

# Smart Urban Mobility: new challenges and solutions

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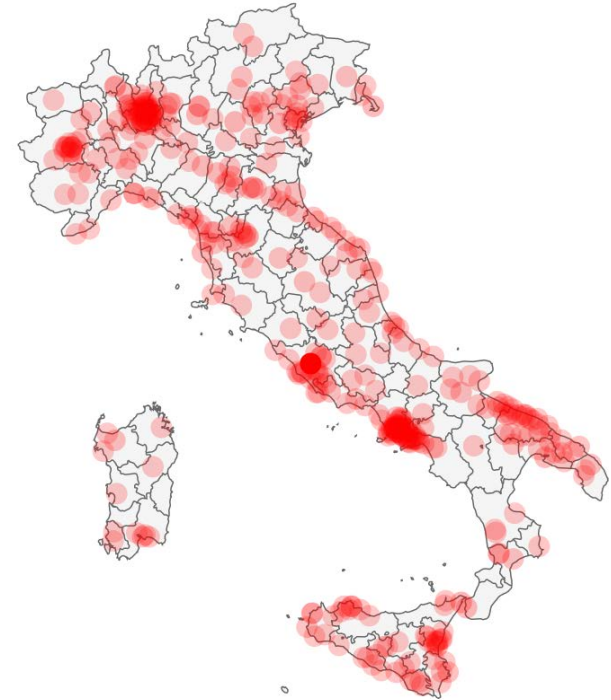
# Urban mobility challenges: threats to modern city systems

# Main characteristics of Italian cities

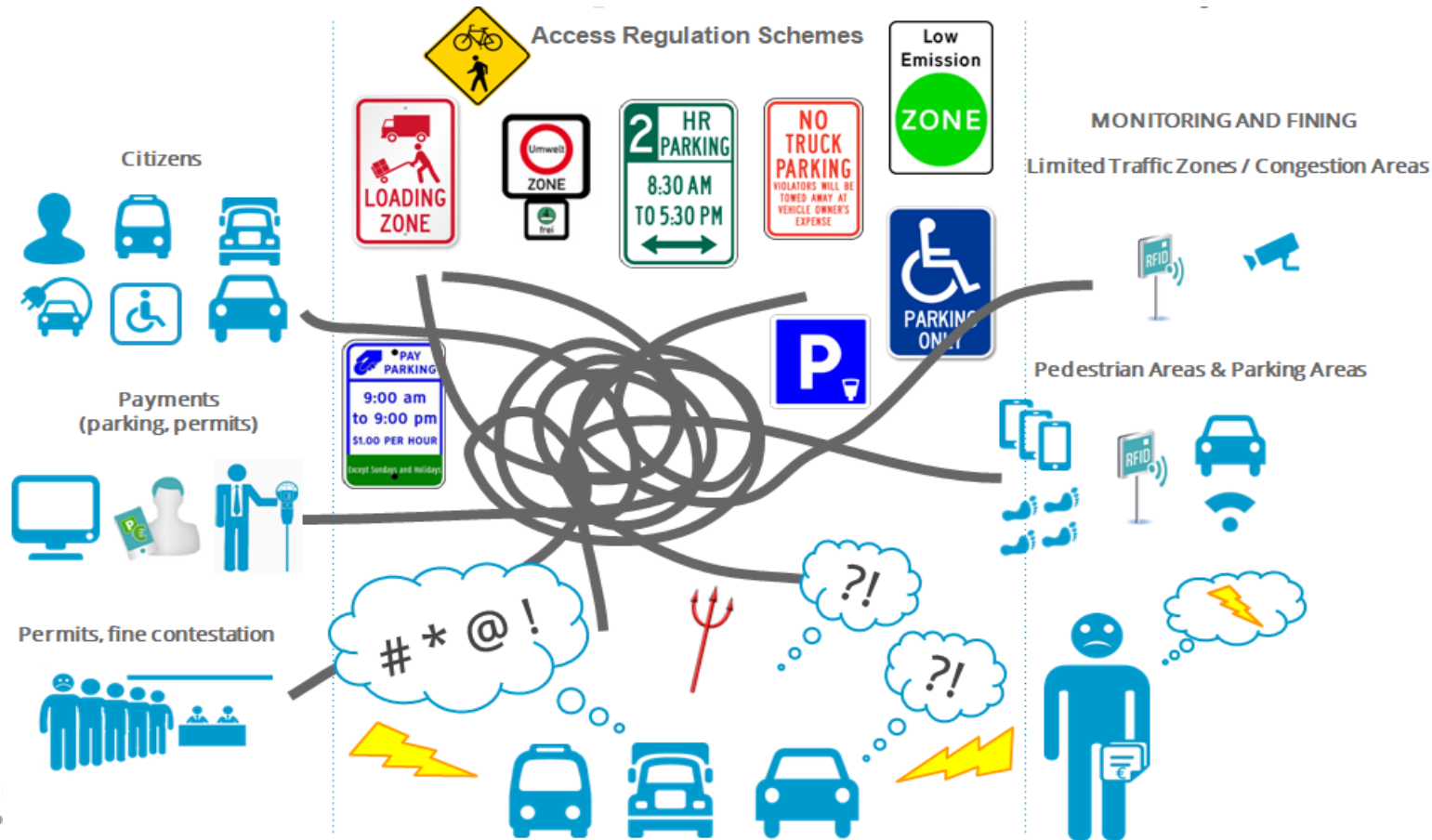
- a. population: *100.000 - 1.000.000 inhabitants (31 cities)*
- b. n. of on-street paid parking spots: *eg. 5.000 paid parking spots*
- c. n. of off-street parking lots owned by the City: *eg. 2.500*
- d. limited traffic / low emission zone (LTZ / LEZ) / congestion charge (CC): *if present, 10-15 access points (depending on the city size)*
- e. sharing mobility: *bike sharing, car sharing, etc.*
- f. public transportation: *bus, metro, etc.*

## Risks:

- lack of urban mobility regulations
- narrow local political view
- increasing dependancy on cars



# Regulations for Access Control, Transit and Parking in the city: Siloed, Fragmented Systems and Lack of Information



# New Urban Mobility Challenges



## Side effects on **health and safety**

- millions suffer from life-long respiratory and cardiovascular diseases
- 25,500 people lost their lives on EU roads equivalent to 70 lives lost per day (2017)
- 135,000 people were seriously injured (2017)



## Average **hours lost in traffic** during peak hours in major cities

- Moscow: 91 hours/year
- London: 73 hours/year
- Paris: 65 hours/year
- Rome: 35 hours/year



## **Costs** per EU drivers in terms of road fatalities, lost productivity, wasted fuel

- almost \$120 billion/year
- 1% of EU GDP
- 3% of Italian GDP



## Urban mobility **pollution**

- 40% of all CO<sub>2</sub> emissions due to road transport
- up to 70% of other pollutants
- Urban traffic noise decreases quality of life
- Energy consumption instead increases due to traffic

# New Urban Mobility Challenges



## Congestion

- One of the most **widespread transport challenges** in urban agglomerations
- Parking need consumes transport capacity that increases congestion by cruising in looking for parking → a vicious circle self generating



## Public transport inadequacy

- Crowdeness creates discomfort
- Not easily reachable in suburban areas
- Not financially self-sustainable and in constant need of public aids
- Inadequacy of e-payments systems and far from MaaS



## Lost of **social interactions**

- Public space is limited and lost in favour of new roads, cars and infrastructures
- Increasing feeling of loneliness and abandonment that impacts on social costs



## **Freight:** feverish growth

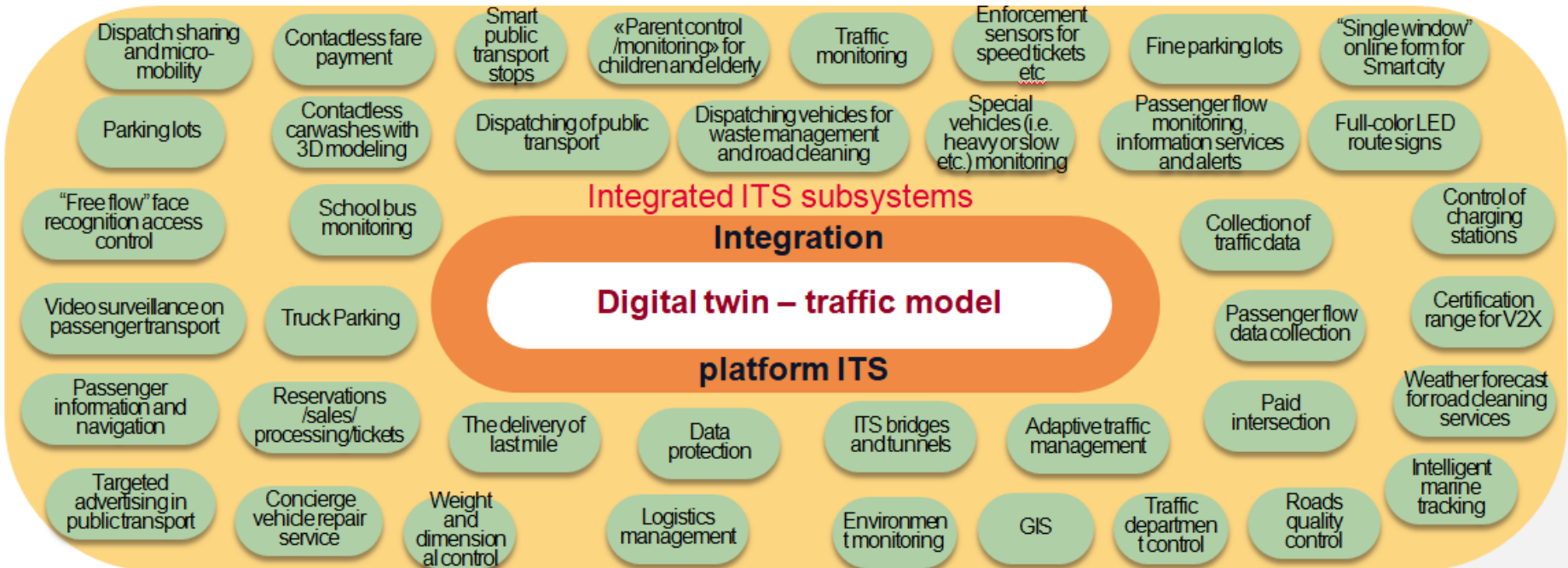
- Parcel deliveries put pressure on law makers
- Freight operators share the same infrastructures of urban mobility increasing the lack of urban spaces dedicated to pedestrian or no-cars areas

# Innovative management of urban mobility challenges brings smart solutions



# ITS architecture within a smart city platform

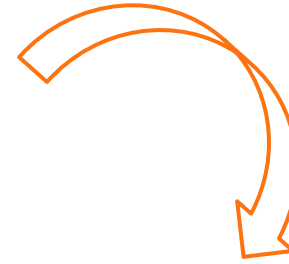
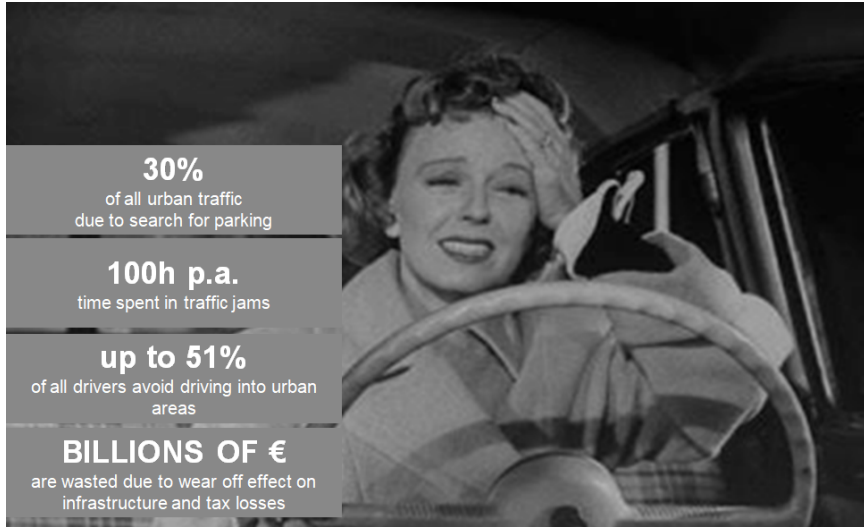
An **intelligent transportation system (ITS)** is an advanced application which aims to provide innovative services relating to different modes of transport and traffic management and enable users to be better informed and make safer, more coordinated, and 'smarter' use of transport networks.



# An innovative management vision of mobility & parking



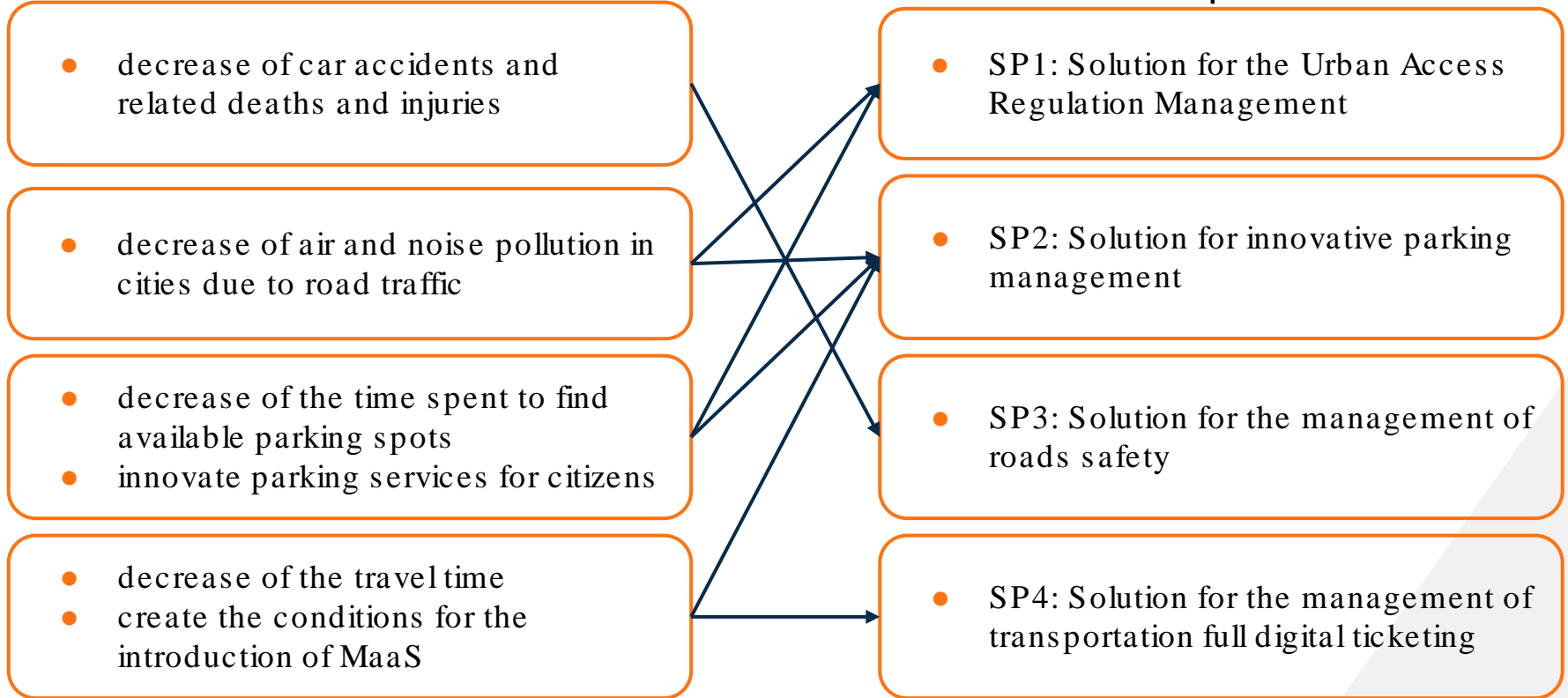
# An innovative management vision of mobility & parking



# Smart Mobility Solutions for the city quality of life

## Needs

## Solution paths



# Solution for the Urban Access Regulation Management

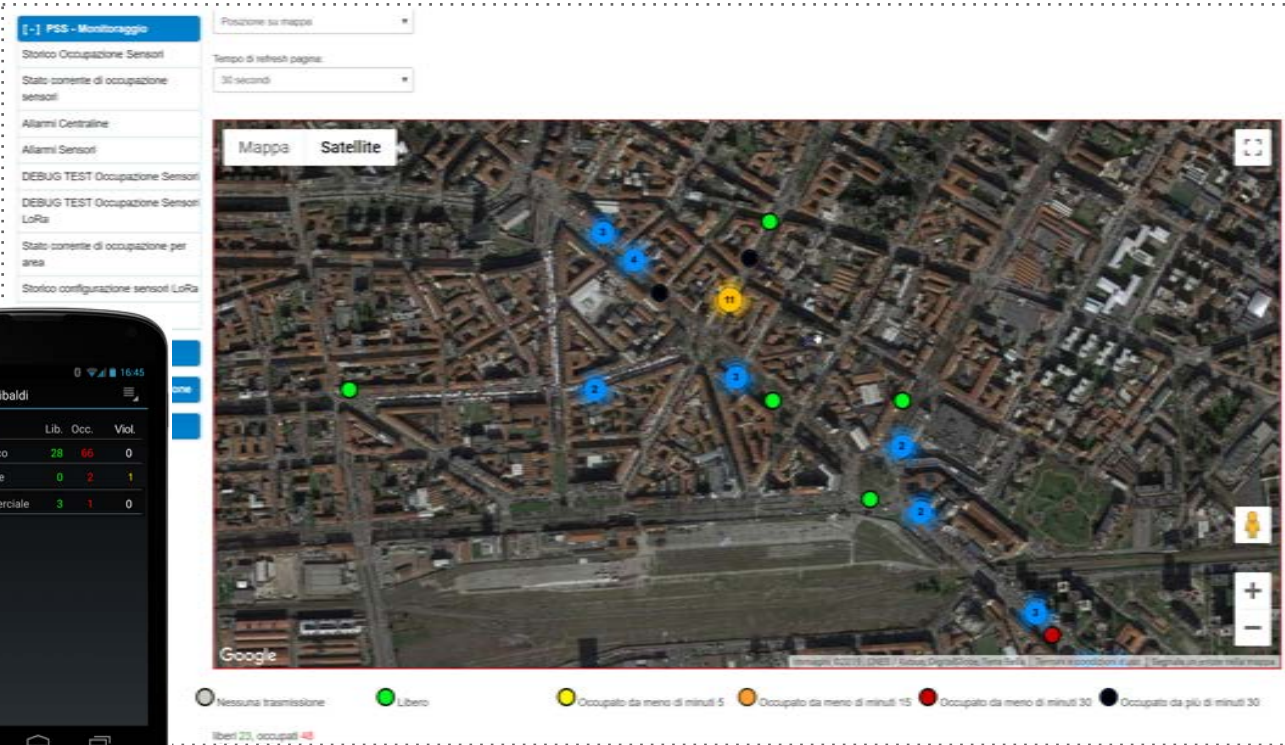
The first Smart Mobility Solution is aimed at addressing cities needs to **tackle the critical issues of the today urban mobility, increase the city's environmental, social and economic sustainability** and to **improve the urban area attractiveness, liveability and accessibility.**

This Smart Mobility Solution regards the outsourcing of the management of all Urban Access Regulations for private mobility:

- Regulations of Low Emission Zones
  - based on vehicle emission
  - user profile
- Regulations of Parking Lots
  - hourly parking tickets (via app/parking meters)
  - yearly permits (residents, families, low mobility, professionals, etc.)
  - tourist busses
- Centralized Management Platform for
  - Digital services and payments (integration of parking meters, mobile apps, etc.)
  - Dynamic Pricing
  - Parking Guidance
  - Providing data for the Sustainable Urban Mobility Plan

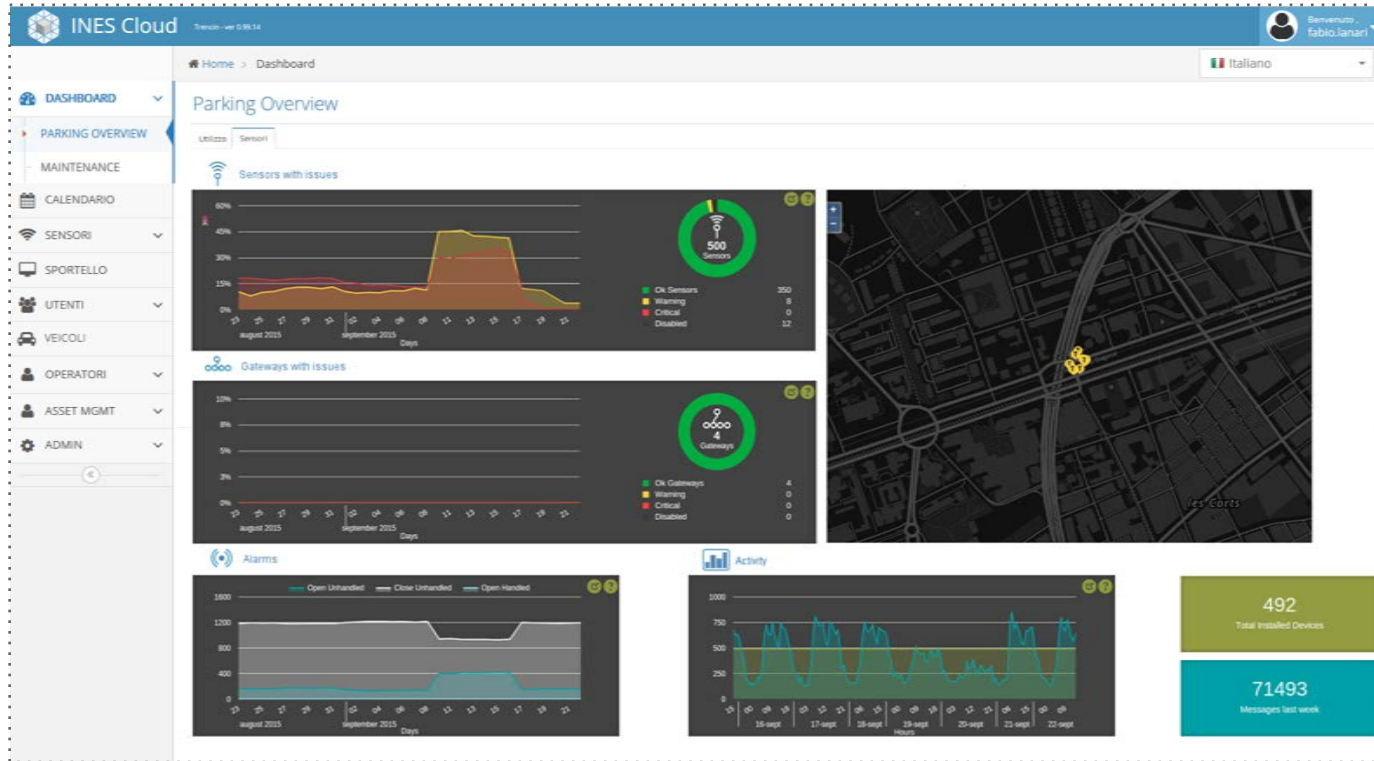


# Smart Mobility Solution: Parking Supervisor



- Management of parking sensors and LPWAN network
- Real Time Parking Occupancy Monitoring
- Alerting to law enforcement officers

# Smart Mobility Solution: Reports & Analytics to support decision makers



- Numerical and graphical reports, help taking more informed decisions
- Front-office activity report (financial reporting) to view all the sales made
- Operators Reports: productivity, services sold, cash flow made, money denominations collected / returned
- Technology operation report

# Smart Mobility Solution: Supervision Platform

INES Cloud Home Menu ⊕ Bentornato Amministratore Kiursys © 2018 Kiursys s.r.l.

**Abbonamenti**

**Abbonamenti - 1 Gestione - Elenco Tipologie**

Ricerca

Codice della Tipologia:

Acquistabile via web:

tot. record: 38 Succ. >>

Codice	Descrizione	Durata	Zona	Importo	Acquistabile via web	Acquistabile mobile	Acq. abilitato servizio AAA	Autorizz. Assoc.	Attiva	Esporta Varchi ZH	Cod. raggr. per report	Struttura con capienza	Peso	
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	ABBONAMENTO ZSC													<a href="#">dettagli</a>

## Permits/Tickets

### De finition:

- Type
- Duration (daily, weekly, monthly, seasonal, annual, per package)
- Tariff area
- Amount (full, discounted for: residents, traders, transporters for urban logistics, tourism, etc.)
- Sales channel (web, mobile)



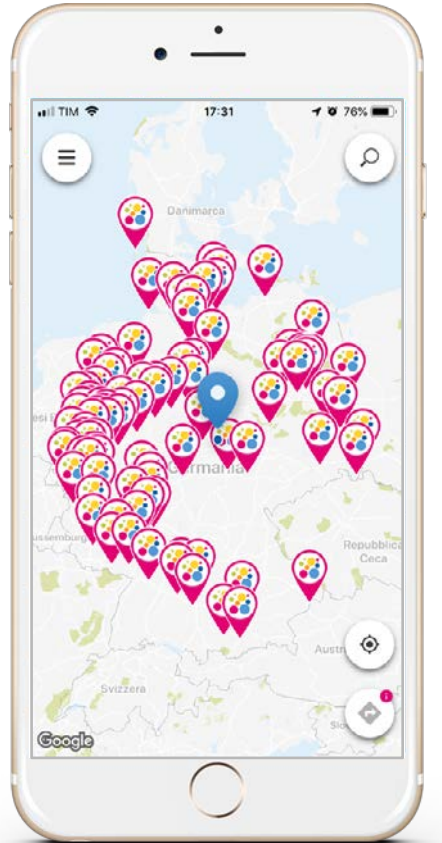
# Solution for innovative parking management

The second Smart Mobility Solution is targeted at cities willing to innovate the parking management and to offer end-users a **seamless parking experience**, by helping them to find and pay for parking easily and quickly.

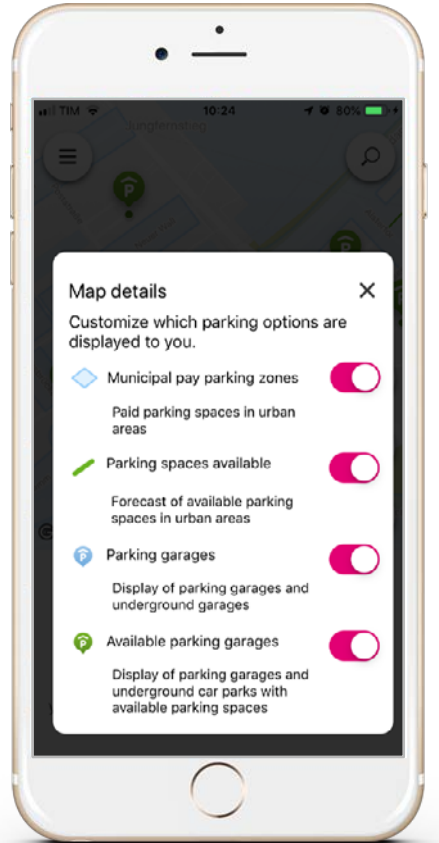
This Smart Mobility Solution refers to the outsourcing of the mobile services for the parking management:

- infoparking on parking availability
- parking payment via mobile app.

# Smart Parking Solution: End-User Mobile Front-End



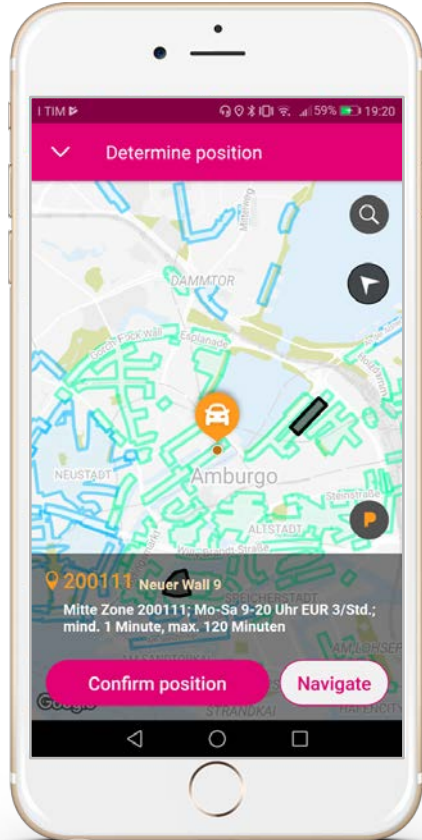
active cities



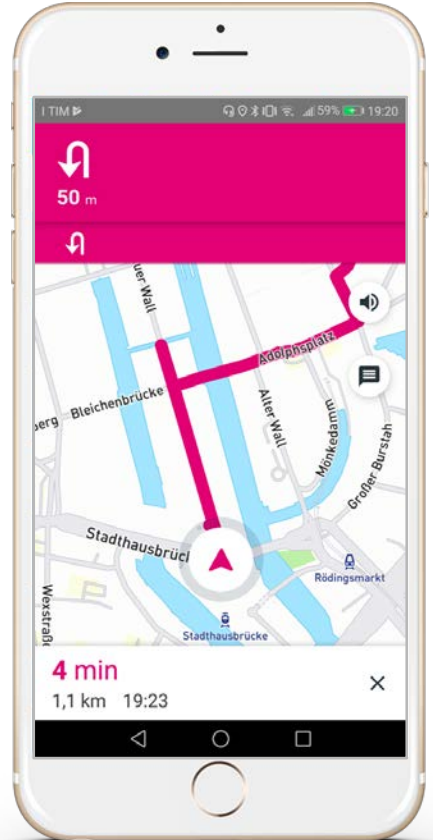
information available

- Mobile parking service to improve:
  - Users needs to quickly find a parking space and pay the parking fee via smartphone
- The user can be guided to her/his destination with an "intelligent" navigator
- The app could offer the itinerary where the user is most likely to find available parking spots
  - The proposed itinerary could also take into account the departure time, travel time, weather conditions, occupancy history, etc.

# Smart Parking Solution: End-User Mobile Front-End



destination selection with parking availability shown



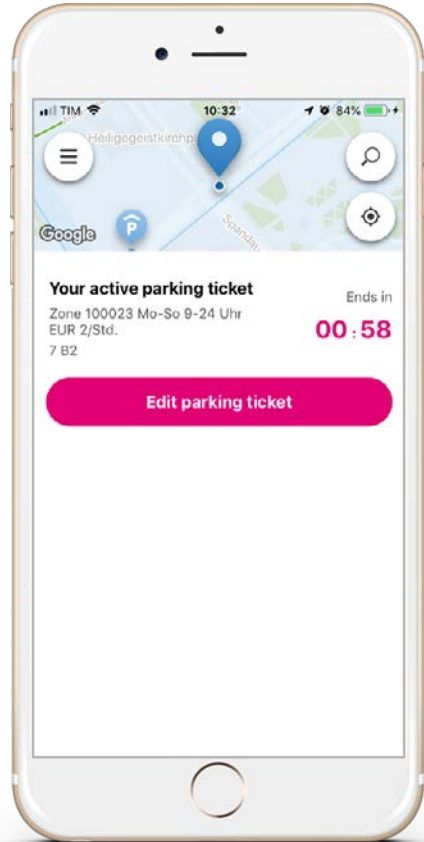
navigation to the selected destination

- Parking predictions: the map displays the zones (areas) of the city where there are greater chances of parking
- Routing: an integrated navigator guides the user towards the desired parking destination, following a dynamically calculated route that suggests the roads where there are greater chances of finding an available parking spot

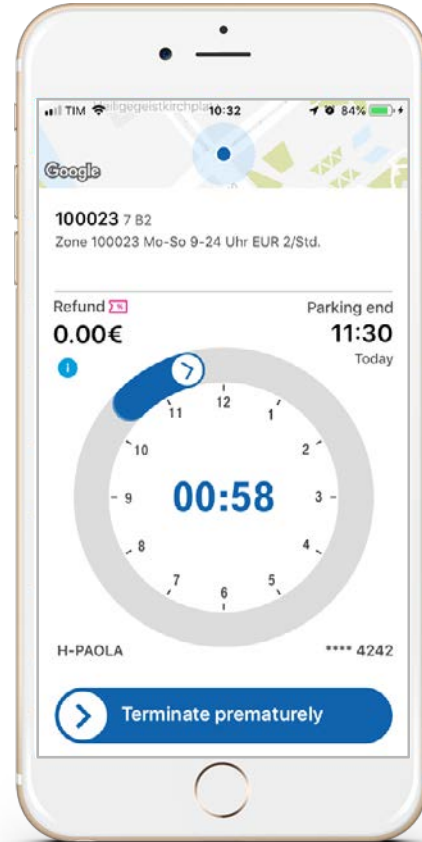
# Smart Parking Solution: End-User Mobile Front-End



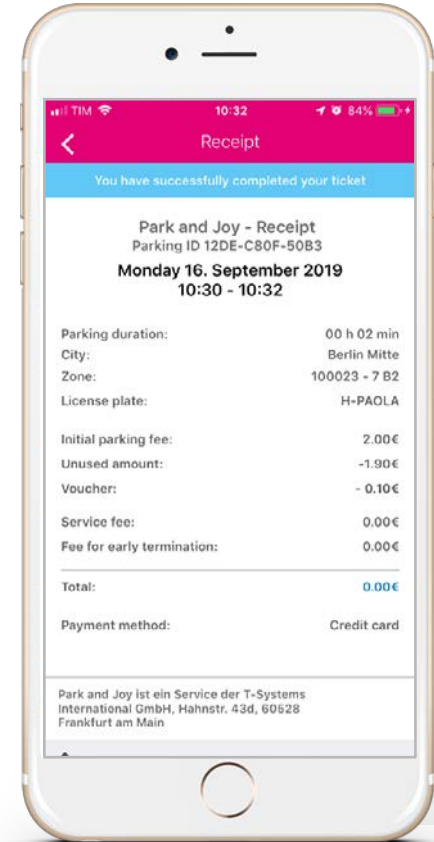
parking fee calculation based on parking time



possibility to change to the parking ticket



parking interruption



receipt of the parking ticket with refund

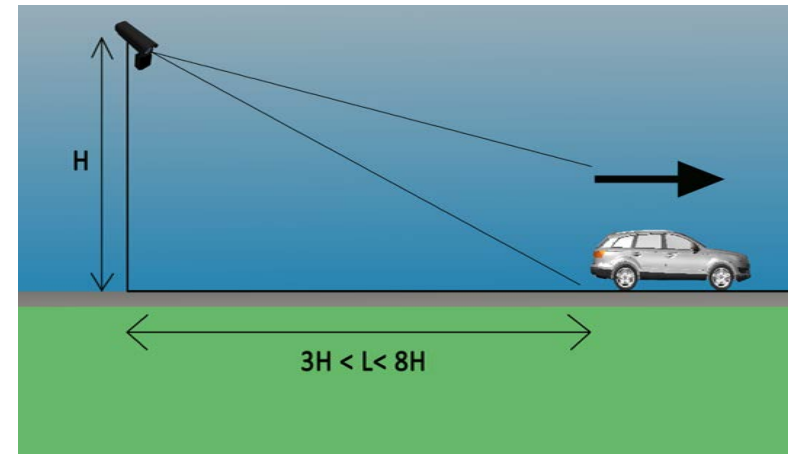
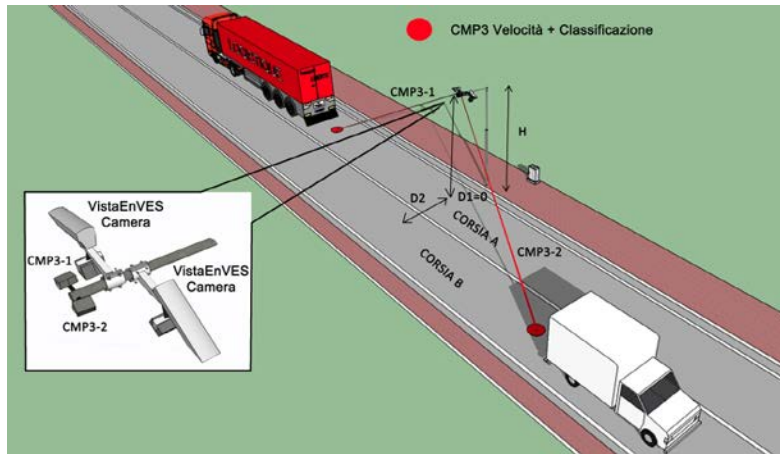
# Solution for the management of roads safety

The third Smart Mobility Solution is targeted at cities willing to **increase road safety standards**, to **protect the more vulnerable road users** (eg. pedestrians, cyclists, etc.) and to **strengthen road accident prevention and control policies**.

This Smart Mobility Solution refers to the outsourcing of the whole life cycle management of speed limit enforcement:

- detection of traffic law infringements via on-field certified devices
- acquisition, validation and memorization of infringement reports in compliance with privacy laws
- massive, automated and industrial printing, notice, notification of infringement reports
- infringement payment management with integration with multiple payment systems

# Example: Vehicle Classification + Enforcement of Instantaneous Vehicle Speed



# Road Safety Solution: Back-Office Management Platform

The screenshot displays the JEnte Back-Office Management Platform. At the top, there is a navigation bar with tabs for LOTTI, RICERCA, DEVICE, UTENTI, STATISTICHE, SCHEDULE, PERMESSI, and RENDICONTAZIONI. Below this, a dropdown menu shows 'Tutti i contratti' and a status indicator 'Solo device attivi ON'. A toolbar contains buttons for '+ Associa Tutti', 'Attiva Tutti', and 'Disattiva Tutti'. The main table lists devices with columns for Seriale, Contratto, Tipo, Produttore, Descrizione, Data Inizio, Data Fine, Operatività, Stato, Attività, Monitoraggio, Attiva, Disattiva, and Schedulazione. Below the table, a detailed view for a specific device is shown, including 'Informazioni generali' (Tipo: Velocità Istantanea, Seriale, Produttore: Engine s.r.l., Descrizione) and 'Indicatori di operatività' (Indicatore: Operatività negli ultimi 30 giorni, Indice di operatività complessivo: 100%). A dashboard at the bottom shows 'Dispositivo:' and four circular progress indicators for Corsie A and B, with values of 100%, 38%, 18%, and 61% respectively.

- Management and monitoring of on-field infringement detection systems
  - operating status
  - activation/deactivation, scheduling





# Solution for the management of transportation full digital ticketing

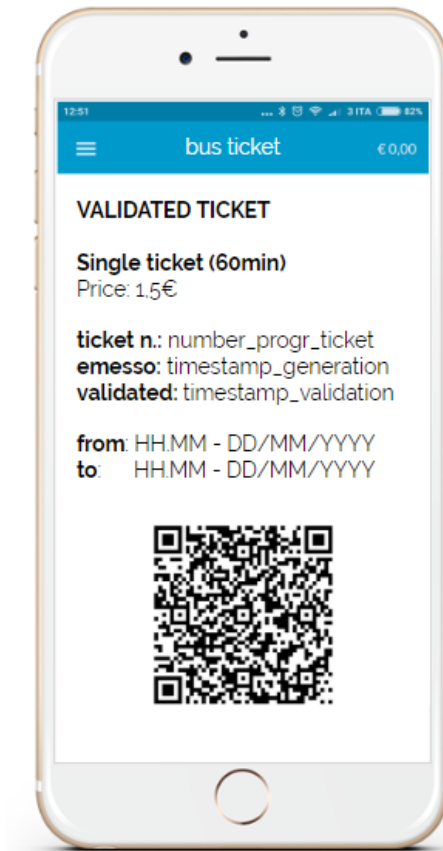
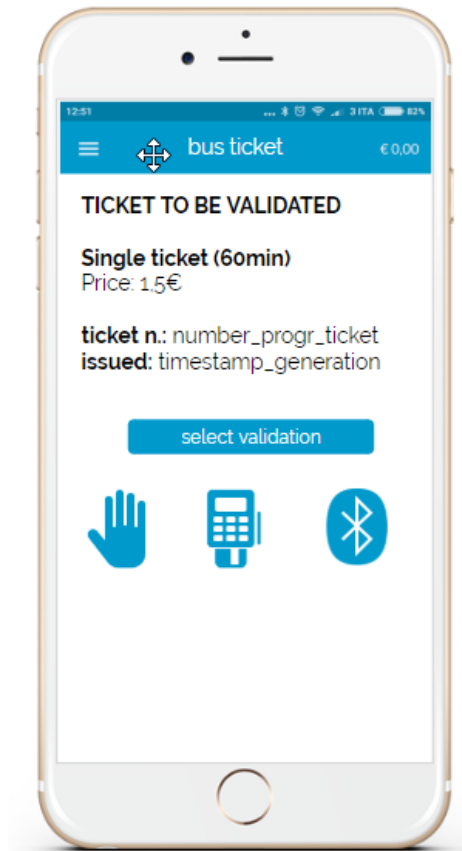
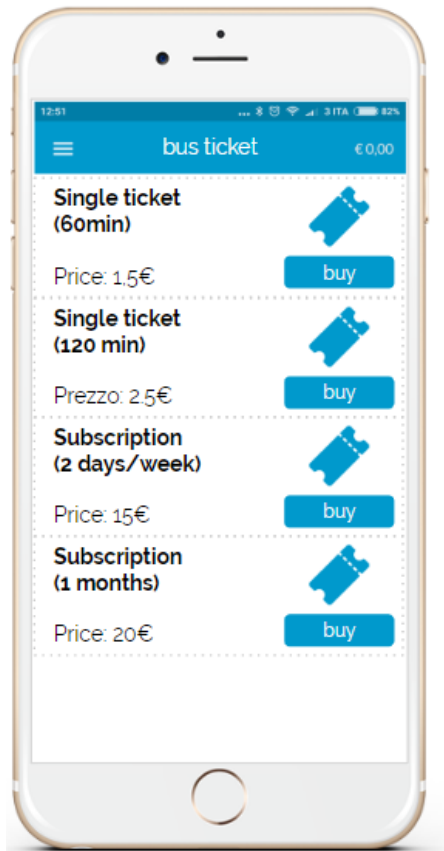
The fourth Smart Mobility Solution is targeted at cities willing to innovate the public transportation ticketing service and to provide end-users a **full digital ticketing tool**, by helping them to find and pay for a bus easily and quickly.

This Smart Mobility Solution refers to the outsourcing of the dematerialised management of public transportation ticketing:

- ticket payment
- ticket validation
- ticket control



# PT Ticketing Solution: End-User Mobile Front End - Purchase



# PT Ticketing Solution: End-User Mobile Front End - Validation



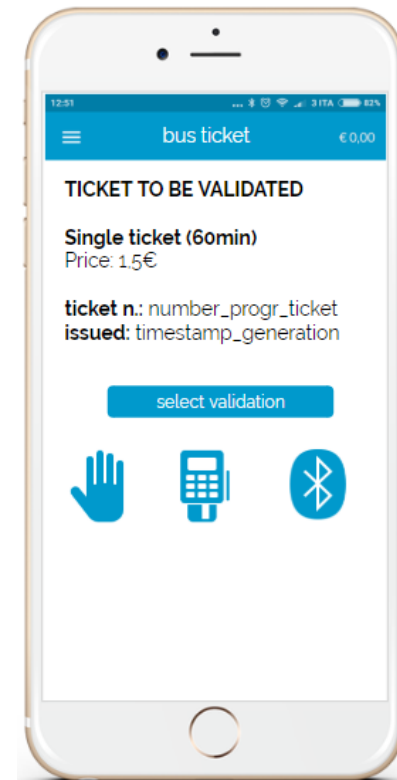
- Manual with validation at the beginning / end of the trip



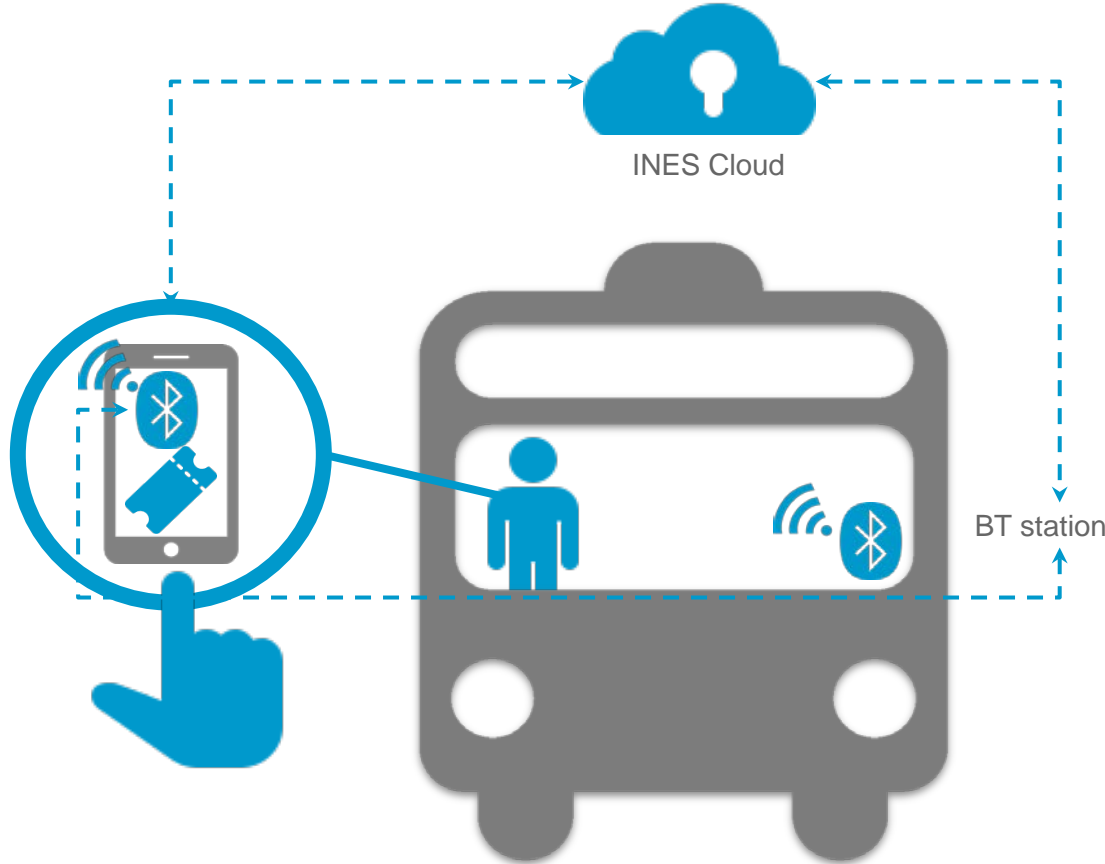
- Manual with reading of the QR code when getting on/off



- (semi) automatic with Bluetooth



# PT Ticketing Solution: Ticket (semi) Automatic Validation



- When a passenger gets on / off the bus, the BT station detects the BT on the user's smartphone
- The user's mobile app
  - asks the user to confirm the check-in / out and to start / end the trip
  - If the user has requested automatic validation, the app could independently manage check-in / out
- The BT station communicates to the platform
  - the number of BT devices on board
  - the BT addresses of the BT devices detected

# Smart Mobility Benefits



## Accessibility

- less time to find an available parking spot
- improvement of traffic conditions (movement and parking)
- less time spent in urban traffic jam
- increased city accessibility



## Safer Environment

- reduction of atmospheric and acoustic pollution
- coherence with international climate change objectives



## Road Safety

- reduction of car accidents
- optimised traffic flow



## Liveability

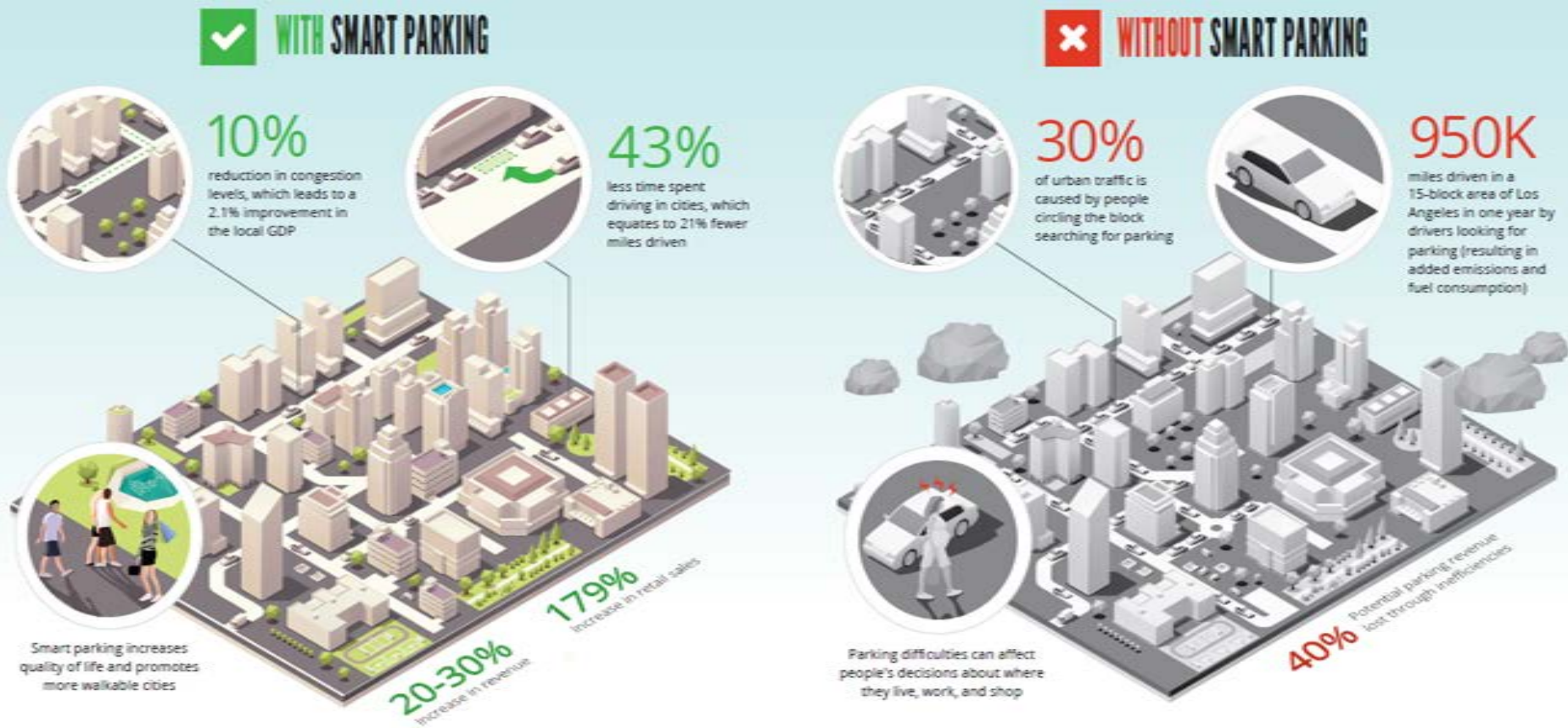
- public space optimization
- increased quality of life, cohesion and attractiveness
- increased financial resources for public services



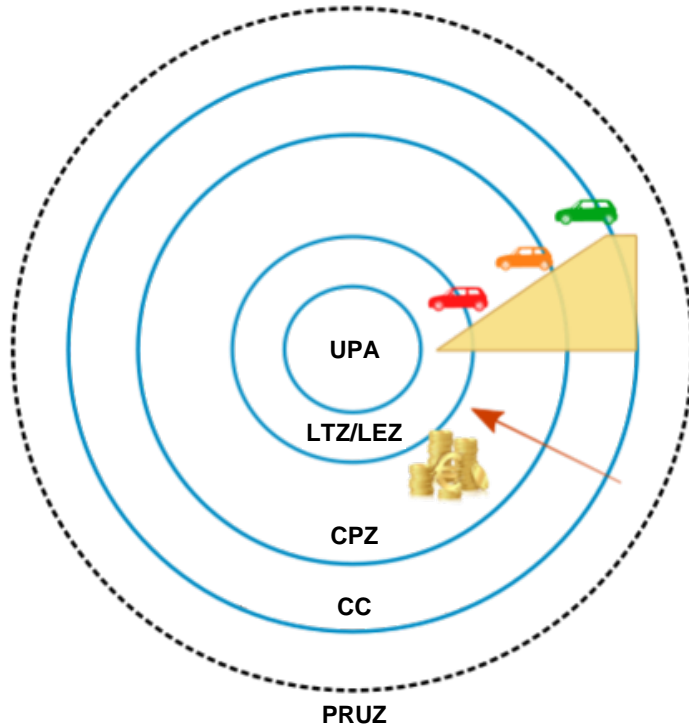
## Health & Wellbeing

- reduction of casualties (death, injuries) and social discomfort
- reduction of diseases due to air and acoustic pollution

# Measurable benefits



# Urban Vehicle Access Regulations foster the modal shift



UVARs - Urban Vehicle Access Regulations are regulations policies for vehicles going into all or part of the urban area to improve issues such as air quality, congestion or how people experience the city. Can be grouped into 3 main categories:

- based on payment
- based on emission limits
- based on permits

Below the main UVARs that can be applied to a city, from the very city center to the external areas:

- **UPA - Urban Pedestrian Area:** areas not allowed to vehicles.
- **LTZ - Limited Traffic Zone:** access is only allowed at certain times of the day or only to certain vehicles or trips (eg. residents, professionals).
- **LEZ - Low Emission Zone:** most polluting vehicles cannot enter or pay a ticket based on Euro vehicle class.
- **CPZ - Controlled Parking Zone:** parking is limited, at set times, to particular categories of users and vehicles (eg. metered parking, residents, disabled, etc.).
- **CC - Congestion Charge:** entry is subject to payment - the money raised from the schemes is usually spent improving transport in and around the city.
- **PRUZ - Particularly Relevant Urban Zones:** external areas with special urban characteristics (eg. close to stadiums, beaches, etc.) where parking schemes or other regulations/restrictions can be applied.

# The added value for citizens of the mobile parking parking

## A SMART PARKING SOLUTION FOR INFOPARKING AND PARKING PAYMENT:



### NEVER AGAIN LOOK FOR A PARKING SPACE

The app tells the user where to find available parking and navigate right there. The user buys the parking ticket and pays with just few clicks.



### NEVER BE LATE AGAIN

The user travels comfortably. S/he is directed to an available parking area near her/his destination without having to drive around the block a dozen times.



### NEVER AGAIN LOOKING FOR CHANGE

The annoying search for small change has done thanks to payment via smartphone.



### NEVER PAY TOO MUCH AGAIN

The user only pays for the time s/he parks. The parking duration can be adjusted as needed - and remotely - later.

# Road Safety Management Impacts



- promote correct behaviours of road users



- strengthen the application of the traffic code



- improve road safety



- increase vehicle safety



- improve road and vehicle monitoring and control through the use of new technologies



- define a sound governance of road safety



# The Added Value for the City from a Full Digital PT Ticketing



- no customized or expensive hardware
- increase in revenues, due to the simplification and the security of the digital ticket
- analysis of transactions and operations of on board control staff
- intermodal tariff optimization
- quick deploy since the solution
  - can be independent of pre-existing paper or electronic ticketing systems
  - is compatible with EMV systems (payment with Credit Cards)
- customer-centric governance and, therefore:
  - CRM
  - SMS / Whatsapp / app / email communications to customers or potential customers
- makes all processes efficient, simple and safe
- reduces technological lock-in (dependence on proprietary technologies)
- simplifies the distribution of the service by releasing it from traditional HW devices (ticket vending machine)
- reduction of operating costs for the management of HW equipment (mechanical machines, TVM)
- quicker update of SW components and simplified maintenance of HW lightweight devices (e.g. tablets, BLE scanners)
- quick data collection, data warehousing and data analysis

# Thank you for your attention