



MEMORANDUM

DATE: November 4, 2016

TO: Rhode Island Division of Public Utilities and Carriers (RIDPUC)

CC: Kevin Lynch

FROM: Amy Archer, PE

RE: **E. Providence RR Crossing – Traffic Consulting Services**
(Pare Project No. 16266.00)

As requested by the Rhode Island Division of Public Utilities and Carriers (RIDPUC), Pare Corporation (Pare) has completed a review of plans prepared by Waterman Engineering Company (Waterman) and the Providence & Worcester Railroad Company (P&W) for a proposed at-grade rail crossing by a drive aisle within the proposed expansion to the Igus, Incorporated (Igus) facility currently located in East Providence, Rhode Island. After reviewing the plans, Pare reviewed the proposed crossing protection compared to the requirements established by the Federal Highway Administration (FHWA), as documented in the Manual on Uniform Traffic Control Devices (MUTCD), and by the American Railway Engineering and Maintenance-of-Way Association (AREMA). The following is submitted as summary of this review.

Plan Review

The plans prepared by Waterman and P&W, dated July 2016 and August 2016, respectively, indicate a proposed railroad crossing for internal circulation by the Igus facility, its employees, and its patrons. This crossing is proposed to have flashing signals on both approaches with a bell connected to the northbound signal. Additionally, the plans show stop signs (R1-1) and advance railroad warning signs (W10-1) for both approaches. Finally, railroad crossing pavement markings are proposed on both approaches, according to the plans.

The rail crossing plan indicates train speeds of 10 miles per hour. Additionally, the activation detectors for the bell to sound are located 440 feet away from the crossing along the rail in each direction. This allows a 30 second warning before the trains' arrival at the crossing itself.

While the proposed railroad crossing is intended for internal circulation and operations, it should be noted that the proposed facility expansion also shows the construction of two entrances on Patton Road, connecting to the adjacent neighborhood. This has the potential to draw some public traffic across the rail crossing.

Field Review and Data Collection

In addition to reviewing the plans provided for the proposed expansion of the Icus facility, Pare performed a site visit to review elements that may affect the design. The site visit was conducted on Thursday, October 27. The primary observation made during the site visit was the available sight distance from the proposed crossing in each direction along the rail. To the west of the crossing there is clear visibility to the Pawtucket Avenue (Route 114) overpass, a distance of approximately 0.60 miles. To the east of the crossing there is clear visibility to the next service cabinet, a distance of approximately 0.40 miles.

While the crossing plan indicated the speed of the trains that pass the proposed at-grade crossing, they did not report the volume of trains passing per day. This information was requested from RIDPUC during the site visit and confirmed to be just a few trains per day, though the specific times of train crossings was unknown.

National Guidelines

The FHWA has many roles in relation to at-grade rail crossings including: the determination of factors that warrant passive or active crossing control; the establishment of best practices for safe passive and active crossing design, as outlined in the MUTCD; and the procedures for safety review, reporting and mitigation of crossings following initial construction.

The following criteria from the FHWA/MUTCD apply to the proposed at-grade crossing:

- Passive and/or active control guidelines apply to all public crossings and all privately owned crossings that are open to the public.
- Passive control refers to measures that alert crossing traffic of the location of a crossing, but do not specifically indicate an approaching train, such as signing and markings.
- Active control refers to measures that specifically indicate an approaching train, such as signals, bells and gate arms.
- Active controls are recommended at crossings of rail lines with high speed trains, high frequency of trains and/or vehicular/pedestrian traffic, crossings with limited sight lines and/or crossings located in urban settings where the density of the roadway network and slow moving traffic increase the likelihood of queues extending through track crossing areas.
- High speeds are defined as freight trains with operating speeds of 40 miles per hour or greater and/or passenger trains with operating speeds of 60 miles per hour or greater.
- A crossbuck (R15-1) sign shall be provided on the right hand side of all approaches to an at-grade crossing with low volumes.
- Grade crossing advance warning (W10-1) signs shall be installed on all low-volume roads in advance of every crossing.
- Yield (R1-2) or stop (R1-1) signs should be used in combination with crossbuck signs at passive crossings.
- Yield control shall be the default for crossbuck assemblies unless an engineering study performed by the regulatory agency or highway authority having jurisdiction over the roadway approach determines that a stop is necessary (unusual conditions and/or poor sight lines).

- Yield or stop signs shall be mounted next to the crossbuck, rather than below on the same post, when adjacent to pedestrian travel or parking, requiring a 7-foot vertical clearance.
- Operating a flashing signal is equivalent to a stop control as part of the crossbuck assembly.
- Railroad crossing pavement markings should be applied to each approach to an at-grade crossing when a centerline is present.

As part of FHWA's review and reporting of at-grade crossings, they quantify that less than 25% of all public rail crossings have gates, approximately 7% have stop signs and only 3% have no signs or signals. While the AREMA references signal guidelines in their *Manual for Railway Engineering*, they identify and defer to the MUTCD as the primary standard for implementation and design of at-grade crossings.

Summary of Findings

Based on the above, Pare concludes that the level of crossing protection proposed for the low-speed, low-volume crossing seems adequate without the presence of gate arms. The availability of more than adequate sight lines in each direction combined with the proximity of the crossing to other roadways also contribute to the agreement that gate arms are not necessary.

The proposed signing and markings, however, are somewhat contradictory to the applications provided within the MUTCD. As noted, crossbuck signs should be present on each approach, and are not proposed. Further, the flashing signal is equivalent to a stop sign, but both are shown on the plans for the proposed crossing. Finally, the railroad crossing pavement markings are a recommended passive control, but are typically included on roadways with a centerline, which is not shown on the proposed improvements plan.

Pare recommends the following be considered by the designer:

- Combination crossbuck (R15-1) and flashing signal on the right hand side of each approach.
- Removal of proposed stop signs. May be replaced with "stop here when flashing" (R8-10 or R8-10a) signs, if desired, to call attention to the stop bar location.
- Addition of centerline striping to accompany the railroad crossing pavement markings.

If you have any questions regarding this information, please do not hesitate to contact me at (401) 334-4100.

Sincerely,



Amy Archer, PE
Project Engineer