



# Smart City Bruges

IEEE Student Branch 29/03/2022

# Vision & Strategy

A photograph of the Singapore skyline at dusk, featuring the Marina Bay Sands hotel with its iconic SkyPark and the Esplanade - Theatres on the Bay. The word "City?" is overlaid in white text with a wavy underline.

City?



# What is the definition of a smart city for Bruges

# Smart City Bruges: Vision

We consider a Smart City as an **ecosystem** of different actors (governments, citizens, schools and companies) who commit themselves in a specific area (city of Bruges) to achieve the sustainability goals through a transition process by using **technology as a facilitator**.

We also conclude from this that **technology is not an end** but should contribute to improving the quality of life for residents and companies and arise from **a clear necessity**.



# Global challenges

- Demographic
  - 70% population in the city and doubling 60+ (2050)
- Societal
  - Climate, migration, energie,...
- Competition
  - Investors, talents, inhabitants,...
- New technologies

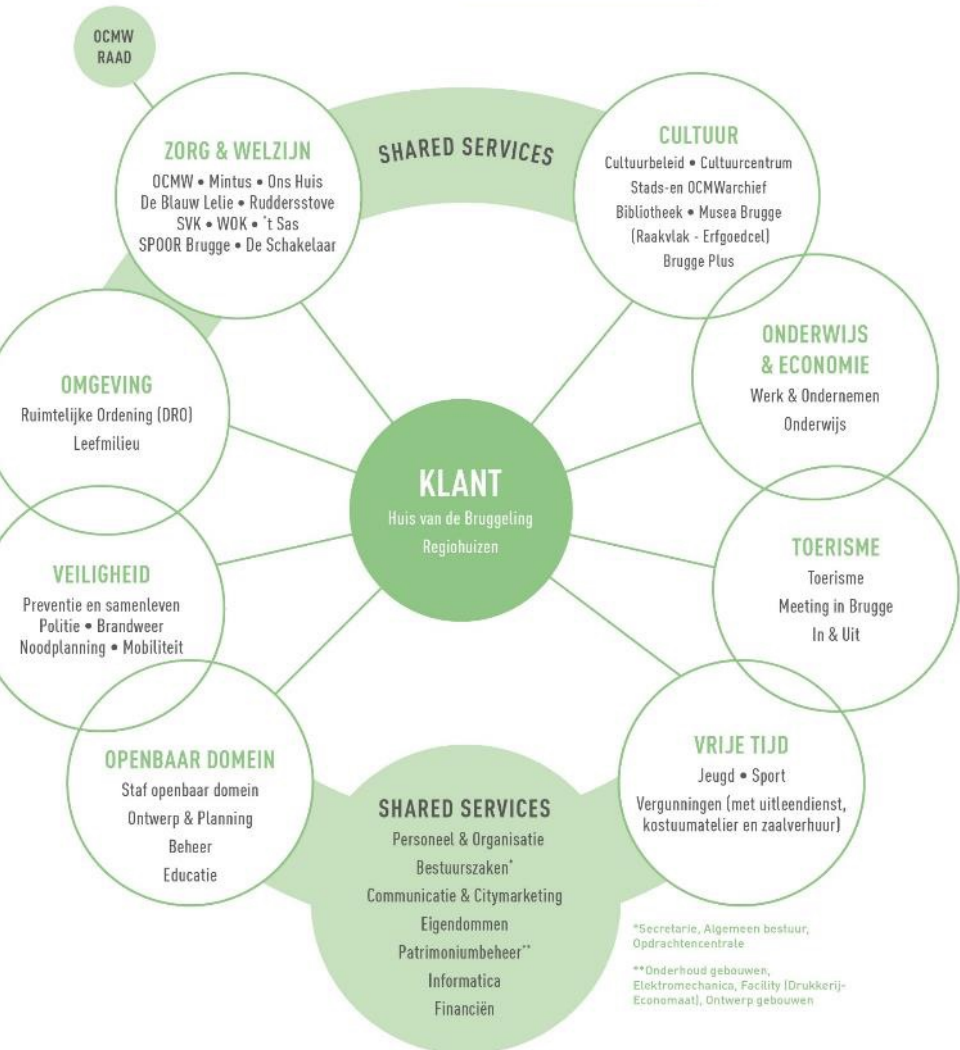
# Smart City themes

- Mobility
- Environment and climate
- Governance
- Citizenship
- Economics
- Living
  
- Strength: Culture and heritage





# Urgencies and points of attention

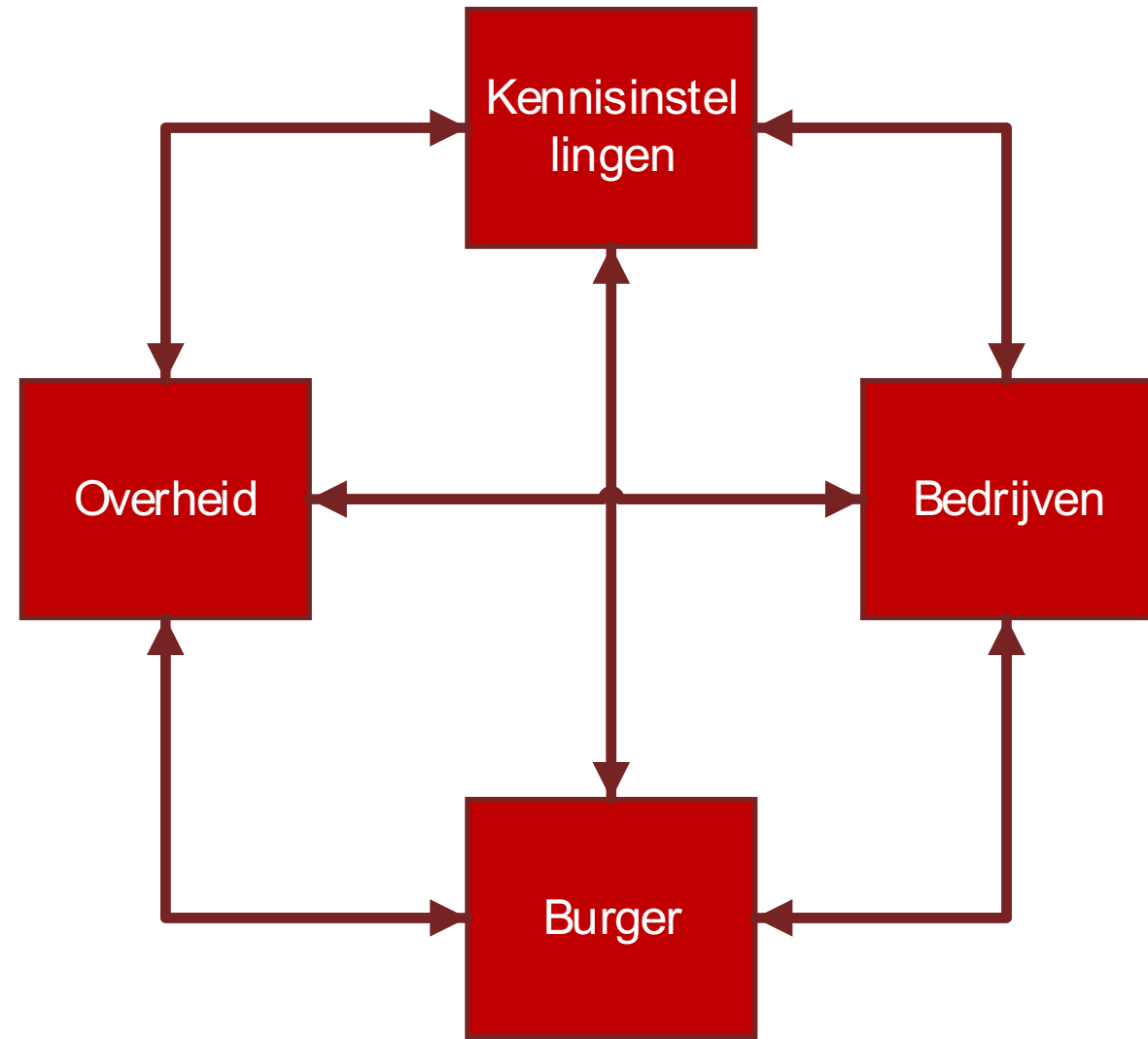


- The perception of technology as an end instead of an “enabler” for necessary issues
- Using a long-term vision and strategy for Smart City
- Need for leadership, coordination and political support
- Knowledge
- Avoid silo thinking
- Sufficient financing
- Room for experiment
- Attention to citizen participation



# Building a network: the quadruple Helix

The cooperation of  
Government, knowledge  
institutions, businesses and  
the citizen







duval union



proximus





howest



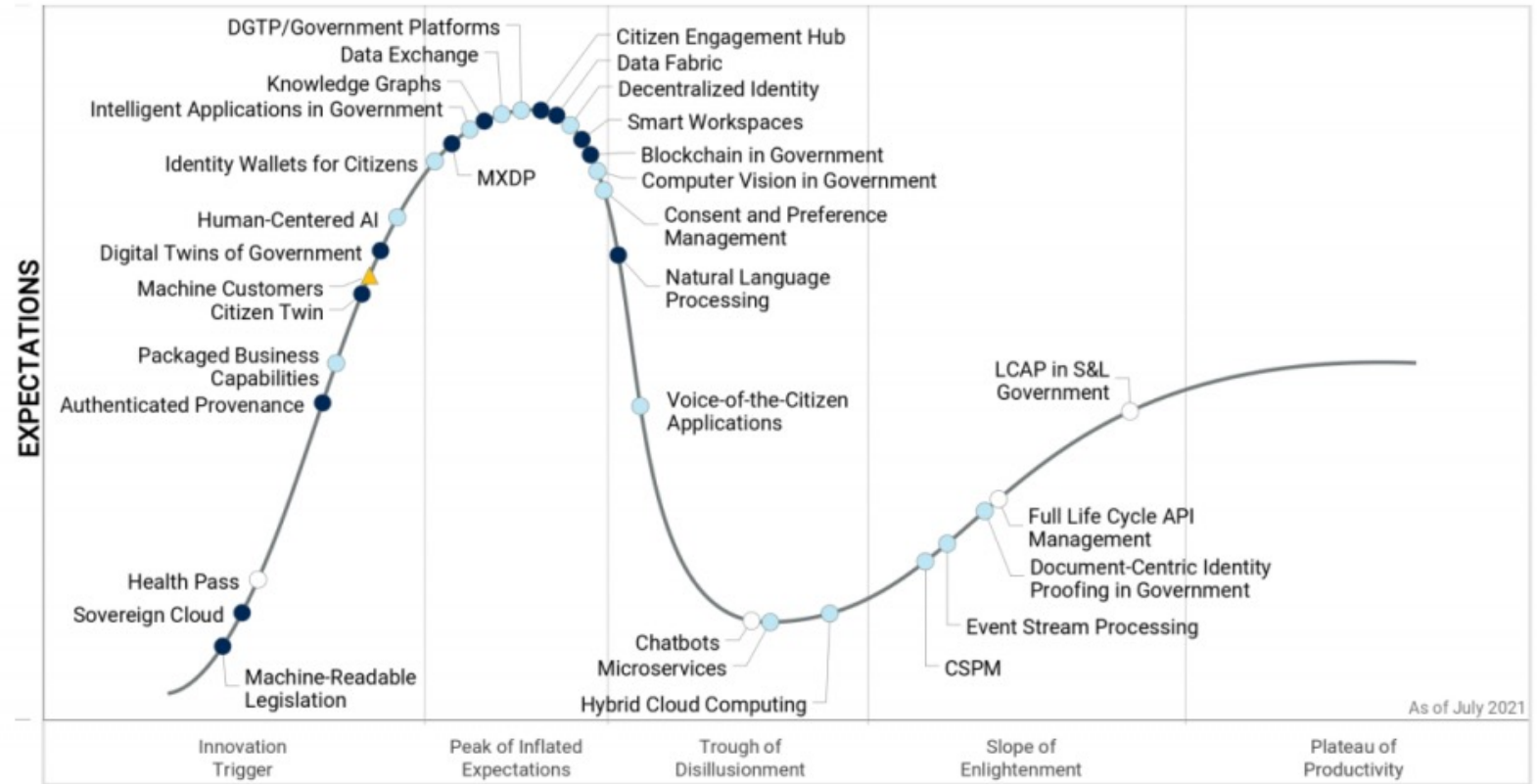
KU LEUVEN



# Smart Cities Hype Cycle

Tele => e- => my => i => smart => ?

## Hype Cycle for Digital Government Technology, 2021

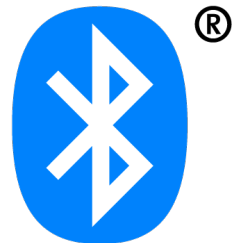


As of July 2021

Source: Gartner (July 2021)

747518

# Technology





From data to insights

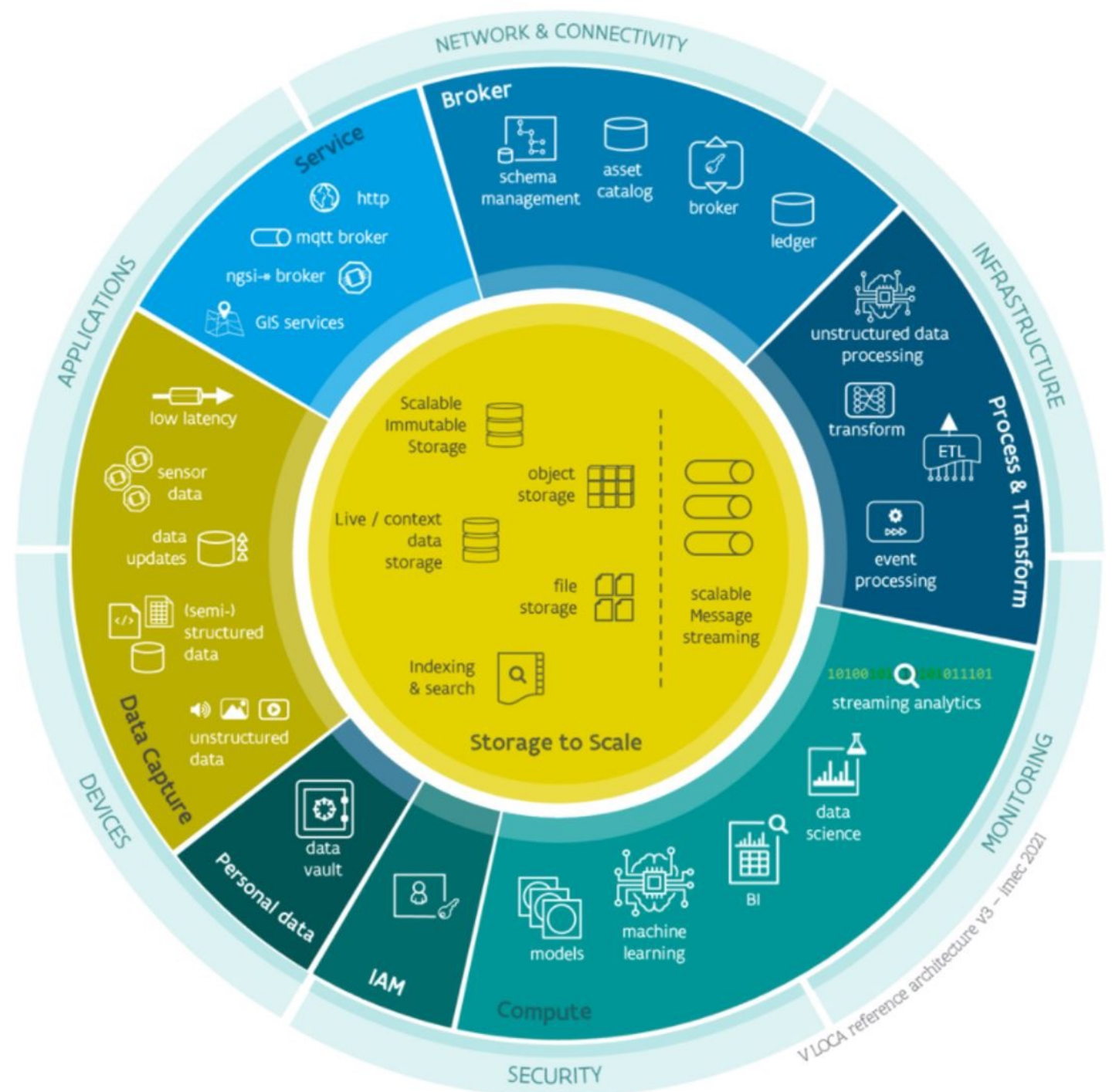
BRU  
GGE

# Smart City Architectuur

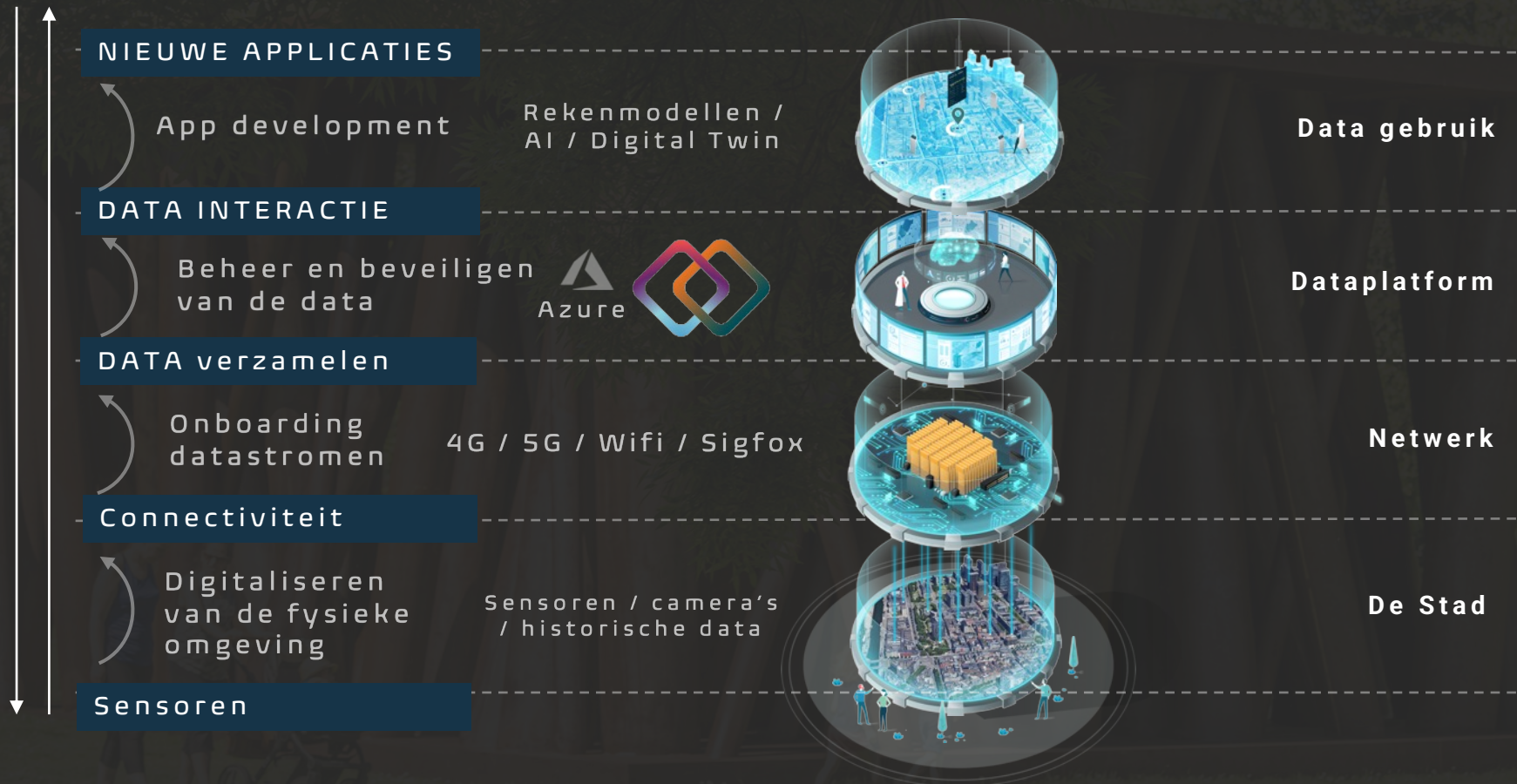


# VLOCA Architectuur

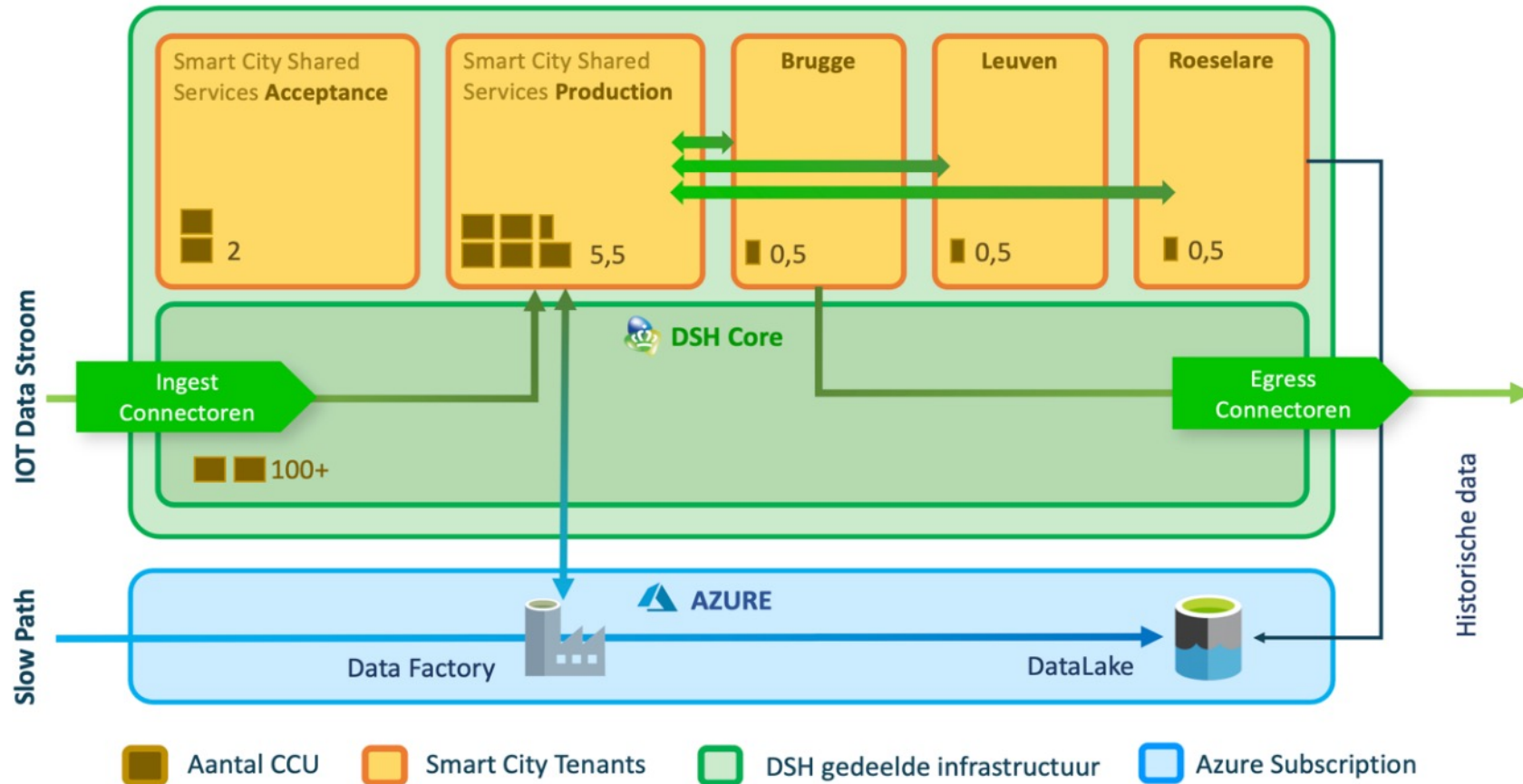
The VLOCA Donut provides a general framework that serves as the base for the proposed component architecture of the offered Smart City Data Platform.  
<https://vloca.vlaanderen.be>



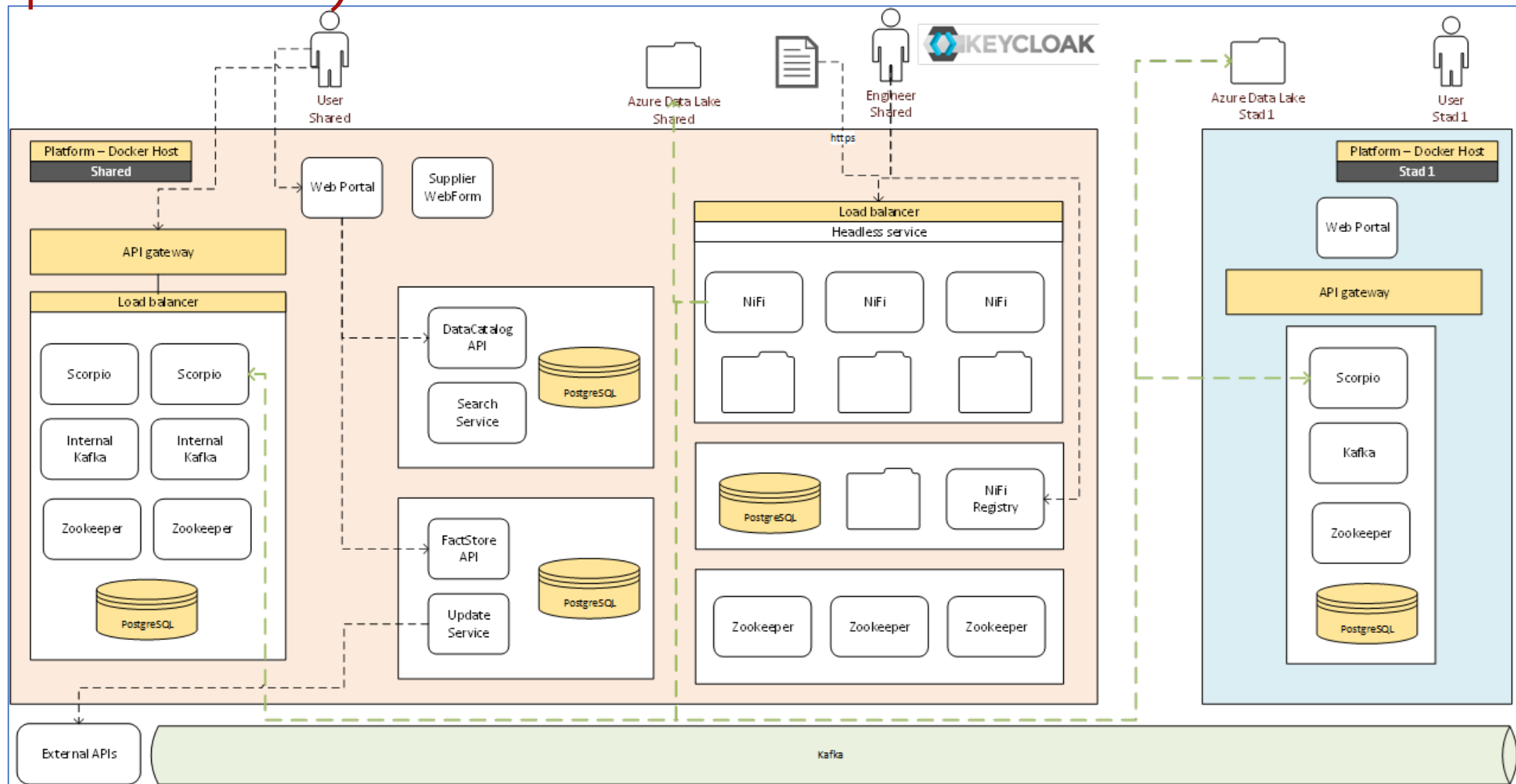
# Architecture – Urban Sense



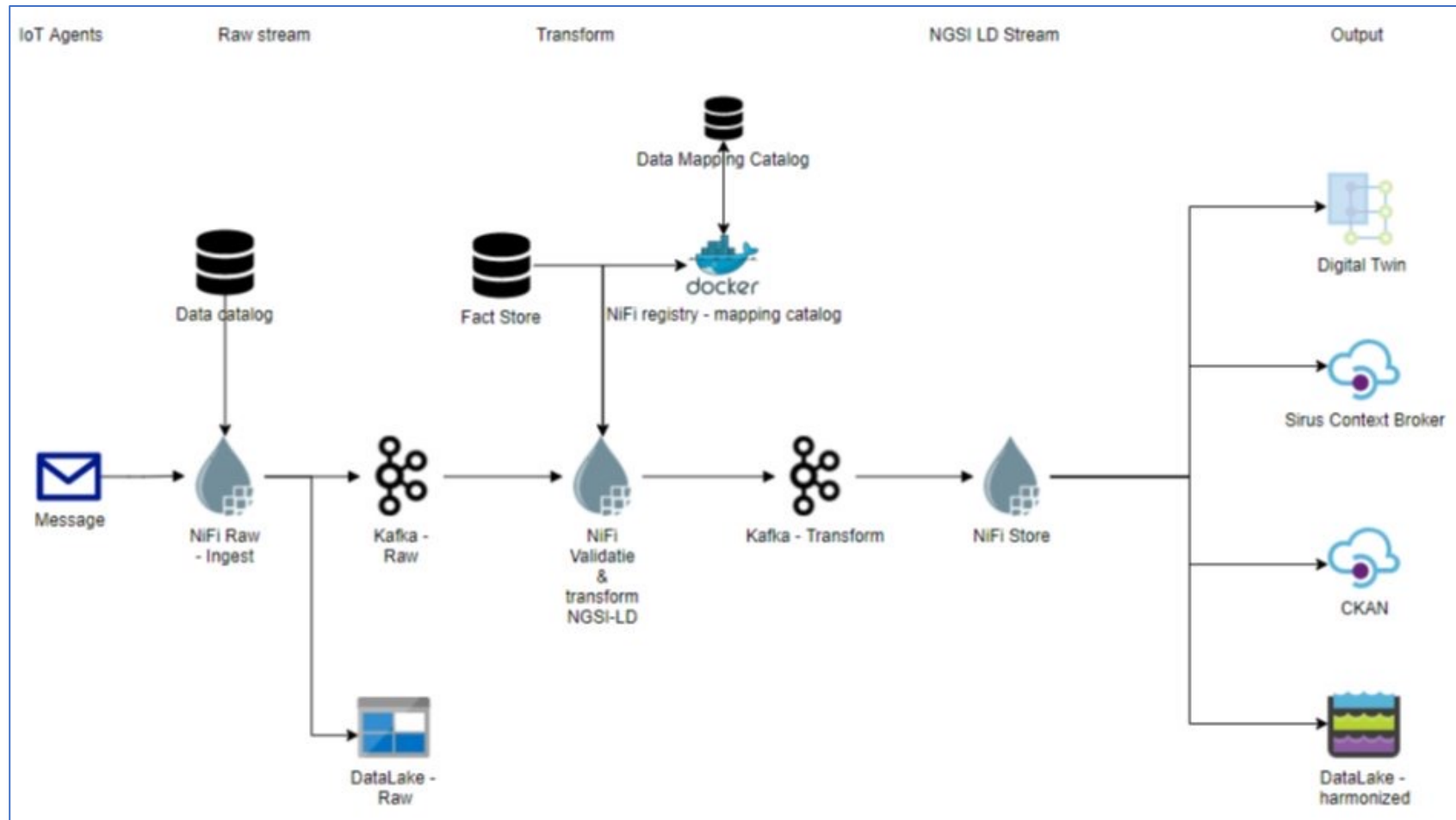
# Urban Sense architectuur (High level)



# Urban Sense (smart city data platform)



# a data stream in Urban Sense



# Interoperability, Standaarden: IoT-Datamodel (standaarden oasc ngsi Id - VLOCA)



OSLO



```
{
  "id": "AirQualityObserved:RZ:Obsv4567",
  "type": "AirQualityObserved",
  "dateObserved": {
    "type": "DateTime",
    "value": "2018-08-07T12:00:00"
  },
  "N02": {
    "type": "Number",
    "value": 22,
    "metadata": {
      "unitCode": {
        "type": "Text",
        "value": "GP"
      }
    }
  },
  "refPointOfInterest": {
    "type": "Reference",
    "value": "PointOfInterest:RZ:MainSquare"
  }
}
```

```
{
  "id": "wastecontainermodel:c1",
  "type": "WasteContainerModel",
  "category": {
    "value": ["dumpster"]
  },
  "cargoVolume": {
    "value": 150
  },
  "modelName": {
    "value": "C1"
  },
  "name": {
    "value": "Dumpster_Brute_2009_Plastic_Green"
  },
  "compliantWith": {
    "value": ["UNE-EN 840-2:2013"]
  },
  "madeOf": {
    "value": "plastic"
  }
}
```



Data, the new gold?

# Smart Projects



# R&D subsidy programs

- Horizon 2020
- Interreg
- EFRO
- Vlaio City of Things
- Circular Flanders
  
- Slim in de Stad (stedenbeleid Vlaanderen)
- BITS (Interreg)
- PIO
- Handshake (europees)
- Smartwaterland
- See2do (Interreg)
- SLIC
- Climate resilient cities
- VLOED (Vlaio)
- ...



**Vlaanderen**  
is sterke steden



# VLOED



# Project management

## **WP1: projectmanagement**

- **×Stad Gent – strategische subsidies (Heidi Tency)**
- ×Stad Brugge – strategische subsidies (Eveline Buyck)

## **WP 2: gebruikersonderzoek**

- **×Stad Brugge – centrummanager (Ilse Snick)**
- ×Stad Gent – dienst economie (Christophe Geernaert)

## **WP 3: data, analyse en training voorspellingen**

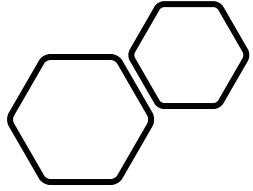
- **×Stad Gent – dienst D&I (Justine Ottevaere)**
- ×Stad Brugge – dienst data (Bram De Vreese)
- ×Externe data-scientist

## **WP 4: IOT proeftuin voor nieuwe technieken**

- **×Stad Brugge – IT-dienst (Lode Nulens)**
- ×Stad Gent – dienst D&I (Justine Ottevaere)

## **WP 5: communicatie & datalabs**

- **×Stad Gent – dienst D&I (Joran Van Daele, Arne Buffel & Justine)**
- ×Stad Brugge – strategische subsidies en dienst data (Eveline Buyck & Bram De Vreese)



# Living Lab

- **Questions**
  - How, where, what, who?
- **Conditions**
  - Worldheritage => Monumentenzorg
  - Energie
  - licencing
- **Selection of kandidates**
- **Installation**
- **Next, data?**



# Allride

- Smart: Mobility, environment and climate, citizenship
- Bike to school safely thanks to an app and bicycle light with GPS
- Pilot project de Frères (Sint-Franciscus-Xaveriusinstituut) and a primary school in Mechelen
- Scifi interreg project
- Bam AE



# Retribution

- Smart: Mobility
- Automatisatie van parking retribution
- OPC and Q2C

## BRUGGE WINT AGORIA SMART CITY AWARD

NIEUWS | 02/03/2018



Brugge

Stad Brugge is bekroond met de Agoria Smart City Award Living om het bovengronds parkeren in kaart te brengen via 'slimme bromfietsen'.

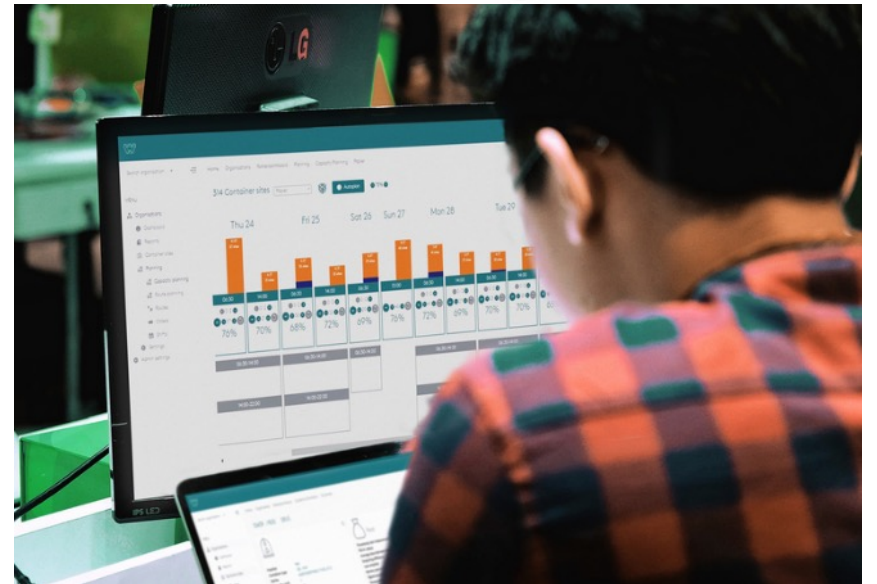
# BITS

- Smart: Mobility
- Occupancy rate
- Interreg BITS
- interparking



# Smart bin

- environment and climate
- 2\*110 bins
- Purpose: optimize pick-up route
- Scifi interreg project
- 2 different systems, Suwaco en Waste vision





# Water meter

- Smart: environment and climate
- In co-operation with Farys
- Purpose: Detection of water loss
- 30+ buildings and fountains city of Bruges
- Poc for Farys



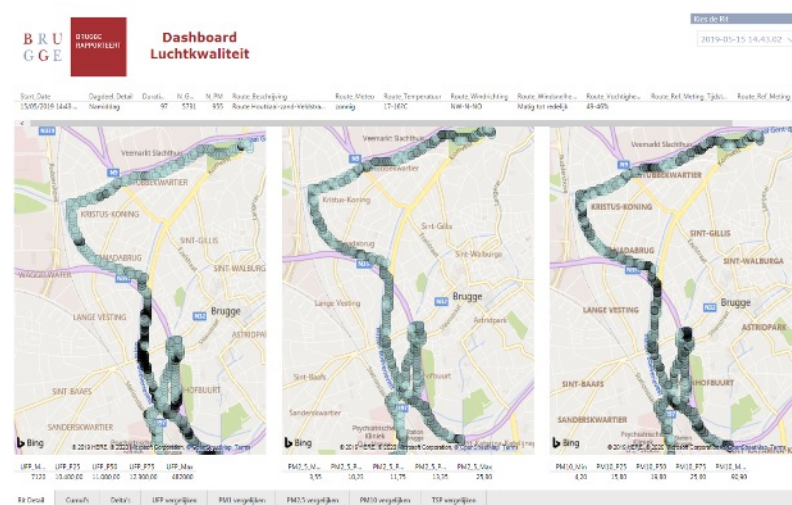
# Counter loops

- Smart: Mobility
- Measuring density different types of traffic
- Permanent and ad-hoc countings
- Signco



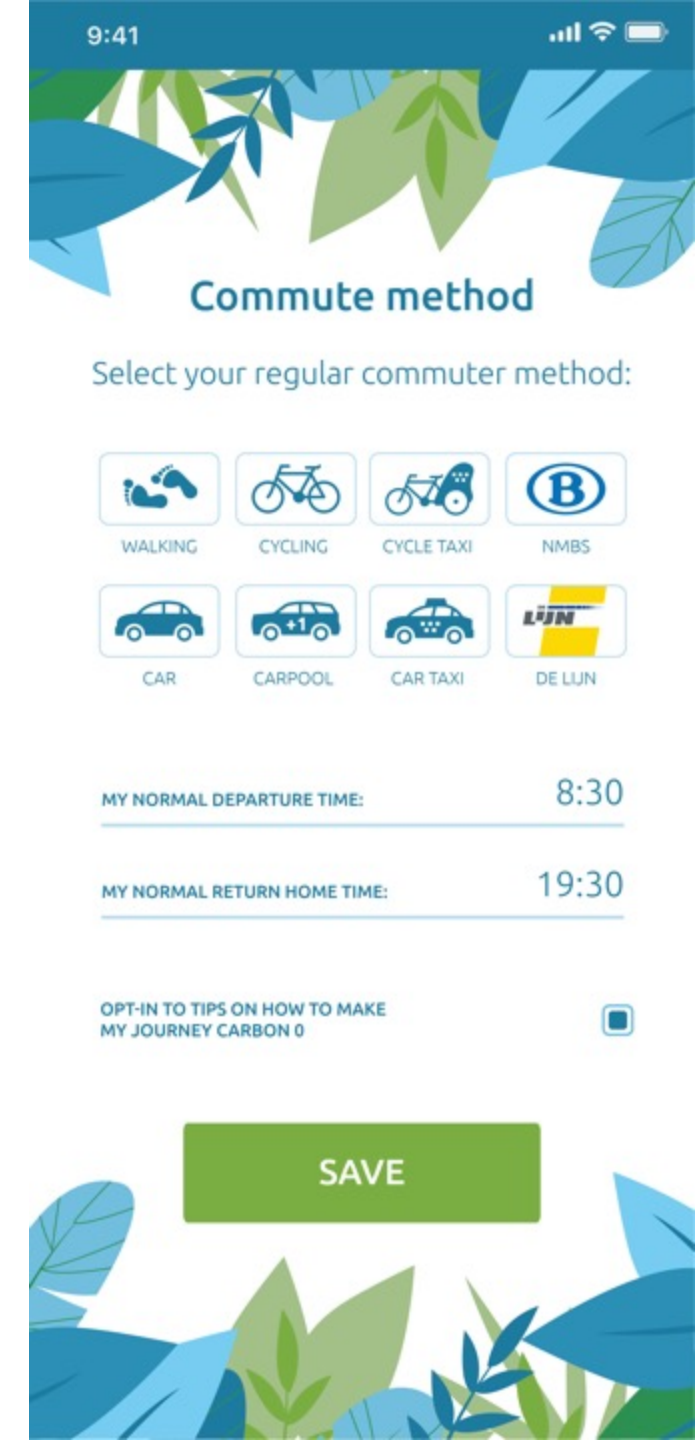
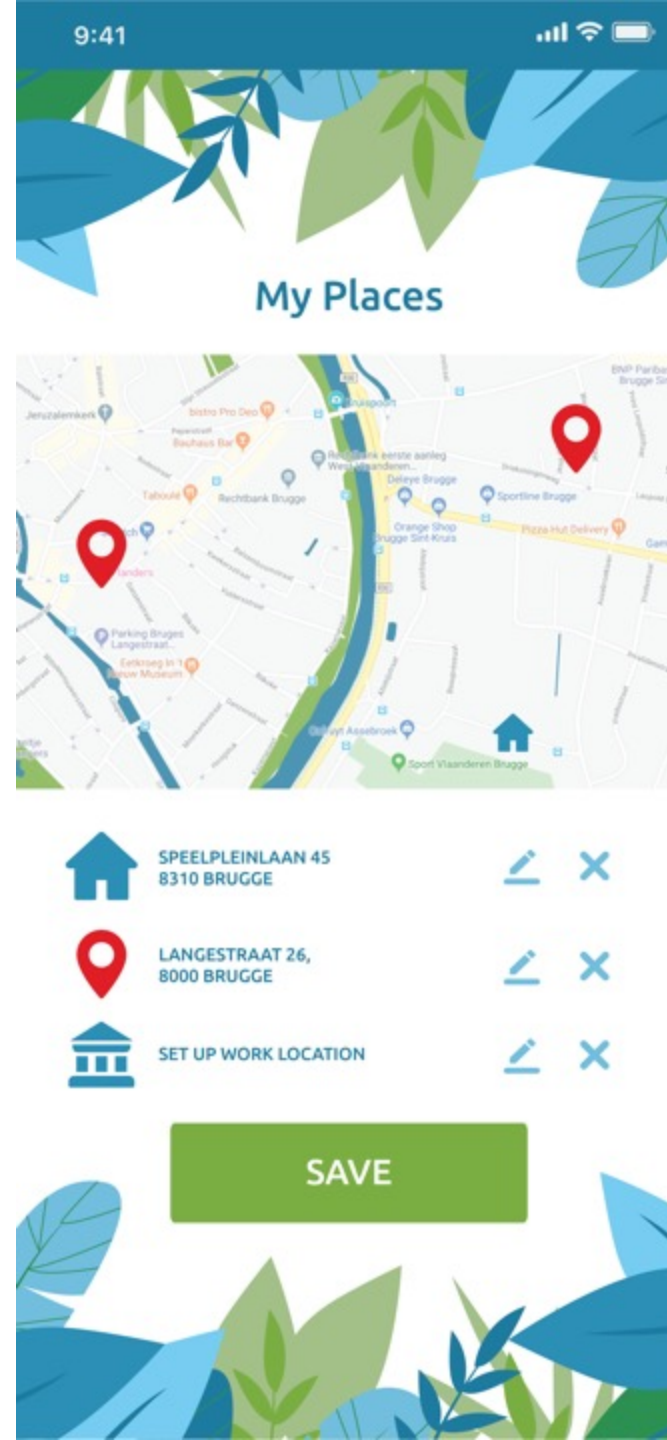
# Air sensors

- Smart: environment and climate
- Fine-meshed measurement network for air quality Gecombineerd met geluidsmeting (nox, pm1, 2,5 and 10)
- Realtime metingen in Zeebrugge, Zwankendamme, Dudzele and Bruges
- Different trajects
- Qweriu, Hopu, Fidas, Luftdaten, curieuzeneuzen



# 7 km Club

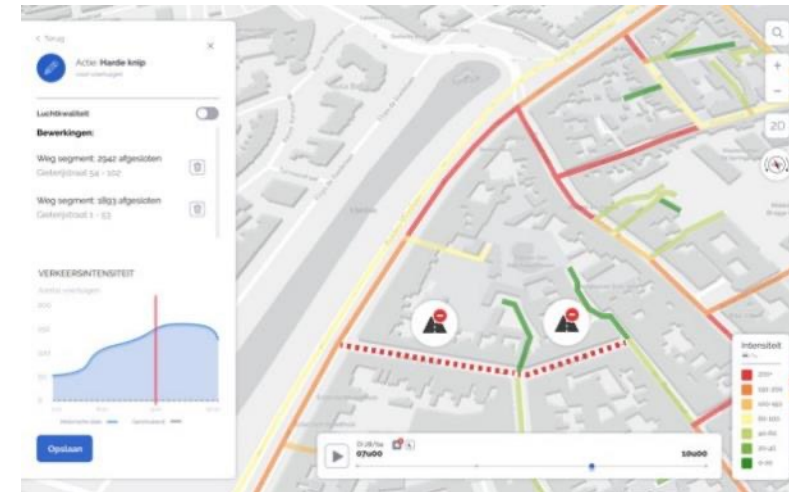
- Inciting to take public transport via game
- Gamification Nation
- Scifi
- citizenship



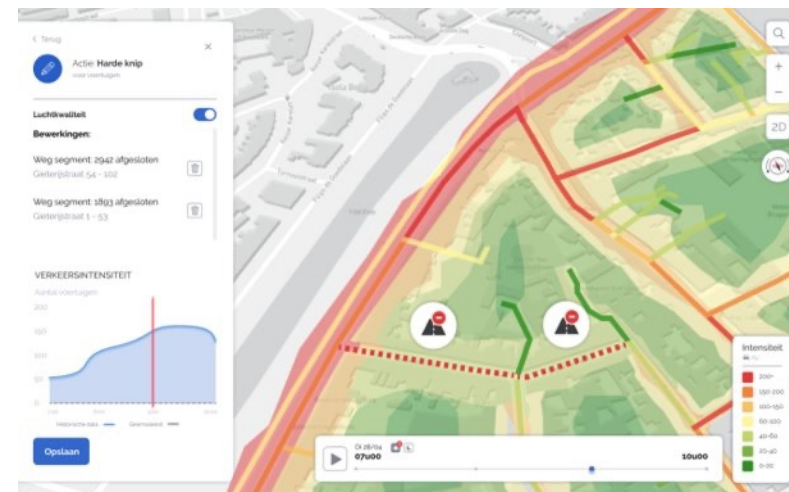
# POC Urban Digital Twin - Imec

- Purpose: Enable cross-domain interactions of data driven models to improve decision making
- Stage 1: start from a low threshold entry point that demonstrates value and impact quickly.
- Stage 2 introduces models enabling forecasting within a specific domain.
- Stage 3 combines multiple data sources and data-driven models that provide insights on how to manage the city.
- Use case: As a mobility/air quality expert I want to simulate the impact of infrastructural interventions in the public domain, on traffic flows/ air quality (& investigate how traffic flows and air quality correlate), so I can compare different scenarios, come to a reasoned solution and formulate an answer to a policy question or complaint of a citizen.
- Models:
  - mobility
  - air quality

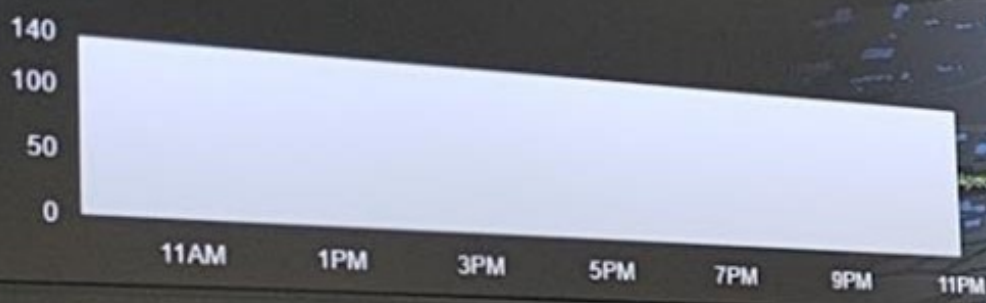
EFFECT OP VERKEERINTENSITEIT



EFFECT OP LUCHTKWALITEIT



Arena



### Free Spots in Parkings

City Center



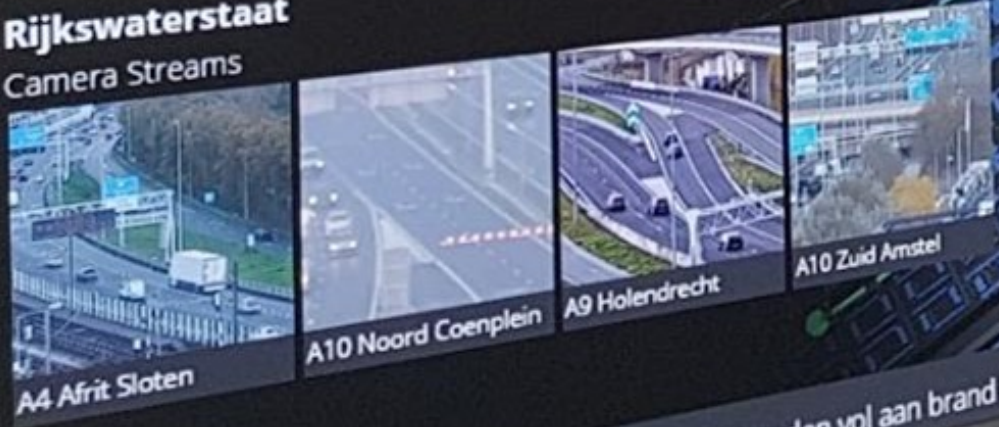
### Free Spots in Parkings

ZuidOost



### Rijkswaterstaat

Camera Streams



A4 Afrit Sloten

A10 Noord Coenplein

A9 Holendrecht

A10 Zuid Amstel

AT5 Brandweer heeft handen vol aan brand bij cacaooverwerker Westpoort AT5 OM In beroep tegen Johnis liquidatiepoging Spy City



Questions?

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