

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC Horseshoe Curve

AND/OR COMMON
Horseshoe Curve

2 LOCATION

STREET & NUMBER 5 miles west of Altoona, on State Route 193

CITY, TOWN	--- NOT FOR PUBLICATION		
Altoona	<input checked="" type="checkbox"/> VICINITY OF	CONGRESSIONAL DISTRICT	
		9	
STATE	CODE	COUNTY	CODE
Pennsylvania	42	Blair	13

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE
<input type="checkbox"/> DISTRICT	<input type="checkbox"/> PUBLIC	<input checked="" type="checkbox"/> OCCUPIED	<input type="checkbox"/> AGRICULTURE <input type="checkbox"/> MUSEUM
<input type="checkbox"/> BUILDING(S)	<input checked="" type="checkbox"/> PRIVATE	<input type="checkbox"/> UNOCCUPIED	<input type="checkbox"/> COMMERCIAL <input checked="" type="checkbox"/> PARK
<input type="checkbox"/> STRUCTURE	<input type="checkbox"/> BOTH	<input type="checkbox"/> WORK IN PROGRESS	<input type="checkbox"/> EDUCATIONAL <input type="checkbox"/> PRIVATE RESIDENCE
<input type="checkbox"/> SITE	PUBLIC ACQUISITION	ACCESSIBLE	<input type="checkbox"/> ENTERTAINMENT <input type="checkbox"/> RELIGIOUS
<input type="checkbox"/> OBJECT	<input type="checkbox"/> IN PROCESS	<input checked="" type="checkbox"/> YES: RESTRICTED	<input type="checkbox"/> GOVERNMENT <input type="checkbox"/> SCIENTIFIC
	<input type="checkbox"/> BEING CONSIDERED	<input type="checkbox"/> YES: UNRESTRICTED	<input type="checkbox"/> INDUSTRIAL <input checked="" type="checkbox"/> TRANSPORTATION
		<input type="checkbox"/> NO	<input type="checkbox"/> MILITARY <input type="checkbox"/> OTHER:

4 OWNER OF PROPERTY

NAME Penn Central Transportation Company

STREET & NUMBER
6 Penn Center

CITY, TOWN	VICINITY OF	STATE
Philadelphia		Pennsylvania

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC Blair County Recorders' Office

STREET & NUMBER
423 Allegheny Street

CITY, TOWN	STATE
Hollidaysburg	Pennsylvania

6 REPRESENTATION IN EXISTING SURVEYS

TITLE
None

DATE
--- FEDERAL --- STATE --- COUNTY --- LOCAL

DEPOSITORY FOR SURVEY RECORDS

CITY, TOWN STATE

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
<input checked="" type="checkbox"/> EXCELLENT	<input type="checkbox"/> DETERIORATED	<input type="checkbox"/> UNALTERED	<input checked="" type="checkbox"/> ORIGINAL SITE
<input type="checkbox"/> GOOD	<input type="checkbox"/> RUINS	<input checked="" type="checkbox"/> ALTERED	<input type="checkbox"/> MOVED DATE _____
<input type="checkbox"/> FAIR	<input type="checkbox"/> UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

When the Pennsylvania Railroad engineers decided to locate their line through Logan's Narrows, five miles southwest of Altoona, they were confronted with a cul-de-sac in the proposed valley, at the foot of Kittanning Point. In order to construct the curve which would allow the line to continue out of the valley it was necessary to fill Kittanning Run, which formed a deep ravine on the north side of the valley, to blast away the face of Kittanning Point, and to fill the second ravine, on the southside of the valley, which was formed by Glenwhite, or Burgoon's Run.

The presence of the Horseshoe Curve indicates the continued success of these three engineering feats. The Curve is 2,375 feet long with a central angle of 220 degrees; its northern end lies at an altitude of 1,594 feet, the southern end at 1,716 feet. The Curve was first laid with two tracks, but now has four.

The terrain around the Curve is still as heavily-wooded and as mountainous as it was in 1853, although to the east of the Curve are two reservoirs, which flow into Lake Altoona. In addition, State Route 193 runs along the north side of the valley, below the railroad tracks, and passes under the Curve at Glenwhite Run. At the apex of the Curve, between the tracks and Route 193 there is now a small park and observation area for interested spectators. A steam locomotive and a caboose are on permanent display here.

Boundaries

The landmark is bounded by a 2,375' corridor which extends the length of the Curve, from a point just east of the eastern bank of Kittanning Run along the roadbed to a point just east of the eastern bank of Glenwhite Run, and which extends in width from the inside, or western extent of the roadbed out to the 1600' elevation line, thus varying in width from approximately 150' to 375' approximately. These boundaries are designed to enclose the Horseshoe Curve track and roadbed.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
<input type="checkbox"/> PREHISTORIC	<input type="checkbox"/> ARCHEOLOGY-PREHISTORIC	<input type="checkbox"/> COMMUNITY PLANNING	<input type="checkbox"/> LANDSCAPE ARCHITECTURE	<input type="checkbox"/> RELIGION	
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> ARCHEOLOGY-HISTORIC	<input type="checkbox"/> CONSERVATION	<input type="checkbox"/> LAW	<input type="checkbox"/> SCIENCE	
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> ECONOMICS	<input type="checkbox"/> LITERATURE	<input type="checkbox"/> SCULPTURE	
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> ARCHITECTURE	<input type="checkbox"/> EDUCATION	<input type="checkbox"/> MILITARY	<input type="checkbox"/> SOCIAL/HUMANITARIAN	
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> ART	<input checked="" type="checkbox"/> ENGINEERING	<input type="checkbox"/> MUSIC	<input type="checkbox"/> THEATER	
<input checked="" type="checkbox"/> 1800-1899	<input type="checkbox"/> COMMERCE	<input type="checkbox"/> EXPLORATION/SETTLEMENT	<input type="checkbox"/> PHILOSOPHY	<input checked="" type="checkbox"/> TRANSPORTATION	
<input type="checkbox"/> 1900-	<input type="checkbox"/> COMMUNICATIONS	<input type="checkbox"/> INDUSTRY	<input type="checkbox"/> POLITICS/GOVERNMENT	<input type="checkbox"/> OTHER (SPECIFY)	
		<input type="checkbox"/> INVENTION			

SPECIFIC DATES

1852-54

BUILDER/ARCHITECT

STATEMENT OF SIGNIFICANCE

Horseshoe Curve, five miles west of Altoona, Pennsylvania, symbolizes two major achievements in the development of the Nation's railroads. First, it is one of the most amazing examples of ante bellum railroad engineering and construction in the United States, and second, its completion marked the joining of the eastern and western divisions of the Pennsylvania Railroad, and thus contributed to the rise of that leading railroad. The Horseshoe Curve is still a vital unit in the Penn Central Railroad, and has been enlarged from two to four tracks.

History

Of the three general routes to cross the State from Harrisburg from the many surveyed from 1839 to 1841 Charles L. Schlotter, Principal Engineer in service for the State, recommended that the middle route which used the valley of the Juniata and Kishacoquillas Rivers to reach and cross the Allegheny Mountains at Sugar Run Gap (Gallitzin, Pa) was the shortest and most economical.

The proposed line over the Alleghenies provided a maximum grade of 0.852% by keeping to the high ground on the approach from Lewistown, Pa. and required deep cuts, high embankments and viaducts. The steep grade would extend for 84 miles limiting train load for the entire distance.

J. Edgar Thomson, Chief Engineer of the Pennsylvania Railroad did not adopt the middle route location west of Lewistown, but followed the lower ground in the Juniata River valley to Logan's Narrows (near Altoona, Pa.) at the base of the eastern slope of the Alleghenies and concentrated the steep grades to the summit to the 9.8 miles west of Altoona.

Extensive surveys were made beginning in 1847 and extending over nearly two years to locate this section of the railroad. These surveys, which were made through a heavily wooded mountainous region and for which maps were non-existent, were attended with arduous living conditions by field forces and included instrumental examination of 44 miles of the crest of the Alleghenies for determination of the heights of the several gaps and location of approaches thereto.

In latter part of 1849 a line over the Alleghenies was adopted to cross at Sugar Run Gap. A summit tunnel was to be constructed to cut off the last 150 feet of grade. The most spectacular engineering feat turned out to be location of the line along the

9 MAJOR BIBLIOGRAPHICAL REFERENCES

- Edwin Alexander, The Pennsylvania Railroad, A Pictorial History (New York, 1947).
 City of Altoona, "Horseshoe Curve" (Altoona, Pa., no date).
 Robert S. Henry, This Fascinating Railroad Business (Indianapolis, 1943).
 H.S. Scholter, The Growth and Development of the Pennsylvania Railroad Company
 (Philadelphia, 1927).
 John F. Stover, American Railroads (Chicago, 1961).

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY 8 acres
 UTM REFERENCES

A	<u>17</u>	<u>713410</u>	<u>4485830</u>	B			
	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING
C				D			
	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

Richard Greenwood, Historian, Landmark Review Task Force

ORGANIZATION

Historic Sites Survey

DATE

8/9/75

STREET & NUMBER

1100 L Street

TELEPHONE

CITY OR TOWN

Washington

STATE

D.C.

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.

FEDERAL REPRESENTATIVE SIGNATURE

Landmark Nov-13-1966

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.

Signature: [Signature]

TITLE

DATE 8/7/78

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE 1/7/78

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST:

DATE

KEEPER OF THE NATIONAL REGISTER

(NATIONAL HISTORIC LANDMARKS)

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CONTINUATION SHEET Horseshoe Curve ITEM NUMBER #8 PAGE 2

east slope, from Altoona to the summit. The slope on the west side is more gradual and much less demanding of engineering skill.

After a resurvey in 1850, it was decided that the new line was to mount the east slope with a grade of not more than 1.8%, or a rise of 1.8 feet for each 100 feet of distance. Crossing low ridges southwest of Altoona, the line came to a valley running westward and followed it along the side of the ridge on a 1.75% grade. But about 5 1/2 miles from Altoona the valley was found to split into two ravines, divided by another mountain. Across the valley at this point lay the ridge which could carry the rails on toward the summit at a 1.73% grade. To have crossed the valley from one ridge to the other would have required a great bridge with a grade of 4.37%--much too steep then, as now, for practical railroad operation.

The total elevation to be overcome in the 9.8 miles was 896 feet.

So, to gain distance and reduce the grade, the Railroad's engineers built a huge earth fill across the first ravine--Kittanning Run, carved away the face of the dividing mountain, and crossed the second ravine--Glenwhite Run by means of another great fill. The rails reached the ridge on the other side of the valley in a great semi-circle 1,300 feet across--Horseshoe Curve.

The grading on the eastern slope of the mountain was heavy and consisted largely of rock. The rock cuts, embankments and culverts near the Horseshoe Curve were especially formidable.

(The earliest known use of the term horseshoe to describe the curve dates from 1862. In a railroad guide book published by George H. Thurston it was stated: "This horse-shoe bend is one of the greatest engineering triumphs of the age"--a description not diminished with the intervening years.)

The railroad was constructed with two main tracks, with construction started in 1850 and line over the mountain was placed in service in 1854.

The westbound track was originally laid with 56 lb. T-rail on crossties ballasted with stone.

The eastbound track was originally laid with 74 lb. U-rails which were replaced in 1856 with T-rails.

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CONTINUATION SHEET Horseshoe Curve ITEM NUMBER #8 PAGE 3

In 1898 the third track was completed.

In 1900 the fourth track was completed.

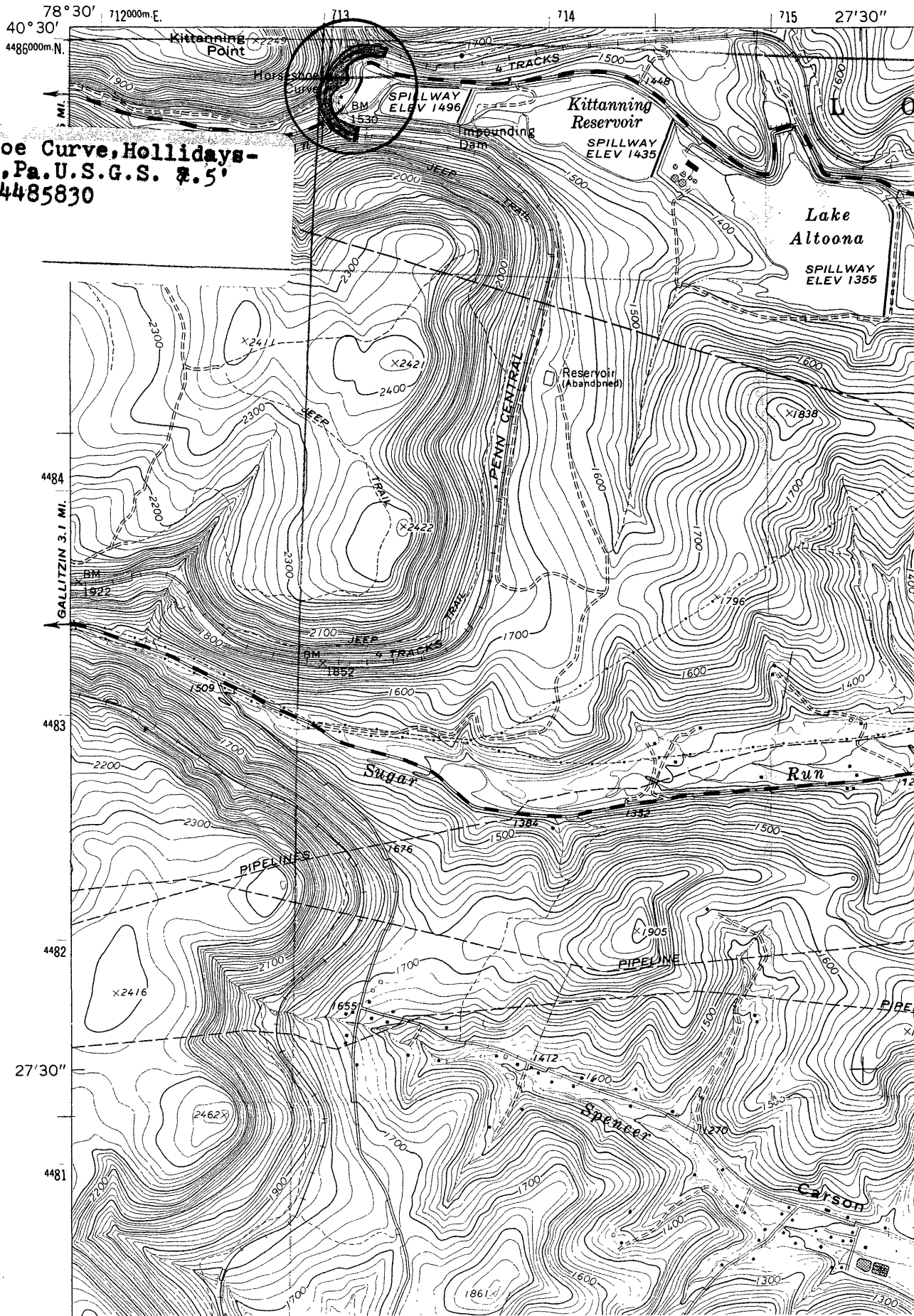
Due to traffic in days of steam locomotives, rails in the tracks, through Horseshoe Curve were transposed--left rail moved to the right and vice versa--because the flanges on the wheels of the railroad cars would grind away that side of the head of the rail with which they were in contact. Transposing the worn rails enabled the Railroad to get all possible use out of the rail. With dieselization of motive power and advent of dynamic braking with rail oilers, wear has been reduced and transportation of rail has been discontinued.

Present rail section through the curve is 140 lb. continuous welded rail.

The exact cost of building the curve is not available, but final cost estimate for the entire 31.1 mile Altoona-Johnstown segment of the railroad exclusive of the summit tunnel was \$2,495,000, equivalent to \$80,225 per mile of railroad and \$52,949 for the 0.66 mile long Horseshoe Curve.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

5295 II SE
(ASHVILLE)



UTM Horseshoe Curve, Hollidays-
burg Quad., Pa. U.S.G.S. 7.5'
17.713410.4485830

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