

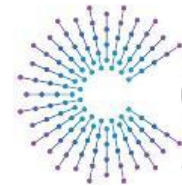


Commercial Vehicle Birds of a Feather

A standards-based approach to vehicle fleet telematics data to build a modern transportation ecosystem for all stakeholders.

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COVESA

Accelerating the future of connected vehicles

BoF Kickoff Agenda

1

The context:

why commercial customers need consistent data to manage their vehicle fleets

2

The approach:

An agreed “best practices” recommendation to be applied by the ecosystem

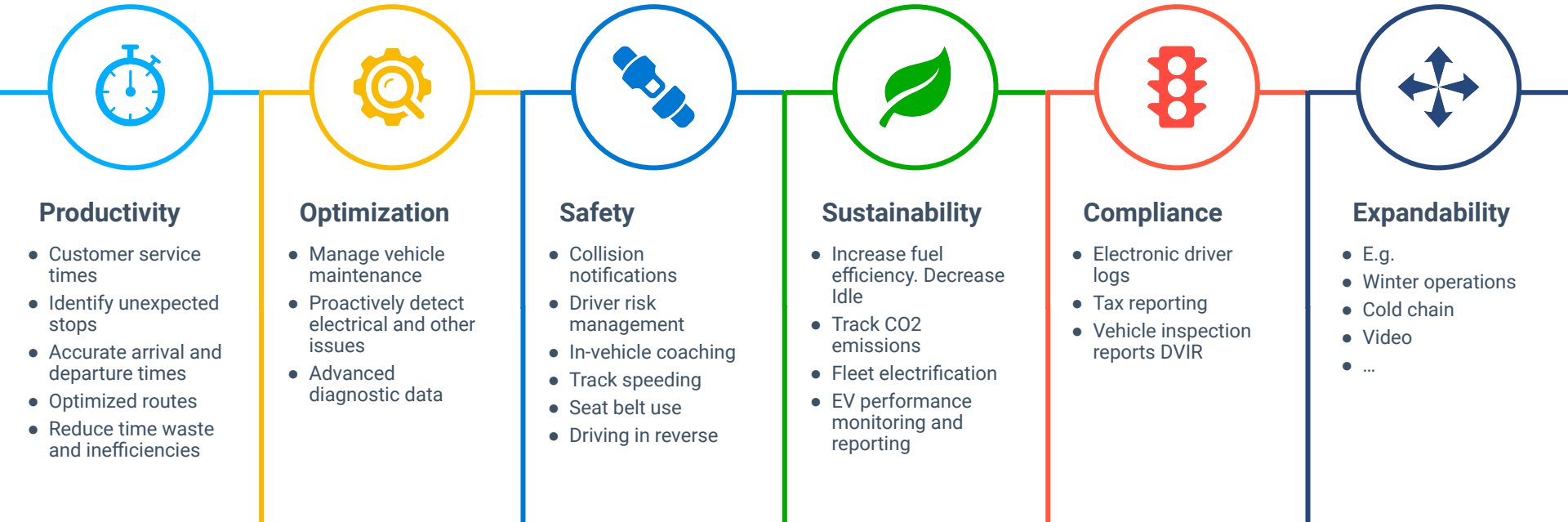
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The benefits:

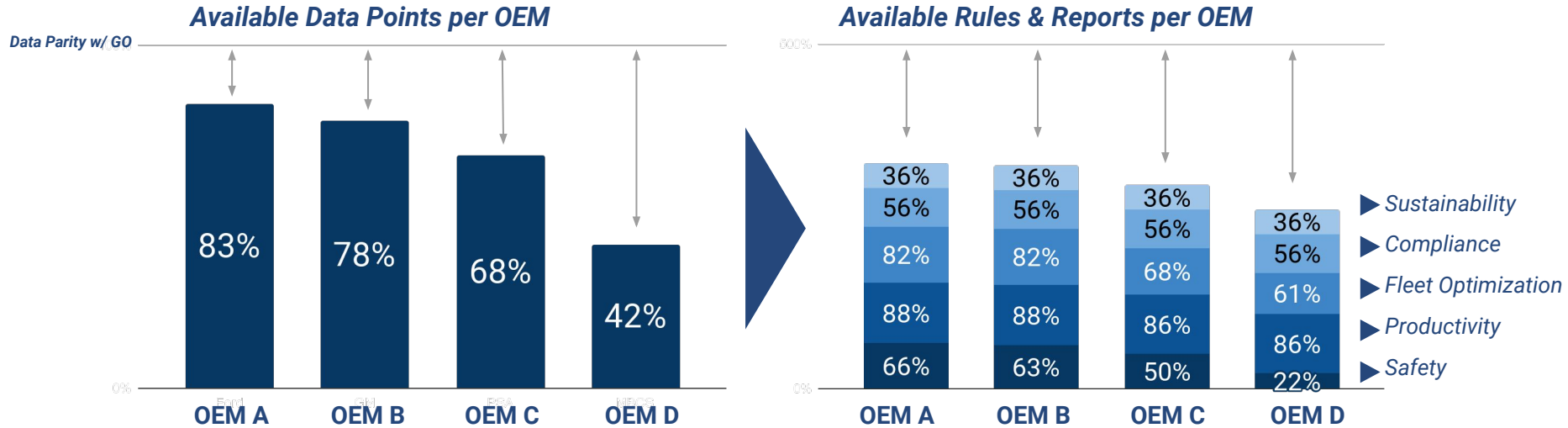
Value added products, reduced integration efforts, value for all stakeholders

Commercial Fleets Run on Data

As data drives their businesses, they have come to rely on and will increasingly require reliable, secure, high quality information platforms

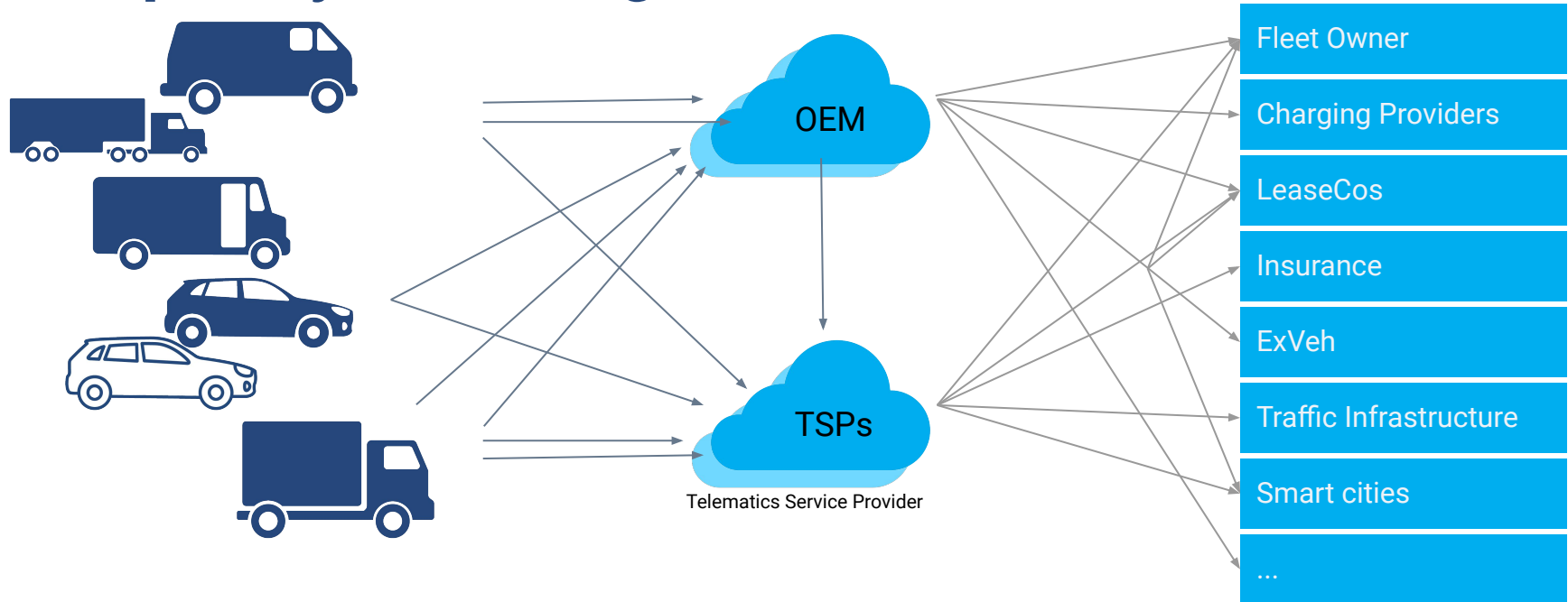


The Issue: OEM data currently not suited for all use cases and different across OEMs



To make best possible use of the OEM data, it has to match the data (in quantity and quality) generated by aftermarket devices (including bi-directional communication!)

Today: Not leveraging the value of data, but creating complexity with integration efforts



Different types, makes, model,
years - and data

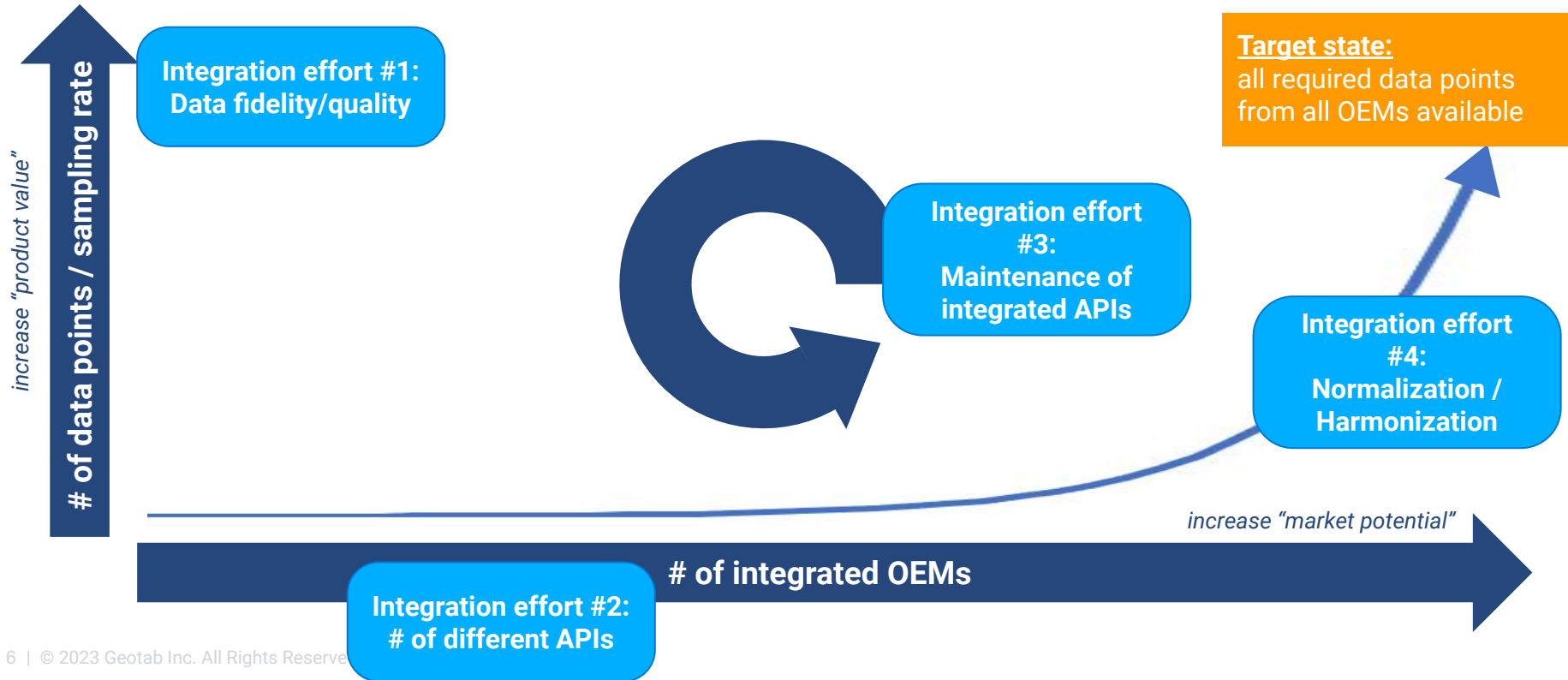
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Multiple OEM and TSP
clouds

X

Multiple data users

Result: enormous efforts to integrate and maintain OEM APIs - not value adding for customers

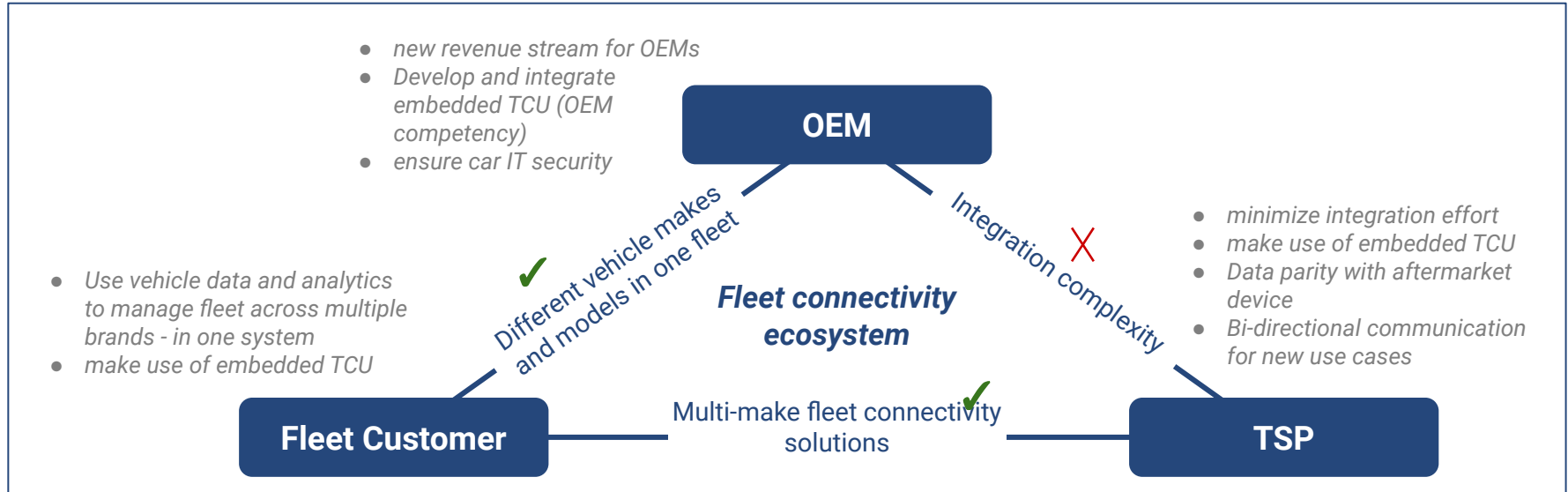


In 2016, McKinsey Report predicted \$750 Billion/year revenue for Telematics by 2030

Data monetization: The missed gold rush of the software-defined vehicle

- Offered services were not interesting enough to the customer because user experience was tedious. Applied remedy: bundle telematics into vehicle sales
- **Despite numerous reorgs** most OEMs have not restructured their business for information revenue streams
- Solutions are one-offs. Scaling across partners or better across OEMs is not established leading to fragmented solutions.

Complexity reduction by using standards for non-differentiating and non-competitive tasks



For a **seamless** and **value-adding product offering** in an **ecosystem**, interfaces between parties should be **frictionless and interoperable** based on agreed **standards and best practises**

“Agreed best practice” approach enables revenue generation, innovation and customer satisfaction

OEM & Supplier

- ✓ **collect and provide** the right data for their customers’ needs, more efficiently (lower bandwidth and cloud storage)
- ✓ Safeguard future **vehicle sales** (customers demand data)
- ✓ **lower product development and integration costs** with standardized solutions

Fleet Customer

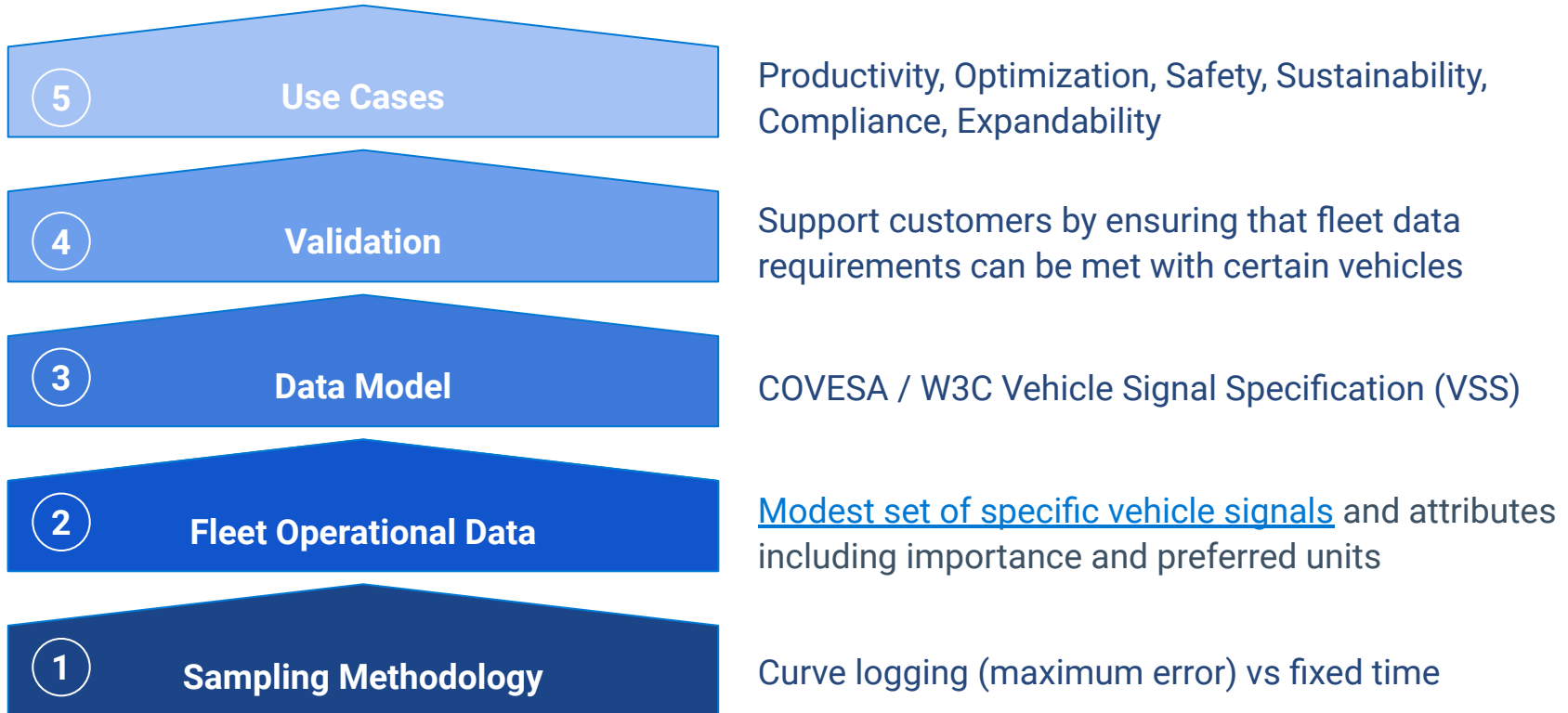
- ✓ get access to similar **data / frequency across brands**
- ✓ **improve their productivity, safety, sustainability, regulatory compliance and grow their business**
- ✓ **Interoperability** with other systems, beyond Fleet Telematics (e.g. ins, roadside assistance, fuel card, ...)

TSP

- ✓ more pertinent insights and services for (the whole) fleet with the right data
- ✓ **Less investment** in API integration
- ✓ **New product** creation based on easy shareable data
- ✓ **Easier support** leads to better customer experience

easier for any prospective partner to **join the ecosystem** and to integrate with and consume data - robust **data marketplace** for all parties

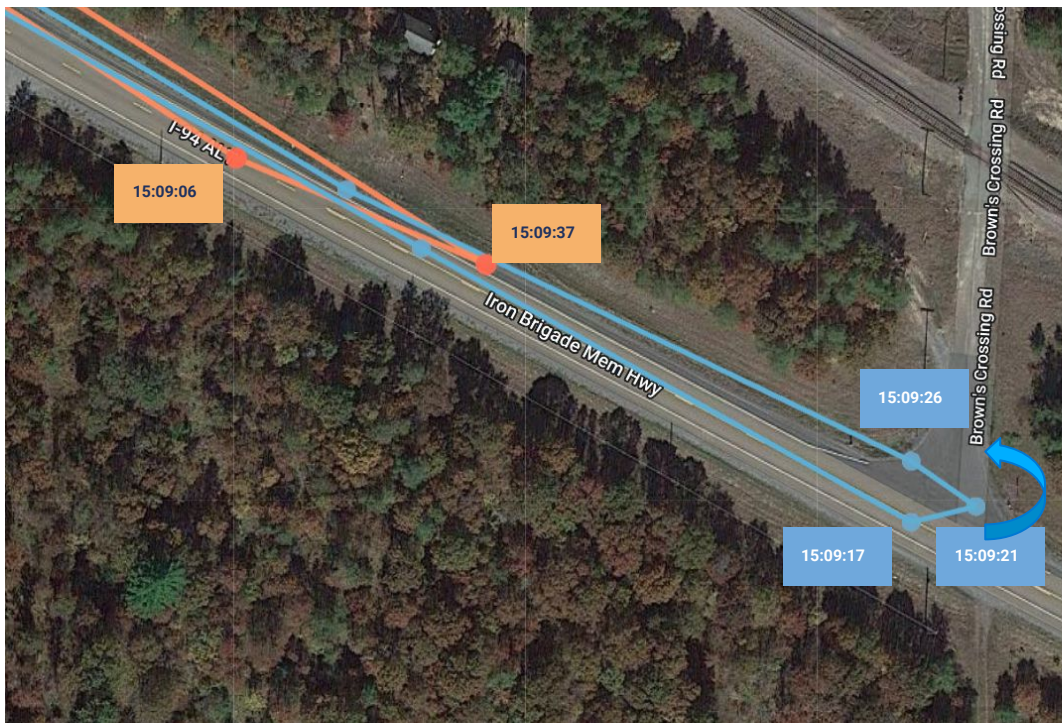
5 elements of the *initial* “recommendations”



Why Sampling Methodology is relevant

- Typically OEMs provides **fixed interval** (time or distance), event or both
- **More** data not necessarily better (e.g. GPS @1 sec) - **relevant** data is needed
- [Curve logic](#) provides intelligent lossy compression, open sourced under MPL
- Produces a **better representation** *and* is **more efficient** (lower cost)

Example: U-Turn Detection



But the u-turn detected by Geotab on Go device indicates the u-turn was taken at the intersection

While the OEM data misses the context because of unavailability of data for 30 seconds

How Curve logging works

- Patented method of moving data efficiently from vehicle to server
- Key value-add: Data is analyzed on the server rather than algorithms in the device

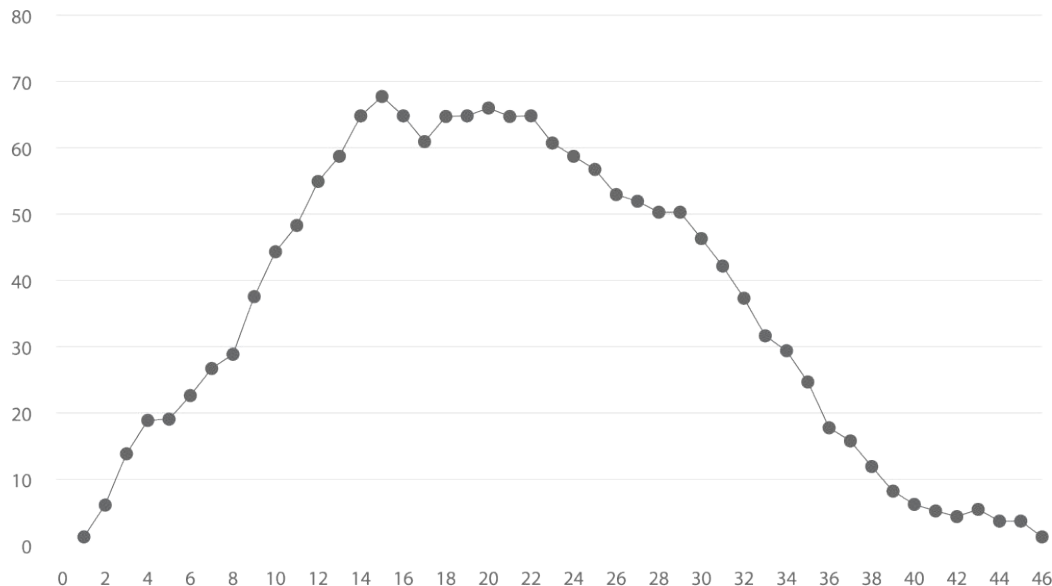
More Info:

[How it works \(blog post\)](#)

[Whiteboard video with Neil Cawse](#)

[Curve Logging @ COVESA](#)

[Curve // Github](#)



Curve logging can be implemented by OEMs on their embedded TCUs

Most needed Data Points, ~80 to start with

Pillar	Use case #	Use Case	Data Point / Feature	Recommended Frequency / Data Reporting Logic	Importance*
Sustainability (EV)	SUSTAINABILITY05	- Identify opportunities for Fleet electrification	GPS	Ideal: smart/curve logic (https://github.com/Geotab/curve) to detect significant change in speed and/or direction and send corresponding data points If smart logging isn't available, 1 Hz	Must Have
Sustainability (EV)	SUSTAINABILITY05	- Identify opportunities for Fleet electrification	Total fuel used (since activation) or Trip Fuel Used	every ignition event	Must Have
Sustainability (EV)	SUSTAINABILITY06	- Ensure EVs are appropriately charged and fleets can run efficiently	EV battery charge % / state of charge (SOC)	ideal: every 1% change during driving and charging min: every 1 min during driving and every 2 min during charging	Must Have
Sustainability (EV)	SUSTAINABILITY06	- Ensure EVs are appropriately charged and fleets can run efficiently	Range remaining	every 1 min during driving and every 2 min during charging	Must Have
Sustainability (EV)	SUSTAINABILITY07	- Optimize charging costs based on zones	GPS	Ideal: smart/curve logic (https://github.com/Geotab/curve) to detect significant change in speed and/or direction and send corresponding data points If smart logging isn't available, 1 Hz	Must Have
Sustainability (EV)	SUSTAINABILITY08	- Ensure EVs are appropriately charged and fleets can run efficiently - Identify and track charging events to control charging costs	Charging Status (AC/DC)	logged at start of charge (charging AC or charging DC) and end of charging (not charging)	Must Have
Sustainability (EV)	SUSTAINABILITY09	- Identify charging costs and optimize charging schedule	AC / DC charging energy in	every 2 min during charging	Must Have
Sustainability (EV)	SUSTAINABILITY10	- Identify electric energy economy and real-world range	Driving energy out	every ignition event	Must Have
Sustainability (EV)	SUSTAINABILITY10	- Identify electric energy economy and real-world range	Driving energy in (from regenerative braking)	every ignition event	Must Have
Sustainability (EV)	SUSTAINABILITY10	- Identify electric energy economy and real-world range	Driving idle energy out	every ignition event	Must Have

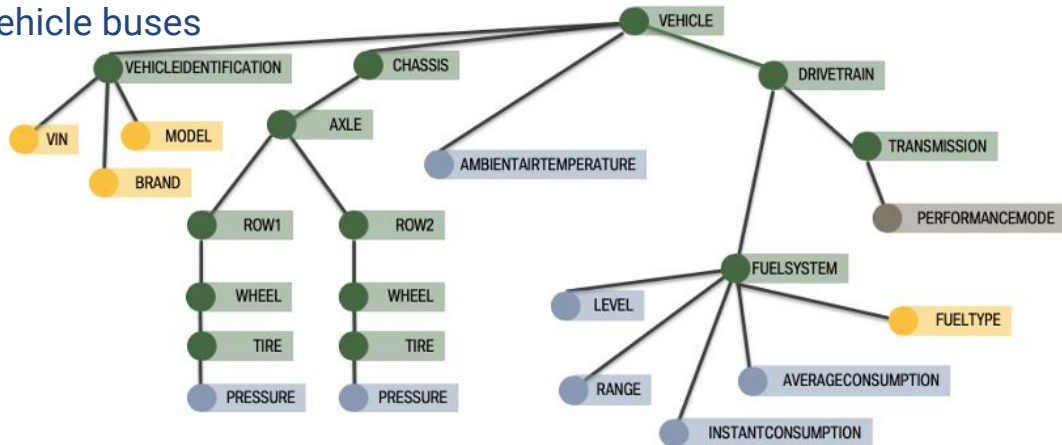
Source: [Fleet Management Data Set](#), including Use Cases, frequency and Importance

Proposal to use COVESA Vehicle Signal Specification (VSS)

The Vehicle Signal Specification (VSS) is an initiative by [COVESA](#) to define a syntax and a catalog for vehicle signals. In short this means that VSS introduces:

- A syntax for defining vehicle signals in a structured manner.
- A catalog of signals related to vehicles.

It focuses on vehicle signals, in the sense of classical attributes, sensors and actuators with the raw data communicated over vehicle buses



Representing sampling campaigns in VSS

A proposed initial deliverable will be to produce recommended signals, leveraging **overlays**, in VSS with sampling guidelines. Easy to use as configuration or generate code from.

Example signal in YAML:

```
Vehicle.LowVoltageBattery.CurrentVoltage:  
  datatype: float  
  description: Current Voltage of the low voltage battery.  
  type: sensor  
  unit: V  
  audiences: FLEET,SERVICE  
  purpose: MAINTENANCE_07  
  collection: 0.033HZ  
  categories: MAINTENANCE,PRODUCTIVITY  
  importance: MUST
```


Fleet Customers benefits from recommendations

- ✓ **Data consistency - enables vehicle integration across vehicle manufacturers**
- ✓ **Simplified integration and analysis - unified data structure enables scalability for fleets to easily change and expand type and number of vehicles.**
- ✓ **Interoperability & vendor independence - freedom to choose best in class vehicles, software/cloud platform, telematics services and analytics**
- ✓ **Scalability - future proofing their business**
- ✓ **Collaborative industry-wide standardization - enable better decision making, improved efficiency, better able to adapt to evolving industry trends**



Pay for product value, not technology integration

Benefits for OEM and Supplier

- ✓ Create additional, continuous revenue streams
- ✓ Be fleet ready and meet customer requirements - Provide the needed information for fleet management
- ✓ Lower cost (bandwidth, cloud storage) by being more efficient in data collection and storage
- ✓ Conventions applicable to other industry verticals (insurance, maintenance, regulatory compliance) - future growth and returns on investment
- ✓ Standards and consistency reduces vendor lock-in as well as supplier and solution provider integration costs



Vehicles as information platforms will drive future vehicle sales

Ecosystem Benefits from these recommendations



Creates a vibrant data ecosystem and lowers entry hurdles / increases competition



Fosters innovation by allowing TSPs to allocate more resources to product creation



Building a sustainable transportation future based on data



Interoperability in the ecosystem avoids vendor lock-in



Safeguarding vehicle security by making expert knowledge available for all participants



Increasing competition creates customer value

More to come...

TSP software on OEM hardware

common/standardized API (e.g. COVESA + AutoSAR effort)

Remote functions

E.g. door lock / unlock, immobilizer, preheating, remote charging, charging presets, remote reset of headunit ..

processes

Harmonized VIN eligibility and vehicles activation APIs + consent management

Other verticals

These conventions can be applied to other vertical industries' data interests: insurance, ev charging, maintenance, regulatory compliance...

What can you do now?

1

Inform yourself

[Commercial Vehicle BoF Charter](#)

[OEM enabled Fleet Management Data Recommendations](#) - [defined set of specific vehicle signals](#)

[Eclipse Fleet-Management blueprint](#)

2

Contribute and provide feedback

[COVESA Commercial Vehicle Birds of a Feather \(BoF\)](#)

Join (attend the regular meetings), refine scope, provide input, contribute, join plugfests & SDV hackathons

Direct interested colleagues towards this effort

3

Implement and endorse recommended best practice

Reach out to ETAS and Geotab if you are looking for support and experience in implementing “best practices” or curve algorithm on your TCU.

Fleet operators can encourage OEM and others to adopt through their procurement process