

MEMORANDUM

To: Stephen O' Connell, PE
From: Jennifer Conley, PE, PTOE
Date: August 12, 2016
Project Name: Norfolk Residential Traffic Impact Analysis
Project Number: 52779B
Subject: Response to the Traffic Peer Review

WSP|Parsons Brinckerhoff (PB) is in receipt of the BETA Traffic Peer Review letter dated July 12, 2016 (BETA comment letter) outlining their comment on the Traffic Impact Memorandum prepared for the proposed 40 unit townhouse development. PB has reviewed the comments provided and offers the following responses and additional information:

T1. The study area should be expanded to include the intersection of Cleveland Street at Route 115, Holbrook Street at Route 115, Cleveland Street at Seekonk Street, and Fruit Street at Seekonk Street. Traffic volumes show that Cleveland is a commuter Route, which in turn suggests these nearby intersection with arterial roadways will be utilized by site-generated traffic.

In response to this comment and the additional clarification provided at the public hearing regarding safety concerns along Cleveland Street and at these locations, PB has conducted a detailed analysis of the stopping sight distances available, the crash history and the expected project impact at each of these locations for the Town's use. In order to provide the most conservative analysis of trip generation impacts at the additional intersections, PB used the fitted curve methodology as is requested in comment T4 below.

As is outlined on the Table provided attached to this response, based on available sight lines and minimal crash data most locations do not raise safety concerns. Although the sight lines are limited at the intersection of Seekonk Street at Fruit Street, the number of crashes was only two over the three year period and only a maximum of two trips will impact this intersection during the peak hour.

Despite limited sight lines approaching Fruit Street at Cleveland Street, only one crash was reported over the three year period reviewed. It is unclear whether the vegetation limited the sight lines is located within the public right of way. The sight lines at the intersection of Cleveland Street at Holbrook Street are limited by grading and vegetation, however, there have been no crashes reported over the three year period.

T2. Crash data and crash analysis should be provided for Cleveland Street

PB researched crash data collected in the study area for the most recent three years available from MassDOT (2012-2014). During those three years nine crashes were reported along Cleveland Street excluding the crashes occurring at the intersections at either end. Of the nine crashes, only one occurred within close proximity of the proposed site. The crash involved a single vehicle colliding with a mail box just 50 feet east of the proposed driveway resulting in property damage. The crash at the

intersection of Cleveland Street and Fruit Street occurred in 2012 when two vehicles traveling in opposite directions sideswiped each other resulting in property damage. The remaining seven crashes were located away from the proposed site or other intersections or the exact locations were unknown. None of the crashes along Cleveland Street were fatal, however, two resulted in injury. The MassDOT average crash rate for a rural local road is 2.08 crashes per million vehicle miles traveled. Cleveland Street has a crash rate of 2.14 crashes per million vehicle miles traveled. Therefore, Cleveland Street is experiencing crashes at a rate typically expected for a rural local road.

The MassDOT District 5 average crash rate is 0.58 crashes per million vehicles entering unsignalized intersections. The intersection of Cleveland Street at Fruit Street has a crash rate of 0.36 crashes per million vehicles entering. The crash rate at the intersection of Cleveland Street at Fruit Street is less than the MassDOT average crash rate.

As outlined above, the crash history at the additional intersection identified by BETA was summarized and is provided attached to this memorandum. The highest number of crashes were experienced at the intersections along Route 115 where traffic volumes are significantly higher than along Cleveland Street. Therefore, the crash rates at those locations are likely significantly lower than the MassDOT District 5 average crash rate.

T3. The study should include an evaluation of geometric characteristics of Cleveland Street, including roadway width pavement condition and horizontal and vertical geometry.

Cleveland Street is a rural local road that runs from its intersection with Route 115 to the west to its intersection with Seekonk Street to the east. Cleveland Street consists of 12 foot travel lanes in each direction divided by a double yellow centerline. Along its length, vegetation (either trees or low brush) grows right up to the edge of the roadway. Cleveland Street consists of both straight sections and some horizontal curvature, but is generally flat or gently graded.

T4. Clarify why the average rate was used instead of the fitted curve regression equations for trip generation calculations. Using the regression equations would result in a more conservative trip generation analysis.

PB determined and analyzed the Build condition using the trip generation from the regression equations. During the AM peak hour, the trip generation increased from 18 vehicle trips (3 in and 15 out) using the average rate to 25 vehicle trips (4 in and 21 out) using the regression equations for an increase of 7 vehicles. During the PM peak hour, the trip generation increased from 21 vehicles (14 in and 7 out) using the average rate to 28 vehicles (9 in and 19 out) using the regression equations for an increase of 7 vehicles.

T5. Capacity analysis including queue analysis should be provided for the expanded study area suggested in comment T1.

As outlined in the response to T1 and summarized in the table attached to this memorandum, even with the more conservative trip generation methodology, the impact of the site is expected to be minimal at the additional intersections. The location with the most significant impact will be Seekonk Street at Cleveland Street and that intersection will experience 15 new trips during the highest hour. A review of the traffic volumes on Cleveland Street approaching Seekonk Street during the peak hours reveals a heavy volume during the weekday AM peak hour only which may result in a reduced level of service during that hour. However, with only one hour of high side street traffic, it is unlikely that geometric or traffic control mitigation would be warranted at this location. In addition, because there is no crash history at this location, no safety improvements are required.

T6. Sight distance should be measured for the expanded study area suggested in comment T1, to assess conditions expected to be encountered for future townhouse residents accessing area arterial roadways.

The additional stopping sight distance measurements were collected and are summarized in the Table attached to this memorandum. As outlined above, adequate stopping sight distance is available at most locations. There are limited sight lines available for vehicles to see an object on the southerly leg of Fruit Street. Although the limitations at this location are vegetation and not limitations due to grade, it is not clear if the vegetation is within the Town's right of way and if the Town is interested in removing the vegetation. The available stopping sight distance at the intersection of Seekonk Street at Fruit Street is also limited due to vegetation.

As indicated, the sight distance at the intersection of Route 115 at Holbrook Street is met at the northerly portion of the westbound leg accommodating westbound right movements, however, sight distance is limited at the southerly portion of Holbrook Street accommodating westbound left movements. Since westbound left traffic destined to the south from the site would make that maneuver at Cleveland Street at Route 115, no site traffic is anticipated on the sight limited leg of Holbrook Street. Therefore, the site has no impact at this location.

In conclusion, although sight lines are limited at some of the additional intersections, no safety concern has developed based on the minimal crash histories.

Table 1: Intersection Evaluation

Cleveland Street at Site Driveway					Comments
Trips			SSD		
AM	PM			Desired	Actual
25	28	EB Sight Lines to Driveway	250	380	SSD requirement met, minimal crashes
Crashes		WB Sight Lines to Driveway		485	
1					
Cleveland Street at Fruit Street					Comments
Trips			SSD		
AM	PM			Desired	Actual
18	19	EB Sight Lines to Fruit Street Southley Leg	250	180	SSD requirement not met for WB vehicles to see NB vehicles ¹
Crashes		WB Sight Lines to Fruit Street Southerly Leg		155	
1		EB Sight Lines to Fruit Street Northerly Leg		270	
		WB Sight Lines to Fruit Street Northerly Leg		270	
Seekonk Street at Fruit Street					Comments
Trips			SSD		
AM	PM			Desired	Actual
1	2	NB Sight Lines to Fruit Street	250	330	SSD requirement not met for SB vehicles to see EB vehicles
Crashes		SB Sight Lines to Fruit Street		140	
2					
Cleveland Street at Seekonk Street					Comments
Trips			SSD		
AM	PM			Desired	Actual
15	13	NB Sight Lines to Cleveland Street	250	430	SSD requirements are met, no crashes
Crashes		SB Sight Lines to Cleveland Street		315	
0					
Cleveland at Holbrook Street					Comments
Trips			SSD		
AM	PM			Desired	Actual
7	9	NB Sight Lines to Holbrook Street	250	130	SSD requirements are not met for NB vehicles to see EB vehicles ²
Crashes		SB Sight Lines to Holbrook Street		725	
0					
Route 115 at Cleveland Street					Comments
Trips			SSD		
AM	PM			Desired	Actual
3	3	EB Sight Lines to Cleveland Street	250	570	SSD requirement met, minimal crashes, minimal trips
Crashes		WB Sight Lines to Cleveland Street		480	
4					
Route 115 at Holbrook Street					Comments
Trips			SSD		
AM	PM			Desired	Actual
0	0	NB Sight Lines to Southerly Holbrook WBL	250	260	No impact at limited sight distance location, overall minor traffic impact
		SB Sight Lines to Southerly Holbrook WBL		220	
4	6	NB Sight Lines to Northerly Holbrook WBR		440	
Crashes		SB to the West Northerly Holbrook WBR		660	
4 ³					

1. Unclear if vegetation limiting sight distance is within town right of way.

2. Note grading and vegetation removal may be difficult because of memorial, but would increase sight lines.

3. Crashes do not differentiate which Holbrook intersection the crashes occurred.