

From building to area, and from smart to sustainable and stakeholders

-

Van Gebouw naar Gebied, en van smart naar sustainable en stakeholders

Lucas Carmody

Senior Manager,

Urban Development and Smart Cities

PwC

Introduction

- 01 Drivers of change
- 02 The challenge
- 03 Urbanists and technologists
- 04 The emerging response
- 05 From building to area and from smart to sustainable
- 06 Why PwC?

01 Drivers of change

BITS, BRICKS, BEHAVIOUR

2018

22 november | Supernova | Jaarbeurs | Utrecht



A lot of people love cities; they're centers of culture and business and life.

More than half the world's population now lives in cities, and that figure will go to about two-thirds of humanity by the year 2050.

Cities are getting bigger.

In 1990 there were ten "mega-cities" with 10 million inhabitants or more. In 2014, there were 28 mega-cities, home to 453 million people.

The coming decades, this **increasing urbanization** comes together with the **challenge of sustainable competitiveness**: a city's ability to keep **growing and developing** over time while keeping the city a **livable place**, fostering **social cohesion and**



Key challenges cities are facing during the coming decades:

Mobility
Pollution
overpopulation
Circular-economy
Urbanization
environmental-protection
Sustainability
Social-inclusion
Housing-affordability
Elderling
energy-consumption
resource-scarcity
Transportation
Accessibility
Homecare

In the Netherlands, we are facing a substantial need to invest in new infrastructure and buildings in the coming decades



Real estate

- 1 million new residential houses needed until 2040, on top of renewal
- Renovation : >55% of corporation housing stock is over 35y old
- 71% of pension funds indicates a wish to invest in new buildings for elderly and sheltered accommodation



Energy transition

- An entirely new, decentralized smart energy grid structure will unfold in the next decades
- Large-scale retrofitting of the built environment required
- 25% of the houses must change gas into alternative energy supply in 2030
- Electrifying current heating needs 10x the capacity of new energy in 20 years
- Challenges in sufficient alternative supplies (e.g. data centers)



ICT infrastructure

- Increased demand for ICT infrastructure to enable self driving cars & smart mobility systems, smart buildings, sensor networks and new data centers
- Telecom: Fiber network backbones; Densifying mobile networks,
- Connecting street furniture
- Challenges in cyber security
- Incoming 5G roll out



pwc

BITS, BRICKS, BEHAVIOUR

2018

22 november | Supernova | Jaarbeurs | Utrecht

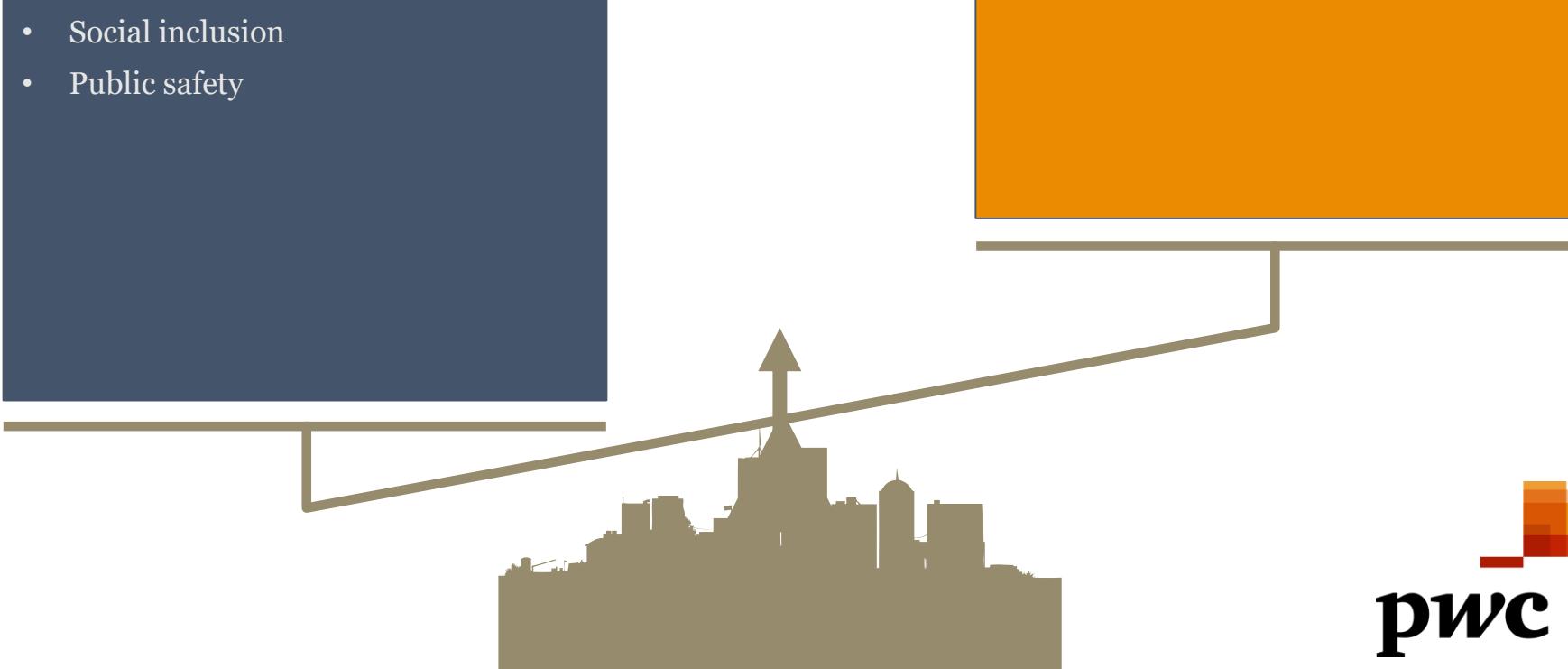


Problem

- Climate change
- Resource scarcity
- Social inclusion
- Public safety

Solution

- Energy transition
- Smart utilities management
- Citizen engagement
- Surveillance, sensor and better urban design



o2 The challenge

New and innovative approaches from outside the traditional urban domain is needed

Traditional domain of urban development



BITS, BRICKS, BEHAVIOUR

2018

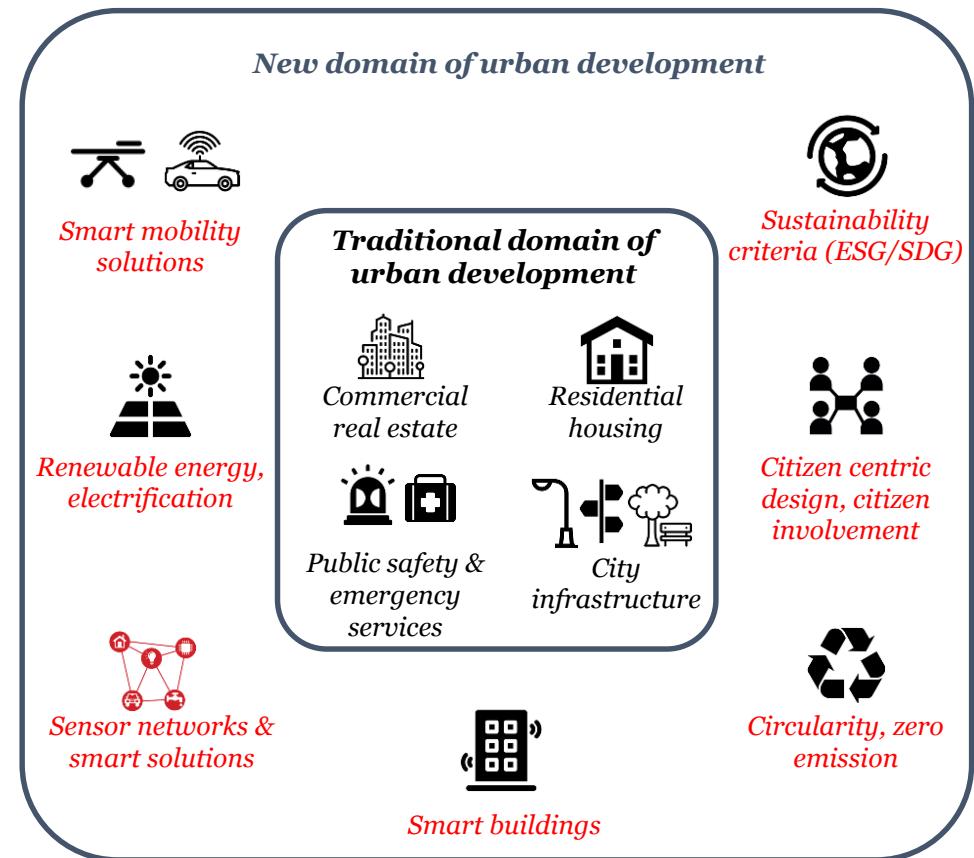
22 november | Supernova | Jaarbeurs | Utrecht



Ecosystem of multiple stakeholders and interests

Many interdependencies between actors and sub-systems

New business models & integrated value cases



03 Urbanists and technologists



Technologist

New urban domain



Understand how digital technology can be applied to existing systems to improve urban lives and address urban issues



Fast and impatient, view the city as a system of systems and looking for ways of optimizing systems



Intimate understanding of their end user with ability to generate big data and live insights



Urbanist

Traditional urban domain



Understand how cities work and use traditional levers of policy, urban planning and architectural design to improve urban lives and solve urban issues



Slow and calculated, view the city more as a set of social constructs and deeply ingrained behaviors that take time to change and influence



Limited ability to understand their end user (e.g. pedestrian movement in a development, neighborhood post development)



Lost in translation

Why integration between tech and urban isn't so simple

When tech doesn't understand urban:

- technology is developed that is urban in application but doesn't actually make cities better
- introducing new tech and smart city solutions to problems that don't exist or you don't properly understand

Case study 1 - Songdo, South Korea



Urbanist and technologist speak a different language

- Technologists prefer to approach problems from first principles, rather than existing practice.
- Urbanists, prefer existing practice, as a mechanism to get things built in the system that currently exists.

Case study 2 - IBM and Portland

- predictive model for urban planning
- using historical data to generate innovative policies for city planning
- result was promote active transport to reduce obesity

When urban doesn't understand tech:

- Uber
- Airbnb
- Sidewalk Labs

BITS, BRICKS, BEHAVIOUR

2018

22 november | Supernova | Jaarbeurs | Utrecht

FHI GEBOUW
AUTOMATISERING

Who pays?

Multiple stakeholders requires identifying value and how to monetize this value



We are giving you our data, what do we get back?

Local community



We are giving you our product/ service, what do we get paid?

Tech company



We have to accommodate new technology, how do we get paid?

Urban developer



How do we fund this untested technology on a city wide-scale?

Public sector



o4 The industry response

What has the response been by the traditional urban domain?



Buy

- **Buy** and invest in proptech that improves the way traditional built environment sector operates and introduces new revenue streams to the existing business model.

PwC's Emerging Trends in Real Estate



Build

- **Build**, some companies are investing in their own dedicated proptech investment and R&D facilities.
- Embracing digital disruption, urban development companies are looking to hire tech talent from outside the urbanist mould.



Bury

- While there remains many in the sector who have decided to **bury** their heads in the sand.
- The sector is too large and fragment to see true disruption.
- Despite talk of disruptive technologies and technical innovations, urban development remains fundamentally unchanged.
- Where is the Uber, Amazon or Booking.com? Unthinkable business models remain relatively absent in the real estate industry (except retail).



BITS, BRICKS, BEHAVIOUR

2018

22 november | Supernova | Jaarbeurs | Utrecht



Blurred lines – merging of old business models with new



Real estate into tech



Tech into real estate



Brookfield

Multifamily properties that can be rented out on Airbnb



Westfield

Platform that empowers retailers to digitize sales



The Durst Organization

Cloud-based platform allows landlords to track repair projects/vendors across portfolio



unibail-rodamco

VC fund and tech accelerator



Blackstone

Tech-based leasing and management platform



Colliers INTERNATIONAL

Real time network for office space. Connecting growing teams and profession looking for space.



Development of city region in Toronto through Sidewalk Labs



Modular high-end housing startup that could be potentially integrated with Alexa technology.



Enables long-term tenants to sublease apartments



Tech fund invests in 'real estate' business



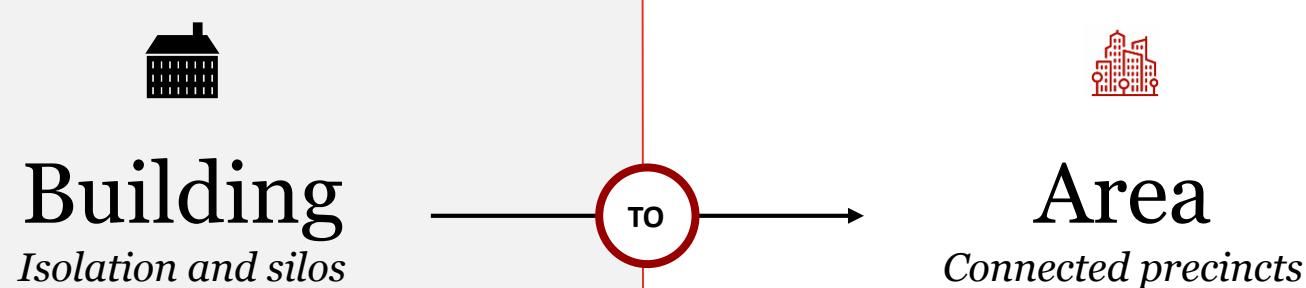
Partners with managers to provide co-working space/ workplace services



Plans to create a mixed-use campus town



05 From building to area,
and from smart to sustainable



1. **Siloed approach** – Individual solutions (e.g. energy, mobility, housing, communication) are executed as individual projects
2. **Single use** – Companies offer individual products and solutions for singular use
3. **Individual business model** – targeted at maximizing profitability or position in the value chain

1. **Put people first** – Understanding how the community uses existing spaces to inform new solutions (e.g. infrastructure, facilities and services)
2. **Connections driven** – create vibrant and productive places where people want to **live, work** and **play**
3. **Partnership models** – Municipalities and market parties function as partners, together in eco-systems with diverse stakeholder objectives and interests (e.g. solutions are developed in ‘innovative partnerships’ in PPP models)

Smart precincts provide a greater opportunity for sustainability



What is the point of working, living or learning in a 5 star Green Building if people are leading 1 star lives once they leave the building?



While there are barriers preventing investment in sustainable technology at a large scale, it's at the precinct level that we go from barriers to benchmarks



The next step is going from benchmarking self-sufficient precincts and from there, precincts that can export their energy and water resources to surroundings neighbourhoods

Barangaroo – Sydney's largest commercial urban renewal project

A model for precincts we can go from neutral to positive.

22 ha site on Sydney Harbour featuring – a mix of uses including recreational and public park lands, residential, hotel, retail and commercial. Key sustainability features:

- **Climate positive** – generates more energy than used, recycle and export more water than is used, and recycle more waste than is generated.
 - Onsite power, cooling, water and waste management to reduce footprint.
 - Recycling 99 per cent of construction waste
- **Social sustainability** – a positive social legacy that benefits the wellbeing of everyone in the community. This has resulted in establishing and delivering at least 50 successful community learning and wellbeing programs



BITS, BRICKS, BEHAVIOUR

2018

22 november | Supernova | Jaarbeurs | Utrecht



Area development is transforming into a ‘new normal’ in which topics like zero-emission, energy neutrality, circularity, ‘smart’ and ‘sustainable’ are becoming part of tender-demands that must to be proven by contractors

ArenAPoort an example for sustainable area development

Amsterdam Arena has the ambition to make ArenAPoort a worldwide example for smart and sustainable area development.

Sustainability objectives include circularity, energy neutrality, citizen involvement, safety and accessibility



- The individual dreams of the project partners in the area have been translated into a joint ambition for ArenAPoort.

In 2030 is **ArenAPoort** een aantrekkelijk, hoogstedelijk en gastvrij verblijfsgebied, een **kloppend hart** van Amsterdam Zuidoost. Een ‘urban’ centrum in Amsterdam met een **unieke mix** van wonen, leisure, winkelen, werken en ontmoeten. Een internationaal uitgaansgebied van allure met een **wereldse vibe** en een prettig leefklimaat op ieder moment van de dag. Een écht stedelijk gebied met **verblijfskwaliteit**, groen en ruimte voor sport en beweging. Op het gebied van slimme mobiliteit, crowd control, veiligheid en duurzaamheid staat ‘innovation by design’ centraal en wordt ArenAPoort het inspirerende **Smart City** voorbeeld voor Nederland.

And we see many other examples of transformations towards smart and sustainable area development, a.o:

Bajeskwarties Amsterdam:
Energy neutral & circular



Brainport Smart District: Helmond
‘Smallest neighborhood of the world’



Toronto Waterfront-Sidewalks Lab
high-tech neighborhood



Milan Innovation District
Transformation of the Milan2015 Expo

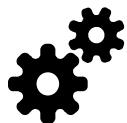


Stockholm Royal Seaport
Next-gen, sustainable urban district



To tackle the key challenges for true realization of future proof sustainable cities

Integrated solution,
overarching silos



Holistic approach
with cross over
effects



People first -
stakeholder
orchestration and
balancing interests



Understanding the
business models of
your partners



Capturing the real
value of the project



Understand how
you can measure
the impact of your
investments



- Integrating point solutions of different layers of the value chain in 1 proposition
- 1 integrated solution, overarching silos and combining all needed skills

- Addressing big urban challenges within area development plans to improve quality of life in cities on 8 main themes
- Urban area development with new innovative solutions in 1 E2E solution
- Realizing cross-over effects

- Orchestration of external stakeholder landscape
- Balancing commercial and public interests
- Integrated business case
- Managing stakeholder field across the municipality and in Public-private partnership

- Improved prospect to value increase
- Social effects will be fact based demonstrable, resulting in:
- Lower risk estimation
- Improved position to attract equity
- Broader range of optional equity partners (green lease, DJSI)

- Able to provide assurance on social outcomes and effects (KPIs, and effect measuring both quantitative + qualitative)
- Realize visible commercial and social effects
- Contribute to business and governmental SDG targets
- Deal value: measurable results, business case realization (commercial and social)

- Life cycle approach: E2E approach: connecting up front city objectives with monitoring of effects during area maintenance
- Both commercial and social objectives as starting point
- Translation in clear KPI's
- Data driven measurement
- Link with SDGs and available measurement systems within the municipality

o6 Why PwC?

PwC bridges and balances the divide between urban and tech

- PwC are a reflection of the new and old urban domain
- We have diverse mix of experienced technologists and urbanists (see digital services vs. capital projects and real estate)
- Our technologists work with our industry experts to help clients from all sectors embrace digital disruption
- Our urbanists work across each phase of the urban infrastructure delivery cycle, for both the public and private sector
- We understand how to bring this together, balance objectives and create large scale value cases and business models that work for all parties



BITS, BRICKS, BEHAVIOUR

2018

22 november | Supernova | Jaarbeurs | Utrecht



**Bart
Kruijssen**

Partner
EMEA Real Estate
Leader

Bart.Kruijssen@pwc.com



**Bas
Weber**

Partner
Consulting

Bas.Weber@pwc.com



**Gertjan
Baars**

Senior Director
Technology expert

Gertjan.Baars@pwc.com



**Peter
Teunisse**

Senior Director
Urban and smart city
regions expert

Peter.Teunisse@pwc.com



**Steven
van Agt**

Managing Director
Advisory

Steven.van.Agt@pwc.com



**Marieke
Fijnvandraat**

Director
Smart City Expert

Marieke.Fijnvandraat@pwc.com



**Lucas
Carmody**

Senior Manager
Urban planning,
economics and smart
cities

Lucas.C.Carmody@pwc.com



Contact us

