Groundbreaking Power Distribution Meets Mechanical Mastery at LIRR Jamaica Station

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What happens when groundbreaking power distribution meets mechanical mastery on the job? The newly renovated Long Island Railroad Jamaica Station in Queens, NY provides a perfect example. To improve commuter capacity, the hub of the Long Island Railroad now offers unparalleled wireless connectivity for 4G, 5G, and public Wi-Fi, from anywhere on the six island platforms. The project was led by a large neutral host provider of high-speed Wi-Fi and cellular services in large public venues like airports, stadiums, and train stations. The wireless revamp was led by VoltServer™ with its Digital Electricity™ platform, along with Faber Industrial Technologies, a leading engineering supplier and UL508A panel shop for the Mid-Atlantic.

Public transit terminals have better reputations as wireless dead zones than sanctuaries of internet connectivity. Unlike open outdoor environments that can easily be targeted by a single macrocell without interference, the hallmarks of public transit— congested urban spaces, concrete infrastructure, and often underground platforms— necessitate a different approach. This is the opportunity for small cell densification. By deploying several small cell radios, the coverage area can be kept small while avoiding the need to pass signals through physical barriers.

Accomplishing such a task at Jamaica Station would require high power distribution to numerous remote radios. To meet MTA specifications, the equipment had to be weatherproof, inaccessible to the public, and relatively inconspicuous. This, along with the challenges of installing equipment in a high-traffic area and adapting to scope changes along the way, tested the agility and cross-functional teamwork of everyone involved.

The objective was straightforward: To build a communications infrastructure consisting of a variety of SOLID Multi-Power Remote Optic Units and 5G mmWave radios throughout the station to ensure connectivity from anywhere.

Traditionally, power would need to be branched off from AC mains, distributed, and conditioned according to the load. This is prohibitively expensive and time-consuming when provisioning a large variety of high-powered radios. VoltServer was chosen to deliver the remote power using their Digital Electricity platform. The solution converts analog electricity into Digital Electricity, which can then be distributed using low-voltage wiring practices to receivers that convert the power back to analog AC or DC, at the prescribed load voltage.

The station's six platforms covering thousands of square feet demanded a large network of energized equipment– all of which had to be protected and organized in a safe, consolidated manner. That's where Faber's mechanical expertise became invaluable. The first challenge was to design and fabricate multiple head-end IT racks that could shelve the dozens of VoltServer transmitters required for the project. The custom racks were designed for oversized wire management with room to mount lightning protection circuits. The centralized point of power distribution provided the foundation for a universal battery backup so that devices can stay online in the event of a power outage.

At the load ends of the system, the magnitude and scope of the project presented their own hurdles. More than 60 powered devices required dozens of power drop points. Cabinets were needed to house the receivers and cable connections. The goal was to optimize cabinet space with the strategic

arrangement of interior equipment, thereby enabling easy access to each component during service. Faber initially started the design with one of its off-the-shelf enclosures, but scope changes— including the addition of Wi-Fi access points laid throughout the platforms— led to brand new enclosures being created. They each incorporated a subpanel to secure the Digital Electricity receivers, the lightning protection circuits, terminal blocks, and heat exchanger systems while providing easy termination points for the power connections. The design included a second set of hinges near the back so that the entire cabinet could flip outwards, providing rear access to components and connectors.

The renovation was a masterclass on two teams adjusting on the fly with modifications to keep up with a project having many moving parts. Despite the technical prowess behind the system, perhaps the biggest achievement of the project was overcoming the nature of the working environment. Jamaica Station is the fourth-busiest rail station in North America, with weekday ridership exceeding 200,000 passengers. There are no “off-hours” available for installation crews to work with limited interference from pedestrians. Faber streamlined the process by building and shipping the fully furnished head-end racks and load-end cabinets with VoltServer’s equipment. With all components prewired and secured, all the team had to do was mount the cabinets, pull in the cable, and terminate it.

VoltServer’s equipment powers nearly 60 kW of loads, including PoE switches, 4G, and 5G radios. To get the system up and running, Faber developed testing procedures to verify power going to the PoE switches, AC units, and continuity between the circuit breakers and cable.

The infrastructure at Jamaica Station is a paragon of mobile densification at a place of public transit. The network guarantees connectivity in the station for its hundreds of thousands of daily commuters.