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PROVIDED BY TOM HALL

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May 23, 2013

Mr. James Novick
209 North Birch Road
Fort Lauderdale, FL 33304

RE: Vintro Transportation Planning Review
Project No. 201304.01

Dear Jim:

As requested, Thomas A. Hall, Inc. has completed a review of the Site Plan Package, Parking System Evaluation and other transportation-related elements of the proposed Vintro Hotel. The new hotel is to be located at 3029 Alhambra Street in the City of Fort Lauderdale. As currently planned, the hotel will have 61 rooms in 13 floors and will also have a 2,000-square-foot restaurant and a 500-square-foot bar/lounge. A discussion of our review and findings follows:

Site Plan Review

A revised site plan package was provided to the City of Fort Lauderdale on May 13, 2013. The new site plan reflected an attempt by the applicant to address concerns raised at the April Planning and Zoning Board meeting. Revisions include a reduction from 69 rooms to 61, although the building height, 164 feet, remains the same.

The proposed hotel will have access via a two-way driveway on the east side of the site. In addition, an auxiliary driveway is provided on the west side of the property to accommodate large vehicles. It should be noted, however, that the first floor clearance height for either driveway as proposed is 13 feet, which is six inches shorter than the American Association of State Highway and Transportation Official's (AASHTO) "Green Book" design height for both Single Unit Trucks and Tractor and Semi-trailer Trucks. Since delivery of everything from foodstuffs to linens are made to hotels on a regular basis, and by means of Single Unit and Tractor/Semi-trailer Trucks, clearance height may result in at least some of those trucks parking on the street rather than within the building as planned. Garbage trucks, on the other hand, have an average height of 12.5 feet so they should clear the first floor ceiling without difficulty.

Sheet C-9, of the site plan package, shows the turning radii for various sizes of vehicles which may seek to access the proposed hotel. As Sheet C-9 shows, the largest vehicle that can manage to use either site driveway is a WB-40 tractor/semi-trailer combination. A WB-40 rig is the smallest tractor/semi-trailer truck in general use and, due to its small

size, is generally found only within seaports, since the trailer is the size of ship freight containers. Actual tractor/semi-trailer trucks used on Florida highways are significantly larger (WB-50 and WB-62) and cannot be accommodated within the hotel's driveways.
Sheet C-3, of the site plan package, is the first floor site plan. As Sheet C-3 shows, the project proposes to narrow the existing width of Alhambra Street by approximately three feet. We assume that this is due to a desire to better accommodate pedestrian traffic. Note, however, that narrowing the roadway will also reduce the parallel parking opportunity along Alhambra Street—a parallel parking opportunity that will be needed if trucks are not able to park within the hotel's property. The average width of a single unit truck or tractor/semi-trailer truck is approximately nine feet. This means that a truck parked against the curb is going to leave, at best, 18 feet in roadway width for the east and westbound through traffic on Alhambra Street, which is well below the Central Beach Master Plan's minimum of 20 feet for two lanes. Even without the narrowing of the roadway, as proposed by the applicant, parallel-parked trucks narrow the road to 21 feet, which is less than the desired 22 feet of width for a two-way street and only one foot wider than the roadway design minimum of 20 feet.

One further consideration regarding tractor/semi-trailer trucks is that, due to their length, if they are parallel parked in front of the hotel, and loading/unloading operations are underway at the rear of the truck, the entire length of the proposed hotel's frontage may be taken up by a single truck. This would result in other vehicle's access to the hotel driveways and parking area being blocked for as long as the tractor/semi-trailer truck was there. Since it is unlikely that the proposed hotel's management would tolerate this condition, large trucks are likely to be parked elsewhere along Alhambra Street instead blocking neighboring development's access.

Sheet SW-101 of the site plan package shows the method proposed for garbage collection. It appears that garbage collection will be done within the parking garage's first floor. During the time of garbage collection, no other vehicular movements will be able to be made on the ground floor. However, garbage collection happens once per day, a few days per week and shouldn't create a significant disruption in garage operations.

The parking scheme proposed for the Vintro Hotel is an efficient, vehicle-lift system. Most of the parking spaces provided within the building (42 out of 48 spaces) double stack one car on another so that 42 vehicles are parked in 21 parking spaces. In addition, a freight elevator is to be used to move vehicles between the first and second floors of the building. The freight elevator can carry one vehicle at a time. Sheets A-301 and A-302, of the site plan package, show the parking arrangement on the first and second floors, respectively.

In addition to the 48 parking spaces contained on site, the inbound (northbound) lane of the building's eastside driveway is capable of storing five vehicles until such time as the valet attendants can attend to them. All parking is proposed to be done by valet, which should increase the efficiency of movement within the garage space.

The site plans for the project show a ten-foot setback from the building to the property lines east-west. Since ordinary setback requirements are one-half the building height, this small setback demonstrates the tight design being employed on this site—a design that doesn't have room for the movement of larger vehicles through the site or permit traditional parking garage designs. In fact, there isn't even a porte cochère for dropping off and picking up guests arriving and departing by taxi or limousine.

Parking System Evaluation
Trip Generation

A "Parking System Evaluation," dated May 6, 2013, was prepared by Hughes Hughes, Inc. on behalf of the Vintro Hotel development. The Parking System Evaluation includes a discussion of project trip generation for the proposed hotel and relies upon the Institute of Transportation Engineer's (ITE) *Trip Generation* manual, ninth edition, for trip generation characteristics. The ITE manual provides trip generation characteristics for a wide variety of land uses, including Hotel (Land Use 310). The independent variable chosen by Hughes Hughes, Inc. was rooms. This seems entirely appropriate. However, when applying the trip generation characteristic information for daily trips, the fitted curve equation was used, (T = [8.95(no. of rooms)] - 373.16) resulting in an artificially low number of daily project trips.

A review of the trips characteristic data shown in the graph provided in the ITE manual reveals that there were ten studies of Hotel trip generation used to develop the rates provided in the manual. Of those ten studies, eight were of hotels ranging from 100 to 300 rooms in size. Two studies, however, were of extremely large hotels (1,600 rooms and 1,850+/- rooms). These two "outlier" studies have the effect of skewing the fitted curve equation results. That is to say, the results have a very high Coefficient of Determination (R^2 value) within the range of 100 rooms and 1,850+/- rooms, but, below that range, begin to behave irrationally. For example, using the fitted curve equation, and assuming a 40-room hotel, would result in negative numbers of trips generated! With only 61 rooms, the Vintro Hotel's daily trips should have been estimated using the average rate (8.17 trips per room) rather than the fitted curve equation. Had this been done, the daily trips for the proposed hotel would be 498, not 173.

Morning and afternoon peak-hour trips appear to have been estimated correctly.

It is asserted on page 3 of the Hughes Hughes, Inc. study that the trip generation rates provided in the ITE *Trip Generation* manual are suburban rates and, as such, overestimate the trips that may be expected to be generated by the proposed Vintro Hotel. It is possible that the rates do overestimate project trips, however, no proof is provided to validate this assertion. It is recommended that three similar sites be studied to determine the actual trip generation from such boutique hotels. If observations of those three (or more) sites during peak days and peak hours reveal a lower trip generation rate than that provided by ITE, such information would be welcome. However, anything less than three similar sites is statistically insignificant.

A "Voluntary TDM Program" is provided in the Hughes Hughes, Inc. report. The Transportation Demand Management (TDM) program includes five elements:

A. Employees will be reimbursed 100 percent of the cost of bus fares.
B. Employees will be given a $5.00 credit on the employee food and beverage allowance for each day that the employee rides a bicycle to work.
C. Provide on-site bike racks for patrons of the proposed restaurant and bar and offer patrons who arrive by bicycle a 10 percent discount on bar and food bills.
D. Organize and maintain a ride-match program to encourage carpooling among employees.
E. Refrain from reimbursing employees for off-site parking costs to discourage them from driving to work.

The report continues and asserts that this TDM program will result in a reduction in Saturday Peak Hour of the Generator inbound trips from 26 to 20 and an increase in outbound trips from 20 to 29. So, the TDM program will actually increase the trips generated by the site during the peak hour of demand from a two-way total of 46 to 49, but, according to the assertions made in the Hughes Hughes, Inc. study, will change the distribution from majority inbound to majority outbound. Again, this assertion is just that, an assertion with no supporting evidence provided.

Beginning on page 6 of the Hughes Hughes, Inc. study is a section entitled "Parking System Evaluation." This section seeks to address three questions "...raised by the public in relation to the proposed parking operation system." Those three questions are:

1. *Using the proposed elevator/lift system, will valets be able to move incoming vehicles to storage quickly enough to avoid queue backup onto Alhambra Street?*
2. *How will sanitation operations which include the unloading, emptying or collection of waste and recyclable containers, truck loading and other deliveries be accomplished on-site so that Alhambra Street is not impacted by these activities?*
3. *Can conflicts between waste removal, truck loading and other deliveries, and valet operations be avoided?*

Question 1 is addressed via a discussion of the parking garage operation and a review of arrival patterns at another hotel site, The Pillars Hotel, which was asserted to have similar characteristics to the proposed Vintro Hotel. There is no doubt that The Pillars Hotel is, in fact, a boutique hotel. However, what the Hughes Hughes, Inc. study fails to mention is that The Pillars Hotel has a total of only 18 rooms. As such, it is no surprise that the arrival and departure rates of vehicles were minimal during the afternoon peak period on Thursday, March 7, 2013 when operations were observed. With so few rooms, there is likely to never be a time when arrival and departure rates are very high or when peaking characteristics can be evaluated in a manner that is valid for comparison to the proposed hotel. Moreover, for field observations to have any statistical significance of any sort there would have to be a minimum of three observations. That is, three sites that are

similar to the proposed hotel should be observed and the parking demand characteristics measured.

Queuing Analysis for the Valet Operation

As an alternative to the Hughes Hughes, Inc. study, Thomas A. Hall, Inc. completed a queuing analysis in the manner prescribed by the ITE's *Transportation and Land Development* manual. Three scenarios were examined:

1. Two-way (entering and exiting) access to the hotel via valet parking with a five percent probability that the available queue storage length will be exceeded.
2. One-way (entering only) access to the hotel via valet parking with a five percent probability that the available queue storage length will be exceeded.
3. One-way (entering only) access to the hotel via valet parking with a determination of the maximum percentage of the peak hour in which the available queue storage length will be exceeded.

Using the Saturday peak hour of parking demand from the applicant's study and their estimate for arriving and departing vehicle service rates for parking, a probability analysis was completed to determine whether the parking demand could be accommodated within the proposed five-vehicle storage length. In Scenario 1, since the parking elevator can accommodate exiting vehicles on the way down from the second floor of the proposed hotel as well as arriving vehicles on the way up, a two-way analysis was completed to determine whether the entire 46 peak-hour trips could be accommodated by two valet attendants—one receiving arriving vehicles and the other delivering departing vehicles. Scenario 2 was a one-way analysis that only looked at the 26 arriving vehicles in the peak hour. Finally, a third analysis calculated the percentage of the peak hour in which the number of arriving vehicles exceeded the available five-vehicle queue storage length.

The analyses demonstrated that both the two-way (entering and exiting vehicle) and one-way (entering vehicles only) queue storage are expected to be exceeded more than five percent of the time, which is generally used as a test of queue storage adequacy and means that additional waiting vehicles are sitting in the through lanes of Alhambra Street. In the third test, the analysis was performed to determine what percentage of an hour would experience a backup of more than the available five-vehicle queue storage length. As the third analysis shows, the five-vehicle queue storage area is expected to be exceeded 65 percent of the time (39 minutes of the peak hour).

In normal valet operations this excessive queue storage problem can be addressed by simply adding more valet attendants. However, with a single freight elevator to move vehicles between floors, an increase in the number of valet attendants becomes largely irrelevant since it is the freight elevator that controls parking service rates. Relying upon a single freight elevator also increases the likelihood of 38 vehicles being trapped on the second floor when the elevator inevitably breaks. It is noted in the Hughes Hughes, Inc. study (Page 7) that, "...the applicant intends to maintain on-going maintenance

agreements to service the car elevator and lifts, thereby insuring their fitness for service." We agree with Hughes Hughes, Inc.'s implicit support of the applicant's intention. However, even if a ThuyssenKrupp technician remained on site continuously, when elevators break, it takes time to repair them. For this reason, the redundancy of two freight elevators is recommended to insure uninterrupted service to the second-floor parking area.

The use of overflow parking across the street in the new City of Fort Lauderdale parking lot is proposed by the applicant should the planned valet operation experience a backup. On the basis of our analysis, this overflow parking appears to be needed and, of course, also takes time for the valet attendants to use.

A question remains as to the availability of parking in the City's parking lot during the tourist season when the adjacent Casablanca Restaurant, and the beach in general, draw people to this new parking lot. With beach parking intentionally reduced by code, the new parking spaces created by the City's parking lot are expected to be used in full during the very peak time examined by the applicant's study. How, then, will several parking spaces be available for overflow parking from the Vintro development as the queuing analysis indicates will be required?

Returning to the public's questions mentioned in the Hughes Hughes, Inc. study, Question 2 *"How will sanitation operations which include the unloading, emptying or collection of waste and recyclable containers, truck loading and other deliveries be accomplished on-site so that Alhambra Street is not impacted by these activities?"* appears to be well answered. The garbage will be collected within the parking area on the first floor of the building on site. However, the Hughes Hughes, Inc. report goes on to also address truck deliveries to the proposed hotel. The report notes that larger trucks will be kept off of the street by using the westside auxiliary driveway. As was noted in the Site Plan Review section of this letter, the larger trucks will not fit in this driveway due to its too low ceiling height and too small turning radius.

Question 3 *"Can conflicts between waste removal, truck loading and other deliveries, and valet operations be avoided?"* is addressed in the Hughes Hughes, Inc. study by noting that "The timing of waste removal should be tightly controlled to occur at a consistent time of day, and days of the week." We agree that this should be the case but question how this is to be accomplished. Again, the report relies upon truck access to the interior of the hotel which cannot be assured with a too low ceiling height and a too small turning radius to accommodate the larger trucks that often service hotels.

Noise

The Hughes Hughes, Inc. study seeks to address noise from garbage collection in its answer to Question 3 above. They note that "...waste removal will occur when the noise generated by the trucks themselves is of least impact on the surrounding residences and businesses." Again, we would ask: How is this to be accomplished?

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Trucks that make deliveries and can't fit inside the building may very well add to the noise levels for neighbors as will the garbage trucks entering the ground floor to empty the waste receptacles. Of course, the choice of exterior wall materials may or may not serve to keep the noise of vehicles and parking machinery within the structure from being heard by the project's neighbors.

The parking system proposed for the Vintro Hotel is a mechanical storage system that relies upon Park Plus, Inc.'s mechanical lifts to park two vehicles in a space ordinarily used by a single vehicle. In addition, the system uses a ThyssenKrupp freight elevator to move vehicles between floors in the parking garage. A review of online literature found no information on the Park Plus, Inc. mechanical lift's noise production. The ThyssenKrupp Company states that their elevator creates noise in the 55-75 decibel range. Fifty-five decibels is not terribly loud (It's roughly equivalent to the sound pressure level of a normal conversation three feet away). Seventy-five decibels, however, is comparable to loud singing three feet away and is much more likely to be perceived as uncomfortable noise. As the sound pressure levels increase, containing those sounds within the proposed hotel structure becomes more difficult.

Other Observations

We will leave it to others to determine the intent of the beach zoning, but all of the many beach projects on which we have worked over the years accumulated several small parcels, such as the site proposed for the Vintro Hotel, and built a larger development on the assembled properties. If the Ventro Hotel is the way of the future, then the following scenario may well come to pass: Assuming that 498 daily trips are generated by the 61-room hotel, and assuming that other sites on the block between Alhambra Street and Seville Street were similarly developed, it is estimated that the remaining parcels west and north of the proposed Vintro Hotel would add a combined total of approximately 2,600 additional daily trips. These trips, when added to the Vintro Hotel daily trips would add 3,098 new daily trips from this single block.

Of course, given the minimal ten-foot setback proposed in the Vintro Hotel site plan, were the same setback used for other developments on the block, the entire block west of the Casablanca Restaurant would have 13-story buildings with a combined total of 20 feet of land between each of them.

Conclusions and Recommendations

Based on these findings, we believe that the developer of the proposed Vintro Hotel has failed to demonstrate, in a statistically valid manner, that their trip generation for the hotel is correct, has failed to demonstrate that the parking system will avoid backups of vehicles onto the public roadway, has failed to demonstrate that delivery trucks will be kept on site and has failed to demonstrate that noise from deliveries, the parking machinery and garbage collection will be contained on site.

In addition to addressing the conclusions stated above, it is recommended that the applicant consider adding a second freight elevator to the proposed hotel to insure that access to the second-floor parking area remains available at all times. This would have the added benefit of reducing the backup of vehicles waiting to be parked as two valet attendants could be moving vehicles from the first floor to the second-floor parking area at any one time.

Should you have any questions or comments regarding this review, please do not hesitate to contact me.

Very truly yours,

Thomas A. Hall
President

TAH/kh

Enclosure

Queue Analysis for Vintro Hotel Valet Parking (Using service rate and trip generation from applicant's parking analysis)

Scenario 1 - Saturday Peak Hour two-way parking demand:

P= **0.05** (probability of backup onto the adjacent street)
M= 5 (queue length which is exceeded p percent of the time)
N= 2 (number of service positions)
Q= 27.52 (service rate)
p= 0.836 (utilization factor)
q= 46 (demand rate - vehicles per hour)
$Q_{M=}$ 0.762 (tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.7620]}{\ln 0.836} - 1$$

$$M = \frac{[-2.9957 - -0.2718]}{-0.1795} - 1$$

M= **14.17, say 14 vehicle queue versus 5 vehicle queue storage availability.**

Scenario 2 - Saturday Peak Hour entering vehicle only parking 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)
Q= 27.52 (service rate)
p= 0.945 (utilization factor)
q= 26 (demand rate - vehicles per hour)
$Q_{M=}$ 0.945 (tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.954]}{\ln 0.945} - 1$$

$$M = \frac{[-2.9957 - -0.0569]}{-0.0569} - 1$$

M= **50.63, say 51 vehicle queue versus 5 vehicle queue storage availability.**

Scenario 3 - Saturday Peak Hour entering vehicle only parking demand just barely exceeding the available queue storage:

P= **0.65** (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)
Q= 27.52 (service rate)
p= 0.945 (utilization factor)
q= 26 (demand rate - vehicles per hour)
$Q_{M=}$ 0.945 (tabled value of the relationship between queue length, number of channels, and utilization factor)

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

$$M = \frac{[\ln 0.05 - \ln 0.954]}{\ln 0.945} - 1$$

$$M = \frac{[-0.4308 - -0.0569]}{-0.0569} - 1$$

M= **5.57, say 6 vehicles waiting for service--occurring over 65 percent of the studied hour.**