December 20, 2013

Nik Kharva
Project Manager
Orth-Rodgers & Associates, Inc.
301 Lindenwood Drive, Suite 130
Malvern, PA 19355

Re: Transportation Impact Study: 3rd Submission Review
Casino Revolution, PHL Local Gaming, LLC
Philadelphia, Pennsylvania
Langan Project No.: 220057201

Dear Nik:

We received your review letter dated December 11, 2013 for the above referenced project. This letter will serve as the final Transportation Impact Study submission. The below responses address the final comments in your review letter. In addition, a copy of the excel table which shows all of the previous comments as being resolved, has been included with this letter.

1. The proposed Hollywood Casino applicant has put the construction of a new westbound I-76 On-Ramp at 7th Street on the table as a means of better traffic management for both its traffic as well as the Sports Complex area. An analysis was provided and their traffic study amended to reflect the addition of this on ramp. A cursory review of this analysis shows improvements to the local street system as well as a reduction in impacts to the existing westbound I-76 On-Ramp at Broad Street. Given the close proximity and identical use, will Casino Revolution also be willing to explore such an improvement as a means of supplementary mitigation and overall traffic management.

Response: Yes, the Casino Revolution applicant is willing to explore providing a new westbound I-76 On-Ramp at 7th Street as a means of supplementary mitigation and overall traffic management. If granted a license, the applicant will work with PennDOT and the City of Philadelphia to explore this potential improvement in more detail.

2. If the site is granted a license the applicant should be willing to investigate and provide arterial ITS implementation at various locations with the input from PennDOT and the City of Philadelphia.

Response: The Casino Revolution applicant is willing to investigate and provide arterial ITS implementation at various locations as determined by PennDOT and the City of Philadelphia, if granted a license.

3. If the site is granted a license then it is recommended that a post-development study to analyze actual casino complex trip generation and traffic operations be provided. This study should be performed approximately six months after opening and should address any unforeseen operational issues that may occur at that time. Some examples of operational

improvements could be but are not limited to, signal timing, ITS upgrades, an examination of the need for a dual right turn lane at Front Street and Pattison Avenue option, better signage and line striping upgrades.

Response: The Casino Revolution applicant will provide a post-development study, if granted a license. We understand that this study will be conducted approximately 6 months after opening. The study will analyze traffic operations and address unforeseen operational issues that may occur at that time. The study may also identify additional operational improvements, examples of which are outlined in the comment above.

4. If this site is granted a license the applicant should expect to be required to work with PennDOT, the City of Philadelphia, the Sports Teams and the Joint Toll Bridge Commission to finalize all aspects of the traffic analysis as well as the design details of the proposed improvements.

Response: The Casino Revolution applicant will work with PennDOT, the City of Philadelphia, the Sports Teams and the Joint Toll Bridge Commission to finalize the traffic analysis and design of the associated proposed improvements.

Sincerely,
Langan Engineering and Environmental Services, Inc.

Daniel D. Disario, P.E., PTOE
Principal

cc:
Daryl, R. St. Clair – PennDOT Bureau of Maintenance & Operations
Lou Belmonte – PennDOT District 6-0
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Name of Project: Casino Revolution and Hotel (PHL Local Gaming, LLC)
Submission: Traffic Impact Study

Designer: Langan (Mr. Dan Disario)
Latest Submission Date: November 22, 2013

REVIEWER INFORMATION	COMMENTS	DESIGNER RESPONSE	RESOLUTION
Orth-Rodgers & Assoc. for Engineering District 6-0 DATE: November 25, 2013 Is a resubmission required?: NO			
1. General	A Transportation Impact Study (TIS), prepared in accordance with Strike-off-letter 470-09-04 (Policies and Procedures for Transportation Impact Studies) must be submitted by the Applicant. The information submitted by the Applicant does not fully comply with PennDOT's TIS guidelines. A compliant TIS report will require vehicular/pedestrian counts at potentially impacted locations, additional trip generation/distribution methodology, existing/future capacity analysis and recommendations and conclusions. Below are components related to a TIS report (not limited to) that should be included when applicable.		
	a) A transportation impact study must be signed and sealed by a professional engineer registered in Pennsylvania.	A transportation Impact Study has been included with this submission.	**Resolved**
	b) Include an executive summary.	An Executive Summary has been included in the Transportation Impact Study.	**Resolved**
	c) All proposed driveways should be evaluated for capacity, sight distance and queuing. There are no sight distance calculations included in the report. Please use PennDOT standards for this analysis.	*All proposed driveways have been evaluated for capacity, sight distance and queuing.* 11/21/13 Response to Resolution comment: Sight distance calculations for the proposed driveways along Front Street have been included in the text of the revised study in the 'Proposed Site Access' section.	Resolved
	d) Include detailed traffic circulation within the proposed site.	Detailed distribution figures have been included in the Transportation Impact Study.	**Resolved**
	e) Provide a traffic signal warrant analysis for any proposed traffic signal locations.	A traffic signal warrant analysis has been included in Appendix I for a proposed traffic signal at the Main Casino Site Driveway along Front Street.	**Resolved**
	f) Provide crash data/history for critical intersections/roadway network. A Summary of the crash analysis can be included in the report, however, actual crash records should be included within the appendix with a confidentiality statement on the cover. It is recommended to separate the crash record appendix from the main TIS report. Please remove the actual crash data information from the main report binder and provide as a separate document with a confidentiality statement on the cover. The Crash Data Summary (Appendix I) lists the number of crashes per year but does not elaborate on the crash types and any discernible patterns for the accidents at the study intersections.	*Crash Data has been included in Appendix J of the Transportation Impact Study. A written summary has been included in the text of the report.* 11/21/13 Response to Resolution comment: The actual crash data information has been removed from the main report binder and has been included as a separate Crash Data Supplement document. We have included an additional table in Appendix J that breaks down the crashes by severity and type. Additional discussion has been included in the Crash Data section of the text.	Resolved
	g) Traffic Signal and system permit plans must be included in the traffic impact study.	All available traffic signal plans and timing plans have been included in Appendix H of the report.	**Resolved**
	h) Street view photographs and/or aerial photos of the study intersections are preferred.	Photographs and aerials have been included in Appendix B for all study intersections.	**Resolved**
	i) The trips generated from other proposed developments that may impact the project site study area must also be included in the projected trip analysis.	We are aware of no proposed developments are located within the study area.	**Resolved**

	j) Include pedestrian distribution to/from venues and provide an access evaluation. The report states there is minimum pedestrian activity currently along S. Front Street. Please elaborate on future pedestrian circulation/routes from Septa station and other Sports Complex facilities to the proposed casino site. The PHL Sports Complex Report (Appendix K) does not discuss pedestrian circulation to the proposed casino site.	*A summary regarding pedestrians has been included in the text of the report. In addition, pedestrian information can be found in the Philadelphia Sports Complex report located in Appendix K.* 11/21/13 Response to Resolution comment: Additional discussion related to pedestrian activity has been included in the 'Evaluation of Pedestrian Facilities' section of the report text. At this time, it is understood that the casino is committed to providing a shuttle to/from the sports complex venues and to the Broad Street subway station. For the minimal amount of assumed pedestrians that will be generated from offsite locations, there are existing sidewalks and pedestrian facilities located along Pattison Avenue, Packer Avenue, and S Front Street that will have direct access to the casino and hotel property.	The applicant noted the existing pedestrian facility will accommodate the 'minimal amount of assumed pedestrians'. However, the existing pedestrian activity does not translate to future pedestrian activity, since there currently is no casino to generate pedestrian trips from the sports complex. Please be advised that future pedestrian facility analysis may be required if this site is chosen. It is noted in the TIS report (pg 9) that the applicant has stated "details of the pedestrian facilities connecting the proposed casino to the Sports Complex Facilities and transit stations will be required" if the applicant is chosen. Resolved
	k) Include an analysis of pedestrian activity at the intersections within the project limits, including the Applicants proposed accesses, to determine if pedestrians are present. The determination if pedestrians are present must be based on pedestrian counts and a visual inspection of the site to determine if clearly defined walking paths exist. The results of this analysis must be utilized to determine if and where pedestrian facilities must be provided.	As part of our analysis, we did not assume an increase in pedestrian volumes based on the modal split identified in the Philadelphia Gaming Advisory Task Force Interim Report of Findings. The design of walking paths at the entrances to the casino will be determined during the design process.	Resolved
	l) Provide pedestrian capacity analysis following the 2010 HCM guidelines for the intersections that are found to be impacted by the increase of pedestrian traffic generated by the casino. Include mitigation improvements for those areas with high pedestrian traffic.	As part of our analysis, we did not assume an increase in pedestrian volumes based on the modal split identified in the Philadelphia Gaming Advisory Task Force Interim Report of Findings.	Resolved
	m) Opening year analysis must be performed for the development. Future analysis must be performed for the horizon year, i.e. 5 years beyond opening year of the development when the first structure is in use and access is constructed to the state roadway. The report must be modified to reflect the opening year and horizon year analysis for the development	There is no growth factor applied for Philadelphia County so the report did not identify separate 5 year horizon years. The report analyzed the Existing/No-Build conditions and then the Build conditions.	Resolved
	n) Queue analysis for all signalized intersection and for unsignalized left-turning lanes must be completed and stated in the report.	Queue analyses has been included in the TIS.	Resolved
	o) Auxiliary lane warrant analysis, in accordance with Strike-off-letter 470-08-07, must be included for the proposed conditions.	Auxiliary lane warrant analysis has been provided in Appendix I.	Resolved
	p) Include a gravity model (a graphic is preferred).	A gravity model has been included in Appendix E.	Resolved
	q) Do not use default values on the traffic analysis inputs (saturation flow rates, utilization rates, etc.). Where existing traffic and pedestrian data is collected, actual values should be used.	Actual values were identified and used within the analysis.	Resolved
	r) A level of service Matrix per lane group must be provided; including numerical delay value.	A level of service matrix has been included in the TIS.	Resolved

	s) The site accesses must function at a minimum level of service D for Urban areas. Mitigation measures or restricted movements from deficient operation locations may be required to meet guidelines.	All site accesses identified in the TIS operate at a minimum level of service D or better.	**Resolved**
	t) All HCS and/or Synchro analysis worksheets and electronic files must be included for review.	Acknowledged.	**Resolved**
	u) All calculations and methodology must also be included in the report to justify the analysis and results.	All calculations and methodologies used in determining our results have been included in the TIS.	**Resolved**
	v) The report should include conclusions and recommendations. Please note that the Developer/Applicant is responsible for mitigating all impact resulting from the proposed development, unless there is another project under construction that will provide mitigation.	The TIS includes the requested sections.	**Resolved**
	w) If the recommendations include the elimination of existing on-street metered parking spaces, a revenue loss evaluation should also be provided.	Not applicable.	**N/A**
	x) Include taxi and bus operation/circulation to/from the site.	All distribution patterns have been included in the TIS.	**Resolved**
2. Trip Gen/Dist.	*Trip rate (trip per gaming positions) should be based on the average of no less than three existing casinos of comparable design and location. The three casinos listed below are valid examples of existing casino locations in metropolitan areas. If trip rates are based on a different methodology please provide justification. a) Sugarhouse Casino (Philadelphia, PA), b) Casino St. Charles (St. Louis, MO), c) Hollywood Casino (Columbus, OH)* Three casino trip rates were provided. The trip rates used for this report were noted as: Friday Commuter Peak Rate(0.43), Friday Casino Peak Rate(0.29), and the Saturday Casino Rare(0.50). Trip rates for two time periods were not in range of the other applicants' rates that have proposed sites in the Stadium District. In addition, two of the three Langan trip rates were significantly lower. Therefore, please update the trip rates for the two time periods, to be consistent (and conservative) with the rates used by the other applicants: Please use Friday Casino Peak Rate = 0.46 and Saturday Casino Peak Rate = 0.58	*Trip Generation rates for the proposed Casino Revolution were based on an average of three casinos: Casino St. Charles, Sugarhouse Casino and Parx Casino. All calculations have been shown in the TIS.* 11/21/13 Response to Resolution comment: Based on e-mail correspondence with Fran Hanney at PennDOT District 6-0 on 11/15/2013, the department stated that we had to update only one of our trip rates. It was determined that we should revise our study to show a Friday Commuter Peak Rate of 0.41 instead of 0.29. The Friday Casino Peak rate of 0.43 and Saturday Casino Peak rate of 0.50 were deemed to be acceptable. This report has been revised to reflect the changes to the Friday Commuter Peak Rate. All figures, trip generation calculations, capacity analysis, etc. have been updated and included in the respective sections of the report. In addition, the e-mail correspondence with PennDOT has been included in Appendix G.	Resolved
3. Phila. Gaming Ad.	The "Executive Summary of the Interim Report of Findings" by the Philadelphia Gaming Advisory Task Force documents should be utilized as a guide to develop trip methodologies. Data is provided for casino visitation patterns by time of day (page 15, table 3) and mode of arrival splits (page 16, graph 2). All analysis, calculations and back up data must be included in the report.	The identified report was used as a guide in calculating our trip generation rates.	**Resolved**
4. Time of day requirement	The Philadelphia Gaming Task Force document states that a casino's Friday visitation peak time is different from the Friday rush hour time (commuter peak). The TIS reports should analyze both critical weekday and weekend peak time periods. Therefore, the following should be analyzed: a) Friday evening commuter peak hours (between 4-6PM, all non-event intersections), b) Friday evening with pre-Phillies event peak hour (all intersections), c) Friday Casino peak hour (between 7-10PM, only for intersections on Packer Avenue from S. Broad St. to Front St. and intersections on S. Front St. at the I-95 ramps), d) Saturday casino peak hour (only for intersections on Packer Avenue from S. Broad St. to S. Front St. and intersections on S. Front Street at the I-95 ramps).	All identified time of day requirements were analyzed as requested.	**Resolved**
Traffic Impact Study 1	The following are a list of intersections that the applicant should include in the study area. These locations are based on the Langan study area from the "Philadelphia Sports Complex Parking and Traffic Management Plan" report, September 21, 2010. The applicant is responsible to use this study as the basis for their evaluation. 1) Penrose Avenue and Pattison Avenue 2) Pattison Avenue and S. Broad Street (Southbound) 3) Pattison Avenue and S. Broad Street (Northbound) 4) Pattison Avenue and S. 11th Street (Friday scenario with event only) 5) Pattison Avenue and S. Darien Street 6) Pattison Avenue and S. 7th Street 7) S. Broad Street (NB & SB) and Packer Avenue 8) S. Broad Street (NB & SB) and Pollock Street 9) Packer Avenue and S. 10th Street 10) Packer Avenue and S. Darien Street/I-76 Eastbound Off/On Ramps	The above listed intersections were included as part of the study area.	**Resolved**

	11) Packer Avenue and S. 7th Street 12) Packer Avenue and S. Front Street 13) S. Front Street and I-76 Eastbound On Ramp (unsignalized intersection) 14) S. Front Street and I-76 Westbound Off Ramps/I-95 Southbound On Ramp 15) S. Front Street and I-95 (SB Off/NB On Ramps)/Dunkin Donuts Driveway 16) S. Broad Street (NB) and S. 11th Street (Friday Scenario with event only) 17) S. Broad Street (SB) and I-95 SB Off Ramp 18) S. Broad Street (NB) and I-95 SB On Ramp 19) W. Oregon Avenue and S. Broad Street 20) I-95 SB and Exit 17 Off Ramp (Broad Street/Pattison Avenue) - Unsignalized Intersection 21) I-95 SB Off Ramp (Exit 19) and WB Packer Avenue - Unsignalized Merge Condition	(continued from above row)	Resolved
2	Applicant will need to coordinate their analysis with the existing operation plan for the sports complex facilities. For the analysis of all event periods, the TIS shall include details of the current operation plan. If any proposed changes to the plan are recommended, it shall be clearly noted in the TIS. All information related to the existing operation plan for the sports complex facilities can be obtained from the Philadelphia Streets Department by contacting the Chief Traffic and Street Lighting Engineer.	The sports complex plan was reviewed as part of the TIS. At this time there are no recommended changes to the plan.	Resolved
3	*Provide detailed pedestrian access information to/from each of the existing Sports Complex venues to the applicant's site.* Same response as for above Comment 1.j: The report states there is currently minimum pedestrian activity along S. Front Street. Please elaborate on future pedestrian circulation/routes from Septa station and other Sports Complex facilities to the proposed casino site.	*A summary regarding pedestrians has been included in the text of the report. In addition, pedestrian information can be found in the Philadelphia Sports Complex report located in Appendix K.* 11/21/13 Response to Resolution comment: Additional discussion related to pedestrian activity has been included in the 'Evaluation of Pedestrian Facilities' section of the report text. At this time, it is understood that the casino is committed to providing a shuttle to/from the sports complex venues and to the Broad Street subway station. For the minimal amount of assumed pedestrians that will be generated from offsite locations, there are existing sidewalks and pedestrian facilities located along Pattison Avenue, Packer Avenue, and S Front Street that will have direct access to the casino and hotel property.	It is noted in the TIS report (pg 9) that the applicant has stated 'details of the pedestrian facilities connecting the proposed casino to the Sports Complex Facilities and transit stations will be required' if the applicant is chosen. The applicant noted the existing pedestrian facility will accommodate the 'minimal amount of assumed pedestrians'. However, the existing pedestrian activity does not translate to future pedestrian activity, since currently there is no casino to generate pedestrian trips from the Sports Complex. Please be advised that future ADA compliant facility will be required for effective pedestrian circulation in the area. Resolved
4	The applicant shall refer to the previous Langan Report as the underlying basis for the parking and traffic analysis of the proposed project site. Use the Sports Complex boundaries as indicated in the Langan Report for the study area. Using the previous report, integrate the site's trip generation/distribution into the existing traffic management strategy plan (Langan Report dated September 21, 2010).	Acknowledged.	Resolved
5	*Due to the location of the proposed site, casino patrons would be required to walk at least one mile to the site from the AT&T (formerly known as Pattison) subway station. If the Applicant is anticipating subway usage for casino patrons and staff, please note if any shuttle bus service and/or other transportation linkage will be provided given the significant distance to the site. Based on the distance from the site to the station, it is not expected that the subway alone would be a viable transportation option.* The Interim Report states 0% pedestrian however it states a 2% public transit (for South Delaware area) which could translate to pedestrians from transit mode of arrival. Please provided justification that patrons/casino staff would not utilize the subway station due to its proximity to the proposed site. Report notes that shuttle service from the stadium area could be provided to the proposed site. Would this also include a shuttle service from the subway station? Please elaborate.	*The revised Transportation Impact Study did not assume that pedestrians would walk to the site from the subway station. The pedestrian modal split of 0% was used as identified in the Interim Report of Findings.* 11/21/13 Response to Resolution comment: At this time, it is understood that the casino is committed to providing a shuttle to/from the Broad Street subway station to accommodate the patrons/casino staff that will utilize the subway in addition to the shuttle for the stadium area.	Resolved

Additional TIS Comments			
6	The report indicated a 70% reduction of hotel trips. Please provide additional justification.	It is our engineering judgment that a hotel located at a casino is primarily associated with casino patron demand. Based on the location of this casino/hotel, it does not appear that a majority of the hotel business would come from non-casino patrons. We assumed a more conservative rate than what was used in the approved SugarHouse Traffic Impact Study (assumed 80%) and feel that a 70% internalization for the hotel use is justified. It should be noted that regardless of the internal capture rate used for the hotel use, there will be no significant impact on the results that we have reached because the trip generation for a 250 room hotel is minimal as compared to the casino trip generation.	Resolved
7	Trip generation was not provided for the other proposed amenities (restaurants, night clubs, etc.). Justification should be provided for trip generation of the additional on-site amenities. The assumption that the bar, restaurant, retail, and multi-purpose space will not generate additional trips seems erroneous.	Based on e-mail correspondence with Fran Hanney at PennDOT District 6-0 on 11/15/2013, the department stated that additional trip generation is not required for ancillary components of the casino (restaurants, clubs, etc.). We have added a write-up in the Trip Generation section of the revised study stating that the three casinos used to develop trip rates had comparable ancillary components and therefore ancillary trips are already incorporated into the calculated trip rates.	Resolved
8	The intersection of Packer Ave & South Front Street during the 'with improvements' condition shows delay values worse than 'without improvements'. This could happen due to redistribution of trips in the model. Please review to make sure the model is accurate, if not, please update the model and the output data.	The submitted levels of service and delays associated with the model are accurate. The 'with improvements' scenario at the intersection of Packer Avenue & South Front Street proposes an additional northbound left-turn advance phase in order to mitigate queuing for that approach. In addition, more green time will be given to the Front Street approaches. Certain movements will experience an increase in delay, however, the proposed improvements will mitigate the potential queuing that is shown in the build conditions without the improvements. The overall intersection LOS gets slightly better in all scenarios with the exception of the Saturday peak hour, which shows a 0.5 sec increase in overall delay.	Resolved
9	In the List of Figures, the Figure Titles are not labeled correctly for Figures 21 to 25.	The List of Figures has been revised to show the correct labels for Figures 21 to 25.	Resolved
10	Traffic signal timing improvements along the Packer Ave, Pattison Ave and S. Front St corridors should be recommended to improve corridor traffic flow; not just individual signals along these corridor streets.	This report addresses impacts that are directly associated with the proposed Casino Revolution development. We identified the intersections that warrant mitigation according to PennDOT standards. Traffic signal timing modifications at all of the intersections within the roadway network can be optimized at a later date if this application is chosen. We will be able to use our model to develop traffic signal timings along the corridor streets with input from PennDOT and the City of Philadelphia. At this time, the TIS addresses only those intersections requiring mitigation based on significant operations changes.	The applicant has noted "Traffic signal timing modifications at all of the intersections within the roadway network can be optimized at a later date if this application is chosen." Resolved
11	Pedestrian Facility and Circulation comments: a) Based on the illustration of the proposed surface parking lot "C", please recommend a pedestrian facility/route to the casino. b) All surface pedestrian crossings should be routed to signalized intersections and mid-block crossings should not be proposed. c) Please note, if applicant is granted a permit, details of pedestrian facilities connecting the proposed site to the other Sports Complex Facilities/transit station will be required at a later date.	a) Surface parking lot "C" is currently proposed to be an overflow valet parking lot. Therefore, it is not intended to have casino patrons walking to/from this location. Casino self-park patrons will utilize the parking garage and surface parking lot "B". For the valet attendants going to/from surface parking lot "C", they can use the existing pedestrian facilities at the intersection of S Front Street and Packer Avenue and travel along S Front Street to access the site. b) There are no proposed mid-block crossings associated with this development. Pedestrian crossings and accommodations will be provided at the proposed Main Site Driveway traffic signal. c) We acknowledge that a more detailed pedestrian circulation plan will be required at a later date if this application is chosen.	Resolved

12	At the proposed driveway traffic signal, please provide illustration on detailed lane assignment (line striping/lane configuration) for all approaches. Please elaborate on any excessive queuing at this intersection.	A preliminary concept plan for the signalized Main Site Driveway has been included in Appendix A. The concept plan illustrates proposed lane assignments and lane striping. Based on the capacity analysis, it does not appear that there will be excessive queuing at the intersection of Front Street and the Main Site Driveway. The highest queue for the eastbound driveway approach is shown as 168' in the Saturday condition, which can be accommodated within the available storage without backing up to the parking garage. In addition, the proposed storage lengths for the northbound left-turn lane and the southbound right-turn lane can both accommodate the projected queues in all scenarios.	An actual traffic signal plan will be required for this location if the applicant is chosen. Resolved
13	Please note that due to the location of the unsignalized site driveways (off S. Front Street), exiting left turning vehicles may conflict with street traffic and left turn queues for the proposed traffic signal. If applicant is chosen, at a future date, additional studies for placement of driveways and a traffic gap study may be required at these driveway locations.	Acknowledged. We understand that an additional driveway location analysis and gap study may be required in the future if our application is chosen.	Resolved
14	Gaming facilities may qualify for supplemental signs under the "PennDOT's Guidelines for Casino Signing" program.	Acknowledged.	Resolved