

ARCADIS OVER SMART CITIES

18 mei 2022



ARCADIS over SMART CITIES



Lieke Arts
Hoofd Adviesgroep Asset
Data Management



Mobility



Inhoud

- Introductie Arcadis
- Introductie Smart City
- Voorbeelden Smart City
 - Smart mobility
 - Digital twin
 - Beeldherkenning
- Overwegingen en uitdagingen Smart Cities
- Omgaan met data in een Smart City

Introductie Arcadis

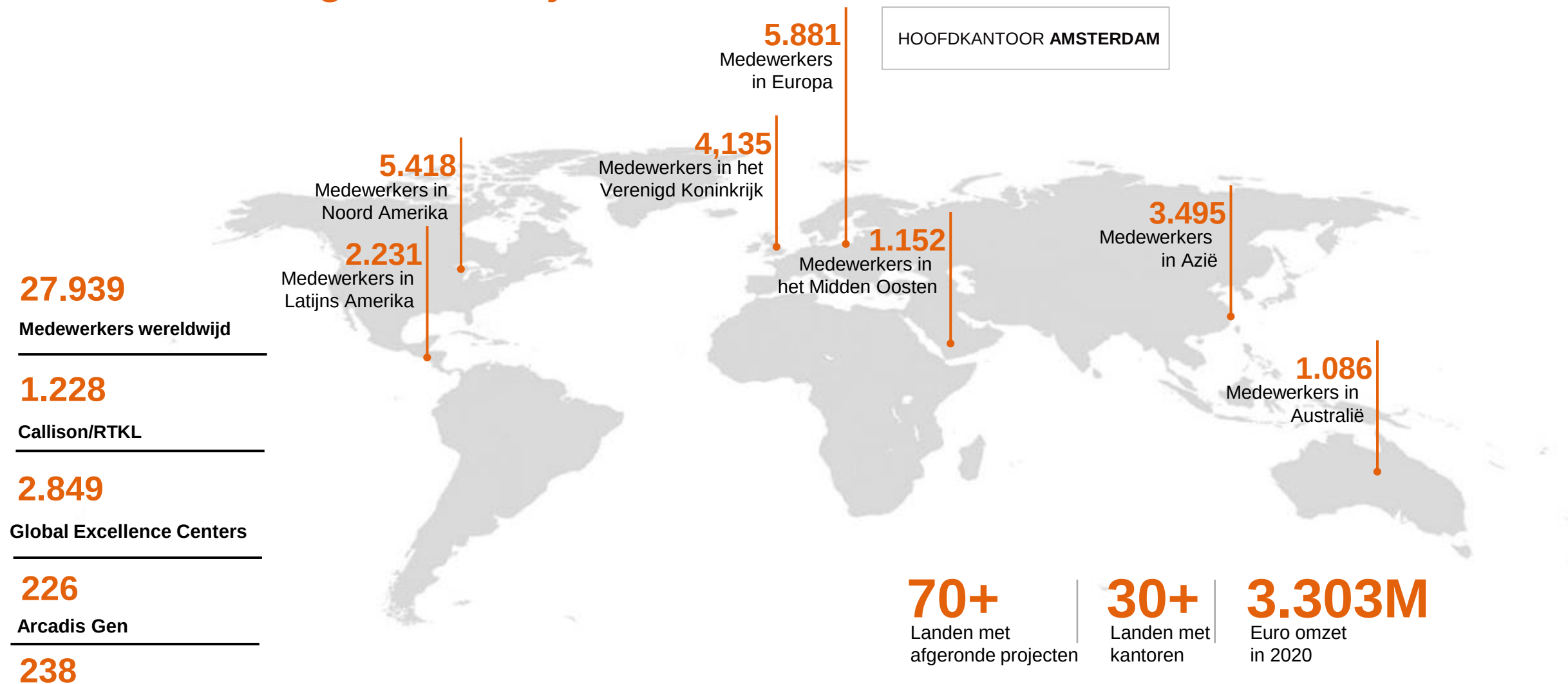
De wereld waarin wij werken...



Mega trends will drive client's demands towards the full strength of Arcadis' resume and services

Over ons.

Lokaal aanwezig, wereldwijd bereik



Arcadis in Nederland

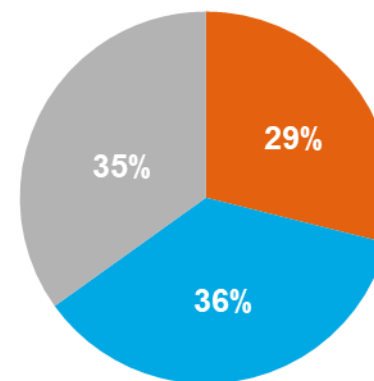
- 10 kantoren
- 2.200 mensen
- verhouding vrouw / man

 **75%**

 **25%**



Onze Klanten

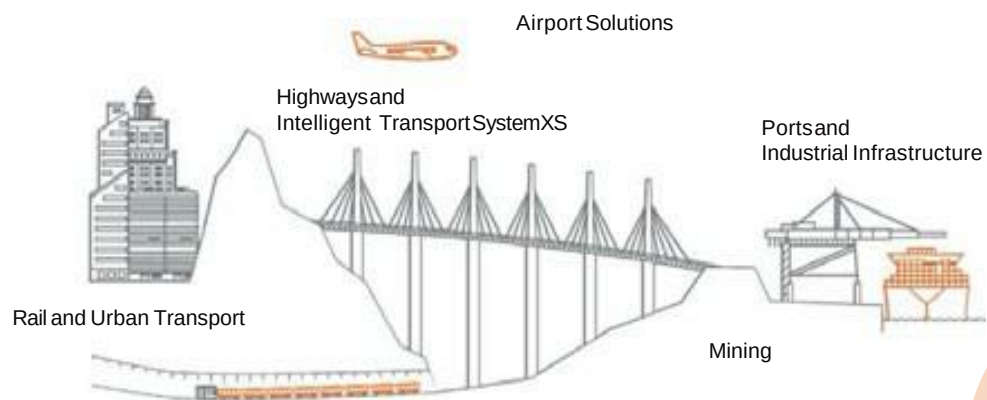


40% Privaat – 60% Publiek
in 12 focus sectoren

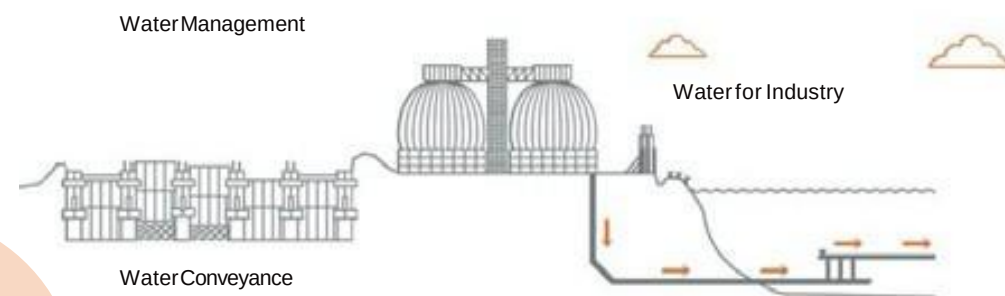
 Gebouwen
 Infrastructuur
 Water & Milieu

Onze oplossingen **sector overstijgend**

Infrastructuur / Mobility

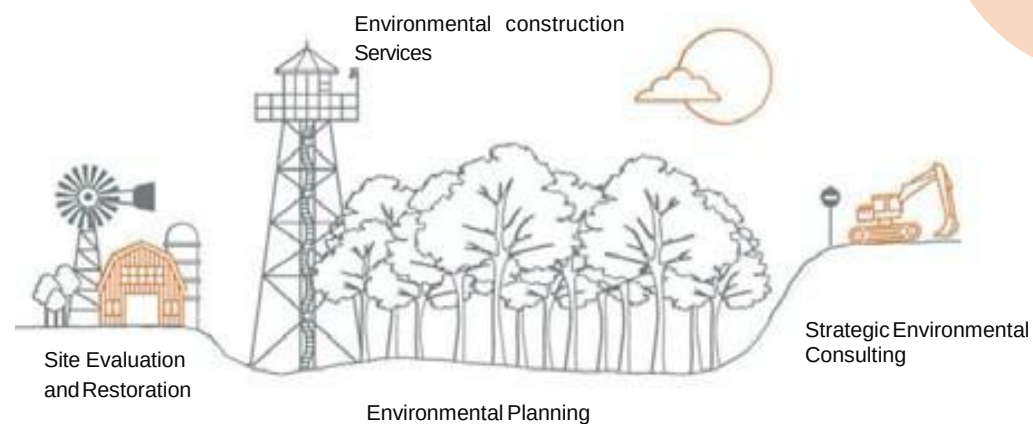


Water / Resilience

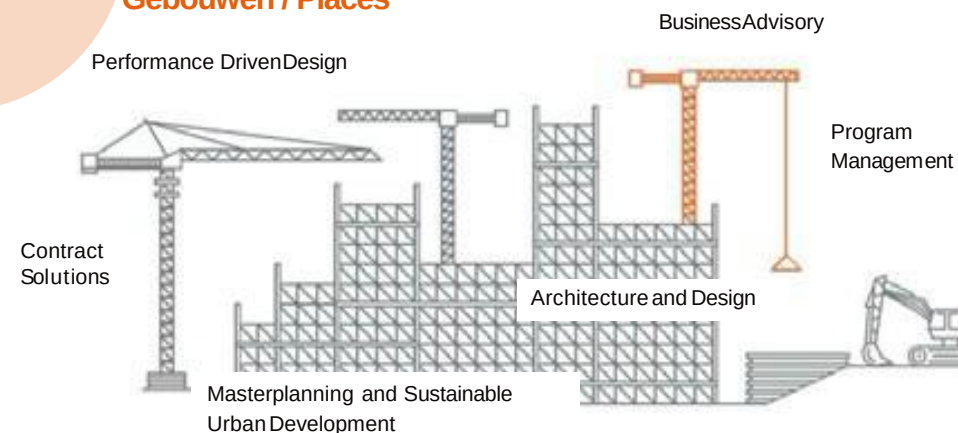


Lokaal aanwezig
Wereldwijd bereik

Milieu / Resilience



Gebouwen / Places



A photograph of three children playing in a park fountain. The children, two boys and one girl, are seen from behind, running through the water jets. They are wearing backpacks. The scene is set in a park with trees and a building in the background, bathed in warm, golden light from the setting or rising sun. The ground is a metal grate, and there are colorful benches on the right.

Bekijk onze projecten

Wonderwoods: Verticaal woonbos in de stad

Utrecht groeit en bloeit door groene woontorens

Utrecht

De bijzondere constructie Wonderwoods bestaat uit twee woontorens van 70 en 90 meter hoog, waarin zo'n drieduizend koop- en huurwoningen komen. Ook is er 27.000 vierkante meter gereserveerd voor andere voorzieningen, zoals Playlab (een culturele publieksfunctie), kantoren, gezonde horeca, fitness, yoga, kleinschalige winkels en educatie.

De landschapsarchitecten van Arcadis ontwierpen het dakgroen, met een link naar de Utrechtse Heuvelrug. Verder ontwikkelden wij het bouwfysisch ontwerp en het gebouwgebonden installatie-ontwerp, terwijl we ook de certificering voor duurzaamheid (BREEAM) en gezondheid (WELL-building) in gang zetten. Bovendien waren we verantwoordelijk voor de watertoets-procedure en het projectmanagement, in samenwerking met MVSA Architects en Stefano Boeri Architetti.



Duurzaam knooppunt in historische omgeving

Ontwikkeling stationsomgeving Driebergen-Zeist

Utrecht

De ontwikkeling van een volledig vernieuwd stationslandgoed dat knelpunten verhelpt en het station transformeert tot een veilig en duurzaam verkeers- en OV-knooppunt.

Het station kreeg een extra spoor en een breed, centraal gelegen perron, terwijl het nieuwe busstation de omliggende gemeenten beter bereikbaar maakt. Aan de zuidzijde biedt een ruime parkeergarage plaats aan zo'n zeshonderd auto's. Het stationslandgoed sluit bovendien naadloos aan bij de groene omgeving met zijn monumentale bomen en historische landgoederen. Ook de duurzaamheid wordt gewaarborgd, onder meer door het hergebruik van materialen van het oude station en zonnepanelen op de perronkappen.

[Link video](#)



Gemeente Sittard gaat voor duurzame energie

Warmte- en koudenet bespaart aardgas en vermindert CO₂ uitstoot

Sittard

Gemeente Sittard gebruikt de restwarmte van industriële processen voor het verwarmen en koelen van 30.000 huishoudens en ondernemers. Met de inzet van dit ondergrondse warmte- en koudesysteem behaalt de gemeente de doelstellingen van de energietransitie.

De warmte is afkomstig van de Biomassa Energiecentrale Sittard en de nafta-kraker van SABIC op bedrijventerrein Chemelot. Het Groene Net kwam op het idee om de restwarmte die normaal gesproken verloren gaat via een ondergronds warmtenet te gebruiken voor verwarming en koeling van de nieuwe energiezuinige woonwijk Tuin van Gulik. Arcadis ontwierp het warmtenet, zorgde voor de aanbesteding en de uitvoering. Daarnaast behoorden de ondergrondse infrastructuur en de huisaansluitingen in de woningen tot onze verantwoordelijkheden.





Toekomstgerichte vervoersoplossing

Mobility as a Service (MaaS) op Amsterdamse Zuidas

Amsterdam

Het internationale zakendistrict Zuidas in Amsterdam fungeert als proeftuin voor het mobiliteitsconcept Mobility as a Service.

Samen met de gemeente Amsterdam verkent Arcadis deze toekomstgerichte benadering van stedelijke mobiliteit door de haalbaarheid en acceptatie van MaaS te onderzoeken. In de pilot 'Zuidas Mobility Experience' vroegen we automobilisten die naar de Zuidas rijden een maand lang hun reispatroon te wijzigen en optimaal gebruik te maken van het prototype van MaaS. Concreet betekende dit dat ze hun Zuidas Pas (smartcard) gebruikten om naar en binnen het zakendistrict te reizen met een combinatie van trein, bus, deelfiets en taxi. De ervaringen uit deze proeven vormden de basis van een grootschalige pilot, die uiteindelijk moet leiden tot een goed werkende MaaS-dienst op de Zuidas. De partijen streven ernaar bij deze pilot alle vervoersoplossingen digitaal met elkaar te verbinden in één app.

Introductie Smart city

Smart Cities

How rapid advances in technology are reshaping our economy and society

LEAD



100 smart cities: The best way forward for India

Anil Chaudhry



THE NDA government's vision for India includes, amongst other things, the creation of 100 smart

ly, it should appeal to residents, commuters and visitors

The sustainable urban life and livable cause cities a

Worldwide, most cities may evolve towards becoming smart cities via incre

management control centre supervises and reacts to traffic disruptions. Conse

gas an done s

WHAT IS IT ABOUT?

A SMART CITY IS IN THE INTERSECTION BETWEEN COMPETITIVENESS, CAPITAL AND SUSTAINABILITY. SMART CITIES SHOULD BE ABLE TO PROVIDE GOOD INFRASTRUCTURE SUCH AS WATER, SANITATION, RELIABLE UTILITY SERVICES, HEALTHCARE; ATTRACT INVESTMENTS; TRANSPARENT PROCESSES THAT MAKE IT EASY TO RUN COMMERCIAL ACTIVITIES; SIMPLE AND ONLINE PROCESSES FOR OBTAINING APPROVALS, AND VARIOUS CITIZEN-CENTRIC SERVICES TO MAKE CITIZENS FEEL SAFE AND HAPPY. IT SHOULD OFFER EASY ACCESS TO PUBLIC TRANSPORT WITH MINIMAL MOTOR-VEHICULAR MOVEMENT

While the land pooling policy will cater to planned urbanisation of outer Delhi, at least four smart sub-cities are set to come up within the city in the next three years

3 East Delhi Hub at Karkarduma
TO BE BUILT OVER 30 ACRES OF LAND

around 4,500 service or studio apartments

Roads to be pedestrian-friendly with minimal motor-vehicle movement

2 Central Delhi
UNDER MUNICIPALITY (NDMC)

Signature Tower having 100 storeys

1 Dwarka Sub-City

First Wi-Fi enabled sub-city

Commercial hub

24x7 power & water supply

Solid Waste management system

"LAKE CITY COMPLEX" at Sanjay Lake in Mayapuri
To be built across 25 acres of land

INTERNATIONAL SPORTS COMPLEX spread across 6.2 acres

New Diplomatic Enclave

OPEN DATA

Jürgen Laartz and Stefan Löff

PARTNERING TO BUILD SMART CITIES

Better communications between local government leaders and technology vendors can encourage the development of connected, resource-efficient urban areas.

JÜRGEN LAARTZ is a director in McKinsey's Berlin office, and STEFAN LÖFF is a consultant in the Munich office. Copyright © 2014 McKinsey & Company. All rights reserved.

A study by the McKinsey Global Institute suggests that the world's 600 fastest-growing cities will account for 60 percent of global economic growth between 2010 and 2025. To achieve and sustain this level of growth—and to acknowledge recent urbanization and climate change trends—municipalities in both emerging markets and developed nations must pay closer attention to the way they manage resources and infrastructure.

Many are pinning their hopes on smart-city projects. Broadly, the term "smart city" refers to the use of innovative technologies in complex urban environments to manage resources and infrastructure in a sustainable way and create opportunities for growth. A city may use intermodal route-planning software, for instance, to help balance the

traffic load across its transportation systems. The same city may use so-called intelligent meters to better match electricity supply with demand, or to detect water shortages. In either case, officials can use the information collected to adjust schedules, equipment, and other variables accordingly, thereby optimizing potentially scarce resources.

Municipalities in Europe and elsewhere already have smart-city initiatives under way, piloting new technologies in certain city districts. The leaders of 22@Barcelona, for instance, are seeking to convert an older industrial area in Spain into a modern, attractive city district offering energy-efficient residential and office buildings and public green spaces as well as a knowledge-sharing environment that will lure innovative companies and workers.

accenture

Strategy | Digital | Technology | Operations

Just How Smart are Smart Cities?

High performance. Delivered.

It's Time for Digital Government to Ask Citizens

As we enter the digital age, 'smart cities' provide a glimpse of the future, but a big gap between the hype and the reality remains. Many smart city initiatives apply technology-driven solutions to yesterday's problems and fail to re-create systems and services designed with their digital citizens in mind. We believe city and digital government leaders must demonstrate clear value, tangible outcomes and engaging experiences for their citizens, businesses and visitors - delivering public service for the future. The reality is that voters (and mayors) only care about outcomes - more efficient transport systems; reduced water and energy bills; more livable buildings - not the technology that makes it possible.

It's time for cities to take the reins from the technology industry and lead the next generation of smart city initiatives from an outcome perspective that is centered on the citizen.

Rebuilding city hall for the digital age

Early adopters rarely grasp how things might work in the future and often use new technology to speed up existing processes, instead of creating new ways of doing things. For example, the advent of word processing software was first seen as a tool to speed up office typing entirely. Today, smart city initiatives are often doing the same thing, thinking in evolutionary instead of revolutionary terms. Few have grappled with the kind of radical re-invention necessary to find new ways of running a city and providing value to citizens.

Where cities have started to do this, the results are impressive, reaching across old silos to drive mission productivity for the whole organization. New York City's DataBridge program, for example, integrated city data from a vast array of sources into a single analytical platform. Looking at data from multiple angles is leading to more insight-driven operations and delivering improvements across city departments. One has been a five-fold increase in the inspection 'hit rate' of New York buildings so dangerous that they must be vacated, boosting return on investment, and making the city safer.

Yokohama Smart City is another example of joined up thinking, in the city's ongoing efforts to cut CO2 emissions, while

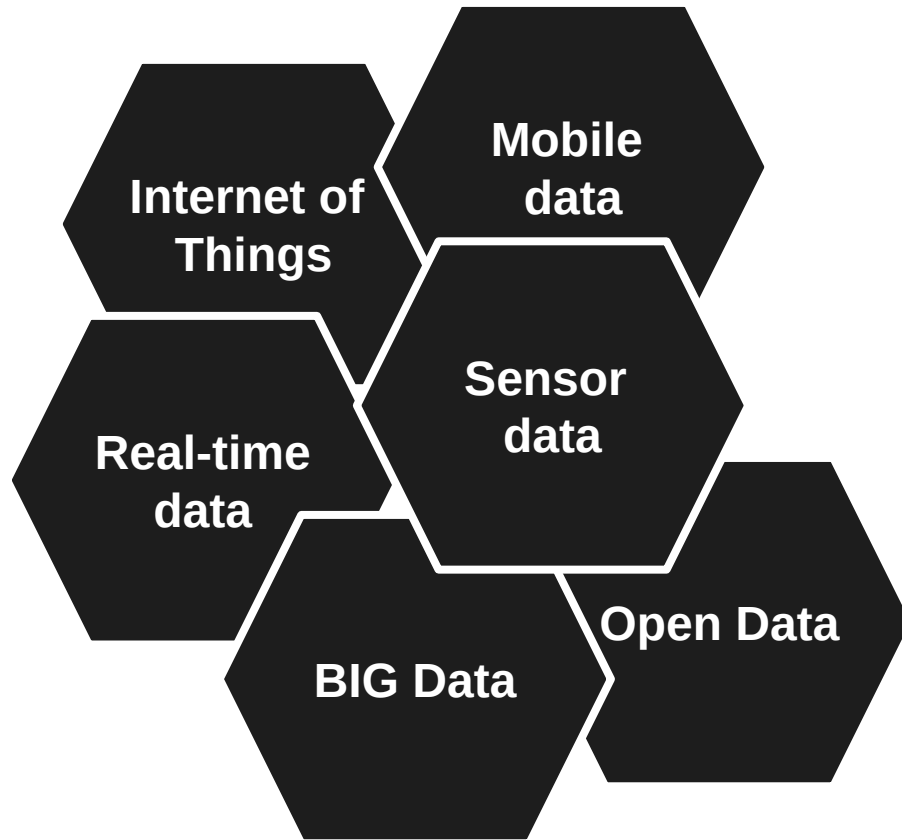
boosting economic growth in the city. It seeks to rethink how the city deals with energy use in a wide range of contexts, from people's individual homes and cars, through to the wider community, bringing together a range of city functions.

This integrated approach rarely happens on its own: it requires new governance structures such as a dedicated executive to own and drive strategy. While some cities are setting up smart city boards to guide strategy, there is still a clear need to grapple with execution. To do so, leading cities such as Amsterdam, San Francisco and Singapore have appointed cross-cutting CIO or CTO roles to turn strategy into reality.

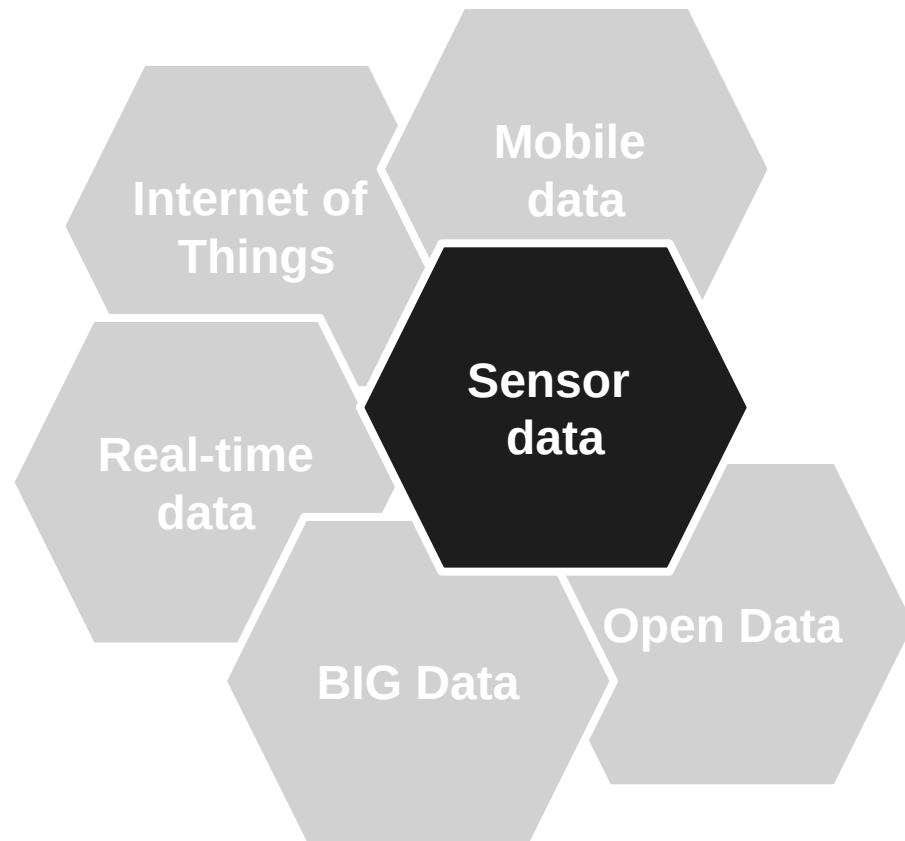
From portal to person - digital government from the citizen's perspective

One of the strengths of the approach taken by cities like San Francisco is the focus on citizens and local businesses: in creating a new leadership role to deliver on digital government innovation, the city has expressly sought to be "transparent, efficient and constituent-focused". This matters. Take the city of Songdo in South Korea: its systems work very well, but far fewer people are moving in than expected. People want outcomes, enjoyable experiences and more personalized services. This is what cities, houses, and schools - and urban

Disrupties in technologie mogelijk door data



Disruptieve technologie door:

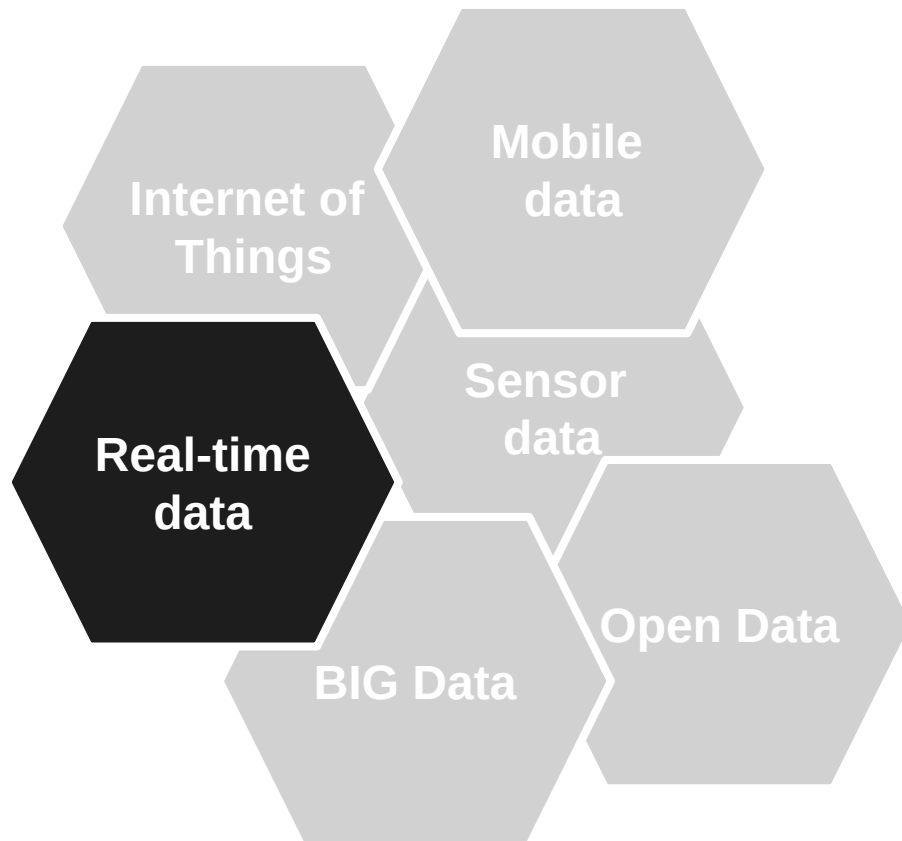


Sensor data

Bijv. Smart Meter



Disruptieve technologie door:

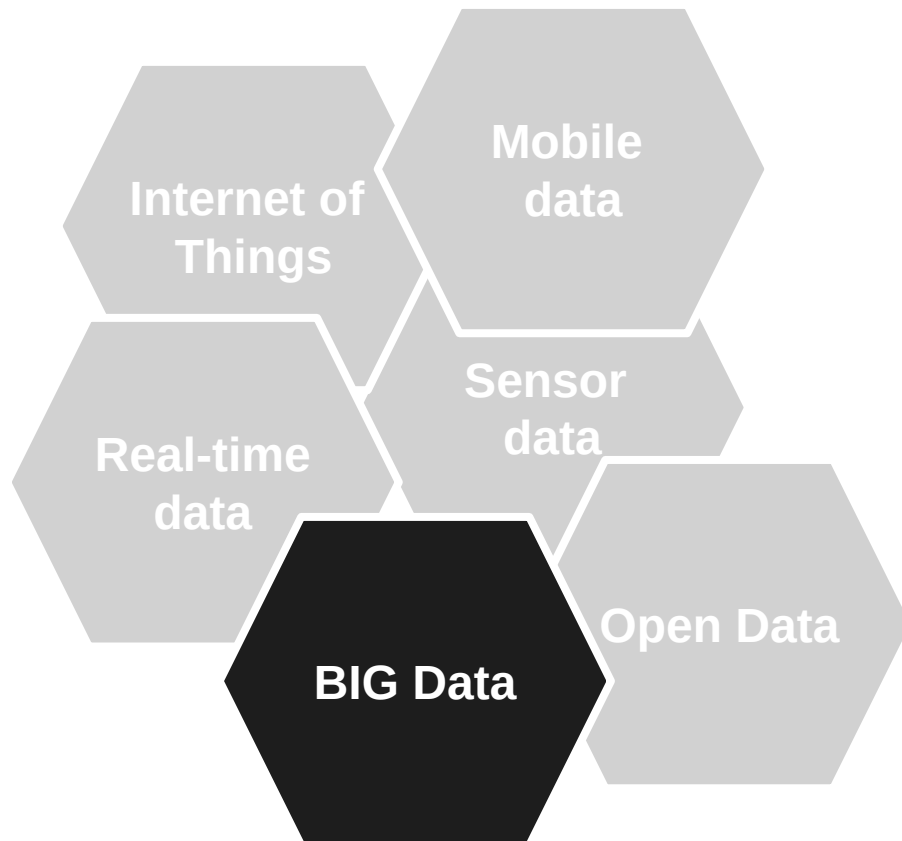


Realtime
data

Bijv. Verkeersinformatie



Disruptieve technologie door:

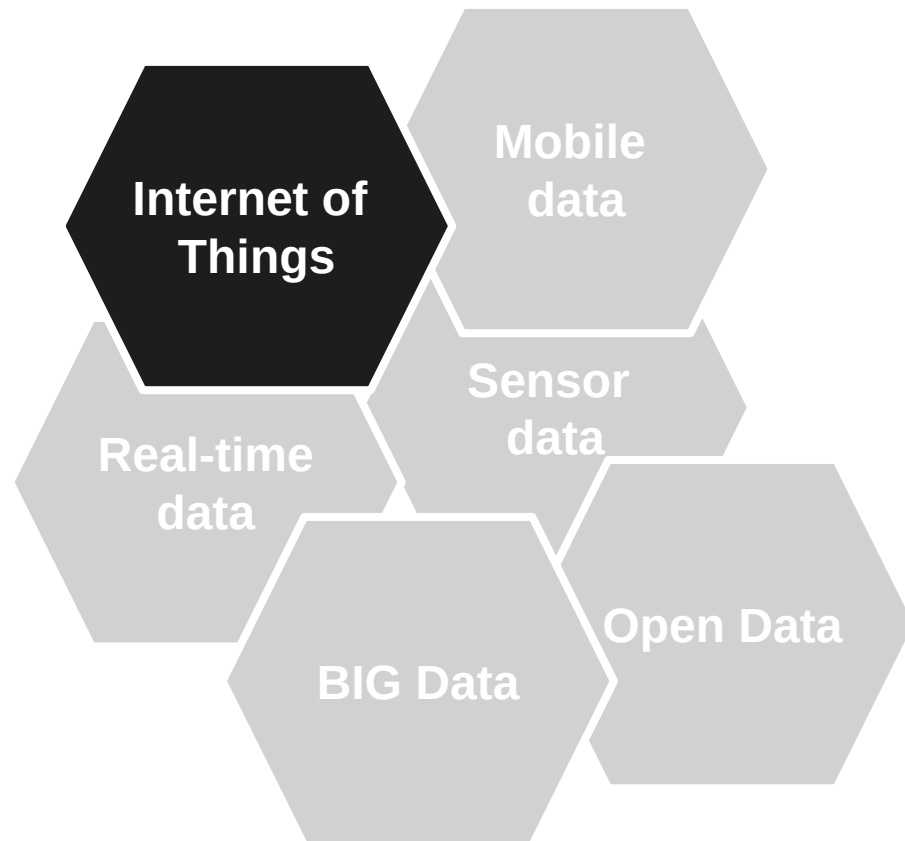


BIG Data

Bijv. Social Media



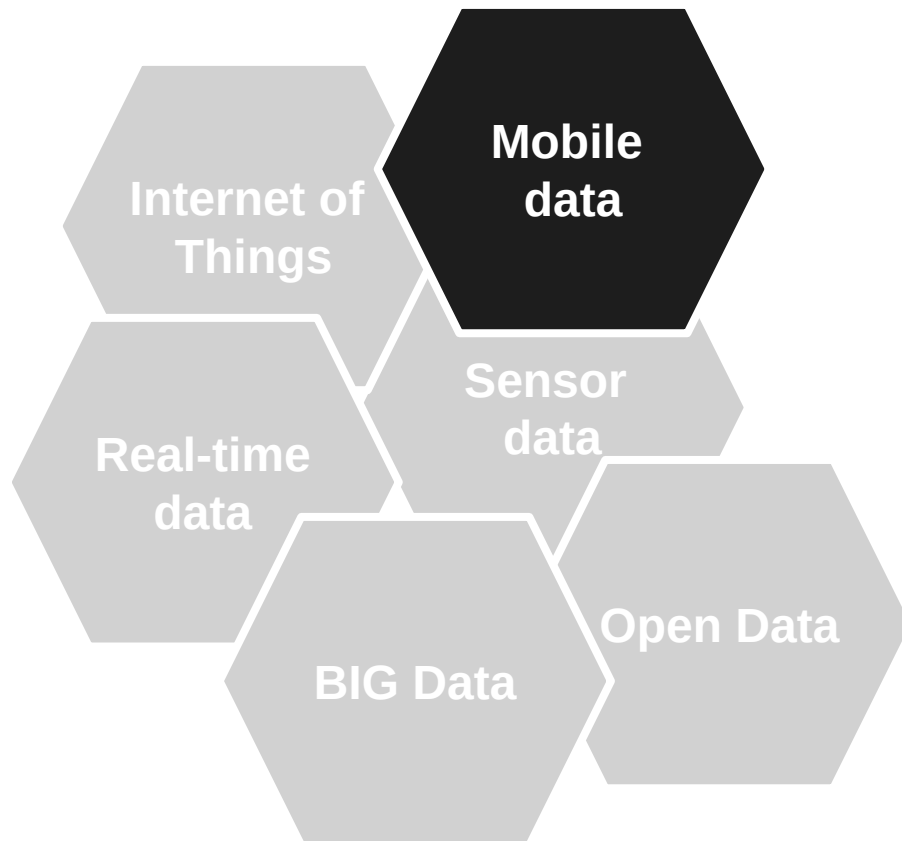
Disruptieve technologie door:



IOT



Disruptieve technologie door:

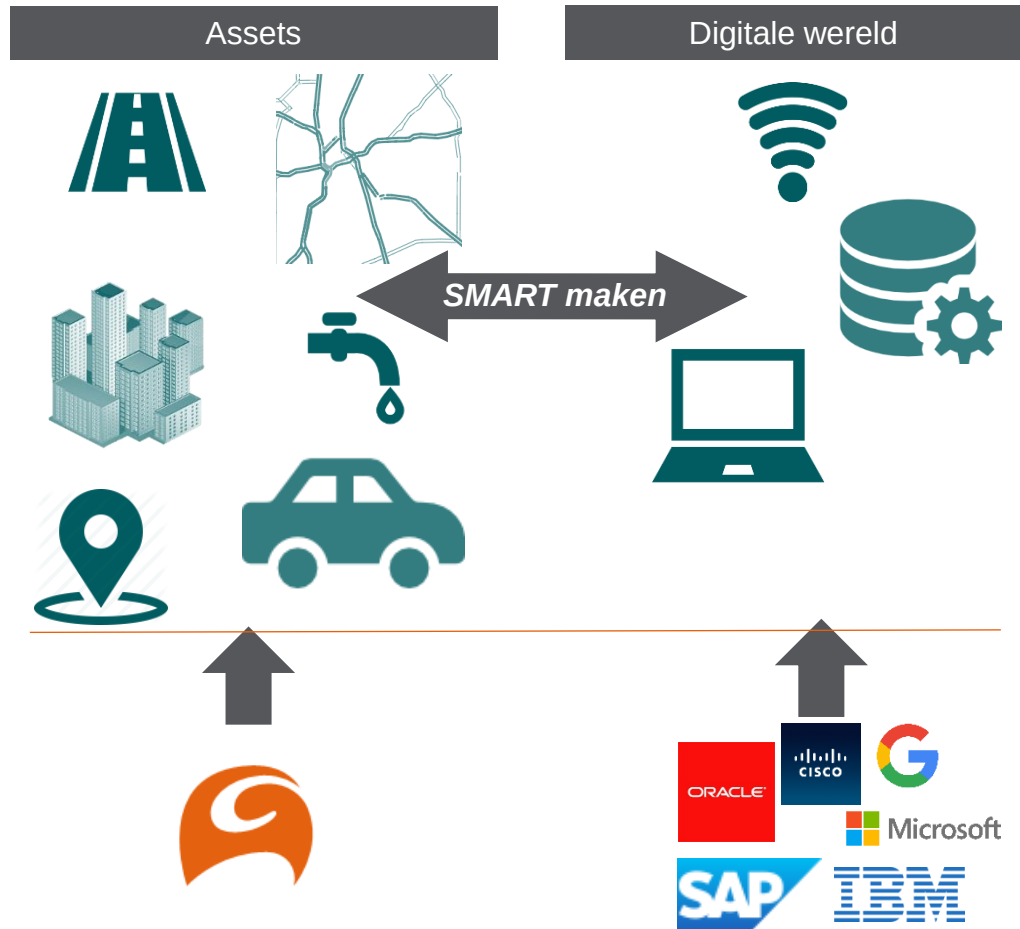


SMART City

Bijv. NO₂ Detectie



De trend waar we vanaf nu groter op inzetten is digital



Smart City

A *Smart City*, is a **resilient**, **efficient** and **innovative** city which uses technology innovations and new business models to improve quality of life.

Resilient.

Smart Cities are resilient. They can adapt easily to new situations and function under stress. They use technology to cope with economic, social and environmental changes and see change as an opportunity.

Efficient.

Smart Cities are efficient. They realise that space, time, energy and materials are scarce. They use technology and design to focus on social challenges such as energy and resource efficiency, mobility and circular economy.

Innovative

Smart Cities are innovative. They believe in the power of innovation and help to drive innovation in the city by linking people, by developing knowledge hubs, by boosting and facilitating prototyping in the city.

Smart city

Zero-emission
buildings

Internet of Things

Self-driving vehicles

Smart roads

Smart logistics

Smart Buildings

Smart Mobility

Smart HVAC

Smart lighting

Smart traffic
management

Integrated
mobility

Smart asset
management

Smart guidance

Smart grids

Smart water
supply

Smart public
services

Smart
lighting

Smart City
systems

Smart water
systems

Smart energy

Smart collaboration

Smart integration

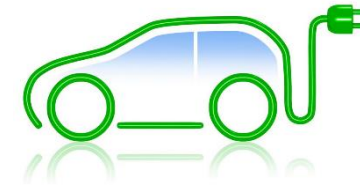
Smart mobility

Transitie in mobiliteit: verschillende trends

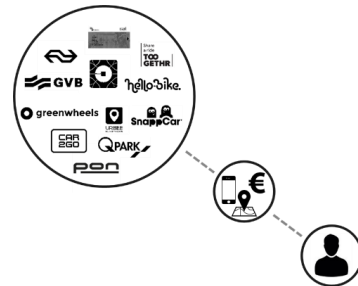
DEELECONOMIE



ELECTRIFICATIE



MOBILITY AS A SERVICE



AUTONOMIE RIJDEN



Need for MaaS @ ZUIDAS

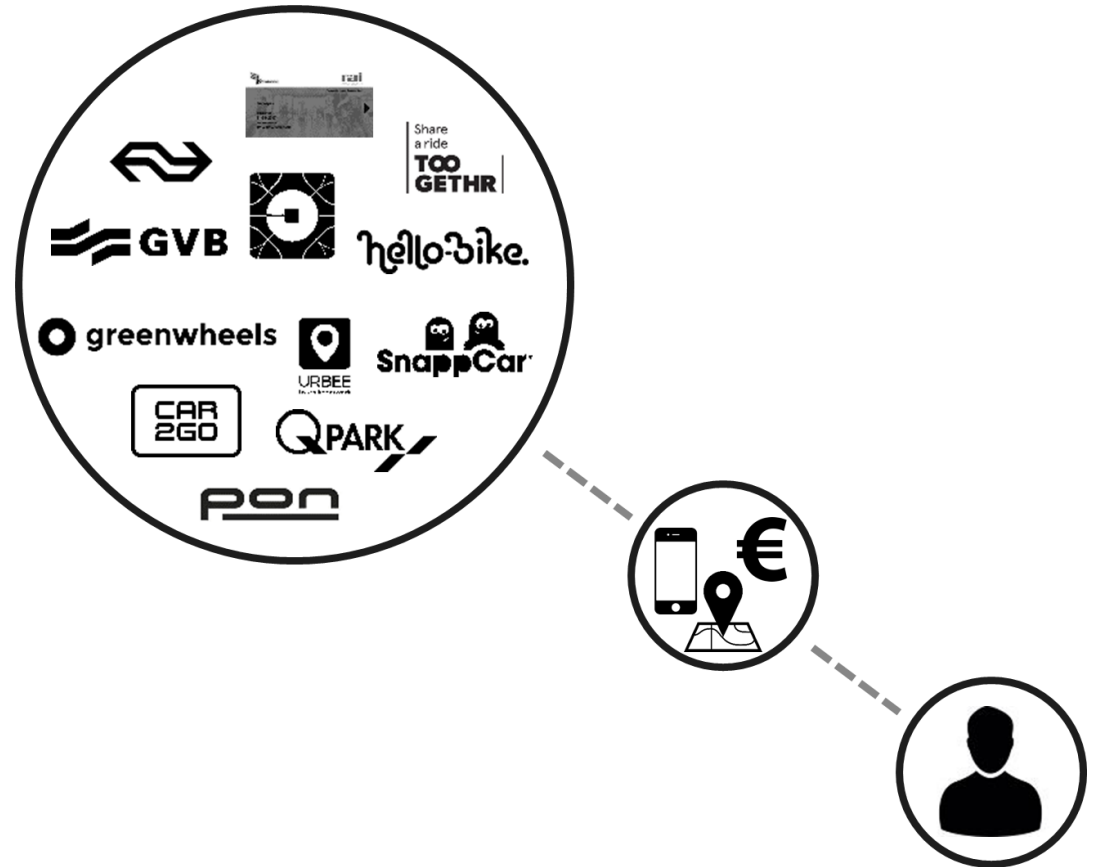


Zuidas is thuis van bedrijven...



... maar zowel de A10 als het station worden flink verbouwd

Anders reizen: er zijn mogelijkheden maar het is momenteel een heel gedoe

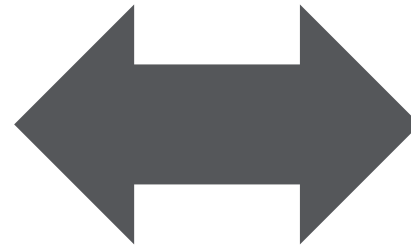


Twee routes **naar succes**

Zuidas employers process and MaaSterplan



- Lange termijn
- Top down
- Commitment



Stop talking – start doing!



- Korte termijn
- Bottom-up
- Gebruikers participatie

Werkgeversproces: **potential and willingness**



Zuidas potential

- Mobility demand
- High profile
- Well-organized
- Mobility options
- Density
- Clear need: construction works

Zuidas willingness

- Employers willing to embrace MaaS

Joint buying process

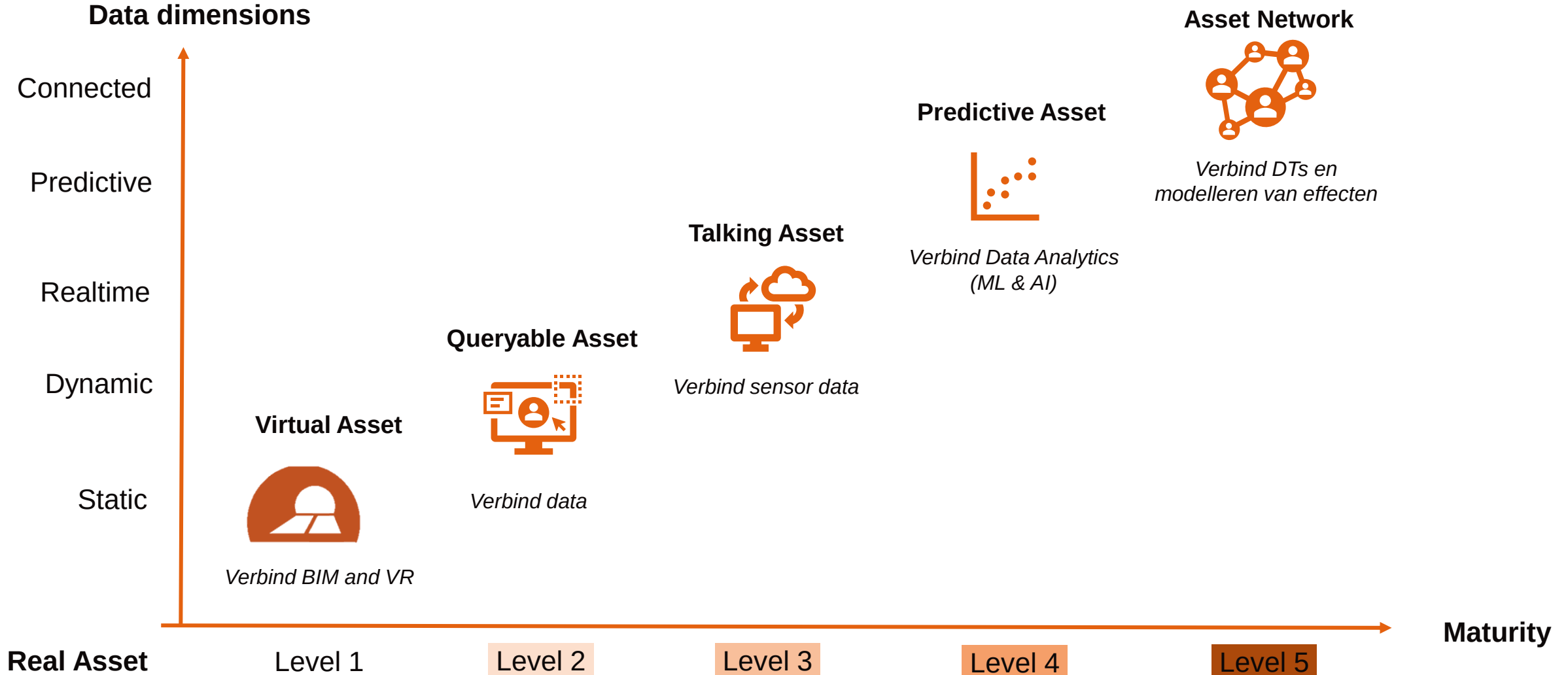
Zuidas Mobility Experience: stop talking, start DOING

- Create **awareness**
- **Prepare** employees for use of MAAS
- Get insight in user requirements & feedback
- Start driving **behavioural change**



Digital twins

Digital Twin - Theorie & Levels



Voorbeeld documenten gekoppeld - hulppostkasten



Test met verkeersanalyse videobeelden



Verlichting & attributen



Attribuut	Voorbeeld
Type	SON-T 1000W E40 1SL/4
Energiegebruik	1056 kW
Aangebracht	15-04-2021
Verwachte levensduur	20000
Restlevensduur	20000
Etc.	

Automatische beeldherkenning

Scalability of IAI use cases

AI-enabled mapping and monitoring of all assets across sectors and sources.

Product information:

PO Roland.Dijkhuizen@Arcadis.com

PM Esther Kuiper@Arcadis.com



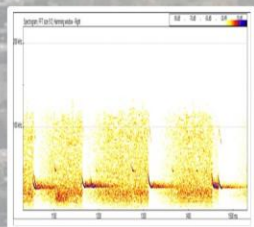
Intelligent Asset Insights
Powered by Arcadis



BRICK DEFECTS
COMPUTER VISION



BATS SOUND DETECTION



GARBAGE AND LITTER
COMPUTER VISION



LANDSCAPE ELEMENTS AERIAL
IMAGERY COMPUTER VISION



MUTATION WATER SYSTEMS
SATELITE COMPUTER VISION



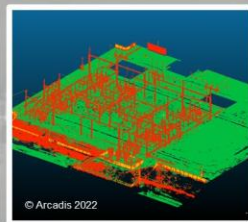
ROAD CONDITION
POINT CLOUD



ROAD SURFACE ANALYSIS
COMPUTER VISION



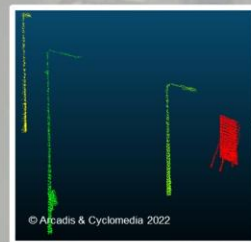
HIGH VOLTAGE ASSETS
POINT CLOUD



RAIL ASSETS
COMPUTER VISION



ROAD ASSETS
POINT CLOUDS



WAREHOUSE DEFECTS
COMPUTER VISION



ROAD DEFECTS
MARKINGS
GUARD RAILS
ROAD SIGNS
ROAD ASSETS



WILDSPOTTER ANIMALS



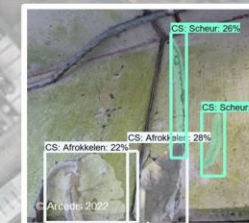
MANHOLES DRONES
COMPUTER VISION



CONCRETE DEFECTS
COMPUTER VISION



CIVIL STRUCTURE CONDITION
COMPUTER VISION



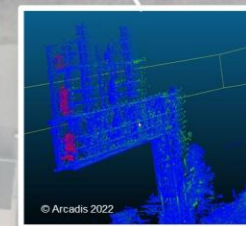
RIVER PLASTIC DRONES
COMPUTER VISION



RIVER BANK EROSION
REMOTE SENSING



RAIL ASSETS
POINT CLOUD



RAIL TRACK CONDITION
COMPUTER VISION



Overwegingen

Uitdagingen in een SMART city

Van wie is de data?



Welke meerwaarde heeft een smart city? Wie betaalt dit?



Hoe organiseer je dit? Wie heeft daarin welke rol?



Hoe gaan onze klanten om met deze stap?



Datagedreven werken
Digitale stad



ProRail

Datalab
IMX



Omgaan met data in een smart city

- Alle data bij elkaar, welke risico's zitten daar aan?
- Wat laten we allemaal van data afhangen? Wie maakt zich daar druk om?
- Maken we onze wereld te ingewikkeld?
- Waar houdt de asset data op en waar begint persoonlijke data?