LONGVIEW BRIDGE
(Lewis & Clark Bridge)
(Columbia River Bridge)
(Interstate Toll Bridge)
State Route 433 spanning the Columbia River
Longview
Cowlitz County
Washington

HAER No. WA-89

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WASH
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WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

HISTORIC AMERICAN ENGINEERING RECORD
NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR
P.O. BOX 37127
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LONGVIEW BRIDGE
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HAER No. WA-89

Location:	State Route 433 spanning the Columbia River between Multnomah County, Oregon and Cowlitz County, Washington; beginning at milepost 0.00 on state route 433.
	UTM: 10/503650/5106420 10/502670/5104880
	Quad: Rainier, Oreg.-Wash.
Date of Construction:	1930
Engineer:	Joseph B. Strauss, Strauss Engineering Corp., Chicago, IL
Fabricator/Builder:	Bethlehem Steel Company, Steelton, PA, general contractor
Owner:	1927-1935: Columbia River--Longview Bridge Company. 1936-1947: Longview Bridge Company operated by Bethlehem Steel. 1947-1965: Washington Toll Bridge Authority. 1965 to present: Washington Department of Highways, since 1977, Washington State Department of Transportation, Olympia, Washington.
Present Use:	Vehicular and pedestrian traffic
Significance:	The Longview Bridge, designed by engineer Joseph B. Strauss, was at time of construction the longest cantilever span in North America with its 1,200' central section. Extreme vertical and horizontal shipping channel requirements requested by Portland, Oregon, as a means to prevent the bridge's construction created the reason for such an imposing structure.
Historian:	Robert W. Hadlow, Ph.D., August 1993

History of the Bridge

The Longview Bridge was built as part of an entrepreneurial dream to make the city of Longview a thriving Columbia River port city. Its history and the city's history were closely intertwined. Battles waged between Longview and Portland over supremacy of the region's economic growth led to the Longview Bridge becoming the country's largest and tallest steel cantilever structure.

Longview city was the dream of Robert Alexander Long, a midwestern businessman whose holdings included the Long-Bell Lumber Company. This firm in 1918 claimed to be the largest lumber retailer and manufacturer in the United States. With southern timber stands vanishing quickly, Long redirected his effort to tapping the Pacific Northwest's abundant old-growth forests. Part of Long's vision was the planned city of Longview.[1]

Wesley Vandercook, Long's chief engineer canvassed sites throughout the region to locate a mill for the Long-Bell Lumber Company with the capacity to cut at least one-million board-feet of lumber and a mill town. He focused principally along the Columbia River near its outlet to the Pacific Ocean. By 1922, Long decided upon the point where the Cowlitz River emptied into the Columbia River to locate his city and lumber operation. According to John M. McClelland, Jr., a local historian, Long and his associates acquired enough land to create a "well planned, beautifully and efficiently laid out city."[2]

Longview's design, with its strict planning and zoning requirements, fit well with the Progressive era's push for order in society. Its long, paved boulevards, and attractive, modern public buildings catered to outside investment. Longview also lured industry besides the Long-Bell lumber operation because of its location on four railroads and its proximity to the Columbia River. The bridge that Wesley Vandercook and his investment partner W. D. Comer of Seattle built in the late 1920s to span the Columbia River between Longview, Washington, and Rainier, Oregon, was a contributing element of this plan.[3]

The story of efforts to construct the Longview-Rainier bridge began in 1921 when the Oregon legislature authorized its state highway commission to survey the Columbia River below Portland for possible sites for a new bridge. The state hoped that a new span might help channel southwestern Washington business trade into Portland and surrounding towns. The Oregon State Highway Commission recommended in 1923 that a five-span steel deck cantilever bridge with a 159' ship clearance be built between

Longview and Rainier at an estimated cost of $2.7 million. With Longview-Rainier at midpoint between Astoria and Portland, the new bridge would serve both communities as a link for travellers along the Roosevelt Coast Military Highway and the Pacific Highway (later U.S. 101 and U.S. 99). Portland's mayor, George Baker, lauded the proposed bridge because it connected Oregon and Washington in a way that demonstrated the two states' "friendliness and neighborliness" towards each other. Longview, which had begun ferry service to Rainier in 1923, sought the bridge as part of its plan for rapid economic growth.[4]

Shortly, Vandercook and Comer pursued the bridge project and in February 1925 Congress granted them a franchise to build it. By November, Washington's state highway commission approved the plans. Oregon's highway commission favored the project, but deferred to the Portland Port commission for a recommendation on the proposal. The Portland organization objected to the idea citing the span as an obstruction to river traffic on the lower Columbia.[5]

Some Oregonians were alarmed at Longview's rapid development and growth in the mid-1920s and contested construction of the proposed structure. Paul King, a *Longview Daily News* correspondent, wrote in 1965 that "the bridge was roundly denounced by the Portland press and civic leaders who viewed it as a block to marine traffic and an easy exit for Oregonians into competitive economic territory." In late 1925, the Port of Portland commission argued that the $3 million span planned by Vandercook and Comer, with its 600′ wide clear channel was not adequate to meet shipping needs on the Columbia. The commission insisted that it could not approve a proposed structure unless it provided for a navigable channel of at least 750′ between piers and 600′ at mid-span, and vertical clearance of 155′. While the port commission maintained that it was only concerned about guaranteeing adequate clearances for Columbia River shipping, its motive was to quash any bridge plan proposed for the Longview-Rainier crossing to maintain Portland's economic viability.[6]

By early 1926, the Portland Port Commission became increasingly adamant about quashing Longview's bridge plans and enlisted the Portland Chamber of Commerce for help. It stated that even the specifications that it previously supported were inadequate. The differences surrounding plans for the Columbia River bridge pitted Longview against Portland, the Lower Columbia Valley against the Willamette Valley, and Washington against Oregon. Foes battled each other with Longview boosters boasting of their city's superiority over Portland as a shipping point and Portland's Chamber of Commerce making derogatory remarks about

its Washington rival, and Longview supporter, Seattle.[7]

Robert Long and Long-Bell used their influence in lumber circles throughout the country to seek Congressional support for the Longview bridge proposal. Finally, in January 1927, a second bridge authorization bill passed Congress and was signed by President Calvin Coolidge. It appeared that Longview had its bridge except for War Department approval of the design which the Navigation Act of 1906 required for structures passing over shipping channels. Portland, though, had succeeded in temporarily stopping the project by getting the extraordinary requirement that plan also meet the approval of the secretaries of Commerce and Agriculture. Ironically, while Portland sought drastic measures to protect its port including requiring that only a bridge with extreme channel height and width clearances would meet its approval, Longview also required a bridge under whioh ocean going vessels could pass because its port was upriver from ths proposed crossing. In sum, Portland's reasons for large clearances were baseless as requirements to protect its shipping. Ths port commission and its allies hoped that by setting unrealistic demands for the proposed bridge's specifications, the structure's financial backers might see the span as being too costly to construct.[8]

Vandercook and Comer pushed on with their plan despite Portland's continued opposition. Hearings in Longview and Portland in March 1927 snded without any decisions. The three cabinet secretaries formally rejected the promoters' original specifications in June. Portland intsrests had convinced them that the structure needed a vertical clearancs of at least 175' at mid-channel and a distance betwsen main piers of 1,000'. It appeared that Portland had been victorious. Nsverthelsss, working with Joseph B. Strauss and his Strauss Engineering Company of Chicago, Vandercook and Comer created a plan that incorporated the cabinet secretaries' requirements. In November, after making many revisions to the plans, the financisrs received permission to build the bridge. Because of the sxtraordinary federal minimum clearance requirements, Strauss's design at the time of construction included the longsst cantilsvered span in North Amerioa, outdistancing its nearest competition by 200'.[9]

Cost estimates for the Longview Bridge ballooned, nearly doubling from $3 million to $5.8 million. Vandercook and Comer hastily looked for backing for the project so construction could begin befors the franchise expired. They arranged financing through the J. and W. Seligman Company of New York and Bradford, Kimball and Compeny of San Francisco. They sold $3 million in first mortgage 6.5 percent sinking fund bonds and 1.6 million in 15-

year sinking fund 7 percent debentures. Control of the venture rested with Vanderoook and Comer holding 50 percent plus one share interest. Bethlehem Steel and the banks equally held just under 25 percent interest in the bridge company. In addition, Bethlehem Steel received $1 million in preferred stock.[10]

Construction began on a nearly two-mile-long structure on 13 October 1928 when the Pacific Bridge Company of Portland started excavating for the piers. On 29 March 1930 the bridge received its formal dedication and was opened to traffic. Longview citizens planned a day-long celebration marking the event.[11]

Design and Description

After receiving federal approval for the design, Vandercook and Comer's franchise company began construction on the Longview Bridge, the longest cantilever span in North America, on 13 October 1928. The general contractor and one-quarter owner in the Longview-Columbia River Bridge Company was Bethlehem Steel Company of Steelton, Pennsylvania. Pacific Bridge Company of Portland built the substructure. Lindstrom and Feigensen of Portland, a noted regional concrete bridge general contractor, constructed the timber approaches and concrete floor deck. Both Bethlehem Steel and the Wallace Bridge and Structural Steel Company of Seattle fabricated steel components. Finally, J. H. Pomeroy and Company of Seattle, a well-known regional steel bridge builder, erected the steel superstructure. The bridge as built reading north to south consisted of:

2,620′ wooden trestle approach
one 40′ steel girder approach span
one 40′ steel tower span
one 168′ steel Warren truss approach span
one 760′ steel truss anchor span
one 1,200′ steel cantilever section consisting of:
  -one 380′ steel truss cantilever span
  -one 440′ suspended steel Warren truss span
  -one 380′ steel truss cantilever span
one 760′ steel truss anchor span
two 337′ steel Warren truss approach spans
one 84′ steel Warren truss approach span
one 168′ steel Warren truss approach span
one 28′ steel girder approach span
1,800′ curved wooden trestle[12]

The bridge design completed by Strauss Engineering Corporation of Chicago, Illinois, complied with a federal permit stipulating

that the bridge be designed to accommodate a clear channel width of 1,000'. In addition, it gave a 185' minimum vertical clearance at the channel piers and 195' at mid-span. The structure's extremely long cantilevered portion and unusually long anchor arms were required to comply with the permit's order to construct only one pier between the main channel and the Longview pier-head line. Its closest competitors at the time of construction were the Strauss-designed Montreal South Shore Bridge in Montreal, Quebec, Canada, with its 1,000' cantilevered section; and the Monongahela River Bridge in Pittsburgh, Pennsylvania, with its 812' cantilevered section.[13]

Borings taken at the crossing site indicated foundations consisting of a gravel and sand bed extending more than 100' below the mean low water level. Excavation proceeded to between 50' and 72' on the four main piers and somewhat less on the approach span piers. More than 180,000 cubic yards of gravel and rock was dredged from the river bottom to create the pier footings. Over 1,000 cedar piling were driven. Cribbing built from 12" x 12" timbers tightly bolted together was floated from the Pacific Bridge Company's shops in Portland and then sunk at the site. Concrete was poured for each pier continuously using tremies.[14]

The two main piers, numbers 2 and 3, on which the anchor spans and cantilever spans were connected, are identical except for the southern most (no. 3) having a slightly shorter substructure. Each have two footings measuring 39' x 84' and run longitudinally along the centerline of the span. Each footing carries two vertical shafts 45' apart which have a cruciform section measuring 33'-4" long and 14' wide. They run to elevation -2.0'. Thence, the section was reduced to a uniform 14' x 14' to elevation +30 feet. Deep longitudinal and transverse diaphragms connect the tops of all shafts. Concrete slabs rest on top of the pedestals and 165' steel towers that support the connection points between the anchor spans and the cantilever spans.[15]

Cement for the piers came by train from Portland and then transferred from the cars to barges by gravity chutes. The barges were towed to a floating mixing plant which was anchored to other barges that contained sand and gravel. For pier 2, three crews working in eight-hour shifts poured its 10,500 cubic feet of concrete.[16]

Piers 1 and 4 were laid out in a similar manner. Concrete for the bottom halves of the piers, from elevation -50' to elevation -2.0' was poured in a continuous operation by tremies. Each has a footing measuring 24' wide by 81' long by 12' deep. The

sections from the top of the footings to elevation -2.0' consist of two 11.5' square vertical shafts connected by a solid concrete diaphragm which tapers from a thickness of 11.5" at the base to 6' at the top. The upper portions, from elevation -2.0' to elevation 30' were continuations of the 11.5' square shafts.[17]

The remaining bents consisted of five small piers on the Oregon side and four pedestal piers carrying a steel tower on the Washington side of the river. In total, for pier construction, there were 124,000 cubic yards of material excavated from the river bed, 436 piles driven, 350 tons of reinforcing and 163 tons of structural steel laid, and 25,000 cubic yards of concrete poured. By 2 November 1928, the Pacific Bridge Company began work on the piers. Sinking of cribs began on 1 February 1929. Substructure construction continued well into the spring of 1929. The *Longview Daily News* claimed that the work on the seven piers excluding the tower pedestals on the Washington approach was "the largest job in under water [*sic*] construction ever attempted."[18]

On 5 June 1929, the first steel was placed on the Oregon side. The last rivet on the bridge was driven on 7 March 1930, Concrete paving on the cantilevered and suspended spans was poured shortly thereafter and the bridge opened for traffic on the 29th. Joseph Strauss's design called for using 12,500 tons of structural steel. Bethlehem Steel fabricated 6,000 tons of this at its Steelton, Pennsylvania mill. The Wallace Bridge and Structural Steel Company supplied the remainder of the order. Strauss selected silicon steel, rolled channel with lattice, for use on all main members in rocker bents, towers, trusses, and main spans and side spans. The unit working stresses he adopted were 24,000 lb. per square inch in tension and 22,500-75 l/r lb. per square inch in compression. Ordinary structural carbon steel used throughout the rest of the structure had unit working stresses of 16,000 lb. per square inch in tension and 15,000-50 l/r in compression.[19]

Pomeroy Company began the steel construction by first erecting the deck truss spans with falsework and travelers. It then assembled then and proceeded on with the anchor arms from shore to the towers. Strauss designed the anchor arms to be erected as self supporting spans, with minimal falsework, but low water levels in the Columbia made it favorable to construct these spans with falsework. The two main towers erected by traveler on the bridge floor while the anchor arms were erected with a one-boom traveler on the floor and a two-boom traveler on the spans' top chords.[20]

The two 380' cantilevered main spans were erected by travelers operating on the top chords. Steel was hoisted from the river near the piers and sent out to the traveler. The 440' suspended Warren truss span was cantilevered out from both main span arms and closed in the center by eight 500-ton hydraulic jacks. "The closing up of this gap," Clifford E. Paine, Vice-President of the Strauss Engineering Corporation explained, "was like clasping of hands as the mighty cantilevered arms projected out to meet two hundred feet above the water. . . . It is a matter of passing interest to note," he added, "that no direct measurement has ever been taken between the two main river piers, the locations of which were determined by triangulation from base lines laid off on each side of the river."[21]

The Pomeroy Company erected the suspension span's two halves out from their respective cantilever arms. Slotted holes in the ends of the chords and diagonals at the center and in the chords at the ends meeting the cantilever arms were used in conjunction with the hydraulic jacks to pin the suspended span on its hangers. This arrangement created a telescoping action that permitted using jacks at the points where the suspended span's top and bottom chords met the cantilever arms. The bottom chord jacks were actuated to push forward the chord halves of the suspended span until they could be pinned. Then the bottom chord members were allowed to shorten to their bearing point so that the top chord pin holes came into alignment. Finally, the top chord was pinned and the span hung freely on its cantilever arms.[22]

Lindstrom and Feigensen began pouring the concrete floor slab for the anchor arms during erection of the suspended span. The firm completed the bridge's entire deck by mid-March 1930. According to a *Longview Daily News* report, use of lightweight volcanic cinder to replace a percentage of gravel used in the deck and sidewalk concrete of the Longview Bridge was a first attempt at using the material in bridge construction. Found in central Oregon, the rock cinder when used in a 1:1:2 mix of concrete gave a unit weight of 120 lbs. per cubic foot, but did not compromise on physical properties of concrete that used gravel aggregate.[23]

Because of the Longview Bridge's length and quantities of steel used in its construction, Joseph Strauss provided several expansion joints to counteract the effects of hot sun on the structure. Many of them resembled two combs with their teeth facing each other. The largest joint has a movement 9.5 inches. Together, they provide a movement of the structure of 66 inches.[24]

Local promoters solicited $4,500 in donations from businessmen and individuals throughout the region. At two o'clock in the afternoon, United States President Herbert Hoover pressed a golden telegraph key at the White House. Its signal relayed across the country actuated a guillotine that severed a barrier of daffodils at the bridge's mid-span and also unfurled a large American flag affixed the structure. Mrs. J. J. Tynan, wife of Bethlehem Steel's western vice-president, christened the structure.[25]

As planned, Washington Governor Roland H. Hartley and Oregon Governor Alfred W. Norblad were to greet each other with a handshake at mid-span to symbolize the formation of a new and friendly bond between their respective states, and set aside any bitter feelings smoldering since Longview's and Portland's battle about the bridge. Unfortunately, Governor Hartley's motorcade was nearly forty minutes late because of heavy traffic and he missed the christening and barrier cutting. In the meantime, airplanes flew above and below the bridge and ships and boats on the river blasted their horns in celebration. Carrier pigeons were released and bands marked the occasion with marches and the national anthem. Dignitaries including regional state governors, West Coast city mayors, and British Columbia's attorney general hailed the bridge as an important transportation link in the north-south highway routes of North America's far west.[26]

After the formal dedication, the festivities moved to Jefferson Square at the center of Longview where both state's governors addressed those present and those listening to the celebration by radio over the National Broadcasting Company's regional affiliates. All throughout the day, visitors in their automobiles drove back-and-forth across the Longview Bridge. By midnight, when the bridge company began to charge tolls, over 11,000 vehicles had passed over it. Crowds gathering for the festivities which included meals, dances, and fireworks totalled nearly 50,000.[27]

In the evening, nearly 300 dignitaries attended a banquet at Longview's new Hotel Monticello where they listened to several speeches, but the capstone of the evening was an oration by the bridge's designer, Joseph B. Strauss. He believed that the Longview Bridge was "almost human." He added, "This bridge takes its place with others as an implement of modern civilization. . . Bridges are essential to progress."[28]

Repair and Maintenance

The Longview Bridge was a toll structure from 30 March 1930 until 19 October 1965. During those thirty-five years its ability to cover investment expenses and maintenance costs was at best marginal. Wesley Vandercook's construction expenses for the structure were nearly double his initial expectation of $3 million. In addition, his belief in the bridge's great popularity among local residents and tourists did not materialize. Many drivers during the depths of the Great Depression were unwilling to sacrifice eighty cents in toll charges to cross the bridge. Traffic over the structure and accompanying toll revenues were dismally low. Six months after the opening day celebration on 29 March 1930 the Columbia River--Longview Bridge Company was financially unsound.[29]

In the mid-1930s, the company was in such sad shape that Bethlehem Steel Company acquired half of Vandercook and Comer's interest and attempted to turn it around. But by 1936 the company was suffering severe financial problems and reorganized under federal bankruptcy laws. By 1939 the Longview Bridge slowly began to pay for itself, but the two trestle approaches were deteriorating and the company could ill afford to replace them. After World War II it promoted the state of Washington's acquisition of the structure.[30]

By the end of World War II, the Longview Bridge Company saw that it still oould not afford the deteriorated timber approach span's costly maintenanoe or replaoement and called on Oregon and Washington to purchase the structure. In December 1947, Washington Governor Mon C. Wallgren recommended that the state seek ownership of the bridge with it falling under the Washington Toll Bridge Authority's jurisdiction. In January 1948, the Washington State Department of Highways took over its maintenance. The Wallgren administration offered the bridge company stockholders $2.25 million for the structure and authorized an additional $1.4 million for needed refurbishment of the bridge, all funded through thirty-year revenue bonds.[31]

The governor's decision sparked controversy and an official investigation in 1949 by his suocessor Alfred Langlie. Critics argued that the state at Wallgren's insistence purchased a "White Elephant" for nearly twice its market value. In reality, the purchase prioe was about the same as the estimates that Oregon State Highway Department and Washington Department of Highways researchers made on the bridge's fair market value, reconstruction costs, and deferred maintenance costs. In 1944, they remained skeptical of the bridge ever becoming a revenue producing asses for the states. Even if the states received it free of oharge, tolls could not even cover the bridge's

maintenance requirements. Nevertheless, one independent engineering consultant estimated that tolls could pay off the structure's debt within fifteen years.[32]

The state set the minimum toll at one dollar per automobile, but increased traffic by 1957 warranted reducing it to fifty cents. Washington and Oregon governors Daniel Evans and Mark Hatfield participated in a bond burning ceremony on the bridge on 19 October 1965. More than 9 million vehicles had driven across the structure during the years that the Toll Bridge Authority managed it, bringing in over $3.8 million in revenue and retiring twelve years early the state bonds issued to purchase the structure in 1947. With the toll lifted, the Longview Bridge came under the Washington Department of Highway's jurisdiction. In 1977, amid reorganization the highway agency became the Washington State Department of Transportation.[33]

A portion of the 1947 revenue bond sale allocated for refurbishment was used initially to replace the north 84 feet of the south timber trestle approach. The remaining curved portion of the south timber approach became the state of Oregon's maintenance responsibility. In 1950, the entire north timber trestle approach was reconstructed in 23 steel-beam spans with concrete decking. Bethlehem Pacific Coast Steel was the fabricator and Guy F. Atkinson Company of Portland was the contractor. Total cost for the project was $810,000. In 1951, a retaining wall was added to the north approach at a cost of $130,000. Throughout the 1950s, pier protection fenders and dolphins were replaced. In 1963, an 84' steel beam span with concrete deck replaced the 1947 north section of the south approach trestle. The state built it at a cost of $74,000. In 1985, the existing cast-in-place sidewalks were replaced with precast sidewalks. In the early 1990s, instability in the bridge's deck beams has caused the concrete deck section to lift at points where it was in contact with the beams. Complete replacement of the deck concrete is anticipated by the mid-1990s.[34]

Aside from ownership changes and routine maintenance problems since construction, the bridge received a new name. On 6 July 1980, Washington Governor Dixie Lee Ray signed Senate Bill No. 3219 into law. Titled "An Act Relating to the commemoration of the 175th anniversary of the Lewis and Clark Expedition . . . ," it linked the Longview Bridge's fiftieth birthday celebration to the landmark early-nineteenth-century overland exploration to the Pacific Northwest. With the law, the Longview Bridge officially became the "Lewis and Clark Bridge."[35]

For additional information and a comparative study of the evolution of cantilever deeign in Washington, see:

WASHINGTON KING COUNTY SEATTLE
WASHINGTON STATE CANTILEVER BRIDGES (HAER No. WA-106)

Data Limitations

Research resources for this structure were abundant. Two general histories of Longview provided good contextual information. An abundancs of articles from Longview, Portland, and Seattle newspapers provided much factual information on the battle for the bridge's construction in the 1920s and the state ownership in ths 1950s and 1960s. Professional engineering journals provided scholarly accounts of the bridge's construction. The Cowlitz County Historical Mussum and the Robert H. Long--Longview Public Library havs historical collsctions relevant to this study.

Project Information

This project is part of the Historic American Engineering Record (HAER), National Park Service. It is a long-range program to document historically significant engineering and industrial works in the United States.

The Washington Stats Historic Bridges Recording Project was co-sponsored in 1993 by HAER, the Washington State Department of Transportation (WSDOT), and the Washington State Offics of Archeology & Historic Preservation. Fieldwork, measured drawings, historical rsports, and photographs were prepared under the general direction of Robert J. Kapsch, Ph.D., Chief, HABS/HAER; Eric N. DeLony, Chief and Principal Architect, HAER; and Dean Herrin, Ph.D., HAER Staff Historian.

The recording team consisted of Karl W. Stumpf, Supervisory Architect (University of Illinois at Urbana-Champaign); Robert W. Hadlow, Ph.D., Supervisory Historian (Washington State University); Vivian Chi (University of Maryland); Erin M. Doherty (Miami University), Catherine I. Kudlik (The Catholic University of America), and Wolfgang G. Mayr (U.S./International Council on Monuments and Sites/Technical University of Vienna), Architectural Technicians; Jonathan Clarke (ICOMOS/Ironbridge Institute, England) and Wm. Michael Lawrence (University of Illinois at Urbana-Champaign), Historians; and Jet Lowe (Washington, D.C.), HAER Photographer.

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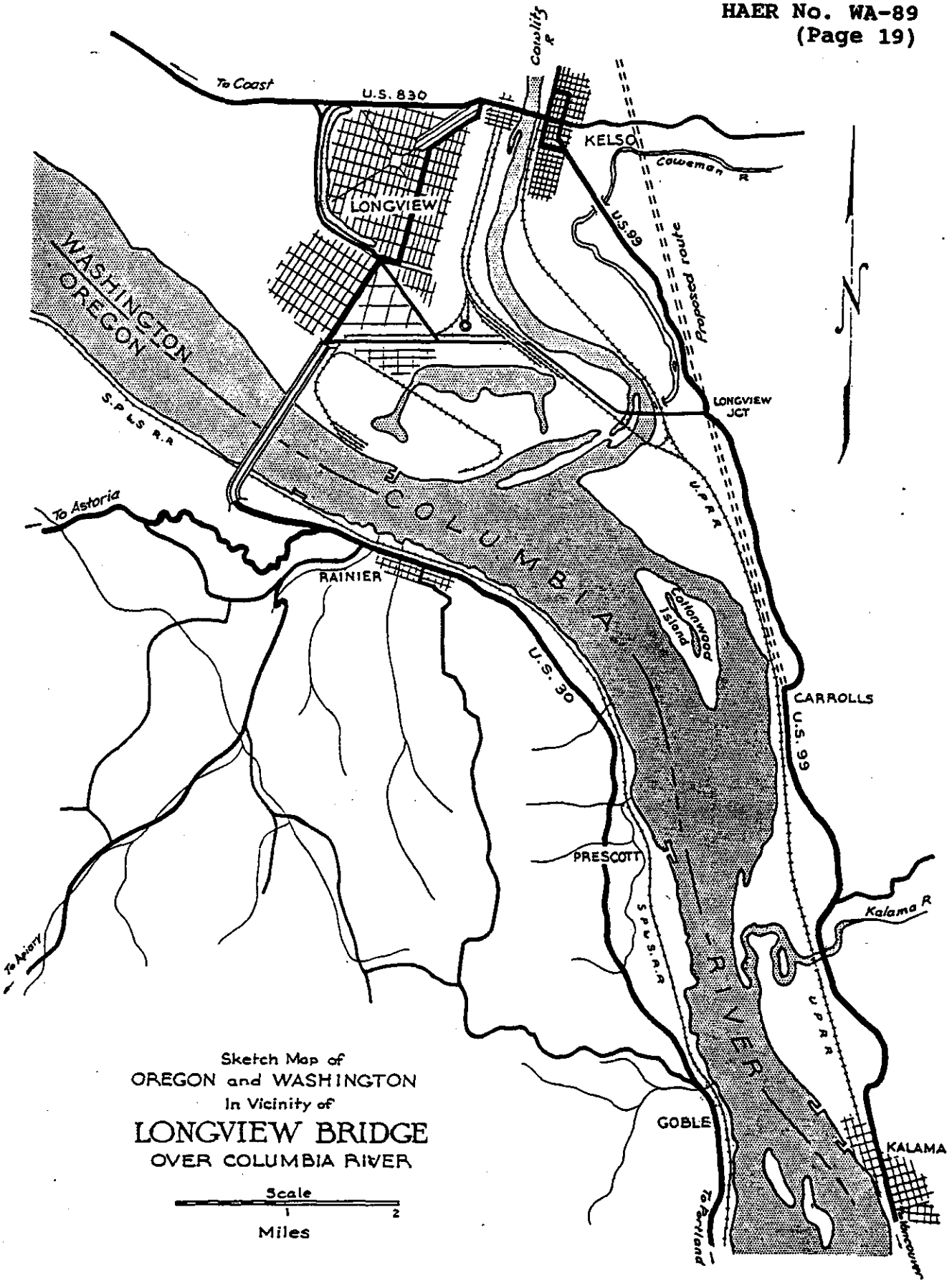

Sketch Map of
OREGON and WASHINGTON
In Vicinity of
LONGVIEW BRIDGE
OVER COLUMBIA RIVER

Scale
1 2
Miles

ENDNOTES

[1] John M. McClelland, Jr., *Longview . . . The Remarkable Beginnings of a Modern Western City* (Portland, OR: Binsford and Mort, 1949), 1-2.

[2] Ibid., 8, 22, 33 (quote), 65.

[3] For discussions of the Progressive era, see Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920* (Cambridge MA: Harvard University Press, 1959); Samuel Haber, *Efficiency and Uplift, Scientific Management in the Progressive Era, 1890-1920* (Chicago: University of Chicago Press, 1964); and Robert H. Wiebe, *The Search for Order, 1877-1920* (New York: Hill and Wang, 1967). McClelland, 62.

[4] McClelland, 48, 121; Paul King, "35-Year History of Span is Recalled Here," *Longview Daily News*, 19 October 1965, 16; "Bridge Site Pointed Out 9 Years Ago," *Longview Daily News*, Bridge Opening Edition, 29 March 1930, 3 (quote). See also the first mention of constructing a bridge between Longview and Rainier in volume 1, number 1, of the *Longview News*, 26 January 1923, 1.

[5] "Bridge Site Pointed Out 9 Years Ago."

[6] King, "35-Year History of Columbia Span is Recalled Here"; "Toll Bridge Plans Opposed by Port," *Portland Oregonian*, 2 October 1925, 27; McClelland, 122; "Port Body Reopens Study of Bridges, *Portland Oregonian*, 14 November 1925, 18.

[7] "Tollbridge Decision Up," *Portland Oregonian*, 25 January 1926; McClelland, 122.

[8] See "Senate Approves Longview Bridge" and "Bridge Bill Fight Will be to Finish," *Portland Oregonian*, 12 December 1926; "Strategy Evolved to Block Bridge," Oregonian (Portland), 6 January 1927; "Sinnott's Coup in Bridge Fails," *Portland Oregonian*, 7 January 1927; "Bridge Bill Rides on Steam Roller," Oregonian (Portland), 15 January 1927, 1, 4;"Longview Span Bill Signed by Coolidge," *Portland Oregonian*, 29 January 1929, 1; McClelland, 122. For a discussion of the whole bridge design issue, see "Courage on the

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[9] "Longview Span Plan Rejected," *Portland Oregonian*, 17 June 1927, 1; "Decision on Bridge Pleases Portland," *Portland Oregonian*, 17 June 1927, 4; "Bridge Site Pointed Out 9 Years Ago," *Longview Daily News*, Bridge Opening Edition, 29 March 1930, 3.

[10] McClelland, 126; "Financial End of Project was Speedily Done, *Longview Daily News*, Bridge Opening Edition, 29 March 1930.

[11] "Great Bridge is Completed in 18 Months," *Longview Daily News*, Bridge Opening Edition, 29 March 1930.

[12] "Longview-Rainier Interstate Toll Bridge Completed," *Western Construction News*, 10 March 1930, 124. The J. H. Pomeroy and Company had erected sugar elevators in Yakima, Washington; skyscrapers in Seattle; the steel portions of the Ross Island and Burnside bridges in Portland; the Crooked River High Bridge, a three-hinged steel deck arch in Central Oregon; and the Vantage Ferry Bridge, a steel cantilever over the Columbia River in Central Washington (later moved to Lyons Ferry over the Snake River). At the time of construction of the Longview Bridge, Pomeroy and Company was working on the David B. Steinman-designed St. Johns suspension bridge over the Willamette River northwest of Portland. See "Jack Pomeroy Tough Subject for Photographers to Catch," *Longview Daily News*, Bridge Opening Edition, 29 March 1930; "Longview-Rainier Interstate Bridge Over Columbia River," *Western Construction News* 4 (10 August 1929): 402-03.

[13] "The 1,200-Ft. Cantilever Bridge at Longview, Wash.," *Engineering News-Record* 104 (15 May 1930): 804-06; "Cantilever Span One of Longest," *Longview Daily News*, Bridge Opening Edition, 29 March 1930.

[14] "Great Blocks of Concrete Form Piers of Bridge," *Longview Daily News*, Bridge Opening Edition, 29 March 1930; "Huge Amount of Materials Used," *Longview Daily News*, Bridge Opening Edition, 29 March 1930; "the 1,200-Ft. Cantilever Bridge at Longview, Wash., 804-05.

[15] "The 1,200-Ft. Cantilever Bridge at Longview, Wash.," 804-06; "Longview-Rainier Interstate Toll Bridge Completed," 123-24.

[16] "Courage on the Columbia: The Lewis and Clark Bridge," *Cowlitz Historical Quarterly* 26 (Spring 1984): 41.

[17] "The 1,200-Ft. Cantilever Bridge at Longview, Wash.," 804-06.

[18] "Longview-Rainier Interstate Toll Bridge Completed," 123-24; "Here's Chronological Story of Bridge from Beginning," *Longview Daily News*, Bridge Opening Edition, 29 March 1930; "Great Blocks of Concrete Form Piers of Bridge."

[19] "Here's Chronological Story of Bridge from Beginning"; "Longview-Rainier Interstate Bridge Over Columbia River," 403; "The 1,200-Ft. Cantilever Bridge at Longview, Wash.," 805.

[20] "The 1,200-Ft. Cantilever Bridge at Longview, Wash.," 805; "Longview-Interstate Toll Bridge Completed," 124.

[21] "Longview-Interstate Toll Bridge Completed," 124; "Closing Span Big Problem in Erection," *Longview Daily News*, Bridge Opening Edition, 29 March 1930.

[22] "Longview-Interstate Toll Bridge Completed," 124; "Closing Span Big Problem in Erection"; "The 1,200-Ft. Cantilever Bridge at Longview, Wash.," 805.

[23] "The 1,200-Ft. Cantilever Bridge at Longview, Wash.," 806; "Light Weight Bridge Floor is Discovered," *Longview Daily News*, Bridge Opening Edition, 29 March 1930; "Longview-Interstate Toll Bridge Completed," 124.

[24] "Sun shines and Bridge Stretches Several Inches," *Longview Daily News*, Bridge Opening Edition, 29 March 1930; Joseph B. Strauss went on to oversee the design of the Golden Gate Bridge in the mid-1930s. After a forty year career that included designing bridges throughout the world, Strauss died in 1938.

[25] "Bridge Ready to Open at 2 P.M. Saturday; Hoover Will Signal Star of Ceremonies," *Longview Daily News*, Bridge Opening Edition, 29 March 1930; "Wire Hookup to Cross Country," *Longview Daily News*, Bridge Opening Edition, 29 March 1930.

[26] "Bridge Ready to Open at 2 P.M. Saturday; Hoover Will Signal Star of Ceremonies"; "Bridge is Given Initiation; Unnumbered Throng Joins in Big Event," *Longview Daily News*, 31 March 1930.

[27] Ibid.; "Jack Keogh to Officiate in Broadcast," *Longview Daily News*, Bridge Opening Edition, 29 March 1930.

[28] "Bridge Men are Honored at Banquet," *Longview Daily News*, 31 March 1930.

[29] "State May End Tale of 'Bridge of Sighs'," *Seattle Times*, 6 November 1947, 3.

[30] Ibid., "35-Year History of Columbia Span is Recalled Here," *Longview Daily News*, 19 October 1965, 16; "Bond-Burning Signals End of Toll Bridge Era," *Longview Daily News*, 19 October 1965, 15; John M McClelland, Jr., *R. A. Long's Planned City: The Story of Longview*, Bicentennial Edition (Longview, WA: Longview Publishing Co. [1976]), 175-78.

[31] McClelland, *R. A. Long's Planned City*, 177-78; "Buying of Toll Bridge Questioned," *Seattle Times*, 8 February 1949, 1.; "State May Buy Bridge at Longview," *Seattle Times*, 7 September 1947, 10; "Longview Bridge Company to Dissolve," *Seattle Times*, 8 June 1948, 20; "Longview Bridge, Structure No. 433/1," Card 1 of 9, Kardex Card File, Bridge Preservation Section, Washington State Department of Transportation, Olympia, WA [WSDOT].

[32] "Buying of Toll Bridge Questioned"; Burwell Bantz, O. R. Dinsmore, R. H. Baldock, and C. B. McCullough, eds., *Report on Trans-Columbia River Interstate Bridge Studies*, Prepared Under the Direction of the Washington Department of Highways and the Oregon State Highway Department, Technical Bulletin No. 16, Oregon State Highway Department (Salem: Oregon State Highway Commission, 1944),

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[34] "Longview Bridge, No. 433/1," Timber Card, 19 January 1954 in Bridge Inspection Report; and "Longview Bridge, Structure No. 433/1," Card Nos. 1, 2, 9, Kardex Card File, both in Bridge Preservation Section, WSDOT; [Robert Krier], "Lewis and Clark/Longview Bridge, Structure No, 433/1," in "WSDOT Historic Bridge Inventory," held by Environmental Unit, WSDOT.

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