

THE NEW NY BRIDGE

FALL 2014



IN THIS ISSUE

2 **Lift NY Super Crane:**
New York's Monumental
Lifter

6 **Project Update:**
Foundations for the
Future

9 **The New NY Works:**
An Empire State
Economic Engine





Andrew M. Cuomo
Governor of New York State

MESSAGE FROM THE GOVERNOR

Another milestone was reached this fall on the New NY Bridge project when the *I Lift NY* super crane, one of the world's largest floating cranes, completed its 6,000-mile journey to start work on the new bridge to replace the Tappan Zee. This super crane is going to help the state save time and more than \$1 billion on the project. No one thought it could be done – especially after a decade of delay and dysfunction – but with the *I Lift NY* super crane now in place, we are one step closer to replacing the aging and obsolete Tappan Zee Bridge.

Early estimates based on traditional methods put the cost of replacing the bridge between \$5.4 and \$6 billion. But we didn't do it the traditional way. Instead, we put the project out to bid under the new design-build law that designates one firm to do both the design and construction of major infrastructure improvements, helping to keep projects on time and on budget.

Thanks to design-build, Tappan Zee Constructors, LLC (TZC) said they could build the bridge for less than \$4 billion. This was possible in part because TZC owns the *I Lift NY* super crane, which will dramatically reduce the time, cost, and environmental impact of the project. No other infrastructure project of this scale in North America is moving at this pace. And that is the value of design-build. It taps private sector ingenuity to save taxpayers money and deliver better results.

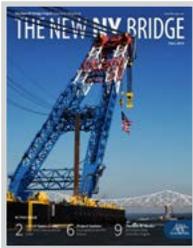
Design-build has been a tremendously successful approach so far, which is why I want to expand this kind of authority to all state agencies. By employing the design-build model, agencies can bring private sector innovation to project delivery, thereby enabling them to propose and pursue new ways of expediting projects at a lower cost to taxpayers. My administration is also proposing an Infrastructure Bank to help fund complex infrastructure projects in serious need of repair or upgrade. Seeded with potential revenue sources such as bank settlements or other one-time cash infusions, the Infrastructure Bank will be a new financing and project management vehicle empowered to deploy alternative project delivery methods and leverage private investment on large-scale, complex, strategic infrastructure projects vital to the state's future success.

There are those who are discouraged by the scale of these projects. They say it can't be done. But that is not the New York way. We are the state that says to all the other states, "yes we can and we will." We are setting an example for the nation: We can build again. We can lead again. We can make government work again. And that is precisely what we are doing with the New NY Bridge project. ■

Andrew M. Cuomo
Governor of New York State

ON THE COVER

I Lift NY arrives on the project site



ON THE WATER

Governor Andrew M. Cuomo is joined by Congresswoman Nita Lowey and Darrell Waters, president and project executive of Tappan Zee Constructors, LLC, in welcoming the *I Lift NY* super crane to the project site.



Quarterly Magazine
THE NEW NY BRIDGE
PUBLICATION ISSUE NO. 4 | FALL 2014

©2014 New York State Thruway Authority

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
Howard P. Milstein, Chairman, New York State Thruway Authority
Thomas J. Madison, Jr., Executive Director, New York State Thruway Authority

NEW YORK'S MONUMENTAL LIFTER



Following months of preparation, the New NY Bridge project's *I Lift NY* super crane arrived in the Lower Hudson Valley in October. Now dominating the area's skyline, the arm of the project's new star player stretches more than 300 feet in length, while a fleet of tugboats maneuver it into place for construction operations. Capable of lifting the weight of 12 Statues of Liberty at once, the colossal crane will reduce construction time by several months and lower project costs by more than \$1 billion.

BUILT FOR THE FUTURE

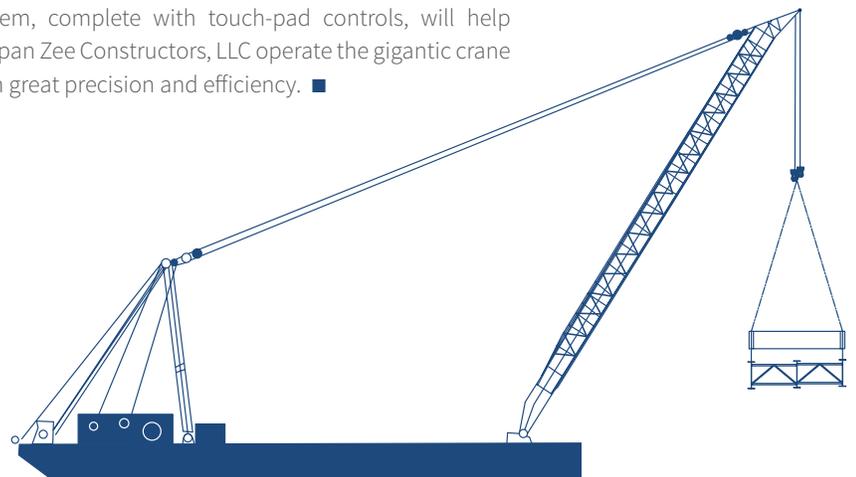
I Lift NY operations will include placing the new bridge's enormous pile caps, girders and deck segments. Later, it will help dismantle the existing Tappan Zee Bridge. At that time, the super crane will remove 1,000-ton pieces of the bridge at once, enabling deconstruction to be completed much more efficiently than if it was carried out by standard-sized cranes. Once the existing bridge is removed, the second span of New NY Bridge will be completed with newly-constructed landings that are in

the same locations as the landings of the existing bridge in Westchester and Rockland counties, thereby reducing the impact on neighboring communities.

PREPARING FOR WORK

I Lift NY spent the past several months moored downriver where it was modified for the specific needs of the project. This work included rigorous lift testing, precise tuning, careful inspections and installation of a state-of-the-art computer operating system. The operating system, complete with touch-pad controls, will help Tappan Zee Constructors, LLC operate the gigantic crane with great precision and efficiency. ■

🌕 *I Lift NY* passed under the existing Tappan Zee Bridge on Oct. 8. The full moon on this date meant much lower tides, which allowed the crane to pass with greater ease.



I Lift NY Super Crane Stats

CRANE
LIFT CAPACITY

1,929
TONS

LIFT CAPACITY IS
EQUIVALENT OF

12 x 
Statues of Liberty

CRANE
BOOM LENGTH

328
Feet 

CRANE
HORSEPOWER

2,540 

Building Bridges to the Next Generation



The New NY Bridge outreach team is helping young New Yorkers understand and appreciate what goes into designing and building modern marvels like the new bridge.

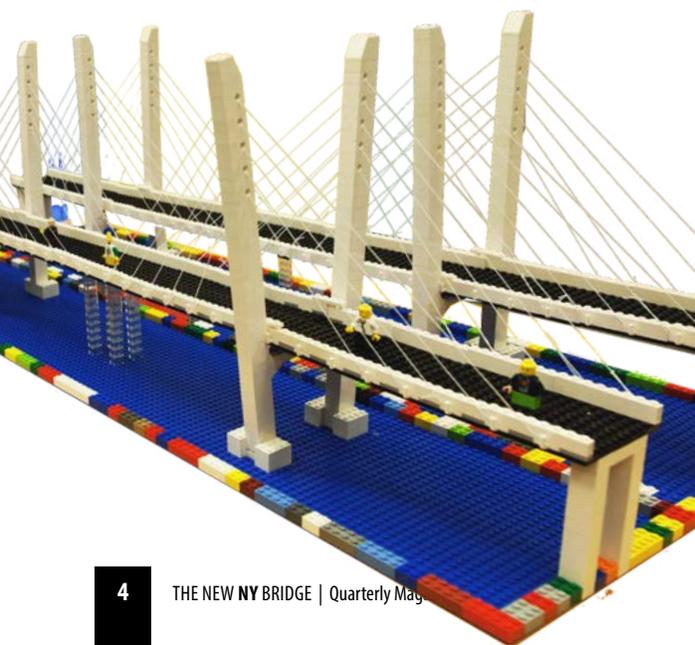
Relecting Governor Andrew Cuomo's goal of using the New NY Bridge to educate tomorrow's architects, designers, planners, engineers and project managers, a major priority of the project outreach team is to engage young people in Westchester, Rockland and beyond. With foundation construction moving into high gear during the current school year, the team is focusing on the how-it-works engineering and the various kinds of materials being used to build the footings of the structure.

Students in lower grades will be introduced to topics such as the fabrication of steel and the mixing and curing of concrete. Middle and high school students will learn about the

bridge's design process and the mechanics behind pile installation.

The educational initiative is intended to inspire the next generation to consider science, technology, engineering and math as educational and career paths. Just as builders of landmark projects such as the Verrazano-Narrows and Robert F. Kennedy (formerly Triborough) bridges helped shape the New York City area during the 20th century, today's New NY Bridge builders are doing much the same with the new river crossing, and tomorrow's engineers will someday help mold the future of New York with their work. ■

⤴ *Through the New NY Bridge educational initiative, elementary and middle school students are learning the basic fundamentals of engineering with hands-on projects. LEGO and K'NEX scale models of the New NY Bridge serve as engaging teaching tools for these younger students.*



HIGHER EDUCATION

Q&A: Real-World Lessons from a New NY Bridge Engineer



TONY CANALE, P.E.
DESIGN & CONSTRUCTION OVERSIGHT
NEW NY BRIDGE PROJECT



multi-media presentations



interactive learning



online resources



TAKE A NEW NY BRIDGE QUIZ!

1. When will the first bridge of the twin-span New NY Bridge project open to traffic?
 - a) Late 2016/early 2017
 - b) Mid-late 2017
 - c) Early-mid 2018
2. How many years is the new bridge designed to last without major repairs?
 - a) 50
 - b) 75
 - c) 100
 - d) 300
3. How many tons of concrete-reinforcing steel bars (rebar) will be used in constructing the project?
 - a) 5 tons
 - b) 180 tons
 - c) 5,000 tons
 - d) 30,000 tons
4. The New NY Bridge will be the longest in New York State. How long will it be?
 - a) 0.5 mile
 - b) 1.6 miles
 - c) 2.4 miles
 - d) 3.7 miles

Answer Key: 1 - A, 2 - C, 3 - D, 4 - D

Tony Canale, a geotechnical engineer at the firm Mueser Rutledge Consulting Engineers, provides design and construction oversight for the foundations of the New NY Bridge. Canale is also an adjunct professor at Manhattan College, where he teaches a graduate course on foundation engineering. He recently sat down with the outreach team to explain how the project is serving as a teaching tool for budding designers and engineers.

Q How does your work experience help you teach the next generation of engineers?

I use examples from my engineering work to help illustrate advanced foundation concepts to my students. While some of the exact data is adjusted for security reasons, the information is proving to be a very useful asset in helping prepare these young engineers for their own careers. As an engineering student, it is important to see how theory is applied in practice.

Q What are the advantages of using real-world examples?

By using actual examples, the students can connect the complex textbook ideas with real projects. This process is an important step in bridging the gap between theory and practice. It also allows the students to see how real-world problems are solved.

Q How do you utilize your work on the New NY Bridge project as a teaching tool?

It's one of the more effective projects that I present to my students. The overall size and scale of the project is unlike anything ever seen in the state. It also contains many different foundation challenges, from working on the water with deep-driven piles to land-based drilled shafts. Utilizing the lessons of the New NY Bridge is proving invaluable in fostering a stimulating learning experience.

FOUNDATIONS FOR THE FUTURE

The New NY Bridge is Rising Out of the Hudson River

New Yorkers gazing across the Hudson River are witnessing engineering history rising from its waters. Progress is being recorded daily as bridge foundations emerge across the three-mile crossing. Check out the day-by-day progress by clicking “construction cams” on NewNYBridge.com, where panoramic and close views are available from different vantage points.

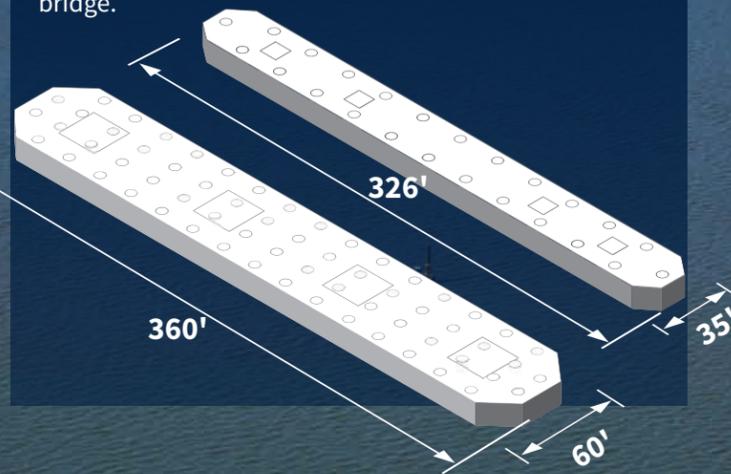
DREDGING



Dredging operations are limited to August 1 through November 1 to avoid the mating and migration seasons of endangered sturgeon.

MAIN SPAN PILE CAPS

As the centerpiece of the new bridge’s foundations, the main span pile caps are longer than a football field and filled with up to 14 feet of steel-reinforced concrete. The pile caps rest atop and unify dozens of piles, providing a strong base that will evenly distribute the weight of the bridge.



I Lift NY SUPER CRANE

The I Lift NY super crane is capable of lifting nearly 2,000 tons at once. Much of the heavy lifting will be associated with placing the project’s steel girders and deck segments.



PILES

As of mid October, more than two-thirds of the foundation piles have been driven into the riverbed. The largest of the piles are six feet in diameter and almost 300 feet in length.



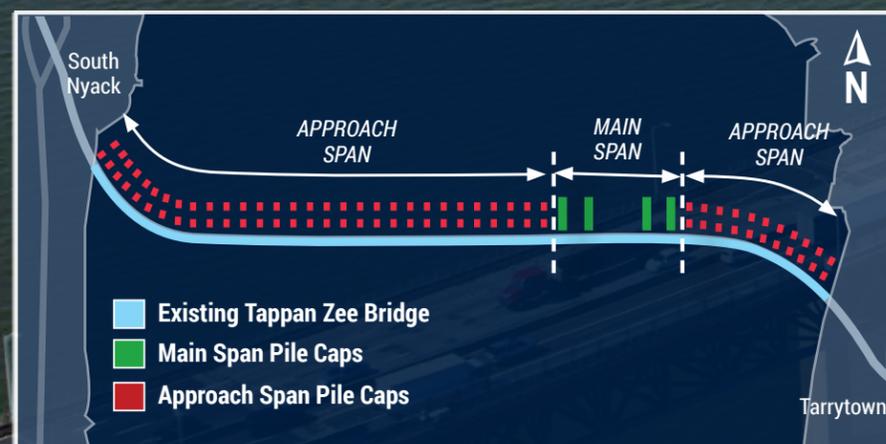
APPROACH SPAN PILE CAPS

Approximately the size of a tennis court, the approach span pile caps are considerably smaller than the main span pile caps, but dwarf them in number: 68 approach span pile caps, which function in the same manner as the two main span pile caps, will support the segments of the bridge east and west of the main span.



CONCRETE BATCH PLANTS

By supplying the large majority of project concrete via two floating concrete batch plants on the Hudson River, Tappan Zee Constructors, LLC will keep tens of thousands of truck trips off local roads. Learn more about the floating batch plants on page 8.



FLOATING CONCRETE BATCH PLANTS

FEWER TRUCK TRIPS ON LOCAL ROADS



Building the new bridge will require the pouring of more than 300,000 cubic yards of concrete. If all of that concrete were supplied by land, it would add tens of thousands of truck trips to the area's already-crowded local roadways over the next four years.

Helping to avoid that traffic scenario, Tappan Zee Constructors, LLC (TZC) is implementing a highly efficient and environmentally conscious system that will supply the large majority of project concrete

without using local roads. By utilizing two floating concrete batch plants on the Hudson River, TZC will be able to produce and deliver concrete as needed directly to the project site.

Each floating batch plant measures about 60 feet wide by 200 feet long. Each plant will produce an average of 125 cubic yards of concrete per hour, rivaling the output of most land-based batch plants.

Another huge advantage of the floating plants is that they will produce concrete exclusively for the New NY Bridge project. Normally, a variety of projects compete for the limited amount of concrete produced at land-based plants, which can lead to shortages and delays during peak construction season. TZC's mobile plants also will enable work crews to move concrete quickly to where it is needed. This is important because concrete begins to set approximately 90 minutes after it is mixed.

The floating batch plants also include several environmentally-conscious features. An advanced air quality system will reduce dust from escaping the plants during production and highly efficient, clean engines will reduce emissions. All systems on the plant and its accompanying support barge will be painstakingly contained to prevent spillage into the river. Additionally, all byproducts from the plant cleaning process will be stored for safe off-site disposal.

With resources deployed with maximum efficiency, reduced environmental impact and less project-related construction traffic on local roads, the state-of-the-art floating batch plants are critical to delivering the New NY Bridge swiftly and safely. ■

WHAT IS CONCRETE?

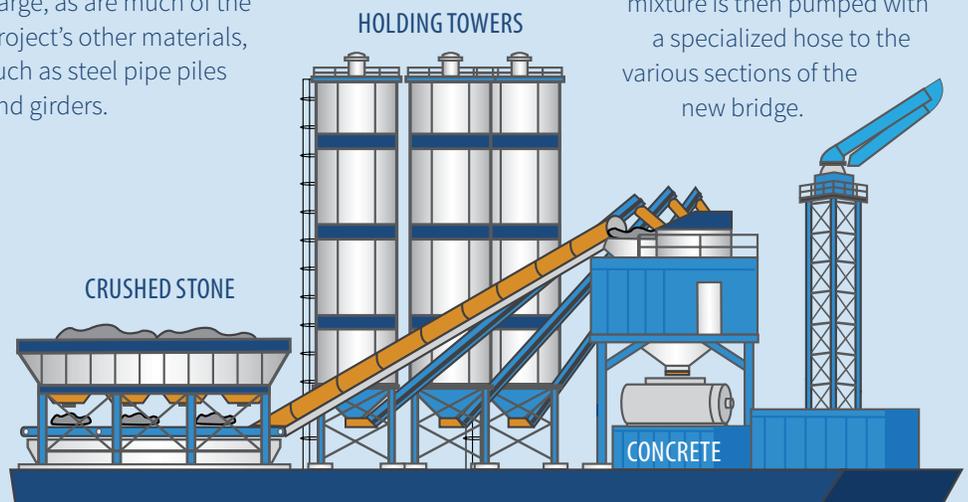
Concrete is a man-made material composed of water, cement, sand and stone. When water and cement are mixed, they react chemically to produce an ultra-strong "glue" that holds the concrete together and allows it to be formed. Heat produced by the chemical reaction must be controlled by water to enable the concrete to cure evenly and reach its full strength. Concrete was first used in large scale by the ancient Romans and today is the most widely used man-made material.

Mixing with Precision

The floating batch plants utilize computer-controlled systems to mix additives with the raw materials to produce concrete that meets stringent specifications. With this system, Tappan Zee Constructors, LLC controls both the quality and quantity of the concrete, enabling construction of a bridge that will last at least a century without major structural repairs.

Crushed stone from a nearby quarry is delivered to the batch plants by barge, as are much of the project's other materials, such as steel pipe piles and girders.

The towers of the batch plants hold raw materials that are mixed in precise proportions by an onboard operator. The final concrete mixture is then pumped with a specialized hose to the various sections of the new bridge.



Quality Control

Testing labs, which are certified by the New York State Department of Transportation, ensure that the concrete cures to its specified strength.



An Empire State Economic Engine

The New NY Bridge project is serving as an economic engine in the Empire State by engaging New York businesses and by hiring locally to the maximum extent possible.

New York-based companies are key suppliers of materials going into the bridge, including more than 300,000 cubic yards of concrete, more than 225,000 tons of steel and 568 miles of electrical wiring and cable.

Thanks to the New NY Bridge project, businesses such as the Fort Miller Company in upstate Schuylerville have substantially expanded their operations. The precast concrete manufacturer recently repurposed its warehouse into a full-fledged work space and hired over a dozen new associates to fulfill its contract requirements. Soon, Fort Miller will produce over 900 precast deck panels for the main span of the new bridge.

Fort Miller relies on fellow upstate manufacturers for materials such as aggregate, steel and rebar. The company also works in partnership with Tappan Zee Constructors, LLC's Port of Coeymans facility, just south of Albany, to float products downriver to the project site.

Welsbach Electric Corporation, based in New York City for over a century, is installing sensitive lighting and communication systems for the new bridge. The

company employs highly qualified journeymen and electricians to ensure the new bridge's lighting and other electrical systems will provide reliable service throughout the next century of operations.

The New NY Bridge project team also regularly reaches out to local disadvantaged business enterprises (DBEs) to aid in construction efforts. DBEs are defined by the U.S. Department of Transportation as small businesses owned and controlled by socially and economically disadvantaged individuals, such as women, minorities, veterans and disabled persons.

Tri-Valley Iron, Inc. in Rockland County is one of the project's DBE firms. Established in 1997, the Palisades-based company has become one of the largest reinforcing iron specialty companies in the Hudson Valley. Tri-Valley fabricates iron for the New NY Bridge project's main span piles and columns, and will produce 2,200 tons of material. ■

⌘ *Subcontractors assemble a rebar cage at an off-site facility. The rebar is forged from galvanized steel and adds stability to the new bridge.*

464
NY businesses
have been awarded contracts to date by TZC

A dark blue silhouette of the state of New York is shown. Overlaid on the map is a white and yellow callout box containing the text '464 NY businesses have been awarded contracts to date by TZC'. The number '464' is in large white font, 'NY businesses' is in yellow, and the rest of the text is in white.

PROACTIVE ENVIRONMENTAL STEWARDSHIP

With rare falcons soaring above and endangered sturgeon swimming below, a core value of the New NY Bridge project is acting as a vigilant steward of the environment. Here are some of the extensive environmental protection efforts that are part of the project:

PROTECTING PEREGRINE FALCONS

that nest in the existing Tappan Zee Bridge is a constant priority. The pair of falcons hatched out three chicks last spring, which have since left the nest. The project team has taken a number of steps to help these birds of prey – the fastest members of the animal kingdom with speeds exceeding 200 miles per hour – avoid being affected by construction operations.

Flags have been placed atop the cranes to deter the birds and their young from perching. In addition, a 100-foot no-construction

zone was established around the perimeter of falcons' nest box during the nesting season. To monitor nesting activities, a live webcam provides images of the falcons on NewNYBridge.com. The falcons' nest box will be moved from the old bridge to the new one after the main span towers are complete.

By tagging and tracking the river's ancient species of **shortnose and Atlantic sturgeon** – whose ancestors date back 200 million years – data is being gathered that will help

researchers and scientists learn more about their behaviors and habitats so they can develop future protection measures on other major construction projects.

Water quality is being ensured by placing gravel on the riverbed in areas that have been dredged. "Armoring" these locations with gravel prevents project vessels from stirring

up silt as they go about their operations. Water samples are taken twice a day during certain operations to further ensure that construction activities are not

having an adverse

effect on water quality. Specialists observe the turbidity, or cloudiness, of the water to assess whether it is clean.

Tappan Zee Constructors, LLC (TZC) relocated **oysters** in the area where dredging occurred and will restore oyster beds when the project is approaching completion.

As piles are driven into the riverbed, they emit sound waves into the surrounding water. To protect marine life, the project uses innovative **bubble curtains** that create

shields of bubbles around piles as they are driven. By dampening and partially disrupting the sound waves, fish are protected from noise that could otherwise disorient and even harm them.

All superintendents, project managers, field engineers and environmental support staff are required to participate in a training program that ensures they are aware of and focused on the extensive measures necessary to fulfill the project's environmental commitments.

As the Thruway Authority and TZC continue to advance construction, these and other stewardship efforts will protect the area's natural environment. When fully completed in 2018, a hallmark of the New NY Bridge project will be the careful stewardship with which it was built. ■



⤴ Three chicks hatched last spring and have left the nest.



⤴ An environmental monitoring boat used by the project team helps track water quality.

OUR COMMUNITY TIMELINE

The New NY Bridge project team is actively involved in the community, partnering with local groups, leading educational outreach efforts and sharing project updates. Our recent work with the community included the following appearances:

YOUNG PROFESSIONALS IN TRANSPORTATION

Project officials are regularly engaging with Young Professionals in Transportation, a network of individuals in the civil engineering field. Through fellowship programs, seminars and technical tours, the team is helping these up-and-comers establish their careers in transportation.



ROCKLAND BUSINESS EXCHANGE

Project team members presented information about the New NY Bridge to members of the Rockland Business Exchange, an independent, volunteer-run organization.



DEEP FOUNDATION INSTITUTE MARINE CONFERENCE

Team members and representatives from Tappan Zee Constructors, LLC (TZC) shared the technical aspects behind the New NY Bridge project during a three-day engineering conference in Tarrytown. From pile driving to environmental compliance, officials explained how the team is building the bridge across the Hudson River.

CRAIN'S NY CONFERENCE

New York State Thruway Authority Chairman Howard Milstein detailed the New NY Bridge project's financial strategies at Crain's NY Conference on the region's largest infrastructure initiatives.

NANUET CIVIC ASSOCIATION

The project outreach team met with the Nanuet Civic Association to inform locals about the New NY Bridge. A Q&A session was held with association members, helping them understand the finer details of the construction process.

HISTORICAL SOCIETY OF ROCKLAND COUNTY BOAT TOURS

Dozens of members of the Historical Society of Rockland County climbed aboard the River Rose, a paddlewheel riverboat, to learn more about the Tappan Zee Bridge and New NY Bridge project. New York State Thruway officials joined the two tours and engaged in a Q&A session with society members.

STUDENT NEWS

WHITE PLAINS HIGH SCHOOL

Students from White Plains High School interviewed Brian Conybears, special advisor to the Governor for the New NY Bridge project, for a student news report.



LEARNING IN RETIREMENT AT IONA COLLEGE

New NY Bridge team members participated in Iona College's Learning in Retirement series, a continuing education program for seniors. Using examples from the New NY Bridge project, they presented a number of engineering ideas and techniques.



LYMPHOMA & LEUKEMIA SOCIETY'S SWIM FOR LIFE

TZC presented a check to the Lymphoma & Leukemia Society's 23rd Annual Hudson River Swim for Life.

WESTCHESTER VIEWING PLATFORM

Visit the Westchester viewing platform, which is now open in Scenic Hudson RiverWalk Park at 157 West Main Street in Tarrytown.





@NEWNYBRIDGE

Stay connected to the project and receive real-time updates by following us on Twitter via your social media accounts and/or mobile devices.



GET UPDATES BY EMAIL

Prefer to receive project information in your email inbox? Visit NewNYBridge.com to subscribe for email updates.



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).