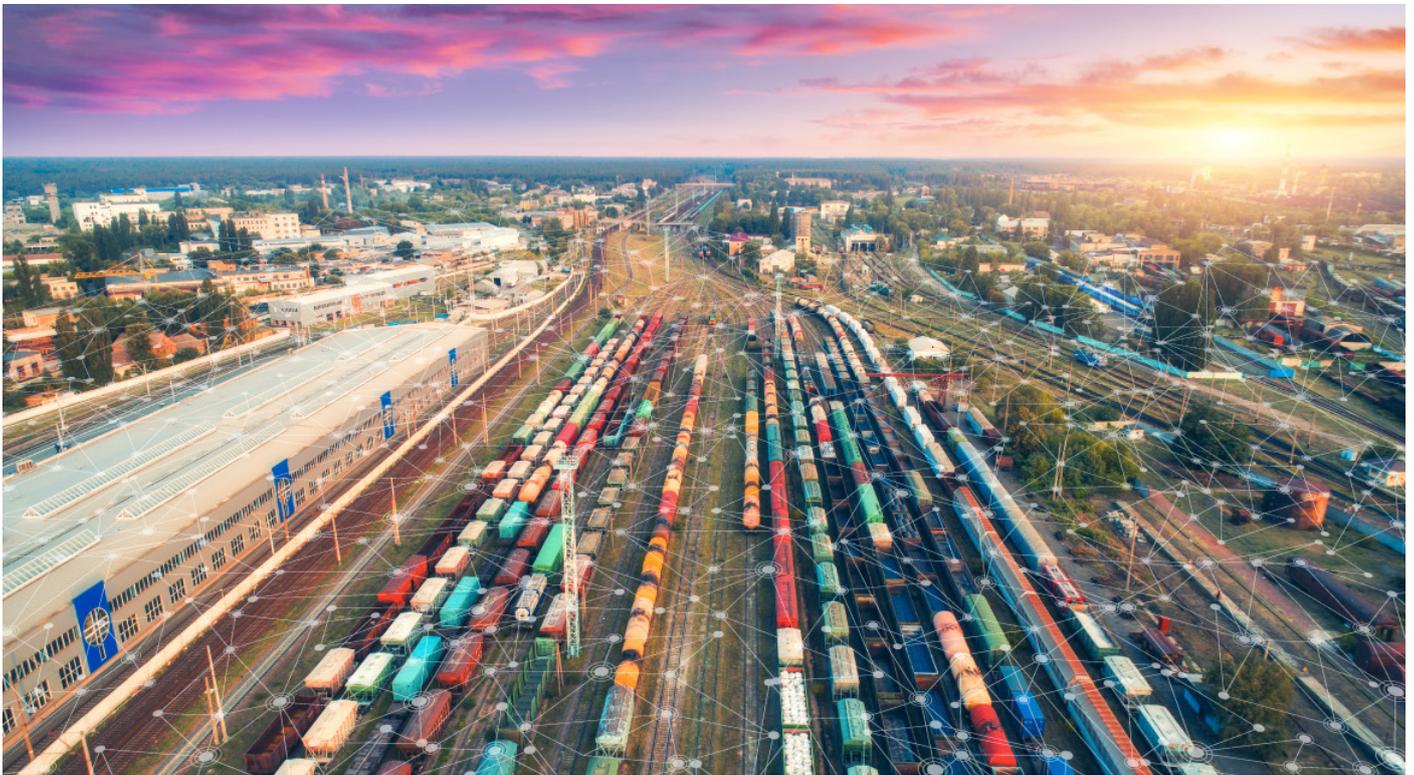


# Rajant

## Maximising the Motion of Rail

By Justin Warren, Sales at Rajant Corporation



America's freight railroads are the most cost-effective in the world. Accounting for more than any other mode of transportation, freight rail transports around 40% of U.S. long-distance ton-miles.

Class I railroads account for about 68% of freight rail mileage. A third of US exports are moved by rail, and intermodal railyards play a pivotal role. An intermodal railyard is a transportation facility for rail operations where cargo is transferred to and from the

train. It is paramount that railyard operators have access to unfailing and robust communications at all times. Operators require a wireless network that seamlessly supports next-generation applications and services while delivering increased safety and productivity.

The railyard plays a considerable part in ensuring essential cargo and goods are delivered on time. Railyard operators are recognising the safety and security gains that real-time vehicle-to-vehicle (V2V) communications can provide. The benefits of integrating innovative

rail applications for automation, real-time tracking, and greater control can be realised by utilising the correct wireless network.

## Robust Environments Require Strong Connections

The complicated operation and dynamic environment of freight railyards require reliable access to real-time data to run smoothly. Intermodal railyards are facilities where the transfer of containers is performed between freight trains, and railcars are stored and maintained. This means that all assets such as cargo, people and vehicles are constantly on the move.

Intermodal yards often introduce heavy equipment among their existing rugged environment to increase speed and efficiency. Vehicle locations, the dynamic nature of stacked containers and trains coming in and out of the

yard all add to the challenge of achieving constant connectivity. Railyard managers are aware that traditional wireless networks, such as Wi-Fi Mesh, Point-to-Multipoint, and LTE, will not offer the robustness, reliability, or high availability needed to run these new applications effectively. These networks operate from fixed infrastructure and must break connectivity for handoffs.

Typically, intermodal yards span a significant distance and involve many of trains, trucks, and other vehicles entering throughout the day. Vehicles, such as hostlers and reach stackers, pick and move the sealed cargo contained stacks between the trains and trucks daily. Suppose railyard operators wish to implement a stack management application to track the contents of the container stack and manage all cranes, vehicles, containers and devices. In that case, a typical wifi solution may not be able to support this. Site constraints mean vertical infrastructure, such as towers, or

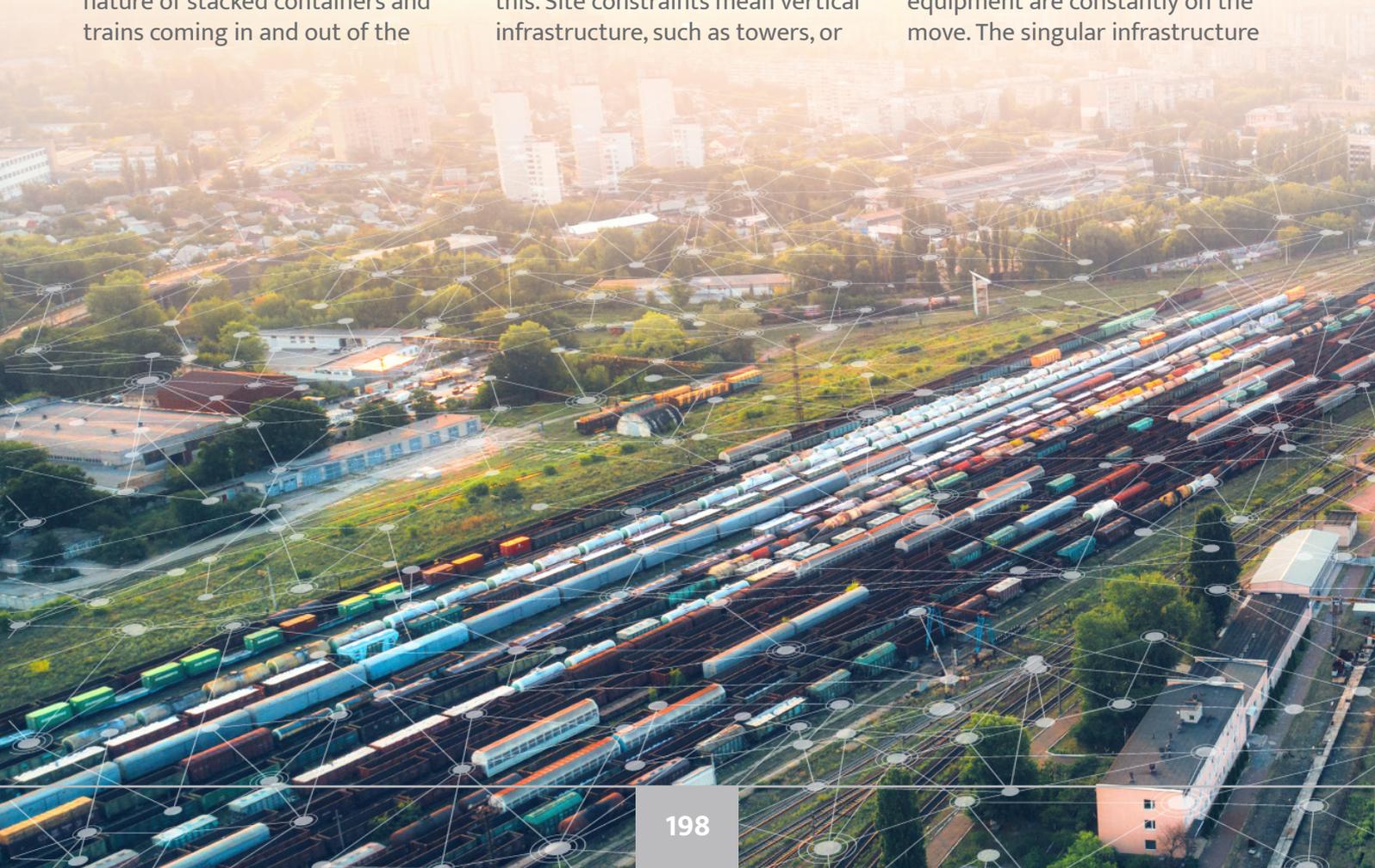
access points cannot be installed easily.

Therefore, railyards need a dynamic network to suit their ever-changing, mobile environment.

## Revolutionising Rail Connectivity

Rajant provides resilient and high-bandwidth connectivity in the intermodal yard to empower intelligent applications to improve container movement efficiency, optimise stack management and increase worker safety. Rajant Kinetic Mesh<sup>®</sup> wireless networks boost speed and efficiency for Class I railroad intermodal railyards, ensuring that operators remain in control, no matter where their assets travel.

Possessing mobility is a critical component for a railyard, where people, devices, vehicles and equipment are constantly on the move. The singular infrastructure



served by each node of the Kinetic Mesh network enables the desired flexibility in the yard and improves container movement efficiency. Even a momentary drop in coverage can compromise railyard operators' ability to run autonomous railyard equipment. The network can hold multiple radio frequencies and any-node-to-any-node capabilities to continuously and instantly transmit data in real-time via the best available traffic path and frequency. As there is no central control node, there is no single point of failure throughout the network.

Vehicles can move out of coverage, and objects can cause obstructions in a railyard, causing certain and sometimes crucial paths in the network to become unavailable. BreadCrumb® nodes can hold multiple connections simultaneously over multiple frequencies and offer an alternative route to delivering data. The BreadCrumbs can be mounted and deployed on moving railyard

equipment and vehicles to overcome signal blockage caused by metal container stacks and cranes. This allows the network to dynamically adapt to local interference and congestion, eliminating downtime even in the most rugged conditions while maintaining high availability.

Updates on rail equipment can also be sent and received in real-time, with an accurate end-to-end view of intermodal operations. This allows for prompt analysis and decision-making.

## High-Bandwidth Mobile Connectivity

Rajant's unfailing connectivity allows railyard operators to take advantage of the opportunities that robust mobility can bring to their networks. Every transportation asset that traverses or resides in the network has access to essential, high-bandwidth mobile

connectivity.

Supporting a host of real-time applications – such as smart container management – these containers within the stack can be auto-scanned, identified and easily located for a swift dispatch. Drivers are also kept out of hazardous areas as they do not need to track down containers manually. Cranes can further be equipped with position detection systems running on the network to track the position of equipment in real-time to streamline tracking processes and decrease truck dwell time.

Rajant's Kinetic Mesh network can support future applications, increase reliability and streamline processes. For railyard operators, Rajant can keep your mission-critical operations moving.

