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# Rajant

## Keeping Railway Technology on the Move with Kinetic Mesh

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With freight transport and everyday passenger travel dependent on rail, unfaltering and continuous operation of the railways is essential globally. In fact, in the United States it is estimated that Class I railroads' operations supported a staggering 1.1 million jobs, 219.5 billion USD in economic output and 71.3 billion USD in wages in 2017 alone.

Whether managing train lines in densely populated cities or transporting cargo across long distances, rail operators are recognising the safety and security gains that real-time vehicle-to-

vehicle (V2V) communications can provide. By utilising wireless and full node-to-node connectivity, such as **Rajant Corporation**'s Kinetic Mesh® mobile networks, the benefits of innovative rail applications and technology for automation, real-time tracking and greater control can be realised.

## Ensuring that Freight Transport Stays on Track

Freight transport plays a huge part in ensuring that essential cargo and goods are delivered. It is estimated that **around a third of US exports move by rail**. This makes everyday transport critical for many sectors, ensuring stocks of materials and equipment never dwindles. Traditionally, a single point of connection failure can run the risk

of shutting down an entire network, leading to serious delays and increased pressure from suppliers. However, with resilient and fully redundant connectivity, the signal cut-out and operational faults can be avoided.

For railroads, operations can be rigorously monitored from command centres and operators can instantly access any incoming analytical insights from applications running on trains. This includes complete visibility of equipment health, speed, location, wheel sensors, freight status and fuel consumption. This can also include regular checks on rail track condition, making operators aware of any maintenance issues in advance. By harnessing the full potential of the Industrial Internet of Things (IIoT), rail operators

can modernise their systems and improve transport speeds, safety, and passenger experience. For innovative rail technology to thrive and ensure transport operations continue to run efficiently, unfailing and reliable networking is paramount. Operators require a wireless network of equal measure in a dynamic, ever-changing and mobile environment. With traditional wireless networks such as wifi, point-to-multipoint (P2MP), and LTE not delivering the high availability new applications require to run effectively, operations can be seriously hindered. These technologies often run from fixed infrastructure and must break connectivity for handoffs. A drop-off in coverage can create a mission-critical disruption, such as reducing overall train location status or stoppage of autonomous railyard equipment.

## Keeping Passengers Connected

In addition to overall train operation visibility and status, passenger experience plays a critical role in ensuring that train services continue to generate extensive revenue for economies worldwide. By providing reliable and high-bandwidth wifi services on board, as well as arrival and departure tracking, security monitoring and

online ticket signal functionality, operators can ensure enhanced passenger experience and security for people while riding.

On the other hand, providing these services without the resilient, wireless connectivity required can run the risk of signals cutting out in remote areas of a rail route, causing service interruption and reputational damage from passengers towards railway providers. Connectivity is fundamental to the efficiency of these services, and a wireless, fully mobile, and unfailing connection with Rajant's Kinetic Mesh technology is the most suitable solution to ensure an uninterrupted journey.

The Kinetic Mesh network gives train operators the ability to leverage digital content updates based on the train's location along the route line relevant to passengers. This creates a revenue stream from advertisers to rail operators helping to offset the costs of important safety and security initiatives.

## Rajant's Unfailing Connectivity Ensures a Seamless Journey

What other benefits can the Kinetic Mesh network offer? Rajant's

pioneering BreadCrumb® radio nodes and InstaMesh® software ensure passenger train and freight operators' high-bandwidth mobile connectivity and signal reach across an entire operation without any wired connection. Deployed on wayside points and on the train itself, the BreadCrumbs work peer-to-peer to form an adaptable mesh between fixed and moving rail assets, creating hundreds of potential paths to direct traffic.

By enhancing customer experience and automated functionality for operators, Rajant Kinetic Mesh can optimise connectivity between command centres and high-speed trains, allowing operators to remain one step ahead of any potential issues no matter where their assets or passengers travel. Not only does it maximise quality of service (QoS), but Rajant Kinetic Mesh has the flexibility to provide both linear functionality and train-to-trackside handoff. This guarantees unwavering communications, even when travelling through remote terrains. The network is capable of mobile communication, enabling it to work autonomously with satellite, point-to-point (P2P) wireless or wired links.

**RAJANT**

# Optimize Rail Communications
# *On the Move*

## Rajant Kinetic Mesh® Brings Operator Control No Matter Where Your Assets Travel

Reliable, fully mobile networks are essential for supporting real-time vehicle-to-vehicle (V2V) communications and in-transit mobile connectivity for dynamic and ever-moving railroads. Only Kinetic Mesh delivers:

### Continuous 'Never Break' Communications
Our mobile network maintains hundreds of data connections, enabling CBTC and **V2V communications between railcars and command centers.**

### High-Bandwidth Connectivity for Superior Control
Robust, high-bandwidth connectivity allows the **instant access of data** on equipment health, speed, location, freight status, and more.

### Increased Safety & Improved Passenger Experience
**Powerful connectivity supports safety applications** like positive train control and onboard CCTV, as well as customer Wi-Fi accessibility.

## *Discover Reliable Rail Connectivity*

Download our "Kinetic Mesh Boosts Speed & Efficiency for Intermodal Railyard" case study at rajant.com/railway-news

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