Leuven Living Lab for FlexCURB

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FlexCurb

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What is FlexCURB?

Consortium & roles

EIT Urban Mobility project 2022-2023

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Cities

Network & expertise

Technology

Budget: 713K

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FlexCURB domain

1. Freight transport
2. Flexible curb management: allocating different parking types to one parking location (marked parking bay or curb without markings) to optimise usage

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Why FlexCURB?

3 main objectives

1. Minimise greenhouse gas emission & traffic congestion
2. Maximise space & delivery times
3. Maximise the cities' understanding of the curbside

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Why FlexCURB?

1. Minimise greenhouse gas emission & traffic congestion

Current situation

- Freight transport is responsible for:
  - 15% of traffic
  - 25% of urban transport CO2
  - 40% of NOx emissions in main European urban areas
- Number of delivery vehicles + 36% by 2030
  (without intervention, source World Economic Forum):
  - ↑ greenhouse gas emissions
  - ↑ traffic congestion (mostly induced by second-lane parking)

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Why FlexCURB?

2. Maximise space & delivery times

Current situation

- Limited space for loading/unloading
- Increasing conflicts in the use of the curbside:
  - vehicle parking
  - loading zones
  - bike lanes
  - bus stops
- Limited timeframes for freight delivery within the city

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Why FlexCURB?

3. Maximise the cities' understanding of the curbside

Current situation

- Many cities are missing a consistent understanding of the supply and demand of curbside assets
- Cities need a comprehensive perspective of their curbside regulations

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FlexCURB solutions

- **Strategic** solutions:
  - Flexible **use** of the curb
  - Flexible curbside **management**
- **Technology** solutions (UrbanRadar):
  - Planning platform for cities
  - Driver App for logistics service providers

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Strategic solution FlexCURB

Flexible **use** of the curb

New situation: allocation of multiple functions to curb spaces

- **Simultaneously** or in different **time windows**
- More **efficient and rational** use of curb space
- Meeting needs of **multiple stakeholders** (last-mile logistics, active mobility, residents, local businesses)
- Improved **vehicle flow**, reduced **congestion** and **double parking**
- Improved **availability of space** for logistics operations

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Strategic solution FlexCURB

5 steps towards flexible curbside **management**

1. Digitalization of curbside regulations (data collection)
2. Visual exploration of regulations (map view)
3. Quantitative analytics on curb regulations (charts and metrics)
4. Analytics on Loading Zones demand from App
5. Adaptation to flexible use & communication of regulations

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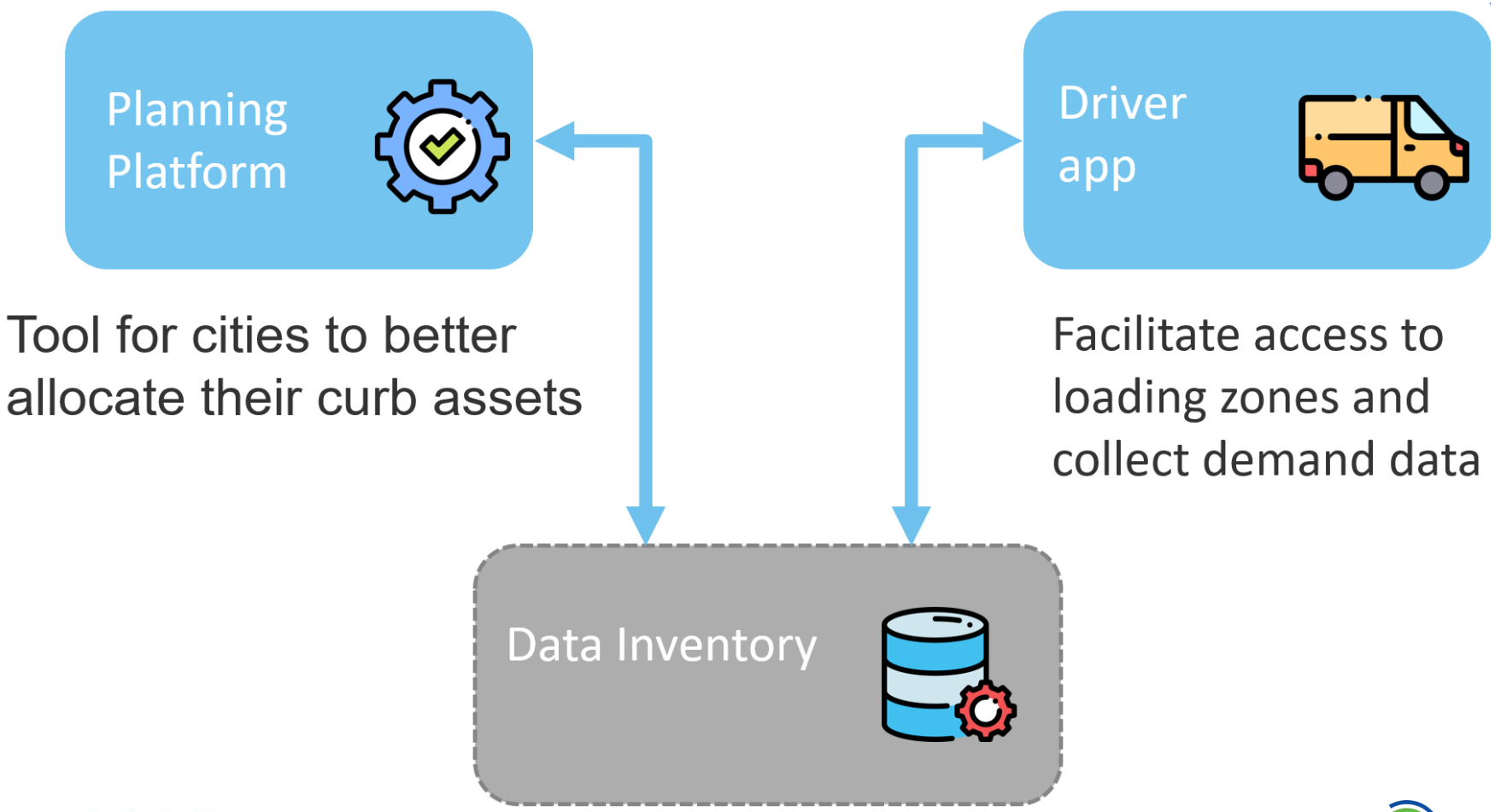
Technology solution: platform & app

= Output 1 & 2



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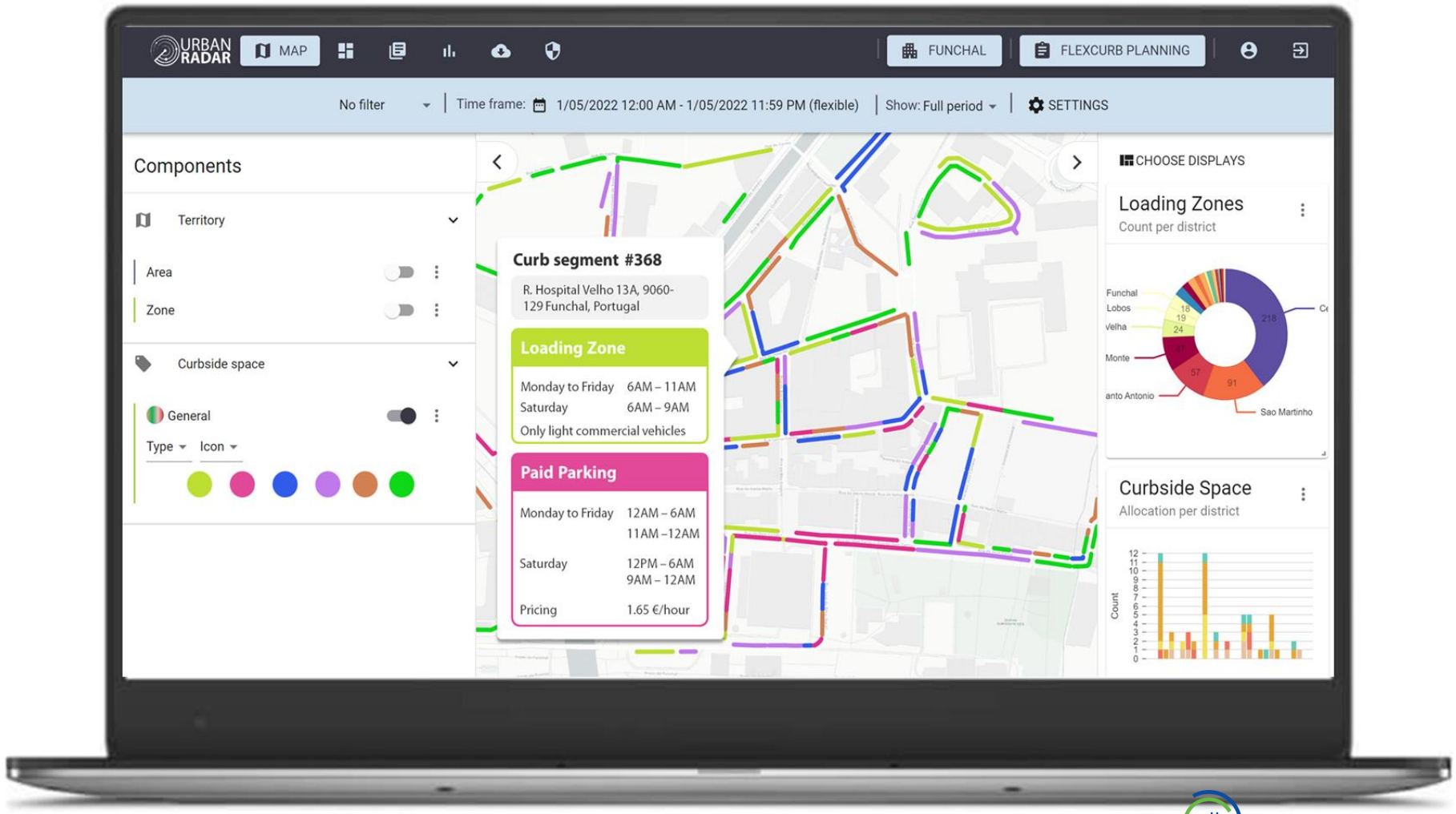
FlexCURB Planning platform

For cities



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FlexCURB Planning Platform

Questions the planning tool should (help) answer

- How well do curb regulations respond to **citizen needs**?
- What is the **curb use distribution** across the city?
- Which curb use takes **most space**?
- How does curb allocation vary by **location**?
- How does the curb allocation vary over **time/day** of the week?
- How does curb use correlate with **land use and demographics**?
- What are the **patterns of use** of **Loading Zones**?

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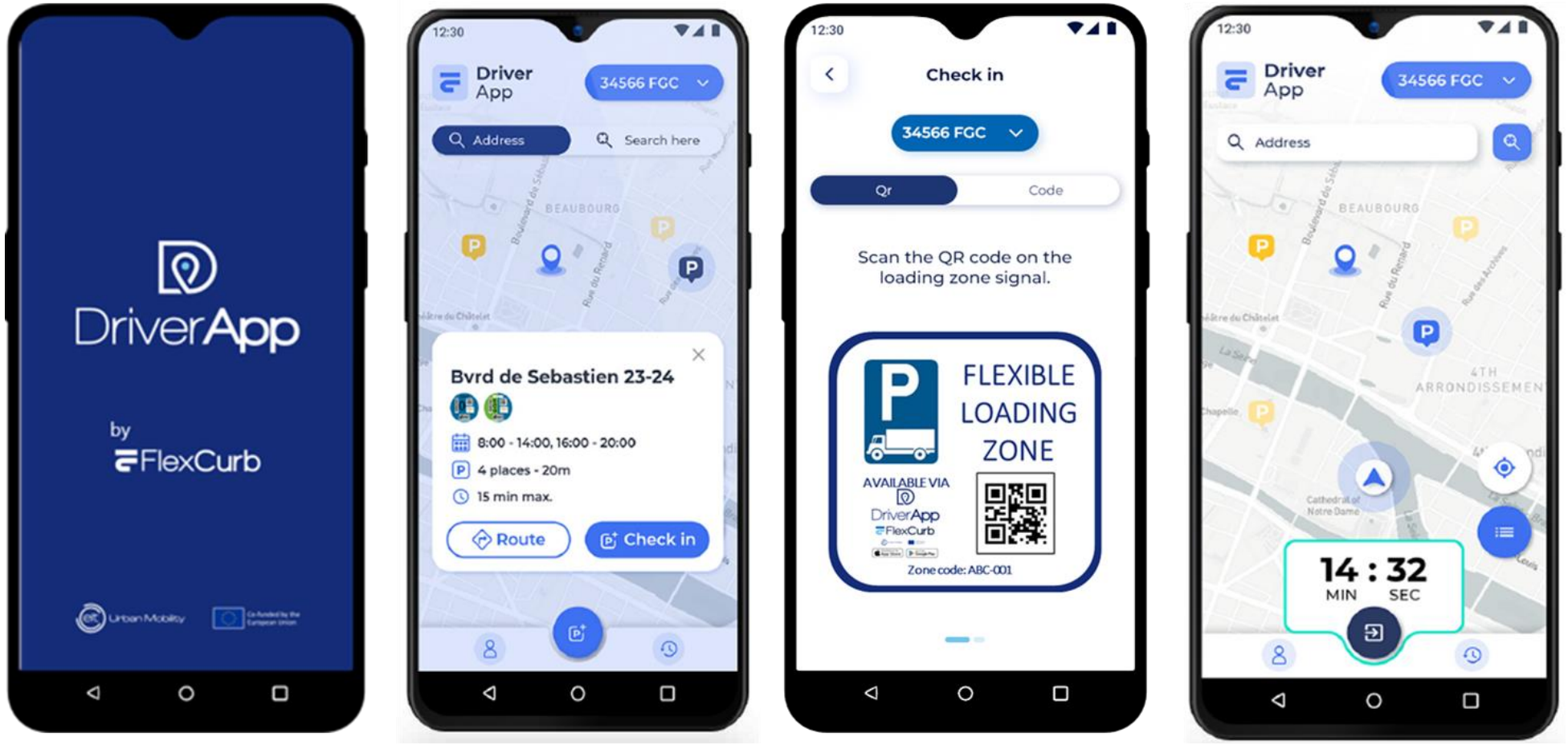
FlexCURB Driver App

For drivers (logistics service providers)



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FlexCURB Driver App

- Let drivers **locate smart Loading Zone** (LZ) in the city where they operate
- Suggest the **closest LZ** to their destination
- Provide **driving directions** to LZ from current location
- Collect destinations **search data**
- Allow for **check-in/check-out** of smart LZ
- **Collect** check-in/check out **data**
- Tell drivers their **remaining parking time** based on LZ conditions

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Approach

Main issues on the curbside in Leuven

Space & time

- **Not enough on street parking space** for residents, visitors (more than 2hours) and freight transport
- No structural maintenance of parking **inventory** (2020)
- No real-time parking **usage data** (apart from Shop & Go parking space)
- Flexible use is illegal according to **Belgian law** (street code) => no flexible enforcement
- **Removing parking spaces** for residents/visitors is a **challenge** (even when replacing them by an alternative)
- **No digital parking cards** (residents, disabled people)
- **Timeframes for delivery** are too short according to logistics companies & local business owners
- Circulation plan

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Main issues on the curbside in Leuven

Circulation plan

- Since 2016
- 5 city zones + 1 car free zone + 1 zone with limited acces for cars
- At least one off street parking per zone
- **Drivers cannot cross the border of a city zone**: they should leave the city through the same zone where they entered the city.
- Main objective:
  - more public space for active mobility, residents and visitors
  - less cars within the city center
- Result 2016 vs 2019 in the inner city:
  - Cyclists +44%
  - Cars -19%
  - Freight: no detailed quantitative analytics

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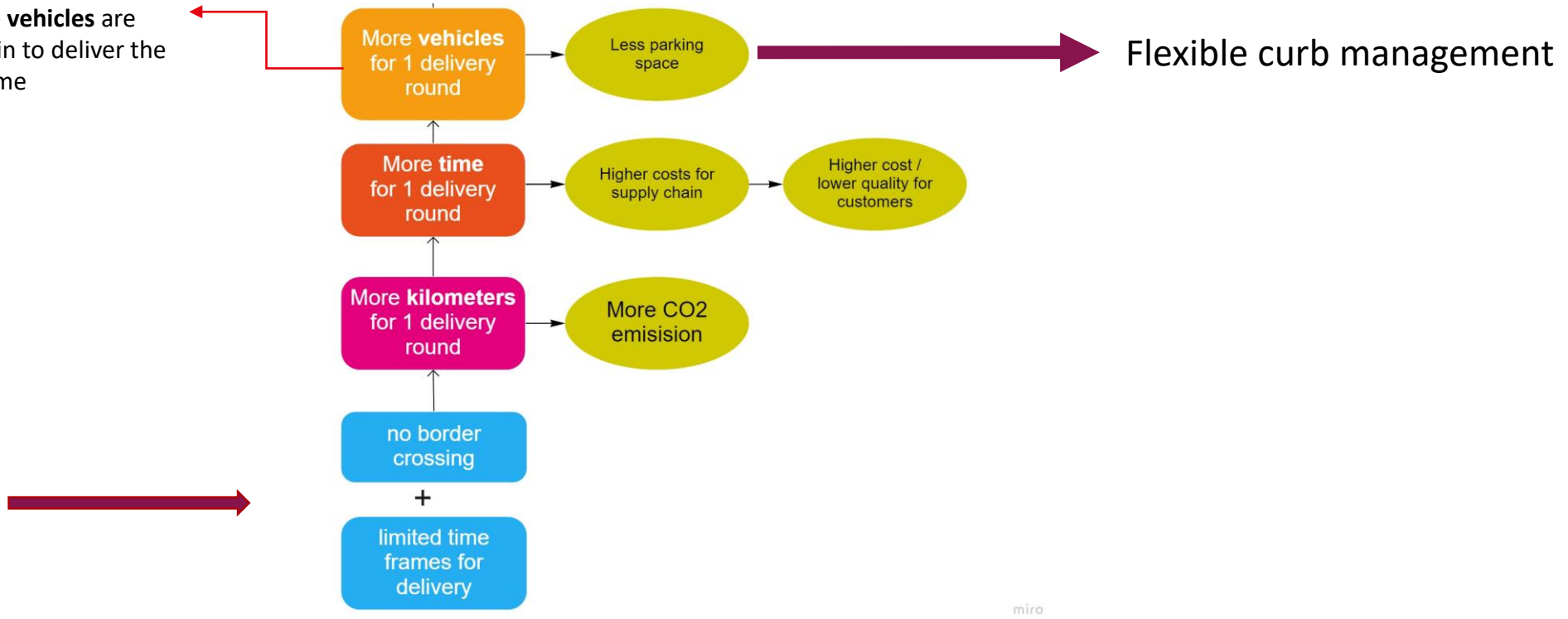
Main issues on the curbside in Leuven

Circulation plan: consequences for freight

To compensate waste of time, **more vehicles** are scheduled in to deliver the goods in time



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How could flexible curb management improve this situation?

- Available (limited) parking space will be used in a more efficient way:
  - we'll give more users access to the same space = MORE SPACE
  - during more hours when possible = MORE TIME
- More space and time for delivery means:
  - less search traffic
  - less waste of time
  - less vehicles
  - less greenhouse gas emissions
  - less costs
  - Less illegal parking (more road safety)
- More monitoring (sensors) means more data about curb usage

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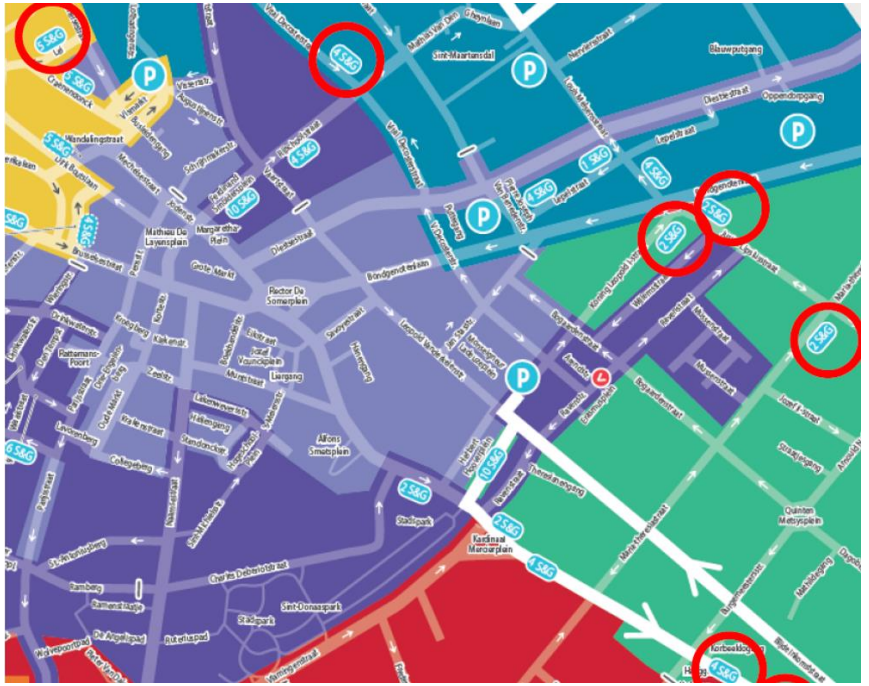
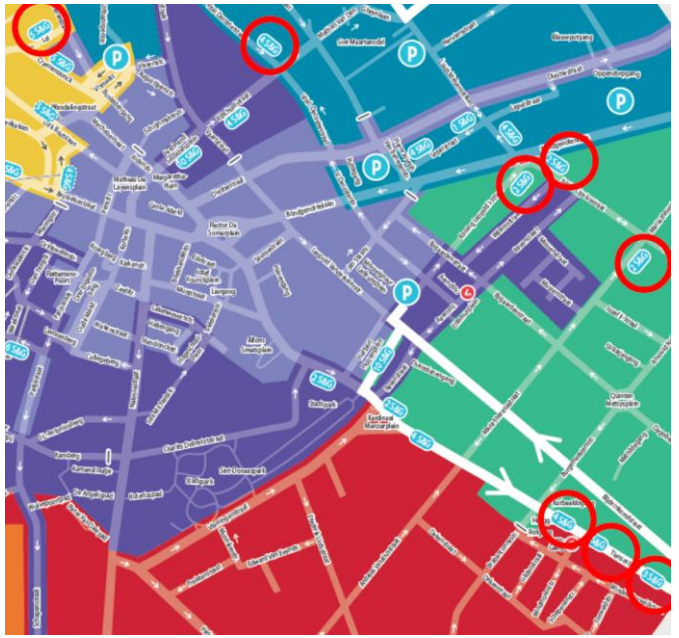
Use case Leuven

flexible use of Shop & Go parking places





Current situation:

- 100 Shop & Go parking places with Nedap sensors since 2017
- Free parking space, 45 minutes max stay, timeframe 9am -6 pm for shopping
- Before & after timeframe: unlimited parking for private cars
- Evaluation & analysis overstay: some parking spaces have
  - a low occupation rate
  - & a low overstay rate
  - => other/flexible usage might be more efficient and tackle freight related needs = Flexcurb scope

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Use case Leuven

flexible use of Shop & Go parking places

- Short term scope FlexCURB:
  - In 5 streets close to the pedestrian zone + 1 street near the ringroad
  - Allocating Shop & Go to both loading/unloading zone and Shop & Go
  - Drivers check in & out (QR-codes) on Shop & Go + current loading/unloading zone
  - Data are imported in planning platform to analyse usage of S&G + loading/unloading zones for freight
  - Drivers can check options for parking + regulations in the app (with or without availability)

Use case Leuven

flexible use of Shop & Go parking places

- Long term (out of scope FlexCURB):
  - merge all Shop & Go parking spaces (min. 3) and loading/unloading zones into 1 smart zone
  - using several timeframes?
  - Creating bookable smart zones (Fase II, no fee, with or without enforcement)

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Use case Leuven

Scope I: 2022

- Tests in July - August 2022
- Locations:
  - S&G in 6 streets (with limited sensor availability)
  - All or part of the loading/unloading zones (without sensors, apart from one)
- 33 sensors, of which 9 new, accurate sensors in 2 streets
- Availability check for these 2 streets if needed
- Check-in by drivers in the Drivers app
- No up-to-date GIS parking inventory (2020)
- Planning platform with correct regulations for loading/unloading zones and S&G parking bays. Not for the other parking types.
- Limited number of logistics companies involved (3?)

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Use case Leuven

Scope II: 2023

- Tests in March-April 2023
- Goal: enhanced planning platform (inventory and usage data) + overview of available S&G places in Drivers app
- Locations:
  - All S&G in the city center (with new sensors)
  - All loading/unloading zones (without sensors, except one)
- 100 - 120 accurate sensors (all S&G's)
- Availability check for all S&G (loading/unloading via QR)
- Check-in by drivers in the Drivers app
- Up-to-date GIS parking inventory (update in 2022 and maintenance going forward)
- API from Geosparc software which contains all up to date locations and regulations (new tender in Summer 2022)
- More logistics companies involved?

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Challenges

Challenges
Monitoring availability

- Limited sensor data
- Check-in/out data from the Drivers app => unreliable if not used (correctly) by all drivers
- Solution:
  - Test in 2022 with 9 new sensors
  - Advanced test in 2023 with new sensors for all Shop & Go's
  - Focus on added value for drivers within the Drivers app (to promote using the app)

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Challenges
Enforcement

- Flexible curb management is not possible according to Belgian law, since one parking bay cannot be allocated to different parking (vehicle) types.
  - Article 11.4.1.4°
  - One parking bay cannot be allocated to both private cars and loading/unloading
- The Shop & Go parking bays have a E9a street sign:
  - vans < 6m are allowed to park there.
  - trucks are not allowed.
  - So no enforcement needed for vans (unless in the event of crossing a white line, but this we could tackle with the police).
  - No solution for trucks (enforcement and signalisation)

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Challenges

Parking inventory not up-to-date

- Parking inventory 2020
- No uniform regulations linked to spatial inventory: missing information linked to specific parking bay:
  - Maximum parking time
  - Applicable timeframe (eg Mon-Sat: 9-18h)
  - Any additional parking restriction
- Manual mapping for all parking types is too timeconsuming, nearly impossible
- Solution:
  - 2022: Manual mapping of regulations linked to 2020 Shop&Go places and loading/unloading zones
  - 2022 Q4: update of GIS and new process flow to keep the inventory up to date

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Challenges

Signage

- the city wants to reduce **number** of street signs (“readable city”)
  - adding more (confusing) signs to mark specific timeframes or usage is not preferred.
- **Dimensions** of street signs:
  - Citizens complain because big signs or displays reduce daylight in their houses (ref. Police Leuven).
  - Not enough space on the curb to install extra signs
  - “Nudging” sign needs more information (why do we do this)
- Solution: check options with stakeholders

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Locations

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Locations FlexCURB use-case

Ideal test locations:

Shop & Go parking bays = active promotion of 6 streets for loading/unloading by vans

1. Shop & Go locations with **less than 60% occupancy** + no high demand for shortterm (45 min) parking + less S&G park events than average
2. With **at least 4 parking bays** (6m each) in order to have enough capacity for both usages (S&G and loading/unloading)
3. **Limited number or no loading/unloading zones** in the same street/around the corner
4. **Near the pedestrian zones** (where loading/unloading is limited to timeframe 6-11 am and 6:30-8:30 pm)
5. In streets with **illegal parking problems**
6. In 3 different parts of the city

Current loading/unloading zones = current use

1. 30 min, 60 min, 2u

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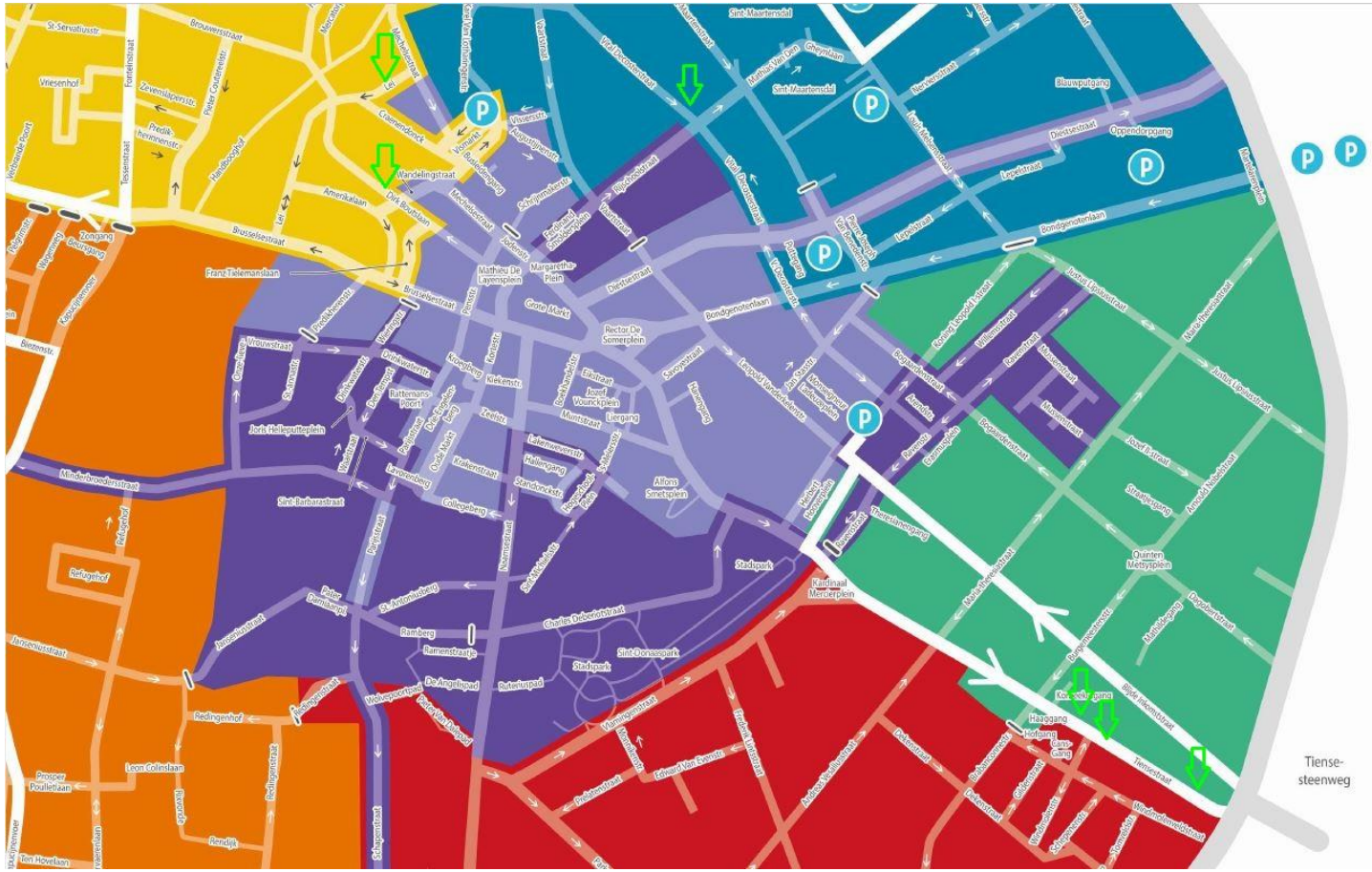
Locations FlexCURB use-case

Selected locations Shop & Go:



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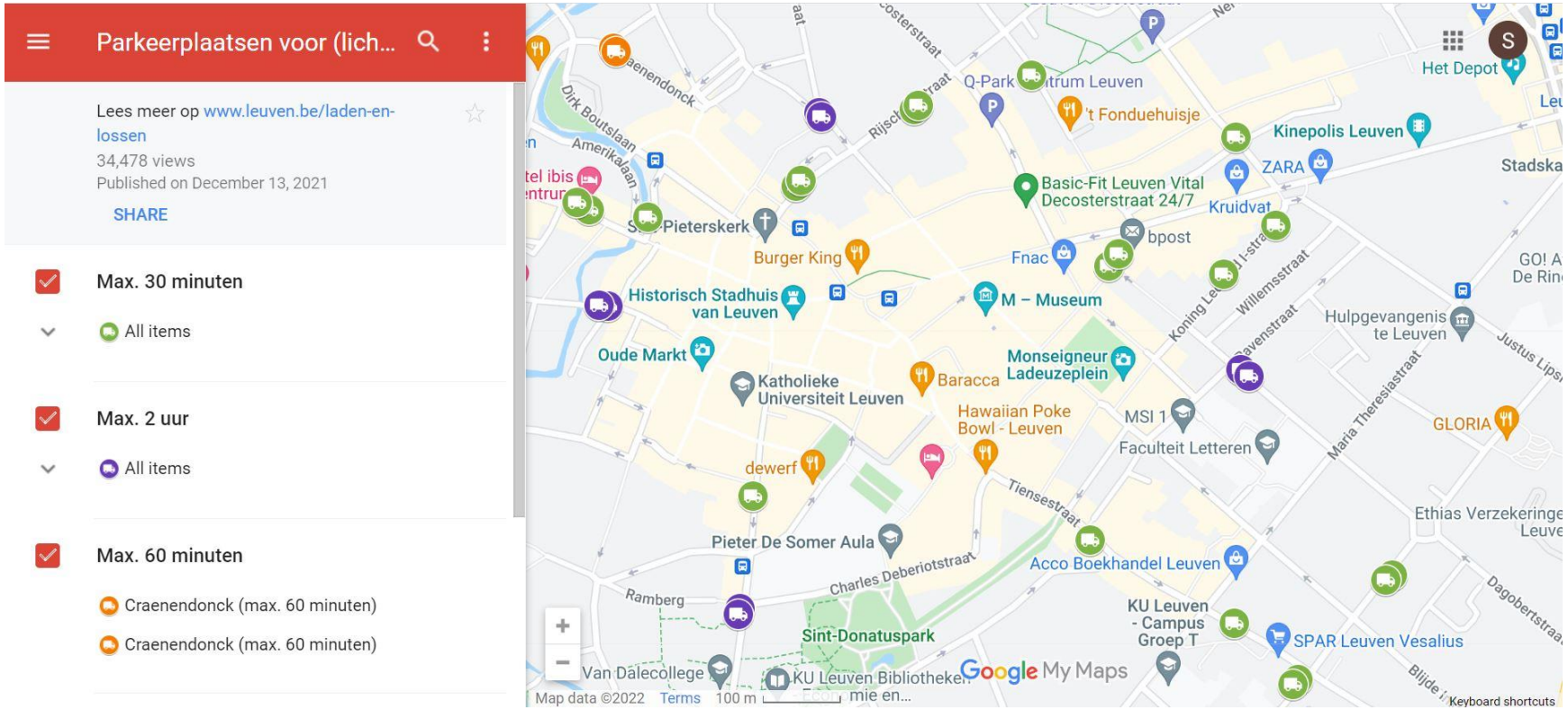
Locations FlexCURB use-case

All or selected loading and unloading zones:



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Activities in Q1

- **Data collection**: parking inventory, local and national curbside regulation…
- **Stakeholder surveys** (Police, service logistics providers, local business owners, Economy dpt)…
- **Defining research question Ughent** (where to locate minihubs, for which goods, + estimation reduction of greenhouse gas emission + modelling traffic flows
- **Street code & signage research**
- **Site visit** Den Haag
- **Regional meetings and workshops** zero emission zone for city logistics (e.g. Rotterdam)
- **Workshop with Leuven knowledge hub** (Innovation, Research within enterprises and universities) on the subject of Leuven as a carbon-neutral city
- **Technology research for smart zones**

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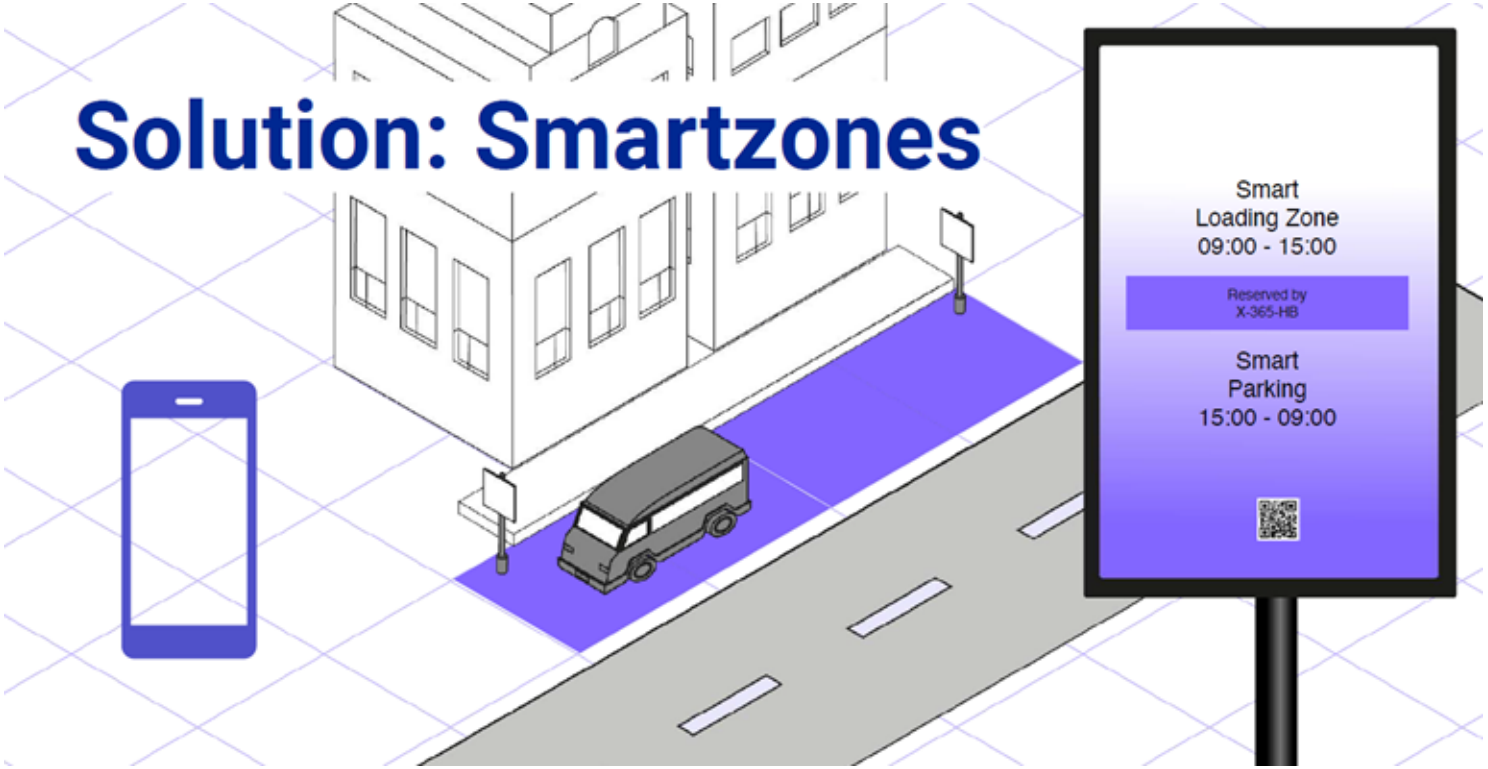
Use case Leuven

Pilot case:
flexible use of Shop & Go parking places



(visual by means of illustration only)

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Next steps Q2 & Q3

- Focus groups, surveys & ride-alongs with logistics providers
- Output 1: planning platform for cities (beta) + first analysis of opportunities for improvement => May-June
- Installation of flexible parking bays (signage) =>July
- Output 2: driver app for drivers (alpha & beta) + user tests with logistics companies (drivers) => July-August
- Mid-term assessment (+ business case adaptation if needed)

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Bpost Ecozone & parcel lockers

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Leuven pilot project 2021-2023

- ecozone within the city center and smart parcel lockers in every neighbourhood (alternative for home delivery)
- Succesful pilot: more lockers and locker locations have been added
- By preference on mobility hubs (with shared mobility)
- Future: “white” lockers

White lockers

- Green last mile delivery: collecting parcels in consolidation centres on the edge of the city
  - Delivery by bpost in the “white” lockers
- Green first mile delivery: picking up parcels in the lockers & bringing them to the consolidation centre for further distribution
- Pilot POC: the concept of white lockers is a possible approach but no steps in this direction
- We understand the city has to take the lead: policy, facilitating, liability issue
- Integration in global mobility policy (e.g. ZES driven)

Thank you!

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