Guilford Avenue Bridge
B-4526
Guilford Avenue over CSX Transportation Railroad Tracks
Baltimore City, Maryland
Circa-1894-1895
Unowned

CAPSULE SUMMARY

The circa-1894-1895 Guilford Avenue Bridge (BC8029) is part of the Baltimore & Ohio (B&O) Railroad Baltimore Belt Line (B-5287). The superstructure of the bridge is at street level and carries Guilford Avenue over the CSX Transportation railroad tracks in a north-south direction in northern Baltimore City, south of East 26th Street. The substructure is a short tunnel set within a deep, east-west oriented cut below street level. The 26-foot-long bridge is an arched single-span, rusticated limestone, red brick, and concrete structure. The east and west elevations consist of a limestone arch lined with evenly shaped voussoirs and a prominent keystone; the remainder of the elevations consist of rectangular coursed limestone. The arch barrel is comprised of brick resting on a rectangular coursed limestone base with concrete footings below grade. Gunite is over portions of the original brick interior. Stepped limestone abutments are set at perpendicular angles to the roadway and are topped with larger capstones. Along the abutments and the railroad cut is circa-2020 metal fencing. The single railroad track has metal rails and wood tie plates set on gravel ballast. The roadway is paved with asphalt and accommodates two-way traffic and sidewalks on each side. Parapets along Guilford Avenue retain original cast-iron fencing.

The Guilford Avenue Bridge was constructed as part of the B&O Railroad's Baltimore Belt Line, a railroad segment constructed 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 allowed the B&O to connect its yards in Mount Clare on the west side of Baltimore to Bay View Junction on the east. Prior to its completion, the B&O used barges to ship its railcars over the Patapsco River. The B&O electrified four miles of the Belt Line between 1895 and 1896.

Maryland Historical Trust
Maryland Inventory of
Historic Properties Form

Inventory No. B-4526

1. Name of Property (indicate preferred name)

historic	Guilford Avenue Bridge
other	B&O Railroad Guilford Avenue Tunnel

2. Location

street and number	Guilford Avenue over CSX Transportation Railroad Tracks	__ not for publication
city, town	Baltimore	__ vicinity
county	Baltimore City	

3. Owner of Property (give names and mailing addresses of all owners)

name	Bridge is considered "unowned" by CSX and Baltimore City, but the city maintains the structure		
street and number			telephone
city, town		state	zip code

4. Location of Legal Description

courthouse, registry of deeds, etc.				liber	folio
city, town	Baltimore, Maryland	tax map	tax parcel		tax ID number

5. Primary Location of Additional Data

_____ Contributing Resource in National Register District
_____ Contributing Resource in Local Historic District
__X__ Determined Eligible for the National Register/Maryland Register
_____ Determined Ineligible for the National Register/Maryland Register
__X__ Recorded by HABS/HAER
_____ Historic Structure Report or Research Report at MHT
_____ Other:_____

6. Classification

Category
_____district
_____building(s)
__X__structure
_____site
_____object

Ownership
_____public
_____private
_____both

Current Function

_____agriculture	_____landscape
_____commerce/trade	_____recreation/culture
_____defense	_____religion
_____domestic	_____social
_____education	__X__transportation
_____funerary	_____work in progress
_____government	_____unknown
_____health care	_____vacant/not in use
_____industry	_____other:

Resource Count

Contributing	Noncontributing	
_____	_____	buildings
_____	_____	sites
__1__	_____	structures
_____	_____	objects
__1__	__0__	Total

Number of Contributing Resources previously listed in the Inventory
__1__

7. Description

Inventory No. B-4526

Condition

___ excellent	___ deteriorated
X good	___ ruins
___ fair	___ altered

Prepare both a one paragraph summary and a comprehensive description of the resource and its various elements as it exists today.

The circa-1894-1895 Guilford Avenue Bridge (BC8029) is part of the Baltimore & Ohio (B&O) Railroad Baltimore Belt Line (B-5287), a 7.2-mile railroad segment constructed between 1890 and 1895 that cuts north and east through the city of Baltimore from Camden Station (B-148) on the south side of the city to Bay View Junction on the northeast.

The superstructure of the Guilford Avenue Bridge carries Guilford Avenue over the CSX railroad tracks in a north-south direction in northern Baltimore City, just south of East 26th Street. The substructure consists of a short tunnel that carries the CSX railroad tracks under Guilford Avenue. The bridge is within the Charles Village/Abell Historic District (B-3736), a primarily residential area with rowhouses in a variety of eclectic late-nineteenth and early-twentieth-century styles. The bridge superstructure is at street level, while the substructure and railroad tracks are set within a deep, east-west oriented cut below street level. The bridge is an arched single-span, rusticated limestone, red brick, and concrete structure measuring 26 feet in length with openings oriented east-west. The east and west elevations consist of a limestone arch lined with evenly shaped voussoirs and a prominent keystone; the remainder of the elevations consist of rectangular coursed limestone. The arch barrel is comprised of brick resting on a rectangular coursed limestone base with concrete footings below grade. Gunite is over portions of the original brick interior. Applied utility piping runs horizontally across the south side of the interior.

Stepped limestone abutments are set at perpendicular angles to the roadway and are topped with a series of larger capstones. West of the bridge, the abutments join tall retaining walls that run along the open cut. The southern retaining wall is regularly coursed limestone. The circa-2000 north wall is poured concrete with metal posts. North of the northwest retaining wall is a second, and much taller, poured-concrete retaining wall topped with a metal picket fence that dates to circa 2018. East of the bridge the north abutments join a full-height, poured-concrete retaining wall of an unknown date; there is no retaining wall on the southeast side of the bridge. Along the abutments and the railroad cut is circa-2020 metal replacement fencing (Crampton and Abell 1994, IV-128). The single railroad track running under the bridge has metal rails and wood ties with metal tie plates set on gravel ballast. The roadway is paved with asphalt and accommodates two-way traffic and a parking lane in both directions. Concrete sidewalks with curbs are on both sides of the road. Parapets along Guilford Avenue retain the original cast-iron fencing.

See **Figure 1a** and **Figure 1b** for annotated 1905 plans and sections of the Guilford Avenue Bridge and **Figure 1c** for a repair and maintenance record of the structure.

Maryland Historical Trust
Maryland Inventory of
Historic Properties Form

Inventory No. B-4526

Guilford Avenue Bridge
Continuation Sheet

Number 7 Page 1

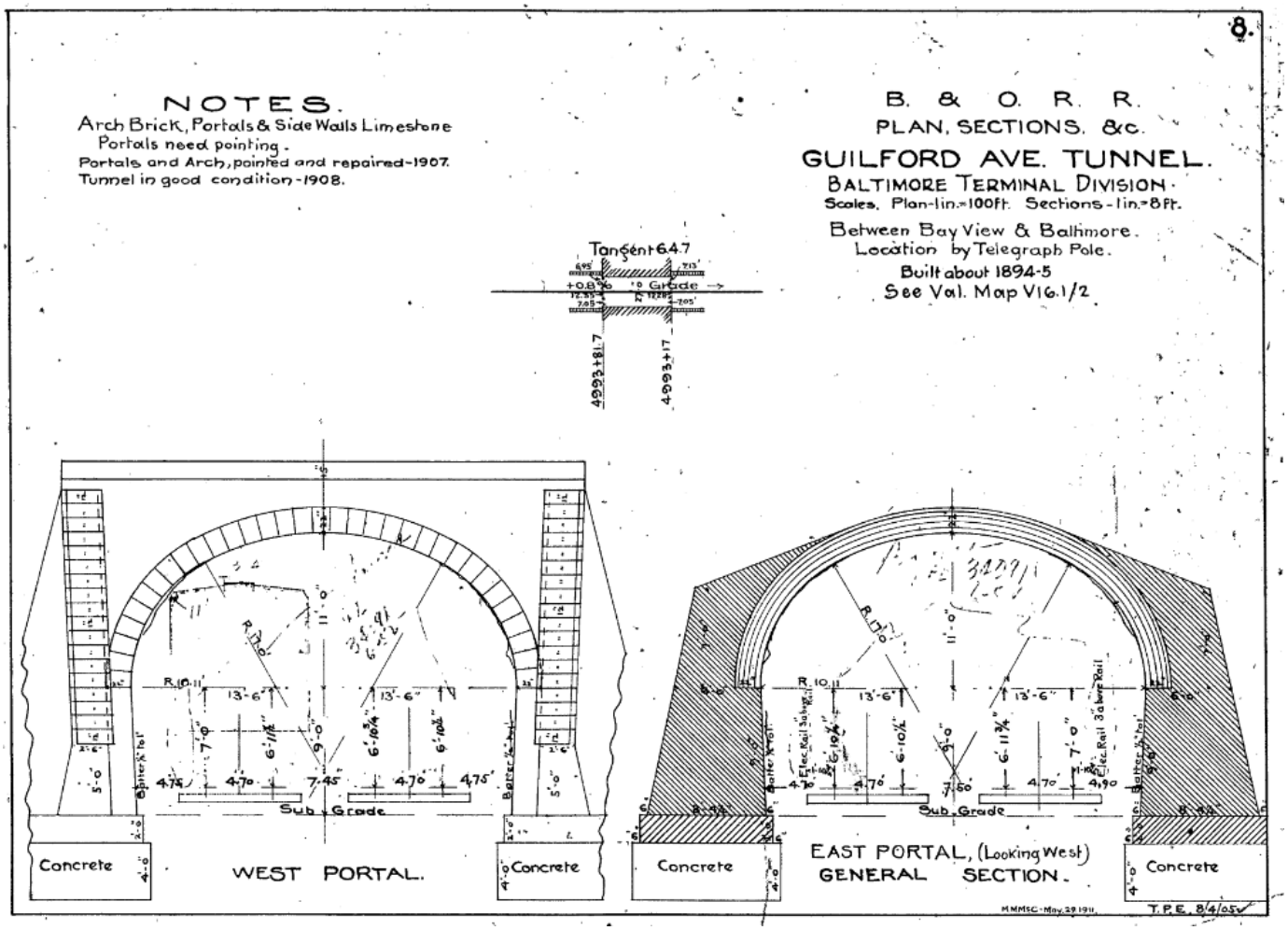


Figure 1a: "B&O RR Plan, Sections, &c. Guilford Ave. Tunnel," 1905 (annotated in 1911).
Image Credit: CSX Transportation

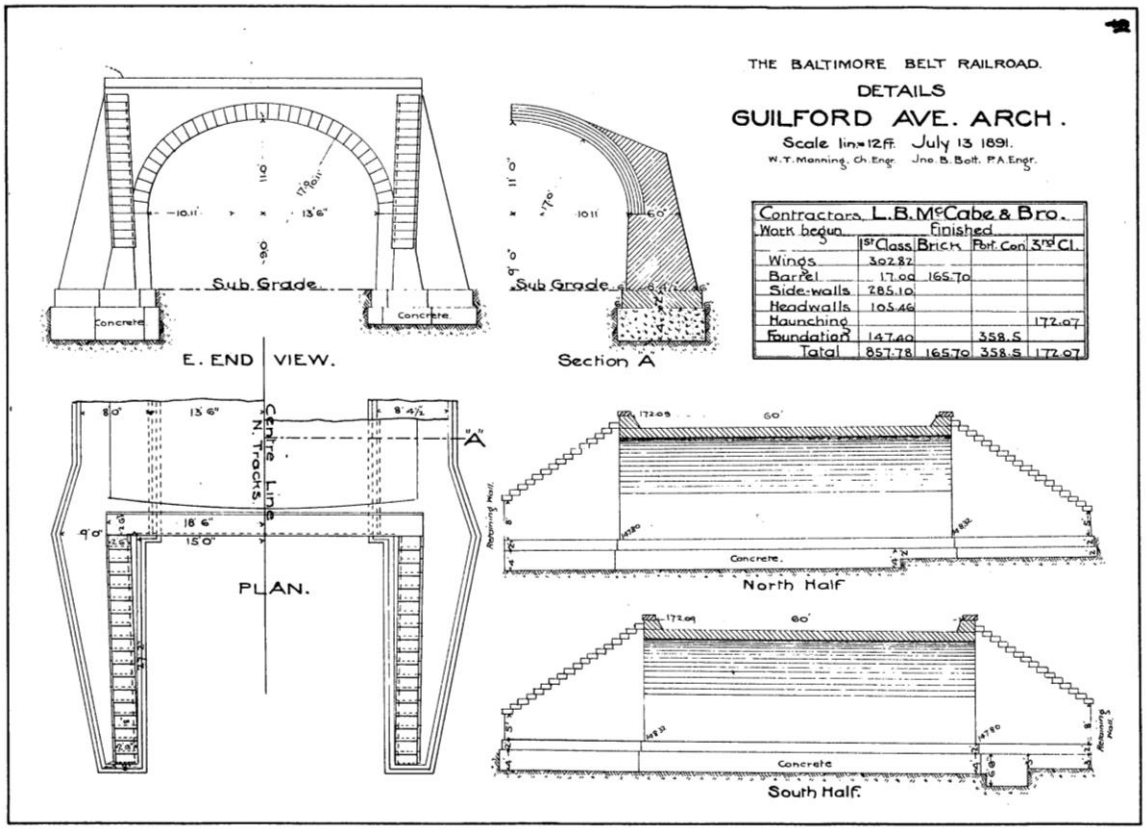


Figure 1b: "B&O RR Plan, Sections, &c. Guilford Ave. Tunnel," 1905 (annotated in 1911).
Image Credit: CSX Transportation

DIVISION - BALTIMORE E. E.
NAME - GUILFORD AVE.
LOCATION - BALTIMORE, MD.

CHARACTER - Stone portals and side walls. 5 Ring Brick Arch
LENGTH - 64.7 FT.

REPAIRS

COMPLETED	FOREMAN	WORK DONE
1-23-37	WJHealy	Cut out side walls for 3rd rail ties Install drain pipe AFE 22909
12-28-37	WJHealy	Repair retaining wall
7-1964-7-1964	RR Riddle	Pointed 2720 S.F. Portals. " 2665 S.F. Arch. " 1,170 S.F. Wall.

Figure 2c: Guilford Avenue Bridge Repair and Maintenance Record, 1937 (annotated in 1937 and 1964).
Image Credit: CSX Transportation

8. Significance

Inventory No. B-4526

Period	Areas of Significance	Check and justify below		
__ 1600-1699	__ agriculture	__ economics	__ health/medicine	__ performing arts
__ 1700-1799	__ archeology	__ education	__ industry	__ philosophy
X 1800-1899	__ architecture	__ engineering	__ invention	__ politics/government
__ 1900-1999	__ art	__ entertainment/ recreation	__ landscape architecture	__ religion
__ 2000-	__ commerce		__ law	__ science
	__ communications	__ ethnic heritage	__ literature	__ social history
	__ community planning	__ exploration/ settlement	__ maritime history	X transportation
	__ conservation		__ military	__ other: _____

Specific dates	1895	**Architect/Builder**	L.B. McCabe and Brother
Construction dates	Circa 1894-1895		

Evaluation for:

_____ National Register _____Maryland Register ____X____not evaluated

Prepare a one-paragraph summary statement of significance addressing applicable criteria, followed by a narrative discussion of the history of the resource and its context. (For compliance projects, complete evaluation on a DOE Form – see manual.)

The circa-1894-1895 Guilford Avenue Bridge was constructed as part of the Baltimore and Ohio (B&O) Railroad's Baltimore Belt Line (B-5287), a railroad segment constructed 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 allowed the B&O to connect its yards in Mount Clare on the west side of Baltimore to Bay View Junction on the east. Prior to its completion, the B&O used barges to ship its railcars over the Patapsco River.

History of Guilford Avenue Bridge Area

The Guilford Avenue Bridge is within an area annexed into the City of Baltimore in 1888. According to the eighteenth-century *Conveyancer's Map of Baltimore*, the land was once part of the original land patent called Huntingdon, which was divided into smaller estates beginning in 1790. The area remained rural farmland owned by the estates of Samuel Brady and P. B. Sattler until the last quarter of the nineteenth century. The area had a rural road running diagonally from northwest to southeast, dividing the Brady and Sattler lands, but was otherwise undeveloped (Bray et al. 2021, 31-32). According to the 1890 Sanborn map, the area had been divided into a rectilinear street plan, following the existing north-south running streets, but the diagonally running street remained (see **Figure 2**). East 26th Street was called "Seventh or Walnut Street" on the map (Sanborn 1890).

Six years later, the Guilford Avenue Bridge was depicted in the 1896 *Atlas of the City of Baltimore, Maryland* by G. W. Bromley (see **Figure 3**). Guilford Avenue was still planned, but not constructed, north of East 24th Street and East 26th Street was laid out west of St. Paul Street, but not to the east. Shortly after the Baltimore Belt Line was constructed, the surrounding area, now part of the Charles Village/Abell Historic District (B-3736), was developed by Francis E. Yewell with an eclectic variety of rowhouse designs featuring small yards and front porches (Bray et al. 2021, 31-32).

Many property owners along the proposed route in the area were displeased with the railroad plans. A. S. Niles, quoted in the *Sun*, expressed his unhappiness that the difference in grade between Guilford Avenue and the planned railroad tracks would be 20 feet (*The Sun* 1890b, 4). Open cuts in general worried the citizens of Baltimore, who wished the B&O to enact "every safeguard" to protect residents from being "mutilated and disfigured" (*The Sun* 1890c, 5). However, the planned rail route crossing under Guilford Avenue proceeded, and the bridge opened in 1895 (see **Figure 4**).

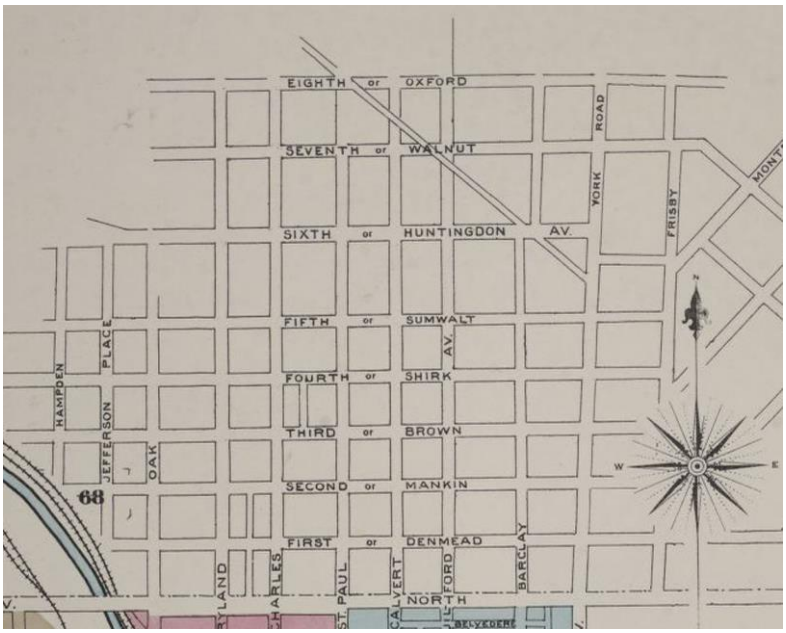


Figure 2: East 26th Street, or "Seventh or Walnut," as it was called in 1890.
Image Credit: Library of Congress

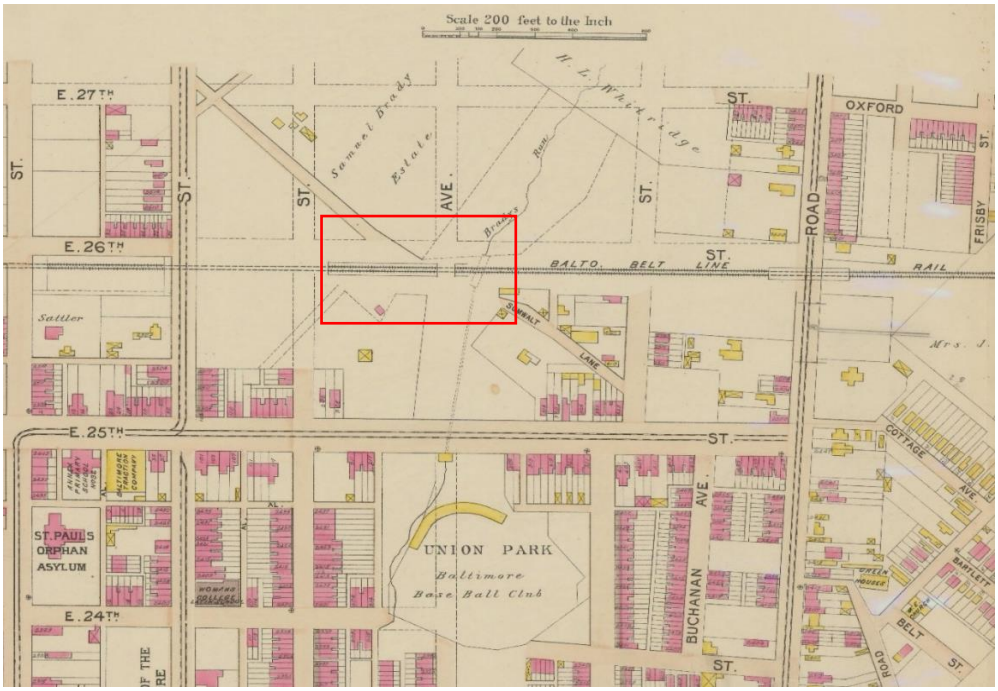


Figure 3: The newly constructed Guilford Avenue Bridge and retaining walls, 1896.
Image Credit: Atlas of the City of Baltimore, Maryland

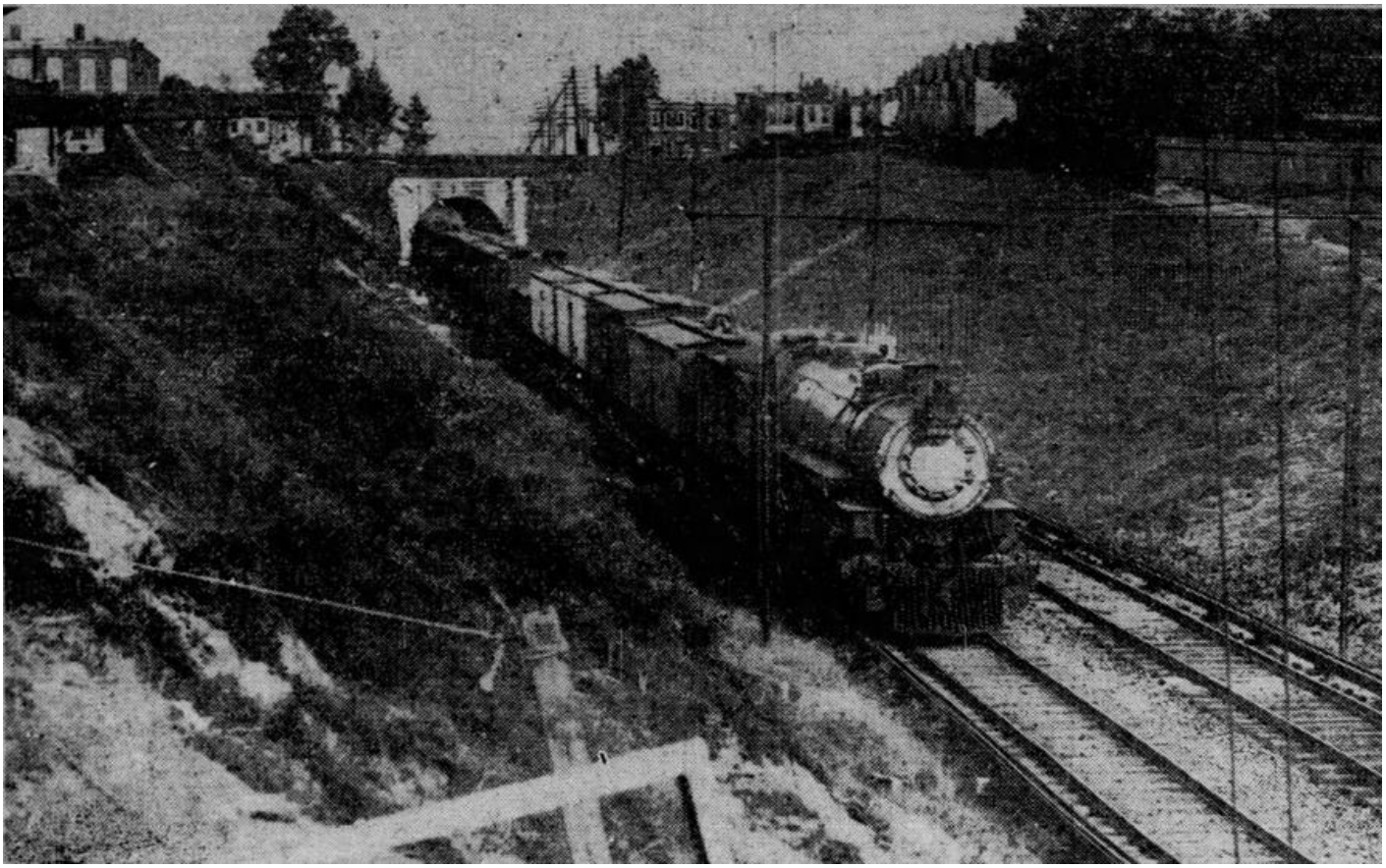


Figure 4: Eastbound train exiting the east portal of the Guilford Avenue Bridge, looking northwest, in 1912 prior to the construction of the East 26th Street retaining wall. Image Credit: *The Sun*, September 28, 1912

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 (Manning 2015, 2).

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) established lines to Baltimore by 1840. The Pennsylvania Railroad (PRR) expanded its Baltimore presence through acquisitions of the Northern Central Railway 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 (Manning 2015, 2).

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 northeast to Bay View Junction, where it connected with the PW&B's line to Philadelphia (Manning 2015, 2).

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 (Manion 1990, 7; Harwood 1990, x).

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 (Manning 2015, 2-3). 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" (Manning 2015, 3).

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 15-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 (Manion 1990, 12-13; *The Sun* 1890a, 1).

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 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 of 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 (Harwood 2002, 87; Lee 2004, 167; Manion 1990, 14-15; Manning 2015, 2-3).

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 joined the Baltimore Belt Railroad Company as chief engineer in 1889 and was instrumental in making the Howard Street Tunnel and 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 B&P Tunnel (Lee 2004, 168). Rea had spent most of his career working for various railroads. He began working at the PRR in 1871 at age sixteen as a chainman on the Morrison's Cove Branch in Pennsylvania. The Panic of 1873 halted most engineering work, and Rea joined the Hollidaysburg Iron and Nail Company for about one year before rejoining the PRR's engineering corps. As an assistant engineer, he helped with the construction of the 1877 Point Bridge, a chain suspension bridge over the Monongahela River in Pittsburgh and the construction of the Pittsburgh and Lake Erie Railroad. In 1879, he served as assistant engineer of the construction of the Pittsburgh, Virginia, and Charleston Railroad, and in 1888, he was made assistant to the PRR's second vice president. In 1889, he resigned and joined the Belt Line project as vice president of the MCRR and chief engineer of the Baltimore Belt Railroad Company. Ill health forced his resignation from work beginning in 1891, but he 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 (*Altoona Tribune* 1925, 2). 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. J.B. Bolt, engineer, may also have had a role in the design of the Belt Line.

The construction contracts were awarded to two local firms, Ryan and McDonald and L. B. McCabe and Brother, the latter of which would go on to help build New York City's first subway in 1904. These two firms were incorporated as The Maryland Construction Company for the construction of the Baltimore Belt Line. The Belt Line construction was divided into four discrete sections: a 2-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 2-mile section from Guilford Avenue to Belair Road; and a 2-mile section from Belair Road to Bay View Junction (Manion 1990, 15; Lee 2004, 173; *Railway Review* 1922, 142).

The anticipated cost of the Belt Line was $6 million—$5 million for the construction and $1 million for contingencies and improvements (Harwood 2002, 85). The Howard Street Tunnel alone was estimated to cost more than $2 million of the budget (Manion 1990, 15). 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' baking 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 (Jacobs 1989, 68). 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 B&O, already suffering financial mismanagement, sunk into receivership in early 1896 (Harwood 2002, 97). John K. Cowen, who replaced Charles Mayer as president a few weeks prior in January of 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 (Reynolds and Oroszi 2000, 39).

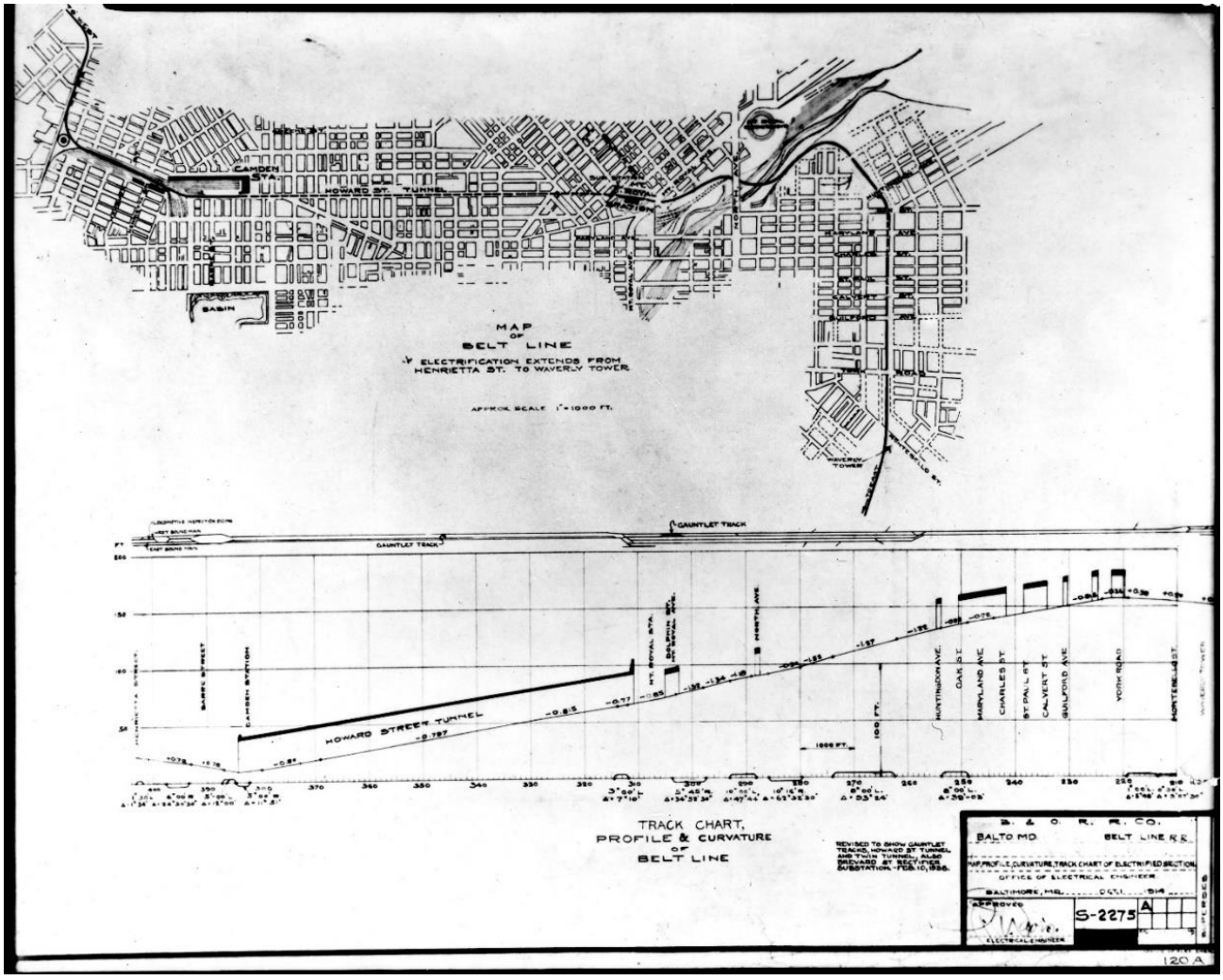


Figure 3: Map and Track Chart, Profile and Curvature of the Belt Line, 1914.
Image Credit: B&O Railroad Museum

When completed in 1895, the double-tracked Baltimore Belt Line ran north from Camden Station via the Howard Street Tunnel (B-79), past Mount Royal Station (B-26), through the shorter Mount Royal Tunnel, through the North Avenue Bridge (B-4521), over the B&P Tunnel, across the Jones Falls, and finally winding north up the east side of the Jones Falls Valley (see **Figure 5**). After reaching

a high point near Huntingdon Avenue and West 26th Street, the line turned sharply east, passing through a long, open cut interspersed with several stone-arch tunnels of varying lengths, including the Guilford Avenue Tunnel, and over several smaller plate 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 10 tunnels totaling 9,605 feet in length. All original tunnel portals and retaining walls along the open cuts are rusticated, regularly coursed limestone, although in most cases the tunnel themselves are constructed of brick. Original bridges generally consist of steel through-plate girders supported by stepped limestone abutments (Manning 2015, 3-4).

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 (Harwood 2002, 87). The lack of smoke and dangerous fumes, which would negate the need for expensive ventilation chimneys, appealed to railroad management (Manion 1990, 19). However, the steep grade (a 0.8 percent incline of approximately 150 feet) 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 (Sagle 1964, 310).

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 (Harwood 2002, 87). 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) (Manion 1990, 19). The original concept called for electric 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 locomotives, or 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 (Harwood 2002, 92-93).

GE's form of electrification included an overhead third rail supported by direct hangers 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 (Harwood 2002, 92; Sagle 1964, 310, 311). A metal "shoe" from the electric motor's roof fit into a slotted, inverted "trough," which delivered the direct current (Harwood 2002, 92).

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, including through the Guilford Avenue Bridge. 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 35 miles per hour and freight trains at 15 miles per hour. In June of 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 of 1896. By then, the four-mile section of the Belt Line was considered fully electrified (Harwood 2002, 92-93, 109).

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 Power House (B-79), which was along Howard Street south of Camden Street. The Power House 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 I-395 (Manning 2015, 7).

Figure 4: East portal of the Guilford Avenue Bridge, looking west from the Barclay Street Bridge, circa 1925.
Image Credit: B&O Railroad Historical Society

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 (see **Figure 6**). In 1903, four new 40-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 60-ton electric locomotives joined the Belt Line. A total of six more, all built by GE, were added in 1912, 1923, and 1927 (Manning 2015, 3; Sagle 1964, 310).

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 it through the Howard Street Tunnel, which caused long trains to temporarily halt 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 (Manning 2015, 3-4; World Wide Rails n.d.; Sagle 1964, 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 (Jacobs 1989, 115).

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 (Jacobs 1989, 120). In 1957, passenger traffic decreased by 120,693 passengers from the year prior. Despite a five 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 of 1957, the B&O filed petitions to completely discontinue service between Baltimore and New York, which included the Belt Line route, to alleviate deficit issues (B&O 1957, 5).

In April of 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 (Manning 2015, 7; *The Sun* 1959, 10; Harwood 2002, 171).

Absorption of the B&O Railroad into CSX Transportation

In the 1960s, revenue continued to sink as operating expenses remained largely the same (Jacobs 1989, 120). 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 (Jacobs 1989, 122). 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 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 (Jacobs 1989, 124-125).

The 1970s proved fruitful for the Chessie System, with total operating revenues rising over $800 million and net earnings of more than $85 million (Jacobs 1989, 125). 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 (Jacobs 1989, 127). As of 2021, CSX continues to operate a freight line along the former alignments of the B&O Baltimore Belt Line and Royal Blue Line (Manning 2015, 4).

Post-Construction Alterations to the Guilford Avenue Bridge

In 1901, the tracks were electrified through Guilford Avenue using an overhead third rail. The following year, the overhead rail was replaced by a ground-level third rail. According to annotated 1905 plans (updated in 1911, 1937, and 1964), in 1907, the portal and arch were repaired and repointed. In 1912, the B&O constructed retaining walls along the north side of the tracks on either side of the bridge to hold up the bed of East 26th Street, which was planned to be opened and paved by the city. The walls were requested by the Peabody Heights Improvement Association to prevent children from accessing the tracks (*The Sun* 1912, 8). The repair and maintenance record notes that in 1937 the side walls in the tunnel were incised to accommodate ties for a new third rail, likely for installation of a gauntlet track that allowed for higher train clearances. The retaining wall was repaired in 1937 (B&O Railroad, 1905). Gunite or shotcrete was applied to the interior of the arch at an unknown date, but possibly in the 1930s when other bridges along the Belt Line were also gunited. Circa 1952, when diesel engines were put in service, the B&O removed the 1937 electrified ground rail. The B&O eliminated passenger service between New York City and Baltimore in 1958, and the rail line was reduced from double tracks to a single track between 1958 and 1960 (Harwood 1990, 170-1). In 1964, the portals, arch, and retaining wall were repointed (B&O Railroad, 1905). In 1984, CSX sought to raise train height restrictions along the Belt Line following the expansion of the General Motors plant in southeast Baltimore. The railroad company lowered the tracks under the Guilford Avenue Bridge, providing a higher, 19-foot, 3-inch clearance to accommodate multi-level automobile carriers.

In 1994, the retaining walls along the south side of East 26th Street between N. Calvert Street and Guilford Avenue began to fail. Several years later, the eastern portion of the original circa-1895 rusticated limestone retaining wall was replaced with poured concrete and metal posts and the 1912 retaining wall was replaced with a poured-concrete retaining wall. In November 2018, the circa-1996 retaining wall failed and was replaced with a new poured-concrete wall; a new metal railing was also installed along East 26th Street (BCDOT n.d.).

As of 2021, the bridge was proposed for demolition and replacement as part of the Howard Street Tunnel Project to allow double stacking of freight trains along CSX's route between Baltimore and Philadelphia. Demolition is expected to occur in 2022.

REFERENCES

Altoona Tribune. 1925. "Blair County Holds Record as Maker of Great Railroad Presidents." October 1925, 2.

Baltimore and Ohio Railroad Company (B&O). 1905, annotated 1911. "B&O RR Plan, Sections, &c. Guilford Ave. Tunnel." Courtesy of CSX Transportation.

------. 1937, annotated in 1937 and 1964. Guilford Avenue Tunnel Repair and Maintenance Record. Courtesy of CSX Transportation.

------. 1914. Map of the Belt Line and Track Chart, Profile and Curvature of Belt Line. Courtesy of the Baltimore & Ohio Railroad Museum.

------. 1957. "131st Annual Report." Courtesy of the Baltimore & Ohio Railroad Museum.

Baltimore City Department of Transportation (BCDOT). n.d. "26th Street Wall Collapse." PowerPoint presentation accessed October 26, 2021. https://transportation.baltimorecity.gov/sites/default/files/26th%20Street%20Wall%20Presentation_Final.pdf.

Bray, Matt, Nicole A. Diehlmann, Laura van Opstal, and Meghan P. White. 2021. "Howard Street Tunnel Project Architectural Historic Properties Identification and Effects Assessment Technical Report." January 2021.

Bromley, G.W. 1896. *Atlas of the City of Baltimore, Maryland*. Philadelphia: G.W. Bromley and Co.

Crampton, Alice, and Julie Abell. 1994. "Guilford Avenue Bridge (BC8029)." Maryland Inventory of Historic Properties Form B-4526. Crownsville, MD: Maryland Historical Trust.

Enoch Pratt Free Library. n.d. *Conveyancer's Map*. On file Maryland Room, Enoch Pratt Free Library, Baltimore, Maryland.

Harwood, Herbert H. Jr. 1990, 2002. *Royal Blue Line*. Baltimore and London: Johns Hopkins University Press, 1990, reprinted in 2002.

Jacobs, Timothy, ed. 1989. *The History of the Baltimore & Ohio*. New York City: Crescent Books, 1989.

Lee, Lawrence J. 2004. "Baltimore's Unseen Artery: A Brief History of the Baltimore Belt Railroad and its Howard Street Tunnel." American Society of Civil Engineers: 163-191.

Manion, Paul. 1990. "Howard Street Tunnel." *The Sentinel* 12, no. 4 (July-August 1990): 6-21. Baltimore and Ohio Railroad Historical Society (B&ORRHS). Courtesy of the Baltimore & Ohio Railroad Museum.

Manning, M. Chris. 2015. "B&O Railroad Baltimore Belt Line." Maryland Inventory of Historic Properties Form B-5287. Crownsville, MD: Maryland Historical Trust.

Railway Review. 1922. "Obituaries." Volume 70, No. 1-5, January-June 1922. Chicago, IL. Accessed October 27, 2021. https://books.google.com/books?id=9Rah8a0dSysC&dq=railway+Review,+January+28,+1922+mccabe&source=gbs_navlinks_s.

Reynolds, Kirk, and Dave Oroszi. 2000. *Baltimore & Ohio Railroad*. Osceola, WI: MBI Publishing Company, 2000.

Sagle, Lawrence W. 1964. *B&O Power: Steam, Diesel and Electric Power of the Baltimore and Ohio Railroad 1829-1964*. United States: Alvin F. Staufer. 1964.

Sanborn Map Company. 1890. *Sanborn Fire Insurance Map from Baltimore, Baltimore County, Maryland.* Volume 2. http://hdl.loc.gov/loc.gmd/g3844bm.g3844bm_g03573189002.

The Sun (Baltimore, Maryland). 1890a. "The Truth Regarding the Belt Railroad." April 5, 1890, 1.

------. 1890b. "Belt Line Questions." April 14, 1890, 4.

------. 1890c. “The Citizens and the Belt Line.” April 25, 1890, 5.

------. 1912. “Scene in Vicinity of Baltimore and Ohio Tracks.” September 28, 1912, 8.

------. 1959. “Fewer Trains.” January 16, 1959, 10.

------. 1994. “CSX, City Tangle over Cost of Repairing Cave-in as Residents Worry About Safety,” January 15, 1994, B1-2.

------. 1996. “Public Notice,” June 17, 1996, 9B.

World Wide Rails. “When Did Diesel Trains Replace Steam?” Accessed September 27, 2021. https://worldwiderails.com/when-did-diesel-trains-replace-steam/.

9. Major Bibliographical References

Inventory No. B-4526

See Section 8.

10. Geographical Data

Acreage of surveyed property	0.11		
Acreage of historical setting	0.11		
Quadrangle name	Baltimore East	Quadrangle scale:	1:24,000

Verbal boundary description and justification

The boundary for the Guilford Avenue Bridge encompasses approximately 0.11 acres in Ward 12 on Baltimore City tax maps. The boundary includes the bridge deck and abutments.

11. Form Prepared by

name/title	Meghan P. White and Nicole A. Diehlmann		
organization	RK&K, LLP	date	4/25/2022
street & number	12600 Fair Lakes Circle, Suite 300	telephone	703-259-3739
city or town	Fairfax	state	VA

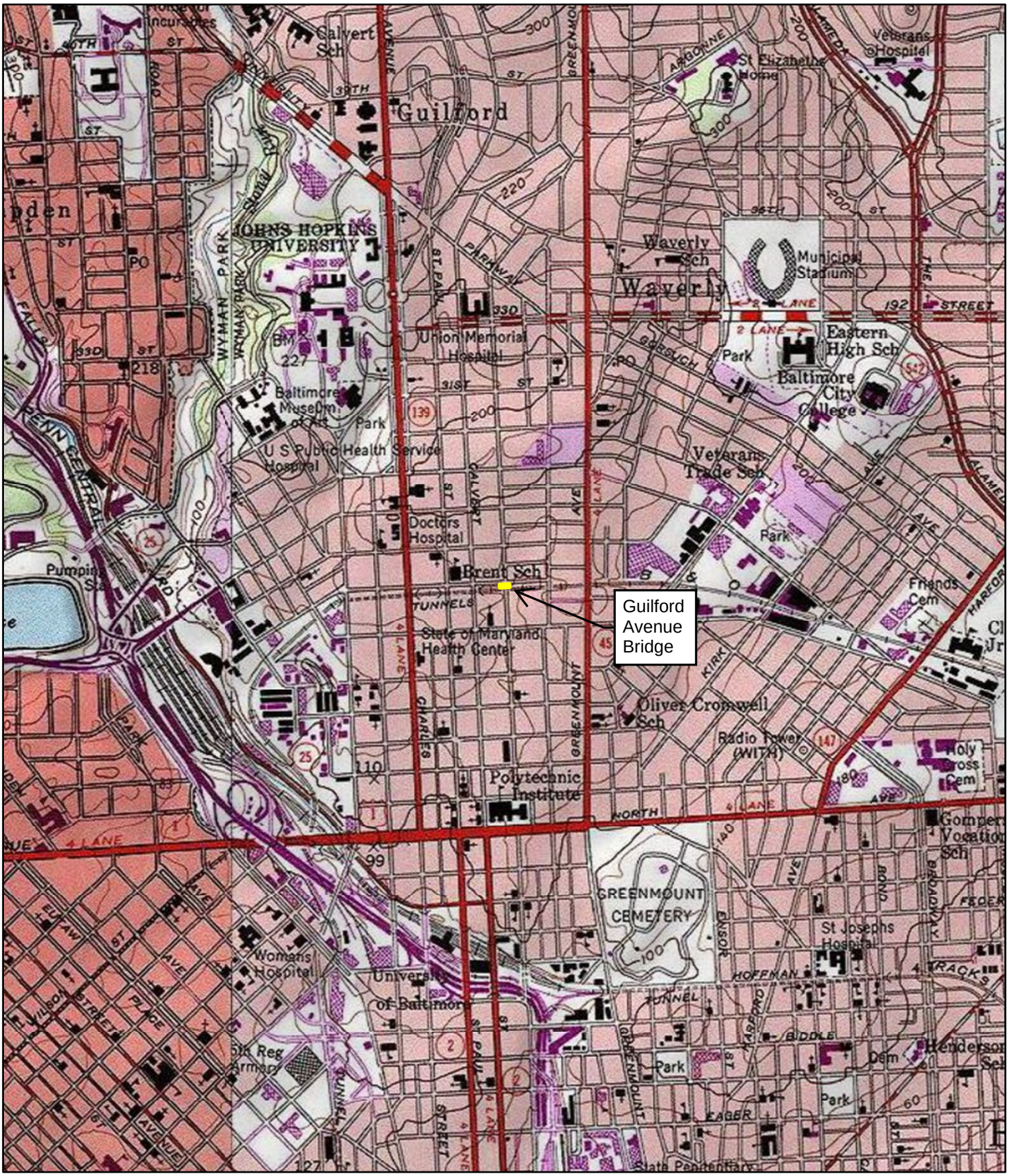
The Maryland Inventory of Historic Properties was officially created by an Act of the Maryland Legislature to be found in the Annotated Code of Maryland, Article 41, Section 181 KA, 1974 supplement.

The survey and inventory are being prepared for information and record purposes only and do not constitute any infringement of individual property rights.

return to: Maryland Historical Trust
Maryland Department of Planning
100 Community Place
Crownsville, MD 21032-2023
410-697-9591

Guilford Avenue Bridge (BC8029) B-4526

Location: Guilford Avenue over CSX Transportation Railroad Tracks Baltimore City



Guilford Avenue Bridge (BC8029) B-4526

Location: Guilford Avenue over CSX Transportation Railroad Tracks Baltimore City

Guilford Avenue Bridge

USGS 7.5' Quadrangle
Baltimore East

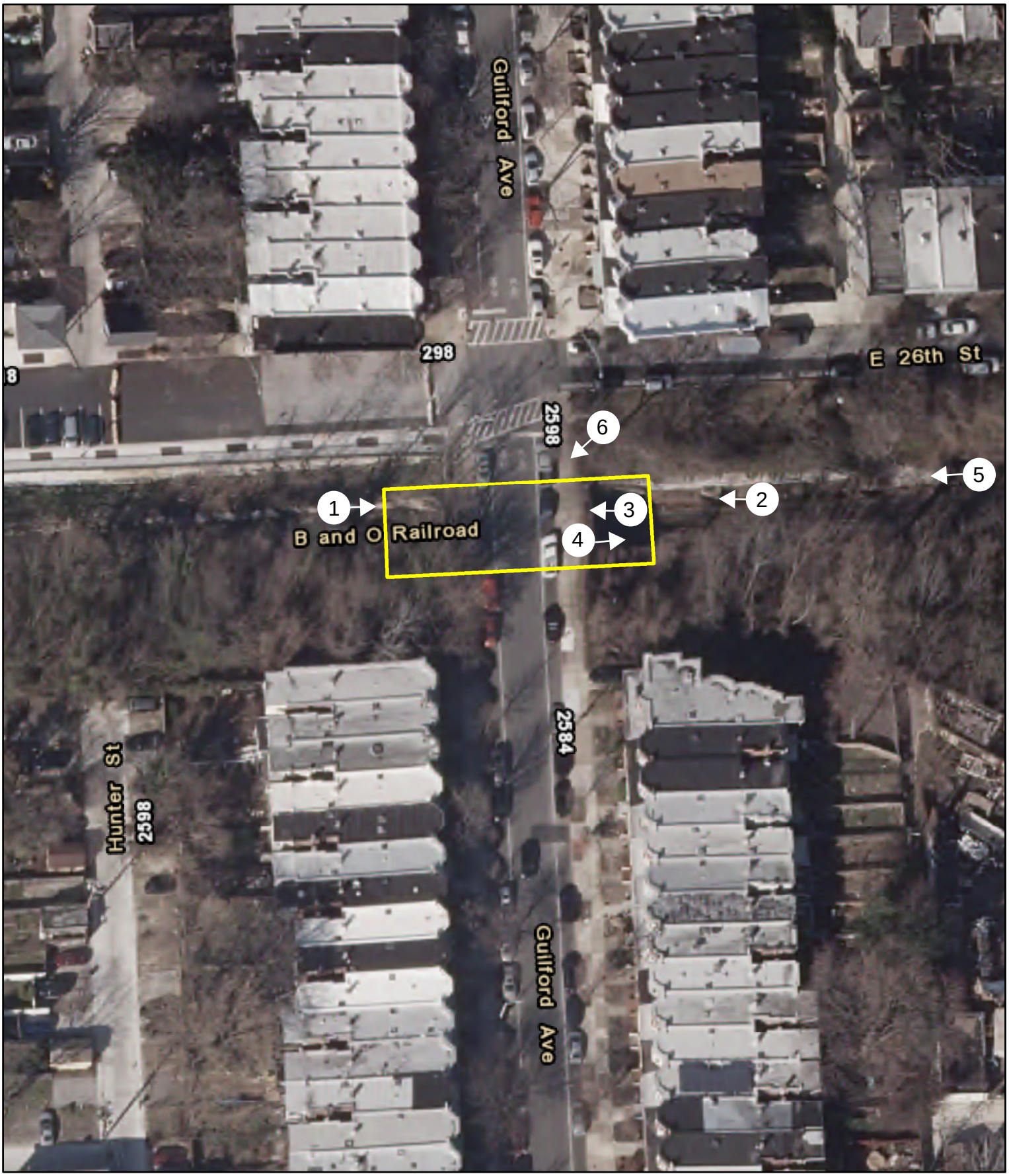
0 0.125 0.25 0.5 Miles

1:12,000

N

Guilford Avenue Bridge (BC8029) B-4526

Location: Guilford Avenue over CSX Transportation Railroad Tracks Baltimore City



Guilford Avenue Bridge

1 Photo Location

0 0.0075 0.015 0.03 Miles

1:900

N

Maryland Historical Trust
Maryland Inventory of
Historic Properties Form

Inventory No. B-4526

Name of Property: Guilford Avenue Bridge
Location: Guilford Road over CSX Transportation Railroad Tracks, Baltimore, MD

Photo 1: West portal and track, looking east to Barclay Street

Photo 2: East portal, looking west to Calvert Street

Photo 3: Detail of east portal and tunnel interior, looking west to Calvert Street

Photo 4: Eastern abutments, looking east to Barclay Street

Photo 5: East portal and track, looking west from Barclay Street

Photo 6: Guilford Avenue over CSX tracks, looking southwest

Maryland Historical Trust
Maryland Inventory of
Historic Properties Form

Inventory No. B-4526

Name of Property: Guilford Avenue Bridge
Location: Guilford Road over CSX Transportation Railroad Tracks, Baltimore, MD

PHOTO LOG

Name of Property: Guilford Avenue Bridge
Name of Photographer: Nicole A. Diehlmann
Date of Photographs: May 2020, September 2020, and November 2021
Location of Original Digital File: MD SHPO

Photographs inserted on continuation sheets.

Photo 1 of 6:
West portal and track, looking east to Barclay Street
B-4526_2021-11-08_001.tif

Photo 2 of 6:
East portal, looking west to Calvert Street
B-4526_2021-11-08_002.tif

Photo 3 of 6:
Detail of east portal and tunnel interior, looking west to Calvert Street
B-4526_2021-11-08_003.tif

Photo 4 of 6:
Eastern abutments, looking east to Barclay Street
B-4526_2021-11-08_004.tif

Photo 5 of 6:
East portal and track, looking west from Barclay Street
B-4526_2020-05-21_005.tif

Photo 6 of 6:
Guilford Avenue over CSX tracks, looking southwest
B-4526_2020-09-27_006.tif