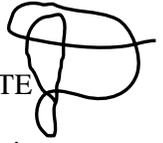


MEMORANDUM



TO: Mr. Daniel Krantz
Vice President, Construction & Development
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FROM: Mr. Jeffrey S. Dirk, P.E., PTOE, FITE
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DATE: September 8, 2014

RE: 6712

SUBJECT: Transportation Impact Assessment Supplement
Gillette Stadium Parking and Access Improvements
Foxborough, Massachusetts

Vanasse & Associates, Inc. (“VAI”) is providing supplemental information in support of the June 2, 2014 Transportation Impact Assessment (“TIA”) prepared for the Gillette Stadium Traffic and Access Improvements project (the “Project”). The supplemental information has been prepared in response to comments received from the Planning Board and the public at the July 10, 2014 public hearing concerning the Project, and addresses the following requested items:

1. Traffic volume information for Route 140 in the vicinity of the proposed employee parking lots;
2. Times of arrival and departure for employees;
3. Sight distance analysis for the proposed Route 140 driveways (Employee Lot A and the Route 140 Connector);
4. Location of street lights along Route 140 in the vicinity of the proposed driveways; and
5. Description of operations for the proposed employee parking lots.

In addition, a review of the motor vehicle crash history at the intersections of Route 140 at Main Street and Route 140 at Route 115 was undertaken based on data available from the Registry of Motor Vehicles for the most recent complete reporting year (2012). This review indicated that there was only one (1) motor vehicle crash reported to the RMV at these intersections in 2012 that exceeded reporting requirements (property damage in excess \$1,000 or a crash resulting in an injury) which, in the context of the number of motor vehicles traversing this corridor (approximately 10,000 to 12,000 vehicles per day) does not indicate an inherent safety deficiency at either intersection with respect to the design or operation of the intersections.

Based on a review of the supplemental information, we have concluded that access can be afforded to the proposed employee parking lots and the Route 140 Connector in a safe and efficient manner given: i) when in use, the driveways will be operated under police detail officer control; ii) traffic control and operations of the Route 140 corridor in advance of and between the proposed driveways will be integrated into the Gillette Stadium Event Traffic Management Plan to include advance warning signs, traffic control devices and lighting; and iii) no inherent safety deficiencies were noted with respect to the design



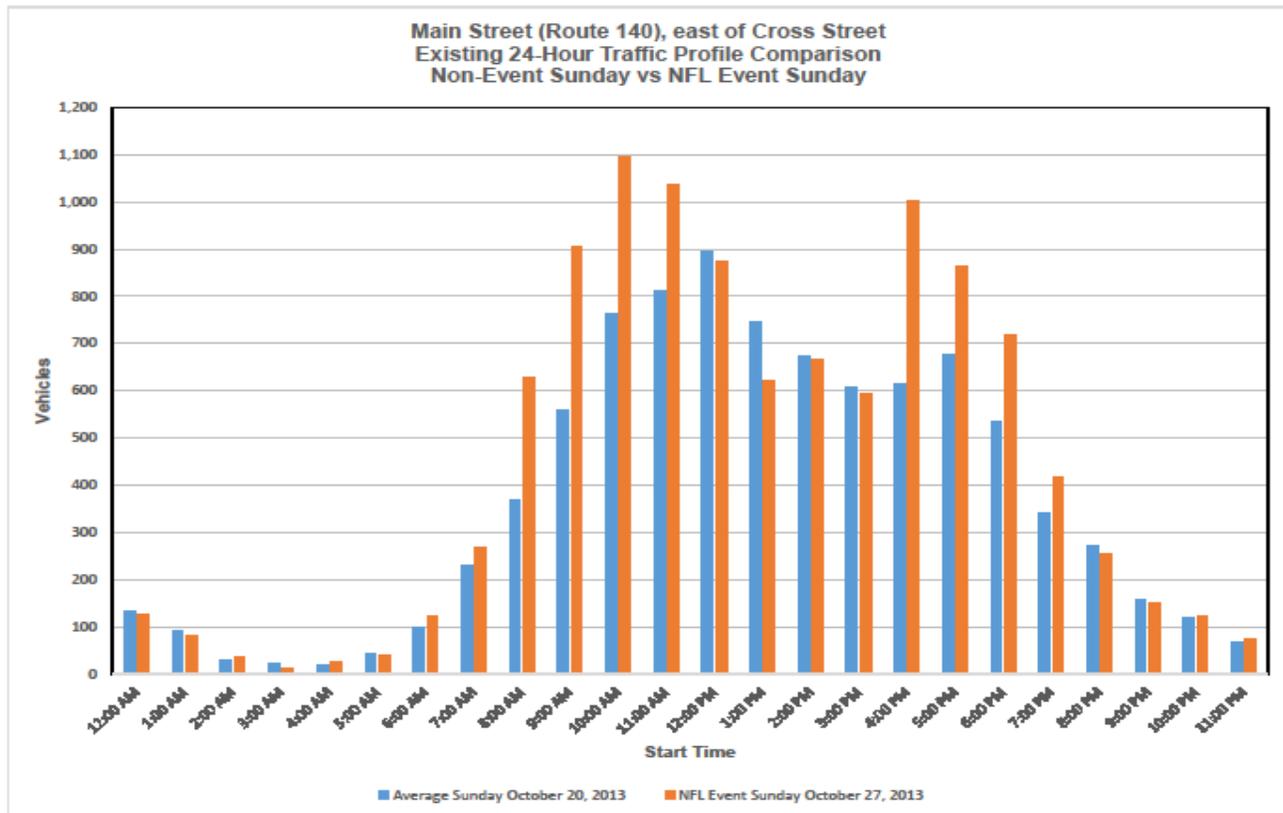
or operation of Route 140 in the vicinity of the proposed driveways based on a review of the most recent motor vehicle crash history.

The following sections are responsive to each of the requested items, with supporting information attached.

ROUTE 140 TRAFFIC VOLUME DATA

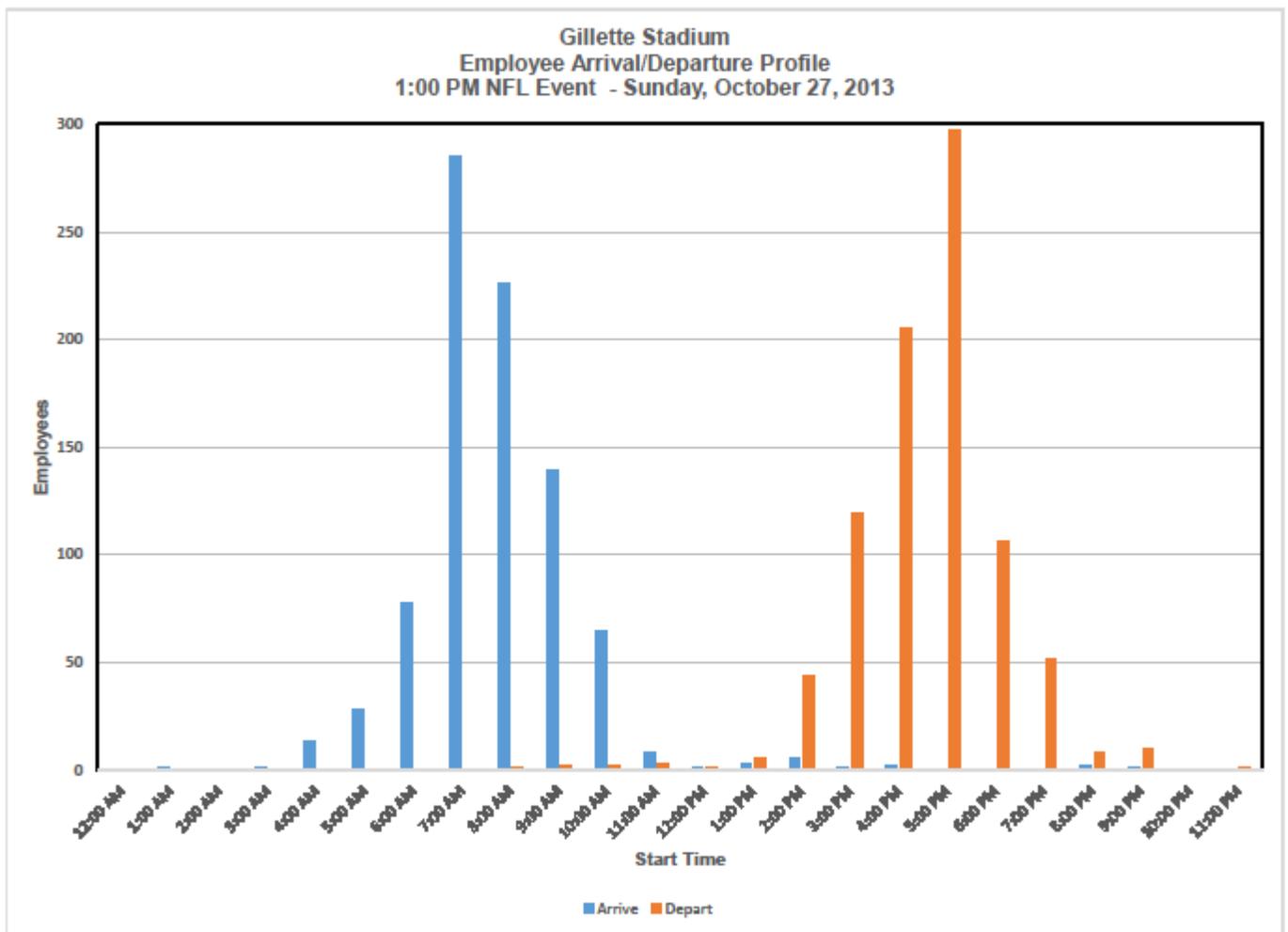
Traffic volume data was collected along Route 140 in the vicinity of Cross Street on Sunday, October 20, 2013, and Sunday, October 27, 2013, with the October 27th traffic counts representing conditions with a 1:00 PM NFL Event at the Stadium. A review of the collected data indicated that Route 140 accommodated approximately 8,870 vehicles (two-way, 24-hour volume) on Sunday, October 20, 2013, without an event at Gillette Stadium. On Sunday, October 27, 2013, with a 1:00 PM NFL Event, the recorded traffic volume was approximately 10,735 vehicles, or an increase of approximately 1,865 vehicles, a portion of which consists of non-event traffic by-passing the Route 1 corridor along the Stadium frontage. For context, Route 140 accommodates approximately 12,000 vehicles per day on an average weekday without a Stadium event.

The hourly traffic flow profile measured along Route 140 on October 20th and 27th, 2013, with the latter inclusive of a 1:00 PM NFL Event, is depicted below.



EMPLOYEE ARRIVAL AND DEPARTURE PROFILE

Employee arrival and departure information for Gillette Stadium was obtained for the 1:00 PM NFL Event on October 27, 2013 to coincide with the traffic volume measurements along Route 140 detailed above. This information is summarized graphically below and illustrates that the majority of employees arrive by 10:00 AM for a 1:00 PM NFL Event, with departure times generally commencing after 2:00 PM depending on function, with the majority of departures occurring between 3:00 and 6:00 PM. For presentation purposes, the number of employees shown in the graph represents 50 percent of the total number of employees at the Stadium on the subject day in order to provide a representation of employee levels that would be associated with the proposed employee lots.



SIGHT DISTANCE ANALYSIS

Sight distance measurements were performed at the intersections of Route 140 at the Employee Lot A driveway and Route 140 at the Route 140 Connector in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)¹ requirements. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner.

In order to determine the appropriate travel speed from which to assess sight lines at the subject intersections, vehicle travel speed measurements were performed along Route 140 in the vicinity of the proposed driveways over a continuous 72-hour period (Friday through Sunday, inclusive) in May 2014. Based on these measurements, the average observed travel speed was found to be 36 miles per hour (mph), with the 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles travelled at or below, found to be 40 mph, which is 5 mph below the posted speed limit along this section of Route 140 (45 mph). The 85th percentile speed is used as the basis of engineering design and in the evaluation of sight distances; however, given that the measured 85th percentile vehicle travel speed was found to be below the posted speed limit (45 mph), the posted speed limit was used to assess sight lines at the subject intersections. That being said, it is likely that ***approach speeds will be less than 40 mph under Major Event Day conditions when the subject segment of Route 140 and the proposed driveways are under police detail officer control as a part of the modifications to the Gillette Stadium Event Traffic Management Plan.***

Table 1 presents the measured SSD and ISD at the subject intersections.

¹A *Policy on Geometric Design of Highway and Streets*, 6th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2011.

Table 1
SIGHT DISTANCE MEASUREMENTS^a

Intersection/Sight Distance Measurement	Feet		
	Required Minimum	ISD ^b	Measured
Route 140 at the Employee Lot A Driveway			
<i>Stopping Sight Distance:</i>			
Route 140 approaching from the east	360	--	500+
Route 140 approaching from the west	360	--	344
<i>Intersection Sight Distance:</i>			
Looking to the east from the Employee Lot A Driveway	360	430/500	500+
Looking to the west from the Employee Lot A Driveway	360	430/500	332
Route 140 at the Route 140 Connector			
<i>Stopping Sight Distance:</i>			
Route 140 approaching from the east	360	--	500+
Route 140 approaching from the west	360	--	500+
<i>Intersection Sight Distance:</i>			
Looking to the east from the Route 140 Connector	360	430/500	500+
Looking to the west from the Route 140 Connector	360	430/500	500+

^aRecommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets*, 6th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2011; and based on a 45 mph approach speed on Route 140.

^bValues shown are the intersection sight distance for a vehicle turning right/left exiting a roadway under STOP control such that motorists approaching the intersection on the major street should not need to adjust their travel speed to less than 70 percent of their initial approach speed.

As can be seen in Table 1, with the exception of lines of sight approaching from and looking to the west at the Route 140/Employee Lot A driveway, the available lines of sight at the proposed intersections were found to exceed the recommended minimum sight distance requirements for a 45 mph approach speed along Route 140, which is consistent with the posted speed limit.

Lines of sight approaching from and looking to the west at the Route 140/Employee Lot A driveway were found to be limited due to the horizontal curvature of Route 140 to the west of the proposed driveway and vegetation located along the south side of Route 140 and west of the driveway. Given that the driveways serving Employee Lot A and the Route 140 Connector will only be open for use by employees during Major Event Days and controlled by police detail officers when in use, the driveways can be operated in a safe manner with implementation of appropriate measures planned as a part of the proposed modifications to the Gillette Stadium Event Traffic Management Plan. These measures include the following:

- Warning signs indicating “Be Prepared To Stop” and “Police Officer Ahead” will be installed in advanced of both driveways.
- Police detail officers will be assigned to direct traffic and control access at both driveway intersections with Route 140.
- Stadium Operations Staff will be positioned at both driveway intersections with Route 140, within Employee Lot A and along the Route 140 Connector to assist the police detail officers and to manage traffic flow and operations within these facilities.



With implementation of these measures and the provision that the driveways are gated at all times when a police detail officer is not present to manage traffic at the driveways, both driveways can operate in a safe manner as designed. In essence, when in operation, the driveways will function similar to conditions where a traffic signal is present, with the detail officer (function as the traffic signal) positioned where they can observe and be seen by traffic approaching from both directions on Route 140 releasing vehicles exiting the driveways when no conflicts are present. *Sight line measurements taken from the position of the police detail officer at the Route 140/Employee Lot A driveway indicate that the available line of sight for both the detail officer and the motorist exceed 500 feet, a distance that exceeds that required for safe operation of the intersection assuming a 45 mph approach speed along Route 140.*

STREET LIGHT LOCATIONS

The location of street lights along Route 140 in the vicinity of the proposed driveways was reviewed on July 17, 2014. Based on these observations, it was determined that there are four (4) street lights mounted on utility poles along the south side of Route 140 between Turner Road (Route 115) and Main Street, two (2) of which are located at the Route 140/Main Street and Route 140/Route 115 intersections, respectively. The closest street light to the Route 140/Employee Lot A intersection is located at the Route 140/Route 115 intersection, approximately 300 feet west of the driveway. A street light is located approximately opposite the location of the driveway that will serve the Route 140 Connector, with a second street light located approximately 400 feet to the east of the Route 140 Connector.

Based on this evaluation, additional lighting, either temporary (when the driveway is in use) or permanent, should be provided at the Route 140/Employee Lot A intersection.

EMPLOYEE PARKING LOT OPERATION PLAN

The following overview summarizes the planned Major Event Day operation of Employee Lot A, Employee Lot B and the Route 140 Connector:

Pre-Event Operations:

- On Major Event Days, designated Stadium employees (to be selected by employee user group) will be directed to Employee Lots A and B via Route 140, and principal access will be provided at the designated entrance points along Route 140 which will be under police detail officer control and supplemented by Stadium Operations Staff.
- Stadium Operations Staff will monitor access points to both Employee Lots A and B and the Route 140 connector driveway to process vehicles and check parking passes.
- The annual update to the Event Traffic Management Plan (TMP) will reflect these improvements and planned operations. Temporary signage will also be posted at appropriate locations to provide wayfinding to the employee parking locations and to indicate the presence of police detail(s) on major event days (described previously)
- Upon parking within these lots, employees will report to designated pick-up/drop-off locations within Employee Lot A and Employee Lot B in the approximate locations shown on the attached plan to pick up by shuttle service.
- Employees will be picked up by shuttle service, which will make regular stops at those designated locations along a loop between Employee Lot A, ultimately dropping off employees at a dedicated area adjacent to the Dana-Farber Field House, proximate to the Stadium, as shown on the attached

plan. The shuttle bus route is designed to avoid Route 1 by utilizing: i) a driveway that connects Employee Lot A to Route 140; and ii) a connector driveway linking Route 140 to the existing service drive behind Bass Pro and the Patriot Place South Marketplace.

- The duration of employee shuttle service during major event days will be based upon check-in times and departures of employees. Parking and security staff will be present in both lots during applicable periods and will help to facilitate efficient shuttle service. Pre-event shuttle service is planned to have concluded prior to the commencement of any event held at the Field House.

Post-Event Operations:

- Employees that have completed their shift/duties will report to the pick-up area at the Field House and be shuttled to the appropriate parking area drop-off location.
- Employees will then depart the parking area in their vehicle in generally the same fashion they arrived, with the exception of Employee Lot A where employees will depart by way of a right-turn to Route 1.
- Traffic at the two driveway entrances on Route 140 will continue to be managed by police detail officers for exiting employees as necessary and in accordance with the TMP.
- When all employees have departed Employee Lots A and B, Stadium parking staff will close all gates.

General Operations:

- Public safety vehicles will be able to use the Route 140 connector drive as an alternate emergency access route to and from Gillette Stadium on major event days, thereby bypassing the need and potential delays along Route 1.
- Similar to other Stadium-controlled parking lots, Team Operations Staff will regularly monitor Employee Lots A and B and the Route 140 connector drive for the full duration of operations. Team Operations Staff will also monitor the Route 140 connector drive to prevent unauthorized use.
- The Route 140 Connector Drive and parking areas will be lighted as shown on the site plans. Lighting is planned to be on in the parking areas and Route 140 Connector Drive only when in use during evening hours on major event days. During all other days, security will be provided in accordance with Stadium procedures.
- On non-event days, the private Route 140 Connector Drive will remain closed and gated; however, access will be provided at all times to emergency vehicles via a Knox Box at all gate locations, as shown on the attached plan. The Town water department will also be provided comparable vehicular access, thereby providing service vehicles a convenient, paved route to the adjoining municipal well location.
- These parking facilities and related access drives are not intended for use by the general public on either on event or non-event days. The private nature trail adjacent to Bass Pro will remain open and accessible consistent with existing policies.

cc: P. Tamm, Esquire – Goulston & Storrs, P.C.
C. Lizotte, P.E. – VHB|Vanasse Hangen Brustlin, Inc.
File

