

**New cable racking system with fire-resistant cables:** The rehabilitation plan uses a racking system to suspend fire-resistant cables on the side of the tunnel rather than buried inside a concrete bench wall, making cables easier to maintain and upgrade and decreasing potential for damage from flooding.

**New wall structure with industrial fiber-reinforced polymer (FRP):** This material, used to carry heavy loads of bridges in transit projects worldwide, was used to create a new wall structure along the tunnel, creating structured panels which are installed to wrap around the damaged bench wall.

**New tracks, including new plates and continuous welded rail:** 6,305 track feet have been installed, including new track ties, using continuous welded rail - allows trains to safely operate at faster speeds and reduces wear and tear of car equipment and the associated maintenance costs.

**New discharge lines, pipes and controls:** The pumping system has been upgraded to handle even greater flooding from potential natural disasters - more than doubles the water pumping capacity.

**New fiber optic monitoring system is being calibrated:** 7,000 feet of specialized hydro- and geo-sensing fiber optic cables have been installed in the first tube. The system will automatically process and transmit data and any alerts directly to the NYCT rail control center.



# Fiber Optic Smart Monitoring Sensor

New fiber optic monitoring system is being calibrated: 7,000 feet of specialized hydro- and geo-sensing fiber optic cables have been installed in the first tube. The system will automatically process and transmit data and any alerts directly to the NYCT rail control center.





## Cable Racking

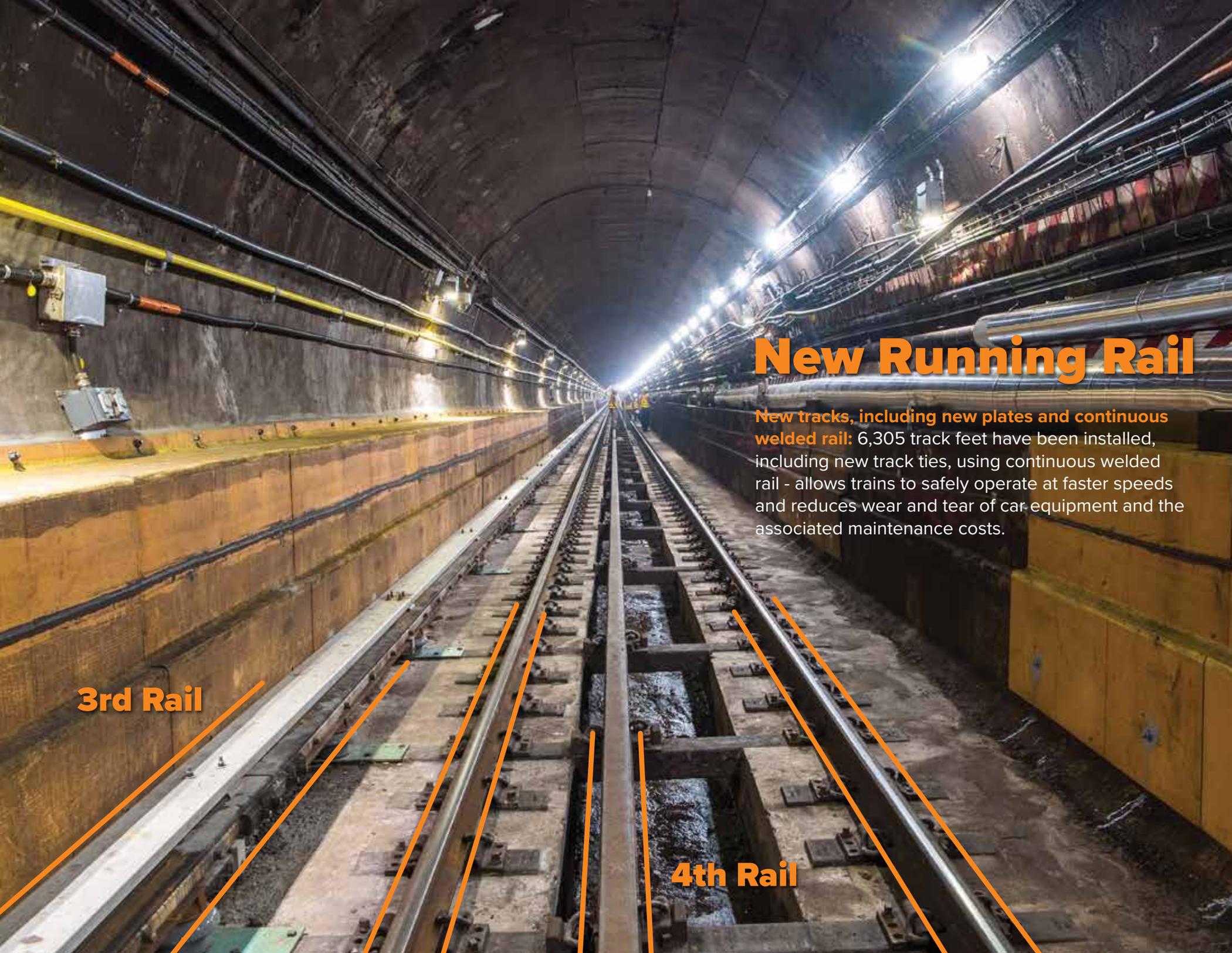
### **New cable racking system with fire-resistant cables:**

The rehabilitation plan uses a racking system to suspend fire-resistant cables on the side of the tunnel rather than buried inside a concrete bench wall, making cables easier to maintain and upgrade and decreasing potential for damage from flooding.



## Pump Discharge Line

**New discharge lines, pipes and controls:** The pumping system has been upgraded to handle even greater flooding from potential natural disasters - more than doubles the water pumping capacity.



## New Running Rail

**New tracks, including new plates and continuous welded rail:** 6,305 track feet have been installed, including new track ties, using continuous welded rail - allows trains to safely operate at faster speeds and reduces wear and tear of car equipment and the associated maintenance costs.

3rd Rail

4th Rail



## Fiber-Reinforced Polymer (FRP)

**New wall structure with industrial fiber-reinforced polymer (FRP):**

This material, used to carry heavy loads of bridges in transit projects worldwide, was used to create a new wall structure along the tunnel, creating structured panels which are installed to wrap around the damaged bench wall.