



**RADIO  
FREQUENCY  
SYSTEMS**

## **Case Study**

# **Japan Subway JMCIA**

Japan Mobile Communications Infrastructure Association (JMCIA) is a telecoms consortium in Japan responsible for deploying wireless connectivity in a range of environments, including road tunnels, railway, and subway tunnels, across Japan. With the government in Japan aiming to deliver 5G to 95% of the Japanese population by March 2024, there are significant infrastructure projects ongoing to upgrade the country's mobile infrastructure to meet this target.

As part of the investment, new public facilities, for example, new subway tunnels, need to be equipped with 5G-ready infrastructure as standard. As part of this, RFS was selected by JMCIA to deploy radiating cables in new rail tunnels connecting Tokyo.

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# The challenges

JMCIA needed equipment that was designed to deliver in-tunnel connectivity, providing 4GLTE and 5G to customers. As such, the key requirements for the project were:

- **Throughput**

The key requirement from JMCIA was a solution that would deliver throughput that would meet the demands of its customers.

- **Easy to deploy**

As subway deployments often have significant limitations on working hours, the solution needed to be easy to install to enable efficient deployments.

- **Multi-operator support**

JMCIA needed an agnostic solution that could be used by all

of Japan's major MNOs, providing consistent, quality of service for all operators.

- **Scalability**

The solution needed to serve the current market demand for 4GLTE services, but also be able to adapt to align with the government's ambitions for 5G.

- **Future-proof**

Along with being able to adapt to 5G, JMCIA required a solution that could be reconfigured should frequency requirements change.

## The solution

**The project with JMCIA began with trials to demonstrate the suitability of the solution to deliver continuous coverage across tunnel environments.**

The trials in both Hannover and Tokyo provided a proof of concept for **configurations using both a single radiating cable and 2x2 MIMO.**

The single cable set-up demonstrated how RFS's **RADIAFLEX cable can offer consistent contoured coverage** at JMCIA's required frequencies. It was also able to **demonstrate this over a substantial distance in-tunnel without the need for repeaters.**

The 2x2 MIMO set-up uses two differently polarized cables to increase the capabilities of the system. The MIMO capabilities shown in the trial

allowed the speed and capacity of the deployment to be increased in line with changing requirements. RFS was also able to demonstrate the scalability of the solution to add capacity.

It was important that the single cable-set up could be upgraded to a 2x2 MIMO scenario in the future to ensure JMCIA can keep pace with growing capacity demands. The trial was able to demonstrate that a second cable could be added to the single cable set-up to deliver 2x2 MIMO in the future. This emphasized the flexibility of the solution and that it could be upgraded as customer needs changed.

On the basis of trial success, RFS was selected for further projects with JMCIA, including new rail projects that opened throughout 2023.

# The result

**The project with JMCIA is ongoing, but we can see that based on the requirements of the project, RFS has been able to deliver a series of successful deployments.**

## Quality & throughput

The principal requirement from JMCIA was to deliver network quality and throughput for all MNOs in Japan. The results of testing showed up to 2x throughput improvement for operators, demonstrating the suitability of the solution for in-tunnel deployments in Japan.

## Future-proof & scalable

The trial and subsequent deployments have demonstrated the future-proofing capabilities of this set-up. The cable is currently serving the demand for 4G connectivity while being fully 5G-ready. As required, 5G capacity can be increased with the addition of an additional cable to deliver 2x2 MIMO in-tunnel as demonstrated in the original project trials. Additionally, by using RFS's stopband-free cable, the system can be re-tuned if

necessary to align with future standards, making for a future-proof and scalable option.

## Easy to deploy

RFS has a long history of deploying its RADIAFLEX cables in underground rail environments. This experience means the solution is designed for easy and fast deployment in this scenario, with accessories designed to make the deployment as easy as possible for integrators and installers.

***“Japan is such an exciting market when it comes to wireless connectivity. The future-oriented focus of this project has allowed us to showcase the flexibility of RADIAFLEX for customers looking for a solution that evolves with their needs. We look forward to continuing our work with JMCIA on further ongoing projects.”***

**Kent Asai, Sales Manager at RFS'**







# Lifetime Connectivity

At RFS we specialize in the design and manufacture of premium, future-ready cable solutions for customers across the globe. With over 120 years of heritage in the industry, we build reliable and long service life connectivity systems. **Because we care about our collective future.**

- We design innovative cable solutions that deliver best-in-class connectivity while tackling network pain points and offering a lower Total Cost of Ownership.
- We bring passion and expertise at every stage, from R&D to installation, to meet our business partners' expectations.
- We deliver the communications foundation for digital transformation across a range of industries including oil & gas, mining, and rail.
- We are changing the perception that all cable is created equal and demonstrating the potential of premium solutions.
- We offer a dynamic and stimulating working environment that promotes diversity and fosters personal and collective accomplishments.
- We are committed to sustainability with greener manufacturing processes and designing long-life equipment with low-energy consumption to support our customers' climate goals.