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Why SGP.32 Is Changing the Rules of Automotive Connectivity

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For more than a decade, the automotive industry has been transforming into a software-defined ecosystem, where vehicles evolve through software updates, digital services, and continuous performance improvements. The scale of that transformation is massive. As of last year, more than [400 million connected cars](#) are on the road globally, with connectivity quickly becoming a baseline expectation for modern vehicles. At the center of this transformation is connectivity. And with the recent finalization of the GSMA's SGP.32 specification, the industry has reached an important inflection point in how vehicles connect to mobile networks globally.



The Growing Complexity of Automotive Connectivity

Modern electric and software-defined vehicles rely on constant, secure connectivity to enable OTA updates, real-time diagnostics, ADAS enhancements, infotainment, telematics, and data-driven upgrades throughout the lifecycle. The complexity of these platforms is already immense. Today's vehicles can contain more than [300 million lines of code](#) and generate up to [25 gigabytes of data per hour](#) from sensors, telematics systems, and in-vehicle applications³.

As automakers expand globally, this creates a logistical challenge: mobile network operator (MNO) requirements vary by country and region. Historically, supporting

multiple markets often meant different hardware configurations, different SIM profiles, and region-specific integrations.

That adds cost, operational overhead, and long-term rigidity – particularly for vehicles expected to remain in service for 10 years or more. What once worked for regional launches and fixed architectures no longer scales in a global, long-lived vehicle fleet. SGP.32 marks a shift from static connectivity choices to a framework where decisions can be managed, governed, and adapted over a decade or more of vehicle operation.

What Makes SGP.32 Different?

SGP.32 is the GSMA's new eSIM specification designed specifically for IoT and automotive use cases. While earlier consumer-focused eSIM standards worked well for smartphones, vehicles present a fundamentally different set of requirements, including long lifecycles, multi-network flexibility, scalable remote management, and secure cross-border operation.

SGP.32 introduces a streamlined remote eSIM provisioning architecture tailored for these needs. It enables secure, over-the-air management of operator profiles without requiring physical access to the vehicle. Unlike earlier approaches, the architecture is designed to operate natively in distributed, resource-constrained IoT environments, reducing dependency on complex backend integrations.

Early adoption is already emerging across the industry. For example, electric vehicle manufacturer Rivian announced that its upcoming R2 vehicle will support the SGP.32 standard, demonstrating how automakers are beginning to integrate the specification into next-generation vehicle architectures.

For automakers, this unlocks the ability to deploy a single global hardware SKU, add or change mobile network providers over time, expand into new regions without redesigning connectivity hardware, and retain full control over connectivity strategy throughout the vehicle lifecycle.

Connectivity is no longer defined entirely at production, but it remains an active design variable long after vehicles are on the road.

SGP.32 vs. Previous Standards: A Necessary Evolution

To fully understand the significance of SGP.32, it is important to compare it with earlier specifications such as SGP.02, which was originally designed for M2M use cases. While SGP.02 enabled remote SIM provisioning, it relies on a more rigid,

operator-centric architecture with limited flexibility for dynamic, large-scale IoT deployments.

That rigidity was intentional and appropriate for an earlier phase of connected mobility, prioritizing stability over adaptability. As vehicles increasingly behave like software platforms, however, the balance shifts toward continuous optimization across networks and regions. As a result, SGP.32 is not just an incremental upgrade – it fundamentally improves how connectivity can be orchestrated, making it better suited for software-defined vehicles and global deployment strategies.

The Strategic Importance of a Single-SKU Model

One of the most significant implications of SGP.32 is the move toward a single-SKU hardware strategy.

In traditional models, entering a new market could require new SIM integrations, regulatory adjustments, or entirely separate hardware variants. This fragmented approach increases supply chain complexity, introduces inefficiencies, and slows global scaling efforts.

With a standardized IoT architecture, automakers can build one hardware configuration capable of supporting multiple network partners across markets. Operator profiles can be provisioned, activated, or changed remotely through secure management infrastructure.

In practice, SGP.32 primarily reduces complexity at the SIM and connectivity layer. Local radio requirements and regulatory obligations may still require market-specific adaptations, but the number of connectivity variants is significantly reduced.

This flexibility allows manufacturers to respond quickly to regional regulatory changes, optimize network performance by market, negotiate connectivity partnerships dynamically, and future-proof vehicles against shifting carrier landscapes. In a world where software agility defines competitiveness, connectivity must be equally adaptable.

5G and the Evolution of Vehicle Capabilities

The adoption of 5G networks further amplifies the impact of this transition. With higher bandwidth, lower latency, and improved network slicing capabilities, 5G enables faster OTA update delivery, enhanced streaming, real-time telematics, cloud integration, and more robust vehicle-to-everything communication. Automakers are already operating connectivity at a significant scale. One leading electric vehicle

manufacturer delivered more than [90 million over-the-air software updates](#) in a single year, illustrating how routine software deployment has become for modern vehicles. At that scale, the primary bottleneck shifts from network performance to operational control over connectivity across regions and operators. SGP.32 provides the foundation that allows 5G-enabled vehicles to scale globally without sacrificing agility.

Security as a Foundational Requirement

As vehicles become increasingly connected, they also become part of critical digital infrastructure. Remote SIM provisioning must meet stringent security standards. Automotive-grade eSIM hardware and remote management platforms are designed to protect credentials, prevent unauthorized access, ensure authentication, and maintain compliance. Security is not a feature layered on top – it is embedded into the architecture from the outset. This is particularly important for vehicles that may receive hundreds of updates over their lifespan. Trust in connected mobility depends on resilient, standards-based security frameworks.

Enabling the Next Phase of Software-Defined Mobility

The automotive industry is moving toward a model where value is increasingly delivered after the vehicle leaves the factory. Feature subscriptions, performance upgrades, new digital services, and evolving driver assistance capabilities all rely on dependable connectivity.

Consumer expectations are evolving alongside these technological shifts. Research shows [nearly 60% of drivers](#) say they would consider switching vehicle brands for better connectivity features, underscoring how central digital capabilities have become to the ownership experience.

SGP.32 supports this model by aligning connectivity with the broader principles of software-defined architecture, including remote management, lifecycle flexibility, global scalability, and security by design. As electric vehicles and connected platforms expand into new regions, the ability to deploy once and scale everywhere will become a defining competitive advantage.

The finalization and early adoption of SGP.32 marks a significant milestone in that journey. Connectivity is no longer just a component - it is part of the vehicle's operating system. Standards like SGP.32, which simplify, secure, and scale connectivity, will define the next decade of automotive innovation.