



# Smart mobility

TRANSFORMATION HANDBOOK

2022



# Transformation is in our DNA

The public health and economic crisis triggered by COVID-19 has focused our minds on the need for **a swifter economic and social transformation** – the only way we can count on a full recovery and get back on track for growth.

We believe that **digitalisation is key** to making this transformation possible. Technologies such as 5G, cloud storage, cybersecurity, AI, big data and IoT will be game-changing – as demonstrated by our extensive catalogue of solutions, applications and use cases. Our capacities and experience make us the perfect partner for businesses and local authorities as they take on the digital challenge.

We stand for a **fair, inclusive and sustainable digital transformation**. Our mission is to harness technology for people and planet, lightening the environmental load and offering our clients solutions that get them working more efficiently and sustainably.







# Smart mobility:

**safe, efficient and sustainable**

Smart, safe and sustainable cities with more efficient traffic and public and private parking as well as shared, multipurpose services and reduced emissions.

The digitisation of roads is key to reducing the number of accidents and fatalities. Examples of this digitization include connected tunnels, automatic tolling and the virtualisation of black spots.

Supporting the C-V2X technology of connected vehicles via an additional sensor on the vehicle's ADAS system that provides information to drivers beyond their immediate field of vision.



# How we are revolutionising mobility

## DRIVING ASSISTANCE IN THE CEREIXAL TUNNEL

### FIRST 5G CONNECTED TUNNEL IN THE COUNTRY

A first step towards the sensorised, smart roads of the future, able to communicate with connected vehicles. This is a pilot that provides driving assistance to vehicles passing through the Cereixal tunnel, both at the entrance to it and throughout their journey.



## INNOVATIVE MUNICIPAL WASTE MANAGEMENT FLEET

### THE USE OF TELEMATICS FOR THE REAL TIME MONITORING OF PREZERO SERVICES

PreZero has sensorised a fleet of more than 4,000 trucks, enabling them to ascertain the location of each truck, routes, areas of interest, kilometres and hours driven. Fleet managers can then detect the most overall effective driving behaviours.



## CYBERSECURITY APPLIED TO CONNECTED MOBILITY

### EFFICIENT AND SECURE VEHICULAR COMMUNICATIONS

We have become the first telecommunications operator to have a Certification Authority recognised by the European Commission linked to the 5G network for vehicular communications, that meets the requirements of the C-ITS standard. We have also developed new vehicle identity models to ensure the traceability, quality and cybersecurity of data.



## CONSELL MALLORCA: MOBILITY PROJECT

### SMART MOBILITY ON THE ISLAND OF MALLORCA

This is a comprehensive digital transformation project. It involves the deployment of several mobility components to monitor air quality, reduce unnecessary traffic through smart parking solutions and ascertain traffic status in real time, communicating this to passengers via digital bus shelters.





## TESTIMONIALS

What our clients say...



Laudelino Laiz | **Stellantis**  
**Head of Innovation in the Iberian Peninsula**

*"Projects such as the Cereixal tunnel facilitate the shaping of the ecosystem that we need to implement in order to develop connected solutions based on 5G technology."*

Paco Gimeno Giménez | **PreZero**

**Head of Digital Transformation and Mobility**

*"Thanks to fleet management, we know in real time where each truck is and what it is doing, so we are able to give our customers the information they ask for at any given moment."*



Rosario Trapero Miralles | **Dekra**  
**Head of Connected and Automated Driving,  
Product Testing Service Division**

*"This project is taking the necessary steps towards helping to create a secure V2X ecosystem that has cross-border interoperability between member countries and is able to ensure the integrity of information."*

Gonzalo Llamas Navarro | **Consell Insular de Mallorca**

**Director of Mobility for the Island of Mallorca**

*"The aim of SmartIsland Mallorca is to provide data to facilitate the analysis of mobility on the island of Mallorca. The purpose is to define new concrete strategies to replace the current mobility model with a more sustainable one."*



# Driving assistance in the Cereixal tunnel:

first 5G connected tunnel in the country

5G

C-V2X

MEC

IoT

A pilot that provides driving assistance to vehicles passing through the Cereixal tunnel, both at the entrance and during their journey through it. Connected mobility requires the vehicle and the road infrastructure to be connected and able to communicate with each other. This pilot is the first step towards the roads of the future; smart, sensorised roads that are able to convey information about what is happening on the road.

## TECHNOLOGY

The use of 5G is essential in this pilot project due to its ultra-low latencies. These are essential when it comes to critical vehicular communications. Another 5G capability is its upstream bandwidth, which has the capacity for the real-time concurrent upload of multiple video streams.

## BENEFITS

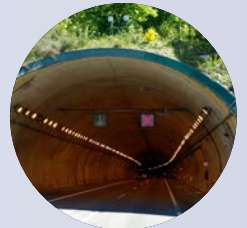
- Better road safety: early warning to drivers of any potential hazards.
- Improved incident response time: tunnel operators and emergency services reduce their response times.
- Integrated platform for tunnel management: access to information regarding the status of the tunnel and its cameras.

## DEPLOYMENT

- 5G coverage in the tunnel and MEC server with C-ITS hub.
- Sensors: 9 DAI cameras, 2 thermal cameras, 2 OCR cameras, 1 opacimeter and 1 weather station.
- C-V2X connectivity to vehicles both natively and through a smartphone app.

## FEATURES

- V2I use cases: adverse weather condition warnings at tunnel exit, as well as warnings of any slow-moving vehicles, reversing vehicles or pedestrians.
- V2V use cases: warnings of sudden braking and approaching emergency vehicles.





# The cybersecurity of connected mobility: safe and efficient vehicular communications



Telefónica has deployed a platform based on Public Key Infrastructure – PKI – integrated in to the European Union cybersecurity node. This acts as a trusted third party for message signing in the European V2X ecosystem. This PKI platform facilitates the provision of batches of anonymous certificates to a vehicle, traffic light, etc. that will then be used to electronically sign the messages sent to the rest of the entities within the V2X collaborative environment. In addition to this, innovative vehicle identity management models have been developed with blockchain mapping and 5G cybersecure communication guarantees.

## TECHNOLOGY

The demonstrator combines 5G connectivity, C-V2X vehicular communications and cryptographic technologies to provide anonymous, interoperable cybersecurity certificates that are valid throughout the EU. These ensure both the integrity of the vehicular communications and foster trust between the various players in the V2X ecosystem. It also enables the management of an IoT ecosystem.

## BENEFITS

- Creation of a trusted V2X ecosystem that guarantees integrity and no identity theft. Cross-border interoperability thanks to its integration into the EU central node.
- Cybersecure communications are backed up by cryptographic hardware mechanisms.
- The identity management model offers value-added services to those companies that need to monitor driver possession, fuel consumption and traceability, such as car rental companies.

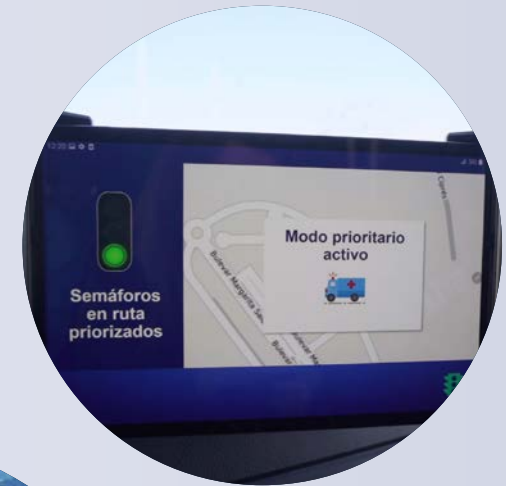
## DEPLOYMENT

- Deployment of 5G coverage.
- PKI (Public Key Infrastructure) platform for the provision of certificates that allow the electronic signing of messages.
- C-V2X connectivity to both vehicles and road infrastructure.

## FEATURES

Under the cybersecurity layer, three uses have been developed:

- Warning of sudden braking.
- Warning of vehicle stopped on the road.
- Warning of traffic light status and time remaining for phase change.



## FURTHER INFORMATION

Video: [Cybersecurity for 5G mobility](#)

# Innovative urban waste management fleet:

## telematics for the real-time monitoring of PreZero services

IoT

BIG DATA

PreZero has a fleet of more than 4,000 sensorised vehicles from which information is collected in real time. A device connected to the vehicle's electronics makes it possible to know in real time where each truck is, what it is doing, how fast it is going and where it is stopping. All this information is processed so that PreZero can predict what is going to happen. They are therefore able to provide municipalities and public administrations with the information they require at all times and thereby provide a real-time solution for their customers.

### KEY POINTS

Thanks to its advanced telematics, this world-class fleet management solution enables the real-time operation of vehicle fleets. It also provides a more strategic vision of the fleet, which helps make decisions.

### BENEFITS

Client benefits:

- Greater efficiency and sustainability, thanks to resource optimisation.
- Time and fuel savings.
- Increased operational safety.

Benefits for the public:

- Improved service quality.
- Environmental improvement as carbon footprint is reduced by minimising travel.



### FURTHER INFORMATION

Video: [PreZero: Vehicle fleet management thanks to IoT & big data.](#)



# Smart Island Mallorca



The Mallorca Smart Island project, financed with funds from the Smart Islands Network (Islas Inteligentes de Red.es) includes 4 components of intelligent mobility. These use technology to improve and sustainably manage traffic levels on the island, to provide information to the public in real time and to detect incidents in real time.

## WEATHER STATIONS

Network of weather stations to ascertain environmental conditions at different points on the island, deployed in 6 locations on the island of Mallorca.

## CAPACITY LIMITATION ROAD CLOSURE

Provision of 10 bi-directional (inbound and outbound) mobile traffic capacity limitation systems with variable mobile messaging panels in 5 locations. Prevents vehicles from turning onto a road if there are no parking spaces available.

## SMART TRAFFIC MANAGEMENT

Fixed traffic monitoring stations (21), CCTV (14) and variable messaging panels (6) to control traffic flow on highways and national roads.

## SMART BUS SHELTERS

Provision of 180 solar-powered bus shelters to provide passengers with public transport information.



# Other cases

## from the sector

We have digital solutions to help our customers manage their travel, enabling them to get around in a safer, more efficient and sustainable way.

### FLEET CONTROL AND OPTIMISATION



We boosted Econorent's digital transformation by sensorising 3,000 of the vehicles in its fleet using our fleet management solution. They have therefore improved the control, optimisation, planning and maintenance of their fleet and reduced theft.



### ADVANCED ANALYTICS FOR EMPLOYEE SAFETY



We work with the Cobra Group (Grupo Cobra) to improve the integral management of its fleet through the use of advanced analytics. Thanks to telematics, we were able to control the use of seat belts and in just 3 months, the number of incidents dropped by 97%. This is just one of many other benefits.



### SMART PEDESTRIAN CROSSINGS



Deployment of 5 smart crossings on main roads in Murcia. They have sensors that can detect when pedestrians are about to cross and these activate the vertical and horizontal light signals embedded in the pavement, warning vehicles.

### ELECTRIC VEHICLE CHARGING POINTS



Development of an innovative platform made up of Telefónica's own technologies integrated in the IDoT (Identity of Things) system. This guarantees the recharging of electric vehicles in a secure, remotely-managed, traceable, sustainable, transparent, auditable and robust manner, in full compliance with the requirements set out by the Spanish National Cybersecurity Institute.



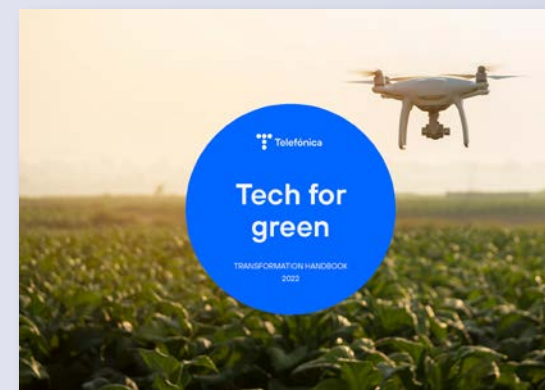
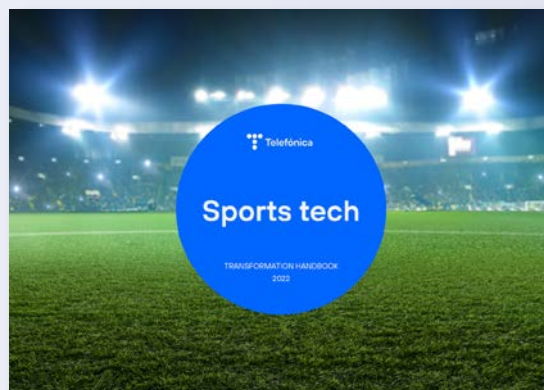
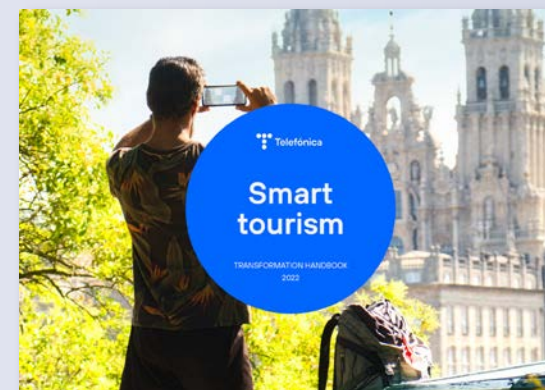
### PARK AND RIDE SENSORISATION IN BARCELONA



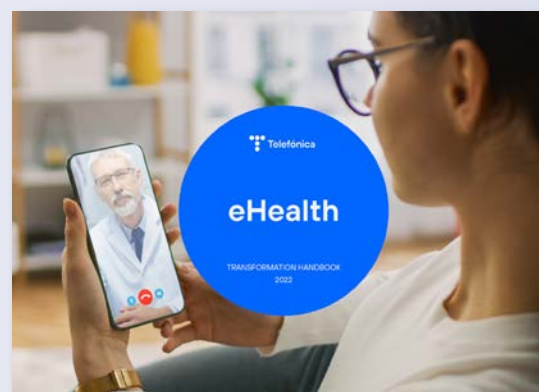
Smart parking to improve the public's quality of life. This initiative controls 11 park-and-ride car parks by using ground sensors located at parking spaces and access points. The data collected helps users to select the appropriate parking through the Mou-te website.



# Transformation handbook collection



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