

# Smart City Bruges

IEEE Student Branch 29/03/2022

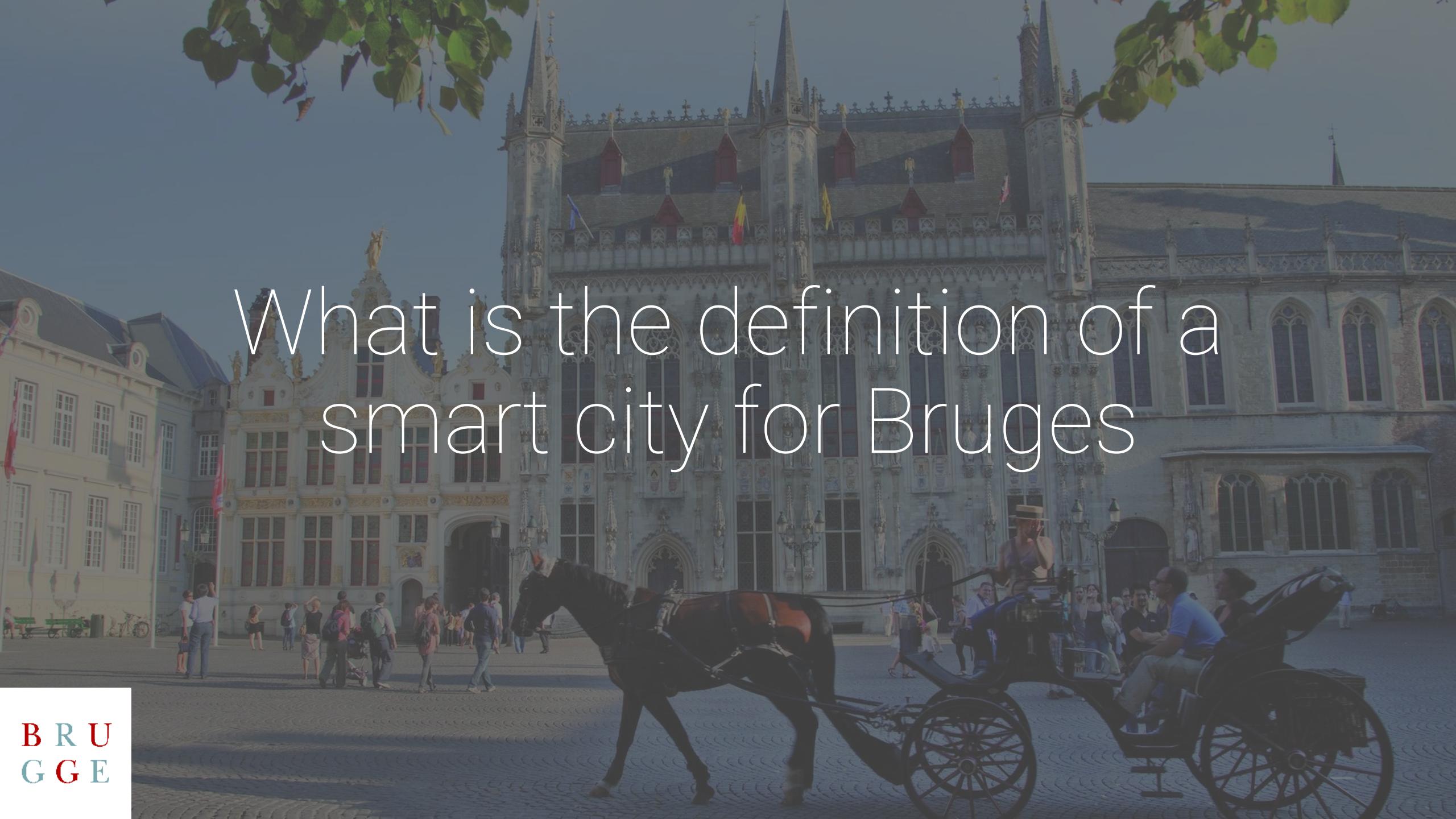


# Vision & Strategy



City?

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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

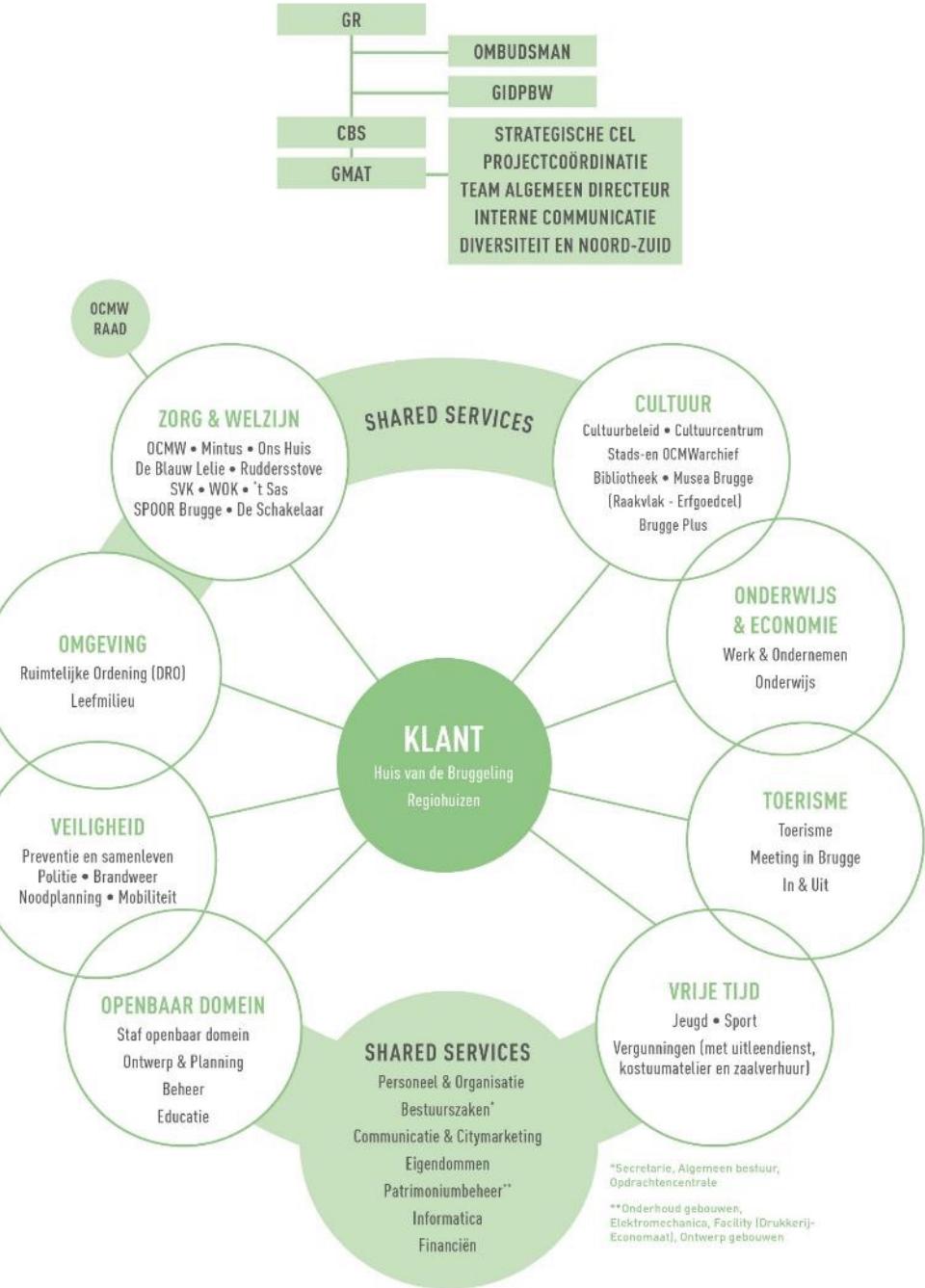
- Demographic
  - 70% population in the city and doubling 60+ (2050)
- Societal
  - Climate, migration, energie,...
- Competition
  - Investors, talents, inhabitants,...
- New technologies

# Smart City themes

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

## SUSTAINABLE DEVELOPMENT GOALS



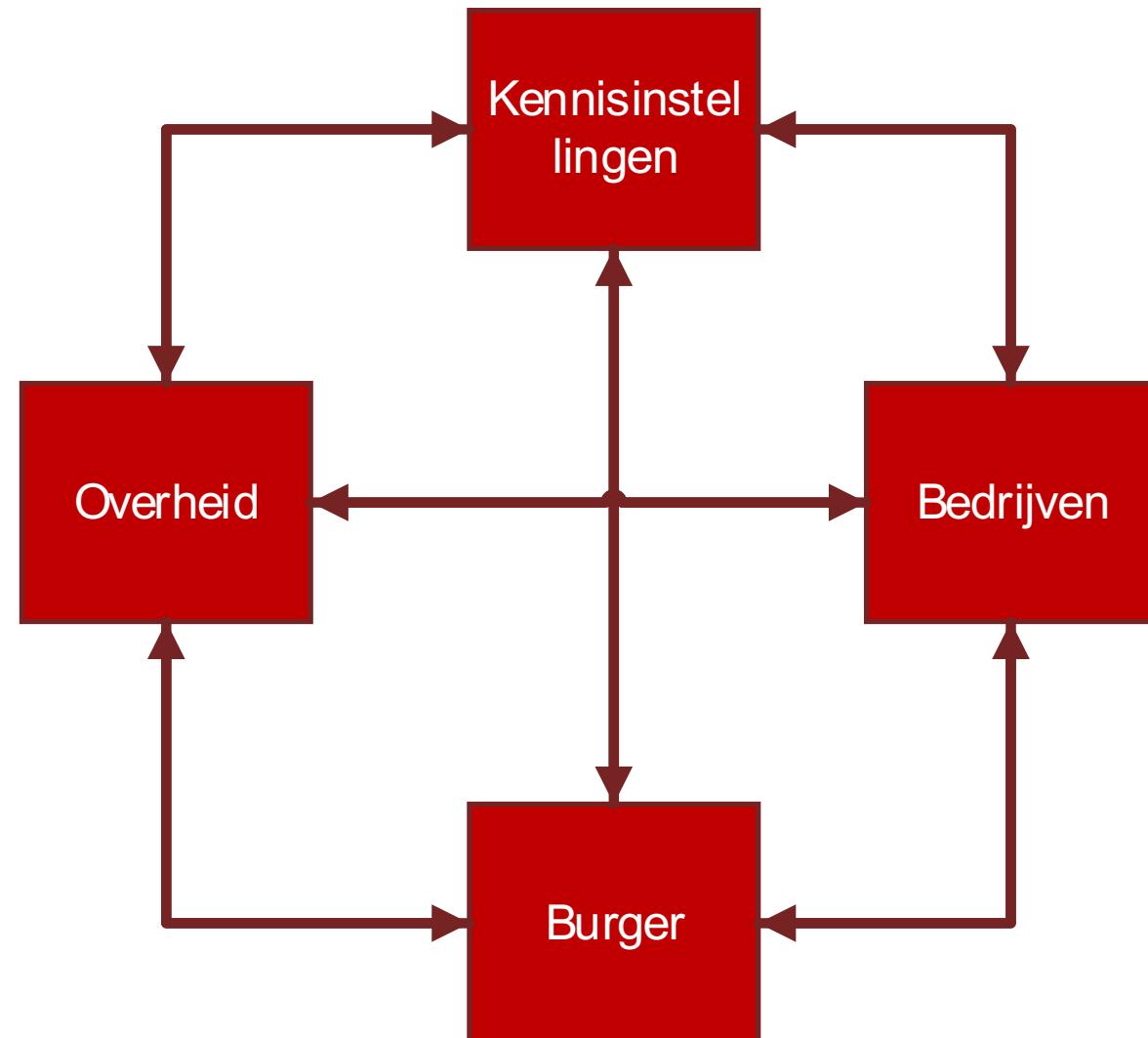


# Urgencies and points of attention

- 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





BITS  
OF  
LOVE

Qweriu

The logo for Aptus consists of a stylized orange triangle pointing upwards, with the word "Aptus" in a lowercase, sans-serif font to its right.

The logo for sneeizz features a blue and teal icon resembling a stylized 'S' or a series of concentric arcs, followed by the word "sneeizz" in a lowercase, sans-serif font.

The logo for FARYS features a red 'F' shape with a yellow and orange arrow pointing towards it, followed by the word "FARYS" in a bold, red, sans-serif font.

The logo for hopu Smart Cities features a hexagonal icon divided into four quadrants (top-left yellow, top-right teal, bottom-left orange, bottom-right blue) containing a stylized 'i', followed by the word "hopu" in a lowercase, sans-serif font and "Smart Cities" in a smaller font below it.

The logo for dønniq energising mobility features a red rectangular background with the word "dønniq" in white and "energising mobility" in smaller white text below it.

The logo for GAMIFICATION NATION features a purple circle containing a stylized 'N' shape, with the words "GAMIFICATION" and "NATION" stacked below it.

CenEnergy.  
IMAGINE.SMART.CHARGING.

The logo for localyse features a green circular icon with a white checkmark inside, followed by the word "localyse" in a lowercase, sans-serif font.

The logo for ANYWAYS features a yellow icon of two arrows pointing in opposite directions, followed by the word "ANYWAYS" in a lowercase, sans-serif font.

L A B  
A D O  
B O X



The logo for Community features a white hexagonal icon followed by the word "Community" in a lowercase, sans-serif font.

The logo for ViNotion features a red 'V' shape with a white 'i' inside, followed by the word "ViNotion" in a lowercase, sans-serif font and "Making surveillance smart" in a smaller font below it.

The logo for sign co features the word "sign" in white on a red background and "co" in white on a grey background, separated by a thin grey line.

The logo for waste vision features a blue and green abstract shape that looks like a stylized 'W', followed by the word "waste vision" in a lowercase, sans-serif font.

The logo for sharecom features a yellow crown icon above the word "sharecom" in a lowercase, sans-serif font, with "sharing experience in IT" in a smaller font below it.

The logo for nuwaco features a green and red abstract shape that looks like a stylized 'N', followed by the word "nuwaco" in a lowercase, sans-serif font.

The logo for OUR CITY APP features a teal circular icon with a white city skyline inside, followed by the words "OUR CITY APP" in a lowercase, sans-serif font.

The logo for CROWD SCAN features a blue and white abstract shape that looks like a stylized 'C', followed by the words "CROWD SCAN" and "THE FUTURE OF CROWD ANALYTICS" in a smaller font.

The logo for ROGER ROLL features a large, stylized 'RR' in blue and purple, with a small star in the center, followed by the words "ROGER ROLL" in a lowercase, sans-serif font.

The logo for ods features the lowercase letters "ods" in white on a teal circular background.



SIRUS

duval union



Capgemini

proximus

The cegeka logo features a stylized 'c' shape composed of blue and red curved segments, followed by the word "cegeka" in a grey sans-serif font.



fluvius.  
Tot bij u

The engie electrabel logo features the word "engie" in blue lowercase letters above the word "Electrabel" in a smaller, grey sans-serif font. A blue swoosh graphic is positioned above the 'e' in "engie".

The CRONOS GROEP logo features a stylized 'C' shape composed of three grey curved segments, followed by the word "CRONOS" in a bold blue sans-serif font and "GROEP" in a smaller grey sans-serif font below it.

The CITYMESH logo features a yellow circular icon with a black outline and a blue 'o' inside, followed by the word "CITYMESH" in a bold black sans-serif font.

The SPIE logo features the word "SPIE" in a large, dark blue sans-serif font with a red circular graphic above the 'i'. The 'i' has a wavy pattern inside it.

The KPMG logo features the word "KPMG" in a bold blue sans-serif font with a graphic of five vertical bars of decreasing height to the left of it.



howest

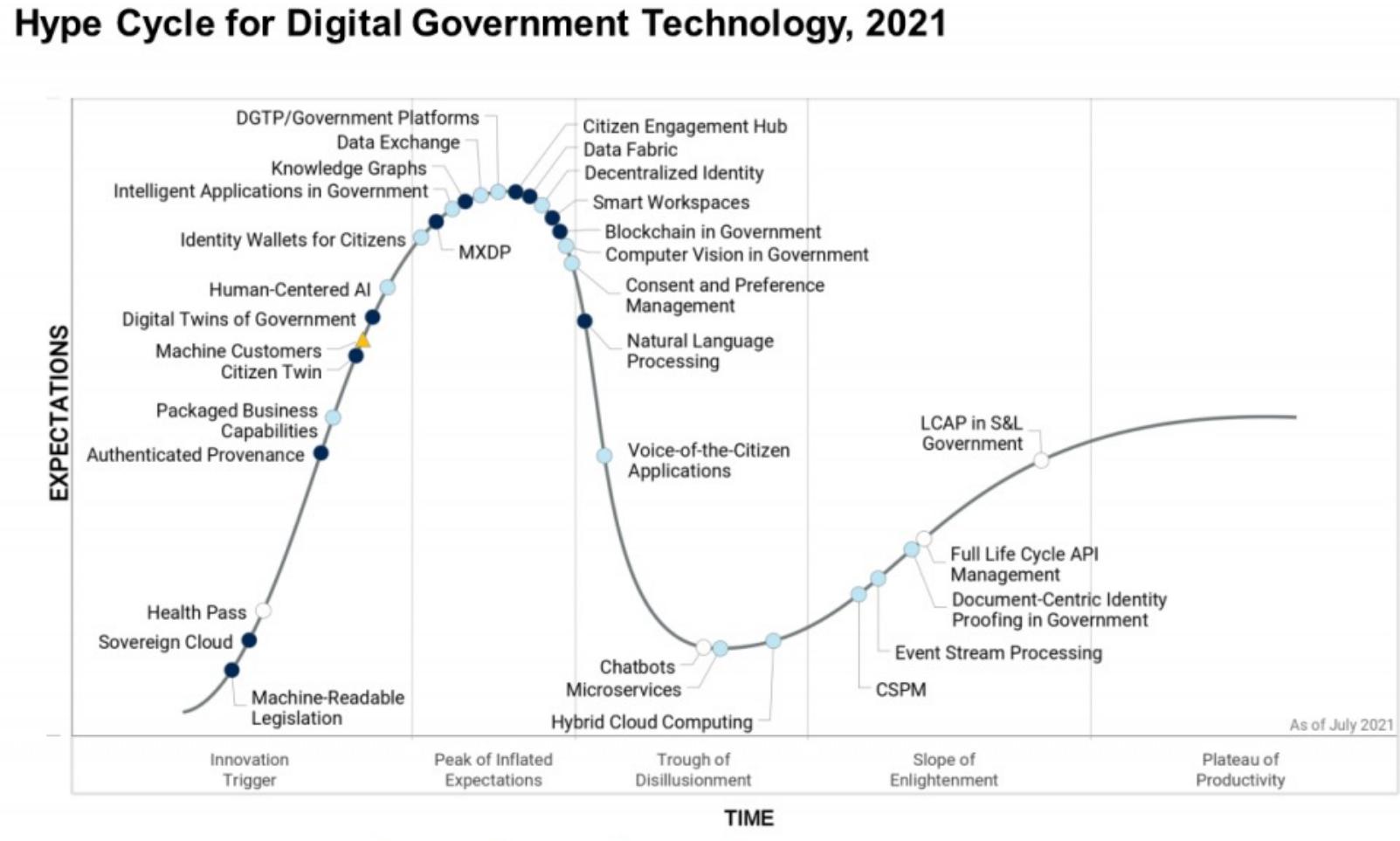


imec



# Smart Cities Hype Cycle

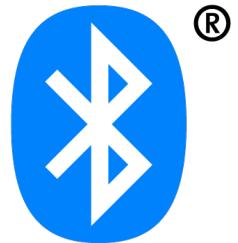
Tele => e- => my => i => smart => ?



Source: Gartner (July 2021)

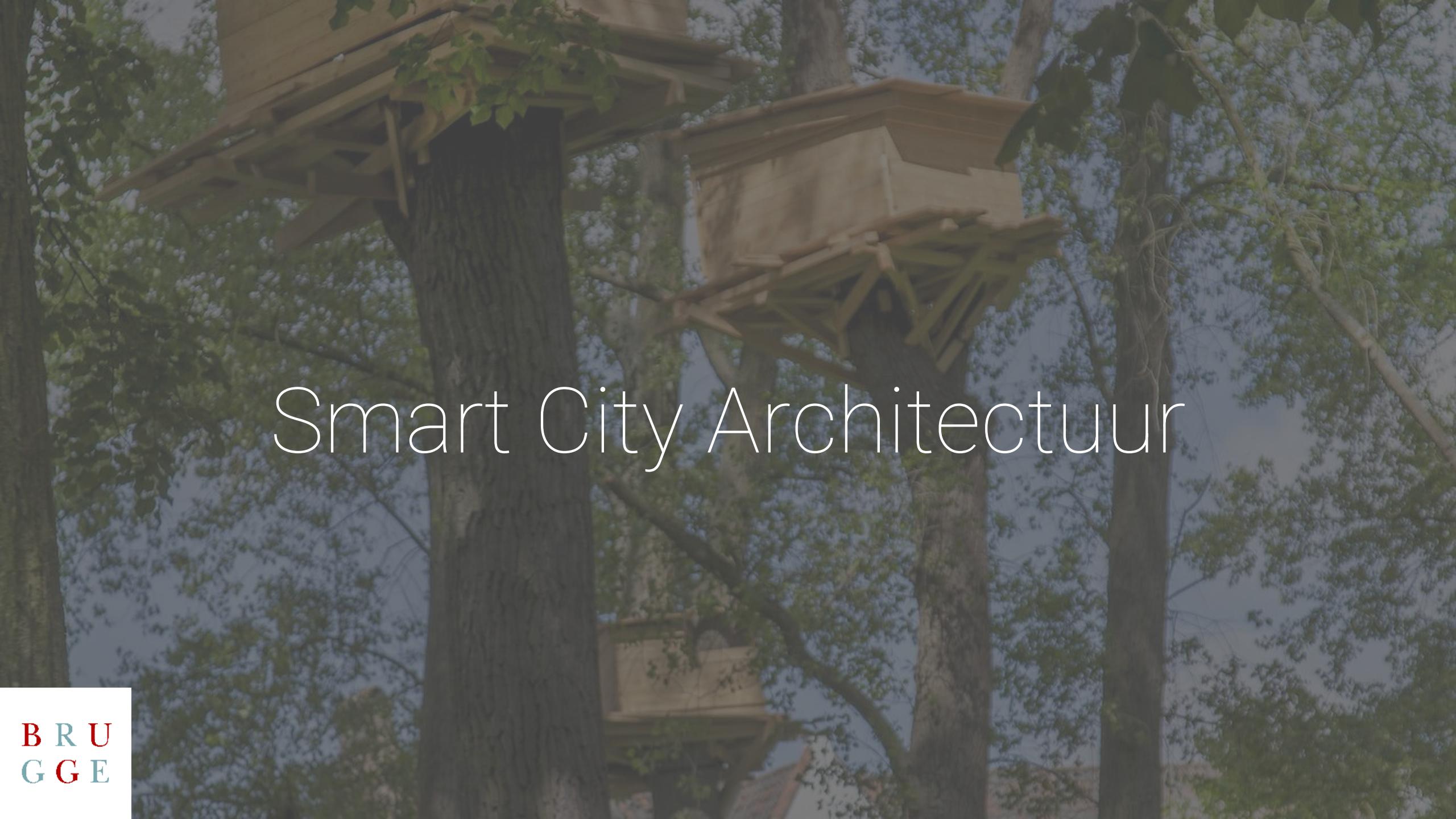
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# Technology





From data to insights

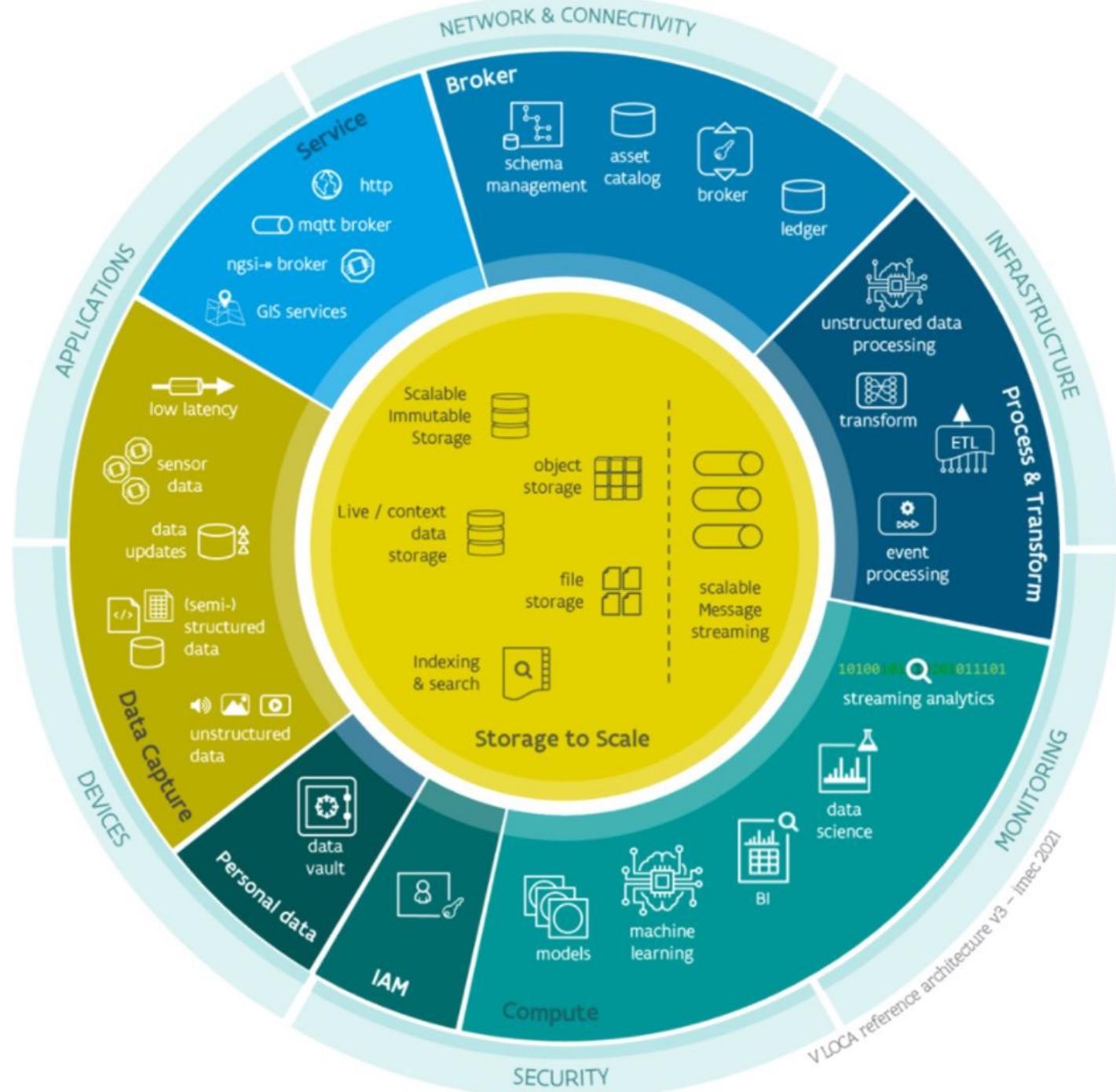


# Smart City Architectuur

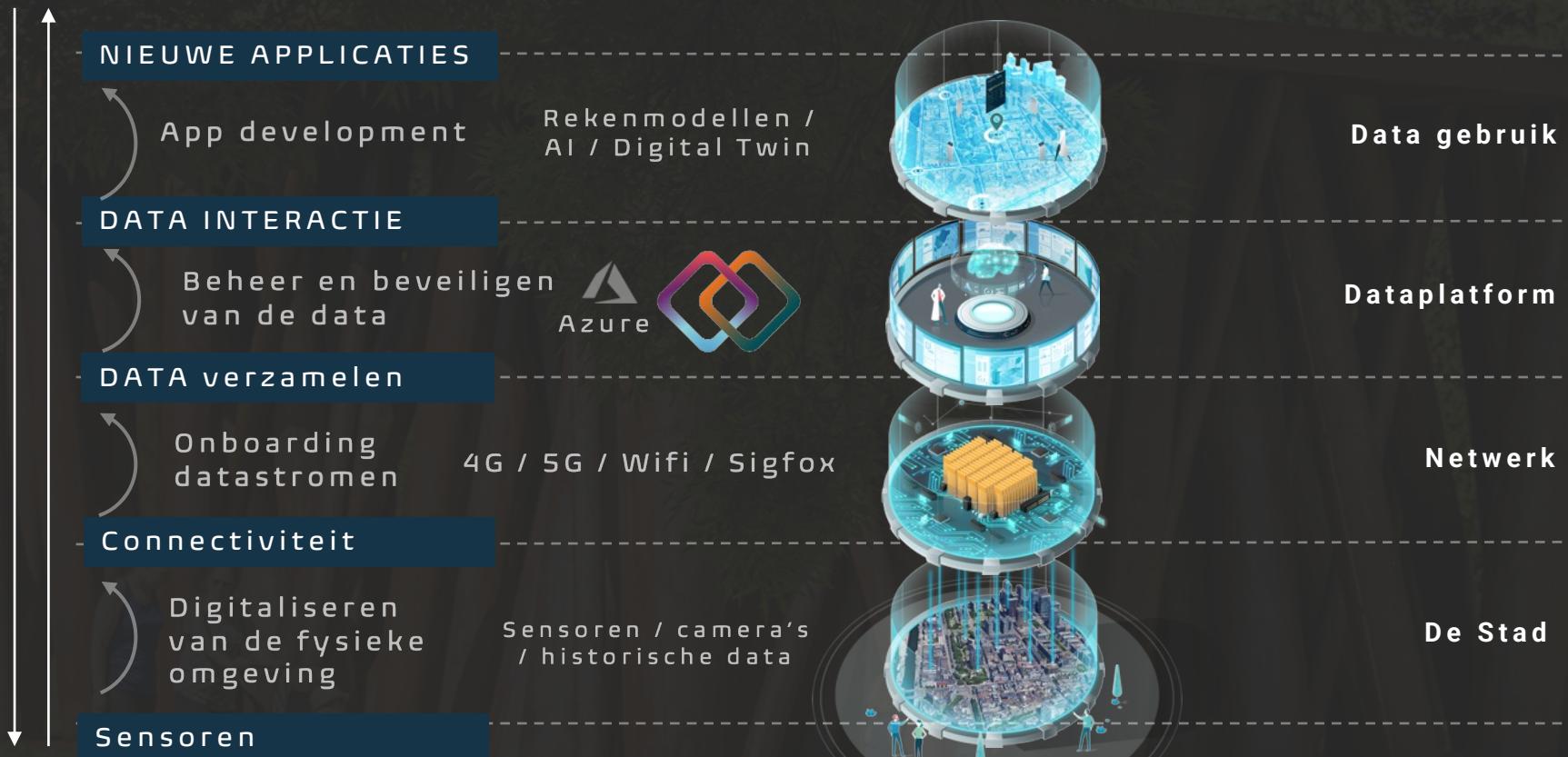
# VLOCA Architectuur

The VLOCA Donut provides a general framework that serves as the base for the proposed component architecture of the offered Smart City Data Platform.

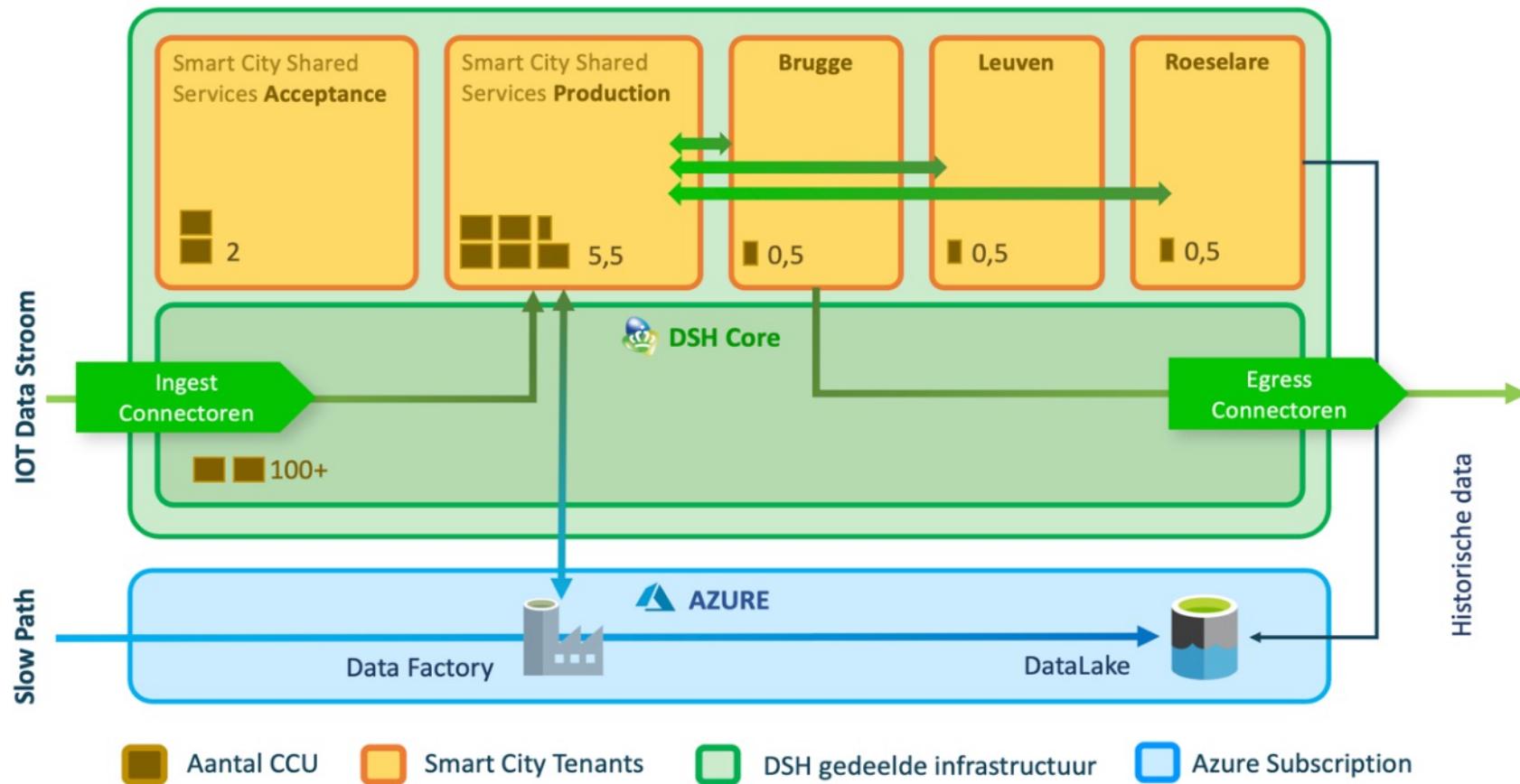
<https://vloca.vlaanderen.be>



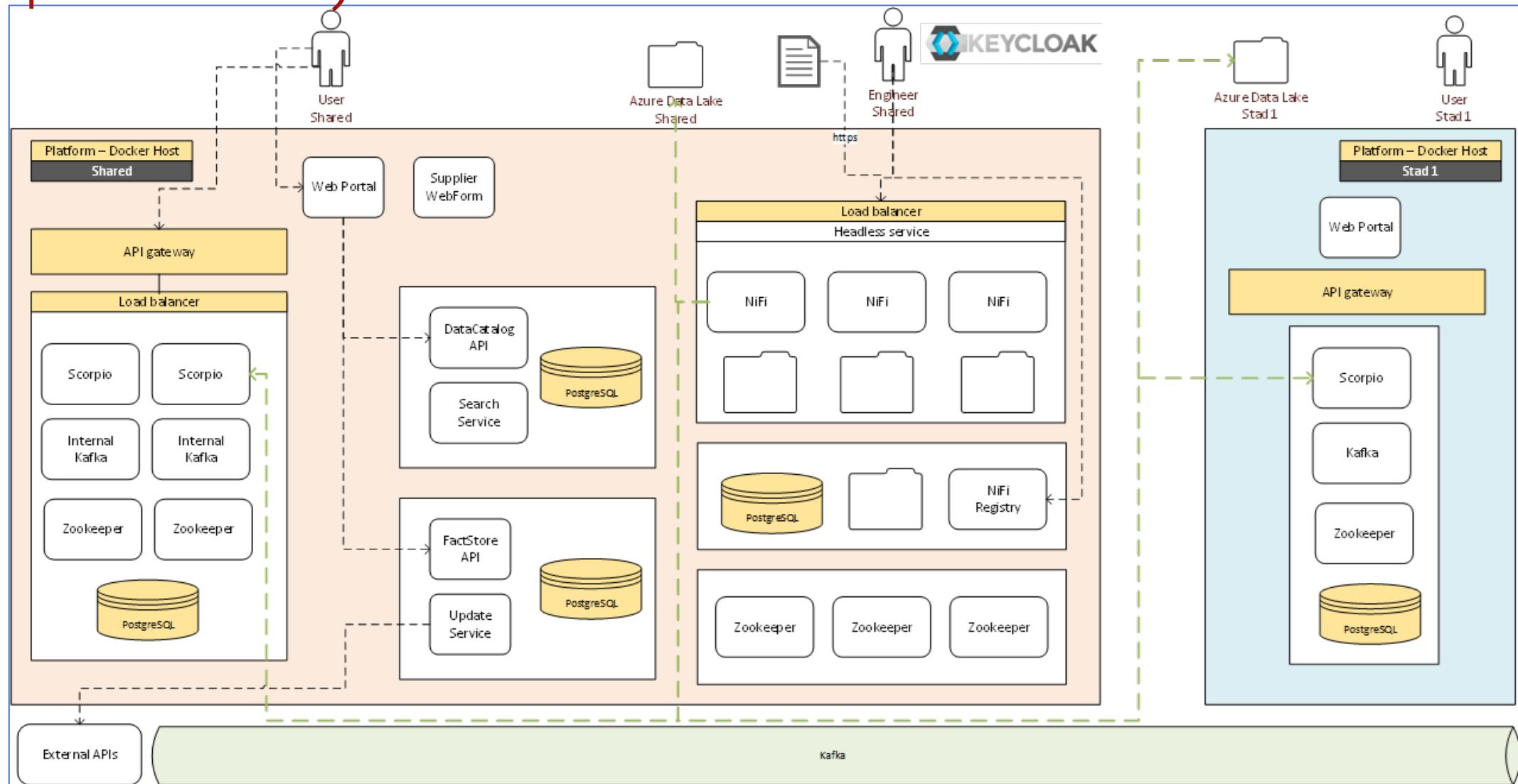
# Architecture – Urban Sense



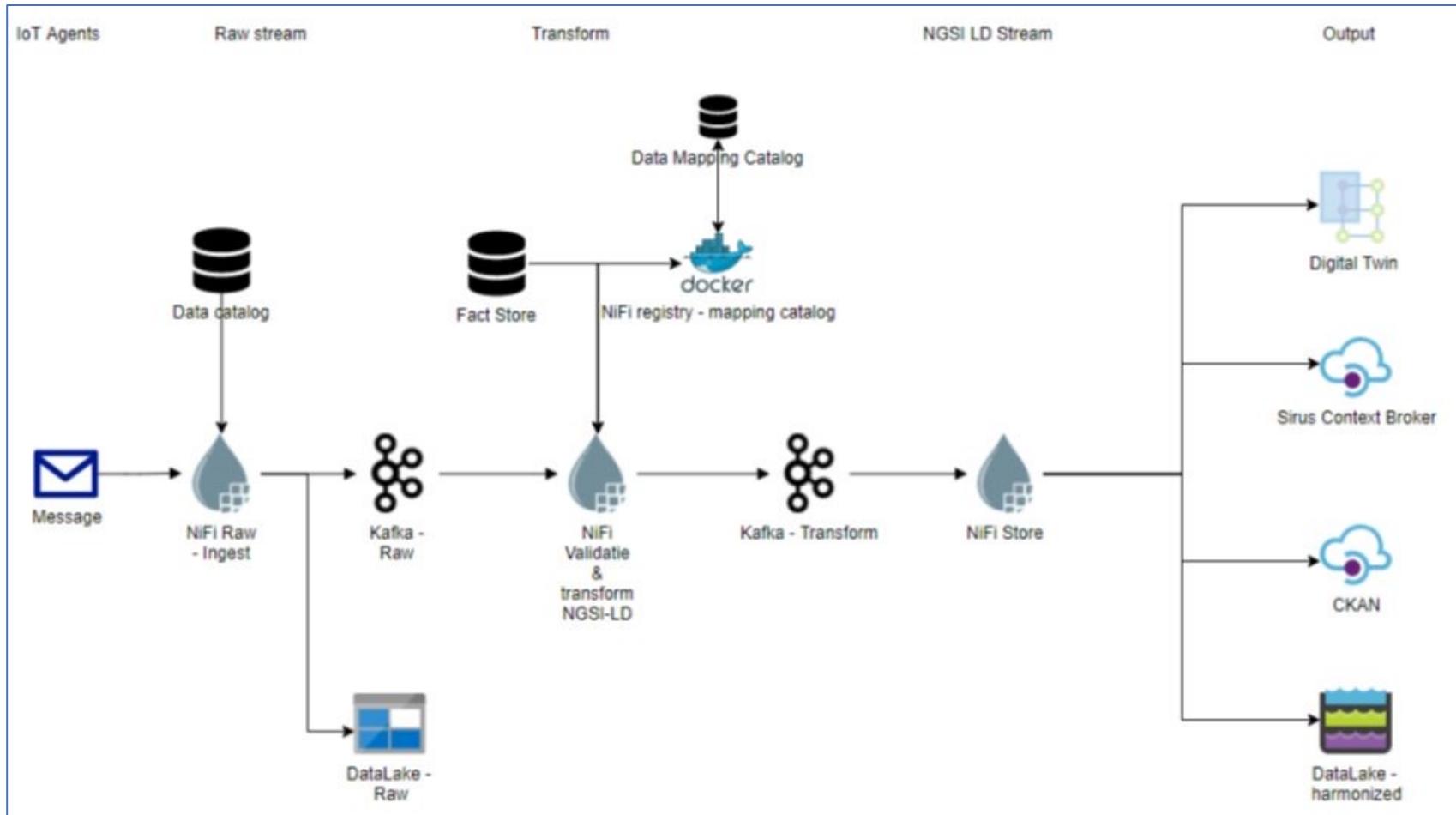
# Urban Sense architectuur (High level)



# Urban Sense (smart city data platform)



# a data stream in Urban Sense



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



```
{  
    "id": "AirQualityObserved:RZ:0bsv4567",  
    "type": "AirQualityObserved",  
    "dateObserved": {  
        "type": "DateTime",  
        "value": "2018-08-07T12:00:00"  
    },  
    "NO2": {  
        "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"  
    },
```

A photograph of two solid gold bars and a gold-colored USB flash drive. The gold bars are stacked, with one partially visible behind the other. The USB drive is positioned in front of the bars, angled towards the bottom left. All objects have a shiny, reflective surface. The background is a dark, solid color.

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 (europnees)
- Smartwaterland
- See2do (Interreg)
- SLIC
- Climate resilient cities
- VLOED (Vlaio)
- ...



# VLOED

CITYMESH

 ViNotion  
Making surveillance smart



 Aptus



 CROWD•SCAN  
THE FUTURE OF CROWD ANALYTICS



# Project management

## WP1: projectmanagement

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

## WP 2: gebruikersonderzoek

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

## WP 3: data, analyse en training voorspellingen

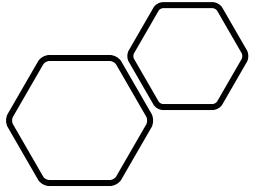
- **xStad Gent – dienst D&I (Justine Ottevaere)**
- **xStad Brugge – dienst data (Bram De Vreese)**
- **xExterne data-scientist**

## WP 4: IOT proeftuin voor nieuwe technieken

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

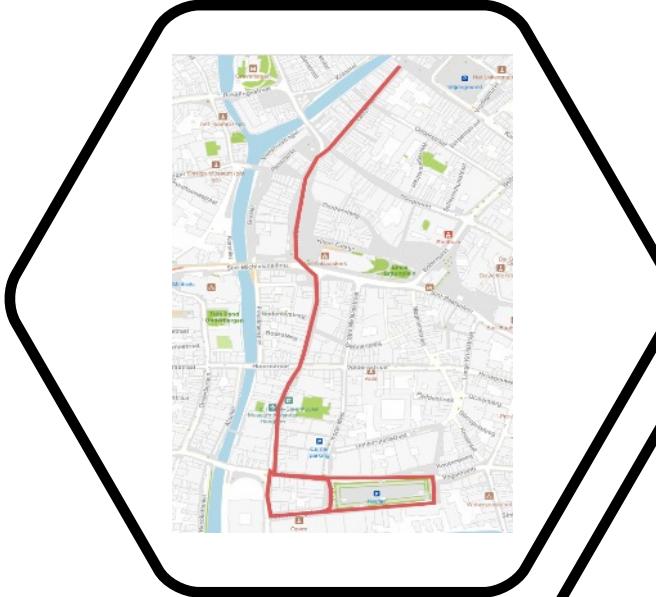
## WP 5: communicatie & datalabs

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



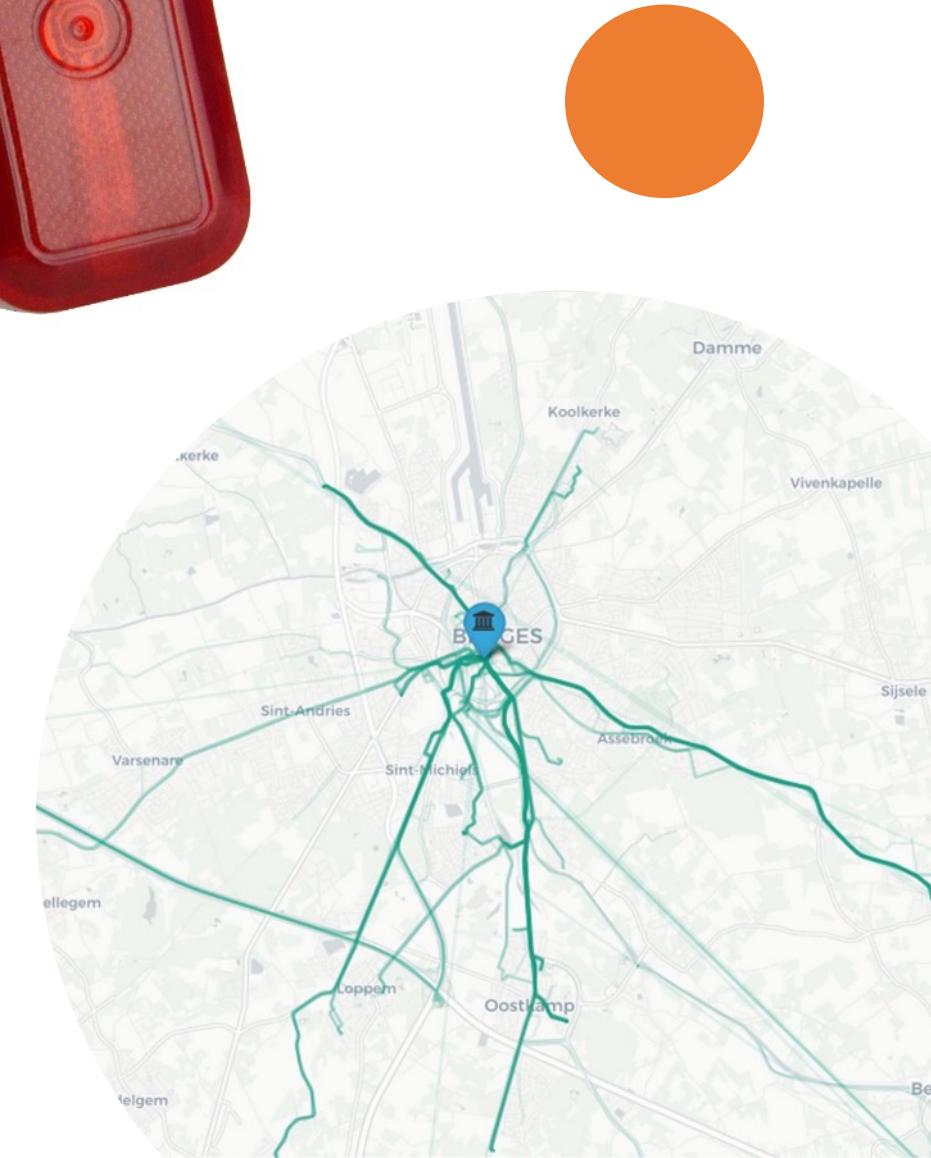
# Living Lab

- **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
- Automatisation of parking retribution
- OPC and Q2C

## BRUGGE WINT AGORIA SMART CITY AWARD

NIEUWS | 02/03/2018



[FACEBOOK](#)

[TWITTER](#)

[in](#)  [p](#)

Brugge

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

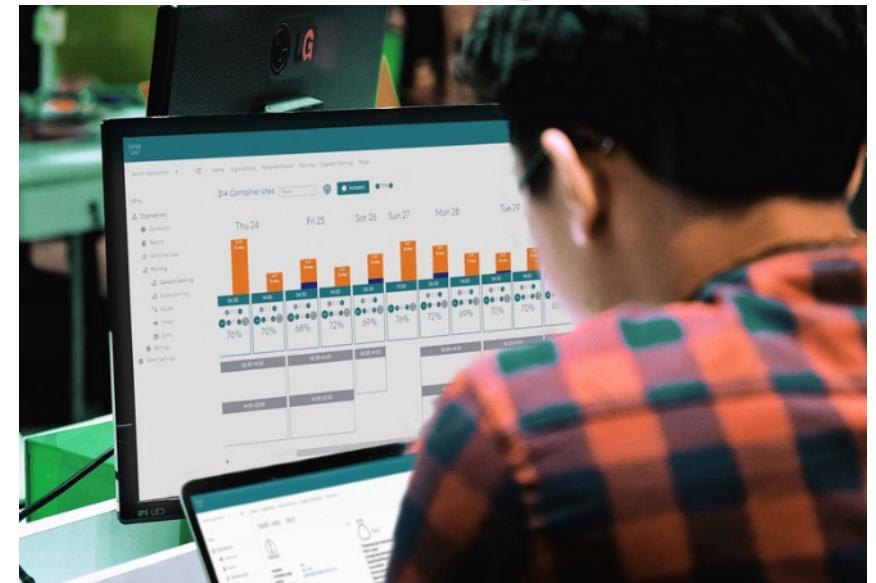
# BITS

- 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



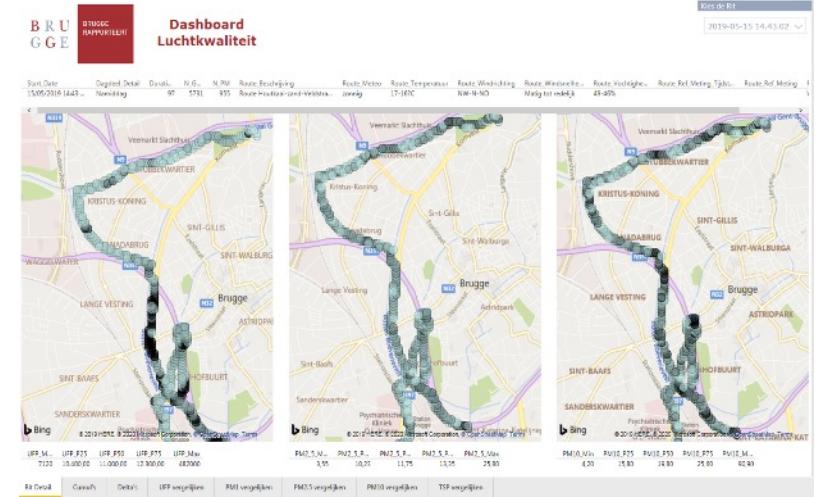
# Counter loops

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



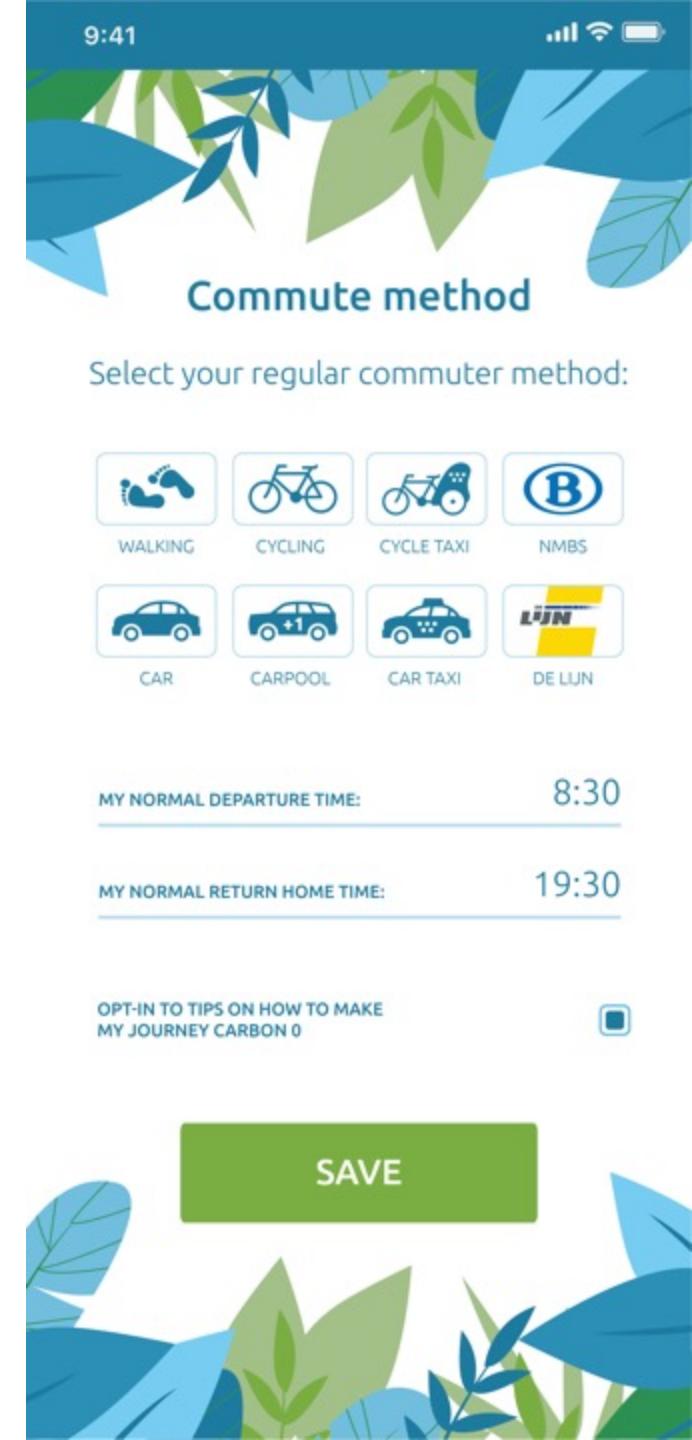
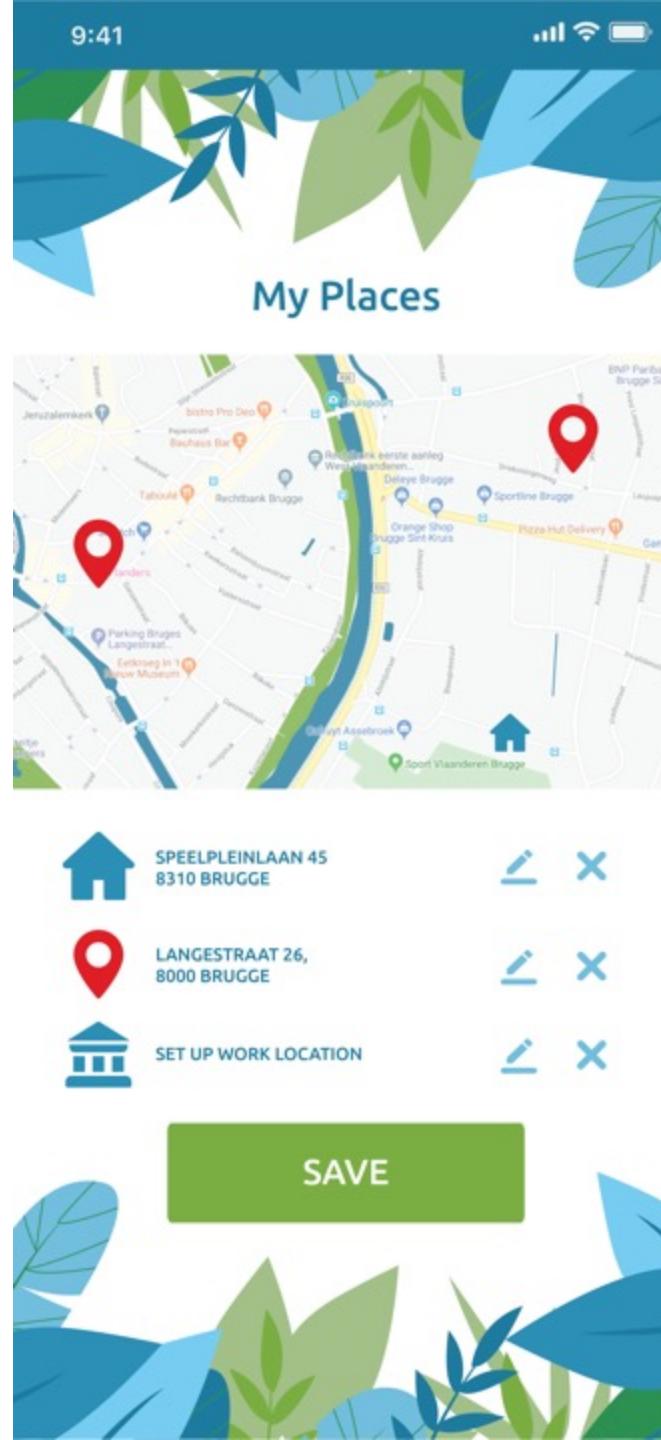
# Air sensors

- 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, curieuze neneuzen



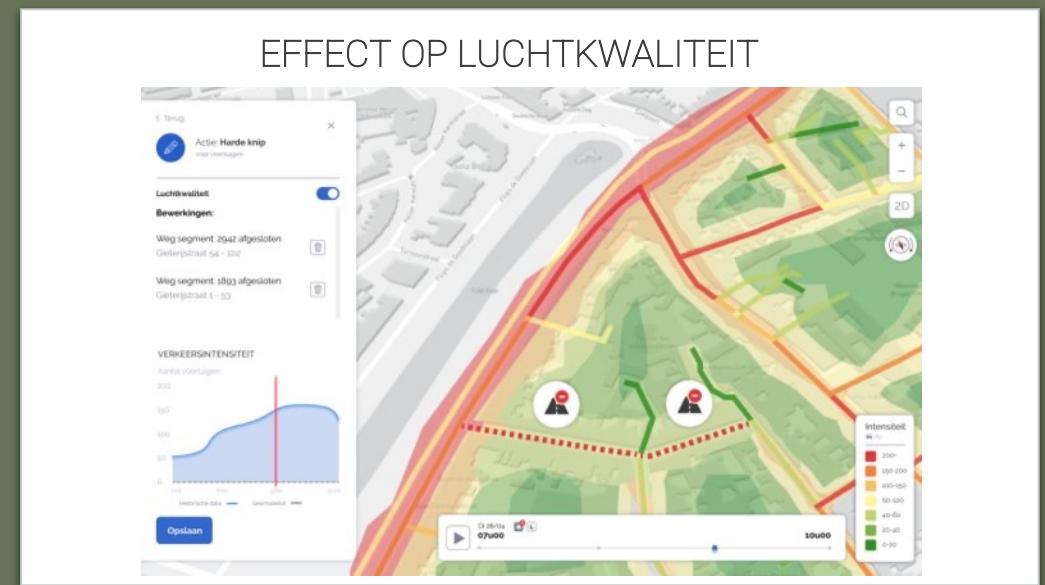
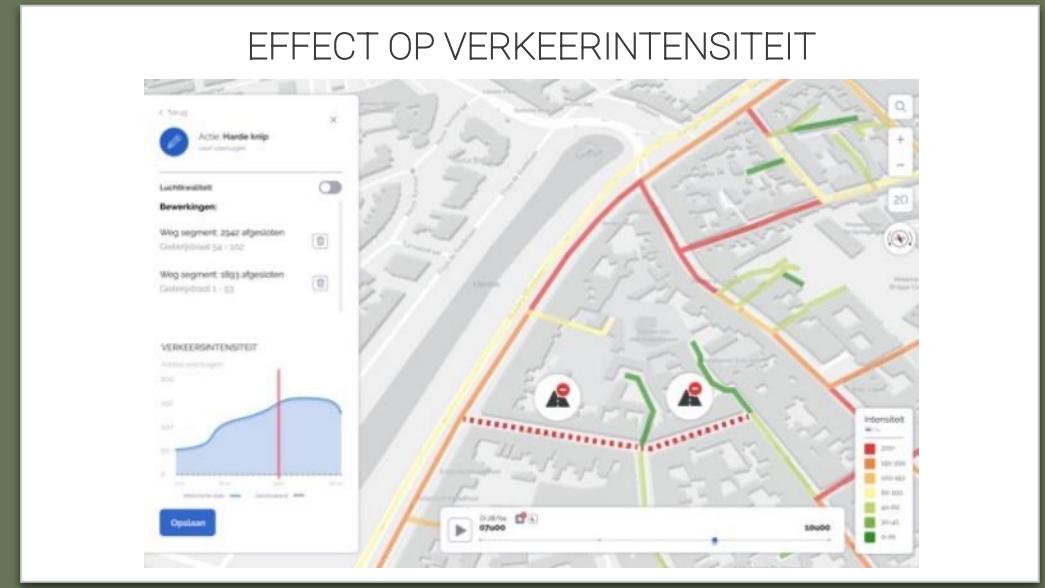
# 7 km Club

- 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



Arena

140  
100  
50  
0

11AM 1PM 3PM 5PM 7PM 9PM 11PM

### Free Spots in Parkings

City Center

8000  
6000  
4000  
2000  
0

1AM 1PM

### Free Spots in Parkings

ZuidOost

8000  
6000  
4000  
2000  
0

1AM 1PM

### Rijkswaterstaat

Camera Streams



AT5 Brandweer heeft handen vol aan brand bij cacaoverwerker Westpoort

AT5 OM in beroep tegen

monis liquidatiepoging Spy City





B R U  
G G E

# Questions?

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