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February 2024

Solving Connectivity for Next-Gen Fleet Telematics

John Gole
Research Director, European IoT Practice
IDC Europe

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Introduction

Connectivity has become a critical enabler of efficient logistics and transportation management operations. Vehicles and assets can now be tracked and monitored to ensure the greatest possible efficiency, reliability, and predictability of supply chains, distribution networks, logistics centers, and asset management.

Vehicle telematics and asset tracking continue to rapidly evolve. Advanced use cases and solutions place new demands on network connectivity, anticipating a move toward 5G networks. Coupled with their global connectivity needs, organizations may have difficulty finding a provider to support the many connectivity requirements of telematics solutions. Fortunately, the global connectivity landscape is changing shape, and a new type of service provider is ready to deliver next-generation capabilities.

AT A GLANCE

KEY STATS

Transport companies are anticipating the move toward 5G. Some 62% of transport companies in a recent IDC survey identified 5G as a key part of their Internet of Things (IoT), cloud, and edge projects, outranking any other technology.

WHAT'S IMPORTANT

As transport companies embrace new telematics features, they will need connectivity with enhanced quality and reliability.

A global IoT connectivity service layer has emerged that can give transport companies the attention and service quality they need.

KEY TAKEAWAYS

Global IoT connectivity is about much more than mobile coverage. It requires a dedicated core network and platform to make global connectivity reliable and simple.

The Evolution of Transport Telematics

Amid the challenges of safety, efficiency, and rising insurance and equipment costs, transport fleet operators are increasingly using vehicle telematics solutions to power their digital transformation initiatives. These telematics solutions, which leverage mobile networks to link vehicle sensors to central (often cloud-based) applications, enable vehicle location tracking, safety monitoring, and route optimization. Over time, more capabilities have been added to these solutions, such as vehicle sensors that enable maintenance scheduling, driver behavior monitoring (observing speed, acceleration, and braking, for example), cold-chain monitoring for freight, and theft prevention.

Next-generation features continue to extend the capabilities of these solutions. Some newer features that are becoming available and will continue to emerge include:

- **Driver safety features:** Driver fatigue monitoring features can detect signs of drowsiness, trigger an alert, and even slow or stop the vehicle.
- **Predictive maintenance:** Telematics systems use machine learning algorithms to predict when vehicles need maintenance, reducing downtime and maintenance costs and boosting productivity.
- **Camera images and video:** Camera imagery can provide numerous benefits, including recording conditions of freight in transit, providing surveillance video around and inside a

parked vehicle, and providing dashcam footage and related video for safety and insurance purposes in the event of an accident.

- **Autonomous vehicle features:** As vehicles add autonomous functionality, such as platooning, fleet management systems will need to integrate with those vehicle systems to enable control and management.
- **Augmented reality:** Fleet management systems can provide drivers with real-time information about their surroundings on an augmented reality display, so that they can navigate more safely.

Next-Gen Telematics and New Connectivity Requirements

Vehicle telematics systems tend to rely on a tracking and monitoring device that is installed on a vehicle. The device connects to an onboard diagnostics (OBD-II) port to collect vehicle data. The device then relays that data back to a central datacenter or cloud service for analysis and utilization by enterprise applications. Communication with the central applications usually requires cellular or satellite connectivity.

Early telematics systems had moderate connectivity requirements. They only needed comprehensive network coverage to send occasional updates about location, scheduling, and routes. The ubiquitous 2G and 3G networks were sufficient for these needs.

As more advanced features emerge, new service requirements for mobile network connectivity will develop. Next-generation telematics solutions will generally require:

- **Higher bandwidth:** Cameras and sensors are generating more and more data and sending it out more frequently over time. Driver assistance and safety and information systems require greater volumes of data delivered to the vehicle. Over-the-air software updates also generate large volumes of data traffic.
- **Lower latency:** Some advanced telematics solutions will leverage advanced driver assistance systems and autonomous functionalities such as vehicle platooning. Such systems require minimal latencies in network connectivity, preferably as close to "real-time" connectivity as possible.
- **Higher reliability:** Some applications, including safety, autonomous operations, and augmented reality applications, will likely require continuous and highly reliable connectivity.
- **5G networks:** To deliver the service speed and quality required for certain use cases, telematics solutions will need to migrate to 5G networks in the coming years.
- **Global coverage:** Connectivity must be seamlessly maintained as vehicles and containers cross borders. A fleet operator's individual applications and functions must connect to available cellular or satellite networks for reliable and fast communication with back-end systems.

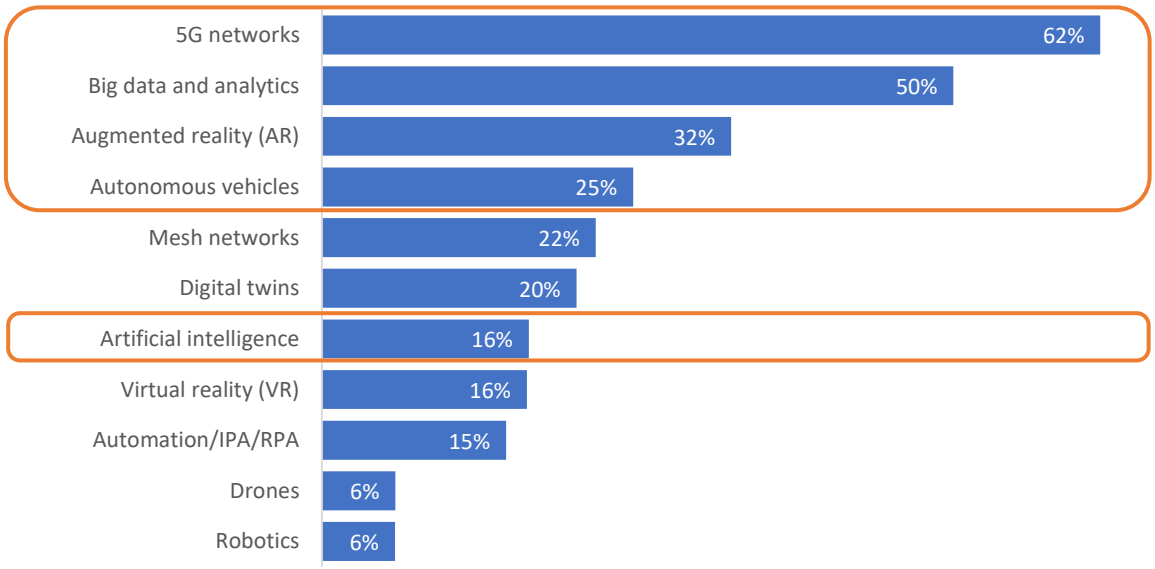
- **International support:** In the event of connectivity problems, the vehicle operator needs to know that local and around-the-clock human support is available to help restore the lost connection. As systems and use cases become more complex, human attention will be critical for analyzing and resolving connectivity issues.
- **Support for Big Data and AI:** Many telematics solutions produce large volumes of data which can now be analyzed by AI systems to enable new features. Autonomous driving, imagery analysis, predictive maintenance, and other capabilities are all powered by AI. As such, connectivity that can deliver data to the cloud and the AI algorithms back to the vehicle becomes more crucial.

IDC research has observed that transport companies are paying keen attention to these emerging technologies (see figure below). As companies consider such technologies and solutions, they will need to be sure that the right connectivity services are readily available.

FIGURE 1

Transport Companies Are Anticipating Adoption of 5G and Other Technologies

Q. Which of the following technologies are important parts of your cloud, edge, and IoT plans? Please choose all that apply.



Base: Transport sector respondents; n = 144
Source: IDC's *European Cloud-Edge-IoT Demand Landscape Survey*, March 2023

Challenges Obtaining the Needed Connectivity

As telematics solutions demand more advanced service capabilities, managing IoT complexity becomes more challenging. Connectivity providers must be able to deliver the required services predictably and reliably across a wide range of network types, mobile operators, geographic

environments, and regulatory regimes. The traditional model for delivering global connectivity is not up to the task of supporting next-generation telematics.

- **Difficulty with roaming:** Mobile network operators are typically national entities. To provide global coverage, they utilize their roaming agreements with other operators. However, local mobile operators prefer data loads that are generated by direct customers, rather than roaming devices. Moreover, regulators want devices to comply with local registration requirements. As a result, extended or permanent roaming is sometimes blocked by regulators or carriers. Brazil, Turkey, Canada, Singapore, India, Australia, and China are major markets that have placed limitations on permanent roaming, and other markets are likely to follow.
- **Inconsistent core networks:** Often, the roaming carrier's network takes traffic from mobile radio, sends it over a national core network, and then delivers it to the primary carrier's network. However, when stitching together many different networks with different software and configurations, network settings can vary and generate difficulties for IoT devices. IoT devices may not find the familiar network settings they rely on and may fail to connect.
- **Low priority for some carriers:** IoT devices are typically a low priority for mobile carriers. Though IoT accounted for 25% of worldwide mobile connections (traditional cellular plus LPWAN) in 2022, it only accounted for 2.5% of spending (source: IDC's *Worldwide Telecommunication Services Tracker*, May 2023). With low revenue per connection, carriers are unlikely to prioritize assisting a lost IoT roaming device.
- **Integration of Connectivity Management Platforms (CMPs):** The primary operator provides a CMP that allows a customer to have visibility of devices and manage the connections. However, the seamless integration of a CMP with the platforms used by other operators is difficult. Settings may differ across platforms, making it difficult to manage settings consistently across all networks.

Delivering the Connectivity that Next-Gen Telematics Needs

Fortunately, the IoT connectivity industry has evolved to solve this problem. Global managed IoT service providers have emerged to provide reliable connectivity for fleet telematics anywhere in the world. These providers have several key characteristics:

- **Specialization in IoT connectivity:** Global IoT connectivity providers should focus on delivering the best IoT services. IoT has evolved as a specialty that requires industry-specific expertise and experience.
- **Globally distributed core network:** Rather than utilizing the data networks of individual operators, each with its own features and software stack, and patching them together for global coverage, it is better to establish globally distributed local core networks, dedicated to IoT and connected to each national operator, that can deliver the guaranteed service quality and consistent network features across the full global network.

- **Flexibility and responsiveness:** The wide variety of IoT devices, modems, applications, service requirements, power supplies, and other features makes IoT connectivity challenging. Enterprises need service providers that can be flexible and responsive to these challenges to ensure that they can deliver the needed connectivity.
- **A single global platform:** Rather than integrating with several other CMPs and continually updating the software to maintain the integration, it is better to establish a single platform that works natively with the globally distributed core networks that are owned by a vendor. This platform provides detailed, real-time visibility into fleets. It enables fleet operators to define settings that work consistently throughout the whole global network, rather than being lost in translation between different platforms.
- **Global carrier relationships:** Global IoT service providers need to establish strong relationships with mobile network operators in every region. Such relationships are important not only for delivering global access but also for complying with local regulations with the support of the local carriers.
- **Global support:** Strong partnerships with local mobile operators also ensure that customer devices are welcomed onto the network, rather than seen as interlopers. As a welcomed customer, fleet operators can rely on local support where needed to overcome any connectivity issues.
- **Support for advanced SIM solutions:** Mobile SIM cards are rapidly changing to support tomorrow's IoT connectivity. Global managed IoT connectivity providers should support any SIM form factor, including traditional chips that are manually inserted into a device and those that are embedded in devices at the factory (known as eUICC or eSIM) or built into the silicon chipset (sometimes called iUICC or iSIM). Providers should also support multi-IMSI SIM technology, which means that the SIM carries the network profiles of more than one operator, to ensure telematics systems can automatically switch networks in different regions. Finally, they should support remote SIM provisioning (RSP), a feature which allows the SIM (in whichever form factor) to receive new operator profiles over the air. With this flexibility, service providers can deliver global connectivity, back up profiles on other networks, and leverage the ability to switch away to competing providers should the need or desire arise.
- **Ready for 5G:** Transport fleets and connected cars will be among the first IoT devices to migrate to 5G. For these customers, connectivity providers must have the infrastructure and capabilities required to deliver the expected quality and reliability across end-to-end networks.
- **Ready for new satellite services:** Transport fleets can move beyond terrestrial network coverage. At such times, the ability to connect to satellite networks can provide transport companies with continued visibility into their assets and freight. Several new low-Earth-orbiting satellite constellations are in development; managed IoT connectivity providers are also working to enable "hybrid mode", a capability that allows access to both terrestrial and non-terrestrial networks via one continuous service.

- **Consumption-based charging:** Fleet telematics users sometimes take vehicles out of service. They thus need a connectivity provider that only charges for active devices and the data those devices consume. The service provider should provide the telematics users with a portal for easy activation, deactivation, and management.

Reducing Complexity

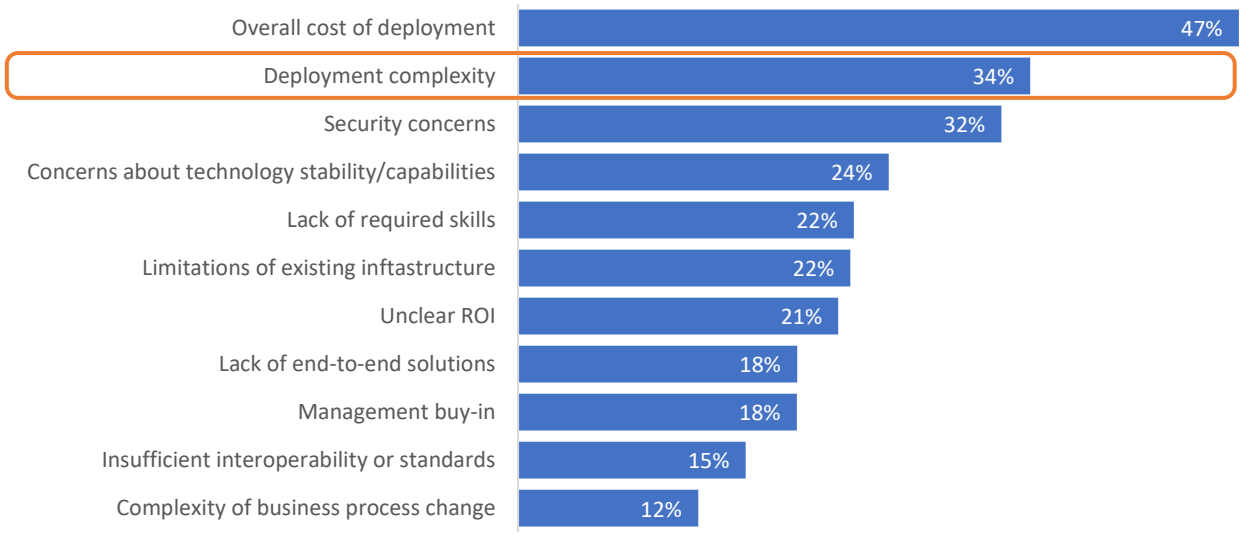
Transportation companies regularly state that complexity is one of the biggest barriers to the completion of their IoT projects. In a recent European survey (see figure below), deployment complexity was the second-most commonly cited challenge after costs. Moreover, complexity is often the main cause of high costs due to projects falling behind schedule and requiring additional resources.

Those delivering fleet telematics need to take the complexity out of these solutions. Leading IoT connectivity providers are doing their part to make that happen.

FIGURE 2

Transport Sector Challenges Holding Back IoT Projects

Q. What do you think are the main challenges holding back or slowing progress on IoT projects within your organization? Please choose up to three challenges.



Base: Transport sector respondents; n=144

Source: IDC's *European Cloud-Edge-IoT Demand Landscape Survey*, March 2023

When a management platform is integrated with globally distributed local core networks, connectivity is more predictable and consistent. Enterprises can thereby develop and deploy their solutions more quickly than ever before. Vehicles can connect consistently, regardless of network, as multi-carrier contracts are handled by the global provider. Management also

becomes reliable because the settings defined in one place work everywhere, and all settings are managed via a single pane of glass. With consistent network settings, telematics devices and connections work reliably across networks, reducing design time and costs and avoiding stranded assets.

IDC Recommendations

The vehicle telematics industry was one of the early IoT success stories, but the continuing innovation in this space presents new challenges for those deploying such solutions. Enterprises utilizing or delivering telematics solutions need to be aware of the importance of connectivity for the safe and reliable operation of those solutions. A reconfiguration of the industry has enabled global managed connectivity providers to deliver a consistent connectivity layer across hundreds of national networks.

Readers of this report should heed the following recommendations:

- **Understand the importance of a stable and consistent global connectivity service for powering vehicle telematics solutions.** Because mobile roaming has been possible for decades, the enabling of IoT roaming must seem as simple as contacting your local mobile operator. However, this is not true. Global connectivity for vehicle telematics requires consistent network performance and connectivity management for a variety of complex solutions, particularly as these solutions continue to expand their feature sets.
- **Ensure your connectivity provider includes comprehensive management capabilities.** Your connectivity supplier should provide you with a portal for managing all connections and only charge for the traffic generated by active connections. The supplier should also offer a rich application programming interface (API) suite that will allow you to integrate connectivity elements into your telematics solution.
- **Be prepared for shifting roaming regulations.** Some countries have restrictions on the duration of a roaming period. As such, choose a connectivity provider that has all the tools needed to manage the differing regulatory and operating environments, and ensure that connectivity is reliable and compliant with changing regulations.
- **Ask your provider how its core network and connectivity platform work with roaming partners.** An incomplete integration can create unexpected results when pushing settings out to distant vehicles. Ideally, a single platform will reduce complexity and provide greater reliability to the end customer.
- **Be sure your provider has the core network to support international 5G connectivity.** Telematics solutions that incorporate advanced new technologies will need the high reliability and throughput — and low latency — of 5G networks. However, those networks will need a core network that is also up to the task.
- **Ensure your provider supports the SIM technologies you require.** Providers should support any SIM form factor; they should also support multi-IMSI SIMs and RSP to make over-the-air profile changes and ensure you will not be locked in to any one provider.

- **Avoid mobile operator lock-in.** Choose a provider that provides the tools necessary — SIM solutions, management capabilities and contract terms — for you to change mobile operators when needed and avoid supplier lock-in.
- **Consider how important telematics connectivity is to your service provider.** Is it a high priority? Are your provider's services and support systems tailored to address the unique needs of transport telematics? A provider focused on global managed IoT connectivity can provide reliable service and an easy customer experience, allowing you to focus on your core business priorities.

floLIVE Profile

floLIVE is a leading global connectivity provider for fleet telematics and IoT solutions. The company specializes in delivering seamless global connectivity, wherever a company's assets may travel. It supports the full range of cellular network technologies, (2G to 5G, NB-IoT, and LTE-M), and incorporates satellite connectivity services into its platform. Its connectivity platform combines the detailed visibility, control, and flexibility features that customers require in an easy-to-use package.

floLIVE developed its own complete technology stack tailored to the needs of telematics and IoT users. The company also developed a portal and APIs that allow fleet operators to remotely view and manage their connections. It further developed its own distributed core network that interconnects with mobile networks around the world, providing resilience and a common network environment.

In addition, floLIVE developed network management systems to suit the unique needs of IoT solutions. It developed a full range of SIM solutions, including eUICC (eSIMs), RSP, and multi-IMSI SIMs. Fleet operators can leverage whichever SIM solution is best for them and manage those connections with the flexibility they need while remaining in compliance with local regulations.

floLIVE's cloud-native distributed core network is a key differentiator. floLIVE developed its core network to integrate with operators at a fundamental level and provide far greater consistency and control than many other providers. Its solution has proven attractive to enterprises as well as many other managed IoT connectivity providers and mobile operators that have chosen to use floLIVE's global network rather than develop their own.

Vendor Hurdles

While floLIVE enjoys several strengths, it does face some hurdles. The key hurdles facing floLIVE are:

- **Need for stronger brand recognition:** floLIVE's technology has proven successful, even to demanding telecom operators. However, the company's brand recognition among telematics solution vendors and customers is a work in progress. The company needs to strengthen awareness of its solution in the industry to achieve faster growth.

- **Possible changes to legal and regulatory environments:** Such changes and uncertainty can slow the adoption of telematics solutions and place demands on floLIVE's team to manage different environments. However, by managing shifting regulatory environments, floLIVE increases the value it delivers to its customers.
- **Slow development of key enabling technologies:** 5G network coverage remains incomplete, while 5G vehicle-to-anything and satellite solutions are still in development. Faster technology development would enable new features to be quickly added to telematics solutions.
- **Competition from tier 1 global telecom operators:** While floLIVE's carrier-grade platform has already achieved significant scale, the company competes with some large global telecom groups with much deeper pockets. floLIVE needs to keep its focus on delivering telematics and IoT connectivity offerings that are better than the rest.
- **Supply chains and market shocks:** The past few years have brought several major shocks to the world economy, disrupting supply chains and forcing quick adaptation. Such shocks could set back floLIVE's telematics business. However, such crises have reinforced the need for fleet operators to increase agility and leverage technology to get more out of their assets.

MESSAGE FROM THE SPONSOR

The power of telematics can transform the way people, vehicles, and assets move around the world, but finding the connectivity to ensure that those "things" are always communicating can be a significant hurdle. In an age where "always-on" connectivity is vital, selecting the right partner to ensure uninterrupted communications — anywhere in the world — is paramount. Traveling to hard-to-reach areas, crossing borders, and switching from carrier to carrier are possible when leveraging a global provider with a local focus that also provides real-time visibility into billing, usage, and scalability by owning the technology stack — delivering complete control to the user. Learn more at flolive.net/connect/.

About the Analysts

John Gole, Research Director, European IoT Practice, IDC Europe

John Gole is the director of IDC's European IoT research. He provides research and consulting on IoT strategies and highlights opportunities to suppliers and enterprise technology users. Prior to this role, John managed IDC's telecommunications, IoT, and mobility businesses for Central and Eastern Europe, the Middle East, and Africa. John is a frequent speaker at industry events. He also mentors start-ups on Prague's start-up scene.

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IDC UK

5th Floor, Ealing Cross,
85 Uxbridge Road
London
W5 5TH, United Kingdom
44.208.987.7100
Twitter: @IDC
idc-community.com
www.uk.idc.com

Global Headquarters

140 Kendrick Street,
Building B
Needham,
MA 02494
+1.508.872.8200
www.idc.com

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