

December 11, 2013

Mr. Frank Montgomery, PE, PTOE  
Traffic Planning and Design, Inc.  
2 Riverside Drive, Suite 506  
Camden, NJ 08103

**RE: Traffic Impact Study: 3<sup>rd</sup> Submission Review  
The Provence by Tower Enterprise, LLC**

Dear Mr. Montgomery:

Orth-Rodgers & Associates, Inc. (ORA) on behalf of the PA Gaming Control Board has finished the second review for the traffic impact study submitted for the proposed The Provence by Tower Enterprise, LLC. The review has been completed with collaboration and feedback from the Pennsylvania Department of Transportation (District 6-0) and the City of Philadelphia.

Our findings indicated the report reasonably met the guidelines contained in the Policies and Procedures for Transportation Impact Studies. The TIS review correspondence is provided in the attached document.

Below are our final comments on the Traffic Impact Study. Please have your responses to these comments and the final version of the Traffic Impact Studies completed and submitted by December 20, 2013.

- In further review of the trip generation (Appendix D) in the TIS has come into question regarding a higher transit mode reduction than recommended by the Task Force document for a Center City casino location. In addition, reductions in trips were also applied to pedestrian and shuttle service that were higher than the recommendations given in the Task Force document. The TIS report offers justification for these trip reductions but can be speculated. In addition, the trip reduction percentage does not add up to the actual trip reduction that was provided in the trip generation document. Even with the discrepancies with the trip generation data, the outcome may still be the same. The recommended improvements along the local streets may not be feasible at these locations. The next bullet point will go into detail at these locations.
- The Traffic Impact Study and responses to our last review make recommendations for improvements to the intersections of N. 15<sup>th</sup> Street and Vine Street Local as well as Vine Street Local and N. Broad Street. After further review it appears that many of those improvements already exist as operational peak hour conditions that have been implemented by the City Streets Department. Others appear to be challenging to construct or of lesser benefit. Accordingly, please investigate the feasibility of providing dual SB lefts on Broad Street to access EB Vine Street. Overhead and possibly active lane control may be necessary to achieve this due to the impracticality

of physically widening the roadway and thus the need to vary lane assignments. Evaluate the operational condition of EB Vine Street from 15<sup>th</sup> thru Broad Street for lane utilization, signage, ITS or other operational improvements to better manage the traffic flow through this section of Vine Street and the two intersections. Explore the possibility of formally striping the I-676 Off Ramp as two lanes with overhead signing to handle additional volumes as well as assign vehicles to the more efficient lane based on destination. Explore the proposed SB 15<sup>th</sup> Street right turn lane at Vine Street along with the possible need for dual right turn lanes. This improvement will be challenging as Vine Street at 15<sup>th</sup> appears to be on Structure due to the off ramp. Further up 15<sup>th</sup> Street it is not on structure and appears to be just a grass median. This movement is critical to accessing the proposed casino from the WB Vine Street expressway off ramp. We realize that there is not time to fully explore these improvements prior to the required final submission date of December 20<sup>th</sup>. Accordingly, indicate the applicant's willingness to fund such improvements if they are deemed practically feasible and beneficial.

- 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. Some examples of operational improvements could be but are not limited to detailed exploration of upgrading signing, pedestrian facilities, trailblazer signs and potential ITS upgrade along the major trip distribution routes along the Callowhill Street and Vine Street corridors to and from I-676 and I-95.
- 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.
- If this site is granted a license the applicant should expect to be required to work with PennDOT and the City of Philadelphia to finalize all aspects of the traffic analysis as well as the design details of the proposed improvements.

If you have any questions pertaining to the technical aspects of this review, or if you are uncertain about how to address any portion of the indicated comments, please contact Francis Hanney, Traffic Services Manager at PA Department of Transportation District 6-0 at 610-205-6560 or at [fhanney@state.pa.us](mailto:fhanney@state.pa.us) for assistance or comment clarification. The Department as well as Orth-Rodgers have set aside December 12th, 13th and 16th should you or any of the applicants require a meeting to discuss the final report.

Respectfully,



Nik Kharva, PE, PTOE  
Project Engineer

***Casino - Transportation Impact Study***  
***3<sup>rd</sup> Submission Review***

Attachment

cc:

Daryl, R. St.Clair – PennDOT Bureau of Maintenance & Operations

Lou Belmonte, PE – PennDOT District 6-0

Francis Hanney – PennDOT District 6-0

Ashwin Patel, PE – PennDOT District 6-0

Manny Anastasiadis – PennDOT District 6-0

N.B. Patel, PE – PennDOT District 6-0

Richard J Montanez, PE – City of Philadelphia

Charles J. Denny, PE - City of Philadelphia

Kisha Duckett, EIT – City of Philadelphia

Steve Bolt, PE, PTOE - Orth-Rodgers & Associates, Inc.



Pennsylvania Department of Transportation  
 Engineering District 6-0  
 7000 Geerdes Boulevard  
 King of Prussia, PA 19406-1525  
 Phone: 610-205-6661

Name of Project: Provence Casino  
 Submission: Traffic Impact Study

Designer: Traffic Planning & Design, Inc.  
 Resubmission Date: December 3, 2013

REVIEWER INFORMATION	COMMENTS	DESIGNER RESPONSE	RESOLUTION
Orth-Rodgers & Assoc. for Engineering District 6-0 DATE: December 4, 2013 Is a resubmission required?:		Responses associated with updated TIS in November 2013	
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.	The revised transportation impact study (TIS) has been signed and sealed by a professional engineer registered in Pennsylvania.	Resolved
	b) <i>Include an executive summary.</i>  An executive summary was included. However, it should provide impacts of the proposed development, proposed methods of mitigation, design waivers requested, and financial responsibilities as per the Policies and Procedures for Transportation Impact Studies.	An executive summary is included in the revised TIS.  The Executive Summary has been updated accordingly.	Resolved
	c) <i>All proposed driveways should be evaluated for capacity, sight distance and queuing.</i>  Access point capacity has been addressed. There is a statement noting that the site access points will be designed to achieve minimum safe stopping sight distance. There should be calculations within the report stating what these minimum distances are and what the available sight distance will be if the casino is built. The queue summary in the Appendices does not state what methodology was used to determine queues or the available storage lengths for each movement.	TPD has provided a statement regarding the available sight distance at the proposed driveways for the Provence development access driveways. Additionally, TPD has determined all driveways will operate at LOS D or better, all are unsignalized access points along one-way streets, and that exiting queues will be managed on site.  In the revised TIS, TPD utilized SYNCRHO 95th percentile methodology for queuing and has included storage lengths in the tables. Additionally, TPD will include a discussion that the Applicant must provide the minimum safe stopping sight distance requirements for 25 mph for all site access points when conducting final design for each access point.	Resolved

	d) Include detailed traffic circulation within the proposed site.	A detailed traffic circulation description is included in the revised TIS.	Resolved
	e) Provide a traffic signal warrant analysis for any proposed traffic signal locations.	A traffic signal warrant analysis is included for the Callowhill Street/16th Street intersection is included in the revised TIS.	Resolved
	f) <i>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.</i>  It is shown in Table 2 that the intersection of Callowhill Street and N. Broad Street had 8 reportable crashes in 2010. Are there any corrective safety measures that can be included with this project to enhance the safety of this intersection. Crash analysis should also be conducted at the intersections of Broad Street and both directions of Vine Street (local). Significant development traffic is routed through these intersections.	<i>A crash data summary is included in the revised TIS and the records are included under separate cover.</i>  In the revised TIS, TPD has recommended capacity, operational, and pedestrian facility improvements at the intersection of Callowhill Street and North Broad Street intersection. TPD included crash analysis data for the intersection of Broad Street and Vine Street (local). TPD has also identified improvements at this intersection to include relocating NJ TRANSIT and SEPTA bus stops on northbound Broad Street and striping the northbound approach to include a right turn lane to help with operations and capacity at the intersection.	Resolved
	g) Traffic Signal and system permit plans must be included in the traffic impact study.	Traffic Signal Permit plans received by TPD are included in the revised TIS.	Resolved
	h) Street view photographs and/or aerial photos of the study intersections are preferred.	Aerial photographs of the study area intersections are included in the revised TIS.	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.	The revised TIS includes traffic from three nearby developments.	Resolved
	j) Include pedestrian distribution to/from venues and provide an access evaluation.	A pedestrian distribution figure is included in the revised TIS.	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.	TPD has included observed and future pedestrian volumes on our schematic figures contained in the report. Additionally, TPD has included a section that discusses where pedestrian access points are located and the future pedestrian circulation on site.	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.	TPD has included the existing and future pedestrian volumes in our capacity analysis calculations and has also identified pedestrian improvements associated with the proposed development.	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.	Opening year analysis would represent an interim analysis after completion and occupancy of a phased development. It is our understanding the Provence is planned to be constructed in one single phase. For this reason, and also, since the recommended traffic growth within the City is 0.0%, no opening year analysis was completed, since it would garner the same results as the design year evaluation.	Resolved

	<p><i>n) Queue analysis for all signalized intersection and for unsignalized left-turning lanes must be completed and stated in the report.</i></p> <p>The queue analysis does not state what methodology was utilized. Calculate storage using the method in Pub 46, Chapter 11.16 and also using the 95th percentile queue from an accepted traffic engineering software package. Available storage lengths should also be provided in the report.</p>	<p><i>Queue analyses for the study area are included in the revised TIS.</i></p> <p>TPD has revised the queue summary in the revised TIS to include storage lengths and identified that the SYNCHRO 95th percentile methodology was utilized per direction in Pub 46. Storage length for the proposed turn lane on Broad Street was calculated using Pub 46 methodology. However, given the constraints, the length was recommended based on the 95th percentile queue.</p>	<p>Thought eastbound Local Vine Street and Broad Street is an off site intersection. It is evident this intersection is critical for the circulation of casino traffic. If applicant is chosen additional review of this intersection (and other critical nodes) may be required, at a later time, to further analyze potential intersection improvements, with City of Philadelphia coordination. Resolved</p>
	<p><i>o) Auxiliary lane warrant analysis, in accordance with Strike-off-letter 470-08-07, must be included for the proposed conditions.</i></p>	<p>An auxiliary turn lane analysis is included in the revised TIS.</p>	<p>Resolved</p>
	<p><i>p) Include gravity model (a graphic is preferred).</i></p>	<p>A gravity model for the vehicular traffic based on daily traffic volumes is contained in the revised TIS. Also, a gravity model for pedestrians based on population data is included in the revised TIS.</p>	<p>Resolved</p>
	<p><i>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.</i></p>	<p>Actual data at each study area intersection was utilized for analysis purposes, aside from the saturation flow rate, for which the default value was utilized as directed in Comment 7 under Traffic Impact Study.</p>	<p>Resolved</p>
	<p><i>r) A level of service Matrix per lane group must be provided; including numerical delay value.</i></p> <p>The site access points were not included in the LOS summaries.</p>	<p>A Level of Service matrix is included in the revised TIS.</p>	<p>Site access LOS table is provided. Queue lengths should have been included within this table for additional review. LOS values are in the acceptable range and most movements are along one-way streets. Resolved</p>
	<p><i>s) The site accesses must function at a minimum level of service D for Urban areas. Mitigation measures or restricted movements from deficient operations locations may be required to meet guidelines.</i></p> <p>The site access points were not included in the LOS summaries.</p>	<p><i>A Level of Service matrix is included in the revised TIS.</i></p> <p>TPD has included the site access points in a separate LOS summary in the revised TIS.</p>	<p>Resolved</p>

	<p>t) All HCS and/or Synchro analysis worksheets and electronic files must be included for review.</p> <p>The printouts included in the Appendix should provide input data such as Sat. Flow, Lane Width, Grade, PHF, T%, turn lane lengths, etc.</p>	<p>All HCS and Synchro worksheets are included in the revised TIS.</p> <p>TPD has included the additional worksheets requested in the revised TIS.</p>	Resolved
	<p>u) All calculations and methodology must also be included in the report to justify the analysis and results.</p>	<p>All calculations and methodology are described and noted in the revised TIS.</p>	Resolved
	<p>v) The report should include conclusions and recommendations. Please note that the Developer/Applicant is responsible for mitigating all impacts resulting from the proposed development, unless there is another project under construction that will provide mitigation.</p> <p>Resolved. However, the recommendations may need to be updated due to existing comments.</p>	<p>The revised TIS includes conclusions and recommendations.</p> <p>TPD has updated the recommendations in the revised TIS per adjustments to the TIS.</p>	Resolved
	<p>w) If the recommendations include the elimination of existing on-street metered parking spaces, a revenue loss evaluation should also be provided.</p>	<p>TPD has included an analysis of the amount of parking proposed to be removed as part of this development. It is TPD's understanding that a fiscal analysis of revenue loss will be performed as part of this application by a financial consultant.</p>	Resolved
	<p>x) Include taxi and bus operation/circulation to/from the site.</p>	<p>TPD has included a section that discusses taxi and bus operations for the proposed site.</p>	Resolved
2. Trip Gen/Dist.	<p>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 casinos location 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)</p>	<p>Trip generation counts were conducted at three (3) local urban casinos, including SugarHouse Casino, Sands Bethlehem, and Harrah's Philadelphia. Specifics regarding the Trip Generation methodology are included in Appendix D of the revised TIS.</p>	<p>Originally marked as resolved, however discrepancies in the trip generation were noted. The results for the recommendations may yield additional degradation to the road network, specifically the two intersections: 15th Street and Vine St Local WB and Broad Street and Vine Local EB. Please see additional comment on review letter.</p> <p>Resolved</p>
3. Phila. Gaming Ad.	<p>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.</p>	<p>The "Executive Summary of the Interim Report of Findings" by the Philadelphia Gaming Advisory Task Force was utilized in developing the trip generation for the proposed Providence. Specifics regarding the Trip Generation methodology are included in Appendix D of the revised TIS.</p>	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), b) Friday Casino peak hour (between 7-10PM), c) Saturday casino peak hour	The revised TIS includes data at all study area intersections for the time periods noted above.	Resolved
Traffic Impact Study 1	In addition to the fourteen (14) intersections in the previously completed traffic impact study, the intersections that the applicant should also include in the study due to their proximity to the site and potential impacts are: a) Franklin Town Blvd and Vine Street, b) 17th Street and Vine Street, c) 17th Street and Spring Garden Street, d) 16th Street and Vine Street, e) 13th Street and Vine Street, and f) 13th Street and Callowhill Street.	The six additional intersections listed above have been included in the revised TIS.	Resolved
2	Evaluate and comment on the concept of connecting the I-676 Off Ramp, located just south of the Applicant's site, to Callowhill Street.	TPD has included an evaluation of this alternative in the revised TIS.	Resolved
3	Evaluate and comment on the feasibility of connecting the I-676 On/Off Ramps to Callowhill.	TPD has included an evaluation of this alternative in the revised TIS.	Resolved
4	Identify the removal of any public parking spaces and loading zones. If applicable provide the net revenue loss due to the reduction of existing metered parking spaces.	TPD has included an analysis of the amount of parking proposed to be removed as part of this development. It is TPD's understanding that a fiscal analysis of revenue loss will be performed as part of this application by a financial consultant.	Resolved.
5	Provide an updated internal circulation diagram for the site. The one provided in the report (Figure 2 - Site Plan) shows conflicting and/or unclear movements and may require an update. Based on the data provided in this graphic it is unclear as to how the overall vehicular access will operate. All possible movements should be depicted and any ramps or access points to multi-level parking facilities should be clearly labeled. In addition the site's access and its potential impact on the I-676 Ramps should also address the impact on the currently one-way condition on Callowhill Street and clearly note any proposed changes to those existing conditions.	TPD has provided a section on the site access and circulation in addition to more detailed site plans located in the attached Figures 2A-D.	Resolved
6	Trip generation percentages were provided in the report; however, a diagram of the distribution was not provided. Provide a gravity model diagram to and from the site. In addition, please show how access to I-95 is provided using local streets as an alternative to I-676.	A figure depicting the traffic distribution is included in the revised TIS. A gravity model for the vehicular traffic based on daily traffic volumes is contained in the revised TIS. Also, a gravity model for pedestrians based on population data is included in the revised TIS.	Resolved
7	It is recommended for this site to update the Synchro default saturation flow rate. Use saturation flow rate of 2100 to accurately model the rates in the City. Additionally, pedestrian crossing data must be accurately input into the analysis to properly account for vehicular delays associated with increased pedestrian crosswalk utilization.	The analyses have been updated to include the default saturation flow rate of 2100, as noted above. Additionally, pedestrian data has been included in the capacity analyses in the revised TIS.	Resolved

8	Future capacity analysis was based on the 2020 base condition (Design year without development) and 2020 Projected condition (Design year with development). However, additional future analysis must be performed for a Horizon Year (based on PennDOT's guidelines) 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 will require the Open Year 2015 analysis.	Opening year analysis would represent an interim analysis after completion and occupancy of a phased development. It is our understanding the Provence is planned to be constructed in one single phase. For this reason, and also, since the recommended traffic growth within the City is 0.0%, no opening year analysis was completed, since it would garner the same results as the design year evaluation.	Resolved
9	In Appendix C it was indicated that an internal capture rate of 75% was utilized. Please provide additional information/calculations to validate the internal capture rate.	Based on the traffic counts conducted at a nearby casino with mixed uses, TPD has verified the 75% interaction. Specifics regarding the Trip Generation methodology are included in Appendix D of the revised TIS.	Resolved
Additional TIS Comments			
10	On page 3 in the parking removal section, bullets 3 and 4 mention the same block but have different measurements.	TPD has revised the report accordingly.	Resolved
11	Instead of assuming that a parking space is 22 feet in length, some areas actually have parking meters such as on Callowhill Street between 15th Street and Broad Street. The north side has 19 spaces and the south side has 10 spaces.	TPD has revised the report accordingly.	Resolved
12	In the arrival/departure distributions, why does the 5% arriving from the east along Vine Street (orange) leave to the west along Vine Street (orange)?	TPD acknowledges the east and west distributions were reversed (4% and 5%, respectively). However we maintain that it results in a volume change of 5 vehicle trips or less during the Friday PM, Friday evening, and Saturday evening peaks; and therefore, will not impact the conclusions or recommendations of the traffic study.	Resolved
13	In the Synchro model at the intersection of North 15th Street and Spring Garden Street, the southbound approach should be a left turn and through/right turn, not a left turn and a through lane.	Although the right turn was not explicitly coded in the analysis, the SYNCHRO software assumes the shared right coding since the right turn volumes were included. As such, there are no LOS changes.	Resolved
14	In the Synchro model at the intersection of Broad Street and Vine Street WB, on Friday and Saturday evening, the SB approach has three throughs and a through/right turn lane. Is there parking allowed at these times in which the SB approach should be two throughs and a through/right turn lane.	There are technically three approach lanes (and three receiving lanes) on Broad Street at the approach of this intersection, as TPD modeled the current parking restrictions in the field.	Resolved
15	In the Synchro model at the intersection of North 15th Street and Vine Street EB, the EB approach should be two throughs for Vine Street and there should be an additional EB link with two throughs and two right turn lanes for the expressway ramp. It is coded as 6 lanes on Vine Street.	TPD has analyzed the intersection with the recommended coding and has determined that no conclusions have changed. The ILOS have not degraded more than ten seconds for any condition. The backup data for this updated analysis are contained in Appendix J of the revised report.	Resolved
16	In the Synchro model at the intersection of Broad Street and Spring Garden Street, the southbound approach should be a left turn lane, two through lanes, and a through/right turn lane.	There is a taxi stand on southbound Broad Street below the intersection with Spring Garden Street that eliminates the receiving lane for traffic traveling through the intersection. Therefore, TPD maintains the lane configurations as contained in the TIS.	Resolved

17	At the intersection of Vine Street EB and 15th Street, during the PM peak hour, the overall intersection delay increases by 16.9 seconds (> 10 sec.) and the southbound left turn goes from an LOS B to an LOS E. Is there anything that can be done to mitigate these degradations.	TPD originally analyzed this intersection as a combined intersection with one controller as it exists in the field and the ILOS delay does not exceed 10 seconds. However, when analyzing as two separate intersections, the ILOS does degrade by more than 10 seconds. TPD recommended phasing improvements at this location to improve overall operations. It is also important to note that despite the >10 second increase, the overall ILOS is a D, which is considered a marginal degradation in an urban setting.	Resolved
18	At the intersection of Vine Street EB and Broad Street, during the PM peak hour, the northbound right turn movement goes from an LOS E to an LOS F (193.4). Is there anything that can be done to mitigate this degradation.	TPD met with the Philadelphia Streets Department in the field to observe operations at this intersection and determine potential improvements. TPD recommended several possible capacity improvements, however they were determined not to be feasible. Therefore, TPD has recommended relocating the NJ TRANSIT and SEPTA bus stops along southbound Broad Street at its approach to Vine Street to improve traffic flows in this area. Additionally, TPD has recommended to stripe the northbound Broad Street curb lane as a right turn only lane. Although this modification does not improve the delay in the SYNCHRO analysis, TPD feels it will improve operations and safety at this location. TPD has included that analysis and results in the report in a section entitled Field Conditions Review (Section VIII.C.g).	Same comment as in above row "1. General (n)". Resolved
19	Please provide a CD with the Synchro file with the next submission.	Will comply.	Resolved
20	Gaming facilities may qualify for supplemental signs under the "PennDOT's Guidelines for Casino Signing" program.		Resolved