The New NY Bridge Project Quarterly Magazine

NewNYBridge.com

THE NEW NY BRIDGE

WINTER / SPRING 2015

IN THIS ISSUE

THE NEW NY BRIDGE

Andrew M. Cuomo
Governor of New York State

MESSAGE FROM THE GOVERNOR

The end of 2014 marked another year of remarkable progress on the New NY Bridge project. Thousands of workers, both on site and around the region, are teaming up to help replace the aging and outdated Tappan Zee Bridge with a state-of-the-art transit-ready span that will last more than a century.

While the icy winter weather can at times cause safety concerns and slow construction, the project remains on schedule and on budget – a testament to all of the dedicated men and women involved in this monumental infrastructure project. We applaud their hard work and thank them for helping to transform this project from an unfortunate example of government dysfunction under previous administrations to an iconic new bridge now rising from the Hudson River and a model for other states to emulate.

For too long the United States has ignored its aging infrastructure, and more bridges across the country are in need of replacement. But I believe that our bridge is special. It is special because it links Westchester and Rockland counties at one of the most beautiful spots on the Hudson. It is special because of its long history as a vital link for transportation, commerce, fishing and recreation. It is special because, like New York State itself, the bridge is making a comeback.

In the 2015-16 Executive Budget, I have proposed investing $1.285 billion in a new Thruway Stabilization program that will help pay for the New NY Bridge project and also help meet capital investment needs on the rest of the Thruway's system across the state, all while minimizing impacts on toll payers. This level of investment will eliminate the need for any toll increases on the New York State Thruway this year and go a long way toward keeping Tappan Zee tolls as low as possible.

At the same time, we also continue to work on finding even more innovative and alternative financing options like the record $1.6 billion Transportation Infrastructure Financing and Innovation Act loan my administration secured with the help of our partners at the U.S. Department of Transportation.

Our team also has selected new leadership for the New York State Thruway Authority, which is undertaking the bridge construction project. With the guidance of Acting Executive Director Bob Megna and Onondaga County Executive Joanie Mahoney, who is my choice to chair the Thruway board of directors, I am confident that 2015 will be another year of extraordinary progress on this historic project. ■

FEEDBACK

We want to hear from you. Share your thoughts on the project and more by emailing us at *Info@NewNYBridge.com*

ON THE COVER

A craftsman climbs the outer form of one of the new bridge's pier columns.

Andrew M. Cuomo
Governor of New York State

Andrew M. Cuomo Governor | New York State Thruway Authority | New York State Department of Transportation | Federal Highway Administration

Quarterly Magazine
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The New NY Bridge Quarterly Magazine is produced by the New NY Bridge team of the New York State Thruway Authority. The publication is created in collaboration with Tappan Zee Constructors, LLC, the design-build contractor for the project.

Andrew M. Cuomo, Governor of New York State
Robert Megna, Acting Executive Director, New York State Thruway Authority

2015: BRIDGE ON THE RISE

After a busy 2014, construction will further intensify and the New NY Bridge will rise more prominently above water this year.

Following the first year-plus of construction, when the majority of work was below the waterline, New Yorkers will begin seeing the new river crossing taking its iconic shape in 2015. With a growing number of workers and an armada of approximately 130 floating cranes, barges, tugboats and other vessels on site, the coming months will see the completion of bridge foundations and an increasing procession of bridge piers across the Hudson River.

While frigid winter weather conditions have temporarily limited activity on the river, numerous off-site facilities have been extremely busy as they fabricate elements of the new twin-span crossing. Precast concrete segments being formed in Schuylerville, N.Y., as well as at locations in Pennsylvania and Virginia, will soon be shipped to the project site. Steel reinforcement cages are being wired together in Rockland County and production of the new bridge's massive steel girders has shifted into high gear. Measuring 12 feet tall and 350 feet long—longer than most barges on the project—these members will serve as the bridge's connective tissue by joining the piers and supporting the bridge's roadway. The girders are being manufactured in Pennsylvania and are being assembled at the project's Port of Coeymans facility south of Albany.

With the largest girders weighing in at a stout 1,100 tons, lifting them into place is a job tailor-made for the *I Lift NY* super crane, which arrived at the project site last fall. However, the giant crane's inaugural duty will be installing a 600-ton approach span pile cap, the first of hundreds of heavy loads the massive lifter will raise this year.

The largest foundation elements—the main span pile caps—also will be completed shortly, after the football-field-long pieces were painstakingly lowered late last year (see profile on *page 8*). When completed, the main span bases will look like small islands in the river, providing solid footings for the new bridge's towers. Thereafter, residents will be able to watch as the towers ascend to their ultimate height of 419 feet. By late fall, the first sections of road deck will extend above the river from both Rockland and Westchester counties.

To keep up to date on the rapidly advancing bridge project, we encourage you to bookmark **NewNYBridge.com** and check back frequently. Individuals keen on observing the progress firsthand are invited to the recently-opened Westchester viewing platform in Tarrytown's Scenic Hudson RiverWalk Park. Those in Rockland soon will be able to watch the action from an observation pier in Memorial Park that will be completed late this spring. Both vantage points will be equipped with telescopes and viewing guides to describe the construction equipment and vessels on the water. ■

Building a Landmark

Watch as members of the project team share their insights and experiences in constructing the new twin-span crossing in this video.

NewNYBridgeGallery.com

Q&A Thruway Expert Outlines **Future Bridge Enhancements**

WAI CHEUNG, P.E.

Security and Operations Manager
New York State Thruway Authority
New NY Bridge Project

When crossing the existing Tappan Zee Bridge, the traveling public has a bona fide traffic advocate in Wai Cheung, the security and operations manager for the New NY Bridge project. Cheung coordinates all operations that affect traffic between the Thruway Authority; Tappan Zee Constructors, LLC; and the project's many subcontractors. With nearly three decades of transportation and traffic engineering experience, Cheung's expertise ensures that all work is conducted with the least possible impact on motorists.

We sat down with Cheung to learn more about how the new bridge will enable travelers to get from Point A to Point B more efficiently.

Q How will the design of the new bridge benefit travelers?

The traffic lanes of the new bridge are based on the latest design standards, which include a lane width of at least 12 feet and full shoulders in both directions. By contrast, the existing bridge's lanes are narrower and there are no shoulders across its 3.1-mile length. Additionally, the new bridge will feature enhanced intelligent transportation systems, or ITS, which are technologies that help keep traffic moving as efficiently and safely as possible.

Q How will ITS improve future travel?

ITS will improve traffic safety and mobility by monitoring conditions and automatically informing operators of any traffic disruptions. This will allow for quick dissemination of traffic information to the public via electronic signs, email and text alerts and other channels. It also will allow prompt communication with law enforcement, first responders and towing operators so they can reopen blocked lanes as quickly as possible. The ITS elements on the new bridge will include traffic cameras, variable lane use and electronic message signs, incident detection systems and roadway weather systems.

Q What other safety measures will the new bridge include?

As always, safety is the top priority for the Thruway Authority. The new variable lane use signs will provide information to motorists about lane closures and incidents to minimize backups and the potential for secondary incidents. The new bridge will include an extensive video system to monitor incidents and emergency phones will be placed along the shoulders of the two bridges and the bicycle/pedestrian shared-use path for customers who need assistance. There also will be emergency turnaround lanes between the two bridge spans to facilitate first responder access and, if necessary, the rerouting of vehicles if major incidents or closures occur.

Q How will the new bridge help keep traffic flowing efficiently in the future?

Travelers can look forward to a total of eight full-time traffic lanes, which will significantly improve traffic flow all year round and especially during busy weekends and holidays. The wide shoulders will ensure that disabled vehicles do not block the travel lanes, and they will enable emergency responders to quickly arrive at the scene of incidents. In addition, many of the systems and elements on the new bridge are being designed to facilitate easy long-term maintenance, without traffic interruptions. Elements such as ladders are being built into the new bridge and specially-designed gantries will enable workers to perform routine maintenance without closing travel lanes and impacting traffic.

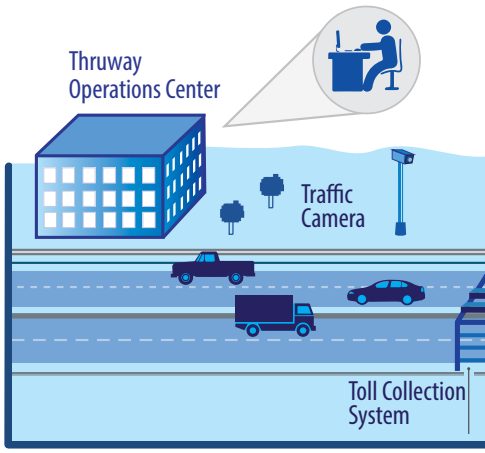
CHANGING LANES

THE NE STANDA

With the existing Tappan Zee Bridge carrying nearly 40 percent more traffic than its original design capacity and population continuing to grow, the New NY Bridge was designed to deliver maximum benefit to future travelers.

Reflecting current Federal Highway Administration (FHWA) standards, the new bridge will feature eight 12-foot wide general traffic lanes, four in each direction, along with emergency shoulder lanes. The additional travel lane on the new bridge (the existing bridge has only seven) and the provision of full shoulders are significant improvements. The shoulders will allow stranded motorists to get out of traffic lanes and will enable the rapid removal of disabled vehicles, both of which are essential to keeping traffic moving. The FHWA estimates that approximately half of traffic congestion delays are caused by nonrecurring events such as stalled vehicles, accidents and debris on the road.

When lane closures are unavoidable, the new bridge will use a series of electronic signs posted every half mile above each traffic lane to inform drivers about that lane's status. These signs will help motorists avoid last-second lane shifts, which can disrupt traffic flow



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and cause congestion.

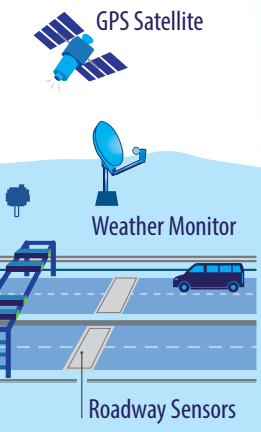
Conditions on the new bridge will be analyzed by a sophisticated monitoring system that will detect everything from weather (including wind and precipitation) to the average speed of traffic. When potential problems are detected, the system will automatically alert Thruway officials, enabling them to respond with greater speed and accuracy.

Beyond technology, the new crossing will include a 12-foot wide bike/pedestrian path. To allow for future needs, the new crossing is also being built to accommodate bus rapid transit service and is designed to handle the additional weight of a commuter rail line.

These features will combine to form a robust transportation network that will get travelers to their destinations with greater ease and improved safety. The twin-span crossing will be completed in 2018. ■

» With wider lanes, traffic management systems, a shared bicycle/pedestrian path, dedicated space for bus rapid transit and the ability to add commuter rail, New York's new bridge will be a model for future transportation facilities.

Inside Intelligent Transportation Systems



Intelligent transportation systems (ITS) combine modern computers and high-speed data communications to help make travel more reliable and efficient for motorists. The new bridge's ITS will connect to the Thruway's larger traffic management network, combining information from numerous sensors in the field. Pavement conditions will be monitored in real-time to improve the efficiency of roadway treatment and snow removal operations during the winter months. These enhancements have been shown to minimize delays to motorists, allowing the public to get the most out of its investment in roads and bridges.

ENHANCEMENTS

The New NY Bridge will feature eight general traffic lanes, two large shoulders and two express/emergency lanes.

TWIN SPANS

The side-by-side spans will more than double the overall width of the existing bridge, separating travel in each direction.

MASS TRANSIT READY

The new bridge's foundations are designed to support potential mass transit options including commuter rail and the bridge has space for dedicated bus rapid transit lanes.

BEHEMOTH BASES

A pair of gigantic concrete elements called main span pile caps will serve as the largest vertebrae in the structural backbone of the New NY Bridge, the largest bridge project in the United States.

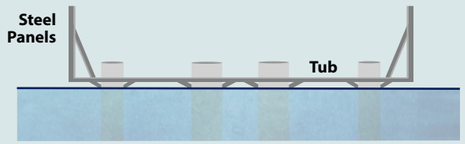
The weight of the new bridge's 1,200-foot main span will be transferred from the bridge's cables up to the 419-foot towers and down to the main span pile caps. These essential structures rest upon dozens of steel foundation piles, consolidating their strength and distributing the weight of the main span.

The main span pile caps required months to complete, as Tappan Zee Constructors, LLC crew members worked inside the hollow, 14-foot-deep caps, filling them with approximately 12,000 cubic yards of steel-reinforced concrete.

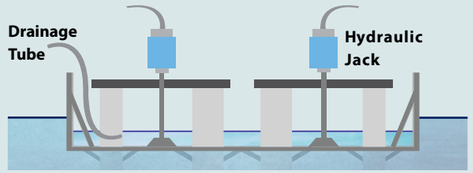
HOW DO THEY DO IT?

STEP 1 Steel piles are driven deep into the riverbed, many reaching bedrock hundreds of feet below the surface. They are arranged in groups of 60 or more.

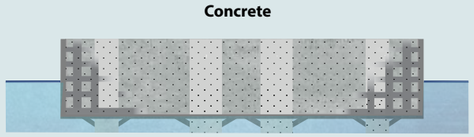
STEP 2 Workers arrange precast concrete floor panels around the piles and then position heavy steel panels around the edges to form a massive "tub" above the river.



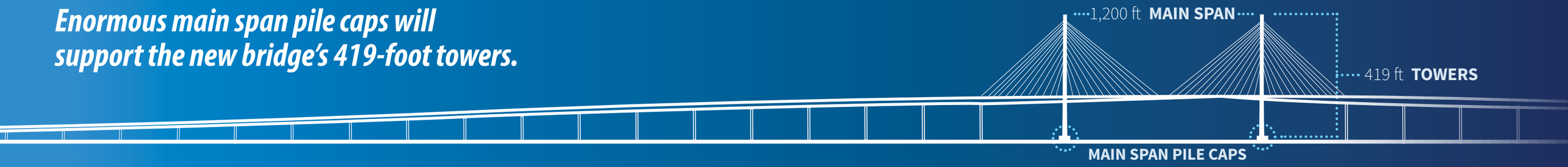
STEP 3 Synchronized hydraulic jacks slowly lower the tub into the river. Learn more about the enormous yet incredibly precise lowering operation on *page 8*.



STEP 4 Workers build the pile cap's reinforcement system inside the lowered tub to form the footing of the future towers, using miles of galvanized steel bars and tons of concrete.



Enormous main span pile caps will support the new bridge's 419-foot towers.



Lowering the Main Span Pile Caps

One of the largest challenges for New NY Bridge project engineers was the construction of the massive main span pile caps, the bases for the 419-foot towers of the twin-span crossing. Normally, constructors would utilize a coffer dam system, with workers sealing off an entire area of the river to create a dry work space. However, Tappan Zee Constructors, LLC (TZC) had to deal with the Hudson River, which is more than 40 feet deep, subject to 6-foot tides and has powerful currents running through its navigational channel. These conditions, combined with the size of the pile caps, led TZC to employ an alternative approach.

TZC turned to VSL, a company known for creative solutions to unique construction challenges. VSL engineers devised a system of 34 synchronized hydraulic jacks that could safely lower the tubs into the river with amazing precision.

In late 2014, the operation lowered the empty "tubs" that surround pile caps, the shell from which the full structure is composed. Each tub, constructed of slabs of concrete and sheets of steel, weighed hundreds of tons and measured more than 360 feet long.

Acknowledging the enormity of the job, a VSL engineer observed, "We've done this hundreds of times around the world, but never with something the size of a football field."

Engineers spent months planning every detail and designing specialized support systems that would hold each section of the tubs evenly. The 34 hydraulic jacks were attached to the structures, each connected to more than a dozen strands of steel cable. The cables were woven throughout the tubs and fed through the jacks. Like a caterpillar moving up a branch, the jacks pulled on the cables, gripping and stretching them to painstakingly lower the pile caps into the river a few inches at a time.

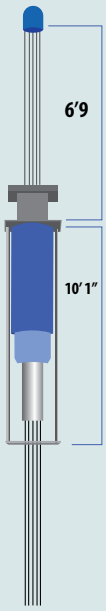
Controlled by a central computer, the jacks moved in perfect unison. A series of sensors precisely indicated the position of each jack to within a fraction of an inch. While the operation proceeded without incident, the system would have instantly stopped the process had any of the jacks gotten out of sync with the others.

The movement of the tubs was barely visible to the naked eye, and it took nearly eight hours for each 14-foot tall tub to be lowered 9 feet. (A video about the first year of construction entitled "Year in Two Minutes" features the lowering operation and is available on **NewNYBridge.com**.) Once anchored in place in the river, the tubs' 360-by-60-foot areas were drained of residual water.

Work will continue through spring of 2015, as the caps are interwoven with cages of galvanized steel and filled with concrete. ■

LOWERING JACKS: A CLOSER LOOK

The hydraulic jacks are threaded with over a dozen strands of steel cable, each connected to the main span pile cap. The jacks slowly pull the cables inches at a time in unison with the other jacks.



Learn more about the main span pile cap construction process on *pages 6-7*.

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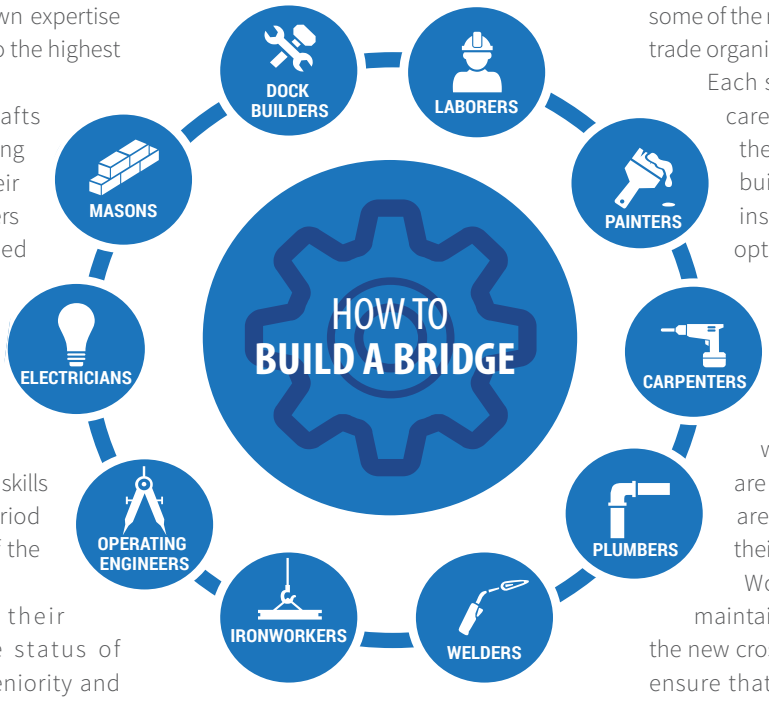
OUT OF MANY PROFESSIONS, A NEW CROSSING IS BUILT

The talented men and women working on the New NY Bridge project hail from a diverse spectrum of trades and skills. With years of training under their belts, each specialist adds his or her own expertise to ensure the new bridge is built to the highest standards of quality.

Trade workers learn their crafts through apprenticeship and licensing programs that are tailored to their particular professions. From welders to dock builders, each specialized worker begins as an apprentice, studying under experienced professionals working in the field. Apprenticeship typically lasts four years before candidates are rigorously tested to verify they can perform on par with their peers. The skills they are gathering during this period are crucial to the construction of the new crossing.

Workers who succeed in their apprenticeship move to the status of journeyperson. However, the seniority and experience of a journeyperson determines the scale and intensity of their assigned projects. Many of the men and women working on the New NY Bridge project have decades of skilled experience.

But even experienced journeypersons are constantly being tested and challenged.



A small sample of the many professions working on the New NY Bridge project.

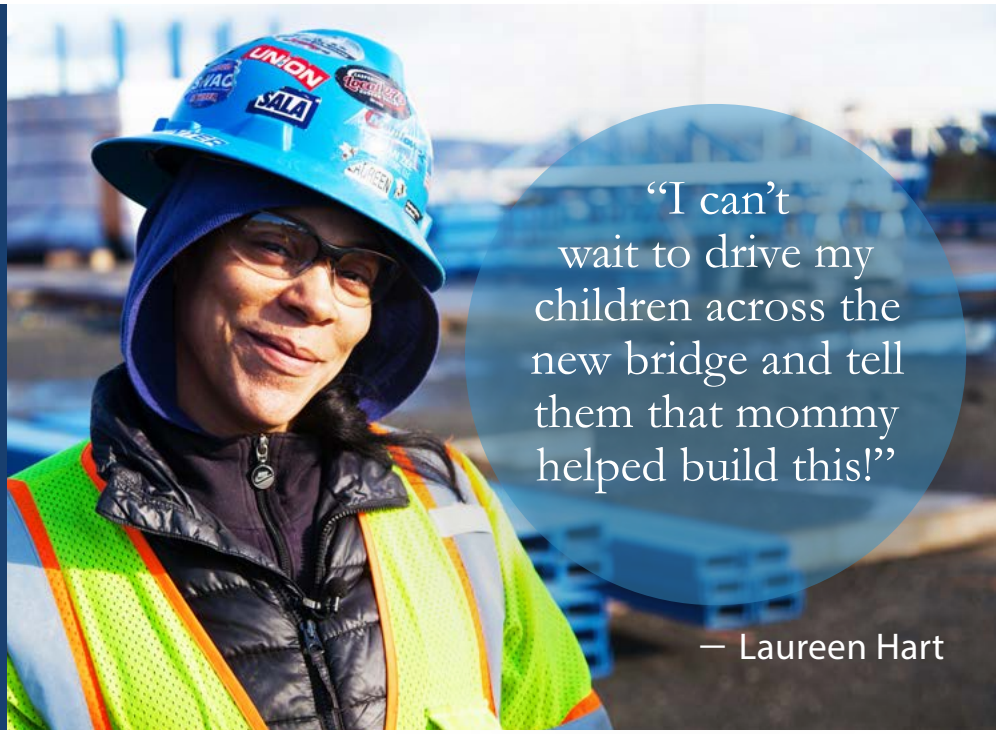
Operating engineers continually acquire new skills and the appropriate licenses to handle bigger and more intricate machines. The operators of the *I Lift NY* super crane, for example, are some of the most accredited individuals in their trade organizations.

Each skilled worker operates in small, carefully coordinated teams to build the new bridge. As ironworkers help build steel foundations, electricians install the power, lighting and fiber optic communication network. Dock builders create work platforms and foundations, while welders turn steel segments into structural elements and masons fill enormous foundation elements with concrete. The tradespeople are supported by laborers, who also are contributing to the project with their efforts.

Working in coordination is key to maintaining the schedule and quality of the new crossing. Leaders and administrators ensure that every team on the project site knows its expected role each and every day. The demands are high, but the result will be a landmark structure each of the workers will be proud to turn over to the public's use and benefit. ■

TZC TEAM MEMBER

LAUREEN HART, a carpenter on the New NY Bridge project, is helping assemble the twin spans' massive piers. After studying under the supervision of experienced professionals during her four-year apprenticeship, Hart became a full-time journeyperson. With years of experience and a repertoire of skills that includes lift operating, crane signaling and scaffold building, she now finds herself in the role of mentor for new apprentices. Hart loves her job on the project and can't wait to show her children the end result of her efforts. ■



REFLECTING
THE HUDSON RIVER
THE TAPPAN ZEE CONTINUES TO INSPIRE

The Tappan Zee is a natural widening of the Hudson River, stretching slightly more than 3 miles across and thus forming something of a natural lake in the river. Wealthy industrialists built estates on its surrounding hills and its shores have attracted a variety of industries that over the years have employed thousands of residents, many of them immigrants.

While the river itself is named after Henry Hudson, an Englishman sailing for the Dutch East India Company who explored it in 1609, this particular area of the waterway between Tarrytown and Nyack derives its name from the local Tappan Native Americans and the Dutch word for sea: zee.

The Tappan Zee is bordered by Rockland and Westchester counties and serves as the namesake for the existing bridge that crosses it. Flanked by the steep, rocky bluffs of the Palisades, the natural beauty of the area has captivated the imaginations of artists and writers for hundreds of years.

America's first internationally best-selling author, Washington Irving, was particularly inspired by the Tappan Zee. His most famous story, The Legend of Sleepy Hollow, refers to the body of water numerous times, describing it in tones of eerie majesty and serene beauty. Irving took up residence in Tarrytown where his estate, Sunnyside, still stands as a national historic landmark.

Now, the Tappan Zee is hosting hundreds of men and women who are building the New NY Bridge project. Among them are designers working with local historians and artists to reflect the rich history of the Tappan Zee area in the new crossing.

The bridge's shared-use path will include six overlooks, or belvederes, each featuring a design that mirrors a particular element of the Hudson Valley's character. These will include the Palisades, the Tappan Native Americans and the Dutch explorers. The "Fish and Ships" belvedere will celebrate the fishing and boat-building history of the Nyacks while "Tides of Tarrytown" will reflect the history of Tarrytown, including the writings of Irving.

You can learn more about the shared-use path and view concept designs of the belvederes at **NewNYBridge.com**. ■

The Tides of Tarrytown Belvedere

The Fish & Ships Belvedere

OUR COMMUNITY TIMELINE

The New NY Bridge project team is actively involved in the community, partnering with local stakeholders and groups, leading educational outreach efforts and sharing project updates.

New York State Business Council Construction/Transportation Committee

Special Advisor to the Governor Brian Conybeare presented a project update to dozens of members of the Business Council of New York State, an organization connecting thousands of companies, local chambers of commerce and professional and trade associations.

Thailand Department of Highways Technical Exchange Forum

The New NY Bridge project was pleased to host a delegation from the Thailand Department of Highways that is planning to design and construct a new roadway system in their country. The delegation studied the design, construction and maintenance of past and present Tappan Zee projects, particularly focusing on the precast roadway segments of the new bridge.

Westchester-Putnam Boy Scouts Award Ceremony

Darrell Waters, president and project executive of Tappan Zee Constructors, LLC and a former Boy Scout himself, was presented with the "Good Scout" award by the Westchester-Putnam Council of the Boy Scouts of America. The event raised $200,000 for the youth organization.

Farley Elementary School Educational Outreach Event

Outreach team members met with special education students at Farley Elementary, sharing information about the construction process on the new crossing and the history behind the existing Tappan Zee Bridge.

@NewNYBridge
The New NY Bridge Twitter

Tuckahoe's Cottle Elementary School teachers get a look at our new project poster.

Cub Scouts Second Annual "Building Bridges to the Future" Event

The outreach team was proud to take part in the second annual "Building Bridges to the Future" Cub Scout event, where young scouts were taught about the bridge project before assembling a replica of the new twin-span crossing.

@NewNYBridge
The New NY Bridge Twitter

Special Advisor to the Governor Brian Conybeare explains NNYB project progress to Nyack High School PTA.

New NY Bridge LEGO Interactive Learning Session

Partnering with a local educational organization called Bricks4Kidz, the bridge team prepared LEGO model kits of the New NY Bridge. The kits were used by children to construct scale models of the new structure.

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NEWNYBRIDGE.COM

The project website provides detailed information about the design and construction of the New NY Bridge. Check back often to see the latest project progress.

1-855-TZBRIDGE

Our phone hotline is open 24 hours a day, 7 days a week, ready for your questions and comments. You can reach us at 1-855-TZBridge (1-855-892-7434).