



ENGINEERING SUCCESS TOGETHER

MEMORANDUM

Date: May 22, 2012
To: Mayor Thomas C. Hoye, Jr.
From: Kien Y. Ho, PE, PTOE
Jason DeGray, PE, PTOE
Subject: Project First Light, Taunton, MA
Traffic Study Peer Review

BETA Project #: 4242

BETA Group, Inc. (BETA), on behalf of the City of Taunton (City), has prepared this technical memorandum to document our peer review findings regarding the traffic impacts of the Mashpee Wampanoag Tribe's destination resort casino proposal (Project). As a peer review consultant for the City of Taunton, our goal is to ensure that the traffic study submitted in support of the Project has been prepared according to industry standards and accurately portrays potential impacts.

Our peer review is summarized in this memorandum into the following components.

1. Trip Generation and Distribution
2. Study Area
3. Data Collection
4. Traffic Analysis
5. Mitigation

The scope, methodology and thoroughness of these components as contained within the preliminary traffic study prepared by Howard Stein Hudson (HSH), the Mashpee Wampanoag Tribe's traffic consultant, have been reviewed to ensure overall study adequacy and to evaluate the appropriateness of the proposed mitigating actions. It should be noted that this review included a significant amount of independent research and analysis to validate the distinctive components of this Project.

Our review comments are as follows:

Background

Project First Light, as the casino proposal has come to be known, includes the construction of a 324,000 square feet (sf) casino inclusive of gaming, entertainment and dining space, as well as 900 hotel rooms, a 25,000 sf indoor water park and 2,500 parking spaces. The casino is to be located on a parcel of land formally associated with the Liberty-Union Industrial Park (LUIP) adjacent to the north-east quadrant of the Routes 24 & 140 interchange. Currently access to this parcel is provided by O'Connell Way via Stevens Street.

Howard Stein Hudson (HSH), the Mashpee Wampanoag Tribe's traffic consultant, has prepared a preliminary traffic study for the Project which assesses existing traffic conditions within the study area including an inventory of existing roadway geometry, daily and peak period traffic counts, and a review of the accident history in the area. This study also evaluates the traffic impacts of the proposed project. Specific traffic projections for the project were determined along with future

traffic demands on the study area roadways due to projected traffic growth which will occur independent of the proposed development. A ten-year time horizon (2022) traffic analysis was performed for this study. Finally this study discusses possible measures to improve existing and future traffic operations in the area and offsetting the traffic-related impacts associated with Project First Light.

In order to streamline the review process, BETA has reviewed and commented upon individual components of HSH's traffic study as they were initially prepared. The preliminary traffic study prepared by HSH is reflective of our comments and represents an agreed upon approach related to determining the traffic impacts associated with the project. Significant modifications to HSH's study were made as a result of BETA's input. Noteworthy elements of this process are documented subsequently in this memorandum.

In reviewing the traffic study, it is important to note that it represents the preliminary traffic impact assessment associated with this project. Should the project advance, a comprehensive study will be required to be conducted as part of a Federal Environmental Impact Statement and Massachusetts Environmental Impact Report.

Finally, as discussed in detail below, the traffic study does reveal that the significant majority of traffic generated by this project will access the casino site via the regional highway system (Routes 24 & 140). It is estimated that approximately 61% of patron traffic will originate from north utilizing Route 24, 16% of patron traffic will originate from the south utilizing Route 24 and 8% will originate from the south utilizing Route 140. These are roadways under the jurisdiction of the Massachusetts Department of Transportation (MassDOT) who will have review and approval authority over the proposed mitigation along these roadways to offset project impacts.

Trip Generation and Distribution

The initial task to assess the traffic impact of the proposed casino was to determine the potential trip generation (amount of new traffic to the area generated by the casino) and trip distribution (how this traffic will travel to and from the casino) associated with the Project.

Trip Generation

As a destination resort casino, Project First Light will be a significant generator of new traffic to the area. On a daily basis¹ it is estimated that the casino will generate **20,783** new vehicle trips (or approximately 10,392 vehicles entering and exiting the casino). To give some perspective the total daily traffic on Route 24 north of the Route 140 interchange was determined to be 73,150 vehicles per day as part of this effort. On a peak hour basis the casino is estimated to generate nearly 1,400 trips during the evening peak hour (4:00-5:00 PM).

Typically trip generation estimations are made utilizing data provided in the Trip Generation Manual published by the Institute of Transportation Engineers. In this case however, the trip generation manual does not contain data relating to a casino development of this type. The numbers presented above are based on data collected over multiple days at the Mohegan Sun casino in Uncasville, Connecticut between 1997 and 1999.

¹ Daily and PM peak hour traffic volumes reported are reflective of conditions on a typical Friday, historically the busiest weekday for casinos.

BETA conducted extensive independent research into available documentation of trip generation rates associated with gaming facilities in order to validate the appropriateness of the selected trip generation methodology. The majority of the available documentation related to trip generation capacity of casinos pertains to Las Vegas style casinos. Trip generation data for casinos of this type do not apply in this instance for the primary reason that these *facilities experience significant nonvehicle trips sharing due to pedestrian walking trips as a result of the synergy created by the close proximity of the hotel/casino*². Some documentation located pertained to west coast casinos. Studies in California typically utilize a rate of 100 trips per 1,000 sf of gaming floor area plus 3 trips per hotel room. Peak hour traffic is calculated as 7% of weekday daily volumes³. Applying these rates to the Project would result in a daily trip generation rate slightly less than the volumes determined by the Mohegan Sun data.

BETA also contacted representatives from the Connecticut Department of Transportation to determine if they maintained any information relative to the Connecticut casinos which could be applicable. These representatives stated they do maintain rates based on the number of gaming positions. These rates equate to 4.2 daily trips per gaming position as well as 0.34 AM & PM peak hour trips per gaming position. Based upon an estimation of 4,500 gaming positions associated with the Project this equates to a slightly lower daily trip generation rate than determined for the proposed Taunton casino and a slightly higher PM peak hour trip generation rate. BETA would like to note that utilizing the ConnDOT rate does result in a notably higher morning peak hour trip generation⁴.

In both cases (California rates & ConnDOT rates) the resulting trip generation estimations are within 10% of the estimation determined by HSH utilizing historic Mohegan Sun data (with the exception of the morning peak hour utilizing ConnDOT rates). As such BETA finds the trip generation estimations presented for the proposed destination resort casino in Taunton to be reasonable.

Trip Distribution

The trip distribution determined for the proposed casino was developed utilizing a sophisticated gravity model. This model accounts for market studies which indicate the driving distance patrons are likely to travel to visit a casino, available routes, population density and competing gaming facilities. BETA reviewed this model in detail and provided our comments and recommended adjustment to the model accordingly. These comments have been incorporated by HSH and are reflected in the resulting trip distribution. It should be noted that the trip distribution numbers presented below are for patron trips, independent trip distribution estimations were made for employee trips. Employee trips however are significantly less than patron trips (Daily employee trips account for approximately 7% of total traffic). The resulting trip distributions indicate that the majority of project trips will arrive to the area via the regional highway system. 91% of patron traffic will arrive and depart the site via either Route 24⁵ or Route 140 from the south. Of the remaining 9% it has been estimated that 6.5% percent will arrive via County Street (Route 140) through Taunton and 2.5% via Middleborough Avenue through East Taunton.

² Recalibration of Trip Generation Model for Las Vegas Hotel/Casinos, Rowe, Kaseko & Ackeret, ITE Journal May 2002

³ Traffic Impact Study for the North Fork Casino Project, TPG Consulting, Inc., 2008

⁴ Most other independent data does indicate morning peak hour trip generation rates to be significantly lower than evening peak hour rates.

⁵ 61% of patron traffic will arrive and depart the site via Route 24 north of the Route 140 interchange

Noteworthy elements of our review of the trip distribution model include the request to account for other potential casino sites in Massachusetts. Although the locations of these sites are unknown, BETA requested that traffic from the regions which could contain additional casinos be adjusted to reflect additional competition in these regions. In addition, BETA requested that some details of the trip distribution model be adjusted to reflect a more conservative (heavier) approach towards the use City of Taunton Streets.

It should be noted that the trip distribution model assumes sufficient capacity exists on the regional highway system and does not account for the possibility of vehicles exiting the highways system to seek alternative routes to avoid congestion.

Study Area

The study area included in the preliminary traffic study includes 14 signalized intersections, 20 non-signalized intersections and 18 roadway/ramp sections. This study area was determined by reviewing the agreed upon trip generation/distribution discussed above. Given these conditions the likely project impacts to traffic can be defined in three areas.

1. The County Street (Route 140) corridor (west of Route 24) including Harts Four Corners
2. The East Taunton Neighborhood
3. The Routes 24/140 & Route 140/Stevens Street Interchanges

The study area selected accounts for each of these three areas. As a result of our review, HSH agreed to include the following locations within the study area:

- Stevens Street at Pinehill Street
- Middleboro Avenue at Pinehill Street/Caswell Street
- Middleboro Avenue at Old Colony Avenue/Liberty Street
- Gordon M. Owen Riverway at Gordon M. Owen Riverway Extension
- Frederick R. Martin Parkway at Cohannet Street

Data Collection

In order to quantify the impacts of the proposed destination resort casino, it is important to collect sufficient data to determine existing and future traffic conditions. As a result of discussions between BETA and HSH, it was determined appropriate to collect peak hour traffic volumes at each of the study area intersections from 7-9 AM & 4-6 PM on a typically weekday and 11 AM – 2PM on a typical Saturday. In addition 72-hour continuous ATR (machine) counts collecting both weekday and Saturday daily traffic volumes were collected along O’Connell Way, Stevens Street and Middleboro Street as well as various locations within the Route 24/140 and Route 140/Stevens Street interchanges.

Along with the traffic volume data, crash records were obtained for all study area locations for the most recent three year period where data was available (2007 – 2009). Each study area intersection was also inventoried for existing geometric conditions (number of lanes, speed limits, signal timings, etc.).

School Activity

Of particular note is existing school traffic along Stevens Street. The entrance to the East Taunton Elementary School, which has a current enrollment of 629 students and a staff of 95 individuals, is located only a couple hundred feet to the north along Stevens Street from the proposed Project driveways. Currently 11 different bus routes transport 400 children to and from this school during a typical school day. An additional 70 students are transported by van to the school via 11 separate routes on a typical day. This however is only a portion of the total school-related traffic which utilizes Stevens Street on a daily basis. In addition to the East Taunton Elementary School, bus routes for the Taunton High School, Martin Middle School, Coyle-Cassidy High School and Taunton Catholic Middle School utilize Stevens Street as well as a multitude of van trips for a larger contingent of City schools. All told, an additional 13 bus and 12 van routes transporting a total of 687 students travel along Stevens Street during school days. This is a total 1,157 students which are transported along Stevens Street during a typical school day via school bus/van transportation between the hours of 7:30 AM and 3:15 PM. This does not account for staff or parent traffic associated with these schools or traffic related to the Bristol-Plymouth Regional High School.

In addition to existing conditions, it is important to collect and account for information related to future roadway conditions. This includes known development projects in the area, planned roadway improvements and general traffic growth trends. Based on the review of available data, the following projects/documents are noteworthy:

1. The Southeastern Massachusetts Metropolitan Planning Organizations 2012 Regional Transportation Plan – This document represents a comprehensive assessment of the regional transportation system including trends, existing deficiencies and planned improvements.
2. South Coast Rail - The MBTA's South Coast Rail project is intended to restore passenger rail service from South Station in Boston to Fall River and New Bedford in southeastern Massachusetts. The cities of Taunton, Fall River and New Bedford are the only cities within 50 miles of Boston that are not served by commuter rail. The Taunton Depot Station would be located off Route 140 at the rear of a shopping plaza that includes Target, Home Depot and other stores.
3. MassDOT Project# 605888 – This project addresses the Route 24/140 interchange. In addition to replacing the structurally deficient Route 24 bridge over Route 140, this project intends to address the regional traffic concerns related to deficiencies at this interchange. In the SMMPO 2012 Regional Transportation plan, this project is considered to be **the most important highway project in the region**.
4. MassDOT Project# 605679 – This project includes the complete reconstruction of the Harts Four Corners intersection. This intersection is critically in need of improvements and is a noted safety concern.

5. MassDOT Project# 605191 – This project involves roadway reconstruction, median installation and sidewalk reconstruction along a commercial stretch (adjacent to the Home Depot Plaza) of County Street (Route 140) in Taunton.
6. Liberty & Union Industrial Park – It is important to note that the land selected for the proposed casino is currently part of the Liberty & Union Industrial Park. Phase II of this project was originally intended to be built on the land currently proposed to be a casino. Should the casino not be developed, Phase II of the industrial park could once again advance. Phase II consists of the development of 663,400 sf of warehouse/distribution space and 69,900 sf of office space.
7. Proposed Mixed-Use Development – While not currently active, we want to note that there is a currently valid state MEPA certificate for the development of a project including an 81 room hotel, 200 seat restaurant and 160,000 sf of industrial space located on a 42 acre parcel bounded by Route 140 to the north and Route 24 to the east (opposite quadrant of the interchange from the casino). There has been no activity associated with this project and it would require local approval process if it were to proceed. As such, this project is not incorporated into the future analyses associated with this casino project. While this project is not included in the analysis, a general background growth rate of 0.6 % per year is also added to the analysis for the 10-year horizon (2022) condition.

Traffic Analysis

BETA has reviewed the traffic analyses associated with the HSH traffic study. These analyses were conducted in an appropriate manner and are reflective of existing and anticipated future conditions. BETA would like to note, however, the unknown impact that the Project will have on the adjacent Silver City Galleria Mall. Currently this mall operates significantly below its trip generating capacity. Should the casino development have a revitalizing impact on this mall, the additional traffic which potentially may be generated could have an impact on the surrounding roadways, particularly the Route 24/140 and Route 140/Stevens Street interchanges. Further evaluation is required to determine the potential this may have on future infrastructure needs. As part of the mitigation for the Project, BETA recommends that a traffic monitoring program be implemented to study this potential and determine its impact.

Mitigations

To offset traffic impacts, the proponent has proposed mitigation to address each of the three areas previously described. These improvements are described below. Additional detail is provided in the HSH Study.

County Street (Route 140) corridor

Along this stretch of Route 140 (which runs from Mozzone Boulevard to Hart's Four Corners), the proponent is proposing to make a series of upgrades to traffic signal equipment and geometric improvements. **Most notably is the commitment to work with MassDOT⁶ to advance the Hart's Four Corner project to construction and implementing critically needed improvements at this intersection as soon as possible.**

⁶ MassDOT Project# 605679 includes the total reconstruction of Hart's Four Corners

In addition, the proponent has committed to upgrade traffic signal equipment at the Gordon M. Owen Riverway Extension and Erika Drive as well as implementing operational improvements at Mozzone Boulevard and, if warranted and approved by MassDOT, signalizing the Bristol-Plymouth High School Driveway. It should be noted that another currently active MassDOT project seeks to make additional improvements to this corridor including median installation, sidewalk reconstruction, drainage improvements and further traffic signal upgrades. The proponent will work closely with MassDOT in the future to coordinate these efforts.

East Taunton

Of utmost importance is the preservation of the East Taunton neighborhood. As such, the proponent has committed to a series of improvements throughout the neighborhood to both improve critical safety and operationally deficient locations as well as to deter any potential for cut-through traffic to the casino and alleviate undue impacts to school activities. The proposed primary site driveway (at the location of the current O'Connell Way) will be designed so vehicles can only exit the Casino towards Route 140. Left turns to Stevens Street will be physically restricted. In addition, the proponent has committed to working with the City to plan for and implement a program of traffic monitoring and safety improvements to preserve East Taunton. These include:

- Constructing a roundabout or traffic signal, inclusive of pedestrian accommodations, at the intersection of Middleboro Avenue/Pinehill Street/Caswell Street
- Constructing a roundabout or traffic signal, inclusive of pedestrian accommodations, at the intersection of Middleboro Avenue/Old Colony Avenue/Liberty Street
- Constructing a raised intersection at Stevens Street/Pinehill Street
- Improving pedestrian accommodations and the installation of flashing warning beacon at the intersection of Stevens Street/Middleboro Avenue
- Realigning the Bristol Plymouth High School Drive at Middleborough Avenue to align with Poole Street
- Installing school zone flashing warning devices along each of approach of Stevens Street at the East Taunton Elementary School Driveway
- Working with the residents to implement further traffic calming improvements throughout the neighborhood.
- Working with the state to implement a truck exclusion (prohibiting trucks) along Stevens Street beyond the Casino driveways and along Pinehill Street.
- Implementing a future traffic monitoring program which will study cut-through traffic and traffic associated with the potential revitalization of the Silver City Galleria Mall.

Route 24/140 & Route 140/Stevens Street Interchanges

As the vast majority of Casino traffic is regional traffic, the Route 24/140 and Route 140/Stevens Street interchanges will be heavily impacted by Project traffic. This interchange system is currently deficient in a number of respects ranging from a structurally deficient bridge (Route 24 over Route 140), capacity needs, safety issues and sub-standard design features. MassDOT Project# 605888 is currently studying the interchange(s) to determine a long term improvement. This is the latest in a series of studies to look at the improvement needs of this location since the mid 1990's. Currently, this latest project is in the conceptual design stage and a number of conceptual interchange alternatives were recently presented at a public hearing by MassDOT. The Southeastern Massachusetts Metropolitan Planning Organization considers this project to be the most important highway project in the region.

One of the most significant deficiencies at the interchange today concerns the Route 24 southbound off-ramp to Route 140 southbound. This movement currently operates under traffic signal control and often backs-up along the ramp affecting the Route 24 southbound mainline during the evening peak period. This is also the ramp which would be most heavily impacted by casino bound traffic during the evening. To alleviate this condition, the proponent is proposing an alternative which removes this movement from the traffic signal control. A new dedicated lane would be constructed on Route 140 southbound with the sole purpose of accommodating this traffic. Creating this lane would allow traffic to proceed off of the Route 24 southbound off-ramp to Route 140 southbound unencumbered. This traffic would remain in its own lane beneath the Route 24 underpass and merge back into the Route 140 mainline after the subsequent signalized intersection at the Route 24 northbound ramps. This improvement would eliminate a significant existing deficiency to the betterment of not only the Casino but regional traffic as a whole. BETA would like to note, however, that the addition of this new lane along Route 140 southbound is critical to the success of this improvement alternative. The ability to add another lane beneath the Route 24 underpass, while appearing feasible at this time, will require detailed engineering to be substantiated and final approval by MassDOT.

In addition, the proponent is proposing to add a new on-ramp to Route 140 northbound directly from the Casino. This would accommodate the significant majority of traffic departing the Casino with direct access to the highway system. This ramp also eliminates the need to accommodate this traffic on Stevens Street where it would have a significant deterrent to operations. To provide this connection, Route 140 northbound between this ramp and the Route 24 northbound on-ramp will be widened to three lanes. Along with these improvements, additional signal improvements will also be provided for the intersections within the interchanges.

BETA has worked closely with HSH and spent a significant amount of time reviewing this component of the proposed mitigation. It should be acknowledged that a number of existing deficiencies currently exist at the Route 24/140 & Route 140/Stevens Street interchanges independent of the proposed Project. Additionally, the proposed Project mitigation does include some of the more critically needed improvements to the interchanges. Nevertheless, in terms of the overall needs of the Route 24/140 & Route 140/Stevens Street interchanges these improvements are considered as an interim improvement. The mitigation proposed addresses the critical deficiencies which clearly need to be corrected to support the development of the proposed destination resort

casino. This improvement, as is acknowledged by HSH, does not fully address the complete range of deficiencies which need to be addressed at these interchanges. **A comprehensive improvement plan is still needed.** It is recommended that the proponent, City and MassDOT work together to develop this plan which should address not only existing deficiencies but regional connectivity and the long term vision for the area.

Additional Improvements

In addition to the improvements described above, the proponent has committed to providing up to thirteen signalized intersections and ten emergency response vehicles with traffic signal pre-emption system and emitters respectively. This equipment will improve emergency vehicle response time significantly. This equipment will be installed on key intersection locations between various fire station routes to the proposed casino site.

Finally the proponent will study the intersections of High Street/Winthrop Street and Route 44/Highland Street and implement traffic signal timing adjustments to improve traffic operations.

Conclusions

The destination resort casino proposed for Taunton, Project First Light, will generate a significant amount of new traffic in the region. The majority of this traffic, however, would utilize the regional highway network. BETA has reviewed the traffic study prepared by HSH, the proponent's traffic consultant, and we concur with the methodology presented therein. The mitigation proposed is appropriate to address the anticipated impacts on the East Taunton neighborhood and the Route 140 corridor as well as various other city locations. The impacts to the Route 24/140 and Route 140/Stevens Street interchange require coordination with MassDOT. While BETA agrees that the proposed mitigation plan does address the critical deficiencies at the interchanges, a comprehensive, long-term solution for this interchange system is still needed. We recommend that all stakeholders (MassDOT, the City of Taunton and the Casino proponent) work together to develop this comprehensive plan which would ensure the long term viability but would also integrate interim improvements so that overall infrastructure improvement costs are minimized.
