

CITY OF THINGS

Davor Meersman
iMinds



15 min
BEFORE RAIN
APPROACHES YOU

✈️ 05 min 37 sec
BEFORE ARRIVAL

✈️ 08 min 07 sec
SINCE DEPARTURE

iMinds

A
City of
Antwerp

VikingCo

✈️ ✈️ ✈️
1,358 KWH
GAINED

✈️ 1,214 KWH
GAINED

✖️
04 TABLES LEFT

✖️
FULLY BOOKED

23 WATT
USED

ENERGY SAVING
MEDAL UNLOCKED

432 METER TO THE
CHEAPEST DIESEL

04 RED LIGHTS
ON YOUR WAY

YOU WALKED 1894 METER
SO FAR

⌚ 17 HOURS
PARKING LEFT

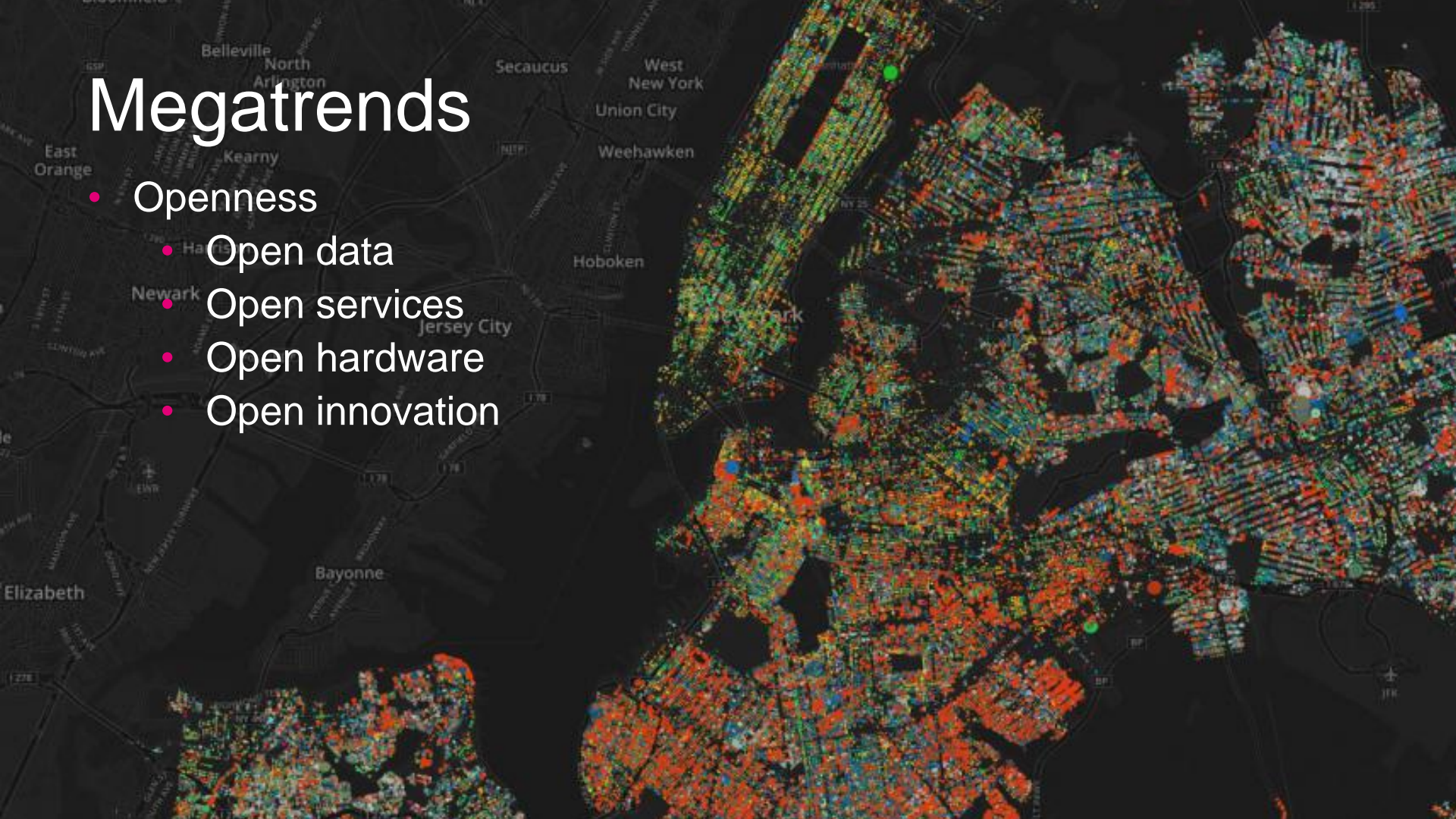
🚚 YOUR PACKAGE
WILL ARRIVE IN 15 MIN

🚲 235 METER UNTIL
BIKE PARKING

🍔 124 PEOPLE
FAVORISED

Megatrends

- Openness
 - Open data
 - Open services
 - Open hardware
 - Open innovation



Megatrends

- Interconnectedness
 - IoT
 - 'Sense' = capture
 - Act and interact
 - 'Always on'

Megatrends

- Granularisation
 - Economy of Me
 - Factory of One
 - Interfaces
 - Standards



Megatrends

- Servitisation
 - Owner vs. user
 - Bus vs. self-driving car
 - Assets become services
 - Flexible spaces





INTERNET OF DATA

BROWSING
ANTWERPEN.BE

SMARTPHONE
CALLING
Zmin 03sec

SMARTWATCH

INTERNET OF THINGS

INTERNET OF HUMANS

The Smart City?



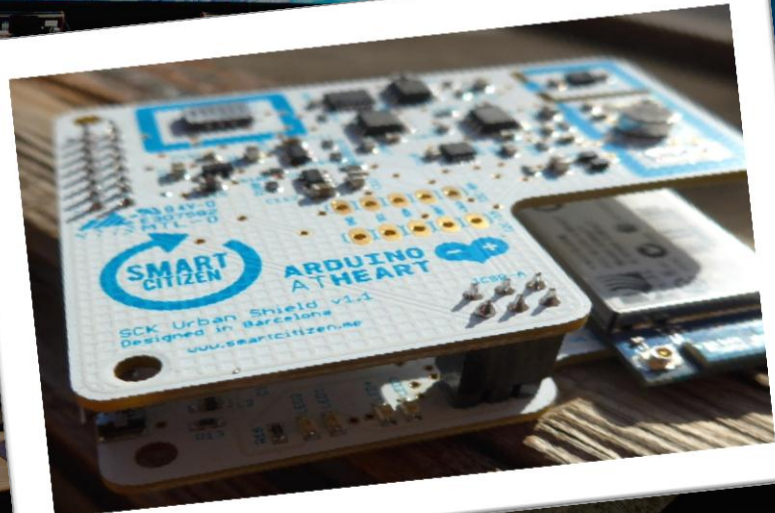
“A city that *monitors and integrates* conditions of all of its critical infrastructures [...] can better *optimize* its resources, *plan* its preventive maintenance activities, and *monitor security* aspects while *maximizing services* to its citizens.” -Hall

“The *bias* lurking behind every large-scale smart city is a belief that *bottom-up complexity* can be bottled and put to use for top-down ends — that a *central* agency, with the right computer program, could one day *manage* and even *dictate* the *complex needs* of an actual city.” -Lindsay

Top-Down vs Bottom-up



CENTRO DE OPERAÇÕES
PREFEITURA DO RIO





“Change seldom arises from purely top-down or bottom-up systems and processes”

(Shepard & Simeti, 2013)

Local Innovation Platform



- Cities are a shared resource and responsibility
- An enabling environment for all involved stakeholders
- With technology as an enabler
- Open data, open innovation, co-creation, living labs
- Quadruple helix put to practice



Quadruple helix in practice: City of Things



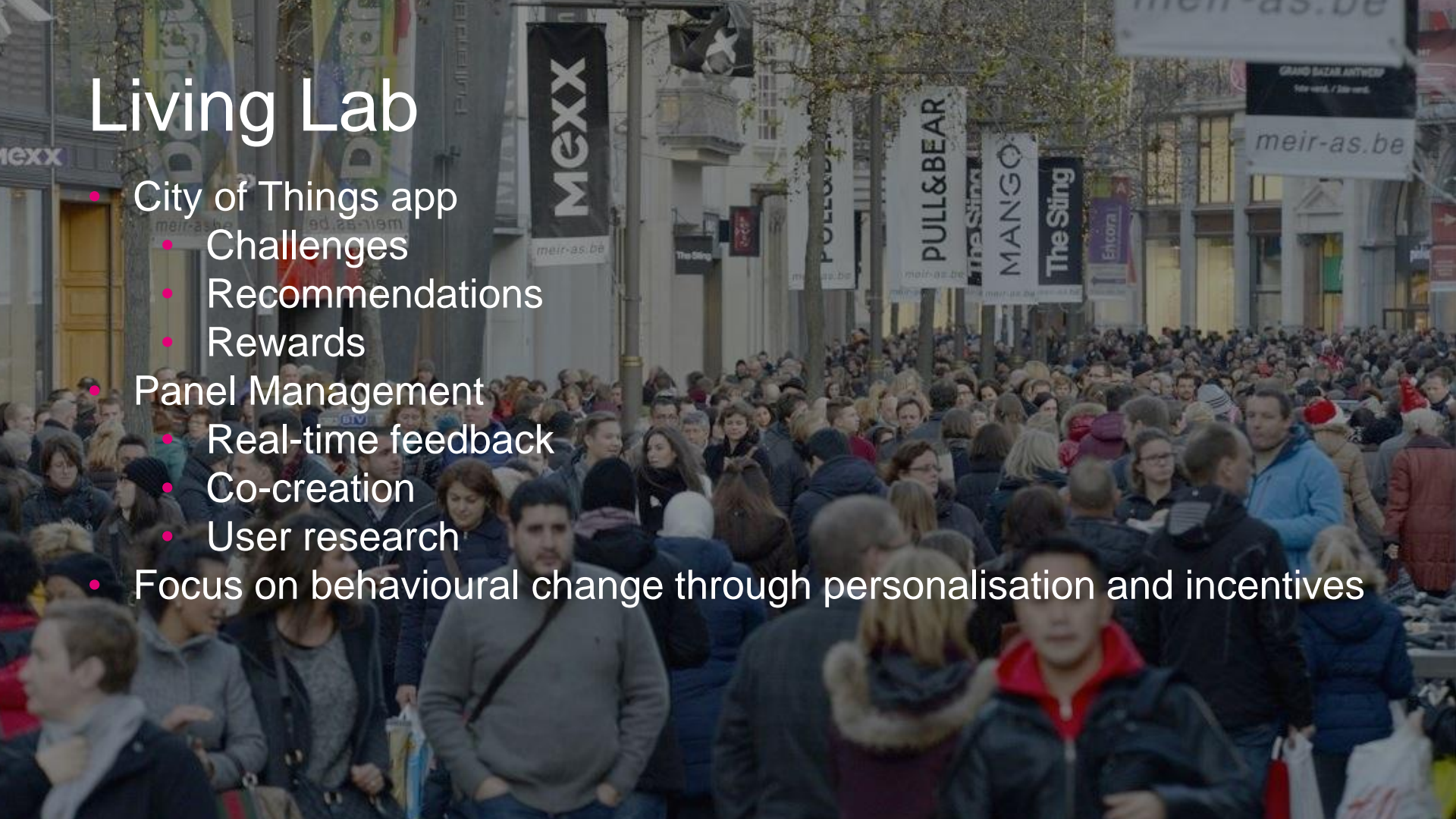
- City of Antwerp
- Mobile Vikings
- iMinds
- Citizens



- In a **real-life** test environment, where users and producers **co-create** innovations in a trusted, open ecosystem that enables **business innovation**

Living Lab

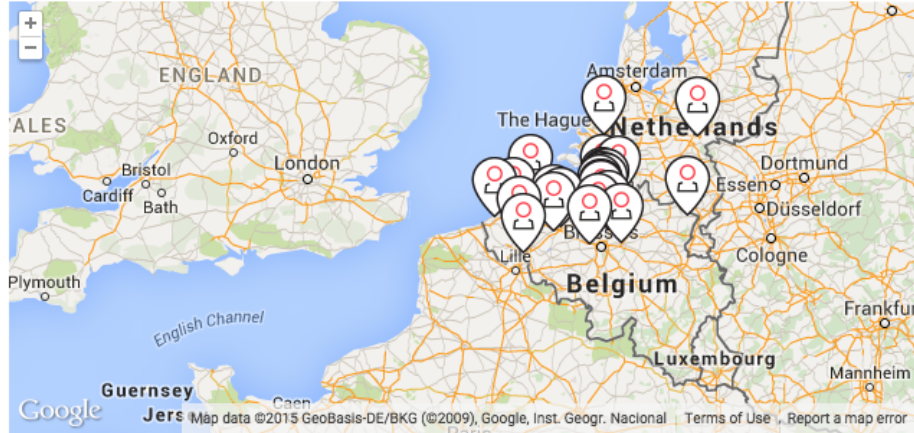
- City of Things app
 - Challenges
 - Recommendations
 - Rewards
- Panel Management
 - Real-time feedback
 - Co-creation
 - User research
- Focus on behavioural change through personalisation and incentives



User behaviour



REAL-TIME MAP OVERVIEW



5578799d9a318c4312000017

PROFILES

HISTORY



22:39 Work
10 hours
ANTWERPEN

22:26 Walking
176m - 13 minutes

18:06 Home
4 hours
Stadhuis
ANTWERPEN

17:46 Building
19 minutes
Boerentoren
ANTWERPEN

16:08 In Vehicle
228km - 2 hours

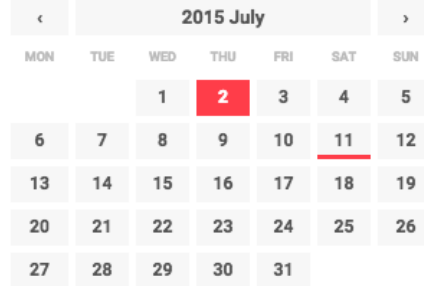
14:02 Building
2 hours
GENT

04:19 Sleep
5 hours

00:30 Home
14 hours
Stadhuis
ANTWERPEN

00:03 Walking
1km - 26 minutes

REAL-TIME MOMENT OVERVIEW



IoT infrastructure

Communication gateways

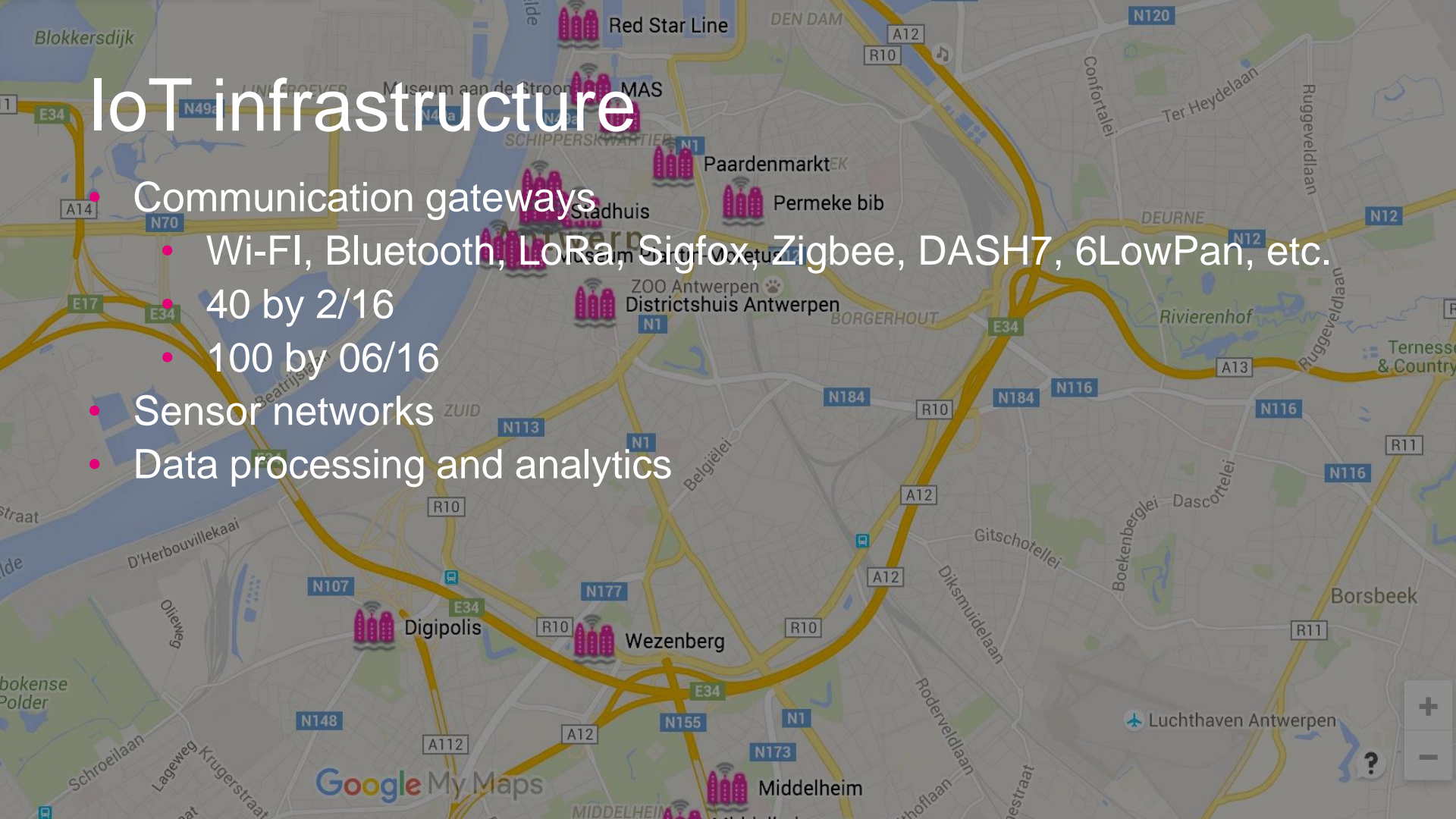
- Wi-Fi, Bluetooth, LoRa, Sigfox, Zigbee, DASH7, 6LowPan, etc.

40 by 2/16

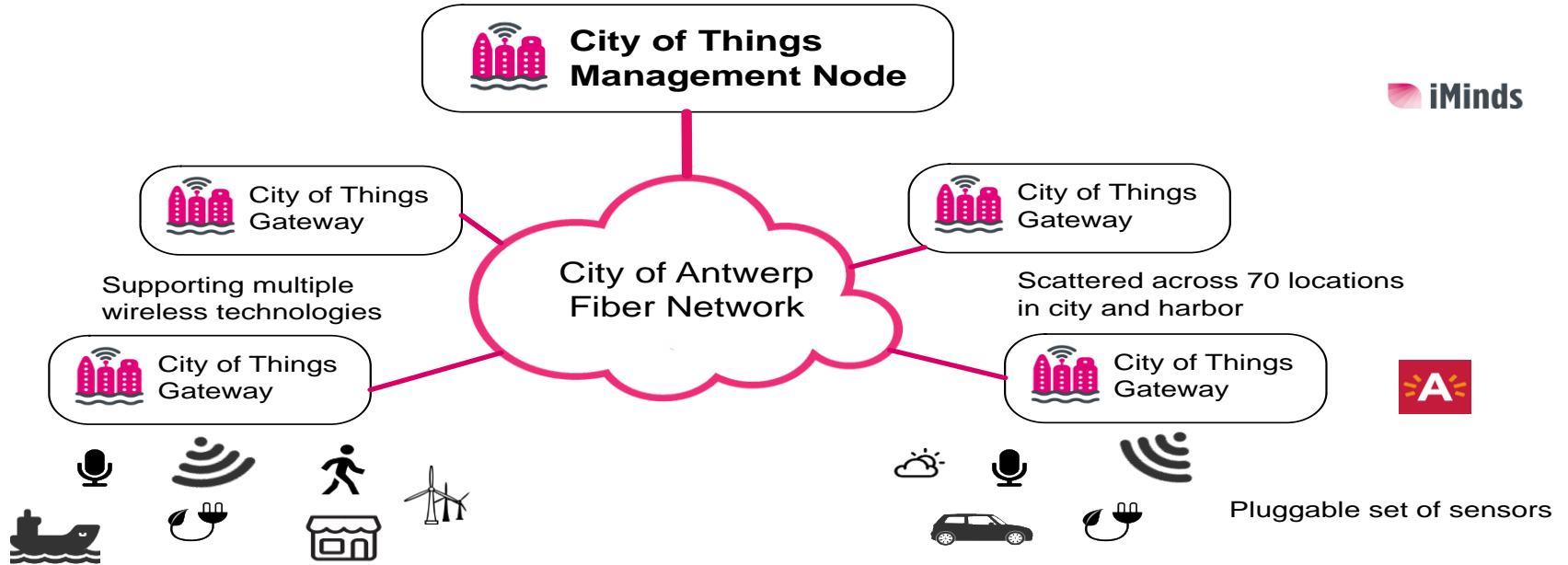
100 by 06/16

Sensor networks

Data processing and analytics



General architecture



Three layers



Business layer

Living lab and analytics infrastructure
for evidence-based innovation



Data layer

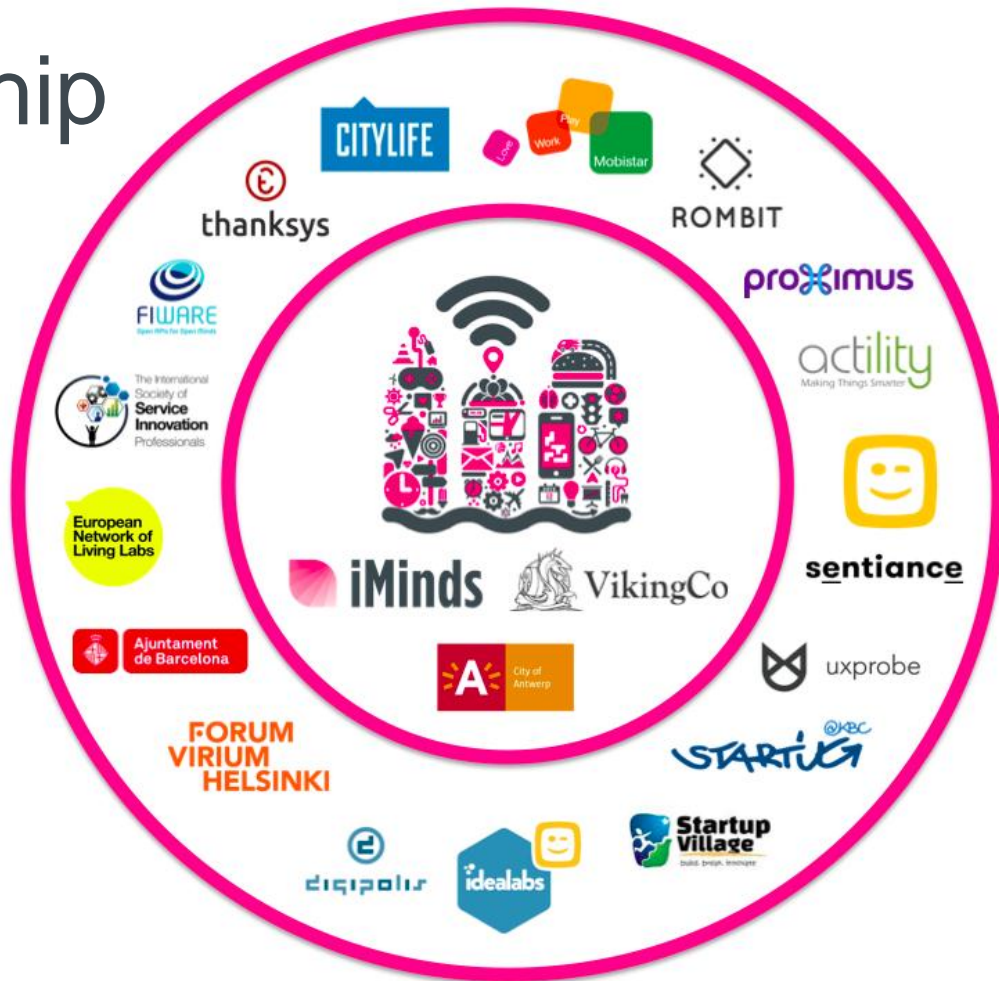
Providing an open data platform with a
real-time view on the city



Network-layer

Deploying a city-wide network
connecting multiple wireless technologies

Partnership



Target groups



- The City itself: IoT as an upgrade
- Startups & SMEs: the city as an experimentation lab
- Researchers: IoT tech, business & social research

City of Things



- Technological capacity to gather and analyse user and sensor data
- Infrastructure to involve, track, and interact with users at a very large scale
- Platform for evidence-based innovation
- Equipping the city with new tech
- Public-Private collaboration models

Smart Services: A-Kaart + CityLife



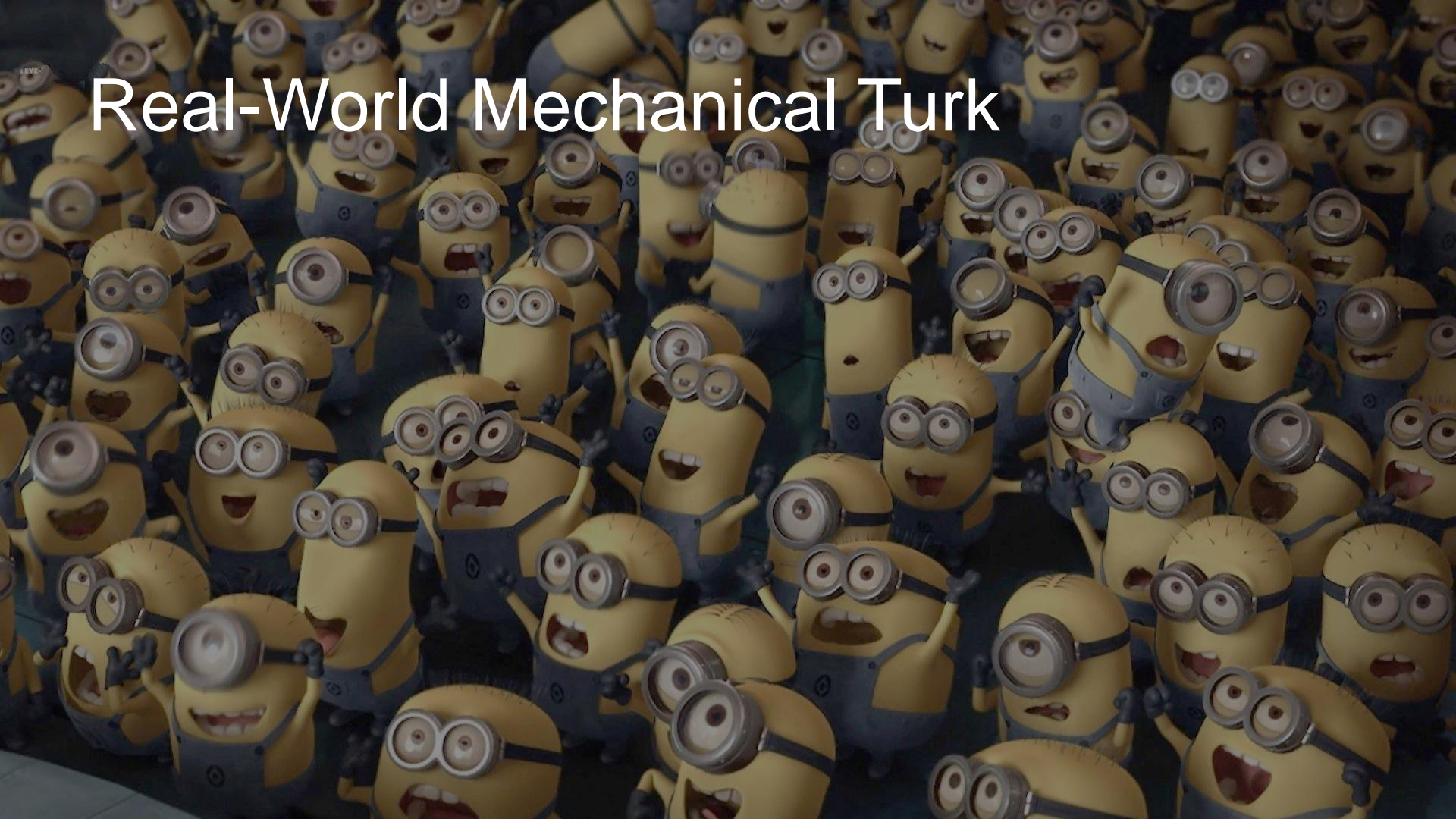
Air Quality Monitoring



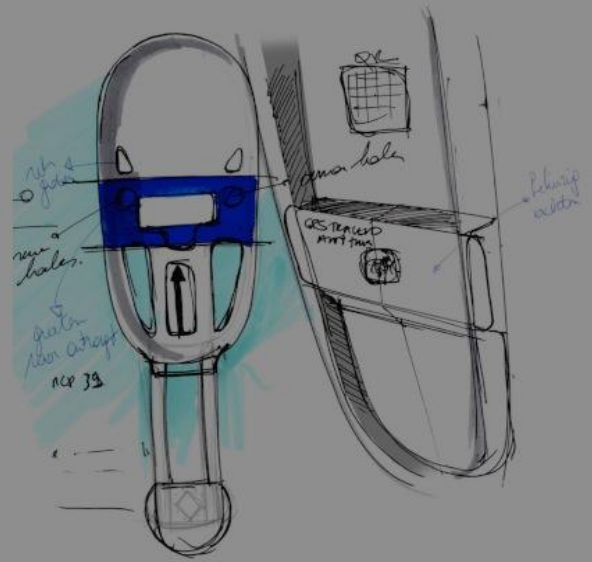
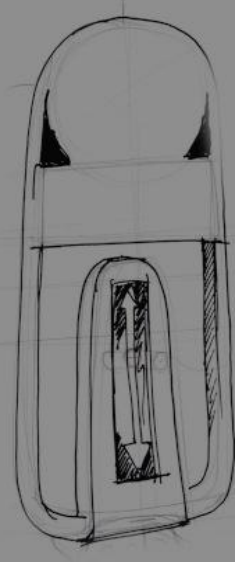
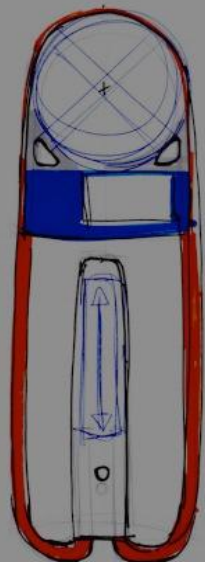
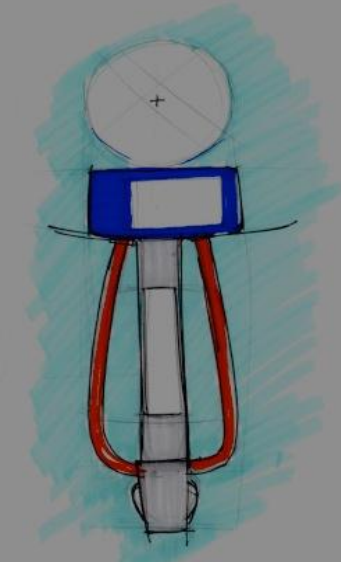
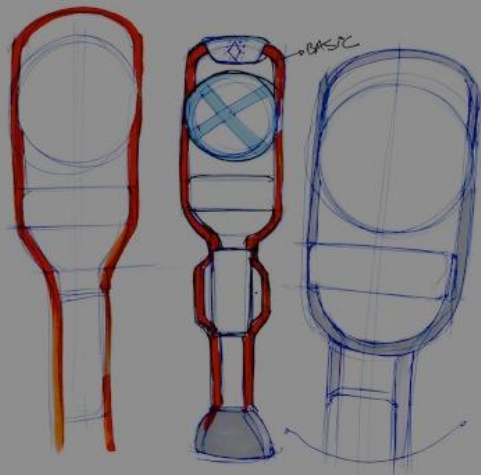
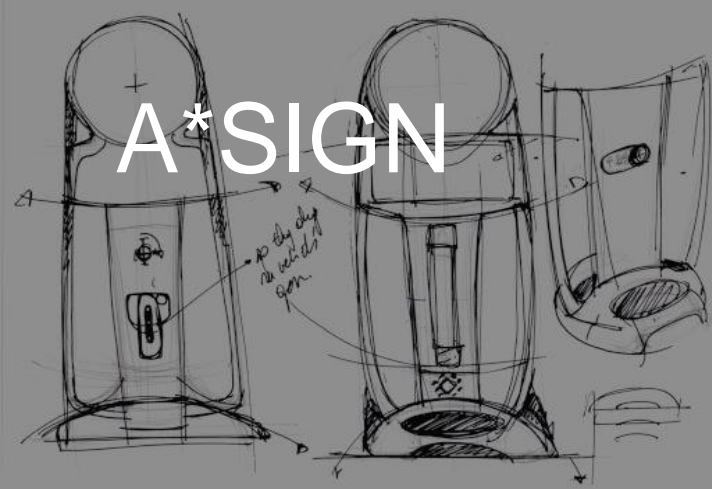
AGILE: Drones in Port of Antwerp



Real-World Mechanical Turk



A*SIGN



Blindsquare



iFest

**ARMIN
VAN BUUREN**



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