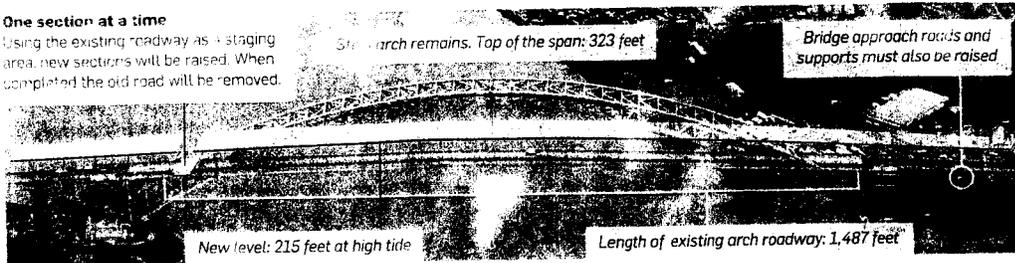


# How a \$1B lift+ will give Bayonne Bridge a boost

ELEVATING THE SPAN WILL CLEAR THE WAY FOR HUGE CONTAINER SHIPS HEADING TO PORTS IN NEWARK AND ELIZABETH. THE NEW DESIGN WILL HELP THE REGION TO COMPETE WITH OTHER PORTS AND RESERVE REVENUE AND JOBS, OFFICIALS SAY.

## One section at a time

Using the existing roadway as a staging area, new sections will be raised. When completed the old road will be removed.

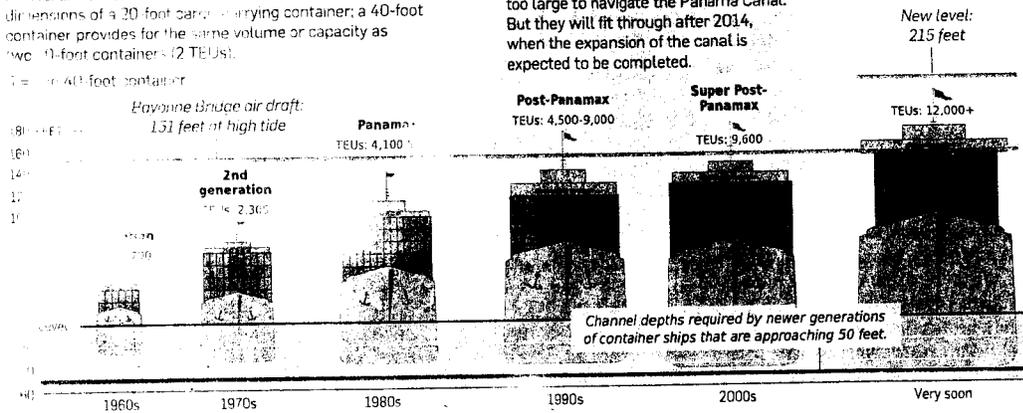


## TEU: Twenty-foot equivalent unit

A measure of volume or capacity based on the standard dimensions of a 20-foot cargo-carrying container; a 40-foot container provides for the same volume or capacity as two 20-foot containers (2 TEUs).

TEU = 40-foot container

"Post-Panamax" refers to ships that are too large to navigate the Panama Canal. But they will fit through after 2014, when the expansion of the canal is expected to be completed.



5. Arvey Corp of Engineers; Mohr+Tamm; The Port Authority of N.Y. and N.J.; Pictometry

FRANK CECALA and ANDRE MALOK/THE STAR-LEDGER

By Steve Strunsky STAR-LEDGER STAFF

Imagine building a stretch of four-lane highway 20 stories in the air, and hanging it by steel cables from a gigantic steel arch. Then, imagine staging the job from an area 60 feet below, on a construction site just 20 feet wide, with cars and trucks rushing by on either side, high above a busy waterway.

If you can imagine that, you have some idea of how workers plan to raise the roadbed of the Bayonne Bridge.

According to the managers and engineers overseeing the project at the Port Authority of New York and New Jersey, raising the road from 151 to 215 feet above the Kill van Kull, while keeping the bridge open to traffic, will be more than a herculean feat of engineering and construction.

The project would also achieve the dual

goals of raising the height clearance of the bridge to accommodate larger container ships, thus assuring the continued viability of the region's port industry, while keeping open a vital commuter link between the two states.

"It's truly an exciting engineering

project, by all means," said Peter Zipf, the Port Authority's chief engineer. "It's a completely challenging project, and that's an engineer's delight. It's coming up with a regional solution to a regional need."

Zipf said the job is also a source of pride for the agency, which has not attempted a comparable bridge project since 1962, when a second, lower deck was added to the George Washington Bridge, a structure always intended to include a second roadway. As an engineering precedent, Zipf said the Bayonne project will be the first time a replacement roadbed is constructed above the old one, with traffic

Continued

## ROOM FOR BIGGER SHIPS

remaining open, before the original structure is removed.

In recent interviews, Port Authority officials cautioned that the roadbed plan is in the concept stage, with up to two years of additional engineering and environmental studies remaining before construction can begin. Even then, they said, it still isn't known just how long the project will take to complete.

But officials did provide some additional details of the project after they announced last month that raising the roadbed had been chosen as the quickest and most cost-efficient solution to the clearance problem.

For example, Port Authority Deputy Executive Director Bill Baroni revealed the project would cost just over \$1 billion, the amount authorized by the agency's board of commissioners in September to address the clearance issue. Zipf said specific changes to the roadway will include a widening of the four traffic lanes from 10 to 12 feet each, along with the addition of shoulders, and a center divider that will replace what is now just a double-yellow line.

During construction, Zipf said, the two inner lanes will be closed to traffic and used as a staging area where a crane will likely be used to hoist a series of 84-foot-wide girders into place, forming the steel structure underpinning the new roadway.

Like the original, the new roadbed will be suspended by steel cables from the bridge's original 79-year-old arch.

The two existing outer lanes will remain open, shielded from the work overhead, providing one traffic lane in each direction. To rise to the level of the higher roadbed, Zipf said the bridge approaches will be made slightly steeper and longer, constructed in a similar method from staging areas on the original approaches.

Norbert Delatte, a professor of civil engineering at Cleveland State University, praised the ingenuity of the plan, and said the higher location of the new roadbed on the arch should not affect its load-bearing capacity. "Structurally, the arch doesn't care," Delatte said.

The Port Authority has been under pressure to raise the bridge's height clearance to accommodate the larger, post-Panamax vessels expected to begin coming into East Coast ports directly from Asia following completion of a Panama Canal widening in 2014.

Officials fear the region could lose shipping business to competing ports like Norfolk, Va., or Halifax, Nova Scotia, threatening the \$36 billion in annual economic activity, \$6 billion in tax revenues, and 269,000 jobs that depend directly or indirectly on the local shipping trade.

Joseph Curto, president of the New York Shipping Association, said some vessels are already forced to wait for low tide or bend their antennae to pass under the bridge en route to container ports on Newark Bay.

"The Bayonne Bridge is not a problem in 2015 or 2016," Curto said. "It is a problem today."

So it was welcome news when the Port Authority announced the roadbed plan on Dec. 29, narrowly meeting a self-imposed deadline to choose a clearance solution by year's end. "That's how you get things done," Baroni said. "You set deadlines and then you meet them."

The Bayonne Bridge was the longest steel arch bridge in the world when it opened on Nov. 15, 1931, designed by engineer Othmar Ammann and architect Cass Gilbert, and built at a cost of \$13 million. The American Institute of Steel Construction named it "the most beautiful bridge of steel," erected that year among structures costing \$1 million or more — ahead of the George Washington, also an Amman-Gilbert design, which opened on Oct. 25, 1931.

The arch has become a symbol of home for Bayonne residents, and word of its preservation was hailed by engineers and local leaders alike.

"I thought they were going to end up with some sort of drawbridge that they would open up," said Gerry Nowicki, a Bayonne Historical Society trustee. "It just so happens that the least expensive way is to preserve something, which is good."

*Steve Strunsky: (973) 392-1544 or  
sstrunsky@starledger.com*