet study done by Carl Walker and Associates, Richard Raskin's "*Successful Management of a Valet Operation*", information obtained from Hotel Indigo and its operating partners, as well as various information obtained from hotel management studies. The analysis focuses solely on the valet and its operations as it pertains to the previous parking plan and the questions that arose concerning how the valet service will handle such high demand throughout a day.

Attached to this analysis are four exhibits that were used to calculate valet staffing levels, peak hour car counts and an annual budget for the valet parking service. These exhibits use various well-tested formulas used by parking analysts to determine important measurements, such as the maximum length of the valet queue and how many valet attendants are needed to meet a certain demand. The first four exhibits are directly related to valet parking operations, and a description of each of these is listed below as a guide for reviewing and understanding how the numbers are generated and what they mean.

### Exhibit Descriptions

**Exhibit A) Valet Ratios-** This worksheet uses the city code number for required parking spaces, a daily turnover rate for those spaces, total cars attributed to each land use, and the peak inflow and outflow times. The turnover rate is the rate at which the valet service can expect to park a car, return it to its owner, and then resell the same space after the first owner has left. For example, retail spaces are expected to have the highest level of turnover, because the timeframe for parking is the shortest. Retail parking will only have the choice of a half day or a full day parking, and will usually only be used for short trips to the store, restaurant or bank. We can confidently estimate that retail parking will have a 1.75 turnover rate, or will fill up to capacity once and then fill up to 75% of capacity a second time within a 24 hour period. This turnover rate allows us to calculate valet interactions, the number of times someone drops off or picks up a car. Once the valet interactions are calculated, they are distributed based on the peak valet traffic times and the corresponding ratio from the valet traffic distribution chart. **(attached as Exhibit C)** This chart breaks down every hour of a 24 hour period into incoming and outgoing traffic, specifically, the percentage of valet interactions that will take place for each land use and each hour.

**Exhibit B) Peak Valet Car Counts-** This matrix is a very detailed valet use chart that tracks the percentage of people that choose to valet park their cars corresponding to each specific land use. For the scope of this analysis, we studied the operational significance of 40%, 75%, and 100% participation rates. We assumed 100% use to demonstrate the peak possible demand on any given day. However, the 40% and 75% represent more accurate estimates to predict daily valet usage on a normal day where occupancy levels are not at the maximum. This chart can be used to estimate daily staffing of valet attendants by using the given valet participation rate expected for that day. For example, If the residences are fully occupied but the hotel will only be 75% occupied on a given night we can use the valet interaction count from 100% residential participation, along with the 75% hotel participation rate to estimate how many attendants we need staffed on a that day.

**Exhibit C) Valet Traffic Distribution-** This matrix calculates the assumed distribution of valet usage throughout a 24 hour period using the turnover ratios, valet service level ratios, and information regarding the specific land uses; to give a distribution chart of when traffic attributed to a specific land use will be using the valet service. For example, the hotel incoming traffic will be heavily distributed during check in hours, while their outgoing traffic will be heavily distributed during check out hours. These percentages were than multiplied by the chart on the Peak Valet Car Count matrix, **attached as Exhibit B**, to get the given traffic counts for each participation rate. This worksheet also gives a more general breakdown of the expected traffic levels each hour. This is done by combining the distributions for each land use for a given hour of the day and multiplying it by the expected overall traffic during that period of time, not taking into account each land uses specific weights. Comparing Exhibit 2 to Exhibit 3, **Exhibit B** gives a detailed breakdown per hour of each specific land use and also demonstrates the participation rates, compared to **Exhibit C** that demonstrates the overall percentage of incoming and outgoing traffic on an hour by hour basis. Exhibit C provides that 5 AM will account for 1.7% of our incoming traffic for the day, which is equivalent to 10.98 cars, while 5 AM will account for only 0.65% of our daily outgoing traffic, or 4.20 cars. It is important to note Exhibit C assumes 100% participation rate as a guideline for the maximum possible valet traffic. This demonstrates the ability of the valet service to handle approximately 1200 interactions a day, roughly 600 incoming and 600 outgoing cars a day. This describes a very unlikely, possibly non-existent, scenario as many of the land uses do not overlap in peak demand times.

On **Exhibit C**, beneath the distribution chart is the **Valet Service Time Breakdown Table** and the **Valet Queue Table**. For each incoming car it will take an average of 4 minutes to park a car and return to park the next car, each outgoing car will take 5 minutes. This one minute difference in timing is due to the assumption that a car will have to be moved and the lift lowered in order to get the top car down and back to the drop off area. Using that timing, a total car count of 15 incoming cars or 12 outgoing cars can be parked per hour, per valet attendant. After the service rate is calculated, valet service levels can be determined by using the hourly traffic counts to determine how many valet attendants will be necessary during each hour of the day. Continuing the 5 AM example, there are an expected 10.98 cars incoming between 5 and 6 AM, while 4.20 cars are expected to be outgoing between 5 and 6 AM. This provides a breakdown of 0.73 (10.98 cars/15 cars parked per hour) valet attendants necessary for incoming traffic and 0.35 (4.20 cars/12 cars retrieved per hour) valet attendants for outgoing traffic, or a total valet staff requirement of 1.1 attendants. This service rate is used to determine the number of valet on staff every hour to calculate the traffic intensity (TI). The traffic intensity is then used to determine the maximum peak hour valet queue length.

### **Queue Length Calculation**

Perhaps, the most important issue addressed in this extensive valet parking study is the potential for incoming traffic to cause a bottle neck effect that will lead to a dysfunctional queuing of the cars. We have the ability to queue up to about 21 cars if necessary (in the underground area alone), but should never need more than a maximum of nine queuing spaces, according to the widely accepted valet principles used in calculating service rates and queue lengths. The formula for queue length directly correlates with the amount of valet attendants you have on staff to determine a service rate and traffic intensity. The formula is **Length of Maximum Queue =  $(TI^2) / (1 - TI)$** ; where **TI is traffic intensity, Traffic Intensity = Service Level / Expected Cars**. For example, if it is expected that there will be 60 incoming cars in an hour and 3 valet attendants on duty parking incoming cars, they can successfully park 15 cars an hour each. Together they have the ability to park **45 cars in an hour**. The remaining demand of 15 cars is the queue that will be spread out over the course of the hour, **with  $TI^2 / 1 - TI$  being the number of cars waiting in the queue during that specific hour**, which in this case would be **TI = 0.75.  $TI^2 = .5625 / .25 = 2.25$  car queue length**. So it would be safe to assume that the queue length would be equal to about 3 cars with those staffing levels. The outgoing traffic will not contribute to the queue as the outgoing valet staff will be responsible just for going to retrieve patron's vehicles that are leaving the building. This allows for the incoming valet staff to only worry about filling out the ticket, inspecting the car, and parking it in its designated space.

It appears that our **Maximum Possible Valet Service Rate** would be about 8-9 valet attendants on staff during the peak time of 4-7 pm. This is due to the residents coming home from work, and new hotel guests checking in, overlapping in peak times. This will not be a common occurrence as most weekdays the hotel will not be 100% occupied, and on weekends, the residents will not all be returning from work so the distributions will be much more evenly dispersed. However, if it were to ever happen that the hotel is 100% occupied on a given weekday, the residences are 100% occupied on a given weekday, the restaurant is at capacity on a given night, and the retail spaces all turnover one full time and then 75% of the spaces are sold for a second time in one 24 hour period; this is the amount of staffing that would be more than adequate with a maximum queue length of 5 cars during a peak traffic inflow period. **If we reduced our valets to 7 during this time the staffing would still be adequate, it would just lengthen the maximum possible queue to about 9 cars instead of the designated 5 car queue length demonstrated in the model. As shown in the building drawings, the queue is at least 19 cars with more than adequate space in between cars, with the possibility of having up to a 21 car queue if needed.** This analysis separated the incoming and outgoing traffic for multiple reasons, one being that the incoming traffic is the only possibility of a queue, so all the ratios and formulas were applied based upon the specific incoming and outgoing traffic, rather than just total traffic in a given hour. Outgoing traffic will not have a queue, instead patrons getting their cars in the order they came out and handing their ticket to the attendant. This is very different from some other valet studies because most valet services see peaks of traffic at the same time, such as a large wedding- all guests arrive within an hour of each other, and usually leave within an hour of each other, which is not the case when considering the distribution of outgoing cars for the different land uses.

**Note: These worksheets are not meant to be a daily operational plan, these are only meant to demonstrate the maximum possible occupancy on a couple given days throughout the year. This study was conducted to show that the operational plan currently in place can more than accommodate for the maximum demand. Exhibit B will act as daily guide that can be used based on historical data once the project is operational, by using the different valet participation rates to determine the staff needed for each land use's valet parking needs on a given day based on occupancy.**

**Park District Valet Parking Study  
Exhibit A**

Footnotes	Building	Land Use	Size		East Lansing City Code Required Spaces		Operational Valet Ratios		Peak Time In / Peak Time Out	
					City Code Base Ratio	City Code Base Demand	Total Daily Turnover Rate	Total Cars Attributed to Each Use		
(**)(*****)	A	Retail	20,987	Square Feet	3.25 / 1000 S.F.	61	1.25	77	Varies	Varies
(***)(*****)	A	Retail Employees	20,987	Square Feet	0.75 / 1000	13	0.25	3	Varies	Varies
(**)	A	Residential	102	Units	Varies / Unit	139	1	139	8:00 AM	6:00 PM
(**)	A	Hotel	120	Units	1 / Room	108	1.5	162	4:00 PM	9:00 AM
(***)	A	Hotel Employees	120	Units	0.25 / Room	24	0.25	6	8:00 AM	7:00 PM
(*)(**)(*****)	A	Casual/ Fine Dining	8,624	Square Feet	16.25 / 1000 S.F.	95	1.25	118	6:00 PM	8:00 PM
(*)(**)(*****)	A	Dining Employees	8,624	Square Feet	3.75 / 1000 S.F.	19	0.25	5	3:00 PM	10:00 PM
						<b>477</b>		<b>Building A Total Daily Car Count</b>	<b>567</b>	<b>Cars per day</b>
(**)	B	Retail	11,020	Square Feet	3.25 / 1000 S.F.	32	0.5	16		
(**)	B	Retail Employees	11,020	Square Feet	0.75 / 1000 S.F.	7	0.25	2		
(**)	B	Residential	42	Units	Varies / Unit	61	1	61		
								<b>Building B Total Daily Car Count</b>	<b>79</b>	<b>Cars per day</b>
								<b>Building A and B Total Daily Car Count</b>	<b>646</b>	<b>Cars per day</b>

**Park District Valet Parking Study  
Exhibit B**

Building	Land Use	% of Valet Parking	Daily Car Traffic Count	Incoming		Outgoing		Incoming		Outgoing		Incoming		Outgoing		Incoming		Outgoing		Incoming		Outgoing		Incoming		Outgoing	
				5:00 AM	5:00 AM	6:00 AM	6:00 AM	7:00 AM	7:00 AM	8:00 AM	8:00 AM	9:00 AM	9:00 AM	10:00 AM	10:00 AM	11:00 AM	11:00 AM	12:00 PM	12:00 PM	1:00 PM	1:00 PM	2:00 PM	2:00 PM	3:00 PM	3:00 PM	4:00 PM	4:00 PM
<b>A</b>	Retail	40%	30.69	0.31	0.08	0.61	0.31	1.84	0.61	3.07	1.23	1.84	3.38	1.23	1.84	1.23	2.46	1.23	2.46	1.23	1.53	3.07	1.53	1.84	2.76		
	Retail	75%	57.55	0.58	0.14	1.15	0.58	3.45	1.15	5.76	2.30	3.45	6.33	2.30	3.45	2.30	4.60	2.30	4.60	2.30	2.88	5.76	2.88	3.45	5.18		
	Retail	100%	76.73	0.77	0.19	1.53	0.77	4.60	1.53	7.67	3.07	4.60	8.44	3.07	4.60	3.07	6.14	3.07	6.14	3.07	3.84	7.67	3.84	4.60	6.91		
<b>A</b>	Retail Employees	40%	1.26	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Retail Employees	75%	2.36	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Retail Employees	100%	3.15	0.31	0.00	0.16	0.00	0.16	0.00	0.47	0.06	0.63	0.16	0.13	0.25	0.13	0.25	0.16	0.38	0.16	0.25	0.25	0.16	0.31	0.06		
<b>A</b>	Residential	40%	55.44	0.00	1.11	0.00	1.66	0.00	3.88	0.00	9.98	1.11	6.10	1.66	2.77	1.66	1.11	1.66	1.66	1.66	2.22	1.11	3.88	1.11	5.54		
	Residential	75%	103.95	0.00	2.08	0.00	3.12	0.00	7.28	0.00	18.71	2.08	11.43	3.12	5.20	3.12	2.08	3.12	3.12	3.12	4.16	2.08	7.28	2.08	10.40		
	Residential	100%	138.60	0.00	2.77	0.00	4.16	0.00	9.70	0.00	24.95	2.77	15.25	4.16	6.93	4.16	2.77	4.16	4.16	4.16	5.54	2.77	9.70	2.77	13.86		
<b>A</b>	Hotel	40%	64.80	0.00	1.30	0.00	5.18	0.65	6.48	0.65	7.78	0.65	11.66	0.65	11.66	1.30	6.48	1.94	1.94	3.24	1.94	6.48	1.30	9.07	1.30	12.96	
	Hotel	75%	121.50	0.00	2.43	0.00	9.72	1.22	12.15	1.22	14.58	1.22	21.87	1.22	21.87	2.43	12.15	3.65	3.65	6.08	3.65	12.15	2.43	17.01	2.43	24.30	
	Hotel	100%	162.00	0.00	3.24	0.00	12.96	1.62	16.20	1.62	19.44	1.62	29.16	1.62	29.16	3.24	16.20	4.86	4.86	8.10	4.86	16.20	3.24	22.68	3.24	32.40	
<b>A</b>	Hotel Employees	40%	2.40	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Hotel Employees	75%	4.50	0.23	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Hotel Employees	100%	6.00	0.30	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
<b>A</b>	Casual/ Fine Dining	40%	47.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36	1.42	4.73	2.36	4.73	4.73	1.42	4.73	1.42	0.95	1.42	
	Casual/ Fine Dining	75%	88.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.43	2.66	8.87	4.43	8.87	8.87	2.66	8.87	2.66	1.77	2.66	
	Casual/ Fine Dining	100%	118.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.91	3.55	11.82	5.91	11.82	11.82	3.55	11.82	3.55	2.36	3.55	
<b>A</b>	Dining Employees	40%	1.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.39	0.00	0.19	0.10	0.10	0.19	0.10	0.19	0.10	0.29	0.29	0.19	0.39	
	Dining Employees	75%	3.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.73	0.00	0.36	0.18	0.18	0.36	0.18	0.36	0.18	0.55	0.55	0.36	0.73	
	Dining Employees	100%	4.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.97	0.00	0.49	0.24	0.24	0.49	0.24	0.49	0.24	0.73	0.73	0.49	0.97	
<b>B</b>	Retail	40%	6.45	0.06	0.02	0.13	0.06	0.39	0.13	0.64	0.26	0.39	0.71	0.26	0.39	0.39	0.26	0.52	0.26	0.52	0.26	0.32	0.64	0.32	0.39	0.58	
	Retail	75%	12.09	0.12	0.03	0.24	0.12	0.73	0.24	1.21	0.48	0.73	1.33	0.48	0.73	0.73	0.48	0.97	0.48	0.97	0.48	0.60	1.21	0.60	0.73	1.09	
	Retail	100%	16.12	0.16	0.04	0.32	0.16	0.97	0.32	1.61	0.64	0.97	1.77	0.64	0.97	0.97	0.64	1.29	0.64	1.29	0.64	0.81	1.61	0.81	0.97	1.45	
<b>B</b>	Retail Employees	40%	0.74	0.00	0.00	0.00	0.00	0.07	0.00	0.04	0.00	0.04	0.00	0.11	0.01	0.15	0.04	0.03	0.06	0.03	0.06	0.06	0.04	0.09	0.04	0.06	
	Retail Employees	75%	1.39	0.00	0.00	0.00	0.00	0.07	0.00	0.04	0.00	0.04	0.00	0.11	0.01	0.15	0.04	0.03	0.06	0.03	0.06	0.06	0.04	0.09	0.04	0.06	
	Retail Employees	100%	1.86	0.00	0.00	0.00	0.00	0.19	0.00	0.09	0.00	0.09	0.00	0.28	0.04	0.37	0.09	0.07	0.15	0.07	0.15	0.15	0.09	0.22	0.09	0.15	
<b>B</b>	Residential	40%	24.48	0.00	0.49	0.00	0.73	0.00	1.71	0.00	4.41	0.49	2.69	0.73	1.22	0.73	0.49	0.73	0.73	0.73	0.98	0.49	1.71	0.49	2.45		
	Residential	75%	45.90	0.00	0.92	0.00	1.38	0.00	3.21	0.00	8.26	0.92	5.05	1.38	2.30	1.38	0.92	1.38	1.38	1.38	1.84	0.92	3.21	0.92	4.59		
	Residential	100%	61.20	0.00	1.22	0.00	1.84	0.00	4.28	0.00	11.02	1.22	6.73	1.84	3.06	1.84	1.22	1.84	1.84	1.84	2.45	1.22	4.28	1.22	6.12		
<b>TOTALS</b>		40%	0.62	2.99	0.92	7.95	2.95	12.82	4.40	23.65	4.71	24.54	5.03	17.90	8.63	11.12	12.17	8.45	13.47	10.81	13.11	11.67	18.32	6.30	26.16		
		75%	1.16	5.61	1.72	14.91	5.47	24.03	8.22	44.34	8.79	46.01	9.34	33.56	16.05	20.81	22.79	15.78	25.22	20.22	24.53	21.84	34.28	11.78	49.00		
		100%	1.54	7.48	2.45	19.88	7.53	32.04	11.47	59.18	12.39	61.51	12.70	45.01	21.70	28.04	30.68	21.27	34.04	27.18	33.02	29.42	45.96	16.06	65.47		

**Park District Valet Parking Study  
Exhibit B**

Outgoing	Incoming	Outgoing	Traffic																								
4:00 PM	5:00 PM	5:00 PM	6:00 PM	6:00 PM	7:00 PM	7:00 PM	8:00 PM	8:00 PM	9:00 PM	9:00 PM	10:00 PM	10:00 PM	11:00 PM	11:00 PM	12:00 AM	12:00 AM	1:00 AM	1:00 AM	2:00 AM	2:00 AM	3:00 AM	3:00 AM	4:00 AM	4:00 AM			
1.84	3.68	3.07	2.76	3.07	1.53	2.46	0.61	1.84	0.31	1.53	0.31	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3.45	6.91	5.76	5.18	5.76	2.88	4.60	1.15	3.45	0.58	2.88	0.58	1.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4.60	9.21	7.67	6.91	7.67	3.84	6.14	1.53	4.60	0.77	3.84	0.77	2.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.38	0.03	0.47	0.03	0.31	0.00	0.25	0.00	0.09	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2.77	8.32	2.77	11.09	5.54	8.32	5.54	2.77	2.77	1.65	1.66	1.11	1.11	0.55	1.11	0.55	0.00	0.55	0.00	0.55	0.00	0.55	0.00	0.55	0.00	0.00	0.00	
5.20	15.59	5.20	20.79	10.40	15.59	10.40	5.20	5.20	3.12	3.12	2.08	2.08	1.04	2.08	1.04	0.00	1.04	0.00	1.04	0.00	1.04	0.00	1.04	0.00	0.00	0.00	
6.93	20.79	6.93	27.72	13.86	20.79	13.86	6.93	6.93	4.16	4.16	2.77	2.77	1.39	2.77	1.39	0.00	1.39	0.00	1.39	0.00	1.39	0.00	1.39	0.00	0.00	0.00	
1.30	9.07	1.30	6.48	6.65	3.24	6.65	3.24	6.65	1.94	6.65	1.30	6.65	6.65	6.65	6.65	6.65	0.00	6.65	0.00	6.65	0.00	6.65	0.00	6.65	0.00	0.00	
2.43	17.01	2.43	12.15	1.22	6.08	1.22	6.08	1.22	3.65	1.22	2.43	1.22	1.22	1.22	1.22	1.22	0.00	1.22	0.00	1.22	0.00	1.22	0.00	1.22	0.00	0.00	
3.24	22.68	3.24	16.20	1.62	8.10	1.62	8.10	1.62	4.86	1.62	3.24	1.62	1.62	1.62	1.62	1.62	0.00	1.62	0.00	1.62	0.00	1.62	0.00	1.62	0.00	0.00	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.95	4.73	0.95	7.09	3.78	8.51	7.09	7.09	9.46	2.36	4.73	0.95	1.42	0.47	1.42	0.00	1.42	0.00	0.95	0.00	0.95	0.00	0.95	0.00	0.00	0.00	0.00	
1.77	8.87	1.77	13.30	7.09	15.96	13.30	13.30	17.74	4.43	8.87	1.77	2.66	0.89	2.66	0.00	2.66	0.00	1.77	0.00	1.77	0.00	1.77	0.00	0.00	0.00	0.00	
2.36	11.82	2.36	17.74	9.46	21.28	17.74	17.74	23.65	5.91	11.82	2.36	3.55	1.18	3.55	0.00	3.55	0.00	2.36	0.00	2.36	0.00	2.36	0.00	0.00	0.00	0.00	
0.10	0.19	0.10	0.04	0.10	0.02	0.10	0.02	0.10	0.00	0.10	0.00	0.16	0.00	0.06	0.00	0.04	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.00	
0.18	0.36	0.18	0.07	0.18	0.04	0.18	0.04	0.18	0.00	0.18	0.00	0.29	0.00	0.11	0.00	0.07	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.00	
0.24	0.49	0.24	0.10	0.24	0.05	0.24	0.05	0.24	0.00	0.24	0.00	0.39	0.00	0.15	0.00	0.10	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.00	
0.39	0.77	0.39	0.58	0.64	0.32	0.52	0.13	0.39	0.06	0.32	0.06	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.73	1.45	1.21	1.09	1.21	0.60	0.97	0.24	0.73	0.12	0.60	0.12	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.97	1.93	1.61	1.45	1.61	0.81	1.29	0.32	0.97	0.16	0.81	0.16	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.06	0.04	0.07	0.01	0.09	0.01	0.11	0.01	0.07	0.00	0.06	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.06	0.04	0.07	0.01	0.09	0.01	0.11	0.01	0.07	0.00	0.06	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.15	0.09	0.19	0.04	0.22	0.02	0.28	0.02	0.19	0.00	0.15	0.00	0.06	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1.22	3.67	1.22	4.90	2.45	3.67	2.45	1.22	1.22	0.73	0.73	0.49	0.49	0.24	0.49	0.24	0.00	0.24	0.00	0.24	0.00	0.24	0.00	0.24	0.00	0.00	0.00	
2.30	6.89	2.30	9.18	4.59	6.89	4.59	2.30	2.30	1.38	1.38	0.92	0.92	0.46	0.92	0.46	0.00	0.46	0.00	0.46	0.00	0.46	0.00	0.46	0.00	0.00	0.00	
3.06	9.18	3.06	12.24	6.12	9.18	6.12	3.06	3.06	1.84	1.84	1.22	1.22	0.61	1.22	0.61	0.00	0.61	0.00	0.61	0.00	0.61	0.00	0.61	0.00	0.00	0.00	
8.62	30.48	10.12	32.95	16.32	25.63	18.91	15.10	16.50	7.08	9.79	4.21	4.96	1.92	3.73	1.45	2.11	0.80	1.61	0.80	0.97	0.80	0.67	0.00	0.00	464.20		
16.12	57.11	18.92	61.78	30.53	48.04	35.37	28.31	30.88	13.27	18.30	7.90	9.27	3.60	6.99	2.71	3.95	1.50	3.03	1.50	1.81	1.50	1.25	0.00	0.00	869.08		
21.93	76.23	25.78	82.42	41.13	64.06	47.54	37.75	41.35	17.69	24.50	10.53	12.39	4.80	9.33	3.62	5.26	2.00	4.03	2.00	2.41	2.00	1.67	0.00	0.00	1166.49		

**Park District Valet Parking Study  
Exhibit C**

DISTRIBUTION OF CAR TRAFFIC				Incoming Traffic	Outgoing Traffic																					
Building	Land Use	% Participation for Valet	Total Daily Car Traffic Count	5:00 AM	5:00 AM	6:00 AM	6:00 AM	7:00 AM	7:00 AM	8:00 AM	8:00 AM	9:00 AM	9:00 AM	10:00 AM	10:00 AM	11:00 AM	11:00 AM	12:00 PM	12:00 PM	1:00 PM	1:00 PM	2:00 PM	2:00 PM	3:00 PM	3:00 PM	
A	Retail	100%	76.73	1%	0%	2%	1%	6%	2%	10%	4%	6%	11%	4%	6%	6%	4%	8%	4%	8%	4%	5%	10%	5%	6%	
A	Retail Employees	100%	3.15	10%	0%	5.00%	0%	5%	0%	15%	2%	20%	5%	4%	8%	4%	8%	8%	5%	12%	5%	8%	8%	5%	10%	
A	Residential	100%	138.60	0%	2%	0.00%	3%	0%	7%	0%	18%	2%	11%	3%	5%	3%	2%	3%	3%	3%	3%	4%	2%	7%	2%	
A	Hotel	100%	162.00	0%	2%	0.00%	8%	1%	10%	1%	12%	1%	18%	1%	18%	2%	10%	3%	3%	5%	3%	10%	2%	14%	2%	
A	Hotel Employees	100%	6.00	5%	0%	6%	5%	6%	8%	10%	12%	4%	3%	4%	3%	4%	3%	4%	3%	4%	3%	4%	7%	4%	5%	
A	Casual/ Fine Dining	100%	118.24	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	3%	10%	5%	10%	10%	3%	10%	3%	2%	
A	Dining Employees	100%	4.85	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	20%	0%	10%	5%	5%	10%	5%	10%	5%	15%	15%	10%	
Subtotal Building A				1.60%	0.43%	1.43%	1.70%	1.80%	2.70%	3.60%	4.80%	4.30%	4.80%	3.60%	4.00%	3.40%	3.50%	4.10%	3.30%	4.70%	3.80%	3.90%	5.40%	5.30%	4.10%	
B	Retail	100%	16.12	1%	0%	2%	1%	6%	2%	10%	4%	6%	11%	4%	6%	6%	4%	8%	4%	8%	4%	5%	10%	5%	6%	
B	Retail Employees	100%	1.86	0%	0%	0%	0%	10%	0%	5.00%	0%	5%	0%	15%	2%	20%	5%	4%	8%	4%	8%	8%	5%	12%	5%	
B	Residential	100%	61.20	0%	2%	0.00%	3%	0%	7%	0%	18%	2%	11%	3%	5%	3%	2%	3%	3%	3%	3%	4%	2%	7%	2%	
Subtotal Building B				0.10%	0.23%	0.23%	0.40%	1.60%	0.90%	1.50%	2.20%	1.30%	2.20%	2.20%	1.30%	2.90%	1.10%	1.50%	1.50%	1.50%	1.50%	1.50%	1.70%	1.70%	2.40%	1.30%
Total % of Daily Traffic				1.70%	0.65%	1.65%	2.10%	3.40%	3.60%	5.10%	7.00%	5.60%	7.00%	5.80%	5.30%	6.30%	4.60%	5.60%	4.80%	6.20%	5.30%	5.60%	7.10%	7.70%	5.40%	
Total Daily Traffic				10.98	4.20	10.66	13.57	21.97	23.26	32.95	45.23	36.19	45.23	37.48	34.25	40.71	29.72	36.19	31.02	40.06	34.25	36.19	45.88	49.75	34.89	
Valet Staff Required:				0.73	0.350	0.71	1.131	1.46	1.938	2.20	3.769	2.41	3.769	2.50	2.854	2.71	2.477	2.41	2.585	2.67	2.854	2.41	3.823	3.32	2.908	
				1.10		1.90		3.50		6.00		6.20		5.40		5.20		5.00		5.60		6.30		6.30		
				6.78		3.88		2.58		-9.69		-18.74		-15.51		-4.52		0.65		6.46		-3.23		11.63		
				10.98		21.65		43.62		76.57		112.76		150.23		190.94		227.13		267.19		303.37				

Incoming Valet Traffic Service Time (minutes)	Incoming Valet Time	Outgoing Valet Time	Peak Hour Valet Queue	Incoming	101.00	Total Valet Attendants Needed
Per Car	3.5	4.5				
Rest Inbetween Cars	0.5	0.5	# of Valet Staff	5.00		24 hours Valet is staffed
Total Time Per Car (Minutes)	4	5	Cars/hr	15.00		4.208333 AVG Valets Per Hour
Per Hour Per Valet	15	12	Cars Parked	75.00		
			# of incoming Cars	64.00	Average Incoming Queue	4.85 5 Vehicle Queue
			Traffic Intensity	0.85		
			T/Squared (I-T)	0.73		
				0.15		

