An aerial photograph showing a two-lane asphalt road that curves through a dense, vibrant green forest. To the left of the road is a large, dark blue body of water, likely a lake or reservoir. The water's surface is slightly rippled, reflecting the sky. The road has a white dashed center line and solid white edge lines. A single white car is visible on the road, moving away from the viewer. The overall scene is peaceful and scenic, with a mix of natural elements.

VSS - Enabling Data Intelligence

Making better-informed decisions

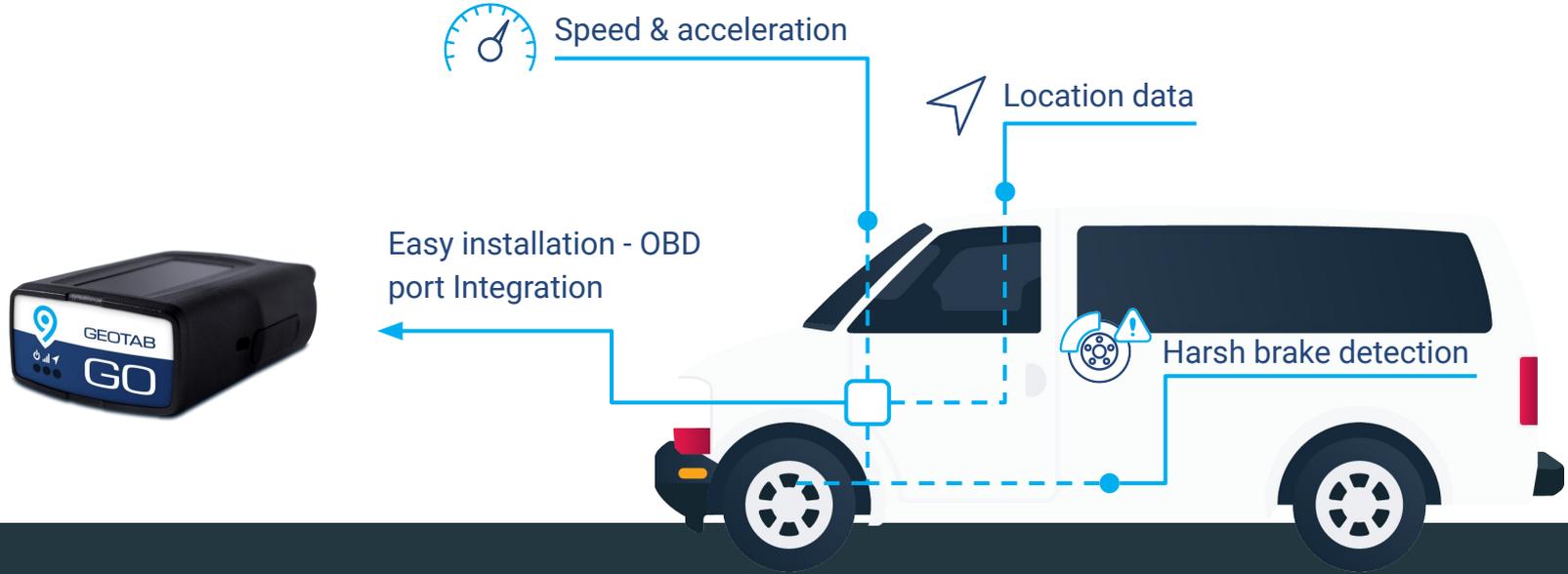
July, 2023

GEOTAB

Agenda

- Purpose of talk is to share the power of automotive datasets, entice OEM's to adopt open standards, improve quality, implement VSS, etc
- Start with high quality data collection
 - Show how bad OEM data can be.....
- Power of Data Intelligence applied to open data
 - 4 million connected vehicles
 - Investments in AI
 - Power of labeled data
 - Special mention: Gen AI
- Geotab Data Processing as a Service
- Example(s): Fleet Safety, Maintenance, Fuel, etc
- Example: Smart Cities (ITS)
- Call for action: Invest in quality data, data sharing
- VSS adoption is license free!

Geotab technology



The Geotab GO device collects various types of vehicular data everyday to empower fleet management

A world leader in GPS fleet management

From grassroots to global leader

- In 2000, Geotab was officially founded in Oakville, Ontario, Canada

#1 Telematics company in the world

- Now recognized as one of the fastest growing technology firms
- Consistently ranks among the top leaders in technology innovation.



Technology breakthrough paves the way for success

- With the Geotab technology stack, customers gather much greater insights on their fleet.

Power of Fleet Data



GEOTAB® 15.

Data @ Geotab

>4 Million

connected vehicles, globally

>75 Billion

data points collected daily

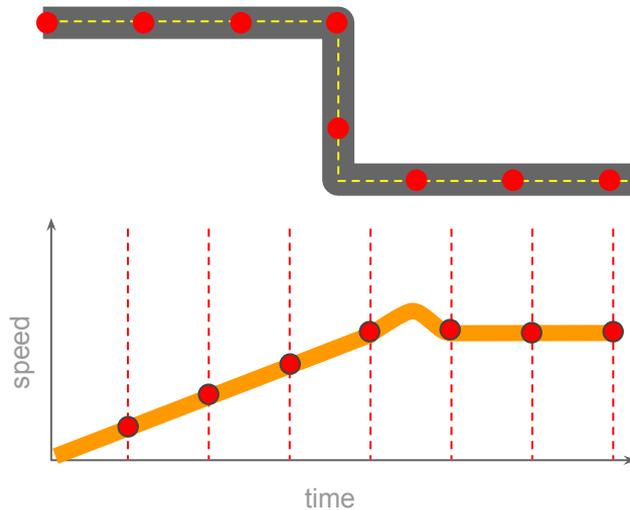
Richest telematics dataset in the world including GPS, traffic, accelerometer, engine data, weather, driver behaviour, and more.



Start with Quality Data Collection - Curve Logic

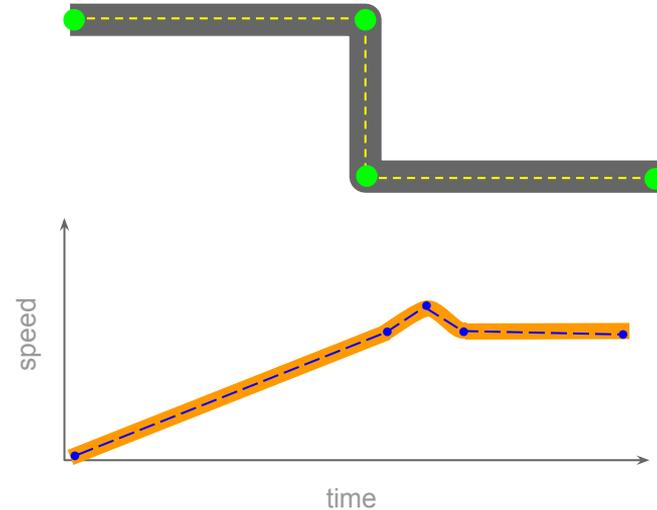
Time-based sampling

- More data transmitted
- Missing data
- Cannot be interpolated

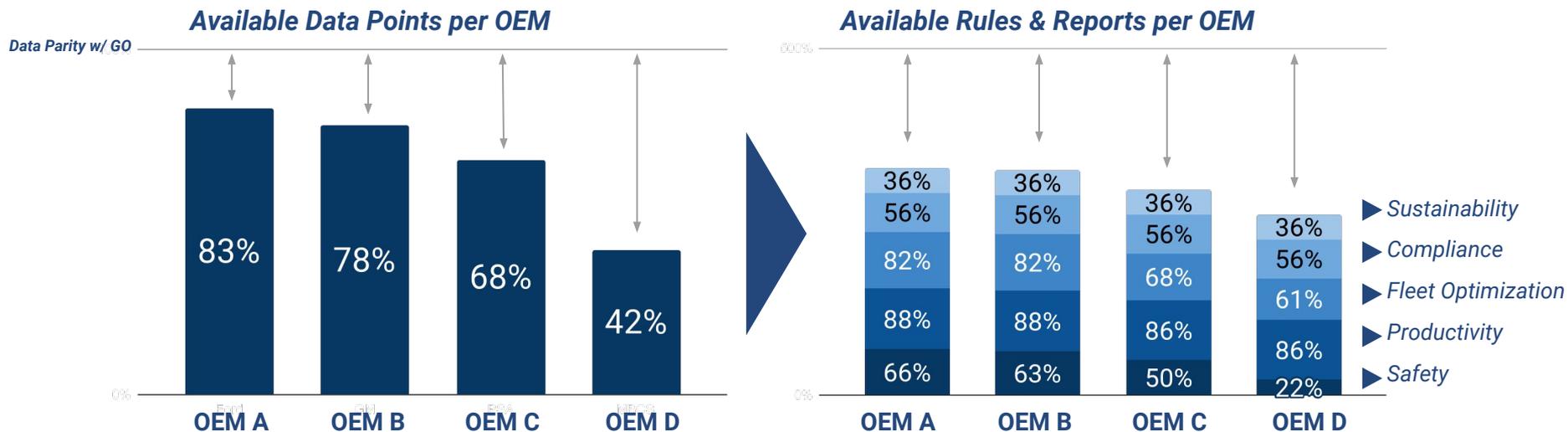


Ramer-Douglas-Peucker

- Reduced data size
- No missing data points
- Better resolution through interpolation

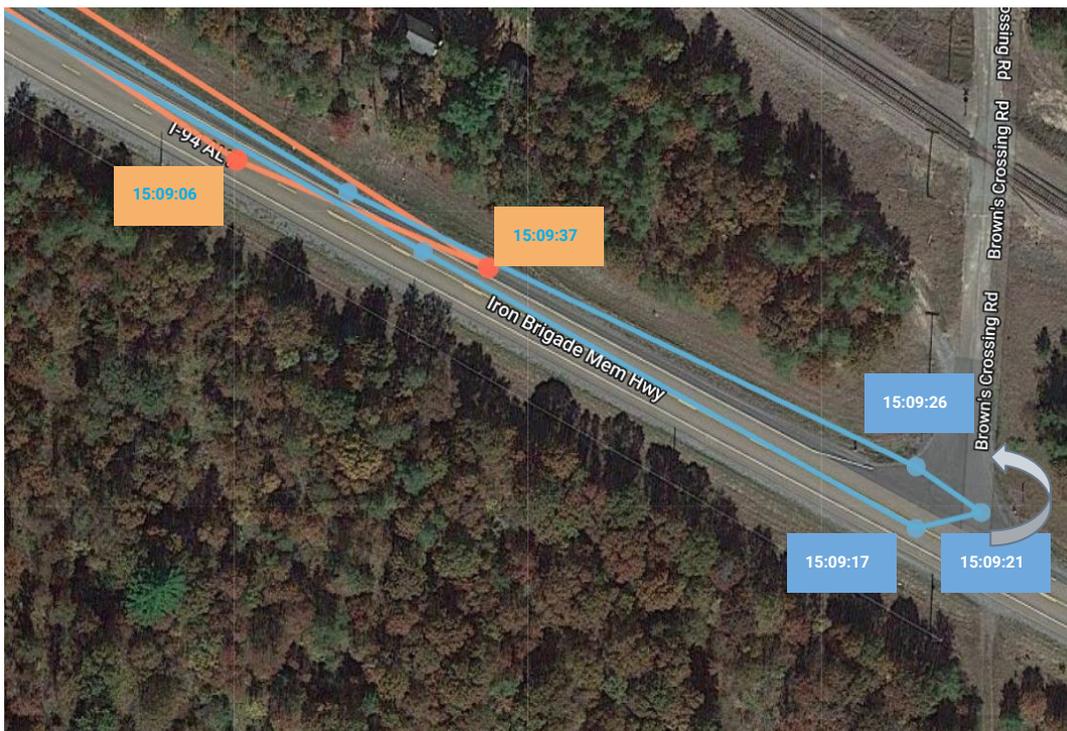


The Issue: Data Collection Is Not Standard Across Industry



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!)

Example: U-Turn Detection



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

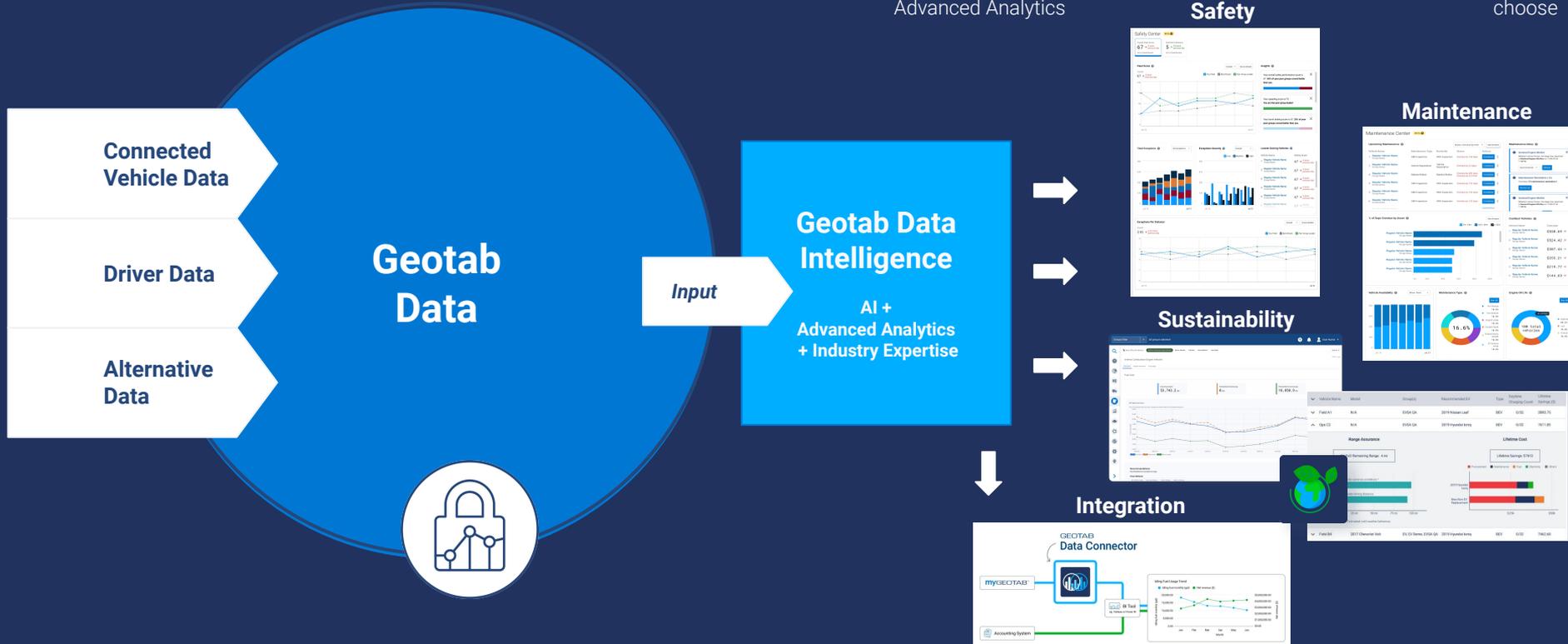
While the low fidelity data misses the context because of unavailability of data for 30 seconds

Your Data. Your Insights. Customer's Way.

How we collect the data
Depends on your unique fleet

How we create value with the data
Leverage all data with AI and
Advanced Analytics

How to access the data
Consume the data you need in the format you
choose





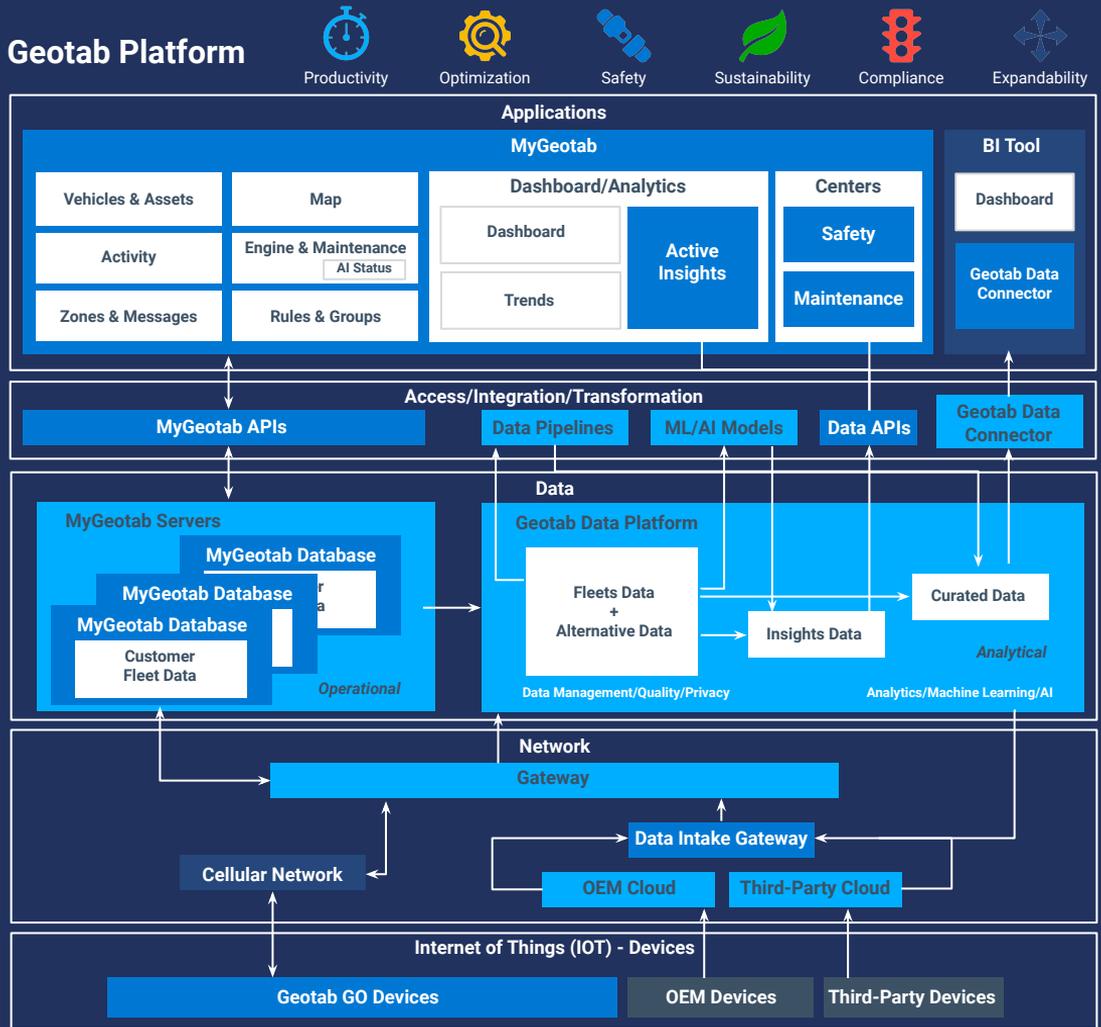
Geotab Data Framework



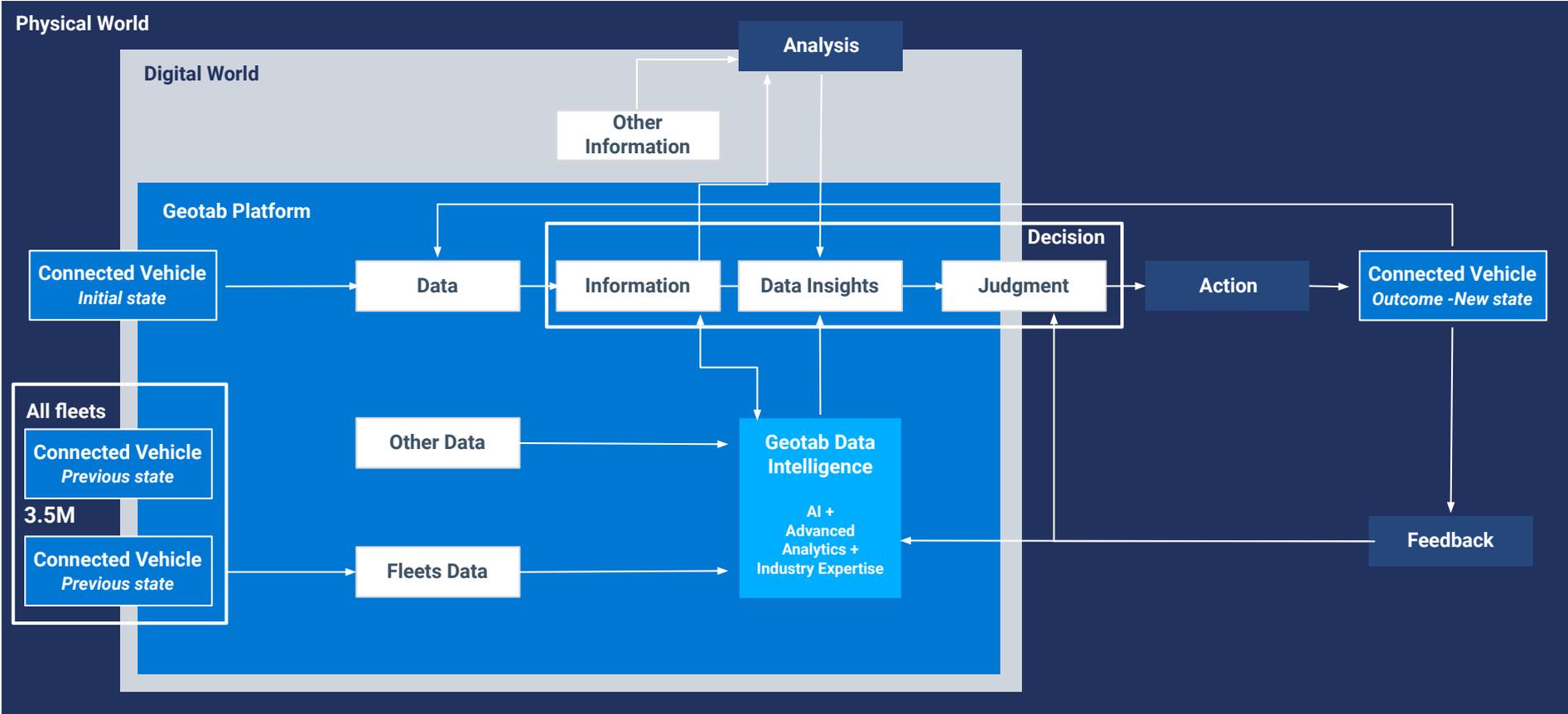
[Geotab Data Framework: the Tool](#)

[Geotab Data Framework: MyLearning Course](#)

Geotab Platform



Decision-making with Geotab Data Intelligence



Examples

Safety

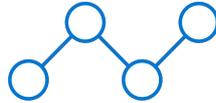
The Challenges with Benchmarking Risk Today

Survey
Based



Manual, slow
& biased

Industry
Comparables



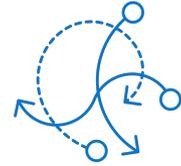
Not apples
to apples

Forums
Conferences



Not
scalable

Changing
Demographics

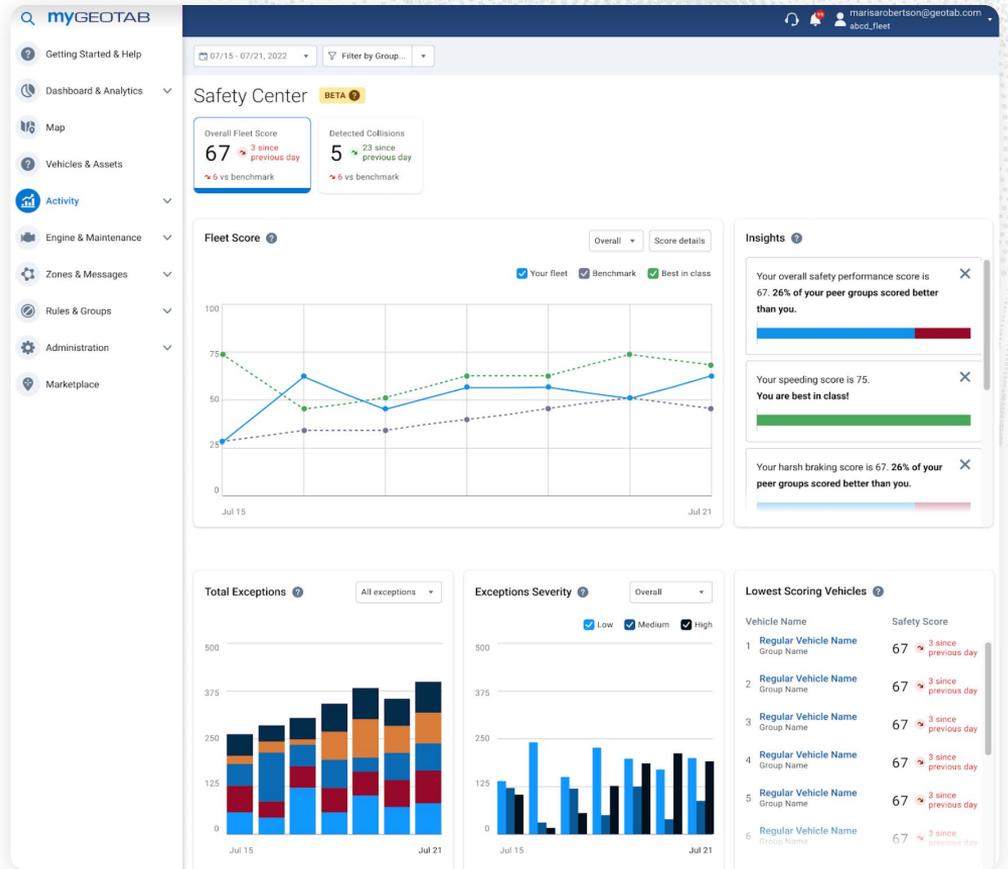


New traffic patterns
post Covid

Safety Center

New insights and user experience

- New data powered safety dashboard
- Fleet Score & Trending
 - Driver
 - Vehicle
- Safety Benchmarking
- Insights into your fleets
- Total Exceptions
- Exception Severity (low, medium, high)



Advancing Safety

A contextual perspective

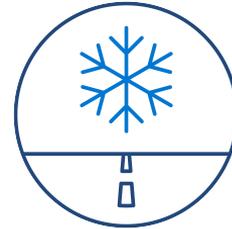
Is this **behavior** safe?



Is this **vehicle** safe?



Is this **environment** safe?



Combination of telematics and why data can help drive safety for all!

What is Safety Context?

- **Driving Behaviour**

- Harsh Events
- Speeding Events

- **Surrounding Static Conditions**

- Intersections
- Road Characteristics

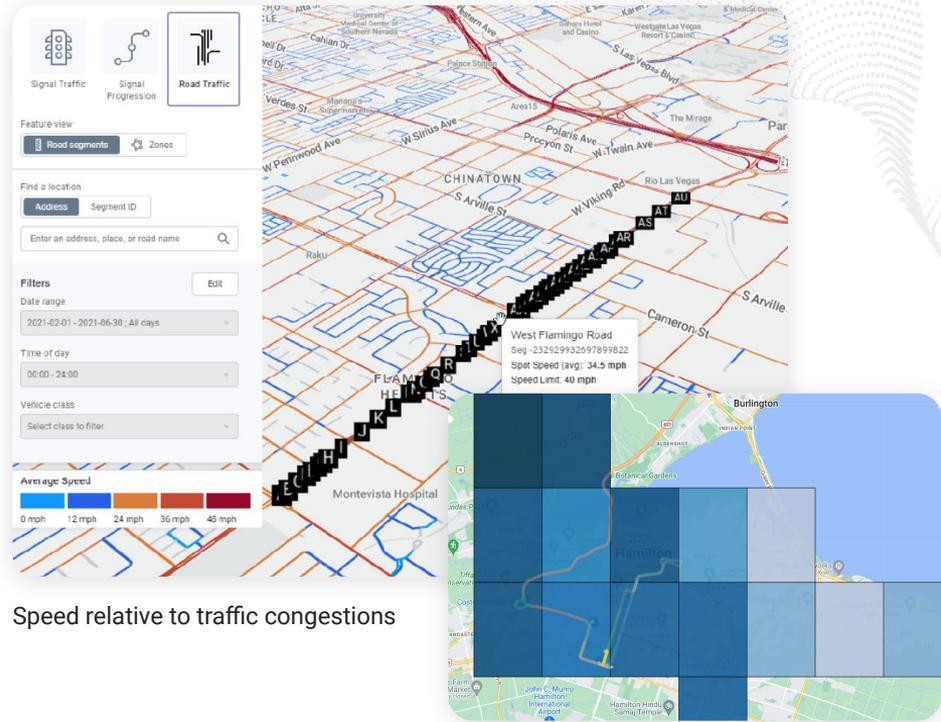
- **Surrounding Dynamic Conditions**

- Congestion
- Familiarity

- **Environmental Conditions**

- Snow, Rain, Wind & Sun

- **Vehicle Context**



Speed relative to traffic congestions

Hyperlocal temperature & precipitation

Maintenance

Maintenance Centre: Reducing Customer Downtime

Predictive and preventative maintenance diagnostics in the new Maintenance Centre in MyGeotab.

Currently: Electrical System Issues, Water in Fuel Detection, Exhaust Gas Regulator Issues, ABS Issues, Engine Coolant Issues, Camshaft Position Sensor Issues, Cylinder Misfire Prediction, Glow Plug Issues

The screenshot displays the 'Insights' section of the MyGeotab Maintenance Centre. It features a sidebar with navigation icons and a main content area with several insight cards. Each card shows potential savings, recent issues, and a 'Take action' button. The insights include Engine Coolant, Collision Detection, Electrical System Issues, and Water in Fuel Detection. Below the insights, there is a table of overdue items and a 'Maintenance inbox' with notifications for engine misfires and reminders.

Insights

Insights with top potential savings offer more opportunities to optimize your fleet. Take recommended action to improve operations. The values displayed are in USD.

- Engine Coolant** (★ Most savings)
 - Potential savings: \$6000
 - Recent issues: 1
 - Category: Maintenance
 - Description: This insight identifies assets with malfunctioning coolant systems on a daily basis.
 - Action: Take action →
- Collision Detection** (★ 2nd most savings)
 - Potential savings: \$4000
 - Recent issues: 2
 - Category: Safety
 - Description: The collision detection tool uses an algorithm that detects major collisions with high confidence and filters out false events.
- Electrical System Issues** (★ 3rd most savings)
 - Potential savings: \$3500
 - Recent issues: 4
 - Category: Maintenance
 - Description: Automatically identifies vehicles' battery health issues. Battery failures lead to vehicle breakdowns, lost time and productivity, and unmet service-level agreements (SLAs) for customers.
- Water in Fuel Detection**
 - Potential savings: \$250
 - Recent issues: 1
 - Category: Maintenance
 - Description: This insight identifies whether there is water in an asset's fuel caused by circuitry or mechanical reasons.
 - Action: Take action →

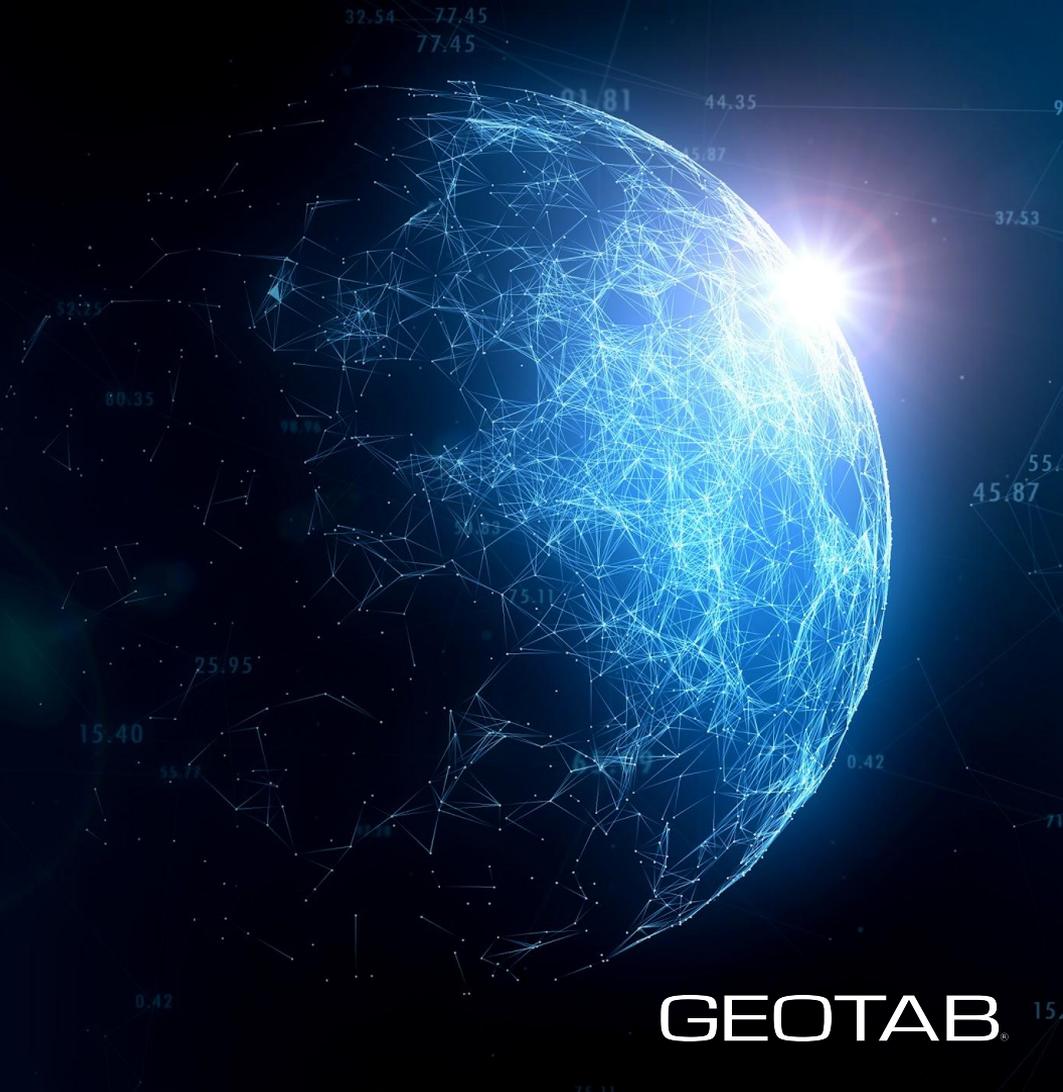
Table of Overdue Items:

ID	Status	Actions
Inspection	Overdue by 132 days	Complete
Inspection	Overdue by 33 days	Complete
Inspection	Overdue by 680 days Overdue by 5219 km	Complete
Inspection	Overdue by 132 days	Complete
Inspection	Overdue by 132 days	Complete
Inspection	Overdue by 132 days	Complete

Maintenance inbox

- General Engine Misfire**
Milady's Horse Drawn Carriage has reported a **General Engine Misfire** on 7/09/22 at 1:08PM
Add reminder | Details
- Maintenance Reminders (12)**
You have 12 maintenance reminders.
Review all
- General Engine Misfire**
Milady's Horse Drawn Carriage has reported a **General Engine Misfire** on 7/09/22 at 1:08PM

Smart Cities & Altitude Platform



GEOTAB® 15.

What is Geotab's Altitude Platform?

A platform for use by the public sector to drive insight from transportation data.

- Requires zero telematics install-base by the jurisdiction
- Provides access to:
 - Data
 - APIs
 - Applications
- US and Canadian Market Focus
- Subscription and Project-based Billing

The screenshot displays the Geotab Altitude Platform interface. On the left, a sidebar contains navigation icons and a 'Hide' button. The main panel shows a map of New York City with a selected area in the SoHo and Tribeca neighborhoods. A 'Select roads to analyze' dialog box is open, showing 'Segments selected: None' and an 'Analyze road speed' button. A 'Re-apply filters to continue' dialog box is also present, indicating that filters need to be re-applied. The interface includes a 'Load dataset (region)' dropdown, a search bar for 'Find a location', and a 'Filters' section with options for 'Date range' (09/31/22 - Yesterday, Mon - Fri only), 'Time of day' (Started trips from 12:00 - 24:00), 'Vehicle class' (Medium Duty Trucks (10,001 - 26,000 lbs)), and '% of Free-flow Speeds' (a color-coded legend).

One more thing.....

Geotab Ace

<https://www.geotab.com/ace/>

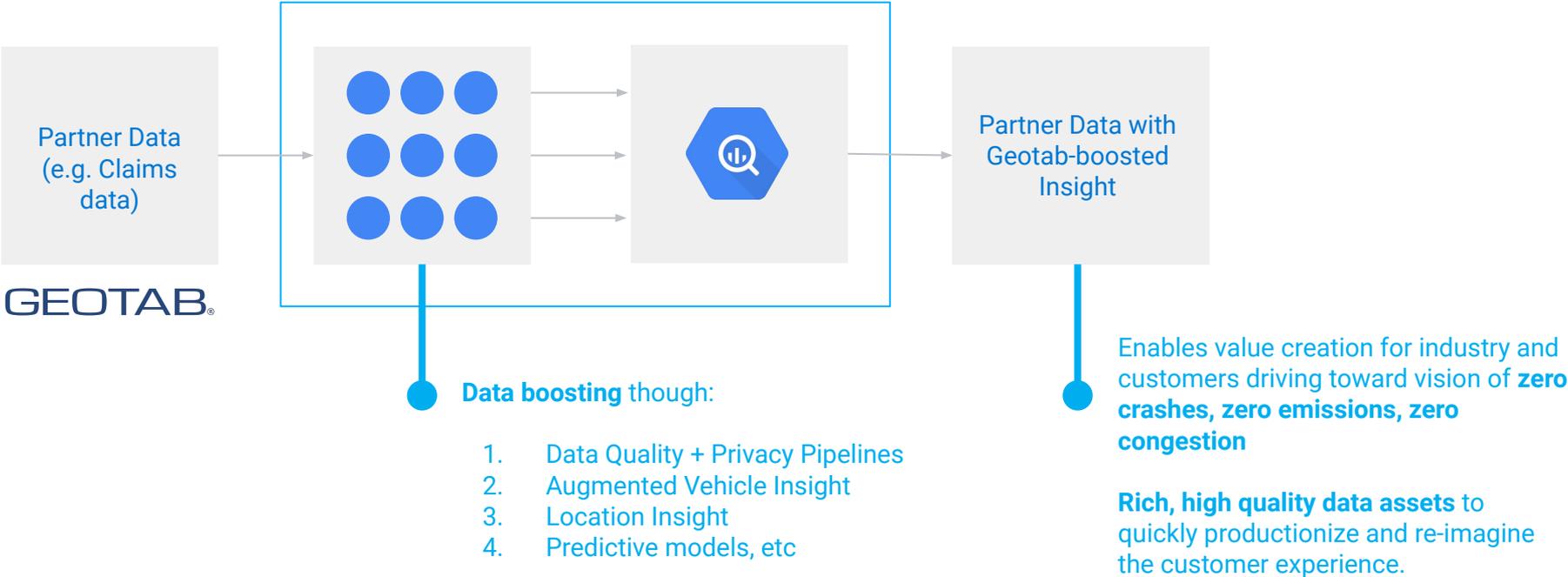
Analyse vast amounts of data to...
identify trends and patterns
uncover areas for improvement
gain recommendations for operational efficiency
...and more

GEOTAB



GEOTAB
Ace

Can we create 1+1=3?

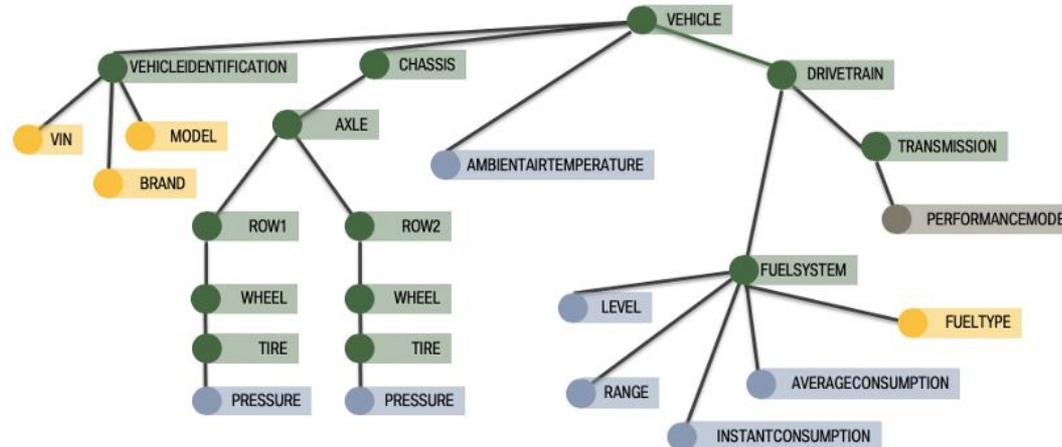


Proposal to use COVESA Vehicle Signal Specification (VSS)

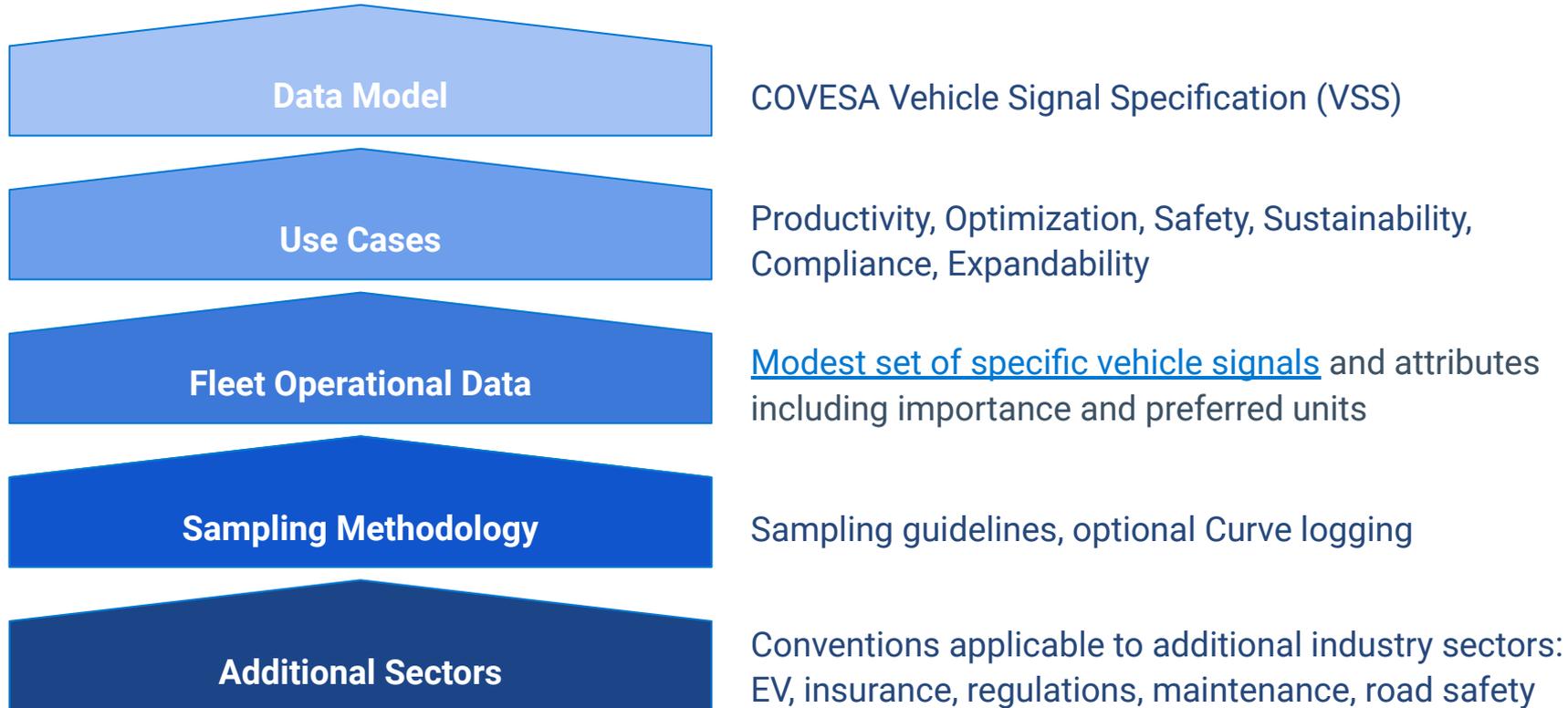
The Vehicle Signal Specification (VSS) is an initiative by [COVESA](#) to define a syntax and a catalog for vehicle signals. In short this means that VSS introduces:

- 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



COVESA Commercial Vehicle Activity Overview



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