CONNECTIVITY CHAOS

Taking Back **Control** of Your Comfort IT Network

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AN **EQUANS** COMPANY

HISTORICAL CHALLENGES

of on-train connectivity

Coverage matters:
Train Wi-Fi depends on mobile network coverage along the route.

Rail routes are tricky:
Long, narrow corridors pose technical and financial challenges.

Capacity gaps persist:
Many areas still can't support full train connectivity.

12-Month Connectivity Report Card

01

GIGABIT TRAIN

Icomera and Deutsche Bahn launched the Gigabit Zug 2030 project to pioneer high-speed, reliable train connectivity for passengers and onboard devices.

The Setup:

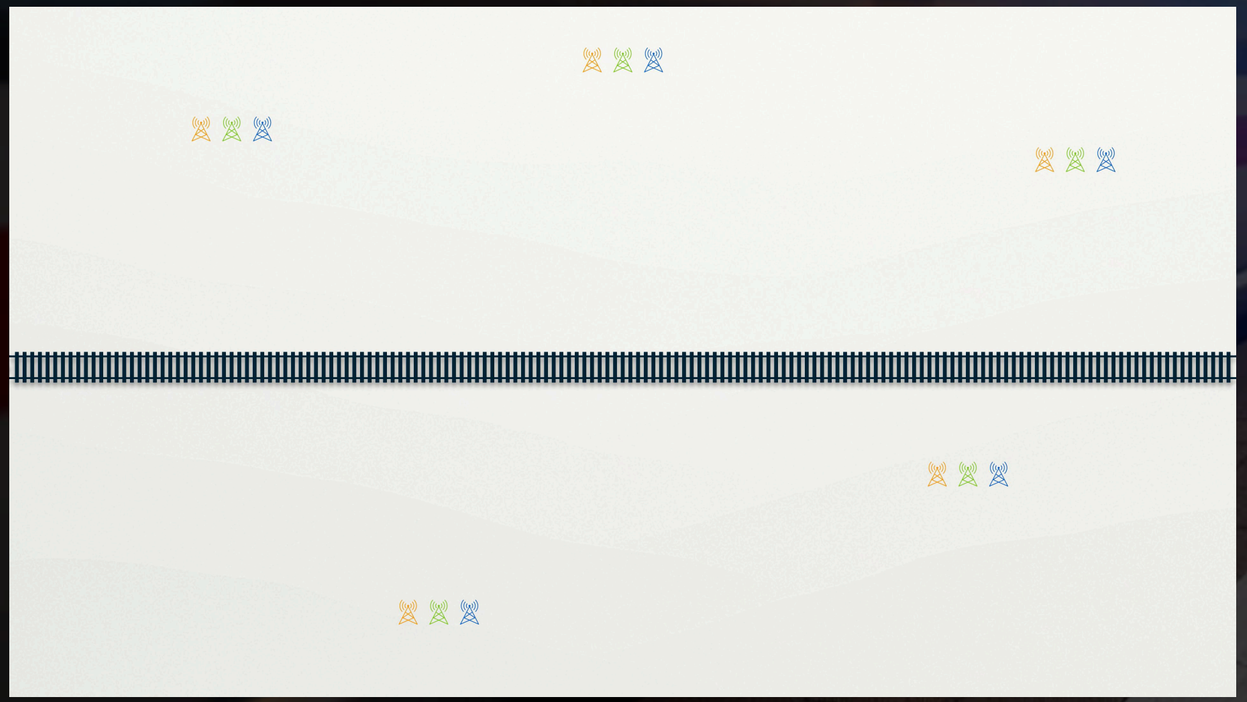
- 2 Starlink satellite antennas
- 3 sectorised antennas
- 1 omnidirectional antenna

Omni Directional Antennas

Sectorised Antennas

Deutsche Bahn Gigabitzug (Gigabit Train) - Sectorised Antenna

Omni Directional Antennas **VS** Sectorised Antennas



12-Month Connectivity Report Card

02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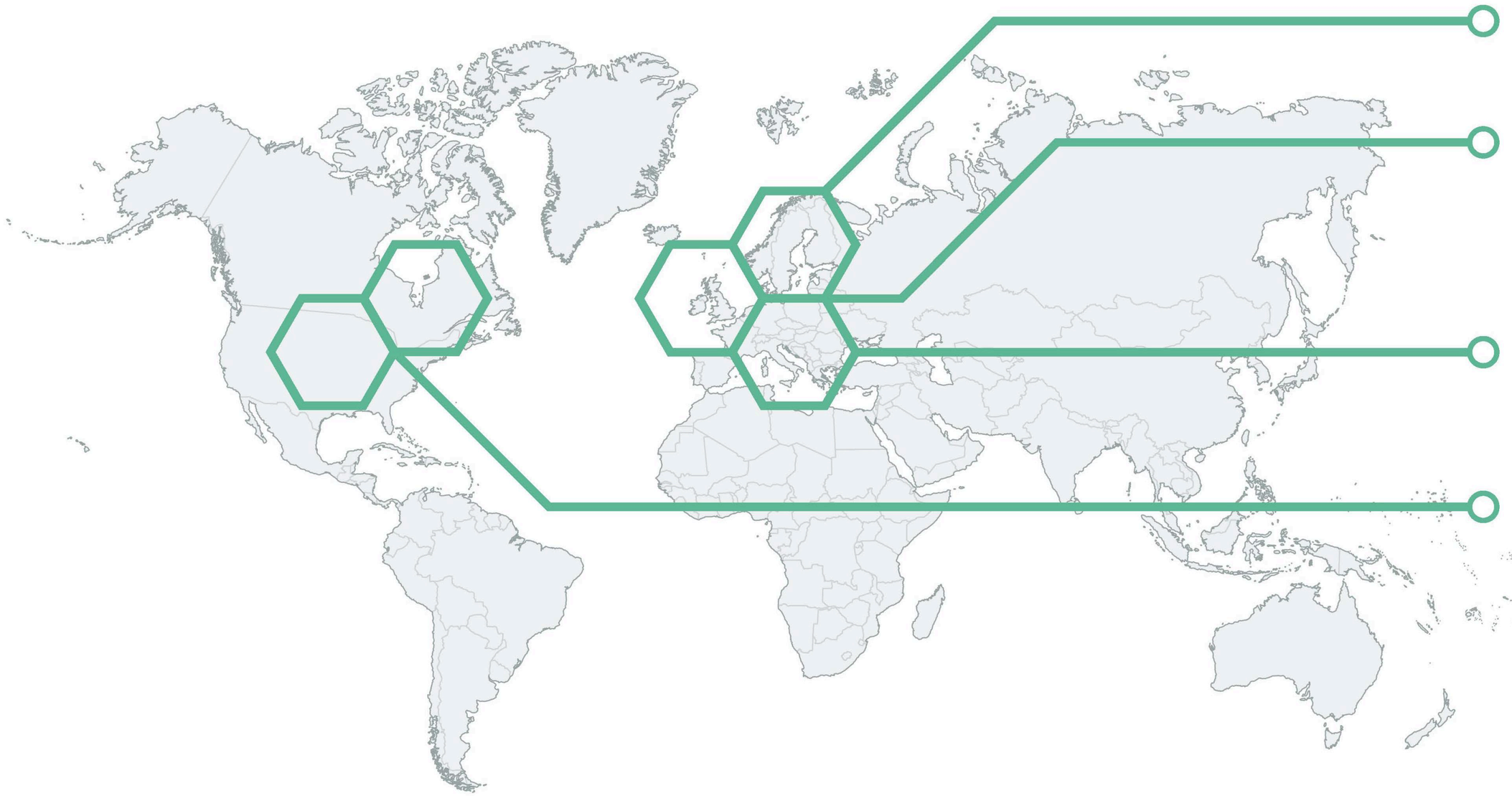
STARLINK
Authorised reseller of Starlink solutions and its dedicated EN 50155-certified rail-tile antenna
Attractive data pricing when compared to cellular data, offering additional, scalable capacity & availability
Priority data for in-motion use
Fully supported by Icomera's ICONIC network monitoring and configuration tools
INGENUITY. INTELLIGENCE. INSPIRATION.

12-Month Connectivity Report Card

03



UK: Several hybrid cellular / satellite network trials using Icomera equipment

Northern Europe: Active satellite connectivity deployments on active passenger services

Southern Europe: Satellite connectivity deployment on freight services

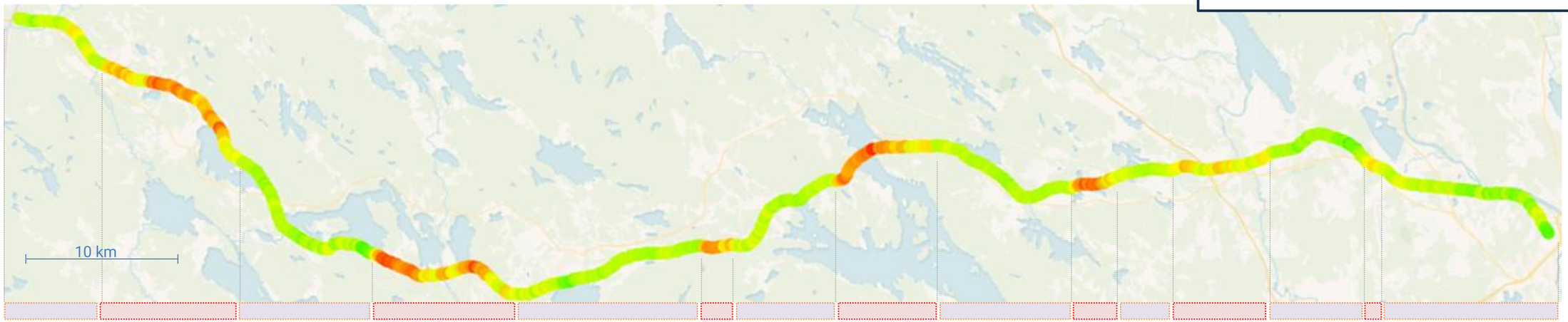
North America: Live satellite deployments on active passenger services

Eliminating Not Spots and Increasing Capacity

Max measured DL Throughput [Mbit/s]

<15	Mainly limited by cellular network capacity
40	
75	
100	Limited by onboard network (prior to upgrade)
125	
150	
150+	

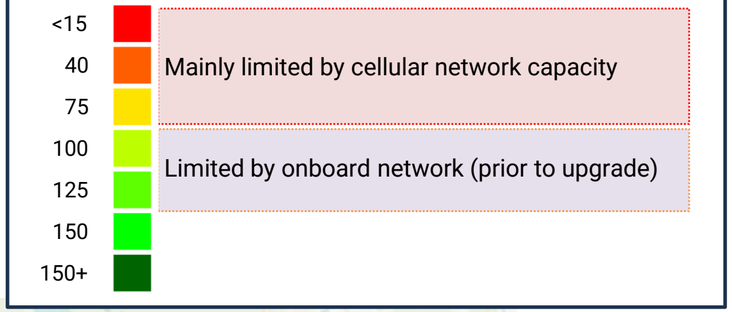
Without Satellite



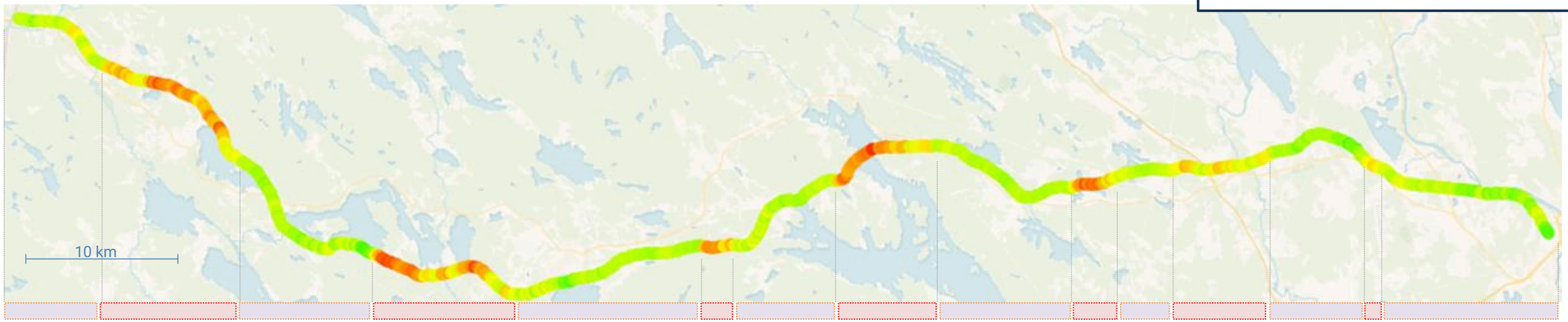
Source: Case example based on real test data (anonymized). Based on passenger generated data only from 20 trips prior to upgrade and 20 trips after upgrade with satellite (dual rail-tiles from Starlink).

Eliminating Not Spots and Increasing Capacity

Max measured DL Throughput [Mbit/s]



Without Satellite



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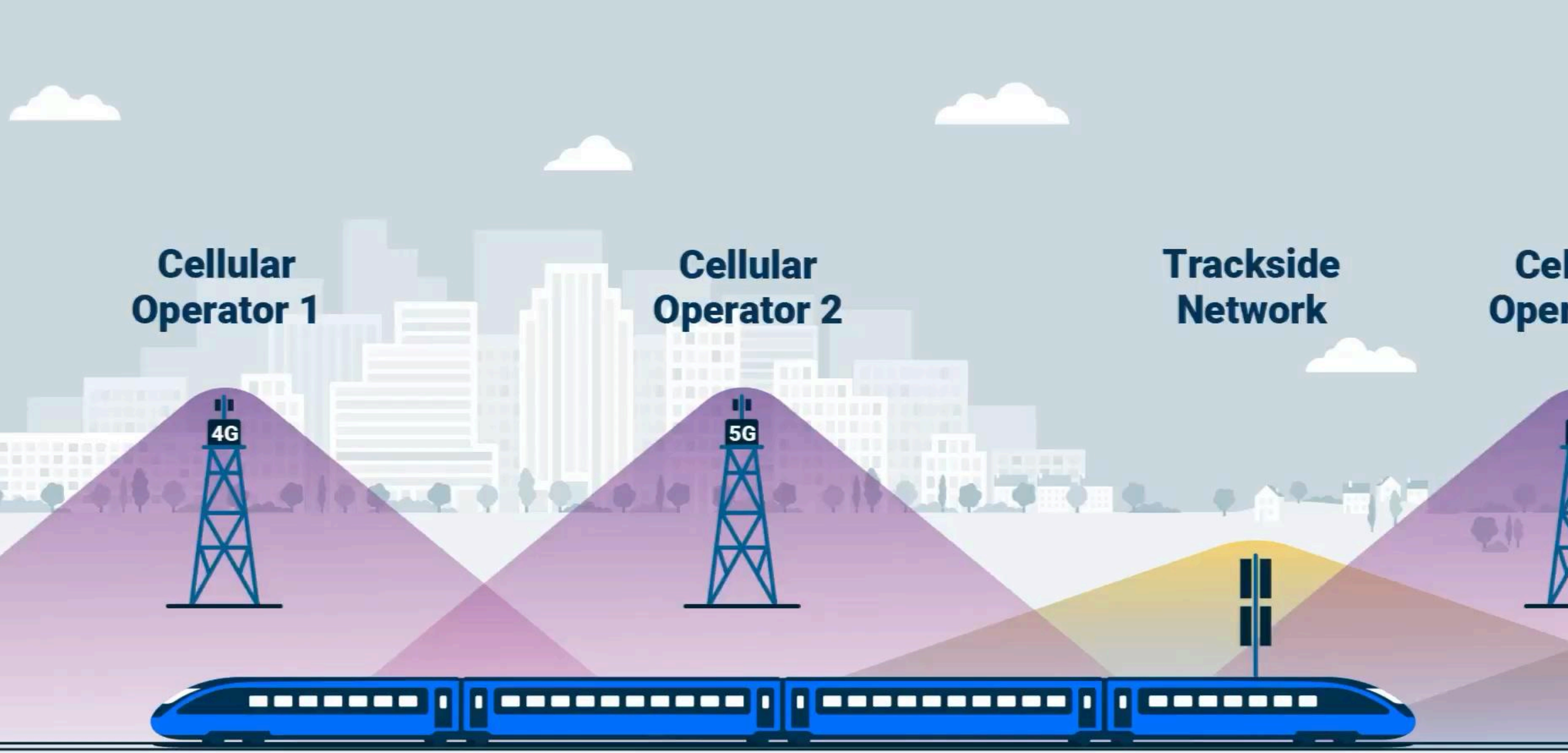
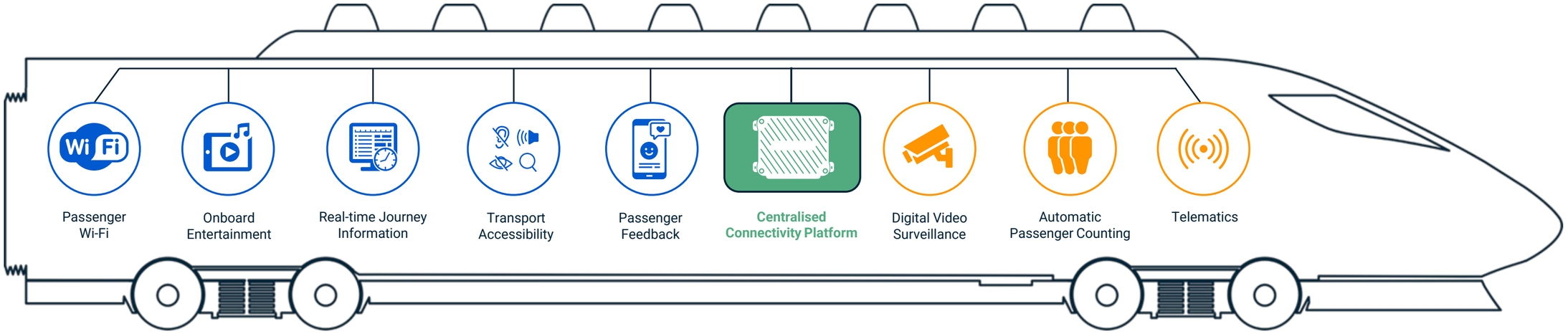
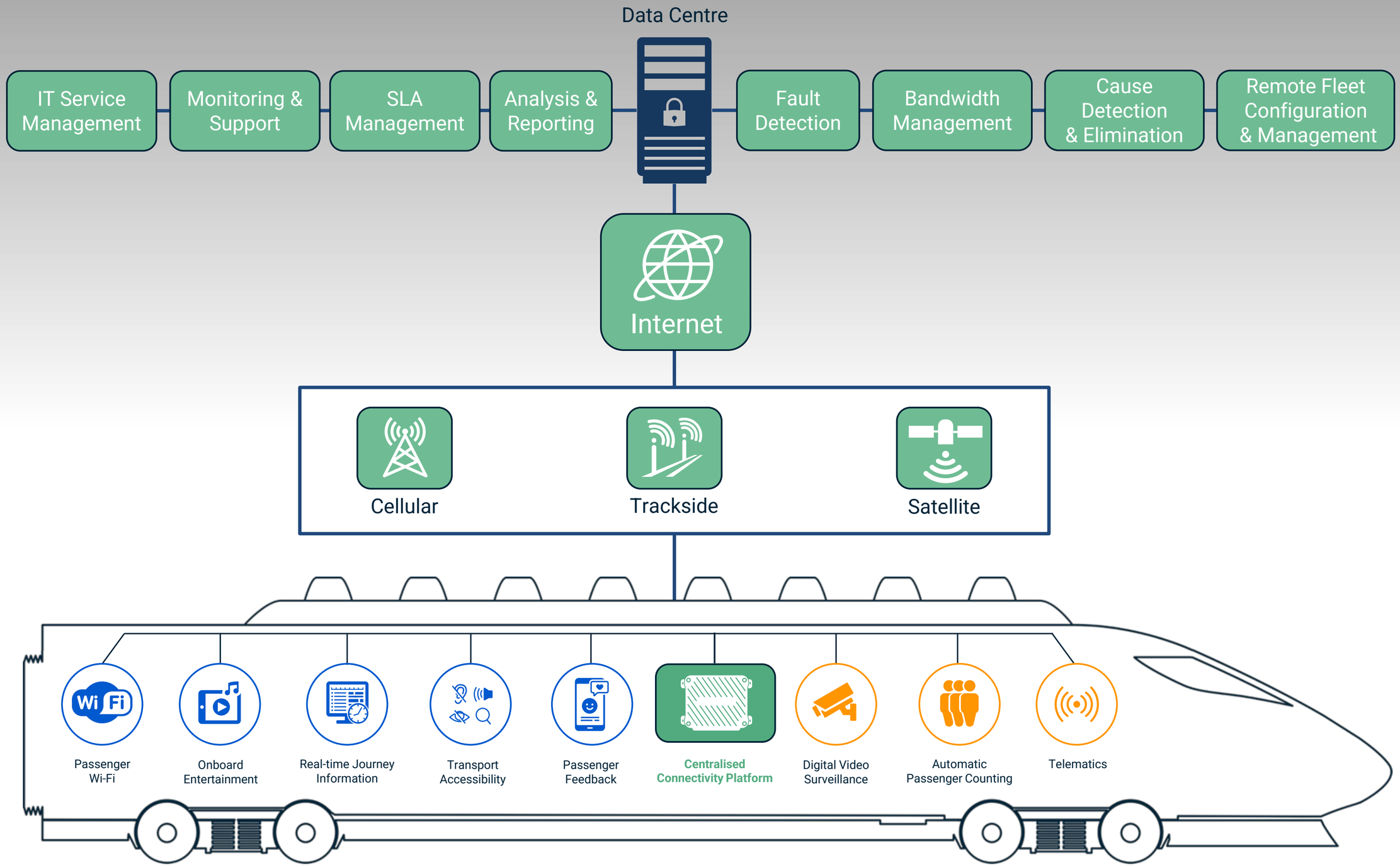
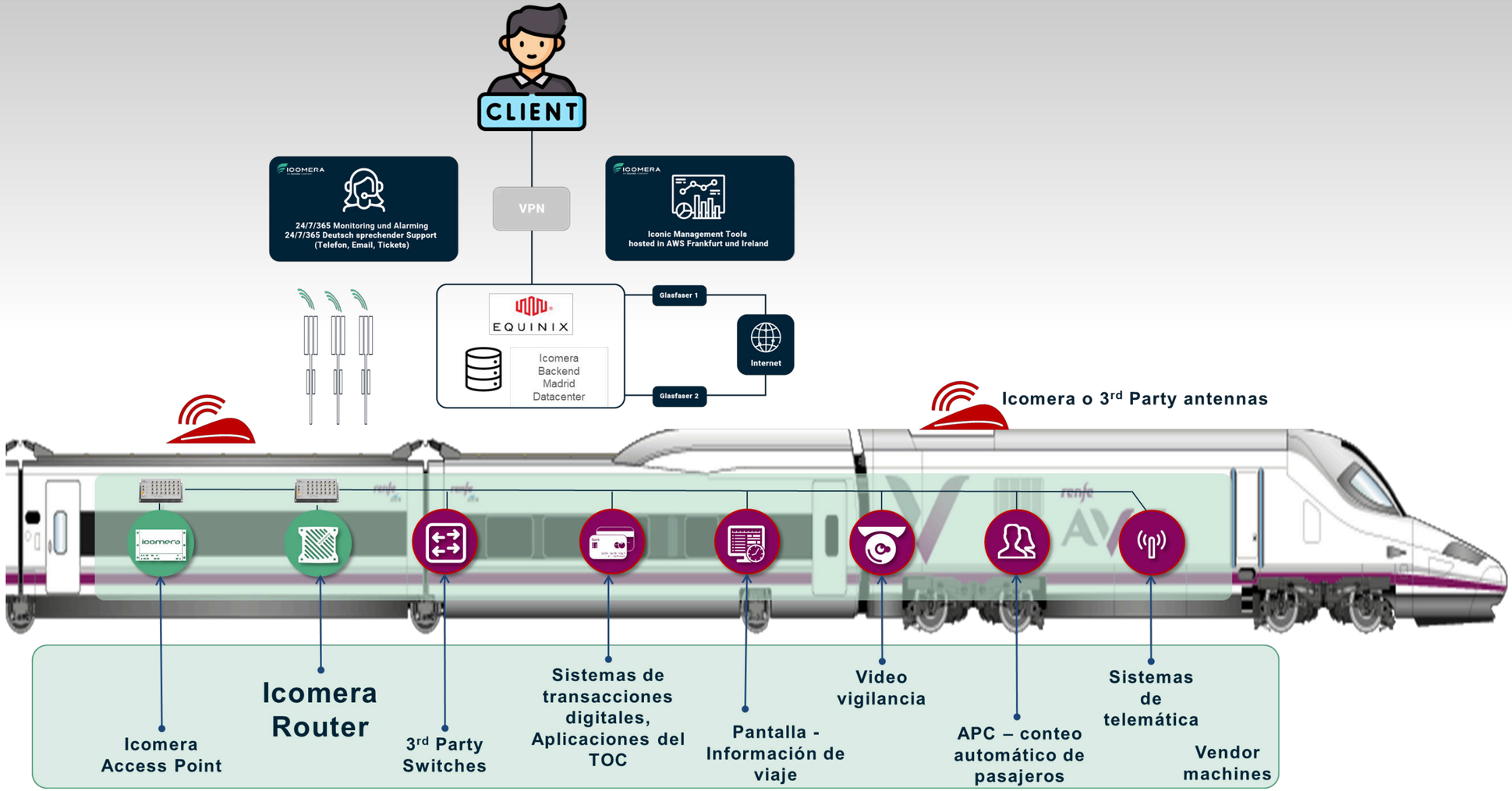


Aggregation is the best approach


Wi Fi
Passenger Wi-Fi
Onboard Entertainment
Real-time Journey Information
Transport Accessibility
Passenger Feedback
Centralised Connectivity Platform
Digital Video Surveillance
Automatic Passenger Counting
Telematics

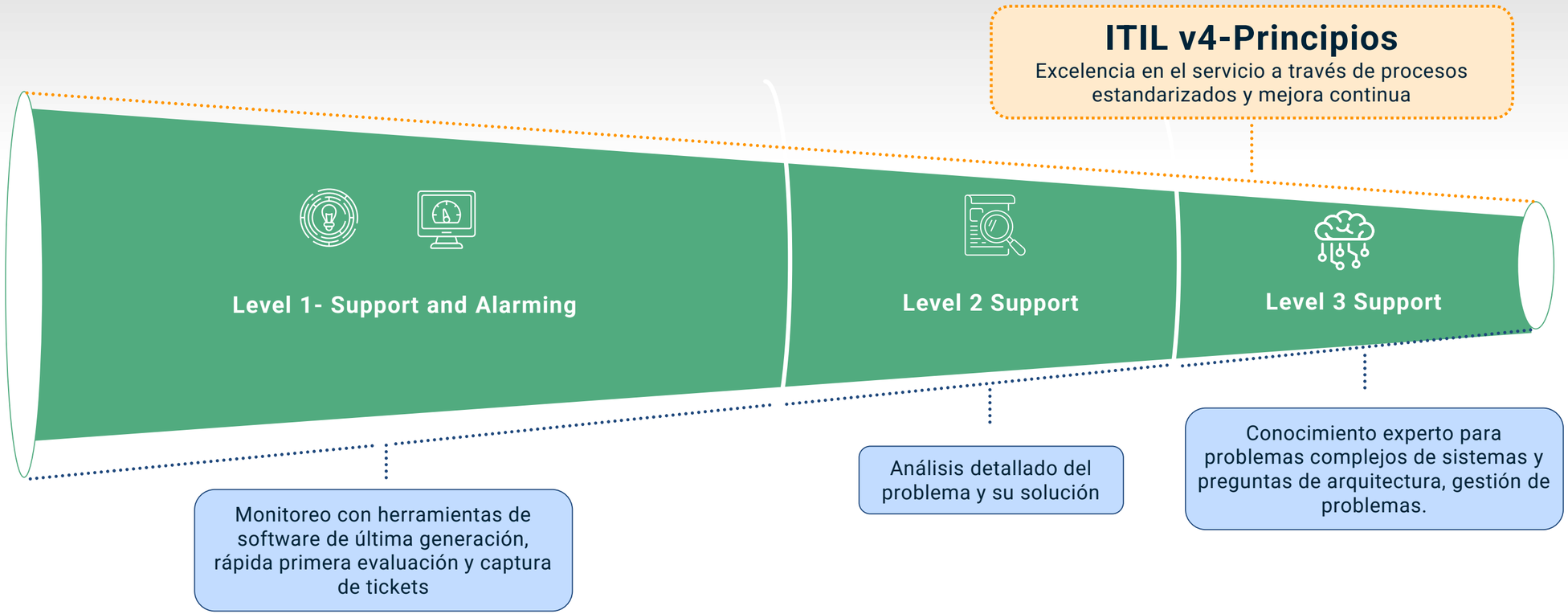

Data Centre
IT Service Management
Monitoring & Support
SLA Management
Analysis & Reporting
Fault Detection
Bandwidth Management
Cause Detection & Elimination
Remote Fleet Configuration & Management
Internet
Cellular
Trackside
Satellite
Wi Fi
Passenger Wi-Fi
Onboard Entertainment
Real-time Journey Information
Transport Accessibility
Passenger Feedback
Centralised Connectivity Platform
Digital Video Surveillance
Automatic Passenger Counting
Telematics

Take Control of your Digital Train



Network Operation Center – Ensure Maximum Availability

ICOMERA NOC opera con una estructura de soporte técnico dividido en 3 niveles siguiendo las mejores prácticas de gestión de servicios de IT definidas por el estándar internacional **ITIL v4**



Objetivo
Maximizar la disponibilidad del sistema

Why Technology POCs Succeed but Fleets Struggle

…Success on 10 carriages isn't the same as success across 1,000


PEOPLE X PROCESSES X TOOLS
INGENUITY. INTELLIGENCE. INSPIRATION. INGENUITY. INTELLIGENCE. INSPIRATION. INGENUITY. INTELLIGENCE. INSPIRATION. INGENUITY. INTELLIGENCE. INSPIRATION. INGENUITY. INTELLIGENCE. INSPIRATION

PEOPLE

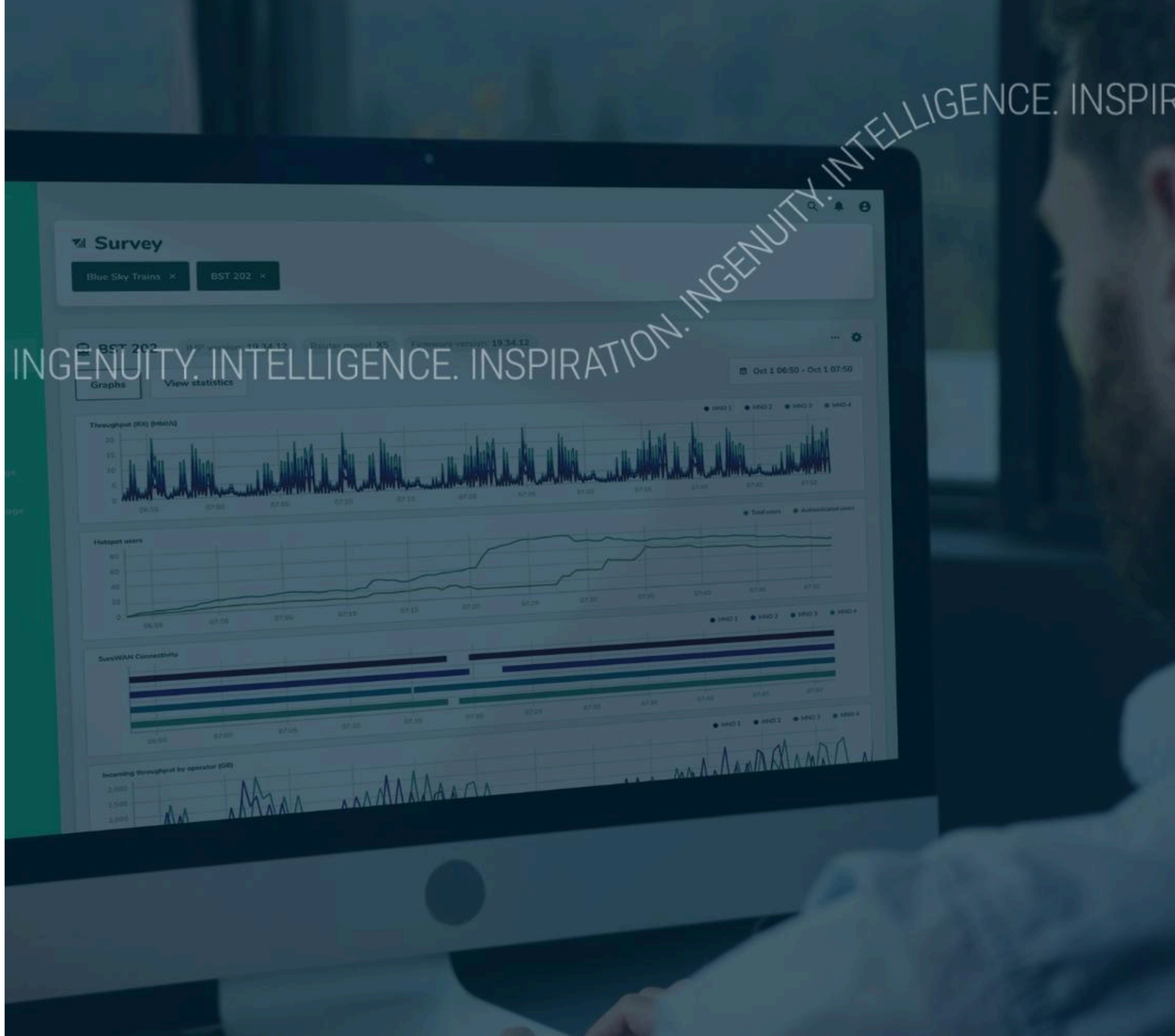
- Service Delivery Managers running the digital fleet day-to-day
- All ITIL-certified
- Clear ownership
- Predictable cadence with your counterparts

PROCESSES

- Incident Management
- Problem Management
- Change Enablement / Change And Release Management
- Service Level Management
- Configuration Management
- Monitoring And Event Management

TOOLS

- **Single Pane of Glass** - Monitor link performance, data usage, and device/app health in one view
- **Network-level Visibility** – Acting as the “glue” at the network layer and providing a single support point for operators.
- **Third-party Service Integration** - Containerise third-party services where it’s a fit (e.g., analytics alongside video surveillance)
- **Seamless Data Flow** - Integrating with the operators’ own tools - aligning with their operational processes and business needs.



Thank You!

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Satellite, cellular and trackside connectivity

unified on board as a single, trusted service layer —

scalable across your fleet.

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