



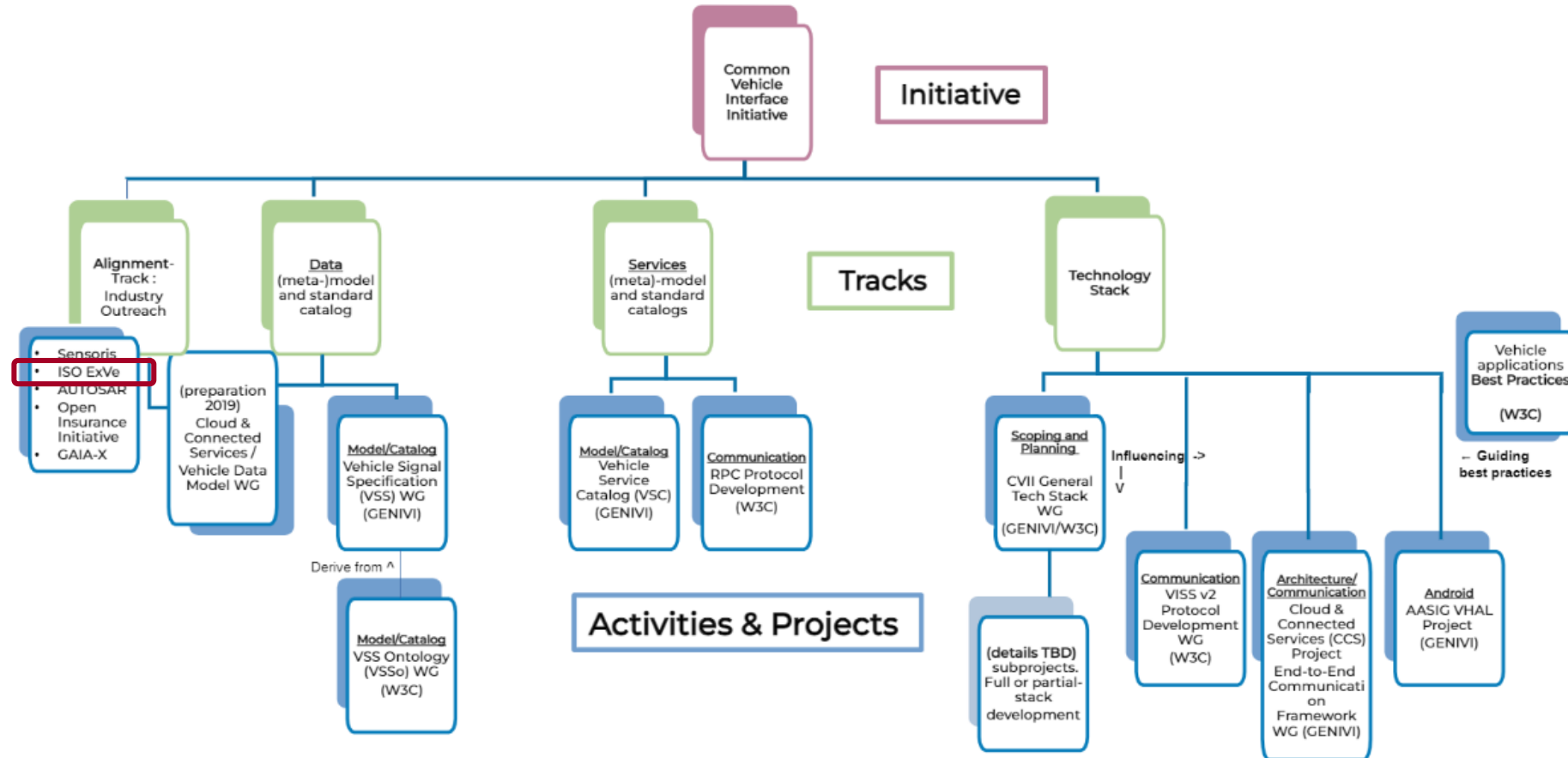
ISO Extended Vehicle (ExVe) – status and future

**@ Common Vehicle Interface Initiative (CVII)
Extended Working Session**

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Technology Planning Dept.
1st July 2021

ISO ExVe within CVII

- Same vision: Support multi-brand use case services with independent vehicle data descriptions on semantic level



Source: GENIVI CVII Working Session

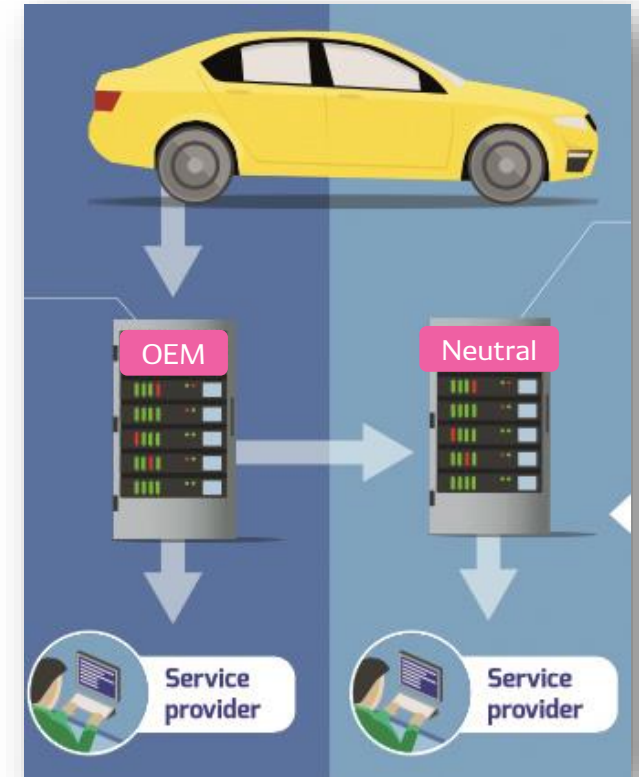
Extended Vehicle (ExVe)

In scope

- providing a system design, guidelines and requirements to allow external parties retrieval of OEM vehicle data through web services
- supporting data access to registered, authenticated and authorized parties
- server based API, supporting a reusable data format

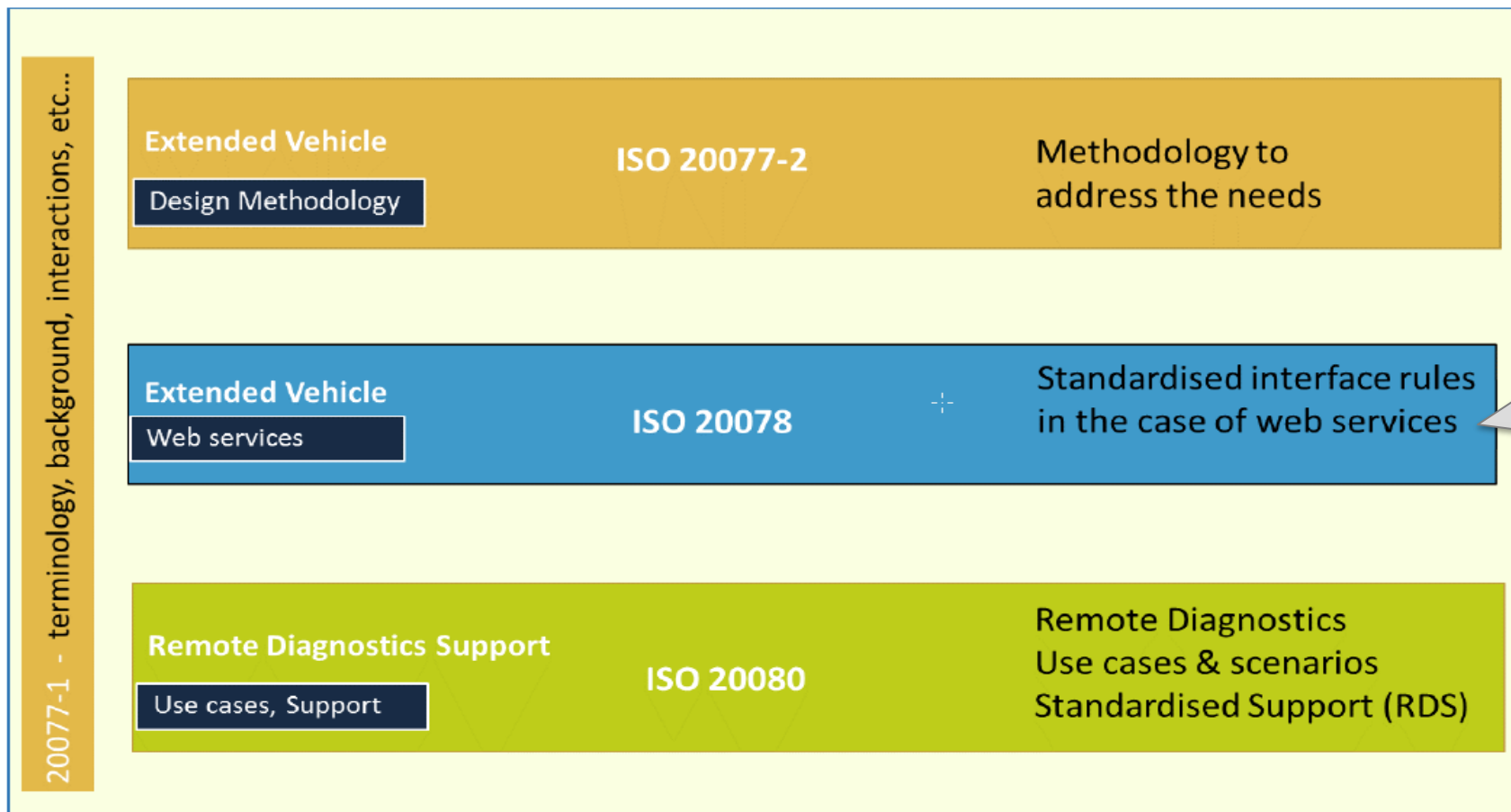
Out scope

- specific hardware system
- In-vehicle data collection
- specific vehicle data, data model or data ontology



Source: <https://www.cardatafacts.eu/vehicle-data-available-service-providers/>

Extended Vehicle ISO Standards



Source: ISO 20077-1

Current:
DIS ISO 20078
2nd Edition

Outlook:
Publication of
ISO 20078
2nd Edition
expected
around EoY21

ISO 20078 Overview

20078-1: ExVe **Content** (terms and definitions, resource types, overview protocol stack)

20078-2: ExVe **Access** (HTTP, URLs, REST)

20078-3: ExVe **Security** (roles, OAuth 2.0/OpenID connect)

20078-4: ExVe **Control** (preconditions and logical processes)

ISO 20078 technology stack

Transport Protocol	HTTP 1.1 (or later version) over TLS 1.2 (or later version)
Service Design	RESTful
Data format	JSON (recommended)
	XML
Authorization	OAuth 2.0 (or later version) compatible framework
End User Authentication	An OpenID Connect 1.0 (or later version) compatible framework

Source: ISO 20078-1

Updates in ISO 20078 - 2nd Ed.

- **Push messaging**
 - Additional to traditional request/reply
 - Offering Party (OEM) sends resources (vehicle data) to Accessing Party (Service Provider) on fulfilled condition, e.g. a DTC becomes active
- **Advanced error messaging**
 - Specific and uniform server side supported response status code for clients, e.g. "exveErrorMsg": "Your request timed out (limit: 120s)".
- **Container Management API**
 - Container = a set of resources configured by the Accessing Party, e.g. "odometer + level fuel tank"
 - Possible operations: Creation, deletion, listing and changing of Containers
 - Specification: OpenAPI 3.0

Players on the pitch

* Currently active participants in ISO 20078 Standardization



Necessity for an open and standardized access to an in-vehicle data approach is recognized beyond all major OEM & Tier-1



Implementations

Mercedes-Benz /developers

- APIs
- SDKs
- CONTACT
- INSPIRE
- WHAT'S NEW
- LOGIN

Experimental Connected Vehicle API 1.0

Tryout URL: <https://api.mercedes-benz.com/experimental>
Production URL: <https://api.mercedes-benz.com/experimental>

An experimental Connected Vehicle API that allows to request vehicle data from a simulator.

Schemes:

Vehicles Provides information about vehicles.

BMW GROUP THE NEXT 100 YEARS

Innovation

HOW CARDATA WORKS.

Ford Dev

ABOUT APPLINK™ OPENIC FAQS NEWS & EVENTS BLOG

Early Access to Ford Connected Vehicle APIs Offered to FordDev Community!

FordDev is excited to announce the availability of the first Ford Connected Vehicle APIs to our global community. These APIs will allow developers to integrate remotely with Ford and Lincoln connected vehicles directly through the embedded modem.

These new APIs are a tremendous step forward in the evolution of the Ford Connected Vehicle ecosystem. Ford has enabled developers to connect drivers when they're in the vehicle through the use of our popular Applink APIs (built on the open source SDL platform) since 2013, and now we're adding the ability to access the vehicle remotely to create features and experiences beyond the vehicle and into the daily lives of Ford owners.

Why choose HIGH MOBILITY

When you choose to work with HIGH MOBILITY you are working with developers who know where you're coming from.

Become part of an engaged community

We are car data pioneers

We're the team who first built connected car apps for Jaguar Land Rover and Fiat Chrysler Group and has been an innovation partner for many others. Now it's your turn to work with us!

CARUSO dataplace

HOME SUCCESS STORIES PRICING DEVELOPER ZONE ABOUT & CONTACT

MARKETPLACE LOG IN

otonomo

Guides API Reference

v1.1 > Guides > Otonomo Full Attributes List

Getting Started

API Overview

Increasing number of ExVe-APIs by OEMs and Service Providers available

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Discover everything you need to know about our simplified and powerful API, how we protect personal data, which data items we offer, and how to consume our data. Check out our [Developer Portal](#) to integrate in-vehicle data into your solutions. In case you have any questions, we would be happy to hear from you.

Audi

Extended Vehicle Data

Überblick Fahrzeugnutzer Serviceprovider Onboarding Guide Nutzungsbedingungen

Attribute names are determined according to three tiers:

1. **Category** – the frame of reference. For example: Vehicle, Mobility, Environment, Driver
2. **Element** – a component of the category. For example: Engine (in the Vehicle category), Speed (in the Mobility category)
3. **Specific** – a description of the element. For example: Temperature (of the Engine), Average (of the Speed)

Each data attribute is a unique trio, separated by two underscores ("_").

Some examples:

- Vehicle_Engine_Temperature - The current temperature of the vehicle's engine
- Environment_External_Temperature - The current air temperature level outside of the vehicle (ODB-II-PID:46) in celsius.
- Mobility_Speed_Value - The vehicle's current speed in Km/h (ODB-II-PID:0D)

Categories description

category	description
vehicle	Current status of the vehicle parts
mobility	Vehicle movement characteristics. e.g speed, acceleration
metadata	data about our data. e.g the time a data point was sampled
manufacturer	manufacturer specifications. e.g make, model, year, recommended tire pressure
location	Location data. e.g longitude, altitude
maintenance	current maintenance issues. e.g DTCs, time to next service

ISO ExVe data model

- Reminder: ISO ExVe does not provide any kind of data model
- Q2/2020: ISO TC22/SC31/WG6 informal sub-group “data and functions description” established
- Motivation: Investigate the development and/or integration of a common data model / data description / data dictionary
- Status: Scope not clarified, first draft available
 - “[...] establish the reference definitions of the data generated by a vehicle that can be used within the framework of a digital service [...]. It also provides a standardized way of describing the parts of the vehicle.”
 - “[...] not intended to define a standard machine-readable format for the vehicle data nor to define the data list to be exposed to the vehicle interface by the manufacturer.”

ISO ExVe and VSS

Idea: Extend ISO 20078 (Web Interface) by reference to VSS through tagging or mapping

JSON format example **tagging**

- Ex. 1: „vehicleId“ : {„value“:„WDB96340310150924“, „ref“:„VSS.VehicleIdentification.VIN“)
- Ex. 2: „dtcSnapshotParameters“: [{“id“:“Odometer“, “value“:“14144.0“, “unit“:“km“, “ref“:“VSS.OBD.Status.Odometer“}, ...]

JSON format example **mapping**

- „vehicleId“ : {„value“ : „ WDB96340310150924“)
- „VSS.VehicleIdentification.VIN“ : „vehicleId“

What do you think is necessary to make use of VSS as potential data model or standard catalog in ExVe?

DENSO

Crafting the Core