Retracing the Path of a Street Railway

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Abstract – The history of technology can stimulate student interest and provide an important historical and cultural prospective for engineering courses. This paper presents the results of historical research about a local street railway, and discusses the use of history of technology topics for freshman and senior courses.

Electric street railways played an important part in the development of cities and towns in the early twentieth century. Many of them operated for only a few decades, and often became obsolete as automobiles and roadways improved.

New Bedford and Onset Street Railway operated electric trolleys between the named cities in Massachusetts from the early 1900s into the late 1920s. As was the custom, most of the track was laid in the public right of way so the public land records contain very little evidence of its existence. Nearly one hundred years later, its original path has been obliterated by infrastructure changes.

The objective of this research was to accurately identify the location of the trolleys' tracks and structures. Examples of maps showing the tracks and facilities are presented along with photos showing trolley cars, stations, car barns, and power plants. Where possible, these are related to current infrastructure.

Keywords: history of technology, street railway, trolley, right of way, infrastructure, transportation

INTRODUCTION

Electric street railways played an important part in the development of cities and towns in the early twentieth century. Many of them operated for only a few decades, and often became obsolete as automobiles and roadways improved. The New Bedford and Onset Street Railway operated electric trolleys between the named towns in Massachusetts from the early 1900s into the late 1920s. As was the custom, most of the track was laid in the public right of way so the public land records contain very little evidence of its existence. Nearly one hundred years later, its original path has been obliterated by infrastructure changes.

The objective of this research was to accurately identify the location of the trolley's tracks and structures relative to the roadway (i.e. "north side of the road") or to adjacent structures or land marks (i.e. "center of the bridge"). This level of accuracy is helpful for understanding how the trolley interacted with the community, its institutions and infrastructure, and for interpretation of historic photos or other data.

Visible remnants of the NB&O system include car barns in New Bedford, Wareham, Middleboro, and Monument Beach. The parent company of the NB&O created an amusement park in North Dartmouth which operated until the mid-1960s. Its wooden roller coaster still stands, abandoned in an empty field south of Route 6. A short segment of its private right-of-way can be seen in Marion. Its route from Wareham to Onset Junction became a city street. Where the trolley crossed under the abandoned railroad grade in Mattapoisett, you can see a dip in the bike path caused by settling of the fill. However, few other physical traces of its existence persist.

Topographic maps which show historical roads and railroads are available. The NB&O operated for only a few decades, and none of these topographic maps depict its period of operation. Route maps are available which show

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the major stops, but these are not sufficient to accurately locate the tracks. Figure 1 shows the route map of the NB&O (in red line), superimposed on a satellite photo along with present day roadways [4].

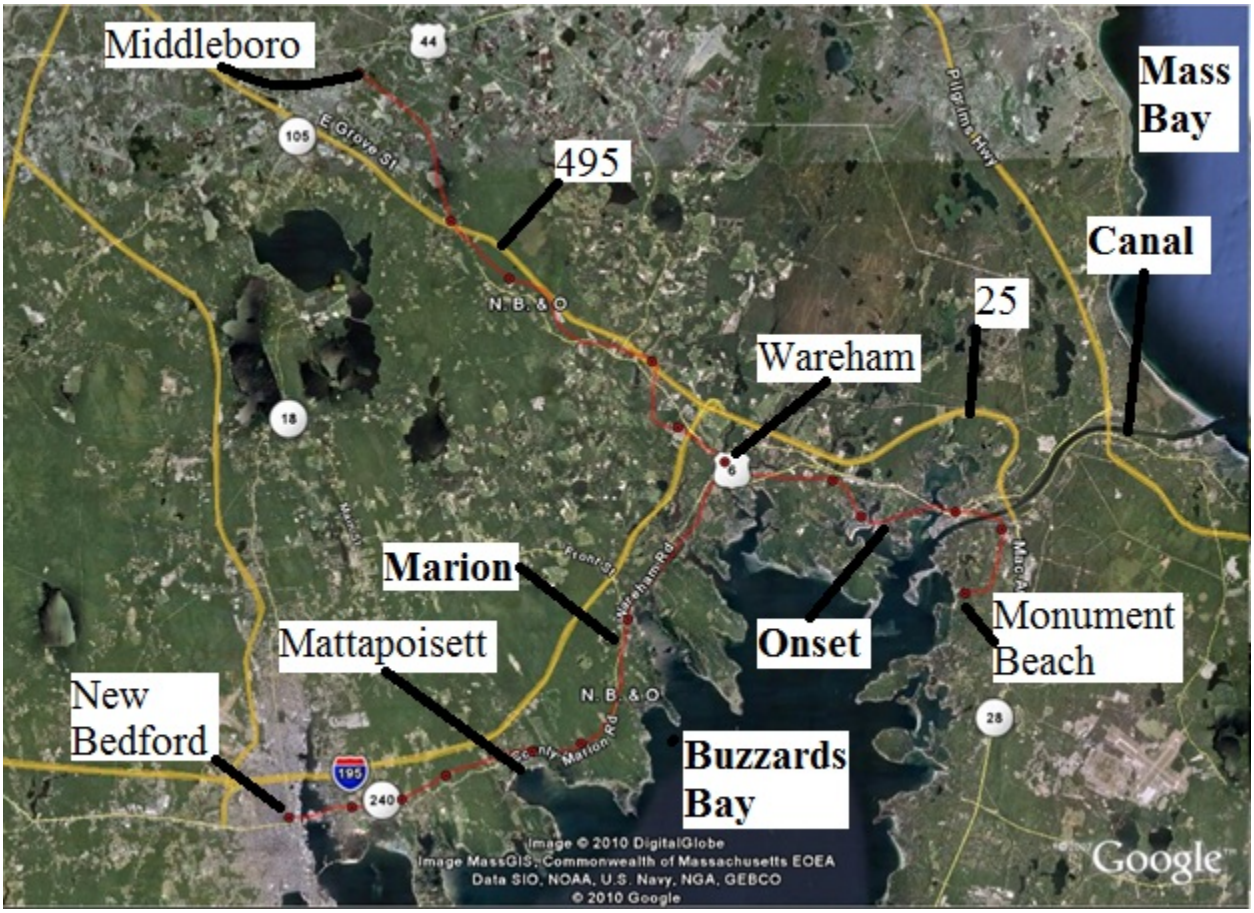

Figure 1 Route Map with present day roadways [4]

HISTORY OF THE NB&O STREET RAILWAY

The predecessor of the NB&O (the New Bedford and Fairhaven Street Railway) began operations in 1872 with horse drawn cars [8]. Its tracks crossed the harbor to Popes Island and Fairhaven on bridges and trestles, terminating at the railroad station in Fairhaven. Electrification began in 1890. The NB&O was incorporated January 23rd, 1901 and began operations in August of that year. The NB&O operated from New Bedford to Wareham to Onset. A separate street railway (the Middleboro, Wareham, and Buzzards Bay) was organized the same year [10]. Its tracks went from Middleboro to Wareham and from Onset to Monument Beach. The MW&BB used the tracks of the NB&O from Wareham to Onset [10]. The WM&BB was sold to NB&O in 1906[10], and the NB&O operated its tracks until 1926. Operations on the original NB&O tracks were suspended on September 30, 1927[8].

August Belmont completed construction of the first canal between Massachusetts Bay and Buzzards Bay in 1916 [11]. Before Belmont's canal was constructed, the NB&O crossed the Monumet River on the old highway bridge. Belmont built a drawbridge over the canal which served the roadway and the NB &O Street Railway. About the time the NB&O suspended operations, the federal government (Army Corps of Engineers) took over the canal and began rebuilding it. The improvements included widening, deepening, and straightening of the canal. The NB&O was gone before the new (Corps of Engineers) canal was constructed.

Physical Plant, Rolling Stock and Operations

Annual reports of the NB&O corporation provide a snap shot of its physical plant, rolling stock and operations. For example, in 1914, the NB&O operated 44 miles of track under electric power, including sidings and switches [10].

All but 9 miles of this was operated in the public way. It operated 11 closed passenger cars, 17 open passenger cars, 1 express car, 2 work cars, 1 "other" car, and 3 snowplows. It also reported one automobile for road use.

The NB&O reported that there were 520,000 passenger and revenue car miles in 1913-1914[10], which corresponds to 45,000 hours of passenger and revenue car operations. During this period, they carried 2,704,000 passengers and employed 143 persons. Total operating revenue for the year was approximately $162,000. Expenses for power totaled $28,500, and $24,170 was paid to "conductors, motormen, and trainmen".

Express freight operations for the NB&O were extolled in a 1902 newspaper article [6]. The author explained that Fall River was considering whether to allow freight express on D&W, so the purpose of article may have been to influence that decision, as well as promote its existing service. Express car 222 made two daily trips, but had to avoid the scheduled passenger cars. Express car 222 had been rebuilt from a wrecked passenger car. When owned by the Dartmouth and Westport (D&W), it had

> "plunged down Smith Mills hill, one fine summer afternoon, tore out a few yards of stone wall and spilled a crowd of passengers over the highway, luckily escaping fatal consequences, but costing the company a pretty penny."

Following the wreck it was first converted to an open sided excursion car, next to a "depot car and then to Express Car 222. Its inside dimensions were 7 x 22 feet. The NB&O used phones to control train operation. Freight cited in the article included 5 cans of naphtha (boat fuel?), a tombstone to be delivered to a cemetery gate, a dog, and builders supplies including lumber, sashes, doors, and bricks. It often delivered groceries, fresh meats, fruit, fish, furniture, iron and steel for blacksmiths, soda water from Wheaton's, beer, and barrels of quahogs (a shellfish). It picked up live poultry and King Philip spring water at Mattapoisett, and left bananas and peaches at Marion. Groceries from New Bedford markets destined for Rochester were deposited in Marion, as Rochester Center was only 4 miles away "on a fine macadam road".

The author expressed frustration with the competing railroad as follows.

> "thanks to the discrimination of the Consolidated railroad against New Bedford and its playful manner of so running the Fairhaven branch that it would not serve anyone or anything, together with its way of charging prohibitive rates between here and the Cape, Wareham long ago ceased to consider New Bedford as a base of supplies, especially in the purchase of meats and other perishable goods."

As a contrast, the freight rates of the NB&O were presented. For example, any package less than 150 pounds could be shipped anywhere on the line for 25 cents. The author noted that some goods could be ordered from vendors on the line, and received the same day.

It is interesting to note that the newspaper may have been concerned about balance. On the same page, a short article appeared under the title "Locomotives will not soon disappear". In this article, C.T. Child of The Engineering Magazine stated that electric locomotives will not take over from steam locomotives.

MAP RESOURCES

New Bedford and Fairhaven, Bristol County

Figure 2 shows the route map for Union Street Railway in 1929 [2]. Union Street Railway was the eventual owner of the NB&O. While the map depicts the system after the NB&O was discontinued, it shows how the NB&O traversed Fairhaven using Washington Street.

USGS Topographic maps of New Bedford and Fairhaven were published in 1893 and 1941. The earlier map shows no trolley tracks, but the latter shows much of the trolley system seen in Figure 2. A portion of the 1941 topographic map is shown in Figure 3 below [16], with dots representing the existing trolley tracks in the streets. The yellow highlighting shows the location of the NB&O tracks as described in various documents [8] [3]. Figures 2 and 3 are the best maps available for the NB&O tracks in Fairhaven.

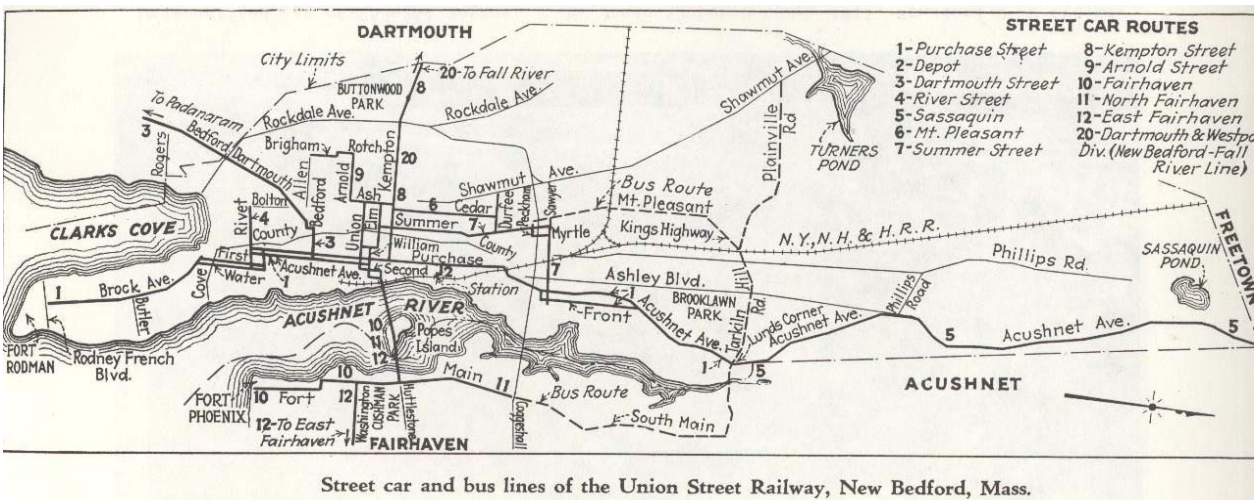

Figure 2 – Union Street Railway, car routings as of 1929 [2]

Figure 3 – NB&O in Fairhaven [16]

Plymouth County

Fortunately, an excellent source of maps was found for the NB&O in Plymouth County, which incorporates most of its trackage. The L.J. Richards Company published a book of maps for Plymouth County in 1903 [1] which shows physical and cultural features, as well as the location of roads, railroads, and trolley tracks. As an example, Figure 4 shows the map for Town of Mattapoisett from the Fairhaven town line to the railroad station. The trolley tracks are shown as black dashes on the south side of the highway. Figure 5 shows the tracks in the center of Mattapoisett. Note that the trolley used a private right of way to pass under the railroad.

Figure 4 – Fairhaven boundary line to the Town of Mattapoisett

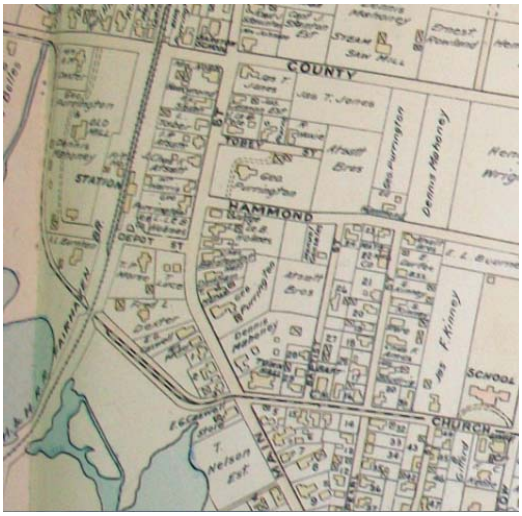

Figure 5 – Mattapoisett Town Center.

Similar maps are available for the rest of the NB&O tracks in Plymouth County, including the towns of Marion, Wareham, Middleboro, and the village of Onset. These maps show the location of the NB&O main tracks and many of the sidings.

Villages of Buzzards Bay and Monument Beach, Barnstable County

No maps showing trolley tracks have been found for the eastern terminus of the NB&O in the villages of Buzzards Bay and Monument Beach. From the L.J. Richards[1] maps of Onset, it is known that the trolley tracks entered the village of Buzzards Bay on a roadway trestle over Buttermilk Bay (see Figure 6) [1] and thence up "Electric Avenue". At the time of line's construction, there was only one road from the village of Buzzard's Bay to Monument Beach ("Old Bridge Road"), so the location of NB&O tracks can be assumed (see Figure 7) [15]. This road crossed the Monumet River until Belmont's canal was completed about 1916 (see Figure 8) [4], when a lifting bridge was built to take the road and the NB&O over the new canal along "Perry Avenue" (see Figure 9) [11].

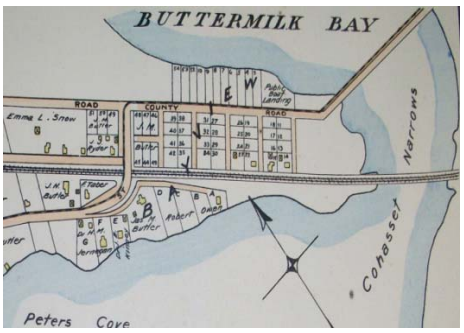

Figure 6 – Trestle over Buttermilk Bay [1]

Figure 7 – First Bridge (over Monumet River) [15]

Figure 8 – Two Crossings (Old Bridge Road and Perry Avenue) [4]

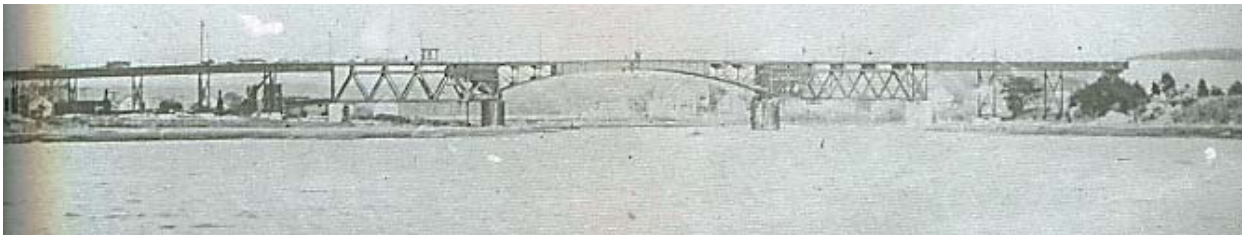

Figure 9 – Crossing Belmont's Canal (extension of current Perry Avenue). Photo Courtesy of Ben Harrison, Buzzards Bay [11]

Figure 10 shows the current use of the trolley barn in Monument Beach. Figures 11 through 26 show sites and operations along the NB&O.

Figure 10 Former trolley barn at Monument Beach, 2011.

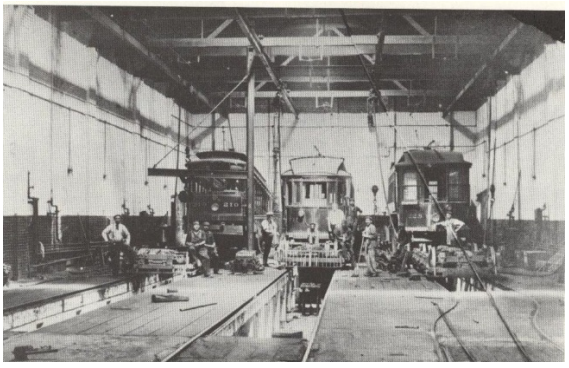

Figure 11 Repair shop at Weld Street, New Bedford [2]

Figure 12 Former car barn at Weld and Purchase St, New Bedford, 2012

Figure 13 Old Draw Bridge between New Bedford and Fairhaven 1893 [12]

Figure 14 New Draw Bridge between New Bedford and Fairhaven, completed 1898 [5]

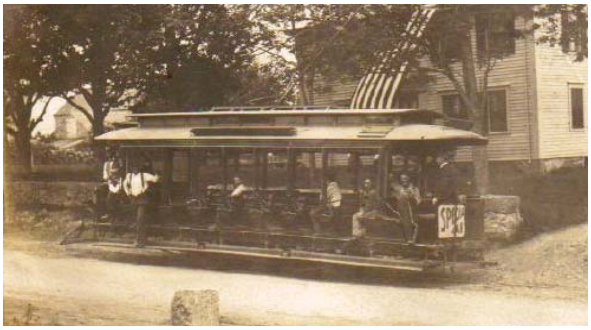

Figure 15 First car to Marion shown at Old Blossom House, Fairhaven [13]

Figure 16 RR Underpass at Mattapoisett [7]

Figure 17Construction on Church St in Mattapoisett [7]

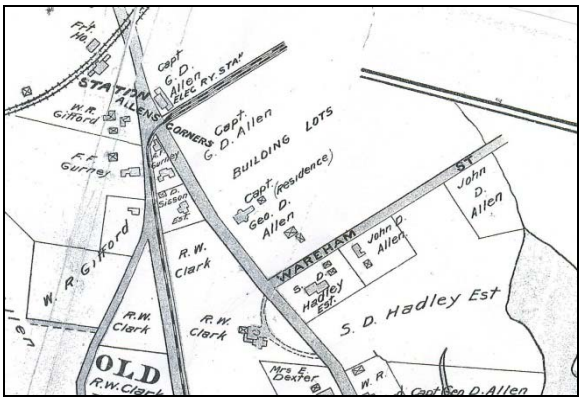

Figure 18 Private ROW in Marion (east of "ELEC RY. STA") [1]

Figure 19 Trolley stop at Spring and Main, Marion [13]

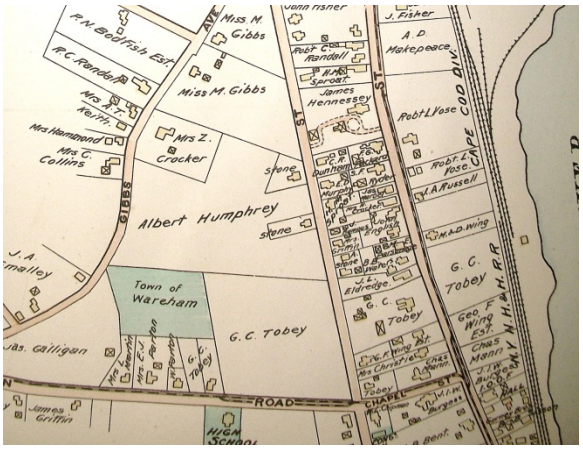

Figure 20 Junction at Main and Chapel in Wareham [1]

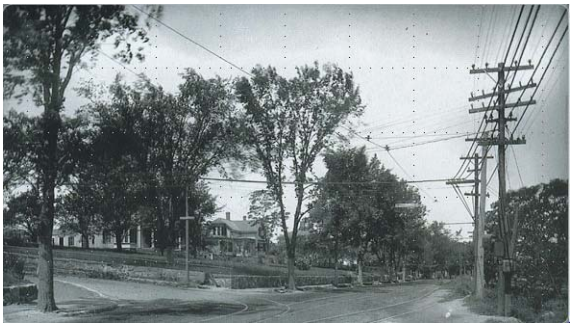

Figure 21 Junction at Main and Chapel, Wareham Geagan Collection [9]

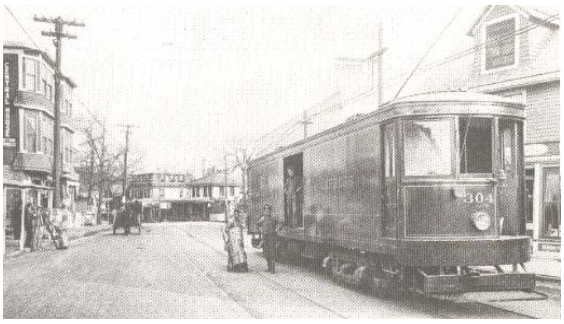

Figure 22 Express Car in Onset [2]

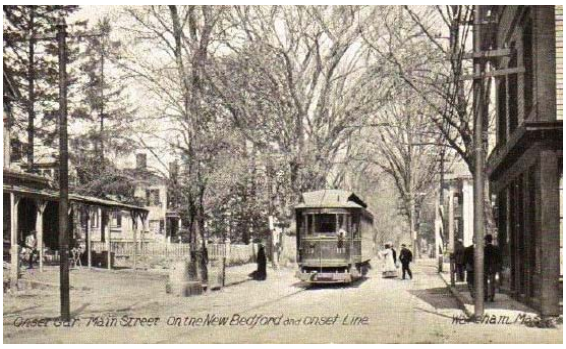

Figure 23 A winter's day in Wareham [13]

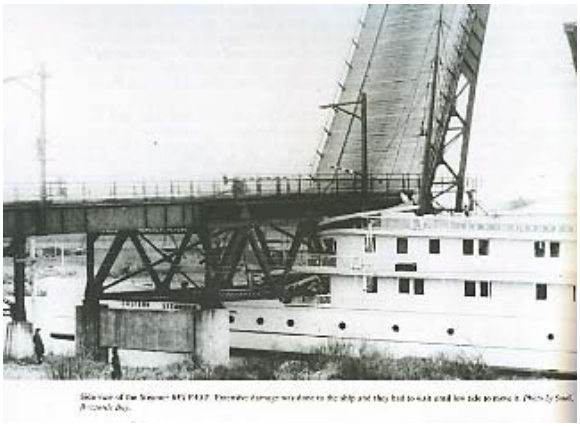

Figure 24 Steamer Belfast meets the Sagamore Bridge (sister of the bridge in Figure 9). Note the trolley tracks on the raised bridge. Photo by Small, Buzzards Bay [11]

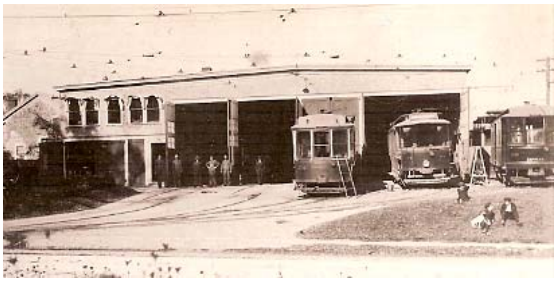

Figure 25 Middleboro Car Barn 1902 [14]

Figure 26 Former Middleboro Car Barn, 2012

Conclusion

The location of most of the track of the New Bedford and Onset Street Railway has been established using a variety of maps, photos, and documents. Excellent maps for the period were found for Plymouth County. However, maps of similar quality have not been found for NB&O tracks in Bristol and Barnstable counties. Within New Bedford and Fairhaven (in Bristol County) the trolleys traversed known roads. The location of tracks within the Village of Buzzards Bay in Barnstable County is known only at the village boundaries. The other NB&O tracks in Barnstable County can be assumed to traverse certain bridges and roads. Photos show original structures which exist today. Historical photos show tracks, structures, and trolley cars operating on the line.

Discussion

Assignments on the history of technology have been used by the author in both senior civil engineering and first year general engineering courses. In a senior seminar course, individual students were assigned to write a paper and make an oral presentation on a topic about the history of technology. Students were given a list of possible topics, or could nominate topics for the instructor's approval. The topics were usually of local or regional interest, including: notable structural failures, safety related tragedies, earth structures left by native populations, controversial projects such as power plants, development of highway corridors, and development of natural resources.

In a first year general engineering course, student groups were assigned to create a poster about a topic from the history of technology. Topics were submitted to the instructor for approval. Students presented their posters during a poster session, during which they reviewed each other's work and provided an evaluation. Topics included the history of radio and television, Marconi's transatlantic radio system, the Big Dig and Zakim Bridge, the Pilgrim Nuclear Power Plant, the Cape Cod Canal, wind farms, robotic surgery, textile mills, and the development of backscatter X-rays. These first year students had completed a calculus course and were enrolled in their first physics course and second calculus course. They had almost no exposure to courses in their majors, so their understanding of the technical issues was quite shallow. However, the posters reinforced their interest in engineering and helped them understand the relationship between projects and various engineering majors.

It is the author's opinion that the study of the history of technology can provide important benefits for undergraduate engineering curricula. In the language of ABET, this includes a better understanding of realistic health, safety, and social constraints, functioning in multidisciplinary teams, the ability to communicate effectively, and a better understanding of the societal context of engineering solutions.

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[14] Thompson (Walter) Collection, Middleboro Public Library,, Middleboro, MA
[15] USGS Topographic Map, "Falmouth, MA, NE quadrant" published in 1893. Image courtesy of the Dimond Library at the University of New Hampshire.
[16] USGS Topographic Map, "New Bedford North, MA," published in 1941. Image courtesy of the Dimond Library at the University of New Hampshire.

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