Howard Street Tunnel
B-79
Beneath Howard Street between Mount Royal and Camden Stations
Baltimore City, Maryland
1890-1895
Private

CAPSULE SUMMARY

The Howard Street Tunnel, built between 1891 and 1895, is part of the Baltimore & Ohio (B&O) Railroad Baltimore Belt Line (B-5287). The approximately 8,700-foot-long brick and concrete tunnel is an underground rail connection beneath Howard Street between the Mount Royal (B-26) and Camden (B-148) Stations. The tunnel consists of four sections: an early-1890s, approximately 300-foot, cut-and-cover section north of Dolphin Street; an early-1890s, approximately 5,900-foot bored section approximately between Dolphin Street and West Lombard Street; an early-1890s, approximately 1,150-foot, cut-and-cover section between West Camden Street and West Lombard Street; and an approximately 1,443-foot, circa-1982, box culvert section at the south end that was extended 50 feet circa 1990. The tunnel is arched with an inverted brick and concrete arch for much of its flooring. The tunnel walls are mostly brick, with a rusticated limestone foundation present at the north portal. Recessed arched alcoves throughout the tunnel provide pedestrian safety from passing trains. A single metal and wood track on gravel ballast runs through the center of the tunnel. Signaling equipment is adjacent to the track. The north portal is approximately 51 feet wide and 27 feet tall and faced in rusticated cut limestone. The opening is lined with unevenly shaped voussoirs. Limestone abutments are set perpendicular to the portal and are topped with a series of stepped capstones. The circa-1990 south portal is poured concrete with a square opening and poured-concrete abutments perpendicular to the tracks.

Howard Street Tunnel was constructed as part of the B&O's Baltimore Belt Line, constructed between 1890 and 1895 in Baltimore, Maryland. The B&O electrified four miles of the Belt Line between 1895 and 1896. 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.

Maryland Historical Trust
Maryland Inventory of Historic Properties Form

Inventory No. B-79

1. Name of Property (indicate preferred name)

historic	Howard Street Tunnel and Power House
other	Howard Street Tunnel

2. Location

street and number	Beneath Howard Street between Mount Royal and Camden Stations	__	not for publication
city, town	Baltimore	__	vicinity
county	Baltimore City		

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

name	CSX Transportation				
street and number	500 Water Street			telephone	904-359-3100
city, town	Jacksonville	state	FL	zip code	32202

4. Location of Legal Description

courthouse, registry of deeds, etc.			liber	folio	
city, town	Baltimore, MD	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	Ownership	Current Function		Resource Count	
				Contributing	Noncontributing
___district	___public	___agriculture	___landscape	___	___ buildings
___building(s)	_X_private	___commerce/trade	___recreation/culture	___	___ sites
_X_structure	___both	___defense	___religion	1	___ structures
___site		___domestic	___social	___	___ objects
___object		___education	_X_transportation	1	0 Total
		___funerary	___work in progress		
		___government	___unknown		
		___health care	___vacant/not in use		
		___industry	___other:		

Number of Contributing Resources previously listed in the Inventory
__1__

7. Description

Inventory No. B-79

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 49.44-acre Howard Street Tunnel and Power House has been surveyed several times, including by Mark Adams of the Baltimore City Commission for Historical and Architectural Preservation in 1969, by Nancy Miller in 1972, and by Steven Levy in 1976. The surveyed area was large, covering not only the tunnel, but also the Baltimore & Ohio (B&O) Railroad's Camden Yards on both sides of South Howard Street at the southern end of the tunnel. The historic extent of the Howard Street Tunnel was listed on the National Register of Historic Places in 1973 (73002187). The Howard Street Tunnel and Power House property has been altered since the most recent survey in 1976, including the demolition of the Power House and construction of the Baltimore Branch of the US Federal Reserve Bank of Richmond and Baltimore Convention Center buildings on the property. This form provides additional historic context and description documentation, including condition and integrity, of the Howard Street Tunnel and Power House property.

The Howard Street Tunnel 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 tunnel is an underground rail connection beneath Howard Street between the Mount Royal (B-26) and Camden Stations of the B&O Railroad. The brick and concrete tunnel measures approximately 8,700 feet in length, 21 feet in height, and 29 feet in width, and is placed between 50 and 70 feet below grade. Trains originally entered the tunnel just southeast of Camden Station, then climbed eastbound (north to Philadelphia) for 7,341 feet at a 0.8 percent grade until exiting out of the tunnel at Mount Royal Station. The tunnel currently consists of four distinct sections: 1) An original, early-1890s, approximately 300-foot, cut-and-cover section runs from just north of West Preston Street to just southwest of Mount Royal Station. 2) An original, early-1890s, approximately 5,900-foot bored section runs from just north of West Preston Street south to north of West Lombard Street. 3) An original, early-1890s, approximately 1,150-foot cut-and-cover section runs between north of West Lombard Street to just south of West Camden Street. 4) An approximately 1,393-foot, box culvert section, dating to 1982, extends from just south of West Camden Street to north of Martin Luther King Jr. Boulevard. In 1990, this section was extended an additional 50 feet to the south, to just north of Martin Luther King Jr. Boulevard, in the same box culvert design as the circa-1982 section (Bray et al. 2021, 8; Lee 2004, 176, 186).

The tunnel is arched and for the majority of its length the flooring contains an inverted brick and concrete arch that provides additional strength to the side walls. The tunnel walls are generally constructed of brick, with a rusticated limestone foundation present in sections of the tunnel, including a short distance at the north portal and longer stretches at the 1895 south portal. Applied utility piping runs horizontally across both sides of the interior. Recessed arched brick alcoves are placed throughout the tunnel to provide pedestrian safety from passing trains. Vertically oriented original rectangular wood blocks are mounted on the tunnel walls and continue to serve their original purpose of securing wiring and lighting, although the existing wiring and lighting are replacements. A single non-electrified track consisting of metal rails and wood ties on gravel ballast runs through the center of the tunnel. Signaling equipment is adjacent to the track on the ground.

The north portal is approximately 51 feet wide and 27 feet tall and faced in rusticated cut limestone (Lee 2004, 178). The arched opening is lined with unevenly shaped voussoirs (see **Figure 1** for as-built plans of the north portal). Metal fencing lines the parapet above the arch. Limestone abutments are set perpendicular to the portal and are topped with a series of stepped capstones. Immediately north of the north portal is the Mount Royal Station and trainshed, set in a deep cut of land. At the north portal, the tunnel bellmouth is much wider than the rest of the tunnel to accommodate sidings that split from the main track to access Mount Royal Station. The tunnel narrows and curves slightly as it approaches West Preston Street and transitions to the bored section. It then continues south directly under North Howard Street. Near West Lombard Street, the tunnel widens to accommodate space for a former siding and a recessed platform on the east side of the tracks, for a planned, but uncompleted, station. There is a single large arched opening on both the north and west sides of the platform. South of West Lombard Street, original steel girders run east-west across the tops of the arches to support the ceiling over the underground platform (see **Figure 2**). The southern early-1890s, cut-and-cover section of the tunnel begins here where the distance between the top of the tunnel and Howard Street is shallow. At the southern end of this cut-and-cover section, the roof is arched and tall limestone foundations are at the side walls. North of West Lombard Street, a portion of the brick tunnel walls are clad in corrugated steel.

The original arched-stone south portal near West Camden Street has been obscured by the 1982 poured concrete box-culvert section, but portions of the portal, including stone voussoirs, are visible from inside the tunnel (See **Figure 3** for as-built plans of the original south portal). The box-culvert section is narrower than the arched section, and an angled poured-concrete wall on the west side connects the 1895 portal to the box-culvert section. The junction between the 1982 boxed culvert section and 50-foot circa-1990 section is marked by a simple seam in the poured concrete. The circa-1990 south portal is poured concrete with a square opening and poured-concrete abutments perpendicular to the tracks.

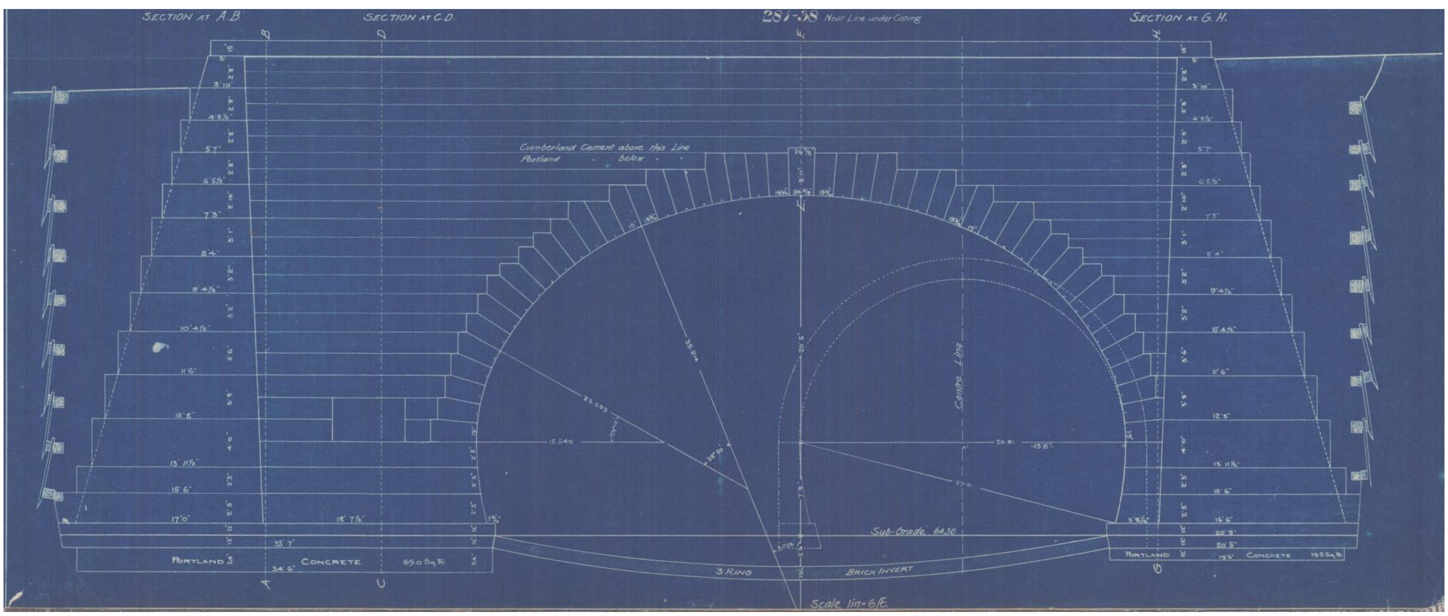

Figure 1: Plan sheet showing the north portal with its wide bellmouth. The smaller arch indicates the width of the tunnel itself, from “The Baltimore Belt Railroad, Records of Construction of Sec. No. 4,” 36, 1895.
Image credit: CSX Transportation

Figure 2: The arched opening east (left) of the tracks leading to the incomplete underground platform, and the original steel girders running east-west across the tops of the arches above the railroad tracks, looking south, 2021.
Image credit: Jet Lowe, HAER No. MD-11-13.

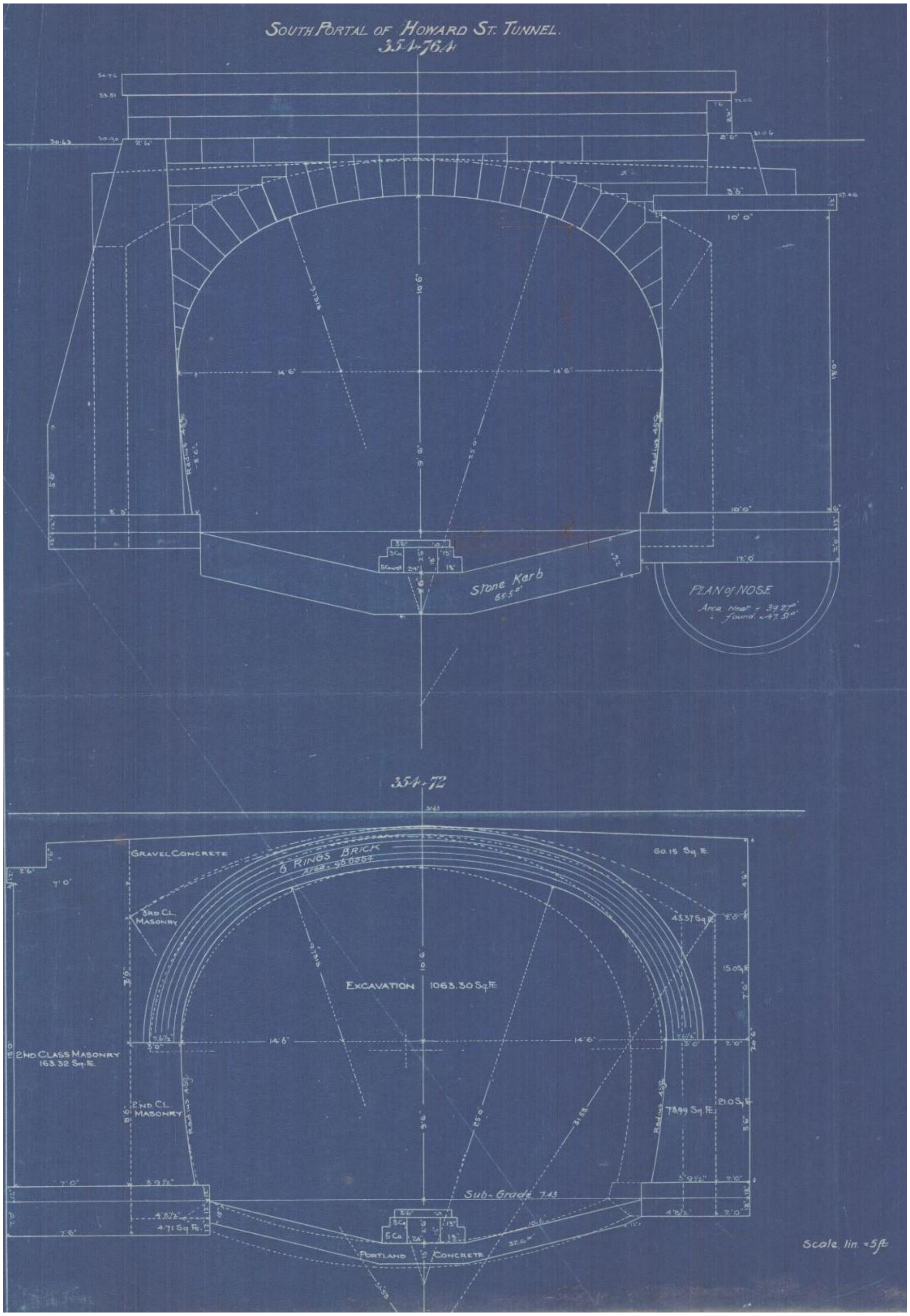

Figure 3: Plan sheet showing the south portal, from "The Baltimore Belt Railroad, Records of Construction of Sec. No. 4," 70, 1895. Image credit: CSX Transportation

8. Significance

Inventory No. B-79

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	X 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 1890-1895

Architect/Builder Samuel Rea, Chief Engineer; Ryan and McDonald Construction Company and L. B. McCabe and Brother, builders

Construction dates 1890-1895

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 Howard Street Tunnel was the centerpiece of the Baltimore and Ohio (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. Once completed, the Howard Street Tunnel was the country's largest soft-ground tunnel and the longest tunnel operated by the B&O Railroad (Harwood 2002, 86).

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).

Project construction was led by Samuel Rea, who joined the Baltimore Belt Railroad as chief engineer in 1889. Though ill health forced his retirement about two years later, he was instrumental in making the Howard Street Tunnel and Belt Line a reality. 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 (*Altoona Tribune* 1925, 2). 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).

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. The company built a platform beneath West Lombard Street in the Howard Street Tunnel, on the east side of the tracks approximately 350 yards north of Camden Station, to serve as the underground portion of a new station at the intersection of Howard and West Lombard Streets to supplement the circa-1856 Camden Station. The platform was intended to be accessed from the street level by stairs and elevators. However, because of financial constraints, the station was never built, and the underground platform was never used (Lee 2004, 178; *The Sun* 1951).

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).

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 4**). 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).

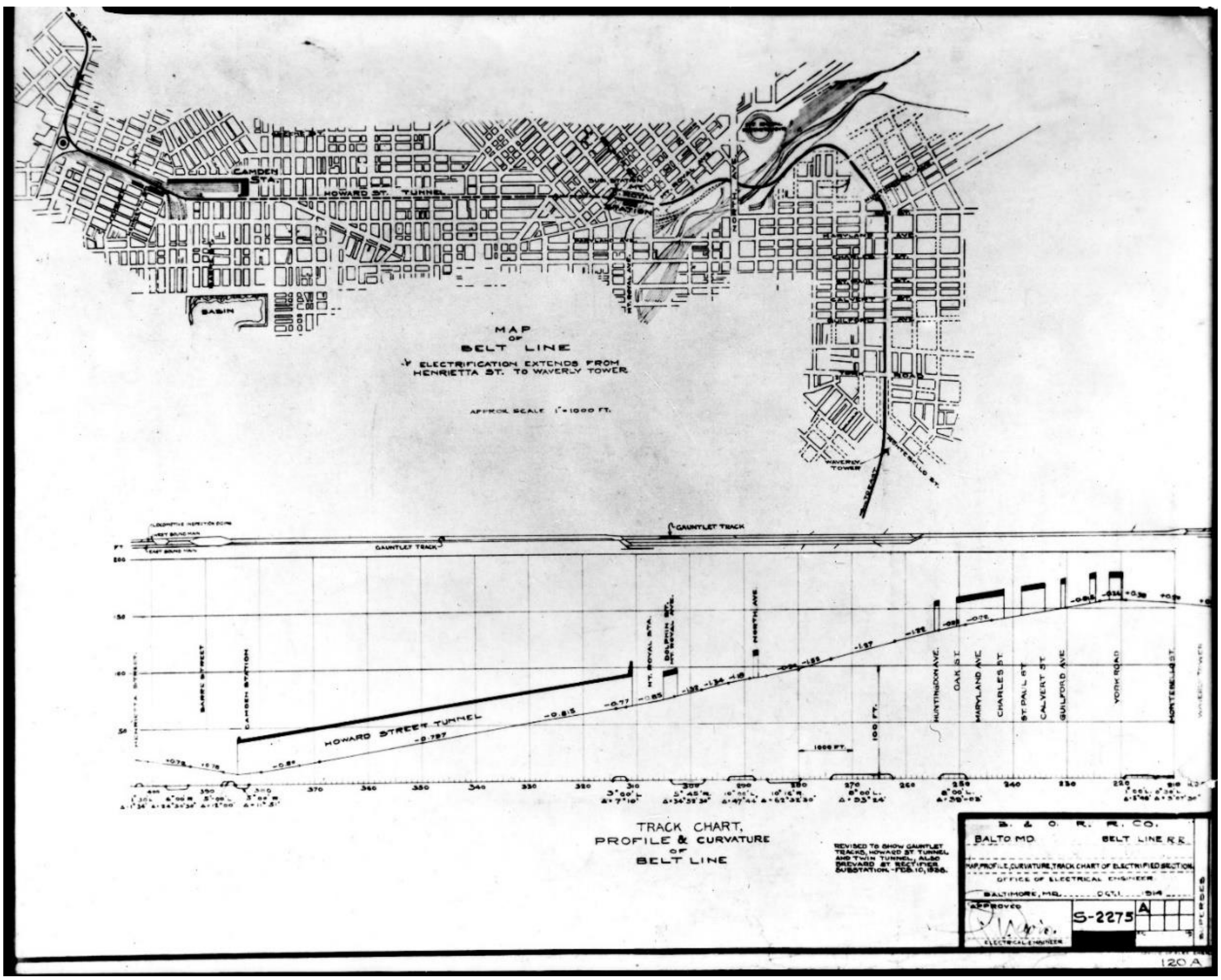

Figure 4: Map and track chart, profile and curvature of the Belt Line, 1914.
Image credit: B&O Railroad Museum

History and Construction of the Howard Street Tunnel

Site conditions made the construction of the Howard Street Tunnel challenging. Above ground were buildings ranging from three to eight stories high. A horse-drawn street railway operated along Howard Street for almost the entirety of the tunnel route, and three blocks at the south end of the tunnel had a new cable railway. In addition, the soil at the Howard Street Tunnel location was composed of loam, clay, and gravel, but primarily fine, soft sand. The discovery of water, in combination with the soft soil, caused concerns regarding potential damage to buildings and streets above the tunnel due to settling from construction (Prelini 1912, 160-161). It was imperative to the B&O Railroad that construction proceed as precisely and carefully as possible to ensure minimal disruption above. Because of these conditions, the B&O engineers chose to use two separate tunneling techniques—a large bored section in the center, flanked by cut-and-cover sections at either end. For most of the length of the Howard Street Tunnel, the B&O engineers selected a modified version of the so-called "German method," a soft-ground tunneling technique developed in 1803 for the St. Quentin Canal in France. It was used again in 1837 for the Königsdorf Tunnel in North-Rhine Westphalia in Germany, under conditions similar to the Howard Street Tunnel. The technique was known as the "German method" for its widespread use in that country (Lee 2004, 174; Prelini 1912, 155; Manion 1990, 17).

The German method involved constructing the side walls and roof before excavating the central tunnel core and constructing the bottom invert. This was accomplished by excavating two small areas, called drifts, on either side of the tunnel where the side walls are constructed. The drifts were supported by wood framing that prevented earth from collapsing into the opening. The drifts were excavated to the height of the springing line of the arch. As the drifts increased in height, the wood framing was reinforced with additional posts. The drifts created a passageway into the tunnel, known as an annular gallery, from which earth could be excavated and tunnel walls constructed. At the same time, another opening, approximately one-third the total height of the tunnel, was excavated at the top center of the arch. Wood trusses and metal ribbing supported the central opening until the side walls and top of the arch were completed, and then they were removed. The masonry lining of the tunnel was constructed at the foundation of the side walls and built toward the roof arch. The invert, a shallow inverted arch that provides additional support to the main arch, was constructed last, after the earth in the central section of the tunnel was removed. See **Figure 5** for section drawings illustrating the German method construction process (Prelini 1912, 155, 158).

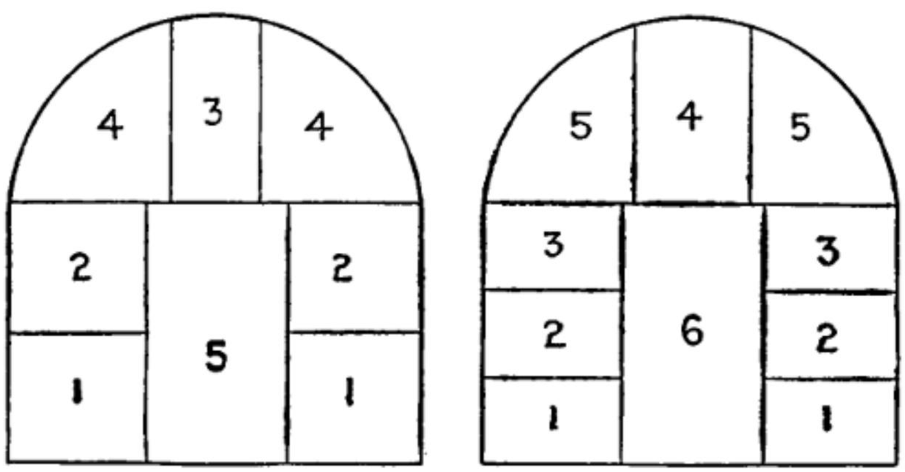

Figure 5: Diagrams showing sequence of excavation in the German method of tunneling, 1912.
Image credit: Charles Prelini

The German method had its advantages and disadvantages. An advantage of the method is that the annular gallery first created in the excavation was small, minimizing earth disturbance. Additionally, building the masonry lining from the bottom and working upwards allowed for a more stable construction. However, the small size of the annular gallery meant that the spoil cars hauling soil out of the tunnel took up nearly all of the space, making it extremely difficult for laborers to work. A second disadvantage was the possibility that the side walls would move closer together due to the loose soil before the invert masonry could stabilize them. Overall, the German method's disadvantages often increased the cost of tunneling projects, leading to the technique's increasingly infrequent use (Prelini 1912, 159-160).

As a result of these challenges, the Howard Street Tunnel was excavated using a modified German method, which was detailed by Charles Prelini in 1912 in the sixth edition of his work, *Tunneling: A Practical Treatise*. The side drifts were excavated as normal, reaching the springing line of the arch. The masonry lining was constructed along the side drifts, resting on a thick concrete foundation. The central heading was excavated next, but unlike the traditional German method of construction, in the Howard Street Tunnel the central heading was enlarged to the whole section of the tunnel. The supporting framework applied to the upper portion of the tunnel created a floor upon which side cuts were formed to reach the top of the masonry of the side drifts, allowing the tunnel walls to be created in a continuous lining up to the keystone (See **Figures 6 and 7**). The side drifts in the Howard Street Tunnel were approximately eight-by-eight feet, though they often extended below the floor level for a stronger foundation. The supporting frames were built approximately four feet apart (Prelini 1912, 160-162). To drain the copious amount of water within the tunnel, E. J. Farrell, Ryan and McDonald's general manager, created a system involving drilling over 40 wells and air-driven pumps (Lee 2004, 174).

The roof arches were constructed of both wood and iron. For the iron centers, two six-by-six-inch angles were butted together and bent to form the shape of an arch rib. Six ribs were built four feet apart. The masonry portion of the roof was between five to eight bricks thick, depending on the softness of the soil. Each arch section measured approximately 18 feet and took up to 125 hours to complete. The timber strutting above the arch and outside of the side walls were left in place, and the empty space between the strutting and the masonry lining were filled with rubble and mortar (See **Figures 7 and 8**) (Prelini 1912, 162-164).

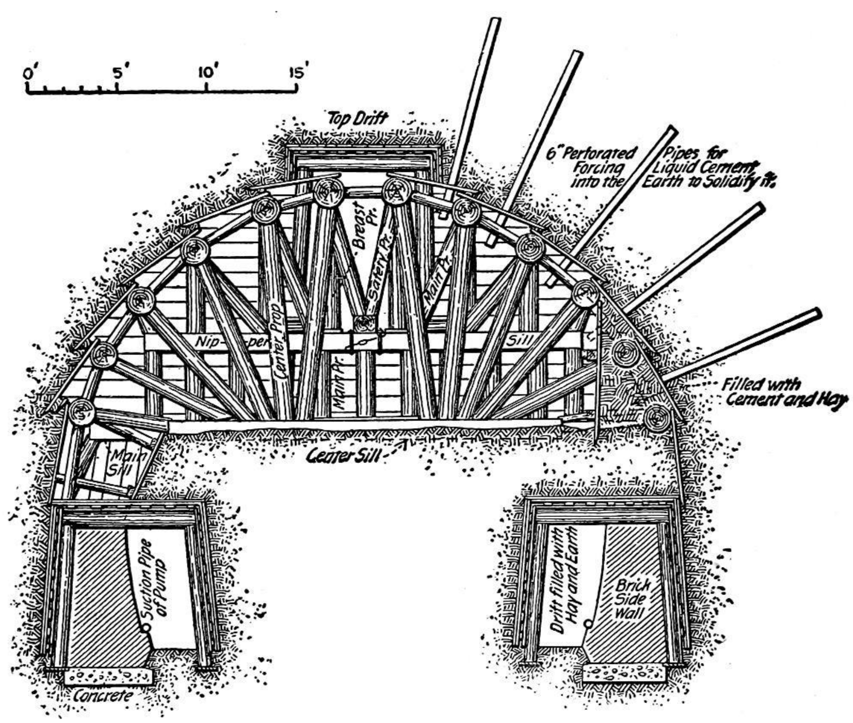

Figure 6: Sketch showing method of excavating and strutting Howard Street Tunnel, 1912. Image credit: Charles Prelini

Maryland Historical Trust
Maryland Inventory of Historic Properties Form

Inventory No. B-79

Howard Street Tunnel
Continuation Sheet

Number 8 Page 6

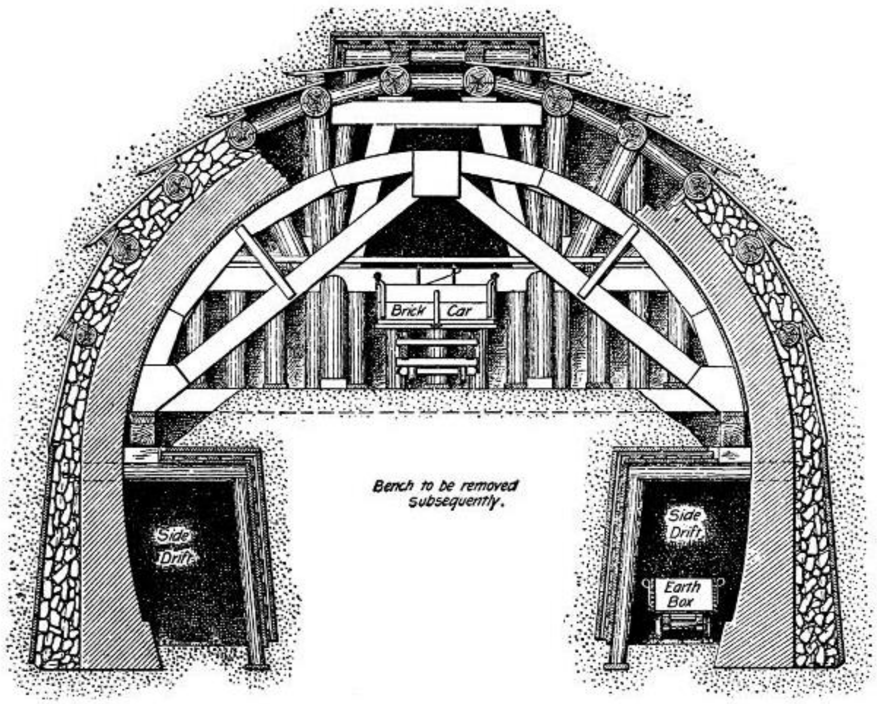

Figure 7: Roof arch construction with timber centers, Howard Street Tunnel, 1912.
Image credit: Charles Prelini

Construction of the masonry invert, upon which the arch of the tunnel would rest, had to be modified from the typical method for the Howard Street Tunnel due to the soft soil. Timbers stretched from one side of the tunnel to the other and rested on vertical posts. Sheet piles were driven into the ground outside of the vertical posts, forming an enclosure in which to safely excavate. Then, an eight-inch layer of concrete was poured, and the masonry invert was built upon the concrete foundation at a depth of two-and-a-half feet. The invert measured more than a mile. The soil north of Madison Street was considered hard enough and did not need the inverted arch (Prelini 1912, 162-164; *The Sun* 1892, 8).

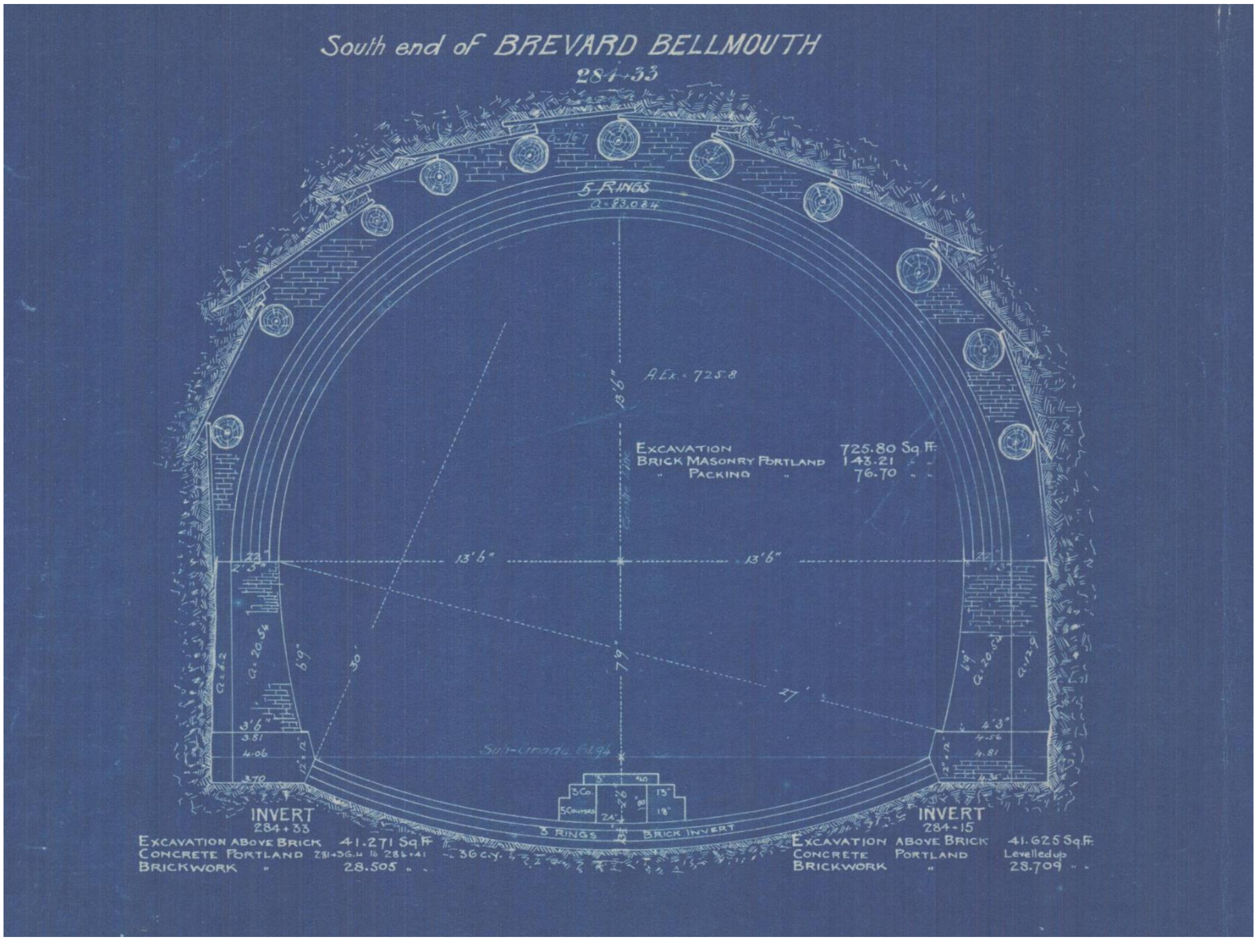

Figure 8: Plan sheet showing the masonry and concrete invert, timber strutting, and roof arch construction, from "The Baltimore Belt Railroad, Records of Construction of Sec. No. 4," 47, 1895.
Image credit: CSX Transportation

The original northern and southern portions of the Howard Street Tunnel, above West Preston Street and below West Lombard Street, were constructed above ground using the cut-and-over method. This comprised approximately one-fifth of the tunnel length. Below West Lombard Street, five vertical shafts below ground were built for the tunnel's excavation, spaced approximately 1,000 feet apart. Men worked in three eight-hour shifts a day. Each uncompleted tunnel section, totaling no more than 400 feet long, was not allowed to be within two contiguous blocks to prevent safety issues like building collapses or street sinking (Manion 1990, 17).

Ryan and McDonald Construction Company and L. B. McCabe and Brother began construction on the tunnel in September of 1890 (Manion 1990, 15). Despite the precautions taken, a cave-in occurred in 1891 after workers encountered quicksand; two workers died in the incident, and the circa-1874 City College at Howard and Center Streets collapsed. In the section of the tunnel excavated using the modified German method, the centers were excavated too quickly, before the mortar in the rubble filling had time to set. This caused the masonry lining to flatten and bulge. Above, Howard Street experienced between 1 and 18 inches of sinking, damaging gas and water mains (Manion 1990, 19; Prelini 1912, 165; *The Sun* 1892, 8; Harwood 2002, 91).

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 Howard Street Tunnel, but concern over buckling of wood 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 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).

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 (Lee 2004, 182). 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 Howard Street Tunnel

In 1937, engineers added a gauntlet to the two tracks within the Howard Street Tunnel to allow clearance in the center of the tunnel for newer and taller freight cars. For a gauntlet configuration, two parallel tracks partially overlapped. Each track operated independently, but trains traveling either track were moved closer to the center of the arch, the tallest section, for additional height clearance. Within the tunnel, a third track was added to partially overlap with the eastbound tracks, allowing the existing track to move closer to the arch center (See **Figure 9**). The westbound tracks were unaltered. Electrified shoes were placed on one side of the electric locomotives on swinging arms or booms so they could extend to the existing third rail (Sagle 1964, 310). This entire electrification system was removed circa 1952, when the B&O completed its shift to diesel locomotives.

Beginning in the late twentieth century, major changes were made to the Howard Street Tunnel and Power House property, which includes Camden Station and the B&O Warehouse (B-148), west of the tunnel at West Camden Street. Prior to December 1979, the US Federal Reserve Bank of Richmond acquired eight acres of the B&O Railroad's Howard Street Tunnel and Power House property at the southeast corner of South Howard and Conway Streets. The bank then constructed a new building on the property to consolidate all its Baltimore Branch operations (Kosnett 1979, 17). In 1982, after the tunnel was under the control of CSX Transportation, it was extended approximately 1,393 feet to the south, primarily over the existing cut, which was covered with reinforced concrete and fill to allow the new elevated I-395 to slope down toward Howard Street. A new portal for trains was constructed south of Lee Street (Lee 2004, 186). Ramps for Martin Luther King Jr. Boulevard were constructed on the southern edge of the property. By this time, the Power House, at the northeast corner of the property on the east side of Howard Street, had been demolished (NETROnline). The building had been vacant since 1971 and was damaged by fire (Miller and Levy 1976, 7.0). The area bordered by Sharp, West Camden, and Eutaw Streets and Martin Luther King Jr. Boulevard was incorporated into the Camden Station Area Renewal Plan in 1983 with the goals of preserving Camden Station and the B&O Warehouse, providing expanded commuter rail service, and generally guiding development in the area (CC-IHM 1983, 1-2).

Maryland Historical Trust
Maryland Inventory of
Historic Properties Form

Inventory No. B-79

Howard Street Tunnel
Continuation Sheet

Number 8 Page 11

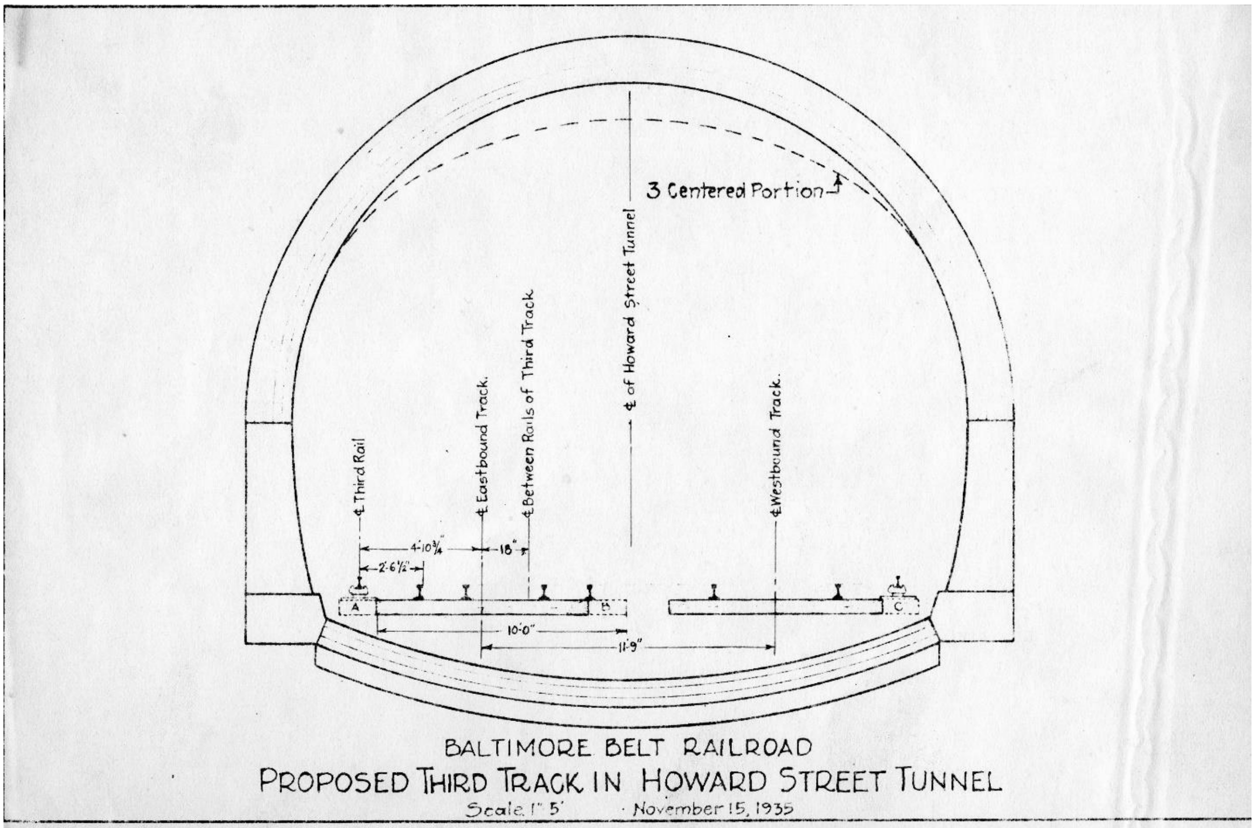

Figure 9: Diagram showing the proposed gauntlet in the Howard Street Tunnel, 1935.
Image Credit: B&O Railroad Museum

In 1984, CSX Transportation 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 within the tunnel to provide a higher 19-foot, 3-inch clearance to accommodate multi-level automobile carriers. The tracks in the early-1890s section of the Howard Street Tunnel were lowered using a switch panelizer machine that removed the tracks, which allowed old ballast to be removed and new ballast laid down, before laying the tracks back in place. The 1982 southern extension of the tunnel had already been built with the required clearance height (*The Sentinel* 1984, 7). Also in 1984, the Maryland Department of Transportation (MDOT) merged several subsidized, but privately owned, commuter rail lines under the Maryland Area Regional Commuter (MARC) brand. One of those commuter routes was the Camden Line operated by CSX Transportation on the former B&O Railroad tracks between Camden Station in Baltimore and Union Station in Washington, DC. The northern terminus for the route was south of Camden Station (Rowlands 2020).

In 1989, the Maryland Stadium Authority gained title to Camden Station and the B&O warehouse (MSA BCLR 2013/180), and in the early 1990s, the larger area near Camden Station was redeveloped. Oriole Park at Camden Yards was constructed west of the property, and the B&O Railroad's former Camden Station and Warehouse were incorporated into the facility. The MDOT Maryland Transit Administration (MTA) constructed a new light rail system through the property, necessitating an extension of the tunnel's southern end by 50 feet, to allow for the crossing of the light-rail tracks over the Belt Line's tracks (Lee 2004, 186). The southern end of the tunnel now exits through a square, poured-concrete portal and carries CSX beneath the light rail (Manning 2015, 4). A small station building and platform serving both the light rail and MARC trains were constructed on the site, south of Camden Station and east of the warehouse (NETROnline).

More changes came to the Howard Street Tunnel and Power House property at the turn of the twenty-first century. Between 1994 and 2002, an expansion of the Baltimore Convention Center was constructed on the northeast corner of the property on land that the City of Baltimore acquired from CSX Transportation in 1985 (MSA BCLR 443/504). Telecommunication companies negotiated with CSX Transportation to bury their fiber-optic cables along the right-of-way inside the Howard Street Tunnel (Lee 2004, 188). The cables were severely damaged in 2001, causing major service disruptions, when a 60-car train derailed inside the tunnel and the cars carrying hazardous materials ignited. Temperatures inside the tunnel reached 1,500 degrees Fahrenheit and smoke filled the tunnel for hours. Despite the high temperatures, the tunnel sustained minimal damage (Lee 2004, 188-189). After the fire, corrugated-steel cladding was added to the interior of the tunnel in the damaged section and the fiber optic cables were removed.

As of 2022, alterations to the tunnel are proposed as part of a project to allow double stacking of freight trains along CSX Transportation’s route between Baltimore and Philadelphia.

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9. Major Bibliographical References

Inventory No. B-79

See Section 8.

10. Geographical Data

Acreage of surveyed property	49.44		
Acreage of historical setting	49.44		
Quadrangle name	Baltimore East	Quadrangle scale:	1:12,000

Verbal boundary description and justification

The boundary consists of the property as surveyed in 1972, which consists of the entirety of the B&O Railroad's former Camden Yards property, which is roughly bounded by West Camden Street to the north, South Sharp Street to the east, West Hamburg Street to the South, and South Eutaw Street to the west.

11. Form Prepared by

name/title	Meghan P. White and Nicole A. Diehlmann		
organization	RK&K, LLP	date	03/22/22
street & number	12600 Fair Lakes Circle, Suite 300	telephone	703-259-3739
city or town	Faifax	state	VA

Historic Image 1: Train exiting the Howard Street Tunnel north portal prior to completion of Mount Royal Station, ca. 1895.
Photo Credit: The Maryland Center for History and Culture, Item MC4171.5.

Historic Image 2: Mount Royal Station, looking southeast toward the north portal of the Howard Street Tunnel, late nineteenth century. Photo credit: B&O Railroad Museum.

Historic Image 3: Men inside the Howard Street Tunnel, ca. 1895.
Photo Credit: Courtesy of the Maryland Center for History and Culture, Item MC4171.12.

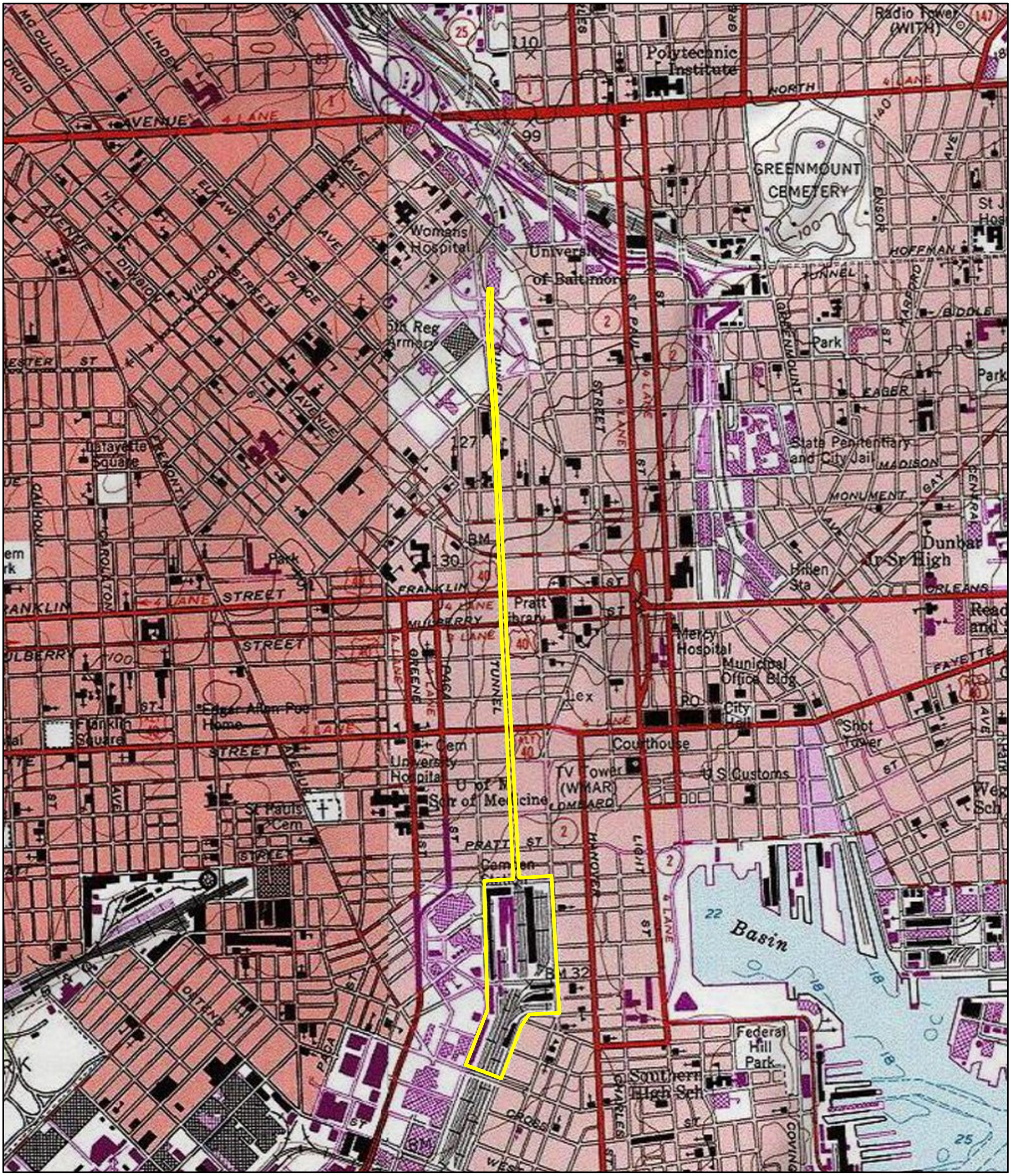
Historic Image 4: Spectators watch as an electric locomotive pulls a steam locomotive and railcars at south portal of the Howard Street Tunnel, ca. 1895. Photo Credit: The Maryland Center for History and Culture, Item MC4171.1.

Historic Image 5: The former south portal at Camden Station, which was enclosed for the construction of I-395, 1971.
Photo Credit: Historic American Engineering Record, Library of Congress.

Historic Image 6: B&O Railroad Power House and rail yard, ca. 1895.
Photo Credit: The Maryland Center for History and Culture, Item MC4171.2.

Historic Image 7: Interior of the B&O Power House, ca. 1895.
Photo Credit: The Maryland Center for History and Culture, Item MC4171.9.

Location: Beneath Howard Street between Mount Royal and Camden Stations Baltimore City



Howard Street Tunnel and Power House

USGS 7.5' Quadrangle
Baltimore East

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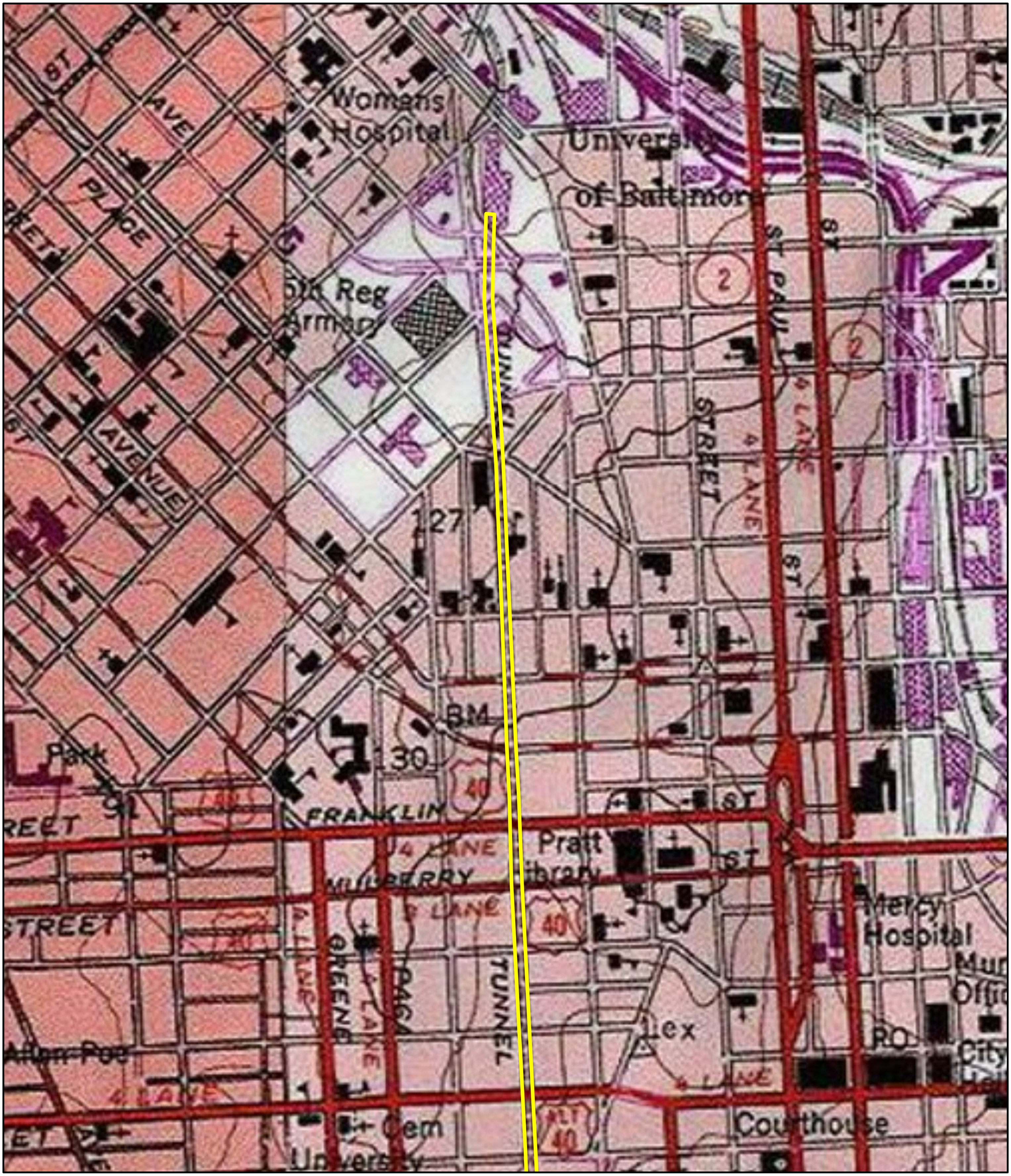
Location: Beneath Howard Street between Mount Royal and Camden Stations — Baltimore City



Howard Street Tunnel and Power House

USGS 7.5' Quadrangle
Baltimore East

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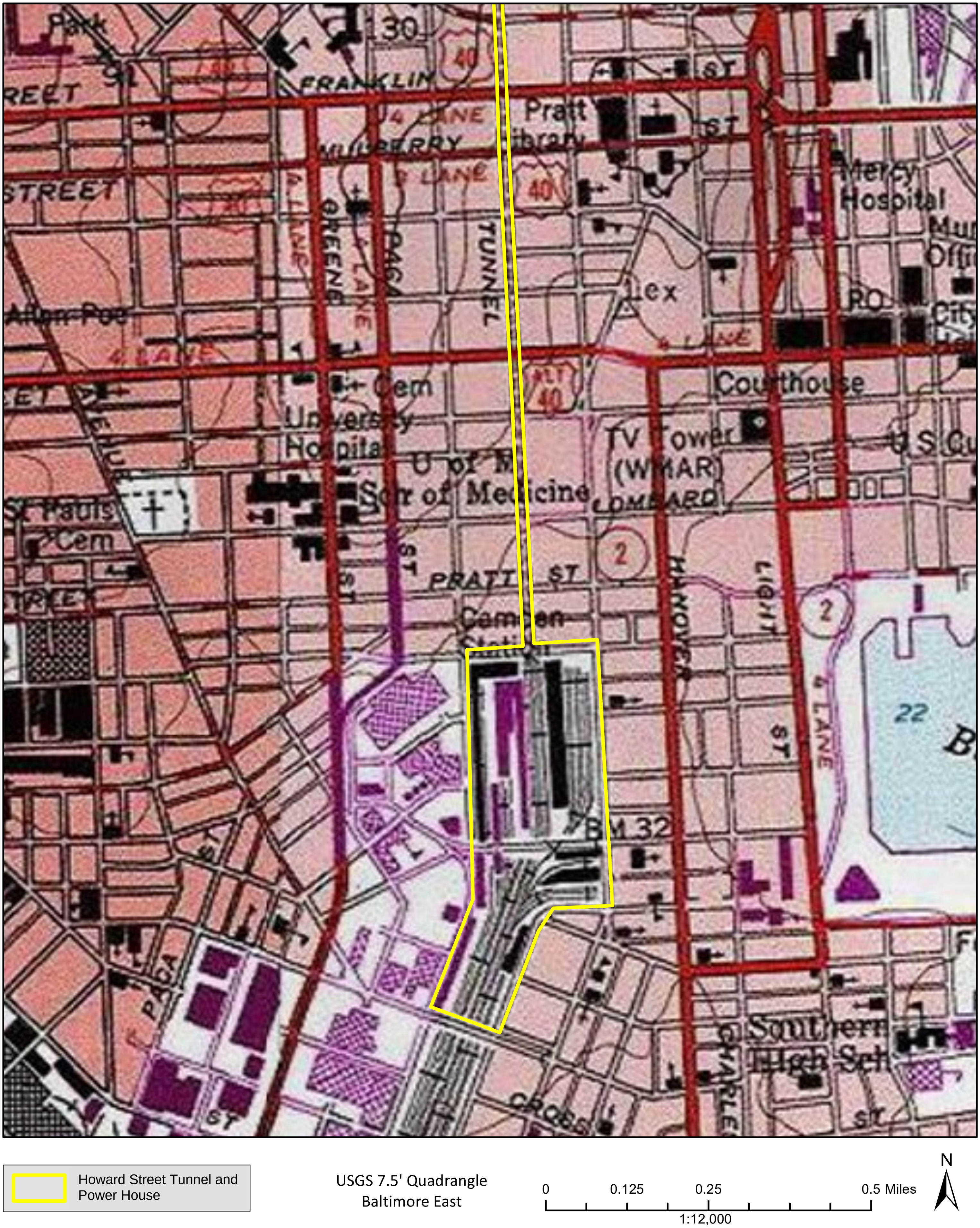
Howard Street Tunnel and Power House

Location: Beneath Howard Street between Mount Royal and Camden Stations

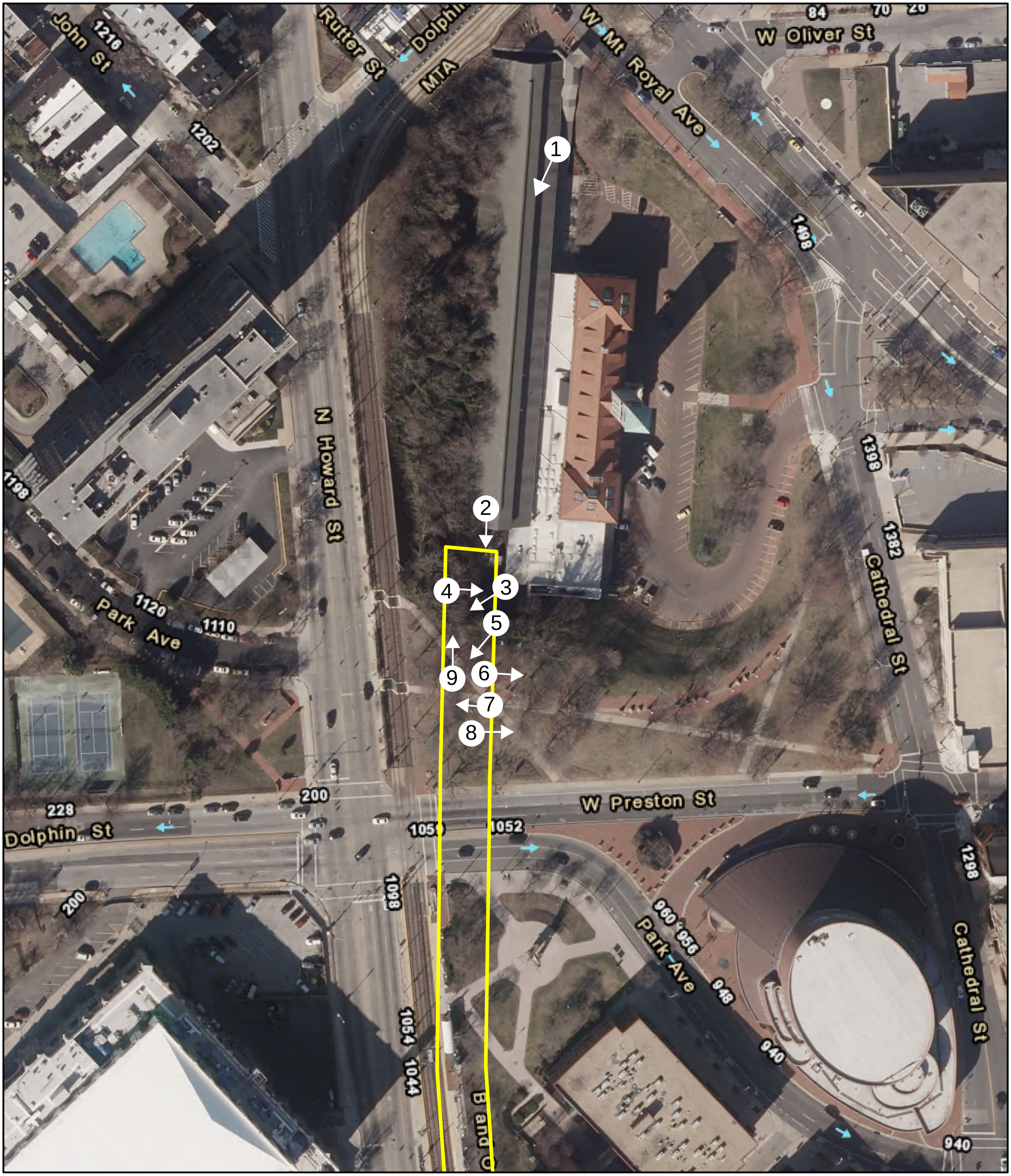
Baltimore City



Howard Street Tunnel and Power House

Location: Beneath Howard Street between Mount Royal and Camden Stations

Baltimore City



Howard Street Tunnel and Power House

1 Photo Location

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Howard Street Tunnel and Power House

Location: Beneath Howard Street between Mount Royal and Camden Stations

Baltimore City

Howard Street Tunnel and Power House

1 Photo Location

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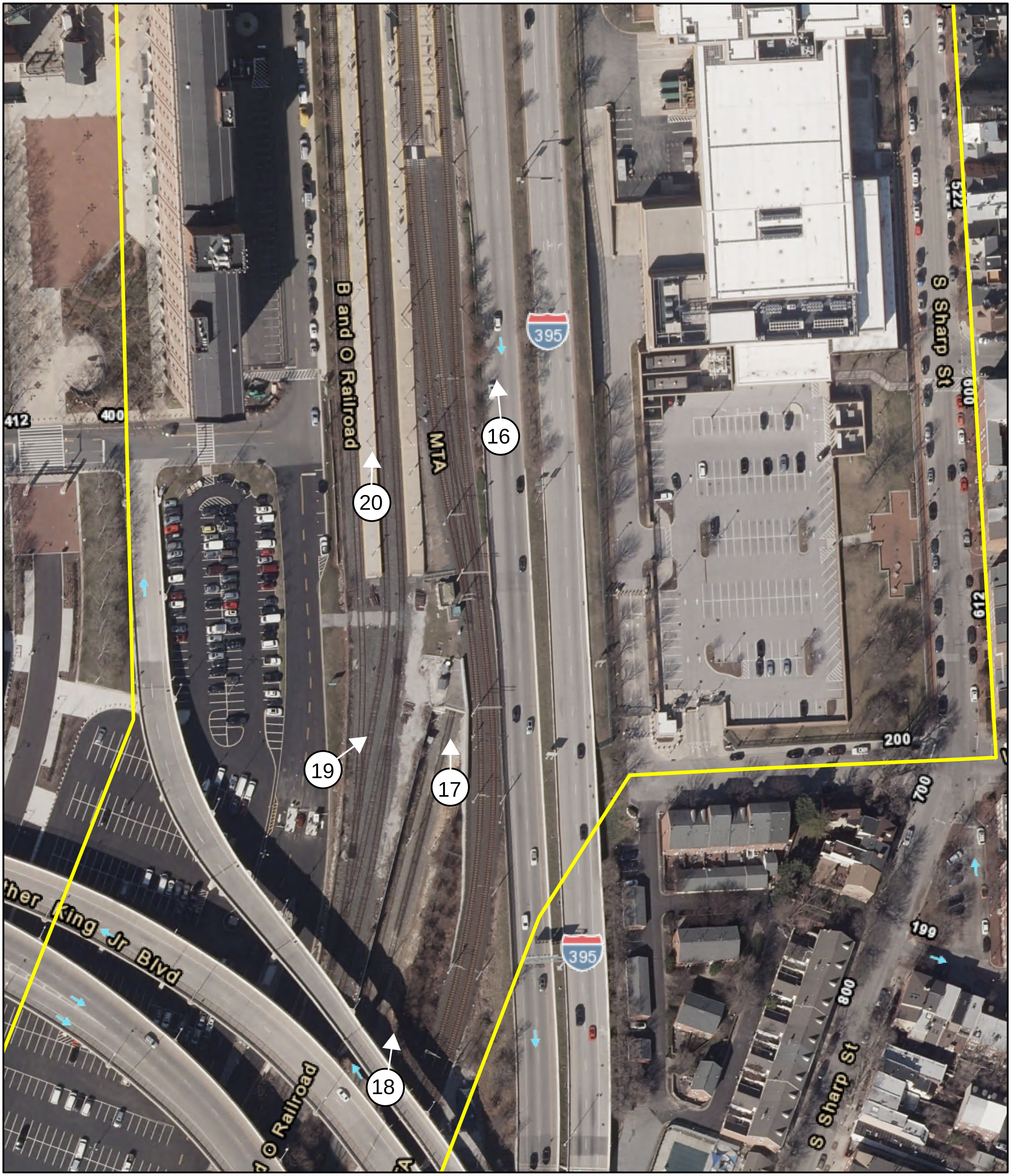
Howard Street Tunnel and Power House

Location: Beneath Howard Street between Mount Royal and Camden Stations

Baltimore City



Howard Street Tunnel and Power House

1 Photo Location

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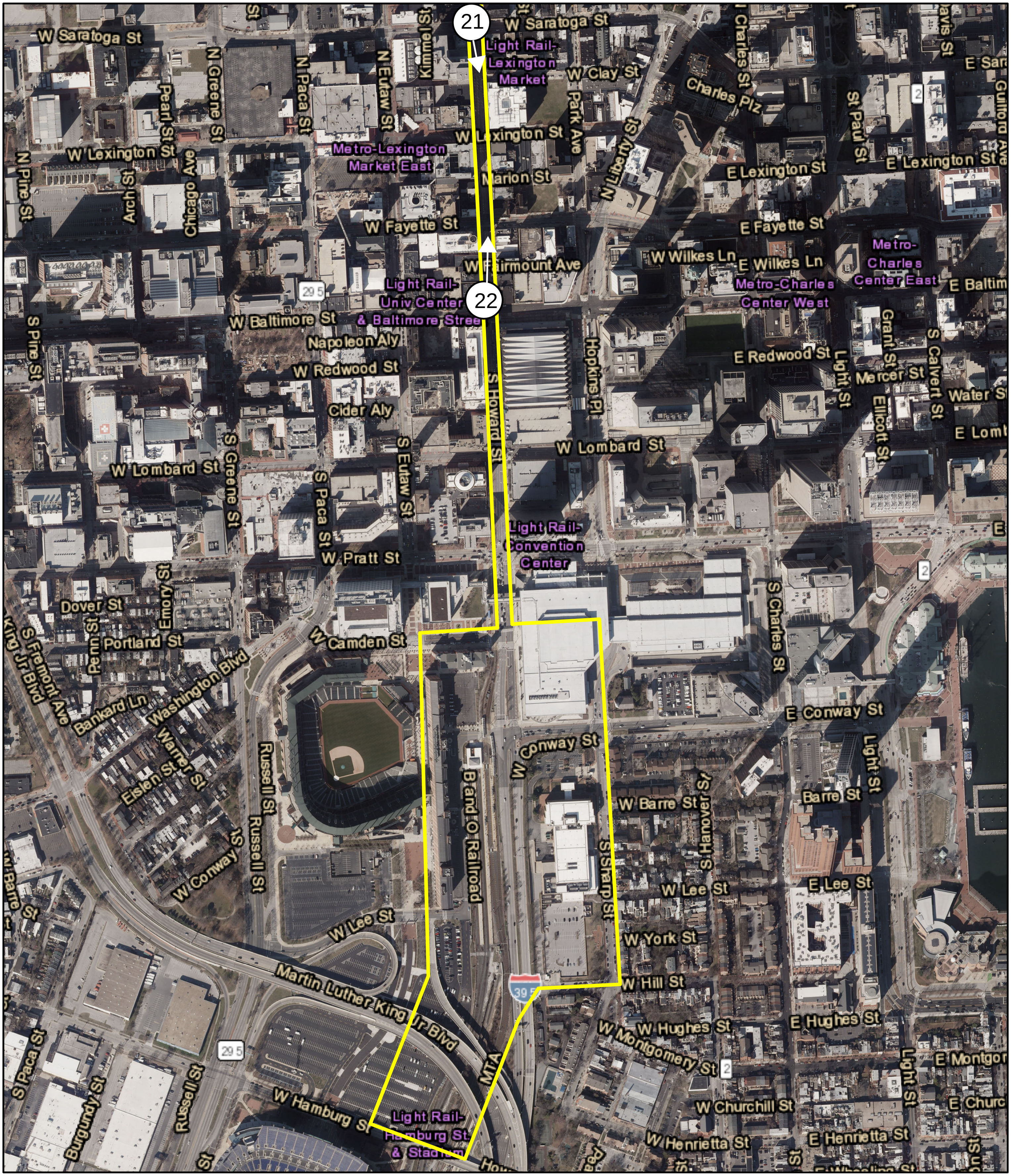
Howard Street Tunnel and Power House

Location: Beneath Howard Street between Mount Royal and Camden Stations

Baltimore City



Howard Street Tunnel and Power House	① Photo Location	0 0.075 0.15 0.3 Miles 1:9,000	N

Name of Property: Howard Street Tunnel and Power House
Location: Beneath Howard Street between Mount Royal and Camden Stations, Baltimore, MD

Photo 1: Inside the trainshed at Mount Royal Station, looking southwest at the north portal

Photo 2: North portal, looking south

Name of Property: Howard Street Tunnel and Power House
Location: Beneath Howard Street between Mount Royal and Camden Stations, Baltimore, MD

Photo 3: North portal and abutment, looking southwest

Photo 4: North portal abutment, looking east

Photo 5: Tunnel interior, looking southwest from the north portal to the northern cut-and-cover section

Photo 6: Typical side wall view, looking east near Mount Royal Station

Name of Property: Howard Street Tunnel and Power House
Location: Beneath Howard Street between Mount Royal and Camden Stations, Baltimore, MD

Photo 7: Typical pedestrian safety alcove, looking west near Mount Royal Station

Photo 8: Typical original wood block for holding electrical wires and lighting, looking east near Mount Royal Station

Photo 9: View from tunnel, looking north to trainshed at Mount Royal Station

Photo 10: View within tunnel, looking north from northern end of the southern cut-and-cover section towards the bored section

Photo 11: View within tunnel, detail of recessed platform near West Lombard Street, looking southeast

Photo 12: View within tunnel north of the recessed platform, detail of invert, looking east

Name of Property: Howard Street Tunnel and Power House
Location: Beneath Howard Street between Mount Royal and Camden Stations, Baltimore, MD

Photo 13: View within tunnel, looking north from the original south portal to the southern cut-and-cover section

Photo 14: View within tunnel, looking north at the junction of the 1895 south portal and the boxed concrete section

Name of Property: Howard Street Tunnel and Power House
Location: Beneath Howard Street between Mount Royal and Camden Stations, Baltimore, MD

Photo 15: View within tunnel, looking south from the 1895 south portal to the boxed concrete section

Photo 16: View within tunnel, looking north from the 1982 boxed concrete section

Name of Property: Howard Street Tunnel and Power House
Location: Beneath Howard Street between Mount Royal and Camden Stations, Baltimore, MD

Photo 17: South portal, looking north

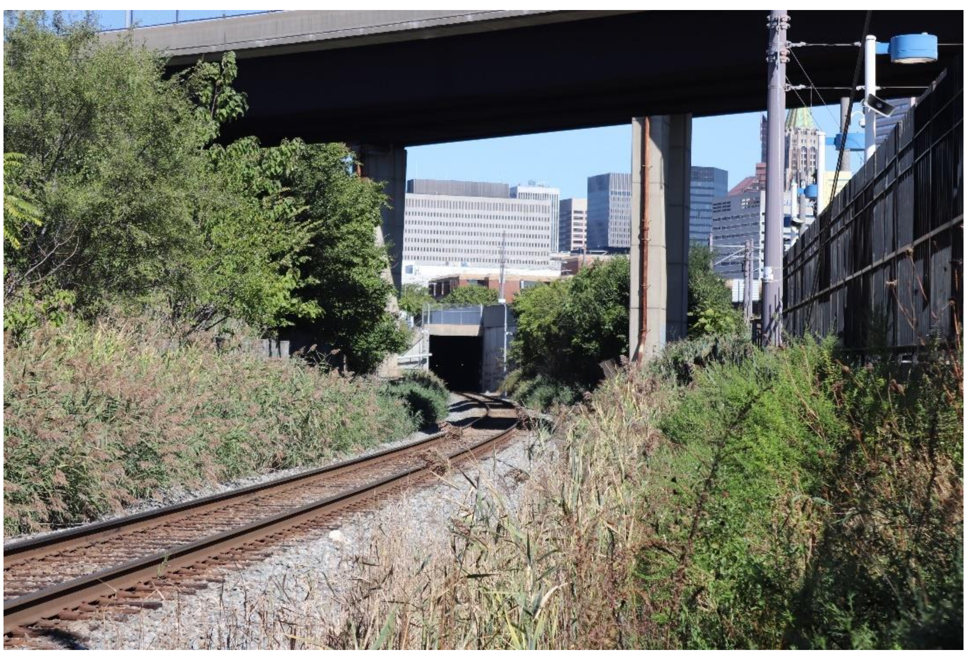


Photo 18: South portal, looking north from beneath Martin Luther King Jr. Boulevard

Photo 19: South portal, looking northeast from parking lot north of Martin Luther King Jr. Boulevard

Photo 20: B&O Railroad warehouse and Camden Station, looking north to Howard Street; former B&O Railroad siding now used by MARC seen at left, MDOT MTA light rail tracks at right, with the Howard Street Tunnel below ground

Photo 21: Howard Street with the Howard Street Tunnel below ground, looking south at West Saratoga Street

Photo 22: Howard Street with the Howard Street Tunnel below ground, looking north at West Baltimore Street

Name of Property: Howard Street Tunnel and Power House
Location: Beneath Howard Street between Mount Royal and Camden Stations, Baltimore, MD

Photo Log

Name of Property: Howard Street Tunnel
Name of Photographer: Nicole A. Diehlmann
Date of Photograph: May 2020, September 2021, And November 2021
Location of Original Digital File: MD SHPO

Photographs inserted on continuation sheets.

Photo 1 of 22:
Inside the trainshed at Mount Royal Station, looking southwest at the north portal
B-0079_2021-09-27_001.tif

Photo 2 of 22:
North portal, looking south
B-0079_2021-09-27_002.tif

Photo 3 of 22:
North portal and abutment, looking southwest
B-0079_2021-09-27_003.tif

Photo 4 of 22:
North portal abutment, looking east
B-0079_2021-09-27_004.tif

Photo 5 of 22:
Tunnel interior, looking southwest from the north portal to the northern cut-and-cover section
B-0079_2021-09-27_005.tif

Photo 6 of 22:
Typical side wall view, looking east near Mount Royal Station
B-0079_2021-09-27_006.tif

Photo 7 of 22:
Typical pedestrian safety alcove, looking west near Mount Royal Station
B-0079_2021-09-27_007.tif

Photo 8 of 22:
Typical original wood block for holding electrical wires and lighting, looking east near Mount Royal Station
B-0079_2021-09-27_008.tif

Photo 9 of 22:
View from tunnel, looking north to trainshed at Mount Royal Station
B-0079_2021-09-27_009.tif
Photo 10 of 22:

View within tunnel, looking north from northern end of the southern cut-and-cover section towards the bored section
B-0079_2021-11-16_010.tif

Photo 11 of 22:
View within tunnel, detail of recessed platform near West Lombard Street, looking southeast
B-0079_2021-11-16_011.tif

Photo 12 of 22:
View within tunnel north of the recessed platform, detail of invert, looking east
B-0079_2021-11-16_012.tif

Photo 13 of 22:
View within tunnel, looking north from the original south portal to the southern cut-and-cover section
B-0079_2021-11-16_013.tif

Photo 14 of 22:
View within tunnel, looking north at the junction of the 1895 south portal and the boxed concrete section
B-0079_2021-11-16_014.tif

Photo 15 of 22:
View within tunnel, looking south from the 1895 portal to the boxed concrete section
B-0079_2021-11-16_015.tif

Photo 16 of 22:
View within tunnel, looking north from the 1982 boxed concrete section
B-0079_2021-11-16_016.tif

Photo 17 of 22:
South portal, looking north
B-0079_2021-11-16_017.tif

Photo 18 of 22:
South portal, looking north from beneath Martin Luther King Jr. Boulevard
B-0079_2021-09-27_018.tif

Photo 19 of 22:
South portal, looking northeast from parking lot north of Martin Luther King Jr. Boulevard
B-0079_2021-09-27_019.tif

Name of Property: Howard Street Tunnel and Power House
Location: Beneath Howard Street between Mount Royal and Camden Stations, Baltimore, MD

Photo 20 of 22:
B&O Railroad warehouse and Camden Station, looking north to Howard Street; former B&O Railroad siding now used by MARC seen at left, MDOT MTA light rail tracks at right, with the Howard Street Tunnel below ground
B-0079_2021-09-27_020.tif

Photo 21 of 22:
Howard Street with the Howard Street Tunnel below ground, looking south at West Saratoga Street
B-0079_2020-05-21_021.tif

Photo 22 of 22:
Howard Street with the Howard Street Tunnel below ground, looking north at West Baltimore Street
B-0079_2020-05-21_022.tif