Artificial Intelligence & Predictive Driving: Enablers of Bologna Smart City

Green Mobility Research Lab

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Michele Caggiano, FEV Italia Managing Director

Agenda

- Smart City & Smart Mobility: a future now really possible
- Artificial Intelligence and Big Data
- Predictive Driving (eHorizon) needs AI outputs
- Bologna Smart Mobility project

The key trends for the automotive industry are focused on mass mobilization in a green way with increasing connectivity

TRENDS & DRIVERS OF THE TECHNOLOGICAL TRANSITION IN MOBILITY INDUSTRY

GLOBAL MEGA TRENDS

Environmental & Air Pollution

Urbanization & Increasing Mobility

Sustainability

Connectivity & Digitization

DRIVERS

Emission & CO_2/FE Regulations

Subsidies & Incentives

Financing

Consumer behavior

NEW TECHNOLOGIES & TRENDS

Alternative Powertrains / E-Mobility

Connected Cars, Autonomous Driving

Shared Mobility

New vehicle concepts

Smart City & Smart Mobility: a future now really possible
Advantages of smart cities: some facts

Main advantages:

- **Smart mobility**: reduction of traffic fatalities, traffic congestion and of time on the road
- **Smart environment:** reduction of emissions
- **Smart living**: increase quality of life and tailored citizen services
- **Smart economy:** high quality jobs while supporting local business

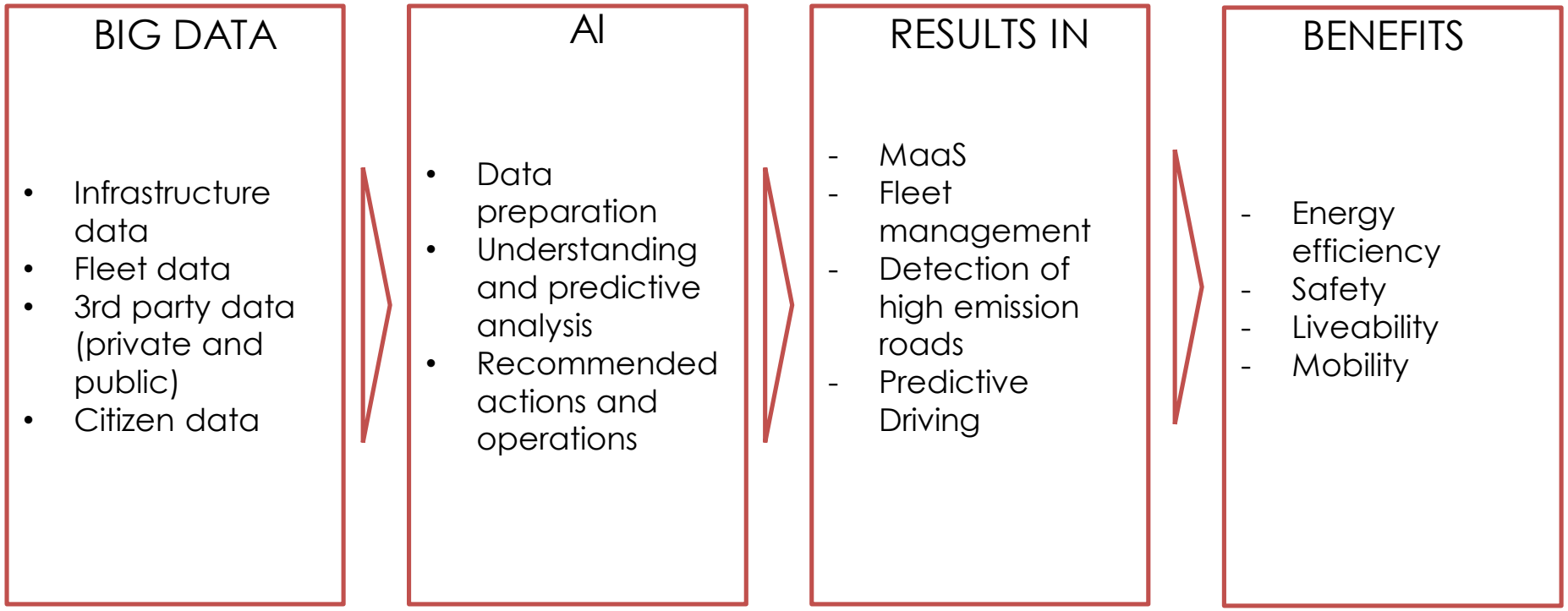
Smart City
Enabling technologies

- IoT
- Cloud computing
- High Performance Computing
- Artificial Intelligence
- Big Data analysis
- Advanced driving assisted systems (ADAS) and Predictive Driving (eHorizon)

These technologies will allow a step forward in Mobility and have a collaborative traffic flow management with both local and global optimization of the energy consumption and reduction of dangerous situation, accidents and pollutant emission.

Artificial Intelligence and Big Data
Transport and Smart City impacts

ARTIFICIAL INTELLINGENCE IS DRIVING THE NEXT PHASE FOR TRAVEL, TRANSPORT AND MOBILITY

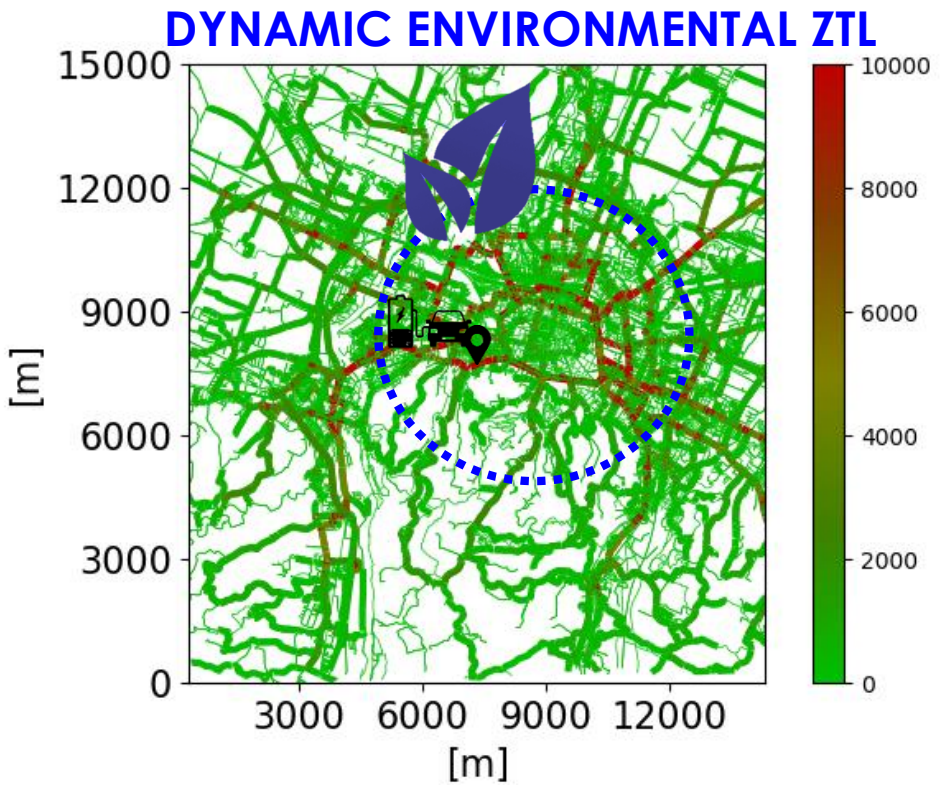


Artificial Intelligence and Big Data
AI enabler - From Internet of Things to MaaS

THE FUTURE MOBILITY AND ITS ECO-SYSTEM IS DEFINED BY NEW TRANSPORT SERVICES

Artificial Intelligence and Big Data
AI enabler - Detection of high emission areas in Bologna

HIGH EMISSION AREAS IDENTIFICATION



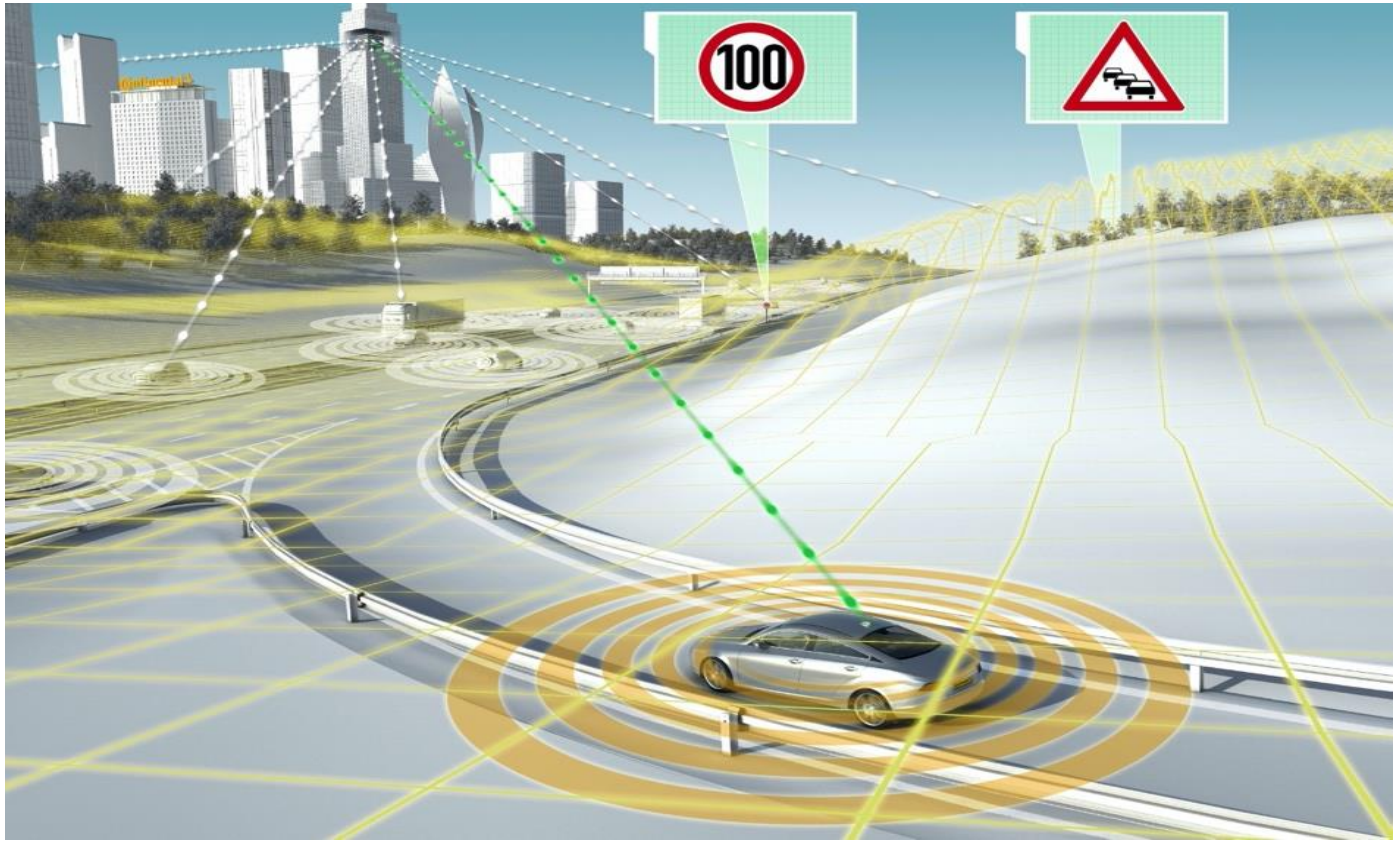
CO_2 [mg] Emission in Bologna (simulation)

- City municipality will able to identify and impose dynamically the environmental ZTL trailored to Bologna urban structure.
- Moreover, it will able to manage the traffic inside the city (diverted traffic), quasi real-time.

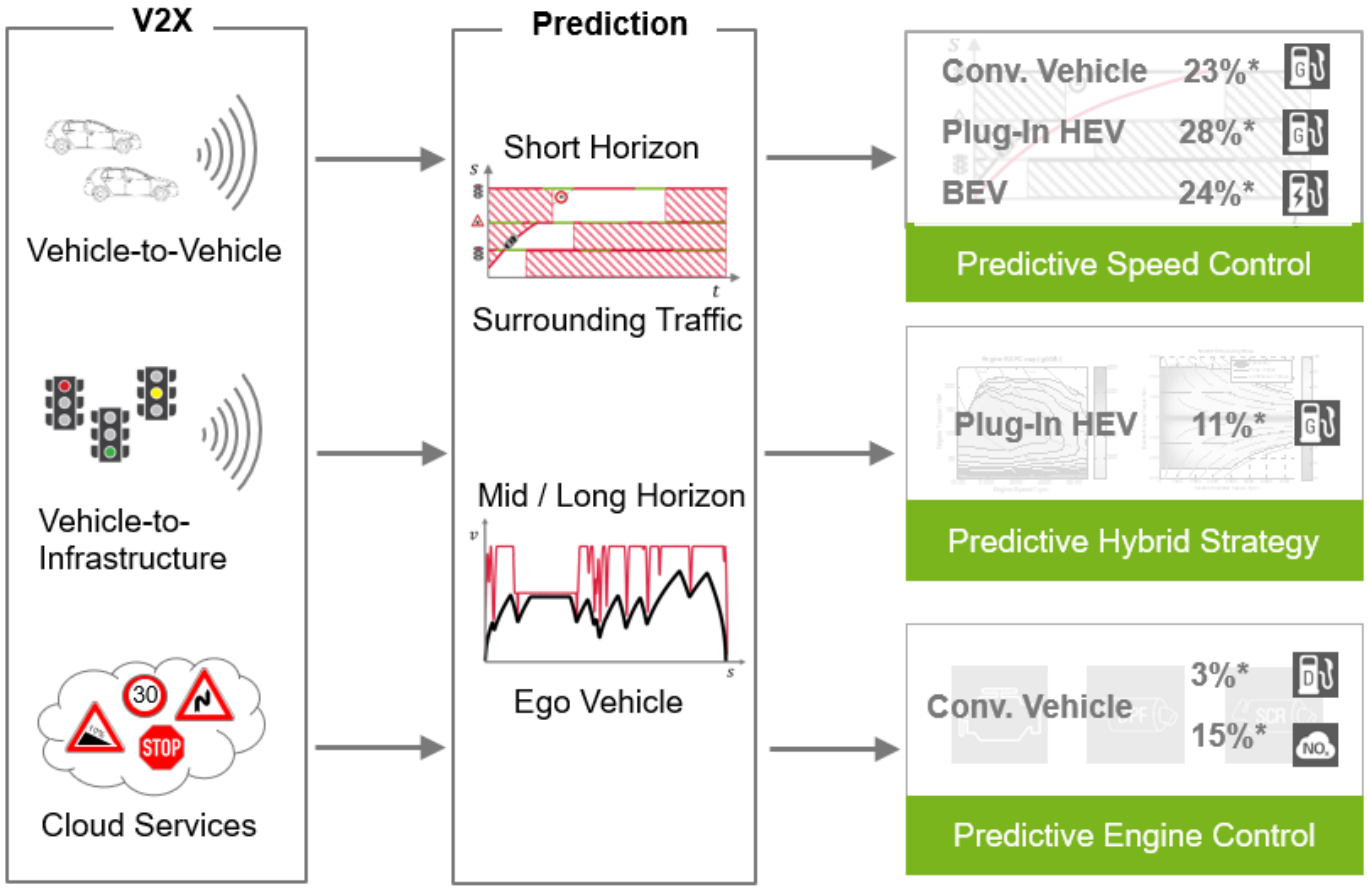
Artificial Intelligence and Big Data
Predictive Driving (eHorizon) enabler

HOW PREDICTIVE DRIVING WORKS

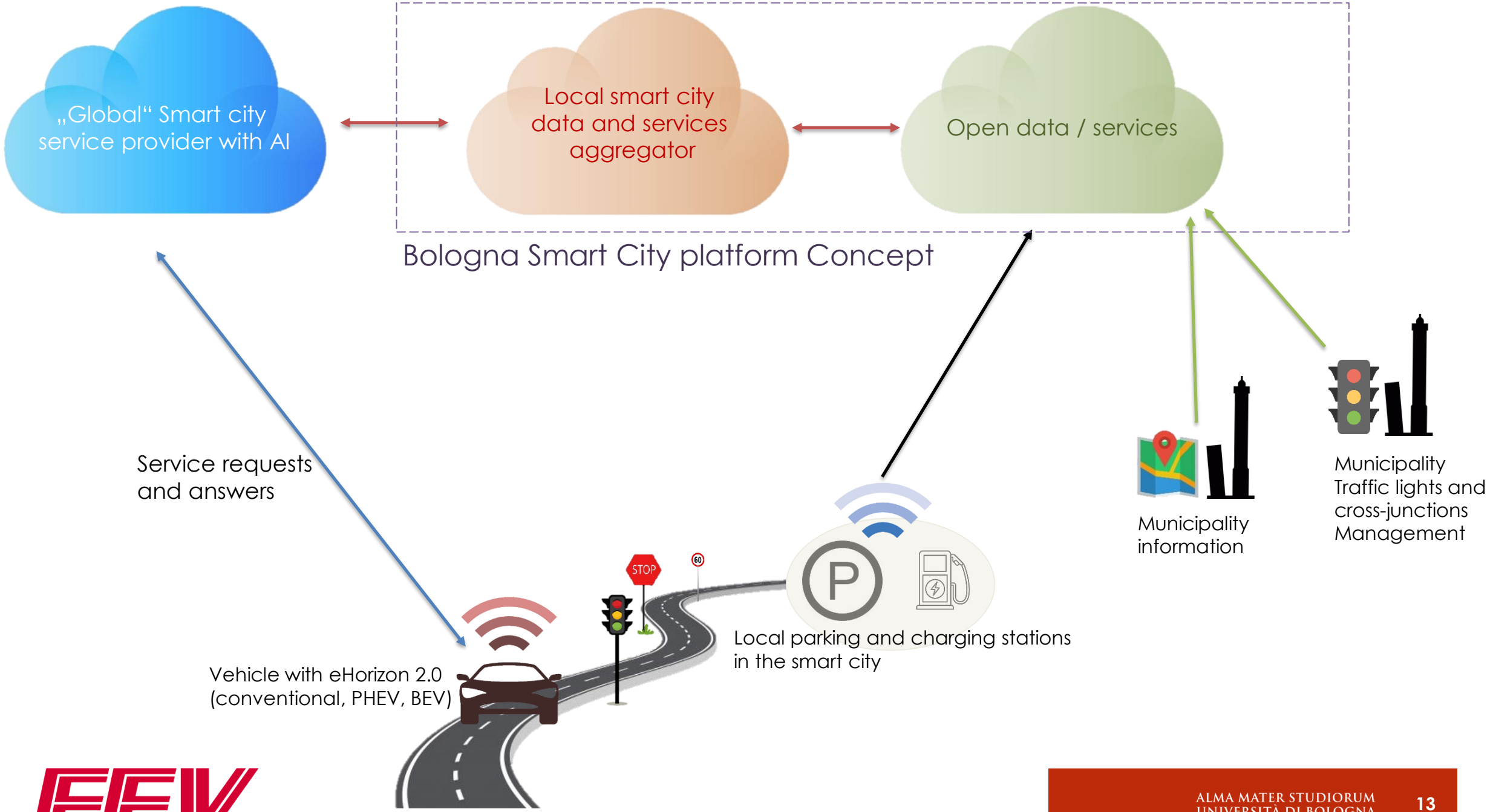
1. The Driver requests destination and services
2. Vehicle reiceves the predicted speed profile of the route (output from AI algorithms in cloud)
3. Vehicle controls optimize On-board energy and navigation via route-tailored HMI



Artificial Intelligence and Big Data
Predictive Driving (eHorizon) enabler with Big Saving Potentials



*FEV simulation results of real life cycles assuming a perfect prediction



Conclusion

With Artificial Intelligence and Predictive driving

Smart City & Smart Mobility are really possible with benefits for all citizen

Green Mobility Research Lab
Department of Industrial Engineering – FEV Italia s.r.l.

caggiano@fev.com
casadio@fev.com