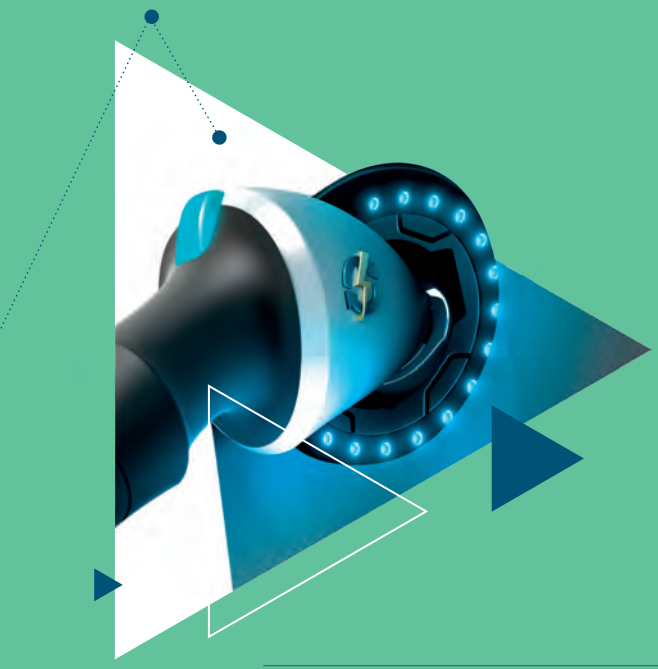
From smart parking
to slow mobility

SMART MOBILITY

a2a smart city | LINEA COM



SMART MOBILITY

Architecture for smart mobility:

01

SERVICES

Displaying information on a map, sending specific alerts, telemanagement of remote systems, smart external operators...

02

BIG DATA ANALYTICS

Support on the management and use of mobility-related services

03

TRASPORT DATA

LoRaWAN technology enables remote management of data recorded by sensors over large distances

04

SENSORS

Detectors and measurers, with reduced energy consumption

SMART PARKING

Private cars are, on average, only used for one **hour a day.** It is therefore essential to understand static traffic, in other words **parking.**

Searching for parking spaces results in higher costs for drivers (time and fuel), and additional negativities associated with **increased air pollution, noise, and road accidents.**

OCCUPANCY SENSORS PAYMENTS NOTIFICATIONS

Smart parking for pay street level parking:
- through advanced sensors it is possible to monitor occupancy status of urban parking areas.
- via a special app, the user can visualise the location of the closest free parking space, proceed to the booking, and receive information on directions;
- through the app, the user can pay for their parking spot, with the possibility of extending their time remotely via their smartphone.

Smart parking for parking areas with specific designation, in particular:
- **Loading/unloading** and time disc areas: the system automatically recognises the status of the space (empty or full), communicates the data to the control centre at the traffic warden office, and sends an immediate alert upon the expiration of the allowed parking time;
- **Disabled parking**; The system, as in the previous case, recognises the status of the car parking space and communicates this to the control centre.

This solution can be useful for two reasons: firstly, it checks the actual need for, and location of, such parking, in relation to population needs.
Secondly, it provides more efficient magement of the correct use of spaces reserved. Parking enforcement officials can plan more accurately when checking car parking spaces.

The technological solution

Park management
This requires integration with the Mobile App system, in order to secure the parking payment in the following ways: the app by credit card or the parking meter by credit card, debit card or cash. An additional solution, for mixed parking areas, recognises the user via a dedicated App.

Park management server
The Park Management Server processes data received and sends updates on available spaces (to variable message signs), to the web platform and to the App that guides the user to a free space. It also sends information to the enforcement officers on the position of vehicles which could be in violation of payment. In the PMS, interfaces are integrated with the Mobile App system.

Rete LoRa e Gateway
The data communications network between sensors and the Gateway is based on the LoRa protocol, the world's fastest-growing loT network. LoRa ensures, in compliance with current regulations (Frequency 868Mhz, maximum power of 14dBm ERP), long-range coverage, thanks to the patented protocol used by this system.

Wireless detection device consisting of a radio and a 3-axis magnetic-resistive sensor that communicates, via a special antenna, the magnitude of detected magnetic variations to the gateway. No need for wiring. Guaranteed power for 8/10 years due to a high capacity battery. Data communication is carried out by using a radio message with encrypted protocol, using very low power (LPRN) and a free

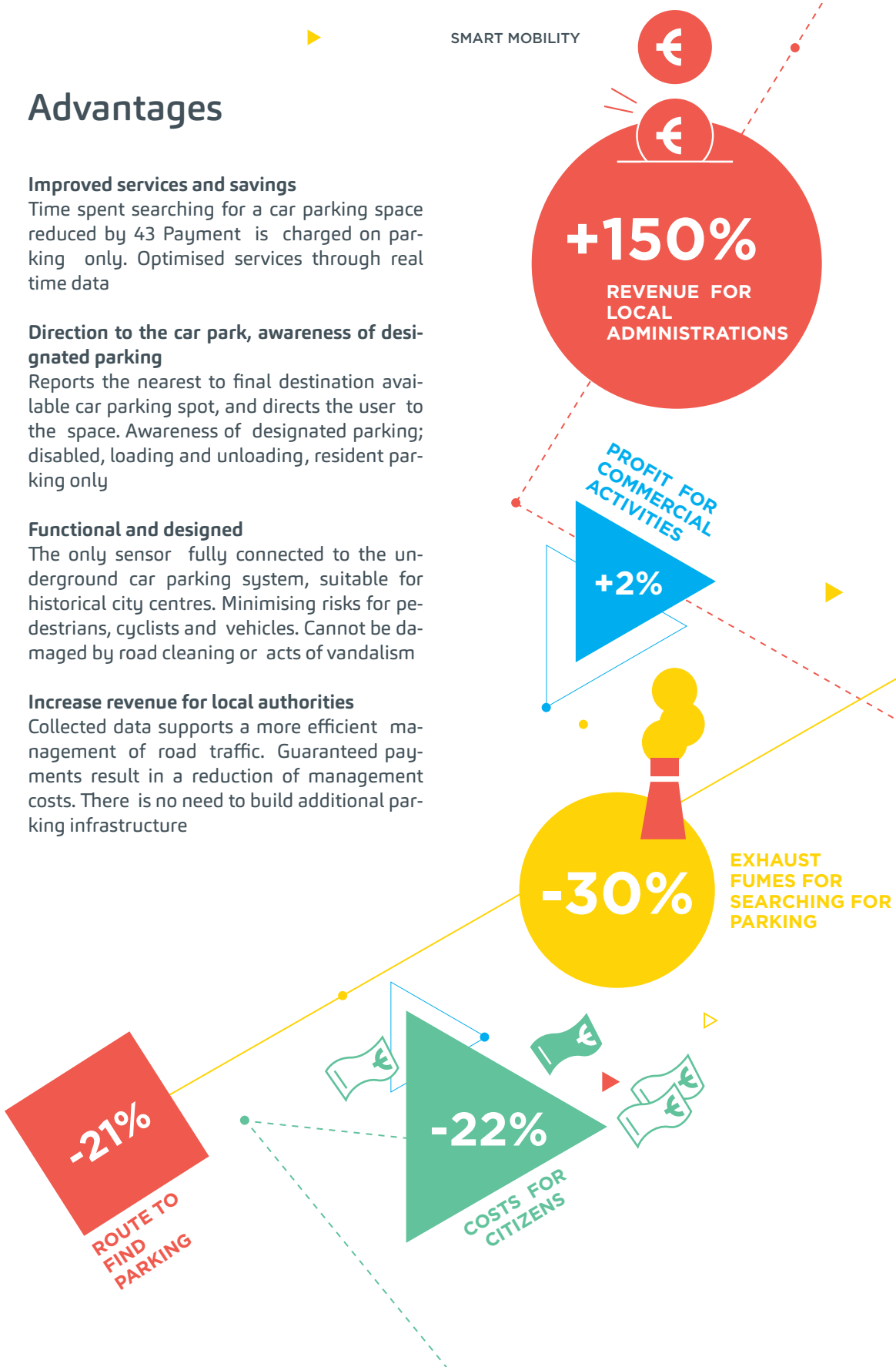
Advantages

Improved services and savings
Time spent searching for a car parking space reduced by 43 Payment is charged on parking only. Optimised services through real time data

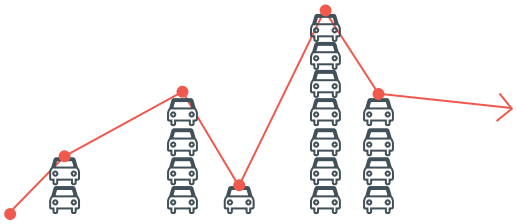
Direction to the car park, awareness of designated parking
Reports the nearest to final destination available car parking spot, and directs the user to the space. Awareness of designated parking; disabled, loading and unloading, resident parking only

Functional and designed
The only sensor fully connected to the underground car parking system, suitable for historical city centres. Minimising risks for pedestrians, cyclists and vehicles. Cannot be damaged by road cleaning or acts of vandalism

Increase revenue for local authorities
Collected data supports a more efficient management of road traffic. Guaranteed payments result in a reduction of management costs. There is no need to build additional parking infrastructure



SMART TRAFFIC



Road traffic monitoring is essential for effective planning of an identified area - on both the operational and strategic level. Automated radar monitoring instruments are able to combine high precision with appropriate operations versatility.

The service involves **monitoring traffic flows** on any urban and suburban road by recording the transit and characteristics of every single vehicle:
time, direction, length and speed of the vehicle, with the reconstruction of the daily and weekly flow curve and identification of peak hours and critical situations such as slowdowns or queuing.

Data is then available in real time and it is also stored in a designated database. Data that can be accessed for future evaluation of any potential correlations with other variables recorded at the same time within the area prescribed.

SOLUTIONS

Sensors on public transport
Presence sensors on public transport are useful both for transport companies, who can obtain data on attendance statistics and develop plans to improve routes and timetables, and for citizens who can check real-time statistics and information on which routes/transport to take to avoid disruption.

Tracking public transport
Continued and accurate localisation of public transport to provide citizens with estimates on waiting times and to obtain real-time traffic information (for example, to set routes based on frequency, time estimates, etc.).

Variable message notices
Real-time communication with road users on the state of traffic, parking, road works, accidents etc.

Vehicles flow analysis
Real-time management of the number of cars and license plates that transit through video surveillance areas within the congestion charge zones (CCZ).

DESIGNED SOLUTIONS

Smart traffic lights
Sensors and cameras placed on traffic lights to detect vehicles and pedestrians.
A centralised system coordinates traffic lights in the city to facilitate smart mobility interventions, such as:
– give priority to pedestrians and public transport
– clearing the road for emergency vehicles
– create «green waves» and decrease the stress of the
drivers

Safe crossing
Detection of pedestrians with video cameras, speed detection panel, flashing sign in case of crossing and presence of pedestrians, recording of vehicles driving through crossing at time when pedestrians are crossing.

Smart car gates
Selected access to buildings and private areas via the use of boosters that verify the identifier vehicle and driver, approving access only to authorised users.

FROM SMART TRAFFIC LIGHTS TO SMART GATES

SMART POINT

Smart point

SOS Stations
Installed in public parks and in remote areas to call the police by pressing a button in case of emergency. The stations are designed with sound analysis recognition tools for shots, explosions, and unusual circumstances. They can also be equipped with video cameras and LCD Touch screens to show information to citizens and tourists, therefore acting as smart info points.

Charge point with defibrillator
Mobile phone charging stations (also compatible with bicycles) equipped with a defibrillator. The charging station is also equipped with WiFi Access Point, 4G repeater and LoRa-WAN gateway.

Recharging stations
Electric mobility is experiencing is going through a transformation that will require additional charging devices to cover road networks.*

*Norway, will stop registering non electric cars from 2025.

SMART MONITORING

From environmental sensors to structural sensors

Environmental and pollution sensors
Environmental and pollution sensors around the city allow the system to collect data and update citizens and other interested parties (real estate agencies, insurance agencies etc.) with information. Useful in heavy traffic conditions, the system is also designed to support more accurate weather forecasting.

Sound pollution sensors
Assess stress levels and health impacts across the city. Support the development of flexible mobility plans, and foresee the optimal design of specific architectural structures to enhance soundproof acoustic insulation; Ultimately improving quality of life and optimise traffic flow.

Structural stability sensors
Sensors that monitor the structural soundness of public infrastructure and historic buildings to prevent collapse, and plan for any potential refurbishment work.

Flood sensors
Sensors monitoring the possible flooding of road facilities (e.g. under-passegeway, manholes) which will help management to plan for road diversions in the event of hazardous conditions for vehicles and pedestrians (via alerts on the variable message signs) and for statistical purposes (plans for infrastructure operations).

SLOW MOBILITY

Slow mobility is attracting new interest from the tourist sector as well as from environmentalist. The EU provides fund to supports the development of such infrastructure.

Inter-modality, connectivity, security, availability of information and environmental protection are key in the creation of new transport infrastructures.

Cycle lanes are of particular significance due to their different uses, which makes them the ideal testing bed to deploy innovative technologies aimed at improving the user experience.

Smart cycle lanes

Cycle lanes are aimed at different users, individual and group use: pedestrians (with buggies and pets), runners, cyclists, and skaters. Nevertheless, all users face the same issues:

– on the road they are all vulnerable to hazards and as such they should be safeguarded;
– they move at a slow and erratic speed and not always at the same speed as each other;
– enjoy open air activities, with high environmental awareness;
– sport activity is the main reason for using cycle lanes; More often such places are recognised as social spaces where people meet and share common interests.

The complete solution for smart cycle lanes includes:

– Video surveillance
– Emergency SOS push buttons
– Usage flow monitoring speed
– Speed Radar
– Acoustic pollution monitoring
– Safety and awareness of road traffic
– Air quality monitoring
– Irrigation of green areas
– Smart Bins, intelligent bins
– Bike sharing
– Parking for intermodal logistics
– Life course 2.0
– QR codes
– Social networking

Mobility in the future will be more flexible, supported by smart parking (employment control of parking spaces), at detection traffic flows and the growing network of smart charging points. The system will inevitably be more sustainable with environmental monitoring and development of slow mobility.

info@a2asmartcity.io

a2asmartcity.io
lineacom.it

a2a smart city