

Introducing Environmental Twins

A central insight in a (bio-)diverse environment

AquaConSoil2023

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Deltares

 Photon Water

 Photon Remediation

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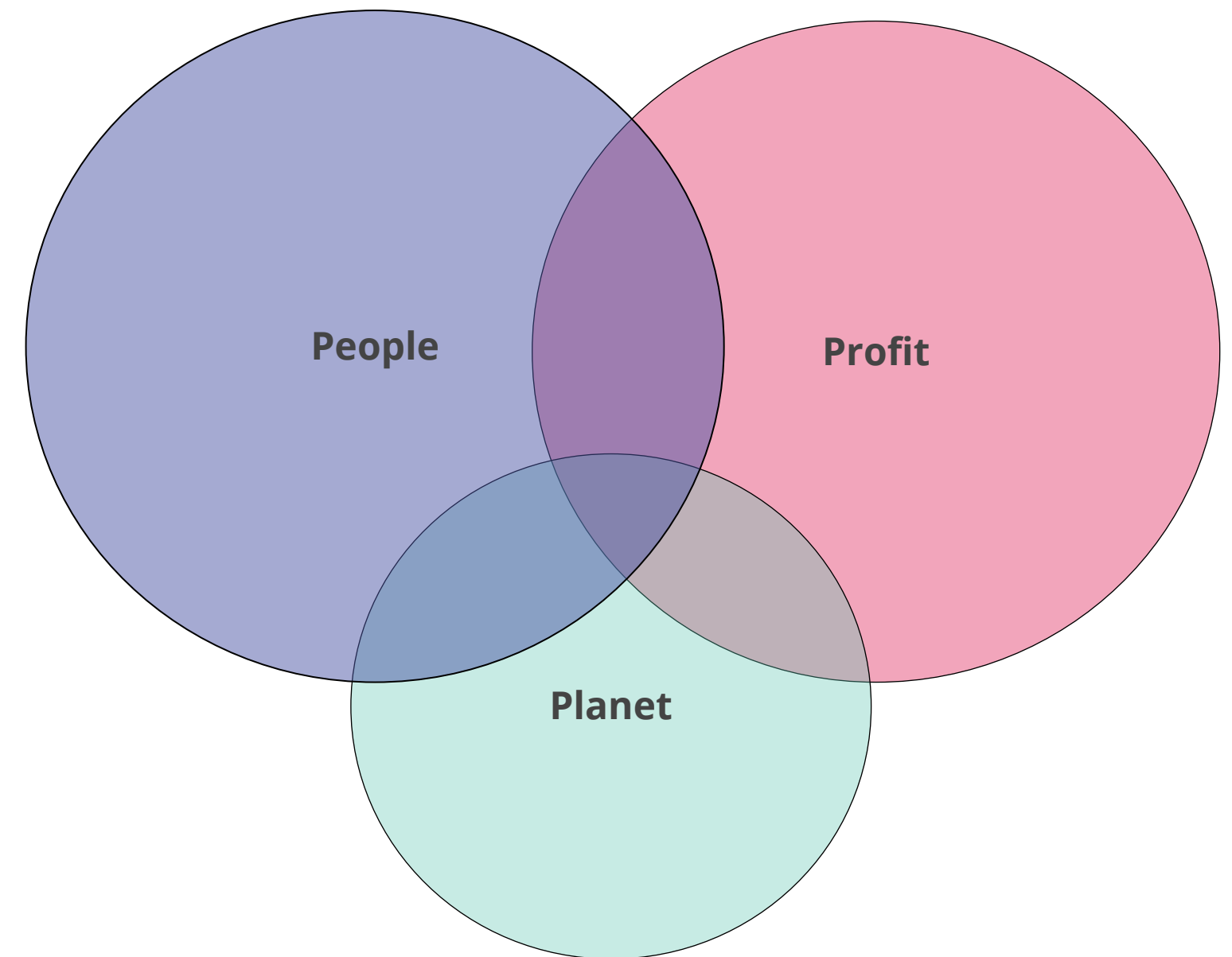
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Introduction

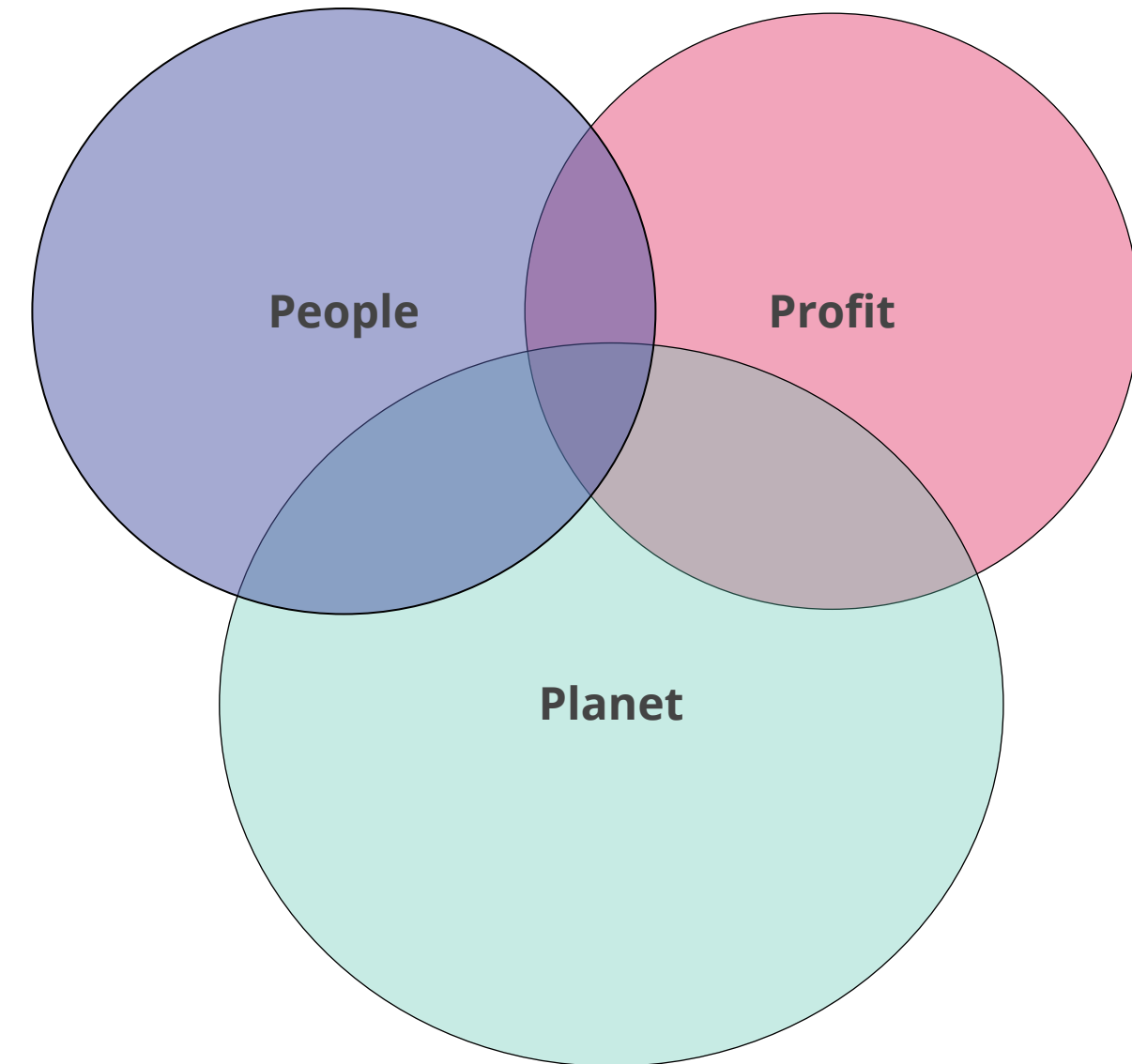


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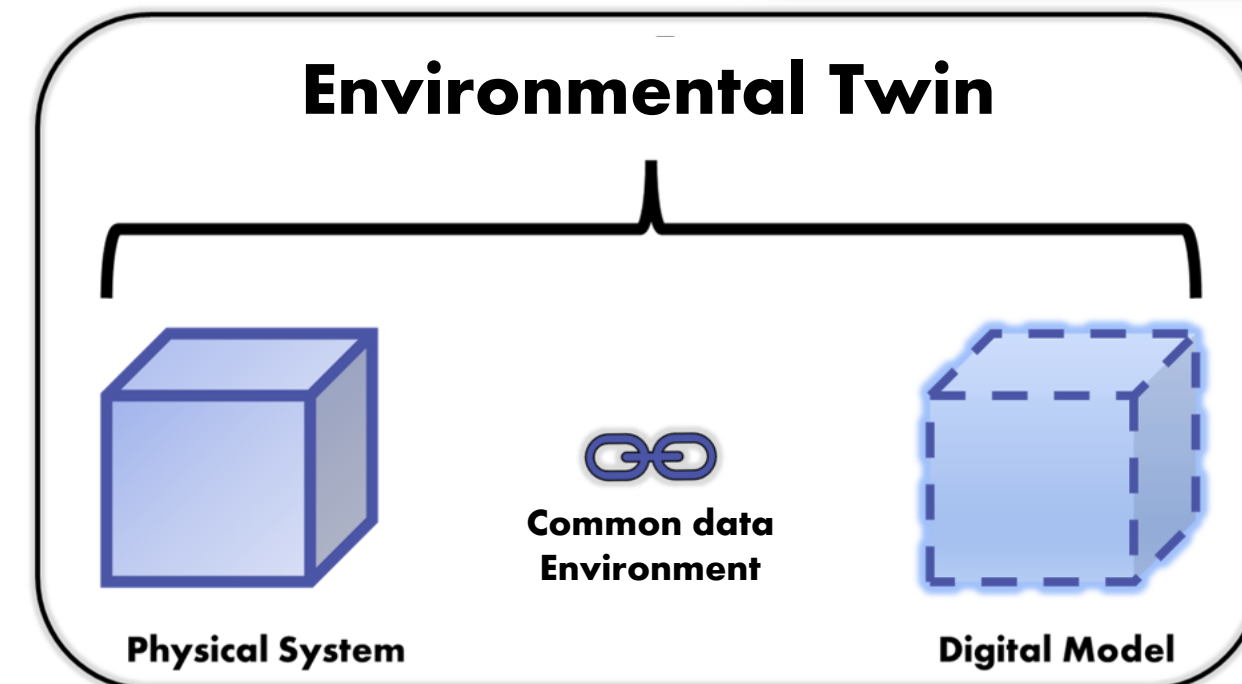
Introduction

- Impact on policy, regulation and legislation
- Environment and Planning Act (2024) in the Netherlands
 - Aiming at protection
 - Defensive approach to activities
 - Simplify and merge legislation



What is an Environmental Twin?

- We monitor and analyse the physical environment:
 - e.g. Soil, Groundwater, Ecology
- Environmental Twins are based on:
 - Open data (buildings, cadastral information etc.)
 - Own data (boreholes, analysis results, groundwater sensors, presence of ecological species etc.)
 - Measuring and monitoring connected through CDE



What is an Environmental Twin? (2)

- An Environmental Twin can function as a tool to:



Describe and visualize



Analyse and monitor



Simulate and predict

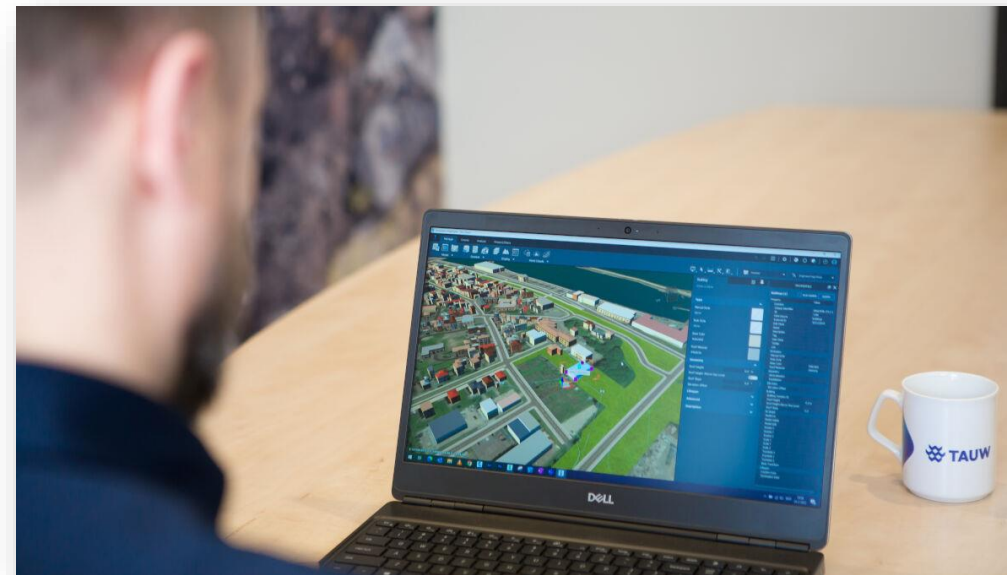
- An Environmental Twin is not just the tool itself:
 - Connectivity: It is part of an ecosystem of linked data sources, analytics, predictive models and platforms
 - It is an iterative 'way of working'

Who can use an environmental twin?

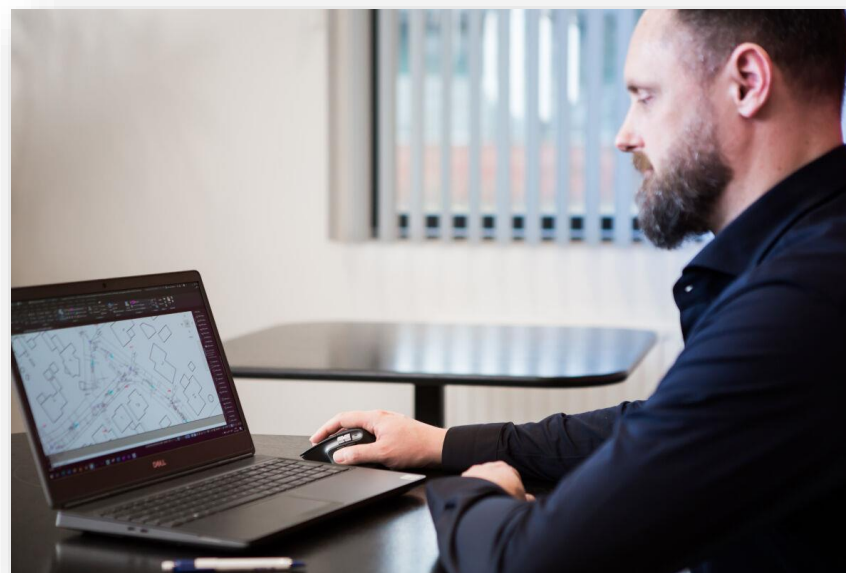
Supporting tool for solving complex spatial problems



Decision makers: Evaluate impact of changes



Spatial planners / designers:
Short-cycle designing

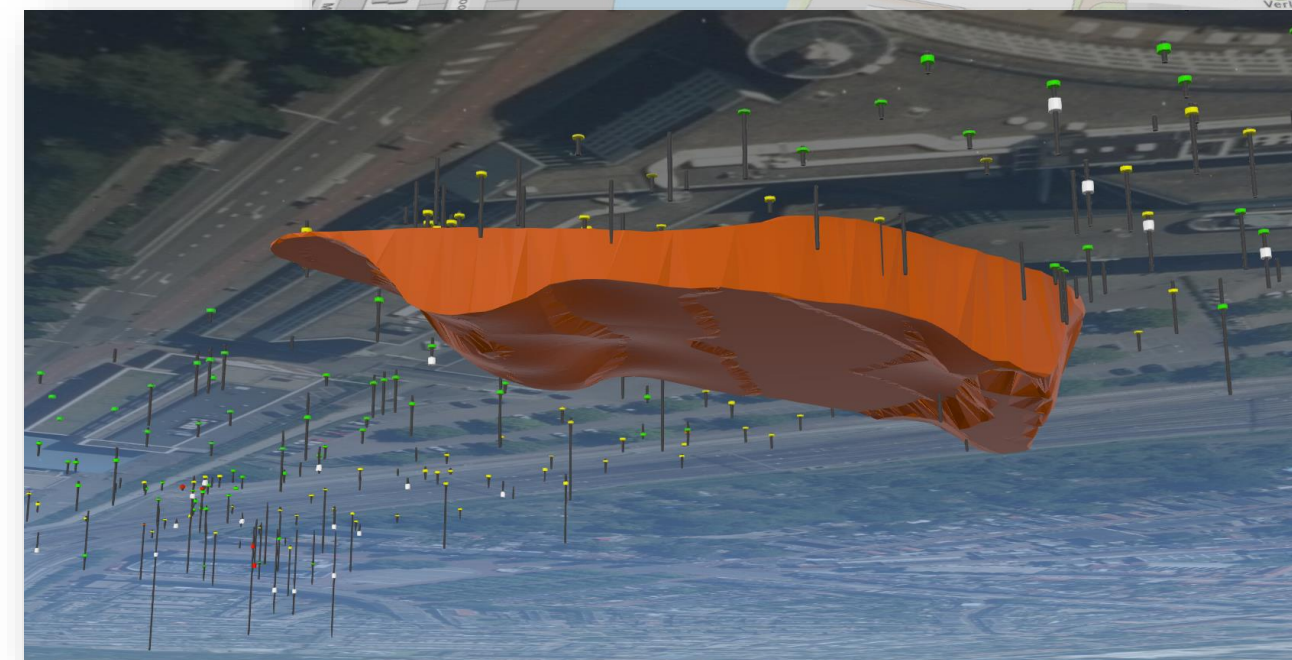


Administrators: Monitoring compliance issues

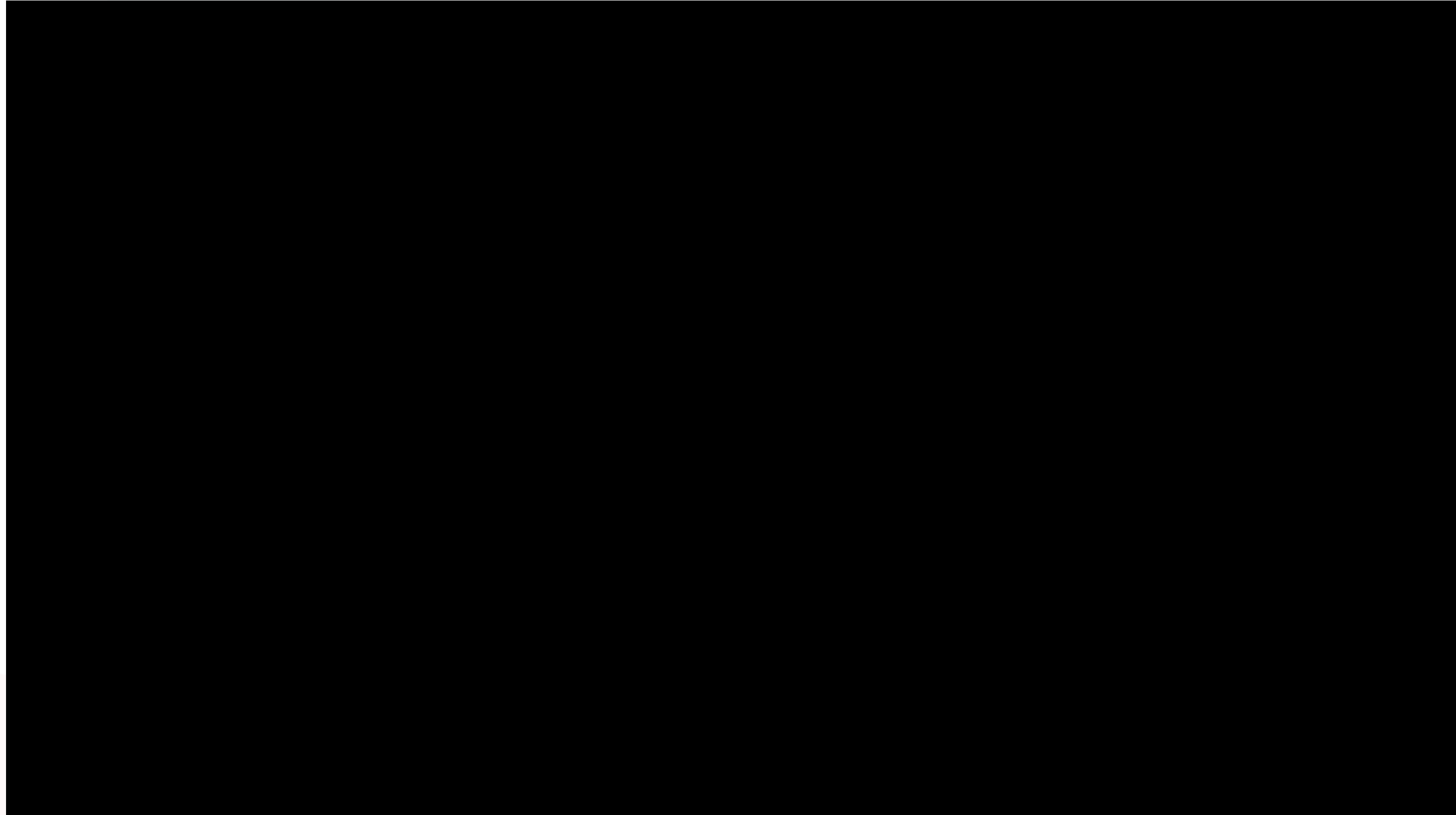
Example 1: 3D Conceptual Site Model

Soil and Groundwater

- Environmental twin for the subsurface domain
- A visual representation (twin) for remediation sites:
 - Identify risks and knowledge gaps
 - Visualizing interfaces
 - Time-linked: changes over time



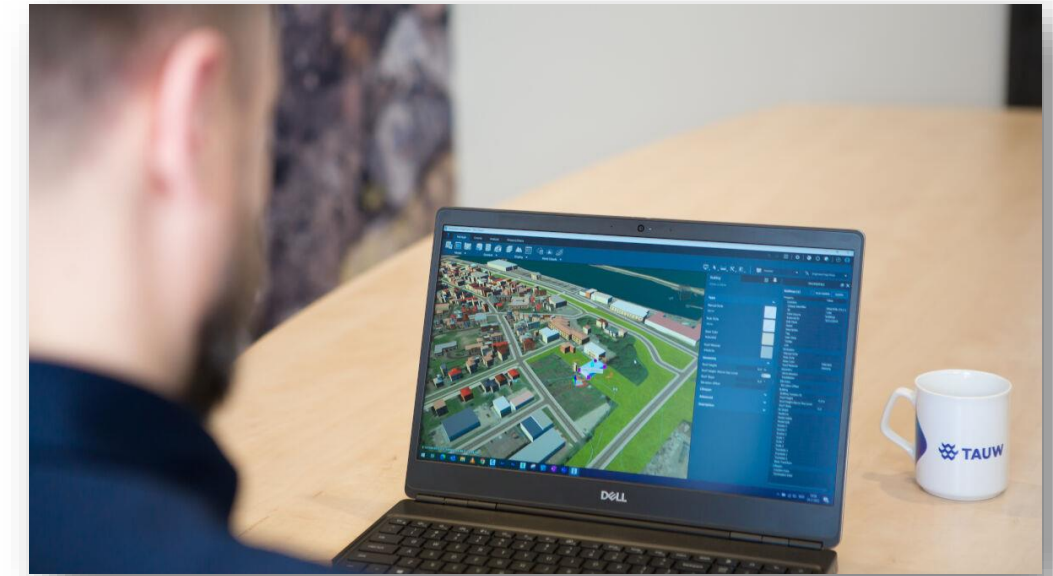
Example 1: 3D Conceptual Site Model



Example 2: Short-cycle designing

Planning and design

- Environmental twin for the design and climate adaptation domain
- An ecosystem of design and simulation practices:
 - Closer co-operation between designer and environmental specialist
 - Quick, automated sharing of design without loss of data to test on environmental impact
 - Client can monitor designing progress and environmental impacts



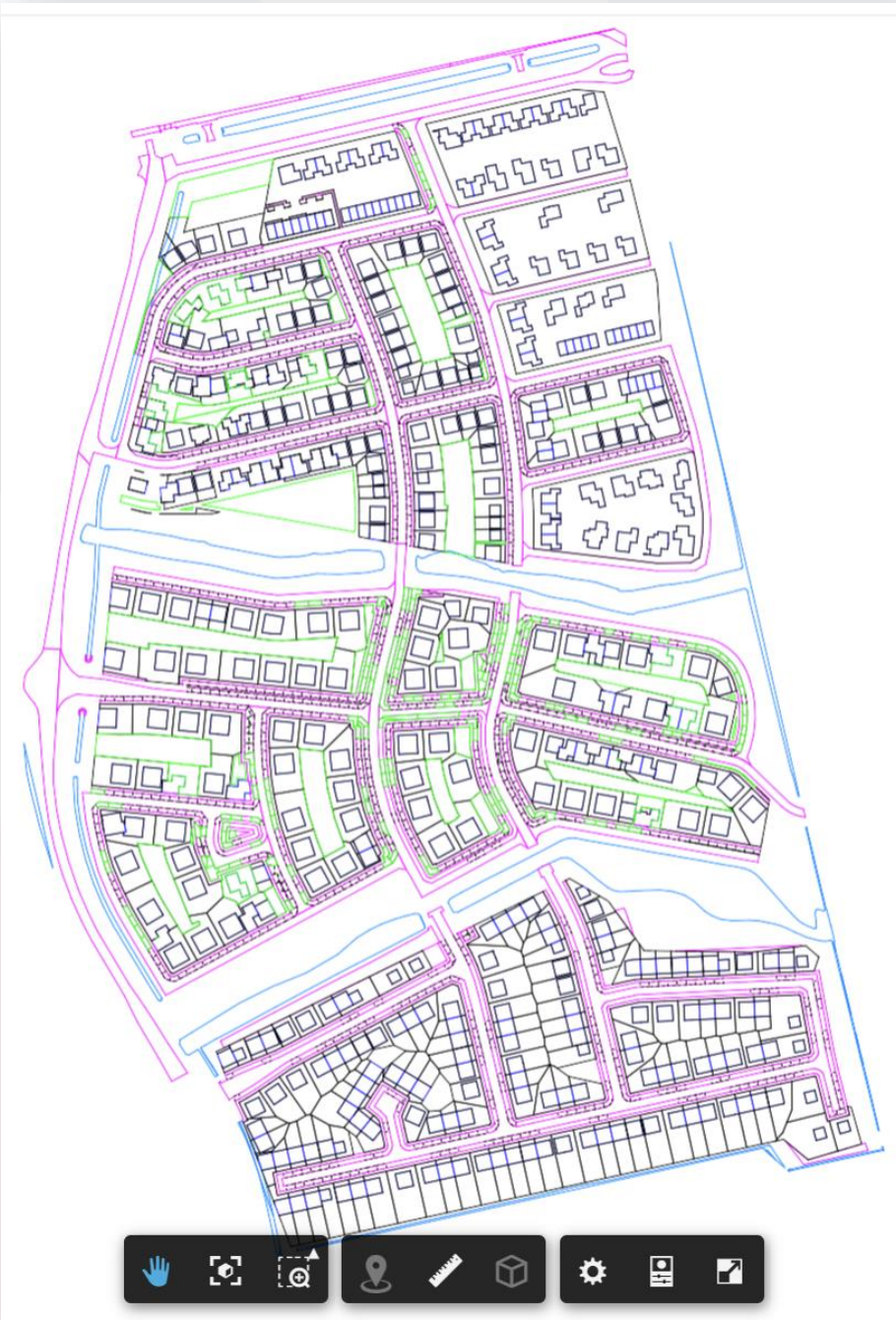
Example 2: Short-cycle designing (2)

Design



Simulate

Adapt



Conclusion

- Environmental twins have potential:
 - To support collaboration in working processes
 - To support decision making
 - To be used to cross professional borders
- Benefit from these digital tools!

Thank you for your attention

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