

Sesión 6: Una vision global del proceso de digitalización  
La movilidad y el valor de la carretera del futuro:  
INFRAMIX, ESRIUM y 5G-ROUTES.

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## ENIDE - Business innovation & digital solutions for enhanced mobility

- Innovative SME based in Barcelona, Catalonia
- Business Innovation & Digital solutions to meet social challenges in Future vehicle, Sustainable Logistics, Sustainable Mobility
- Focus on Business modelling & planning, Living Labs conceptualisation & management, and Dissemination
- Access to a large industrial network of partners at International level
- 20 framework programme projects (FP7, H2020):





## Innovación en el vehículo....



... pero la infraestructura es fundamental hacia una digitalización de los sistemas de transporte por Carretera (vehículo + Infraestructura)



# INFRAMIX – Preparing road infrastructure for mixed vehicle traffic flows

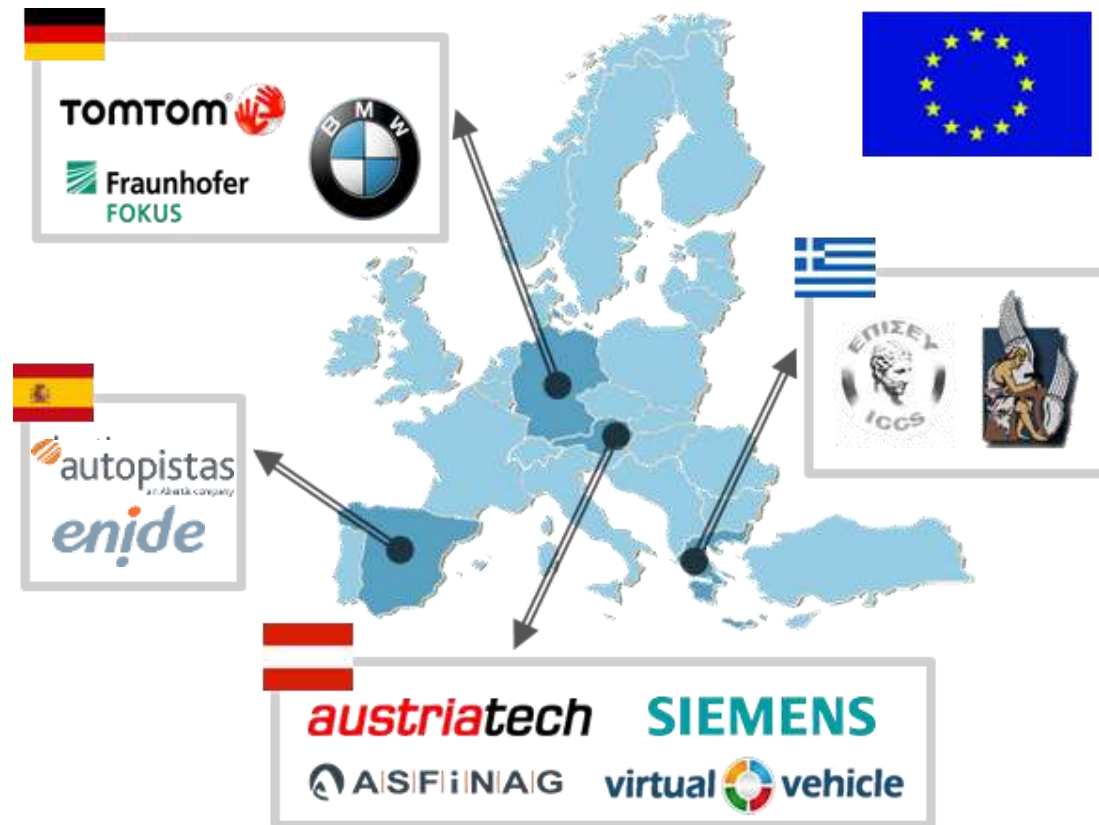
**Duration:** 1 June 2017-31 May 2020

**EC Funding:** 5M €

**Coordinator:** AustriaTech

**Consortium:** AustriaTech, ICCS, Asfinag, Fraunhofer, Siemens, Virtual Vehicle, Autopistas, Enide, Technical University of Crete, TomTom, BMW

**www.inframix.eu**







## INFRAMIX Infrastructure Support levels for Automated Driving (ISAD)

	Level	Name	Description	Digital information provided to AVs			
				Digital map with static road signs	VMS, warnings, incidents, weather	Microscopic traffic situation	Guidance: speed, gap, lane advice
Digital infrastructure	A	Cooperative driving	Based on the real-time information on vehicles movements, the infrastructure is able to guide AVs (groups of vehicles or single vehicles) in order to optimize the overall traffic flow	X	X	X	X
	B	Cooperative perception	Infrastructure is capable of perceiving microscopic traffic situations and providing this data to AVs in real-time	X	X	X	
	C	Dynamic digital information	All dynamic and static infrastructure information is available in digital form and can be provided to AVs	X	X		
Conventional infrastructure	D	Static digital information / Map support	Digital map data is available with static road signs. Map data could be complemented by physical reference points (landmarks signs). Traffic lights, short term road works and VMS need to be recognized by AVs	X			
	E	Conventional infrastructure / no AV support	Conventional infrastructure without digital information. AVs need to recognise road geometry and road signs				

# 5G-Routes - 5th Generation connected and automated mobility cross-border EU trials

5G-ROUTES (5G-PPP Phase 3): to validate 5G in CAM under realistic conditions, conducting advanced large-scale field trials to demonstrate seamless functionality across a cross-border corridor (Baltica-North)

Start date: September 1st, 2020  
Duration: 36 months  
Coordinator: ERICSSON EESTI AS  
Total funding: € 9,177,397.88

## Consortium



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 951867.





## Objectives

- **To develop innovative and commercially exploitable CAM UCs for automotive, railway and maritime sectors within the cross-border context.**
- To analyse the technical and business requirements for the UCs to enable extensive large-scale CAM field trials.
- **To advance and optimise the enabling technologies using AI for the reliable, seamless and uninterrupted delivery of interoperable CAM services across borders.**
- **To develop the infrastructure, integrate the technological enablers in an E2E CAM ecosystem, setup the 5G corridor and facilitate lab and large-scale field trial validation.**
- To demonstrate the potential and the user value in advanced CAM deployments at cross-border areas.
- To develop and validate the business models of advanced CAM UCs and protect EU IP.
- To provide rationalised contribution to key standardization bodies within the CAM context.
- To ensure long-term success through wide dissemination of the project's results; to exploit synergies with other 5G-PPP projects and 5G CAM initiatives.

## CAM Trials & Cross-border Use Cases

- Automated Cooperative Driving
- Awareness Driving
- Sensing Driving
- Uninterrupted infotainment passenger services on the go
- Multimodal services



While conducted remotely 80 km away





This project has received funding from the European Union Agency for the Space Programme under the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004181.

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# Objectives of ESRIUM

Horizon 2020 project increasing the safety and resource efficiency of transport on European roads.

Its key innovation is a digital map of road surface damage and road wear.

The digital road wear map will contain unique information for the road operators to enhance the road maintenance planning and to provide routing recommendations (in-lane and cross-lane) to vehicles.

Through ESRIUM, transportation becomes...

- **Smarter:** Exploiting detailed driving recommendations received from the road operator in every automated and connected car.
- **Safer:** Allowing the vehicle to drive on undamaged road surface.
- **Greener:** A longer paving lifetime makes road operations greener and more resource-efficient.



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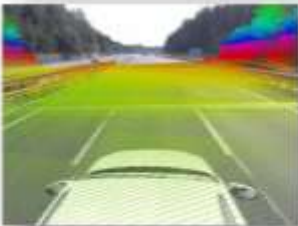
## Technical Challenge

Cost Efficient Data Acquisition



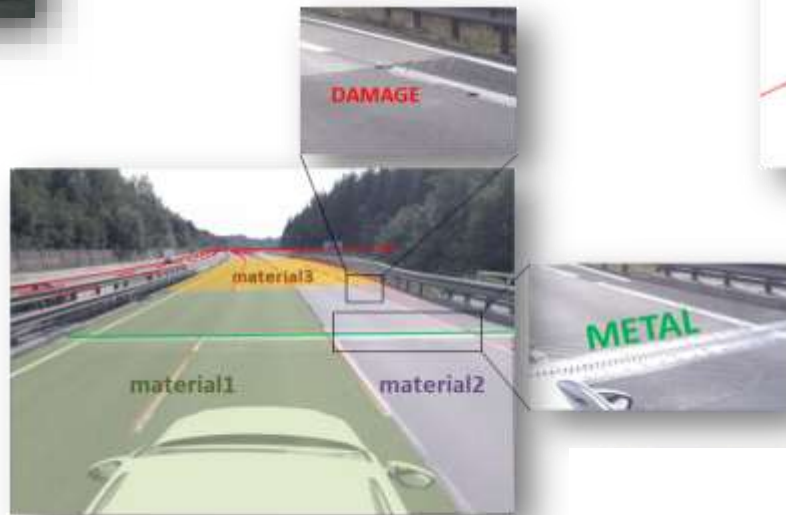
(a)

Lane Data Capture



(b)

Detection of Damages and Changes



(c)

Communication of Driving Recommendations for Automated Vehicles



(d)

Reduced Road Wear

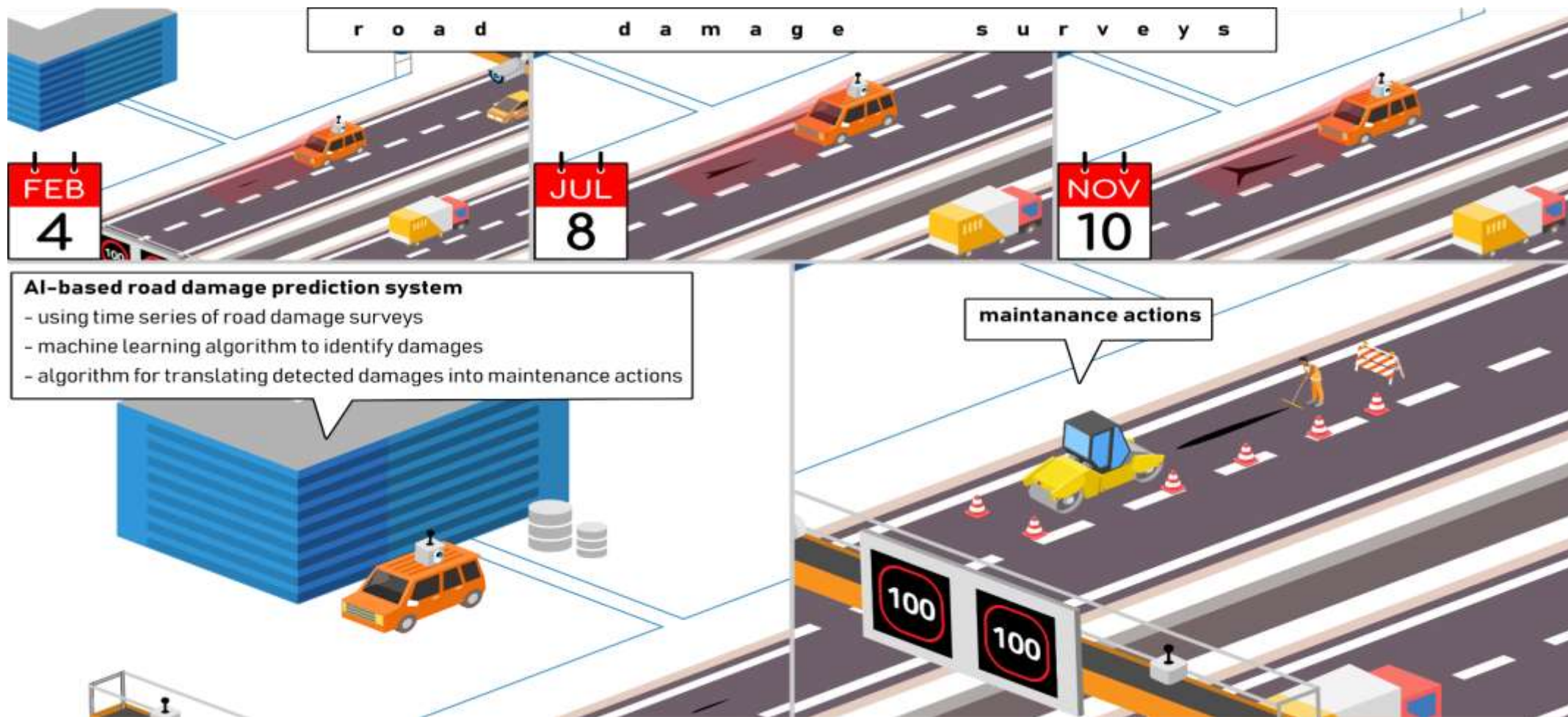


Optimized Maintenance



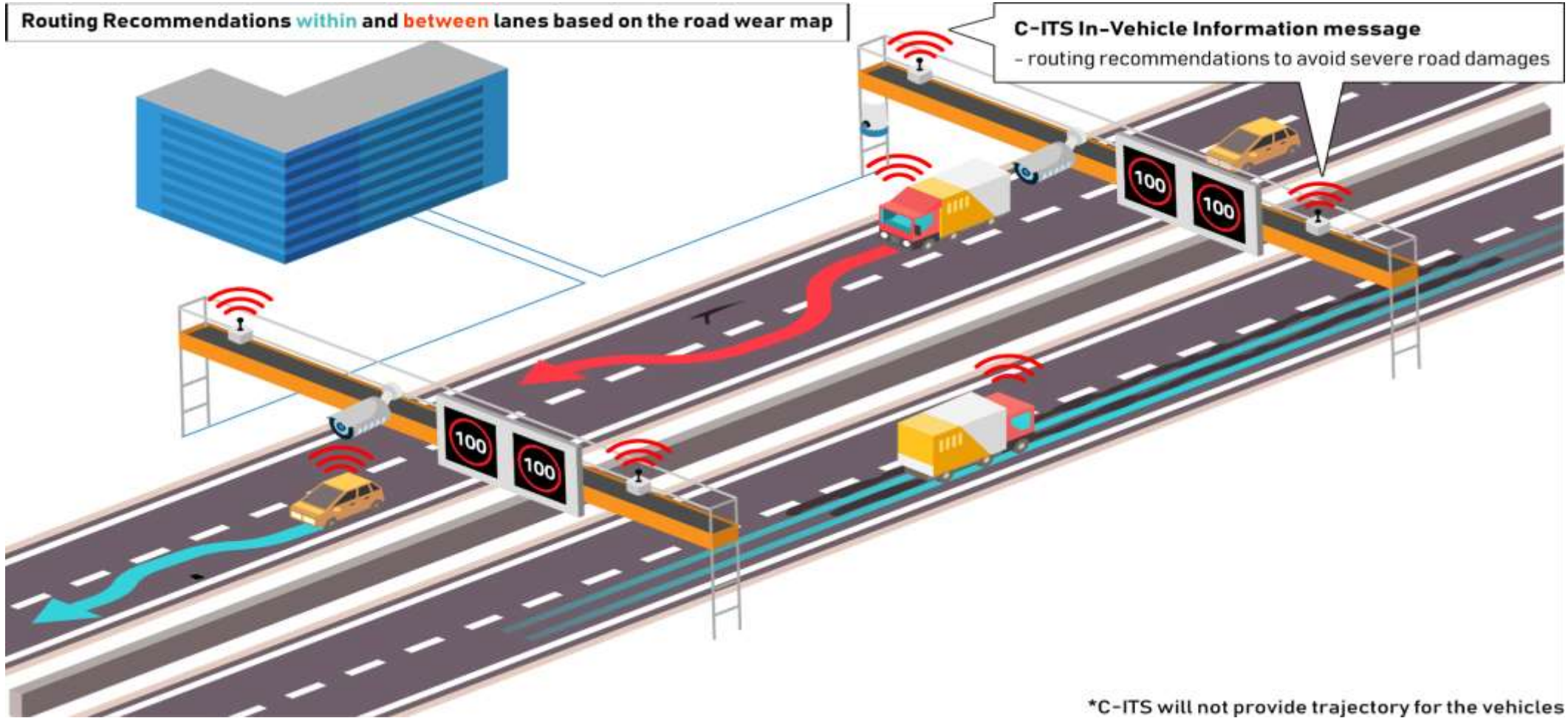
(e)

# AI-based road damage prediction for road maintenance

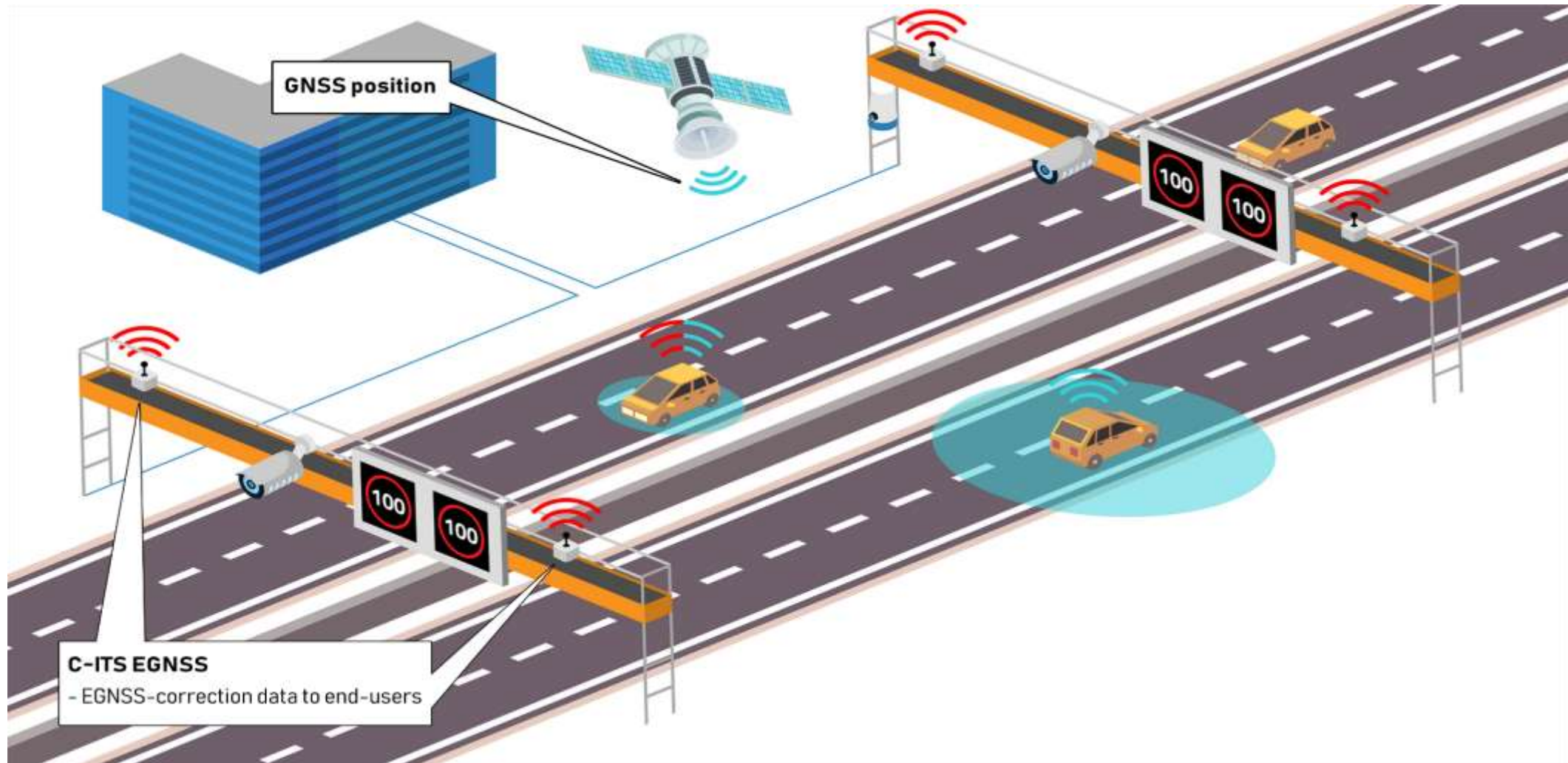




# Routing recommendations provided via C-ITS messages

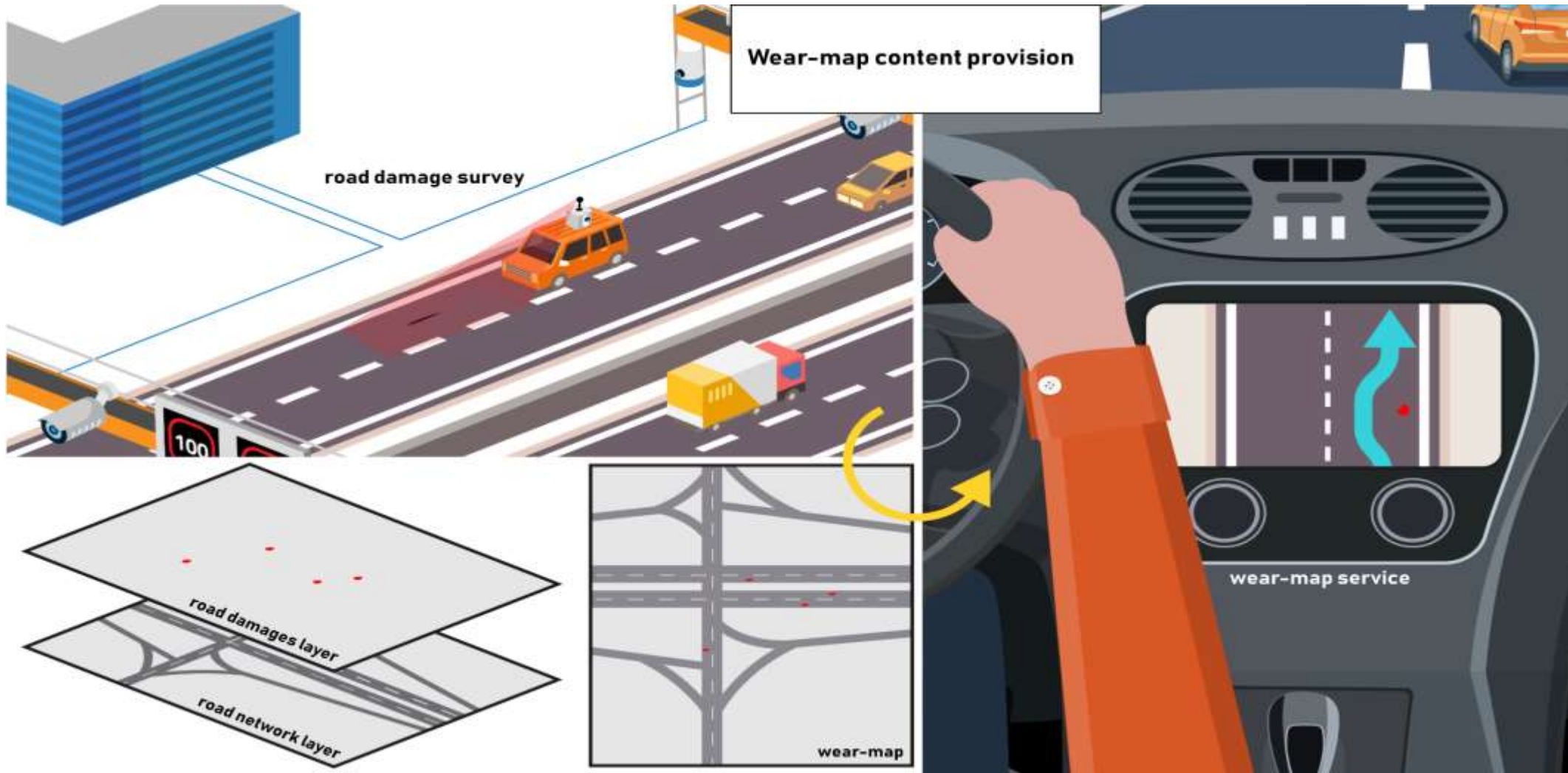


# 'GNSS-correction data' provision via C-ITS





# Wear-map content provision



## Conclusiones:

- Sistemas de movilidad (vehículo + infraestructura + digitalización)
- Digitalización para mejorar la movilidad: nuevos servicios, eficientes, sostenibles, gestionables, etc
- Ecosistema: colaboración entre todos los actores involucrados (automoción, construcción y gestión de infraestructuras, telecom&IT, servicios de valor añadido, etc)

MUCHAS GRACIAS POR SU ATENCIÓN

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