

United States Department of the Interior
National Park Service

National Register of Historic Places
Inventory—Nomination Form

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

For NPS use only

received NOV 26 1985

date entered

JAN 7 1986

1. Name

N/A

historic

and/or common Allegheny County Owned River Bridges Thematic Group

2. Location

street & number Allegheny, Monongahela, and Ohio Rivers

n/a not for publication

Pittsburgh, Homestead,

city, town Coraopolis, Neville Twp. N/A vicinity of

state Pennsylvania

code 042

county Allegheny

code 003

3. Classification

Category

___ district

___ building(s)

___ structure

___ site

___ object

☒ thematic

Ownership

☒ public

___ private

___ both

Public Acquisition

n/a in process

n/a being considered

Status

☒ occupied

___ unoccupied

___ work in progress

Accessible

___ yes: restricted

☒ yes: unrestricted

___ no

Present Use

___ agriculture

___ commercial

___ educational

___ entertainment

___ government

___ industrial

___ military

___ museum

___ park

___ private residence

___ religious

___ scientific

☒ transportation

___ other:

4. Owner of Property

name County of Allegheny; Department of Engineering and Construction

street & number 501 County Office Building, Ross Street

city, town Pittsburgh

n/a vicinity of

state Pennsylvania

5. Location of Legal Description

courthouse, registry of deeds, etc. Allegheny County Office Building

street & number Ross Street

city, town Pittsburgh

state Pennsylvania

6. Representation in Existing Surveys

title Allegheny County Survey

has this property been determined eligible? ___ yes ☒ no

The Sixteenth Street Bridge was listed in the National Register August 13, 1979

date 1979-1984 ___ federal ___ state ☒ county ___ local

depository for survey records Pennsylvania Historical and Museum Commission

city, town Harrisburg

state Pennsylvania

7. Description

Condition		Check one	Check one	
___ excellent	___ deteriorated	___ unaltered	☒ original site	
☒ good	___ ruins	☒ altered	☒ moved	date 1927 (Coraopolis Bridge)
☒ fair	___ unexposed			

Describe the present and original (if known) physical appearance

This thematic nomination consists of seven roadway bridges which cross the major rivers in Allegheny County and are owned by the county. The county-owned bridges are part of a group of thirty-five roadway bridges that cross the county's three major rivers. These thirty-five bridges are the most visually prominent, functionally important, and structurally significant of the county's more than 1,700 bridges. Of the thirty-five bridges, twenty-two are owned by the Pennsylvania Department of Transportation and thirteen are owned by Allegheny County. Of the twenty-two state-owned bridges, two are listed in the National Register of Historic Places and others which are eligible for listing are currently being nominated for inclusion. ¹ Of the thirteen county-owned bridges, four are ineligible because they are less than fifty years old. Two more county-owned bridges are ineligible because they are being replaced. The remaining seven county-owned bridges are eligible for nomination because they pre-date 1935, are free of major alterations, and have significance in the areas of county transportation, engineering and politics. One of the seven eligible bridges, the Sixteenth Street Bridge, is already listed on the National Register of Historic Places.

The seven bridges included in this nomination cross Allegheny County's three major rivers: four cross the Allegheny, two cross the Monongahela and one crosses the Ohio. They are important links in the tracery of bridges which tames the local topography and provides essential corridors for transportation. Five of the bridges--the Sixth, Seventh, Ninth, Sixteenth, and S. Tenth Street Bridges--link dense urban areas with Pittsburgh's downtown which occupies a triangle of land at the confluence of the three rivers. The Homestead High-Level Bridge links the steel town of Homestead with Pittsburgh's residential East End. And the Coraopolis Bridge links the town of Coraopolis with heavily industrialized Neville Island by crossing a back channel of the Ohio.

Each bridge responds to both the topography and the land and water transportation requirements of its site. The bridges are all multi-span structures, and range in length from 995 to 3107 feet. The Sixth, Seventh, and Ninth Street Bridges are notable for their rather abrupt terminations at the shorelines; but the Sixteenth Street and the Homestead High-Level Bridges, in particular, cross significant distances over land and riverside railroad and industrial facilities in preparation for their actual river crossings. The majority of the bridges spring from relatively flat land, but the northern end of the Homestead High-Level Bridge springs from a high bluff.

All of the bridges are in use for automobile traffic, but they all originally carried streetcar lines as well. Six of the bridges have four lanes of traffic and sidewalks on both sides. The Coraopolis Bridge is wide enough for three lanes, but now carries two and has only a single sidewalk. All of the bridges have sufficient clearance over the rivers to allow for the passage of river traffic as required by the U.S. Army Corps of Engineers for each specific site.

Six of the bridges continue to meet the necessary requirements of their original sites. But the Coraopolis Bridge, which was originally located on the Allegheny River at Sixth Street in Pittsburgh, was moved to its present site in 1927. It has demonstrated unusual topographic versatility by its effective erection at two different sites. Its movement, however, was necessitated by its limitations in the face of changing land and water transportation requirements.

1. The Pennsylvania Historical and Museum Commission is preparing a nomination of all state-owned highway bridges in Pennsylvania that are eligible for the National Register of Historic Places.

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The bridges range in date from the 1892 Corapolis Bridge to the 1937 Homestead High-Level Bridge. The other five were all built by the County during a period of particularly extensive public improvements between 1924 and 1932.

The bridges are all essentially of steel construction, but they represent a variety of structural types. The Coraopolis Bridge is a through truss bridge with two bow string trusses. The Sixteenth Street Bridge is a through arch bridge with three tied arches. Three are nearly identical self-anchored eyebar-catenary suspension bridges: the Sixth, Seventh, and Ninth Street Bridges. The S. Tenth Street Bridge is a wire-cable suspension bridge. And the Homestead High-Level Bridge is a deck truss bridge employing a Wichert continuous truss. Six of the seven bridges rest on piers faced with masonry; only the Coraopolis Bridge has unadorned concrete piers.

The Sixth, Seventh, and Ninth Street Bridges and the Sixteenth Street Bridge have decorative masonry pylons rising above the deck at the abutments. These contain lanterns at the first three bridges, and are topped with elaborate bronze winged seahorse and globe sculptures at the Sixteenth Street Bridge. The towers of the S. Tenth Street Bridge are architectonic and have a Modernistic quality. But, for the most part, the bridges rely on their structural forms for aesthetic impact. The through truss and through arch bridges display complexity and rhythm; the suspension bridges communicate grace and lightness; and the deck truss Homestead High-Level Bridge presents elegant if spare functionalism.

Aside from general maintenance and repairs, deck work, and the new work (including piers) necessary to reerect the Coraopolis Bridge, the bridges are not known to have experienced any major alterations.

8. Significance

Period	Areas of Significance—Check and justify below			
___ prehistoric	___ archeology-prehistoric	___ community planning	___ landscape architecture	___ religion
___ 1400-1499	___ archeology-historic	___ conservation	___ law	___ science
___ 1500-1599	___ agriculture	___ economics	___ literature	___ sculpture
___ 1600-1699	___ architecture	___ education	___ military	___ social/
___ 1700-1799	___ art	☒ engineering	___ music	___ humanitarian
☒ 1800-1899	___ commerce	___ exploration/settlement	___ philosophy	___ theater
☒ 1900-	___ communications	___ industry	☒ politics/government	☒ transportation
		___ invention		___ other (specify)

Specific dates 1892-1937

Builder/Architect (Various)

Statement of Significance (in one paragraph)

Allegheny County, Pennsylvania is one of the country's foremost centers for bridge-building. The county's bridges meet specific topographical conditions in a terrain of hills and valleys and four rivers, and are essential elements in determining the visual character of Pittsburgh and its environs. They also meet local transportation needs, and have played a crucial functional role in regional urban development. Because of the overall significance of bridges to Allegheny County, the means whereby bridge-building has been carried out here assume importance. The County itself has been the major local bridge-building agency. Its modes of operation and the bridges which it built are important aspects and elements of American bridge-building history. But aside from their significance as the product of a political vehicle in a region that both requires and showcases bridges, the bridges themselves are significant as the work of prominent engineers and architects and, in some cases, as nationally acknowledged examples of innovative engineering.

Allegheny County is carved out of the rugged terrain of western Pennsylvania. The land is generally uneven with steep hills and deep narrow valleys. But the major topographical features are the broad river valleys, for it is in Allegheny County that the region's four rivers--the Youghiogheny, Monongahela, Allegheny, and Ohio--conjoin. Bridges played an early role in the development of this land from the simplest bridge over a narrow stream or "run," to the first river crossing of the Smithfield Street Bridge over the Monongahela in 1818. Today the county has over 1700 bridges spanning from hill to hill and shoreline to shoreline. These bridges include nearly every standard bridge type--except for ones with movable spans and very recent varieties--as well as some examples of rare types. The river bridges are the most prominent. A view along any of the county's rivers yields a rhythmic succession of crossings. There are both railroad and roadway crossings, but the roadway bridges are the more numerous and dramatic and better visually emphasize the area's topographic forms and its unique patterns of development. And they are part of a nationwide trend: after 1925, the longest and most important bridges, and the great majority of all bridges, were built for roadways.¹

All of the roadway bridges included in this nomination have served notable river crossings. The Coraopolis Bridge stood from 1892-1927 as the third bridge at the Sixth Street crossing of the Allegheny River which first linked downtown Pittsburgh and its sister city of Allegheny in 1819.² The bridge's current Coraopolis-Neville Island site on a back channel of the Ohio River is considerably less conspicuous; but its successor Sixth Street Bridge of 1928 and the contemporary Seventh and Ninth Street Bridges which also replaced

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earlier bridges, are also included in this nomination. That three nearly consecutive streets required river crossings and a succession of new bridges signifies the importance of the connection between downtown Pittsburgh and Allegheny (Pittsburgh's North Side after annexation in 1907). The Sixteenth Street Bridge (1923), further up river, has served a similar purpose after replacing an earlier structure.

The S. Tenth Street Bridge of 1932 is sited at the narrowest point on the Monongahela River's course through Pittsburgh, and connects central Pittsburgh to the city's South Side. The bridge was expressly planned to improve this linkage by replacing an earlier bridge and complementing the Armstrong Tunnel, built through a bluff at the bridge's north end in the 1920s. The Homestead High-Level Bridge (1937), further up the Monongahela, replaced the 1894 Brown's Bridge which had been 1,300 feet long but only 19 feet wide, had a steep and winding northern approach, and ended in a succession of railroad grade crossings. The present bridge is slightly downstream from the former crossing, and gains its name from its much higher course which evaded the northern approach and spanned the railroads.

With rare exceptions, roadway river bridges were privately built and operated as toll crossings throughout the nineteenth century. The Coraopolis Bridge, for instance, when first erected at Sixth Street, Pittsburgh in 1892, was built by the Sixth Street Bridge Company and Fidelity Title and Trust Company. It was a toll bridge until acquired and declared free by the County in 1911. The other bridges included in this nomination, however, were all built by Allegheny County itself and never collected tolls.

When the Sixteen Street Bridge was erected in 1923, the County employed a few engineers under the supervision of a County Engineer--James G. Chalfant at this time. Much of the engineering work on this bridge, however, was actually done by an outside consultant, and a New York architectural firm and sculptor also contributed to the design.

Despite isolated projects like the Sixteenth Street Bridge, there was a broad perception in the early 1920s that the community at large "due to the war and other causes had been dilatory in carrying on [its] annual normal necessary public improvements."³ A new Board of County Commissioners sought to rectify this situation and assume County leadership for public works projects. The commissioners undertook an extensive program of bridge and highway construction in 1924 with two pivotal acts: they issued bonds totaling \$29,207,000 and established an Allegheny County Department of Public Works so that "[they] would have a responsive engineering organization to carry out the mandate of the people in an efficient and expeditious manner."⁴

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The new Department of Public Works consisted of a Bureau of Bridges, a Bureau of Highways, a Bureau of Tests and Materials, and a Department of Architecture with some responsibility for assistance in bridge design. Vernon R. Covell, a long-time county engineer, was appointed Chief Engineer of the Bureau of Bridges, and Stanley Roush, a local architect, was placed in charge of the Department of Architecture. The Department of Public Works quickly acquired a large staff of engineers and architects because of the need to meet an ambitious schedule of projects, and political patronage.

The Sixth, Seventh and Ninth Street Bridges were among the many major County projects completed between 1924 and 1928. A second bond issue was made in 1928 totaling \$43,680,000. This work extended to 1932 and included the S. Tenth Street Bridge. While running for re-election in 1931, Joseph G. Armstrong was able to claim that the County public works program had made a major contribution to local employment both through construction work and the patronizing of local industries--every pound of steel used in the bridges was manufactured locally, and that more County improvements had been made during the prior eight years than during the previous 136 years of the county's existence.⁵

Armstrong and his fellow commissioners were not re-elected, however. A new Board of Commissioners dismissed most of the Department of Public Works staff and divided the Department's responsibilities between the County Planning Commission and a County Works Department. In 1936 bridge-building responsibility was consolidated under the County Works Department. The major projects of this period, however, were completed under the control of the Allegheny County Authority which was established to take advantage of federal Public Works Administration funds. The Authority was supervised by a board of engineers and architects, and employed outside consultants as well as a staff which included former County employees. The Homestead High-Level Bridge was built by the Allegheny County Authority as part of PWA project no. 2976.

In addition to volatile political conditions, a framework of external controls has molded Allegheny County bridge-building practice. During the 1920s, plans for each bridge over a navigable stream were approved by over a dozen official and civic organizations including such diverse authorities as the U. S. War Department and the Pittsburgh Municipal Art Commission. The impact of these two was most thoroughly felt along the Allegheny. The then existing Sixth, Seventh, and Ninth Street Bridges were condemned and ordered removed by the War Department in 1919 because they were obstructions to navigation. The replacement bridges of the 1920s met War Department requirements. But they were also a product of the Municipal Art Commission which virtually dictated their form because of a preference for suspension bridges. The Commission had also greatly influenced the design of the rather baroque Sixteenth Street Bridge.

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A number of significant engineers were associated with the bridges included in this nomination. Theodore Cooper had important roles in building the Eads Bridge in St. Louis and the Brooklyn Bridge in New York, and by the turn of the century was an eminent railroad bridge engineer. The monumental Quebec Bridge of 1907, however, collapsed with 82 lives lost while being constructed under his supervision. Before this inglorious end to an illustrious career, Cooper designed the Coraopolis (formerly Sixth Street) Bridge of 1892, which is reported to be the only surviving work solely of his design. The Sixteenth Street Bridge is credited to county engineer James G. Chalfant. But H.G. Balcom of New York was a consulting engineer, and the bridge can be added to his distinguished list of engineering works which includes Grand Central Station, Rockefeller Center, and the Empire State Building.

The Sixth, Seventh, Ninth, and S. Tenth Street Bridges are generally attributed to Vernon R. Covell. Covell worked for the County from 1906 into the 1930s and was Chief Engineer after 1922. Most of the actual design work was apparently done by subordinates, but the bridges, and other works produced under Covell's authority, are of uniformly high quality. These include the tied-arch West End Bridge which is listed on the National Register of Historic Places. One notable subordinate was George S. Richardson who largely designed the Homestead High-Level Bridge for the Allegheny County Authority. The genius of this bridge, however, was Pittsburgh engineer E. M. Wichert who developed and patented the "Automatically Adjustable Continuous Bridge."

A few of the bridges reflect the work of notable architects. Warren and Wetmore of New York, architects for the Sixteenth Street Bridge, had a nationwide private practice and did design work for Grand Central Station and an extensive collection of railroad stations and hotels. Stanley Roush's work, on the other hand, was almost solely local and public. He was Pittsburgh City Architect from 1914-21 and County Architect from 1921-32. He made necessary alterations to H.H. Richardson's Allegheny County Courthouse after street-lowering operations, designed new portals for Gustav Lindenthal's Smithfield Street Bridge after it was widened, designed the Allegheny County Office Building, and contributed to the design of many of the county's tunnels, bridges, and other public works. His projects include the Sixth, Seventh, Ninth, and S. Tenth Street Bridges.

These men designed bridges which reflected national trends in bridge-building. By the turn of the century, steel had become the choice structural material. It enabled engineers to design bridges that, for all practical purposes, would not need to be replaced. This advantage was accompanied by a steady increase in the quality and decrease in the cost of steel. All of the bridges included in this nomination are products of this new age of steel. The Coraopolis and Sixteenth Street Bridges reflect the early large-scale applications of steel

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in heavy truss and arch bridges which reached their peak of development in the early twentieth century. The Sixth, Seventh, Ninth, and S. Tenth Street Bridges represent the popularity of the leaner steel suspension bridge in the 1930s. The Homestead High-Level Bridge represents a stage in experimentation with the ideal continuous steel truss.

In addition to (or in spite of) their participation in national trends, four of the nominated bridges are widely acknowledged examples of innovative engineering. The Sixth, Seventh, and Ninth Street Bridges have three claims to national significance: they were the United States' first self-anchored suspension bridges; are the only important surviving examples of the eyebar-catenary suspension bridge in this country; and are the nation's only trio of virtually identical spans.⁶ (The Sixth Street Bridge, completed in 1928, also received the first annual most beautiful bridge of the year award from the American Institute of Steel Construction).

The three self-anchored suspension bridges were a creative solution to the conflicting demands of official bodies and the bridge sites. The Allegheny River shorelines were not suitable for the anchorages of typical suspension bridges, as desired by the Municipal Arts Commission. With the self-anchored suspension bridge, the anchorages are eliminated by using the stiffening girder which carries the deck as a compression member to resist the horizontal pull of the suspension system. Eyebars were chosen for the suspension system because they could better connect with the stiffening girder. The bridges were actually erected as cantilever structures until the catenaries were completed.⁷

The Homestead High-Level Bridge was the first major span of Wichert trusses ever built. The Wichert truss was a solution to the problems posed by the continuous truss: a truss which passes over multiple points of support but functions as a single structural member along its entire length. The key to the Wichert truss was a Y-shaped member, rising from each pier, to which the lower chord of each span was hinged. The result was that each span could act independently, but the load was distributed over the length of the bridge.⁸ The Wichert truss was a major advance, but received limited use because alternate means of continuous truss design were soon developed. The Homestead High-Level Bridge is just short of fifty years old, but its significance as a rare and prominent example of an innovative engineering technique, and its role in the history of Allegheny County bridge-building, qualify it as a part of this thematic nomination.

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1. Carl W. Condit. American Building (Chicago: The University of Chicago Press, 1968), p. 214.
2. The second Sixth Street Bridge was an early (1859) suspension bridge designed by John A. Roebling.
3. Norman F. Brown. "Allegheny County Improvements started in 1928 Total \$43,680,000," Greater Pittsburgh, December 222, 1928, p. 21.
4. Brown, p. 19.
5. Joseph G. Armstrong. "8 Eventful Years" (pamphlet).
6. David Plowden. Bridges: The Spans of North America (New York: The Viking Press, 1974), p. 238.
7. Plowden, p. 238. Only seven large eyebar suspension bridges were built in North America; five were in Pittsburgh.
8. Plowden, p. 256.

9. Major Bibliographical References

Armstrong, Joseph G. "8 Eventful Years" (pamphlet). 1931.

Brown, Norman F. "Allegheny County Improvements Started in 1928 Total \$43,680,000,"
Greater Pittsburgh, December 22, 1928, p. 19-21.

10. Geographical Data

Acreage of nominated property (see attached survey forms)

Quadrangle name Ambridge, Pittsburgh East and

Quadrangle scale 1:24000

UTM References Pittsburgh West quadrangles

A (see attached survey forms)

Zone Easting Northing

B Zone Easting Northing

C Zone Easting Northing

D Zone Easting Northing

E Zone Easting Northing

F Zone Easting Northing

G Zone Easting Northing

H Zone Easting Northing

Verbal boundary description and justification

See Individual Survey forms

List all states and counties for properties overlapping state or county boundaries

state N/A code N/A county N/A code N/A

state N/A code N/A county N/A code N/A

11. Form Prepared By

name/title Martin Aurand; Director, Preservation Research

organization Pittsburgh History and Landmarks Foundation date July 1985

450 The Landmarks Building

street & number One Station Square

telephone (412) 471-5808

city or town Pittsburgh

state Pennsylvania

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

☒ national

☐ state

☐ local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature



title Dr. Larry E. Tise, State Historic Preservation Officer

date

11/19/85

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I hereby certify that this property is included in the National Register

See Continuation Sheet for listing date
Keeper of the National Register

Attest:

date

Chief of Registration

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Condit, Carl W. American Building. Chicago: The University of Chicago Press, 1968

Plowden, David. Bridges: The Spans of North America. New York: The Viking Press, 1974.

Proceedings of the Engineer's Society of Western Pennsylvania. Various years.

Richardson, George S. History of Allegheny County Bridges (Manuscript). 1979.

White, Joseph and M. W. von Bernewitz. The Bridges of Pittsburgh. Pittsburgh: Cramer Printing & Publishing Company, 1928.

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Multiple Resource Area
Thematic Group

dnr-11

Name Allegheny County Owned River Bridges Thematic Resources
State Allegheny County, PENNSYLVANIA

cover form Accept Patrick Andrus 1/7/86

Nomination/Type of Review

Date/Signature

1. Sixth Street Bridge

for Keeper Shelton Byrum 1/7/86

Attest _____

2. Seventh Street Bridge

for Keeper Shelton Byrum 1/7/86

Attest _____

3. Ninth Street Bridge

for Keeper Shelton Byrum 1/7/86

Attest _____

4. South Tenth Street Bridge

for Keeper Shelton Byrum 1/7/86

Attest _____

5. Homestead High-Level Bridge

Substantive Review for Keeper

Patrick Andrus 1/7/86

Attest _____

6. Corapolis Bridge

for Keeper Shelton Byrum 1/7/86

Attest _____

7. Sixteenth Street Bridge
(already listed 8/13/79)

Keeper _____

Attest _____

8.

Keeper _____

Attest _____

9.

Keeper _____

Attest _____

10.

Keeper _____

Attest _____