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June 5, 2018

Elias Hayon
General Manager
ASSOCIATED PARKING SYSTEMS
16499 NE 19th Avenue Suite 110
Miami, FL 33162

RE: South Beach Hotels Valet Parking Traffic Operations Analysis
Project No. 201815.01

Dear Mr. Hayon:

As requested, we have completed a traffic operations analysis per the requirements of Section 18-337(6)a of the City of Miami Beach's Code of Ordinances. The analysis was based on information provided by your firm for the valet parking operations serving five hotels within the City of Miami Beach, Florida. It is our understanding that the valet parking operations rely upon parking spaces contained within the Pelican Garage at 1041 Collins Avenue. A brief summary of our analysis methodology and findings follows:

Affected Hotels
There are five hotels that are analyzed in this report. The studied hotels are:

1. Hotel Breakwater
2. The Villa (Casa Casuarina)
3. Hotel Victor
4. Hotel Ocean
5. Casa Victoria

Figure 1 – Hotel Locations shows the locations of each of the hotels.

Study Area Roadways
Ocean Drive is a two-lane, undivided, north-south roadway with parallel parking on the east side and mostly valet parking operations on the west side.

Collins Avenue is a two-lane, north-south street with parallel parking on both sides and a painted median.

Washington Avenue is a four-lane, median-divided, north-south roadway with parallel parking on both sides.

Pennsylvania Avenue is a two-lane, undivided, north-south street with parallel parking on both sides.

Ninth, Tenth, Eleventh, Twelfth, Thirteenth, Fourteenth and Fifteenth Streets are two-lane, undivided, east-west streets with parallel parking on either side.

Espanola Way is a one-way westbound roadway with parallel parking on both sides.

1. Hotel Breakwater Valet Parking Analysis

The Hotel Breakwater is a 99-room hotel located at 940 Ocean Drive in Miami Beach. The hotel also houses two restaurants. The valet parking operation has a "Valet Parking" stand located at the entrance to the hotel on the west side of Ocean Drive to alert motorists to the availability of valet parking at this location. The valet operation at the Hotel Breakwater allocates 100 feet (five car lengths) to the valet parking operation.

Valet Parking Route and Distance

As **Figure 2** (enclosed) illustrates, from the front of the Breakwater Hotel, it is a distance of 1,305 feet to the entrance of the Pelican garage on Washington Avenue. This is well below the 2,500-foot limit imposed by Section 18-337(6)a of the City of Miami Beach's Code of Ordinances and also below the 1,800 feet permitted under the Conditional Use agreement for the Pelican Garage. The return trip, which is shorter at 1,185 feet, is well below the distance limits in the City's ordinance or the Conditional Use agreement.

Ordinarily, the valet attendant will receive a vehicle from its owner in the designated valet parking ramp on Ocean Drive, then proceed south to Ninth Street, turn right and proceed west, then turn right again onto Collins Avenue and proceed north to the garage entrance. When returning, the valet attendant will exit the parking lot and proceed north on Collins Avenue to 11th Street. The attendant will turn right onto 11th Street and proceed east to Ocean Drive where they will turn right again and proceed south to the valet parking ramp serving the Hotel Breakwater.

Valet Parking Time

Parking demand at the Hotel Breakwater was estimated using the Institute of Transportation Engineers' (ITE) *Trip Generation* manual, 10th Edition. ITE Land Use Code 310 – Hotel was used. According to the ITE manual, the peak hour of the generator on a Saturday is equal to:

T = 0.69(X) + 4.32 (56% in, 44% out)
X=99 rooms

T = 0.69(99 rooms) + 4.32 = 72.63 vehicle trips (41 in, 32 out).

Although there isn't a direct correlation between the ITE *Trip Generation* manual and the ITE *Parking Generation* manual, 4th Edition, the *Parking Generation* manual indicates that hotels' average peak period parking demands are highest on Saturday when there are 1.20 parked vehicles per occupied room. The peak period is between 7:00 and 8:00 p.m. or 9:00 and 10:00 p.m. Based on this information it seems appropriate to assume that the highest demand for valet parking will occur during the Saturday evening peak period. This also corresponds to actual experience at other hotels in the area. Copies of the relevant information from the ITE reports is enclosed.

Seventy-three vehicles entering and exiting the hotel seems like a large number. However, another factor affecting parking demand must also be considered. Both Uber and Lyft have recently made significant impacts on parking demand in Miami Beach and elsewhere. In fact, parking demand at restaurants, hotels and clubs is down, according to valet operators, by at least 50 percent—even further at less prestigious establishments. A Walker Consultants' report (copy enclosed) notes that rental car service has been reduced by 50 percent in just the last couple of years as passengers opt for ride hailing services instead. In Miami Beach, which is a world famous tourist destination, this means that fewer and fewer visitors are renting cars that need to be parked. Consequently, parking demand is declining rapidly. In the particular case of the Breakwater Hotel, the average Saturday night valet parking demand used to be 50 vehicles in the peak hour. Over the last two years, with the advent of Uber and Lyft, this number has dropped to 22 vehicles, which is less than half of the former valet parking demand.

Applying a 50-percent reduction to the parking demand estimate obtained from the ITE manual results in an average peak period parking demand of 37 parking spaces, with 21 entering vehicles and 16 exiting vehicles.

According to Google Maps, the time required to drive from the Breakwater to the Pelican Garage is approximately four minutes. Google suggests that the return trip from the Pelican Garage is also four minutes.

Of course, all 37 vehicles must be served at the valet drop-off/pick-up area. Using techniques described in Chapter 8 of the ITE's Transportation and Land Development manual, a queuing analysis was completed for the valet ramp on Ocean Drive. The enclosed queuing analysis was completed to determine how many attendants were required to service the parking demand, assuming 21 arrivals during the peak hour and an average time of one minute to receive the vehicle from its owner and exit the valet ramp. Another 16 vehicles depart from the valet ramp, but require the same minute per vehicle average service time to hand the vehicle over to its owner and see them leave. As the queuing analysis identified as "Scenario 1" reveals, a single valet attendant is required to receive vehicles during the average peak period parking demand. This doesn't consider the time that it takes to then drive the vehicles to a parking space and return.

Parking in the Pelican Garage is expected to require a total time of ten minutes: receiving the vehicle (one minute), driving the approximately 1,305 feet required to enter the parking garage (four minutes, according to Google Maps), driving through the lot to the furthest space (30 seconds), and returning by vehicle to the valet ramp (four minutes, according to Google, plus one minute to hand off the vehicle to its owner). It should be noted that, in those instances when the valet attendant jogs back to the Hotel Breakwater, Google indicates that it takes half as long as driving, just two minutes.

Because of the time required to park a vehicle, a second queuing analysis was completed with an average service time of 600 seconds, which is the combined average service time for all 37 parked vehicles, both entering and leaving. The 600-second service time equals ten minutes and the parking demand is 37 vehicles, so, with the maximum number of vehicles that are expected to be parked at the Pelican Garage, the analysis reveals that up to ten valet

parking attendants would be required at peak parking times to maintain less than five vehicles in the valet parking ramp along Ocean Drive.

2. Villa Casa Casuarina Hotel Valet Parking Analysis

The Villa Casa Casuarina is a 10-room hotel located at 1116 Ocean Drive in Miami Beach. The hotel also houses a restaurant. The valet parking operation has a "Valet Parking" stand located at the entrance to the hotel on the west side of Ocean Drive to alert motorists to the availability of valet parking at this location. The valet operation at the Villa Casa Casuarina allocates 100 feet (five car lengths) to the valet parking operation.

Valet Parking Route and Distance

As **Figure 3** (enclosed) illustrates, from the front of the Villa Casa Casuarina, it is a distance of 1,110 feet to the entrance of the Pelican garage on Washington Avenue. This is well below the 2,500-foot limit imposed by Section 18-337(6)a of the City of Miami Beach's Code of Ordinances and also below the 1,800 feet permitted under the Conditional Use agreement for the Pelican Garage. The return trip, which is longer at 1,235 feet, is well below the distance limits in the City's ordinance or the Conditional Use agreement.

Ordinarily, the valet attendant will receive a vehicle from its owner in the designated valet parking ramp on Ocean Drive, then proceed south to Tenth Street, turn right and proceed west, then turn right again onto Collins Avenue and proceed north to the garage entrance. When returning, the valet attendant will exit the parking lot and proceed north on Collins Avenue to 12th Street. The attendant will turn right onto 12th Street and proceed east to Ocean Drive where they will turn right again and proceed south to the valet parking ramp serving the Villa Casa Casuarina.

Valet Parking Time

Parking demand at the Villa Casa Casuarina was estimated using the Institute of Transportation Engineers' (ITE) Trip Generation manual, 10th Edition. ITE Land Use Code 310 – Hotel was used. According to the ITE manual, the peak hour of the generator on a Saturday is equal to:

T = 0.69(X) + 4.32 (56% in, 44% out)
X=10 rooms

T = 0.69(10 rooms) + 4.32 = 11.22 vehicle trips (6 in, 5 out).

As noted previously, the peak parking demand time is assumed to be Saturday evening.

Similar to the Hotel Breakwater, average peak parking demand is being reduced substantially by the use of Uber and Lyft ride hailing services. Applying a 50-percent reduction to the parking demand estimate obtained from the ITE manual results in an average peak period parking demand of six (6) parking spaces, with three (3) entering vehicles and three (3) exiting vehicles.

According to Google Maps, the time required to drive from the Villa Casa Casuarina to the Pelican Garage is approximately three minutes. Google suggests that the return trip from the Pelican Garage takes two minutes to walk.

Of course, all six (6) vehicles must be served at the valet drop-off/pick-up area. Using techniques described in Chapter 8 of the ITE's Transportation and Land Development manual, a queuing analysis was completed for the valet ramp on Ocean Drive. The enclosed queuing analysis was completed to determine how many attendants were required to service the parking demand, assuming three (3) arrivals during the peak hour and an average time of one minute to receive the vehicle from its owner and exit the valet ramp. Another three (3) vehicles depart from the valet ramp, but require the same minute per vehicle average service time to hand the vehicle over to its owner and see them leave. As the queuing analysis identified as "Scenario 1" reveals, a single valet attendant is required to receive vehicles during the average peak period parking demand. This doesn't consider the time that it takes to then drive the vehicles to a parking space and return.

Parking in the Pelican Garage is expected to require a total time of ten minutes: receiving the vehicle (one minute), driving the approximately 1,110 feet required to enter the parking garage (three minutes, according to Google Maps), driving through the lot to the furthest space (30 seconds), and returning by foot to the valet ramp (two minutes, according to Google). Retrieving a vehicle takes a similar time.

Because of the time required to park a vehicle, a second queuing analysis was completed with an average service time of 390 seconds, which is the combined average service time for all six (6) parked vehicles, both entering and leaving. The 390-second service time equals six minutes and thirty seconds and the parking demand is 6 vehicles, so, with the maximum number of vehicles that are expected to be parked at the Pelican Garage, the analysis reveals that a single valet parking attendant is required at peak parking times to maintain less than five vehicles in the valet parking ramp along Ocean Drive.

3. Hotel Victor Valet Parking Analysis

The Hotel Victor is a 91-room hotel located at 1144 Ocean Drive in Miami Beach. The hotel also houses a restaurant. The valet parking operation has a "Valet Parking" stand located at the entrance to the hotel on the west side of Ocean Drive to alert motorists to the availability of valet parking at this location. The valet operation at Hotel Victor allocates 120 feet (six car lengths) to the valet parking operation.

Valet Parking Route and Distance

As **Figure 4** (enclosed) illustrates, from the front of the Hotel Victor, it is a distance of 1,255 feet to the entrance of the Pelican garage on Washington Avenue. This is well below the 2,500-foot limit imposed by Section 18-337(6)a of the City of Miami Beach's Code of Ordinances and also below the 1,800 feet permitted under the Conditional Use agreement for the Pelican Garage. The return trip, which is shorter at 1,115 feet, is well below the distance limits in the City's ordinance or the Conditional Use agreement.

Ordinarily, the valet attendant will receive a vehicle from its owner in the designated valet parking ramp on Ocean Drive, then proceed south to Tenth Street, turn right and proceed west, then turn right again onto Collins Avenue and proceed north to the garage entrance. When returning, the valet attendant will exit the parking lot and proceed north on Collins Avenue to 12th Street. The attendant will turn right onto 12th Street and proceed east to Ocean

Drive where they will turn right again and proceed south to the valet parking ramp serving the Hotel Victor.

Valet Parking Time

Parking demand at Hotel Victor was estimated using the Institute of Transportation Engineers' (ITE) *Trip Generation* manual, 10th Edition. ITE Land Use Code 310 – Hotel was used. According to the ITE manual, the peak hour of the generator on a Saturday is equal to:

T = 0.69(X) + 4.32 (56% in, 44% out)
X=91 rooms

T = 0.69(91 rooms) + 4.32 = 67.11 vehicle trips (38 in, 29 out).

As noted previously, the peak parking demand time is assumed to be Saturday evening.

Similar to the Hotel Breakwater, average peak parking demand is being reduced substantially by the use of Uber and Lyft ride hailing services. Applying a 50-percent reduction to the parking demand estimate obtained from the ITE manual results in an average peak period parking demand of 34 parking spaces, with 19 entering vehicles and 15 exiting vehicles.

According to Google Maps, the time required to drive from Hotel Victor to the Pelican Garage is approximately four minutes. Google suggests that the return trip from the Pelican Garage takes two minutes to walk.

Of course, all 34 vehicles must be served at the valet drop-off/pick-up area. Using techniques described in Chapter 8 of the ITE's Transportation and Land Development manual, a queuing analysis was completed for the valet ramp on Ocean Drive. The enclosed queuing analysis was completed to determine how many attendants were required to service the parking demand, assuming 19 arrivals during the peak hour and an average time of one minute to receive the vehicle from its owner and exit the valet ramp. Another 15 vehicles depart from the valet ramp, but require the same minute per vehicle average service time to hand the vehicle over to its owner and see them leave. As the queuing analysis identified as "Scenario 1" reveals, a single valet attendant is required to receive vehicles during the average peak period parking demand. This doesn't consider the time that it takes to then drive the vehicles to a parking space and return.

Parking in the Pelican Garage is expected to require a total time of seven-and-a-half minutes: receiving the vehicle (one minute), driving the approximately 1,255 feet required to enter the parking garage (four minutes, according to Google Maps), driving through the lot to the furthest space (30 seconds), and returning by foot to the valet ramp (two minutes, according to Google). Retrieving a vehicle takes a similar time.

Because of the time required to park a vehicle, a second queuing analysis was completed with an average service time of 450 seconds, which is the combined average service time for all 34 parked vehicles, both entering and leaving. The 450-second service time equals seven minutes and thirty seconds and the parking demand is 34 vehicles, so, with the maximum number of vehicles that are expected to be parked at the Pelican Garage, the analysis reveals

that eight (8) valet parking attendants may be required at peak parking times to maintain less than five vehicles in the valet parking ramp along Ocean Drive.

4. Hotel Ocean Valet Parking Analysis

The Hotel Ocean is a 27-room hotel located at 1230 Ocean Drive in Miami Beach. The hotel also houses a restaurant. The valet parking operation has a "Valet Parking" stand located at the entrance to the hotel on the west side of Ocean Drive to alert motorists to the availability of valet parking at this location. The valet operation at Hotel Ocean allocates 80 feet (four car lengths) to the valet parking operation.

Valet Parking Route and Distance

As **Figure 5** (enclosed) illustrates, from the front of the Hotel Ocean, it is a distance of 1,530 feet to the entrance of the Pelican garage on Washington Avenue. This is well below the 2,500-foot limit imposed by Section 18-337(6)a of the City of Miami Beach's Code of Ordinances and also below the 1,800 feet permitted under the Conditional Use agreement for the Pelican Garage. The return trip, which is longer at 1,565 feet, is well below the distance limits in the City's ordinance or the Conditional Use agreement.

Ordinarily, the valet attendant will receive a vehicle from its owner in the designated valet parking ramp on Ocean Drive, then proceed south to Tenth Street, turn right and proceed west, then turn right again onto Collins Avenue and proceed north to the garage entrance. When returning, the valet attendant will exit the parking lot and proceed north on Collins Avenue to 13th Street. The attendant will turn right onto 13th Street and proceed east to Ocean Drive where they will turn right again and proceed south to the valet parking ramp serving the Hotel Ocean.

Valet Parking Time

Parking demand at Hotel Ocean was estimated using the Institute of Transportation Engineers' (ITE) Trip Generation manual, 10th Edition. ITE Land Use Code 310 – Hotel was used. According to the ITE manual, the peak hour of the generator on a Saturday is equal to:

T = 0.69(X) + 4.32 (56% in, 44% out)
X=27 rooms

T = 0.69(27 rooms) + 4.32 = 22.95 vehicle trips (13 in, 10 out).

As noted previously, the peak parking demand time is assumed to be Saturday evening.

Similar to the Hotel Breakwater and others, average peak parking demand is being reduced substantially by the use of Uber and Lyft ride hailing services. Applying a 50-percent reduction to the parking demand estimate obtained from the ITE manual results in an average peak period parking demand of 12 parking spaces, with seven (7) entering vehicles and five (5) exiting vehicles.

According to Google Maps, the time required to drive from Hotel Ocean to the Pelican Garage is approximately four minutes. Google suggests that the return trip from the Pelican Garage takes four minutes to walk.

Of course, all 12 vehicles must be served at the valet drop-off/pick-up area. Using techniques described in Chapter 8 of the ITE's Transportation and Land Development manual, a queuing analysis was completed for the valet ramp on Ocean Drive. The enclosed queuing analysis was completed to determine how many attendants were required to service the parking demand, assuming seven (7) arrivals during the peak hour and an average time of one minute to receive the vehicle from its owner and exit the valet ramp. Another five (5) vehicles depart from the valet ramp, but require the same minute per vehicle average service time to hand the vehicle over to its owner and see them leave. As the queuing analysis identified as "Scenario 1" reveals, a single valet attendant is required to receive vehicles during the average peak period parking demand. This doesn't consider the time that it takes to then drive the vehicles to a parking space and return.

Parking in the Pelican Garage is expected to require a total time of seven-and-a-half minutes: receiving the vehicle (one minute), driving the approximately 1,255 feet required to enter the parking garage (four minutes, according to Google Maps), driving through the lot to the furthest space (30 seconds), and returning by foot to the valet ramp (two minutes, according to Google). Retrieving a vehicle takes a similar time.

Because of the time required to park a vehicle, a second queuing analysis was completed with an average service time of 570 seconds, which is the combined average service time for all 12 parked vehicles, both entering and leaving. The 570-second service time equals nine minutes and thirty seconds and the parking demand is 12 vehicles, so, with the maximum number of vehicles that are expected to be parked at the Pelican Garage, the analysis reveals that four (4) valet parking attendants may be required at peak parking times to maintain less than four vehicles in the valet parking ramp along Ocean Drive.

5. Casa Victoria Valet Parking Analysis

Casa Victoria is a 22-room hotel located at 507 Espanola Way in Miami Beach. The valet parking operation has a "Valet Parking" stand located at the entrance to the hotel on the south side of Espanola Way to alert motorists to the availability of valet parking at this location. The valet operation at Casa Victoria allocates 40 feet (two car lengths) to the valet parking operation.

Valet Parking Route and Distance

From the front of Casa Victoria, it is a distance of 2,150 feet to the entrance of the Pelican Garage, as the crow flies. Driving from the hotel to the Pelican Garage, however, requires approximately 3,470 feet of travel distance along the local roads. As **Figure 6** shows, from the front of Casa Victoria, it is a distance of 6,214 feet to the entrance of the 550 Lenox parking garage on Lenox Avenue. The distance to either parking garage is well above the 2,500-foot limit imposed by Section 18-337(6)a of the City of Miami Beach's Code of Ordinances. However, it is permitted as a "grandfathered" parking destination for this hotel. The return trip, which is longer at 6,930 feet, is also above the distance limits in the City's ordinance or the Conditional Use agreement.

Ordinarily, the valet attendant will receive a vehicle from its owner in the designated valet parking ramp on Espanola Way, then proceed west to Euclid Avenue, turn left and proceed south, then turn right onto 7th Street. At Lenox Avenue the attendant will turn left and proceed south to the garage entrance. When returning, the valet attendant will exit the

parking lot and proceed north on Lenox Avenue to 9th Street. The attendant will turn right onto 9th Street and proceed east to Meridian Avenue where they will turn left and proceed north to 15th Street where they will turn right onto 15th Street and go east to Drexel Avenue. At Drexel Avenue, the valet attendant will turn right and proceed south to Espanola Way where they will turn right and enter the valet parking ramp serving Case Victoria.

Valet Parking Time

Parking demand at Casa Victoria was estimated using the Institute of Transportation Engineers' (ITE) Trip Generation manual, 10th Edition. ITE Land Use Code 310 – Hotel was used. According to the ITE manual, the peak hour of the generator on a Saturday is equal to:

T = 0.69(X) + 4.32 (56% in, 44% out)
X=22 rooms

T = 0.69(22 rooms) + 4.32 = 19.5 vehicle trips (11 in, 9 out).

As noted previously, the peak parking demand time is assumed to be Saturday evening.

Similar to the Hotel Breakwater and others, average peak parking demand is being reduced substantially by the use of Uber and Lyft ride hailing services. Applying a 50-percent reduction to the parking demand estimate obtained from the ITE manual results in an average peak period parking demand of 10 parking spaces, with six (6) entering vehicles and four (4) exiting vehicles.

According to Google Maps, the time required to drive from Casa Victoria to the 550 Lenox Garage is approximately seven minutes. Google suggests that the return trip from the 550 Lenox Garage takes 24 minutes to walk. Because of the lengthy walk time, it is expected that valet attendants will return to the valet stand from the 550 Lenox Garage with a retrieved vehicle. Vehicles returning from the garage to Casa Victoria require the same seven minutes as those headed to the 550 Lenox Garage.

Of course, all 10 vehicles must be served at the valet drop-off/pick-up area. Using techniques described in Chapter 8 of the ITE's Transportation and Land Development manual, a queuing analysis was completed for the valet ramp on Espanola Way. The enclosed queuing analysis was completed to determine how many attendants were required to service the parking demand, assuming six (6) arrivals during the peak hour and an average time of one minute to receive the vehicle from its owner and exit the valet ramp. Another four (4) vehicles depart from the valet ramp, but require the same minute per vehicle average service time to hand the vehicle over to its owner and see them leave. As the queuing analysis identified as "Scenario 1" reveals, a single valet attendant is required to receive vehicles during the average peak period parking demand. This doesn't consider the time that it takes to then drive the vehicles to a parking space and return.

Parking in the 550 Lenox Garage is expected to require a total time of sixteen-and-a-half minutes: receiving the vehicle (one minute), driving the approximately 6,214 feet required to enter the parking garage (seven minutes, according to Google Maps), driving through the lot to the furthest space (30 seconds), returning with another vehicle (seven minutes) and handing it over to its owner (one minute).

Because of the time required to park a vehicle, a second queuing analysis was completed with an average service time of 990 seconds, which is the combined average service time for all 10 parked vehicles, both entering and leaving. The 990-second service time equals twelve minutes and thirty seconds and the parking demand is 10 vehicles, so, with the maximum number of vehicles that are expected to be parked at the 550 Lenox Garage, the analysis reveals that six (6) valet parking attendants may be required at peak parking times to maintain less than two vehicles in the valet parking ramp along Espanola Way.

Conclusions

Based on the findings reported above, with the appropriate number of valet attendants serving the valet parking operations at the five studied hotels, all are expected to operate well on a Saturday evening when parking demand is highest. It is, therefore, concluded that the proposed five hotel valet parking operations will be well maintained and do not violate any of the requirements of Section 18-337(6)a of the City of Miami Beach's Code of Ordinances with the exception of Casa Victoria, which is further from the 550 Lenox parking garage than is permitted by the ordinance. However, the use of this garage is grandfathered into the parking for the hotel.

Very truly yours,

Thomas A. Hall
President

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Deerfield Beach, FL 33442

Enclosures

TAH/kh

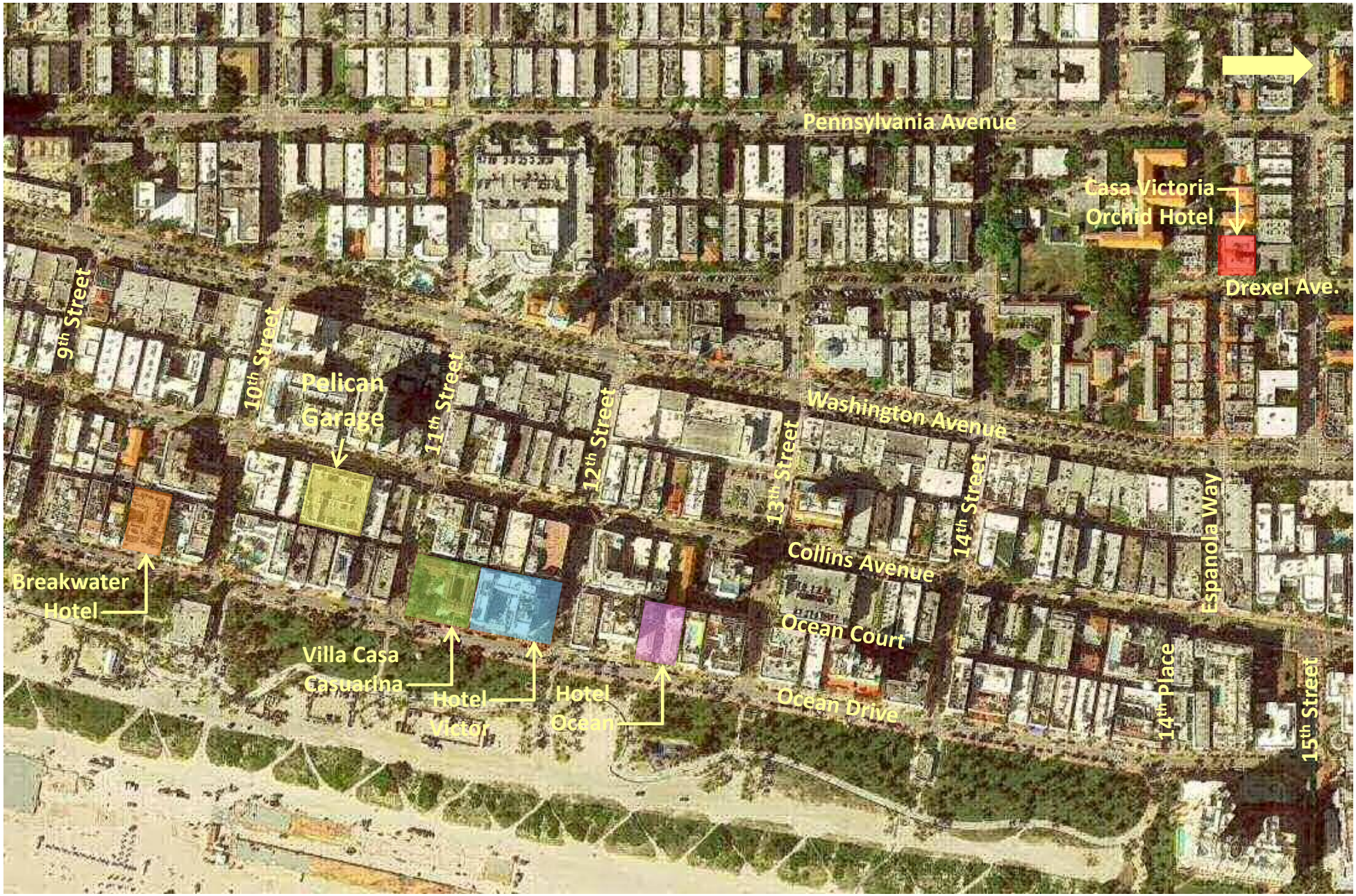

Figure 1 – Hotel Locations

Valet Parking Traffic Operational Analysis

City of Miami Beach, Florida

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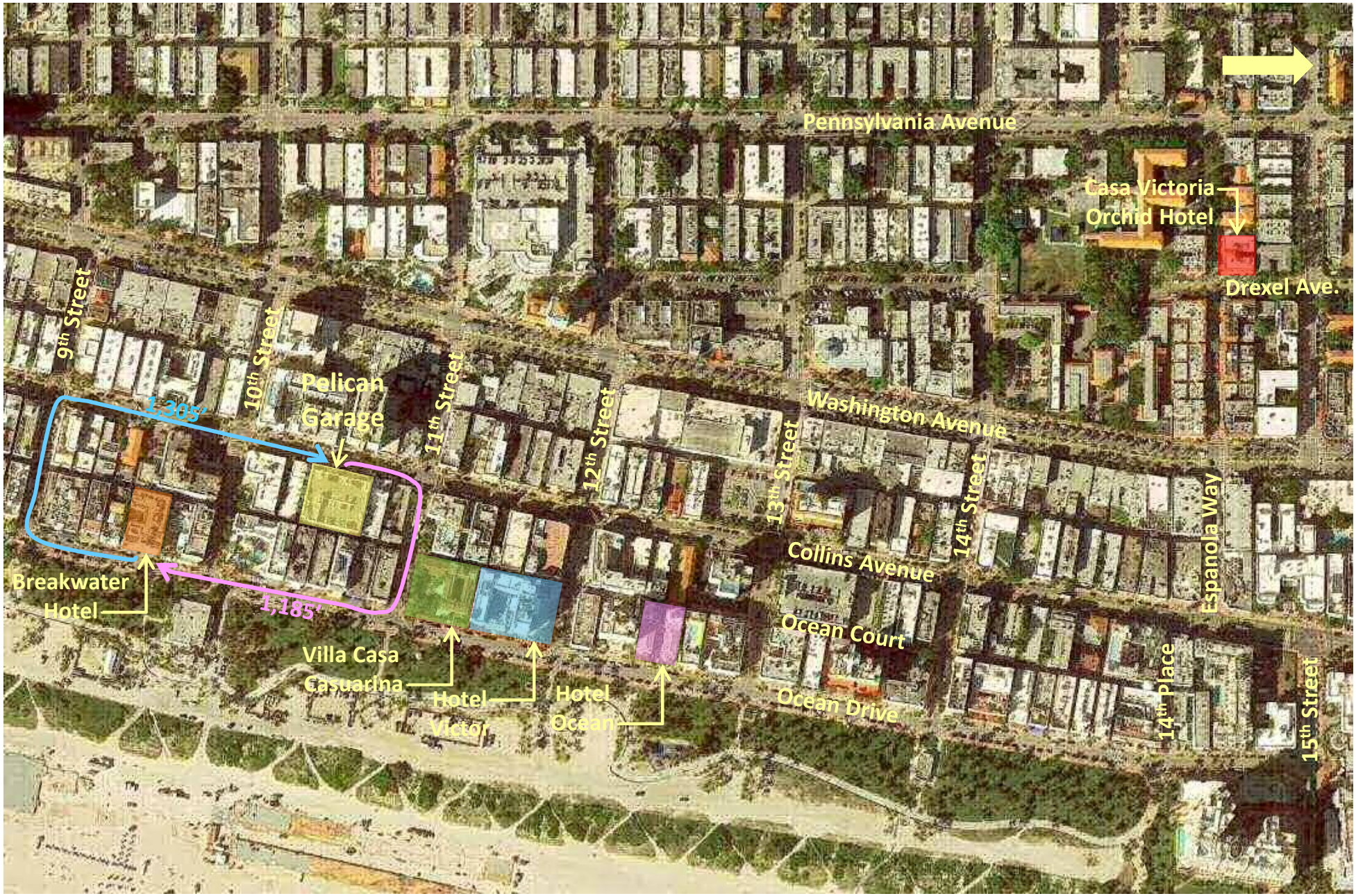

Figure 2 – Breakwater Hotel Valet Parking Distances

Valet Parking Traffic Operational Analysis

City of Miami Beach, Florida

Thomas A. Hall, Inc.

Figure 3 – Villa Casa Casuarina Valet Parking Distances

Valet Parking Traffic Operational Analysis

City of Miami Beach, Florida

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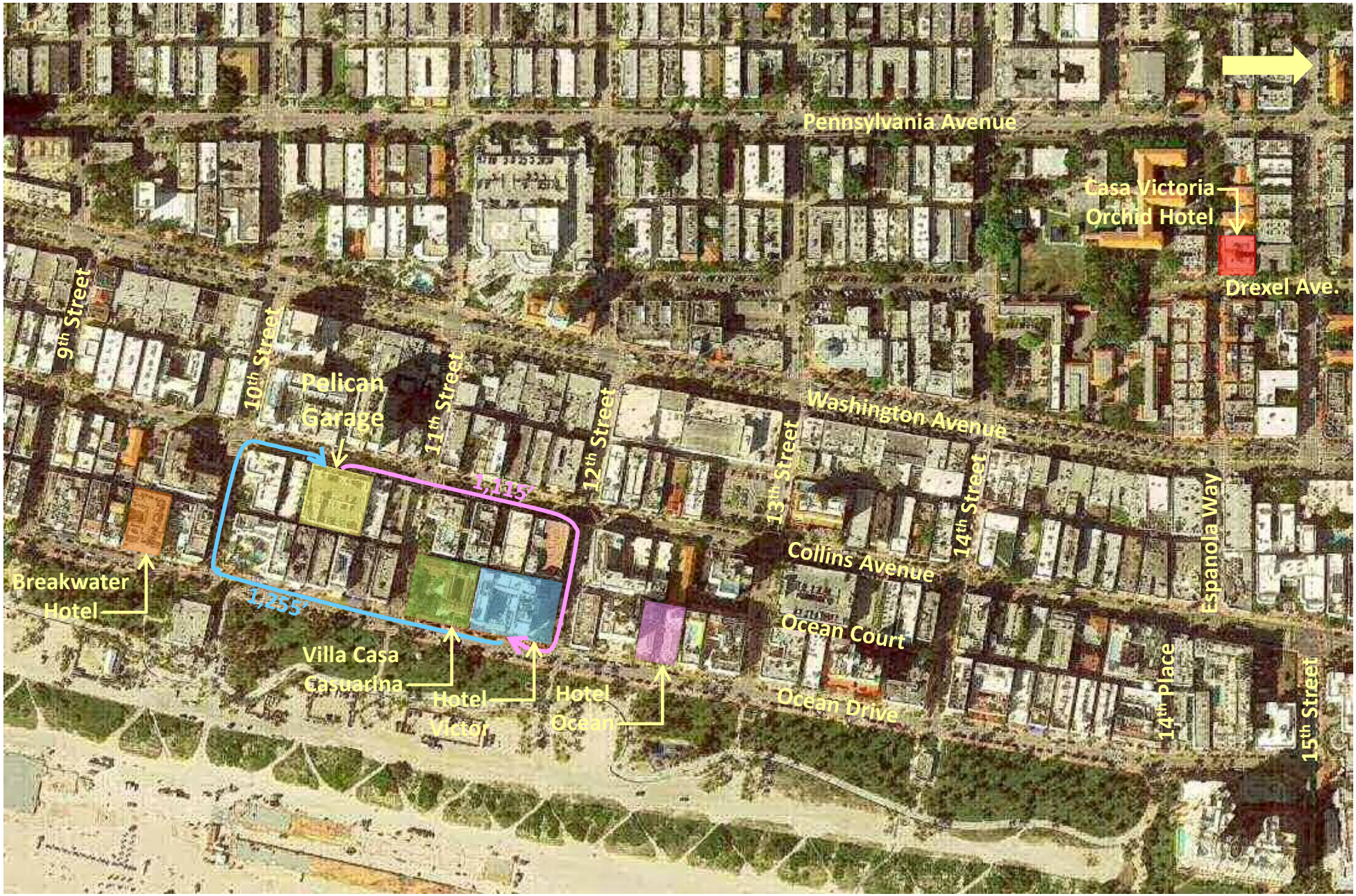

Figure 4 – Hotel Victor Valet Parking Distances

Valet Parking Traffic Operational Analysis

City of Miami Beach, Florida

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Figure 5 – Hotel Ocean Valet Parking Distances

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Valet Parking Traffic Operational Analysis

City of Miami Beach, Florida

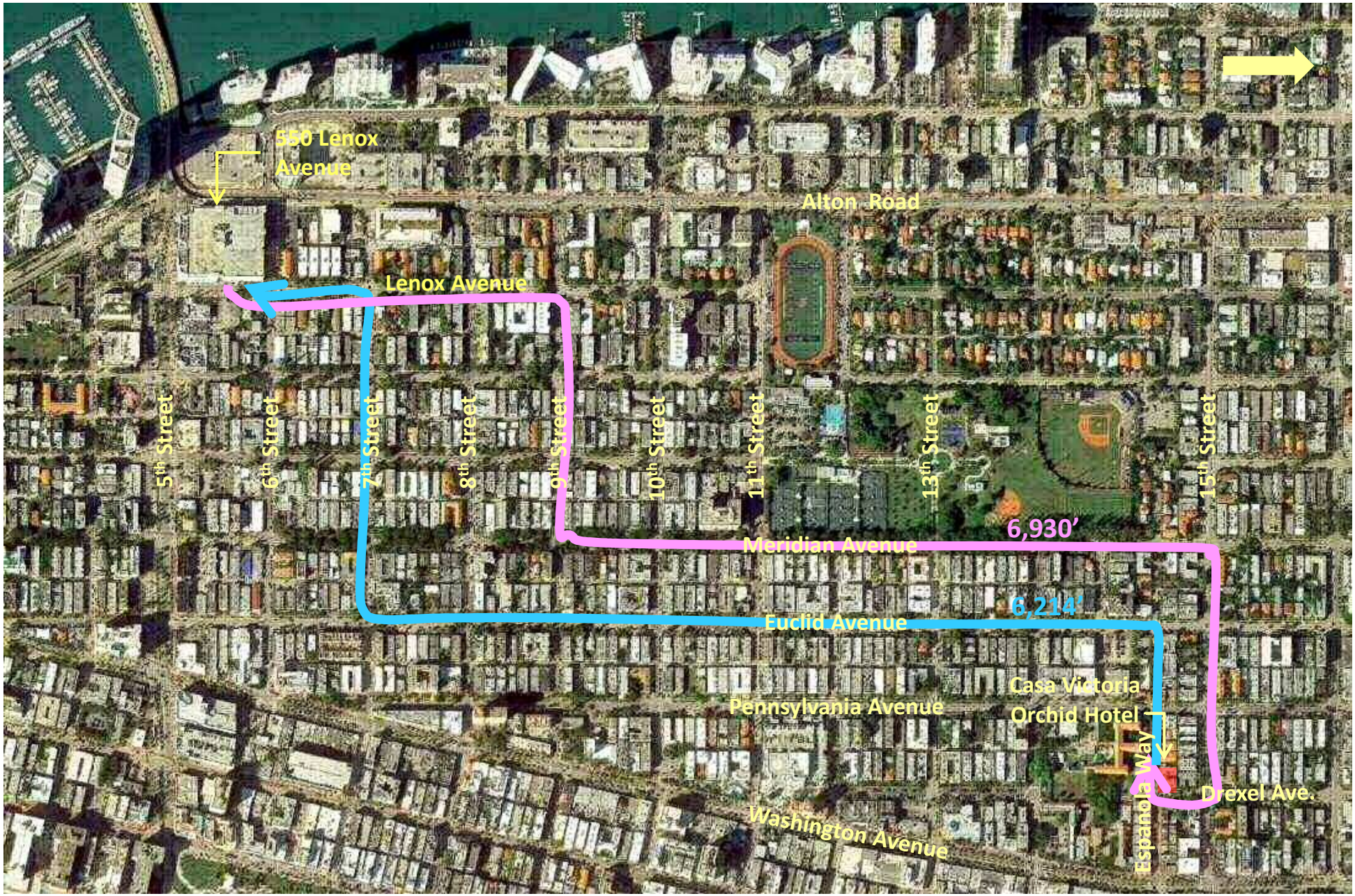

Figure 6 – Casa Victoria Valet Parking Distances

Valet Parking Traffic Operational Analysis

City of Miami Beach, Florida

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Queue Analysis for Hotel Breakwater

Scenario 1 - Peak hour drop-off demand:

$P =$	0.05	(probability of backup onto the adjacent street)
$M =$	5	(queue length which is exceeded p percent of the time)
$N =$	1	(number of service positions/valet attendants)
$Q =$	60.00	(service rate - vehicles per hour)
$p =$	0.617	(utilization factor)
$q =$	37	(demand rate - vehicles per hour)
$Q_{M=}$	0.6170	(tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.617]}{\ln 0.617} - 1$$

$$M = \frac{[-2.9957 - -0.4829]}{-0.4834} - 1$$

$M =$ **4.1980** (< 5 vehicle lengths of queue storage required.)

Scenario 2 - Peak hour demand for the Breakwater Valet Ramp:

$P =$	0.05	(probability of backup onto the adjacent street)
$M =$	5	(queue length which is exceeded p percent of the time)
$N =$	10	(number of service positions/attendants)
$Q =$	6.00	(service rate - vehicles per hour)
$p =$	0.617	(utilization factor)
$q =$	37	(demand rate - vehicles per hour)
$Q_{M=}$	0.4534	(tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.4534]}{\ln 0.617} - 1$$

$$M = \frac{[-2.9957 - -0.7910]}{-0.4834} - 1$$

$M =$ **3.5607** (< 5 vehicle lengths of queue storage required.)

Queue Analysis for Villa Casa Casuarina

Scenario 1 - Peak hour Drop Off Demand:

$P =$	0.05	(probability of backup onto the adjacent street)
$M =$	5	(queue length which is exceeded p percent of the time)
$N =$	1	(number of service positions/valet attendants)
$Q =$	60.00	(service rate - vehicles per hour)
$p =$	0.100	(utilization factor)
$q =$	6	(demand rate - vehicles per hour)
$Q_{M=}$	0.100	(tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.100]}{\ln 0.100} - 1$$

$$M = \frac{[-2.9957 - -2.3026]}{-2.3026} - 1$$

$M =$ **-0.6990** (≈ 0 vehicle lengths of queue storage required.)

Scenario 2 - Peak hour Demand for the Villa Casa Casuarina Valet Ramp:

$P =$	0.05	(probability of backup onto the adjacent street)
$M =$	5	(queue length which is exceeded p percent of the time)
$N =$	1	(number of service positions/valet attendants)
$Q =$	9.23	(service rate - vehicles per hour)
$p =$	0.650	(utilization factor)
$q =$	6	(demand rate - vehicles per hour)
$Q_{M=}$	0.650	(tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.650]}{\ln 0.650} - 1$$

$$M = \frac{[-2.9957 - -0.4308]}{-0.4308} - 1$$

$M =$ **4.9542** (< 5 vehicle lengths of queue storage required.)

Queue Analysis for Hotel Victor

Scenario 1 - Peak hour drop-off demand:

$P =$	0.05	(probability of backup onto the adjacent street)
$M =$	6	(queue length which is exceeded p percent of the time)
$N =$	1	(number of service positions/valet attendants)
$Q =$	60.00	(service rate - vehicles per hour)
$p =$	0.567	(utilization factor)
$q =$	34	(demand rate - vehicles per hour)
$Q_{M=}$	0.5670	(tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.5670]}{\ln 0.567} - 1$$

$$M = \frac{[-2.9957 - -0.5674]}{-0.5680} - 1$$

$M =$ **3.2754** (< 6 vehicle lengths of queue storage required.)

Scenario 2 - Peak hour demand for the Victor Valet Ramp:

$P =$	0.05	(probability of backup onto the adjacent street)
$M =$	5	(queue length which is exceeded p percent of the time)
$N =$	8	(number of service positions/attendants)
$Q =$	8.00	(service rate - vehicles per hour)
$p =$	0.578	(utilization factor)
$q =$	37	(demand rate - vehicles per hour)
$Q_{M=}$	0.6478	(tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.6478]}{\ln 0.578} - 1$$

$$M = \frac{[-2.9957 - -0.4342]}{-0.5480} - 1$$

$M =$ **3.6747** (< 6 vehicle lengths of queue storage required.)

Queue Analysis for Hotel Ocean

Scenario 1 - Peak hour drop-off demand:

$P =$	0.05	(probability of backup onto the adjacent street)
$M =$	4	(queue length which is exceeded p percent of the time)
$N =$	1	(number of service positions/valet attendants)
$Q =$	60.00	(service rate - vehicles per hour)
$p =$	0.200	(utilization factor)
$q =$	12	(demand rate - vehicles per hour)
$Q_{M=}$	0.2000	(tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.2000]}{\ln 0.200} - 1$$

$$M = \frac{[-2.9957 - -1.6094]}{-1.6094} - 1$$

$M =$ **-0.1386** (≈ 0 vehicle lengths of queue storage required.)

Scenario 2 - Peak hour demand for the Ocean Valet Ramp:

$P =$	0.05	(probability of backup onto the adjacent street)
$M =$	4	(queue length which is exceeded p percent of the time)
$N =$	4	(number of service positions/attendants)
$Q =$	6.32	(service rate - vehicles per hour)
$p =$	0.475	(utilization factor)
$q =$	12	(demand rate - vehicles per hour)
$Q_{M=}$	0.5545	(tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.5545]}{\ln 0.475} - 1$$

$$M = \frac{[-2.9957 - -0.5897]}{-0.7444} - 1$$

$M =$ **2.2320** (< 4 vehicle lengths of queue storage required.)

Queue Analysis for Casa Victoria

Scenario 1 - Peak hour drop-off demand:

$P=$	0.05	(probability of backup onto the adjacent street)
$M=$	2	(queue length which is exceeded p percent of the time)
$N=$	1	(number of service positions/valet attendants)
$Q=$	60.00	(service rate - vehicles per hour)
$p=$	0.167	(utilization factor)
$q=$	10	(demand rate - vehicles per hour)
$Q_{M=}$	0.1670	(tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M=\frac{[\ln 0.05-\ln 0.1670]}{\ln 0.167}-1$$

$$M=\frac{[-2.9957--1.7898]}{-1.7918}-1$$

$M=$ **-0.3269** (≈ 0 vehicle lengths of queue storage required.)

Scenario 2 - Peak hour demand for the Casa Victoria Valet Ramp:

$P=$	0.05	(probability of backup onto the adjacent street)
$M=$	2	(queue length which is exceeded p percent of the time)
$N=$	6	(number of service positions/attendants)
$Q=$	3.64	(service rate - vehicles per hour)
$p=$	0.458	(utilization factor)
$q=$	10	(demand rate - vehicles per hour)
$Q_{M=}$	0.4414	(tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M=\frac{[\ln 0.05-\ln 0.4414]}{\ln 0.458}-1$$

$$M=\frac{[-2.9957--0.8178]}{-0.7802}-1$$

$M=$ **1.7916** (< 2 vehicle lengths of queue storage required.)