

Summary of May 2016 BETA Engineering Report on an MBTA Train Horn Quiet Zone for Needham

The Transportation Committee has examined the BETA Engineering May 2016 report requested by the Board of Selectmen and also BETA's response to certain follow-up questions that we posed for BETA (attached to this report). The Committee has compiled this report to summarize the steps that would be needed to create a Train Horn Quiet Zone and present our estimate of the total cost for the Selectmen's consideration in their capital project planning.

First of all, the Committee has concluded from BETA's response to our questions that it is possible to eliminate the need to sound horns at all crossings in the town, including the five public highway crossings at Oak Street, Great Plain Avenue, May Street, Rosemary Street, and West Street through Needham Center and Needham Heights and the private crossing at the Needham Golf Course on the other side of town. This would be done by creating a Federal Railroad Administration (FRA) Quiet Zone covering the five public highway level crossings from Oak Street to West Street, and, through a separate agreement with the MBTA not involving the FRA, reaching an accommodation on a cessation of train horns at the private Golf Course crossing. These initiatives are discussed in turn below.

A. FRA Quiet Zone at the Public Crossings

To establish a train horn Quiet Zone, the FRA requires that crossing safety be improved by the addition of Supplemental Safety Measures (SSM's) so that the combined safety of all the crossings with SSM's and no routine train horn use is greater than for the same set of crossings "as is" with no SSM's and routine blowing of train horns. The SSM's considered in detail in the BETA report are the installation of so-called "Four Quadrant" gates to prevent cars from leaving their lanes and "slaloming" around the gates and onto the level crossing when the gates are down with warning lights flashing and bells ringing. In addition to the installation of the Four Quadrant gates, the SSM's would need to include:

- a. Vehicle Presence Detectors to prevent a vehicle from being trapped on the tracks when the gates come down,
- b. Constant Warning Time Devices (CWTD's) to cause the gates to close the same time before the train reaches the crossing regardless of the speed of the train, and
- c. Power Out Indicators (POI's) to provide a visual signal to warn the locomotive engineers if the electrical power to a particular crossing has failed.

The BETA report estimated the cost of installing Four Quadrant gates with Vehicle Presence Detectors at the five public highway crossings from Oak Street to West Street at about \$1.3 million dollars. The additional cost of CWTD's and POI's was estimated to be approximately \$150,000 per crossing for CWTD's and approximately \$100,000 per crossing for POI's, but determining whether these devices were or were not already present at each crossing was deemed to be outside the scope of the BETA services.

The Transportation Committee contacted Mr. John Ray, the Massachusetts Department of Transportation's Deputy Administrator for Rail (and formerly MBTA's Director of Railroad Operations), who was able to inform us that only the Rosemary Street crossing in Needham already has CWTD's and

that none of the crossings have POI's. We therefore estimate that this would increase the cost of Four Quadrant gate SSM's to enable an FRA Quiet Zone by about \$1.1M for a total cost of about \$2.4M.

B. Cessation of Train Horns at the Golf Course Private Crossing

In its response to our questions, BETA expressed confidence that the town could reach an accommodation with the MBTA and amend the private grade crossing agreement to allow no routine train horn operations at the Golf Club crossing (see the response to Questions 13-15 in the attachment). The first step in this process would be to request a meeting with Mr. John Ray. If Mr. Ray agrees in principle to the revision of the agreement's language, it could be modified through the efforts of Town Counsel working with MassDOT's legal staff. The BETA report recommended repurposing a set of Dual Crossing Gates from one of the five public crossings to the Golf Course location to improve its safety.

C. Conclusion

The BETA report and BETA's response to our additional questions indicate that the town could achieve the goal of suspending the routine use of train horns in Needham by the two-step process of a) creating a Federal Railroad Administration (FRA) Quiet Zone at the five public crossings in town, and b) amending the private grade crossing agreement at the Golf Course to eliminate the routine sounding of train horns at that crossing. The FRA Quiet Zone would require the addition of Supplemental Safety Measures at the public crossings at Oak Street, Great Plain Avenue, May Street, Rosemary Street, and West Street. If Four Quadrant gates with Vehicle Presence Detectors are selected for all five crossings, and Constant Warning Time Devices and Power Out Indicators are added to those crossings not currently protected, the current estimated total cost of the project would be about \$2.4M. The relocation of a set of Dual Crossing Gates from one of the public crossing to the Golf Course crossing and the amendment of the private grade crossing agreement are not expected to appreciably affect the cost. The Committee would suggest that an allowance of \$100,000 be budgeted for this work to make a total budgeted cost of \$2.5M.

At least 26 of the towns served by the MBTA Commuter Rail system have implemented FRA Quiet Zones. In these towns, trains approaching a public level crossing ring bells in advance of the crossing; automatic gates close, and at-crossing bells ring and lights flash for both sides of the highway at the crossing; but the train engineers do not sound train horns except in the case of an observed danger. In 20 towns (including Needham), no Quiet Zone is in place and train engineers routinely sound the train horns four times for each crossing. Mr. John Ray indicated that most towns establishing Quiet Zones have selected median barriers at the level crossing as a low-cost, low-maintenance option for SSM's. In reply to the Committee's question about this alternative (Question 18 in the attachment), BETA Engineering indicated that the Needham Public Works Department has advised against median barriers because of snow removal issues and because "three of the streets (Oak, May, and West) are generally narrow and have driveways in close proximity to the grade crossing(s). Movement of trucks into and out of these driveways and parking areas would be significantly impacted by median barriers."

If the Board of Selectmen decides to proceed to establish a train horn Quiet Zone in Needham using Four Quadrant gates at each public highway crossing (with an amended private crossing agreement at the Golf Club), the Capital Planning Budget should include an expenditure of \$2.5M for the required Four Quadrant gate SSM's with associated Vehicle Presence Detectors, Constant Warning Time Devices, and Power Out Indicators and for the work at the Golf Course crossing.



ENGINEERING SUCCESS **TOGETHER**

September 29, 2016

Anthony L. Del Gaizo, P.E.
Town Engineer
500 Dedham Street
Needham Massachusetts 02492

Re: *Follow-up Questions on Quiet Zone Report - Response*

Dear Mr. Del Gaizo,

BETA Group, Inc. (BETA) received the follow up questions from the Board of Selectmen and Transportation Committee regarding our May 10, 2016 presentation. We have reviewed the questions and offer the following responses.

1. Q. Would the safety of the grade crossings in Needham be increased by the use of Supplemental Safety Measures (SSMs) such as quad gates or median barriers?

A. The addition of SSMs would increase the safety of the grade crossings.
2. Q. Which would have greater crossing safety: (i) with SSMs and no routine use of train horns; or (ii) without SSMs but with routine use of train horns (existing status quo)?

A. Our rail expert, Mr. Egan, believes that the use of train horns provides a safer grade crossing than can be accomplished in a Quiet Zone.
3. Q. In the event that a Quiet zone is established, will bells on the train engine and crossing gates still sound and will lights on the engines and on crossing gates still flash at each level crossing?

A. In a Quiet Zone the bells and lights on the grade crossing warning devices will activate as normal. The bells and ditch lights on the locomotives will not activate.
4. Q. In the event that a Quiet zone is establish, will routine use of train horns be used in the absence of unusual hazardous situations?

A. There is no "routine" use of train horns in a designated Quiet Zone. Train horns will be used when, in the locomotive engineer's opinion, an emergency situation exists, such as person or vehicle on the right of way, which requires use of the train horn to warn those people of an impending situation.
5. Q. In the event that a Quiet zone is establish, will train engineers have the discretion to sound the horn in the event of any unusual situation of danger, such as a person or vehicle on the tracks?

A. Same answer as No. 4. There is no "routine" use of train horns in a designated Quiet Zone. Train horns will be used when, in the locomotive engineer's opinion, an emergency situation exists, such as person or vehicle on the right of way, which requires use of the train horn to warn those people of an impending situation.

6. Q. Are Constant Warning Time devices, Vehicle Presence detectors, and Power Out features required improvements for installation of Quad Crossing gates to permit the establishment of a Quiet Zone?

A. Constant Warning Time Devices and Power Out Features are required prerequisites for a Quiet Zone. Vehicle Presence Detectors are not required for a Quiet Zone, and are a further SSM, as Four Quadrant Gate Systems can be developed either with or without Vehicle Presence Detectors.

7. Q. Which of the grade crossings in Needham are equipped with Constant Warning Time Devices?

A. We did not investigate this matter with the MBTA/Keolis as this was outside the scope of our services.

8. Q. Which of the grade crossings in Needham are equipped with Power Out features?

A. We did not investigate this matter with the MBTA/Keolis as this was outside the scope of our services.

9. Q. What is the estimated cost of providing Constant Warning Time at each Needham crossing that is not already so equipped?

A. It is difficult to offer an exact number since Keolis will be responsible for securing and installing the equipment but the equipment will likely be in the \$150,000 range per crossing.

10. Q. What is the estimate cost of providing Power Out features at each Needham crossing that is not already so equipped?

A. As with question 9, it is difficult to offer an exact number since Keolis will be responsible, but equipment will likely be in the \$100,000 range per crossing.

11. Q. Do the cost estimates for the quad gate installation include Vehicle Presence Detectors and if not, what would the cost be?

A. Yes.

12. Q. What entities are qualified to do the pedestrian crossings assessment at Needham Center and Hersey, and what would be the estimated cost of the assessment?

A. These assessments are normally done by a committee formed by the Town (and its consultant), the FRA, the owner of the Rail Line (The MBTA), and possibly, the operator (Keolis).

13. Q. The BETA study states: "We have asked the FRA for a clarification ...at the Needham Country Club grade crossing." What was the result of the regional manager's inquiry with his superiors regarding the private (golf course) crossing?

A. We have reviewed this matter with Mr. Frangella, of the FRA. He clarified the FRA position on the private crossing. Since the Country Club crossing is more than a quarter mile from the last public grade crossing it cannot be included in the Quiet Zone. He further advises that if the town reaches an accommodation with the MBTA regarding the private crossing, it is not necessary to involve the FRA in that decision, since that would fall outside the purview of the FRA.

14. Q. Is it BETA's opinion that the Town could reach an accommodation with the MBTA regarding the private crossing and amend the private grade crossing agreement accordingly to allow no routine train horn operation at the Golf Club crossing?

A. Yes.

15. Q. What is BETA's recommendation as to how to pursue reaching such an accommodation and its opinion of the cost of doing so?

A. The first step would be to request a meeting with John Ray, head of commuter rail. While the ultimate revision of contract language will be done by others, if Mr. Ray agrees in principal, this will assist the process. The cost will be a function of the hours expended. Does the country club have its own counsel who would handle such negotiation, or is the town going to take the lead?

16. Q. If the Town cannot reach an accommodation, in BETA's opinion what would the most cost-effective way to eliminate the need to sound horns at the Golf Club crossing?

A. It is important to understand that, from the MBTA perspective, this grade crossing (and every grade crossing) is a potential liability. The goal of the MBTA is to minimize their exposure as relates to any incidents at crossings. This dictates their maintenance practices, operating practices and their use of warning devices. That said, there are two alternatives if an accommodation cannot be reached: Eliminate the crossing or create a grade separation. Neither of which is desirable, but are options.

17. Q. What would be the additional cost of such required improvements (Constant Warning Time devices, Vehicle Presence detectors, and Power Out features), in addition to the Quad Crossing gate improvements, to allow the establishment of a Quiet Zone?

A. That cost has not yet been developed.

18. Q. Are there any of the level crossings in Needham that could be acceptable for the Quiet Zone by installing median barriers as Supplemental Safety Measures? What is the estimated cost of median barriers at these crossings compared with Quad Crossing gates?

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A. Public Works has advised against Median Barriers. The reason cited was concern regarding snow removal issues. Additionally, three of the streets (West, May and Oak) are generally narrow and have driveways in close proximity to the grade crossing(s). Movement of trucks into and out of these driveways and parking areas would be significantly impacted by median barriers. As such, we did not develop a cost for median barriers.

Please let me know if you have any questions.

Very truly yours,
BETA Group, Inc.

Robert T. Mackie, PE, BCEE
Vice President

cc: File
Thomas Egan, ECG

Job No: 5176