WESTERN MARYLAND RAILWAY, CUMBERLAND EXTENSION
Chesapeake & Ohio Canal National Historical Park
Pearre (milepost 125) to North Branch (milepost 160)
Pearre
Washington County
Maryland

HAER MD-175
MD-175

PHOTOGRAPHS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

ADDENDUM TO:
WESTERN MARYLAND RAILWAY, CUMBERLAND EXTENSION
Chesapeake & Ohio Canal National Historical Park
Pearre to North Branch, from WM milepost 125 to 160
Pearre
Washington County
Maryland

HAER MD-175
HAER MD-175

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
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1849 C Street NW
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HISTORIC AMERICAN ENGINEERING RECORD

WESTERN MARYLAND RAILWAY, CUMBERLAND EXTENSION

HAER NO. MD-175

Location: From Pearre, Washington County, Maryland to North Branch, Allegany County, Maryland, from Western Maryland milepost 125 to 160. The line paralleled the Potomac River, with three entries into Morgan County, West Virginia, in the vicinity of Paw Paw.

The Western Maryland Railway, Cumberland Extension is located at latitude 39.543991, longitude -78.459126. The coordinate represents pier 5 of Bridge No. 1416, the Sixth Potomac Crossing, located adjacent to MD-51, on the east side of the highway. The coordinate was obtained in 2003 using a GPS mapping grade unit accurate to +/- 3 meters after differential correction. The coordinate's datum is North American Datum 1983.

Dates of Construction: 1904-06; subsequent additions

Present Owner: Chesapeake & Ohio Canal National Historical Park, National Park Service, U.S. Department of the Interior

Present Use: Abandoned railroad grade

Significance: The westward expansion of the Western Maryland Railway, beginning with the Cumberland Extension, was one of the last new mainlines constructed during the U.S. railroads' period of extensive growth between the Civil War and World War I, and it represents the height of railroad civil engineering at the beginning of the twentieth century. By employing modern materials and steam-powered construction equipment, engineers were able to design and build a railroad that included six major bridges, three tunnels, and extensive earthworks in this section alone to achieve low grades through rugged terrain along the upper Potomac River. While high construction and maintenance costs coupled with changes in the transportation industry ultimately led to the railroad's abandonment, the surviving roadbed and structures continue to bear witness to the sophistication of the era's engineering and construction capabilities, as well as the bold visions of those who underwrote such projects.

Historian: David A. Vago, with J. Lawrence Lee, Christopher H. Marston, and Justine Christianson, 2010

Project Information: The Historic American Engineering Record (HAER) is a long-range program that documents and interprets historically significant engineering sites and structures throughout the United States. HAER is part of Heritage Documentation Programs (Richard O'Connor, Manager), a division of the National Park Service, U.S. Department of the Interior. The Western Maryland Railway Recording Project was undertaken for the Chesapeake & Ohio Canal National Historical Park (CHOH, Kevin Brandt, Superintendent). Sam Tamburro, CHOH Cultural Resource Program Manager, oversaw the project, and William Spinrad, CHOH Lands Officer, provided assistance in the field. Christopher H. Marston, HAER Architect, served as the project leader, with assistance from J. Lawrence Lee, HAER Engineer-Historian, and Justine Christianson, HAER Historian. The 2009 HAER field team consisted of Steven Utz, field supervisor, Ashley Cramer and Abigail Rosen, architects, and David A. Vago, historian. Additional fieldwork and drawings were completed in 2010 by Jeremy T. Mauro and Anne E. Kidd, HAER contract architects, and Pavel Gorokhov, Yan Konan, and Giancarlo Pinedo, Montgomery College interns. Jet Lowe, HAER Photographer, produced the large format photographs.

Introduction

The Western Maryland Railway's Cumberland Extension of 1904 to 1906 represented a work of civil engineering of unprecedented magnitude in its use of cutting-edge technology. For this reason alone, it was noteworthy, even though only a short time elapsed before it was bested by other works. The Cumberland Extension was an extraordinarily expensive undertaking and, ultimately, a minimally effective one. It traversed some of the least-populated country in the Potomac Valley, which meant it had to aggressively recruit traffic from elsewhere. Because it cost so much and had to work so hard to pay for itself, the Cumberland Extension and the subsequent Connellsville Extension kept the Western Maryland Railway (WM) within fair sight of financial ruin for most of its existence. Most of the profits were re-invested in maintaining the physical plant or repaying construction debt, which meant that many of its stockholders did not earn dividends.

Nevertheless, the Cumberland Extension operated for seven decades, and during the 1940s and 1950s, the WM earned its reputation of being an effective, well-run organization. Its well-maintained equipment and physical plant made it the Mid-Atlantic region's railroading showpiece, while good on-time performance and well-marketed services made it a favorite with customers. This conservative, polished appearance belied the financial difficulties that plagued the company. The high construction costs resulting from its period of great expansion in the 1900s and the perpetual maintenance costs associated with the railroad's bridges, tunnels, and earthworks combined to prevent it from achieving financial success.[1]

Background

Despite the high costs associated with its construction, the Western Maryland Railway was a modern railroad at the forefront of early-twentieth-century civil engineering technology. The road's infrastructure was well ahead of its older, neighboring competitors, like the Baltimore and Ohio Railroad (B&O) and the Pennsylvania Railroad (PRR), who later invested considerable funds to realign and modernize their routes. Three major factors explain the difference in construction between earlier railroads like the B&O and later ones like the Western Maryland.

The first difference was the level of political will and economic capital poured into the line. The circumstances under which this happened were unique to the Western Maryland and a small group of railroads across the continent that had been assembled through the last decades of the nineteenth century by railroad financier and mogul Jay Gould. The Wabash, Missouri Pacific, Denver and Rio Grande Western, and Western Pacific railroads formed the core of Jay Gould's railroad holdings when his son, George, inherited them in 1892.[2] During the ensuing

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[1] See William Price, *Western Maryland Steam Album* (Potomac Chapter, National Railway Historical Society, 1985), and David P. Morgan, "Western Maryland," *Trains Magazine* (March 1954), p. 50.

[2] Information on the Goulds and the Fuller Syndicate comes from the following sources: George M. Leilich, "The Western Maryland: A Corporate History," *Railroad History* no. 155 (Autumn 1986), pp. 72-77; Julius Grodinsky, *Jay Gould: His Business Career 1867-1892* (Philadelphia: University of Pennsylvania Press, 1957); George H.

decade, George Gould gradually worked out a plan to build a coast-to-coast railroad, developing an idea first conceptualized by his father. George Gould acquired the WM at the dawn of the twentieth century as his link to the East Coast. Thus, as a part of what would have been the nation's first and only true transcontinental railroad line, the Western Maryland became the focus of an unprecedented capital expenditure program.[3] Without Gould's interest, the railroad could well have remained a relatively obscure agricultural road, possibly done in by the Great Depression or by truck competition in the 1950s like its neighboring line, the Maryland and Pennsylvania Railroad. As it stood, however, its role as a link in a planned transcontinental route made the Western Maryland exceptional. Though the scheme eventually fell apart, it had direct bearing on the other two points, rapid improvements in technology and improvements in the organization of capital. Both of these were trends in the national milieu that were influencing other railroads, but by virtue of the fact that substantial portions of the line were built new after these trends were well established, they distinguished the Western Maryland of the early twentieth century.

Like the unique ambitions that drove its expansion, technology was the second difference between the WM and its antecedents. Engineers laid the B&O along the Potomac River in the 1840s. At that time, the first innovations and inventions that led to the development of heavy construction equipment were still, at best, in their earliest formative stages. Large workforces using mostly hand tools to sculpt the earth were primarily responsible for constructing railroads. The Potomac River's flood plain provided the easiest grade to follow, as compared to the surrounding, hilly countryside, and consequently required the least amount of earthwork. To build a straighter route would have required many more cuts, fills, and tunnels, along with the toil of many additional laborers working by hand to remove debris loosened by black powder charges. The level of engineering and technology of the era's forged-iron, cut-stone, and hewn-timber construction methods could not economically support such construction.

Six decades later, technology had advanced considerably. By the first decade of the twentieth century, the Western Maryland's engineers had dynamite, steam shovels, cranes, and other heavy equipment at their disposal to help remove geologic obstacles. They also benefitted from improvements in steel, timber, and concrete, often steel-reinforced, to aid in constructing bridges, tunnels, and culverts. It was thus far easier to build in the hills above the flood plain. Since the Gould Empire was willing to invest considerable capital in making the Western Maryland a viable link in its transcontinental scheme, its engineers could employ much of the current technology to their advantage.

The third point of difference between earlier railroads and later ones like the Western Maryland was the organization of capital and the corporate culture under which capital improvements took place. Industrial capitalism was in its fledgling years during the B&O's construction, and consequently it was "a work of local investors, trial-and-error engineering, and

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Burgess and Miles C. Kennedy, *Centennial History of the Pennsylvania Railroad Company: 1846-1946* (Philadelphia: The Pennsylvania Railroad Company, 1949), pp. 513-516.

[3] Adam Thomas, *In Terrain of Empire: Railroads Between Cumberland and Pittsburgh* (Denver: Self-Published, December 2004), pp. 32-37.

limited system-building."[4] On the other hand, the Western Maryland, as part of Gould's envisioned transcontinental system, was a product of comprehensive and deliberate planning. In building the state-of-the-art Cumberland and Connellsville extensions, Gould extended the railroad west from Big Pool, Maryland, to Connellsville, Pennsylvania, 50 miles south of Pittsburgh. Gould's Wabash Pittsburgh Terminal Railway had reached Pittsburgh from the west, and he planned to build a new line between Pittsburgh and Connellsville as the final link in his system. These came at the tail end of a whole series of consolidations in nearly every industry, which represented a maturing of industrial capitalism that resulted in planned infrastructure being the most widely accepted way of doing business, expected of nearly anyone who wished to be taken seriously by investors. Gould realized at the outset that his transcontinental system would require a massive investment, but he fully expected that the resulting efficiency and marketing advantages would generate a tremendous increase in traffic, lower costs, and long-term profits.

The Western Maryland Railway developed at a time when investors were just opening one of the United States' last frontiers in industrial development. Many scholars assert today that the Appalachian region remained a frontier much later than places that were settled to the far west owing to the ruggedness of its terrain.[5] This certainly held true in vast swaths of western Pennsylvania, western Maryland, and West Virginia, where road and rail transportation alike did not arrive until financiers and engineers could find the means and the motive to break through the mountains' geologic obstacles.

Coal and timber were Appalachia's most lucrative resources, but they were hard to reach. In the 1870s and 1880s, when railroads were already established through remote parts of the Rockies and the Sierra Nevada as part of the search for gold, silver, copper, and lead, the low but steep, rocky, and serpentine Appalachians still presented a formidable barrier, and consequently their resources remained largely untapped. Agricultural settlers, mostly yeomen, sought the easiest routes across the mountains, usually choosing to settle on the flatter, richer soil west of the Ohio River. Early railroads across the mountains like the B&O followed suit, their builders seeking the easiest route through the mountains, not into them. Accordingly, engineers selected routes along river flood plains, crossing the mountains at the easiest natural passes and bypassing the higher elevations. Financiers and engineers built railroads with the purpose of gaining access to natural resources in the mountains only when it was convenient or necessary for the westward journey. It took strong financial backing to build railroads that could access the more remote parts of the mountain region's rugged interior.[6]

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[4] Thomas, *In Terrain of Empire*, p. 5.

[5] John Alexander Williams, *Appalachia: A History* (Chapel Hill: University of North Carolina Press, 2001), Chapter 1.

[6] Several works describe how the railroad network evolved in the Appalachian region between the early nineteenth and early twentieth centuries, along with the social and economic forces behind that evolution. See, for example, Albert Perry Brigham, *From Trail to Railway: Through the Appalachians* (Boston: Ginn & Company 1907); Williams, *Appalachia: A History*, chapters 4 and 5; Ronald D. Eller, *Miners, Millhands, and Mountaineers: Industrialization of the Appalachian South, 1880–1930* (Knoxville: University of Tennessee Press, 1982); and Ronald L. Lewis, *Transforming the Appalachian Countryside* (Chapel Hill: University of North Carolina Press, 1998).

Three separate lines emerged in some of the more rugged parts of Appalachia after 1900. All were at the forefront of railroad construction technology and earned a substantial portion of their operating revenue as bituminous coal haulers. Most significantly for this study, construction on the Virginian Railway; the Carolina, Clinchfield and Ohio Railroad (Clinchfield); and the Western Maryland Railway produced railroads that made extensive use of large-scale earthwork, bridges, and other state-of-the-art infrastructure, and that terminated in, rather than beyond, the Appalachian region, connecting it to Tidewater ports for distribution of coal. This was not Gould's initial interest in the WM; in fact, coal was an afterthought. Just the opposite was true for the Virginian and the Clinchfield, though the latter also served as a bridge line between the Chesapeake and Ohio Railway (C&O) and several southern lines.

Of these three modern Appalachian railroads, the Western Maryland's endpoints were the most populous, and it enjoyed the most through traffic. However, it is also the only one whose main route does not remain largely intact and in service today. What accounts for the discrepancy, and the apparently-backward turn of events, is that it was beset by financial problems from the beginning owing to the cost of its construction. For the most part, it was the most redundant of the three. The Virginian and the Clinchfield remained far enough away from competing lines that they captured complete markets and remained vital, even to the larger, surrounding systems that eventually absorbed them. They also had the backing of the corporate interests behind some of the country's best coal mines that yielded large volumes of high-quality coal. With solid financial backing, they were built specifically to serve these mines, and they were built very well. The Virginian tapped excellent southern West Virginia coal seams that its nearest rival, the Norfolk & Western (N&W), did not and thus thrived on something of a niche market. After the N&W merged with the Virginian in 1959, the Virginian's well-engineered, low-grade line became the N&W's preferred route for all of its heavy eastbound trains. Although initially envisioned as a mine-to-port carrier, the Clinchfield was the only one of the three that did not extend to the Atlantic coast. On the other hand, its C&O connection at Elkhorn City, Kentucky, along with its southern connections with the Atlantic Coast Line (ACL), Seaboard Air Line (SAL) and Southern (SOU) railways provided several routes to the Midwest, Mid-Atlantic, and Southeast regions. As a direct north-south route through the mountains, the Clinchfield supplemented its coal business with extensive Midwest-Florida traffic in both directions. Unfortunately, the WM had no similar distinction after Gould's transcontinental scheme collapsed.[7]

Despite its roots as a coal-carrying connector between the Chesapeake and Ohio Canal (C&O Canal) and the city of Baltimore, the WM was originally planned as part of a vast transcontinental scheme. Although the acquisition of coal lines in West Virginia was secondary to its main purpose, coal ended up being one of the WM's primary revenue generators. WM, like the other two railroads mentioned above, served as a conduit for coal to Tidewater and the Ohio Valley. Most of the coal was a lower-quality coal from the Upper Monongahela drainage with considerably more market variability and more tenuous corporate backing. Without

[7] For a thorough history of the Virginian Railway, see H[arold] Reid, *The Virginian Railway* (Milwaukee, WI: Kalmbach Publishing, 1961). A good history of the Clinchfield with emphasis on its coal traffic is Robert A. Helm, *The Clinchfield Railroad in the Coalfields* (Forest, VA: TLC Publishing, 2004).

substantial through traffic, the location of the Western Maryland directly adjacent (within mere yards in some places) to the Baltimore and Ohio Railroad for almost its entire route made this railroad redundant as a regional carrier.

Transportation competition in the Potomac Valley had intensified more than a century before the WM's Cumberland Extension added another line to its already slim course. Higher mountains and the Eastern Continental Divide lay west of Cumberland, but a natural passage known as The Narrows just west of the Queen City provided an easy entry into the upper Potomac Valley, making it a preferred conduit for transportation routes of all kinds. By the start of the twentieth century, space in the valley was at a premium as various transportation companies vied for the best route along the narrow flood plain. Thus, the Western Maryland shared this valley not only with the Baltimore and Ohio, but also with a turnpike road and a canal. Behind each of these routes were the earliest movers and shakers in the District of Columbia, as well as business leaders and advocates for the city of Baltimore, each of whom sought to attract business for their ports.

Between the end of the American Revolution and the Civil War, transportation here and on other parts of the eastern seaboard saw steady technological advances with each passing decade. Politicians and business leaders argued that industrial growth and westward expansion were essential to the new nation's survival. Transportation and commerce became political as well as economic commodities. All along the Atlantic seaboard, each port eagerly sought to outdo its competing cities by developing an improved infrastructure to connect it to the country's interior.

George Washington himself advocated better transportation routes to the west, including routes in Virginia along the James River and from the lower Potomac basin and northern Virginia to the west. His vision called for canals and improved roads. Thus, in the Potomac Valley, a turnpike road to Cumberland came first, followed by the C&O Canal, and finally the B&O Railroad.[8]

Over a century of construction had passed prior to the 1904-1912 period when the Western Maryland's westward extensions were built, and space was consequently at a premium. The most level land along the river, including the flood plain and the gentler slopes immediately above, had already been claimed. The newcomer's engineers had no choice but to build higher up the valley's slopes. To compensate, they took the opportunity to use modern construction methods that, in the end, gave the railroad the easiest grades, but also the greatest financial problems.

The construction of numerous routes through the valley was the product of inter-city competition, one that ultimately led to the sale of the Western Maryland to interests who promised to turn it into a contending transportation artery. Starting with the turnpike road and then later helping to see the B&O through, Baltimore's elite class backed a series of successive transportation routes through the Potomac Valley to the west. All of them were meant to give

[8] A general survey history of the routes from the Atlantic coast across the mountains to the West, including through the Potomac Valley, is available in Brigham, *From Trail to Railway*.

their port an edge over Philadelphia and New York, Baltimore's larger, northern competitors. While its favorable access to the Chesapeake Bay ensured that Baltimore's leaders remained hopeful that they could somehow come out ahead, more formidable, better-funded transportation systems to the other two ports always kept Baltimore just behind the curve. First, good roads west from Philadelphia gave that city an edge. Baltimore responded in kind, extending its network of turnpikes west from the colonial-era hub of Joppa—first to Frederick, then to Hagerstown and Cumberland, connecting with the new National Road to Wheeling. The C&O Canal pushed through the Potomac Valley from Washington soon after, making the journey easier for bulk commodities but requiring transfer of goods to wagon for the trip into Baltimore. The Erie Canal's through route to Lake Erie gave New York City a formidable edge, and the city of Baltimore responded by constructing the Baltimore and Ohio Railroad—first to Wheeling, then Parkersburg, and much later to Pittsburgh.

The Pennsylvania Railroad soon bested the B&O. Crossing the Keystone State by way of a pass between the Juniata and Conemaugh River watersheds, it was Philadelphia's most successful answer to the Erie Canal. Previously, the Pennsylvania Main Line Canal operated a combination canal and railroad system that required transfers of boats onto, and off of, specialized railcars that carried them across the Allegheny Mountains on eleven separate sections of railroad at different elevations that were connected by twelve inclined planes. Dissatisfied with this cumbersome and uneconomical system, the state of Pennsylvania commissioned an all-railroad route across the state, constructed during the 1840s to link existing rail lines east of the Susquehanna Valley to the Ohio River at Pittsburgh. The resulting through connection between Philadelphia and the rapidly growing steel center of Pittsburgh proved to be very lucrative. For Baltimore, it meant that the B&O's only viable option was to serve the lower Monongahela Valley, so the B&O's line extended from Cumberland to Pittsburgh.[9] Although this did not bring Baltimore enough of an edge to take the lead, it undoubtedly saved it from obscurity. When the PRR eventually acquired controlling stock in the B&O, the cities' hierarchy during the Industrial Age was sealed.

By the turn of the twentieth century, Baltimore's leaders had one last hope for giving their port a competitive edge. Their plan was to extend the Western Maryland Railroad, at the

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[9] The B&O was a collaborative effort between Virginia and Maryland. Its planners headed due west from Cumberland, building to Wheeling first at the insistence of Virginia authorities who wanted to keep more southerly river ports available for any future, all-Virginia routes from Richmond, and then to Parkersburg after the railroad decided it was more convenient for interchanging with river traffic to Cincinnati and the West at that location. Ironically, this westward route from Cumberland—splitting at Grafton in what is now West Virginia to serve Parkersburg and Wheeling—was not the easiest route, because it had to cross several large divides and could not achieve a good, downhill valley to follow until it was almost within sight of the Ohio River. Turning northwest at Cumberland would have put it only a few miles from the Monongahela basin. As the Pittsburgh line eventually showed, it was a tough uphill climb for the first few miles, but a largely downstream, downhill trip beyond the continental divide. Politics prevented it from happening. At first interested in providing Pittsburgh as a possible western terminal for the B&O, the Pennsylvania Legislature instead decided to construct its own railroad west from Philadelphia, and in 1847 authorized the governor to issue a proclamation annulling any rights that would allow the B&O to enter Pennsylvania. Had the B&O connected to Pittsburgh first, it could have bested the competing port of Philadelphia nearly two decades in advance of the completion of the Pennsylvania Railroad. For more information, see John F. Stover, *History of the Baltimore and Ohio Railroad* (West Lafayette, IN: Purdue University Press, 1987), Chapter 5, and Burgess and Kennedy, *Centennial History of the Pennsylvania Railroad Company*, Chapter 1.

time a tiny agricultural line, to the west and turn it into a modern link in a transcontinental route. Today's Western Maryland roadbed between Hancock and Cumberland, although devoid of track, remains as a manifestation of efforts driven by that hope, which was never fully realized. As far as it was executed, though, the plan included two extensions: one to Cumberland, the other to Connellsville, Pennsylvania, just upriver and southeast of Pittsburgh.

Vying for space in the Potomac Valley and then crossing some of the most rugged terrain in the Alleghenies, the two extensions were, by necessity, rich in technology, substantial in form, and aggressive in construction. Like any such venture, they were also expensive, but they appeared to be a solution that could render the competition obsolete. With a private magnate, George Gould, ready to invest heavily into the project, Baltimore leaders thought they had little to lose and, quite possibly, a lot to gain with a modern, direct rail route to the West. Selling their interest in the tiny Western Maryland Rail Road to Gould, the city's leaders gave their approval to the plan.

The Cumberland Extension, shoehorned into the upper Potomac Valley by way of a series of substantial bridges, cuts, fills, and tunnels, illustrates what made the idea of extending the Western Maryland appealing to Baltimore's civic leaders. It also shows why it was such an expensive railroad, and thus such a fiscal failure. An Interstate Commerce Commission (I.C.C.) finance docket dated August 3, 1965—shortly after the first steps in the C&O-B&O merger were taken—notes that, "the B&O tracks between Cherry Run and Cumberland are adequate to handle the traffic of the WM and… the nine crossings of the Potomac River, the five tunnels and the many fills and cuts could be abandoned with substantial savings in maintenance."[10] However, the late date of this observation belies the fact that this was a costly and redundant railroad from the start.

Gould's grandiose scheme required a mammoth investment of capital in acquisitions of existing railroads and in major new construction on the Western Maryland, starting with the Cumberland Extension. The debt incurred turned out to be more than revenue could support, and the company defaulted on interest payments in 1908 and 1909. Sued by creditors, Gould lost the Western Maryland as well as the other roads intended to be part of his transcontinental system.

In the face of its adjacent, financially robust competition just across the river, the Western Maryland Railway struggled to maintain a healthy balance between revenues and expenses. The remaining physical plant as it exists today shows why the line's owners eventually chose to abandon it. An enterprising industrialist attempted to use cutting-edge technology to best his competitors and failed.

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[10] Interstate Commerce Commission, I.C.C. Engineering Field Notes, Valuation Survey, pp. 4-5, Box 34, Folder 11, Valuation Sections 1, 2, 3, 8, 9 & 10 (Washington Interstate Commerce Commission, 1919-1921), Record Group 34, National Archives and Records Administration-College Park, Maryland.

Current Conditions[11]

From 1912 to 1975, the Western Maryland Railway's main line extended from Baltimore to Connellsville, Pennsylvania, by way of Hagerstown, Hancock, and Cumberland, Maryland. Major secondary routes ran from Hagerstown to Shippensburg, Hanover, and York, Pennsylvania, and from Cumberland to Elkins, West Virginia. The Cumberland Extension was part of the main line, extending from Big Pool Junction, 18 miles west of Hagerstown, to Cumberland. Since 1980, the Chesapeake and Ohio Canal National Historical Park has owned the section of the Cumberland Extension from the eastern abutment of the Polly Pond Bridge, Western Maryland milepost 125.3 located just east of Pearre, Maryland, to North Branch, Maryland, milepost 159.9, for a total length of 34.9 miles. Structures and earthworks remaining along the route today include cuts and fills, bridges, tunnels, and the remains of shanties, cabins, and parts of the telegraph communication system. While this report focuses on the resources under NPS ownership, some related structures built for the Cumberland Extension will also be discussed.[12]

The Cumberland Extension today is largely overgrown and devoid of many of the obvious remnants of a railroad right-of-way, such as track and ballast. A well-graded roadbed, whether on fill, cut, or flat land, is the strongest evidence of what was once here. Telegraph line poles and the occasional rusted signpost reinforce the evidence, as do the line's substantial bridges, tunnels, and culverts. Visually, the lush vegetation challenges the idea that trains ever traversed the line, but this newer growth does tend to contrast with the surrounding woods, especially when viewed from the air. The species of plants growing on the roadbed are those that thrive in open light during the early stages of their growth, a further subtle reminder of the fact that a well-maintained railroad did once pass over the ground beneath them.

Major structures on the section of the Cumberland Extension that is today under National Park Service ownership include six multi-span bridges across the Potomac River, two major creek crossings, several concrete culverts, and three tunnels. While each structure on the line is unique, each structure type followed standard designs issued by the Western Maryland Engineering Department in Baltimore. Accordingly, there are a number of descriptive details that apply to several structures with only minor differences, and similar fabrication practices were employed for all of the steel or concrete structures. Unique details will be covered as the individual structures are discussed.

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[11] This description of the Cumberland Extension's current conditions is based on site visits and measurements by the field teams in 2009-10, as well as historic drawings, maps, and photographs, found mainly at the Western Maryland Railway Historical Society in Union Bridge, Maryland (hereafter cited as WMRHS). It is corroborated by information contained at The Western Maryland West Sub website, http://www.wmwestsub.com, last accessed on January 15, 2011.

[12] Property deed for Western Maryland Railway, Chesapeake & Ohio National Historical Park, Hagerstown, Maryland, signed Aug 2, 1980, on file Land Manager's Office, Headquarters, Chesapeake& Ohio National Historical Park, Hagerstown, Maryland (hereafter cited as CHOH).

In common with many railroads, the Western Maryland assigned unique numbers to items such as bridges, tunnels, and signals that also indicated their location along the railroad. On the Cumberland Extension, these were all four-digit numbers. Although they did not include a decimal point, the first three digits represented a milepost and the last digit indicated the nearest one-tenth of the mile beyond it (in the westward direction). For most structures, the number typically indicated its eastern end. For example, the east abutment of the 1,367'-long Bridge Number 1348 was located at milepost 134.8, or approximately 4,200' west of milepost 134. The major bridges and tunnels also had identifying names, such as "Second Potomac and C&O Canal Crossing."

The large concrete culverts are comprised of horseshoe arches, headwalls, portals, and wing walls that were poured in place using wooden forms erected on-site. Dirt and rock fill was added after the concrete had cured and the forms had been removed to build the sub-roadbed to the desired grade, thus filling the space between the concrete members. Arch openings range from 6' to 20' in diameter, and side walls are battered with a 1-to-12 outward slope.

Retaining walls were built with a variety of materials: concrete, timber, and stone, or a combination. These are most prominent in the sections adjacent to the C&O Canal. Concrete retaining walls were poured in place using wooden forms erected on-site. As with the culverts, dirt and rock fill was added after completion to establish the desired grade. Timber was used for smaller retaining walls by simply stacking railroad ties above a concrete or stone foundation. The retaining walls helped stabilize filled portions of the roadbed that did not have sufficient room for a gradual slope.

The Pennsylvania Steel Company in Steelton, Pennsylvania, fabricated all the steel bridges, from plates and standard structural shapes (primarily L sections) to form columns, beams, braces, chords, stringers, gussets, and other components using riveted connections. To the extent practical, these components were shop fabricated, then riveted together on-site. Many of these components employed steel straps on one or two sides in a simple Warren or lattice web pattern to reduce component weight. This was the standard industry practice for constructing steel truss and plate girder bridges in the first half of the twentieth century.[13]

The deck plate girder bridges all have two plate girders with lateral struts and diagonal braces between them. Each plate girder has top and bottom flanges formed from L sections, and each girder is stiffened with vertical L sections riveted to the plate. As is typical for this type of bridge, the spacing of these stiffeners is closer to each end than to the mid-span. Since stresses that would tend to buckle the plate vary in magnitude along the length of the bridge, engineers optimized the structure with this variable spacing.

Reflecting current modern railroad practice, the WM shied away from through truss bridges wherever possible. Using deck-style bridges eliminated the clearance limitations associated with through trusses. The WM utilized two styles of deck truss bridges for the six major crossings of the Potomac River on the Cumberland Extension, a 150' Warren truss and a

[13] The WMRHS has a sampling of erection and fabrication drawings of several WM bridges in its collection from both the Pennsylvania Steel Company and the Western Maryland Engineering Office that date from 1903 to 1906.

125' Warren truss. Both designs carried a single track. While minor dimensional differences can be found on these bridges, each 150' Warren deck truss measures approximately 150' long, 12'-6" wide, and 20' to 25' deep. These spans feature trusses located outboard of the track, with lateral beams and longitudinal stringers between the top chords to support the track. This maintains the desired height of the bottom chords above the river by allowing the top chords to rise about 16" above the tops of the ties. These trusses have inclined end posts and vertical intermediate posts at every panel point. Lateral braces located horizontally between the top and bottom chords and vertically between the end posts and intermediate posts stiffen each span against twisting and horizontal loads. Extensions of the stringers at each end carry the track between the ends of adjacent spans. One end of each truss has a post-and-strut addition that supports these two extensions where they meet at the midpoint.

The 125' Warren deck truss spans all measure approximately 125'-0" long, 12'-6" wide, and 13'-10" deep. Requiring less depth than the 150' spans, they are also narrower so that their top chords serve as stringers to directly support the track. Each truss has intermediate posts only where diagonal members meet at the lower chord, and each has an extension at both ends to span the gap between the upper chords of adjacent spans. Where these deck truss spans meet deck plate girder spans, the engineers employed an unusual connection. There the truss's end extension included a vertical plate between the stringer extensions, and one end of the adjoining deck plate girder was fastened to it. Thus the weight of the plate girder span and any passing train was transferred to the end of the truss span, which, in turn, rested on shoes on top of the pier, rather than having independent shoes for each span. As with the 150' spans, lateral bracing was used horizontally between the top and bottom chords and vertically between the end posts and intermediate posts to stiffen the bridge.

Outside the National Park Service boundary west of North Branch, the remaining Potomac River crossings are multiple deck plate girder spans. The WM used single span, through plate girders with rounded top corners over the four C&O Canal crossings, and a through plate girder span with square corners over the B&O at North Branch. Notably, this trend continues almost universally on the Connellsville Extension, and on many parts of the upgraded branch lines into West Virginia.

Limited vertical clearance below the track in two locations prohibited the use of deck-style bridges and made through-style bridges necessary. These spans over the B&O Railroad and the C&O Canal utilize Baltimore trusses.[14] The bridges are 123'-0"and 135'-0" in length, 19'-0" and 16'-0" wide, and 27'-3" and 24'-6" tall, respectively. The B&O Crossing is on a sharp curve, which necessitated additional width to provide sufficient clearance for the overhang of locomotives and cars. The decks on these bridges rest atop a lateral-and-stringer grid, and the stringers are attached by way of gussets and L-section steel to the bottom chords. The location of the B&O Crossing required that the bridge and its abutments be skewed by 51°. Thus, its two trusses are significantly offset from one another, but they are otherwise identical, and the bridge's top and bottom lateral members are perpendicular to them. With this bridge located on

[14] A Baltimore truss is a Pratt truss that has been subdivided to provide locations for additional lateral beams beneath its stringers. These two bridges are unusually short for Baltimore trusses, and their intersecting diagonal members at mid-span make them appear to be subdivided Warren trusses.

a sharp curve, the engineers had to include the ability to handle significant lateral forces from passing trains in its design.

For shorter spans, the WM utilized riveted deck plate girder (DPG) spans, which varied in length from 50' to 95', and in depth from 5'-2" to 9'-3". The DPGs were used as end spans on the river crossings, as interior spans above the flood plain, and over the two most substantial tributary creek crossings. As with the B&O Crossing, several of these DPG spans are on curves, and they were designed to carry significant lateral loads as well. These curves were all superelevated, or banked, which was accomplished with additional rock ballast under the outside rail on land. The bridges required spacers between the ties and stringers, and these are still evident on several of the bridges.

The plate girders are made of steel plate and L sections fabricated into the equivalent of deep I-beams. The L sections are riveted to the tops, bottoms, ends, and sides of the plates. The vertical L sections stiffen the plate against buckling. The longitudinal top and bottom flanges also resist buckling while assisting the plate with transmitting the vertical forces to the ends of each span. Lateral and diagonal L-section members form a horizontal truss arrangement between the chords at the top and bottom, giving the structure a rectangular cross section. These are attached to the plate girders by means of plate steel gussets which are, in turn, riveted to the girder's flanges. At the top of the girders the horizontal members are riveted to the bottom of the gussets below the flanges, while at the bottom they are riveted to the top of the gussets above the flanges.

The concrete piers and abutments for the bridges were poured in place in a similar manner to that employed for the culverts. Anticipating that increasing traffic would make a second track advantageous, the engineers designed all of these piers to be wide enough to accommodate parallel spans in the future. While the second set of bridges could not be justified when the line was built, the additional cost of these larger piers was relatively low, and having them in place when the second track was installed offered major technical and economic advantages. Only the Town Creek Crossing received a second set of spans to accommodate a passing track.

All of the piers supporting the large deck truss spans, as well as any others that would experience non-flood-condition flowing water, are concrete. While their heights vary considerably, they share a similar design. Each consists of a base, a tapered section making up most of the height, and a cap on which the bridge shoes rest. In plan, each pier's downstream face is perpendicular to its transverse sides, while their upstream faces form a "V" that splits the current as a breakwater. On Bridge No. 1348, the Second Potomac Crossing, the piers are skewed to closely match the direction of the river's flow, and the span ends are skewed to match them.

In some cases where bridges span the flood plain for an extended distance, riveted-steel piers on concrete footings were used instead of concrete piers. These were easier and less expensive to build over land, but they did not require the resistance to the effects of flowing river water that concrete provided. The steel piers vary in height, but they are of similar construction. The piers typically measure about 20' tall, with the bents spaced just over 29' apart. Like the

bridge spans, the steel piers are riveted structures composed of common structural sections. They are only found supporting DPG spans, with the end of each span bearing directly on a bent. Smaller DPG spans bridge the length of the pier between bents. Lateral and longitudinal diagonal bracing stiffens an angled column on each side, which in turn supports a 7'-10" x 1'-0" lateral plate, which supports the DPG span. The four corners of each pier rest on tapered, cast-in-place concrete footings. Like the concrete piers, the steel piers were sized to accommodate a second track.

The spans rest on shoes atop each pier or abutment. The shoes are of a complex, fabricated design made from plates and structural shapes that allow the steel spans to flex as needed, yet transmit the forces to the piers in a stable manner that does not cause wear to the tops of the piers. To accommodate changes in each span's length caused by thermal expansion and contraction in response to changes in the ambient temperature, the east-end shoes of the truss spans include rollers that permit the span's end to lengthen or contract several inches, thus eliminating unnecessary longitudinal tensile or compression forces in the span. The west ends have fixed shoes that prevent the spans from shifting on the piers. Except for the rollers, these shoes are of similar construction, and there are variances to suit the different types of spans.

The bridges on the route remain structurally intact. On the major river crossings, some of the ties have been selectively removed to deter access; the ties that remain are often in various states of decay. Most are solid enough to walk on, and there is even evidence of vehicular traffic on some. Others, however, are severely deteriorated. Those ties that are near the ends of bridges and where vegetation surrounds the spans are sometimes covered in moss and other forms of plant life. The concrete work of the bridges, like the tunnels, is showing the effects of years of freezing and thawing, as well as the occasional flood, which undoubtedly barrages the piers and abutments with all sorts of debris. The steel is mostly solid, though some thinner plate members have rusted through in places. Most of the steel has not seen a solid coat of paint in decades, and very little remains of the finishes. Some of it holds fine plant matter, but most is well exposed enough to remain dry. Where ties have been removed, the stringers and top chords show bands of pitting—evidence that the ties held moisture against their unpainted surfaces. In some cases saplings and branches have grown through or against the steel parts and conform to their contours, but they do not appear to have caused any deflection. Some of the bridges, like the First B&O Crossing, have dents that appear to have been caused by overhanging loads on passing trains. There are a few intact builders' plates, and well-preserved, painted bridge numbers survive on some abutments, including bridge numbers 1360, 1396, 1413, and 1474.

The three tunnels now on NPS property, named Indigo, Stick Pile, and Kessler, were all bored to accommodate a straight single track, and they range in length from 1,700' to 4,350'. These tunnels all have timber framing throughout. As with the bridge piers, WM engineers apparently assumed that these tunnels would be enlarged for a second track in the future, at which point the tunnels would receive masonry linings. This is a rather curious plan for an otherwise modern railroad. While other double-track railroad tunnels existed at the time, most were built several years earlier. In the early 1900s, double-track tunnels were generally dug with two single-track bores. The reason for choosing a temporary wooden lining and future bore enlargement over a finished, masonry-lined tunnel that could later be supplemented with a

second single-track tunnel is not now known, but the narrow cuts on some of the tunnel approaches may have made a separate bore for a second track unattractive. No enlargements occurred, and one can now only speculate about the difficulties that would have been involved in enlarging and lining any of these tunnels while they remained in service.

Each tunnel has a concrete portal, typically with a minimum 16'-9" width and a vertical clearance of at least 20'. The face walls are battered 1-to-12, and the portals measure 6'-8" thick at the top parapet and 8'-6" at the base. The interiors of these three tunnels are framed with vertical timbers supporting a five-segment timber arch on 4' centers for the length of the tunnel. These vertical timbers rest atop wooden sills that sit on the tunnel floor and support caps at the spring line of each arch. At certain sections above the arches and behind the posts are planks used for holding dry packing in the form of rock rubble tightly between the planks and the bedrock. The planks and packing help hold any loose pieces of the bedrock in place. There are also timber braces wedged into the rock opening between the rock wall and vertical posts. The dimensions of each piece vary according to the proximity of the adjacent bedrock to the timber. Below the point where the packing boards cease, the bedrock is exposed behind the vertical timbers, with anywhere from a few inches to 3' of clear space between the tunnel wall and the timbers. From reviewing the Western Maryland's standard plans, it appears these tunnels were all designed to be concrete lined, however only the two tunnels near Cumberland, outside of NPS ownership, are finished with approximately 10"-thick interior concrete shells. These two tunnels primarily penetrate soil rather than rock, which necessitated lining their entire lengths of less than 800' each with concrete during their original construction to prevent any possibility of the soil collapsing.[15]

The three tunnels on National Park Service property are in surprisingly good condition, though only Stick Pile Tunnel remains dry for most of its length. Timbers remain solid, likely owing to the relatively sterile environment. Outside, the concrete portals are covered with spalls, showing the effects of years of freezing and thawing with no maintenance, but they retain their basic form, integrity, and dimensions.

The Cumberland Extension on Maryland Department of Natural Resources Property (milepost 105-125)

At the eastern end of the Cumberland Extension, one of the few operating sections of the original Western Maryland main line remains active between Big Pool, Maryland, and Cherry Run, West Virginia. The actual junction point is just east of the village of Big Pool at Big Pool Junction, milepost 105 from Baltimore. The WM's original main line connected with the C&O Canal at Big Pool, where workmen transferred coal and other traffic eastbound from barges to trains.[16] At first, the railroad terminated at the canal, but it later crossed the Potomac just west of there to a connection with the B&O Railroad at Cherry Run, West Virginia. The Cumberland

[15] Examples include: Western Maryland Lines Standard Plan, "Single Track Tunnel Medium Rock Section," July 15, 1910, and "Single Track Tunnel Hard Rock Section," July 11, 1910, both in Drawings Room, WMRHS.
[16] W. Raymond Hicks, "The Cumberland Extension – Western Maryland Railroad Company," *Railway and Locomotive Historical Society Bulletin* no. 122 (April 1970), pp. 26-35.

Extension became the new main line on its completion in 1912, and downgraded the Cherry Run extension to a branch. Today, the Cherry Run extension is still in use, connecting other lines of WM-successor CSX Transportation in Hagerstown to the former B&O mainline. (The B&O is also a component of CSX Transportation). CSX continues to use WM bridges to cross the canal and Potomac on this branch. Bridge No. 1055 over the C&O Canal is a 122'-long, skewed Baltimore through truss. It is reached from Big Pool Junction over a long, curved fill continuing between the canal crossing and Bridge No. 1057 that spans the Potomac River. It consists of five 137' Baltimore through truss spans for a total length of 700'. Three deck plate girder spans on the Maryland side and a single one on the West Virginia side complete the bridge. Historic photographs show that these bridges were originally pin-connected Pratt through trusses with the same lengths, and that the fills were initially frame timber trestles that were later filled in. The date of replacement has not been determined, but these spans are similar to those employed on the Cumberland Extension.[17]

The route of the Cumberland Extension main line proceeds west-northwest from Big Pool over a gently rolling landscape of farms and small agricultural towns, crossing small rivers and streams on short bridges and culverts. Today, the Western Maryland Rail Trail (WMRT), owned by the Maryland Department of Natural Resources, occupies the old Cumberland Extension right-of-way for 19 miles between Big Pool Junction and Pearre, Maryland. The rail trail passes Parkhead, Maryland, at milepost 108, and goes through the town of Hancock, Maryland, just beyond milepost 115. Hancock is between Great Tonoloway and Little Tonoloway creeks, a short distance west of the former. In places where streams were small enough, like Little Tonoloway Creek, the railroad's civil engineers elected to continue the fills over them, allowing the watercourses to pass through culverts instead. This was likely meant to be a savings in long-term maintenance, and one less piece of steel infrastructure subject to vibration, expansion, contraction, and rust. Whether the susceptibility of concrete to freezing and thawing was considered a factor is not clear. The Little Tonoloway Creek crossing, west of Hancock, is typical of the concrete culverts. Fills across low areas that needed to drain only rainfall were penetrated with smaller cast-iron pipes or concrete box culverts.

Upstream from Hancock, the Potomac River forms a relatively straight trough for several miles to the west-northwest. The C&O Canal parallels it on the Maryland side, with its towpath lying between the canal bed and the river's north bank. On the uphill side of the canal is the Western Maryland right-of-way, occupied today by the asphalt-paved rail trail. Today there is a replica of a watch box built to Western Maryland standard plans by a local Boy Scout troop at milepost 123.8, where an original one once stood.[18] The roadbed reaches the crest of a gentle, continuous grade less than 4 miles west of Hancock, above the remains of a cement works at Round Top. Woodmont, home to a hunting club, was the next flag stop station, just a few miles past Round Top. The foundation for an old school house that stood along the railroad until the 1920s remains a landmark beside the recreational trail today.

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[17] Western Maryland Railway Photograph Collection, in Archive Room, WMRHS.

[18] A watch box refers to a small enclosure for an operator at a location that did not include a depot or waiting shed. Telegraph operators manned the watch boxes in remote locations where rock slides, or other damage to the track, were likely so they could provide immediate notice whenever a problem occurred. They could also receive train orders from the dispatcher and pass them to train crews as necessary.

The Cumberland Extension in C&O Canal National Historical Park

Just east of the town of Pearre, the line crosses the inlet to Polly Pond on Bridge No. 1253, a 37-$^{1}/_{2}$' long x 24" deep I-beam span. This man-made pond was the result of the C&O Canal Company enlarging the mouth of the creek to create a boat basin. The pond was originally open to the canal, but Western Maryland officials later placed fill across the river-facing side and built the bridge on concrete, winged abutments to allow the pond to drain.

Pearre follows at milepost 127.[19] Once a tiny flag stop near a collection of farmhouses and a lock on the C&O Canal, Pearre today is limited to a parking lot for the rail trail, which conceals the extant foundation of the Western Maryland depot, a few hunting camps just to the west of it, and a small collection of mothballed buildings (including two dwellings and a canal lockhouse) in the care of C&O Canal National Historical Park. A short distance past Pearre, the current, paved bike trail ends. National Park Service property follows the WM grade to North Branch.[20]

Like the vast remainder of the Cumberland Extension, the NPS section is undeveloped. Beyond the current trail's end, the right-of-way is in various stages of reversion to nature. The first few yards are in good enough shape to drive a car onto, but the road that occupies it quickly diverges toward the river to provide access to the canal towpath. Beyond this point, thick vegetation occupies the track bed. This brushy growth clears up enough to make the line passable on foot after about 200', but not by car. From here, a thick carpet of fallen leaves punctuated by a smattering of shrubs and trees with trunks a foot in diameter or less covers the roadbed. In other places, grass and short weeds encroach on the roadbed with saplings growing along the edges. The roadbed is at a fairly low grade here and nearly level with the towpath. It quickly begins ascending, however, in order to clear the Potomac River in the bends a few miles to the west. These river bends, often referred to by locals as the "Paw Paw Bends," called for some of the railroad's most extensive construction work, and they make this part of the railroad grade the least accessible.

Bridge No. 1276, Sideling Hill Creek Crossing

By Sideling Hill Creek, which is a few hundred yards past the end of the existing rail-trail, the elevation of the roadbed is at least 10' higher than the towpath. Spanning the chasm is Bridge No. 1276, Sideling Hill Creek Crossing. The 145'-long bridge consists of two deck plate girder spans carrying a single track on a 3° 30' curve, nearly 50' above the creek bed. The outside of the curve faces away from the river and up Sideling Hill Creek. Concrete abutments and an intermediate pier support the spans, each of which consists of two parallel plate girder chords, 1'-4" in width, spaced across from one another on 8'-0" centers.[21]

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[19] Pearre is pronounced locally as "Pah-ree," with emphasis on the second syllable.
[20] The Department of Natural Resources built the section of the Western Maryland Rail Trail from milepost 125.3 to 127 on National Park Service land so the trail could end at the newly built Pearre parking lot.
[21] See Pennsylvania Steel Co., "Bridge over Sideling Hill Creek," C-175, 1904, sheets 4 and 5, in Drawings Room, WMRHS.

The eastern span is the longer and deeper of the two, at 95'-0" in length and 9'-3 $^1/_4$" in depth. There are a total of eight panel points on each girder of the longer span. The plates are joined by narrow plate steel gussets and reinforced by vertical, back-to-back, steel L sections at the joints. Additional angle steel reinforcing members occur at intermediate points within each panel. There are two 10'-10 $^1/_4$" panels at each end of each girder, divided into thirds by two intermediate reinforcing angles. In the center of the span there is a panel 14'-4" in length, and on either side, between the center panel and the end panels, are four 13'-6" panels, two on each side of the center panel. The center three panels are divided in two by a single angle reinforcement, while the ones adjacent to each end panel are divided into thirds. The lateral members of the horizontal truss webbing at the tops and bottoms of the girders are joined to the girders by way of gussets attached to the girder flanges at each panel point. Diagonal members are also attached to the same gussets on the north side of the span and attached to their own gussets on the south side in the center of each panel. The longer span's eastern end sits on a roller shoe at the east abutment, which supports the bridge. The abutment has angled wings so that it can also serve as a retaining wall for the fill to the west of the bridge. The western end of the east span rests on a fixed shoe atop a stepped pier at the west bank of the creek.

Attached to the east span by way of a riveted butt joint and towering over the creek's steep bank is the shallower, 50'-long west span. The opposite end of the span rests directly on the concrete west abutment in a cove between two concrete abutment wings that are perpendicular to the abutment face and whose tops angle down from the top of the abutment to the top of the surface upon which the bridge rests. This shorter span's center line angles 13° southward from the center line of the longer span to follow the track's curvature. The construction of the panels and the horizontal webbing on this span differs somewhat from the larger span. A single large gusset-and-angle-iron joint subdivided into nine distinct sections by individual angle steel reinforcing members, divides the span into two sections, which are tall and narrow near the ends and gradually widen toward the center. There are four panel points in the horizontal truss webbing with a lateral member at each. The two panels at the ends include two diagonals, while the center panel includes four without a lateral between the center two diagonals. These members are joined to the girder flanges in the same manner and orientation as in the long span and correspond to the locations of the vertical angle reinforcements on the girders.

The two deck plate girder spans remain in place with almost all of the ties and are accessible by makeshift footpaths from the towpath. The ties are fairly well preserved and covered with a decayed asphaltic coating with $^1/_8$" to $^1/_4$" pebble aggregate, likely applied to make walking the bridge safer for repair crews. Owing to its curvature, the outside rail was superelevated 5" to induce some centripetal force onto passing trains that reduced the curve resistance and inertially induced lateral force at speed. Wooden, wedge-shaped spacers between the top flange of the outer plate girder and the ties created the superelevation.

The intermediate pier at the joint between the spans is concrete and consists of a cap, slightly wider than the vertically-tapered section below it, which rests in turn on a bottom section with vertical sides. The east and west sides of the pier are parallel. In plan, the downstream face

is perpendicular to the sides, while the upstream face has an equilateral 45° wedge to split the stream current. A 4" piece of angle steel embedded in the concrete reinforces the upstream face. Dimensions for the pier are as follows: 35'-7" tall (from the water level to top cap), 9' wide at the base, 6'-8" wide at the top cap, and 34'-5 $^{3}/_{4}$" maximum depth at the point at the base.

East of Sideling Hill Creek, the railroad is on a cut-and-fill bench and crosses an approximately 300'-long fill before returning to the bench. A series of bench cuts through shale and other rock of substantial size – as high as 50' or more—punctuate the landscape on the uphill side of the bed, particularly west of the still-extant concrete milepost 128. There are substantial rock falls and slides at several of these cuts, some of which have also filled the canal prism almost all the way across and left only a narrow walking trail on the downhill edge of the roadbed. On the downhill side, concrete retaining walls of varying height support a large portion of the filled side of the bench, keeping the roadbed stable and out of the canal.

The Potomac River flows eastward, and between Keifer's and Pearre, Maryland, its elevation drops approximately 100' over a straight-line distance of about 11 miles toward the northeast. The river, however, flows through a series of oxbows—the Paw Paw Bends—for a total length of almost 25 miles. This meandering path of the river, caused by rugged terrain, made this section the greatest engineering challenging of the railroad east of Cumberland. The engineers located and designed six major bridges, three tunnels, and significant earthworks to achieve a 14-mile-long alignment with a maximum grade of 0.5 percent (26.4' per mile). Unfortunately, achieving this low grade required curves as sharp as 6° (955' radius), which limited the maximum speed of freight trains to 35 miles per hour (mph) through the area.[22] Passenger trains were allowed 40 mph.

Tunnel No. 1292, Indigo Tunnel

Where the Potomac River bends end, approximately 1-$^{1}/_{2}$ miles west of Sideling Hill Creek, the railroad diverges slightly to the north. After it diverges from the river, the grade passes through a short cut on three curves of 5°, 3° 30', and 6° to reach the east portal of Indigo Tunnel, the longest on the railroad.[23] This 4,350' single-track tunnel with concrete portals at each end bores through a spur of High Germany Mountain. The tunnel portal frames a 16'-10"-wide arched opening with a height of 20'-6" from the top of the ties to the apex of the arch. The tunnel's overall width varies since it is bored through rock along the material's natural fracturing planes, but the WM engineer's office called for a rough opening clearance of 20'-6" wide. Indigo Tunnel passes through the relatively soft and brittle Foreknobs rock formation and enters at a natural point of separation between two layers of rock in a small cut.[24] Various layers of rock at more than 45° angles from the horizontal inside the tunnel near the portals slope upward

[22] Railroad curves are usually stated in degrees, which refer to how much the track's direction changes every 100'. Thus, the greater the number of degrees, the sharper the curve, and the slower a train must travel through it. The term derives from the surveying method used to lay out curves. While sharper curves generally have more superelevation to help compensate than wider curves, there are practical concerns that limit the maximum to about 5", so speed restrictions must be imposed. Where possible, most railroad engineers prefer curves of 3° or less on main lines to minimize operational problems.
[23] There are four 6° curves on the Cumberland Extension.
[24] Erica Clites, geologist, site visit with Dave Vago, August 5, 2009.

toward the center of the mountain. The centerline of the tunnel is at an acute horizontal angle to the rock's natural bedding planes, so bands of rock in the north wall of the tunnel reappear several yards to the west on the south wall.[25]

Indigo, Stick Pile, and Kessler tunnels have partial linings of timber framing rather than masonry linings. Plans called for replacing the temporary timber framing with concrete when the tunnels were enlarged for a second track. The enlargement never occurred, so the framing remained in place throughout the tunnel's service life, and it is still essentially intact. Its design appears to be an amalgamation of the company's standard framing diagrams for tunnels through medium rock with and without firm sides. All framing members are 10" x 10" hardwood timbers, though 4" x 8" planks were used for the arch decking along with side braces known as outriggers that supported roof extensions outside the bases of the roof arch. While the roof is lined with planks and rubble packing, the walls are open. The posts, located on 4' centers, rest on horizontal sills along both sides of the tunnel's floor. These sills are now mostly buried under settled track ballast, fallen rocks, and decomposed organic material. Longitudinal members called top plates rest on top of the posts, and the arch roof rests in notches cut into them. Each arch frame consists of five pieces set end-to-end and cut at equal angles to form the segmented arch. A 4" x 8" plank keys each joint, and the pieces are bolted together through the keys, with four bolts at most joints.[26]

Indigo Tunnel brings the railroad across the base of the upper Potomac River's first oxbow, which flows toward the West Virginia side. (The C&O Canal follows the river to pass around High Germany Mountain rather than through it.) At the west end of the tunnel, the railroad passes through another short cut and gradually gets closer to the canal again for a short distance. Like the portion east of the tunnel, the roadbed is on a bench directly adjacent to the canal on the uphill side, but only for a short distance. High Germany Road comes down the mountain beside the railroad grade and crosses it at grade about 1-$^{1}/_{2}$ miles west of Indigo Tunnel. East of the road crossing, the grade is overgrown with weeds, grass, shrubs, and saplings, but west of the crossing, it is bare and covered in gravel and sand where a nearby landowner uses it for vehicle storage. The first few feet beyond the crossing bear partially-exposed ties buried in this fine, muddy gravel. The road quickly drops 10' to 15' below the railroad grade, which crosses this small valley on a heavily vegetated fill. High Germany Road turns north here and passes through a concrete culvert beneath the railroad to reach Orleans Road in Little Orleans, Maryland.

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[25] Only limited information about Indigo Tunnel's construction and condition could be obtained on site, as entry into it was not possible. At some time after the line's abandonment, this tunnel became a hibernaculum for a colony of bats. In addition to the biological hazards posed by bat droppings, the past five years have seen numerous bat colonies in the northeastern U.S. become infected with White-nose Syndrome, a serious fungal infection. In an effort to halt its spread, the National Park Service has severely restricted access to the tunnel.

[26] Tunnel dimensions are from fieldwork at Stick Pile Tunnel and from Western Maryland Lines Standard Plan, "Single Track Tunnel Hard Rock Section," in Drawings Room, WMRHS.

Culvert No. 1308, High Germany Road Culvert

Culvert No. 1308 is a single-arch, concrete culvert that allows a single-lane county road to pass beneath a fill for the railroad at Little Orleans. The 28'-2" long horseshoe culvert has a 17'-0"-diameter arch over walls having a 1-to-12 outward batter. On its south (river) side, the sidewalls transition to a pair of concrete retaining walls that curve around to parallel the roadbed and keep the fill from sliding toward the road. This culvert exhibits moderate deterioration, evidenced primarily by spalling at its edges and corners and by missing pieces of concrete where vehicles have struck the low arch.

Little Orleans, once a thriving canal town, today has only one commercial building: a grocery store and tavern called Bill's Place, which operates in a building constructed after the original store burned in the 1990s. The watering hole currently draws business from locals, hunters, bikers and recreational canal users. Across High Germany Road, a small side track at Little Orleans allowed loading and unloading of boxcars for several small, local customers, most notably the barrel-stave works that built it. A longer track served the Billmeyer Lumber Company. After that operation closed, it was sold to a local resident for the loading of coal hopper cars. A few feet of rail remain from this track, lying amongst dense understory, where they project off to the north at a slight angle to the main line just west of the road culvert. This is the only remaining rail on the entire line except for a small stretch just east of Cumberland where the Western Maryland line crosses the B&O. Its private ownership kept it from being removed when the line was abandoned. The Little Orleans passenger waiting shed was probably located where a gravel roadway now extends between this siding and the main line. The roadbed and gravel road continue past this short stretch of extant track along the same earthen fill extending past the village of Little Orleans. A short distance west of the village, another culvert penetrates the fill.[27]

Culvert No. 1309, Fifteen Mile Creek Culvert

Culvert No. 1309 is a large, double-arch concrete culvert that allows Fifteen Mile Creek to pass beneath the 50' high fill just west of Little Orleans. Each arch is 20' in diameter, and the culvert measures 155'-7" long. Like other WM concrete culverts, these arches are of a horseshoe design with 1-to-12 battered walls. This structure is unique in that it features a tapered obelisk with a pyramidal top serves as a breakwater and stands between the arches. It measures 7' wide at the base, 3'-10"' at the top, and 20' in height. The top of the upstream, or north, portal of the culvert has become detached from the remainder of the face, at least partly following a line of demarcation between concrete pours. This band of concrete across the face of the culvert now projects 2" to 4" outward—likely pushed from behind by the earth fill.

The gravel road that now runs along the former roadbed continues southwest from Fifteen Mile Creek. The stream at this point bends slightly to the west against a steep, almost vertical, rock face. This rock formation continues uphill beyond the track level, so immediately

[27] Western Maryland West Sub website, "Little Orleans/B130.8," found at: http://www.wmwestsub.com/littleorleans.htm, last accessed October 19, 2010.

past the double culvert the roadbed enters a deep cut. It traverses this cut on a 4° curve and passes through a parabolic arched, corrugated-metal culvert at milepost 131.1. This fill-and-culvert system, which replaced an earlier wooden bridge, carries Pleasant Plains Road across the railroad grade. A few yards past this point the cut ends, once again putting the roadbed on a fill, through which a small stream passes via a small pipe culvert. Then, the roadbed crosses yet another small road at grade, and enters a low cut about 60' long that leads to the First Potomac Crossing.

Bridge No. 1317, First Potomac and C&O Canal Crossing

The single-track Bridge No. 1317 is 767' long and consists of four Warren deck truss spans bracketed on each end by a single deck plate girder span. Each truss span is 150'-0" long from shoe to shoe and 21'-0" in height between the centerlines of the top and bottom chords. The centerlines of the two trusses are 12'-6" apart, placing them outside the ends of the ties. This arrangement is common to all of the 150' truss spans on the first four Potomac crossings. The deck plate girders are 9'-$^{1}/_{2}$" tall, and the track is approximately 58' above the water level. The bridge is on a 0.0027 percent descending grade westward.[28]

The truss spans rest on concrete abutments and piers that were wide enough to accommodate the spans for a never-installed second track. The two outer piers are spaced 151'-4" apart while the two inner piers are 152'-8" apart, measured from the centerline of each pier. Each truss is composed of eight panels measuring 18'-9" wide. On these first four river crossings, the ties are supported on a beam-and-stringer arrangement between the top chords, with the stringer centerlines spaced 6'-6" apart. The tops of the ties are approximately 10" below the upper surfaces of the top chords. Since the end posts are inclined, extensions of the stringers at each end carry the track between the ends of adjacent spans. One end of each truss has a post-and-strut addition that supports the two adjacent extensions where they meet directly above each pier. Fixed shoes at their east ends and roller shoes at their west ends support these trusses atop the piers. These fabricated shoes locate the lower surface of the bottom chords 4' above the top face of the piers.

The top chords are 1'-8 $^{3}/_{4}$" deep and consist of steel plate box girders reinforced at the top and bottom corners by steel angles. The top and bottom plates of these chords extend over the horizontal sections of the angles, thus forming horizontal flanges. Transverse horizontal beams measuring 3'-1 $^{5}/8$" deep and riveted to the intermediate posts at each panel point connect the parallel trusses and support the longitudinal stringers that, in turn, support the track. The top chords are stiffened against transverse bending with diagonal lateral braces between the trusses that span the panels in alternate directions. The lateral braces consist of steel angles riveted back to back.

The bottom chords are 1'-8 $^{1}/_{4}$" deep and constructed like the top chords. Horizontal bottom struts riveted to the bottom chords connect the trusses. These are fabricated of steel plate

[28] Dimensions are from measurements taken with the Leica ScanStation 2 in November 2009. Details were compared with Pennsylvania Steel Co., "Second Crossings Potomac River," 1904, in Drawings Room, WMRHS.

and angles using riveted connections. The diagonal members of the trusses are the same width as the chords. They were assembled like box girders with plate steel faces parallel to the rails and crossed webbing perpendicular to them. The diagonal members, including the end posts, are similar to the chords in size and construction. Like the top chords, the bottom chords are stiffened against transverse bending with lateral braces, but with twice the number of braces forming a crossing pattern through each panel.

The intermediate posts of the trusses are also fabricated box girders, but they feature a smaller section and simpler, alternating webbing aligned perpendicular to the rails. Transverse diagonal braces at each panel point stiffen the span longitudinally in torsion. These extend the full height of the trusses and consist of two back-to-back pairs of riveted steel angles that cross at midpoint.

There is a deck plate girder approach span at each end of the bridge. The spans measure 78'-3 $^{3}/_{4}$" long at the west end and 77'-9 $^{5}/_{8}$" long at the east. The outer ends of each deck plate girder span rest on fabricated shoes that, in turn, bear on the abutments. Their inner ends are riveted to transverse beams between the truss extension posts, thereby conveying that portion of the bridge and train weight to the truss's shoes and thence to piers. On the deck plate girder spans, the ties rest directly atop the girders, whose centerlines are 7'-0" apart.

Immediately west of the First Crossing, trains had to negotiate a 5° curve on a fill to align with the river, since the railroad grade follows it around Doe Gully Bend in West Virginia between the First and Second Potomac Crossings. Shortly after the end of the curve, the roadbed widens to accommodate a siding that was slightly over 1 mile long. The right-of-way narrows beyond the siding. Concrete foundations for signals, as well as concrete battery cellars are extant near both ends of this siding.

The roadbed is covered with grass and some small saplings, but not a great deal of low brush until it reaches the northwest end of the bend, where a short overgrown section precedes a grade crossing of Doe Gully Lane. From here to the west side of the bend, the road parallels the track just downhill from it. The roadbed in this area is on a low bench that is only 6' to 8' feet above the flood plain. Many of the ties in this section are still in place, and there are even stacks of ties sitting in the drainage ditch on the uphill side. While others are cast about, the stacked ties are still bundled and appear to have been new when placed there. Ties higher in the stack have not made contact with the ground, leaving them in remarkably good condition. Several houses occupy the flood plain through this stretch, and the landowners use the roadbed through this stretch as a driveway. The owner of the first house at the Doe Gully Lane grade crossing also uses the roadbed to store vehicles and equipment. Several hundred yards to the west, another nearby landowner has placed a large pile of dirt on the roadbed, and in two places, driveways have been cut into the side of the embankment to provide access between Doe Gully Lane and the railroad right of way.

At the west end of Doe Gully Lane, on the southwest side of the river bend, the roadbed cuts through the finely layered light brown shale that forms the adjacent hills and crosses hollows of gradually increasing size on earthen fills drained by pipe culverts. A concrete signal

foundation and a battery cellar remain on one fill, and the remains of several batteries litter the bottom of the embankment on the other side. At the end of this stretch, the gravel drive that has been traveling atop the roadbed diverges uphill, while the railroad continues across a fill and around the second of four 6° curves to reach the Second Potomac Crossing. A unique gate is located approximately 200' east of the bridge, that could be called "railroad scrap art." Apparently fabricated by a WM field crew during or shortly after the post-abandonment rail removal, it is a vertically hinged gate consisting entirely of: sections of rail, flame-cut to various lengths, tie plates, a replacement milepost made from rail with its "B-134" number still readable, and a few other pieces of scrap steel. A single section of rail forms the gate bar, and several tie plates and short pieces of rail tack-welded together comprise a crude, but effective, counterweight. Other sections of rail make up the vertical posts. The gate appears to have been erected to stop those who may have just missed the sharp left-hand turn for the nearby hunting club from reaching the bridge.

Bridge No. 1348, Second Potomac and C&O Canal Crossing

At 1,367', this is the longest bridge of the six in the Paw Paw Bends. Crossing the canal, a broad flood plain, and the river, the Second Potomac Crossing consists of fifteen spans (including the short spans atop three steel piers). It is the only one of the six crossings with four different span designs, and the only one with skewed spans. The long sides of concrete piers 1 through 6 are not perpendicular to the track centerline; instead they are skewed 28° from it to match the direction of the river's flow at this location. The ends of the 150' Warren deck truss spans between them are necessarily skewed to match. The western portion of this bridge over the flood plain and canal are not skewed, so the deck plate girder spans at each end of the skewed truss spans have one end skewed and the other square.

From east to west, Bridge No. 1348's spans are a deck plate girder (one end skewed), five 150' Warren deck trusses (skewed), one deck plate girder (one end skewed), three deck plate girder spans interspersed with short deck plate girder spans on steel piers, a 125' Warren deck truss, and a single DPG span. The 125' Warren deck truss, which spans the canal and its tow path, rests on concrete piers, while steel piers support the DPG spans. The DPG span on the eastern end is slightly rotated to accommodate the spiral transition between the 6° approach curve and the tangent track on the remainder of the bridge.

The 150' Warren trusses on Bridge No. 1348 are similar to those on the First, Third, and Fourth Potomac crossings, except for differences in their end panels that form the skew. These five trusses measure 150'-0" long shoe to shoe and 20'-3" deep. Each is comprised of eight panels. In plan, the four central panels are rectangular, but each end has a trapezoid and a parallelogram panel. Vertically, the lengths and angles of the diagonals and end posts in these outboard panels were adjusted to suit the plans of the top and bottom chords. The stringer extensions and supports between adjacent spans were similarly modified.

As noted earlier, six DPG spans bridge the flood plain. All are fabricated of riveted steel plate and L sections. Three of these spans measure approximately 64' each between steel piers, and three 27' spans support the track across the tops of steel piers 7 through 9. One end of the

westernmost span rests on concrete pier 10, which is one of two that support the 125' Warren deck truss over the canal. The ties rest directly on the top flanges of these six spans.

The single 125' Warren deck truss is similar to those used for the Fifth and Sixth Potomac Crossings. This truss is only 13'-9 $^{3}/_{8}$" deep and 10' -0" wide (between member centerlines). Since the ties rest on the top chords, floor beams and stringers were not required. The size and geometry of this bridge also allowed alternate intermediate posts to be deleted without compromising the bridge's load capacity. A final 64'-long deck plate girder spans the gap between this truss span and the west abutment.

The 125' Warren deck trusses were joined with unusual connections to the deck plate girder spans on both the Fifth and Sixth Potomac crossings. Each connection of a DPG to the end extension of a 150' truss has the end of the DPG resting directly on top of a heavy lateral beam, or on haunches attached to it transferring the weight of the DPG and train to the truss's end structure in compression, which is common practice. On the Fifth and Sixth Potomac crossings, though, the DPG is connected to the 125' truss's end extension by riveting the end of the DPG to the side of the plate portion of the truss's lateral beam. Thus, the DPG's load is transmitted to the end of the truss's end structure in shear rather than compression. Such a shear connection is rarely employed in bridge design, and the reason for using it here is not clear. Nevertheless, all of these joints appear to have functioned well and remain in good condition.

At the west end of the Second Potomac Crossing, the railroad crosses a substantial fill and then enters a hollow and cut that lead to the east portal of a tunnel that provides a straight route through one of the oxbows, thus eliminating the sharp curves otherwise needed to follow the river in this area. Between the bridge and the tunnel, the line is on a 5-percent ascending grade westbound for approximately $^{1}/_{4}$ mile.

Tunnel No. 1355, Stick Pile Tunnel

Stick Pile Tunnel is the second of the three tunnels in this serpentine stretch of the Potomac and the shortest at 1,705'. Most of this tunnel was bored through various strata of rock. It is mostly timber framed, except for a 10' section at the east end of the tunnel, where a thick layer of soft overburden and fill just inside the portal requires a different support. Here, the side posts support horizontal timbers that cross the tunnel roof perpendicular to the track. While virtually all tunnels experience some amount of water seepage from the surrounding earth and rock, Stick Pile Tunnel is relatively dry. Except for a few yards of deep sludge at the east end, the floor is dry enough for a person to walk its entire length. Vandals in the 1980s cut and removed nineteen of the timber posts along approximately 300' of the south wall. Apparently aware of the potential for structural collapse, the thieves left at least one post in place between those they removed. They cut 10' sections of timber from the vandalized posts, which they left cleanly sawn top and bottom.

West of the tunnel, the roadbed passes through a short fill no taller than the tunnel portal, and then briefly encounters a broad, flat area that railroad employees knew as Green Ridge. This was a small village that centered on the apple-picking operations of the Merten family. Little

remains of the village or the railroad facilities originally located here, which included a bunk house, waiting shed, and tunnel maintenance apparatus, except for Kasecamp Road. Now serving as a Maryland Forest Service access road, Kasecamp Road led to the railroad facilities and village. Between mileposts 135 and 136, the roadbed crosses a substantial cut and fill to reach the Third Potomac Crossing.

Bridge No. 1360, Third Potomac and C&O Canal Crossing

The Third Potomac and C&O Canal Crossing is 855'-7" long and consists of nine spans. It features three 150' Warren deck truss spans, each of which measures 150'-1" long x 24'-11 $^1/_4$" deep center to center. Three DPGs measuring 80'-0", 93'-1", and 92'-5", and two 29'-11"-long DPGs across steel piers span the canal and flood plain on the Maryland side of the river. A fourth DPG measuring 77'-9" long connects the westernmost Warren truss to the concrete abutment. Steel piers 1 and 2 support the spans above the canal and flood plain, and concrete piers support the spans across the river. The DPG and 150' Warren deck truss spans are similar in design and construction to the same types of spans used in the other Potomac crossings.[29]

The railroad, once again in West Virginia, followed the river around another oxbow bend from milepost 136 to milepost 140, called Magnolia Bend. This required another 6° curve to turn parallel with the river before encountering a rocky hillside. A bench interspersed with some fills and cuts provided the roadbed's route around this oxbow, but the engineers had to overcome two challenges to reach it. For approximately $^1/_4$ of a mile west of Bridge No. 1360, the track had to be supported roughly 50' above a flood plain. Construction photos reveal that this initially was accomplished by the rapid erection of a timber trestle, but in the ensuing years, the railroad dumped many carloads of earth in and on both sides of this trestle to build a large fill that left the trestle intact within it (see Illustrated Appendix, Figure 12). The trestle is no longer visible, but substantial portions—perhaps most or all—of it likely remain entombed. The Western Maryland's first encounter with the Baltimore and Ohio Railroad, west of the connection at Big Pool Junction (milepost 104.9) where the Cumberland Extension began, presented the second challenge. The B&O's original route in this area, built in 1842, curves along the south bank of the Potomac River through the Paw Paw Bends because this provided the easiest, quickest, and cheapest way to build the line, and it adequately accommodated the short, light trains of the day. Although the B&O relocated the new line and removed its original, multi-track mainline in 1914, crossing it presented yet another challenge to the WM's engineers.

Bridge No. 1363, First B&O Railroad Crossing

With only about 25' of difference in elevation between the B&O and WM tracks, a deck-type bridge was not an option, and the bridge's required location on a 6° curve with 4" of superelevation meant that it would be heavily skewed. The curve also necessitated a wider than usual bridge to clear the overhang of locomotives and cars. To satisfy all of these conditions, the engineers chose to use a through-truss design.

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[29] Dimensions are from optical measurements taken with a Leica ScanStation 2 in April 2010.

The resulting bridge is a Baltimore through truss, measuring 123' long (shoe-to-shoe centers) on each side and skewed 51°. Each of its two identical trusses consists of five panels, subdivided by short intermediate posts and diagonals. The odd number of panels required a combination center panel with crossed diagonal members. The bridge measures 27'-3" tall and 19'-0" wide (centerline dimensions). The two trusses are staggered by 24'-6", the width of one panel, and they rest upon concrete abutments that parallel the B&O right of way—now a dirt road. This allows the floor beams and top lateral members to remain perpendicular to both trusses, significantly simplifying the bridge's design and fabrication. Only the lateral members at the ends had to be set diagonally to connect like points of the two trusses. Like the other truss bridges on this line, the riveted members consisted of steel plate and L sections with flat stock used for webbing in the larger members. Wooden spacers under the ties along the outside of the curve established the superelevation.

The stringers are not continuous, nor are they a uniform distance from the sides. To consistently support the curved track, each panel's section of stringer is offset from those adjacent to it. Thus, stringers are approximately 2'-3" closer to the lower chord at the midpoint of the southeast side than at either end. This need for offset stringer sections made a Baltimore truss a better choice than a simpler Pratt truss, as the additional intermediate posts allowed more floor beams to support shorter stringer sections. The alignment of the curve through the bridge also required that it be 3' wider than an equivalent span on tangent track to accommodate the overhang of rolling stock.[30]

West of Bridge No. 1363, the roadbed continues on the 6° curve to direct it along the river and around an oxbow called Magnolia Bend. Between mileposts 136 and 139, the roadbed is again mostly on a bench set into the sides of several hills, but four significant fills were needed to maintain the grade across the valleys in-between. The roadbed widens in this area—known to railroad employees as Jerome—to accommodate a double-ended, signaled siding. This siding, from milepost 136.4 to 138.8, occupied most of the distance between the First B&O Crossing and the Fourth Potomac Crossing.

At the approximate midpoint of this siding, the Jerome operator's cabin is located at milepost 137.25. Although significantly deteriorated, this cabin is the only extant railway structure standing on the portion of the Cumberland Extension under National Park Service ownership. Connected by telegraph, and later telephone, to the dispatcher's office in Hagerstown, the operator at Jerome received train orders from the dispatcher who controlled all train movements over this section of the railroad, typed the instructions on standard forms, and handed them to train crews as they arrived.

The small, frame operator's cabin, measuring about 10' x 12' in plan, sits on the downhill side of the roadbed, its gable perpendicular to the track. It is sheathed in whitewashed German

[30] Dimensions are from optical measurements taken with a Leica ScanStation2 in April 2010, and from available engineering drawings. See Pennsylvania Steel Co., "Bridge over B. & O. R.R.," C-478, sheet 3, 1905, and Western Maryland Railroad, "Bridge over B. & O. R.R," BO-24, sheets 1-3, 1905, all in Drawings Room, WMRHS.

siding that is largely covered by "Insulbrick," an asphaltic paper material with a granular coating on the outside face intended to resemble brick. Gaps in the Insulbrick expose the siding. Some of the siding appears to have been removed to permit holes through the wall, presumably for no-longer-present pipes, wires, or conduits. One large, missing piece on the front of the building, facing railroad west (southwest by the compass), was presumably stolen several years ago because it displayed a painted Western Maryland Railway logo.

The building's front and rear, as well as the side facing the track, have window openings. A single window opening faces the track side and is centered beneath the gable peak. The rear has two windows, as does the front. On the front façade, a doorway occupies part of the space between the windows. The sashes and door are all missing. A modest, canopied porch about 2-$^{1}/_{2}$' wide and supported by masonry piers extends along the front of the building. The porch's roof extends from the main roof along the same plane, and it is supported by 4"-square wood pillars. Since the building is on a downward slope from the roadbed and to the northeast, it has a partial basement enclosed by planks. The building sits on wooden beams atop masonry piers of varying height.[31]

The cabin's interior includes a closet in the northeast corner and the remains of a desk and cabinet at the southeast corner. Vertical tongue-in-groove siding painted two-tone green covers the interior walls and ceiling. There are several "ghosts" in the paint where boxes, paper items, or other devices once hung on these walls. The floor is tongue-in-groove hardwood. A small, square opening in the ceiling provides access to an attic.

Other remnants of the telegraph/telephone communication system remain scattered along the line, including many of the wooden poles. The valuable signal equipment was removed after abandonment of the WM, but the concrete footings remain in several places, including one just outside this cabin that supported a train order signal. Manually controlled by the operator, its aspect told train crews whether or not the operator had orders for them. The original signal for each direction was a lower quadrant semaphore, with the pair mounted on a common mast. Three-color-light signals later replaced the semaphores. Additional foundations in the area supported signals that indicated the presence of other trains and/or how the siding turnouts were set. A short distance southwest of the building is the collapsed and rotted remnant of a small, wooden platform on a timber frame.

Bridge No. 1396, Fourth Potomac and Second B&O Crossing

At 1,029', the Fourth Potomac and Second B&O Crossing is the second longest in the Paw Paw Bends. Similar in design to the first three river crossings, it has nine DPG spans and four 150' Warren deck truss spans. The DPG spans on the east end are aligned to match the transition spiral between the west end of the 6° curve and the tangent track across the Warren deck truss spans. Thus, in plan, the angle between adjacent DPG spans decreases from 4° to 1°. From the east abutment, the bridge first crosses a 31' approach span, followed by a 72'-11" span

[31] Data about the physical appearance and condition of the Jerome operator's cabin comes from a visual site inspection by David Vago in August 2009.

over the original B&O right of way. Six more DPGs, including three that span the tops of steel piers, carry the track over a flood plain. These DPGs and steel piers are similar to those already described, except the short pier-top spans here have the same depth as the longer spans between the piers. Instead of a dual-bent pier, a single bent supports the junction of the two east-end spans. The line straightens out to cross the Potomac River over four 150' Warren deck trusses. The trusses are 24'-11 $^{1}/_{4}$" deep (chord member centerlines), and they are supported on concrete piers. The bridge culminates with a single 57' DPG approach span to a concrete abutment.

West of the bridge and again in Maryland, the roadbed traverses a fill and cut to reach the east portal of Kessler Tunnel, which was built across a notch in Tunnel Hill formed by a natural stream. The cut was dug directly from the streambed at the lowest point in the notch, so the flow from this stream now passes through drainage ditches on either side of the roadbed. As the cut proceeds west, the natural terrain rapidly gains altitude on both sides. Owing to the angle of the bedding planes, which travel uphill from south to north, and the easily-fractured rock, the north and south sides of the cut are very different in character. The south face of the cut is jagged where workmen building the grade blasted directly across the rock planes, whereas on the north face, the rock could be more easily removed along the planes. Consequently, the rock face on the north face has broad, smooth surfaces. There are collapses on both sides. On the jagged south side, the rock has crumbled and fallen onto the roadbed in small piles of talus, while on the north side, large chunks simply separated along the parallel planes and slid downhill. At the deep west end of the cut at the Kessler Tunnel portal, the drainage is poorest, and nearly all the roadbed is saturated and muddy.

Tunnel No. 1405, Kessler Tunnel

The 1,843'-long Kessler Tunnel is located in Maryland, northwest of a pair of bends in the Potomac River. The tunnel is framed with timber like the other two tunnels and has concrete portals that show deterioration, with spalling at the corners and at many of the joints between the concrete pours. It has the poorest drainage of the three NPS tunnels, so its floor is covered with 1' to 2' of water, mud, and decomposing leaves for most of its length. The highest point of this tunnel is at the center, with descending grades to the portals to promote drainage since two overhead streams were expected to make this tunnel wetter than Indigo or Stick Pile. Currently, the roadbed appears to be nearly level, probably due to fallen material around the portals and midpoint erosion since its abandonment. When inspected for this report, the roadbed at the west portal was dry, while water in the ditches alongside the tunnel flowed freely. The north drainage ditch with a pipe culvert at the west portal diverts surface water away from the western approach cut and roadbed.

The west portal opens into a deep cut, but the roadbed transitions onto an earthen fill as the mountainside drops down to the river. This fill serves as the approach to the Fifth Potomac Crossing, the first of two bridges over the river at Bevan's Bend, located north of the railroad. The roadbed on the fill is lightly overgrown with shrubs and weeds, but in the cut it is almost completely devoid of such vegetation and instead covered by a thick layer of fallen leaves.

The collapsed remains of a shanty are located between Kessler Tunnel's west portal and the Fifth Potomac Crossing. The shanty is probably the remains of a manned watch box, but it was later used as a telephone box. Beside it rests a two-pole gantry for telegraph/telephone lines that has fallen onto the hillside. An intact pole still stands at the opposite end of the bridge, as do several elsewhere. A few wooden telegraph arms also remain cantilevered from the bridges.

Bridge No. 1407, Fifth Potomac Crossing

The Fifth Potomac Crossing, the first of two similar bridges, measures 636'. It is made up of six spans that include four 125' Warren deck trusses flanked by DPGs. The trusses are 13'-10" deep, while the depth of the DPG spans is 7'-6". The DPGs are 63'-7" and 64'- 4" long, respectively, at the east and west ends. As noted previously, the Warren trusses on the Fifth and Sixth Potomac crossings differ from the 150' trusses used in the first four river crossings in that they are shorter, shallower, and narrower, and because the ties rest directly on the top chords instead of separate stringers. Thus, the width of the truss spans is 10' (between top chord centerlines). As in the other bridges, the lighter construction of the deck plate girder spans allows them to be only 7' wide. All five piers are concrete, and they support the deck of Bridge No. 1407 about 55' above the normal water level. Other details of the 125' Warren deck trusses and the connection of DPG spans to them are discussed in the description of the Second Potomac Crossing.

West of the Fifth Potomac Crossing, the roadbed sits atop another of the line's many high earthen fills. This one is heavily overgrown with weeds and high grass, and shrubs and saplings are gradually encroaching on the sides. The fill extends about 150' to meet the side of the hill that formed Bevan's Bend. The roadbed then travels briefly across a level spot in the hillside, which then rises again to a low peak about 20' above track level. The track passes through this hill in a cut, exposing the bright orange shale beneath its natural surface, and then emerges onto a short fill as the hillside drops to the river. This fill forms the eastern approach to the Sixth Potomac Crossing.

Bridge No. 1413, Sixth Potomac and C&O Canal Crossing

The Sixth Potomac Crossing, the westernmost of the six river bridges across the Paw Paw Bends, is very similar to the Fifth Crossing in design with four 125' Warren deck trusses and a deck plate girder span at each end. The bridge's overall length is 650', only 14' longer than the Fifth Crossing, but its two DPG spans have significantly different dimensions. Here, the east end span is 64' long, while the west end span, which crosses over Maryland State Road 51, stretches 79'. The DPG span over the highway still advertises the railroad it served for so many years with "WESTERN MARYLAND" painted in white block letters 2'-2" high, two letters per panel.

The roadbed continues west of the Sixth Potomac Crossing on a $^{2}/_{10}$-mile-long earthen fill over a high flood plain, skirting the edge of a pasture on the south side of the grade. This rather wide fill consists of earth that is mostly covered with low grass and shrubs. There are few encroachments and disturbances to the earth, except for a barbed wire fence that the neighboring farmer erected to keep his cattle off the west end of the fill.

Bridge No. 1416, Fourth C&O Canal Crossing

The 135'-long Bridge No. 1416 is a single Baltimore through truss with six panels. As in the First B&O Crossing, these panels are subdivided with short intermediate posts and diagonals that anchor additional floor beams. The truss is 24'-10" deep (between chord centerlines) and 16'-3 $^1/_2$" wide (between truss centerlines). The canal passes under the bridge at an angle of 54° from perpendicular, but the bridge is long enough to have abutments perpendicular to the track centerline that clear the canal prism and towpath. The vertical clearance under the bridge was approximately 25' to the canal's water level and 12' to the towpath. After crossing the canal, the line negotiates three moderate curves over the next mile. Near the west end of the third curve, the line crosses a substantial fill with a concrete culvert for a stream called Purslane Run.

Culvert No. 1423, Purslane Run Culvert

The Purslane Run Culvert is a 14'-0" diameter arch with a maximum height of 12'-4" and an overall length of 219'-1". The Western Maryland only built 83'-8" of the single-arch concrete structure. The eastern portion is a stone culvert built under the Chesapeake and Ohio Canal ca. 1848. The WM's western portion extends the contour of this older culvert under the railroad. Like the other WM concrete culverts along this line, the Purslane Run Culvert incorporates a 1-to-12 batter in its sidewalls.

A waiting shed and signal siding were once located at Kiefer's (milepost 142.28), so the roadbed is wider here. The siding's east end was less than $^1/_{10}$ mile west of Purslane Run, and the double track extended for 1-$^1/_3$ mile, most of which was a compound curve to the right that realigned the roadbed with the north bank of the Potomac River. This location was known as Fairplay. From this point, the roadbed runs along the canal's uphill (north) side for another 7 miles. After ascending a slight hill on the west end of Fairplay, the grade is level for 4 miles. However, more than half of the line between milepost 145 and 149 consists of moderate to sharp curves between 1° and 4°. The hillside above the canal is extremely steep for the first 2 miles, which necessitated the construction of concrete, cut-stone, and timber retaining walls over half the length to prevent the railroad's collapse into the canal. In some cases, there was so little space between the hillside and the canal for a bench that the retaining walls were built directly above the canal bed with telegraph and signal line poles located below the retaining walls and mere inches from the water's edge, while the rock faces were cut away to provide a right of way with the minimum practical horizontal clearance.

At milepost 146, the roadbed ascends a short grade as it approaches Town Creek, which was originally home to a siding that was lengthened in 1913, eight years after the Cumberland Extension opened, and a small depot that was removed many years ago. About a mile of the roadbed now serves as a recreational access road to the Town Creek Aqueduct on the canal, approximately 100' downstream from the WM's Town Creek Crossing.

Bridge No. 1474, Town Creek Crossing

Like the span over Sideling Hill Creek, the Town Creek Crossing is made up of deck plate girder spans, but is unusual in that it accommodated a second track. The original bridge, completed in 1905, measures 180' in total length. It has three deck plate girder spans canted to follow a 2° 30' curve, including an 80' center span with a depth of 8'-9 $^{3}/_{4}$", bracketed by two smaller spans with which it shares a pair of concrete piers. The shorter spans are 50' long x 6'-7 $^{1}/_{4}$" deep, and all three spans measure 7'-0" wide. Many of the bridge ties still exist, and they have wooden spacers between the top of the girders and the ties to achieve the curve's superelevation.

To support an extension of the Town Creek siding, a second bridge was erected in 1913, making this the only place on the Cumberland Extension where abutments and piers originally sized for two tracks actually received a second parallel bridge. While largely similar to the 1905 deck plate girder spans, the new spans had a different lateral bracing system, having X lateral bracing instead of W bracing which utilized 50 percent more interior panels. Also 7'-0" wide, these spans supported the track in the same manner as the original spans. For both bridges, the tops of their ties were approximately 34'-6" above the creek's normal water level.

West of the Town Creek Crossing, the line is on a fill that separates the canal basin and Town Creek, which flows parallel to the railroad for a short distance. The railroad likely constructed its fill on top of an existing canal earthwork that would have kept the canal and basin's water level at an elevation above the creek. The WM built a concrete-arch culvert through its new fill at milepost 147.5. This 10'-diameter concrete arch culvert measures 35'-11" high above the creek on its north side, creating a picturesque artificial waterfall into Town Creek.

As the creek turns uphill to the north, the adjacent ground rises gradually to meet the railroad, which ends the fill and puts the roadbed back on a bench above the canal. For the approximately 3-mile approach to Oldtown, the canal widens considerably, but the hillsides are not as steep in this area as they are around Fairplay. The roadbed rests largely on benches cut into the hillside, but it is only 5' or 6' above the canal. The roadbed diverges from the artificial waterway 2 miles before it enters Old Town and passes through a cut about 20' deep and $^{1}/_{2}$-mile long, curving to the north. The roadbed widens near the west end of this cut to accommodate the Oldtown siding. Between milepost 149 and 150.2, the roadbed crosses Long Farm Road and negotiates a 4° curves back toward the west. The beds of the main and side tracks are stepped, with the siding a few feet lower than the main track on the south side. The curved portions of both tracks are super-elevated. For approximately 1 mile east of Oldtown, the roadbed is on a fill across a broad, cultivated flood plain. Near the west end of the 4° curve, someone, presumably a local resident, dug out a substantial hole from the fill, probably for fill dirt used elsewhere. Just beyond it, a few sections of fence on the north side mark the site of a sawmill that once used the roadbed but no longer stands. This fill becomes shallow at its west end and then cuts across the side of a hill on a bench, with its downhill side facing south. Following this is another fill with a 6'-diameter concrete arch culvert that allows a small stream to pass beneath the railroad at mile 150.8. The west end of the passing track was directly above the culvert. West of the turnout, the roadbed remained roughly the same width to accommodate the Oldtown

team track. The station site and roadbed are just west of the fill on a bench across the side of a small knoll.

Oldtown[32]

Long before the construction of the railroad, Oldtown, Maryland was a prominent stop on the C&O Canal, with a large basin for canal boats and two locks. For the Western Maryland, Oldtown was the only location on the Cumberland Extension between Pearre and South Cumberland to have a full-service station building.[33] The Oldtown depot at milepost 150.94 was on the south side of the roadbed, along with several other railroad buildings that are no longer standing. Their locations are now marked by piles of wood studs, joists, and siding surrounded by heavy vegetation that approximates the edges of the buildings.[34] The roadbed through here is overgrown with tall grass and shrubs and very few trees. Several ties remain in place at the site of the station's team track, where local merchants and farmers could ship or receive freight.[35]

Through Oldtown the roadbed is on a fill of varying height from about 4' to 12' above the gently rolling landscape of its adjacent properties. The line is parallel to two roadways here, Maryland Route 51 on the uphill (north) side and Opessa Street (Oldtown's main thoroughfare) on the downhill side. At two locations where roads once crossed the track—one at grade, and the other through an underpass—the roads now pass through completely excavated sections of fill. The site of the depot, and much of the track itself, is overgrown with scrubby bushes and small trees, except for a 3'- to 4'-wide strip of exposed ballast down the center. The roadbed cuts through a thin stratum of yellow and gray shale that is eroding onto the track bed in places. At the west end of town, Opessa Street crosses the roadbed at grade. The roadbed continues across a field on an overgrown fill. Route 51 diverges to the north, paralleling the railroad for a short distance. The railroad grade curves slightly to the southwest for approximately 1 mile before rounding a 4° curve to turn almost due west at milepost 152.5, where it once again encounters the C&O Canal. This is also the location where the railroad, which has been on an ascending grade most of the distance from Town Creek, first exceeds 600' in elevation.

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[32] The Western Maryland track charts show the name as two words, but most other references show the name as one word.

[33] Town Creek had a station for a very short time, but it seems to have been removed prior to 1917.

[34] Field notes from the Interstate Commerce Commission's 1921 Valuation Survey of the Western Maryland along with accompanying photos taken in 1917 list the following structures at Oldtown: WS-2 sign, Stock chutes & fence & 18" vit pipe under pens, cinder platform area 25' x 100' & cinder inter track 5' x 120', WS-2 sign (2), pump house with crib for coal bin, powder house, valve pit, combination station with screenings platforms and curb, sump well, dam and pipe line, cinder driveway 10' x 350', coal house, GI covered oil box west end of station, water tank drip tub, drains & pipes under track, screenings area around tank & to rear, tool house and screenings platforms, tool house (old construction camp), toilet, and watch box used as telephone box with wood platform. See ICC Engineering Field Notes, Box 40, Folder 31, Sections 3-4, Record Group 134, National Archives and Records Administration-College Park, Maryland. Additional photographs from color slides taken during the 1950s show some of the structures and the layout at Oldtown. See William P. Price, *The Western Maryland Steam Album* (Potomac Chapter, National Railway Historical Society, 1985). Photos of the station complex are also located in WMRHS.

[35] The term "team track" refers to a public side track where customers without private side tracks would drive a wagon pulled by a *team* of horses or mules up to a freight car so they could transfer their goods from the car to the wagon, or vice versa.

From this point, which is about 2 miles west of Oldtown, all the way to Spring Gap, the railroad is on a bench cut above or beside the canal. It is directly adjacent to the canal and only a few feet above the water's surface for about 2 miles. High grass grows on the line here, with occasional small, scrubby conifers and a few hardwood saplings, resulting in a landscape reminiscent of the Atlantic coastal region. The vegetation is less dense and brushy since it is exposed to more sunlight than on any other part of the route. There is even some exposed, sandy earth. Details of infrastructure are less distinct here than at other places along the route. Only a couple of the telegraph poles are visible from the canal towpath; the remainder have fallen over or been removed.

The Potomac River and the canal turn west-northwest, and the railroad bed follows, gradually climbing uphill. It remains on a bench above the canal in many places and makes four or five digressions of gradually increasing length to cut through the noses of adjacent hills. A mile or so west of Spring Gap the hillside above the canal is so steep that the railroad cut is actually only a few feet away from the canal. Canal engineers exposed a sheer rock face decades earlier to make way for their artificial waterway, and railroad engineers carved a two-sided cut through the same formation, leaving a high, narrow rock wall between the two. The roadbed here is approximately 25' above the canal, and it climbs even higher approaching Spring Gap.

Bridge No. 1575, Oldtown Road Crossing

At Spring Gap, the railroad turns to the northwest, crossing Maryland Route 51. The overpass that carried the railroad over the highway here is no longer extant, but the remains of its skewed concrete abutments—following the sharp curve in the highway—still exist as knee-high retaining walls along the highway shoulder. Originally this was an I-beam span similar to the one at Polly Pond that measured 20'-4" long with a 20"-high I-beam. A larger concrete span that measured 53'-6" long, 29' wide, and 13'-6" tall replaced this in 1932. "Western Maryland Railway" was painted in the three rectangular recesses of the concrete girder. This span was removed ca. 1995 as part of a highway widening project.[36]

From Spring Gap to North Branch, the railroad is a considerable distance uphill from both the canal and the highway, although a series of locks on the canal bring the waterway closer to the railroad's elevation. The railroad, meanwhile, cuts through the noses of three major hills west of Spring Gap and several smaller ones. In between, it crosses the hollows on high fills, including one at Kirk Hollow, and again at the somewhat wider cove formed by Collier Run. Culverts at the bottom of each fill, and at several smaller watercourses, allow the hillside streams to pass through.

Approaching North Branch around milepost 159, the line parallels Maryland Route 51 on a bench cut into the steep hillside directly above the highway. A road widening project in the early 1980s cut into the railroad grade so that in places the roadbed is only a few feet wide. Here, the track is headed almost due north, parallel to the river. It proceeds on an abbreviated,

[36] See Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, "Western Maryland Railway Bridge (Spring Gap Underpass)," HAER No. MD-115.

carved-away bench, briefly crossing Moore Hollow on another high fill. Beyond Moore Hollow, the highway diverges from the railroad enough to afford the roadbed its full width again. At North Branch, the railroad grade originally curved west on a fill where Pittsburgh Plate Glass (PPG) Road joins MD-51. Major reconstruction at this intersection resulted in much of the fill being obliterated on the curve.

It is in this curve that the NPS property ends just east of milepost 160. For the next 5 miles, the Cumberland Extension passed through greater Cumberland on both private and public land, crossing the B&O, the C&O Canal, and the Potomac River several times. While detailed documentation of the Cumberland Extension west of North Branch was outside the scope of this project, some brief descriptive material follows to furnish context and provide a sense of the additional engineering challenges that had to be overcome to give the Western Maryland access to the Cumberland region.

The Cumberland Extension in the Cumberland Vicinity

Bridge No. 1601, Third B&O Crossing

The 169'-11"-long Bridge No. 1601 was built to cross the B&O line, which crosses the river just east of this location. The Third B&O Crossing consists of one through plate girder (TPG) span--termed "through" because its girder walls rise above the deck--that is 85' long and 108" deep with square corners, and two DPG approach spans, one 41' long and the other 35'-11" long. Both DPGs are 46" deep. As with the line's other through truss spans, the TPG span was necessary to provide adequate clearance for the B&O under the bridge. This bridge cost $14,193.37 to erect.[37] Intact track commences just short of the bridge, and continues across it to a group of turnouts that produce divergent tracks to an interchange with the B&O and a siding to the former Pittsburgh Plate Glass plant, as well as other industrial enterprises. CSX, corporate successor to the B&O, accesses the remaining customers on these tracks, which are only a few hundred yards at their longest, via the original B&O-WM interchange. This is the only section of the WM's Cumberland Extension west of Big Pool with active track still in place. It is, however, now rarely used.

After crossing the former B&O, the Western Maryland grade passes through a variety of properties. It cuts diagonally across the wide, flat bend of the river here in a northwesterly direction, mostly on a raised fill embankment. Construction of a power plant has obliterated a large section of the grade. At Mexico Farms, the WM grade is broken near the intersection of Mexico Farms Road and Burbridge Road.

Bridge No. 1610, Fifth Canal Crossing Abutments

Though only the concrete abutments remain today, this was the site of an 85'-long through plate girder bridge that crossed the canal. Unlike Bridge No. 1601, the upper end

[37] Western Maryland Railway Company Photograph BC-165, "No. 1601--North Branch-over B. & O, R.R.," 1917, in Photograph Collection, WMRHS.

corners of the 108"-high girder are rounded instead of square. WM built the bridge at a cost of $11,855.[38] The railroad grade continues west on a fill above the broad flood plain in the river bend, encountering the Seventh Potomac Crossing in less than a mile.

Bridge No. 1618, Seventh Potomac Crossing

This bridge is the first of four Potomac River crossings in the Cumberland area. All are much shorter than the river crossings at the Paw Paw Bends, consisting of multiple plate girder spans. The Seventh Potomac Crossing has four 112"-deep deck plate girder spans that total 382' in length. Concrete piers and abutments support the spans. Today the area around the bridge is heavily overgrown, while the bridge itself is completely devoid of ties and inaccessible from public roads.[39]

The north (railroad west) end of the Seventh Potomac Crossing puts the roadbed at the foot of an oxbow plateau in West Virginia. Initially undeveloped, the plateau has been occupied by the Greater Cumberland Regional Airport for several decades.[40]

Tunnel No. 1624, Welton Tunnel

The railroad passes through this oxbow plateau by way of a cut in the north-northwesterly direction and the Welton Tunnel, a 783.4'-long, single-track bore through the higher portion of the formation. Unlike the tunnels in the Paw Paw Bends area, Welton and the nearby Knobley tunnels are concrete lined. Construction of new roads, runways, and taxiways for the airport, including some Federal Aviation Administration-mandated fills, has obliterated the grade at the east portal of the tunnel. The portal reportedly still exists in a natural depression between the field's two longest runways, but the area is inaccessible to the public and verification was therefore not possible. The west portal has been sealed with concrete blocks, though the blocks have been partially broken out. This portal is set into a sheer rock cliff where a sharp bend in the river carved a vertical rock face out of the mountainside, making for a nearly-vertical drop from the tunnel portal to the riverbed. Less than 5' beyond the tunnel portal is the Eighth Potomac Crossing, whose eastern abutment was also built directly onto the rock face.

Bridge No. 1625, Eighth Potomac Crossing

The Eighth Potomac crossing is 382' long, and it consists of four 111"-deep deck plate girder spans supported by concrete piers and abutments. It was originally built for $39,762.59. Its southeastern half (railroad east) crosses the river, while the northwestern portion spans the flood

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[38] Several drawings and photographs provide evidence of the existence of Bridge No. 1610, including "Track Chart: Book #3: Cumberland to Hagerstown & Big Pool to Cherry Run" (1954 Western Md. Ry. document; reprint, Union Bridge, MD: Western Maryland Railway Historical Society, 2010), p. 6, and Western Maryland Railway Company Photograph BC-167, "No. 1610--West of North Branch-over C. & O. Canal," 1917. Both in WMRHS.
[39] Western Maryland Railway Company Photograph BC-168, "No. 1618--W. of North Branch--over Potomac River," in Photograph Collection, WMRHS.
[40] The "oxbow plateau" refers to the rise inside of a horseshoe-shaped river bend. The Potomac's horseshoe bends, or oxbows, east of Paw Paw occur as the river winds its way between the northeast-to-southwest running Appalachian ridges; this plateau is a low rise with a ridge-like spine near its center.

plain on the Maryland side. All but the westernmost hundred feet or so of the bridge is devoid of ties, but this bridge is far less overgrown than the Seventh Potomac Crossing.[41]

The Eighth Potomac Crossing puts the grade into South Cumberland on a fill adjacent to the City of Cumberland's Gene Mason Sports Complex. South Cumberland is located on yet another oxbow bend in the Potomac, with the C&O Canal paralleling the river on the Maryland side. Going across this bend largely on fill, the railroad crosses the canal twice. The first of these two crossings is about $^{1}/_{2}$ mile northwest of the Eighth Potomac Crossing.

Bridge No. 1628, Sixth C&O Canal Crossing

The Sixth C&O Canal Crossing is a single through plate girder measuring 89.2' long. Its girders are 108" deep with rounded top corners. This bridge retains its ties and guard timbers, but two steel channel pieces bolted to each end bar access. The bridge cost $11,520.10.[42]

Between the Sixth and Seventh Canal crossings, the grade is mostly intact, but it is employed for a variety of purposes because the adjacent property is mostly in private hands. The fill passes through a short section of dense growth and then crosses the city street grid for about four or five blocks. The roadbed passes between the backyards of adjacent houses on a fill. On the south side of the fill, the track is at about second-floor level, but on the north side of the fill, the natural terrain is higher so the track bed is only a few feet above the adjacent lawns. Since abandonment, many residents of this area have used portions of the roadbed as their own to build sheds, park vehicles, or simply extend their lawns.

No evidence of the Western Maryland station for South Cumberland at Virginia Avenue remains. A bulk fuel distributor has constructed a substantial corrugated metal building directly atop the grade on the west side of the street. Beyond the western end of South Cumberland's street grid, the grade curves slightly to the south, partially obliterated by newer construction along Canal Parkway, and crosses a short, overgrown fill. It is here that South Cumberland's other through plate girder canal crossing is located.

Bridge 1633, Seventh C&O Canal Crossing

Like the Sixth C&O Canal Crossing, the Seventh C&O Canal Crossing is a through plate girder bridge with rounded top corners and measures 108" deep and 84' long. This bridge also retains its ties and guard timbers, and it, too, has barriers to access. Past this crossing, the railroad crosses the flood plain on a roughly $^{1}/_{8}$-mile-long fill in a northwesterly direction to reach the Ninth Potomac Crossing.

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[41] I.C.C. Survey Photograph BC-169, "No. 1625--Potomac R--E. of South Cumberland," 1917, in WMRHS.

[42] I.C.C. Survey Photograph, "No. 1628--Over Potomac River--South Cumberland," 1917, in WMRHS.

Bridge 1635, Ninth Potomac Crossing

Basically identical to the Seventh Potomac Crossing, the Ninth Potomac Crossing is a four-span, 382'-long bridge, with 112"-deep deck plate girder spans on concrete abutments and piers. Here the Cumberland Extension returns to West Virginia yet again, where it encounters Knobley Mountain, which rises almost 1,200' above the roadbed, within 50' of the bridge's northwest abutment.

Tunnel 1636, Knobley Tunnel

Knobley Tunnel conveys the roadbed through Knobley Mountain in a 1,448'-long, concrete-lined bore. At the tunnel's west portal, the line passes through a cut, over which a concrete bridge carries Miller Road, and into the town of Carpendale, West Virginia.

During HAER fieldwork in 2009-10, the HAER field team noticed construction crews repairing the tunnel and regrading the right-of-way for a rail-to-trail project. This spur trail will allow hikers and bikers to access Carpendale through Knobley Tunnel and over the Ninth Crossing to the C&O Canal towpath.[43]

Maryland Junction

Milepost 164.1, located approximately $^{1}/_{10}$ mile west of the tunnel's west portal was the site of Maryland Junction and an interlocking tower (MY Tower).[44] At this point, the original Cumberland Extension curved to the northeast toward downtown Cumberland, and the milepost numbering continued to milepost 165.8, the current location of the Baltimore Street grade crossing north of the Cumberland passenger station.

Maryland Junction was the site of the junction of the WM's Thomas Subdivision with the Cumberland Extension. The area was home to two sizeable yards, both with roundhouses for servicing locomotives, and it became the operational center of the railroad's western end. MY Tower routed westbound trains to Ridgeley Yard (physically located northeast of the junction), the Cumberland Station, and the Connellsville Subdivision, or to Knobley Yard and the Thomas Subdivision, which turned southwest along the Potomac River toward the coal fields in the Elkins, West Virginia, region. The railroad's automatic block signal system for the West Subdivision ended just west of Knobley Tunnel, and a no-longer-extant interlocking plant at MY

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[43] The American Recovery and Reinvestment Act funded this West Virginia Department of Highways project in 2010. Cory Galliher, "Stimulus money to help finance Carpendale Rails-to-Trails," *Cumberland Times-News*, October 20, 2009, available at http://times-news.com/archive/x546406921, accessed February 7, 2011, and Megan Miller, "Verizon installs conduit in train tunnel," *Cumberland Times-News*, April 3, 2010, available at http://times-news.com/local/x1612525315/Verizon-installs-conduit-in-train-tunnel, accessed February 7, 2011.

[44] Interlocking towers control the movement of trains at junctions and multiple track crossovers through the use of interlocked track switches and signals. The tower operator can only set a track route once other conditions are met, such as the mitigation of interfering routings or the proper setting of manual signals to prevent conflicting train movements. On the Western Maryland, this was mostly manually controlled and mechanically actuated. Today, most interlocking plants are manipulated remotely by electronic controls and hydraulic, pneumatic, or electromechanical ones.

Tower controlled traffic through the junction. Knobmount Yard has been completely abandoned and its rails removed, while part of Ridgeley Yard remains in place serving as the yard and repair shop of the Western Maryland Scenic Railroad (WMSR), a tourist railroad that operates over a portion of the ex-Connellsville Subdivision.[45]

Bridge 1655, Mulligan St. Crossing

Between the north end of Ridgeley Yard at Light Tower and the Tenth Potomac Crossing into Cumberland, the line crossed Mulligan Street on a 50'-long through plate girder bridge. This bridge features a different design than the through plate girder bridges discussed above, and its proportions are substantially different as well. The plate girders are approximately 52" deep and of riveted construction, but they do not have vertical stiffeners on their exteriors. With the bottom of its stringers at approximately the same elevation as the bottom flanges of the plate girders, the level of the tracks across it is close to the vertical mid-point of the plate girders. This bridge was built to carry three tracks and is thus approximately 50' wide. The vertical clearance above Mulligan Street is approximately 15'. Its concrete abutments are vertical with angled wing walls. The WMSR currently uses this bridge, which now has two tracks.[46]

Bridge 1656, Tenth Potomac Crossing

Approximately $^{1}/_{2}$ mile northeast (railroad direction west) of Ridgeley Yard, the railroad crossed the river a final time on the Tenth Potomac Crossing. This bridge is 565' long, and it consists of six double-tracked, through plate girder spans with curved corners supported by concrete piers and abutments. It crosses at the confluence of Wills Creek and the Potomac River to connect Ridgeley Yard and downtown Cumberland. The three spans on the Maryland side of the river diverge from a straight alignment to accommodate a 10° left-hand curve that ends at the southern end of the Western Maryland Passenger Station platforms.[47]

Bridge 1657, Eighth C&O Canal Crossing

Bridge 1657, a four-span, 78'-6"-long concrete deck bridge spans the guard lock of the C&O Canal on the bank of the Potomac River that marks its western terminus. This double-track bridge was built with a concrete floor instead of the open decks featured on the other Cumberland Extension spans. The track rests on a ballasted roadbed across the bridge, a feature that allowed for precise alignment of the transition spiral on the north end of the 10° curve on Bridge No. 1656.

The tracks parallel Wills Creek but then enter the WM's Connellsville Subdivision and cross the creek approximately 600' north of the station, after which the line runs generally parallel to the west side of the creek through the Cumberland Narrows. The Connellsville

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[45] Pete Brown, "Ridgeley, Maryland Junction, and Knobmount," *The Blue Mountain Express* 33, nos. 3 & 4 (Fall and Winter 2004).
[46] Brown, *The Blue Mountain Express*, 11.
[47] For photos of the Cumberland passenger station, built in 1912, see Historic American Buildings Survey (HABS), National Park Service, U.S. Department of the Interior, "Western Maryland Railway Station," HABS No. MD-1318.

Subdivision right of way is generally identifiable most of the way to its terminal at Connellsville, Pennsylvania, but the WMSR's track only extends to Frostburg, Maryland.

Corporate History and Background

The sale of the Western Maryland Railway to George Gould's Fuller Syndicate in 1902 was one of the city of Baltimore's last efforts at superseding other Atlantic Coast ports in size and traffic density during the industrial age.[48] The city had a stake in the carrier from its inception and considered it a viable competitor to the city's other westward railroad, the Baltimore and Ohio. City officials agreed to the sale in order to facilitate the railroad's westward extension at the start of the twentieth century. Beset by expensive capital expenditures and underdeveloped market connections, the railroad struggled to serve the city and, ultimately, did not save it from being bested by competitors like Philadelphia. During its operational history, the WM did help Baltimore become a viable coal port and briefly set the standard for railroad construction in the region.

The Western Maryland Railway had as its most direct antecedent a small line built to connect Baltimore with farm communities to the north and west of the city. The original charter of the Baltimore, Carroll, and Frederick Rail Road dates to 1852, but the name did not last; a year later the Maryland General Assembly changed the name to the Western Maryland Rail Road. Construction began westward from Owings Mills in 1857 and continued for five years. The line reached Union Bridge before the Civil War interrupted construction in 1862. Interestingly, some public officials in Baltimore favored the railroad even then as a possible alternative to the B&O. While the war overshadowed other events at the time, city officials were becoming increasingly resentful of the B&O's monopoly on local and regional transportation. Mayor John Lee Chapman, elected in 1862, was at odds with B&O President John Garrett and often demonstrated favor for the WM. Still, construction remained at a standstill for the duration of the war.[49]

Three years after war's end, a former Confederate general named John Mifflin Hood assumed the presidency of the WM, and construction resumed in earnest. In 1872 the WM finally reached its original destination, Hagerstown. A year later, the company began working on its own route into Baltimore east from Owings Mills, replacing a connection to the port city

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[48] For information on the corporate history of the Western Maryland Railway, especially covering the relationship between the Western Maryland and B&O Railroad, the city of Baltimore, and the Fuller Syndicate, see the following sources: Ross Grenard and John Krause, *Steam In the Alleghenies: Western Maryland* (Newton, NJ: Carstens Publications, 1981), p. 5; Harold H. Williams, *The Western Maryland Railway Story* (Baltimore, MD : Western Maryland Railway, 1952); Roger Cook and Karl Zimmerman, *Western Maryland Railway: Fireballs and Black Diamonds* (Laurys Station, PA: Garrigues House, 1992); Stover, *History of the Baltimore and Ohio Railroad*; Brigham, *From Trail to Railway*; and "Western Maryland's Future," *The New York Times*, June 28, 1902, available at http://query.nytimes.com/mem/archive-free/pdf?res=9C0CEFDB113BE733A2575BC2A9609C946397D6CF, last accessed October 5, 2010.

[49] "Western Maryland Railroad Collection, 1857-1961 [Maryland Historical Society website]," available at: http://www.mdhs.org/library/mss/ms002190.html, last accessed October 19, 2010.

on a branch of the Northern Central Railway. The first Western Maryland trains arrived in Baltimore in 1875.

For the next twenty-five years, the railroad expanded enough to begin carrying some through traffic. Through acquisitions and new construction, it gained two lines into Pennsylvania, which gave it connections to Harrisburg, Gettysburg, and York, and thus some bridge traffic from connections in those cities. More significantly, it also expanded west. In 1892, the Western Maryland Rail Road built the Potomac Valley Rail Road, which ran west from Hagerstown to Big Pool. Here, it connected to the C&O Canal. From Big Pool, the railroad crossed the Potomac to Cherry Run, West Virginia, and a connection with the Baltimore & Ohio Railroad. These two connections provided it with its first high-revenue through traffic, taking coal from the west to the city of Baltimore.[50]

When Hood resigned in 1902, the railroad's direction changed, reflecting a renewed interest on the part of Baltimore's city leaders to increase transportation competition to the west, especially against the B&O. An industrialist's dream of a transcontinental railroad with Baltimore as its eastern terminal emerged as a possible solution to the competition problem.

It was this vision that resulted in two major extensions to the WM, brought it up to the high standards that it became known for, and transformed it from a regional farm-products hauler into a through trunk line in competition with the B&O and other major systems. The industrialist behind the vision was George Gould. Funding for a private acquisition of the line's publicly-held stock and extension of the railroad to the west came from this speculator who had the backing of Baltimore's political leadership. The first extension followed the city of Baltimore's sale of its controlling stock to the Fuller Syndicate on May 7, 1902. Investor Edward Laton Fuller organized the syndicate, which included Gould as its president as well as Myron T. Herrick, former governor of Ohio; Joseph Ramsey, president of the Wabash Railroad and a former executive of the Pennsylvania Railroad; and Alvin W. Krech, a vice-president of the Wheeling and Lake Erie Railroad.[51] Its primary purpose was purchase and expansion of the Western Maryland.

Gould was the son of industrialist Jay Gould, who had assembled a series of railroads in the Midwest, Great Plains, and Rocky Mountain states, as well as the Erie in the east.[52] Jay Gould was a major player in the growth of railroads in the United States for most of the latter part of the nineteenth century, particularly in the west, as he worked to fulfill his vision for creating a transcontinental rail network. Jay Gould aggressively cut freight rates and formed his ever-changing holdings into a group of competitive trunk lines to create stiff competition with other western railroads. The lines that he controlled lent themselves to the possibility of a coast-to-coast system; one of his main holdings (which his son did not inherit) was the Union Pacific, one of two companies that, in the late 1860s, built what is popularly called the first

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[50] Richard Parks, "An Eastern Regional Railroad of the 1930's - 1940's: Western Maryland Railway," available at: http://www.r2parks.net/WM.html, last accessed October 19, 2010.
[51] Thomas, *In Terrain of Empire*; and Burgess and Kennedy, *Centennial History of the Pennsylvania Railroad Company*.
[52] For information on Gould, see Grodinsky, *Jay Gould: His Business Career*.

transcontinental railroad—an endeavor to connect the Missouri River with Sacramento, California, authorized by President Lincoln. However, since Jay Gould's primary activities centered on maintaining financial solvency on the stock market and maneuvering around his competition with rate adjustments, a truly transcontinental system never materialized. He passed away in 1892, leaving his holdings in a trust for his six children, including George—an arrangement that later led to controversy in the family as George Gould overspent his loans in the course of building new railroads like the WM.

The younger Gould took his father's transcontinental vision a step further, making the task of bringing it to fruition his primary objective. Jay Gould apparently had envisioned the Western Maryland as a link in an amalgamated transcontinental route made up of two of the lines that he later passed on to his children, the Wabash Railroad (Wabash) and the Missouri Pacific Lines (MP), with other lines not yet constructed providing the westward links. His son proceeded with the idea and developed the final plan. Through the Wabash, George Gould acquired control of the Denver and Rio Grande Railroad (D&RG) in 1901. Combined, the Wabash, MP, and D&RG connected Salt Lake City with Toledo, Ohio, on Lake Erie. The D&RG connected Salt Lake City to Denver, while the MP traveled east from Denver, linking up with the Wabash at St. Louis. The Wabash went east from St. Louis into Ohio.[53] With the D&RG fully under his control, Gould organized the Fuller Syndicate, which acquired the Wheeling and Lake Erie. The W&LE connected to the Wabash at Toledo and brought his network within 60 miles of Pittsburgh. With these linked lines, George Gould needed only to link Salt Lake City to the Pacific Ocean and Pittsburgh to the Atlantic with the new railroad. This vision would have produced the country's first true transcontinental railroad route. Pursuing it aggressively, Gould continued to acquire or build additional railroads to connect his father's lines with the oceans. One of these acquisitions was the WM, which only needed the approval of Baltimore's city fathers.

Gould's proposal to acquire the WM was favorable to the City of Baltimore for three reasons: it included concrete proposals for expansion into the Port of Baltimore and to the west, the bid came in the form of an upfront cash payment, and it came with an offer to assume the company's outstanding debts to the city of Baltimore.[54] In the late nineteenth century "the Western Maryland continued to struggle with debt and Baltimore continued to bail it out…by 1902 the Western Maryland Rail Road owed the city almost $9 million."[55] This debt gave the city its controlling stock, but the city wanted the stock back in private hands. Gould successfully outbid the three other proposals which, while they offered higher prices, did not always offer payment upfront and did not directly address the issue of the debt.[56] Perhaps just as importantly, the other bids would have made the Western Maryland part of other, larger systems. An independent route was a priority for Gould, as it was for the city

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[53] See Grodinsky, *Jay Gould: His Business Career*.
[54] Harold H. Williams, *The Western Maryland Railway Story* (Baltimore, MD: Western Maryland Railway, 1952), also available online at http://railsandtrails.com/WM/WMStory1952/, last accessed October 5, 2010.
[55] E.M. Killough, *A History of the Western Maryland Railway Company Including Biographies of the Presidents* (Baltimore: Western Maryland Railway, 1940).
[56] See Killough, *A History of the Western Maryland Railway Company*; and Williams, *The Western Maryland Railway Story*.

The idea of building an independent route to the West was not a new idea in Baltimore; other proposals had come forward but not come to fruition. The Baltimore and Ohio had long ago linked Baltimore to Cumberland, and merchants in the port city might, perhaps, have longed to improve rates through competition by building a new route. In 1864, the mayor of Baltimore, at the behest of a group of coal companies, authorized a survey of a route through the Potomac Valley. Another proposal apparently surfaced in the 1890. As reported in the *Hagerstown Daily Mail*, the Maryland legislature was reviewing a bill "enlarging the powers of the Baltimore and Cumberland Railroad [to build a line] east to Hagerstown."[57] The paper went on to speculate that the new line could interchange with the Western Maryland there or extend on its own to Baltimore. City residents may also have resented the Pennsylvania Railroad's ownership of the B&O. Yet another piece of evidence, a map associated with a 1913 property conveyance from a local landowner to the B&O in West Virginia at Bevan's Bend, near Paw Paw, indicates a right-of-way for a Potomac Railroad that first crosses, then parallels, the B&O. This may have been an earlier surveyed route, or based on a written note on the map indicating a 1902 sale, one of several routes considered by Western Maryland engineers; regardless, it is a railroad that was never built.

Thus, while several came forward, no proposals for a railroad to compete with the B&O from Baltimore to Cumberland came to fruition until the Fuller Syndicate intervened. "The Baltimoreans righteously indignant over the recent acquisition of their Baltimore & Ohio by the Pennsylvania Railroad which was the chosen instrument of their arch-rival Philadelphia were delighted with this golden opportunity to make their city the eastern terminus of Gould's system."[58] One of the proposals competing with Gould's bid came from another Philadelphia carrier, the Philadelphia and Reading. The Baltimoreans were apparently not interested in that one, either.[59]

When Gould stepped in, the City of Baltimore was ready to sell its share of the Western Maryland. Baltimore had largely funded the railroad through stock subscriptions, loans, and city guaranteed mortgages.[60] It wanted to be free of its interest in the railroad and begin collecting on its debt. Even with the divestiture, though, the city sought a scheme that could advance its position as a seaport through construction of a direct, modern link to the west. Gould's proposal, a transcontinental route, was the ultimate possibility. The city seems to have picked the Gould proposal mainly because of this independence, stating in its contract,

> no title shall vest in the purchaser or purchasers of stocks of the Western Maryland Railroad if sold to a railroad company now controlling, owning, or operating any line or system of lines centering, terminating, or operating in the cities of Baltimore or Philadelphia…The mayor and city council of Baltimore shall be entitled to institute legal proceedings to inquire into any such sale [and] annul, cancel, and prevent the violation of this ordinance.[61]

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[57] "Railroad Extension," *Hagerstown Daily Mail*, February 19, 1892.
[58] Grenard and Krouse, *Steam in the Alleghenies*, p. 3.
[59] Killough, *A History of the Western Maryland Railway Company*.
[60] Killough, *A History of the Western Maryland Railway Company*.
[61] Williams, *The Western Maryland Railway Story*, p. 91.

Clearly, Baltimore's political leaders wished to create railroad competition to the west, not reduce it. The Fuller Syndicate initially bid $8,509,820.00, then upped its bid to $8,751,370.45, plus the city's debt payoff.[62] In the end, it paid $8,631,470.45 for the stock to several Baltimore banks who forwarded the money to the city, in addition to a deposit of $500,000 on a $3 million guarantee to build Tidewater port facilities.[63]

Once the sale agreement with Baltimore was complete, the mayor "sent a letter to each of the Directors representing the city on the board, requesting that they tender their resignations to the new owners of the property."[64] A temporary board was appointed in June 1902, and control of the railroad was given to Henry Bishop until the syndicate completed purchase of the West Virginia Central and Pittsburg Railway (WVC&P) and consolidated it into the Western Maryland. This board included former president John M. Hood and Edwin Gould (George's brother), as well as Winslow S. Pierce, H.B. Henson, Lawrence Green, W.H. McIntyre, Leon Greenbaum, George R. Gaither, and S. Davies Fairfield, joined by F.S. Landstreet representing the WVC&P. Stockholders elected Gen. Thomas J. Shyrock, George B. Baker, and Charles W. Slagle to represent them. Once the board assumed permanent control, Pierce became its president. Gould went to work on extending the route.[65]

The two extensions that Gould built as part of his purchase agreement made good on his intent to turn the railroad into a westward trunk line. Known as the Cumberland Extension, the first addition was finished in 1906. Before its completion, the Western Maryland's major western termini included Williamsport, Maryland, where it interchanged coal brought east on the C&O canal, and a place called Cherry Run, West Virginia, on the banks of the Potomac, where the Western Maryland interchanged with the B&O.[66] The Western Maryland board of directors passed an order for construction of an extension to the west in early 1903 after the B&O declined to grant the Western Maryland the rights to use its line from Cherry Run to Cumberland. This was a key turning point in the railroad's planning. One historian commented on the Western Maryland board's dramatic response, "a cheaply built road would never challenge the B&O, so Gould's engineers built a B&O killer, with lower grades, broader curves, and fewer miles, 254.2 vs. 282.5, between the common end points of Baltimore and Connellsville."[67]

The work proceeded under the presidency of Winslow S. Pierce, whose association with the Goulds dated to 1885 when he began working for the Missouri Pacific Lines (MP) as an assistant to general counsel. In 1892 he was promoted to General Attorney for MP as well as its main subsidiary, the Texas and Pacific Railway. His duties expanded in 1891 to include a position as general counsel for the St. Louis-Southwestern Railway and the Wabash Railroad, two more properties that Gould could test him on. By the turn of the century, Pierce was well-

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[62] Williams, *The Western Maryland Railway Story*, p. 91.
[63] "Western Maryland's Future," *The New York Times*, June 28, 1902.
[64] Killough, *A History of the Western Maryland Railway Company*, p. 12.
[65] "Western Maryland's Future."
[66] Leilich, "The Western Maryland: A Corporate History", and Williams, *The Western Maryland Railway Story*.
[67] Tom Biery, "Underdogs Really are Better: Western Maryland: Cumberland, MD., 1973," *Trains Magazine* (February 2004), p. 63.

established as a railroad lawyer and had earned Gould's trust. He became president of the Western Maryland (WM) in 1902, left for a year, and then returned to the position, also assuming chairmanship of the WM's Board of Directors, in 1904—the year that construction began on the Cumberland Extension.[68]

Under Gould and Pierce, the company assigned its chief engineer, J. Q. Barlow, to the task of surveying potential routes, selecting the best one, and constructing it across Washington and Allegany Counties (see Construction and Technology section of this report for additional information on the route selection). Barlow's job was not an easy one.

> The physical union of the Western Maryland and [Cumberland] at first seemed impracticable, because nature and the works of man (the mountains and the C&O Canal) had produced a combination of obstructions between these two roads which it was not believed even twentieth century engineers could overcome. There were high mountains to tunnel and long bridges to erect over the winding Potomac, and in addition the Canal and the National Turnpike seemed to close in on the right of way.[69]

The Cumberland Extension served as the first step in completing a link to other Gould-controlled railroads in Pittsburgh; the Connellsville Extension, begun in 1907 from Cumberland to Connellsville, Pennsylvania, was the second.

Unfortunately, financial troubles brought the work to a halt. The company had overextended itself in its zeal to make good on its promises. On October 17, 1902, the railroad entered into an agreement of credit with the Bowling Green Trust Company of New York (Bowling Green), where the latter company loaned the railroad $50,000,000 in the form of bonds, bearing an annual interest of 4 percent per year. Almost immediately, Gould began acquiring other railroads and incorporating them into the Western Maryland system, making good on his pledges to extend the railroad westward, improve the existing line, and add new port terminal facilities in Baltimore. A 1917 mortgage refinance agreement between Western Maryland and the Bankers Trust Company of New York (Bankers) referenced a loan dating back to October 1, 1902, under Bankers' predecessor company, The Mercantile Trust Company of New York, also in the amount of $50,000,000, and refinanced once before in 1905.[70] Whether this is the same as the Bowling Green agreement, or whether it was a separate indenture (which would total the railroad's obligations to $100 million!) is not clear.

The railroad used $42,518,000 of its Bowling Green loan, making payments on the interest in the meantime. Still, costs steadily added up. Although some of the acquisitions provided additional revenue, the leftover debts that Gould took over from the City of Baltimore,

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[68] Williams, *The Western Maryland Railway Story*; and George H. Burgess and Miles C. Kennedy, *Centennial History of the Pennsylvania Railroad Company: 1846-1946* (Philadelphia: The Pennsylvania Railroad Company, 1949).
[69] Williams, *The Western Maryland Railway Story*, p. 56.
[70] Washington County Circuit Court (Land Records) [MSA CE 18-101] EO 151, April 1917, pp. 0150-0153, available in the Office of the Lands Manager, CHOH.

combined with the cost of acquisitions, and—especially—the extremely high cost of building the Cumberland Extension, proved more than the company could handle. On April 1, 1908, the Western Maryland Railroad Company defaulted on its interest payment of $200,000. It defaulted on the same amount twice more in quick succession, on October 1, 1908, and April 1, 1909. The Equitable Trust Company of New York (Equitable), successor to Bowling Green, took the railroad to court. Foreclosure proceedings began on June 14, 1909, and ended on June 27. A Federal court removed the railroad from Gould's hands, and on October 9, Equitable issued a Foreclosure Decree bearing the terms under which potential receivers could bid on the company. Bidders were required to place $250,000 down and had to place minimum bids of $6,500,000, payable in four installments at thirty, forty, fifty, and sixty days from the award date.

The final award date is not recorded, nor is the name of the final bidder. However, in his 1940 history of the company, Edward M. Killough indicated that Gould had originally acquired the Western Maryland with the assistance of the Rockefellers. In his 1952 history, Harold H. Williams indicated that "Rockefeller"—likely John D. Rockefeller, Sr.—owned a controlling interest in the company before the I.C.C. re-awarded it after World War I.[71] The elder Rockefeller was probably a receiver and primary financier of the reorganized company in 1909 as well. It is not clear how the receivers paid off the debt, but the 1913 Annual Report shows a line for mortgage bonds valued at $46,633,000.00, payable at 4 percent interest, scheduled to mature in 1952, and assumed by the Western Maryland *Railway* Company on behalf of Western Maryland *Rail Road* Company—the company organized by the Fuller Syndicate and turned over to the receivers five years prior.[72]

In the turbulent years surrounding the foreclosure of the Western Maryland, Gould also lost control over several other railroads. The continued losses apparently made his brothers and sisters—co-owners of the trust inherited from their father—quite upset. According to a 1925 article, "[George Gould's] brothers and sisters are trying to recover $30,000, which they say he lost from the estate by mismanagement, from his ten children."[73] Indeed, as a result of his investment and construction activities between 1901 and 1907, Gould managed to lose the Western Maryland, the Western Pacific, the Missouri Pacific and its subsidiary Texas and Pacific, the Denver and Rio Grande, and the Wabash Pittsburgh Terminal to receivership. Gould remained a member of the Board of Directors for the reorganized company at least as late as 1913, even serving on the executive committee, but none of his old associates from the Missouri Pacific remained, and ownership was no longer with the family. Only the St. Louis-Southwestern, not part of the transcontinental scheme, remained in the family after 1916, when his siblings sued him for mismanagement, wresting control of what was left away from him for good.[74]

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[71] Killough, *A History of the Western Maryland Railway Company*; and Williams, *The Western Maryland Railway Story*.
[72] The Western Maryland Railway Company, *Fourth Annual Report for the Year Ended June 30, 1913*, p. 19, in MS 2190: Western Maryland Railroad Collection, Maryland Historical Society, Baltimore, Maryland (hereafter cited as MHS).
[73] "The Goulds Are Going," *Time Magazine* (March 23, 1925), available at http://www.time.com/time/magazine/article/0,9171,881484,00.html, last accessed October 19, 2010.
[74] "The Goulds are Going."

Gould was not exceptional in seeking to build a modern and advanced railroad, but it was the available capital relative to the line's high cost of construction that prevented his vision from being realized. Railroads contemporary to the Cumberland Extension were built to similar standards and old ones—notably, the Pennsylvania—were brought up to date with major construction and realignments. The Western Maryland was just simply an expensive railroad. A line that ranged between 30' and 60' above the flood plain and that required nearly continuous digging through and rearrangement of the upturned bed rock was considerably more expensive than a similarly-modern line through more agreeable terrain. The work consumed Gould's capital faster than his workforce could dig through the upper Potomac Valley landscape.

Still, it was a grand vision. Although never completely materialized, Gould's plan would have connected the WM to his own system and completed his transcontinental route. If fully realized, Gould's system could have been a real competitor against the existing, major eastern systems. The largest two were the Pennsylvania Railroad (PRR) and the New York Central System (NYC). The former was a state-funded public works project that, after completion, fell under the control of a collection of Philadelphia businessmen with strong ties to coal and steel in western Pennsylvania. A succession of railroad presidents served as the project's unified front. Its original main line connected Philadelphia to Pittsburgh in the 1840s, but by serving lucrative coal mines and steel mills, plus the agriculturally-rich regions of central Pennsylvania, it quickly grew. Shrewd management allowed the railroad to expand its territory to serve New York, Baltimore, Washington, Detroit, St. Louis, Louisville, Chicago, and nearly all of Pennsylvania, Ohio, and Indiana by the 1870s.

The New York Central Railroad grew into a vast network under the Vanderbilts, and it was the Pennsylvania's biggest competitor. The system was a successor to the 1830s-era Mohawk and Hudson Railroad (M&H) connecting Albany and Schenectady. This tiny company expanded into a line that traveled up the Hudson Valley from New York City, then west on the old M&H route and beyond to Buffalo, Cleveland, and Chicago, with another line to Columbus, Cincinnati, and St. Louis. Major subsidiaries connected it to Boston, Charleston (West Virginia), Peoria, and a substantial part of southern Michigan. One of its most lucrative subsidiaries, the Pittsburgh and Lake Erie (P&LE), connected the NYC to Pittsburgh, providing the PRR with some of its fiercest competition.

Other eastern lines also competed for east-west trade. E.H. Harriman was most famous for financing the Southern Pacific and Union Pacific lines in the late nineteenth century, but he was also responsible for unifying the Erie Railroad (previously a Jay Gould property), which connected northern New Jersey and Chicago by cutting across the northeast tip of Pennsylvania to Buffalo and then following a route across Ohio and Indiana about 100 miles inland from the Great Lakes. The Erie's closest competitor was the combined routes of the Delaware, Lackawanna, and Western Railroad, and the predecessors to the New York, Chicago, and St. Louis Railroad (Nickel Plate Route), which connected Hoboken and Chicago by way of Scranton, Buffalo, and Cleveland. To the south, the Norfolk and Western Railway and the Chesapeake and Ohio Railway competed to connect the Tidewater Virginia seaport cities of Norfolk and Newport News with the Midwest, doing lucrative business in hauling Pocahontas

coal from western Virginia, southern West Virginia, and eastern Kentucky to coastal and Great Lakes ports.

The Baltimore and Ohio was the oldest of the east-west lines across the Appalachians, and the Western Maryland's closest competitor. Its ownership, and the stock that it controlled, reflected the sometimes complicated relationships between the railroad companies. Originally established in 1828 under a State of Maryland charter, the B&O's original route was completed during the 1830s and 1840s across Maryland to Point of Rocks; it then crossed the Potomac River at Harper's Ferry and followed the Potomac's southern shore to Cumberland. From there the line proceeded west of the Alleghenies to Grafton, where lines diverged to Wheeling and Parkersburg. A branch line built from Baltimore to Washington, DC, completed in 1835, gave the B&O access to the national capital. After the Civil War and West Virginia statehood, the line expanded in many directions: west from Washington to Point of Rocks, and Parkersburg to Cincinnati; north from Baltimore to Philadelphia, and northwest from Cumberland to Pittsburgh and Chicago. As its line around Pittsburgh proved circuitous, the B&O later formed an agreement with the P&LE to operate through Chicago trains over the latter's line from Connellsville, Pennsylvania, to Youngstown, Ohio. Since the PRR owned a controlling stock interest in the B&O by then, it took Interstate Commerce Commission intervention to enact the deal on the New York Central-owned company's tracks.[75]

These major east-west rail carriers competed or cooperated in east-west traffic as geographic, economic, and political conditions necessitated it. Together, the officials of these carriers saw George Gould's proposal as an obvious threat, but the management of the PRR and the B&O were especially concerned. Gould was building a modern railroad that, as a transcontinental system and a regional trunk, could have cut into a variety of markets. His Western Maryland Rail Road was a direct, almost mile-for-mile competitor to the B&O all the way from Baltimore to Connellsville, and especially in the upper Potomac Valley, where the Cumberland Extension was being built.

While the B&O was a close competitor, the PRR had even more at stake. The PRR had a contentious relationship with Jay Gould, George's father, after he unsuccessfully threatened to destroy the PRR system in 1869 and then spent the remainder of his life building the empire of railroads that his son would inherit. At the dawn of the twentieth century, this empire became a renewed threat to the PRR. One alarming sign of trouble for the PRR was George Gould's purchase of the Wheeling and Lake Erie from another portion of his father's estate in 1901. Andrew Carnegie, who undoubtedly saw a chance to create a competitive environment and more favorable freight rates for his Carnegie Steel Company, allegedly supported the acquisition.[76]

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[75] Alexander J. Cassatt was elected president of the PRR in 1899 and worked with New York Central officials to effectively raise freight rates by curtailing the practice of issuing rebates to major shippers. They did this by obtaining controlling stock interests in a number of Northeast and Mid-Atlantic trunk lines. Cassatt purchased B&O stock in 1899, 1900, and 1901, resulting in four PRR positions on the B&O board and control of the company. In May 1901, the PRR-controlled board requested the resignation of B&O president John Cowen and subsequently appointed Leonor F. Loree, whose first job had been as a rod man on a PRR survey crew, in his stead. For more detailed information, see Stover, *History of the Baltimore and Ohio Railroad*, pp. 194-197.
[76] Burgess and Kennedy, *Centennial History of the Pennsylvania Railroad Company*.

Shortly before turning his properties over to the U.S. Steel Corporation, he entered into an agreement with the syndicate that stated the steel company's subsidiary Union Railroad would interchange with the W&LE and thus route a quarter of all of Carnegie's westward steel traffic over the Gould-controlled line. The Pittsburgh Coal Company also supported the Fuller Syndicate until its existing westward connections persuaded it otherwise. Still, Carnegie's agreement stood, and if this was not enough of a threat to the PRR's stronghold on the Pittsburgh steel trade, two of Gould's lines would have encroached directly on its territory.[77] One was the Western Maryland, running southeast up the Monongahela Valley; the other was the Wabash Pittsburgh Terminal, a subsidiary of the Wabash Railroad that Gould planned as the Western Maryland's western connection, running from Pittsburgh to the north and west. An alternative scheme would have avoided Pittsburgh altogether by connecting the W&LE at Zanesville, Ohio, with the West Virginia Central & Pittsburg (newly absorbed into the Western Maryland) at Belington, West Virginia. Gould probably recognized the potential of the steel mills along the Monongahela as customers and that constructing a line to them would provide competition to the PRR so he decided to build toward Pittsburgh instead. The Wabash Pittsburgh Terminal began operating into Pittsburgh in June 1904 but went into receivership in 1908 before completion.

Meanwhile, the Pennsylvania Railroad began legal proceedings against the Fuller Syndicate in 1904—likely on anti-trust grounds. These were not successful in stopping the scheme, but the PRR was also fighting back in other ways. In 1902 it chose not to renew its contract to have the Gould-controlled Western Union Telegraph Company operate the telegraph lines along its rights-of-way and had them evicted with the support of the Federal Circuit Court the following year. They formed a new contract with the Postal Telegraph Company instead, which was no small loss for Gould, who had telegraph lines over the entire PRR network, by then the largest railroad (in route-miles) in the world. The PRR forcibly removed these lines, along with the revenue that they earned. More importantly for Gould's expanding rail system, the PRR had quickly reacted to Gould's agreement with Andrew Carnegie the year before. The PRR approached the steel magnate and renegotiated its relationship with Carnegie Steel, which did not lead to elimination of Carnegie's agreement to connect the Wabash Pittsburgh Terminal to the Union Railroad but did prompt the Carnegie interests to assert successfully that the percentage shipment agreement was legally unenforceable.[78] This was a loss of important potential revenue for Gould, whose quickly-mounting construction debt could ill support it.

The Wabash Pittsburgh Terminal was planned concurrently with the Cumberland Extension, and its engineering costs bore a striking resemblance to the Western Maryland. As Thomas describes,

> the entire sixty-mile route from Steubenville, Ohio, to Pittsburgh was spectacular, running almost entirely on high bridges or through long tunnels. But, at $35,000,000, it was also stunningly expensive—one of the costliest railroads ever built in the United States.[79]

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[77] David R. Sweetland, *Western Maryland in Color* (Kutztown, PA: Morning Sun Books, 1995).
[78] Burgess and Kennedy, *Centennial History of the Pennsylvania Railroad Company*, p. 515.
[79] Thomas, *In Terrain of Empire*. p. 36.

Other historians have placed the cost as high as $45 million, or $750,000 per mile.[80]

Construction costs like this brought down Gould and the Fuller Syndicate. The Cumberland Extension incurred some of the largest debts, costing $13 million. The syndicate also incurred litigation expenses in fighting the PRR and others. The increasing costs were due to changes to the scope of work on the Cumberland Extension after unanticipated difficulties drove up construction costs. In addition, other extensions to Gould-controlled railroad lines in the Midwest and the West placed formidable expenditures on the books. As costs mounted, one after another of the Fuller Syndicate railroad companies fell into receivership. When the Panic of 1907 made any additional capital unavailable, the Fuller Syndicate snapped.[81]

Nevertheless, out of Gould's hands and under a reorganized company now called the Western Maryland Railway, the Connellsville Extension was completed in 1912. In addition to the extensions, the expanded system now included a new coal loading terminal on Baltimore's waterfront, called Port Covington, and a number of existing WM routes had been upgraded to match the standards of the new line.[82] The receivers appointed a former company officer named Benjamin F. Bush to be the line's new president, a position he had previously held, in 1907. As a former fuel agent for the Missouri Pacific Lines, Bush was a longtime associate of Gould's. Bush finished the Connellsville extension, thus completing part of Gould's vision.[83]

Instead of connecting to the now-aborted Wabash Pittsburgh Terminal, however, Bush signed an agreement at the start of construction to connect with the Pittsburgh and Lake Erie, controlled by one of Gould's competitors—the New York Central. This connection was enticing to the New York Central because,

> [the combined] route provided the shortest distance between Baltimore and Pittsburgh, Cleveland, and Toledo, gateway to Detroit. Only the Pennsylvania Railroad offered a shorter Baltimore-Chicago route, but the Western Maryland link provided easier grades and wider clearances.[84]

Notably, the Western Maryland's route was actually the shortest east of Pittsburgh (another reason that it ruffled feathers among its competitors). It was only later that the similarly-direct Wabash Pittsburgh Terminal, reorganized as the Pittsburgh and West Virginia, reached Connellsville to connect with the Western Maryland in 1931. By then the transcontinental dream was decades gone, and the P&LE continued to be the main western funnel into the Western Maryland.[85]

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[80] Thomas, *In Terrain of Empire*; Biery, "Underdogs Really Are Better"; Cook and Zimmerman, *The Western Maryland Railway*; and Sweetland, *Western Maryland in Color*.
[81] Thomas, *In Terrain of Empire*; Biery, "Underdogs Really Are Better"; Cook and Zimmerman, The *Western Maryland Railway*; and Sweetland, *Western Maryland in Color*
[82] For more on Port Covington, see Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, "Port Covington Terminal, Coal Pier No. 4," HAER No. MD-75.
[83] Burgess and Kennedy, *Centennial History of the Pennsylvania Railroad Company*.
[84] Thomas, *In Terrain of Empire*. p. 38.
[85] Cook and Zimmerman, *The Western Maryland Railway*.

Nevertheless, the Western Maryland managed to survive for seven decades. It also set a precedent for construction that its competitors quickly followed, but not before those competitors fought its advance. In fact, the Cumberland Extension was a feat theretofore considered impossible. The competition looked upon the plan with a combination of trepidation and smug humor. At the time, the B&O was controlled by the Pennsylvania, which stood to lose traffic to a potential cross-country competitor. Its president, Leonor F. Loree, offered his opinion on the proposed Western Maryland route. "Mr. L.F. Loree reported to Mr. A.J. Cassatt, President of the Pennsylvania Railroad that it would be impossible to build a line paralleling the B&O through the Potomac Valley and that the WM was virtually pocketed."[86]

Among the tactics that the B&O used to thwart the competition was its purchase of controlling stock in the C&O Canal Company.

> As is well known, the Baltimore and Ohio Railroad Company has been the mainstay of the canal for more than a dozen years, not that it loved the canal, but because by maintaining its grip through successive trusteeships it was in position to keep it out of the hands of those corporations which sought possession of its banks as a railroad bed. Had they been successful the Baltimore and Ohio would have had a most formidable competitor in coal traffic…which is its very life blood.[87]

The canal company, under B&O ownership, went so far as to institute legal proceedings against the Western Maryland's attempts to gain right-of-way across canal land. As events turned out, the Gould interests built the line well above the canal's water level. This was accomplished partly with the backing of Maryland officials who wanted to see to completion a line competitive with the B&O and partly through the investment of enormous sums of borrowed capital.

This short, level route was important because, if properly marketed, it could give the Western Maryland and Gould's proposed transcontinental system a decided advantage in speed over its larger, more well-established competitors for through traffic between the Midwest and the eastern seaboard and, by extension, transatlantic shippers. It was likely this perceived competitive advantage that drove Gould, aside from the advantages of package deals, simplified billing, and a reduction in shared revenues with other companies that a single, transcontinental system could provide to potential freight customers and stockholders. The topography, however, dictated that a straight and level route would require a substantial amount of infrastructure to overcome mountain ridges, valleys, river bends, and a dearth of available, ideal real estate.

Infrastructure on the Cumberland Extension west of Hancock consists of a series of cuts, fills, culverts, tunnels, and bridges designed to carry the railroad at an average of around 75' above the Potomac. This enabled the railroad to avoid a number of oxbows in the river, cutting across the corduroy landscape of ridges and valleys that the river winds through.

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[86] Hicks, "The Cumberland Extension—Western Maryland Railway Company," p. 15.
[87] "The Future of the C and O Canal: Will It Be Operated as at the Present Time," *Cumberland Evening News*, October 7, 1905.

> The construction features of this extension were particularly daring. The course of the turnpike was changed many times to accommodate the railroad. Retaining walls were built down the bed of the canal to support the road. Of the sixty miles of line, five tunnels represent two miles, one of which, Indigo Tunnel, is 4350 feet long. The Potomac River is crossed eight times by the railroad and there are a total of twenty-three steel bridges on the extension. The line is of modern construction, provisions being made in the larger bridges for the construction of a second track when needed.[88]

Of the 30 miles between Sideling Hill Creek and Spring Gap, over 20 percent (more than 6 miles) are in or across major cuts, fills, bridges, and tunnels. This does not include the hundreds of smaller fills, cuts, and other grading that helped to make the grade level.

This incorporation of such extensive, and expensive, earthwork, bridges, and tunnels provided a shorter route through the Paw Paw Bends than that of the original B&O "Low Line" alignment of 1842, which went circuitously around the ridges rather than through or across them. The WM's alignment was nearly level as well, with no grade steeper than 0.5 percent west of Williamsport, but it was far from straight.[89] Although the Cumberland Extension achieved the shorter route between Hagerstown and Cumberland, the alignment did require many curves between 2° and 5°, and six 6° curves (not including tracks within yard limits). Through the Paw Paw Bends alone, it had twenty-five curves totaling over 6 miles in length (44 percent of the total distance) between mileposts 128 and 142, and these sharp curves restricted freight train speed to 35 mph. Passenger trains were allowed 40 mph.[90]

While he had it, the Cumberland Extension provided Gould with access to lucrative coal fields on the West Virginia Central and Pittsburg Railway, which he acquired in 1902, connecting Cumberland to Elkins and Belington, West Virginia. The coal revenues that this purchase enabled him to collect helped offset the cost of constructing the new line, and the losses that he was quickly incurring elsewhere.

> With this extension in operation for freight March 15th and passenger service June 17th, 1906, the Western Maryland had a through line from Baltimore to Belington, W.Va., a distance of 295 miles, where connection was made with the Baltimore and Ohio, and with the Coal and Coke road at Elkins, which Senator [Henry Gassaway] Davis built from the profits of his West Virginia Central sale….It was

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[88] Killough, *A History of the Western Maryland Railway Company*, p. 31.

[89] Realizing the WM's operational advantage in this area, the B&O, whose Low Line through the area was hampered with even sharper curves, replaced it with the Magnolia Cutoff, or "High Line," a new alignment at least comparable to the WM's route, in 1914. Almost entirely south of the river, the Magnolia Cutoff needed to cross the Potomac only twice, and the total length of its four tunnels was 365' shorter than the WM's Indigo Tunnel alone. B&O built the Magnolia Cutoff as a double-track line with fewer curves and higher speed limits than the WM's alignment, thus negating any operational advantage the WM had achieved.

[90] Railroad curves are measured in degrees, meaning the track's direction changes every 100'. Thus, the greater the number of degrees, the sharper the curve, and the slower a train must travel through it. As earlier noted, where possible, most railroads prefer curves of 3° or less to minimize operational problems. "Track Chart: Cumberland to Hagerstown & Big Pool to Cherry Run."

> a line that could originate large amounts of tonnage and distribute it over the Baltimore and Ohio at Cumberland, the Philadelphia and Reading at Shippensburg, to the Cumberland Valley and the Norfolk & Western at Hagerstown, and to the Pennsylvania at York, Penna.[91]

Related increases in earnings allowed the company to make good on one of Gould's promises: it paid off the City of Baltimore's debts and indentures, freeing it from any entanglement in the line's finances. Well beyond the mid-twentieth century, these eastern West Virginia lines provided the WM with a significant proportion of its income. Thus, the Cumberland Extension, by providing the WM access to this lucrative product, went some distance in redeeming Gould. While a financial burden, Gould's work also meant that the reorganized Western Maryland Railway Company took over a nearly-complete (and very modern) railroad, one that had the potential to tap a sizeable share of the market for bridge traffic between the Midwest and the eastern seaboard.

The idea that the WM could serve as part of a much larger system did not fade entirely with the dissolution of Gould's empire. During World War I, the United States Railroad Administration attempted to coordinate the entire railroad system for the war effort by taking over the railroads. The effort ultimately failed, and the Transportation Act of 1920 effectively liquidated it with a provision that authorized the Interstate Commerce Commission (I.C.C.) to rule on railroad consolidation questions. This led to a series of proposals to unify the eastern railroads, the Western Maryland among them.

In the 1920s the I.C.C. came up with a unification proposal for the railroads prepared by Harvard University professor William Z. Ripley and endorsed by President Hoover. The I.C.C. did not adopt the proposal as official policy until 1932, and it dissolved soon after. However, as the proposal gathered steam through 1924, it caught the attention of the big four eastern railroads who had the likeliest chance of receiving control of other, smaller systems: the New York Central, Pennsylvania, Chesapeake and Ohio, and B&O. When these railroad officials caught wind of the proposal, they came forth with their own private suggestions for which railroads might be consolidated together and attempted to negotiate with a unified plan. While none but the B&O were interested in the Western Maryland directly—each railroad's proposal assigned the Western Maryland to another company's system—the proposals delayed any conclusive deals on the part of the I.C.C. The debates died quickly in 1925, when the Delaware and Hudson came forward with a proposal of its own. Already tired of negotiations and with none able to accept the others' terms, the big railroads backed out. While mergers, consolidations, and takeovers were nothing new in the dog-eat-dog world of railroad finance, the extensive government regulations after the Transportation Act of 1920 took some getting used to.[92]

After the other railroads backed off, the I.C.C. began making formal preparations to enact its own, tentative scheme. Under its proposal, the Western Maryland was assigned to the

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[91] Killough, *A History of the Western Maryland Railway Company*, p. 25.

[92] The I.C.C. and other consolidation proposals in this and the following paragraphs are detailed in Burgess and Kennedy, *Centennial History of the Pennsylvania Railroad Company*, pp. 580-581; Stover, *History of the Baltimore and Ohio Railroad*, pp. 260, 283-284; Cook and Zimmerman, *The Western Maryland Railway*, pp. 50-51.

B&O.[93] Since this basically went along with most of the railroads' private proposals, the B&O acquiesced. In 1927, the I.C.C. allowed the B&O to purchase 42.88 percent of Western Maryland's stock from John D. Rockefeller, Sr., a controlling interest, for $18,673,050.[94] The purchase totaled 159,000 shares with a par value of over $31 million. Added to its stock interests in the Reading Railroad and the Central Railroad of New Jersey and its 1931 purchase of a controlling interest in the Chicago and Alton, it is no surprise that the B&O embraced the I.C.C.'s proposal, which could have made its system as large and competitive as its competitors in the consolidation scheme. Of particular note was the likely reason that the Western Maryland stock was not strongly coveted by other lines. The company was still paying down substantial debts incurred during construction for decades afterward, because the railroad's stock failed to return dividends, and along its Cumberland and Connellsville extensions, it had yet to generate significant online traffic.[95] B&O coveted the line as a parallel, competing route, and it wanted to keep it out of the hands of competitors who could potentially turn it into something more lucrative. However, after some stock sales between a number of railroads, including the sale of Western Maryland and Chicago and Alton stock to the B&O, the I.C.C. failed to act on a final scheme. Its proposal faded into obscurity, likely influenced by opposition from the railroads. The B&O could thus control the parallel Western Maryland line's stock without immediate threat and unimpeded for the time being.

It did not remain unimpeded, however, owing to the intervention of yet another railroad company controlled by the Fuller Syndicate. Independent of the I.C.C. proposal or those of any of the larger railroads, Frank E. Taplin, who controlled the Pittsburgh and West Virginia (P&WV), came forward with a much smaller consolidation proposal of his own. More than likely inspired by Gould's original transcontinental vision, Taplin proposed to link it with the Western Maryland, the Wheeling and Lake Erie, and the Wabash Railroad. The B&O was unwilling to relinquish its stock in the Western Maryland, however, and ultimately outmaneuvered Taplin in a 1932 compromise under the I.C.C. that placed the B&O's Western Maryland holdings in trust with the Chase National Bank of New York. The B&O could own the Western Maryland and receive dividends, but could not appoint voting members to its board.[96] This reduced the B&O's ability to control the Western Maryland or merge any of its operations, but protected it from acquisition by other lines, and the B&O retained rights to sell at any time. At any rate, the Great Depression began soon after, so by the time the P&WV finally reached Connellsville, most railroad consolidation proposals had been set aside. This outcome served the P&WV and Western Maryland anyway, as the roads could—and did—still exchange traffic at Connellsville.

In fact, the connection with the Pittsburgh and West Virginia and the earlier Pittsburgh and Lake Erie connection were vital to the WM. While not part of a transcontinental railroad, these westward connections nevertheless transformed the WM from a local short line and

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[93] Cook and Zimmerman. *The Western Maryland Railway*, Chapter 2.
[94] Cook and Zimmerman, *The Western Maryland Railway*, Chapter 2; Killough, *A History of the Western Maryland Railway Company*; and Leilich, "The Western Maryland: A Corporate History."
[95] Don Phillips, "Whatever Became of the Western Maryland? Part 2: A Mixing of Colors," *Trains Magazine* 40, no. 8 (June 1980): pp. 44-50; Leilich, "The Western Maryland: A Corporate History."
[96] Morgan, "Western Maryland," p. 50.

tidewater coal conduit into a regional through carrier, with connections to the Great Lakes and the Midwest.[97] These connections could not have been made without the ultra-modern Cumberland and Connellsville Extensions. In time, freight agents working for the Western Maryland and its connections began negotiating to have traffic routed over these lines, often including so many railroads that the agents whose paperwork had to include each line's abbreviation came to call it the "Alphabet Route."[98]

Once the Cumberland Extension line went into operation, coal from the fields of northern West Virginia went to market on the Western Maryland. When the Connellsville Extension opened in 1912, merchandise moved back and forth over it and the Cumberland Extension between the East Coast and the Midwest. A long-distance passenger train traveled over the line between Baltimore and Chicago from 1913 to 1917. Some interchange traffic with the C&O Canal, mostly coal, lasted until the B&O, which controlled the canal since the late nineteenth century, abandoned it in 1925. Carload traffic from Hancock, Hagerstown, and points east provided important secondary revenue. When the Cumberland and Connellsville extensions went into operation, the railroad also took advantage of industries in the areas around Cumberland, Elkins, and the Monongahela Valley to provide it with carload traffic. Even with online carload traffic, though, the completion of the through line to Connellsville made coal and bridge traffic the Western Maryland's main source of sustenance.[99]

Though it passed through sparsely-populated country, a few industries along the Cumberland Extension provided modest local, carload revenue for the railroad during the early years of the line's operation. There was a cement plant near Hancock and another at Round Top.

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[97] Stephen J. Salamon and William E. Hopkins, *The Western Maryland Railway in the Diesel Era* (Silver Spring, MD: Old Line Graphics, 1991); and Sweetland, *Western Maryland in Color*, both provide good summaries of Western Maryland operating and traffic patterns.

[98] The "Alphabet Route" was a conglomeration of smaller railroads which, connected end-to-end, formed a larger system that could compete with giants like the Pennsylvania, New York Central, and Baltimore & Ohio between Chicago, St. Louis, and the Atlantic coast. The New York, Chicago, and St. Louis Railroad (known informally as the Nickel Plate Road) connected Chicago and St. Louis with Toledo, Cleveland, and Buffalo. Like the Nickel Plate, the Wabash Railroad served St. Louis, and also Detroit, connecting those cities to central Ohio. The Wheeling & Lake Erie connected with the Nickel Plate at Bellevue, Ohio, just south of Toledo. From there it ran southeast to Pittsburgh Junction, Ohio, where it exchanged traffic with the Pittsburgh and West Virginia. The P&WV, in turn, forwarded traffic to the Western Maryland at Connellsville. An alternate routing could also carry freight between the Nickel Plate at Cleveland and the Western Maryland at Connellsville on the Pittsburgh and Lake Erie. From Connellsville, the Western Maryland provided a conduit not only to the port of Baltimore, but also to its connection at Shippensburg, Pennsylvania, with the Reading Railroad, which connected the Alphabet system to Philadelphia and to the Lehigh and Hudson River. The Lehigh and Hudson River, in turn, connected to the New York, New Haven and Hartford. By this last connection, the Alphabet Route served Boston, Providence, and most of southern New England. Traffic from the Nickel Plate could also travel to the lower Hudson Valley by way of its connection with the Delaware, Lackawanna, and Western Railroad at Buffalo, which ran east to Hoboken, New Jersey.

[99] Bridge traffic is revenue freight traffic, often in complete trains or at least large blocks of several cars, originating on a railroad other than the host railroad, and usually also terminating off the host railroad. The host railroad serves as a 'bridge' between two disconnected carriers or between a disconnected carrier and shipper or receiver. In the case of the Western Maryland, bridge traffic operated between the P&WV/P&LE connections at Connellsville and ocean-going ships at Baltimore, as well as connections with the Reading Railroad in Pennsylvania. The Western Maryland, combined with the Reading, the Lehigh and Hudson River Railroad, and the New York, New Haven and Hartford Railroad, served as a bridge route between its Ohio Valley connections and New England.

The latter was the third in a succession of buildings constructed for an operation that opened in the 1830s to supply material for the canal's construction. The previous two buildings burned, the second as recently as 1903. After a four-year period of insolvency, but with a new railroad in place, the third successive plant opened on a narrow strip of land wedged between the Western Maryland and the C&O Canal. This new facility at Round Top could produce 300 barrels of cement daily and remained in operation for some time.[100]

There were other industries on the Cumberland Extension as well. Cross ties were loaded onto cars for a time at Pearre, as were barrel staves at Little Orleans. Apple growers proliferated on the line. Orchards shipped apples by train from several points at the east end of the line, plus notably large orchards at Pearre, Little Orleans, Green Ridge, and Oldtown. An orchard at Cohill (east of Pearre) continued to provide business until well after World War II.

Most interestingly, though likely not a high revenue producer, the Woodmont Rod and Gun Club just east of Pearre used the railroad to trade in live game. Recalled Thomas Donegan, who worked summers there as a teenager,

> Woodmont shipped a lot of turkeys and deer from Pearre. They were shipped out by rail—railway express, not freight. They were live. They traded bucks for does and vice versa. At one time I think they got deer out of Cuba. The Michigan deer didn't like this area.[101]

Of particular note was a sawmill that the Kulp Lumber Company operated on the north side of the broad, flat valley floor just east of Old Town. During the first decades of the WM's existence, Kulp shipped carloads of lumber from its own siding. During the 1880-90s, a narrow-gauge logging railroad called the Green Ridge Railroad brought material in from the north that it interchanged with the C&O Canal and the B&O by means of a wooden trestle across the Potomac at Okonoko, West Virginia. It was gone by the time the Western Maryland arrived in 1904. Partly through exhaustion of raw material, and partly through a series of corporate changes that stalled any prospects for growth, the Kulp operation ceased in 1914.[102]

Two decades later, most of the Cumberland Extension's local freight that had survived during World War I became casualties of the Great Depression. Some industries remained, and some new ones emerged in the post-World War II period—most notably, a large Pittsburgh Plate Glass plant between North Branch and Cumberland. Former train service employee Wilbur Metz recalled,

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[100] Thomas F. Hahn and Emory L. Kemp, *Cement Mills Along the Potomac River* (Morgantown, WV: Institute for the History of Technology & Industrial Archaeology, 1994), pp. 76-79.
[101] Wilbur Metz, interview by David A. Vago, July 14, 2009.
[102] Benjamin F.G. Kline, Jr., *Tall Pines and Winding Rivers: The Logging Railroads of Maryland*, 2nd ed., (Strasburg, PA: Friends of the Railroad Museum of Pennsylvania, 2007), pp.86-92; Bob Zimmerman and Mason Cooper, "Green Ridge Railroad of Maryland," undated article available at WMRHS. The WMRHS also has some historic photographs of the Kulp sawmill.

> there was an apple packing plant west of Hancock. That's where Dylan's orchards used to be, and they'd put cars in there. We picked up apples there, and they shipped them to Florida, years ago….There was another packing house at Cohill. There was a station and siding at Pearre, and a storage track at Little Orleans—a local picked up cars, ran out from Hancock one day and back the next—and Doe Gully. There was a connection to the B&O at Jerome. At Fairplay there was nothing but a sidetrack, and a water plug for the steam engines at Oldtown. [At] North Branch there was another connection with the B&O. They had a wye there to go into the B&O. That was by the [Pittsburgh Plate Glass] plant, and there was a tire plant.[103]

For the most part, however, the Western Maryland from the 1930s onward focused on the traffic that its infrastructure was best suited for: heavy-duty, through service.

The Cumberland Extension mostly served as a conduit for coal from the mines of West Virginia and southwest Pennsylvania to the Port of Baltimore. In the early 1950s Western Maryland originated between 4 and 5 million tons of bituminous coal a year. Once suitable locomotives were obtained, the line also earned revenue as a bridge line for high-speed merchandise traffic, which meant that it forwarded traffic from one railroad company's line to another's. It also hauled grain traffic from the west when the St. Lawrence Seaway froze over. The P&LE supplemented this by providing the Western Maryland a path to the steel mills of the Monongahela Valley and the ports on Lake Erie—both direct outlets for coal. Bridge traffic came through the P&LE in the first three decades. From the 1930s onward, much of this traffic operated in concert with the P&WV and the collection of other railroads known informally as the "Alphabet Route." Even with this prosperous traffic came drawbacks; "Western Maryland tends to be a one-way railroad, moving up to seven times more revenue tonnage eastbound than in the reverse direction."[104]

Choosing the Route

The routing of the Western Maryland Railway and its construction are a significant part of the story, revealing how technological advancements made the construction of this line possible. Gould's Western Maryland project, and indeed his whole transcontinental scheme, was a gamble, apparently based on the faith that the risk involved in spending $50 million in credit could be justified by the rewards that the finished product would produce. The chosen route and the infrastructure required to complete it required considerable forethought. Still, no direct written evidence states clearly how J.Q. Barlow, chief engineer, and the civil engineers working under him chose to build the route that they did. Surveys begun in 1902 closely duplicated the survey that the mayor of Baltimore authorized in 1864.

A report produced by Barlow in 1902 does shed some light on the question of how the route was chosen. In it, he presented his analysis of the surveys he made of potential routes for

[103] Metz, interview.
[104] Morgan, "Western Maryland," p. 51.

the Cumberland Extension. Of the route that he recommended, Barlow declared, "No line exceeds 0.3% ascending grade eastward or a 0.5 descending grade eastward, and the maximum curve is 6 degrees, but for 25 miles east of Cumberland and 15 miles west of Big Pool nothing heavier than 4 degree is used….The estimates are based on embankments 16 foot wide, rock cuttings 18 foot wide and earth cuttings 20 foot wide." All of these reinforced the idea that Gould intended to build a railroad to very high standards. Barlow divided the territory between Cumberland and Big Pool into seven sections, working from west to east, divided by places that Gould or others that Barlow answered to meant for the railroad to serve. Notably, Barlow established the roadbed "above the highest known flood water in all cases," but this was a common practice when railroad builders could afford it. If builders did not have sufficient funds, they would often have to make expensive repairs after a washout.[105]

With these standards established, Barlow surveyed an assortment of routes for each section with the intent of recommending the best route within each segment. In the first section, from Cumberland to North Branch, he provided six options. In the second section, from North Branch to Okonoko, he gave five options, while from Okonoko to Paw Paw he only found one. In the serpentine bends of the Potomac east of Paw Paw, Barlow created three sections, providing four alternate routes from Paw Paw to Baird, three from Baird to Doe Gully, and three again from Doe Gully to Sideling Hill Creek. From Sideling Hill Creek to Big Pool he indicated only one possible route.

Beyond his adherence to his construction standards, Barlow supplied little written justification for using any particular combination over another to indicate superiority with regard to engineering or geology. The rationale for his preferred route in the section from Cumberland eastward was purely economic, using a formula that relied on a prediction of how quickly each route could repay itself:

> in general it may be said that the best and most economical line is that, whose operating cost plus interest on cost of construction is a minimum for any given traffic movement, and to determine this…interest is taken at 5 percent, notwithstanding R.R. investments generally stand at 4 percent, this is because construction cost only is taken as a basis for computation, whereas the ultimate cost is likely to be larger….[106]

From this statement, it can be deduced that Barlow wanted to select the route by trading off how expensive it would be to operate against its initial cost to find a balance that would result in the quickest repayment of the construction costs from traffic revenue. (Greater initial cost usually reduced operating cost.) Unfortunately, Barlow seemed certain that he was underestimating the construction cost in all instances. Since there is no extraordinarily detailed list of the costs he estimated—there are only general categories—it is unknown if his estimates were casual, or if they were detailed but he simply had no way of being sure until construction

[105] J.Q. Barlow, "Western Maryland Railroad: Report and Estimate of Cost, Line Cumberland to Big Pool, March 15, 1903," p. 3, in MS 2190: Western Maryland Railroad Collection, Maryland Historical Society, Baltimore, Maryland (hereafter cited as MHS).
[106] Barlow, "Western Maryland Railroad: Report and Estimate of Cost," p. 10.

was well enough underway that these were realistic. There was also the fact that he was only including costs directly related to the execution of his engineering work. Barlow stated, "the estimates aim to represent the cash cost of constructing the road on the ground, but include nothing for equipment, general organization, financial expenses, or interest during construction."[107] Therefore, Barlow knew the cost would be high. If Gould read the report, he would know that too, but it seems that neither knew just how expensive the construction of the railroad would turn out to be.

In each section, Barlow stated the rationale for his route choice, but he was not consistent in his use of variables to judge routes, except in his comparison of projected costs to earnings. To be fair, this has a lot to do with the fact that the conditions on the ground vary between sections, but this does not fully explain an important distinction: Barlow based his recommendations for each section based on different tonnage projections. On the Cumberland to North Branch section, Barlow's recommendations, based on tonnage estimates, suggested one option for less than 2,000,000 annual tons, one for 2,000,000 to 13,000,000 annual tons, and another for 40,000,000 or less, with a final recommendation based on the estimate of 13,000,000 tons. He based his projections for train-mile costs on the national average for hauling coal, and his projected traffic levels and revenues on what the PRR and the nearby B&O were doing at the same time. A comparative map of the routes referred to in the report does not survive. Without the map, or a more detailed analysis of the terrain and other conditions, very little can be determined about the advantages or disadvantages of the alternates, other than some minimal information about curvature and grading. It is also impossible to determine where the routes would have gone.

For the North Branch to Okonoko section, Barlow discounted options based primarily on upfront costs and practicality, including two on the towpath side of the canal. Barlow stated that only one alternative made sense "for the reason that the longer and more undesirable lines are also those of the highest cost."[108] Therefore, he applied the same criteria in suggesting the line he thought would pay for itself the soonest, but again, offered little detail. He noted, "between Okonoko and Paw Paw the lines on the berme side of the canal, about two miles of it is difficult work, owing to the steep slopes and the closeness of the canal. To avoid obstructing canal navigation this two miles would most likely have to have work…carried along…in the winter when the canal is empty. There is a possible alternative by crossing the river…but such an alternative would nearly double the cost…."[109] Based on this passage, it must be assumed that he thought building along the canal opposite the towpath was the only viable option.

For the Paw-Paw to Baird section, he recommended a route based on 22,000,000 tons of yearly traffic and 18,000,000 tons for Baird to Doe Gully. The changes in tonnage estimates from one section to the next are puzzling at first look. While there were some sawmills and orchards in operation along the route, it seems unlikely that Barlow thought these could account for a discrepancy from one segment to the next of 9,000,000 tons per year. With no junctions between North Branch and Big Pool, and minimal online industry, it remains a mystery how he

[107] Barlow, "Report and Estimate of Cost, Line Cumberland to Big Pool," p. 3.
[108] Barlow, "Report and Estimate of Cost, Line Cumberland to Big Pool," p. 53.
[109] Barlow, "Report and Estimate of Cost, Line Cumberland to Big Pool," p. 23.

decided which tonnage estimates to use on each section, and why he did not use a consistent figure for each. Perhaps Gould and Barlow saw possibilities for traffic beyond bridge traffic from Connellsville and West Virginia coal, but more likely Barlow also considered the competitive advantage when choosing each segment. This quote regarding a route through the Paw Paw bends is especially telling: "the O line is recommended, notwithstanding its initial cost is over $100,000 greater, and that this difference in cost is not wholly counterbalanced by traffic conditions until the tonnage movement approximates 20,000,000 tons a year."[110] His strategy through this section was in favor of straightness of route and avoiding the river bends, which—although he makes no reference to the fact—gave the railroad the competitive edge it needed over the PRR and the B&O in the form of a straighter route that would be easier to operate. Barlow seemed to recommend the routes that he did through the bends in order to avoid paralleling the canal. This is understandable, for doing so would have created curvature in the railroad that would have offered it no advantage. One option was to tunnel through Doe Gully Ridge further to the south and avoid a pair of Potomac Crossings, but Barlow indicated that it would have been much longer than any other option and would have required embankments where it would parallel the B&O—an economically and politically tricky proposition, no doubt, and again, one with no advantage over the adjacent competition.

East of the Paw Paw Bends, Barlow returned to his policy of recommending the options that would provide the quickest repayment based on what he determined to be reasonable traffic estimates. He recommended the option of tunneling through Indigo Hill based on an 18,000,000-ton traffic projection, recognizing that it was a high estimate, but stating that building 2 miles around the hill along the canal would not be feasible as a work of engineering and that any other option would even longer tunnels. East from there, however, he thought the gradient along the canal was easy enough to justify building so close to what was then still a navigable waterway. This was an easy option to build and thus any loans could be quickly repayed. As it turned out, Barlow's recommendation is exactly where the railroad was built in this section.

Barlow concluded his report by comparing two options, composed of combinations of routes chosen from each section for the line between Old Town and Sideling Hill Creek. One was called the "River" option and the other was the "Interior" option. Barlow stated,

> the conclusion is that the river route should be adopted and a recommendation has herein been made as to the particular one of the several river lines. Its estimated cost is considerably in excess of the estimated cost made by the Consulting Engineer, but it must be borne in mind that the results of extensive surveys give a vastly better basis upon which to compile estimates than a visual reconnaissance only. The Consulting Engineer's estimate of about $3,400,000 was for a line of heavier grades and curves of a character generally somewhat inferior to the lines surveyed; his report further states that a better character of line…would cost something like half a million dollars or more… The

[110] Barlow, "Western Maryland Railroad: Report and Estimate of Cost," p. 37.

> estimate herein given for the recommended line is $5,107,716. This initial out-lay may be reduced to about $4,900,000 by certain construction economies as before noted.[111]

Barlow was certainly correct that surveying could produce a more accurate estimate than visual reconnaissance, but information about how the results of his surveys influenced his recommendations are lost with his maps, as are any indications of whether his recommended River Route bears any similarity to the route that the abandoned roadbed follows today. The only assumption that can reasonably be made is that the river option was cheaper because the terrain close to the river was naturally easier to follow, possibly softer and easier to build through, and therefore cheap enough to pay back quickly from freight revenues.

At any rate, Barlow chose the option that, to him, seemed most likely to pay for itself more quickly than the others and that offered the "minimum of complications with either the B. & O. R. R. or the C. & O. Canal" except where the line was "forced on the berme slope of the Canal by unavoidable topographical conditions." He cited the B&O's practice of following the canal near Harper's Ferry as precedent. Lastly, he added, "Should it be thought that the proposed new lines still contain a good many bends and curves, it may be said that a traffic on the new line practically equaling the capacity of a double track road, would be required to justify the expense necessary to make any changes…the line, when compared with the B & O R R between the same points, is shorter and with lighter curves and grades…." Barlow offered this table to reinforce the last point:

	Distance	Maximum Curve	Maximum Grade eastward
B. & O. R. R.	65.00 Miles	9 ½ degrees	30 Ft/Mile
W.M.R.R. Surveys	60.18 Miles	6 degrees	16 Ft/Mile

It would thus seem that Gould's goal of besting the competition was not at all lost on Barlow.[112]

It takes some analysis of the goals of the line's planners and financiers in relation to the landscape to produce a reasonable hypothesis for why the existing route was chosen. Barlow's report makes it clear that cost was a major factor. It is likely that competitiveness also played a large role. The fact that the best river-bottom land was already in use lent some credence to the decision to build the railroad at a slightly higher elevation, as did Barlow's declaration that the entire line was above any predictable flood stage. The availability of more advanced technologies and the possibility for real competition against formidable competitors suggests an obvious reason why straightness and ease of grade were chosen in spite of the expense.

Still, there are inconsistencies to explain. Through the Paw Paw Bends, the line tunneled through ridges to cross the bends in a straight line on the Maryland side, but on the West Virginia side followed the river through curves that limited freight trains to 35 mph.[113] Why the builders chose to do it this way, when a straight, modern railroad seemed to be the goal, is not immediately clear until one studies some of the nuances of the local geography. The most

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[111] Barlow, "Western Maryland Railroad: Report and Estimate of Cost," pp. 53-54.
[112] Barlow, "Western Maryland Railroad: Report and Estimate of Cost," pp. 47-49.
[113] "Track Chart: Cumberland to Hagerstown."

notable one is fairly plain. Each of the Paw Paw bends is much broader on the West Virginia side. The way the river curves through the hills, which are generally ridges that run from northeast to southwest and are composed of rock strata that run at compound angles to the ridges, is a product of a waterway's natural tendency to find the path of least resistance. In Appalachian geology this means the low point in the strata and the weakest substrates. As a result, the river bends are formed in such a way that each oxbow whose outer circumference faces toward West Virginia is very sharp, leaving only narrow hills that are easy to tunnel through. On the other side, each oxbow whose outer circumference points away from West Virginia defines curves that are two or even three times as broad as those on the Maryland side, with large ridges in the middle that would have necessitated additional tunnels. Barlow's report again offers some insight.

> A line has also been run in this vicinity, tunneling the Doe Gully Ridge further south, in the attempt to carry a line around the South River bend, thus avoiding the crossings of the Potomac, and joining the previous groups of lines near the common point at Baird. The tunnel required proved to be 3,200 feet in length, and the line itself longer than any of the others; also nearly a mile and a half would have to be built on a pile trestle in the edge of the river at the foot of the high and steep embankment of the B & O R.R., and subsequently be filled with rock. Our grade would be lower than the B&O in this vicinity, at first it was thought we might place our embankment on the side of theirs, but this could hardly be done without some kind of an agreement….[114]

While the tunnels that were eventually built on the Maryland side were certainly long and the fills large and numerous—at 4,300', Indigo Tunnel was 1,100' longer than the tunnel through Doe Gully Ridge would have been—none seemed to frighten Barlow the way the West Virginia geology did. Perhaps what it would have taken to get to the tunnel discouraged him as much as the hill itself, as his reference to the pile trestle indicates.

Another factor, however, was the politics of building on the same side of the river as the B&O, upon whose territory the Cumberland Extension was already encroaching. Across Doe Gully bend, rather than paralleling the B&O's old main line along one of its few departures from the river, the Western Maryland grade instead followed the river on a horseshoe curve, visible from a bluff high over the river on the opposite side and bracketed at either end by sharp curves leading to the river crossings to and from Maryland. Any more coexistence than necessary was undoubtedly an untenable proposition for the Western Maryland and the B&O alike, whose officers may well have winced at the section of Magnolia Bend where the two lines eventually did run parallel. The B&O eventually got the advantage through Doe Gully Bend when, in constructing the Magnolia Cutoff, its builders located their line without a tunnel through a low hollow more than 2 miles to the southeast.

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[114] Barlow, "Western Maryland Railroad: Report and Estimate of Cost," pp. 37-38.

The job of building the Cumberland Extension was easier outside the Paw Paw Bends. Barlow's trend of building straight lines and tunnels in Maryland and river-following curves in West Virginia does not continue in the river bends immediately downstream from Cumberland. On the Maryland side, the railroad still cuts straight across the landscape, mostly on wide, flat river plains, while both tunnels are on the West Virginia side. This, at least, can more obviously be explained by geography. On the West Virginia side near Cumberland, no flood plain existed; the only choice was to go around or through some fairly steep hills. The primary objective was to reach a good point of interchange with the east end of the WVC&P. The best site for the interchange was Knobmount, south of Ridgeley, West Virginia, which was flat, undeveloped, and directly accessible to the WVC&P. The only way to reach this point was to tunnel through the cliffs on the West Virginia side of the Potomac southeast of Cumberland. Nevertheless, the fact that the approach was so different from the rest of the Cumberland Extension, and that the bridges are also different—composed of all deck plate girder spans, as opposed to the deck trusses in the Paw Paw Bends—suggest that a policy or personnel change may have occurred at some point during construction, or that the geology on the West Virginia side of the Paw Paw Bends may have simply been too formidable. The fact that the river and adjoining flood plains are so much narrower and closer to the bedrock around Cumberland may also explain the difference in bridge construction; the geography dictated shorter spans, which could be deck plate girders.

Regardless, in the minds of those who planned the railroad, the criterion of absolute cost was secondary to the matter of how quickly the railroad's builders thought the line could pay for itself. Even this criteria, however, was secondary to the goal of making the railroad one that could compete with the longer-established B&O and PRR.

A dynamic working relationship undoubtedly existed between Barlow, whose objectives included balancing practicality, cost, and satisfying his boss, George Gould, whose objective was to make money in the long run. He seemed to believe that success in this regard depended on his ability to build a competitively cutting-edge railroad. More than likely, this would have led him to make some brash key decisions. As an example of how this played out in the dichotomy between the two personalities, Barlow recommended in his report that $200,000 of construction funds might be saved if the railroad was initially put in operation using temporary wooden trestles on the bridge approaches with the more expensive, but permanent, fills replacing them only after the line was running and earning income. The line opened in 1906 with permanent fills at every bridge approach, except one. The likelihood that this only added $200,000 to the cost is quite small. George Gould wanted a modern railroad, and within some constraints, he got it.

Other officers weighed in on the matter in letters after Barlow submitted his report. Henry Pierce, the acting vice president of the Western Maryland, along with several other officers, questioned whether building along the canal was really possible. Barlow reasserted the Harper's Ferry precedent. Pierce and his associates overruled Barlow on two important matters. Against Barlow's initial recommendations, they suggested that part of the line be built across South Cumberland, a more direct route than the one that Barlow recommended on the West Virginia side, but with access to a far higher number of industries and a greater population. They

also suggested that the line take a more direct route east of Paw Paw. The result was that two additional Potomac Crossings were necessary. Though the difference would be a greater cost, they reasoned that the increased operating efficiency and potential traffic would justify it. In subsequent letters, Barlow conceded the point.[115]

As with any major transportation artery, route selection was a balancing act for everyone involved. Only the practical and unavoidable matters of geology and the available capital brought the first criterion, absolute cost, to bear on the other two criteria of profitability and competitive edge. These things explain why the Western Maryland's Cumberland Extension route, as built, was straighter than anyone else's, but also why it was not straighter than it was. Though its high cost and aggressive construction might suggest otherwise, the Cumberland Extension was a compromise.

Construction

The entire Cumberland extension was completed in less than three years, at a cost of $6,918,934, or $115,000 per mile.[116] The railroad company filed a charter for the new line with the Maryland Secretary of State in May of 1903. While some roadbed surfacing and track-laying began on May 28, construction bids were not closed until June 15, and general contracts were not awarded until the following August 1.

In order to build the Cumberland Extension, the Western Maryland Railroad Company negotiated with the landowners along the route to purchase strips of land for the roadbed and a narrow buffer zone on either side. Where it could not negotiate a purchase by transfer or quit claim deed, the railroad company pursued condemnation of the necessary property. In a few places, the railroad company acquired the land by agreement rather than deed. Additionally, there were negotiations with nearby landowners for temporary use of land for "borrow pits," where earth for fills was excavated, or for land to dump excess material from excavations.

Even with outright ownership of most of the route in hand, a few unique right-of-way issues had to be settled before the work could proceed. Files at the Lands Manager's office at C&O Canal National Park include a 1903 agreement between Washington County and the Western Maryland that indicates the National Turnpike from Conococheague Creek to Cumberland—by then a public road—had to be relocated to accommodate the railroad's construction. This agreement required that the railroad company bear the expense of the relocation, construct and pay for safety features wherever the two transportation routes

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[115] Larry Lee, HAER Engineering Historian, suggests that Barlow may have considered, if only briefly, another option for the line between Pearre and Town Creek. That route would have followed Sideling Hill Creek for 2 miles, before turning southwest and tunneling through the south end of a ridge to emerge above Fifteen Mile Creek. After following Fifteen Mile Creek for 3 miles, the line would cross the creek to follow Deep Run southwest along the east base of Green Ridge. A cut through the valley's highest point would have then reached Big Run and followed its eastern bank to Town Creek, where it would have met the existing right-of-way. This option would have required one 3,500' tunnel and perhaps ten creek crossings, but its grades may have been steeper than desired.
[116] Cook and Zimmerman, *The Western Maryland Railway*.

interfaced, and build the new road according to the county's specifications. The agreement also went into great detail about the infrastructural requirements at some locations. The I.C.C.'s engineering field notes of 1920 reference a May 1904 voucher, in the amount of $3249.49, one of several payments the railroad made to contractors on behalf of the Chesapeake and Potomac Telegraph Company: "[for] reconstructing the Hagerstown to Cumberland line westward from Big Pool to allow the W.M.R.R. Co. to construct their new railroad as agreed with the county commissioners of Washington County."[117] The canal right-of-way was an even more formidable obstacle. Although Fairfax Landstreet, a Western Maryland Railroad Company vice president under the Gould syndicate, successfully purchased the State of Maryland's interest in the canal in 1904, the competing B&O held a controlling interest. Legal proceedings concerning the new railroad's right to cross the still-active C&O Canal delayed some of the work until a February 1905 settlement. In this settlement, the railroad paid $500,000 for forty-two strips of canal land for crossings and other uses. The railroad received clear title to the properties, but the canal itself stayed in C&O Canal Company's hands. A ruling by the Court of Appeal of Maryland the previous June sustained the railroad's right to cross the canal, with the provision that the railroad be liable for damages incurred in construction. Once this issue was settled, contiguous work on the new grade could proceed.[118]

In the section of the railroad paralleling the canal, around milepost 127, railroad construction crews removed a total of 140,000 cubic yards of rock and placed it on the riverbank. In the engineering field notes for its 1920 Valuation Report on the line, the Interstate Commerce Commission expands somewhat upon the railroad construction crews' treatment of the canal.

> It appears the [Western Maryland] was particularly desirous of expediting this rather difficult and necessarily slow work and made some special arrangements with the sub-contractor to put on an extra large force and push the work, and in carrying out this rush program, the [Western Maryland] assumed the extra costs involving the rehandling of material and the resulting damages to the canal.[119]

I.C.C. engineering field notes for the 1920 Valuation Survey refer to a number of amounts paid by the railroad as compensation for damage to the canal. One page of notes cites an August 1905 voucher "for labor performed and material furnished repairing canal damaged by blasting" in the amount of $1676.75. Other liabilities covered by the railroad included building a bridge to maintain a U.S. mail route across the canal, repairing leaks in the canal, and moving and altering a building at Canal Lock Number 55. This arrangement, compounded by the magnitude of the work and the weather, cost the railroad more than it had anticipated.

> It seems this period covered the winter months during which the canal was not operated. In carrying out this program the severity of the winter prevented the sub-contractor from completing his work within this period. The resulting

[117] I.C.C. Valuation Field Notes, p. 26, Box 40, Folder 30, Section 3-1.
[118] Cook and Zimmerman, *The Western Maryland Railway*.
[119] I.C.C. Valuation Field Notes, pp. 5-7, Box 34, Folder 11, Valuation sections 1, 2, 3, 8, 9 & 10.

> damages to the canal and to certain of its shippers amounted to about $33,000 and, as mentioned above, this and other expenses were borne by the railroad.[120]

Damage was not limited to the canal, either, according to a more colorful, contemporary account in the *Cumberland Evening News*.

> [Western Maryland chief engineer John Q. Barlow] was a mighty and energetic force while he was removing those thousands of tons which blocked the way for his roadbed. Powerful blasts broke all the window panes within half a mile. Huge rocks were thrown across the Potomac River. Baltimore and Ohio rails were broken and trains stopped. Telegraph wires were severed and communication was once interrupted for three hours. An express train of Pullman cars was not sighted in time one day. The match was applied. The train was so badly shaken that panes were broken and passengers were frightened.[121]

While it likely ignored the annoyances it caused the B&O, the Western Maryland addressed the issue of possible further damage to the canal after the line went into use by pouring riprap onto the bank that separated the railroad from the canal. "When bridge masonry was built close to canal towpath, necessitating excavation that might injure towpath, closely laid riprap was placed along inside of canal on slope of towpath."[122] Bands of rock about a 1-$^{1}/_{2}$' deep and 12' tall occurred at three locations: a 150' stretch half a mile west of Little Orleans, another one half a mile east of Green Ridge, and one more a quarter of a mile west of Green Ridge, all built in 1904. When the canal was re-watered after construction, most of these were no longer visible below the water's surface. Infrastructure through this area included the riprap, as well as a stretch of concrete and masonry retaining wall where the railroad was directly adjacent to the canal. West of Sideling Hill Creek, damage to the canal was less a concern since the topography took the railroad away from the canal.

J.Q. Barlow, Chief Engineer of the Western Maryland, planned and guided the engineering work for the railroad. He was assisted by William Cary Hattan, who served as resident engineer on the project at Hancock in 1904-1905 before leaving to work on the Clinchfield Railroad, a project of comparable complexity in Virginia, Tennessee, and the Carolinas. Mary Hattan Bogart, his daughter, inherited her father's collection of memoirs and photographs from the railroad construction projects, which she organized into a book. Unfortunately, Hattan's memoirs did not start until 1908, but his photographs and other written records provide some information on the line's construction, as Bogart details.

> The construction was progressed under three separate divisions. In the building of this first division very little machinery was used. After blasting, most loose or rock excavation was finished by hand. The material was then moved in narrow gauge dump cars drawn by mules. The use of steam shovels was very limited….

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[120] I.C.C. Valuation Field Notes, pp. 5-7, Box 34, Folder 11, Valuation sections 1, 2, 3, 8, 9 & 10,
[121] "The C&O Canal: In Intention of Interferring (sic) with the Waterways," *Cumberland Evening News*, December 24, 1904, p. 1.
[122] I.C.C. Valuation Field Notes, pp. 5-7, Box 34, Folder 11, Valuation sections 1, 2, 3, 8, 9 & 10.

> Beyond Sideling Hill Creek…some of the most difficult construction had to be done….The track had to be carried on a shelf cut into the rock and, in some places supported on fills held in place by concrete retaining walls.[123]

Hattan's work was restricted primarily to the section of the line from Indigo Tunnel to the east. Among other things, he supervised the enlargement or replacement of bridges on the existing section of the Western Maryland track east of Big Pool in order to meet the demands of increased traffic that the Cumberland Extension would bring. While much of the new railroad was built using state-of-the-art construction methods at the start of the twentieth century, the scale was exceptional.

For the bridges, six types of spans were used. The choice of which span to use was mostly dependent on the distance to be spanned between abutments or piers, but the clearance requirements beneath the bridges also had to be taken into account. For very short spans, the railroad usually constructed single or double concrete-arch culverts, especially where the feature to be bridged passed beneath a fill and where high clearance was not a concern. In a few instances where the railroad crossed a small road, I-beams below the ties and between concrete abutments were also used. In locations where the railroad crossed another railroad or the C&O Canal, through trusses and through plate girder spans were used to provide necessary clearance under the bridge. For river, stream, and high-level canal crossings, deck plate girders and two styles of deck trusses were installed, supplemented with deck plate girder approach spans. In each case, the application depended on the distance between piers and abutments. Deck plate girders were applied to the shortest distances. Deck trusses with the ties on their top chords were used in medium-distance applications, and deck trusses with the ties on stringers between the top chords were used for the longest spans.

In building the bridges, workmen constructed concrete piers and abutments first. Wooden forms for concrete tunnel portals, culverts, and bridge piers and abutments were composed of individual planks placed edge to edge in frames. At river crossings, cement was mixed on the shore and hauled to the pour sites in buckets, suspended by aerial cables (see Appendix, Figure 9).

Smaller bridges and culverts were constructed largely to, or adapted from, Western Maryland standard company drawings. Most of the small overpasses were built directly from the standards, as were some of the large culverts like the one over High Germany Road at Little Orleans and the nearby double-bore one over Fifteen Mile Creek. A few culverts were adapted from the standards to meet existing conditions, including one that was spliced onto an existing culvert under the C&O Canal. Retaining walls were a mix of concrete and location-specific dry-laid, cut-stone block applications; a few culverts also used cut-stone blocks.[124]

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[123] Mary Hattan Bogart, *Conquering the Appalachians: Building the Western Maryland and Carolina, Clinchfield, and Ohio Railroads through the Appalachian Mountains* (Railroad Research Publications, 2000), p. 73.
[124] Western Maryland standard drawings 434-G, 632-D through 650-D, 889-G through 891-G, in Drawings Room, WMRHS.

While the railroad's planners did not go to the great expense of constructing tunnels, fills, cuts, culverts, and other earthworks to accommodate double tracks, they did make the bridge piers wide enough for a second track to be added. This was a twofold question of expense. First, while widening the earthworks would not have required removal of existing work, new piers would have necessitated removal of the steel spans atop them or a second set of piers, either of which would have been expensive and disruptive. Second, concrete was cheap. While building wider earthworks initially would have cost a great deal more, concrete forms and the material to fill them were easy to come by, and the labor cost of building a wider pier was not significantly greater. Therefore, it was easy to accommodate the possibility of future double-tracking at the bridges from the beginning.

To build the large steel truss spans, workmen built temporary wooden trestles from bank to bank to carry materials and to furnish access and support during construction. These trestles usually carried a narrow-gauge railway for materials carts, and they appear in photographs to have been roughly built and without consistent measurement—possibly even from tree branches and sapling poles (see Appendix, Figure 10).[125]

Trusses were assembled atop the piers one member at a time with the help of wood-and-steel derricks assembled onsite. The Pennsylvania Steel Company fabricated the bridge members at their plant in Steelton, Pennsylvania, and sent them to the Potomac Valley as a kit of parts for final assembly. Workmen assembled box beams, plates, and girders using hot riveting. Movable jib cranes with angled booms rigged out from the deck sat atop the already-constructed portions of the trusses and lowered new pieces into place. A traveling chassis made it easy for the derricks to advance with construction. All of the steel bridges are of riveted construction, though today an occasional replacement bolt exists. Truss and girder members were constructed mostly of plate and rolled steel members in order to keep the construction as light as possible. Castings were limited to a few large washers and other load-spreading devices. The ties were laid on the framework. These bridges had no closed deck or ballast, although the railroad appears to have applied a rough-aggregate asphalt coating to the surfaces of the ties at some later date, either to preserve them or to make it safer for track workers to walk on them.

Temporary narrow gauge railways were also used in the excavation of cuts and tunnels, where rock was loosened by drilling and blasting, and in the construction of fills, which frequently used material removed from the cuts and tunnels. The *Cumberland Evening News* provided another colorful account where tunnel construction was concerned:

> Just think of those ponderous blasts! Tunnels were dug into solid rock. In those tunnels 1,400 kegs of powder were placed. A puff, a thunderous report, and 250,000 tons of rock were lifted from its foundation and hurled into the canal, into the Potomac and distributed over surrounding territory. This was not one blast. It was several. And when the way was paved for the road bed, when the water was again in the canal and when the mules was again on the towpath the fact was

[125] A series of panoramic photographs taken during construction of the Cumberland Extension survives in the collection of the Hagerstown Roundhouse Museum, Hagerstown, Maryland.

> demonstrated that Mr. Barlow is one of those men who "do things." He is an Eastern man by birth and education and a far western man by training. He learned how to build roads over mountains, under mountains, and around mountains, how to bridge can[y]ons and rivers; how, in short, to get there quickest with the least expense, before he came to Maryland.[126]

Either steam shovel and dinkey equipment or hand labor removed the blasting debris and soft overburden and loaded it into four-wheeled dump cars, which then transported the material to fill sites.[127] Small 0-4-0T locomotives colloquially called "contractor's dinkies" and typically used in construction projects pulled the small cars. At least one construction photograph shows an open-frame derrick at the top of a fill, presumably used to hoist material out, with a steeply-inclined narrow gauge track carrying the dump cars from the top of the fill to the bottom at one end.[128] Temporary trestles spanned fill locations, and the dump cars would unload material around the trestles until they were completely buried. The railroad leased the rights to either dig fill material or dump waste material on private land adjacent to the right-of-way. I.C.C. field notes indicate several specific cases where compensation was paid to landowners for this right. An example is a case where the "Carrier paid $200 for use of 1.15 acres, for spoil bank purposes. All rights of carrier ceased on completion of construction work."[129]

> Tunnel construction began with a small bore just large enough for workmen to fit into, which was then enlarged from within.
>
> All the tunnels were included in a contract with MacArthur Bros. Co. and associates, the general contractors….The material…consisted of earth, loose and solid rock and shale….The solid rock in the tunnels was much harder than that in open cuts.[130]

To break up the rock, workers took advantage of the rock's natural tendency to fracture along the layers of its strata. Indigo Tunnel passes through a northeast-to-southwest strip of the Foreknobs Formation, an Upper Devonian Age geologic formation composed largely of shale with deposits of sandstone and siltstone. The Kessler Tunnel also passes through this same geologic formation, while the Stick Pile Tunnel passes through the similar, but slightly harder, Brallier Shale formation.[131]

The rock at Indigo Tunnel is folded and skewed at compound angles to the horizontal and the vertical, following the outside contours of the mountain. It is formed in very thin layers, having originally been composed of layers of sediment on an ocean bottom. The individual layers of shale are of varying color and consistency and fracture easily along the bedding planes.

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[126] "The C&O Canal: No Intention of Interferring (sic) with the Waterways," *Cumberland Evening News*, December 24, 1904.
[127] I.C.C. Valuation Field Notes, pp. 1-26, Box 40, Folder 30.
[128] Panoramic photograph, collection of the Hagerstown Roundhouse Museum.
[129] I.C.C. Valuation Field Notes, pp. 1-26, Box 40, Folder 30.
[130] I.C.C. Valuation Field Notes, pp. 1-26, Box 40, Folder 30.
[131] Site visit with Erica Clites, Geologist, NPS National Capital Region, August 5, 2009.

Civil engineers likely chose this formation because it would be easy to dig through. There are no drill marks in the tunnel for blasting charges, probably because the rock crumbled easily enough to obliterate them. Passing through the upturned bands of rock, the tunnel encounters shale with high iron content at the outer ends that was formed in a low oxygen environment. This rock would have been very dark gray when first exposed during construction but soon oxidized to varying shades of red and orange. It crumbles the most easily of any of the bands that the tunnel passes through. The rock further inside the tunnel is grayer, because it likely contains more sandstone, but it still crumbles easily.

Through most of the tunnel, the sides are slightly concave and a considerable distance from the support timbers—unlike what standard tunnel drawings call for—suggesting that the sides have crumbled away over the years. This is especially true in the iron-rich layers near the portals. The regular passage of trains must have contributed to this. Track crews almost certainly would have checked for and removed rock falls from the tunnel on an almost-daily basis as revealed in the following account.

> During construction of…Indigo Tunnel, a man who was working in the tunnel was injured when a timber fell on him. The man ended up in the hospital and lost his leg….He later lived in Little Orleans…[and] worked…as a "portal man" for ten years in the very same tunnel where he had lost his leg. The man was replaced by his son…[who] worked the night shift as portal man…for over 44 years. He was responsible for maintaining the track in the tunnel, keeping them free of rocks and debris that may have fallen….During a downpour the man had checked one end of the tunnel and was at the other end when he heard a "terrific racket" at the end of the tunnel he had just checked. It turned out that an approaching train had hit a rock slide. The train had wrecked and the man was blamed for the accident. However, he was later cleared….[132]

Western Maryland standard drawings called for different construction methods depending on the conditions and materials through which each tunnel was bored. The engineers constructing the Cumberland Extension tunnels adapted these ideal-conditions standards to the specific geologic conditions present.[133] Timber held together with iron hardware lined the tunnels. Between the five-paneled arch ceiling timbers and the rock roof of the tunnel, thick planks held dry packing—essentially stone rubble or crushed rock—in place to stabilize the roof. In order to place the dry packing between the arch lagging planks and the tunnel roof, workers backfilled the dry packing as construction of the timber frame advanced. The total cost for five tunnels, as charged, was $768,374.39. Excavation costs were responsible for the bulk of this, at $538.392.64, followed by timbering, at $135,546.20, or about $53.14 per linear foot. Concrete costs at the portals were relatively low, totaling $3,998.91 for sidewalls and $7,440.90 for arches.[134]

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[132] Francis L. Webb, Sr., *Reminiscences of a Western Maryland Railway Maintenance Man* (Union Bridge, MD: Western Maryland Railway Historical Society, 1984), p. 14.
[133] Western Maryland Standard Drawings 29-G through 39-G and 654-B, in Drawings Room, WMRHS.
[134] I.C.C. Valuation Field Notes, pp. 56-72, Box 40, Folder 30.

Indigo Tunnel was framed with 10" x 10" oak timbers on 4' centers that were "obtained from a contractor at Hancock, Md." [135] Barges on the canal hauled in the drilling equipment for the tunnel's construction. Tall, vertical timbers reinforced by angle braces framed the blasted-out stone faces that formed the tunnel walls. At the top of the verticals was a line of stringers, and above that, the tunnel roof was framed with a five-sided timber arch. These timbers supported lagging planks that, in turn, kept the dry packing solidly against the hard rock of the tunnel ceiling. The railroad's agreement with the canal once again manifested itself in the disposal of waste rock and dirt from the bore.

> Of the extra bills incurred in the construction of the tunnels, only one of the large amounts was in connection with the Indigo Tunnel. It was decided to waste the material here at a different place from that contemplated when the bids were made and the contract awarded. For this purpose inclines were built and machinery was installed at each end of the tunnel to carry the waste over the canal. The Railway Co. agreed to pay such additional cost…over the method of waste disposal originally planned by the contractor. The amount the company paid…was $6,698.91.[136]

The Indigo Tunnel cost $324,058.62 to build, including $732.10 to cover the expense of moving a steam shovel from Indigo to Kessler Tunnel. Some of the excavated material became fill at the west end to forma level roadbed beyond the cut at the west portal.

Railroad engineers bored the $128,590 Stick Pile Tunnel through the rock of the ridge that formed the oxbow. Here, the "tunnel lining extends beyond [the] natural portals for about 18'. Some 7' of this is occupied by a concrete portal and rest by a timber section…. [The] tunnel proper is timber lined, open sides."[137] Thus, while the full length of the tunnel was 1,707', the length of excavation was only 1,672'. The concrete portals on all of the tunnels caused a similar discrepancy. Like Indigo Tunnel, Stick Pile Tunnel was framed with 10" square timbers on 4' centers, with the roof formed by a five-sided arch. An exception to the typical construction occurred in this tunnel at the west (south) end, where the roof was framed at 90° to the walls for about 20' from the concrete portal.

The third tunnel, Kessler Tunnel, was located at the base of two small oxbows. Its east portal was at milepost 140.2, and it extended 1,843'-3". It was framed in the same way as Indigo Tunnel, and like the other two, had plain, reinforced concrete portals. Total cost for the tunnel's construction was $145,546.54. A breakdown of the construction materials gives an idea what this cost covered, plus labor. The tunnel's construction required 372 cubic yards of concrete in the portals, 352,000 board feet of timber to frame the walls and ceiling, 3,789 cubic yards of dry stone packing, 298,331 board feet of planking to support the dry packing and bracing the side timbers, and 12,019 pounds of iron hardware holding it all together. This tunnel went through the same hard-rock ridge that the C&O Canal's nearby Paw Paw Tunnel penetrated.

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[135] I.C.C. Valuation Field Notes, p. 56, Box 40, Folder 30.
[136] I.C.C. Valuation Field Notes, p. 56, Box 40, Folder 30.
[137] I.C.C. Valuation Field Notes, p. 56, Box 40, Folder 30.

The track itself, when new, was laid mostly with 90-pound rail, then typical for heavy-duty mainlines. On the main track, 9"-wide, 8'-6" long ties were laid on 22.5" centers except at rail joints, where they were placed at 18" centers. When the line was later upgraded to 130-pound rail, the standard tie spacing was changed to 21.5". Standard drawings specified that the inside grain should face downward. Ballast typically went to a maximum depth of 2 $^1/_2$'. The main tracks were ballasted primarily with crushed limestone but occasionally also by sandstone or slag. Yard tracks, industrial sidings, and short spurs were usually ballasted with cinders.

> Slag ballast is from the Pittsburgh District. Cinders are obtainable at the shops and round houses at Hagerstown and Cumberland. Sandstone ballast is partly local and partly from Bidwell, on the Connellsville Branch. Broken limestone ballast was obtained from the following points, listed in the order of importance: Cavetown, Md., Pinesburg, Md., Bittinger, Pa., Thomasville, Pa., and Chambersburg, Pa. Local sandstone and limestone is used in the walls, culverts, and other masonry. For concrete purposes broken limestone from Cavetown was used, and sand was obtained locally from the canal and river, shipped to the work by canal. Clearing and grubbing is through light growth and no timber of commercial size is found immediately adjacent to the right-of-way. Ties may be secured from the surrounding country.[138]

At the ends of each bridge, tunnel, or major fill, temporary camps consisting of large tents that likely held tools and materials were set up to facilitate construction. The tents probably also housed blacksmiths, machinists, and other skilled workers who would have been necessary to keep the operation running. Large piles of rock and earth sat outside, and wooden hoppers were built to sort the rock and load it into the dump cars. There was no track in place to bring in supplies while the bridges and earthworks were still under construction, so all materials arrived by horse-drawn wagons, by canal, or by harvesting it from the surrounding land. For the same reason, movable railroad bunk cars were also not available. In all likelihood, the vast majority of the workforce lived onsite in tents or in canal boats rendered idle by the construction.

Construction began at Big Pool, Maryland in 1904.[139] By February 1905, the Western Maryland payroll supported a total force of 2,629 workmen to build the Cumberland Extension. A large proportion of the skilled workforce was likely native-born, but there were also large numbers of Italian and Austrian immigrants. The crews worked in two shifts around the clock. Workers slept in temporary housing on the job site, which moved from place to place as the work advanced. The railroad spent $1,200 a day feeding this workforce. Food allotments included a half a pound of fresh meat per worker, plus thirty cases of corn, seventy-five bushels of potatoes, 240 pounds of coffee, 600 pounds of sugar, and 3,360 pounds of flour, and unspecified thousands of eggs. Wages for laborers ran between $1.50 and $1.75 a day; if Hagerstown Division freight train crew wages can be hypothesized as comparable, skilled workers would have made between $70 and $100 a month.[140]

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[138] I.C.C. Valuation Field Notes, p. 6, Box 40, Folder 30.
[139] Ray Wongus, Jr., "The Cumberland Extension," *The Blue Mountain Express* 22, no. 3 (Fall 1993): p. 12.
[140] Untitled report in Western Maryland Railway vertical file, Western Maryland Room, Washington County Regional Library, Hagerstown, Maryland.

The 24-hour work cycle brought quick results. By February 6, 1906, track had been laid over the entire length of the Cumberland Extension, but work remained to be done. As the engineer's report indicated, "at that time much still had to be done to complete ballasting, lining tunnels, building telegraph lines, stations, water tanks, section houses, and other facilities."[141] For the next one and a half months, crews rushed to finish this work. The railroad opened to the first through freight train on March 15. The first passenger train followed on April 17, 1906.

When the Connellsville Extension opened in 1912, the railroad's mileage had doubled in less than ten years.[142] The Western Maryland issued its 44th Annual Report in 1906, reporting that it operated 540.92 route miles of track and owned 5,920 freight cars.[143]

Over its lifetime, the line's physical plant did not change much, thanks to the advanced technology of its construction. However it did see the installation of heavier rail to accommodate larger locomotives and higher-capacity coal hopper cars and the extension of passing tracks to accommodate longer trains. Having originally been laid with 90-pound rail, the line was upgraded to 130-pound rail in the 1920s. The track was also raised just before World War II to accommodate locomotives with wider clearance requirements. Francis L. Webb, Sr. recalled,

> we were stationed at Green Ridge, on a short siding, just west of [Stick Pile] tunnel. Our camp and tool cars were close to the bridge on which we were working. We were raising track eight inches so the new Mallet-class 900 engines could pass without scraping the side girders [on the bridges].[144]

In 1913 passing tracks were added on the Cumberland Extension at Parkhead, Hancock, Herbert, Jerome, and North Branch, while existing ones were extended at Hancock, Fairplay, Town Creek, and Oldtown.

In addition to the track upgrades, a few bridges toward the east end of the line were replaced or upgraded shortly after the line opened. In 1910, a 37' I-beam bridge near Pearre, milepost 125.3, was built, likely replacing a wooden stringer arrangement. During 1911-1912, the timber trestle bridge at milepost 125.3 over the C&O Canal at Tonoloway, Maryland, was replaced with a steel span on concrete supports. A temporary trestle carried the line around the site while work continued. The largest bridge upgrade came further to the west in 1913 when a passing track was added at Town Creek, necessitating the addition of a second set of spans on the double-width concrete abutments and piers. As previously noted, this was the only location on the Cumberland Extension where the railroad actually installed a second bridge on the wide abutments and piers.[145]

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[141] Williams, *The Western Maryland Railway Story*.
[142] Leilich, "Western Maryland Railway: A Corporate History," p. 155.
[143] Sweetland, *Western Maryland in Color*.
[144] Webb, *Reminiscences of a Western Maryland Railway Maintenance Man*, p. 19.
[145] I.C.C. Valuation Field Notes, pp. 1-56, Box 40, Folder 30.

When the line opened, the Western Maryland had already adopted standard designs for all sorts of buildings, including stations, passenger waiting sheds, section houses, tool sheds, water tanks, and the many other building types that were repeated along the route. Most were balloon-framed, wooden structures. Even the wayside signs were standardized, right down to the lettering, painted on pieces of standard-sized and shaped plate steel mounted to poles that were fashioned from recycled locomotive boiler flues. Stations at Pearre, Town Creek, and Oldtown were all built to the same specifications, which matched WM depots built elsewhere in Maryland, Pennsylvania, and West Virginia. The Town Creek station was replaced by a waiting shed after World War I, but the Pearre and Town Creek stations remained until shortly after passenger trains were discontinued in 1953. The Town Creek waiting shed was quite likely identical to the ones that stood at Woodmont, Little Orleans, Kiefer's, and several other locations on the Cumberland Extension. Facilities for section crews at Little Orleans, Oldtown, and other locations varied. For example, one section crew might have an adjacent chicken coop, while another had a hog pen. Still, the buildings themselves were built from a set of standard plans. Small, identical wooden watch boxes were installed at bridges, tunnels, and cuts. Over the years, as maintenance and other operations were upgraded and streamlined, many of these structures were removed as well.[146]

The mostly-modern infrastructure of the route otherwise remained the same, and in remarkably good repair, until abandonment in 1970. One exception was in operating technologies. In its first years, a train-order system operated the Cumberland Extension, which meant the dispatcher controlled traffic by scheduling trains and arranging meets between opposing trains on passing tracks. The dispatcher telegraphed orders to depots or train order stations where no town existed, as schedules were made and revised. Local agents then typed these orders onto small sheets of thin paper called "flimseys" and handed them up to the crews of passing trains. In June 1915, responding to public outcry over a deadly wreck, the railroad announced that it would install an absolute block system, which divided the railroad into segments, or blocks, guarded by automatic signals. Automatic block signals (probably semaphores) were erected to protect the tunnels between Hagerstown and Cumberland. The railroad also installed a telephone dispatching system for all of the lines west of Hagerstown, including the Cumberland Extension, presumably replacing the telegraph. These required upgrades and additions to the structures along the route.

While the eastern end received block signals, the Cumberland Extension, which saw less traffic than other parts of the railroad owing to the lack of online industries through the isolated region, remained under train-order control. Operators used manual semaphores known as order boards to signal moves and updates to orders, and these were employed through the 1950s, when the railway installed Centralized Traffic Control (CTC). First developed by Union Switch and Signal Company, CTC enabled a dispatcher to directly control signaling and train movements from one location. Color-light signals and powered switches at sidings and junction points replaced the telegraph train-order system's semaphores. Radio communication further reduced

[146] Conclusions reached from reviewing Western Maryland Standard drawings and historic photographs at WMRHS.

the need for local operators. By that time, passenger trains were gone, and operating efficiency drove the decision to convert to the new system.[147]

The poles of the telegraph system were a conspicuous part of the infrastructure and remain so today in places. Located every few yards along the entire railroad, they carried telegraph wires for the railroad and Western Union, as well as signal communication lines. As communication technologies advanced, they remained in place to carry the wires of telephone rather than telegraph systems. Even when radios were installed, they continued to support other functions. As described by Charles Hyde,

> the line poles carried the signal lines, communication lines – dispatcher line, the message line for other communication – and Western Union even had their own lines. Then they also carried the signal control wires. At one time Western Union owned the pole lines. Western Maryland bought them later.... the wires got as big as furnace pipes in an ice storm. We had to chip all that off and put them back up. Then the roadbed got icy too and if you jumped off the train you'd slide down off the bank. Then they'd have to throw a line down to get you back up.[148]

Like any other infrastructure, the line poles could be a maintenance headache. Even in good weather, maintenance conditions were sometimes perilous. According to Hyde, "there would be a bracket for the lines on the bridge down low. We hung down on a rope to get to the bridge wire bracket down by the abutment. Some lines just had high poles, 50 or 60 feet, and the wires hung out over the river."[149]

Other infrastructure on the line included a whole host of buildings. Most numerous were the watch boxes constructed to shelter the employees whose job was to watch for landslides, snowdrifts, and other obstacles. The earthwork on the Cumberland Extension occasionally threatened the safe operation of trains since the benches cut into the mountainsides were often steep and sometimes penetrated through fairly soft ground and easily-fractured rock. As a result, land and rock slides were quite common. The terrain was rugged, and the construction a strong enough departure from the natural landscape, that several locations along the Cumberland Extension required constant surveillance for safe operation, "subsidence has been estimated at various points along the line, where carrier's records and statements of employees familiar with the territory showed such to exist. Many of the cuts are in rock which is unstable, necessitating the presence of watchmen."[150] In one notable incident, a 1950 landslide caused a freight train to derail and pile up in the canal near Pearre.[151] The wreck in May 1950, a few miles to the west, resulted in an unrecorded number of claims for the contents of demolished freight cars, and nearly cost the railroad No. 1411, one of its modern Class J-1 Baldwin steam locomotives. Though the engine was rebuilt in Hagerstown and placed back into service, it was scrapped only

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[147] Webb, *Reminiscences of a Western Maryland Railway Maintenance Man*; Williams, *The Western Maryland Railway Story*; and Leilich, "The Western Maryland: A Corporate History."
[148] Charles Hyde, telephone interview by David A. Vago, July 2009.
[149] Hyde, interview.
[150] I.C.C. Valuation Field Notes, p. 8, Box 34, Folder 11, Valuation sections 1, 2, 3, 8, 9 & 10.
[151] Photographs of the 1950 derailment can be found under milepost 127 in Photograph Collection, WMRHS.

four years later when the railroad replaced steam with diesel locomotives.[152] For a time, one watch box was located near the site of this landslide, and it remained a troublesome area, with occasional derailments. Gary Penner, a yard office clerk at Hagerstown, recalled two wrecks around 1970.

> You remember the derailment there at Round Top? Three shifts of trackmen walked the track at Round Top to check for slides. An Eagle Scout rebuilt the telephone shack there at the west end not long ago. In the late 60s and early 70s I rode the second [Alpha-Jet] when the first one was on the ground through there. We left when it was dark and got back when it was dark. Then, there was a washout at Parkhead where a couple of N&W engines went into the canal. The first few carloads were Hershey's candy. The scouts helped clean it up, and they wouldn't take any candy. But then later in the yard office here they had a box. Everybody along the line had some candy.[153]

In the April 2, 1970 wreck, all five Norfolk and Western diesel locomotives derailed, along with thirty piggyback cars loaded with candy and paper towels. While there were no fatalities, the crewmen were trapped in the lead locomotive until they could be rescued. The fireman, R. H. Corderman, never returned to work, and in the end the rockslide cost the railroad $1,000,000.

Like the bench cuts, the tunnels also required monitoring, and additional watch boxes—later replaced by trackside telephones—served them as well. Charles Hyde, who worked on the Western Maryland signal crew, said that, "in bad weather, you had to check the tunnels. There'd be icicles hanging in there that the train could hit. There were phones at every siding to call the dispatcher."[154]

Since the line was fairly remote, stations were few. Small, partially-enclosed waiting sheds served passengers at Woodmont Rod & Gun Club, Little Orleans, and Kiefer's. Only Oldtown and Pearre received true stations. An agent who doubled as station agent and telegraph train-order system operator staffed the sheds.

Mary Donegan Howe's grandfather lived in Pearre, where he had worked for the canal. She would often visit him there in the 1910s and 20s. Her father and uncle both worked for the Western Maryland. Her father, Thomas Donegan, began working as a brakeman, and eventually became a conductor. Her uncle was one of three station agents at Pearre from 1908 to 1934, working the day shift. Like many agent-operators in small villages, his telegraph key made him the community's singular connection to the outside world. Recalled Mary,

> sometimes when we visited there, my father would not be with us as he would be on call for a trip….If he had a run to Cumberland while we were visiting, Uncle Vincent…would let us know when Pop would be passing the house. We would

[152] David L. Eckman, "Mishaps and Misfortunes - Cumberland Extension," *The Blue Mountain Express* 22, no. 3 (Fall 1993): p. 22.
[153] Western Maryland employees, interviews by David A. Vago, July 28, 2009.
[154] Hyde, interview.

> line up on the back porch, and the whistle would blow a mile down the line. As soon as we would spot the engine, our eyes were glued to the box cars. Lo and behold, there was Pop standing on top of a box car. The train would be going at a high rate of speed…I always wondered how he could stand on that thing and not fall off; he must have had really good balance. He told us that when he was on top and they came close to entering Indigo Tunnel, he would like flat on the catwalk until they got through the tunnel.[155]

The railroad's familial relationship with its employees and the communities along the line extended beyond the local depots.

> In our early days, our mode of travel was by train. My father, being a railroader, was entitled to ride on the trains free. This also included the family. They would put Thomas and me on the train in Hagerstown and instruct Mr. Hornbaker, the railroad detective, to keep an eye on us until we would get off at Pearre. There Uncle Vincent, who was agent and operator for the railroad, would take charge until the train proceeded on its way to Cumberland.[156]

In addition to the stations, locomotive water tanks, telephone boxes, and telegraph way stations supported the operation of the railroad. Most railroad buildings were built to standard plans from sawn, dimensioned lumber. They were easy to build, easy to repair, and easy to replace. Their placement, and gradual elimination, reflected the state of operating procedures as they were when the line opened, and as they evolved through the century.

Other buildings along the line included section houses and tool sheds, and all of the outbuildings that came with them: chicken coops, hog pens, coal bins, and outhouses. Francis L. Webb, Sr. was a track repairman whose recollections were published in 1984 by the Western Maryland Railway Historical Society.

> Each section gang was composed of a foreman and ten men. Our territory was five miles. It was our pride to keep those miles in the best possible condition.... The company sent its division engineer and track supervisors on tours. They would decide where new rail, ballast, and ties were needed. Section gangs were combined and all the work was performed…by hand…. Beginning in the spring we surfaced track, renewed ties, kept the track in line, and the curves in good shape. This continued…until August, when mowing began…with hand axes and mowing scythes. When winter approached and the ground froze, we were careful to keep the track in good gauge.[157]

In the early twentieth century, all repair operations moved by rail, including those performed by other repair divisions. While section gangs maintained track, other crews worked

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[155] Mary Donegan Howe, "C&O Canal, WM Railroad Traffic Create Boom Town in Pearre," *Maryland Cracker Barrel* (February/March, 2000), p. 7.
[156] Howe, "C&O Canal," p. 7.
[157] Webb, *Reminiscences of a Western Maryland Railway Maintenance Man*, p. 15.

on the rest of the railroad infrastructure. Webb later recalled "during the late 1920s when I was working with the Bridge and Building Department of the W.M. Rwy., we were stationed at Green Ridge. We were in camp cars and moved from place to place as needed."[158] Eventually, labor-saving machinery and hi-rail vehicles that could bring crews and repair equipment to the site from afar made these labor-intensive section gangs and other crews obsolete. Webb noted,

> times began to change. The company enlarged its locomotives, and rolling stock became heavier. It began to use machines for the work which once had been done by track hand…. This led to a reduction in forces that did away with the good old trackman…. I have watched the track-surfaces machine in operation, and I definitely find that it cannot put the ballast where I could with a rammer or a shovel.[159]

As technologies gradually eliminated demand for labor, the work was either consolidated or reallocated by specialization. This is how Charles Hyde, who worked in signaling and was based in Hagerstown, described a crew's responsibility in his field during the 1950s and 60s: "the signal maintainer and assistant maintainer or maintainers had about 20 miles or so of track. They were responsible for switches, crossing flashers, telephones and later radios. They worked for the signal and communication department."[160] The Western Maryland depended on true section crews for decades, but even after they became obsolete, the company still found a sectional system to be an efficient means of keeping track of the railroad in maps and on the ground.

Description of the Completed Railroad [161]

As completed, the Western Maryland Railway's Cumberland Extension was a single-track railroad with passing sidings at periodic locations and a few online industries and wayside freight stations served by stub-end sidings. By rail, it was 59.28 miles from Big Pool, Maryland. to Knobmount, West Virginia, the terminals that defined each end of the segment for its crews and dispatchers. As previously noted, the route was built on a substantial series of cuts and fills. One railroad company diagram depicts the profile of the natural terrain of the surveyed route juxtaposed behind a profile of the railroad grade, revealing a fairly straight and level grade against a zigzag landscape profile. From the profile's scale, the landscape generally diverged from the grade by 50' to 75' above or below track level at hundreds of points along the line, and sometimes rose above the track level as high as several hundred feet – necessitating the five tunnels. The huge amount of earthwork was necessary to maintain a flat, high-level grade that would not be susceptible to floods and as straight a run as practical.[162]

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[158] Webb, *Reminiscences of a Western Maryland Railway Maintenance Man*, p. 19.
[159] Webb, *Reminiscences of a Western Maryland Railway Maintenance Man*, p. 19.
[160] Hyde, interview.
[161] The following describes the WM as completed in 1906, as well as structures and the development along its route.
[162] Western Maryland Railroad Company Chief Engineer's Office, "Western Maryland Railroad Condensed Profile, Cumberland Extension, Big Pool Junction to Knobmount," Drawing No. AO-900, Cumberland, Maryland. September 21, 1905, found at WMRHS.

The Cumberland Extension branched off the old main line to Cherry Run at Big Pool, on the Maryland side of the Potomac. While the old main line crossed the Potomac River into West Virginia, the new Cumberland Extension remained on the Maryland side of the river, north of the canal. West of Big Pool, contractors built deck plate girder bridges across Licking and Great Tonoloway creeks, each consisting of three spans on concrete piers. At milepost 107.8, a road crossed the railroad on a steel plate girder bridge.

At Parkhead, located at milepost 108, was a passing track. There was also a passing track at the east end of Hancock just beyond the Great Tonoloway Creek crossing, from milepost 114.4 to milepost 116.9. Barlow constructed the railroad grade into the Potomac River's westward trough on a slight, 3-mile climb from Hancock, more or less following the river's upstream change in elevation. Through this area the railroad paralleled the C&O Canal, which is what enabled the easy, continuous grade. The canal's towpath was between the river and the canal, and the railroad grade was on the opposite, uphill side since there was little room left in the river's flood plain. The only thing the railroad builders could do besides building much higher uphill was to cut a bench along the canal's uphill side.[163]

> For much of the length of this line the C&O Canal lies between it and the river. The canal was built years ago and naturally occupies the most favorable location in the valley. In many places the railroad lies on the hillside above the canal, with resulting difficulties in construction. At certain locations, as shown by cross-sections, bench cut rather than sidehill work was necessary, and a certain amount of damage to the canal seems unavoidable.[164]

The railroad builders defaulted to use of the uphill side of the canal to build the railroad wherever it was feasible with some exceptions like at Paw Paw, West Virginia. Westbound trains climbing the easy grade from Hancock topped out in a deep cut on the side of Little Roundtop Mountain. Occasionally, the railroad grade diverged from the side of the canal to cut through the nose of a hill that the canal circumnavigated. Railroad engineers saw such places as opportunities to ease curvature or save distance. In cases of extremely sharp curvature along the canal, like Round Top, it was the only option.

At Round Top, the railroad served the Round Top Cement Mill, which was wedged between the railroad and the canal. There was a passing siding that began here, where a large apple orchard once provided traffic for the railroad. The grade paralleled a highway west of Cohill, and a number of feeder roads for this highway crossed the track. Except in the case of fill construction, the builders of the railroad did not seem to avoid crossing roads at grade, probably because the automobile was in its infancy at the time of construction and also because of the rural nature of the area. In fact, no automatic warning signal was ever installed at a grade crossing between Hancock and North Branch. Crossbucks protected two grade crossings at the west end of the Round Top siding. West of the siding, there was a fill, with an 85'-long concrete

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[163] Information on interference with canal activities comes from the following sources: I.C.C. Valuation Field Notes, pp. 5-7, Box 34, Folder 11, Valuation sections 1, 2, 3, 8, 9 & 10, and p. 3, Box 40, Folder 30.
[164] I.C.C. Valuation Field Notes, p. 17, Box 34, Folder 11, Valuation sections 1, 2, 3, 8, 9 & 10.

arch culvert passing through it. A private road crossed the railroad near the end of this fill, where there was another short, double-ended siding. Another road crossed the track at grade at this siding.

From here, the railroad crossed a series of smaller tributary creeks on concrete culverts. It was directly adjacent to the canal in most places and ran on mostly level grade through a series of deep cuts with fills. A road passed under the railroad at milepost 121.7, which crossed it on a short deck plate girder span. At this location, the Western Maryland granted the Potomac Edison Power Company rights to build a power line across the railroad. A smaller concrete overpass also bridged a road a short distance later. At milepost 125 was Tonoloway, which served as the western end of the remaining active track until 1986. This was a location name for the railroad and not a town. At milepost 125.3, a single-span, I-beam bridge on concrete abutments crossed the entrance to Polly's Pond, located at the mouth of a geographic feature called Long's Hollow. Polly's Pond was a large turning basin for canal boats, fed by a stream coming down Long's Hollow. The railroad approached this crossing from a bench cut on either side, and a fill crossed the mouth of the pond. Construction of the railroad fill negated the pond's usefulness to canal boat operators, who, by the early twentieth century, were not often using it anyway.

At milepost 126 was Woodmont, which the track passed on a fill. The railroad maintained a small waiting shed here for passengers traveling to and from the local hunting club. Since the Cumberland Extension ran through a remote and sparsely-populated area and the WM ran few passenger trains, most of the stations were three-sided sheds like the one at Woodmont. A schoolhouse at this site served the local population, which was barely large enough to constitute a village. Most traffic through the waiting shed was whatever patronage did not arrive at the club by car, schoolchildren from nearby Pearre, and perhaps the occasional milk can.

The railroad reached the village of Pearre at milepost 127. The land here was relatively flat, enough so that the railroad builders gave the canal some breathing room in the vicinity of the depot. The edge of the ballast was about 20 yards from the canal here. Still, the land undulated enough for the railroad to have been built on a shallow fill, complete with an arch culvert to allow a small stream to pass through to the canal from the hollow uphill from the station. Pearre was called Sideling Hill before the WM arrived because of the large northeast-to-southwest ridge upon whose shoulder it rested. This community grew around a lock on the C&O Canal, and included a few houses, a hotel, and a store. Railroad construction there necessitated relocation of the one-room Sideling Hill School, which was later torn down. Some children also attended the Woodmont School and occasionally hopped rides on passing freight trains to get home. The railroad staffed a station for Pearre in front of a passing track that was just short of a mile long. As was the case with all staffed stations, the Pearre station included a telegraph operator's bay and an order signal for passing trains. Pearre was also home to a section crew, who helped maintain the railroad. Each section had a crew whose responsibility was to maintain track and infrastructure through their sections. Facilities for the section crew included the foreman's house, along with bunk, tool, and chicken houses and other smaller ancillary structures.

Woodmont Road crossed the railroad at the Pearre passenger station and then re-crossed it a short distance later. A 1937 Federal Aid Project straightened the road, putting it entirely on the north side of the railroad. This work accomplished three things: it eliminated the grade crossings, removed the station building, and widened the railroad fill here to accommodate the road. In the process, an arch culvert was extended to accommodate the widened fill.

The Sideling Hill Creek Crossing at milepost 127.6, west of Pearre, was adjacent to an aqueduct of the C&O Canal. Just a few yards to the east stood a collection of buildings relating to a canal lock. For some time, whether due to subsidence or original construction, the track dipped slightly as it crossed the creek. Company drawings suggest that this problem was fixed in the summer of 1933. Track crews installed deeper ties with shims on the bridge, and raised the track with fill on the solid ground, bringing the tops of the rails up by about a foot.

Beyond Sideling Hill Creek, the railroad bed followed the river to a point near milepost 129. This mile-long section required substantial earthwork close to the canal. As described by W. Raymond Hicks,

> the canal along this portion was built by making an embankment on the edge of the river and then cutting a channel between the bank and the solid rock of the hillside. The railroad track is on a shelf which again is cut into more hillside…the charges of dynamite used in blasting would hurl rock into the canal and it is recorded that four steam shovels were needed to promptly clear the canal.[165]

The railroad's departure from the Potomac River came at the last oxbow of the Paw Paw Bends. The railroad grade cut straight across the base of the horseshoe-shaped river bend. After following almost half of the bend, a 6° curve directed the line toward Indigo Tunnel at milepost 129.2, the first of the three tunnels and the longest. The railroad line traveled southwest through Indigo Tunnel and followed the river and canal again for a short way on another bench cut into the steep hillside. Further up the slope is High Germany Road, which extended downhill to meet the roadbed and crossed it at grade. This was at the west end of a 700' fill with two culverts. One, at milepost 130.8, bridged the narrow roadway of High Germany Road again, which passed under the railroad to head north. The roadway culvert was poured monolithically with a pair of adjacent, curved concrete retaining walls on the south side of the track. These walls turned to parallel the centerline of the track. The other culvert crossed Fifteen Mile Creek approximately 500' further west.

The High Germany Road culvert was located at Little Orleans. This small village was a lumber transshipment point in the pre-Western Maryland era. Orleans Crossroads, on the opposite bank of the river, gave it its name. Little Orleans was also home to a section crew. A small passenger waiting shelter stood here, along with a freight house, pump house, lime and coal storage structures, and a collection of other railroad buildings. The pump house fed a 50,000-gallon wooden tank that supplied water for steam locomotives. A tool house, a bunk house, section foreman's house, and stable supported the local section gang. A grocery store just

[165] Hicks, "The Cumberland Extension – Western Maryland Railroad Company," p. 3.

north of the track served the village. Opened in the 1830s, it originally sat beside the canal and served as a shipping warehouse for area farmers, replete with a second-story jib crane to facilitate the loading of boats. It was relocated in 1905 to its present location when the railroad came through.

A short distance past Little Orleans, railroad contractors built the large and monolithic concrete Fifteen Mile Creek culvert, a double-arch culvert adapted from the WM's standard 15' concrete arch culvert. A bridge consisting of wooden timber stringers on a pair of timber bents carried a roadway over a railroad cut about 1,000' beyond Fifteen Mile Creek. The old wooden bridge was like several on this line that were built to a Western Maryland standard specification for small, one-lane-road bridges.[166]

From Little Orleans west for a bit more than a mile, the right-of-way cut across the base of a small oxbow in the river. The roadbed remained well above the river level through this section, either in cuts or on high fills. Rejoining the river at the other side of the oxbow, the roadbed encountered the first major bridge at milepost 131.7, known by the railroad as the First Potomac and C&O Canal Crossing. Construction of this 766' bridge was typical of the first four Potomac crossings; it cost $96,542.26.[167]

West of the First Potomac Crossing, the railroad traveled across the flood plain on a fill that required 90,000 cubic yards of dirt. The railroad turned westward to parallel the river on a 5° curve, at the end of which the fill became a bench. (The right-of-way here is on the West Virginia side.) A mile-long siding immediately after the curve was named Doe Gully by the WM. At the west end of this siding, the line encountered another oxbow in the river, known as Doe Gully Bend. Here the railroad generally followed the river as it reversed direction. A short tangent followed by a sharp "S" curve (4° and 6°) took the track to the Second Potomac and Canal Crossing.

Similar to the first crossing, the Second Potomac and C&O Canal Crossing spanned the river on five 150' Warren deck trusses, but this bridge crossed at an angle, and its piers were skewed by 28° to be in line with the river's current. These five spans had their ends skewed to match the piers, but their central panels were rectangular. A single deck plate girder approach span on the east end had one end skewed to match the pier as well. The western portion of this bridge crosses the flood plain on four deck plate girder spans supported by three intermediate steel piers. One end of one span was skewed to match the adjacent truss and pier, but the remainder were rectangular in plan. A second style of Warren deck truss crossed the C&O Canal, followed by a single deck plate girder approach span to the Maryland-side abutment. The canal span was 125' long, so it could be a simpler, lighter structure than the 150' ones. Its track rested on its top chords. At 1,367' in length, this was the longest of the WM's ten Potomac crossings, the only one with skewed spans, and the one with the greatest variety of bridge types. (The tenth crossing also had skewed piers, but its spans were rectangular, even though three of them had slightly angled ends to accommodate a curve.)

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[166] I.C.C. photograph BC-141, "No. 1311-W. of Little Orleans," 1917, in WMRHS. WM standard drawings for these overpasses can be found in Drawings Room, WMRHS.
[167] I.C.C. Survey photographs BC-142 & BC-143, "No. 1317-W. of Little Orleans," 1917, in WMRHS.

Roughly midway across the bend, at milepost 135.3, railroad engineers bored the Stick Pile Tunnel, the second of the line's five tunnels. The line exited Stick Pile Tunnel into a short rock cut, beyond which a fill carried it to the Third Potomac and C&O Canal Crossing. This 855'-7" bridge cost $103,495.97 to build.[168] It crossed back into West Virginia and encountered the ridge that created another oxbow called Magnolia Bend. Leaving the bridge, westbound trains immediately entered the most severe curve on the line between Big Pool Junction and Maryland Junction, a 6° right-hand curve that changes the railroad's heading by 90°. Through this curve, westbound trains were climbing a 0.25 percent grade as well. As originally built, the roadbed was on a timber trestle. After the line opened to traffic, the railroad brought in numerous trains of hopper cars loaded with fill dirt that was dumped on the trestle, eventually burying it and building up the fill seen today.

The trestle, and later fill, supported only about two-thirds of this curve, because the line had to cross above the B&O's Low Line at milepost 136.3 and then follow a bench cut into the ridge. A through truss bridge was necessary to provide adequate clearance below it for the B&O, and the engineers had to design a bridge that was both extra wide to furnish enough clearance for long locomotives and cars within the truss and skewed to maintain the 6° curve's alignment over the B&O. The resulting bridge was a single-span Baltimore through truss that was approximately 5' wider than normal and skewed by 51°. The engineers also designed it with non-continuous stringers so that those for each panel could be offset from center as needed to follow the track's curvature. Costing $29,416.52 to erect, the price of this bridge was almost twice that of a similar bridge on tangent track over the C&O Canal about 5 miles farther down the line.[169]

Leaving the bridge, a bench cut into the ridge supported the remainder of the curve that brought the line essentially parallel to the river. The east end of a 3-mile-long siding at Jerome, West Virginia, the Cumberland Extension's longest, began immediately after the curve, and it followed the river around Magnolia Bend, completely reversing direction for the final time. The switch for an interchange track to the B&O was located approximately 1 mile from the switch, and the Jerome operator's cabin was about 1,200' beyond that. About half a mile beyond Jerome's west-end switch, the route traversed another sharp "S" curve that extended beyond the river bank and more than 200' onto the Fourth Potomac Crossing.

The Fourth Potomac Crossing and Second B&O Crossing spanned the B&O's Low Line and the river's flood plain to reach the Maryland shore. At 1,029', this was the second longest bridge on this line, and its construction cost was $117,618.59.[170] Beyond this crossing, the roadbed cut across the combined base of two small oxbows. This was where the third tunnel, Kessler Tunnel, was located. The tunnel went through the same hard-rock ridge that the C&O Canal's nearby Paw Paw Tunnel penetrated. About 300' beyond the southwest-facing west portal of Kessler Tunnel, at milepost 140.7, the railroad encountered the Fifth Potomac Crossing,

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[168] I.C.C. Survey photograph BC-146, "No. 1360-Over Canal & Potomac," 1917, in WMRHS.
[169] I.C.C. Survey photograph BC-148, "No. 1360 - W. of Green Ridge - Over B.&O.R.R.," 1917, in WMRHS.
[170] I.C.C. Survey photographs BC-149 & 150, "No. 1396 - E. of Kiefer Over Potomac River & Canal," 1917, in WMRHS.

which put the track inside Bevan's Bend, a small oxbow. The track reached the West Virginia side of the bridge on a fill and passed through a cut halfway across the bend before it encountered the Sixth Potomac Crossing at milepost 141.3. The cost of this bridge was recorded as $87,576.27, and it can be safely assumed that the cost of the Fifth Potomac Crossing was very close to this amount.[171] A small wooden bridge, consisting of horizontal timber stringers on vertical bents, once carried a road over the railroad in this cut, but it no longer exists. The west (south) end of this bridge crossed Maryland State Highway 51 on a plate-girder span. At the uphill side of the highway near the bridge, the railroad maintained a small, brick pump house, which survives, but in derelict condition. Having negotiated the Paw Paw Bends, the WM remained in Maryland from this point to milepost 161.8, southeast of Cumberland, a distance of 20.6 miles.

From the west end of the Sixth Potomac Crossing, the roadbed then traveled on a fill about 1,000' to the C&O Canal, which it crossed for the fourth time on a 135'-long Baltimore through truss bridge to provide the necessary clearance above the canal. This bridge, being fairly short and on tangent track, was less expensive to build than the other truss bridges on the line, costing only $15,305.60.[172]

At milepost 142.2, a location called Kiefer's, the railroad encountered another fill. A small passenger waiting shelter at Kiefer's formerly stood there. The railroad encountered two private roads here; the first crossed the railroad at grade while the second passed beneath it through a culvert.

A double-ended siding started about $^1/_2$ mile before milepost 143 and ended just before milepost 144. Bypassing one last, small river bend toward the West Virginia side, the railroad passed through a cut at milepost 143.8 and rejoined the riverbank as it emerged from the cut. At the west end of the passing track was a short side track and another waiting shed at a location called Fairplay. From here the railroad rejoined the north side of the canal, which it followed through another fairly straight, westward trough toward Cumberland.

Again, the roadbed mostly occupied a bench uphill from the canal, as it did on the stretch east of Sideling Hill Creek, and crossed more tributary streams. The most notable was a set of plate girder spans at milepost 147.4 that crossed Town Creek directly adjacent to the C&O Canal's Town Creek Aqueduct. Bridge No. 1474, Town Creek Crossing, was built for $16,268.58.[173] This was the site of a passing track, since there were actually two sets of two spans on the double-width piers. The track was curved through here, so the paired spans were at slight angles to one another. The bridge, as built, originally accommodated only a single track. To the east of the bridge was a station on the north side of the main track and a short industrial side track. The passing track, later downgraded by the railroad to status as a storage track, and referred to as such on company drawings and by employees still living at the time of this report, was added in 1913. The second set of spans over Town Creek was built to accommodate this

[171] I.C.C. Survey photograph BC-154, "No. 1413 - E. of Kiefer - Over Potomac R.," 1917, in WMRHS.
[172] I.C.C. Survey photograph BC-156, "No. 1413 - Over C&O. Canal - E. of Kiefer," 1917, in WMRHS.
[173] I.C.C. Survey photograph BC-159, "No. 1474 - Town Creek - Over Town Creek," 1917, in WMRHS.

new track. The station only lasted a short time; a 1932 drawing indicates only a waiting shed here on the south side of the railroad.[174]

There was a concrete culvert $^{1}/_{10}$ of a mile to the west of Town Creek. A few miles further to the east, the track briefly left the canal and its hillside bench. It crossed a farm field on an S-curve fill and rejoined its mountainside bench a short distance later. The line passed Oldtown, Maryland, at mile 150.9 where there was a wooden locomotive water supply tank adjacent to a collection of wood frame, shiplap-sided buildings. The buildings included a small Western Maryland standard wooden station, an enclosed signal maintainer's shed, and a large wooden pump house that fed the water tank. These were constructed directly atop the earthen bench that carried the railroad on the downhill side of the track. The track bed is carved into a one-sided cut on the uphill side of the track, opposite the depot. All of these structures stood at the west end of a double-ended passing and storage track; there was also a stub side track at the depot. For a time, the railroad served an orchard here by means of a 639' siding which branched away from the main line to the northeast on a 17° curve. This siding was just west of the depot, where a county road crossed the main track at grade.

From here into the Cumberland area, the line continued to follow the hillside above the canal. It was sometimes directly adjacent to the canal and sometimes a good distance away. The railroad crossed a county road on a simple overpass at milepost 151.1 that consisted of a pair of short, steel beams on concrete abutments. A nearly identical bridge, 21'-3" long, crossed a stream at milepost 152.3. The railroad was just downhill from Maryland State Highway 51 through the stretch that followed. There were two small grade crossings at a location called Kiester; one was a public road and one was private. Around milepost 157 the line diverged from the canal to the north, climbing higher on the adjacent hillside. At milepost 157.2 another timber road bridge with sloped approaches crossed the railroad at the top of a low cut.

At the town of Spring Gap, Maryland, an industrial track for an unknown use was built in 1913 according to the Annual Report for June 30 of that year. There was also a station here. At milepost 157.6 in Spring Gap, the railroad crossed Maryland State Highway 51 on a no-longer-extant plate girder overpass.[175] Differences between the abutments in earlier and later photographs suggest that the bridge may have been reconstructed to some degree when the highway was widened and covered with blacktop for heavier automobile traffic.[176] West of Spring Gap the railroad bed was uphill from the canal and the highway. Since it was higher up the noses of the hills and their adjacent hollows, it passed through a series of long cuts and fills for about 2 miles before passing through North Branch, Maryland.

At North Branch a passing track was constructed in 1913. Then, just past mile 160 near the southeast edge of the city of Cumberland, the Western Maryland grade passed over the B&O mainline on a through plate girder bridge, with deck plate girder approaches, on two concrete

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[174] Drawing No. 926-T, in Drawings Room, WMRHS.
[175] I.C.C. Survey photograph BC-164, "Bridge No. 1575, 'Old Town' Road Crossing," 1917, in WMRHS.
[176] Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, "Western Maryland Railway Bridge (Spring Gap Underpass)," HAER No. MD-115, documented the bridge in photographs as mitigation prior to the bridge's removal by the Maryland State Highway Administration.

piers. An interchange track was located west of the underpass. Here, in a southwesterly bend in the Potomac, a large Pittsburgh Plate Glass Company plant was built in the 1950s on the south side of the railroad. A cut led to the Fifth C&O Canal Crossing at milepost 161.0, an 85' long single through plate girder span built for $11,855.35.[177] This was followed immediately by a fill and then the 382' Seventh Crossing of the Potomac at milepost 161.8, which cost $41,456.04.[178] The Seventh and Eighth crossings were both high bridges composed of deep-section, deck plate girder spans on concrete piers. The railroad entered another pair of cuts on the west side of the river and then passed through Welton Tunnel, whose construction was delayed by several cave-ins. This tunnel passed beneath a bluff that would become Cumberland's airport—actually on the West Virginia side—before it immediately emerged onto the 382'-2" Eighth Potomac Crossing, which was built for $39,762.59.[179]

After the Eighth Crossing the track crossed the C&O Canal and passed through South Cumberland, traveling northwestward and crossed the Potomac again at the Ninth Potomac Crossing, milepost 163.5. One tenth of a mile later, the line passed through Knobley Tunnel and reached Maryland Junction. Here the route diverged, with each fork leading to a yard: one called Knobmount Yard, forming the original end of the Cumberland Extension and leading to a connection with the West Virginia Central line into the West Virginia coalfields, and one called Ridgeley Yard, leading to downtown Cumberland and the Connellsville Extension. The latter entered Ridgeley, West Virginia, from the southwest and passed the roundhouse and the yards where trains were sorted and reassembled. Crossing the Potomac once more, the line entered downtown Cumberland directly at the point where Wills' Creek flowed into the larger river. The Cumberland passenger station was on the north side of the track immediately past the bridge. Knobmount was the original terminus of the Cumberland Extension; the operational division later ended at the passenger station.

Equipment

Equipment used on the line evolved over the years, partly reflecting national trends and changes in technology, but also partly reflecting the geographic and commercial requirements of the WM. Nineteenth-century motive power on the Western Maryland before the Gould era for both passenger and freight service consisted of several different sizes of 4-4-0 or "American Standard" type locomotives, as was typical of most railroads in the United States before 1900.[180]

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[177] I.C.C. Survey photograph BC-167, "No. 1610 - West of North Branch - Over C.&O. Canal," 1917, in WMRHS.
[178] I.C.C. Survey photograph BC-168, "No. 1618 - W. of North Branch - Over Potomac River," 1917, in WMRHS.
[179] I.C.C. Survey photograph BC-169, "No. 1625 - Potomac R. - E. of South Cumberland," 1917, in WMRHS.
[180] "4-4-0" refers to the arrangement of wheels on a common type of steam locomotive according to a system of designation called Whyte's classification. The first number refers to what are called pilot or pony wheels, which were unpowered wheels mounted in a swiveling truck that could readily follow curves and irregularities in track while providing a guiding force to assist the locomotive into and out of curves. The WM's locomotives had 0, 2, or 4 pilot wheels. The center number represents the number of driving wheels on a common frame. The WM operated single-frame locomotives with 4, 6, 8, and 10 driving wheels. The last digit refers to the number of trailing wheels. Like the pilot wheels, trailing wheels were unpowered—a few locomotives had booster engines to power trailing wheels to assist in starting trains—and most were mounted in a swiveling truck. Trailing trucks carried the weight of large fireboxes on modern locomotives, and the WM owned locomotives with 0, 2, and 4 trailing wheels. While

From the Western Maryland's inception through the first decade of the twentieth century, freight and passenger cars were built primarily of wood and sheathed in tongue-and-groove or plank wood siding. Cars that could be used to haul coal, agricultural, and manufactured goods, including low-sided coal gondolas with drop bottoms, flat cars, and box cars formed the bulk of the freight car fleet, while day coaches, baggage cars, and mail cars served as passenger accommodations. In the 1880s, a fleet of 4-6-0 "Ten-Wheelers" joined the roster, but this wheel arrangement was mostly gone from the railroad again within three decades. The mountainous terrain and the arrival of larger locomotives made both the 4-4-0s and the 4-6-0s obsolete on the Western Maryland by 1910.

In 1884, the railroad received its first of the 2-8-0 "Consolidation" type locomotives for freight service from Philadelphia's Baldwin Locomotive Works, which was the Western Maryland's nearly-exclusive supplier. Over the next forty years, this freight hauler became the most prevalent type of locomotive on the system. Since most of the locomotive's weight was on its driving wheels, the arrangement was well-suited to most of the WM's grades, especially west of Cumberland. When the Gould/Fuller Syndicate purchased the West Virginia Central and Pittsburgh Railroad, its fleet of 2-8-0s and 4-4-0s joined the Western Maryland roster. At the time of the Cumberland Extension's completion, these were the standard locomotive types for mainline service.

The period between 1900 and 1930 saw significant growth in the size and weight of Western Maryland engines, which was made possible by the improved physical plant. With Gould's improvements, the line began acquiring much heavier 2-8-0 types. Anticipating the growth in traffic and capacity, a fleet of 2-8-0s class H-5 and 0-6-0 switch locomotives class B-2 arrived in 1905.[181] The H-7 class of 2-8-0 engines was purchased to accommodate the anticipated traffic expected to be a direct result of the Cumberland Extension in 1906.[182] From this point, the railroad steadily acquired larger and larger 2-8-0s for through freight trains and coal trains, mostly from Baldwin. A subclass of these engines, the H-7a types, represented an unusual departure from usual Western Maryland practice in that they were constructed at the American Locomotive Company's (ALCO) Richmond works in 1911. In the thirteen months following the August 1, 1912, opening of the Connellsville Extension, fifteen more Baldwin 2-8-0s, class H-7b, arrived on the property.

The passenger locomotive fleet, modest though it was, also grew in the expansion and construction period. Anticipating the first possibility of true intercity service, ten 4-6-2 type

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most locomotives had a single set of driving wheels, some, known as articulated locomotives, had a second set of drivers on a second frame that was pinned to the center of the locomotive so that it could swing to better align with curves. The flexibility of an articulated design allowed for a greater number of drivers and a second pair of cylinders. Articulated locomotives required four digits in the Whyte System. The WM used 0-6-0 and 0-8-0 yard switchers, and 4-4-0s, 4-6-0s,and 4-6-2s to pull its passenger trains. Freight service saw the greatest variety, including 2-8-0s, 2-10-0s, 4-8-4s, 2-8-8-2s, and 4-6-6-4s, plus some of the 4-4-0s and 4-6-0s in its early years.

[181] More on the railroad's timeline, including locomotive acquisitions, is available in Charles Kilbourne, "A Western Maryland Railway Chronology," *The Blue Mountain Express* 41, no. 1 (Summer 1985): pp. 6-7.

[182] Information on Western Maryland's H-7 class and other 2-8-0 locomotives compiled from David R. Sweetland, "Western Maryland Classes H7, H7-a and H7-b 2-8-0s," *The Blue Mountain Express* 36, nos. 3 and 4 (Fall and Winter 2007).

passenger locomotives arrived in 1909, assigned to class K-1. A fleet of nine heavier 4-6-2 type passenger locomotives, class K-2, also from Baldwin, followed in 1912.[183]

The railroad expanded its car fleet in the same period, acquiring an assortment of equipment. Steel hopper cars for coal service began joining the fleet in 1905 after Gould purchased the West Virginia Central and Pittsburg and inherited its fleet of early steel cars built in 1902 and 1903. The railroad purchased its own steel cars the same year from the Cambria Steel Company in Johnstown, Pennsylvania. A large car order in 1912 expanded the fleet in keeping with the opening of the Connellsville Extension. This included 1,000 50-ton capacity steel hopper cars, Western Maryland's last order in a class of 3,700 cars of this size built between 1905 and 1912. Many more steel cars of widely varying types followed. By the late 1920s, 50 to 55 tons was the normal capacity for hopper cars, and Western Maryland maintained a fleet of more than 10,000 that earned the bulk of the company's revenue. The railroad's shop in Elkins, West Virginia, built some, but many came from Bethlehem Steel.[184]

The smaller 2-8-0s were assigned to local and branch line service. The last 2-8-0s, the Class H-9s that Baldwin delivered in 1921 and 1923, were among the largest Consolidations ever built. Other types of engines, including older, smaller 2-8-0s and purpose-built 0-6-0s and 0-8-0s, served as switchers in the yards.

When the railroad acquired its 4-6-2 Pacific-type passenger engines, the last 4-4-0s were retired. The Pacific types briefly pulled the Chicago passenger train until it was discontinued. As passenger service contracted during the 1930s, the lighter K-1s were relegated to hauling mixed passenger and freight trains in West Virginia and to hauling local freight and passenger trains. This left the K-2s to handle longer-distance passenger trains and Baltimore commuter service. Western Maryland finally sold the K-1s to the Seaboard Air Line Railroad in 1944, where their light weight was well suited to the sandy roadbeds of the coastal south. After 1930, most passenger trains made little, if any, money but they ran to accommodate U.S. Mail Railway Post Office service requirements and to provide many small communities with their sole link to the outside world.

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[183] A member of the K-2 class, No. 202, is one of only two surviving Western Maryland steam locomotives. It is located in a city park in Hagerstown, Maryland, where it has been on display since the mid-1950s. In 1947 it was converted to burn oil instead of coal in accordance with a Baltimore city smoke ordinance and thus assigned to commuter trains in that city. Prior to that, it likely regularly operated on the Cumberland Extension. The other surviving steam locomotive is No. 6, a three-truck Shay gear-driven locomotive. Built in 1945 by Ohio's Lima Locomotive Works, No. 6 was the largest Shay ever built, as well as the last. Designed strictly for slow-speed operation, it worked a branch line serving a mine tipple in West Virginia, and only operated over the Cumberland Extension when traveling to Hagerstown for heavy repairs. Today it operates on the Cass Scenic Railroad in West Virginia.

[184] Information on the West Virginia Central cars is available from research performed by Al Westerfield for production of a model railroad hobby kit that represents them in various incarnations. While instruction sheets for the kits include more detailed information, basic history is available at www.westerfield.biz, kit series no. 8400, last accessed on October 21, 2010. More detailed information on the Western Maryland's steel hopper car fleet comes from W.J. Oertly, Jr., "Early Steel Hopper Cars of the Western Maryland," *The Blue Mountain Express* 21, no. 2 (Spring 1992): pp. 15-19.

Freight service remained the revenue earner. The 2-8-0s, particularly Class H-9, remained the primary road freight locomotives through the 1920s, supplemented by a fleet of slow, heavy, and powerful 2-8-8-2s that could switch the large yards near Connellsville and work the coal mine branches of West Virginia. The federal government allocated some 2-10-0 "Decapods" built for Russia but were thwarted from exporting them by the Bolshevik Revolution to several U.S. railroads during World War I, including the WM. These Class I-1 locomotives served primarily on branch lines since they were light in weight and their many wheels distributed this weight well on track that was not suitable for heavier axle loadings. The much larger and heavier Class I-2 2-10-0s arrived during the 1920s, and they entered service pulling the heaviest trains on the steep grades of the Connellsville Extension, often with two or three of them on a single train. They soon began making regular appearances east of Cumberland as well.

During this period, the Western Maryland continued to acquire steel—which became the preferred material for car construction after 1905—rolling stock, Coal hoppers came first, since the solid fuel was the railroad's main traffic source. Steel boxcars, flatcars, and gondolas followed, and the railroad ordered new cars of these types on a fairly regular basis until World War II, splitting its orders among several car builders. The World War I era was an exception. To conserve steel for armaments, the United States Railroad Administration (USRA), which took over operation of most railroads during the conflict, developed standard designs that used composite (steel and wood) construction. The USRA assigned 300 composite boxcars to the WM during this time. By the 1940s, the Western Maryland's fleet of 50- and 55-ton twin-hopper cars formed the largest portion of its freight car fleet and consisted of two major types: cars with straight side sills and sides stiffened with channel-section ribs, and cars with dropped, or "fishbelly," side sills and hat-section ribs on the sides. Long trains of these cars traveled between the West Virginia coal fields and Port Covington in Baltimore by way of the Cumberland Extension daily. Freight cars of the interwar period formed the bulk of the Western Maryland's fleet through the early 1950s.[185]

The federal government did not take over America's railroads during World War II, but it did exercise control over everything that was manufactured during the war. Railroads, including the WM, were soon hauling record volumes of war materiel and troops, but their choices for new equipment to handle the traffic were very limited. After the European start of war in 1939, the Western Maryland's management recognized that eventual U.S. participation in the war was likely and that its aging locomotives would be hard-pressed to handle the expected traffic. It could not, however, know when the U.S. would be drawn into the conflict, or how the railroads would function and acquire needed equipment. Accordingly, the Western Maryland ordered new, high-speed, articulated steam locomotives from the Baldwin Locomotive Works in 1940.

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[185] Information on mid-century Western Maryland Freight Cars comes from Jack Brown, *Western Maryland Color Guide to Freight and Passenger Equipment* (Kutztown, PA: Morning Sun Books, 1996); William J. Oertly and D.A. McFall, *Western Maryland Railway Revenue Equipment: Boxcars and Refrigerator Cars* (Union Bridge, MD: Western Maryland Railway Historical Society, 2006); The Rensselaer Polytechnic Institute Railroad Club's "NEB&W Guide to Freight Cars," available at http:railroad.union.rpi.edu/article.php?article=1511, last accessed October 21, 2010; "Steam Era Freight Cars," available at http://www.steamfreightcars.com, last accessed October 21, 2010.

The twelve Class M-2 4-6-6-4 Challengers, delivered in late 1940 and early 1941, cost $3 million, but they quickly proved their worth, particularly on the Connellsville and Cumberland lines. The wisdom of this purchase was further validated after the Japanese attacked Pearl Harbor on December 7, 1941.

Immediately after the war, the WM had something of a split personality regarding new motive power. The railroad had begun experimenting with diesel power in 1941, purchasing a small fleet of four-axle switching locomotives. For this order, Western Maryland went with its usual supplier, Baldwin, choosing that company's model VO660. More switchers came during World War II in the form of Baldwin VO1000s and American Locomotive Company (ALCO), models S1 and S2. These switchers gave excellent service and economy, so like most other railroads—notable exceptions being coal haulers N&W, VGN, and C&O—the WM began ordering diesels for road service soon after the war, with the first of these units delivered in 1947. Between then and complete dieselization in 1954, the Western Maryland ordered additional diesel locomotives from Baldwin, ALCO, and the Electro-Motive Division of General Motors (EMD). These first-generation diesels ranged between 900-1600 horsepower, and all rode on 4-wheel trucks. Most of the post-war units were for road service, and they could be coupled together into multi-unit sets that were all operated by one engineman. These diesels enabled service upgrades on premium trains by eliminating some of the service stops and engine changes that steam locomotives required.[186]

The other side of the road's post-war personality manifested itself in a 1946 order for twelve 4-8-4 steam locomotives, again from Baldwin. Delivered in early 1947, these Class J-1 Potomacs—the southern-leaning WM rejected the Northern name used by many railroads for the type—cost the company $2.7 million. There seem to be two reasons why the WM bought them. With almost every railroad buying diesels, delivery times were long from all of the builders, and the WM needed modern power as soon as possible. Its older locomotives were well worn from heavy service during the war, but with diesels on the way, an extensive rebuilding program would not have been a wise investment.[187]

There seems to have been an outside influence as well. The Western Maryland and the Reading [Railroad] Company operated through trains over both railroads using pooled power between Allentown, Pennsylvania, and Hagerstown. On these trains, the locomotive from one road pulled the train over the entire route, thus avoiding the lost time and expense of changing locomotives at Shippensburg, Pennsylvania, the interchange point. (While this practice is now common, it was fairly rare for freight trains in the late 1940s.) Both railroads contributed locomotives to the pool. Like the WM, the Reading's steam locomotives were in poor condition at the end of World War II, but the company could not afford to purchase new power—either

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[186] The economic and operational advantages of diesel locomotives over their steam predecessors have been examined at length in numerous technical and historical publications, so they will not be discussed here.

[187] Nevertheless, the Western Maryland earned a reputation for keeping its steam locomotives in better condition than nearly any other railroad in the east, something evident in several photographs taken by Joe Quinn in Hagerstown during September 1954—two months after the last steam locomotive pulled a Western Maryland train. They show a variety of 2-8-0s and 4-8-4s still clean and polished, never to run again. See "Hagerstown, September 1954," *The Blue Mountain Express* 17, no. 1 (Winter 1987-88): pp. 11-15.

steam or diesel. The Reading decided instead to rebuild thirty 2-8-0s into modern 4-8-4s in its own shop, using all it could from the old locomotives combined with new boilers from Baldwin and various parts from other suppliers. The result was a fleet of thirty modern 4-8-4 Northerns completed between 1945 and 1947. One of their early assignments was handling the Allendale-Hagerstown trains, where they delivered improved performance and a reduction in operating cost. Since this was pooled power, the WM realized its share of these benefits, but it had no comparable power to replace its older, slower steam locomotives in the pool. Reading pressed the WM for power equivalent to its new Northerns. Not wanting to pull its M-2 Challengers off of its primary lines, and unable to obtain diesels promptly, the road ordered the J-1 Potomacs from Baldwin, who delivered them in just a few months. Thoroughly modern steam locomotives, they gave excellent service and ultimately operated over all of the WM's main lines. Numerous photographs of these locomotives on the Cumberland Extension exist. Unfortunately, the locomotives were doomed to a short operating life; they had all been retired by 1954.[188]

While the Western Maryland had advertised itself as the "Fast Freight Line" for years, the modern, new power enabled the railroad to adopt an aggressive publicity campaign that promoted its new and faster through-freight service. One part of the image was the "fireball" herald, a stylized version of the "Fast Freight Line" herald with a flame-like trailing wing. Beginning with the new M-2s in 1940, it adorned all freight locomotives, both steam and diesel.[189] As a bridge route, the Western Maryland depended heavily on its connections, and they likewise depended on the WM to attract shippers. This group of connecting railroads had been nicknamed the "Alphabet Route" for some time because all of the various lines' reporting marks had to be shown on the freight waybills, so they decided to take advantage of the moniker by calling these run-through freight trains "Alpha-Jets." Delivering the fast service this name implied took considerable effort on the part of each road, especially in expediting interchanges, but it largely worked and allowed railroads like the WM to remain competitive with their larger neighbors.

By the late 1950s, EMD had become the WM's sole locomotive supplier, and the road began to purchase second-generation, 2500-horsepower GP35 and SD35 units in 1963. The SD35s had six axles with traction motors instead of the four under the GP35s and the earlier models, which made them more suitable for the heavy coal trains. Between 1966 and 1969, 3000 hp SD40s followed, with five GP40s delivered in 1971. These were the last diesel locomotives purchased by an independent WM.

While the diesel locomotive fleet provided greater efficiency and flexibility of operation, new developments and improvements in freight cars enabled more specialized and profitable service. During the 1950s, freight cars grew steadily larger, and their carrying capacity increased, a trend that continued into the 1970s. The 40' boxcars able to carry 50 to 70 tons were largely replaced by 50' and 60' cars with up to 100-ton load limits by 1970. Specialized cars for automobiles, chemicals, and bulk commodities broadened the Western Maryland's ability to

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[188] Advertisement "Modern Equipment," reproduced in *The Blue Mountain Express*, 41, no. 1 (Summer 1985): pp. 8-9. Also see Photograph Collection, WMRHS.
[189] Salamon and Hopkins, *The Western Maryland Railway in the Diesel Era*.

handle a growing variety of shipments between Midwestern production centers and Eastern outlets. One major new type of service was trailer-on-flat-car (TOFC), often called "piggybacking," that allowed a shipper to deliver a sealed trailer over the road to the nearest railroad loading facility, where that trailer was loaded on a specialized flat car that carried it for most of its journey. Another truck driver met it at the other end's facility and drove it to its final destination. TOFC service has continued to grow since it began to gain popularity in the mid-1950s, and it became a large component of the Cumberland Extension's traffic over the next two decades.

Operations

Operationally, the Cumberland Extension was part of the West Subdivision of the Western Maryland Railway. Connecting Hagerstown and Cumberland, it formed the central core of the entire railroad. Eastward from Hagerstown, the East Subdivision extended to Baltimore, while the Lurgan Subdivision ran north into Pennsylvania, passing through its namesake town to connect with the Reading at Shippensburg. This provided access to Philadelphia and, by a connection through the Central Railroad of New Jersey and the Lehigh and Hudson River Railroad, New England. Another line provided access to Gettysburg, Hanover, and York, Pennsylvania. From Cumberland, the Thomas Subdivision ran southward into the coalfields of West Virginia, passing through its namesake town to reach Elkins, where coal and lumber branches split to the northwest, east, and south. The Connellsville Subdivision gave the railroad its westward connection to Pittsburgh and the Midwest via the Pittsburgh and Lake Erie and Pittsburgh and West Virginia railroads. Trackage rights over a B&O line to the southwest gave the WM access to a short, otherwise isolated branch that served coal mines around Fairmont, West Virginia. The West Subdivision tied the other four subdivisions together, and most WM through trains traversed it.[190]

Freight schedules remained fairly constant from the late 1930s through the early 1970s. The railroad operated most freight trains as "symbol freights." Each train received a symbol consisting of letters and numbers that designated the train's origin, destination, and its place in the daily succession of trains following the same route, or its status as a specialized service, such as the high-priority Alpha-Jets. Up to three Alpha-Jets operated over the line daily in each direction between Baltimore and any of three terminals in western Ohio. Two westbounds ran in the pre-dawn morning, followed by the third in the early afternoon. Eastbound, an Alpha-Jet traversed the Cumberland Extension in the late morning, and another ran in the early evening. A through train operated in each direction for cars connecting to and from New England points, and the line also hosted a general merchandise freight daily in each direction, with cars picked up and set out only at Hagerstown and Connellsville. In the later years, coal trains usually operated as extras that did not have established schedules. The daily accommodation mail and passenger train operated once in each direction from Baltimore to Elkins and back. Local freight was

[190] Salamon and Hopkins, *The Western Maryland in the Diesel Era*; Cook and Zimmerman, *The Western Maryland Railway*, chapters 2-5; Office of Valuation Engineer, "Western Maryland Railway System Map Showing Original Corporations and Dates of Construction" (Western Maryland Railway, October 8, 1937), in Archive Room, WMRHS.

limited, usually dispatched once a day from Hagerstown to Cumberland, and if photographs are a good indicator, often consisting of less than ten cars.[191]

Of the 13,088 freight cars in Western Maryland's fleet in 1950, 10,754 were coal-hauling hopper and gondola cars. The remainder (2,140) was mostly boxcars. In spite of the low number of boxcars in Western Maryland's fleet, it is quite likely that boxcars belonging to railroads all over the country formed the greatest percentage of the freight cars in motion on the system at any given time, due to through merchandise and other interchange operations that required these versatile and ubiquitous cars. Since these cars usually traveled in bridge traffic movements, and because management avoided having foreign-railroad cars on the property for more than 24 hours in order to avoid per diem fees, most of these cars did not remain on Western Maryland property for long.[192] Coal-carrying cars, on the other hand, which formed the bulk of Western Maryland's own fleet, could be stored on-line for months at a time during coal strikes or slow market periods without incurring per diem charges.

The Western Maryland Railway maintained a reputation as a well-run railroad that effectively balanced progressivism and conservativeness in its approach to customer service and to operation.[193] The company kept pace with marketing and service trends in transportation and quickly adopted improvements to its infrastructure and equipment, while also trying progressive approaches to recruiting and retaining customers. Once the WM added a structure to its physical plant or new equipment to the fleet, the company earned the conservative side of its reputation by keeping it in very good—often impeccable—condition. The Western Maryland had some of the highest maintenance standards of any railroad, keeping older locomotives in service longer and in better condition than most of its competitors. While the origins of this "spit-and-polish" corporate culture are somewhat obscure, it was consistently maintained throughout the WM's life as an independent company. Most photographs show rights of way to be excellently maintained, with bridges consistently well-painted, ballast tamped to sharp edges, rails aligned perfectly, and brush cleared well away from the track. The company's rolling stock received equal treatment in the shops. This was common among most large railroads until the onset of the Great Depression, when many of the "extra touches" were abandoned. For any structure or machine, there is some optimum level of maintenance that strikes a balance between reliability

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[191] Salamon and Hopkins, *The Western Maryland Railway in the Diesel Era*; Sweetland, *Western Maryland in Color*; and Price, *Western Maryland Steam Album*, all provide synopses of Western Maryland operations in the mid-twentieth century.

[192] Each railroad received, and still receives, a daily, or "per diem," fee for any freight car it owned from whatever railroad happened to possess the car at midnight each night. This provided an incentive for railroads to return cars to their home railroads. If, for example, a load of cement left Round Top in a Western Maryland car on Monday, was turned over to the W&LE that evening, arrived at interchange with the Nickel Plate the following morning, and arrived at the customer's loading dock on Wednesday, Western Maryland would receive fees from the W&LE for Tuesday and the Nickel Plate for Wednesday. If the customer did not unload the car quickly, they would pay per diem as well, as could the Nickel Plate for failing to pick up the empty car. Conversely, a Nickel Plate car anywhere on Western Maryland rails at midnight would cost the WM the same charge. Usually railroads balanced fees and charges at the end of each month. Because of the speed of its bridge-traffic trains, the short length of its mainlines, and the relatively small size of its freight car fleet, WM usually received far more in per diem fees than it paid

[193] Morgan, "Western Maryland," pp. 48-57. While a somewhat biased and glowing account of the railroad's operations in the 1950s, this article provides a good summation of what characterized Western Maryland's reputation, as well as providing some insight into how the company earned it.

and cost. Although considerable differences remain, today's railroads demonstrate that this optimum balance often makes appearance a low priority in the overall scheme of things. For its own reasons, the WM management evidently believed that a first-class appearance was worth the additional expenditures needed.

Western Maryland train operations were trim and efficient, increasingly focusing on those services that earned the most profit. Glowing accounts like this one spoke to the high level of competence in management and operations:

> Straight through the depression it squeezed enough net out of its gross income to pay all of its fixed charges, and today [1954] its bonds and equipment trust certificates bear Moody's treasured "A" and "Aa" credit ratings. In its mileage bracket–say, 750 to 1000 miles–…only the extraordinary Kansas City Southern surpasses it as a money maker.[194]

However, such statements were tempered by the fact that much of the revenue earned was consumed by payments on large loans and maintenance expenses. Later in the article quoted above, the author continued:

> its outstanding stock, with a book value of 77 million dollars, is two-thirds common. The other third embraces 7 per cent cumulative first preferred and 4 per cent cumulative second preferred. The trouble is that dividends are in arrears (or owed) on the 7 per cent stock in the amount of $126 per share…and until they're paid off the 4 per centers and common stockholders can't get a nickel.[195]

Regardless of its appearance or reputation for delivering quality service, the Western Maryland Railway faced increasing financial problems throughout the 1950s, and they continued into the 1960s.

Decline of the Western Maryland

During the 1950s, the railroad's conversion from steam to diesel motive power, elimination of passenger service, improvements in traffic control, and the addition of new customers all improved efficiency or increased revenue, but they were offset by factors the WM's managers could not control. Railway labor costs were on the rise as the operating, maintenance, and clerical unions sought to take advantage of the booming post-war economy after two decades of depression and wartime controls. A rapid growth in trucking supported by new, publicly financed highways—particularly after construction of the Interstate System began in 1956—siphoned off an increasingly larger portion of the high-value, high-tariff merchandise shipments. Additionally, the I.C.C. continued to dominate all aspects of railroad management

[194] Morgan,"Western Maryland," p. 50.
[195] Morgan, "Western Maryland," p. 51.

with regulations that specified everything from account numbers to service levels and, most importantly, freight rates. These external factors made it very difficult to control costs. A number of services and branch lines had outlived their usefulness, but the conservative I.C.C. severely restricted the railroads' ability to reduce or eliminate unprofitable and marginal trains or trackage. Combining these factors with its long-standing construction debts and generally high maintenance costs made the Western Maryland of the 1960s a company whose future looked grim.

Fortunately for the WM, a solution began to emerge at about the same time. The WM was not the only railroad experiencing similar difficulties during the late 1950s. One railroad with some similarities to the Western Maryland, the New York, Ontario and Western, was forced into bankruptcy in 1957, and the railroad was dismantled. Accordingly, the I.C.C. came under heavy pressure to recognize that American railroads had serious competition not just from each other, but from other modes of transport as well, and to change its outdated positions on such matters as freight rates and mergers. The commission responded by including the financial health of railroad companies in what it termed "the public interest," which changed its analytical perspective on mergers.[196]

To illustrate the change, the Virginian Railway had been sought as a merger partner by the Norfolk & Western Railway, the Chesapeake and Ohio Railway, and other railroads since the 1920s. However, the I.C.C. had denied every application presented to it, ruling that any reduction in the number of railroads would reduce competition and thus lead to rate increases that would not be in the public interest—even though the commission could deny any changes. After the I.C.C. approved the Nashville, Chattanooga and St. Louis (NC&StL)-Louisville and Nashville (L&N) merger in 1957, based largely on claims of cost reductions that would minimize the need for rate increases, the N&W and Virginian decided to try again. This time, the I.C.C. considered the cost-reduction benefits of merger claimed by the two companies and approved the application. The Virginian was merged into the N&W in 1959. These mergers encouraged other railroads to investigate mergers of their own that strengthened their financial resources while selectively adjusting their networks to focus on the most profitable services. They ignited a boom period for railroad mergers that cut the number of independent carriers roughly in half by the end of the decade.[197]

The WM management and directors soon realized that merging their company into a larger railroad offered their greatest opportunity, but which one should they court? As it turned out, that decision was made by others. Though a merger was accomplished, the ultimate outcome was probably far different from what most WM people expected.

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[196] Dain L. Schult, *Nashville, Chattanooga & St. Louis: A History of the "Dixie Line"* (Forest, VA: TLC Publishing, 2001), pp. 191-200; Richard E. Prince, *Norfolk & Western Railway: Pocahontas Coal Carrier* (Millard, NE: Richard E. Prince, 1980), pp. 73-74; and Reid, *The Virginian Railway*, pp. 81-82, 130-131.

[197] The complete merger review process is too complex to be examined here. Suffice it to say that the I.C.C. considered factors representing a wide variety of viewpoints, but its prime concern was the likely effect of any change on competition and the rates shippers would be charged. Merger applications are now examined by the Surface Transportation Board (the I.C.C.'s successor), but the process has been streamlined considerably.

Events that began outside the Western Maryland resulted in it being merged into successively larger railroad companies. While this initially appeared to be the WM's saving grace, other changes in railroading throughout the Mid-Atlantic and Midwestern regions ultimately spelled doom for the company and most of its track. The saga began in 1959, when, after resisting a merger proposal from its main rival, the Pennsylvania Railroad, New York Central President Alfred Perelman approached President Walter J. Tuohy of the Chesapeake and Ohio to propose a three-way merger with the Baltimore and Ohio. Recognizing that the NYC's position was weak, Tuohy and the C&O's stockholders rejected Perelman's idea, but they realized that the B&O could compliment the C&O and decided to buy a controlling interest in it instead. Perelman tried to do the same, but in their ensuing duel to woo B&O stockholders, the wealthier C&O managed to purchase 70 percent of the B&O's stock by the spring of 1961, solidly giving Tuohy controlling interest and eliminating the challenge from Perelman. The I.C.C. had to approve the purchase, of course, which it did on December 31, 1962. With this purchase, Tuohy had successfully begun creating a railroad system that would soon include the Western Maryland as well. (Rebuffed, Perelman restarted negotiations with the Pennsylvania that led to the Penn Central, a 1968 merger that became America's largest corporate bankruptcy up to that time only two years later.[198])

The C&O and B&O remained two separate companies, but under the guidance of Cyrus S. Eaton they began to gradually combine management and coordinate operations. Eaton also took note of the controlling stock in the Western Maryland that B&O had purchased in 1927. In 1964, the C&O and B&O filed with the I.C.C. to terminate its 1932 order that had placed the B&O's Western Maryland stock in trust to ensure the company's functional independence. Western Maryland management, apparently seeing the possibility of a merger, supported the appeal, which the I.C.C. soon approved. Four years later, the I.C.C. also approved a C&O-B&O proposal to actively control the Western Maryland, which, like the C&O and B&O, remained a separate company.[199]

Over the next five years, the Western Maryland's board evolved to reflect the new situation as individuals nominated by the C&O-B&O management replaced members as their terms expired. By 1973, Eaton had completed his consolidation of C&O-B&O-WM management and operations, and the conglomerate, newly led by Hays T. Watkins, Jr., started marketing itself as the Chessie System, named after a fictional cat the C&O had used in its passenger marketing for many years. Though managed by a single team, the C&O, B&O, and WM continued operating as separate companies. While new and repainted equipment received a bold, new Chessie System scheme, each locomotive and car retained its C&O, B&O, or WM reporting marks to identify the individual owners.

Within the Western Maryland ranks, it looked like the railroad would fill a niche within the larger system, since the WM and its Alphabet Route connections still provided a good route for through merchandise traffic. The Chessie System would also be able to assume and retire the WM's debt, which could allow the company to flourish. As the Chessie System consolidated,

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[198] Reynolds and Oroszi, *Baltimore & Ohio Railroad*, pp. 57-59.
[199] Stover, *History of the Baltimore and Ohio Railroad*, p. 364.

other railroads in the region also made changes that negated any competitive advantage that might have accrued to the Western Maryland. During the 1960s, the Norfolk and Western expanded into the Midwest through a series of acquisitions, including the Pittsburgh and West Virginia, the Western Maryland's key connection at Connellsville. Even with the P&WV's ownership change, the Alphabet Route remained lucrative for a time, bolstered by Chessie management's investments in piggyback freight service on the WM. Former train service employee Wilbur Metz recalled, "they did really good business out of Toledo (Ohio), hooking up with the N&W, moving fast freight."[200] While this was good for the WM, it was less so for the other Chessie System roads. Chessie's constituent companies operated as competitors to the N&W in many corridors, and each favored routing traffic entirely over its own lines to maximize its revenue while ensuring that its rival earned none. With its own B&O lines extending to Detroit, Chicago, and St. Louis, Chessie began to market these routes instead of the Alphabet Route. The effort was successful, and as traffic moved from the Western Maryland to the B&O, Chessie downgraded the WM line.

The decision to finally abandon the Western Maryland in the early 1970s was an easy one for its corporate parent. Since the B&O and WM were essentially parallel all the way from Hancock to Connellsville, one of the routes was clearly redundant. The question of which to keep came down to the advantages each line offered. The financially robust and resilient B&O had countered the WM's advantage through the Paw Paw Bends when it opened a new alignment of its own called the Magnolia Cutoff in 1914. This route used bridges, tunnels, and cuts to bypass most of its original, circuitous line that followed the Potomac River with a higher, straighter line somewhat similar to what the Western Maryland had constructed. With only two Potomac crossings and four short tunnels with a combined length less than that of the WM's Indigo Tunnel alone, it was considerably cheaper to maintain. Improvements to other sections of the B&O line similar to the Magnolia Cutoff had further improved the railroad as a whole. Finally, the Western Maryland was a single-track line with sidings, whereas the B&O was double-tracked, with additional tracks in critical locations. The B&O line's operational and maintenance advantages were substantial.

The Chessie System filed a petition with the I.C.C. to abandon the Connellsville Extension and most of the Cumberland Extension west of Tonoloway, Maryland, on June 11, 1973. This would leave the line from Hagerstown to Big Pool and Cherry Run in service, plus the track from Big Pool to Tonoloway that served a pulpwood loader and could be used to store idle freight cars. In the North Branch area, industrial tracks serving the Pittsburgh Plate Glass plant would remain open, but with access from the B&O main line. The only other portion to be retained was from Cumberland through Maryland Junction and Knobley Tunnel to serve a salvage yard in South Cumberland, Maryland.[201]

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[200] Western Maryland employees, interviews by David A. Vago, July 28, 2009.
[201] Jeremy Cooper, "Western Maryland Railway: West Subdivision/Cumberland Extension," http://www.wmwestsub.com/main.htm, last accessed Feb. 22, 2011.

After the required studies and public hearings the I.C.C. approved the abandonment on February 19, 1975.[202] The company immediately began preparing to shift the remaining WM traffic over to the B&O line, which was largely accomplished on May 12. The final train ran from Hancock to Cumberland on May 21, 1975.[203]

Probably spurred by interest in the line on the part of competitor Norfolk and Western, and wanting to make the abandonment as permanent as possible, the Chessie System began removing the track quickly after the last train ran. Photographs dating to the spring of 1976 reveal a stretch of limestone ballast through scrubby vegetation devoid of track.[204] The steel rails and track components were salvaged for use elsewhere, or scrapped if unsuitable for that, but the roadbed was left as is, including the bridges, tunnels, culverts, and retaining walls.

The C&O Canal National Historical Park began negotiating with the railroad for purchase of the Cumberland Extension roadbed from Pearre to North Branch in 1976, shortly after its abandonment. Had the route been laid on a right-of-way rather than on property the WM owned outright, ownership of it would have reverted directly to the adjacent landowners. Seeking to acquire the land as a buffer zone for the canal, the National Park Service acted quickly after a special act of Congress authorized the purchase, citing the fast-rising value of land as a reason for haste. The property transfer took place on December 2, 1980. Because its initial interest in the line was as a buffer, the Park Service was only interested in the Maryland side, but as a condition for the deal the railroad required that the government acquire its land in West Virginia as well. Initial conversations between the Park Service and local representatives indicated that the Park Service would sell the West Virginia land to the county or to adjacent landowners. The Park Service even went so far as to seek prices for removing the bridges, which it saw as a liability. Several historical, environmental, and recreational advocacy groups in the area, including the C&O Canal Association, argued for the roadbed's potential as a recreational corridor, but opposition from the adjacent landowners prevented any significant progress toward that goal.

Given this difference of opinion, the cost of bridge removal, and the sizeable resources needed to convert the roadbed into a safe, attractive trail, the Park Service chose to mothball the property instead. Sections of the roadbed are used as access roads to various properties, but the bridges have been barricaded to prevent vehicular access. Since the track was removed, some adjacent property owners have treated other portions to be extensions of their property. Occasional conversations have taken place over the management and disposition of the roadbed, but without conclusive result. Thus, the Park Service-owned portion of the roadbed remains

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[202] Office of Cooperative Activities, National Capital Parks, National Park Service, "A Preliminary Report on a Portion of Right-of-Way Abandoned by the Western Maryland Railway Company Between Hancock and Cumberland, Maryland" (Published by Agency, July 1976, revised by C&O Canal National Historical Park, October 1976).

[203] Cooper, "Western Maryland Railway: West Subdivision/Cumberland Extension."

[204] Photographs on file with the following documents: National Register of Historic Places Inventory-Nomination Form: Western Maryland Railway (abandoned portion in Federal ownership), and Additions to C&O Canal National Historical Park Pursuant to Public Law 95-615, both available at the Office of the Lands Manager, CHOH.

essentially intact but overgrown for much of its length. It does, however, serve as the intended buffer for the canal in several places.

With the National Park Service in possession of most of the Cumberland Extension west of Pearre, the Maryland Department of Natural Resources became interested in the Big Pool-Pearre section for a recreational trail and purchased it from Chessie System successor CSX Corporation in 1990. The Western Maryland Rail Trail, as it is known, opened in three stages between 1998 and 2005, and 22-$^{1}/_{2}$ miles of paved trail for hikers and bikers now extends from Big Pool to Pearre.[205] The Great Allegheny Passage trail was envisioned in the early 1990s as a recreational rail-trail connecting Cumberland to Pittsburgh. The section from Cumberland to the Maryland-Pennsylvania line opened in 2006. The rail-trail meets the C&O Canal towpath trail at Cumberland and parallels former WM track now used by the Western Maryland Scenic Railroad, a 16-mile tourist line to Frostburg, Maryland. From there hikers and bikers can continue northwest on the former Western Maryland Connellsville Extension roadbed. From Connellsville, the trail follows the Pittsburgh & Lake Erie Railway roadbed to McKeesport, and eventually the Great Allegheny Passage will be completed uninterrupted into downtown Pittsburgh. Thus the Cumberland to Pittsburgh rail-trail follows the same line envisioned by George Gould a century earlier.[206]

The Western Maryland Railway officially ceased to exist as a corporation on May 1, 1983, when its few remaining assets were merged into CSX, and its debt at last settled. Only portions of the three sections of the West Subdivision noted above still remain in service, with the Hagerstown-Cherry Run section the only one to see regular traffic. The industrial tracks near North Branch see much less usage, and the line from Cumberland across the river to Ridgeley, West Virginia, is now used only by the WMSR to access its shop and small yard.[207]

Conclusion and Legacy

The abandoned railroad grade of the Western Maryland Railway's Cumberland Extension represents a failed experiment in which a railroad baron made a bold gamble in an effort to best his competition using expensive modern technology. It nearly worked. With its 1912 arrival in Connellsville, the Western Maryland almost came into its own as a bridge route and coal hauler between the Pittsburgh area, the West Virginia coalfields, and the Port of Baltimore. The railroad possessed an excellent physical plant and good connections to the Midwest, but these had come at a very high price. Had George Gould's transcontinental scheme not collapsed, the massive investment might have paid off handsomely for all of the railroads involved, but it fell apart shortly before the last pieces could be put into place, leaving the Western Maryland a small, independent railroad saddled with a huge debt and high maintenance costs, but without the

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[205] "DNR Announces Third Phase of Work Completed on Western Maryland Rail Trail," Maryland Department of Natural Resources press release, May 19, 2005.
[206] For more information on the Great Allegheny Passage, see: http://www.atatrail.org/index.cfm, last accessed February 22, 2011.
[207] Phillips, "Whatever Became of the Western Maryland? Part 2," pp. 44-50; and Western Maryland employees, interviews.

volume of traffic—hence revenue—needed to repay it and turn a profit. Despite innovative management, aggressive marketing, and reliable service over a well-engineered and superbly, albeit expensively, maintained railroad, this debt was a burden from which the company could never fully recover.

Stripped of its place in a transcontinental system, the Western Maryland could be little more than a redundant, regional carrier through a sparsely populated area, struggling to survive against formidable competition that served major markets well beyond its termini. That would have been challenge enough without the heavy debt obligations, and it proved impossible with them. Perhaps the most amazing part of this story, as well as the greatest legacy of its people, is that the Western Maryland Railway survived as well as it did for as long as it did.

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Illustrated Appendix

All photos from the Western Maryland Railway Historical Society collection, Union Bridge, Maryland.

Figure 1. View of the Potomac River valley west of Sideling Hill. The B&O was on the south (left) side, the Western Maryland on the north. Great Cacapon, West Virginia seen in the distance.

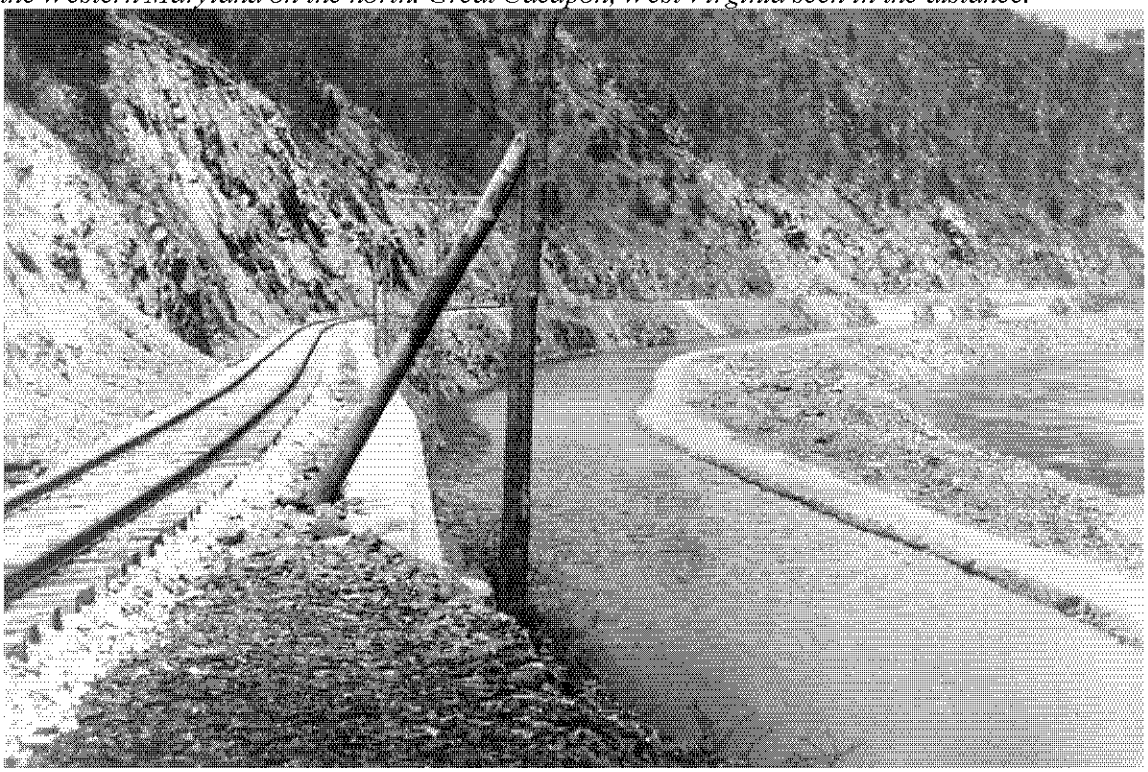


Figure 2. WM built long benches (half cut/half fill) and retaining walls next to the C&O Canal, mile 129.

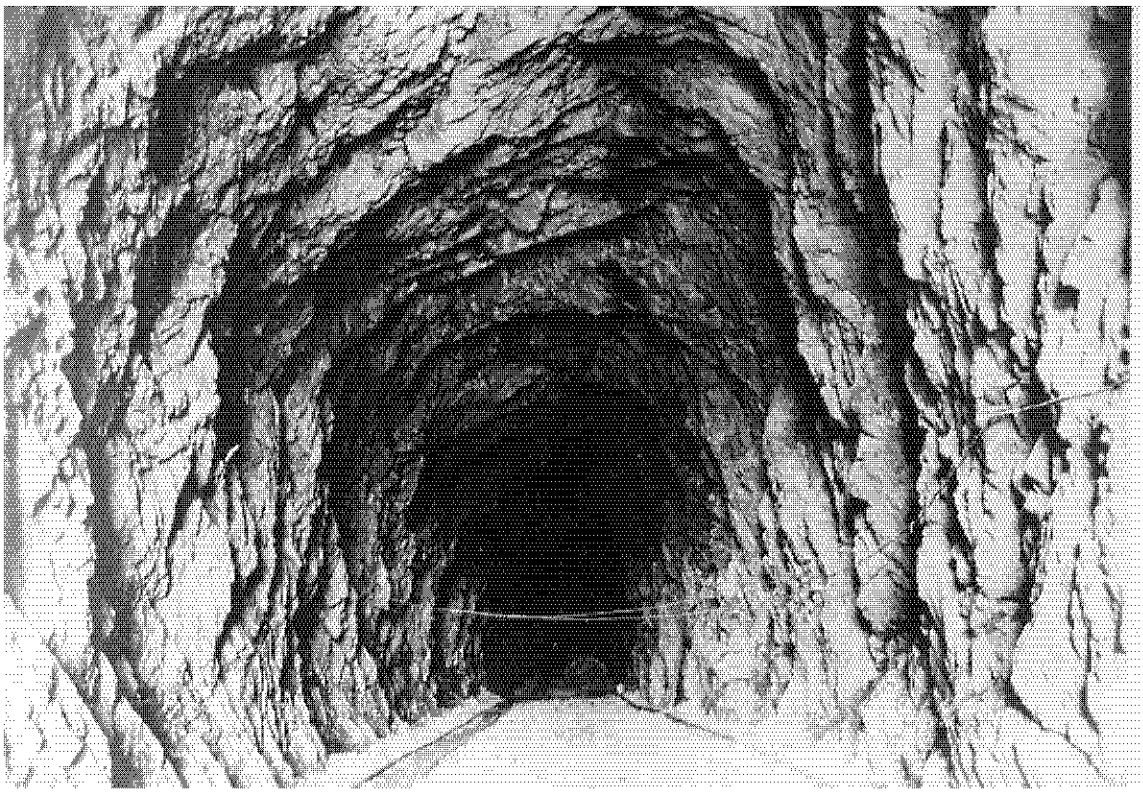


Figure 3. View of Indigo Tunnel interior after blasting, but prior to timber framing, ca. 1904.

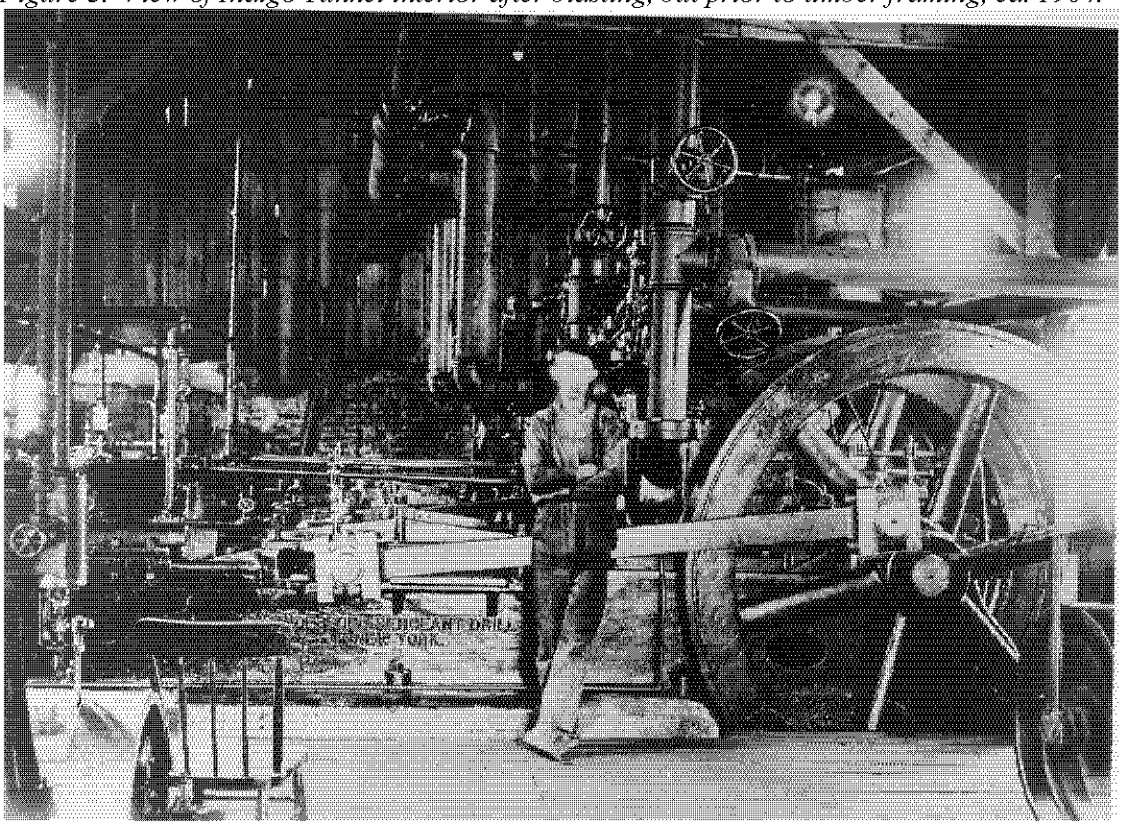


Figure 4. A temporary air compressor plant for tunnel ventilation during construction, ca. 1904.

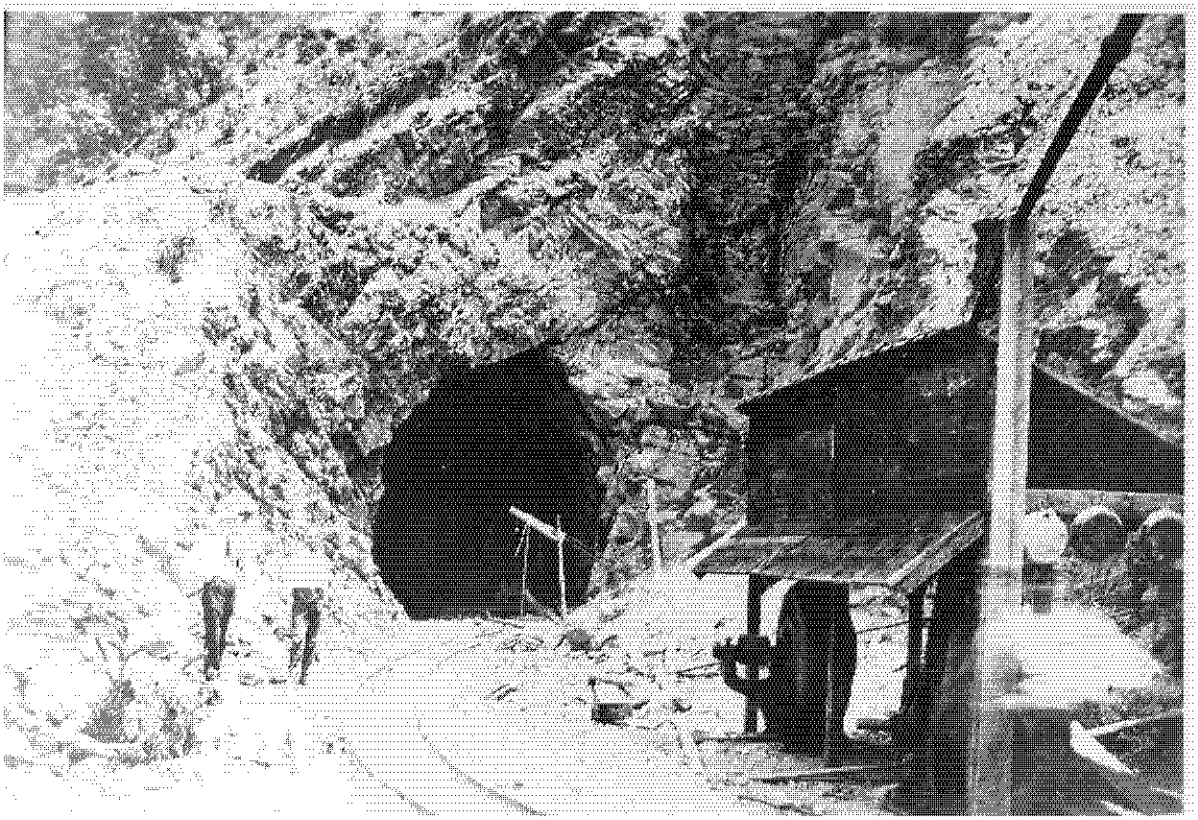


Figure 5. Storage shanty erected outside Indigo Tunnel portal, ca. 1904.

Figure 6. Remains of work camp by west portal of Stick Pile Tunnel, including a boarding house, and a movable track maintenance machine, 1967.

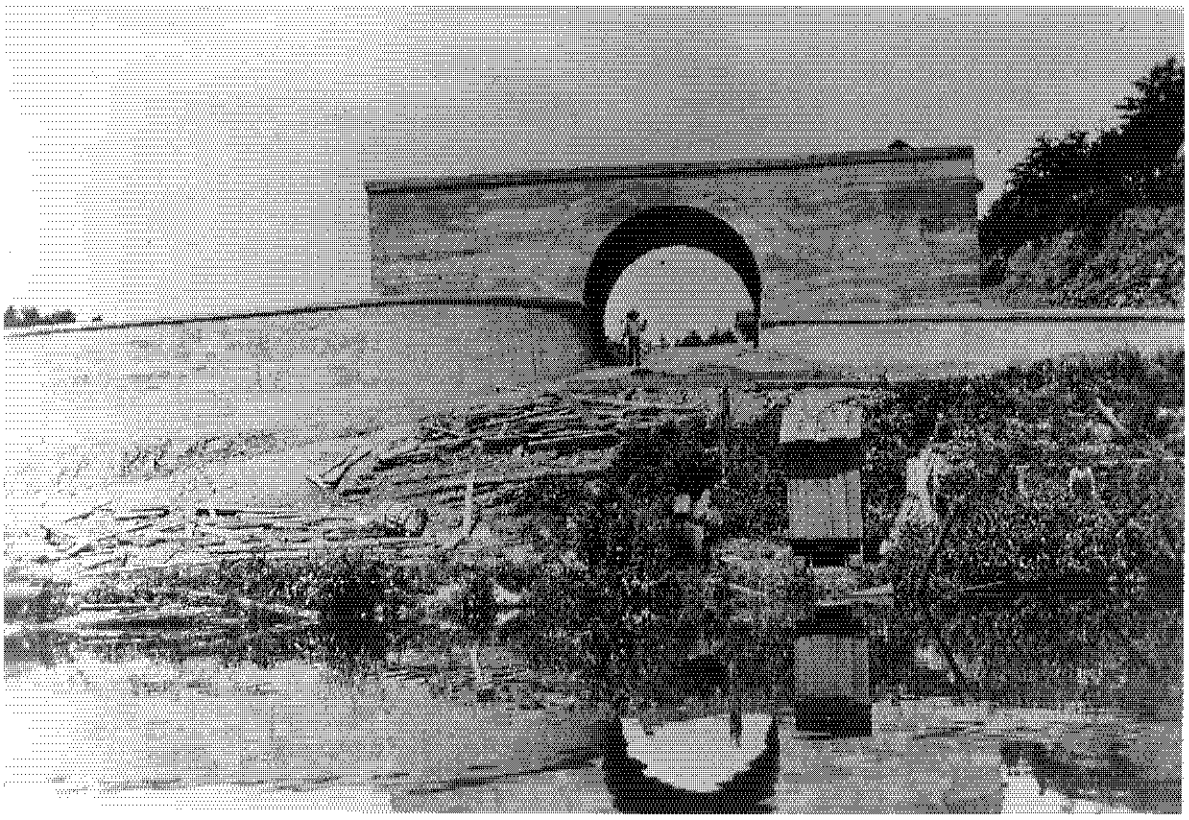


Figure 7. Culvert No. 1308, High Germany Road Culvert under construction, before fill, ca. 1906.

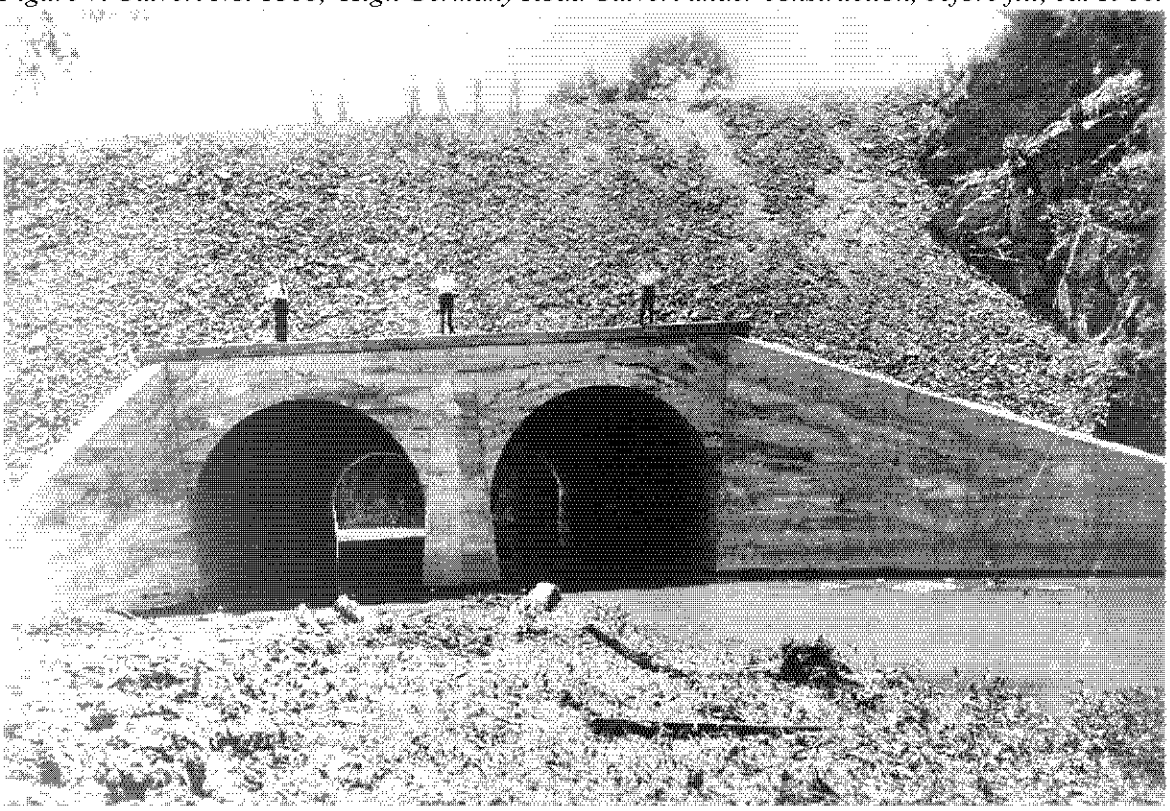


Figure 8. Culvert 1309, 20'-6" diameter Fifteen Mile Creek Culvert following completion, ca. 1906.

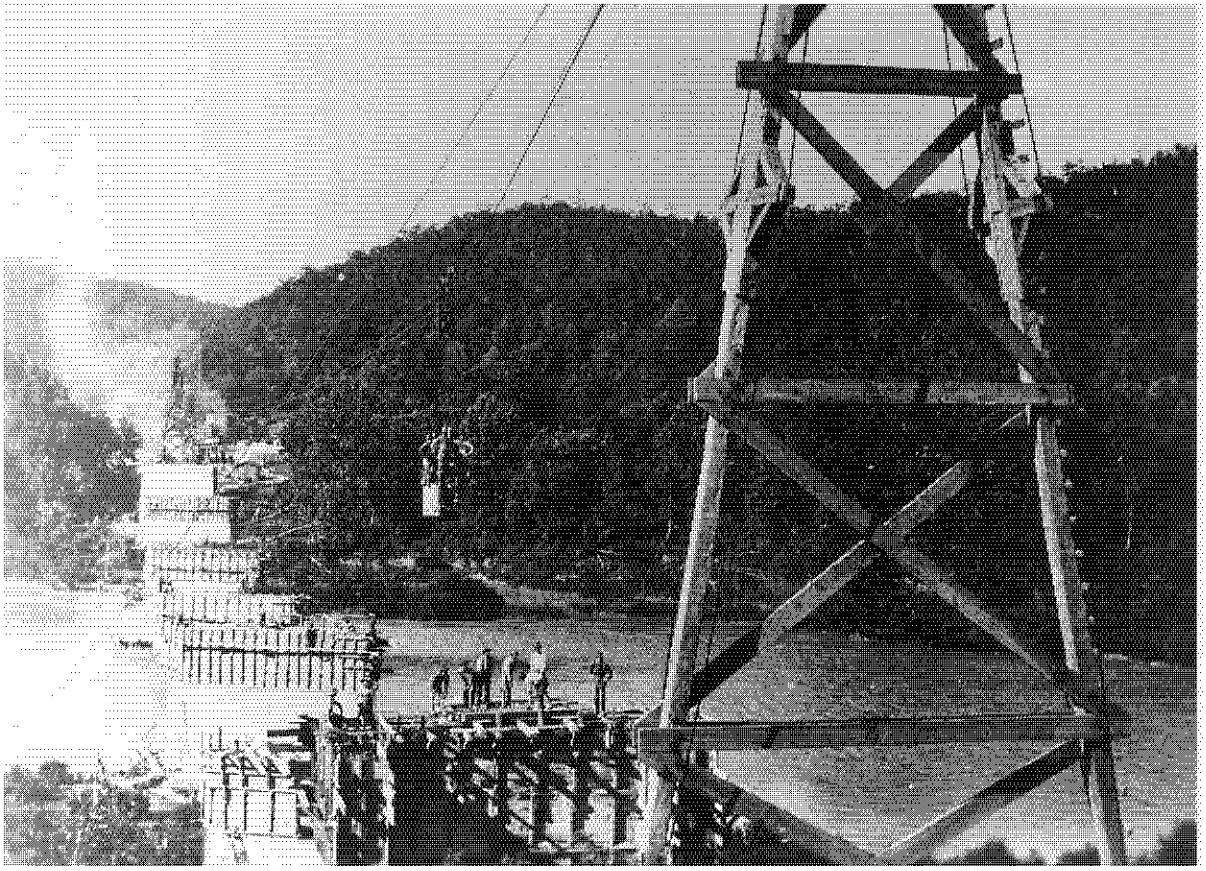


Figure 9. Timber towers support cables ferrying concrete and workers during pier construction at Bridge No. 1348, the Second Potomac and C&O Canal Crossing, ca. 1904.

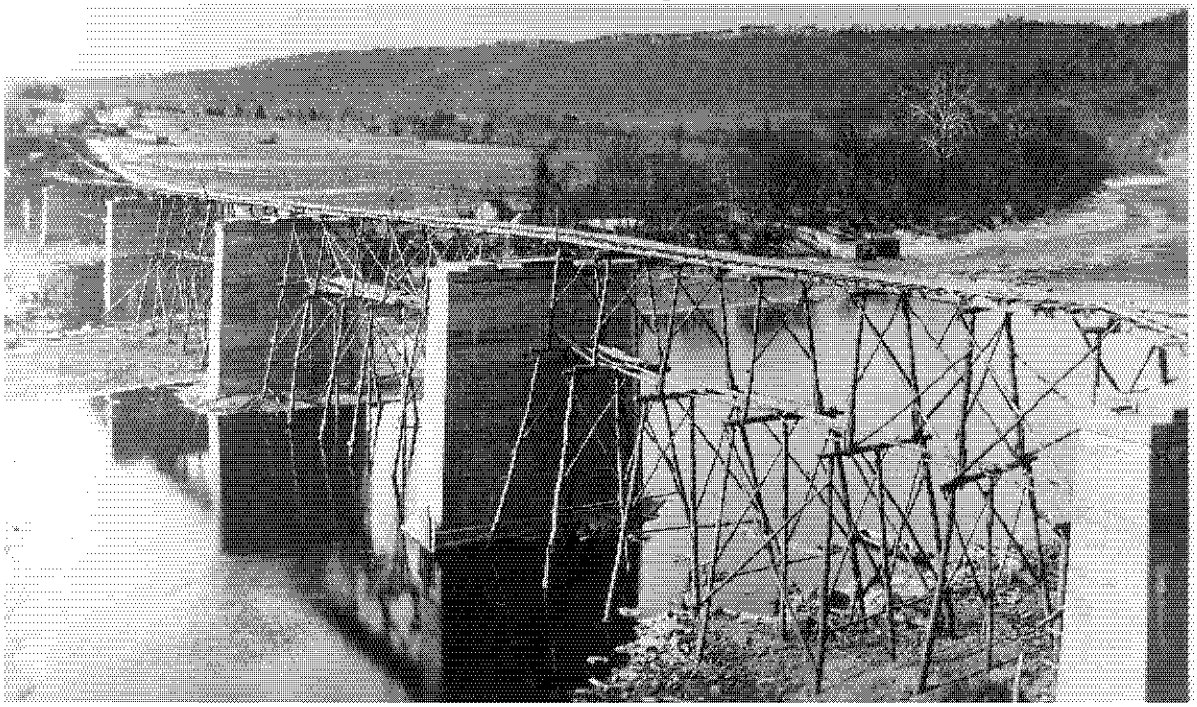


Figure 10. Falsework supported a temporary track at the Sixth Potomac Crossing, mile 1413, ca. 1904.

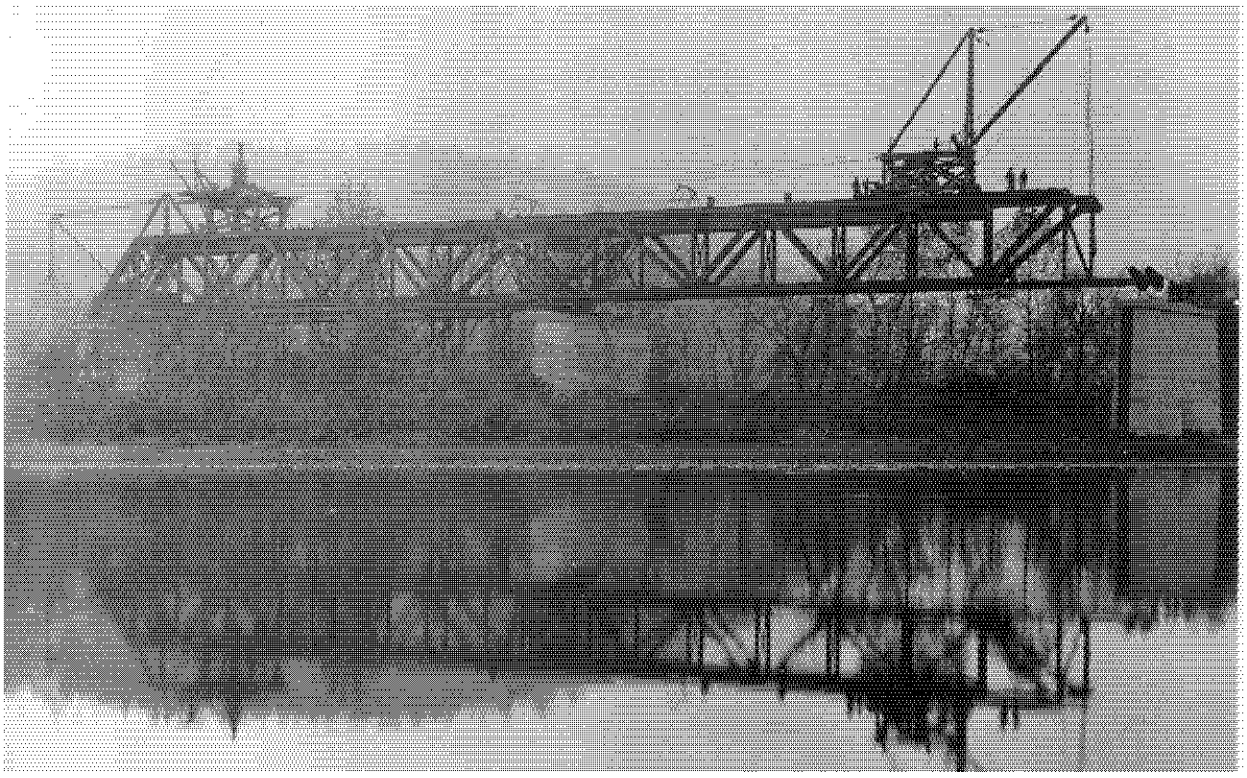


Figure 11. Cranes erecting steel members on the 150' Warren deck truss of the Second Potomac and C&O Canal Crossing, ca. 1905.

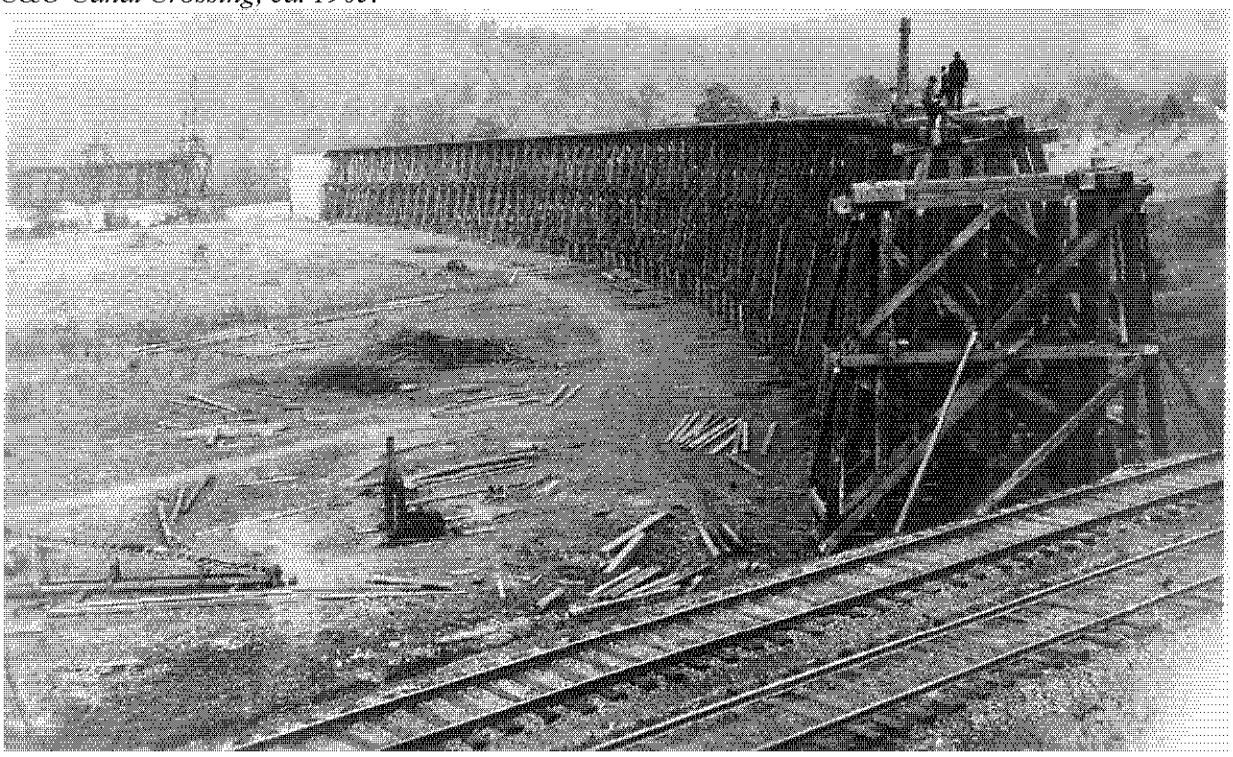


Figure 12. This substantial timber trestle was constructed across the flood plain on a six degree curve to connect the Third Potomac Crossing and the First B&O Crossing, milepost 1363, ca. 1905. The railroad later brought in earth to make this a fill, completely burying the trestle.

Figure 13. An M-2 4-6-6-4 articulated leads an eastbound freight over the First Potomac Crossing, 1955.

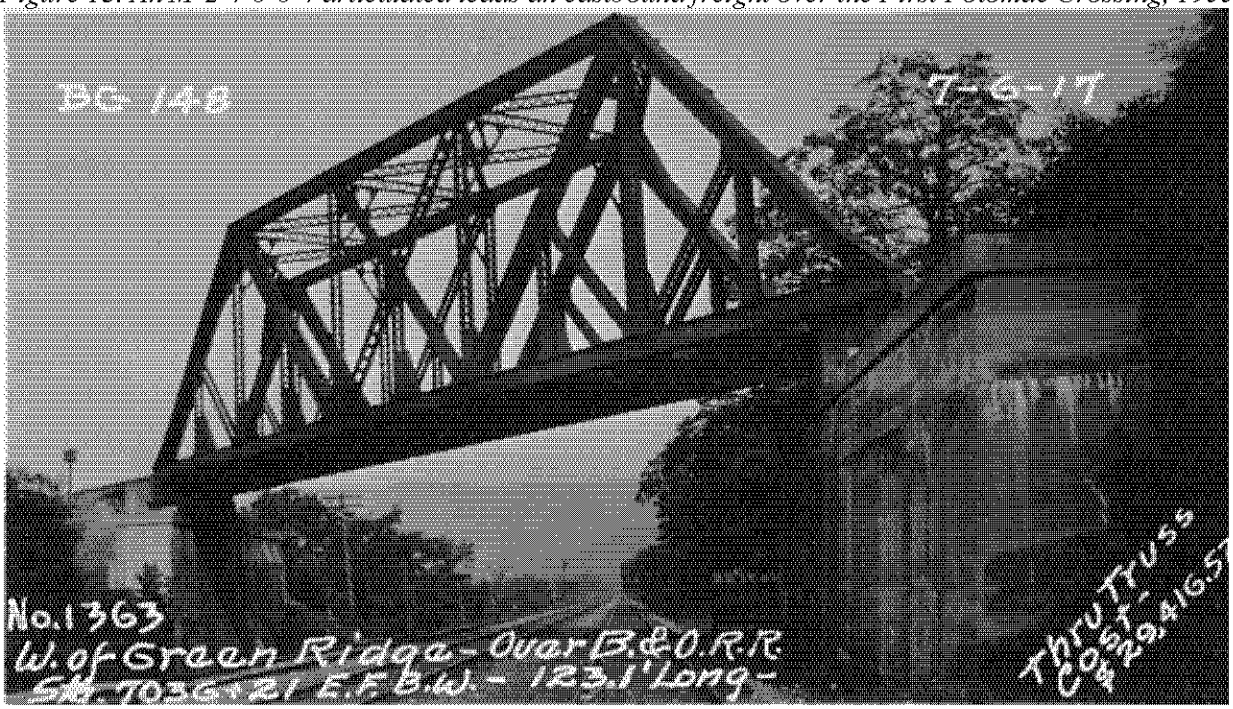


Figure 14. Western Maryland built this skewed Baltimore through truss at the First B&O Crossing, over the original B&O" Low Line" through Magnolia Bend, West Virginia, 1917.

Figure 16. An Electro-Motive GP35 leads a pair of F-7s heading east over the steel piers and deck plate girders spanning the C&O Canal at the Third Potomac and C&O Canal Crossing, milepost 136.0, 1967.

Figure 15. The telegraph operator's cabin at Jerome, West Virginia, mile 137.25, the midpoint of a double-tracked section along Magnolia Bend, 1966.

Figure 17. The west portal of Tunnel No. 1405, Kessler Tunnel stood at the end of the four 125' Warren deck trusses and two deck plate girders of Bridge No. 1407, the Fifth Potomac Crossing.

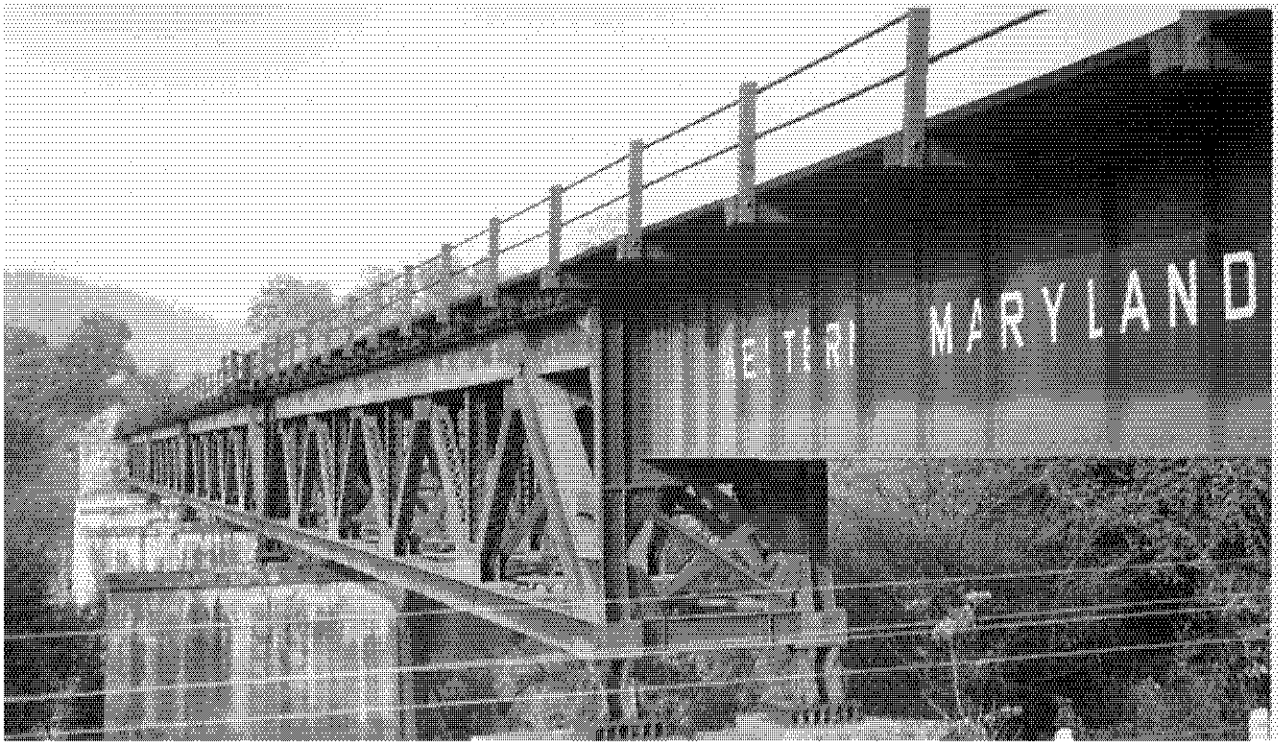


Figure 18. "Western Maryland" was painted on the DPG span over MD 51 near Paw Paw, West Virginia on Bridge No. 1413, the Sixth Potomac Crossing, 1955.

Figure 19. Baltimore through truss built over the towpath at Bridge No. 1416, Fourth C&O Crossing.

Figure 20. Newly completed 10' diameter Collier's Run Culvert at mile 158.2 prior to fill, ca. 1904.

Figure 21. Proud workers at culvert in Oldtown, mile 150.8, 1904. Note the narrow-guage 0-4-0T locomotive and side-dump cars used for earth moving during railroad construction and the decorative keystone over the arch.

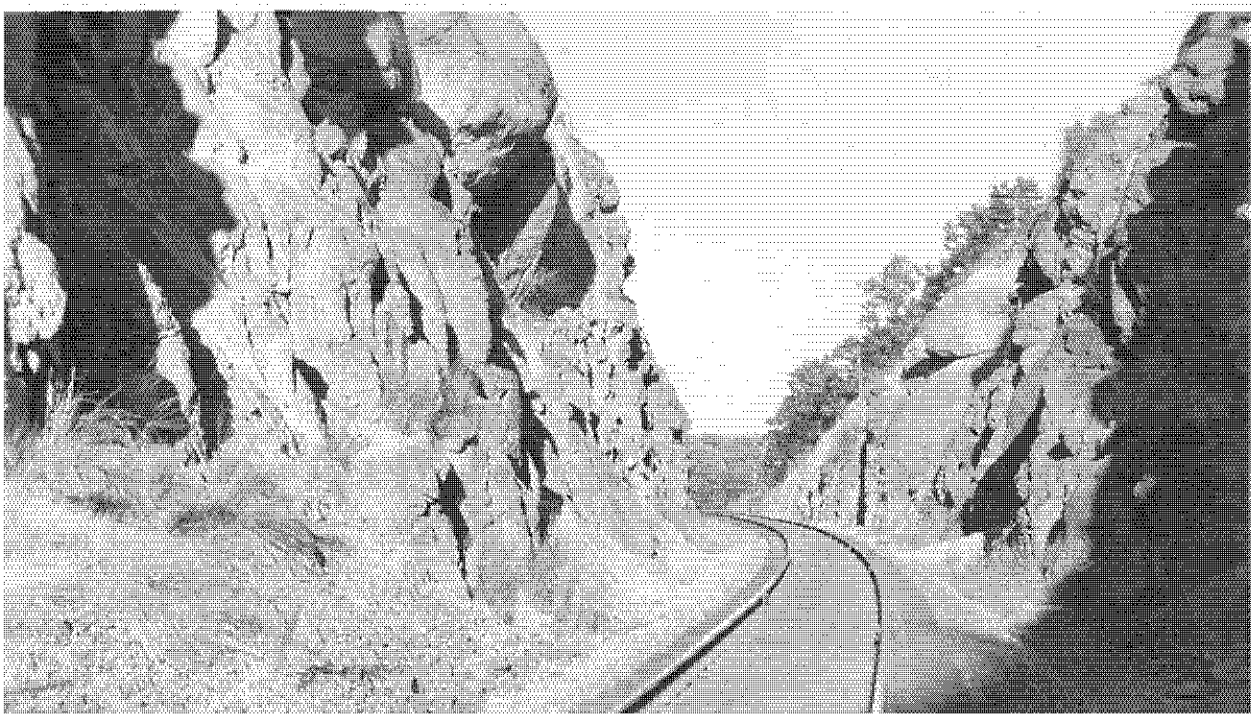
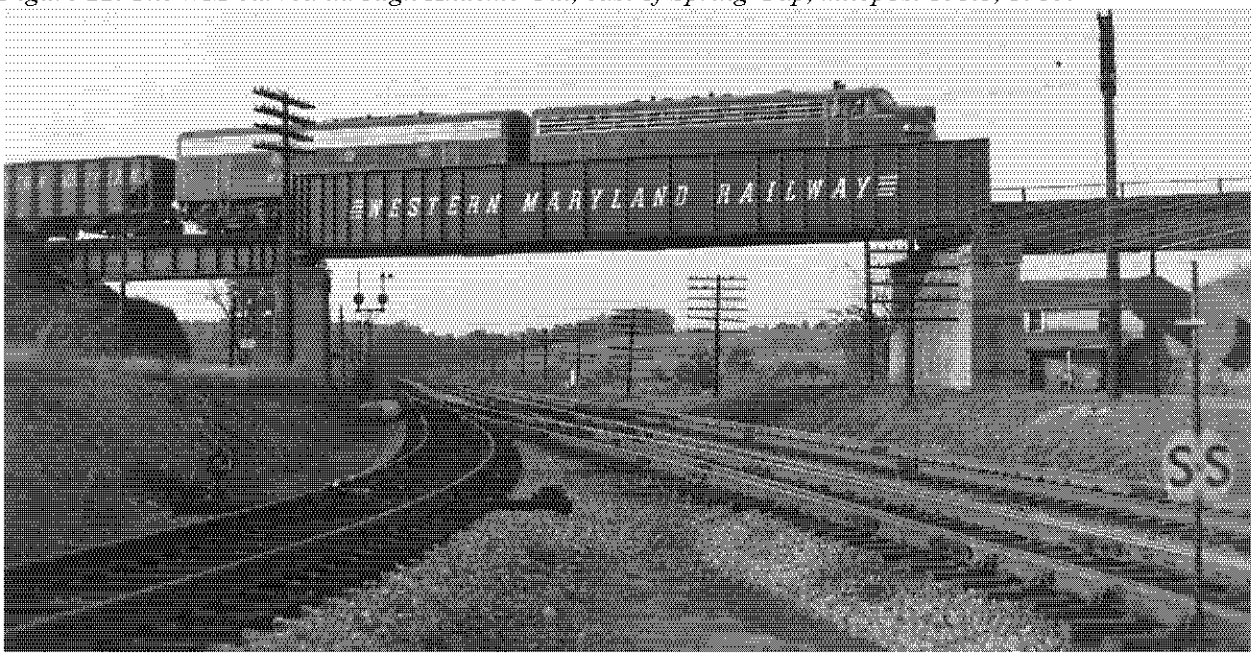


Figure 22. The WM curved through Knuckle Cut, east of Spring Gap, milepost 153.3, 1935.



Firgure 23. A pair of eastbound Electro-Motive F7s passes over Bridge No. 1601, Third B&O Crossing, at North Branch, 1955. The National Park Service western boundary is just to the east (right) of the abutment (off the frame).