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February 9, 2021

David Klein  
Klein Outdoor Advertising  
54 Broad Street  
Suite L107  
Red Bank, NJ 07701

**Re: Proposed Billboard Sign  
Route 15 South MP 1.68  
Block 801, Lot 7.01  
320 N.J. Route 15  
Borough of Wharton, Morris County, NJ  
DT Job # 3167-99-003T**

Dear Mr. Klein:

The following is a traffic engineering and safety assessment for the referenced matter consisting of the construction of a double outdoor advertising sign located along N.J. Route 15 southbound in the Borough of Wharton, Morris County, New Jersey. It is proposed to construct a LED Variable Message Sign (VMS) with a face area of 11' x 36' for each face. This sign will be placed on a single V-shape support along the southbound lanes side of Route 15. The proposed sign will be 40' in height above grade, to the top of the sign and the bottom of the sign, including the 2 feet apron is 27' above grade (i.e.; the sign will have 27 feet of under clearance).

### **Existing Conditions**

N.J. Route 15 is an Urban Minor Arterial with a posted speed limit of 40 mph (58.7 feet per second ("fps")) at this location. The subject property is located approximately 300 feet north of the "T" intersection of Route 15 and Mount Pleasant Avenue. Route 15 provides a 5-lane cross-section along the site frontage with two (2) travel lanes in the northbound direction. There are two (2) dedicated left turn lanes and one (1) through lane in the southbound direction. The highway narrows south of its intersection with Mount Pleasant Avenue to provide one (1) travel lane in each direction. The highway is under the jurisdiction of the New Jersey Department of Transportation ("NJDOT") and the Average Daily Traffic in this area of Route 15 is 34,671 vehicles per day as of 2019, based on latest available NJDOT count data at the nearest station. Route 15 provides a curved horizontal alignment and a relatively flat vertical alignment in the vicinity of the proposed sign location.

Mount Pleasant Avenue is an Urban Major Collector with a posted speed limit of 40 mph (58.7 feet per second ("fps")) at this location. Mount Pleasant Avenue intersects Route 15 to form the stem of the T-intersection, providing two (2) dedicated left turn lanes and two (2) dedicated right turn lanes in the westbound direction at the intersection. There are two (2) receiving lanes traveling away from the intersection. The roadway is under the jurisdiction of the Borough of Wharton and the Average Daily Traffic in this area of Mount Pleasant Avenue is 29,684 vehicles per day as of 2018, based on latest available NJDOT count data at the nearest station. Mount Pleasant Avenue provides a curved horizontal alignment and a relatively flat vertical alignment in the vicinity of the proposed sign location.

As previously mentioned, the proposed outdoor advertising sign is located on the southbound side of Route 15 on Block 801, Lot 7.01 at approximately milepost 1.68. One (1) sign face is visible to northbound traffic of Route 15 and westbound traffic of Mount Pleasant Avenue and the other faces visible to southbound traffic flow of Route 15.

Due to the horizontal curvature of both roadways, the effective visibility of the signs facing the respective traffic flows is constrained by the surrounding roadside vegetation. As such, the sign facing the Route 15 northbound and Mount Pleasant Avenue westbound traffic flows becomes visible approximately 450' from the sign's location, along each roadway. Additionally, the sign facing the Route 15 southbound traffic flow becomes visible approximately 650' from the sign's location.

### **Proposed Advertising Sign**

#### *Northbound facing sign*

The visibility of the proposed digital outdoor advertising sign facing the northbound and westbound directions of Route 15 and Mount Pleasant Avenue, respectively, will be effectively visible by drivers beginning from a distance of at least 450' prior to the sign location while being located within a 40-degree cone of vision *i.e.*, that area, also known as center of gaze, in which a driver has a generally clear view of objects in and around the roadway for some distance.

As the driver traveling along Route 15 northbound progresses further north, the sign will continue to be within that 40-degree cone of vision for approximately another 283'. It is not until the motorist is approximately 167' from the sign that the approach angle is greater than 20-degrees to the line of travel and the sign is outside of that 40-degree cone of vision. This distance of 283' at 40 mph or 58.7 fps allows for a "time of read" of approximately 4.8 seconds. This time is more than sufficient to allow the driver to perceive the sign and read the message of the sign while still relying on his or her center of gaze. In other words, there is no need for the driver to take their eyes off-the-road in order to read the sign's message as the motorist is driving towards the sign. Note that the proposed sign will be within the 40-degree cone of vision for drivers traveling along Mount Pleasant Avenue westbound for the duration of their time traveling to the intersection with Route 15; therefore, sufficient time to allow the drivers to safely read the message without taking their eyes off-the-road. given the traffic signal located at the intersection, the average travel times through this distance will be greater than 4.8 seconds. Therefore, it is deemed that the sign is situated in an appropriate location for optimal visibility for oncoming motorists.

#### *Southbound facing sign*

The visibility of the proposed digital outdoor advertising sign facing the southbound direction will be effectively visible by southbound drivers beginning from a distance of at least 650' prior to the sign location while being located within a 40-degree cone of vision *i.e.*, that area, also known as center of gaze, in which a driver has a generally clear view of objects in and around the roadway for some distance.

As the driver progresses further south, the sign will continue to be within the 40-degree cone of vision for approximately another 562'. This distance of 562' at 40 mph or 58.7 fps allows for a "time of read" of approximately 9.6 seconds. This time is also more than sufficient to allow the driver to read the message of the sign while still relying on his or her center of gaze. In other words, there is no need for the driver to take their eyes off-the-road in order to read the sign's message as the motorist is driving

towards the sign. As with the northbound direction, this “time of read” assumes no interference with the driving the 562 feet distance, and given the traffic signal located at the intersection, the average travel times through this distance will be greater than 9.6 seconds. The sign is situated in an appropriate location for optimal visibility for oncoming motorists.

### **Traffic Safety**

With the construction of a digital multi-message LED sign, there are no traffic safety implications created its implementation with an LED format.

Reference is made to FHWA study *The Possible Effects of Commercial Electronic Variable Message Signs (CEVMS) on Driver Attention and Distraction* dated February, 2009, FHWA study *Driver Visual Behavior in the Presence of Commercial Electronic Variable Message Signs* dated September 2012, and four (4) studies prepared by Tantalia Associates, Inc., Consulting Engineers, Philadelphia, PA entitled:

- 1) *Study of the Relationship Between Digital Billboards and Traffic Safety in Cuyahoga County, Ohio*, dated November 9, 2009.
- 2) *Study of the Relationship Between Digital Billboards and Traffic Safety in Albuquerque, NM*, dated March 8, 2010,
- 3) *Study of the Relationship Between Digital Billboards and Traffic Safety in the Greater Reading Area, Berks County, PA*, dated August 2, 2010, and,
- 4) *Study of the Relationship Between Digital Billboards and Traffic Safety in Henrico County and Richmond VA*, dated November 29, 2010.

The two (2) FHWA studies were humanistic studies that concluded that variable message signs are not a distraction to motorists. They have a minimal effect on decreasing the time drivers are looking toward the roadway ahead, and when these drivers did, the average fixation time on such a sign was only 0.379 seconds, and far less than 2.0 seconds, which the National Highway Transportation Safety Administration (NHTSA) recognizes as the threshold of a hazardous situation. The studies found that drivers do not take long glances at such signs and maintained focus and concentration on the driving task.

Tantala studies included the statistical association between digital billboards and traffic safety. In these studies of accident data on highways at a total of 67 digital billboard locations were analyzed. The overwhelming conclusion and finding of these studies was that there is no statistically significant relationship associated with these billboards and accident occurrences.

While the 40-degree cone-of-vision measured from a fixture point is considered center gaze where images are clear, the para-peripheral vision outside of the 40 degrees to approximately 80 degrees. In this region of vision distinguishing detail and shape is weak, but ability to distinguish lights and movement (e.g., brake lights or objects moving within the path of the driver’s vehicle) is strong.

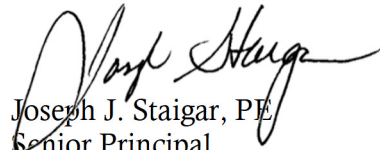
Furthermore, it is noted that the LED technology that digital signs are reliant upon does not allow for the imagery to be seen at angles greater than approximately 65 degrees to the viewer, or at least causes the image to significantly fade beyond that angle. As the driver approaches the sign and is at an acute angle to it (beyond an 80-degree cone-of-vision), the image disappears. In this manner, the driver will not “rubberneck” if he or she is inclined to read the sign as the sign is about to be passed, because there is no or only a faded image to be seen. This is unlike a static sign which can be seen until the driver is past the sign.

**Conclusion**

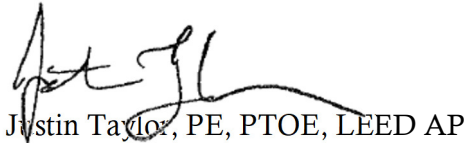
The proposed digital outdoor advertising sign is designed and located to provide optimum visibility, acuity and legibility for motorists. The New Jersey Department of Transportation (NJDOT) has cognizance over all outdoor advertising signs in New Jersey. NJDOT has reviewed this site and has approved and issued a permit for the proposed digital sign. Having NJDOT's approval in hand further ensures motorist safety. It is designed and located in a manner that it will not be a distraction to motorists and not cause a safety hazard.

Very truly yours,

**Dynamic Traffic, LLC**



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