Background

- The Hell Gate Bridge first opened to passenger rail revenue service on April 1, 1917, which created a continuous all-rail link between Boston and Washington, D.C. through New York City. It represented the completion of what we today call the Northeast Corridor (Washington, D.C.-New York City-Boston).

- The Hell Gate Bridge spans the East River and is the centerpiece of a complex of bridges and viaducts that links Astoria, Queens, on Long Island, with the mainland in the the Bronx via Wards and Randall’s Islands.

- The Hell Gate Bridge was built to carry the New York Connecting Railroad (NYCR), which linked Manhattan north to the Bronx via Queens and south to Brooklyn. The NYCR is 8.96-miles long and cost $27 million to construct. It was jointly funded by the Pennsylvania and New York, New Haven & Hartford railroads, which were linked by the NYCR.

- The bridge was designed by engineer Gustav Lindenthal, who was born in the Austro-Hungarian Empire and immigrated to the United States in 1874. He collaborated on the design with architect Henry Hornbostel.

- The first revenue passenger train to use the Hell Gate Bridge was the Federal Express, which traveled overnight between Boston and Washington, D.C.

- Currently, approximately 40 daily Amtrak Northeast Regional® and Acela Express® trains cross the bridge each day, as well as freight trains.

- April 1, 2017 marks the centennial of regularly-scheduled passenger rail service over the bridge.
Hell Gate Bridge Design and Construction

- The Hell Gate Bridge was the longest steel arch bridge in the world when completed in 1916 and instantly became an icon of American railroading. (Passenger service over the bridge began in 1917)

- The bridge takes its name from a narrow stretch of water once known for the treacherous rapids and strong tides encountered by maritime vessels traveling between Long Island Sound and Upper New York Bay.

- The main span of the bridge measures 1,017 feet between the centers of the two flanking towers.

- The main arch is 305 feet above the river’s average high-level water mark.

- The bridge deck is 135 feet above the average high-level water mark, and the deck is 93 feet wide.

- Two 3000-pound jacks were used to close a gap of 5/16 of an inch at the top of the arch.

- The bearings at the base are 17 feet square and weigh 248 tons. They exert the thrust of the arch to the abutments.

- The towers measure 103 by 139 feet at ground level and are 220 feet high.

- The dead load of the bridge is 51,000 pounds per foot, and the approximate live load is 24,000 pounds per foot.

- The bridge originally carried four tracks—two for passenger trains and two for freight service. One track was later removed.

- The bridge rivets are some of the largest ever used; the bridge contains approximately 1.2 million rivets.

- The bridge uses “I” beams to support the deck due to the tremendous loads involved.

- The bridge was constructed of approximately 19,400 tons of high-grade carbon steel.

- The bridge was built by the American Bridge Company, renowned for its work on bridges in the United States and around the world.

- In addition to the Hell Gate Bridge, the crossing between Queens and the Bronx includes viaducts and two smaller bridges.

Amtrak Northeast Corridor

- Amtrak’s Northeast Corridor (NEC) is the busiest railroad in North America, with approximately 2,200 Amtrak, commuter and freight trains operating over some portion of the Washington-Boston route each day.

- Amtrak owns and operates 363 miles of the 457-mile NEC spine between Washington, D.C., and Boston. Trains regularly reach speeds of 125-150 mph (201-241 kph).

- New York Penn Station is the busiest in the Amtrak national network, welcoming more than 10.4 million Amtrak customers in Fiscal Year 2016.

- For more information about how Amtrak is investing in the future of the Northeast Corridor, visit nec.amtrak.com.

Thank you to Dave Frieder for his assistance in compiling facts and figures about the Hell Gate Bridge.