A NEUTRAL AND SECURE APPROACH FOR ACCESSING IN-VEHICLE DATA FOR 3RD PARTY SERVICES.

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GENIVI AMM | April 18th, 2018
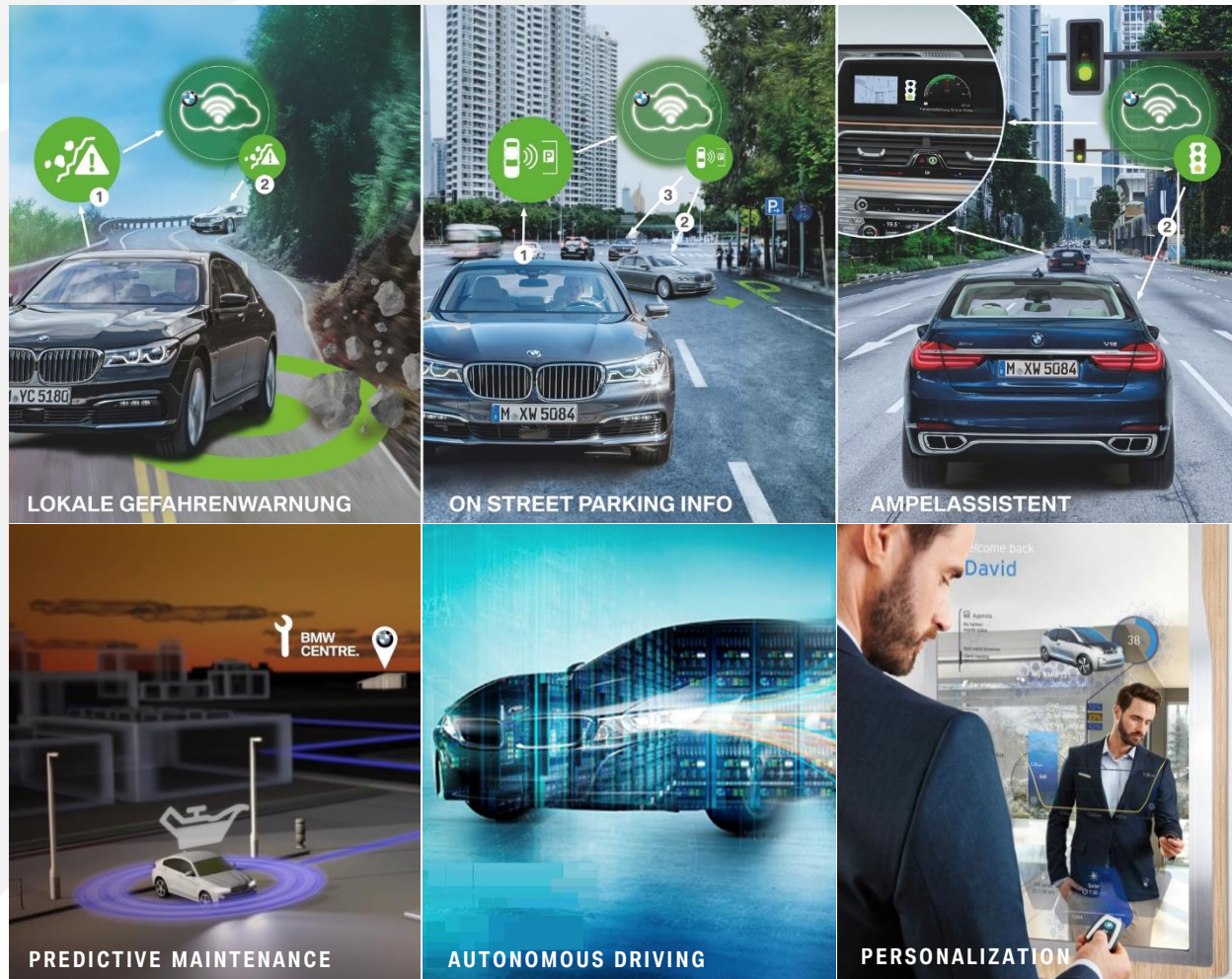
BMW GROUP

THE NEXT 100 YEARS

BMW   MINI

AGENDA.

1   Motivation: Sharing In-Vehicle Data.

2   Possible Alternatives for Accessing In-Vehicle Data.

3   VDA NEVADA – Share & Secure.

4   First solution following the extended vehicle approach: BMW CarData.

1
MOTIVATION: SHARING IN-VEHICLE DATA.

VEHICLE GENERATED DATA ARE ENABLING NEW DIGITAL SERVICES IMPROVING SAFETY, EFFICIENCY AND COMFORT.

LOKALE GEFAHRENWARNUNG

ON STREET PARKING INFO

AMPELASSISTENT

PREDICTIVE MAINTENANCE

AUTONOMOUS DRIVING

PERSONALIZATION

— More **safety** and more **efficiency** on the road.

- For **connected foresight** sensor data is essential.
- **Training data** from vehicle sensors are the basis of **machine learning** for autonomous driving.

— More **reliable** travel and **better planning** of garage visits.

- Vehicle data signals **service requirements** at an early stage.

— Recognize and fulfill **individual needs.**

- Data as a basis for **personalized functions**.

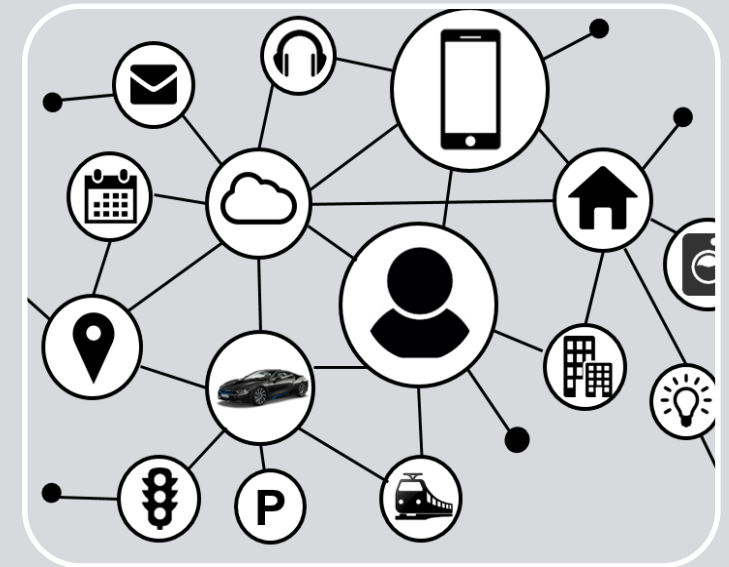▶ **Data Security and Privacy are Top Priority!**

THERE ARE MANY REASONS FOR SHARING DATA.

Secure Backend

General inspection

Coolant temperature
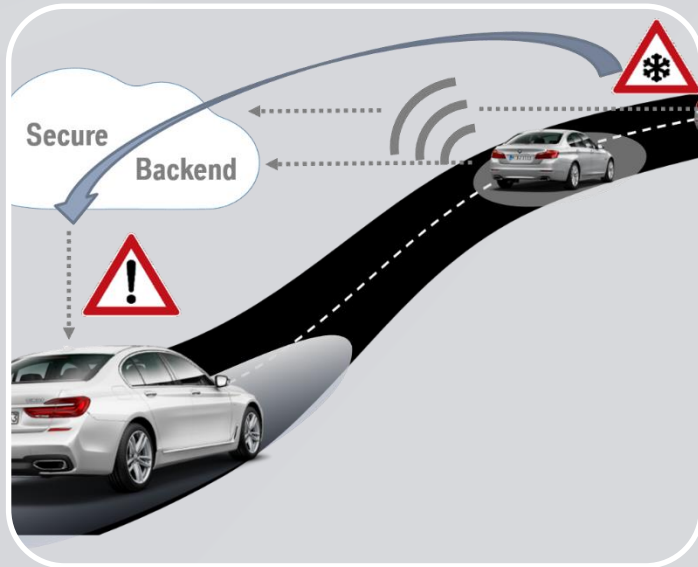
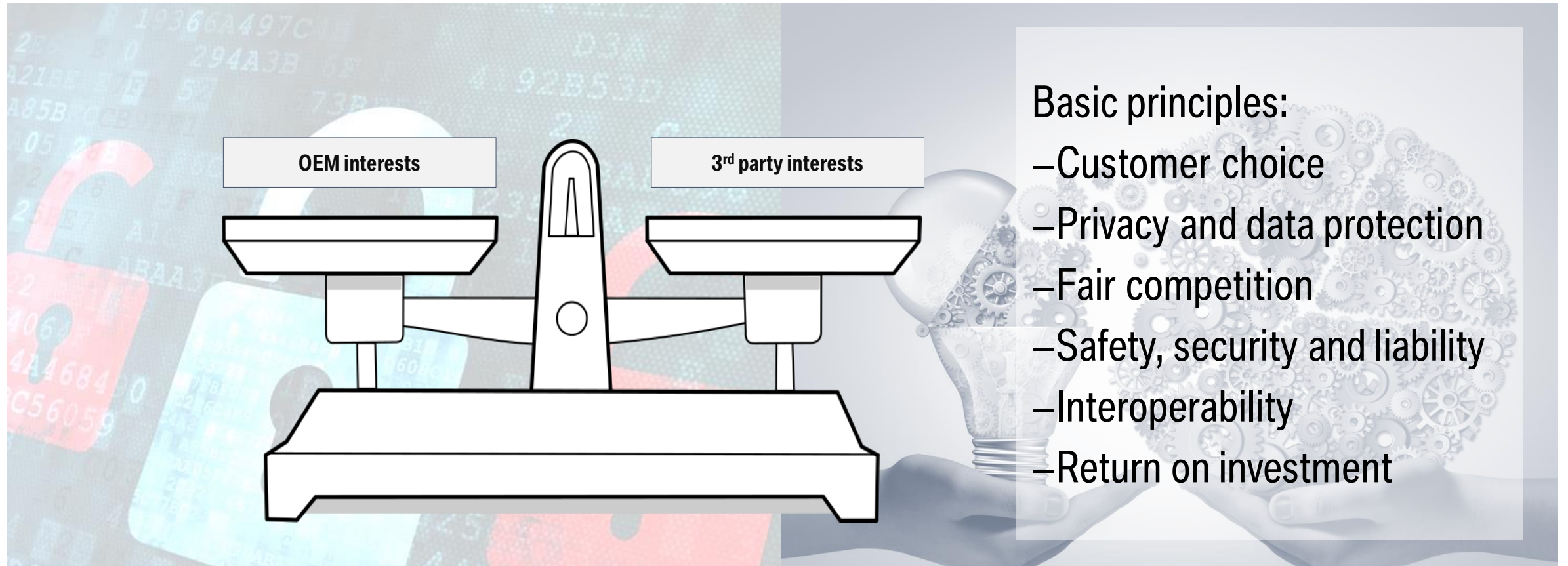**Improving Driver Assistance Systems**
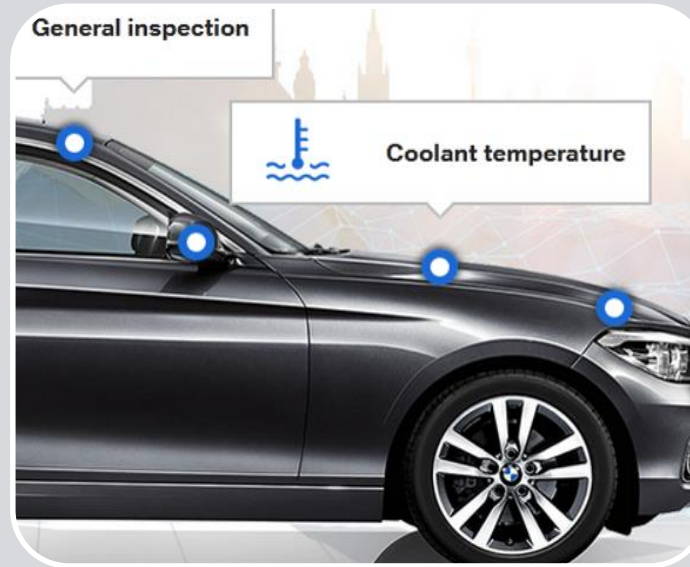
Repair and Maintenance Services

General Digital Services

ACCESS TO VEHICLE GENERATED DATA BY THIRD PARTIES.
DATA SECURITY AND PRIVACY FIRST - BUSINESS FOLLOWS.

OEM interests

3rd party interests

Basic principles:
- Customer choice
- Privacy and data protection
- Fair competition
- Safety, security and liability
- Interoperability
- Return on investment

OEMs and 1st tier suppliers within **VDA** (Verband der Deutschen Automobilindustrie) as well as within **ACEA** (European Automotive Manufacturers Association) and **CLEPA** (European Association of Automotive Suppliers) worked together on a concept meeting these basic principles.

AUTOMOTIVE SECURITY IS ORGANIZED IN PROTECTIONS LAYERS WHICH EXTEND FROM THE VEHICLE VIA THE IT-BACKEND TO EXTERNAL PARTNERS.

Vehicle

Protection layer vehicle interfacees

Protection layer vehicle network

Protection layer ECU level
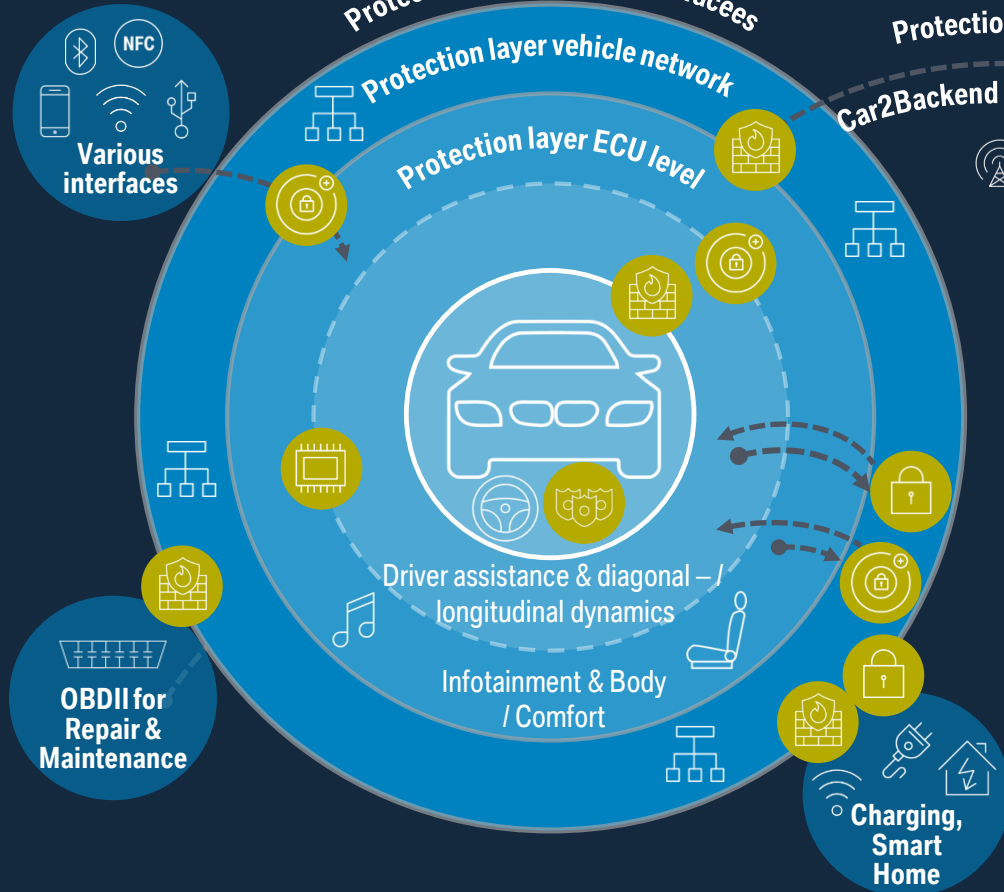
Protection layer

Car2Backend Connectivity

BMW IT Backend

Protection layer IT-Backend

Various interfaces

Driver assistance & diagonal – l longitudinal dynamics

Infotainment & Body / Comfort

OBDII for Repair & Maintenance

Charging, Smart Home

Connected Mobility Backend

IT-Backend

ADAS Backend

Extended Vehicle ISO 20078

Mobile Apps

External partners

Neutral Server

Legend:

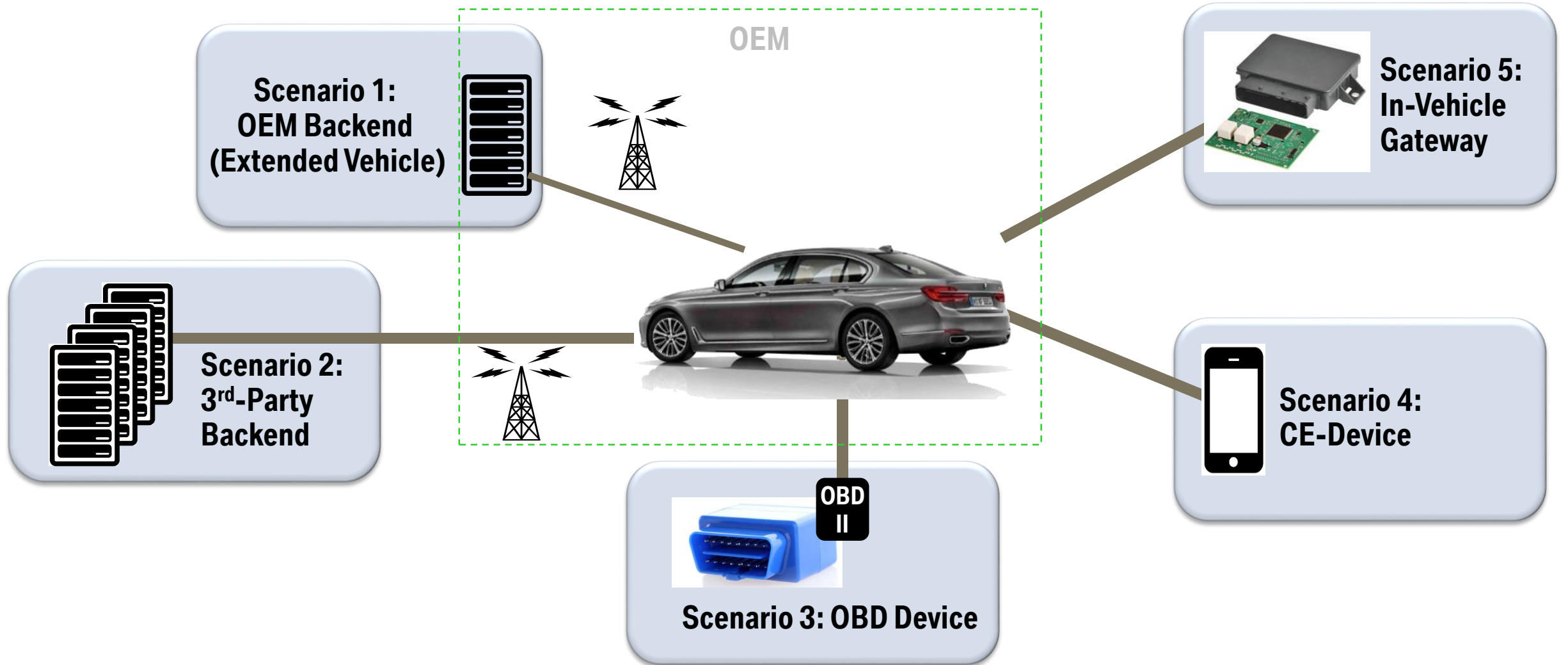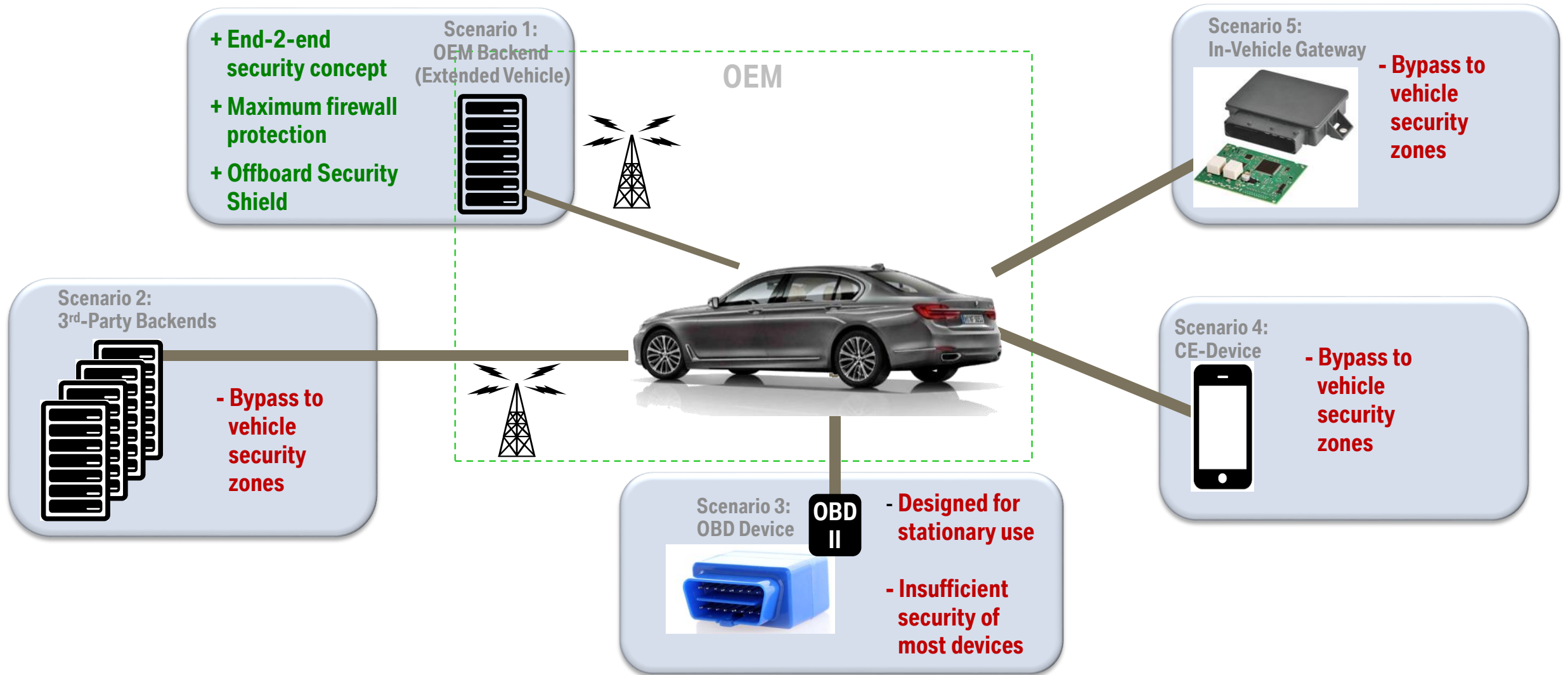|			
Secure Storage	Secured connection	Functional separation	Firewall
Key Management	Secure ECU	Security Base Protection	

2
POSSIBLE ALTERNATIVES FOR ACCESSING IN-VEHICLE DATA.

POSSIBLE ALTERNATIVES FOR ACCESSING IN-VEHICLE DATA.
OVERVIEW.

OEM

Scenario 1:
OEM Backend
(Extended Vehicle)

Scenario 2:
3rd-Party
Backend

Scenario 3: OBD Device

OBD II

Scenario 5:
In-Vehicle
Gateway

Scenario 4:
CE-Device

EVALUATION OF THE DIFFERENT SCENARIOS.
SAFETY AND SECURITY.

Scenario 1:
OEM Backend (Extended Vehicle)

+ **End-2-end security concept**
+ **Maximum firewall protection**
+ **Offboard Security Shield**

OEM

Scenario 5:
In-Vehicle Gateway

- **Bypass to vehicle security zones**

Scenario 2:
3rd-Party Backends

- **Bypass to vehicle security zones**

Scenario 4:
CE-Device

- **Bypass to vehicle security zones**

Scenario 3:
OBD Device

OBD II

- **Designed for stationary use**
- **Insufficient security of most devices**

EVALUATION OF THE DIFFERENT SCENARIOS.
RESPONSIBILITY AND LIABILITY.

OEM

Scenario 1:
OEM Backend
(Extended Vehicle)

+ **clear**

Scenario 5:
In-Vehicle Gateway

- **unclear**

Scenario 2:
3rd-Party Backends

- **unclear**

Scenario 4:
CE-Device

- **unclear**

Scenario 3:
OBD Device

OBD II

- **unclear**
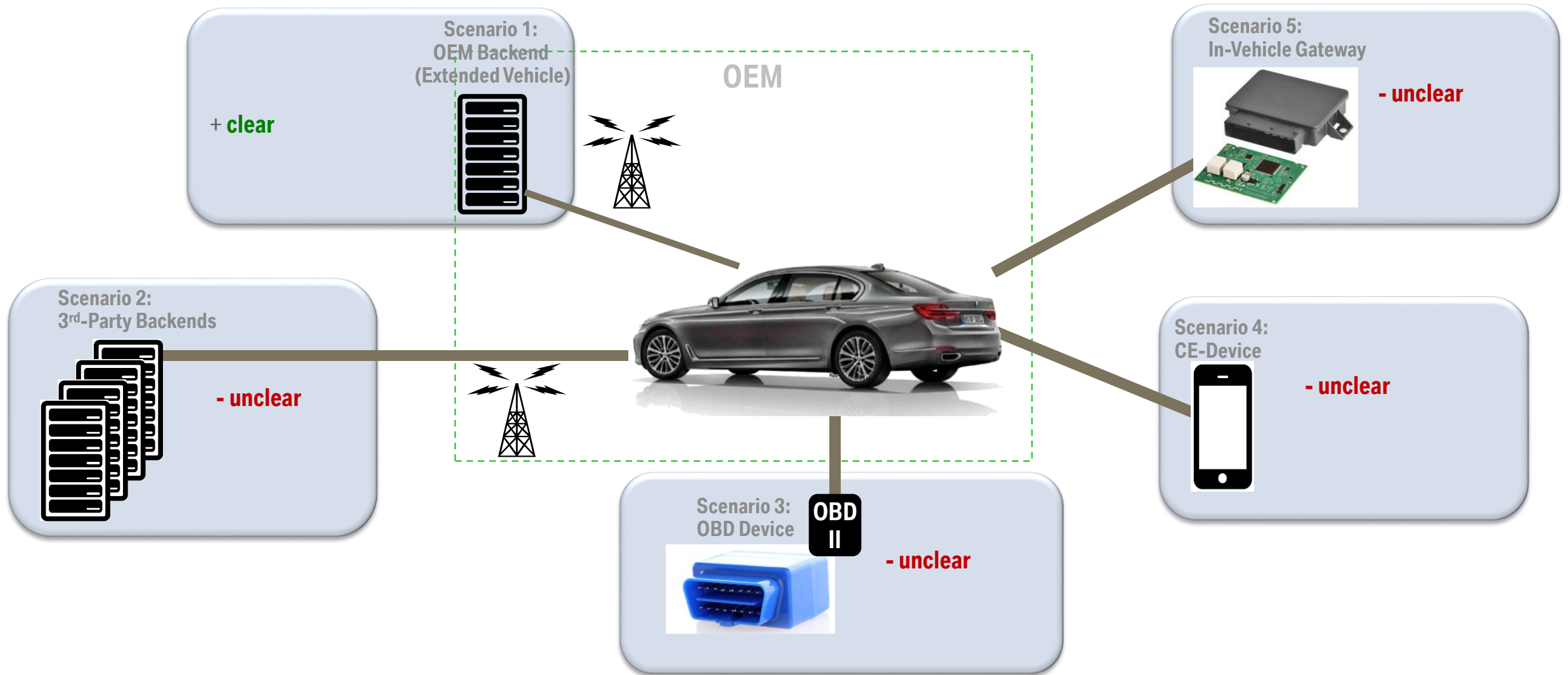
EVALUATION OF THE DIFFERENT SCENARIOS.
EASE OF ACCESS AND NON-DISCRIMINATION.

Scenario 1:
OEM Backend
(Extended Vehicle)

+ Unlimited 3rd parties
+ No automotive know-how
+ No hardware
~~- No anonymity~~
+ Anonymity via Neutral Server

OEM

Scenario 5:
In-Vehicle Gateway

- Limited 3rd parties

Scenario 2:
3rd-Party Backends

- Detailed automotive know-how
- Vehicle variety

Scenario 4:
CE-Device

- Specific vehicle option
- Specific customer device

Scenario 3:
OBD Device

OBD II

- Only one 3rd party

3
VDA NEVADA – SHARE & SECURE.

ACCESS TO IN-VEHICLE DATA.
CORE ELEMENTS OF THE VDA NEVADA – SHARE & SECURE CONCEPT.

1. Safe, Secure, and Fair Access to In-Vehicle Data
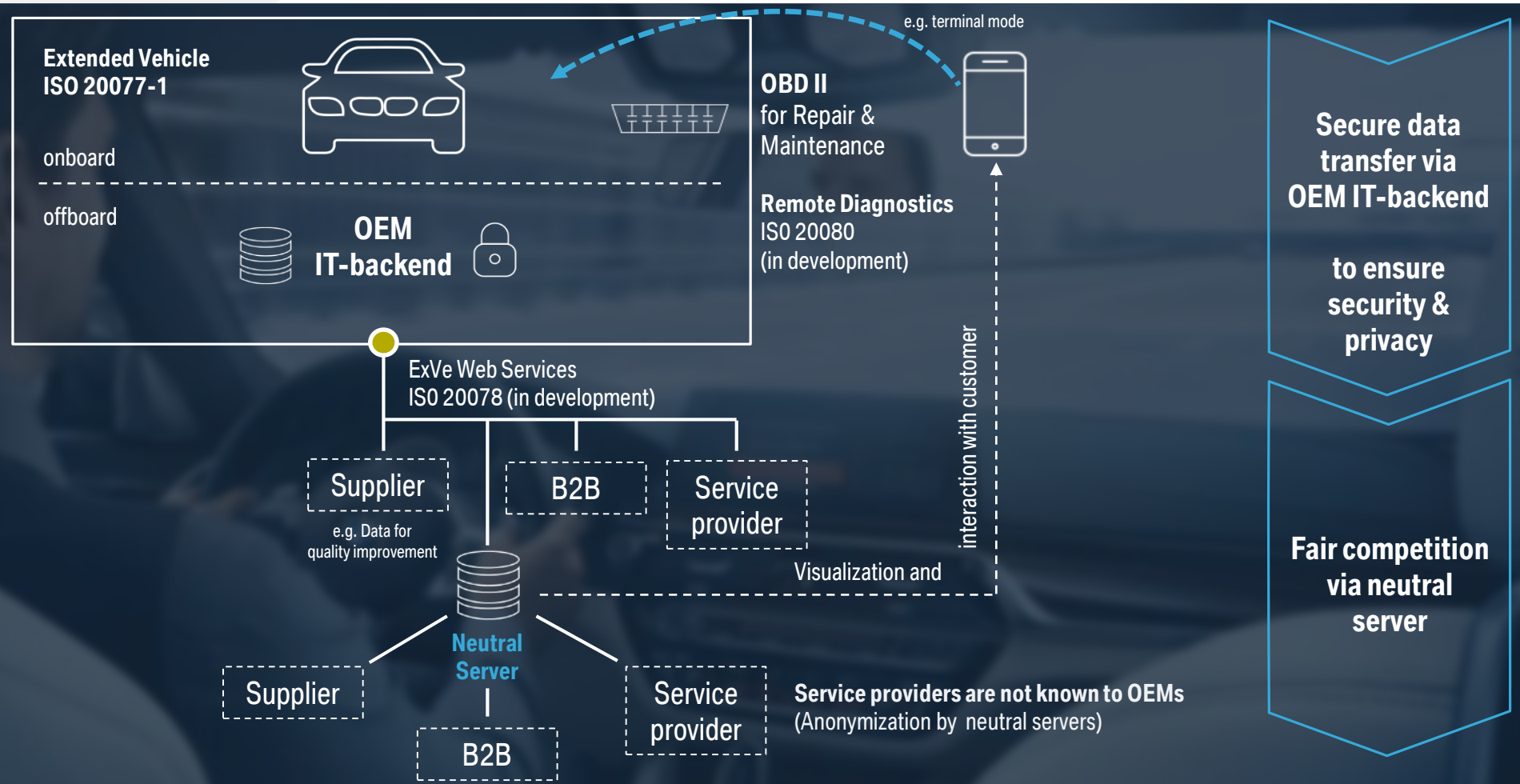
2. Use Case Categories

3. Demonstration of Operational Capability through Proof-of-Concepts

NEVADA: Neutral Extended Vehicle for Advanced Data Access

NEVADA – SHARE & SECURE COMBINES THE EXTENDED VEHICLE WITH NEUTRAL SERVERS TO GUARANTEE FAIR COMPETION AND NON-DISCRIMINATION.

Extended Vehicle ISO 20077-1

onboard

offboard

OEM IT-backend

e.g. terminal mode

OBD II for Repair & Maintenance

Remote Diagnostics ISO 20080 (in development)

ExVe Web Services ISO 20078 (in development)

Supplier

e.g. Data for quality improvement

B2B

Service provider

interaction with customer

Visualization and

Neutral Server

Supplier

B2B

Service provider

Service providers are not known to OEMs (Anonymization by neutral servers)

N eutral
E xtended
V ehicle for
A dvanced
D ata
A ccess

Share & Secure

Secure data transfer via OEM IT-backend

to ensure security & privacy

Fair competition via neutral server

USE CASE CATEGORIES.

B2B Agreement between OEM and 3rd Party				
Customer Consent				

Category 1	Category 2	Category 3a	Category 3b	Category 4
Data for improved traffic safety	**Data for cross brand services**	**Data for brand specific services**	**Data for component analysis and product improvement**	**Personal data**
Traffic safety relevant data	None differentiating vehicle data	Vehicle data differentiating and IP relevant for OEM	Vehicle data differentiating and IP relevant for OEM and supplier	"Right of access" granted only to the parties authorized to process data by law, contract or consent
Fire Department, Police, 911, …	Product	Dealer, Subsidies	Product	Customer

Available to 3rd parties	Limited availability to 3rd parties	Available to 3rd parties

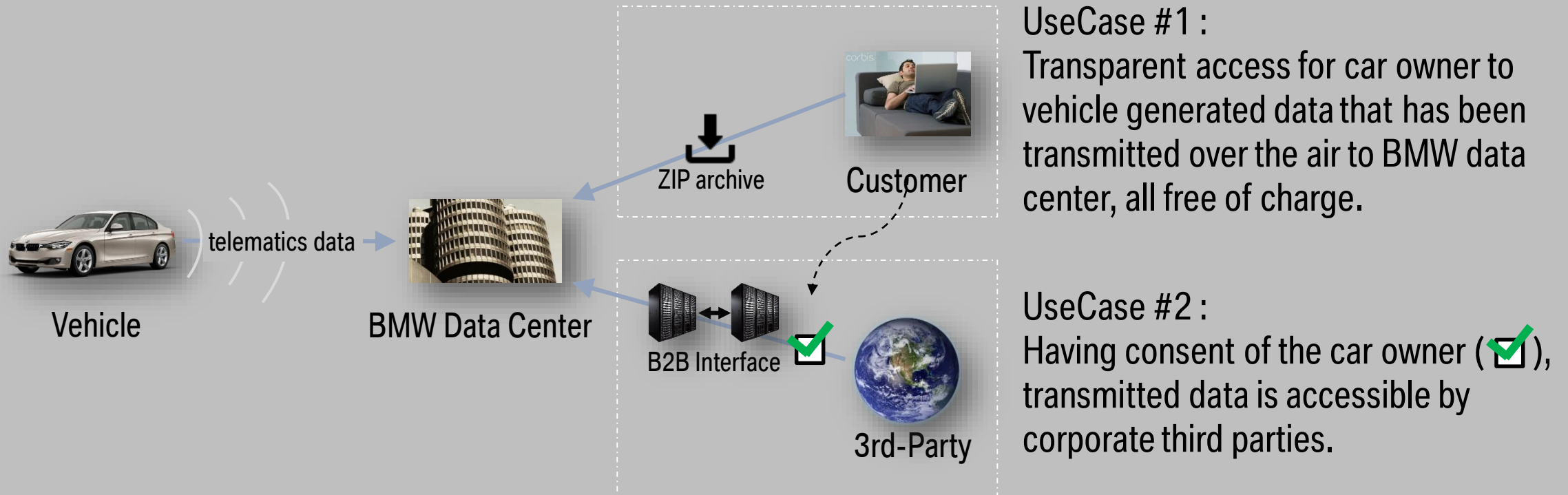# PROOF-OF-CONCEPTS OF THE NEUTRAL SERVER CONCEPT.
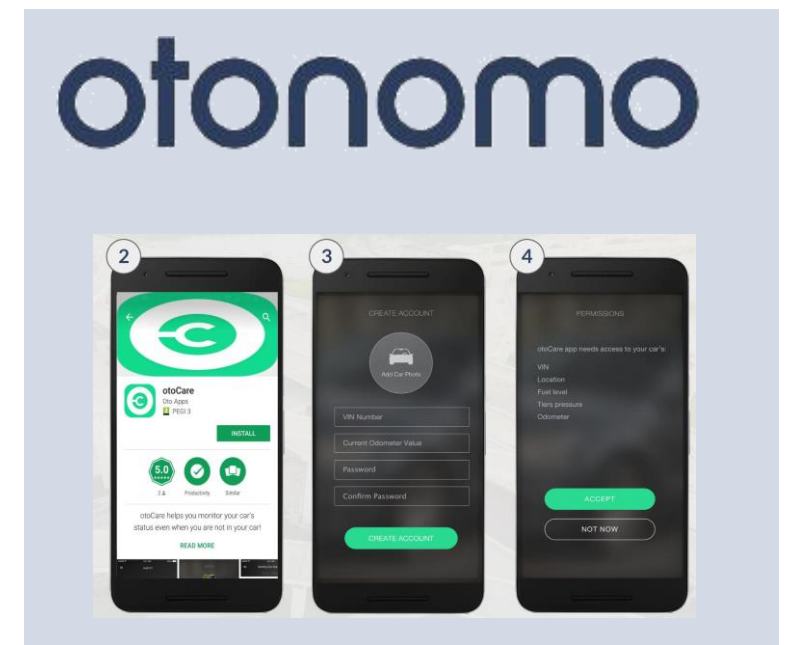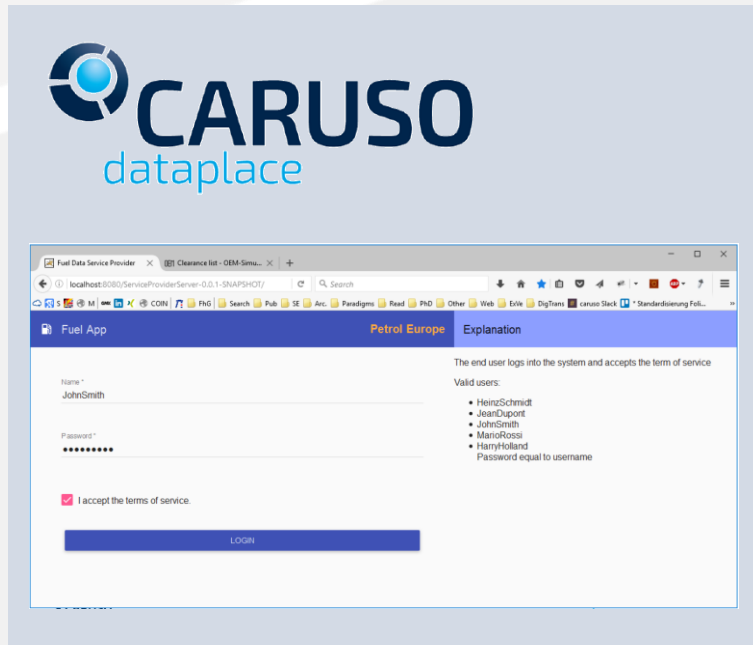
- Proof-of-Concept implementations of Neutral Servers by independent parties.
- Different Use Cases to demonstrate overall concept and customer consent process.
- Open for large number of Neutral Servers to promote competition and diversity.
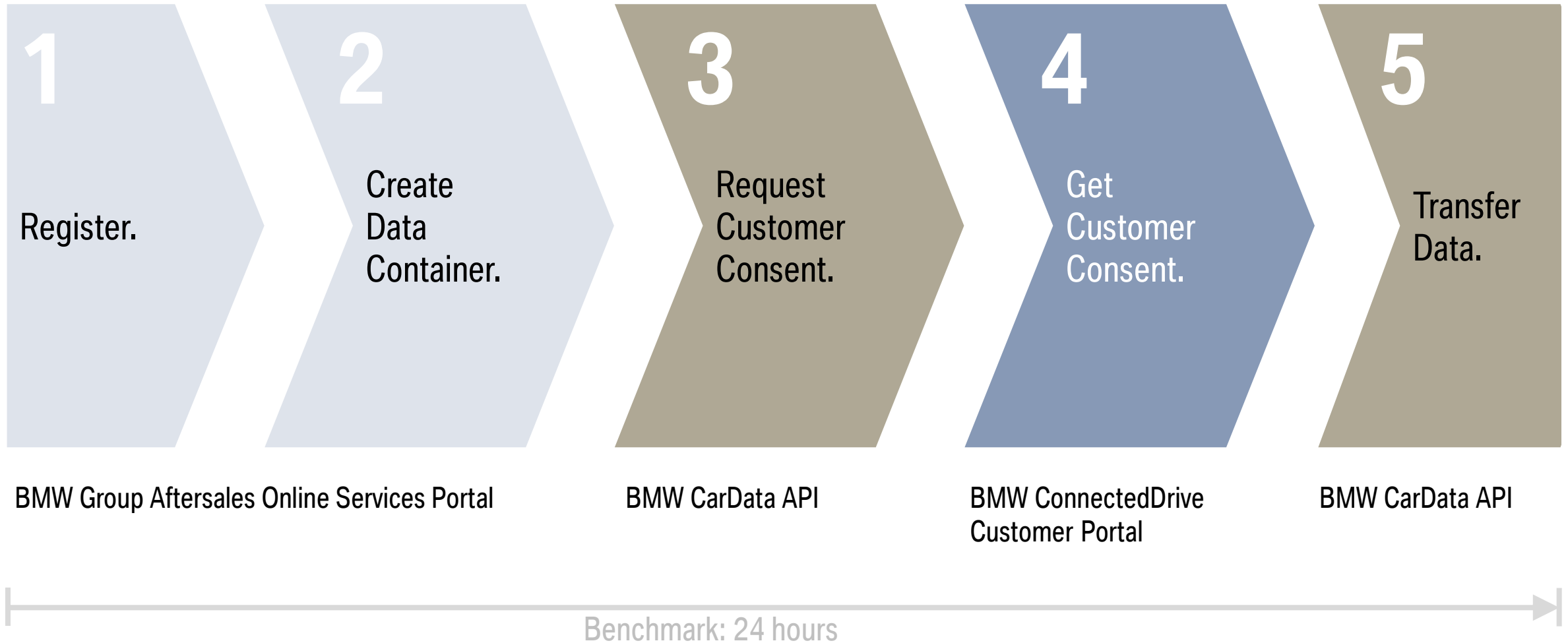
4

FIRST SOLUTION FOLLOWING THE EXTENDED VEHICLE APPROACH: BMW CARDATA.

BMW CARDATA: THE BMW IMPLEMENTATION OF THE EXTENDED VEHICLE.
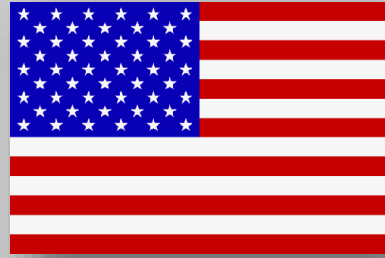## TRANSPARENCY AND PORTABILITY REGARDING TELEMATICS DATA.

ZIP archive

Customer

Vehicle

telematics data

BMW Data Center

B2B Interface

3rd-Party

UseCase #1 :
Transparent access for car owner to vehicle generated data that has been transmitted over the air to BMW data center, all free of charge.

UseCase #2 :
Having consent of the car owner (✓), transmitted data is accessible by corporate third parties.

BMW CARDATA.
NON-DISCRIMINATORY ACCESS FOR THIRD PARTIES.

1	2	3	4	5
Register.	Create Data Container.	Request Customer Consent.	Get Customer Consent.	Transfer Data.
BMW Group Aftersales Online Services Portal		BMW CarData API	BMW ConnectedDrive Customer Portal	BMW CarData API

Benchmark: 24 hours

BMW CARDATA.
NEXT STEPS.

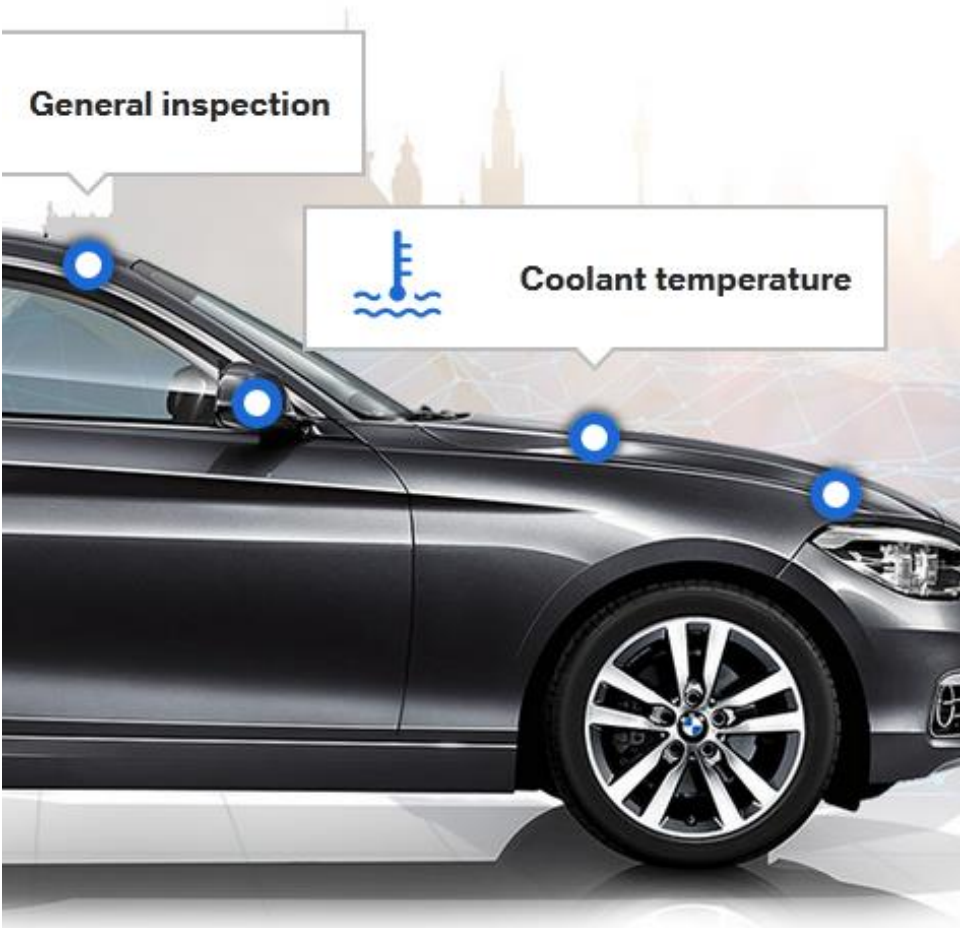| Rollout EU	Rollout USA	MINI CarData	Additional Features
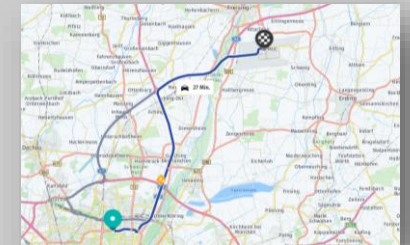
Updates while driving
High-frequency data
Additional data
…

BMW CARDATA.
SUMMARY OF BENEFITS AND ADVANTAGES FOR 3RD PARTIES.

- No hardware expenses, no integration costs.

- Integrated end-to-end security concept from vehicle to backend.

- No cooperation with BMW required (100% self registration process).

- Non-discriminating:
  - Available for all European companies, no restrictions regarding industrial sector or use case.
  - Data of a given vehicle is available to an unlimited number of 3rd parties (in contrast to dongle solutions).
  - Access via standard web-interfaces, no automotive know-how required.

THANK YOU FOR YOUR ATTENTION.

Q&A

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We are hiring: https://www.bmwgroup.com/de/karriere.html
Specialists (m/f) Data Management and Data Governance

A Neutral and Secure Approach for Accessing In-vehicle Data for 3rd Party Services | BMW Group | April 18th, 2018

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