

Satellite Positioning for Smart Mobility Using European GNSS*

*Global Navigation Satellite System



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Photo by Anton Shkaplerov, courtesy of ROSCOSMOS

What is Smart Mobility?

What most of us are doing is NOT smart



What is Smart Mobility?

Some of us have been acting smarter, for example in Taipei



What is Smart Mobility?

And some of us are even smarter, for example in Tokyo



What is Smart Mobility?

In some rare cases, people can be extremely smart, as in Copenhagen



Smart Mobility on the Road

A positive example from Slovakia: GNSS-based road tolling



Satellite-Based Truck Tolling in 2010

1st national tolling on all major roads

GNSS units mandatory for all trucks

First use of windshield-mounted units

System was built in less than 1 year

> 99% accuracy from the first day

> million toll transactions per day

Largest toll system in Europe in 2014
(17,000km of tolled roads)

Image courtesy of Siemens AG Österreich

Smart Mobility on the Road

Smart use of GNSS: 2,500km tolled roads, not just the motorways



Image courtesy of Skytoll a.s.

Smart Mobility on the Road

Smart use of GNSS: expansion in 2014 to 17,000km in just 3 months!



Image courtesy of Skytoll a.s.

Smart Mobility on the Road

Less smart example in a neighboring country: microwave-based tolling



Smart Mobility on the Road

Less smart example: building microwave gantries on 1,500km of roads



Image courtesy of
Generalna Dyrekcja Dróg
Krajowych i Autostrad

Smart Mobility on the Road

Less smart example: 30 months needed to expand to 2,600km of roads

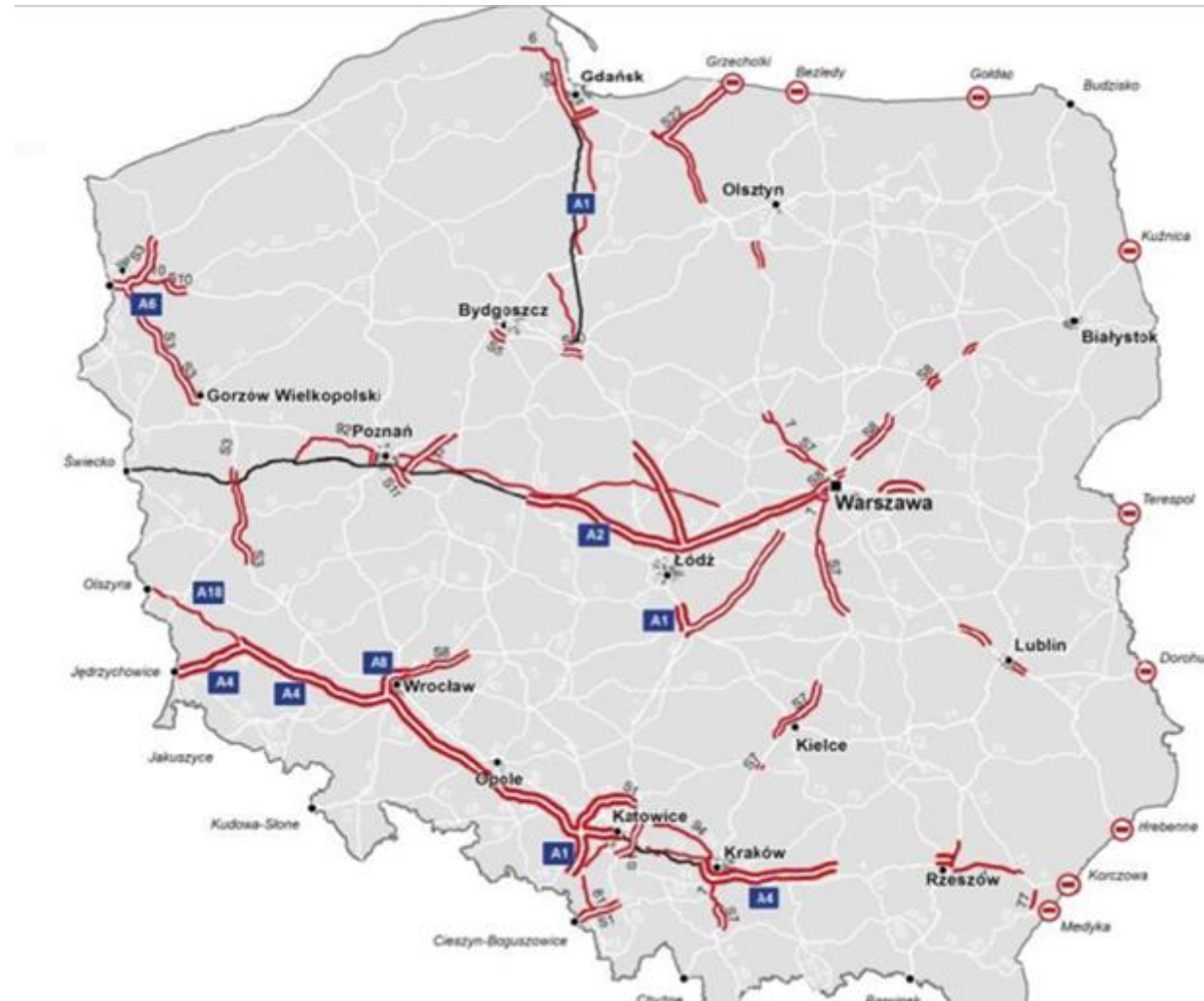


Image courtesy of
Generalna Dyrekcja Dróg
Krajowych i Autostrad

Using GNSS in Smart Mobility

Galileo: a European technology project with an enormous impact



© European
Space Agency

Using GNSS in Smart Mobility

26 Galileo satellites already in orbit, fully operational in 2020



Using GNSS in Smart Mobility

Satellite positioning has become a key element for Smart Mobility



„Lime“ e-scooter
in central Prague

Using GNSS in Smart Mobility

Europe invests in high-precision positioning: Horizon 2020 Projects



The “G-Motit” Project

Funded by the European Commission

Electric scooters sharing in Barcelona

Position accuracy is a key to success

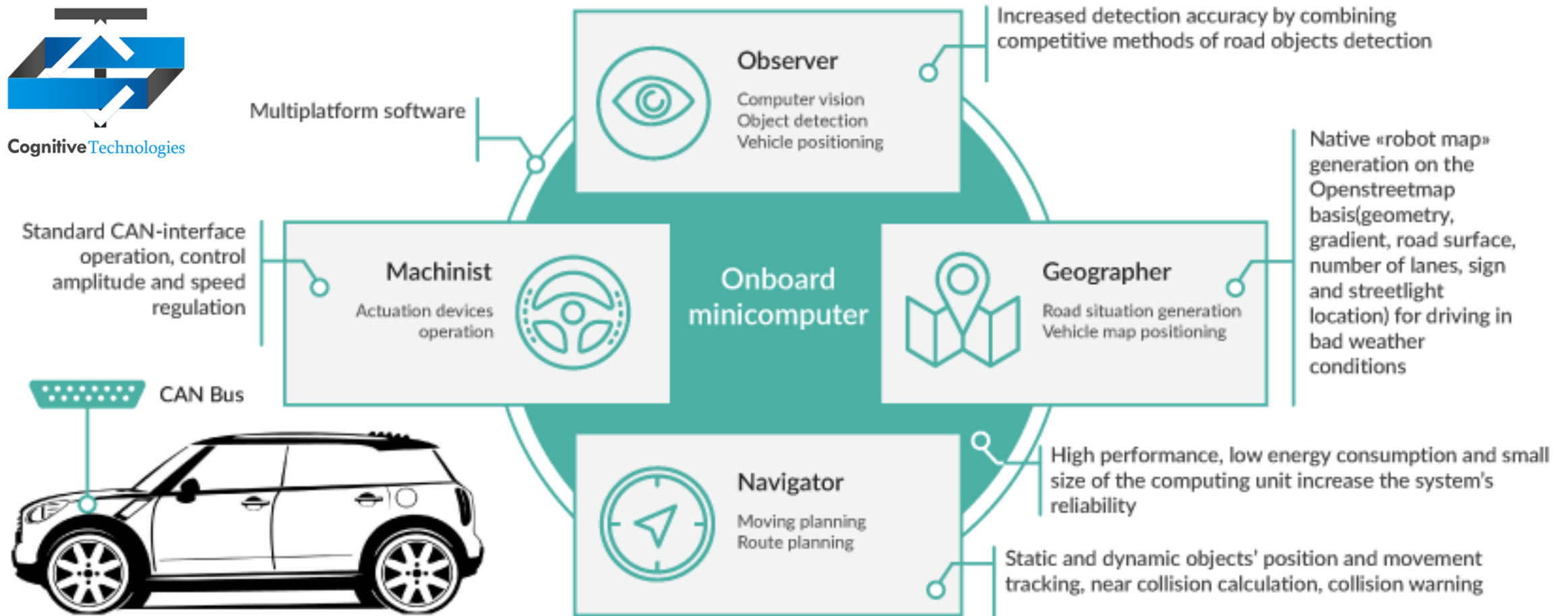
Users can find scooters they reserved

Operators need to locate all scooters for re-charging and maintenance

Image courtesy of the European GNSS Agency

Using GNSS in Smart Mobility

European GNSS is a core component for Autonomous Vehicles



Courtesy of Cognitive Technologies

Using GNSS in Smart Mobility

Galileo Reaches an Position Accuracy within Decimeters!



Image courtesy of Continental AG

EGNSS in Smart Mobility

Prior to Galileo we were dependent on GPS and GLONASS



GPS is controlled by the United States military



GLONASS is controlled by the Russian military

EGNSS in Smart Mobility

Galileo is the only civilian-controlled GNSS



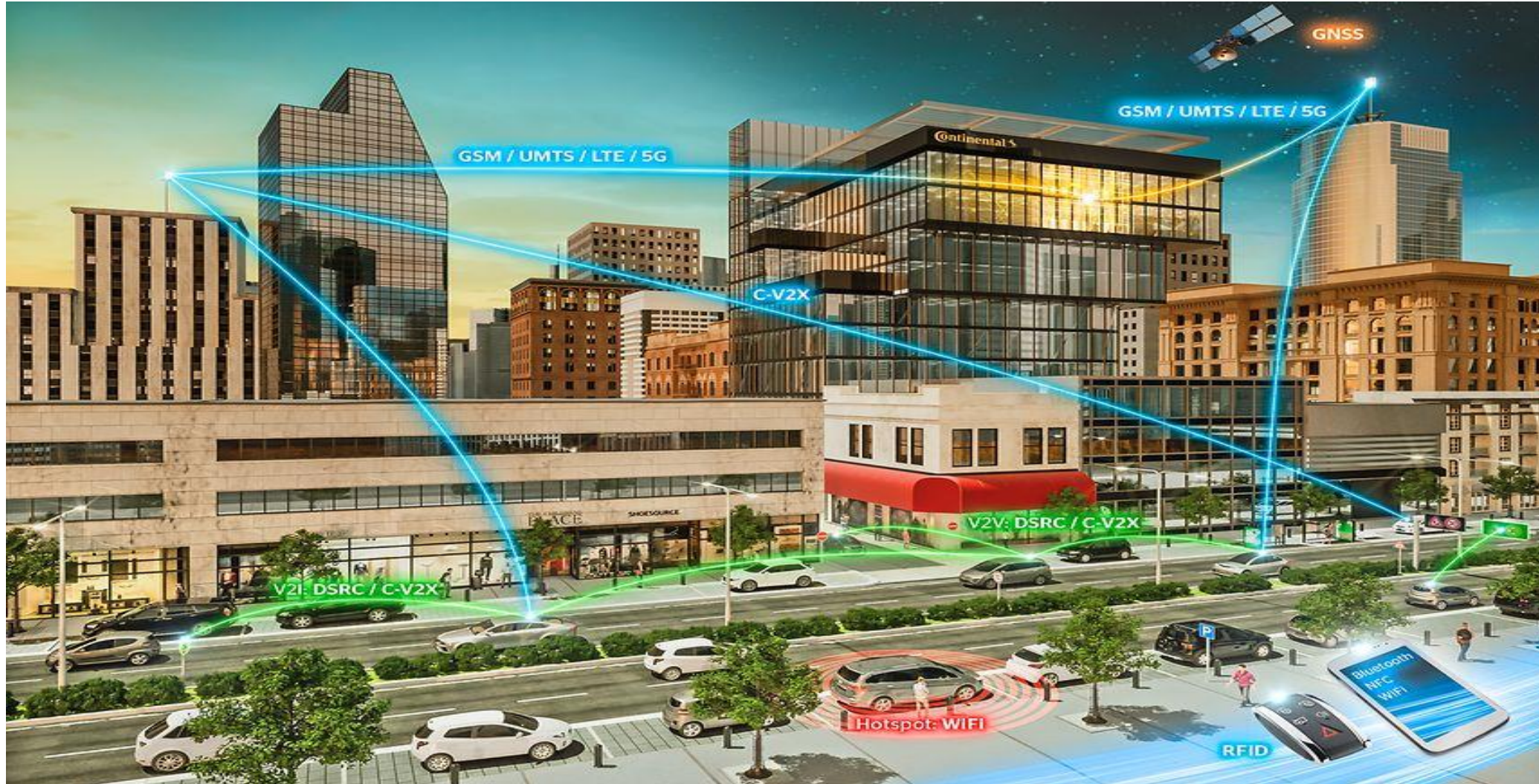
The European Commission controls Galileo



Commissioner Elżbieta Bieńkowska

Using GNSS in Smart Mobility

Galileo is essential for European Smart Mobility initiatives



© Continental AG

Using GNSS in Smart Mobility

Galileo is the first GNSS to provide signal authentication

Authentication service will provide a secure and reliable location, by detecting interference (spoofing) attacks – ready by 2020.

THE TIME HAS COME FOR GALILEO.

IT HAS REVOLUTIONIZED GNSS.

MAKE SURE THAT GALILEO IS A REQUIREMENT IN ALL SMART CITY SPECIFICATIONS AND TENDERS!



What ELSE is Smart Mobility?

“Our house is on fire” - we must urgently reduce CO₂ emissions



She speaks today at the R20 Austrian World Summit

GRETA THUNBERG of Sweden

A 16 year makes us face the facts:

- climate change is an existential threat
- we have only 11 years to stop it
- - 80% CO₂ emissions by 2030
- we must all change our ways
- we must change public policy now
- we need to be REALLY smart
- we owe it to our kids & grandchildren

ACT NOW: MOVE SMART, EAT SMART!

How we move and how we eat are by far the greatest factors affecting CO₂ and how we can save humankind.



**POSITION YOURSELF ON THE ROAD
WITH OUR EXPERTISE IN GNSS**

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