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November 13, 2006

Project C050619

Mr. Frank T. Donaghue
Chief Counsel
Pennsylvania Gaming Control Board
303 Walnut Street Strawberry Square
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Harrisburg, PA 17101

Traffic Impact Study Correspondence 11/8/06
Harrah's Station Square Casino
City of Pittsburgh
Allegheny County, PA

Dear Mr. Donaghue:

Thank you for your correspondence on November 9, 2006 (copy enclosed) regarding our traffic impact study. The study submitted to the Pennsylvania Gaming Control Board (PGCB) was an initial study. We have completed and submitted an expanded and updated report dated October 2006 and Addendum 1 dated November 2006, which addresses design year 2018 traffic conditions. The expanded and updated report and Addendum 1 were developed based on scoping meetings with the City of Pittsburgh and PennDOT and comments contained in the initial review by McCormick Taylor dated September 7, 2006.

The following are our responses to the comments contained in the November 8, 2006 letter from Mr. Albert Federico of McCormick Taylor to Mr. Glenn Rowe of the Pennsylvania Department of Transportation (copy enclosed).

Comment 1 (Approach): It would be appropriate for the engineer preparing this analysis to have stamped and signed the report. *The applicant has indicated that the pending revised study will be stamped and sealed by a licensed engineer.*

Response: An expanded and updated study report and Addendum 1 have been developed. They have been stamped and signed by a licensed engineer.

Comment 2 (Approach): The analysis included an evaluation of two peak periods: the weekday evening and Saturday late-evening. *The applicant has indicated that the pending revised study will include a third evaluation period: Friday evening.*

Response: An expanded and updated study report and Addendum 1 have been developed and include a Friday evening evaluation period. The Friday peak hour to be studied (4:30 pm – 5:30 pm) was determined at a meeting with staff of the City of Pittsburgh Planning Department.

Comment 3 (Approach): The analysis did not address impacts to the intersection(s) of Carson Street and the West End Bridge (West End Circle). The evaluation of the operation of these intersections is considered appropriate. *The applicant has indicated that a pending revised study will include an evaluation if this intersection.*

Response: Traffic data has been collected at the intersections of the West End Circle and at the north end of the West End Bridge. Both the existing and the planned new configurations of the West End Circle have been analyzed for 2008 and planned new configuration only for 2018

design year conditions. The results are included in our expanded and updated study report and Addendum 1 as requested.

Comment 4 (Data Collection): All intersections, except for the entrance to the Wabash Tunnel, were counted manually. *The applicant has indicated that the pending revised study will include counts of this intersection.*

Response: The Wabash Tunnel (HOV facility) intersection at W. Carson Street has been counted from 4:00 PM to 6 PM on a non-Friday weekday, from 4:00 PM to 6:00 PM on a Friday, and on a Saturday from 5 PM to 7 PM. During these time periods, the tunnel is open to outbound traffic only. Traffic count data for this intersection has been included in Volume 2 of 2 (Appendices) of our expanded and updated study report. The left turns and right turns into the tunnel were counted. The through volumes were balanced based on counts at adjacent intersections.

Comment 5 (Data Collection): The study did not include manual turning movement traffic count data within the technical appendix.

Response: All manual turning movement count data is included in Volume 2 of 2 (Appendices) of the expanded and updated study report.

Comment 6 (Trip Generation):Due to the lack of available data in ITE Trip Generation regarding gaming facilities, the trip generation estimates for the gaming facility were based upon patronage and employment figures provided by Harrah's. However, no documentation of these figures is included in the technical appendix.

Response: Documentation of the trip estimates is included in the expanded and updated traffic study report. The trip generation estimates were developed based upon patronage and employment estimates provided by Harrah's, Downtown travel characteristics developed in conjunction with the City of Pittsburgh Planning Department and hourly distribution estimates from traffic studies of existing casinos documented by the Institute of Transportation Engineers (ITE). The patronage estimates provided by Harrah's are higher than those used for other gaming facilities in Pennsylvania. The travel characteristics for patrons and employees reflect the travel modes currently available at Station Square and vehicle occupancy surveys conducted at existing gaming facilities. These characteristics, which are documented in the report, were reviewed with the City of Pittsburgh Planning Department and modified based upon their input.

Comment 7 (Trip Generation): When comparing trip generation estimates for the gaming component of the three Pittsburgh gaming sites, the trip generation for Harrah's Station Square Casino is significantly lower than that for the other gaming sites. Factors that may be contributing to the assumed lower trip generation may include:

- **The significant percentage of patrons assumed to utilize non-automotive modes of travel: 30 percent of patrons and 50 percent of employees.** *The applicant has indicated that the pending revised study will include revised modal splits.*

Response: The expanded and updated traffic study report includes revised modal splits. As previously stated in the October 12, 2006 response to comments:

Station Square is currently a transportation hub served by many forms of public transportation (e.g. Light Rail, Bus and Incline Rail) as well as private services such as charter bus service and shuttle bus service to/from the Downtown and Southside. Our previous traffic study estimated the following mode split for casino patrons during peak hours on design days:

70% Auto/Taxi/Limo
15% Public Transit (Light Rail and Bus)
10% Private Charter, Downtown Shuttle and South Side Shuttle
5% Inclines, Boat Service, Bicycle and Walk

We met with the City of Pittsburgh Planning Department and they agreed that these percentages were acceptable for peak-hour design conditions for weekdays at Station Square. However, the City recommended that a lower percentage be used for Public Transit on Saturdays because there is less service to Station Square on weekends. After reviewing transit schedules for Saturdays, we are using the following mode split for the peak design hour on Saturdays:

77.5% Auto/Taxi/Limo
7.5% Public Transit (Light Rail and Bus)
10% Private Charter, Downtown Shuttle and South Side Shuttle
5% Inclines, Boat Service, Bicycle and Walk

The use of public transportation modes (light rail and bus) is estimated to be higher for casino employees than for casino patrons based upon the current Downtown Pittsburgh employee travel characteristics. The City of Pittsburgh Planning Department has reviewed and accepted these updated mode split percentages for casino patrons and employees.

-The low percentage of daily patrons assumed to arrive during the peak period: 5.9 percent of the daily patrons during the evening peak hour.

Response: The existing peak traffic volumes on the streets in the Station Square study area occur between 4:30 pm and 5:30 pm on weekdays and between 5:45 pm and 6:45 pm on Saturdays. Those were the peak traffic periods selected for analysis in discussion with the City of Pittsburgh. A study of gaming casino traffic by Paul C. Box and William Bunte published in ITE Journal in March 1998 identified the hourly distribution of inbound and outbound traffic to casinos (with 24 hour operations) on weekdays and weekends. That study identified the following hourly distributions for gaming casino traffic:

		Inbound	Outbound
Weekday	5:00-6:00 pm	5.9%	6.6%
Saturday	6:00-7:00 pm	7.8%	6.9%

These percentages were used in the Station Square transportation analysis. Higher percentages of patron traffic occur on weekdays after 6:00 pm based upon the Box/Bunte study results, but the traffic volumes on the streets in the study area are lower during these periods. The 4:30 -5:30 pm period was the critical weekday traffic period. The Saturday percentages represent the highest hour of the day and reflect that 5:45 pm – 6:45 pm is when traffic is currently highest at Station Square.

- **The assumed vehicle occupancy of 2.5 persons per vehicle for patrons and 1.1 persons per vehicle for employees.**

Response: In the expanded and updated study, documentation is provided of vehicle occupancy surveys that were conducted at existing gaming facilities. This information is presented below:

Surveys of Vehicle Occupancy Rates at Existing Gaming Facilities

Casino Application	Existing Casino Surveyed	Size	Location	Survey Results
Presque Isle Downs - Erie	The Mountaineer Track & Gaming	80,000 sf of gaming 3,200 slot machines	Chester, West Virginia	**2.60** patrons/ vehicle
Chester Downs Philadelphia	Atlantic City Casinos	13 Major Casinos 1.3 Million SF	Atlantic City, New Jersey	**2.40** patrons/ vehicle
Majestic Star Pittsburgh	Casino Niagara	95,000 sf of gaming	Ontario, Canada	**2.30** patrons/ vehicle
Trump Casino Philadelphia	Delaware Park	2,500 slot machines	New Castle, Delaware	**2.25** patrons/ vehicle
Poconos Downs Racing	Saratoga Raceway	55,000 sf of gaming 1,300 slot machines	Saratoga, New York	**2.20** patrons/ vehicle
Isle of Capri Pittsburgh	San Pablo Lytton Casino	800 slot machines 30 table games	San Pablo, California	**1.18** patrons/ vehicle

Based upon these findings and review and input from The City of Pittsburgh Planning Department, a vehicle occupancy factor of 2.35 persons per vehicle was selected to convert patron person trips to vehicle trips. No specific surveys were conducted for current employees at Station Square, but it was expected that the employee vehicle occupancies will be much lower and closer to national averages of 1.1 per vehicle.

- **The significant 20% reduction assumed for interaction between gaming patrons and the existing Station Square uses.** *The applicant has indicated that the pending revised study will include revised capture assumptions accounting for the significantly larger generation from the gaming site.*

Response: Our determination of new trips for the Casino considered the capture of existing trips generated by Station Square. Existing development at Station Square includes 30 retail shops, 25 restaurants and night clubs, 400 hotel rooms and related meeting/banquet facilities, office space and the Gateway Clipper fleet docks. During survey hours on weekdays and Saturdays, peak hour traffic counts at the Station Square driveways ranged from between 1100 vehicles per hour to 1218 vehicles per hour. Many of these current visitors will be attracted to extend their stays and visit the Casino as part of their activities at Station Square.

Internal capture rate refers to the percentage of internal trips that occur within a mixed-use development as a result of interaction between compatible land uses. The rate reflects the percentage of trips generated by one of the uses that will visit other uses within the development without requiring additional external trips. The Institute of Transportation Engineers (ITE) presents discussion of internal capture rates in their Trip Generation Handbook and provides guidelines and procedures for utilizing these rates.

Although data surveys of internal capture rates are limited, the Institute of Transportation Engineers provides guidelines for capture rates within a mixed-use development. For different types of retail uses within a mixed-use development, they identify three internal capture rates:

Midday Peak Hour	29%
PM Peak Hour	20%
Daily	30%

Station Square is currently a mixed-use development and will continue to be a mixed-use development in the future with the proposed Harrah's Casino. Given the compatibility of the Casino with the existing restaurant and night club uses, this interaction is expected to be significant. The 20% internal capture rate identified by ITE for PM peak hour trips was used to reflect existing Station Square patrons who will visit the casino while at Station Square. PennDOT has accepted the 20% internal capture between uses in other mixed-use projects that include casinos. Our analysis used the 20% reduction for the lower of the existing inbound or outbound movement, resulting in less than a 20% capture rate. The calculations for internal capture are listed below:

	Internal Capture Rate		
	Inbound	**Outbound**	**Total**
Design Weekday (4:30 – 5:30 PM)			
Existing Station Square Trips	**281**	**819**	**1100**
Internal Capture Trips	**56**	**56**	**112 (10%)**
Design Friday (4:30 – 5:30 PM)			
Existing Station Square Trips	**489**	**729**	**1218**
Internal Capture Trips	**98**	**98**	**196 (16%)**
Design Saturday (5:45 – 6:45 PM)	**863**	**294**	**1157]**
Existing Station Square	**59**	**59**	**118 (10%)**
Internal Capture Trips			

Comment 8 (Trip Generation): The overall concept plan for Harrah's Station Square includes retail, restaurant and hotel uses ("Phase 2") not accounted for in the project trip generation.

Response: The project trip generation analysis for 2008 conditions identified trips generated by patrons and employees of the casino, which included trips to the ancillary retail and restaurant uses within the casino. Major retail and restaurant uses already exist at Station Square and their traffic is included in the background traffic counts. The patronage and employment forecasts by Harrah's include casino and ancillary retail and restaurant facilities. The Harrah's patronage forecasts were very high when compared to other gaming facilities proposed for Pennsylvania. The 2008 trip estimates did not include new hotel rooms because the Sheraton Hotel already exists at Station Square and the additional hotel rooms were not proposed until after 2008. In the expanded and updated transportation analysis that includes 2018 traffic conditions,

additional traffic generation is included for new hotel rooms, as well as, residential units that are proposed on the East parcel. At the same time the existing restaurant and night club uses on the East Parcel are to be eliminated. Also, commuter parking that is currently permitted at Station Square will be eliminated in order to have sufficient parking for the development program. The traffic generation associated with the restaurant/night club uses on the East Parcel and the commuter parking operations were taken out of the existing background traffic numbers for 2018.

Comment 9 (Analytical Approach): Verification of the base peak hour volumes and related factors utilized in the analysis could not be completed as the manual turning movement traffic count data were not provided.

Response: All manual turning count data is included in Volume 2 of 2 (Appendices) of the expanded and updated study report.

Comment 10 (Analytical Approach): The lane configuration and geometry of the intersections appear to be modeled appropriately for existing conditions; however several improvements proposed to mitigate traffic impacts which are noted in the body of the study do not appear to incorporated into the "build" condition models (i.e. additional Carson Street left turn lane at the Main Access).

Response: These discrepancies have been addressed in the expanded and updated study report.

Comment 11 (Analytical Approach): Based on the information provided it appears that the signal phasing operations at the traffic signals appear to be modeled appropriately in Synchro, with the following exceptions.

- Numerous reports include phases noted as having been modeled with phasing conflicts; however the reporting format (HCM) used by the applicant did not provide sufficient information to verify the validity of these errors.

Response: Conflicts were reported at some locations due to non-standard NEMA phasing. These locations were viewed on SymTraffic and observed to run correctly with no vehicular conflicts.

- The green time allocated to selected phases at several signalized intersections is below the seven second minimum typically required by PennDOT. It should be noted that this may be a result of the reporting format (HCM) used by the applicant and not necessarily an error in the modeling.

Response: This has been addressed in the expanded and updated traffic study report and Addendum 1.

Comment 12 (Analytical Approach): The capacity analysis utilizes the maximum permissible peak hour factor (1.00) without supporting justification. The applicant has indicated that the factors were derived from the counted volumes; however factors of 1.00 indicate a perfectly balanced traffic flow over an entire hour and are not typically encountered with such frequency. The use of a higher than appropriate peak hour factor can significantly influence the results of the capacity analysis.

Response: The peak hour factors were derived from the manual turning movement counts. They were determined based on the peak 15 minute volumes of the total intersection within the peak hour, not the individual peak hour of each approach. All manual turning count data is included in Volume 2 of 2 (Appendices) of the expanded and updated study report.

Comment 13 (Analytical Approach): The study does not include an evaluation of future conditions 10 years after the project build out, which is typically required by PennDOT for a highway occupancy permit (HOP) submission. *The applicant has indicated that the pending revised study will include the 10 year build out analysis.*

Response: Addendum 1 to the expanded and updated traffic study report contains evaluations of the 2018 design year traffic conditions. This includes future hotel and residential condominium trip generation.

Comment 14 (Analytical Approach): The analysis did not provide an evaluation of vehicle queuing and determinations regarding the adequacy of existing and/or proposed turn lane lengths. *The applicant has indicated that the pending revised study will include queuing analyses.*

Response: The addendum to the expanded and updated traffic study report will contain an evaluation of existing and proposed turn lane and through lane lengths.

Comment 15 (Analytical Approach): The analysis does not address the issues associated with potential staging of parking during facility construction, specifically how the removal of the West Lot will be addressed.

Response: Currently, the West Lot is primarily used for event parking for scheduled events at the amphitheater and special functions at Station Square. At the start of construction, the amphitheater will be closed permanently and special events will not be scheduled at Station Square during this period. Also, commuter parking will be eliminated at Station Square to increase the availability of parking for Station Square patrons. The parking program includes a horizontal expansion of the existing parking garage to achieve approximately 200 new parking spaces in that location. These spaces are expected to be completed and available during construction of the casino.

Comment 16 (Evaluation of the Recommended Improvements): The proposed mitigation includes widening the existing east access driveway at Arlington Avenue and Carson Street to provide dual left turn lanes and an exclusive right turn lane; however the intersection is still projected to operate with a deficient level of service "E" for two of the movements. Additionally the existing elevated rail lines and associated structures will increase the complexity of any potential improvements.

Response: Sufficient mitigation is proposed in accordance with PennDOT traffic impact study requirements. The specific requirement is that for intersections where existing levels of service are at LOS D, E, or F, they can remain at LOS D, E, or F respectively if the delay (in seconds) is decreased or improve from LOS F to E or LOS E to D. The proposed mitigation for the Carson Street at Arlington Avenue Intersection keeps the level of service the same while decreasing the delay or improves level of service.

Comment 17 (Evaluation of the Recommended Improvements): This proposed improvements to the intersection of Commerce Street and Carson Street include modifying the traffic signal to operate with inefficient split-phasing. Improvement alternatives which permit concurrent signal phasing (i.e. without the shared through/left-turn lane) should be explored.

Response: The intersection operates at an acceptable LOS C or better for all approaches with split-phasing and a left/left-through lane conditions. Without this lane configuration, the level of service for Commerce Street will operate at LOS D. Further, the approach opposite Commerce Street is a private parking lot with no through traffic.

Comments 18 (Evaluation of the Recommended Improvements): The analysis recommends a traffic signal at the new Carson Street egress; however, supporting signal warrant analyses are not provided in the technical appendix. *The applicant has indicated that the pending revised study will include signal warrant analyses.*

Response: This new intersection has been eliminated from the proposed casino site plan. A new traffic signal is proposed at the existing intersection west of the existing parking garage. This existing intersection will become Casino Drive and will serve as the primary access to the existing garage and to/from the casino porte cochere pick-up/drop-off and to/from valet parking. A traffic signal warrant analysis has been provided for the Casino Drive intersection in the expanded and updated transportation analysis.

Comment 19 (Evaluation of the Recommended Improvements): The report notes that , at the intersection of Carson Street and Smithfield Street, a pedestrian overpass across Carson Street will be constructed. In addition to improvements at this intersection, pedestrian accommodations should be adequately addressed at each of the signalized intersections. This includes proper delineation, ADA accommodations, adequate crossing times and pedestrian indications. The investigation of pedestrian count down timers may also be appropriate.

Response: The primary pedestrian movements in the vicinity of Station Square are related to walking trips across the Smithfield Bridge to/from Downtown and to/from the bus stops, light rail station and incline rail station. The pedestrian overpass across Carson Street will redirect most of the pedestrian traffic away from the Smithfield Street intersection with Carson Street. Accommodations to pedestrian traffic, including pedestrian count down timers will be investigated for each of the intersections evaluated in the study except for the intersections located through the West End Circle. No pedestrian facilities are available at the Circle nor were there any pedestrians observed during the counted periods. Also, the whole West End Circle is going to be reconstructed starting next spring (2007) with construction finishing up in 2009.

Comment 20 (Evaluation of the Recommended Improvements): The mitigation plan assumes the interconnection of the six traffic signals along Carson Street within the study area and programmed to operate as a system providing coordinated progressive traffic movements.

Response: Yes, that is correct.

Comment 21 (Evaluation of the Recommended Improvements): The report discusses the implementation of an internal traffic management plan, the utilization of ITS technologies and the establishment of a transportation management center. The use of these mitigation measures will require long-term participation and financial support of local and state agencies.

Response: The use of ITS technologies and establishment of a traffic management center at Station Square is part of the overall transportation improvement program to upgrade both traffic and parking conditions. The observation of real-time traffic and parking conditions with strategically located CCTV cameras will permit quick response by the Transportation Manager at Station Square to adjust traffic flow patterns and parking operations within the site through use of dynamic message signs. PennDOT has already confirmed that they currently have a fiber link to Station Square from their traffic management center that will allow them to receive the video feed from the proposed CCTV cameras and to assist with incident management activities. Until the City of Pittsburgh progresses with their ITS program, coordination from the Station Square traffic management center will take place using standard telephone communications. The Station Square ITS program will be designed and coordinated with the City of Pittsburgh for future connection.

Comment 22 (Evaluation of the Recommended Improvements): Except as noted above, it appears that the proposed improvements adequately mitigate the project impacts based on the results presented in the analysis. It should be noted that the omissions in the capacity analysis (as noted above) may be influencing the reported results and the analyzed operation of the intersection. Additionally the inclusion of the evaluation of the 2018 design year may identify additional deficiencies requiring mitigation.

Response: The expanded and updated study report includes all of the manual turning movement counts. Addendum 1 dated addresses 2018 design year conditions.

<u>Highway Occupancy Permit Issues</u>

- **This study does not include an evaluation of future conditions 10 years after the project build-out date, which is typically required by PennDOT for a highway occupancy permit (HOP) submission.**

Response: The 2018 design year analysis has been completed and is included as Addendum 1 of the expanded and updated study report.

- **The need to address the 10 year analysis as well as the various inconsistencies in the analysis (i.e. Peak Hour Factors) may result in additional mitigation requirements that will impact the HOP process.**

Response: The 2018 design year analysis has been completed and is included as Addendum 1 of the expanded and updated study report. The peak hour factors shown in the Synchro output can be seen in Volume 2 of 2 (Appendices) of the expanded and updated study report.

- **Potential widening improvements to Carson Street may be constrained by Mount Washington to the south and/or existing development to the north. Where widening is proposed, the acquisition of new right-of-way and need for retaining walls on the Mount Washington side of Carson Street should be considered.**

Response: The intent is to accomplish the additional widening of Carson Street within available ROW or utilizing land available within Station Square. During the design phase consideration will be given to the acquisition of new ROW or use of retaining walls, if that becomes necessary.

- **Insufficient information was available to adequately assess the potential impacts of proposed improvements to existing utilities. However, transportation improvements within urban locations such as the proposed site typically require extensive utility coordination and relocation.**

Response: Station Square is in a very urban setting with existing utilities located within and adjacent to the existing roadways. It is expected that utility coordination and relocations will be included in the extensive transportation program that has been proposed.

If you have any questions or require additional information, please call me at 412.476.2000, extension 1722.

Sincerely,

GAI Consultants, Inc.

for David F. Kundrat, P.E.
Project Traffic Engineer

Enclosures
DFK:MSG/ptm

Cc: Mr. Albert Federico, McCormick Taylor
Ms. Susan Hensel, PGCB
Mr. Victor Stabille, Dilworth Paxon