

BALTIMORE & OHIO RAILROAD, BALTIMORE BELT LINE  
(Belt Line)  
Connecting Camden Station to Bay View Junction  
Baltimore City  
Maryland

HAER No. MD-203

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
U.S. Department of the Interior  
Interior Region 1, North Atlantic - Appalachian  
1234 Market Street, 20th Floor  
Philadelphia, PA 19107

**HISTORIC AMERICAN ENGINEERING RECORD**  
**BALTIMORE & OHIO RAILROAD, BALTIMORE BELT LINE**  
**(Belt Line)**

**HAER No. MD-203**

- Location:** Connecting Camden Station to Bay View Junction, Baltimore City, Maryland.
- The Baltimore & Ohio (B&O) Railroad's Baltimore Belt Line (Belt Line) is located at latitude: 39.2986904322, longitude: -76.5515349475. The coordinate represents the Belt Line's eastern terminus at Bay View Junction. This coordinate was obtained on February 22, 2022, by plotting its location using the National Geodetic Survey website's Conversion and Transformation Tool. The coordinate's datum is North American Datum 1983. The Belt Line's location has no restriction on its release to the public.
- Present Owner/  
Occupant:** CSX Transportation.
- Present Use:** Railroad line.
- Significance:** The Belt Line was a major infrastructure improvement that was part of a larger effort by the B&O to provide through service between Washington, DC, and New York City. The Belt Line allowed the B&O to connect its yards in Mount Clare on the west side of Baltimore to Bay View Junction on the east. The Baltimore Belt Line is the first example of electrified rail service in the country.
- Historian(s):** Meghan P. White, Laura E. van Opstal, and Nicole A. Diehlmann, Rummel, Klepper, & Kahl (RK&K), LLP, 2022.
- Project  
Information:** The Belt Line was recorded between November 2021 and March 2022 by RK&K, LLP, Baltimore, Maryland, for CSX Transportation (CSX). The recordation was undertaken pursuant to a stipulation of the *Memorandum of Agreement Among the Federal Railroad Administration, the Maryland State Historic Preservation Officer, the Pennsylvania State Historic Preservation Officer, the Maryland Department of Transportation Port Administration, and CSX Transportation Regarding the Howard Street Tunnel Project Baltimore City, Maryland and Delaware County, Pennsylvania* (MOA). This MOA only required documentation of certain elements of the Belt Line and its contributing properties; thus this

documentation provides an overall description and history of the Belt Line but does not describe all elements of the railroad corridor in detail. Project personnel included RK&K historians Meghan P. White, Laura E. van Opstal, and Nicole A. Diehlmann and photographer Jet Lowe. The sponsor for the recordation is CSX. Cooperating agencies include the Federal Railroad Administration; the Maryland State Historic Preservation Officer; and the Maryland Department of Transportation (MDOT) Maryland Port Administration (MPA).

## Part I. Historical Information

### A. Physical History:

1. **Date(s) of construction:** Ca. 1890-95, as indicated in contemporary newspapers.
2. **Architect/Engineer:** The “Records of Construction of Section No. 4 of the Baltimore Belt Railroad” list Samuel Rea, Chief Engineer, September 1889 to April 15, 1891; Richard Randolph, Chief Engineer, April 15, 1891, to August 22, 1892; and W. T. Manning, Chief Engineer, August 22, 1892, to completion.

Rea was instrumental in making the Belt Line a reality. His ingenuity provided workable solutions for the route the Belt Line would thread through Baltimore, including the tangle of tracks at Jones Falls Valley by the existing North Avenue Bridge and the Baltimore and Potomac Tunnel.<sup>1</sup> Rea spent most of his career working for various railroads, including the Pennsylvania Railroad (PRR) and the Pittsburgh, Virginia, and Charleston Railroad. In 1889, he joined the Belt Line project as vice president of the Maryland Central Railroad and chief engineer of the Baltimore Belt Railroad Company, although ill health forced his resignation from work beginning in 1891. Rea returned to the PRR as assistant to the president in 1892, later serving in various vice president roles until he was elected president of the company in 1912.<sup>2</sup>

Manning became chief engineer of the Baltimore Belt Railroad Company and assistant chief engineer of the B&O Railroad in 1892 and chief engineer of the B&O Railroad in 1894. He oversaw construction of the Belt Line before retiring from the B&O in 1899.

Plans for the B&O Railroad Guilford Avenue Tunnel list Manning and J. B. Bolt, P.A. Engineer, who may also have had a role in the design of the Belt Line. No bibliographic information was found for Richard Randolph or J. B. Bolt.

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<sup>1</sup> Lawrence Lee, “Baltimore’s Unseen Artery: A Brief History of the Baltimore Belt Railroad and its Howard Street Tunnel,” in *Baltimore Civil Engineering History*, ed. Bernard G. Dennis Jr. and Matthew C. Fenton IV, P.E. (Reston, VA: American Society of Civil Engineers, 2004), 163-91, doi:10.1061/40759(152)11.

<sup>2</sup> “Blair County Holds Record as Maker of Great Railroad Presidents,” *Altoona Tribune* (Altoona, PA), October 1, 1925.

3. **Builder/Contractor/Supplier:** Ryan and McDonald and L. B. McCabe and Brother, contractors. The Baltimore Belt Railroad Company established these two firms as The Maryland Construction Company, which was listed as the builder on the “Records of Construction of Section No. 4 of the Baltimore Belt Railroad.”<sup>3</sup>
4. **Original plans and construction:** Research for original construction documents, including as-built construction plans, focused on four structures associated with the Belt Line—the Howard Street Tunnel (HAER No. MD-11), North Avenue Bridge (HAER No. MD-203-A), Guilford Avenue Tunnel (HAER No. MD-203-B), and Harford Road Tunnel (HAER No. MD-203-C). The double-tracked Belt Line ran north from Camden Station via the Howard Street Tunnel, past Mount Royal Station, through a pair of tunnels known as Mount Royal Tunnel, over the Baltimore & Potomac Tunnel, through the large stone-arch North Avenue Bridge, over the B&O Railroad Baltimore Belt Line Bridge across the Jones Falls, and finally winding north up the east side of the Jones Falls Valley (see Figure 1). After reaching a high point near Huntingdon Avenue and West 26<sup>th</sup> Street, the line turned sharply east, passing through a long, open cut interspersed with five stone-arch tunnels of varying lengths. The tunnels carried the alignment under the following roads or blocks of roads: Huntingdon Avenue; North Howard Street, Maryland Avenue, and North Charles Street; St. Paul and North Calvert streets; Guilford Avenue; and Greenmount Avenue. Girder bridges with rusticated limestone abutments carried the Belt Line over Montebello and Taylor avenues. At Harford Road, the Belt Line passed through another tunnel and then crossed over a series of girder bridges, ultimately connecting with the B&O’s Royal Blue Line to Philadelphia at Bay View Junction. In total, the Belt Line included 7.2 miles of track and ten tunnels totaling 9,605'-0" in length. All original tunnel portals and retaining walls along the open cuts were rusticated, regularly coursed limestone, although in most cases the tunnels themselves were constructed of brick (see Figures 2 and 3). Bridges generally consisted of steel through-plate girders supported by stepped limestone abutments.<sup>4</sup>
5. **Alterations and additions:** This section is not a comprehensive list of all alterations and additions to structures associated with the Baltimore Belt Line. See HAER reports Nos. MD-11, MD-203-A, MD-203-B, and MD-203-C for more detailed explanations of alterations and additions to the Howard Street Tunnel, North Avenue Bridge, Guilford Avenue Tunnel, and Harford Road Tunnel.

Since initial construction, many of the Belt Line’s tunnels and bridges have had minor repairs, such as repointing brickwork, according to annotated as-built plans and physical evidence.

In 1901, the electrified section of the Belt Line was extended one mile east to the Waverly neighborhood in north Baltimore. The following year, the overhead catenary

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<sup>3</sup> Paul Manion, “Howard Street Tunnel,” *The Sentinel* 12, no. 4 (July-August 1990): 6-21, 15.

<sup>4</sup> M. Chris Manning, “B&O Railroad Baltimore Belt Line,” Maryland Inventory of Historic Properties Record B-5287 (Crownsville, MD: Maryland Historical Trust, 2015), 3-4.

wires were replaced with a ground-level third rail.<sup>5</sup>

In 1924, a tunnel was constructed to carry the Belt Line under Barclay Street. It has concrete façades and abutments and the numbers “1924” inscribed at the top of the arched opening.<sup>6</sup>

In 1945, a concrete and steel girder bridge with concrete abutments was constructed to carry the Belt Line over Aisquith Street, according to a date inscribed on a stone.

A bridge carrying Sisson Street over the Belt Line was in place by as early as 1899; however, the current concrete, three-span, deck-plate girder bridge was likely rebuilt in 1950.<sup>7</sup>

In 1957, a concrete and steel, two-span, deck-plate girder bridge replaced an original bridge that carried the Belt Line over Loch Raven Road.<sup>8</sup>

Between 1958, when the B&O eliminated passenger service between Baltimore and New York City, and 1960, the rail line was reduced from double tracks to a single track.<sup>9</sup>

Sometime between 1957 and 1966, a bridge carrying Interstate 83 (I-83) over the Belt Line was constructed northwest of North Howard Street.<sup>10</sup>

In 1984, CSX Transportation lowered some of the Belt Line tracks to increase height clearance following the expansion of the General Motors plant in southeast Baltimore.<sup>11</sup>

In the early 1990s, a new box-girder tunnel was constructed over the Belt Line northwest of North Howard Street and southwest of I-83 to accommodate the path of the MDOT Maryland Transit Administration (MTA) light rail over the Belt Line.<sup>12</sup>

The current concrete bridge over the Belt Line at the intersection of Sinclair Lane and Edison Highway was constructed ca. 2014.<sup>13</sup>

The bridges at Garrett Avenue, North Rose Street, Federal Street, North Macon Street, and Pulaski Highway were modified at unknown points in time.<sup>14</sup>

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<sup>5</sup> Herbert H. Harwood Jr., *Royal Blue Line* (Baltimore and London: Johns Hopkins University Press, 1990; repr. 2002), 92.

<sup>6</sup> Manning, “Belt Line,” 5.

<sup>7</sup> Manning, “Belt Line,” 5.

<sup>8</sup> Manning, “Belt Line,” 5; “Historic Aerials,” Nationwide Environmental Title Research, LLC (NETROnline), accessed February 23, 2022, <https://www.historicaerials.com/viewer>.

<sup>9</sup> Manning, “Belt Line,” 7.

<sup>10</sup> “Historic Aerials,” NETROnline.

<sup>11</sup> “Belt Line Clearance Project,” *The Sentinel* 6, no. 5 (September-October 1984): 7.

<sup>12</sup> “Historic Aerials,” NETROnline.

<sup>13</sup> Manning, “Belt Line,” 6.

<sup>14</sup> Manning, “Belt Line,” 5-6.

As of 2022, CSX Transportation has proposed a number of modifications to and demolitions of structures associated with the Belt Line to allow double stacking of freight trains along CSX's route between Baltimore and Philadelphia.

- B. Historical Context:** The Belt Line is a railroad segment built between 1890 and 1895 in Baltimore, Maryland. The Belt Line was a major infrastructure improvement that was part of a larger effort by the B&O to provide through service between Washington, DC, and New York City. The Belt Line was the most complicated part of the overall objective to providing service between Washington, DC, and New York. All other segments of the overall B&O project lacked the significant obstacles posed by the construction of the tunnel and the route through Baltimore City. As it compares to projects by competitors, it is unique because the primary competitor of the B&O was the Pennsylvania Railroad, which grew by acquisitions rather than new capital construction. The Pennsylvania Railroad acquired existing lines and associated infrastructure while the B&O undertook this massive-scale construction project.

### *Railroads in Baltimore*

The B&O Railroad was chartered in 1827 and three years later became the first operational railroad in the United States. The railroad's goal was to connect Baltimore to the lucrative markets of the Ohio River Valley. Westward progress was slow, as the line to Wheeling, West Virginia, was not completed until 1852; however, other segments were completed more quickly. The B&O opened a southern branch to Washington, DC, in 1835 that departed from the B&O's eastern terminus at Mount Clare Station at Pratt and Poppleton streets in southwest Baltimore. In 1857, the B&O moved its eastern terminus to its newly constructed and much larger Camden Station at West Camden and South Howard streets, which was much closer to downtown.<sup>15</sup>

The B&O soon faced stiff competition from other railroads. The Philadelphia, Wilmington, and Baltimore (PW&B) Railroad and the Baltimore and Susquehanna Railroad (later known as the Northern Central Railway [NCR]) established lines to Baltimore by 1840. The PRR expanded its Baltimore presence through acquisitions of the NCR and the Baltimore and Potomac (B&P) Railroad. In 1873, the PRR constructed the 1.7-mile B&P Tunnel under the west side of Baltimore, providing a western connection to their newly constructed Union Station in the Jones Falls Valley. On the east side of the city, the PRR constructed a tunnel under Hoffman Street, which connected Union Station to the PW&B's line to Philadelphia.<sup>16</sup>

With these improvements, the PRR gained a continuous north-south route through Baltimore connecting Washington, DC, to Philadelphia. Meanwhile, the B&O had no such connection through Baltimore, leaving the railroad at a distinct disadvantage. A partial solution to provide better access was the construction of a spur from Camden Station to Locust Point on the west side of the Baltimore Harbor. At Locust Point, a specially designed ferry transferred cars across the harbor to Canton on the east side. From Canton, a line continued two miles

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<sup>15</sup> Manning, "Belt Line," 2.

<sup>16</sup> Manning, "Belt Line," 2.

northeast to Bay View Junction, where it connected with the PW&B's line to Philadelphia.<sup>17</sup>

North of Bay View Junction, both the PRR and B&O used tracks owned by the PW&B. Both railroads sought to acquire the PW&B, and, in 1881, the PRR, which was in a better financial position, secured ownership of the PW&B. Three years later, in 1884, the PRR prohibited all B&O service from the tracks, removing the B&O's access to Philadelphia. This action spurred the construction of the B&O's Royal Blue Line, a new rail alignment between Bay View Junction and Philadelphia. North of Philadelphia, the B&O relied on tracks owned by the Reading Railroad and the Central Railroad of New Jersey to reach New York's harbor.<sup>18</sup>

### *Establishment of the B&O Belt Line*

While the Locust Point to Canton ferry continued to operate as a stopgap measure in Baltimore, the B&O explored other options for a rail connection through Baltimore, including a proposed elevated line that was unpopular with civic leaders. The proposed alternative was the construction of a 1.4-mile tunnel under Howard Street that would connect Camden Station to Bay View Junction through Baltimore's less populous north side. From Bay View Junction, the line would connect to the B&O's Royal Blue Line to Philadelphia. This route posed complicated construction challenges, including the need to cross the Jones Falls Valley and the tracks and rail yard of the PRR while avoiding major roadways, the North Avenue Bridge (under construction at the time), and the southeast portal of the B&P Tunnel. According to one historian, "the topography, tracks, and city streets presented a maze of obstacles at varying elevations, and [the chief engineer] had to find a way to thread the new line," all four tracks of it at this point, "through it all." The final design "literally wove the Belt Line through these existing structures."<sup>19</sup>

In 1888, the B&O incorporated the Baltimore Belt Railroad Company, which allowed the railroad to gain right-of-way through Baltimore. They were joined in this venture by the Maryland Central Railroad (MCRR), a small, narrow-gauge line that had initiated the idea for the tunnel; however, the MCRR soon failed, and the B&O took full control of the project. The plan proved controversial, however, as the Baltimore City Council voiced concerns about possible surface disruptions during construction of the tunnel. Baltimore residents were also concerned about dangerous track crossings and smoke and gas ventilation causing serious health hazards, a problem that plagued the now fifteen-year-old B&P Tunnel. A group of Baltimoreans calling themselves the "Citizens' Committee" published their concerns in a news article in 1890, expressing frustration at several factors that would disturb the lives of nearby residents, including the size of proposed open cuts, lack of limits on train speed, and location. The committee, however, was supportive of the proposed tunnel beneath Howard Street.<sup>20</sup>

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<sup>17</sup> Manning, "Belt Line," 2.

<sup>18</sup> Manion, "Howard Street Tunnel," 7; Harwood, *Royal Blue Line*, x.

<sup>19</sup> Manning, "Belt Line," 2-3.

<sup>20</sup> Manion, "Howard Street Tunnel," 12-13; "The Truth Regarding the Belt Railroad," *The Sun* (Baltimore, MD), April 5, 1890.

The B&O made a few concessions to ensure completion of the project. As part of the ordinance for the Belt Line, the B&O agreed to construct granite coping with iron rails, as well as walls with iron railings and curbs to protect pedestrians from the open cuts during the tunnel's construction. To limit bottlenecks inside the Howard Street Tunnel and to protect passengers from fumes and gases from steam locomotives, the city approved the railroad's request for double tracks and side tracks to keep traffic moving. The railroad was prohibited from adding ventilation openings along Howard Street. Instead, it was instructed to build tall chimneys on its property to lift smoke above the city; however, a later decision to use electric power along the line negated the need for such ventilation structures. Howard Street, a busy thoroughfare, had to remain open during construction, and the city's northside streets along the Belt Line route could not be obstructed by construction. Additionally, the city allocated land for two passenger stations along Howard Street, though only Mount Royal Station was constructed. After two years of negotiations and land surveys, in the fall of 1889 the B&O and Baltimore City officials announced final plans to construct a tunnel beneath Howard Street. In May 1890, all necessary approvals were secured from Baltimore's mayor, City Council, and the Maryland Legislature to allow the Baltimore Belt Railroad Company's work to commence.<sup>21</sup>

Project construction was led by Samuel Rea, who joined the Baltimore Belt Railroad Company as chief engineer in 1889 and was instrumental in making the Baltimore Belt Line a reality.<sup>22</sup>

The construction contracts were awarded to two local firms, Ryan and McDonald Construction Company and L. B. McCabe and Brother, the latter of which would go on to help build New York City's first subway in 1904. The Belt Line construction was divided into four discrete sections—a two-mile section from Hamburg Street to Mount Royal Avenue, which included the Howard Street Tunnel; a 1.2-mile section from Mount Royal Avenue to Guilford Avenue; a two-mile section from Guilford Avenue to Belair Road; and a two-mile section from Belair Road to Bay View Junction.<sup>23</sup>

The anticipated cost of the Belt Line was \$6 million—\$5 million for the construction and \$1 million for contingencies and improvements. The Howard Street Tunnel alone was estimated to cost more than \$2 million of the budget. The timing of this expensive project was unfortunate, as the Panic of 1893 exacerbated a period of financial instability across the country and led to the failure of one of the B&O's principal financial supporters, the Baring Brothers' banking firm in London. Between 1892 and 1896, the B&O's total revenue dropped sharply. The B&O was forced to cut back proposed expansion plans, allowing for the completion of the Belt Line but no other costly projects. Everyday infrastructure maintenance also suffered. The Belt Line's construction went over budget, totaling approximately \$7 million, which was the B&O's most expensive rail project to date. The

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<sup>21</sup> Harwood, *Royal Blue Line*, 87; Lee, "Baltimore's Unseen Artery," 167; Manion, "Howard Street Tunnel," 14-15; Manning, "Belt Line," 2-3.

<sup>22</sup> Lee, "Baltimore's Unseen Artery," 168.

<sup>23</sup> Lee, "Baltimore's Unseen Artery," 173; "Obituaries," *Railway Review* 70, no. 1-5 (January-June 1922): 142.



B&O, already suffering financial mismanagement, sunk into receivership in early 1896. John K. Cowen, who replaced Charles Mayer as president a few weeks prior in January 1896, steered the B&O through receivership over the next two years. When the company emerged, it had added over 200 new locomotives, 28,000 new freight cars, and more than 120,000 tons of steel rails and was in better financial shape overall.<sup>24</sup>

### *Electric Railways and the Conversion to Diesel Locomotives*

Although the B&O included stipulations against tunnel pollution from the steam locomotives in the incorporation document for the Baltimore Belt Railroad Company, company officials settled on using electric locomotives by the beginning of the line's construction in 1891.<sup>25</sup> The lack of smoke and dangerous fumes, which would negate the need for expensive ventilation chimneys, appealed to railroad management.<sup>26</sup> However, the steep grade (a 0.8 percent incline of approximately 150') of Howard Street Tunnel's eastbound tracks (heading north to Philadelphia) required a powerful locomotive, and an electric one powerful enough had yet to be built.<sup>27</sup>

Electrified transportation was a relatively new concept at the time. Some horse-car lines and a citywide streetcar system in Richmond, Virginia, had been electrified by 1890. The pace picked up in the last decade of the nineteenth century, with more horse-car lines being converted to electricity. The electrified lines were not meant to haul heavy freight and were limited primarily to light passenger traffic. The Belt Line, however, would be carrying both freight and passengers. Without having built an electric locomotive strong enough for the task, General Electric (GE) convinced the B&O that their electric locomotives would be able to haul heavy freight and passenger trains better than steam.<sup>28</sup> GE agreed to build not only the locomotives but also the lighting, electric signaling, power distribution, and two power plants (although only one was constructed).<sup>29</sup> The original concept called for electric locomotives, or motors, pushing the trains through the tunnel, but concern over buckling of wooden cars led engineers to decide to have the motors pull the trains. The role of the electric motors was primarily to pull the steam locomotives through the Howard Street Tunnel from Camden Station to Mount Royal Station at the north end of the tunnel. For passenger trains, the electric motor would uncouple at Mount Royal Station and be replaced with a steam locomotive. Freight trains, having no need to stop at the passenger station, were to be hauled to Huntingdon Avenue.<sup>30</sup>

GE's form of electrification included an overhead third rail supported by direct hangers

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<sup>24</sup> Harwood, *Royal Blue Line*, 85, 97; Manion, "Howard Street Tunnel," 15; Timothy Jacobs, ed., *The History of the Baltimore & Ohio* (New York: Crescent Books, 1989), 68; Kirk Reynolds and Dave Oroszi, *Baltimore & Ohio Railroad* (Osceola, WI: MB Publishing, 2000), 39.

<sup>25</sup> Harwood, *Royal Blue Line*, 87.

<sup>26</sup> Manion, "Howard Street Tunnel," 19.

<sup>27</sup> Lawrence W. Sagle, *B&O Power: Steam, Diesel and Electric Power of the Baltimore and Ohio Railroad 1829-1964* (n.p.: Alvin F. Stauffer, 1964), 310.

<sup>28</sup> Harwood, *Royal Blue Line*, 87.

<sup>29</sup> Manion, "Howard Street Tunnel," 19.

<sup>30</sup> Harwood, *Royal Blue Line*, 92-93.

within the tunnels and a steel and iron catenary system consisting of two Z-bars arranged in a box with a slot in the bottom outside of the tunnels. A metal “shoe” from the electric motor’s roof fit into a slotted, inverted “trough,” which delivered the direct current.<sup>31</sup>

The original electrified section of the Belt Line began south of Camden Station and ended three miles north at Huntingdon Avenue, though in 1901 it was extended one mile east to the Waverly neighborhood in north Baltimore. The three original electric locomotives built for the Belt Line weighed nine tons. Each had four electric motors that produced a total of 1,440 horsepower, which were 27 percent more powerful than the B&O’s steam locomotives. The motors could pull passenger trains eastbound through the Howard Street Tunnel at thirty-five miles per hour and freight trains at fifteen miles per hour. In June 1895, one month after the Belt Line formally opened, the first electric motor arrived in Baltimore from GE’s plant in Schenectady, New York. A second arrived in November and a third in May 1896. By then, the four-mile section of the Belt Line was considered fully electrified.<sup>32</sup>

To power the electric locomotives on the Belt Line, the B&O had to create its own electricity, since no electric utilities existed in Baltimore at the time. E. Francis Baldwin, designer of many buildings and structures for the B&O, designed the Baltimore Belt Line Powerhouse, which was along Howard Street south of Camden Street. The Powerhouse operated until 1914, when the B&O began receiving power from a local utility company. Later, the building was used as a repair shop for B&O train cars. It was demolished in the late 1970s for the construction of Interstate 395 (I-395).<sup>33</sup>

The B&O Belt Line operated on the overhead electric rail system for several years. In 1902, it was replaced with a third electrified rail at ground level, which remained in use for several decades. In 1903, four new forty-ton motors were added for slow-speed freight service; they worked in sets of two to haul up to a 1,600-ton train. In 1906, one more was added to form a three-unit job when necessary. Four years later, two sixty-ton electric locomotives joined the Belt Line. A total of six more, all built by GE, were added in 1912, 1923, and 1927.<sup>34</sup>

In the mid-1930s, the B&O began to convert from steam and electric to diesel engines. Diesel locomotives were easier to maintain, so the B&O did not need as many crew members as it did for steam or electric motors. Diesel motors could also handle a variety of track situations better than steam or electric and were more reliable and cheaper overall. For the Belt Line, switching to diesel eliminated the stopping of freight trains at Camden Station to pick up an electric locomotive to haul them through the Howard Street Tunnel, which caused long trains to halt temporarily at at-grade street crossings. Sections of electrified rail remained in place for several more years, but in 1952 all remaining electrified engines were replaced with diesel, and the third electrified rail was removed from the track shortly after.<sup>35</sup>

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<sup>31</sup> Harwood, *Royal Blue Line*, 92; Sagle, *B&O Power*, 310-11.

<sup>32</sup> Harwood, *Royal Blue Line*, 92-93, 109.

<sup>33</sup> Manning, “Belt Line,” 7.

<sup>34</sup> Manning, “Belt Line,” 3; Sagle, *B&O Power*, 310.

<sup>35</sup> Manning, “Belt Line,” 3-4; World Wide Rails, “When Did Diesel Trains Replace Steam?” <https://worldwiderails.com/when-did-diesel-trains-replace-steam/>; Sagle, *B&O Power*, 310.

### ***Decline of the Railroad***

In 1944, over \$112 million in debt and interest had come due for the B&O. Over a two-year period, the Interstate Commerce Commission (ICC), a federal agency established in 1887 to regulate railroads, considered and eventually approved the B&O's deferment plan, which set maturity dates between 1965 and 2010. Though this lightened the company's financial burden, the decline of passenger service on the B&O after World War II exacerbated matters. The railroad had seen a steady decline in passenger traffic following the end of the war as faster and more efficient means of transportation via automobiles and airplanes became more commonplace and affordable. In 1946, passenger service revenue fell by 25 percent as inflation rose. In the postwar period railroads spent billions in private funding for railroad maintenance, while federal and state governments subsidized highway construction, further eroding railroad passenger and freight traffic<sup>36</sup>

The situation worsened for the B&O in the 1950s. Automation in the railroad industry led to an 81 percent decrease in the number of B&O employees.<sup>37</sup> In 1957, passenger traffic decreased by 120,693 passengers from the year prior. Despite a 5 percent fare increase, passenger revenue declined by more than \$231,586. In 1957, the B&O discontinued eight passenger trains between Baltimore and New York, which included the Belt Line route, resulting in a net annual saving of approximately \$1.6 million. In November 1957, the B&O filed petitions to discontinue completely service between Baltimore and New York, which included the Belt Line route, to alleviate deficit issues.<sup>38</sup>

In April 1958, the B&O eliminated passenger service between New York City and Baltimore. Anticipating a reduction in train traffic, the B&O chose to single-track much of its railroad from Baltimore to Philadelphia. By 1960, the Howard Street Tunnel and most of the Belt Line had been reduced to a single track. However, planners failed to account for the fact that passenger service occurred mostly during the day, with freight service occurring overnight. Reducing to a single track meant that freight traffic continued to suffer congestion despite a decrease in overall train traffic.<sup>39</sup>

### ***Absorption of the B&O Railroad into CSX Transportation***

In the 1960s, revenue continued to sink as operating expenses remained largely the same.<sup>40</sup> Across the country, railroads were suffering. In 1960, the Chesapeake and Ohio (C&O) Railroad sought to purchase a majority share in B&O common stock, which was achieved the following year and approved by the ICC on December 31, 1962. The new combined C&O/B&O totaled 11,000 miles of tracks. The C&O embarked on a number of improvements to the B&O's infrastructure. In 1971, Hay Watkins, an employee of the C&O

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<sup>36</sup> Jacobs, *The History of the B&O*, 115.

<sup>37</sup> Jacobs, *The History of the B&O*, 120.

<sup>38</sup> Baltimore & Ohio Railroad, "131<sup>st</sup> Annual Report," (1957), 5.

<sup>39</sup> Manning, "Belt Line," 7; "Fewer Trains," *The Sun* (Baltimore, MD), January 16, 1959, 10; Harwood, *Royal Blue Line*, 171.

<sup>40</sup> Jacobs, *The History of the B&O*, 120.

since 1949, became president of the C&O/B&O and renamed the railroad company, mostly for marketing purposes, the “Chessie System.” The logo—a cat with a blanket tucked beneath its chin—dated to the 1930s, in which a C&O advertisement in *Fortune* magazine ran with the tag line “Sleep Like a Kitten,” referring to the C&O’s smooth ride.<sup>41</sup>

The 1970s proved fruitful for the Chessie System, with total operating revenues rising over \$800 million and net earnings of more than \$85 million. In 1980, the ICC approved a merger of the Chessie System with the Seaboard Coast Line, which had formed in 1967 from a merger between the Atlantic Coast Line and the Seaboard Air Line. The 1980 merger produced a holding company known as CSX Transportation; rumor had it that the “C” stood for Chessie, the “S” for Seaboard, and the “X” was due to the fact that the result of the merger was greater than simply adding the two systems together. In 1986, the B&O, C&O, and CSX Transportation consolidated into CSX Transportation Incorporated.<sup>42</sup> As of 2022, CSX continues to operate a freight line along the former alignments of the Belt Line and Royal Blue Line.<sup>43</sup>

## Part II. Structural/Design Information

### A. General Statement:

- 1. Character:** The Belt Line is a good example of a railroad alignment constructed through the commercial and residential areas of an established city. Its siting and design display the B&O’s grade-separated approach to weaving the new line through Baltimore City in the early 1890s. The Belt Line features elements of a unified design strategy, including portals, abutments, and retaining walls along open cuts constructed with rectangular coursed rusticated limestone. The majority of the tunnel interiors feature brick construction.<sup>44</sup>
- 2. Condition of fabric:** The Belt Line is in fair condition, with some changes to the overall fabric and some loss of integrity due to replacement of some structural elements; however, the overall route remains in its original alignment.

**B. Description:** The Belt Line runs north from Camden Station via the Howard Street Tunnel, past Mount Royal Station, through the pair of tunnels known as Mount Royal Tunnel, over the Baltimore & Potomac Tunnel, through the North Avenue Bridge, over the B&O Railroad Baltimore Belt Line Bridge across the Jones Falls, and finally north up the east side of the Jones Falls Valley. The alignment then passes through small limestone-arch tunnels and early twentieth-century plate girder bridges. After reaching a high point near Huntingdon Avenue and West 26th Street, the line turns sharply east, passing through a long, open cut interspersed with several stone-arch tunnels of varying lengths. The tunnels carry the

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<sup>41</sup> Jacobs, *The History of the B&O*, 122, 124-125.

<sup>42</sup> Jacobs, *The History of the B&O*, 125, 127.

<sup>43</sup> Manning, “Belt Line,” 4.

<sup>44</sup> Lee, “Baltimore’s Unseen Artery,” 178.

alignment under the following roads or blocks of roads—Huntingdon Avenue; North Howard Street, Maryland Avenue, and North Charles Street; St. Paul and North Calvert streets; Guilford Avenue; Barclay Street; and Greenmount Avenue. A variety of girder bridges carry the Belt Line over Loch Raven Road (formerly Montebello Avenue), Kirk Street (formerly Taylor Avenue), Garrett Avenue, and Aisquith Street. At Harford Road, the Belt Line passes through another short tunnel and then crosses over a series of girder bridges, ultimately connecting with CSX’s line to Philadelphia at Bay View Junction, formerly known as the Royal Blue Line. All original tunnel portals and retaining walls along the open cuts are rusticated, regularly coursed limestone, although in most cases the tunnels themselves are constructed of brick. Later tunnels, such as the 1924 one at Barclay Street, are small and made of concrete. Original bridges generally consist of steel through-plate girders supported by stepped limestone abutments. Later bridges, such as the ca. 1914 bridge at Sisson Street or the ca.-1957 bridge at Loch Raven Road, are concrete and steel deck-plate girder bridges.<sup>45</sup>

**C. Mechanicals/Operation:** Not applicable.

**D. Site Information:** The Belt Line travels north from south Baltimore. The Belt Line’s tracks run through open cuts set below street level and tunnels, over bridges of varying lengths, and through an underground tunnel through both residential and commercial areas.

### Part III. Sources of Information

#### A. Primary Sources:

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#### B. Secondary Sources:

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<sup>45</sup> Manning, “Belt Line,” 3-5.

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**C. Likely Sources Not Yet Investigated:** ICC valuation records may exist for structures associated with the Belt Line. These records are held by the National Archives and Records Administration. CSX Transportation may have original or as-built construction documents for additional bridges and tunnels of the Belt Line.

Part IV. Figures

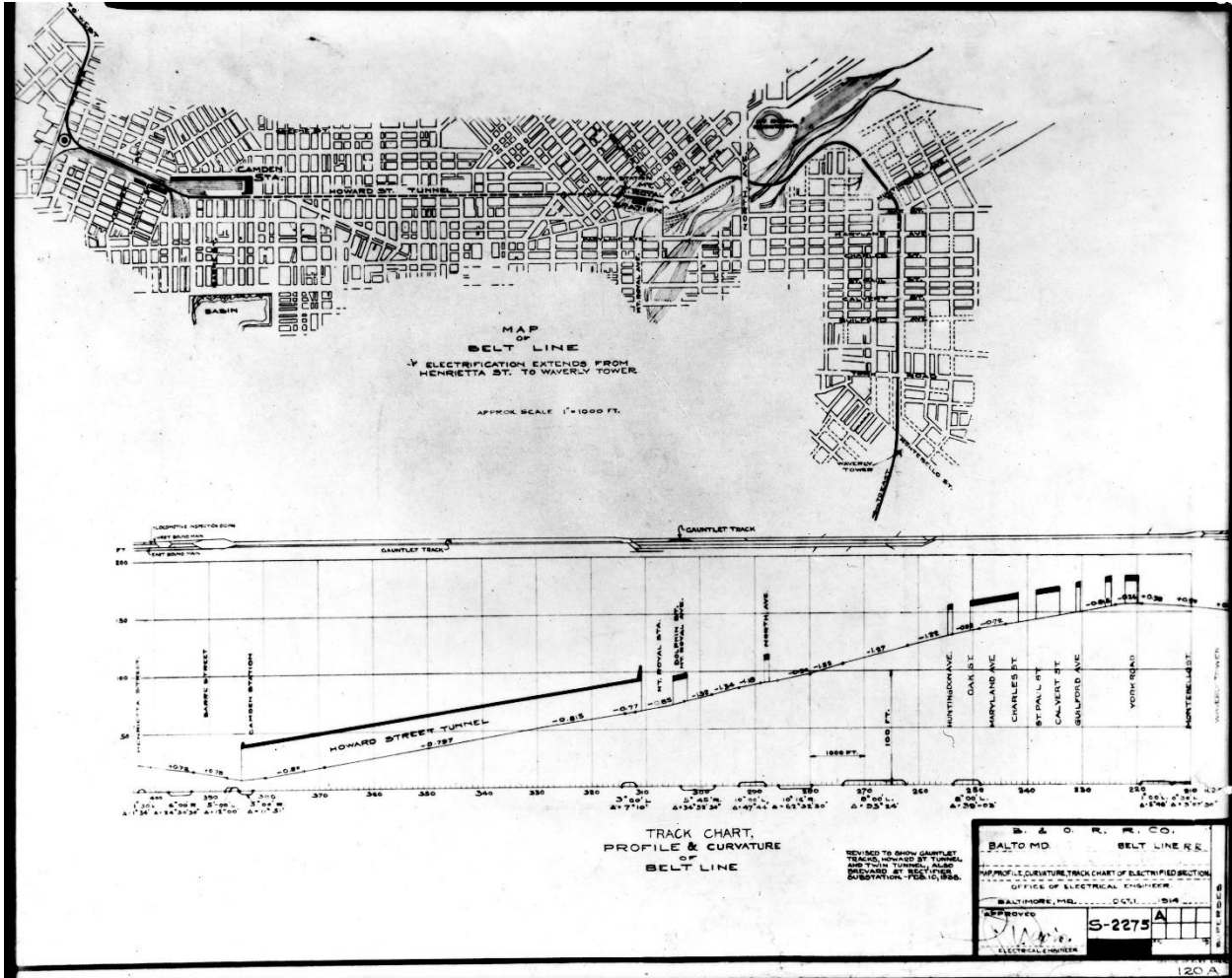


Figure 1: Map and Track Chart, Profile and Curvature of the Belt Line, 1914. (Map and Track Chart courtesy of B&O Railroad Museum.)

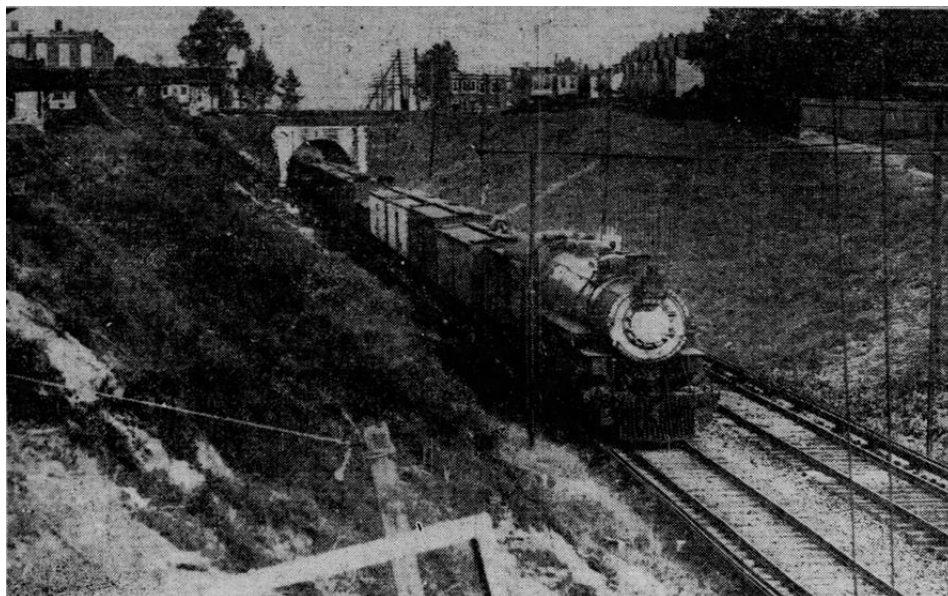


Figure 2: An example of an open cut along the Belt Line. Eastbound train exiting the east portal of the Guilford Avenue Tunnel, looking northwest, in 1912. (Image from *The Sun* [Baltimore, MD], September 28, 1912.)



Figure 3: East portal of the B&O Railroad Guilford Avenue Tunnel, looking west from the Barclay Street Tunnel, ca. 1925. The east portals of the St. Paul and Calvert Street and the North Howard Street, Maryland Avenue, and North Charles Street Tunnels can be seen in the background. (Image courtesy of the B&O Railroad Historical Society.)