McCormick Taylor
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November 8, 2006

Mr. Glenn Rowe, P.E.
Pennsylvania Department of Transportation
Bureau of Highway Safety and Traffic Engineering
Commonwealth Keystone Building
400 North Street, 6th Floor
Harrisburg, PA 17105

RE: Harrah's Station Square Casino Transportation Analysis
Detailed Traffic Impact Study Review

Dear Mr. Rowe:

McCormick Taylor, Inc. has completed its detailed review of the traffic study submitted for the proposed Harrah's Station Square Casino, located in the City of Pittsburgh. The material reviewed consisted of the following:

- Harrah's Station Square Casino Transportation Analysis, prepared by DKS Associates and GAI Consultants, dated December 2005.
- Letter prepared by GAI Consultants dated October 12, 2006, responding to the Initial Review Comments, dated September 7, 2006.

This detailed review builds upon our initial review, dated September 7, 2006. Consistent with our approved scope of work McCormick Taylor conducted a project site visit; evaluated the technical elements of the traffic analysis; assessed the feasibility of constructing the various transportation improvements proposed in the study; and contacted the PennDOT District office and municipal representatives.

Project Summary

The project site is located north of Carson Street (PA Route 837), along the southwest bank of the Monongahela River within the City of Pittsburgh, Allegheny County. The project is proposed to be developed in a manner complimentarily to the existing Station Square entertainment center. The Harrah's Station Square Casino and related parking facilities are proposed to be located on the portion of Station Square that is currently occupied by the west parking lots and the Amphitheatre. Access to the gaming facility will be obtained via seven driveways, six along Carson Street (four existing and two new) and one existing driveway along Smithfield Street. The Harrah's Station Square Casino will be developed as a Class II gaming facility, inside the urban boundaries within PennDOT District 11-0.

The transportation analysis assumed the proposed gaming facility would include the following new uses:

- 4,000 slot machines (3,000 at opening, another 1,000 added later)
- Restaurants
- Retail space
- 3,100 parking spaces within two parking facilities (creating 1,815 new parking spaces at Station Square)

The following principal uses currently exist at Station Square:

- 400-room hotel and conference center,
- 269,400 square feet of restaurant, entertainment, service, and retail space among multiple buildings,
- 423,000 square feet of office space among multiple buildings,
- 90,000 square feet of Amphitheatre space and support facilities, and
- 3,785 parking spaces in surface lots and multi-level parking garages.

The following existing uses would be removed from the site:

- Amphitheatre, and
- Surface parking lots at the west end of the site

The study also notes that the Overall Master Plan Concept for the Station Square site proposes a mixed use, dense, walk-able urban environment with a mix of employment, civic and housing facilities. The concept includes the later replacement of the East Warehouse Building to include residential development. The plan notes the construction of 1,530 residential units and 50,000 square feet of neighborhood retail space. However, these uses were not considered in this study.

PennDOT and Municipal Coordination

McCormick Taylor contacted Cheryl Moon-Sirianni, PennDOT District 11-0 Assistant District Engineer for Design. Ms. Moon-Sirianni indicated that while PennDOT was very interested in the gaming projects no formal submissions had been made to the District. Further conversations with Jeff Karr ADE Maintenance and Bill Lester Permits Manager indicated that initial conversations had taken place with the applicant but only with regards to traffic impact requirements.

McCormick Taylor contacted Sidney Kaikai, Transportation Planner at Pittsburgh's Department of City Planning. Mr. Kaikai indicated that the Department had completed an in-house review, available for download on the Department's website, of the proposals for all three gaming sites in Pittsburgh. Mr. Kaikai also noted the following specific items regarding the Harrah's Station Square plan:

- The Department had serious reservations about the completeness of the Station Square traffic study, which was returned to the applicant to be expanded and reworked. The Department understands that the applicant would be submitting a revised study at a future date.
- Vehicular access to the site is considered a concern as all traffic will be required to use the local street system.
- The Department evaluated the impacts of the Harrah's Casino development but not the impacts of the Phase 2 residential, office, and retail development.
- The preliminary alignment of the Hi-Speed Maglev track would impact the "Phase 2" development.
- There are several site design concerns, including the integration of riverside access and pedestrian access to adjacent bridges. It is not clear how these connections would be made.

Site Visit

McCormick Taylor visited the location of the proposed gaming facility and the study area addressed within the applicant's impact study. The following observations were made as part of the site visit:

- Most of the traffic signal installations in the study area appeared to be in good condition.
- Some of the study area intersections appear to have recently been re-constructed.
- A wide range of travel modes and facilities converge near Station Square including: busways, light-rail, incline-rail, HOV, and pedestrian trails.
- Significant pedestrian activity associated with the existing Station Square development was observed within the site and along Carson Street.
- The existing Station Square access driveways provide minimal area for the queuing of vehicles accessing the site.
- Potential widening improvements to Carson Street may be constrained by Mount Washington to the south and/or existing development to the north.


Station Square Access at Arlington Street

- 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.

Technical Review of the Traffic Study

The applicant provided limited materials in response to the initial September 7, 2006 review. As such, the previous comments are generally considered outstanding. It should be noted that the applicant indicated that a revised study addressing the previous comments will be submitted in mid-November; however that timeframe will not permit the study to be considered as part of this review. Comments presented in *italics* were noted by the applicant as to be addressed within the pending revised study.

Approach

1. 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.*
2. 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 be include a third evaluation period: Friday evening.*
3. 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 the pending revised study will include an evaluation of this intersection.*

Data Collection

4. 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.*
5. The study did not include manual turning movement traffic count data within the technical appendix.

Trip Generation

6. 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 and assumptions is included in the technical appendix.
7. 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 mode splits.*

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

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

Analytical Approach

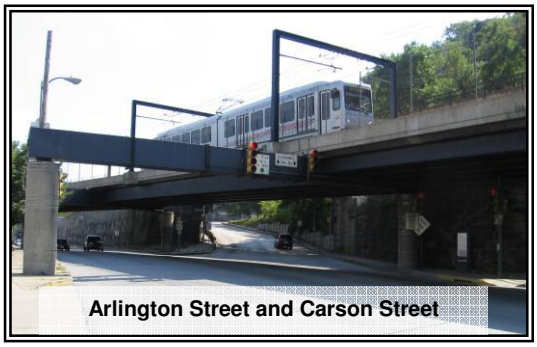
9. Verification of the base peak hour volumes and related factors utilized in the analysis could not be completed as the manual turning movement traffic count data were not provided.
10. The lane configuration and geometry of the intersections appear to be modeled appropriately for existing conditions; however several improvements proposed to mitigate traffic impacts which are noted in the body of the study do not appear to have been incorporated into the "build" condition models (i.e. additional Carson Street left turn lane at the Main Access).
11. 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 included 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.
    - Phase 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.
12. 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.

13. This 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.*
14. 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.*
15. 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.

Evaluation of the Recommended Improvements

McCormick Taylor evaluated the recommended roadway improvements identified in the Harrah's Station Square Casino Transportation Analysis. The mitigations measures proposed were reviewed for completeness and adequacy in serving the anticipated additional traffic volumes.

16. 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.


Arlington Street and Carson Street

17. The 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.
18. 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 warranty analyses.*

19. 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 intersection. This includes proper delineation, ADA accommodations, adequate crossing times, and pedestrian indications. The investigation of pedestrian count down timers may also be appropriate.


Carson Street and Smithfield Street

20. 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.
21. 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 the long-term participation and financial support of local and state agencies.
22. 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.

Highway Occupancy Permit Issues

McCormick Taylor evaluated issues that may impede the issuance of a PennDOT Highway Occupancy Permit (HOP). This investigation included preliminary assessments of apparent issues associated with right-of-way, existing structures, utility conflicts, and the constructability of the roadway improvements suggested in the study. It should be noted that PennDOT District 11-0, without having been provided any materials submitted by the applicant, was unable to provide comments regarding potential permitting issues.

- 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.
- 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.

- 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.


Carson Street Constraints

- 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.

Conclusions

Based on our review there are still issues that have not been addressed by the information submitted by the applicant. Further consideration of the project impacts would benefit from the applicant:

- Revising the traffic analysis to address previously noted technical deficiencies including expanding the study area; utilizing trip generation assumptions consistent with other urban applications; and revising capacity analyses to eliminate the use of inappropriate factors.
- Coordinating with the City and PennDOT District to establish appropriate limits, implementation criteria and funding mechanisms for the proposed Intelligent Transportation Systems (ITS) and Traffic Management Center (TMC).
- Developing a coordinated traffic signal timing plan for Carson Street that includes provisions to minimize queuing at site accesses.
- Advancing the design of the improvements to the intersection of Carson Street and Smithfield Street, including verification that sufficient right-of-way is available and that existing facilities do not present insurmountable constraints.
- Coordinating with utility providers to assess potential relocation impacts associated with roadway improvements.
- Coordinating with transit service providers to ensure the provision of integrated service to the proposed facility consistent with the anticipated hours of operation.
- Developing improvements to ensure integrated pedestrian accessibility with adjacent, complimentary uses.

I trust that this review will assist PennDOT and the Pennsylvania Gaming Control Board in their evaluation of this application. I am available if you have any questions regarding this review.

Very truly yours,

McCORMICK TAYLOR, INC.

Albert Federico, P.E., PTOE
Senior Traffic Engineer

cc: Paul Resch, PA Gaming Control Board
Paul Archibald, McCormick Taylor