

Blackwell's Almanac

A Publication of the Roosevelt Island Historical Society



Recognize it? It's a tower of the Queensboro Bridge (see "Getting Here! Bridge(s) over Turbid Waters," p. 2) photographed by bridge-climber/photographer Dave Frieder (see "The Magnificent Bridges of New York City," p. 9). Note the innovative eyebars used instead of cable. Until 1960 the decorative finials held flag masts, but they rusted so badly they were removed. Now the top of the finials are outfitted with aviation beacons.

Getting Here! Bridge(s) Over Turbid Waters

Contents

- P. 2 Getting Here!
Bridge(s) Over Turbid
Waters
- P. 8 Acknowledgment
of Support
- P. 9 The Magnificent
Bridges of New York
City
- P. 12 Add Your Name
to the *Blackwell's*
Almanac Mailing List
- P. 13 RIHS Calendar;
Become a Member
and Support RIHS

Blackwell's Almanac

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Blackwell's Almanac
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Island Historical
Society

By the late-19th century, the inmate/inpatient population of Blackwell's Island at any given moment had soared to some 7,000. That number didn't take into account staff, part-time, commuting employees, administration, and visitors. Nor did it accurately depict an ever-changing flow of humanity, numbering in the many thousands each year, that entered and left the alms house, workhouse and hospitals. At the time, public transportation to and from the island consisted only of a twice-daily ferry at 26th Street (the Bellevue pier) and Department of Corrections steamboats that transported prisoners between the Tombs and Blackwell's. But that was about to change. A momentous plan was in the works: a bridge to link Manhattan and Queens, with important benefits for Blackwell's Island.

The Queensboro Bridge

It should be said at the outset that the factors prompting construction of the Queensboro Bridge had little to do with Blackwell's Island. Rather it was the shortcomings of the many steam-driven ferries that plied the East River estuary between Manhattan and Queens. Their performance was invariably blemished by such setbacks as collisions, boiler explosions, storms, blizzards and blankets of thick fog. On the occasions when the East River froze, ice floes could trap the boats for hours, making for a lengthy and terror-filled crossing. Moreover, they could not transport railroad cars from one bank to the other.

Against this backdrop, powerful private interests were militating for construction of a bridge. Rich Long Island-side factory owners, such as piano manufacturer William Steinway and Standard Oil Company co-owner Charles Pratt, wanted a better way to transport raw materials, finished products and employees. Manhattan's funeral trade would be happy to skip the boat part of their procession to the approximately 19 cemeteries in Queens. Developers viewed the open, country-like spaces of Queens, if outfitted with better transport, as ripe for residential throngs. And the Long Island Rail Road, forced to shuttle passengers by ferry between Queens and Manhattan, looked forward to a seamless train trip across a bridge.

Early Days: The first attempt to build a Manhattan-Queens crossing played out as early as 1877. Dr. Thomas Rainey, director of the New York and Long Island Bridge Company, proposed a suspension bridge of lacy ironwork that would start at East 76th Street in Manhattan, anchor on Blackwell's Island, then stretch to 34th Avenue in Queens. Work progressed for a few years, until in 1883, the \$5 million project went bankrupt.

That didn't stop Austin Corbin, president of the Long Island Rail Road. So eager was he for a non-stop route into New York, he eventually approached Rainey with two unassailable arguments for renewing the project: he offered to finance the undertaking and he presented Rainey with a completed design. This new plan consisted of a steel cantilever



Cantilever Construction: Cantilevers are structures that project horizontally into space, supported on only one end (like a diving board). Cantilever bridges are economical to build, they are stronger than suspension bridges, and they allow for long spans and wide clearances under the span. The Queensboro Bridge is an example of double cantilever construction: the Manhattan and Roosevelt Island cantilevers meet and pass over the west channel of the East River, while the Roosevelt Island and Queens cantilevers cross the east channel. There is a smaller truss connecting the two island piers. This photo shows traveling cranes ready to position the final sections of the roadway. Photo: New-York Historical Society Collection.

bridge with three main spans supported by granite piers. The first connected East 64th Street in Manhattan with Blackwell's Island; the second segment spanned the island; and the third ended at 40th Avenue in Long Island City.

Begun in 1895 amid high hopes, the bridge suffered a perverse fate: Corbin died in a carriage accident in 1896, halting all work. In 1898, the Spanish-American War further stalled construction. Incorporation of the outer boroughs into New York City in the same year tolled the final death knell for Rainey's scheme. The promise of improved transportation had been a major inducement in getting citizens from the outlying regions to vote for being part of Greater New York. So now the City fathers appropriated the bridge project as their own.

Three's a Charm: In 1902, noted bridge architect Gustav Lindenthal was named City Bridge Commissioner and handed yet another design that had already received final administrative approval. It would be a cantilever construction, 120 feet wide, reaching from 60th Street to what is now Queens Plaza. It is said that Lindenthal was appalled by the plan's abject ugliness.

He immediately hired prominent architect Henry Hornbostel to help him add some aesthetic refinement to the design. Together they decided to streamline the bridge to a width of only 86 feet by adding a second deck. They enhanced its interlacing steelwork with graceful repetitions of symmetrical patterns and light finial ornaments. The anchoring piers in Manhattan and Queens were designed not only to support the bridge spans, but also to provide arched public purpose space. On the Manhattan side,



Vaulted Arches with Guastavino Tile: Looking east from Second Avenue, this space under the Manhattan approach housed a vibrant market from 1914 until the 1930s. After being demoted to a grimy storage area for decades, it was restored to its former splendor in 1999 as the Bridge Market. Photo: Museum of the City of New York.

Lindenthal and Hornbostel insisted on vaulted arches lined with Guastavino tile.

Although these modifications cast the bridge as a work of art, it was still an 8,601-foot-long marvel of engineering. Cutting edge specifications called for the use of the new, stronger nickel-steel alloy and eyebars instead of cable. This supported the construction of four carriageways (vehicular roads for autos and horse-drawn conveyances) and two trolley tracks on the lower roadway, plus two pedestrian paths and two train lines above.

The Second Avenue elevated train and a train from Grand Central Station eventually crossed the bridge and connected to the Queensboro Plaza station. Five trolley lines had their terminals under the bridge approach east of Second Avenue between 59th and 60th Streets. Each line (traveling to Astoria, Steinway, Corona, Flushing and College Point, and Queens Boulevard) was accessed by its own decorative cast iron and terra cotta entranceway (one of which is now our Visitor Center) and descending staircase.

The Modern Way to Blackwell's Island: At the midpoint of the lower bridge span was a special stop that allowed vehicles and passengers on the Queens Boulevard

trolley line to turn into a building on the north side of the bridge that provided access to Blackwell's Island. Called the "upside-down building" because it was entered through its roof and its lobby was on the eighth floor, the structure had five elevators capable of taking passengers and trucks to island level. Importantly, the building also served as distributing center and storehouse—a vast improvement over the delivery of tons of supplies by boat. Each floor, encompassing distributing offices, refrigerated food lockers, a restaurant, bakery, pharmacy and drug manufactory, coffee roasting facility, and storage, could receive trucked-in provisions directly. Not surprisingly, this upside-down innovation was featured in Ripley's *Believe It or Not*.

The bridge, completed at a cost of \$20 million versus the originally estimated \$17 million, officially opened in 1909 to a week of fanfare and an audience of 300,000 spectators. A choir and comic opera entertained. Bloomingdale's held a special sale and sold a commemorative silver spoon. A vast parade made its way from downtown across the bridge. And for two hours the structure was enveloped in an astounding display of fireworks, the most amazing of which was a rainbow-colored simulation of Niagara Falls



People entering a kiosk, which led to underground stairs and the trolley track. Photo: Sid Kaplan and the NYC Municipal Archives.



The Elevator Storehouse: Looking west, the building on the north side of the bridge provided convenient access to Blackwell's Island day and night. Those traveling east on the south side of the bridge, stepped into a passageway that crossed under the roadbed to the north-side entrance to the building. Photo: The Eleanor Schetlin Collection at the RIHS.

that poured over the Queens side of the bridge.

Today (or at least according to 2017 counts) the (Ed Koch) Queensboro Bridge is one of the major crossings of the East River, each day carrying over 170,270 vehicles, 5,400 cyclists, and more than 2,000 pedestrians. It is also distinctive in that it is the only one of the four great East River bridges that is not a suspension bridge.



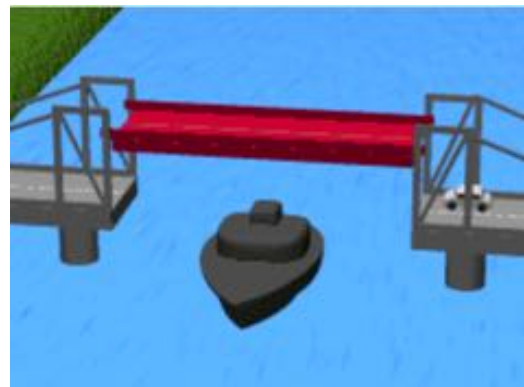
Contemporary View from the Center of the Upper Roadway: *In the years following inauguration of the bridge, skyrocketing traffic volume and the increasing use of automobiles occasioned numerous changes. Originally a toll of 10¢ was collected, but this was discontinued in 1911. Trolleys were rerouted from the center lower deck to outer lower tracks, making way for vehicular traffic. Eventually all tracks were removed in favor of autos; the pedestrian sidewalks on the upper level were also subsumed by auto traffic, and a single walkway was built on the north side of the lower deck. Photo: Dave Frieder in “The Magnificent Bridges of New York City.”*

The Roosevelt Island Bridge

By the early 1950s, the upside-down building—the sole public vehicular connection to what was then Welfare Island— was serving 1,000 cars and trucks a day. Growing traffic to and from the island’s institutions plus

increasing congestion on the already heavily traveled Queensboro Bridge required that something be done. That something turned out to be a vertical lift bridge (originally called the Welfare Island Bridge) across the east channel of the river.

Not that there wasn’t official resistance to the idea. The New York City Council doubted that the estimated \$6.5 million span would carry enough traffic to justify its cost. However, at the time, a plan was in the works to nearly double the number of hospital beds on the island to 10,000. This was projected to substantially increase rush hour worker traffic and push peak Sunday visitor traffic to around 10,000 as well. Result: the bridge proposal was adopted.



Lift Bridge: *The span rises vertically while remaining parallel with the fixed part of the deck. Credit: en.wikipedia.org.*

Construction of the bridge, which measures 2,877 feet including approaches, began in 1952 and was completed in 1955. The 418-foot movable mid-section stretches 40 feet

above mean high water, and when it is in lift position, provides a vertical clearance of 100 feet. The raising mechanism depends on 48 cables, balanced by concrete counterweights. The bridge also encompasses a six-foot wide pedestrian walkway on its north side.

Of course, the river's water level varies with the tides. So two illuminated signs facing both upstream and downstream alert pilots as to the clearance under the main span of the bridge as the tide rises and falls. When a boat signals the need for raising the span, the bridge operator acknowledges the signal, stops car traffic by turning the traffic lights to red, closes the traffic gates and starts the lift.

As with any construction project, the bridge had its problems and delays. The most dramatic occurred in July 1954: the construction team was just about to float the steel mid-section into position and set it on its concrete piers, when—oops!—one of the two wooden barges holding the 1,000-ton span sank. Engineers managed to transfer the sinking end of the span to a metal scow, and

disaster was averted, but operations were delayed for a time.

Shortly after the bridge's opening, the elevators from the Queensboro Bridge were closed to the public, although two remained in operation in case of emergency. The last remaining trolley line, the one that had served Welfare Island, was discontinued in 1957. The elevators and the upside-down building were all demolished in the 1970s.

Once the development of Roosevelt Island was envisioned, it was clear that there would be an enormous amount of car traffic on an island residential complex whose goal was a low-traffic environment. To minimize traffic volume on Main Street, the Motorgate Parking Garage was built in 1974 directly accessible from the bridge.

As anyone living on Roosevelt Island knows, most ships navigating the East River use the deeper west channel. The result is that the lift feature of the RI Bridge is greatly underutilized. Because maintenance of this function is so expensive, the New York City



RI Bridge in its latest color palette. Photo: en.wikipedia.org.

Department of Transportation actually considered, in early 2001, doing away with the lift mechanism and making it a fixed bridge. But cooler heads prevailed. First, it was thought prudent to have a back-up East River through-way. In addition, vessels are now forced to use the east channel every September during the United Nations General Assembly when security considerations prohibit use of the west channel (this may not have been the case before 9/11).

So, now test openings of the bridge are carried out periodically to ensure that all is working properly. During these tests, Emergency Medical Services and other city agencies are required to be on hand in case the bridge breaks down and there is no vehicular way of getting on or off the island.

Starting in 2010, the bridge underwent a three-year reconstruction. The city replaced the entire roadway deck and approaches, updated all mechanical and electrical systems, installed a new pedestrian passageway and safety fencing, replaced bearings to meet current seismic codes, repaired any deteriorated structural elements and installed a new turning lane from the bridge onto southbound Vernon Blvd.

The bridge was also repainted. Through the years, the bridge has been painted a number of colors, including royal blue, gray and red. The latter was an unfortunate choice since it

faded to an insipid pink. This round's color choice was maroon, which happily is fading to an interesting, more organic shade.

The New York City Council needn't have worried. In addition to an endless array of delivery trucks servicing Roosevelt Island businesses, institutions and residents, a congested Motorgate and impossible-to-find street parking speak to the volume of visitors and commuters who cross the bridge every day.

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ORIGINAL "POETRY IN MOTION" POSTERS FROM THE NYC SUBWAY \$30 EACH AT THE VISITOR CENTER



**THE ROOSEVELT ISLAND HISTORICAL SOCIETY
WISHES TO ACKNOWLEDGE ITS GRATITUDE
TO THE FOLLOWING INDIVIDUALS
FOR THEIR GENEROUS SUPPORT
OVER THE PAST YEAR**

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The Magnificent Bridges of New York City

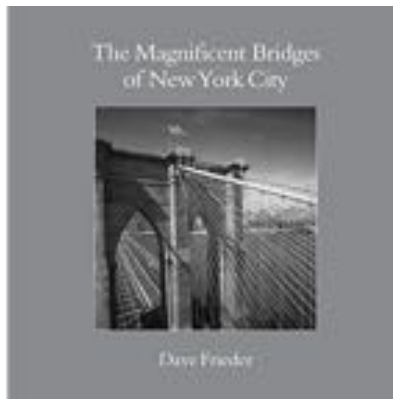
If you include overland footbridges, there are an incredible 2,027 bridges in New York City. That's one of the many things audience members learned from intrepid bridge photographer Dave Frieder during his December presentation at the Roosevelt Island branch of the Public Library. Sponsored by the Roosevelt Island Historical Society and based on his new book "The Magnificent Bridges of New York City," Frieder's talk and accompanying slides were revelatory in another way as well: they demonstrated the brilliant design and aesthetics of our workaday water crossings—New York's bridges as we had never seen them before!

As a kid, Dave Frieder and his family had to travel either the FDR Drive or the West Side Highway to visit his grandparents. The bridges they passed fascinated him; they all had the same function but looked so different from one another. The finials or "crowns" on the Queensboro Bridge; the huge spheres that topped the towers of the Manhattan Bridge; the Herculean main cables of the George Washington Bridge—he always wondered what it would be like to see them up close.

It took till he was in his 40s, but he found out. Having developed an abiding interest in photography, he honed his skill in a series of workshops run by a former assistant to Ansel Adams, the famous chronicler of Yosemite National Park. But, he was told, skill was not enough; he needed to focus on a subject that meant a lot to him and to concentrate on bringing out its hidden beauty. That was the catalyst: bridges!!!

After doing research at several libraries and confirming that no coffee-table book on the subject existed, Dave went into high gear, literally and figuratively. He contacted every major bridge authority in New York City—NYCDOT, Port Authority of New York and New Jersey, Triborough Bridge and Tunnel Authority, even Amtrak. With appropriate high-liability insurance and a healthy concern for safety, he was given permission to climb and photograph any bridge he wanted to as long as he was accompanied by one or two ironworkers. Undaunted by heights and helped immeasurably by an avocation in gymnastics that lasted until he was 36 years old, Dave has made history.

Over 25 years, "The Bridge Man," as he is called, climbed 20 of New York's great bridges and photographed them in intimate and distinctive ways. Here are a few samples from his beautiful book.



George Washington Bridge

Opened in 1931, connecting Manhattan and New Jersey across the Hudson River. It was going to be called the Hudson River Bridge, until school children



Upward view of New Jersey tower.

suggested naming it after our first president. When the initial site chosen for it was abandoned as being impractical, the bridge approaches were located at Fort Washington, NY and Fort Lee, NJ, both historic sites used by George Washington to defend New York during the Revolutionary War.

Ideas for a cross-Hudson bridge date as far back as 1868, but leaders of the Reconstruction reserved available funding for more needed projects. Upon completion in 1931, the GW Bridge boasted the longest main span (3,500 feet) of any bridge in the world until it was eclipsed by the Golden Gate Bridge in 1937. However, with its parallel wire cable system supporting both an upper and lower roadway, the structure remains the world's only 14-lane suspension bridge and busiest vehicular crossing, carrying more than 106 million vehicles per year.

Hell Gate Bridge

This railroad bridge opened to traffic in 1917, spanning the strait between Astoria, Queens and Randall's Island/Ward Island. A design collaboration between Henry Hornbostel and Gustav Lindenthal (the architects of the Queensboro Bridge), the bridge used carbon steel, a recent development, to help support the anticipated heavy rail traffic. It also used more steel than the Queensboro and Manhattan Bridges combined, endowing it with the ability to carry the weight of 60 train engines.



The Hell Gate Bridge and its striking architecture have been the inspiration for other notable spans, including the Bayonne Bridge and the Sydney Harbor Bridge in Australia.



View of stonework detail from upper chord.



Manhattan Bridge

Opened in 1909 linking Canal Street in Manhattan, across the East River, to the Flatbush Avenue Extension in Brooklyn. A real workhorse, the two-level bridge carries autos, trains, pedestrians and cyclists.



The Manhattan span was the first suspension bridge to use flexible steel towers and the technologically innovative Warren truss, whose members can be in both compression and tension. This component proved to be one of the strongest of the many trusses available and helped make the structure the pioneer for modern, long-span suspension bridges.

Upper view of Brooklyn tower from main cable.

Verrazzano-Narrows Bridge

Upper roadway opened in 1964 and lower in 1969, spanning the Narrows (the inlet separating Upper New York Bay from Lower New York Bay) to connect Brooklyn and Staten Island. Preceded by many failed proposals for a Narrows crossing dating as far back as 1888, the suspension bridge—the last bridge construction project in NYC—was finally realized by Robert Moses. It was named for Giovanni da Verrazzano, the first European to enter New York Harbor in 1524.

The span was designed with a particularly generous clearance above average high water mark (228 feet) in order to accommodate all cruise and container ships that enter the Harbor. Once boasting the longest central span (4,260



Cable strands, eyebar, Staten Island anchorage.

feet) in the world, it is now only 14th in the hierarchy; nevertheless, its towers (693 feet) are so tall, they can be seen from all five boroughs. At present there is only auto traffic, with no provision for pedestrians or bikes.



Williamsburg Bridge

Opened in 1903, connecting Manhattan at Delancey Street with Brooklyn at Broadway across the East River. Designed by the seemingly ubiquitous Henry Hornbostel, the Williamsburg Bridge was originally intended to mitigate overcrowding on the Brooklyn Bridge.

At the time of its construction, it was the first major all-steel suspension bridge over

1,000 feet long. Substituting steel for the usual arched masonry approaches significantly reduced costs, as did the decision not to support the side spans leading to the approaches (that is, the trusswork between the towers and the anchorages) from the main cables. Engineers opted for the use of shorter and lighter suspending cables instead. During a major overhaul that began in 1988, the span was closed entirely. Before the bridge's reopening in 2002, a new bike path was installed, resulting in the densest bike traffic on any bridge in the country.



View from service walkway through Manhattan tower.

Editor's note: "The Magnificent Bridges of New York City," which features both photographs and extensive text about each bridge, is available on Amazon.

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RIHS Calendar

**Roosevelt Island Historical Society Lecture Series—FREE
@ the New York Public Library Branch, 524 Main St., 6:30 pm**

Thursday, February 13, 2020

Eighty Days: Nellie Bly and Elizabeth Bisland's History-Making Race Around the World

Intrepid journalists Nellie Bly and Elizabeth Bisland set forth on November 14, 1889 to travel around the world as speedily as possible, racing each other and the fictional 80-day voyage by Jules Verne. Matthew Goodman will recount stories of their trips, capturing vignettes of the late 19th century.

Save these dates for the Spring/Summer Lecture Series; speakers to be announced.

Tuesday, May 19, 2020

Tuesday, June 23, 2020

Tuesday, July 21, 2020

Tuesday, September 15, 2020

These lectures are supported by funds from Amalgamated Bank, Roosevelt Island Operating Corporation's Public Purpose Fund and New York City Council Member Ben Kallos, with additional funding from the New York City Department of Youth and Community Development.

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