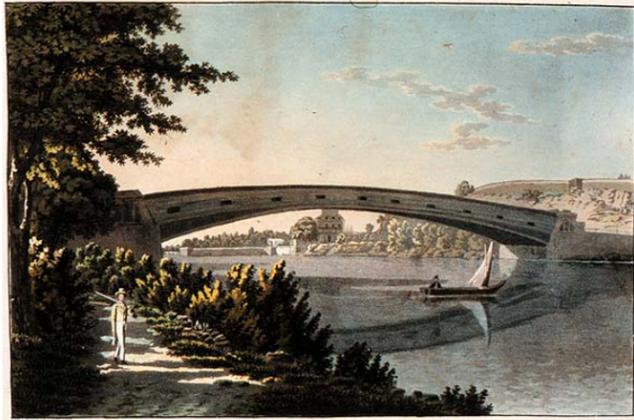


**1 Spring Garden Street Bridge** - A ferry and six successive bridges served this historic crossing of the Schuylkill River before the construction of the current Spring Garden Street Bridge in 1966. A floating bridge over the River here lasted from 1776 to 1789 when a flood destroyed it. High water washed away its successor, also a floating bridge, in 1809. The first permanent span at this location opened in 1813. For it, Lewis Wernwag, one of the earliest professional bridge builders in the nation, designed a timber arch-covered structure. Known as the Colossus of Fairmount or the Upper Ferry Bridge, it ranked as the longest single-arch bridge in the world. It burned in 1838.



The Colossus / Upper Ferry Bridge at Spring Garden, circa 1825

In 1842, Colonel Charles Ellet, Jr. created the Wire Bridge to replace the Colossus. The first cable suspension bridge for vehicles in the country, this bridge remained in use until 1875. Its narrow roadway, a mere 18 feet, could no longer carry the volume of traffic generated by a rapidly expanding city. Jacob H. Linville, an engineer, designed the next bridge. He specified a double-deck, Linville truss bridge with an upper deck to take Spring Garden Street over the River and a lower deck for Callowhill Street. It lasted 90 years when obsolescence and deterioration required its replacement.

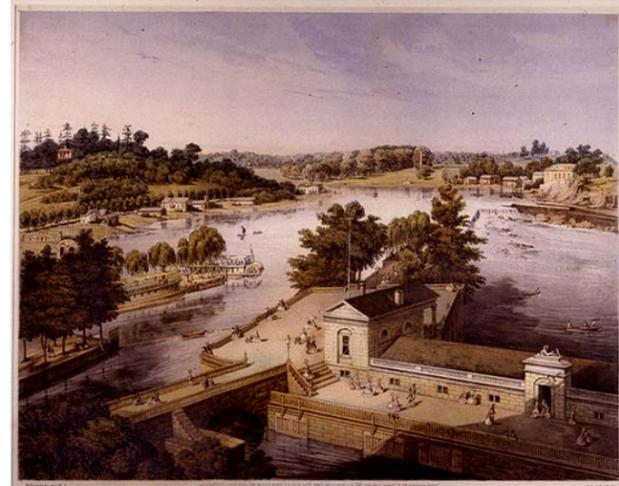
The present Spring Garden Street Bridge consists of a two level structure resting on common piers. The lower level opened in December 1965, the upper bridge in June 1966.

**2 The Fairmount Water Works** - The Fairmount Water Works was the first municipal waterworks in the United States. Designed in 1812 by Frederick Graff and built between 1819 and 1822 it operated until 1909, winning praise for its design and becoming a popular tourist attraction.

Following a series of yellow fever epidemics in the late 1700s (which was at the time thought to be caused by unclean water) city leaders appointed a "Watering Committee" which eventually picked Frederick Graff to design a new waterworks, in order to provide clean water to city residents.

After the waterworks closed in 1909 the facility was used for several purposes, including the city aquarium (which closed in 1962) and later a swimming facility which closed in 1973. In more recent years attempts have been made to return the waterworks to its previous position as an engaging tourist attraction. Despite a severe fire which caused setbacks

to the restoration, an interpretive center has now been added and tours are regularly given. Its position near Boathouse Row and the Philadelphia Museum of Art is hoped to aid in making it a regularly-visited tourist site once more. It was placed on the National Register of Historic Places in 1976 and is also a National Historic Civil and Mechanical Engineering Landmark.



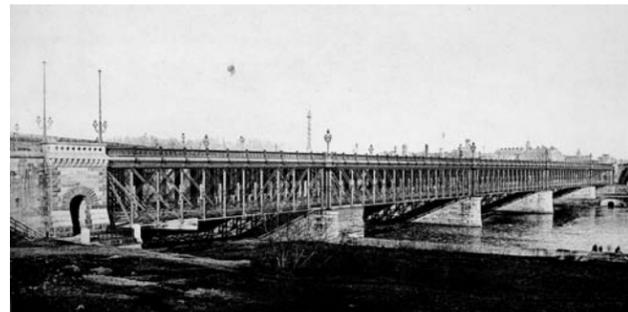
The Fairmount Water Works, circa 1867

**3 Girard Avenue Bridge** - The City of Philadelphia erected the present Girard Avenue Bridge, the third to span the Schuylkill River at this crossing, in 1969-1971.

In response to the growth of population and development into West Philadelphia in the mid-nineteenth century, the Pennsylvania General Assembly directed the Philadelphia County Commissioners to build a free bridge over the Schuylkill River at Girard Avenue at a cost of \$175,000. This first bridge at this location consisted of a three-span, timber arch, Howe truss and opened in 1855. In 1872, the Grand Jury determined that its condition had become dangerous.

The replacement structure, a handsomely ornamented, wrought iron, quadrilateral Pratt truss bridge with two decks constructed on four piers, opened on July 4, 1874. Its width of 100 feet made it the widest bridge in the world and enabled it to accommodate seven carriage lanes and two pedestrian walkways over its 1,000 feet length. It served as a principal gateway to the Centennial Exposition of 1876 in West Fairmount Park.

The increasing volume and weight of vehicular traffic during the twentieth century accelerated the deterioration of the 1874 bridge and led



The Girard Avenue Bridge, circa 1874

City officials to make plans for its replacement. In conjunction with the construction of the Schuylkill Expressway, the western spans underwent rebuilding in 1956. In the next decade, the Philadelphia Department of Streets turned to redesigning the sections over the River and Kelly Drive. A steel-welded, continuous girder structure, the new bridge has three 197-foot spans and one 135-foot span in an arch configuration evocative of the earlier bridges over the Schuylkill River. Erected in stages to keep the 1874 bridge in use, this bridge became fully operational in 1971.

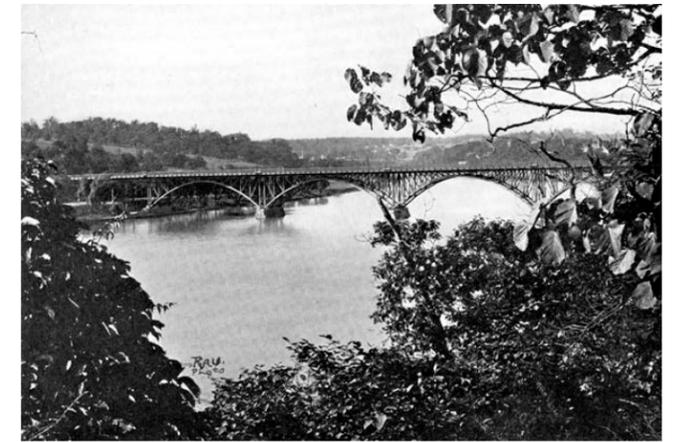
**4 Columbia Bridge** - The current Columbia Bridge consists of eight concrete arch spans supporting four railroad tracks and a pedestrian walk. It measures 755 feet in length and 56 feet in width. Two sets of track went into operation in 1920 followed by the other two in 1921. It carried the main line of the Reading Railroad from Philadelphia to Reading. It also served the industries along the Schuylkill and Delaware River and the passenger trains of the Reading and of the Baltimore and Ohio. It remains in use today.



The Columbia Bridge during the 2006 floods

The original crossing, built in 1834, the first of three bridges to span the Schuylkill River at this crossing formed an important link in Pennsylvania's effort to compete with the Erie Canal. The Main Line consisted of a railroad from Philadelphia to Columbia, PA on the Susquehanna River, a canal from Columbia to Hollidaysburg, the 37-mile long Allegheny Portage Railroad which included a 900 feet long tunnel to traverse the mountains to Johnstown and a canal to complete the 394-mile route into Pittsburgh. The system used specially designed canal boats that flatcars could haul over the railroad. The Main Line began operation in 1834.

**5 Strawberry Mansion Bridge** - Erected in 1896-1897 as the Fairmount Park Trolley Bridge by the Fairmount Park Transportation Company, the Strawberry Mansion Bridge established a convenient connection over the Schuylkill River between East and West Fairmount Park. Before its construction, the nearest river crossings occurred more than a mile upstream and one and three quarter miles downstream. The Bridge opened on June 13, 1897 with right-of-way for trolley cars, vehicles and pedestrians. The last trolley run over the Bridge occurred on November 5, 1946.



The Strawberry Mansion Bridge, circa 1900

The Phoenix Bridge Company erected the Bridge from plans by Russell M. Thayer, Jr. and Theodore Cooper. It consists of four steel arches with three Warren truss approach spans at either side and granite abutments and piers. Its historic association with the Park and trolley cars and the elegance of its high arches make this one of the most significant bridges in Philadelphia.

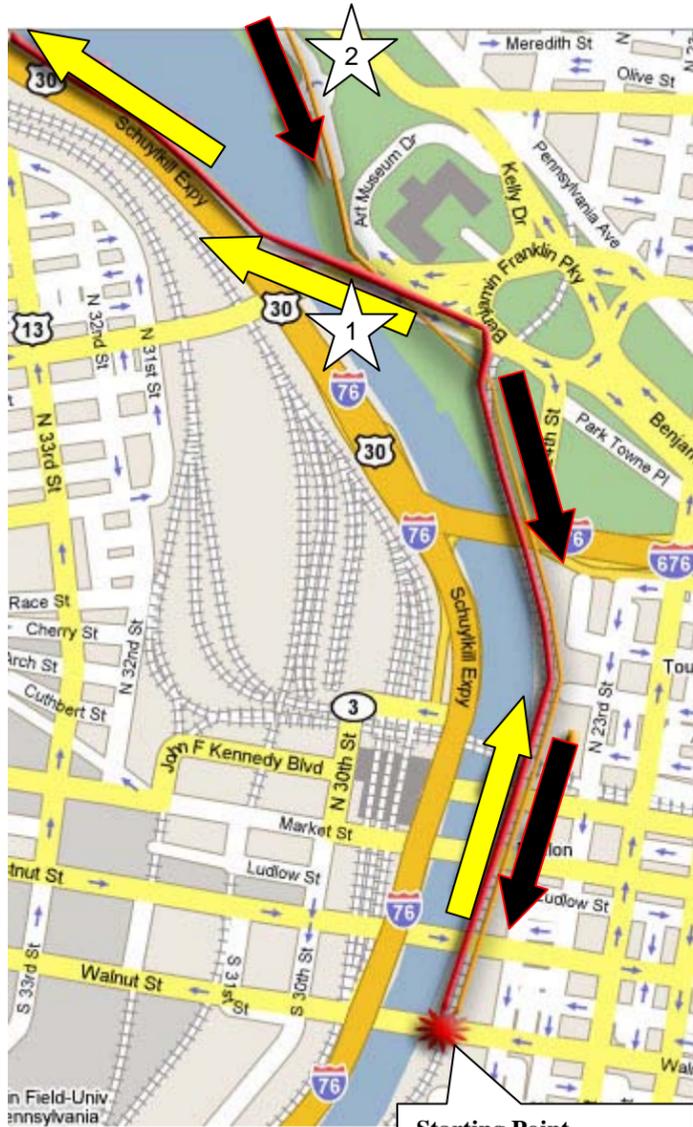
**6 Falls Bridge** - Erected in 1894-1895, the Falls Bridge connects East Falls and West Fairmount Park. Six previous bridges spanned the Schuylkill River at this location. The first, a chain suspension bridge built in 1808, lasted until 1816 when a heavy snowfall destroyed it. The nation's first wire suspension bridge, the "spider bridge," replaced it, but the new bridge survived only six months before a snow and ice storm wrecked it. In 1822, 1850, 1878 and 1893, winter storms and high winds carried away the four, succeeding timber bridges.

George S. Webster, the City's Chief Engineer and Surveyor from 1893 to 1913, designed a new metal truss bridge to withstand the forces of wind and water that had destroyed six earlier bridges over the Schuylkill River at East Falls. He created a three-span, steel and iron, pin-connected Petit thru truss variation of the Pratt truss with vertical end posts constructed on two granite piers. Webster originally proposed a bridge with two decks. Never constructed, the upper deck would have carried a railroad, trolleys and vehicles between the bluffs of West Fairmount Park and the river terrace of East Falls.



The Falls Bridge

Continued on Map 2



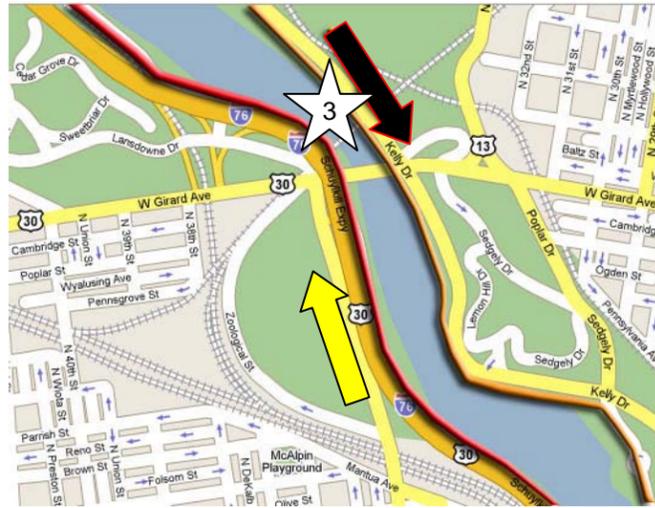
Map 1

Starting Point  
Below Walnut St. Bridge

Legend

-  Spring Garden Street Bridge
  -  Fairmount Water Works
  -  Girard Avenue Bridge
  -  Columbia Bridge
  -  Strawberry Mansion Bridge
  -  Falls Bridge
-  Starting Point to Falls Bridge
  -  Return Trip from Falls Bridge

Continued on Map 3



Continued on Map 1

Map 2

Continued on Map 4



Continued on Map 2

Map 3



Continued on Map 3

Map 4

The Engineers Club of Philadelphia would like to thank the following contributors:

Joe Syrnick - Schuylkill River Development Corp.

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For information on additional activities and events along Schuylkill Banks, visit [www.schuylkillbanks.org](http://www.schuylkillbanks.org)



Engineers' Club of Philadelphia  
Founded in 1877



## Engineering Tour of the Schuylkill Banks

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