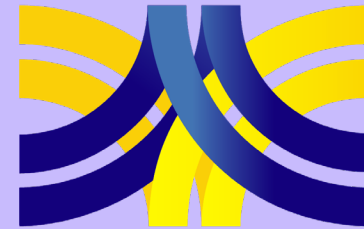


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*Decarbonizing Road Infrastructure : Challenges,
Perspectives and Actions in Tough Economy*

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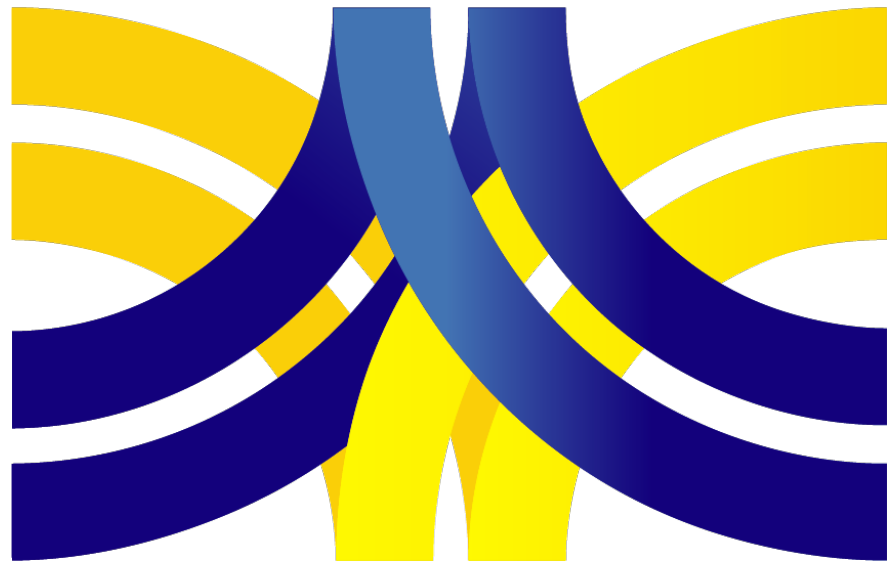


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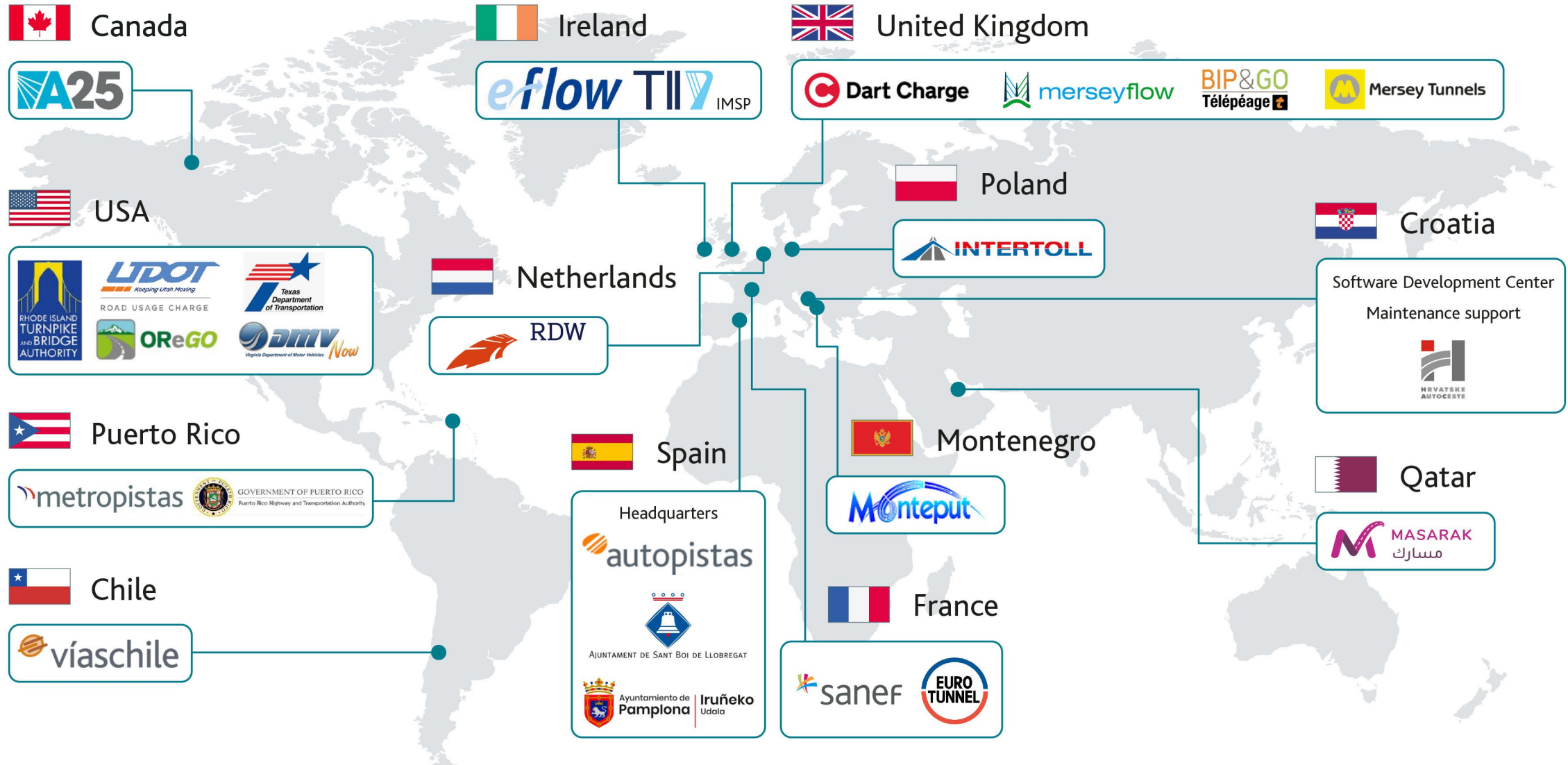
Integration of Road User Charging & Free-Flow Tolling

Benoît ROSSI

Business Development Director EMEA/LATAM
benoit.rossi@emovis.com

 **emovis**
Abertis Mobility Services

emovis: global presence



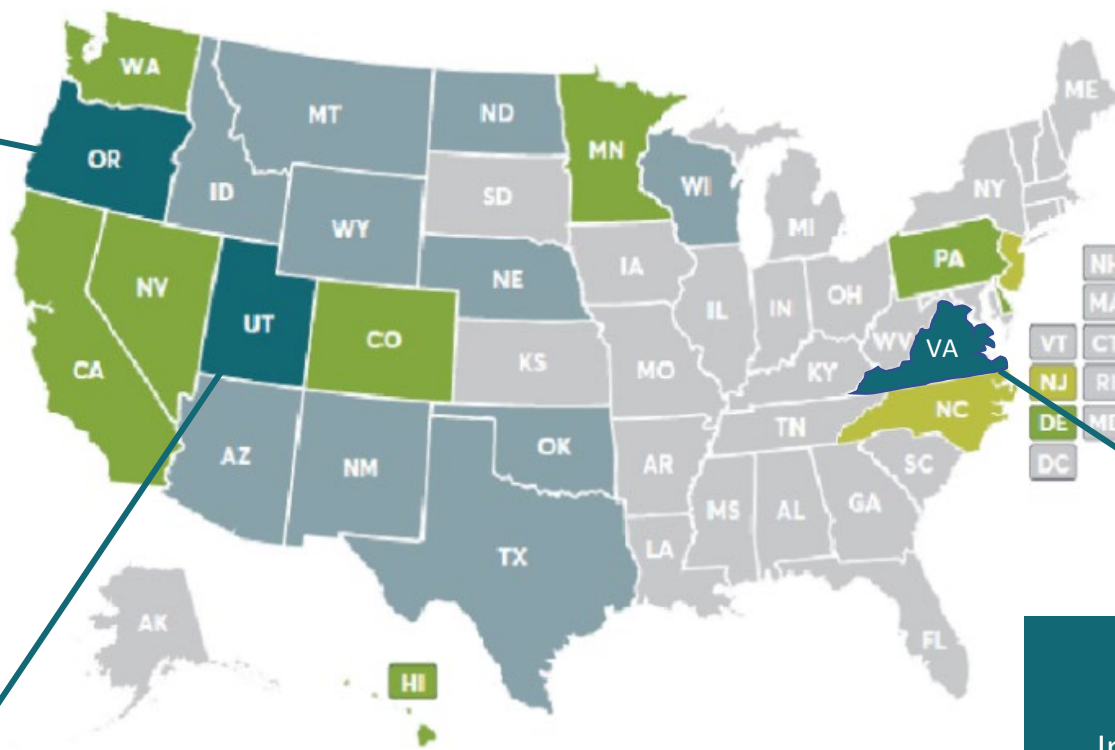
Road User Charging – Programs in the US

■ Enacted programs ■ Pilots/demos ■ Planned pilots ■ Research only

Oregon
In 2015 the State of Oregon, as a pioneer, deployed a pilot project (capped at 5,000 vehicles) based on RUC as a potential alternative to fuel tax revenues.
emovis is present since 2015.



Utah
In 2017 the State of Utah enabled legislation for RUC and **emovis** was awarded the contract in 2019.
The program is live since 2020.



Virginia
In 2020 the State of Virginia enabled legislation for RUC and **emovis** was awarded the contract in 2021.
The program is live since July 2022.

RUC in the US
3 live programs = 3 x emovis

Road User Charging – Why doing RUC?



- **Fairness**

Users pay proportionately for the exact amount of the road they use and spread out their payments over their registration period



- **Choice**

Users control how, when and what they pay



- **Flexibility**

Agencies can adjust revenues as economic conditions, demand and technology changes



- **Better Incentives**

RUC creates incentives for users and agencies to evaluate the efficiency, quality and cost of transportation

Road User Charging – Why doing RUC?



- **Infrastructure**

Helps reduce traffic congestion and air pollution

Reduces road wear



- **Sustainability**

Applies to all vehicle types, no dependency on fuel usage and gas tax

Road User Charging – Technology Options



Embedded Telematics

These types of applications use factory-installed components, systems, and interfaces that are wholly contained in the vehicle and accessible to users through an in-dashboard display. **In the long term, it is anticipated that embedded systems will dominate the telematics market** since they are an increasingly common feature in newer-model vehicles. They also provide very reliable and accurate data and are difficult to tamper with.



OBD-II Dongles

These applications generally take the form of a dongle that is **self-installed by the driver** through the vehicular onboard diagnostic (OBD) port. The dongle then receives and stores vehicular data through this connection.



Blackbox

These applications **require the hard installation** of an in-vehicle device to the chassis of a vehicle, which typically requires the services of a professional installation technician. Blackbox applications provide very detailed and reliable data, but they are **relatively difficult to install** and are not expected to be a significant telematics-based technology services platform in the long term.



Smartphones

They are primarily a communication medium but they are used by consumers for numerous non-communication-related applications, including the provision of in-vehicle services. Smartphone apps enjoy significant utilization, primarily due to the popularity of smartphones. Location data gathered from apps **tend to be less accurate, and devices can be turned off** or removed from the vehicle, lowering the reliability of any data gathered in terms of accurately assessing distance traveled.



Hybrid Approaches

Hybrid applications occur when two different technologies are combined to provide vehicle telematics-based services. **Smartphones are a component of 5 most hybrid approaches because they can be coupled to both embedded and OBD-II based technologies.** The challenges of smartphone applications can be addressed in hybrid systems; for example, OBD-based devices can maintain logs of vehicle starts and stops, which can be paired with smartphone data to identify gaps in usage data.

Freeflow and RUC – Is coexistence possible?

- **Tolling will continue to exist**
 - **Tolling** it is the best way to sustainably finance specific infrastructure: motorways, tunnels, bridges.
 - **Free-flow is expanding in Europe** in the “traditional tolling countries” (France for example) or in new countries (Netherlands)
- **RUC schemes can fund large road network (other than just highway)**

CHALLENGES

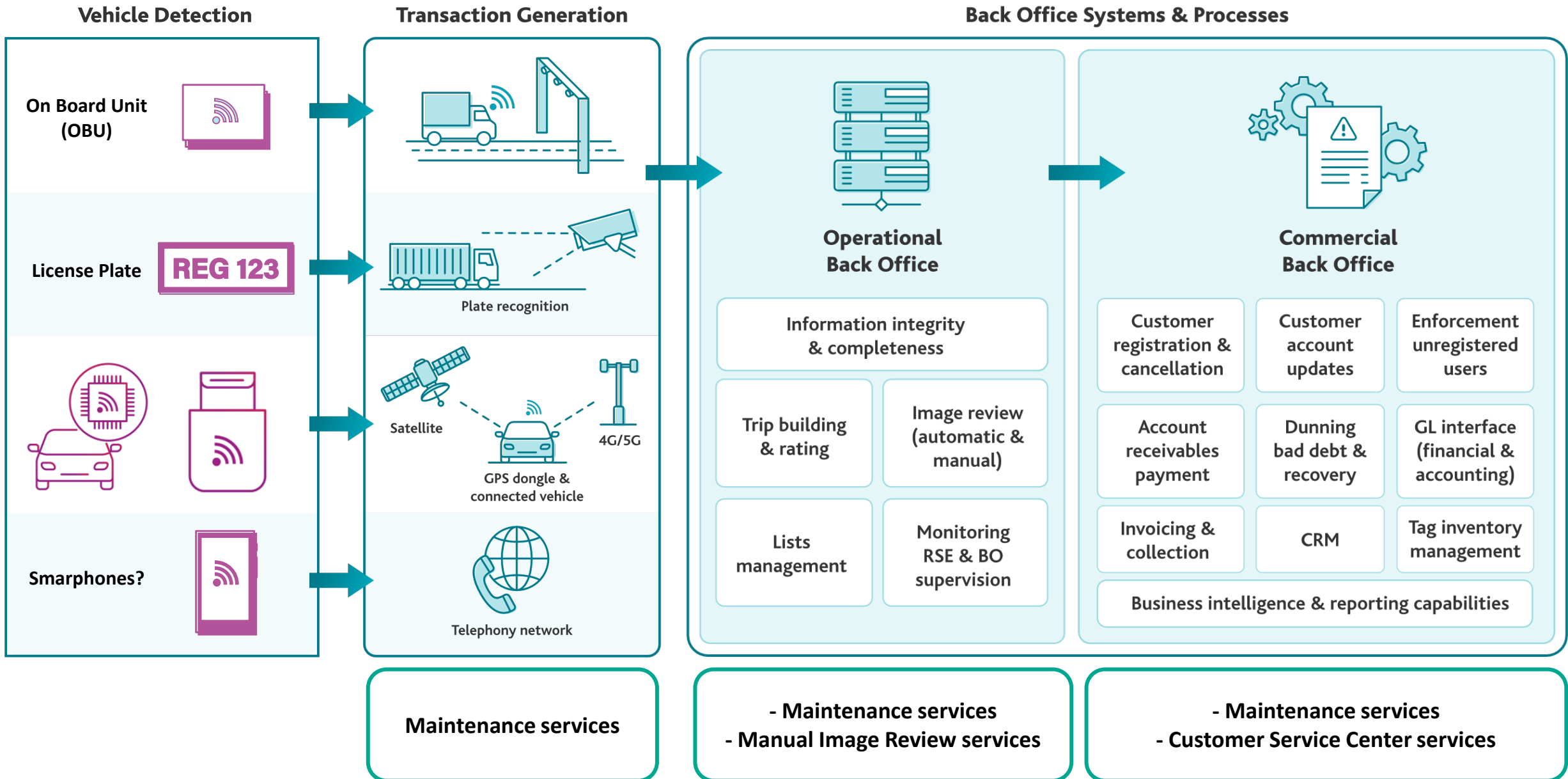
- **It has to be simple for the users:**
 - **Technically**
 - **Contractually**
- **EETS framework provide a good basis for RUC in Europe**
- **Connected vehicles are key for the deployment and convergence**
 - Easy to install (nothing to do)
 - Easy to enforce as telematics is not supposed to stop
 - Hybrid solution with connected vehicle are possible too: mobile phone linked to the car

Freeflow and RUC are converging

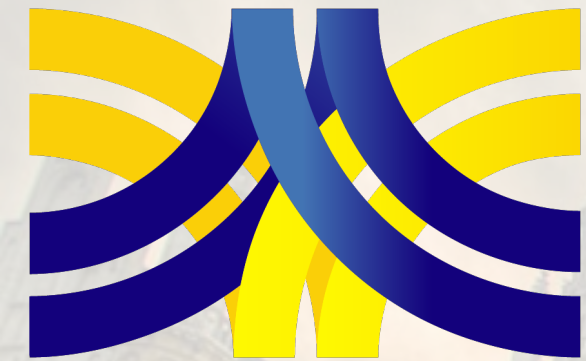
- Utah is now starting a pilot for RUC / Freeflow convergence
 - Integration of Road Usage Charge and Express Lanes (I-15) Tolling
 - Synchronizing and harmonizing tolling and RUC systems
 - Combining toll and RUC payments into a single wallet.
 - Local Overlay of RUC
 - Demand Management or Corridor Pricing.
 - Data accessibility and control mechanisms necessary for distributing revenue to local communities, individual cities or counties, or between states.
 - Technological feasibility of charging a supplement to the Base RUC for the use of local roads.



Freeflow and RUC – One single system



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**THANK YOU FOR
YOUR ATTENTION**

Benoit.rossi@emovis.com

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