

PTOLEMUS Consulting Group

Exploring the opportunities for VAS in the future mobility pricing market



IBTTA's 83rd Annual Meeting & Exhibition

Frederic Bruneteau - Dublin – 1st September 2015 - PTOLEMUS intellectual property

The strategy consulting firm for the mobility ecosystem

Applications providers



Automotive manufacturers & suppliers



Mobile telecom operators



ITS operators, regulators & fleets



Mobile device & positioning suppliers



Telematics solution providers



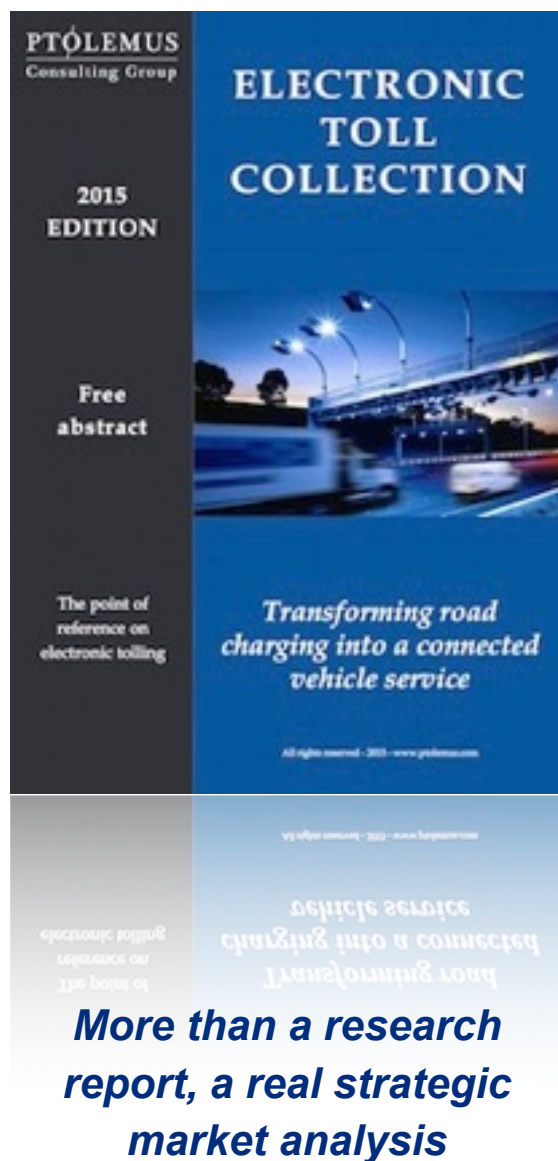
Insurers, aggregators & assistance providers



Banks & private equity investors



PTOLEMUS just published the ETC Global Study, the most comprehensive analysis of the tolling market worldwide



- **650-page analysis of the global electronic tolling landscape based on:**
 - 60 interviews in 12 countries
 - 135 figures and charts
 - 3 years of hands-on experience advising key players in the ecosystem
- **A comparative assessment of tolling technologies, models and trends**
 - ANPR, DSRC, Infrared, GNSS, RFID & WAVE technologies & business models compared
 - Evolution path from toll gates, ETC to MLFF
 - The new trends: big car data, mobile tolling, mobility pricing and sustainable mobility
- **A detailed analysis of all major players' strategies & solutions**
 - Their development strategies in the new value chain compared
 - 23 company profiles, from Atlantia to Xerox
 - 35 tolling markets compared
- **A decryption of regulatory evolutions**
 - Bill 810, eCall, EETS, ERA Glonass, REETS, Resolution 005 AGEPAR
 - 43 standards & patents listed: 6C, CEN, ETSI, ARTEFATO, ISO, etc.
- **2010-25 bottom-up market forecasts**
 - Number of devices sold, vehicles subscribed by technology & vehicle type
 - **36 countries covered** in Europe, North America, South Africa, India, China, Japan, Korea and South East Asia
- **An in-depth review of ETC markets**
 - 35 countries in Europe, America, Asia & Africa profiled and analysed
 - 14 case studies including ATI, AutoPass, BroBizz, Ecotaxe, e-way, Hu-Go, LKW Maut, PrePass, Via Verde, etc.
- **Toll charger models**
 - Toll connected services opportunity analysis
 - Markets' readiness for connected services
 - Integration with 11 VAS and 5 connected services

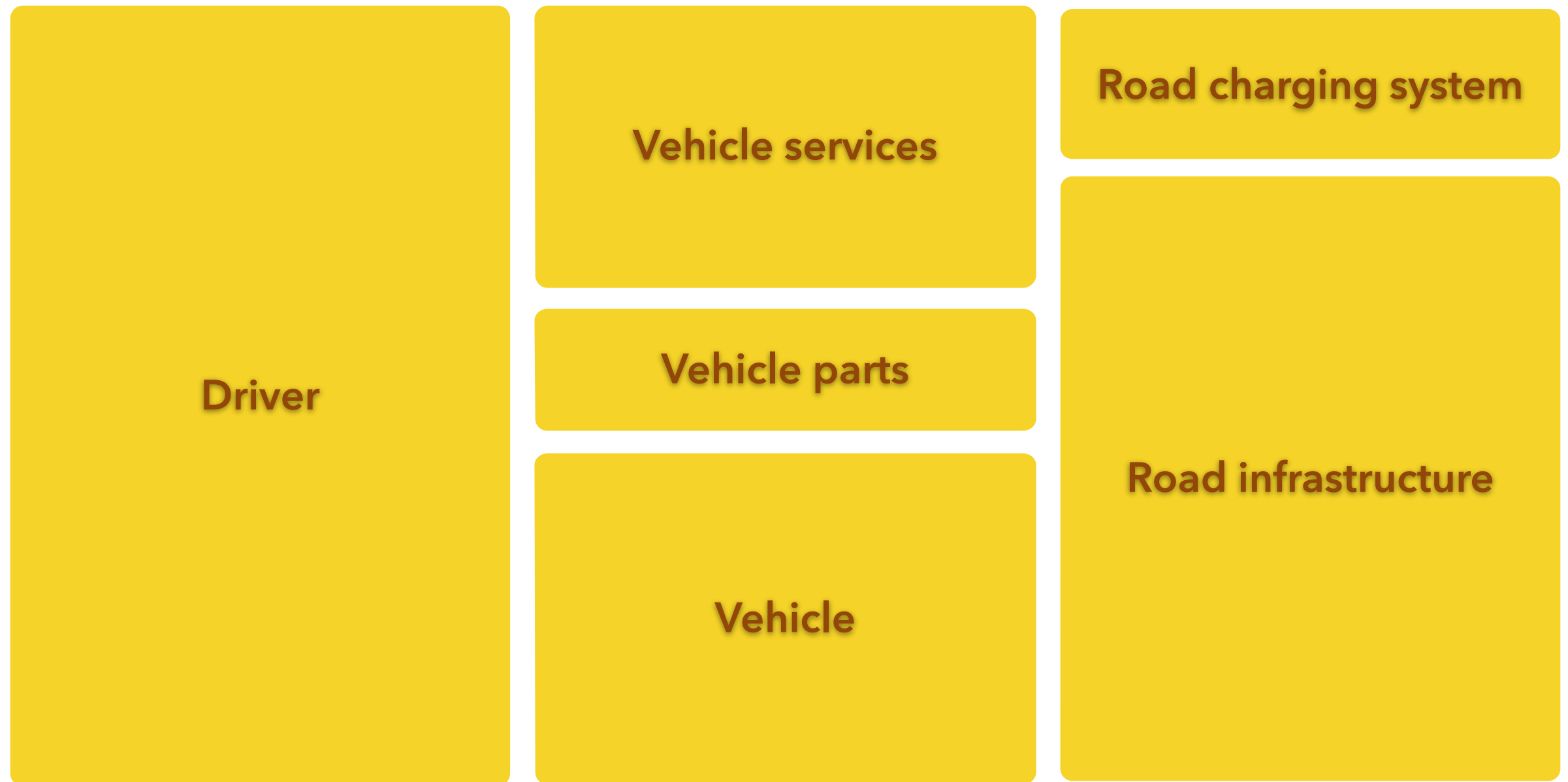
**Mobility pricing means charging for the 3 cost components:
driver, vehicle and road infrastructure**

Driver

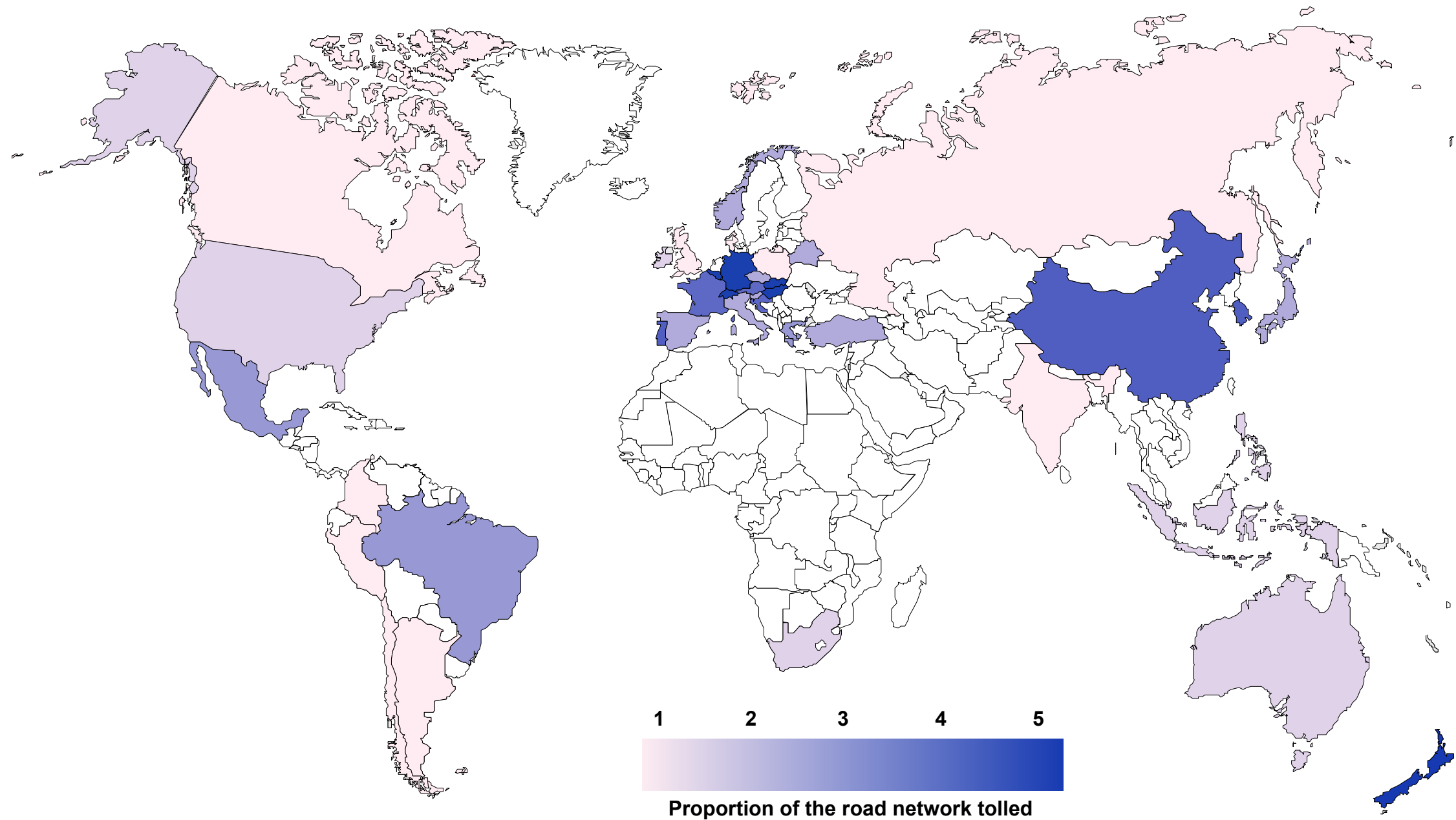
Vehicle

Road infrastructure

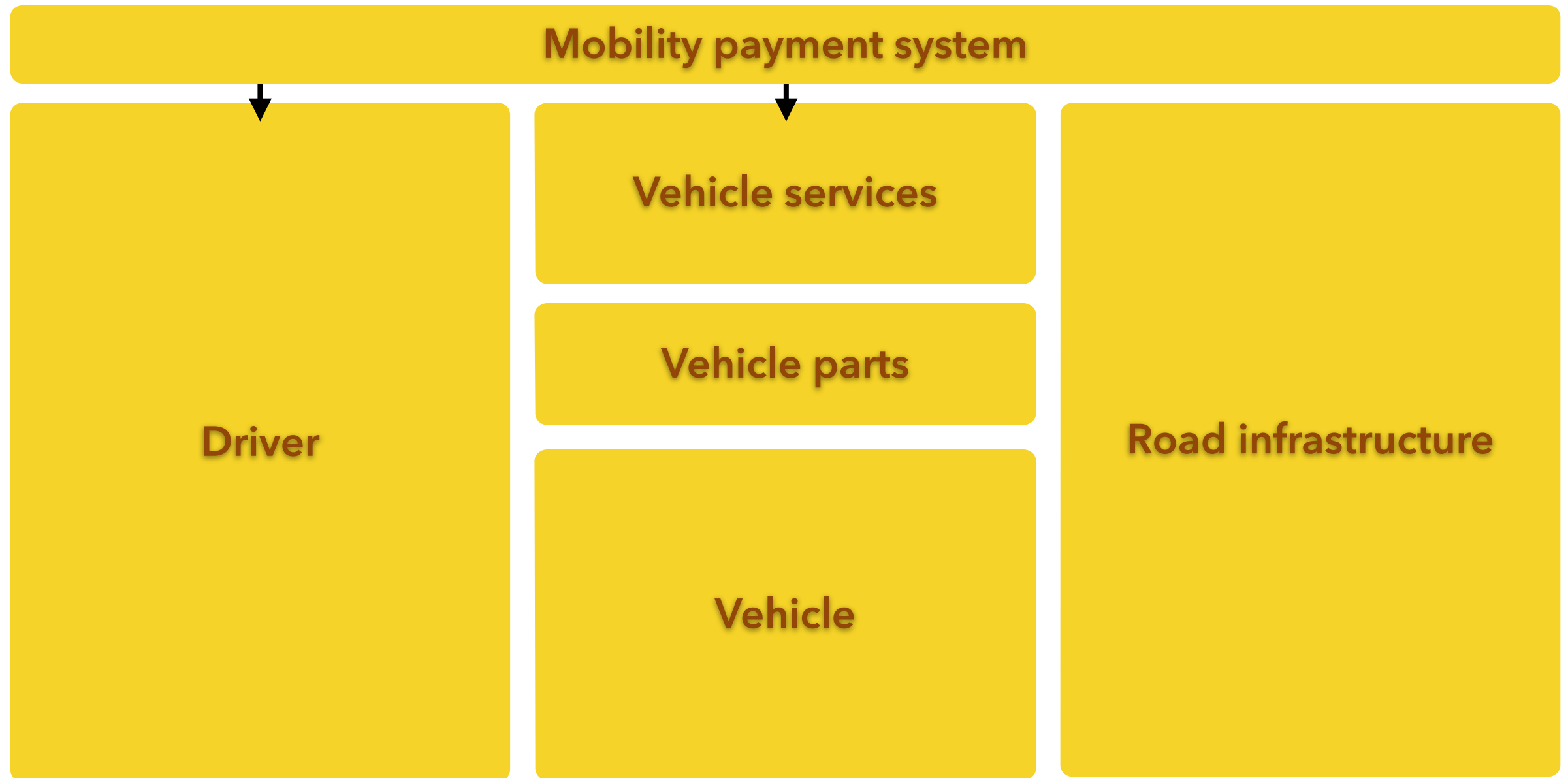
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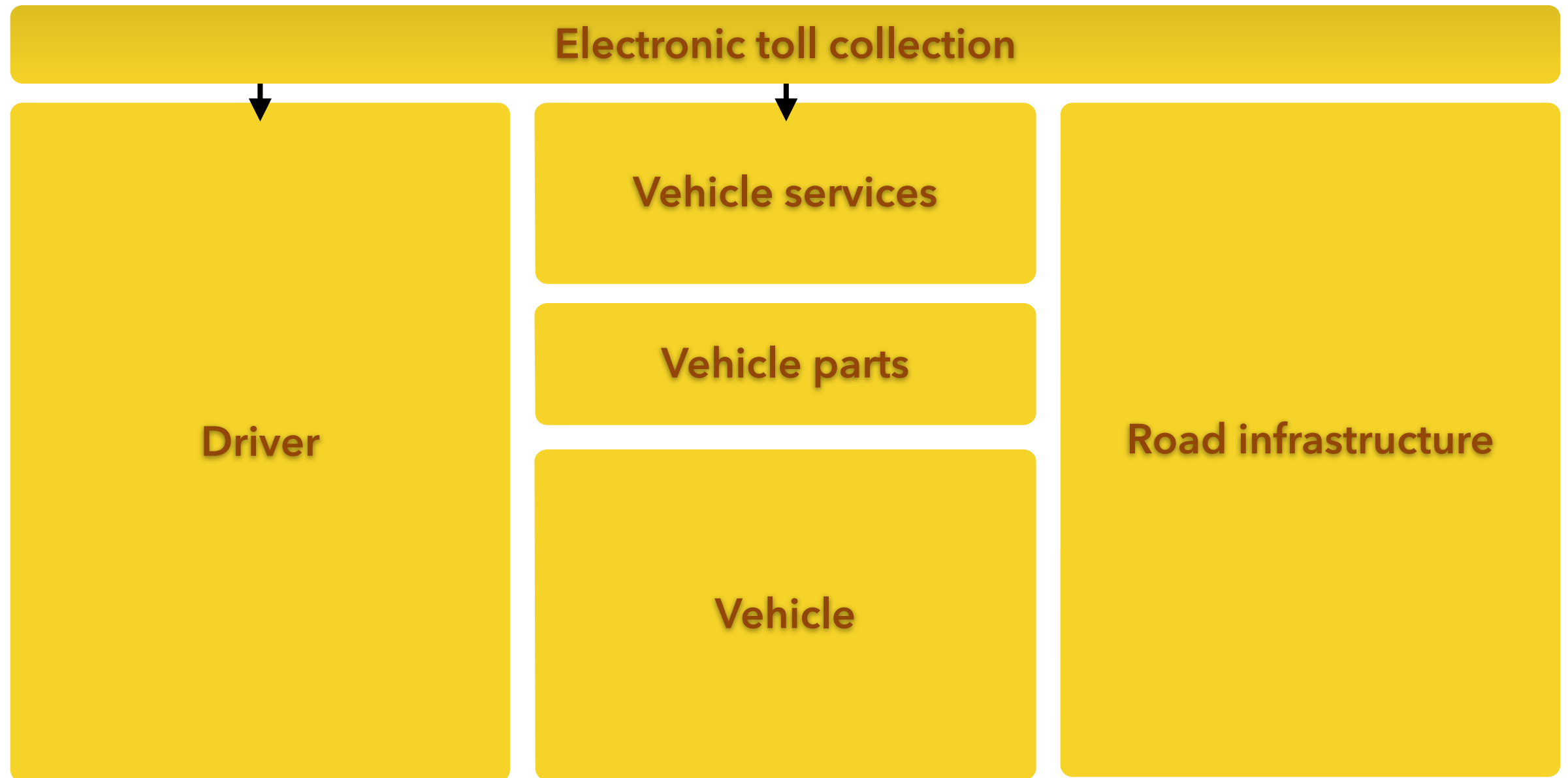
Road tolling is becoming global and progressing fast



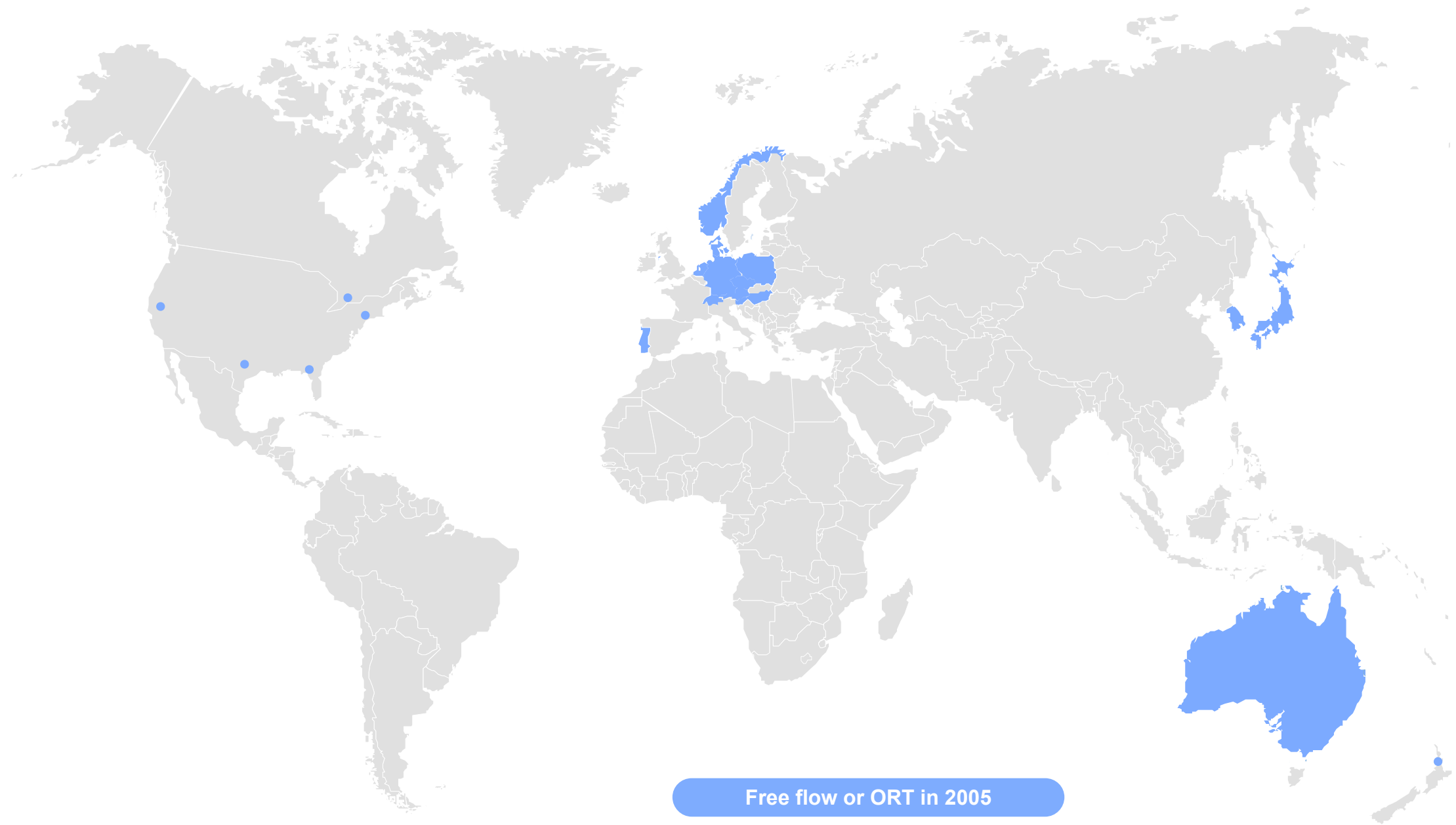
The road charging system could become the payment layer of all mobility services



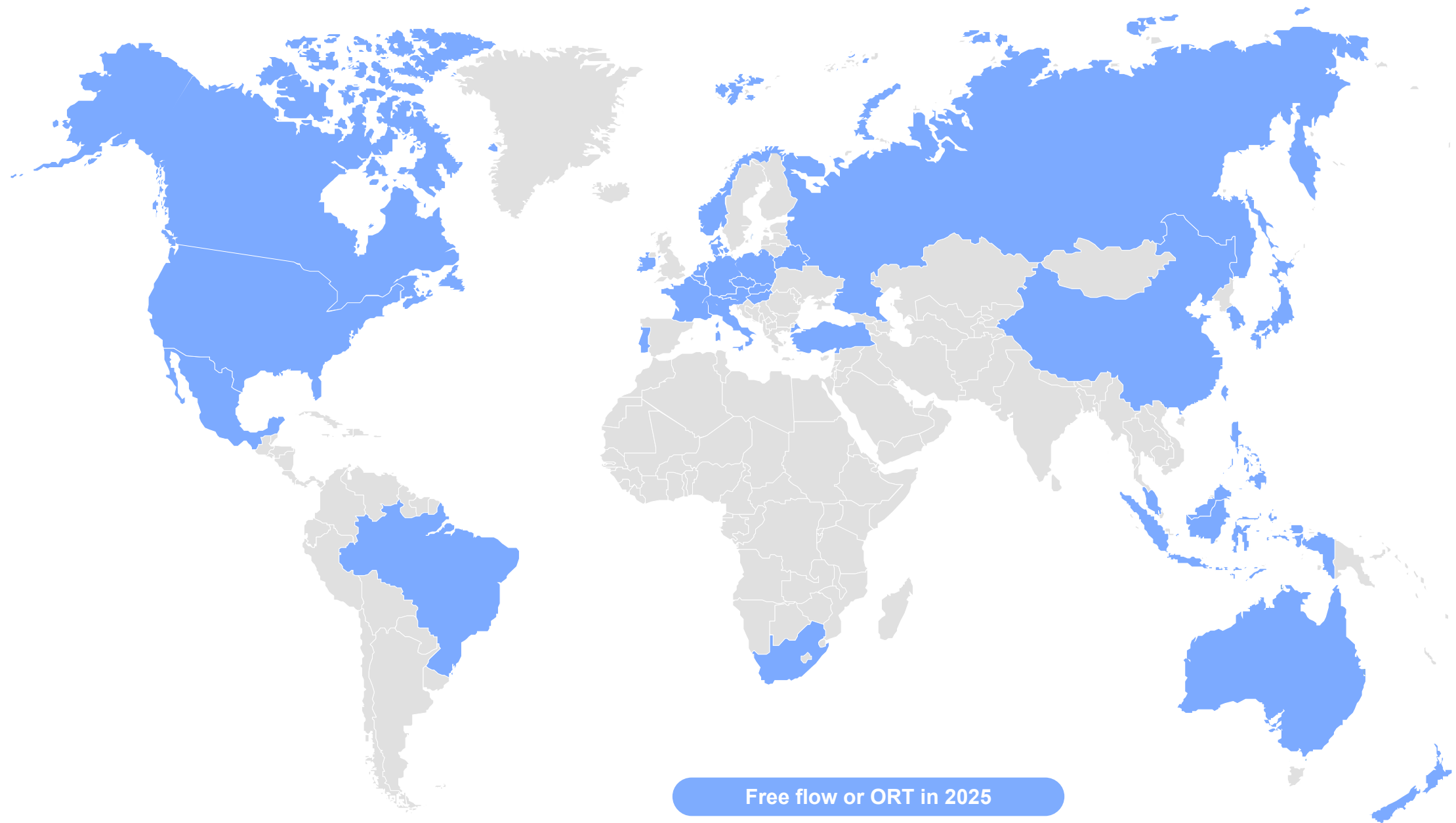
This can happen only if the payment system is electronic and relies on a secure device / process



The gates of tolling are falling...

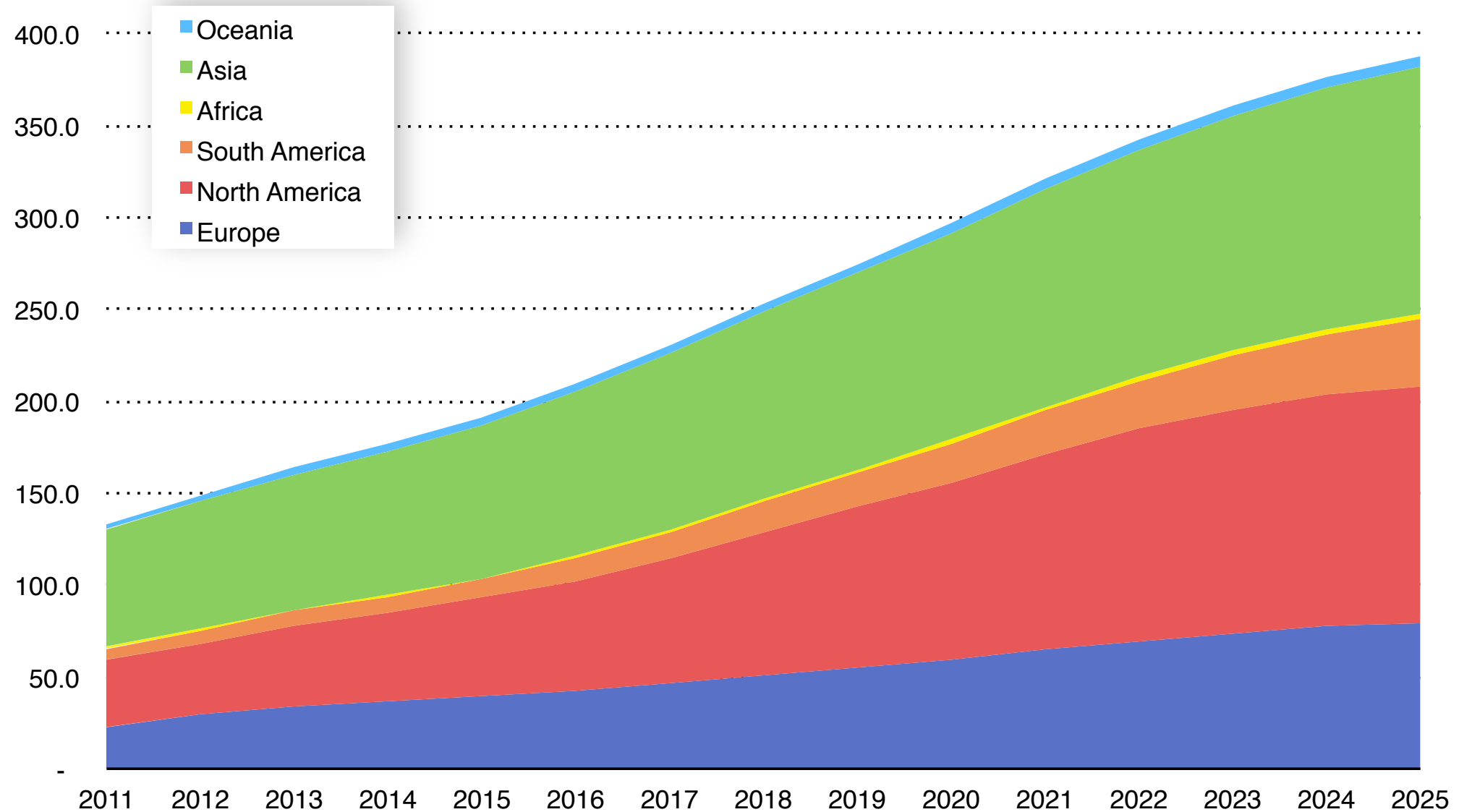


The gates of tolling are falling...



Global ETC subscriptions will exceed 300 million by 2020

Cumulative number of ETC subscriptions worldwide (in millions)



Mobility pricing could be performed using a tolling OBU but also other connected devices

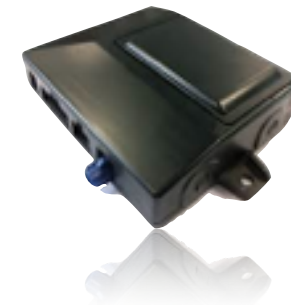
Digital tachograph



Telematics insurance device



eCall device



Electronic tolling device



Smartphone



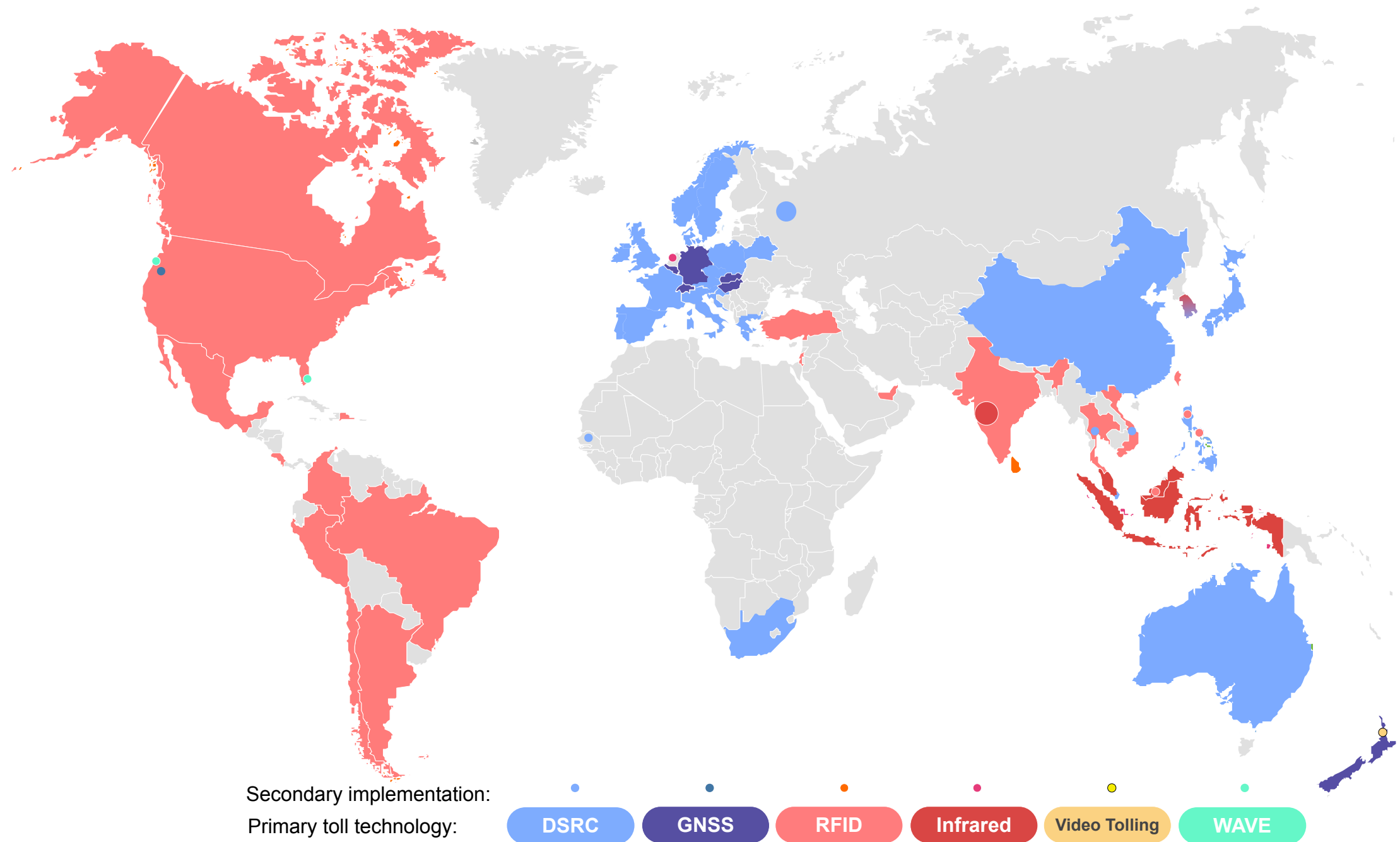
Fleet telematics black box



On-board computer



Today, the toll technology world is split into 2 camps



There will be *no* successful VAS market without a roaming level playing field

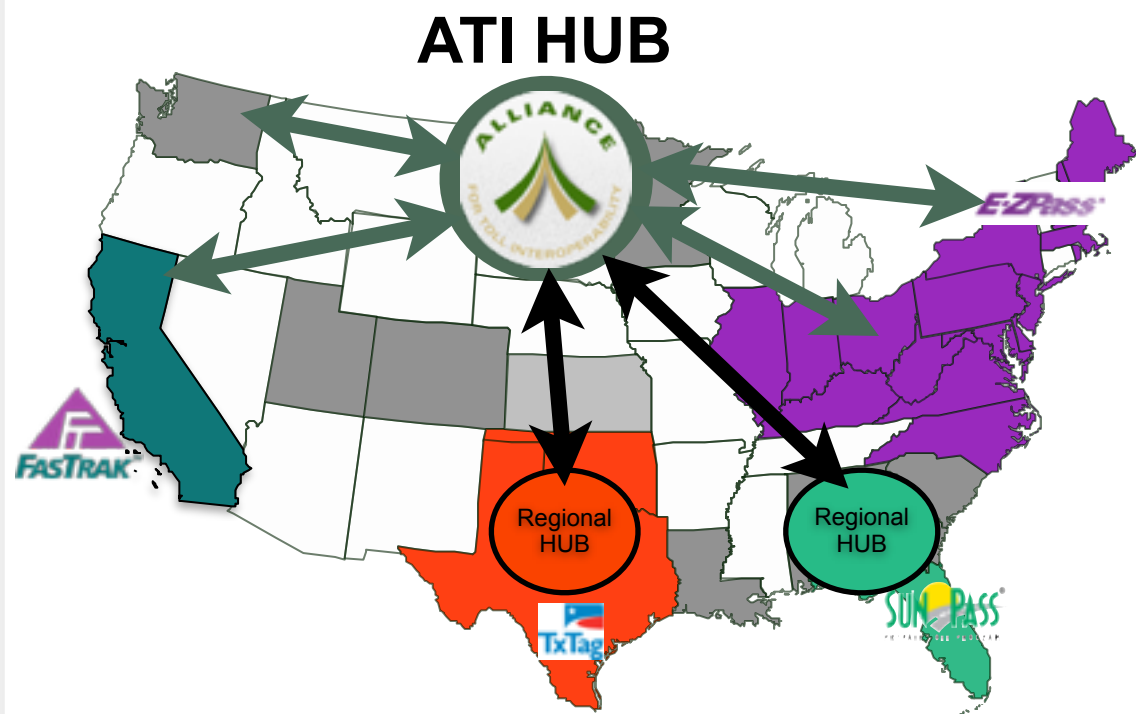
- Scale is required for VAS success
- The mobile telecoms services industry, one of the most successful VAS platforms, has grown to a \$700 billion market thanks to roaming
- How can the industry move to roaming faster?
- A possible option: shift from device- to cloud-based intelligence
 - Barriers force the system to rely on hardware
 - Free flow transforms tolling into a software-based information exchange
 - ID and location become the key requirements
 - Consequence on privacy and enforcement



Applying cloud-based roaming in the US and in the EU

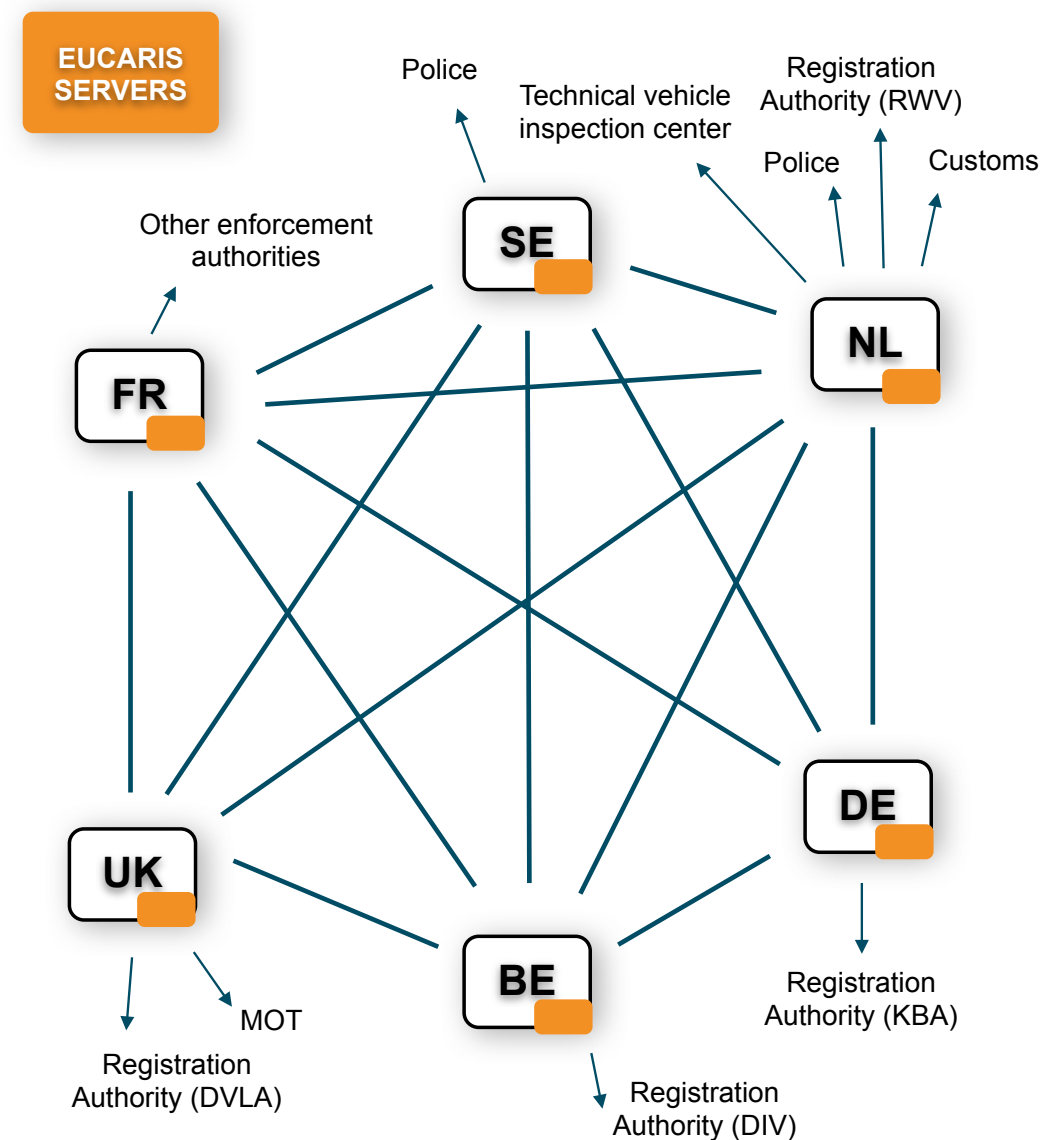
ATI's HUB

Number plate information exchange mechanism



EUCARIS

Number plate information exchange mechanism



Openness makes the ETC business case more attractive

Belgium's *Viapass* HGV tolling system

2016



Viapass

- New and different
- Not EETS-interoperable from the start
- Single device allowed
- Closed to other EETS-compatible devices
- Expensive (€1.4 billion over 12 years) and took 5 years (2011-2016)
- No VAS allowed
- Mix of pure GNSS location and segments

Hungary's *Hu-Go* HGV tolling system

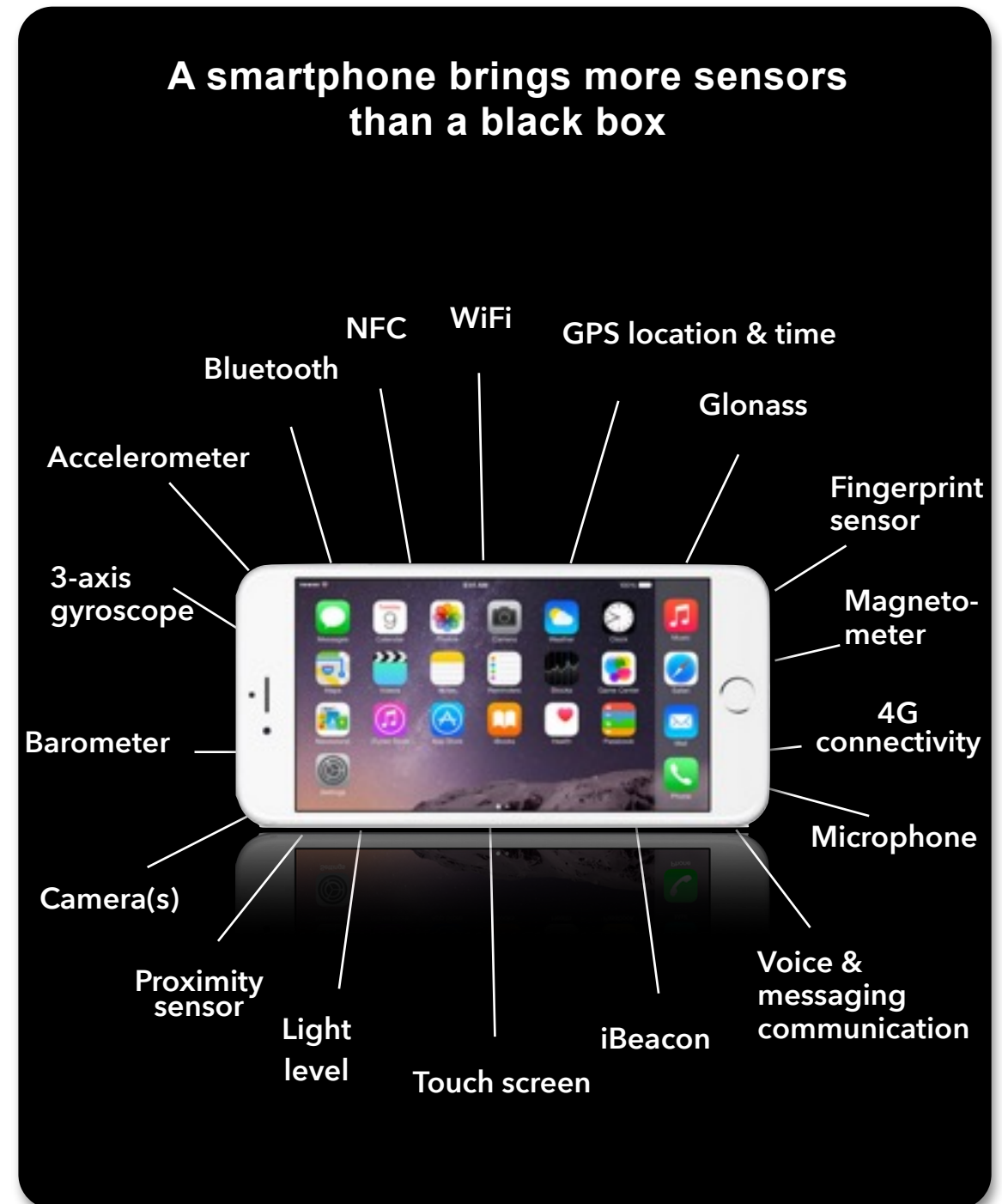
2013



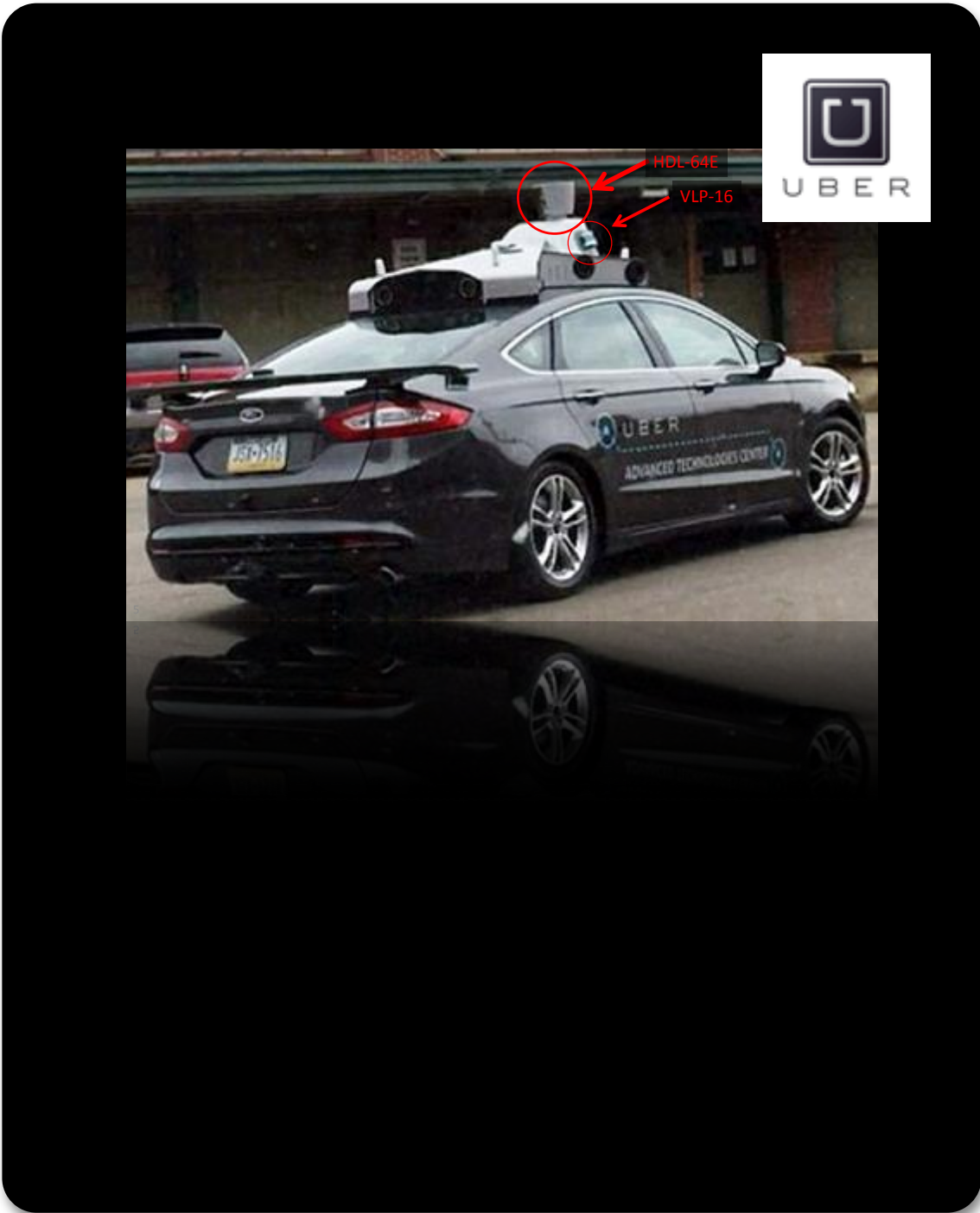
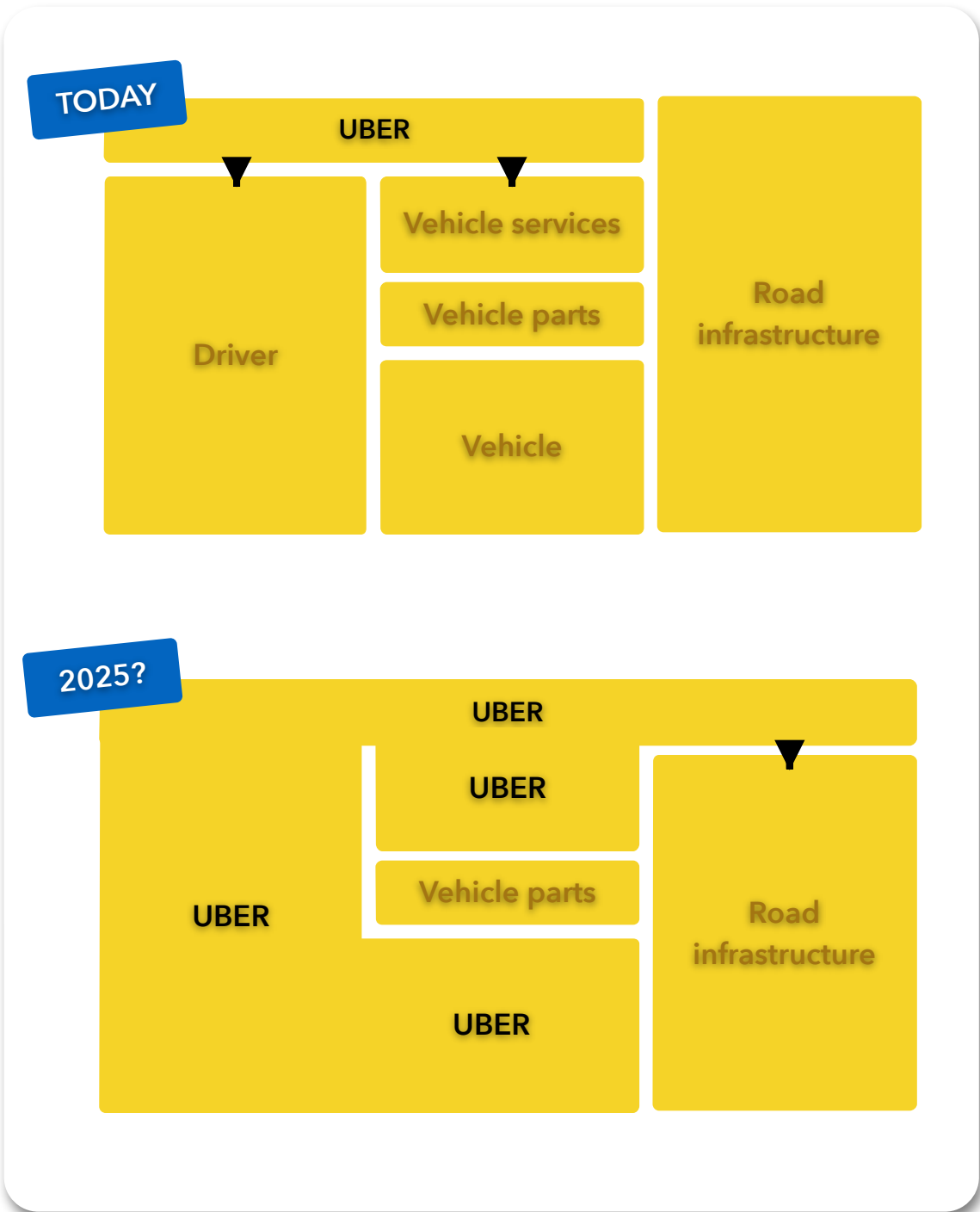
- New and different
- Not EETS-interoperable from the start
- Open to any certified device (22 suppliers available)
- Completely open system
- Very inexpensive (€75 million for initial set-up) and built in 6 months
- Fully integrated with fleet management services
Unlimited potential for VAS
- Segment-based (hybrid)

If roaming doesn't come, the smartphone will force its way in!

- **50-75% penetration** in North America and in Europe
- A very successful **service delivery platform**, e.g. 1.5 million apps on the App Store
- **18 sensors** in the iPhone 6, 1-2 new ones added every generation
- Today, the device offers
 - A customer interface
 - A reliable GNSS antenna
 - Identification to match with ANPR
 - Secure payment and account management
 - A platform for VAS

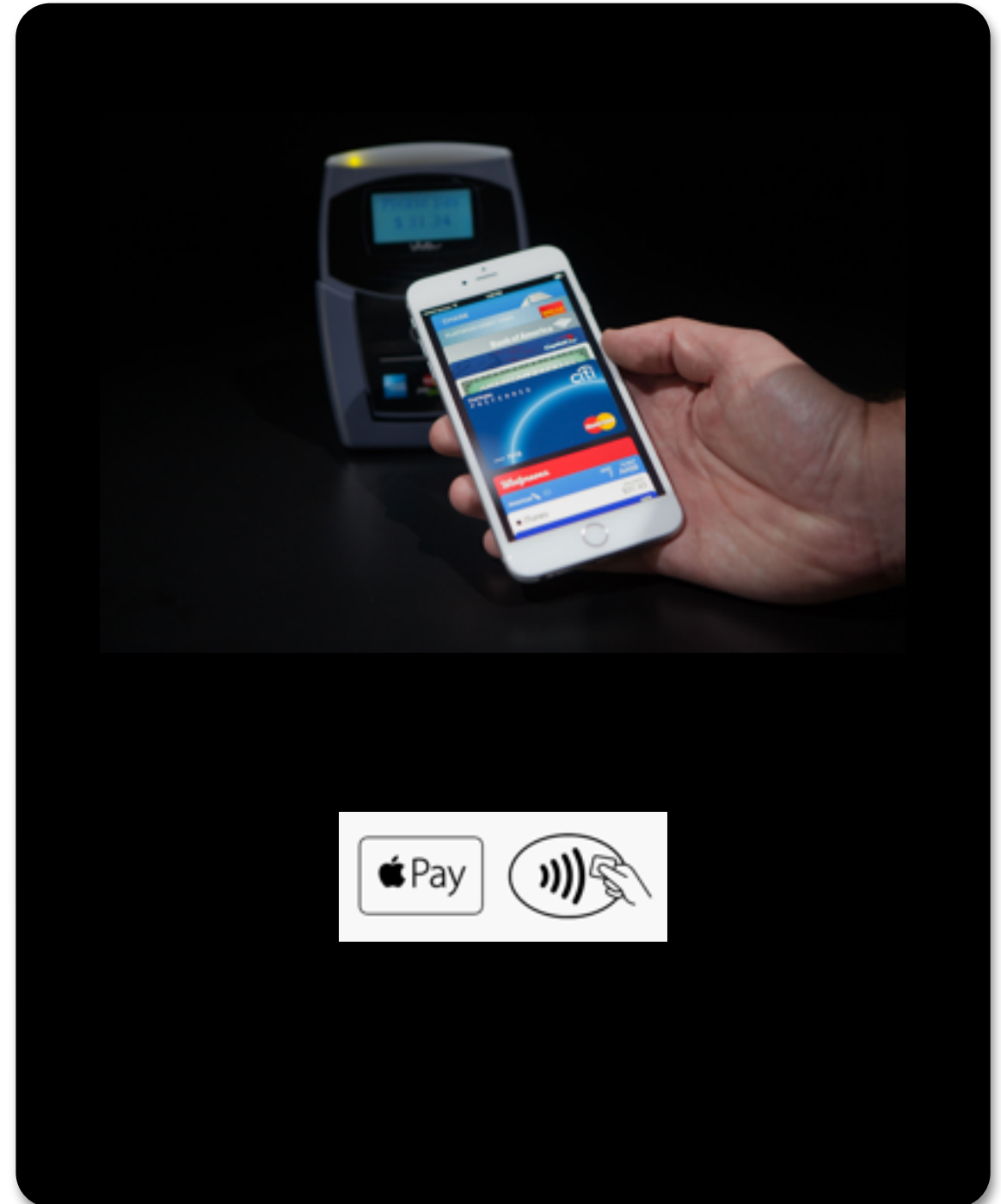


If the car becomes a public transport, who will operate it?



Road operators could become “car pipes”

- **Roaming is becoming a must if the industry wishes to survive**, as it brings
 - Economies of scale, i.e. lower device costs
 - Higher revenues
 - Higher user benefits
- **But it is not sufficient:** despite having achieved roaming, mobile operators have mostly become data pipes
- Road charging could become just another Apple Pay service
- **More value needs to be provided by toll operators to customers**



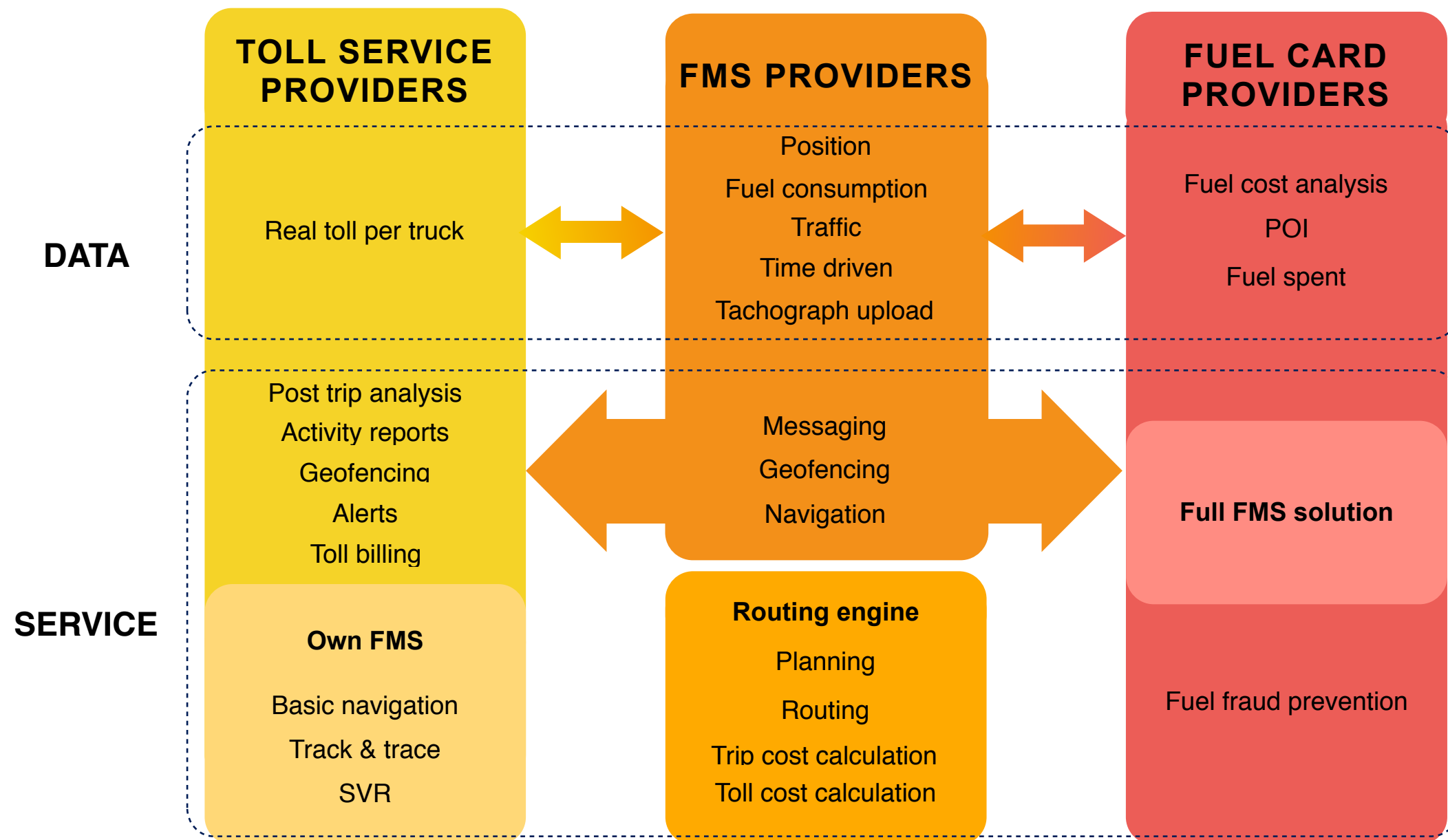
Smartphones are becoming a viable solution to provide a very low cost road charging solution open to VAS

- For example, Cintra is experimenting *Satelize*, a smartphone-enabled solution for road pricing and a platform for road services
- Compatible with existing tolling systems, it allows for **distance-based charging**
- Technology solution based on
 - Geo-fence virtual control points
 - ANPR for enforcement
- The software platform can also offer:
 - Road services (traffic, weather, etc.)
 - Emergency call services
 - Loyalty programs
 - HOV schemes
 - Discount policies for green vehicles and responsible driving
 - Insurance premium bonuses*



Partnering with fleet tracking suppliers brings key advantages

Fleet vehicles - Complementarity and data exchange between service providers



Openness is a must for toll chargers / agencies to move to VAS and mobility pricing



Thank you!

- Connected vehicles, autonomous vehicles, free flow and roaming are about to radically change tolling
- If ETC becomes a feature of a wider service controlled by new entrants, then monopolies will crumble
- Regulators should **support innovation** by facilitating access to a secure ANPR data exchange
- We recommend tolling operators to
 - **Drive interoperability & integration** with other services if they do not want to become payment commodities
 - **Partner** with players **outside** the tolling sector: car sharing providers, insurance companies, OEMs, etc.
 - **Build B2C or B2B businesses**, besides their existing B2G activities

PTOLEMUS Consulting Group

Strategies for Mobile Companies

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PTOLEMUS is the first strategy consulting firm focused on the connected vehicle

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

Road charging / electronic tolling, Usage-based Insurance, 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

PTOLEMUS in a nutshell - Typical assignments



Performed the feasibility study of a shadow electronic tolling system

Publicly-owned toll charger



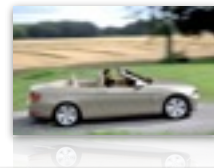
Conducted the technology due diligence of a major fleet management service provider

Major private equity fund



Defining strategic positioning in insurance telematics value chain

Global tier-1 automotive supplier



Defined strategy & business plan of its telematics business

Pan-European insurance company



Defined its strategy in mass cellular positioning data

Mobile operator



Defined strategic positioning in the field of fleet connected vehicle services

Major motorway operator



Led commercial due diligence of a UK data management service provider

Financial investor



Assisted in sourcing a driving behaviour database across Europe

Global tier-1 automotive supplier



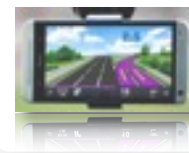
Assisted in developing its usage-based charging telematics business

MAGNET MARELLI



Evaluated the technologies & business potential of the European electronic tolling market

Major embedded electronics vendor



Assisted in sourcing the navigation engine of its next generation in-car system

Consumer electronics device supplier



Assisted in designing a digital roadside assistant solution using OBD dongles

Global roadside assistance group



Defined & implemented partnership strategy in connected commercial vehicle ecosystem

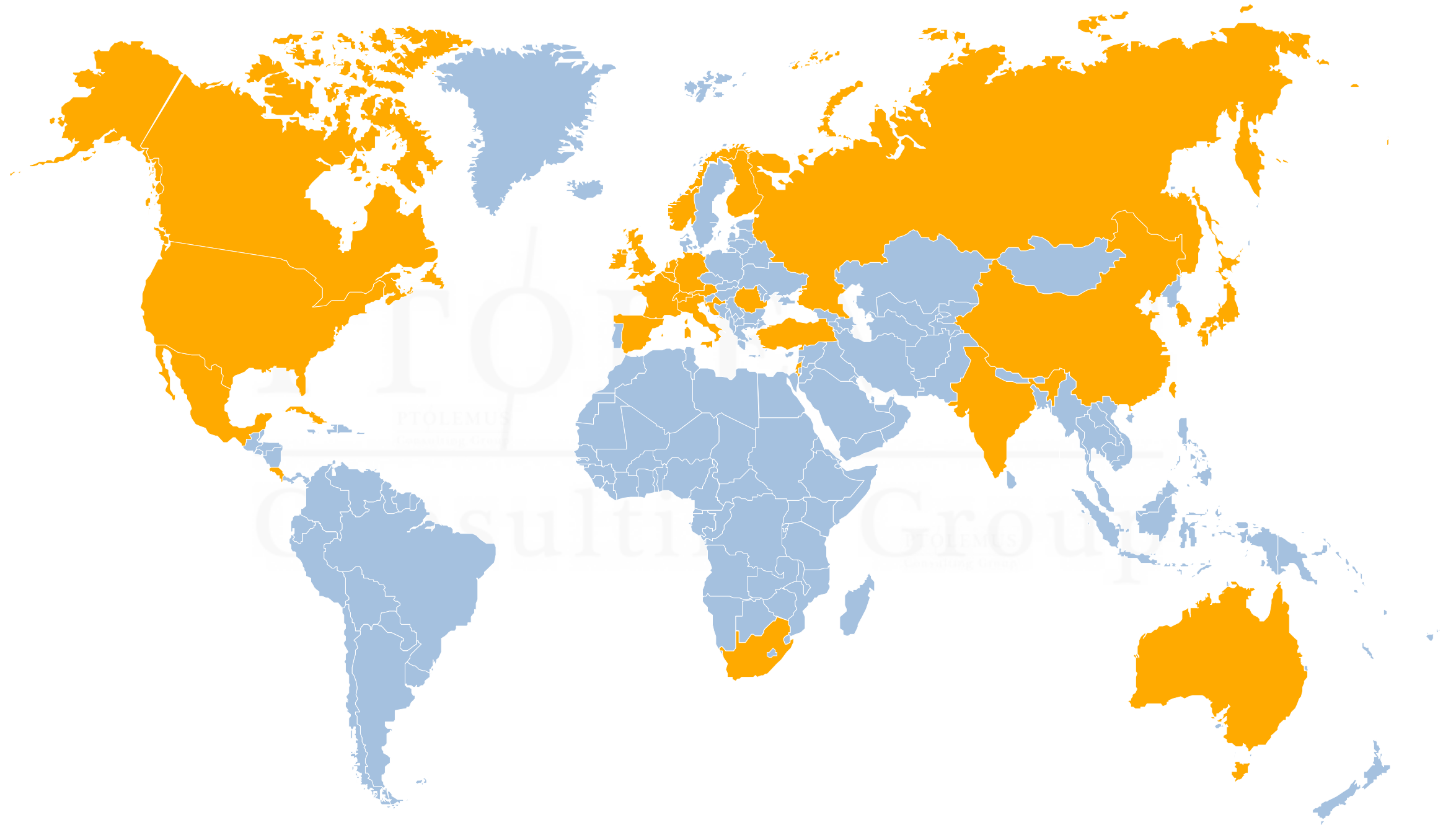
Future EETS service provider



Appraised future telematics technology & market trends and their impacts

Leading EU insurance group

Our clients come from around the globe



A growing recognition

They mentioned PTOLEMUS

