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**5GAA – 5G Automotive  
Association e.V.**  
Neumarkter Straße 21  
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# 5GAA Statement of Intent

## How Industry Should Approach the Subject of Dataspaces

### Introduction

The rapid digitalization of the automotive and mobility sectors has made the way we think about “data” increasingly important. Around the world, governments, industry consortia, and technology providers are developing frameworks known as “dataspaces” to manage and share data across sectors. Yet, for connected vehicles and intelligent transport systems, data alone is not enough: what matters is transforming raw data into meaningful, contextualized information that can be delivered where and when it is needed.

In the following paper, 5GAA aims to clarify the preferred conceptual approach that the automotive industry would like to take when it comes to dataspaces and their evolution toward “Information Networks”. More specifically, this short paper will detail the language that should be used, the different types of operations and the impact that these have, including best practices, as well as the commonalities and regional differences. These discussions are not new within 5GAA, and the scope of this paper is global and does not prioritize any one region or country, but instead is designed to provide 5GAA and its members with a clear message that can be easily communicated to relevant international organizations, ministries, regulators, and policymakers from across Europe, North America and Asia-Pacific.

### From Data to Information and from Dataspaces to Information Networks

Globally, multiple initiatives are advancing the concept of data spaces, including the European GAIA-X project, the International Data Spaces Association, and sector-specific efforts such as Catena-X in the automotive sector and the United States National Secure Data Service Pilot.

It is critical that the right language is employed for the right purposes and that there is a clear understanding of what is meant by “dataspaces”. The dataspace term typically refers to a collection of data that is managed and shared within a specific context. There is a risk of ambiguity, as most often the focus is primarily on raw data without considering its context or meaning.

In the scope of V2N2X, 5GAA proposes to enrich any [raw] data in an explicit way with corresponding context information. Examples of such explicit context information can be time and location of a data emitting event, source and content ownership of a given [raw] data message, a confirming digital signature by its source-instance or stakeholder, coding information about the data format used, or location and time, information about the validity period (time-to-live), or information about the anticipated geographic relevance area. Such additional context information is called “metadata”. Metadata often appears in form attribute-value-pairs. Together with the corresponding [raw] data, it provides contextualized information, or in short “information”. Thereby turning [raw] Data to Information. It makes the given information machine-readable and allows automatic data format conversions, should a receiver prefer different coding formats than the sender provided.

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“Information” can be retrieved by direct integration with all potential sources. This is most often not practical and is not scalable. It can be stored in more centralized databases to which all relevant information consumers should integrate. This might be a feasible concept for static or semi-static information, such as lasting road construction work. When it comes to highly dynamic information (e.g. real-time traffic situation information), with very many information sources and receivers, 5GAA suggests a network approach in which information gets routed to where it matters. The 5GAA V2N2X concept<sup>1</sup> applies an information push approach instead of requiring all potential receivers to poll (or query) for potentially relevant information. Therefore, we recommend talking about an “Information Sharing Network”, or “Information Network” for short.

An example of a distributed network structure, in which information (in the form of data-packets) gets routed to a destination, is the well-known internet, with its routers deployed on a global scale.

This approach aligns better with the needs of the automotive industry, where timely, structured, and formalized information delivery is crucial for various applications such as road safety, traffic management, and intelligent transport systems. Furthermore, machine-readable information, with metadata context and format information attributes, allows for on-the-fly data-field transcoding, should it be required. It thereby decouples the IT systems of the various stakeholders and can decouple the software lifecycles to the different stakeholders.

Correspondingly, we refer to the effective V2N2X operation of the different systems together as “interworking” or “interworking on service level”. This contrasts with the often quoted “interoperability demands” on device or radio protocol levels.

Continuing from this position, instead of “sharing” or “providing,” 5GAA suggest talking about **“publish and/or deliver information,”** and, when talking about “accessing” information, stakeholders should **“subscribe”** to relevant information services and **“receive information”** when needed.

A prerequisite for a publish/subscribe mechanism to work is that a given information provider registers a corresponding information category as an “information service”. This allows potential receivers of such information to subscribe to such an “information service” group. Again, the metadata fields can be used to describe such service groups, to filter information streams and to deliver only notifications of relevance to the subscribing receivers.

This generic publish/subscribe principle is already used with many business-to-business system integrations. And it is supported by standardized and payload agnostic carrier protocols such as Advanced Message Queuing Protocol (AMQP)<sup>2</sup>.

By just adding a further metadata field, an indication can be provided if a given information service is “public” or if that service requires a business subscription. In the case of a signed-up business service, the corresponding receiver subscription-identifier could go with the “information-service-subscribe” act. Meaning that the very same system approach can seamlessly advertise public and commercial information services. The delivery of business services to subscribed customers can, however, occur in direct relations.

This reframing emphasizes proactive, reliable, and context-aware delivery of information, rather than just (semi-)static data access. The list is not exhaustive but lays out the ground to properly frame the discussion with concrete terms that reflect the evolution of mindset in the automotive industry.

1. 5GAA Whitepaper [“Road Traffic Operation in a Digital Age: A Holistic Cross-Stakeholder Approach”](#).

2. [AMQP](#) (Advanced Message Queuing Protocol)

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## Types of Information and Operations

Different operational contexts demand tailored and scalable approaches that can support long-term, sustainable operations. For **first responders**, time-critical information flows are essential to ensure safety. In the field of **road safety**, consistent and trusted alerts must be provided to prevent accidents, and such safety-relevant information should be available free of charge as a baseline service to all road users, forming a kind of “public” service. For **traffic management**, dynamic information is required to optimise traffic flows and reduce road congestion, while advanced, value-added services for professional users can be offered on a subscription basis to support enhanced operations such as automated driving support. To achieve such **decentralised information** approaches — where data owners retain control and where information is published, subscribed to, and routed efficiently rather than being stored in a single central location — can provide scalability, resilience, and trust. Finally, **Intelligent Transport Systems (ITS)** depend on integrated, multi-modal information services to deliver seamless mobility solutions.

Illustrative cases show the value of this approach. For example, “**workzone data exchange**”<sup>3</sup> has been used to improve both safety and traffic efficiency. In addition, local pilot projects such as the NordicWay<sup>4</sup> initiative on cloud-based data exchange for road safety and the operational deployments in Belgium (Mobilidata<sup>5</sup>) and in the Netherlands Talking Traffic<sup>6</sup> programme enabling real-time traffic light information services, demonstrate the impact that timely, structured, and formalised information delivery can have when applied in real-world scenarios.

## Commonalities and Regional Differences

To ensure coherence and avoid fragmentation, it is important to build on existing global standards and protocols, recognizing that significant work is already available or underway. For example, major technology companies, such as Google, are actively promoting interface standards across the United States and internationally, meaning 5GAA, as an industry association, is not starting from scratch and should be aiming to build on what is already existing. While there are shared principles that can apply globally, local variations in regulatory frameworks, infrastructure maturity, and market structures necessitate flexible, global-region approaches. One example of this is the Advanced Message Queuing Protocol (AMQP)<sup>2</sup>, a payload-agnostic carrier protocol, recommended by European deployment projects C-Roads<sup>7</sup> for the IP based interface used for information sharing between backend systems (e.g. realized in the Belgium–Netherlands initiatives) and now also adopted by EUROCONTROL for its System Wide Information Management (SWIM) operations<sup>8</sup>.

At the same time, several challenges must be addressed. **Cost coverage** remains critical to ensure sustainable funding and viable business models. **System liability** requires clear rules on accountability for technical performance, while **content liability** is essential to build trust in the accuracy and quality of the information being published and delivered. This would mean that only trusted actors should get access to the information sharing network. End-consumers should only be served by those trusted actors.

3. Work Zone Data Exchange ([WZDx](#)).

4. [NordicWay](#).

5. [Mobilidata](#).

6. [DMI Ecosystem](#).

7. [C-Roads](#).

8. EUROCONTROL SWIM Technical Infrastructure Specification (14 July 2025)

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## Conclusion

By changing the language used and taking into account the operational and regional differences that are inherent, industry can take a clear position on a previously vague concept. We avoid the “my data” thinking and head towards “Are you connected to the ITS Information Network?”. From this concept, 5GAA has a role to play to ensure connectivity becomes an enabler for the scale-up of automotive connected mobility services. Moreover, local variations in regulatory frameworks, infrastructure maturity, and market structures necessitate close monitoring to avoid the emergence of regionally incompatible concepts. The above changes will guide the industry to be able to properly engage with policymakers and stakeholders from across the world clearly and proactively.

# 5GAA

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