

Big data in the vehicle: another brick in the wall?

*Intelligent transportation
in the era of big data*



PTOLEMUS is the first strategy consulting firm focused on telematics and geolocation

Our consulting services

Strategy definition

Vision creation, strategic positioning, business plan development, board coaching & support

Investment assistance

Strategic due diligence, market assessment, feasibility study, M&A, post-acquisition plan

Procurement strategy

Specification of requirements & tender documents, launch of tenders, supplier negotiation & selection

Innovation management

Value proposition definition, product & services development, architecture design, assistance to launch

Business development

Partnership strategies, detection of opportunities, ecosystem-building, response to tenders

Implementation

Deployment plans, complex / high risk project & program management, risk analysis & mitigation strategy

Our fields of expertise

Car infotainment & navigation

Connected services (Traffic information, fuel prices, speed cameras, weather, parking, points of interest, social networking), driver monitoring, maps, navigation, smartphone integration

Usage-based charging

PAYD / PHYD insurance, road charging / electronic tolling, fleet leasing & rental, car sharing, Car As A Service, etc.

Telematics & Intelligent Transport Systems

ADAS, connected vehicle, crowd-sourcing, fleet management, eCall, bCall, SVR, tracking, vehicle data analytics (OBD / CAN-bus), VRM, V2X, xFCD

Positioning / Location enablement

M2M & connectivity

We help all players in the mobility ecosystem

Telecom operators



Vehicle makers & telematic vendors



Content & application providers



Mobile device & positioning suppliers



Insurers, aggregators & assistance providers



ITS operators & regulators



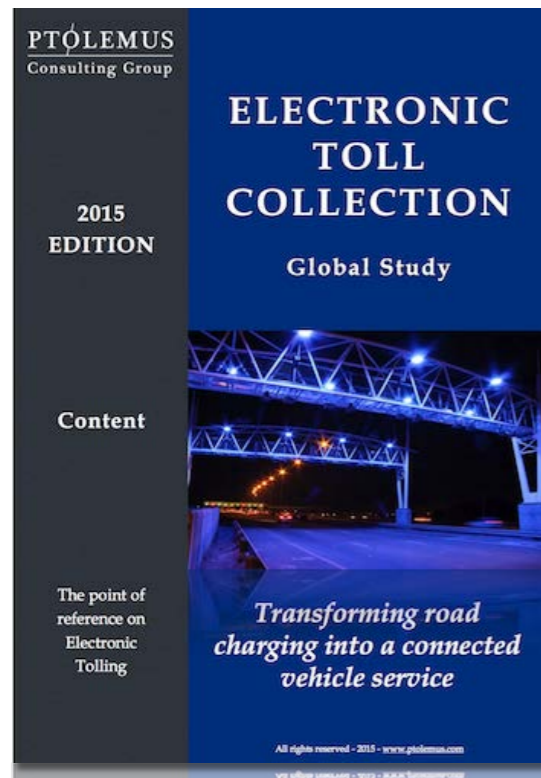
Fleets



Financiers



The ETC Global Study is the most comprehensive analysis of the tolling market worldwide



**More than a research report;
a real strategic market
analysis**

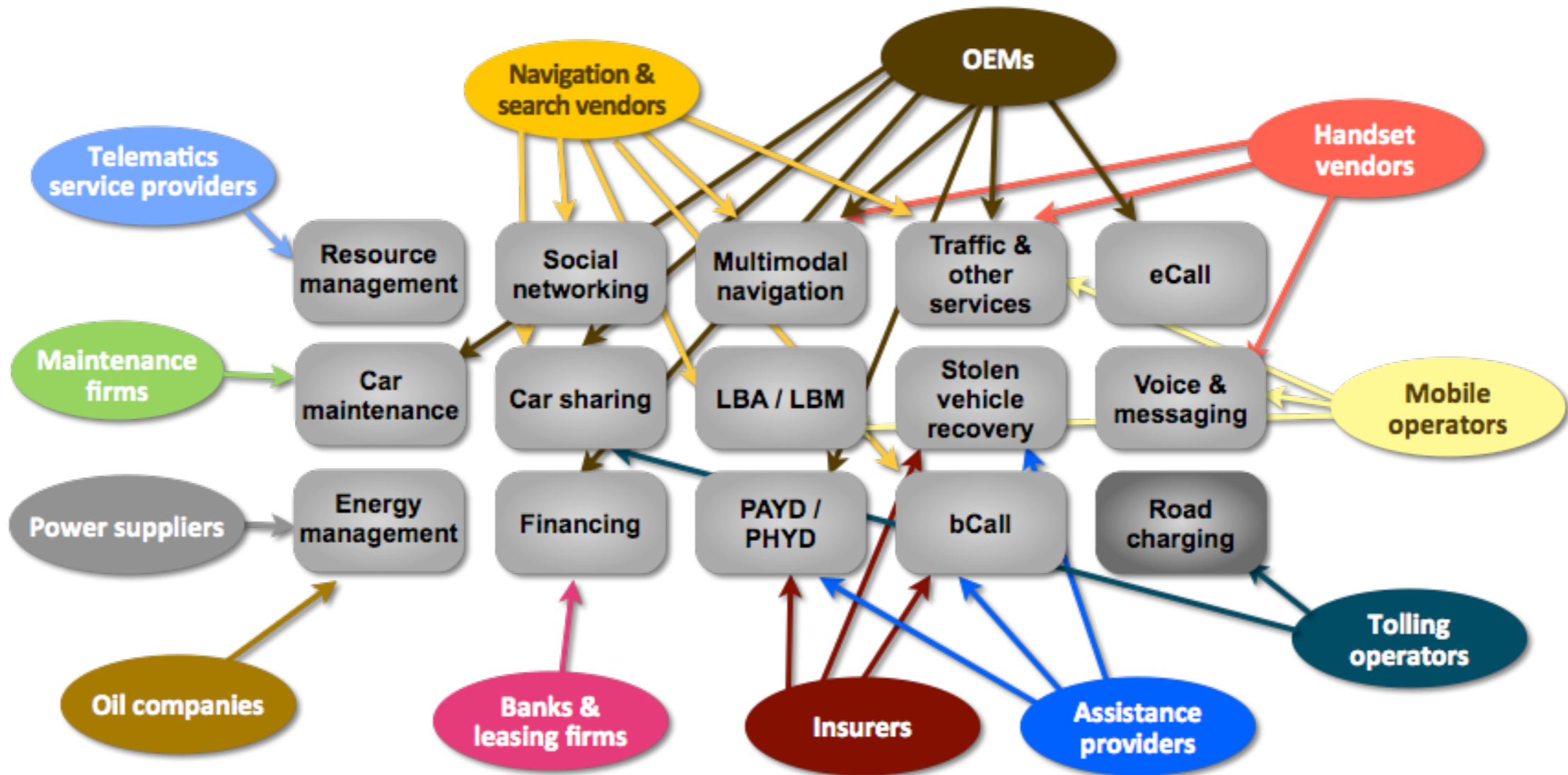
- **500 pages of analyses of the global electronic tolling market based on:**
 - 60 interviews in 12 countries
 - 135 figures and charts
 - 3 years of hands-on experience
 - Our experience advising key players in the ecosystem
- **A systematic review of each ETC network in Europe, the US and 20 other countries**
 - Detailed profile per country
 - The range and evolution of core technologies analysed
 - The new patents and partnerships
 - Regulatory changes (EETS, etc.)
- **Tolling models, enforcement and technologies compared & analysed**
 - Business models of GNSS vs. DSRC based on case studies
 - Evolution paths between toll gates, ETC and MLFF
 - The rise of mobile tolling
- **14 case studies** including AutoPass, BroBizz, Ecotaxe, LKW Maut, Hu-Go, e-way, ViaPassVia Verde, The Hub, PrePass
- **2014-30 market forecasts**
 - Country forecasts for Canada, China, France, Germany, India, Italy, Japan, Russia, South Africa, the UK & the US
 - Bottom-up estimates of the number of devices sold, vehicles subscribed by technology & vehicle type
- **Toll service providers and service provider market models**
 - Markets' readiness for interoperability
 - Integration of tolling with 11 VAS and 5 connectivity services
- A complete set of **recommendations** for governments, toll chargers, toll service providers, technology suppliers and telematics service providers

Vehicles host fresh, sensitive, high value data, which also creates new service provision opportunities

Mileage
Fuel consumption
WEATHER
SEAT BELT STATUS
LOCATION
ACCIDENT ALERT
AIRBAG STATUS
driving behaviour
REAL-TIME speed
REPAIR STATISTICS
ROAD CHARGING DATA
TEMPERATURE
DIAGNOSTICS information
CO₂ EMISSIONS
VIN
TRAFFIC JAMS
CRASH DATA
PARKING AVAILABILITY
EXHAUST GASES
SHOPPING behaviour
AVERAGE speed
TIRE PRESSURE

Numerous stakeholders are starting to offer connected vehicle services...

Connectivity is fostering competition



... Leading to *numerous* connected devices in the vehicle

Digital tachograph



eCall device



Electronic tolling device



On-board computer



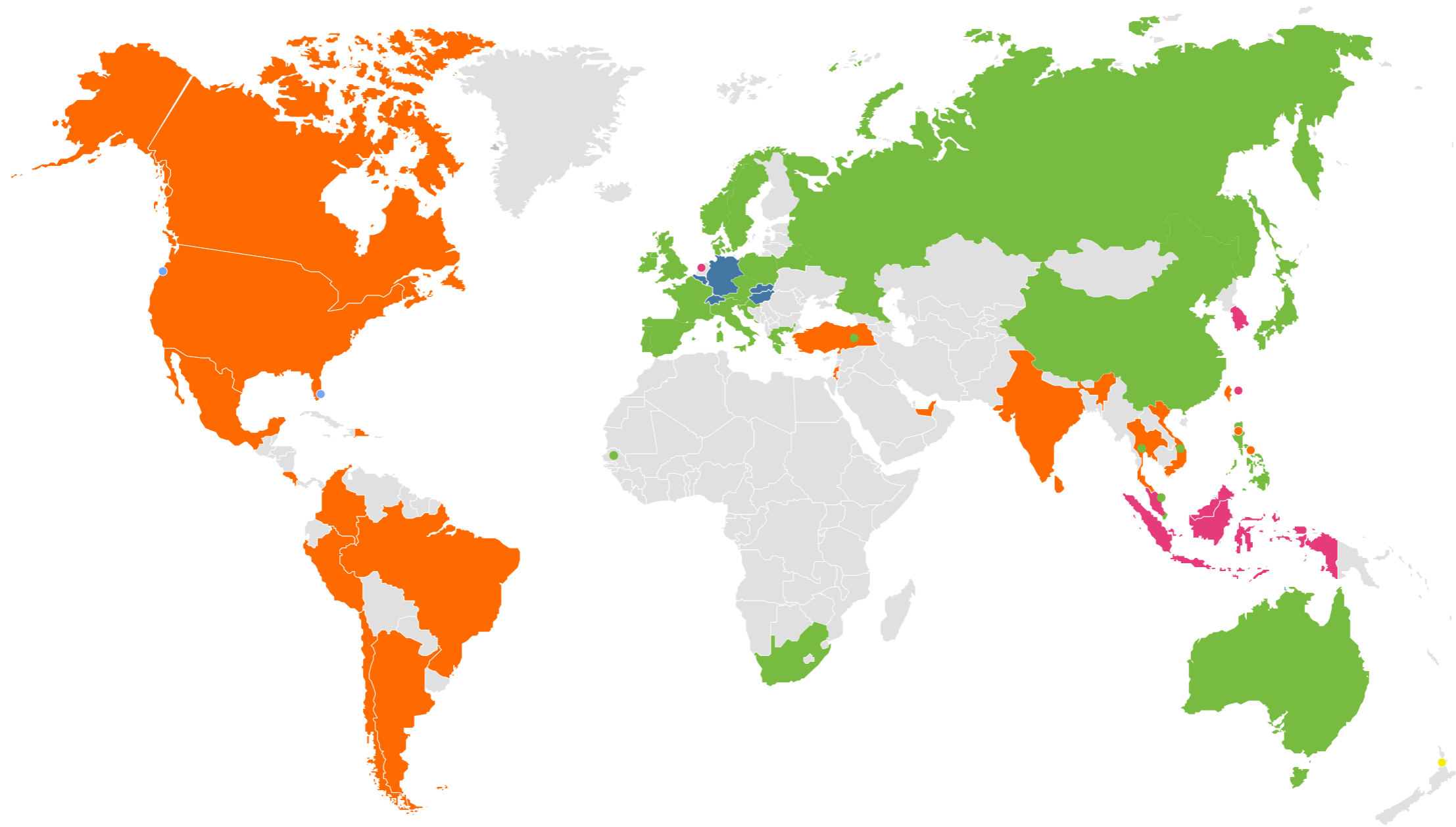
Fleet telematics black box



Smartphone



...and *numerous* ETC technologies* used globally



Large scale deployment **DSRC** **GNSS** **RFID** **Infra-Red** **Video** **WAVE**
Secondary implementation ● ● ● ● ● ●

Numerous standards are relevant to Electronic Fee Collection but they are not all applied

	DSRC-based EFC		EFC-tech. independent	Autonomous-EFC	
	Tests	Requirements		Requirements	Tests
Frameworks	14907-1 Test Procedures		17573 EFC Architecture 17574 Security Profiles 16439 Security Framework		
Toolboxes	14907-2 DSRC-OBUs Tests	14906 AID for DSRC-EFC 25110 AID, IC-cards 16875 Interface OBE+	12855 Info Exchange 17444-1/2 Charging Perf. Indic.	17575-1/2/3/4 AID Auto.-EFC XXXXX Sec.Mon: CC XXXXX Sec.Mon: TR	16401, etc Auto-test (4*2 parts)
Profiles	15876-1/2 IAP Test	15509 IAP for DSRC-EFC	TS XXXX IAP for Info Exchange	16331 IAP for Auto-EFC 12813 CCC for Auto-EFC 13141 LAC for Auto-EFC	13143-1/2 CCC Test 13140-1/2 LAC Test
Technical Reports		TR 16040 Urban DSRC	TR 16152 First Mount OBE TR 16092 Pre-Paid Req. TR 16219 Value Added Serv. TR XXXXX EFC on ITS stations		

Drivers directly feel the walls between different providers



Saving lives



Scenario 1

Major car accident in rural area

Today

- Car can remain unassisted for hours
- Risk of death or aggravation of injuries is very high
- Rescue depends on good samaritans...

With connectivity - ACN / eCall by OEM

- Alert is sent immediately indicating the magnitude & location of the crash and a call is made to check status
- An ambulance is sent within 1 minute
- Rescue time is generally < 30 minutes depending on area

With Big Data

- Alert is sent immediately to emergency centre, road authority, family and insurance company
- The ambulance is made aware of the particular condition and blood group of the driver
- The road operator can organise the cleaning of the road surface & limit side accidents and traffic jams
- The insurer can initiate the claims & indemnification process, without any request to the family at this difficult time

Saving money



Scenario 2

Car gearbox about to break down

Today

- Driver continues driving until vehicle stops
- Risk of related accident is high
- Breakdown can happen anywhere... preferably in the worst place...

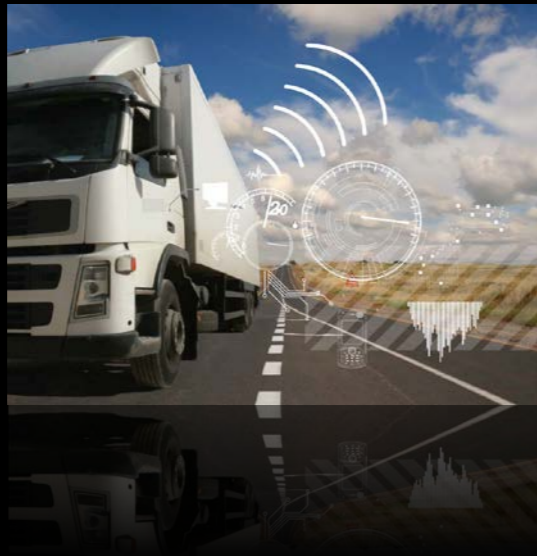
With connectivity - Remote diagnostics by OEM

- Driver receives alert on her mobile phone after her last trip
- It is requested to drive asap to its dealer
- The gear box is replaced at a cost of €5000 within 3 days

With Big Data

- Driver receives alert on her mobile phone after her last trip from her car maker & her roadside assistance company
- She receives two quotes and chooses the workshop recommended by her assistance company, as it has the gearbox in stock
- The gearbox is replaced within 24 hours at a cost of €3500

Saving time, money and the environment



Scenario 3

HGV traveling between different countries / states

Today

- Driver stops at all toll gates
- Driver loses precious time in traffic jams at toll gate
- Toll tickets are expensed, generating significant

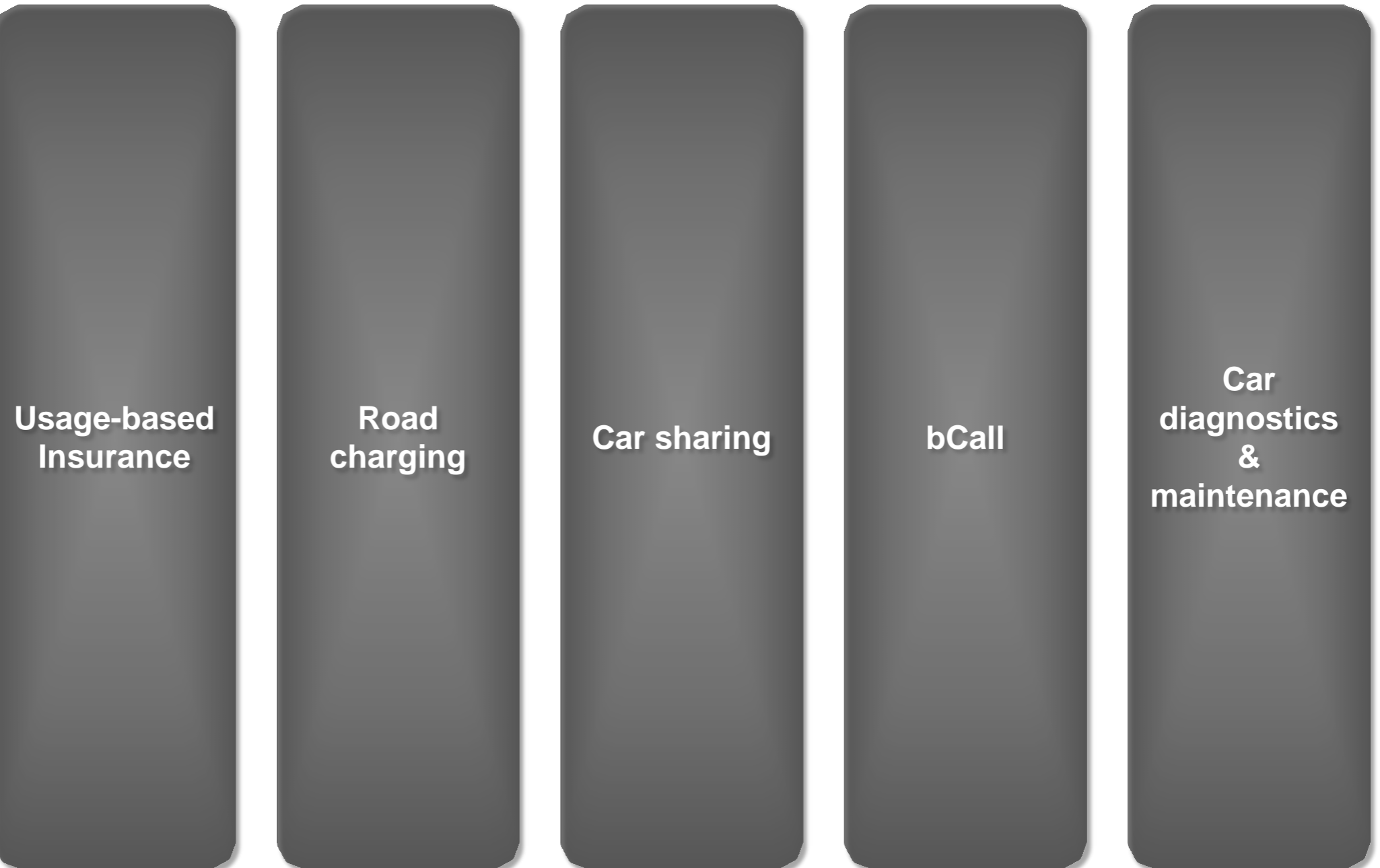
With connectivity - ETC by each service provider

- Driver equips his truck with a specific device for each toll charger
- Authorisation & payment are made automatically, saving significant time on the road and in the office
- Company must handle accounts with each toll charger & devices storage & installation logistics
- Potentially dozens of devices on the windscreen...

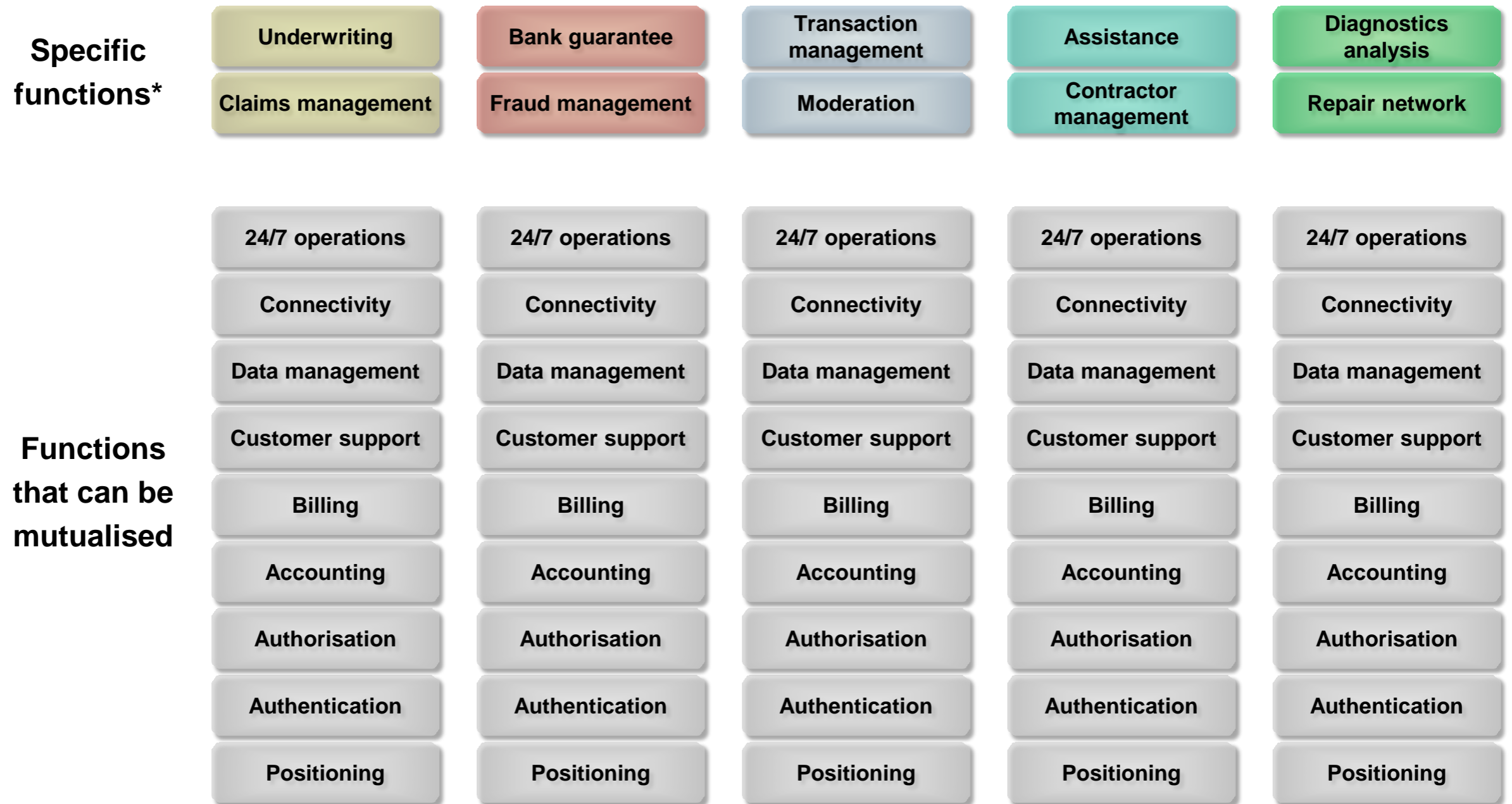
With Big Data

- Driver equips his truck with a single connected device
- Itinerary is optimised based on complete cost including energy & tolling
- Pays for all roads & motorways automatically thanks to a single invoice from its service provider
- Device is also used for the tachograph service, roadside assistance, fleet management, eCall and UBI

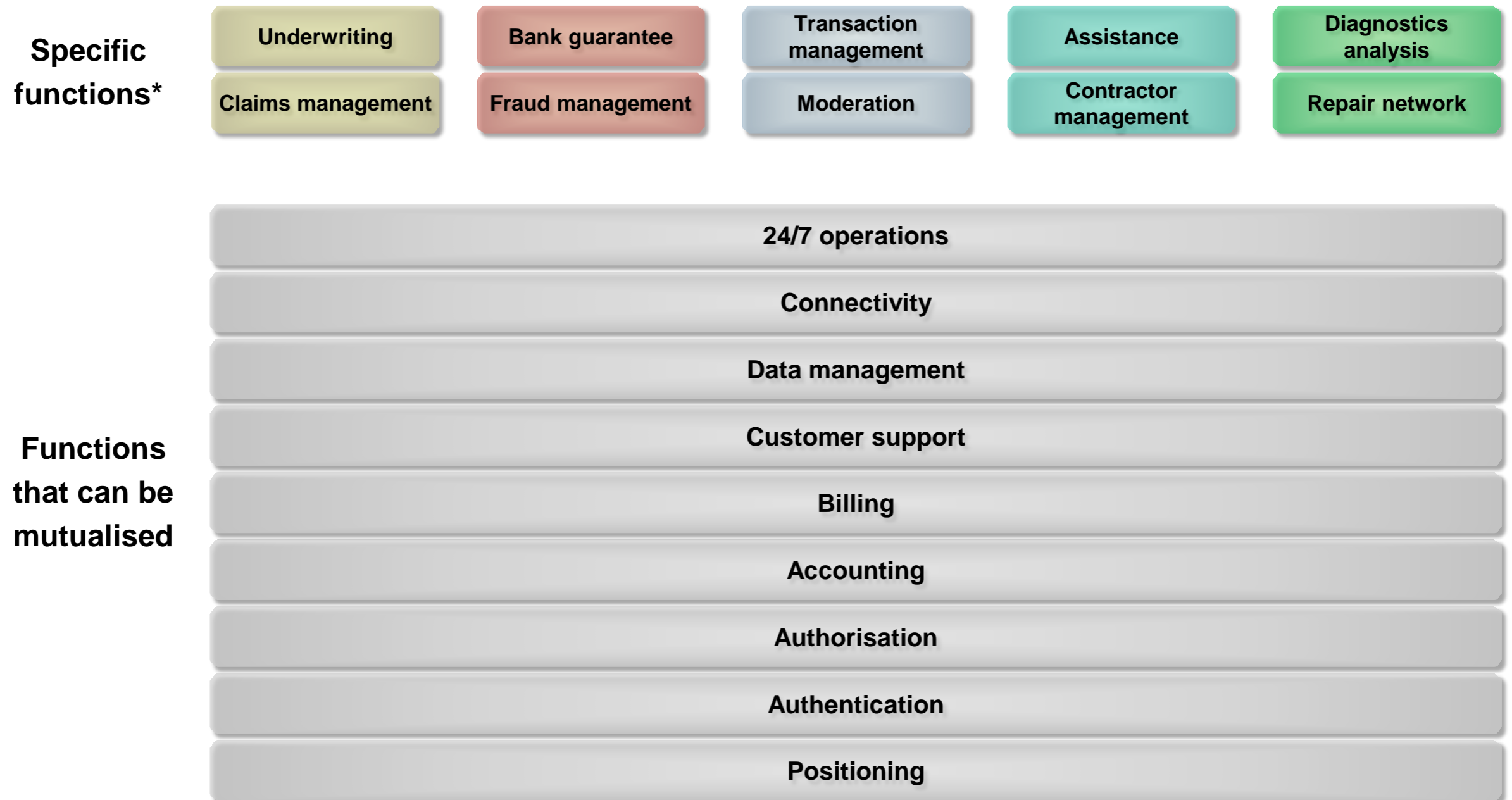
Let us analyse 5 of these connected services



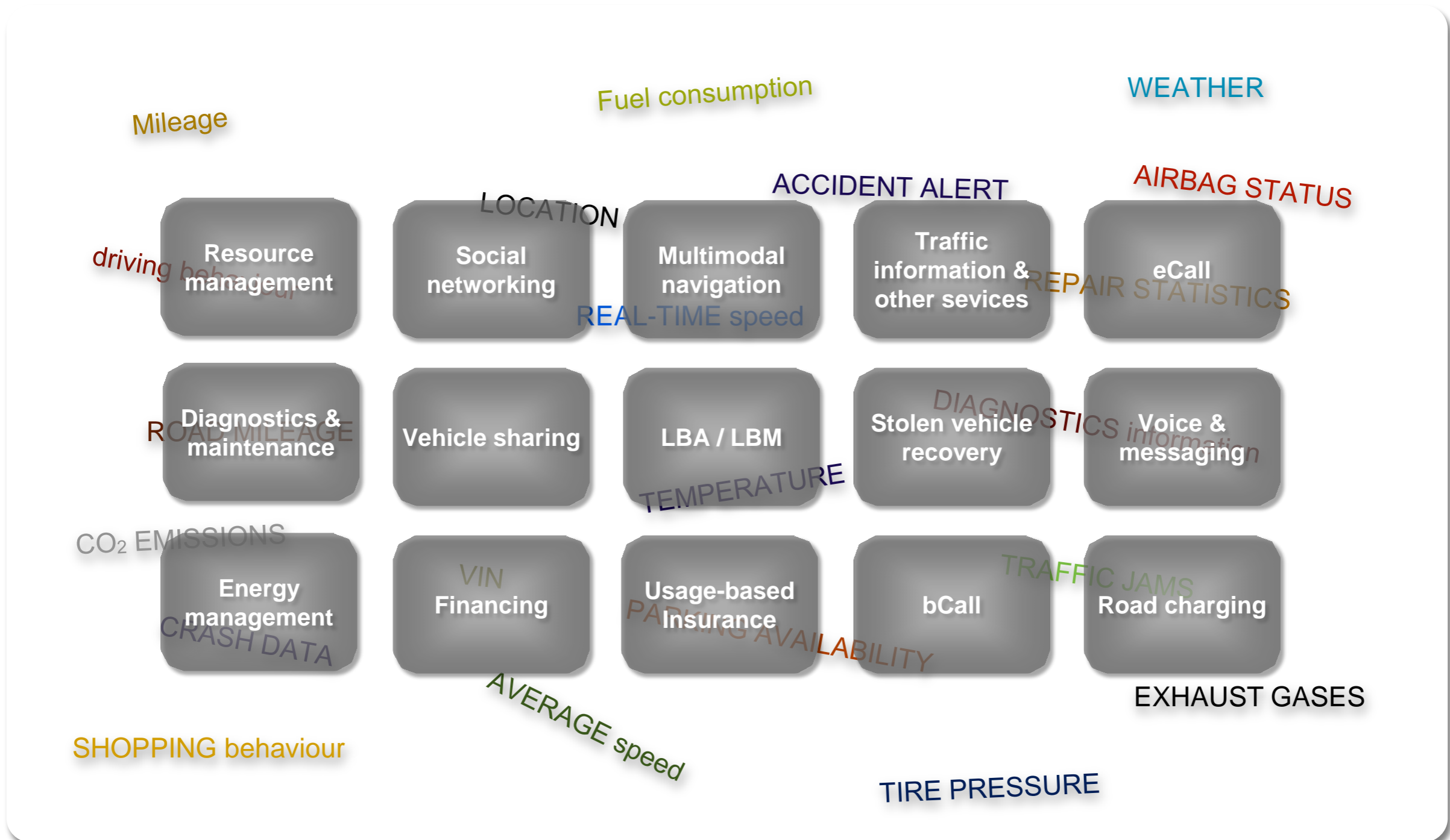
Numerous of these functions could be mutualised, notably when related to device, data, connectivity & billing



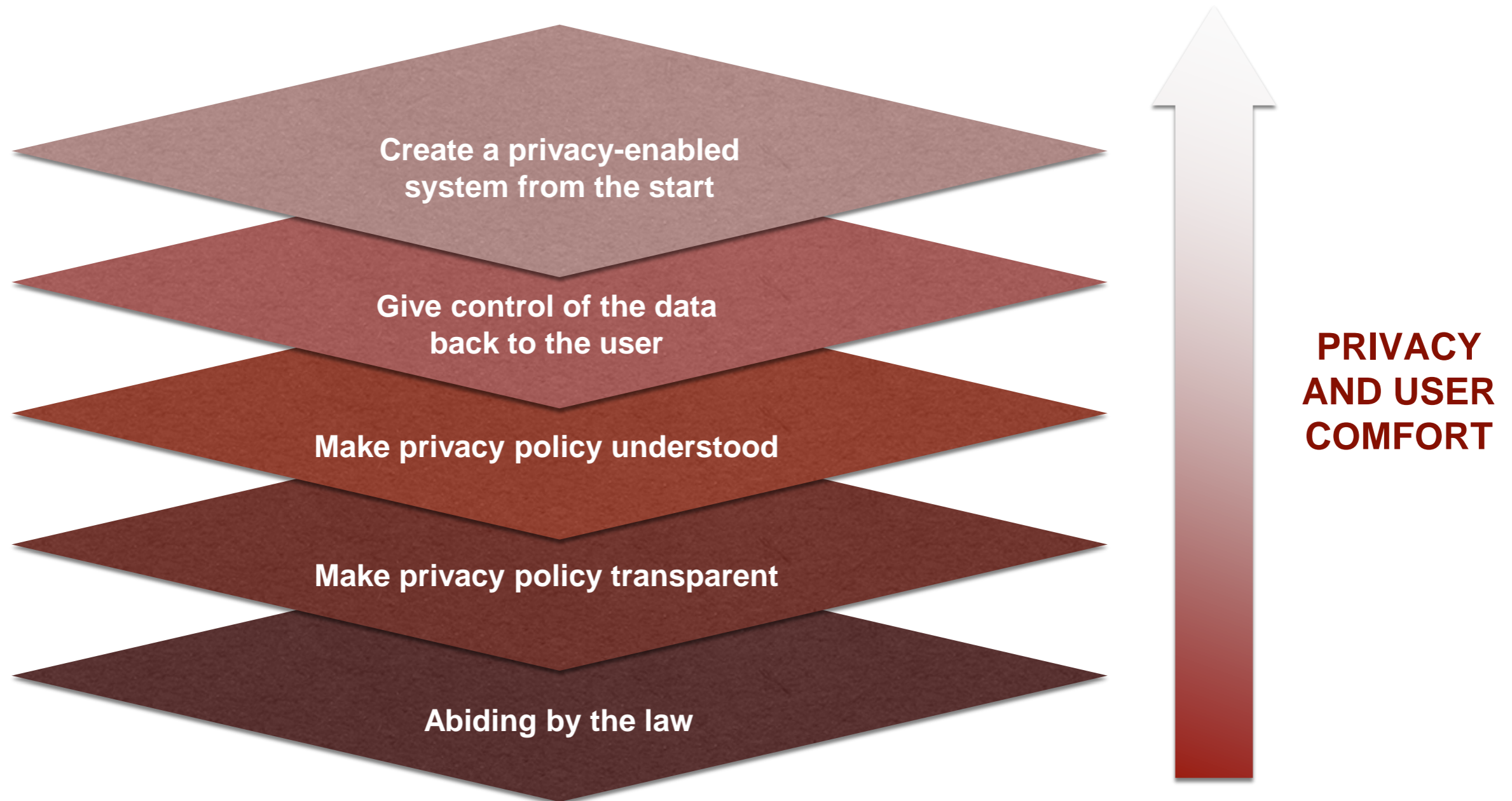
Integration of multiple services is coming...



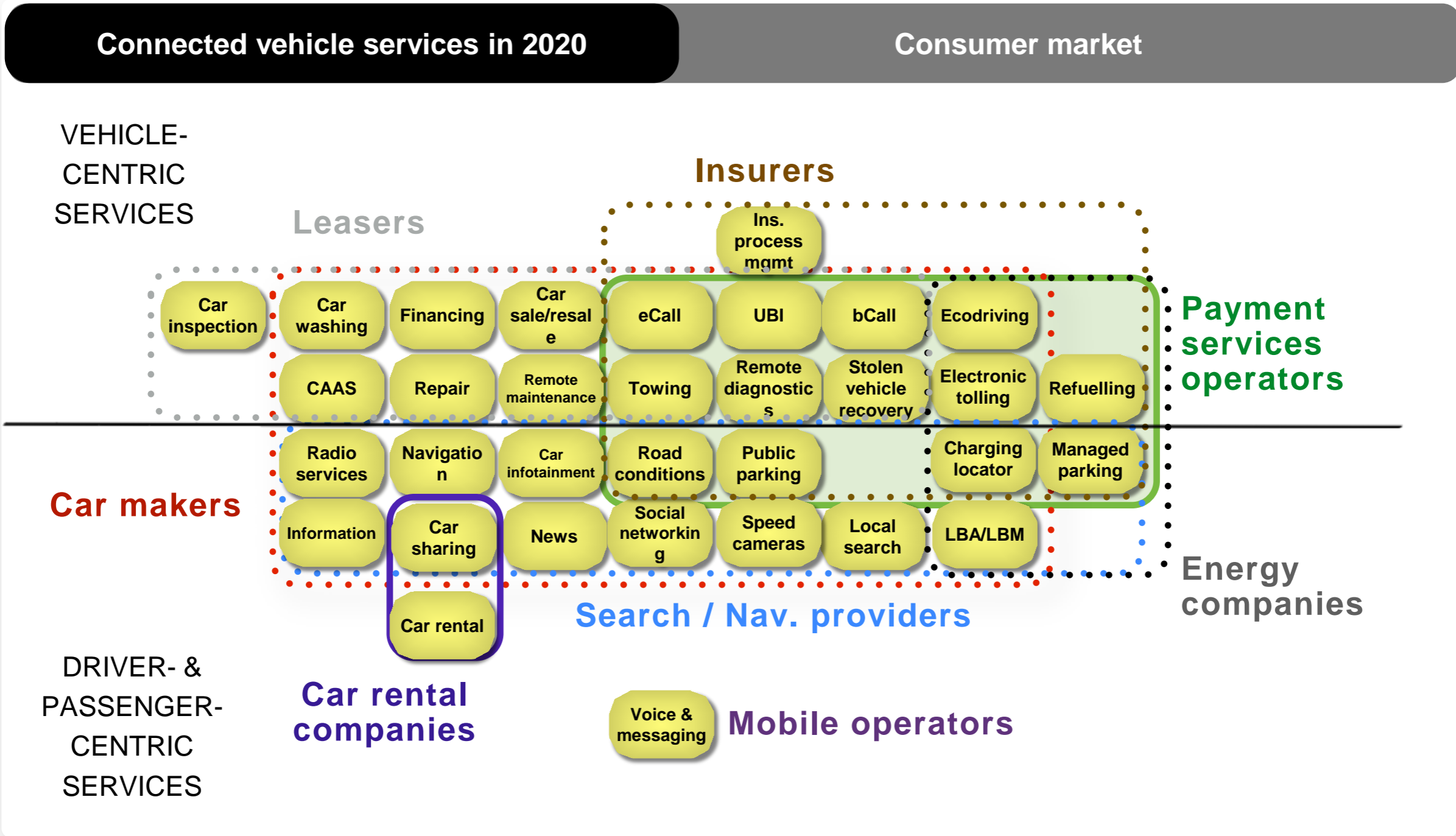
To achieve big data, walls between different services must be broken



Obviously big data service providers must take privacy more than seriously

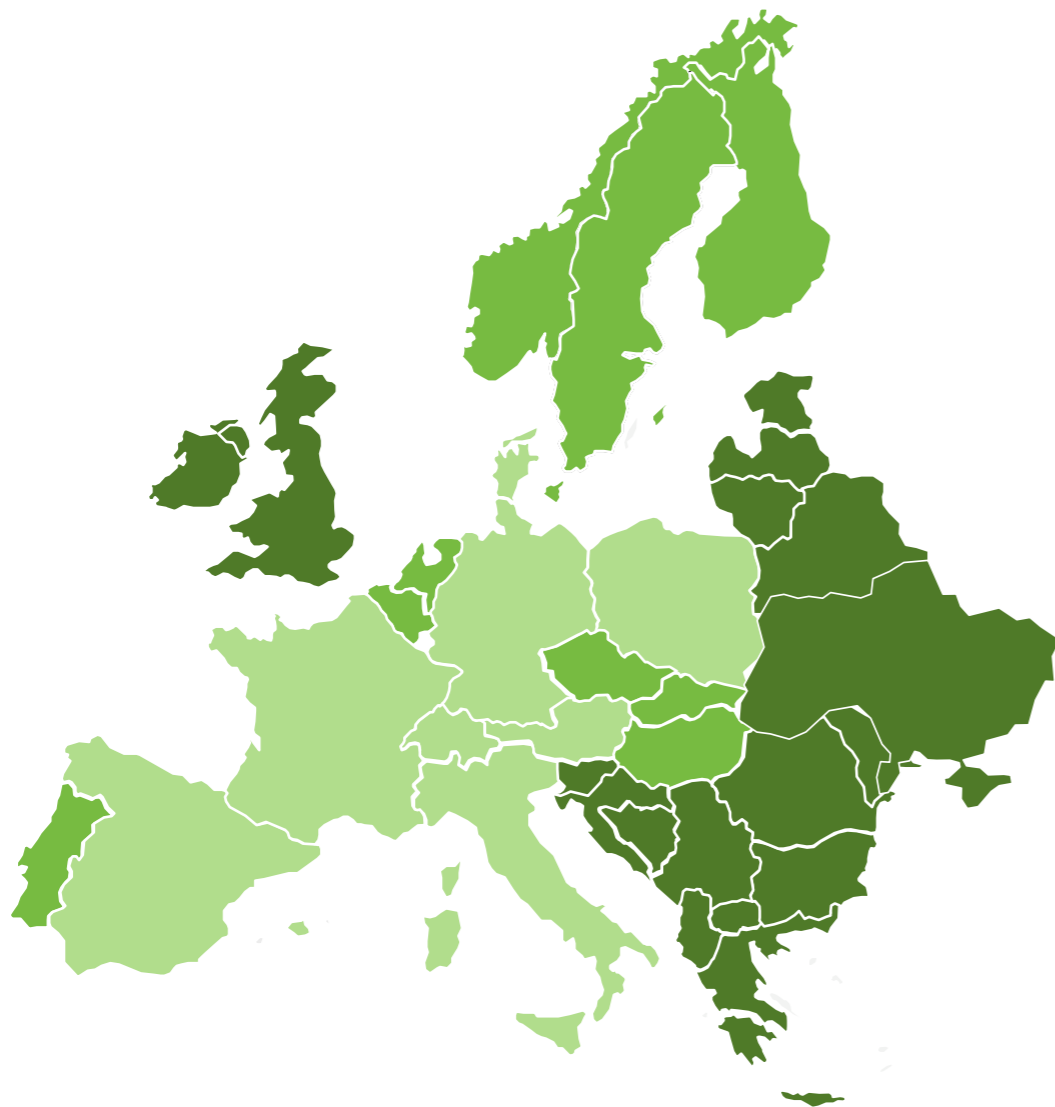


All service providers are starting to aggregate & integrate connected services but not all are as powerful



Regulatory initiatives may be required to trigger the opening of the European e-tolling market

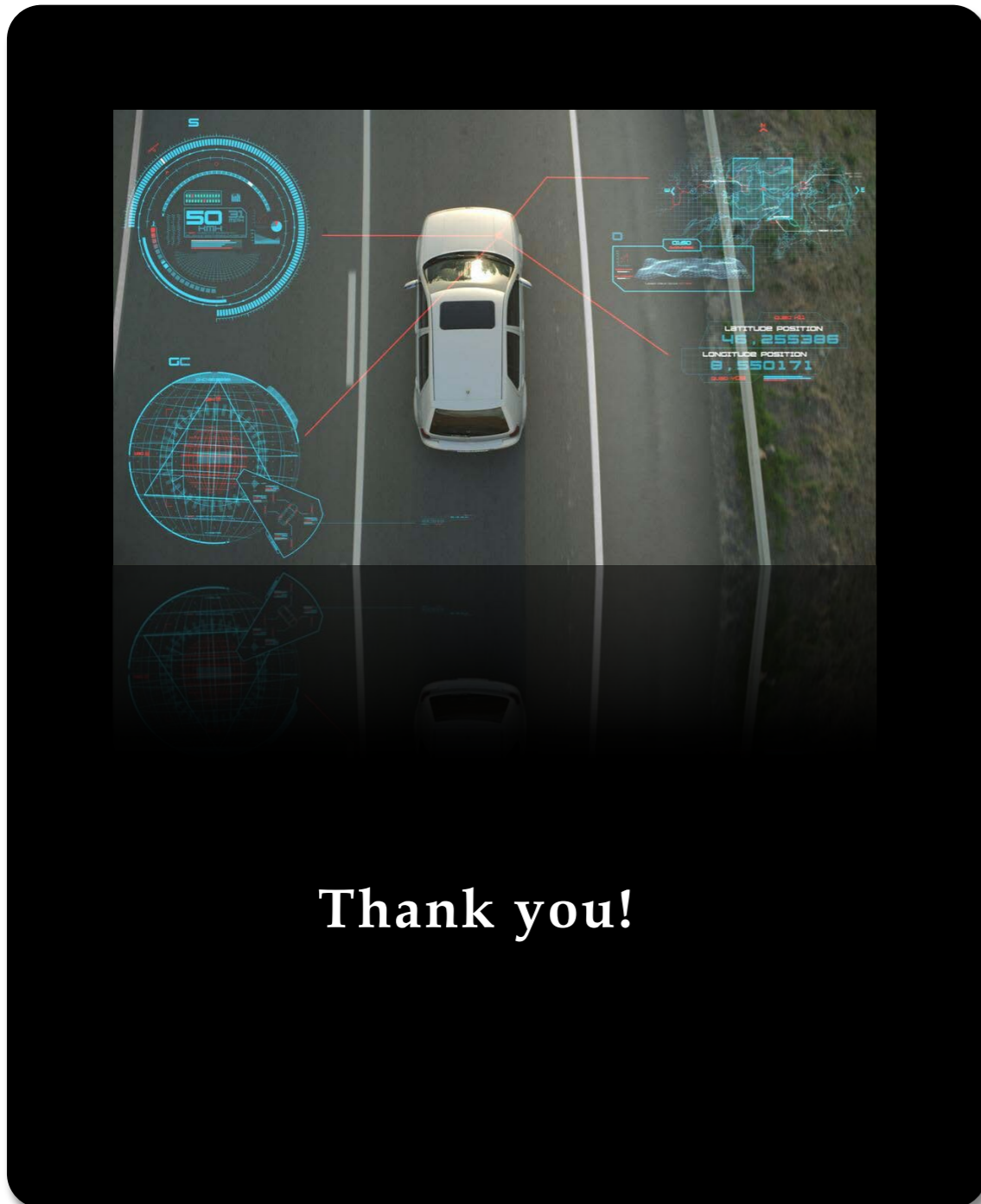
- Initial interoperability 2014-18
- 2nd phase 2019-20
- 3rd phase 2020+



Possible evolution scenario

- A number of factors are driving change
 - *2009 decision on EETS directive* makes EETS available for HGVs from October 2012 and for other passenger cars and LCVs by October 2014
 - *2011 Eurovignette directive* on HGV road charging enables toll charging for external costs & dynamic / congestion-based charging on all motorways
 - *EU "20-20-20" climate objective* involving a 20% reduction in CO₂ emissions by 2020 (vs. 1990)
- The Belgian project (2016) and the renewal of the German system in 2017 could be the 1st steps of a EU-wide interoperability
- The Commission also announced in March 2013 the Regional EETS (REETS) project gathering 8 countries
- We expect however that the EC will need to pass further legislation to force Member States & toll chargers to open up the market

To achieve big data, let us break the walls between technologies, stakeholders & industries



- **The path towards tolling interoperability is long & uncertain**
- Other industries are moving much faster towards connected vehicle services, driven by car makers, leasing companies and Internet players such as Google
- **Tolling operators** should drive interoperability & integration with other services if they do not want to become payment commodities
- **Regulators should create level playing fields to competition** by opening access to data to all parties
 - A Minimum Set of Data...
 - ... at a reasonable cost
 - And public service data (accidents, road & weather conditions, etc.)

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