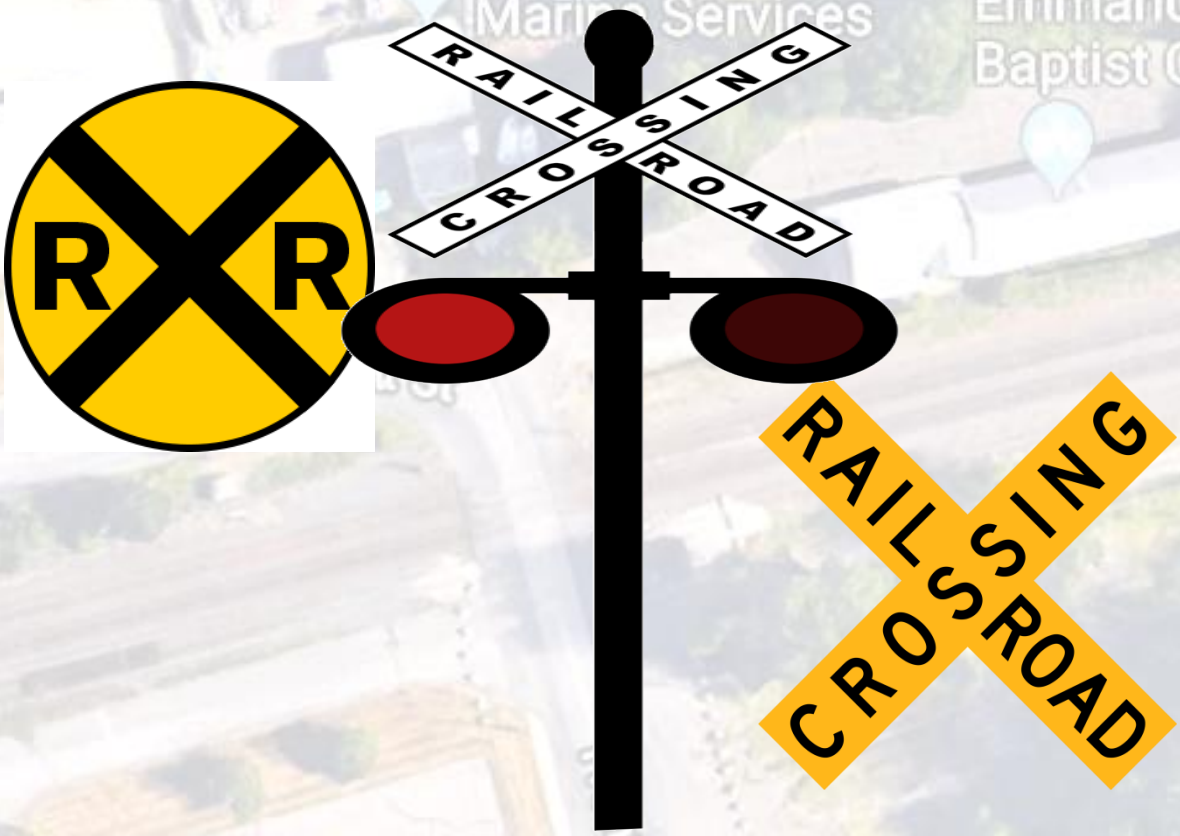
Top High Risk At-Grade Railroad Crossings in the Pioneer Valley



Prepared under the direction of the Pioneer Valley MPO by the:

PIONEER VALLEY PLANNING COMMISSION

APRIL 2019

Prepared in cooperation with the Massachusetts Department of Transportation and the U. S. Department of Transportation

https://omaharentalads.com/explore/railroad-sign-clipart/

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Introduction

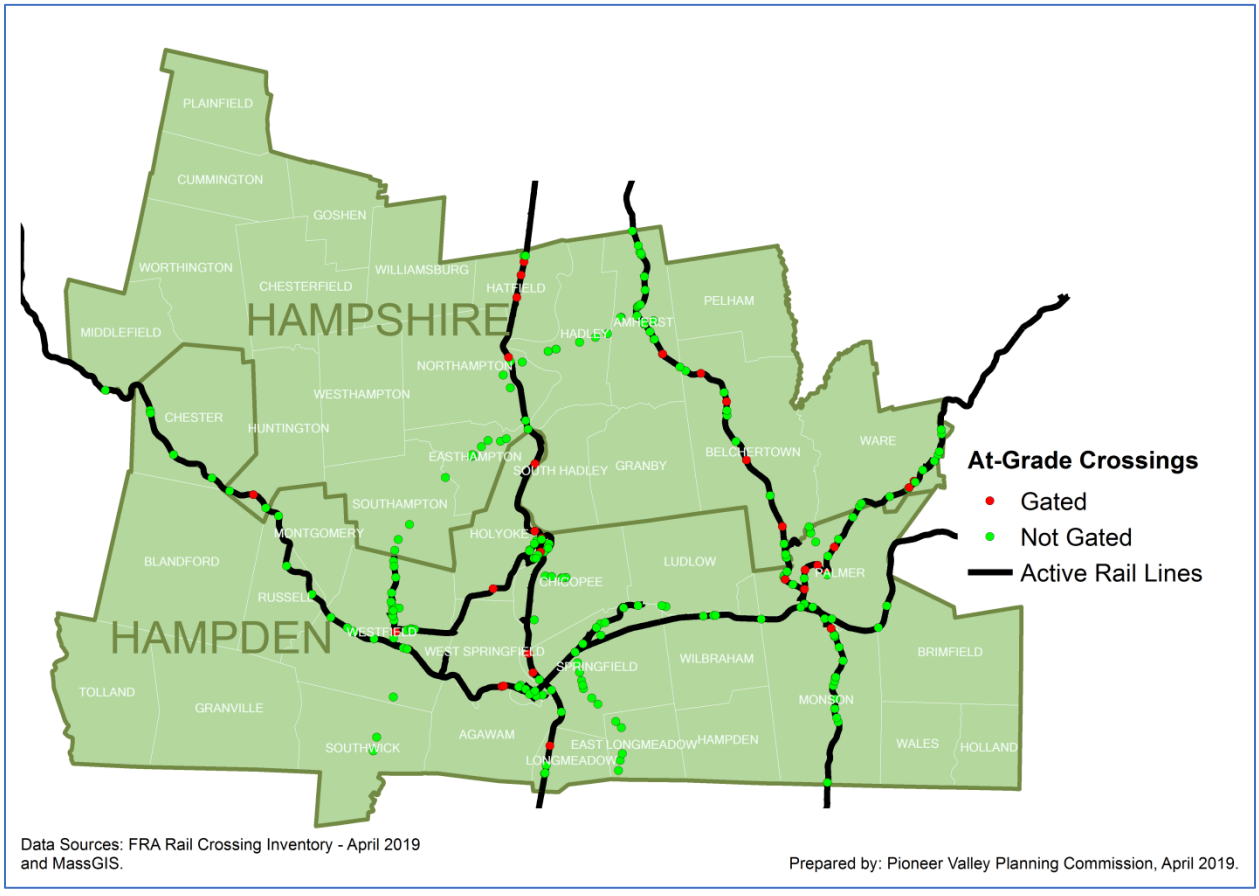
In March 2017, a fatality occurred at the railroad crossing along Birnie Road in Longmeadow. This incident prompted the closing of the crossing which had a history of previously reported fatalities in the years of 1975, 1981, and 1982. Time to time changes and improvements were made along the crossing to stop such incidents, however these measures were not able to prevent the crash along this low volume road.

In light of this event, the Pioneer Valley Planning Commission undertook a study of identifying and studying high risk at-grade railroad crossings in the region to further assist the local communities in improving transportation safety along these locations.

Regional Profile

The Federal Railroad Authority's (FRA) rail crossing inventory summarizes at-grade rail road crossings in the region. There are currently 295 (Hampden 198, Hampshire 97) at-grade crossings in the Pioneer Valley (PV) Region according to their database. A lot of these locations are located along non-operational rail road tracks. A total 31 of these 295 crossings are gated. Many of the at-grade railroad crossings in the PV region do not have safety gates. Figure 1 depicts the locations of these crossings.

Figure 1: At-Grade Railroad Crossings



Web Accident Prediction System (WBAPS)

In order to identify the top high risk crossings in the region, the PVPC utilized the Federal Railroad Administration's Web Accident Prediction System (WBAPS).

https://safetydata.fra.dot.gov/webaps/

The WBAPS is a computer model whose online portal generates reports listing public highway-rail intersections for a State, County, City or railroad ranked by predicted collisions per year. These reports include brief lists of the Inventory record and the collisions over the last 10 years.

It is important to note that this is an analytical tool that **does not rank** crossings in terms of most to least dangerous. It rather enables State and local highway and law enforcement agencies identify public highway-rail crossing locations which may require additional or specialized attention **based on predicted risk of possible incidents**. This feature helped us to ascertain that it can be used as a tool to nominate particular crossings which may require attention towards physical safety improvements or enhancements in the Pioneer Valley Region.

The WBAPS accident prediction formula is based upon two independent factors (variables): (1) basic data about a crossing's physical and operating characteristics and (2) five years of accident history data at the crossing. However, these data are obtained from the FRA's inventory and accident/incident files, which are subject to some errors and inaccuracies.

In a nutshell, WBAPS is designed to nominate crossings for further evaluation based only upon the physical and operating characteristics of specific crossings as voluntarily reported and updated by States and railroads and five years of accident history data. And therefore it was utilized to identify candidate locations for this study.

The report generated by WBAPS listed:

1. Rail Road Crossing along Front Street (West Springfield) and Bridge Street (Agawam),
2. Bark Haul Road (Longmeadow), and
3. Birnie Road (Longmeadow)

as top 3 high risk public highway – railroad crossings in the region. This report is included as Appendix 1.

Front Street Crossing (West Springfield)

This is a 2 track crossing located at the border of West Springfield and Agawam along the CSX Railroad network. This location is in proximity of CSX railyard to its east. It is a gated railroad crossing with flashing lights and cross bucks.

Front Street is a local road serving small commercial development in the vicinity of the railroad crossing and it connects to Bridge Street in south providing access to residential neighborhoods in Agawam. Vehicles approaching the railroad crossing from north along Front Street have to make a sharp right turn in the close vicinity of the tracks. This geometry of the road sometimes makes it difficult for the faster moving vehicles to visualize the gates in advance.

Figure 2: Aerial view of Front Street Crossing

Source: Google Maps
https://www.google.com/maps/place/Front+St,+West+Springfield,+MA+01089/@42.1006236,-72.6375104,221m/data=!3m1!1e3!4m5!3m4!1s0x89e6e11621cdf515:0x6756f03101b3b006!8m2!3d42.100557!4d-72.639029

FRA's WBAPS

The WBAPS report refers to this crossing as Bridge Street crossing in West Springfield; however Bridge Street gets converted to Front Street north of the Westfield River just across Agawam townline. The report indicates that there are approximately 24 trains per day that utilize these tracks and the maximum allowable speed for the trains along this crossing is 40 mph.

This location experienced 2 crashes between 2013 and 2017; it ranks as the top in the region with 0.105 annual predicted collisions

Warning Devices

There are activated gates accompanied by flashing lights and cross bucks along both north and south bound directions of the Front Street in advance of the railway track crossing. The gates are approximately 15 feet wide and extend along the approach however the receiving lanes along both sides remain open. Because of this it is possible for some vehicles to ignore the gates and make an illegal movement across the tracks in case of longer gate closing intervals. Auxiliary flashing lights accompanied by cross bucks have been installed along the south bound approach of Front Street to alert the vehicles along the bend.

Figure 3: Cross Bucks and Gates along West Springfield side approach (left) and Agawam Side Approach

Source: PVPC

At the time of the survey, railroad crossing pavement markings installed along Front Street and Bridge Street in Agawam were mostly faded and could not be visualized.

Warning Sign along Front Street southbound approach was mostly faded and needed replacement. At the time of the field survey advance warning sign along north bound approach of Front Street was found missing.

Figure 4: Faded Advance Warning Sign along Front Street

Source: PVPC

Existing geometry along south bound approach as well as vegetation and presence of multiple utility poles along northbound approach make the approaching railroad tracks difficult to view in advance from West Springfield side.

Traffic Volumes and Speed

Traffic volume and speed data was collected along both approaches to determine the peak hours along the streets and the impact of prolonged closing of the gates. Speed data was also collected to analyze the risk of possible collisions due to vehicles trying to speed across the crossing in order to avoid being stuck at the gates. The results are depicted in the table below:

Table 1: Traffic Volumes and Speed

	Front Street (West Springfield)	Bridge Street (Agawam)
Average Speed (mph)	18	24
85% Percentile Speed	30	37
Annual Daily Traffic	7565	7083
Morning Peak Hour	11:00 am/ 249	7:00 am/ 207
Afternoon Peak Hour	6:00 pm/ 546	5:00/pm 325

Source: PVPC

Pavement Condition

At the time of the survey, pavement in the vicinity of the crossing was found to be in poor to fair condition because of multiple pot holes and cracks. The pavement markings were faded at numerous locations and concrete curbing along the sidewalk in the north of Front Street was damaged intermittently.

Figure 5: Pavement Condition and Curbing

Source: PVPC

Sight Distance

The sight distance for the vehicles along the tracks in both directions was limited because of the curvature in the tracks along both east and west directions of Front Street. Longer gate closing times sometimes lead to driver frustration, the limited sight distance also adds on to the problem as the drivers waiting at the gates cannot see approaching trains from either side of the gates.

Figure 6: Geometry of the Railroad Tracks

Source: PVPC

Crash History (Recent 10 Years) in WBAPS Report

The WBAPS lists 4 crashes that occurred at this location in past decade. The table extracted from the report is pasted in figure below which shows the data represented for each crash.

Figure 7: WBAPS Crash History Table

Crossing	Date/Time	Railroad	City/hwy	Highway User/ User Speed	Type Track/ Train Speed	Weather	Circumstances/ View of Track Obstructed	Warning Devices/ Operating?	Interc/ Lights	# Killed / # Injured
525901A										
	10/31/15	CSX	WEST SPRINGFIELD	AUTO	MAIN	34 F	TRN STRUCK HWY USR	GATES	NO	0
	12:22AM		BRIDGE STREET	020MPH	035MPH	CLEAR	NOT OBSTRUCTED	YES	YES	1
	09/14/13	CSX	WEST SPRINGFIELD	AUTO	MAIN	56 F	TRN STRUCK HWY USR	GATES	NO	0
	1:25AM		BRIDGE STREET	000MPH	027MPH	CLEAR	NOT OBSTRUCTED	YES	YES	0
	04/17/12	CSX	WEST SPRINGFIELD	AUTO	MAIN	65 F	TRN STRUCK HWY USR	GATES	NO	0
	7:10PM		BRIDGE STREET	005MPH	038MPH	CLEAR	NOT OBSTRUCTED	YES	YES	0
	02/06/08	CSX	WEST SPRINGFIELD	AUTO	MAIN	43 F	TRN STRUCK HWY USR	GATES	NO	0
	11:20AM		BRIDGE STREET	030MPH	040MPH	RAIN	NOT OBSTRUCTED	YES	NO	0
Total Accidents:	4									

Source: https://safetydata.fra.dot.gov/webaps/ July 2018

Gates Closing Observations

The local business owners in the vicinity mentioned their concerns regarding the gates being closed for extended periods of time leading to traffic queuing and delays. Long freight trains coupling and decoupling at the CSX rail yard block the movement of traffic for long periods of time several times of the day. Motorists are forced to wait anywhere from 20 minutes to an hour as the freight cars block the crossing while the long line of containers move back and forth as cars are attached and detached at the multimodal freight facility, located about a mile away in the east of the crossing.

This information was confirmed by PVPC when visual data was collected at the location for a continuous period of time. This data also confirmed the incidents of vehicles speeding across the crossing by

maneuvering around the gates and some drivers ignoring the warning signs, the flashing lights and gates closing audio.

Recommendations

It is recommended that the local department of public works for both the communities work in cooperation to improve the conditions within their jurisdictions along this location. As a short term measure the pavement markings need to be repainted and long term the pavement needs repaving to improve the condition and eliminate rutting and pot holes. It is recommended that the curbing along the pavement also gets repaired and replaced as per need.

Advance warning sign along the West Springfield approach needs to be replaced. Vegetation along the Bridge Street approach towards the east needs to be maintained and trimmed for proper visibility of cross bucks and flashing lights.

The Town of West Springfield and Agawam need to work with CSX Railroad to resolve the extended and frequent closing of the gates and idling of trains along the tracks in the crossing during certain occasions.

It is recommended that the CSX railroad initiate an engineering study to examine the behavior of the drivers along the crossing and consider replacing the current gates with four-quad gates if warranted to prevent the drivers from going around the gates when the half gates are down.

As a long term measure it is also suggested that the local authorities consider installing advance warning signs along the streets approaching the Front Street and the Bridge Street to let the drivers know of the gates closing thereby they can avoid the route during those times.

Improvements and Proactive Measures by Local Authorities

The findings and concerns in this report were briefly discussed with local authorities in draft format. As a result a number of short term improvements were made at this location to improve the traffic conditions. The Mayors of both the communities have actively voiced their concerns in light of the developments made through this report. An article describing their efforts was published in the Republican dated October 2018. It has been attached as Appendix 2.

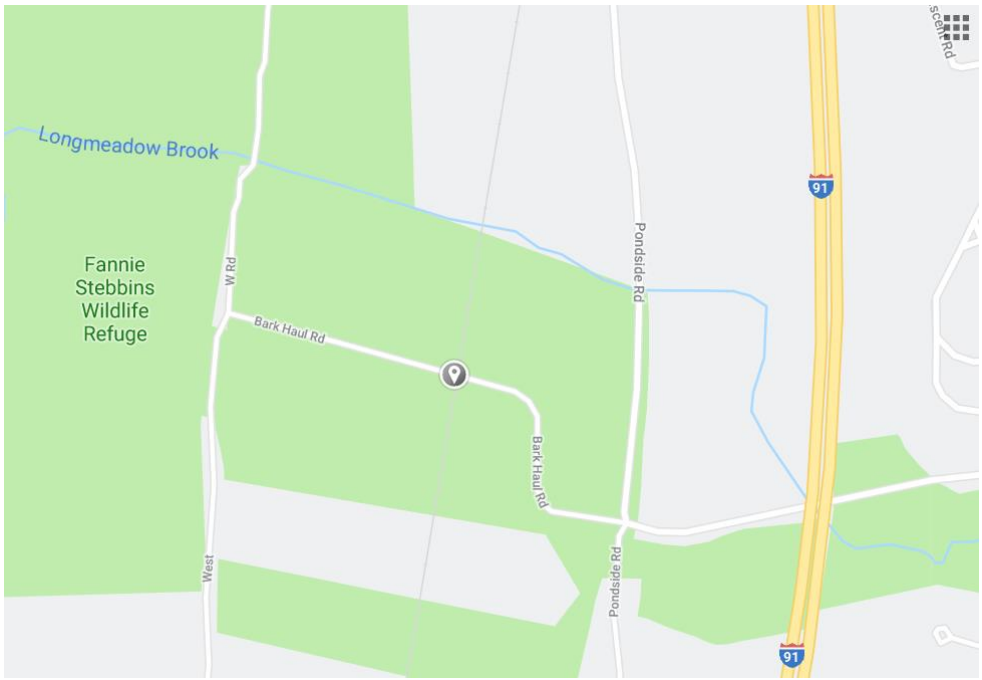
Bark Haul Road Crossing

It is listed as a Private Railroad crossing belonging to Amtrak. There are 2 tracks along the crossing. Bark Haul Road is a gravel path in the vicinity of the crossing along the train tracks within the Fennie Stebbins Wild life Refuge Area. The road is currently restricted to the motor vehicles beyond Pondside Road and is utilized as a trail by local residents and visitors for floodplain wildlife viewing and recreation. Motor vehicles were observed to utilize the vicinity of the intersection of Bark Haul Road and Pondside Road for parking.

Figure 8: Fannie Stebbins Wild Life Refuge Map

Source: www.trailsrunproject.com

Figure 9: Bark Haul Road Crossing



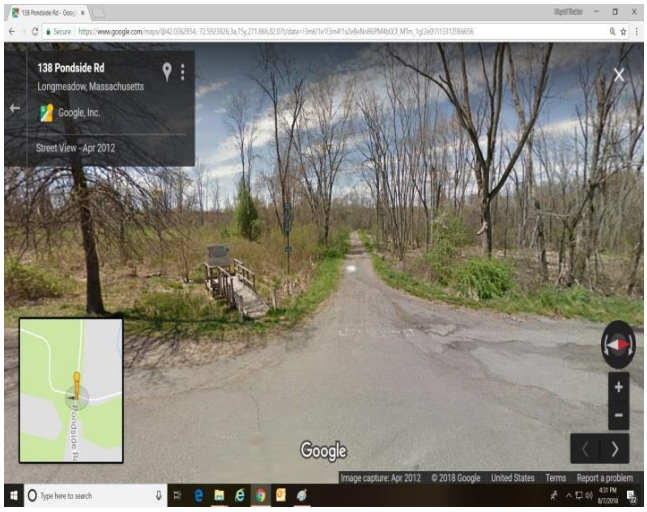
Source: Google Maps

Figure 10: Gate across Bark Haul Road Approach from Pondside Road

Source: PVPC

Bark Haul Road is partly paved and partly gravel. Google Images dating back to 1990 depict that it was open to traffic back then. This is also evident by distinct rutting along the road. Google Street view from April 2012 also indicates that the road was open to traffic as recently as the year 2012.

Figure 11: Google Street View Image from 2012



Source: PVPC, Google

WBAPS DATA

The WBAPS report states that the warning devices were updated in April 2017. And that the location did not register any crashes within last 10 years. The report indicates that there are approximately 12 trains per day that utilize these tracks and the maximum allowable speed for the trains along this crossing is 70 mph. This crossing along with Birnie Road crossing has annual predicted collision rate of 0.073 and ties in at second position along with Birnie Road, after Front Street Crossing in West Springfield.

The report lists the ADT along this crossing as 300 vehicles, which based on current conditions and local information seems inaccurate.

There is a possibility that the patrons of the conservation area and local residents who utilize the road for recreational purposes could be distracted by the vegetation and wildlife and such a situation could result in a traffic safety hazard.

Warning Devices

The WBAPS report states there are cross bucks present at the location however at the time of field visit only Stop signs were observed along both approaches of Bark Haul Road supplemented by a private railroad crossing sign and an information sign for reporting incidents and emergencies. The sign post for westbound approach pf Bark Haul Road was damaged and the signs were laying along the road. Overgrown vegetation was covering the signs along both directions.

Figure 12: Warning Signs along Bark Haul Road

Source: PVPC

Recommendations

The road is currently closed to traffic and it is not known what the plans are for this road once the planned improvements along the Birnie road crossing are implemented. There is a possibility that this crossing is pulled up high along with Birnie Road crossing because of the crashes that occurred at the other location. This road is closed to motor vehicle traffic and therefore if the traffic data gets updated in the FRA system the results might be different for the predicted collisios. It is recommended that the Town of Longmeadow work in cooperation with Amtrak to update the FRA database and observe the results. If the location is still considered high risk than an engineering study to determine the possible improvements should be considered.

In the meantime short term improvement measures like repairing the damaged signs and proper maintenance of the gate restricting the access of motor vehicles should be considered to ensure the safety of the users of this road.

Birnie Road Crossing

Birnie Road has been closed to traffic since March 2017 after the crash that resulted in fatality occurred along this location between a motor vehicle and a train. Currently the Town DPW is awaiting the upgrade of the existing warning devices before reopening the road to public.

Figure 13: Birnie Road Northbound Approach; Advance Warning Sign and Barriers

Source: PVPC

Birnie Road is a local road in Longmeadow that provides access to farms and several residences along Dunn Road and W Road located to the west of the railroad tracks along the banks of River Connecticut. FRA database depicts ADT of 300 along this road in past.

WBAPS DATA

The WBAPS report states that the warning devices were updated in March 2017. And that the location registered a crash which resulted in a fatality within last decade. The report indicates that there are approximately 12 trains per day that utilize these tracks and the maximum allowable speed for the trains along this crossing is 70 mph. This crossing along with Bark Haul Road crossing has annual predicted collision rate of 0.073 and ties in at second position along with Bark Haul Road, after Front Street Crossing in West Springfield.

Warning Devices

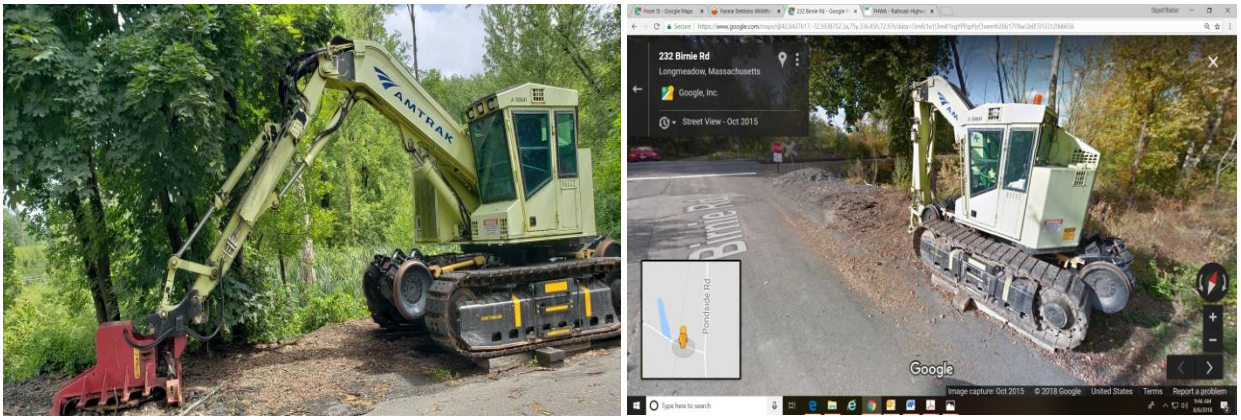
The warning devices information for the two locations in Longmeadow seems to be switched in the FRA database. Birnie Road crossing has Stop Sign and crossbucks to alert the drivers about the approaching tracks. These devices were installed before 2017 as can been seen in Google street view from October 2015. Currently the Town is awaiting the upgrade of the warning devices to flashing lights along with cross bucks at this location. The PVPC was not able to officially confirm whther or not gates will be installed.

Figure 14: Cross Bucks and Stop Sign

Source: PVPC

An Amtrak service vehicle is parked along the side of Birnie Road westbound approach. This vehicle can also be observed in street view images dating back to 2015.

Figure 15: Amtrak Service Vehicle



Source: PVPC, Google

Pavement Markings

Pavement markings exist along both approaches of Birnie Road to inform the drivers about the approching railroad tracks crossing the highway. These markings have considerable faded along the eastbound approach.

Figure 16: Pavement Markings

Source: PVPC

Media Reports on Historic Crashes

According to numerous news paper articles in the aftermath of the 2017 crash, warning signs were not present at the time of the previous fatal collisions, recorded in 1975, 1981 and 1982. An accident report for a July 2005 collision -- which resulted in no deaths or injuries -- lists stop signs and cross bucks in the category of "Type of Crossing"

Recommendations

There are plans for several improvements along this location which include updating the warning devices and improving pavement condition and vegetation maintenance. The details of the planned improvements could not be verified at the time of this report; however it is expected to surely improve the safety conditions along this location.