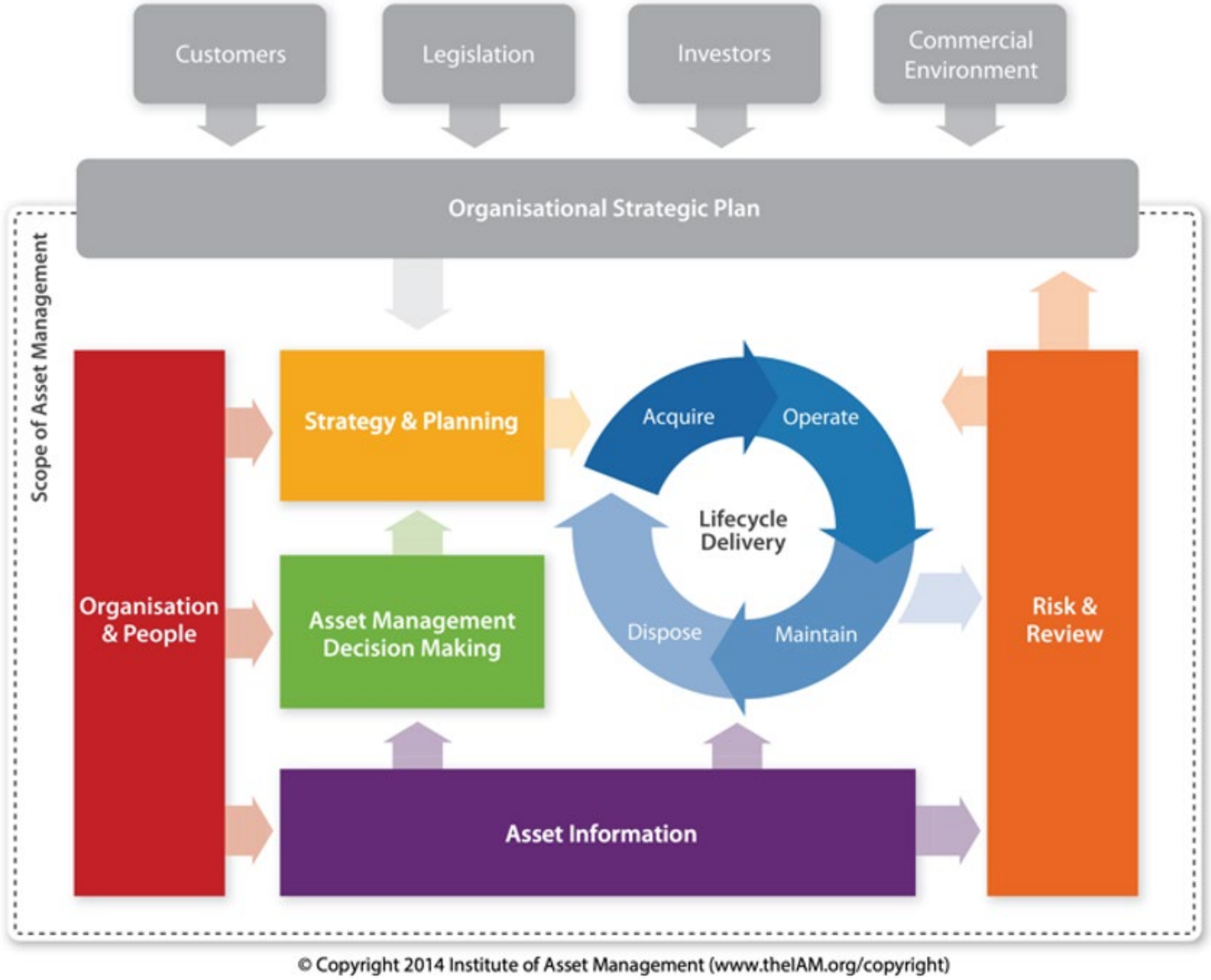
UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

URBAN & PUBLIC INFRASTRUCTURE RESEARCH INITIATIVE

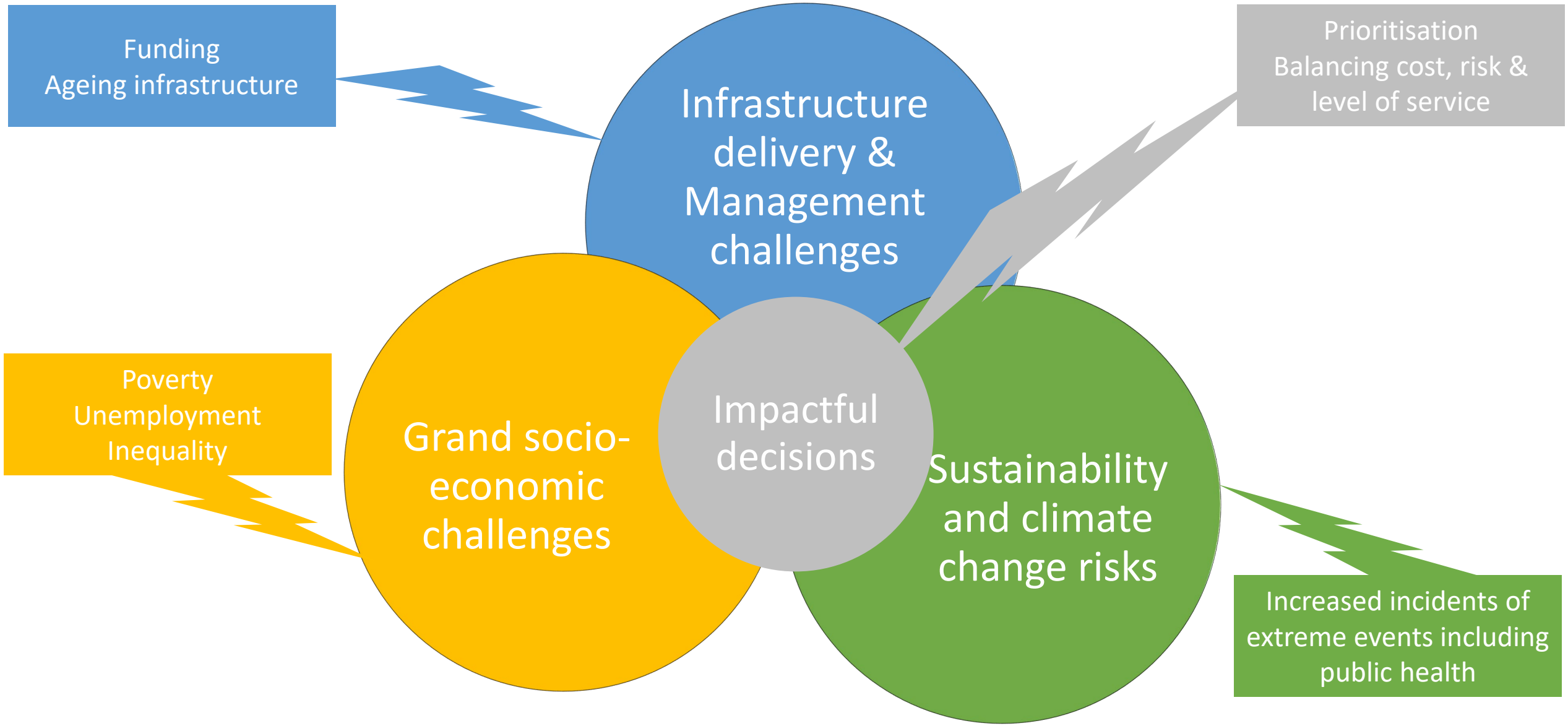
Data-driven infrastructure management

Prof Pilate Moyo

Department of Civil Engineering

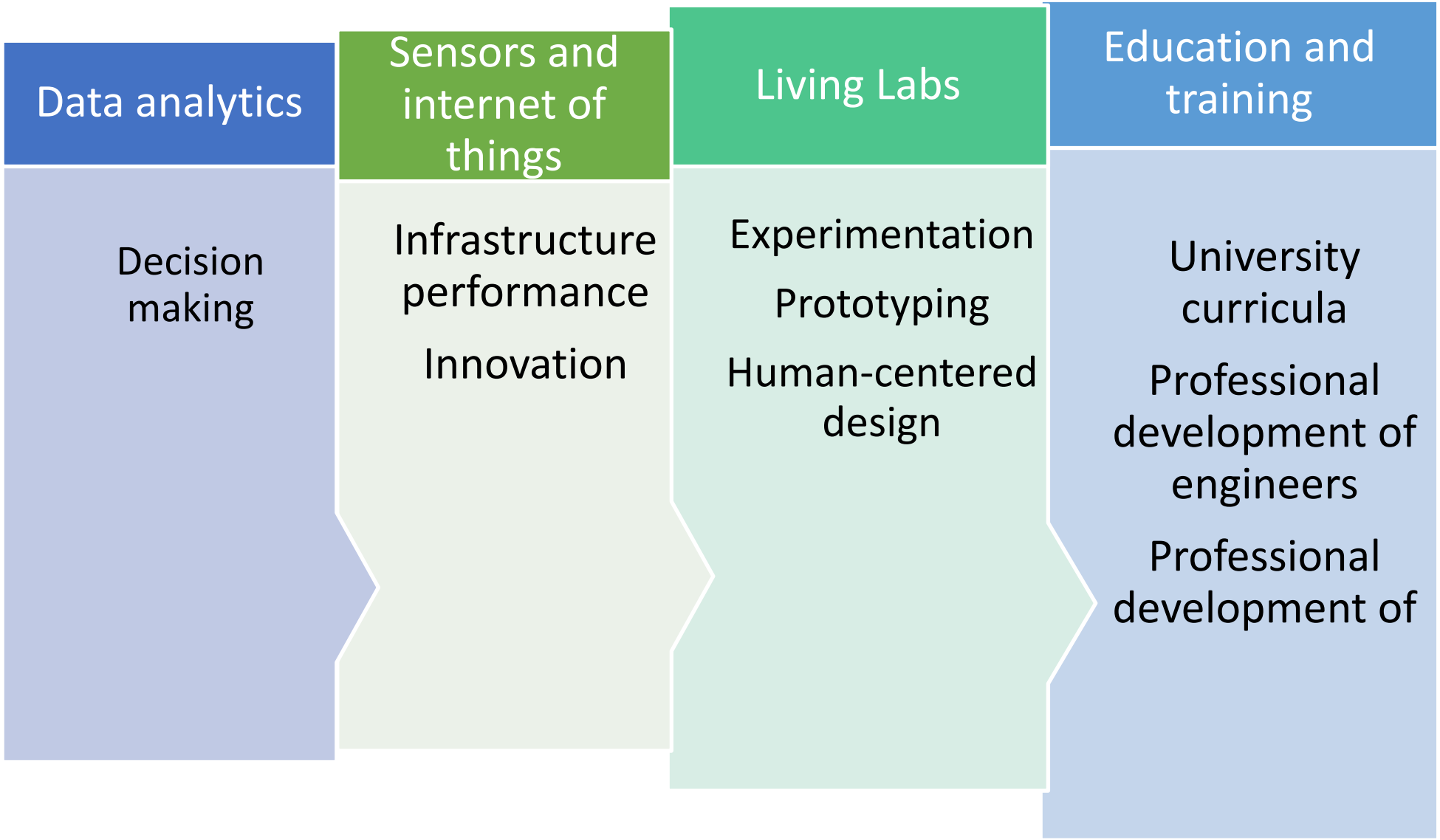


Asset Management System [ISO55000, ISO55001, ISO55002]


Funding
Ageing infrastructure
Infrastructure delivery & Management challenges
Prioritisation
Balancing cost, risk & level of service
Poverty
Unemployment
Inequality
Grand socio-economic challenges
Impactful decisions
Sustainability and climate change risks
Increased incidents of extreme events including public health

Opportunities

- The emergence of Digital technologies is enabling extraordinary ideas and tools capable of changing the way we live.
- Supportive legislation


Data analytics
Sensors and internet of things
Living Labs
Education and training
Decision making
Infrastructure performance
Innovation
Experimentation
Prototyping
Human-centered design
University curricula
Professional development of engineers
Professional development of

Urban and Public Infrastructure Initiative

- Recognise the challenges and opportunities
- Infrastructure is a catalyst for development
- A human centric-approach is critical for success
- Public sector-industry-academia partnerships are essential [MISA, DWS, DPWI, STATS SA]

Key research themes

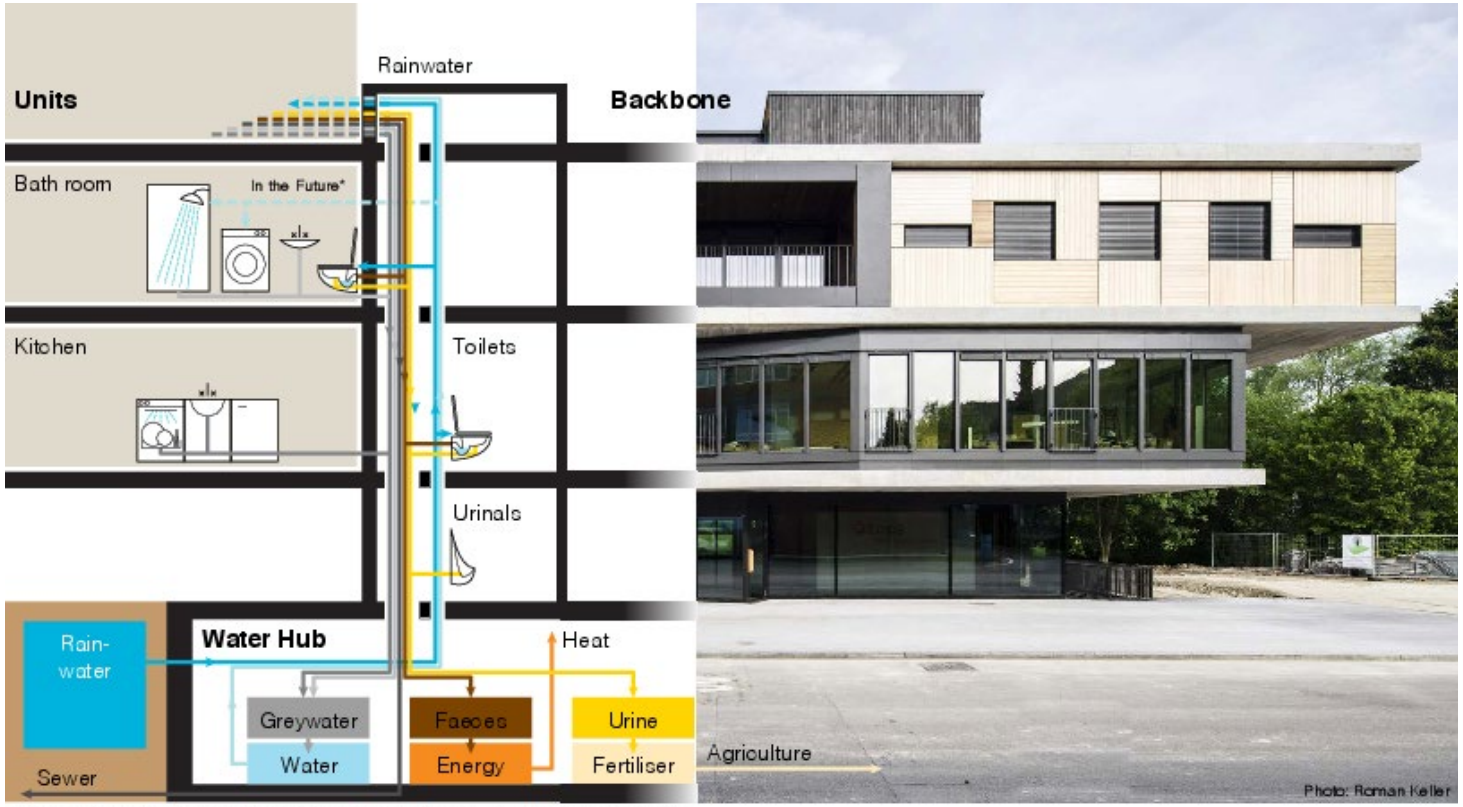
- Infrastructure Policy and Legislation
- Public Infrastructure Management
- Infrastructure and public health
- Data & Information Analytics
- Infrastructure Resilience & Sustainability (Climate Change)
- Entrepreneurship & Innovation

Establishing a Digital Laboratory

The **Digital Lab** will be an information hub supporting a range of research activities on **Urban and Public Infrastructure** by providing facilities for:

1) Data analytics and data visualisation [data driven decision making]
2) Digital twinning, including testing and deployment of sensors
3) Internet of things
4) Extended reality
5) Live experimentation (the facility will be designed as a living laboratory - water & wastewater, energy efficiency etc)
6) Investigating the role of new technologies in shaping infrastructure in anticipation of or in response to climate change.
7) Education and training.

Living Laboratory



* Treated greywater will only be reused after extended testing, in order to guarantee its quality.

NEST: exploring the future of water and waste management & resource recovery

- The separation of the waste streams will be permanent
- The treatment options will be variable
- When the ‘waste’ stream is not being treated it will be sent to the sewer network

- COVID-19 has shown the power of science and the combined effort of all sectors

- Infrastructure challenges can benefit from the lessons of COVID-19

Thank you