Totally 3D (T3D)

On our way to a 3D Digital municipality

*The cities of Rotterdam, Amsterdam and the Hague in cooperation with
the Association Netherlands municipalities (VNG)*

Gemeente Amsterdam · Den Haag · Gemeente Rotterdam · VNG

Gerlof de Haan – VNG (projectmanager projecttrack scalability and applicability)

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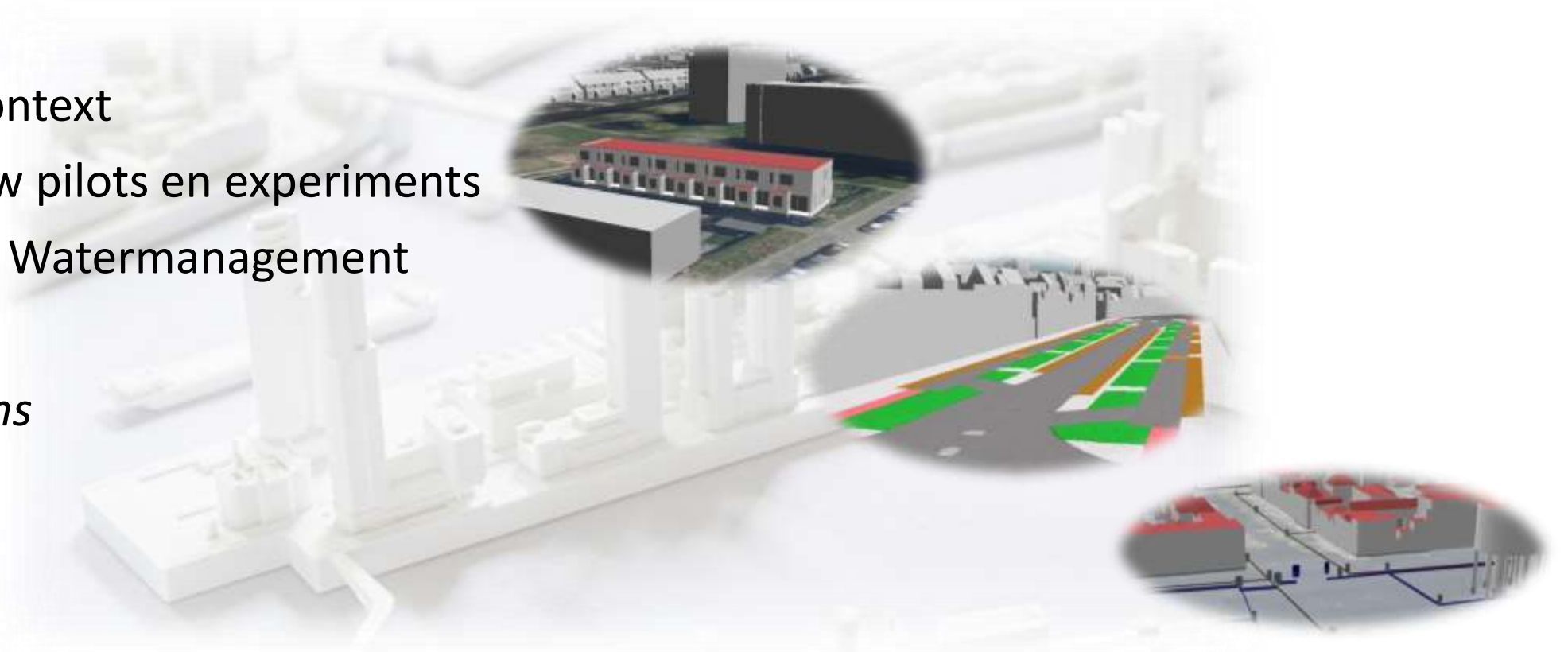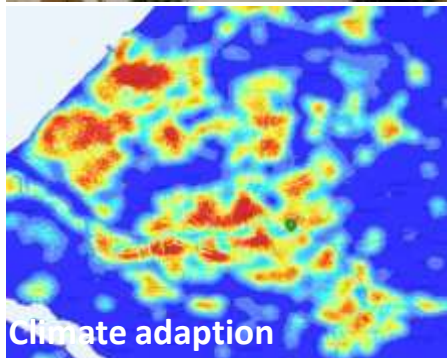**FIG Commission 7 & 2 Annual Meeting 2023**
2-4 October 2023, Deventer

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Agenda:

- Intro /context

- Overview pilots en experiments

- Usecase Watermanagement

- *Questions*

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The bigger (national) picture: big challenges in the environment and planning domain

watermanagement

housing

Energy transition

Climate adaption

nitrogen

Mobility

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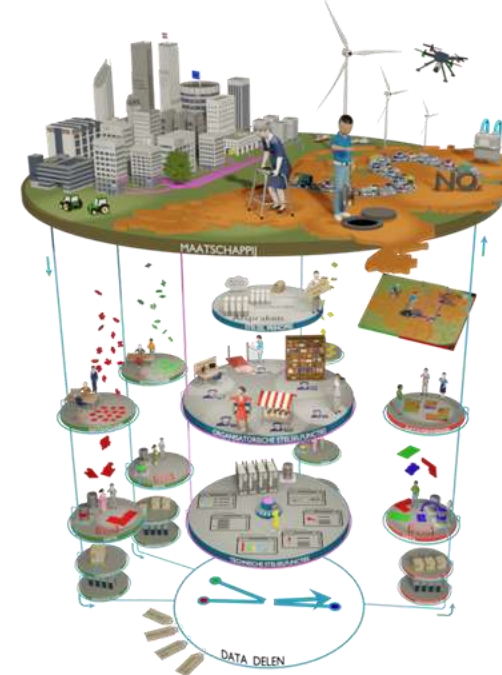Leica Geosystems

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The bigger (national) picture: big developments in the geo-information domain:

- Further development of national master key geo-datasets: towards a, coherent 3D geo-data foundation (instead of the current set of loosely coupled 2D geo-datasets)

- Current nationwide 3D datasets for the Netherlands as post processed data available: 3D BAG (buildings and adresses) en 3D Basisvoorziening (buildings en terrain)

- National programme for digital cooperation in the building proces (DigiGO) -> BIM- Geo integration

- European and National data strategy and the principles of federative datasharing

Zicht op Nederland

Data (remains) at the source

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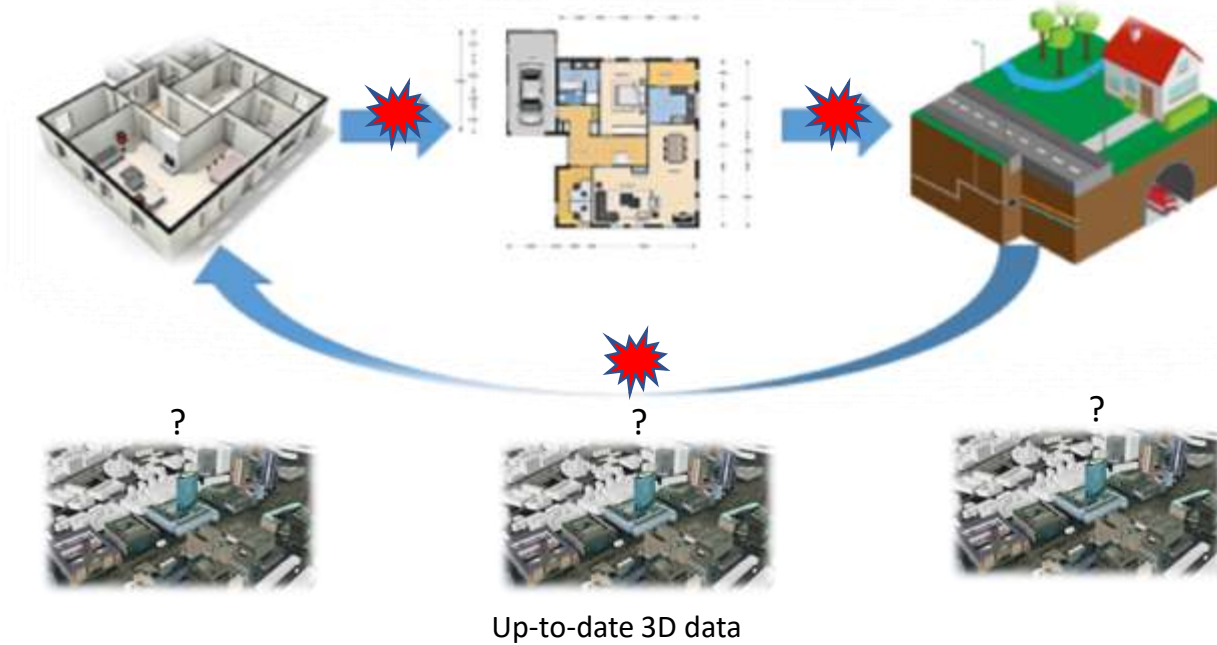
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Why T3D?: 3D Dataflow (nowadays in the netherlands)

Building en spatial planningprocess
output = 3D data

(national and local) key geo-datasets
input = 2D data

Usecases
need for 3D information

Either loss of information or
duplication of work

?   ?   ?

Up-to-date 3D data

Main goal: providing <u>up-to-date</u> 3D data (as a result of day to day processes)

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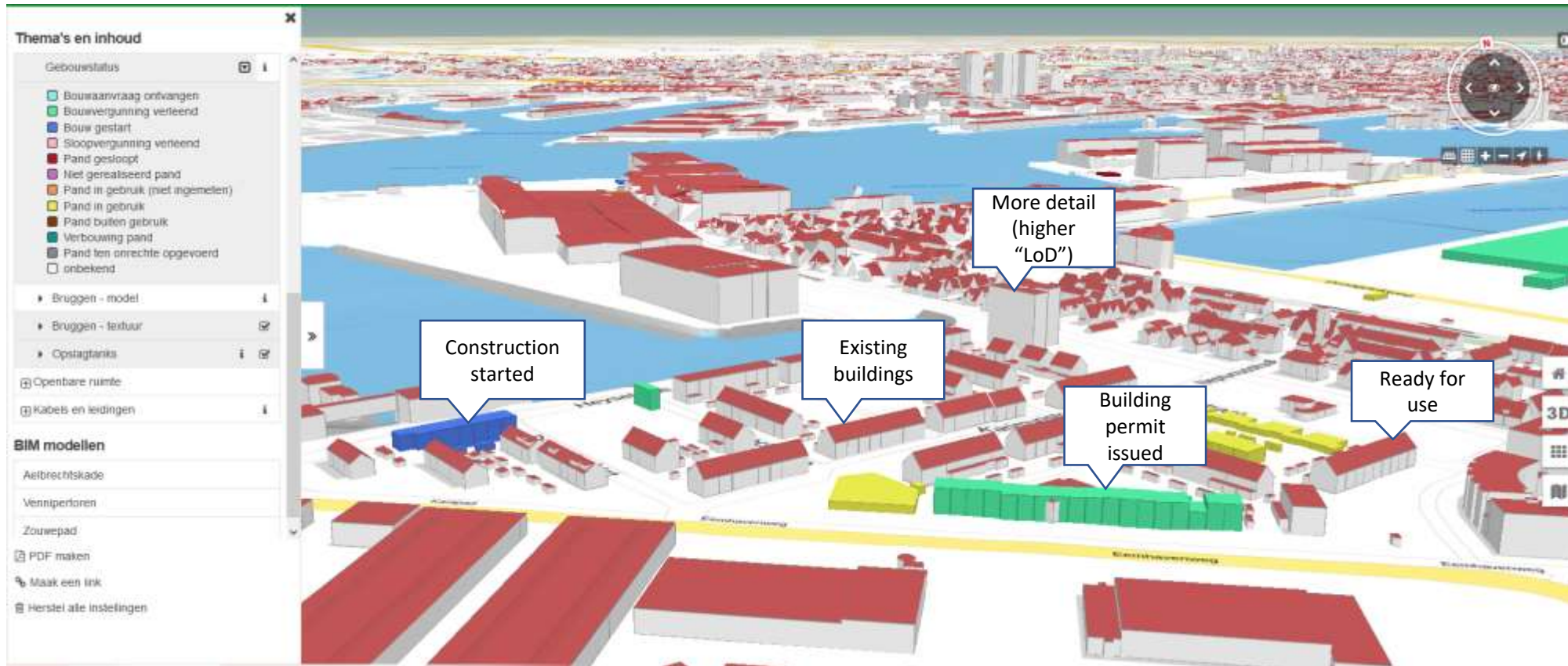
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3D datamanagement: T3D reference process

Source: globale procesarchitectuur SOR (DisGeo)
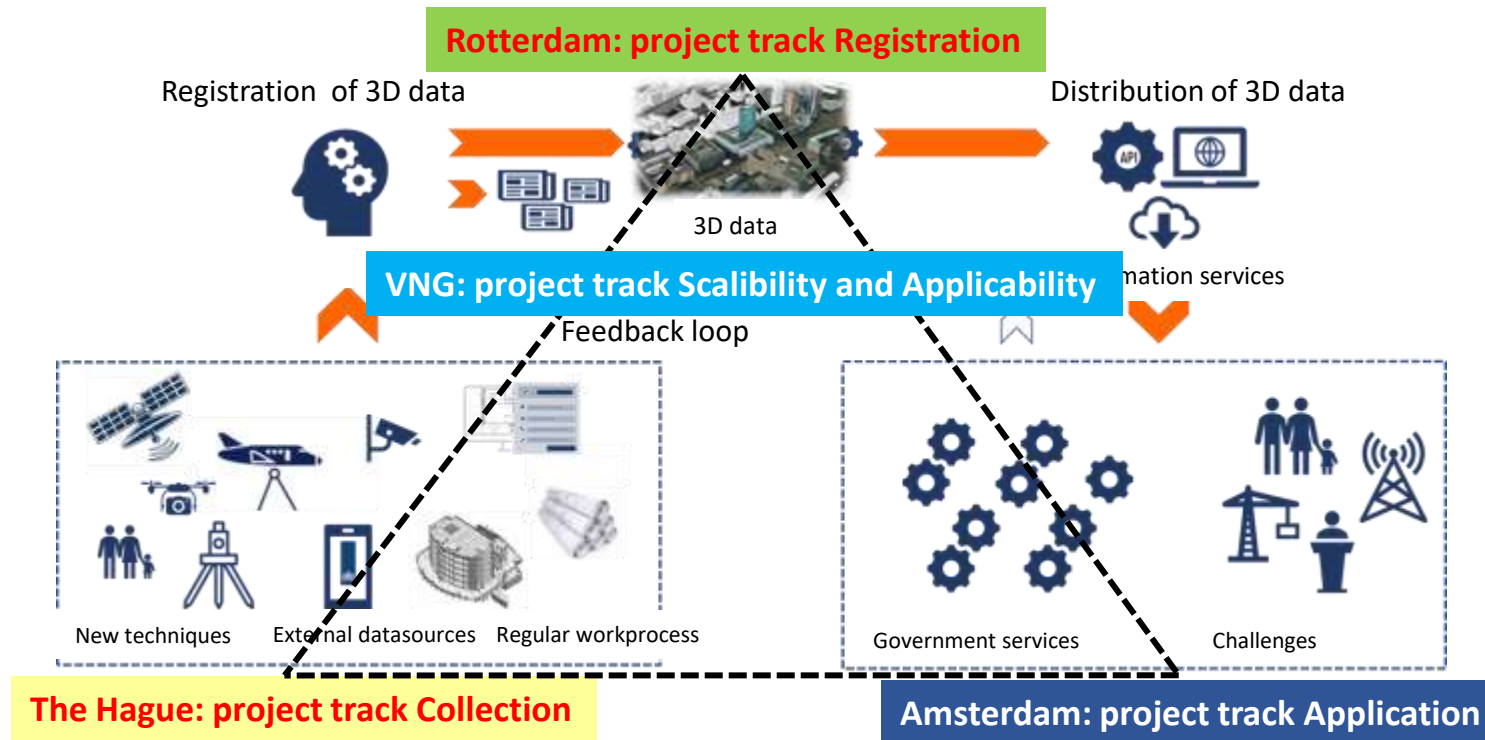
Rotterdam: project track Registration

Registration of 3D data

Distribution of 3D data

3D data

VNG: project track Scalibility and Applicability

Feedback loop

New techniques   External datasources   Regular workprocess

Government services   Challenges

The Hague: project track Collection

Amsterdam: project track Application

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Approach: 3 project phases (2020 – 2023)

Explore – Experiment – Implementation (testing setup)

Focus on 3D datamanagement, "powered" by 3 usecases:

1. Smart gathering of individual 3D building data (both outside and inside) for use by enforcement, taxes en safety (using BIM and Lidar and 2D floorplans)

2. Using a 3D citymodel for 3D Permitcheck en 3D feedback

3. Using 3D data about public space and sewerage for flood analysis in a 3D Citymodel

International standards: CityGML, CityJson, IFC, 3D Tiles, LAZ
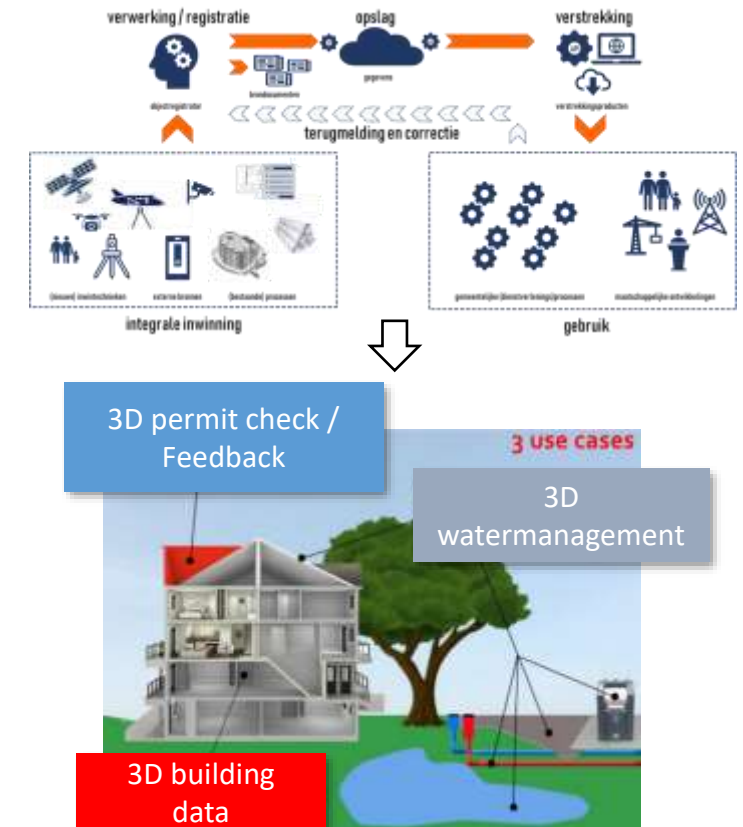
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3D permit check / Feedback

3D watermanagement

3D building data

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Overview pilots and experiments:

The Hague:
- Various techniques for collecting and automatically generating 3D data as part of daily operations (IFC, mobile Lidar)
- Basic implementation of the orchestration of data and data "pipelines"
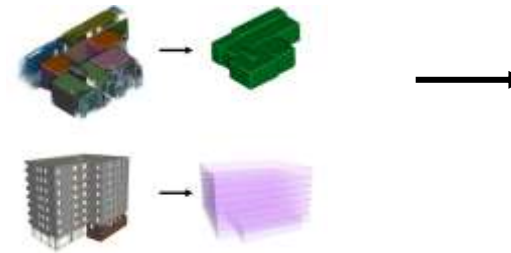
Amsterdam:
- Prototype "do it your self" 3D permit check en 3D feedback
- Input 3D datamodel is used for updating the 3D registration

Rotterdam:
- Tools for submitting changes (triggers) in a 3D datamodel and tools for updating a 3D registration
- Concept of a datafoundation and management of data-quality: 3D Datamodel in relation to other geo-datasets

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Usecase Watermanagement (flood analysis)
(demo)

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Current national 3D dataset for the Netherlands

Source	Application	Reference date
BGT	Terrein	**01-01-2021**
BAG	Gebouwen	**01-01-2021**
Luchtfoto's	hoogtegegevens	**winter 2020**
Luchtfoto's	infraroodgegevens ten behoeve classificatie van hoge vegetatie	**zomer 2020**

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Current national 3D dataset for the Netherlands

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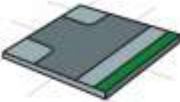
3D Public space: Level of detail (LoD) - concept

x.0 … x.4 (left to right) = more detailed information objects (in relation to Assetmanagement and subsurface data)

LoD 1…3 (topdown) = more detailed height data
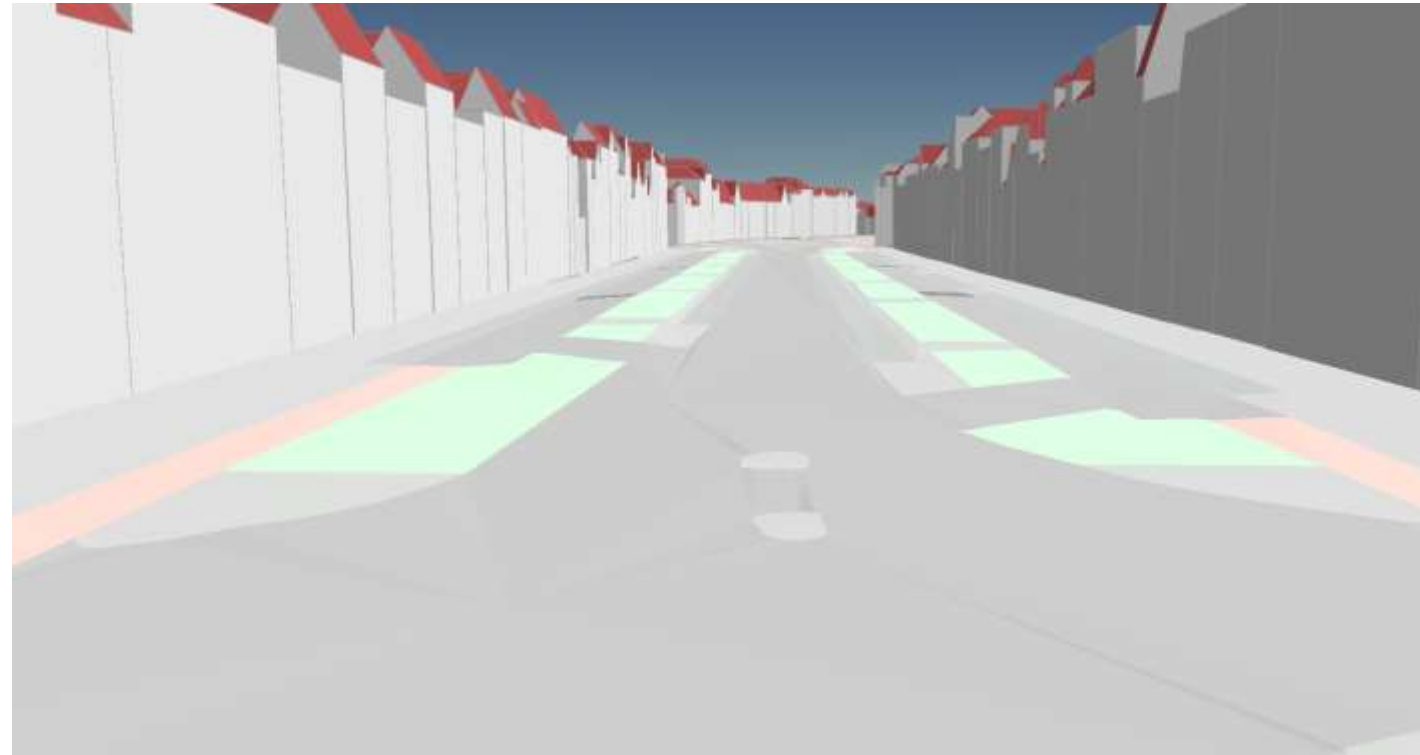
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LoD 0.1

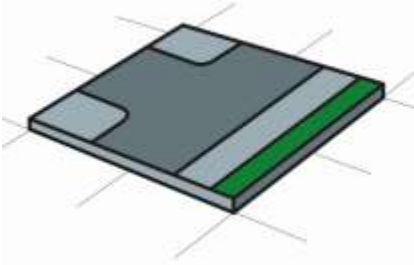Digital Transformation for Responsible Land Administration
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LoD 1.1

Totally 3D (T3D)
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LoD 2.1

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LoD 3.1

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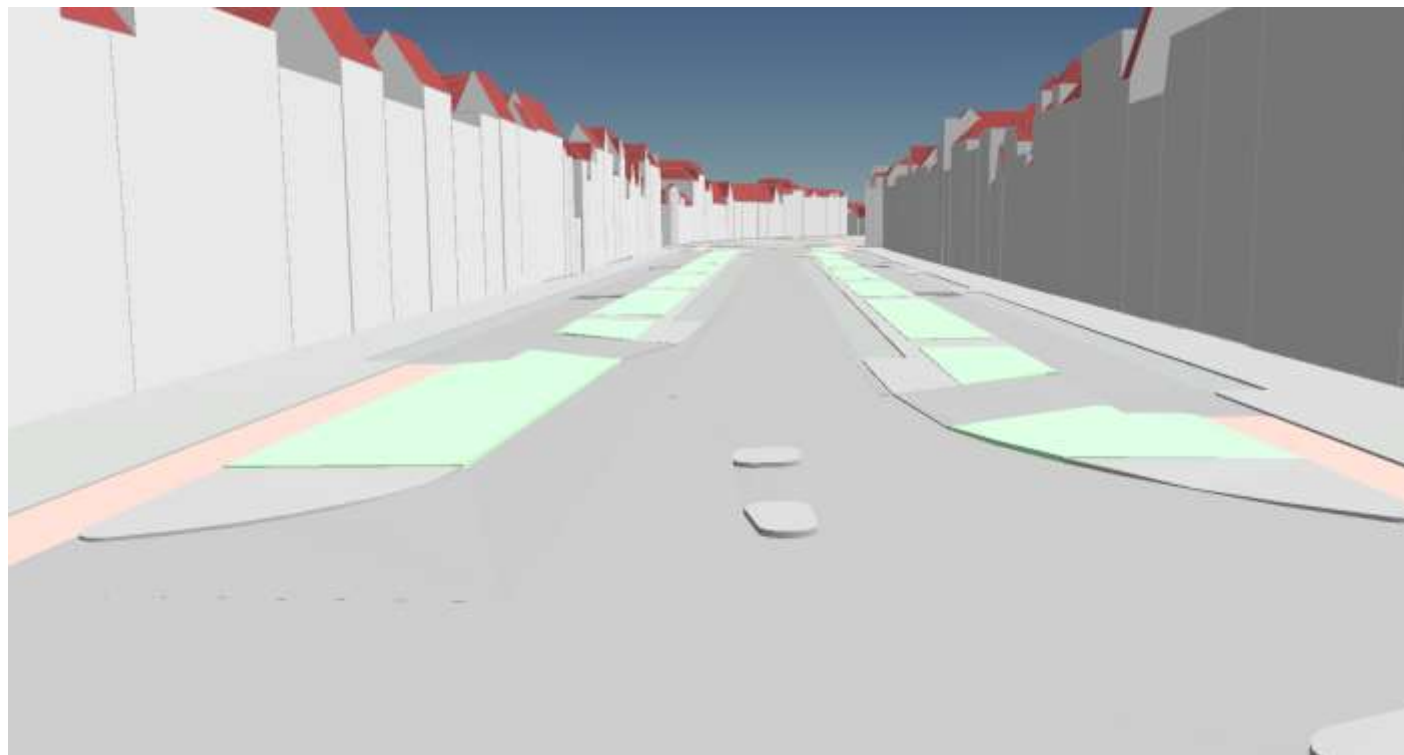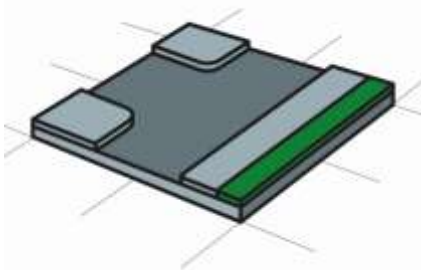## Current national 3D dataset

Rotterdam 3D
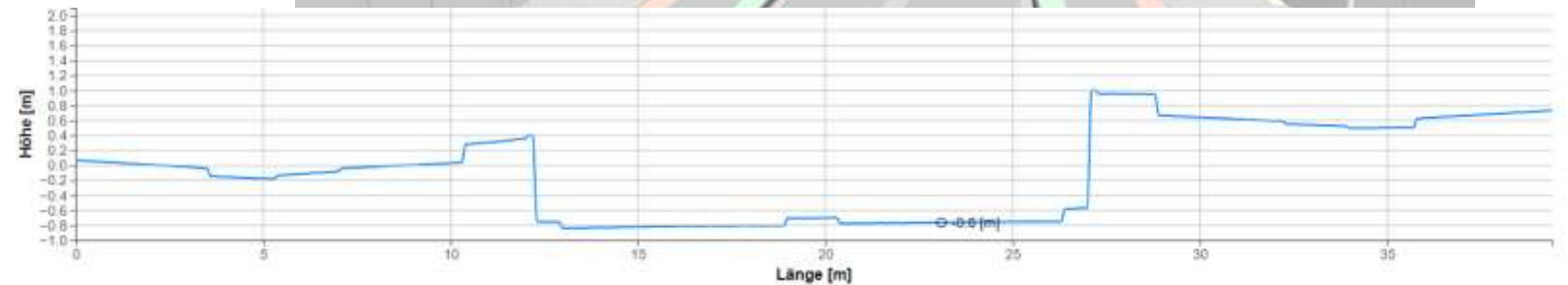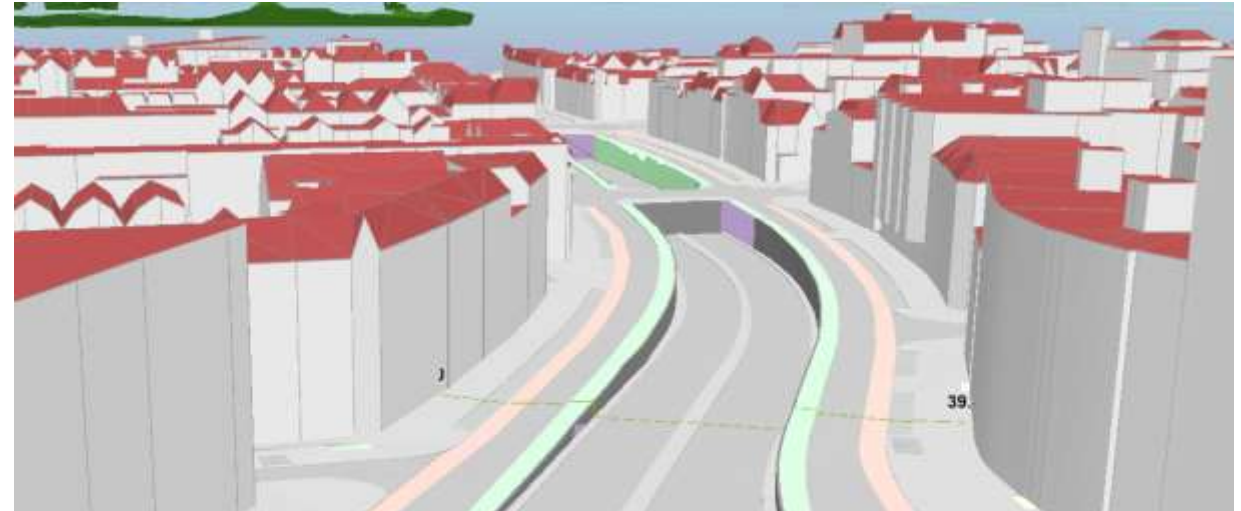
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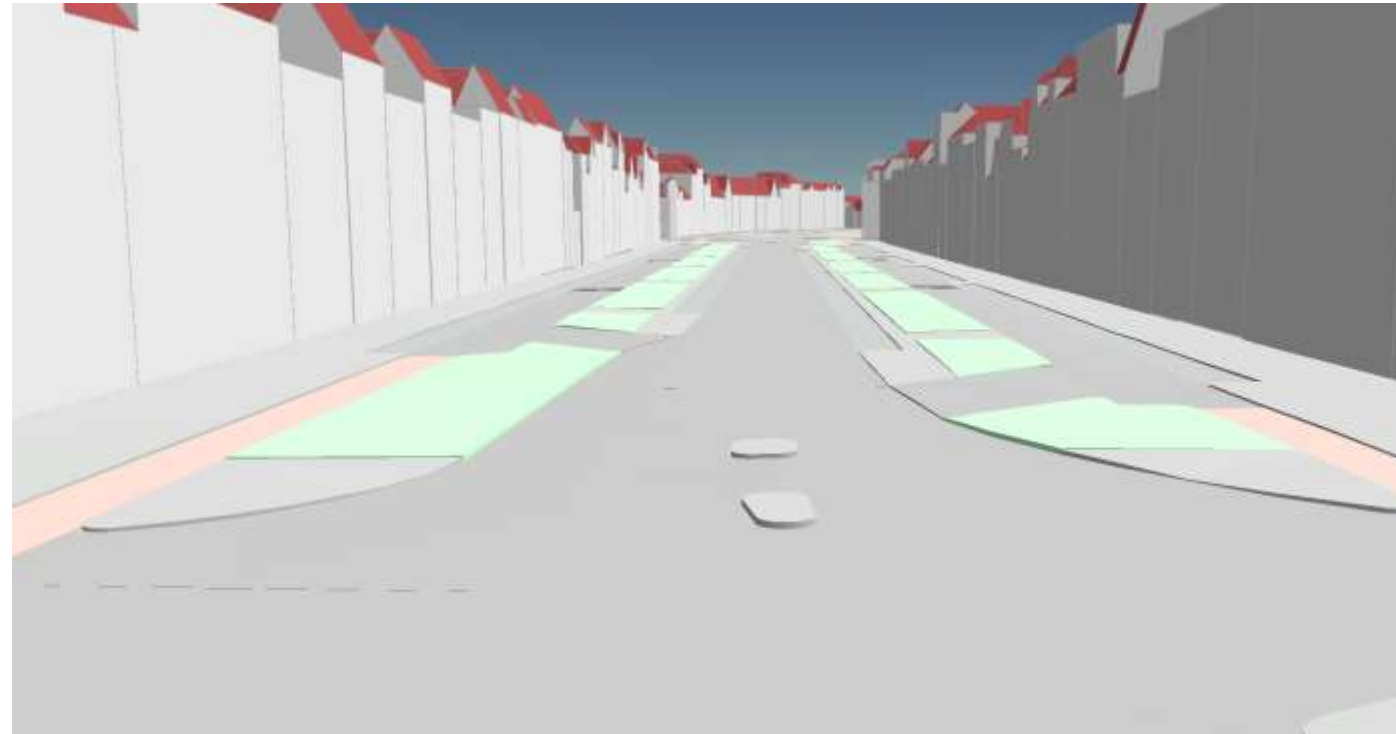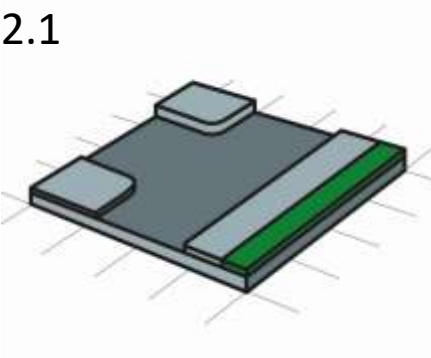Details

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Choices en consequences

	pnt/m2	LoD	mB CityGML	tijd (min)
Aerial LiDAR (Rotterdam)	36	0.1	1,2	00:23
		1.1	1,6	01:33
		2.1	2,4	02:07
		3.1	38,4	10:23
Mobile LiDAR	85	0.1	1,2	01:05
		1.1	1,6	02:16
		2.1	2,4	03:00
		3.1	48,5	15:40
AHN4	24	0.1	1,2	00:19
		1.1	1,6	01:15
		2.1	2,4	01:44
		3.1	35,9	08:59

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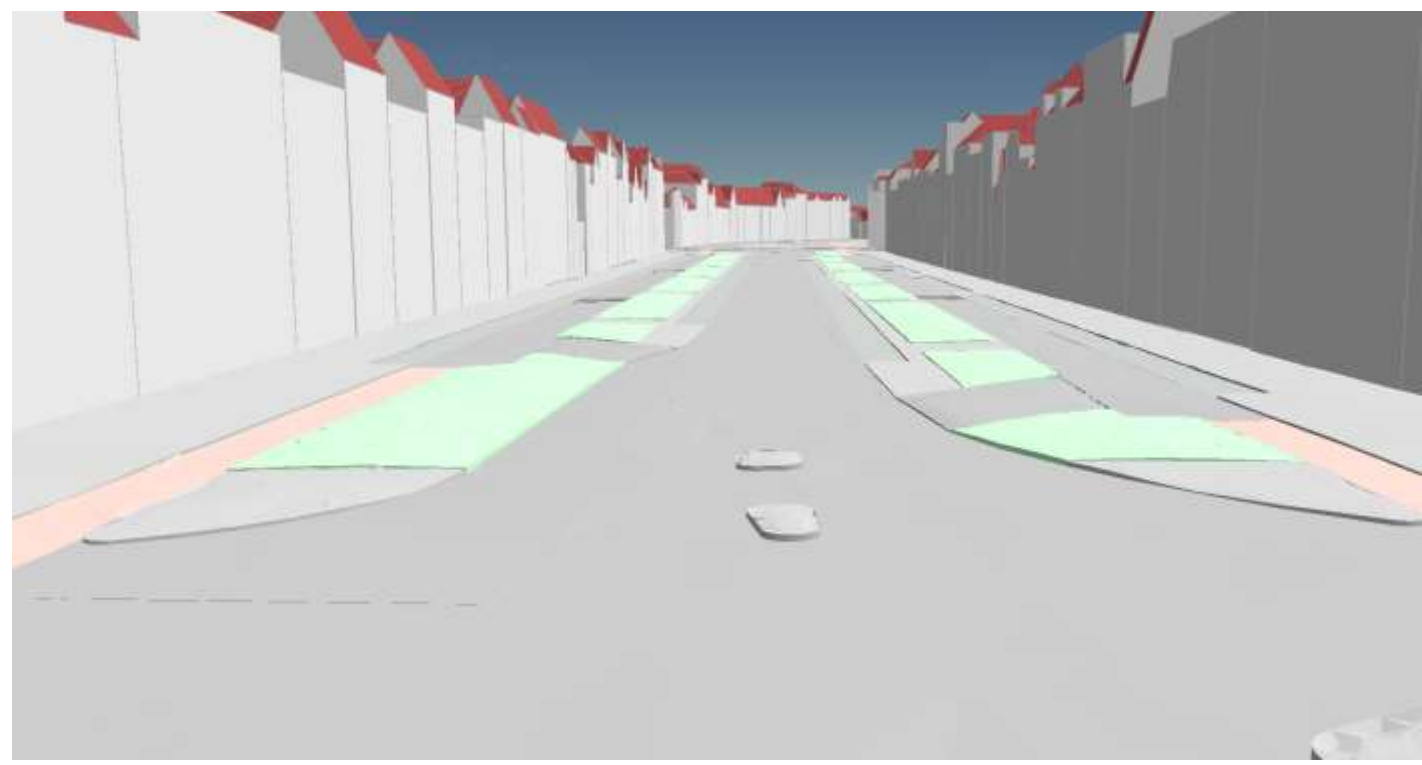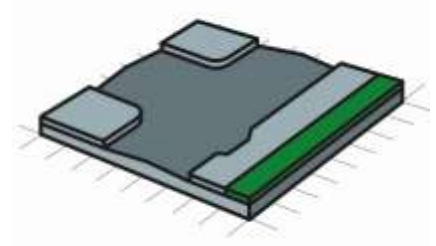
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Updating a 3D Basemap (3D BGT):

Day to day process (new)

Starting with the current process ("2D – triggers") and using the existing datamodel (IMBGT/IMGEO)

Adding up-to-date 3D data in the daily operations:
- (mobile obtained) Pointclouds (both street and arial)
- BIM (IFC)
- Survey data (x,y,z)
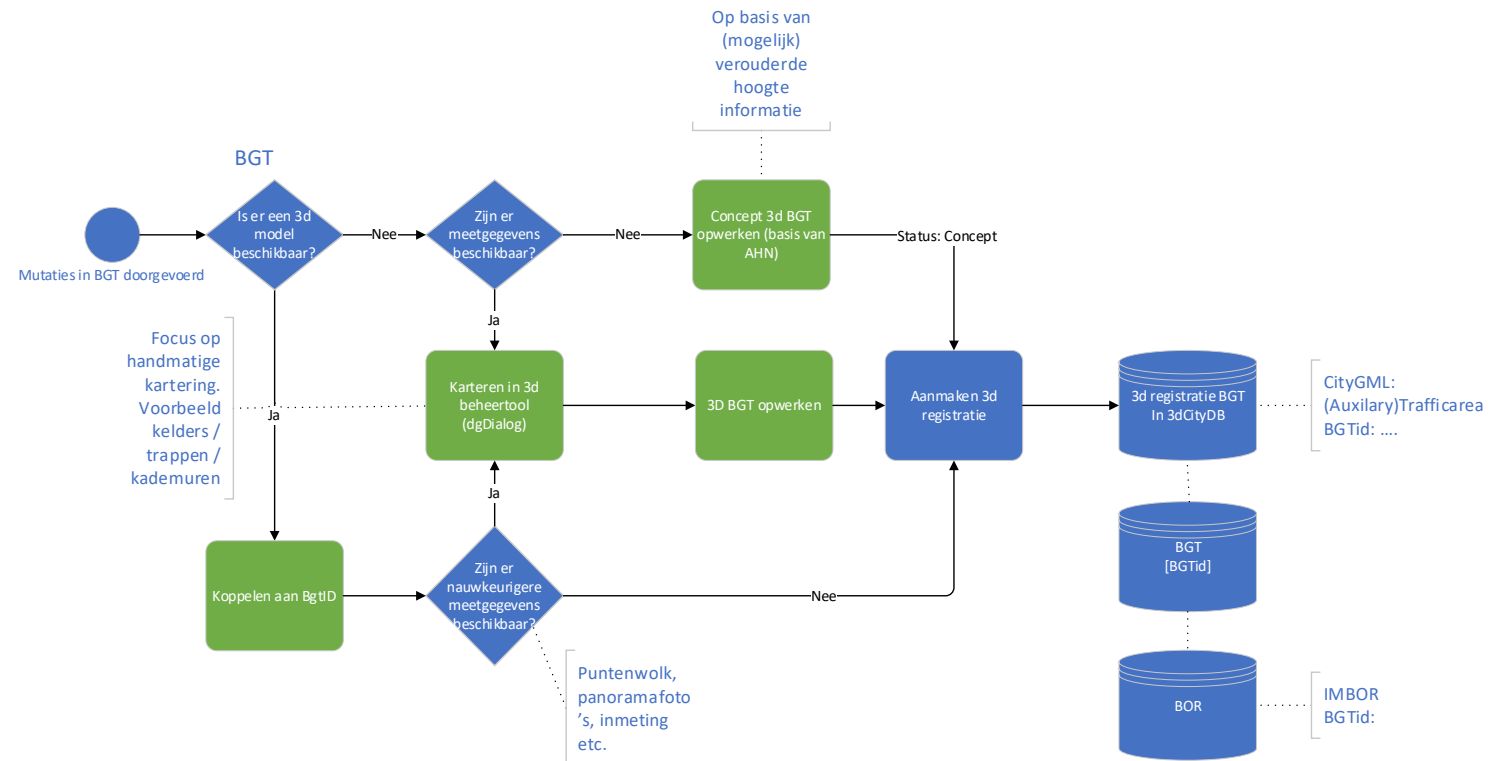
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National 3D dataset (3D BAG)
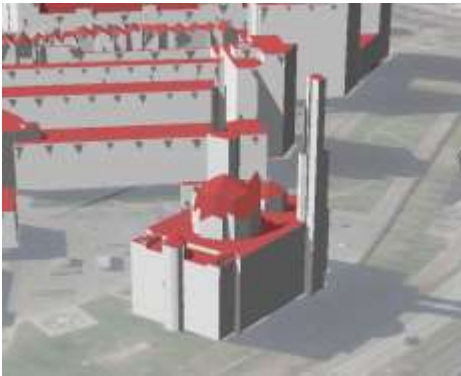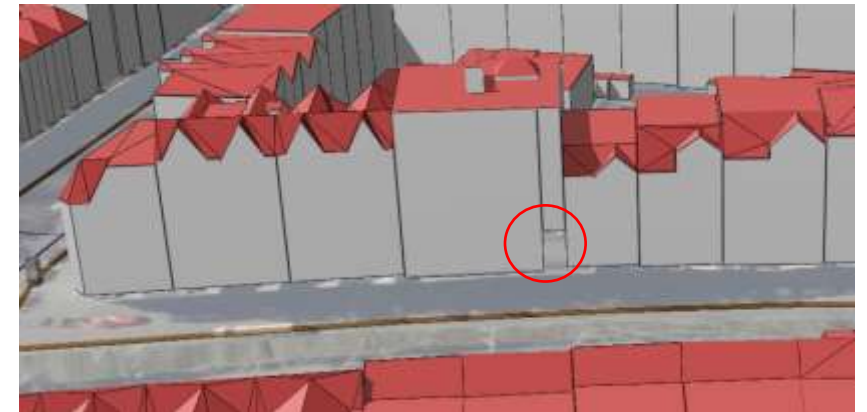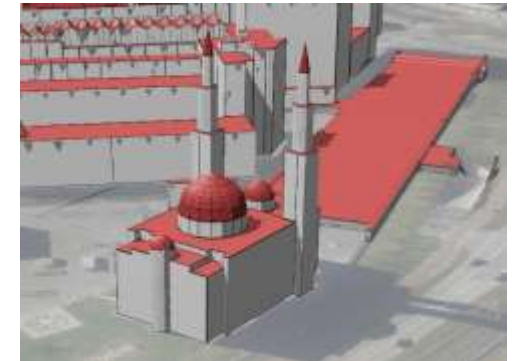
Rotterdam 3D

versus

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Updating 3D buildingmodel: adding more detail

Automaticaly detecting of grids, windows en steps (doors) using lidar and 360' data.
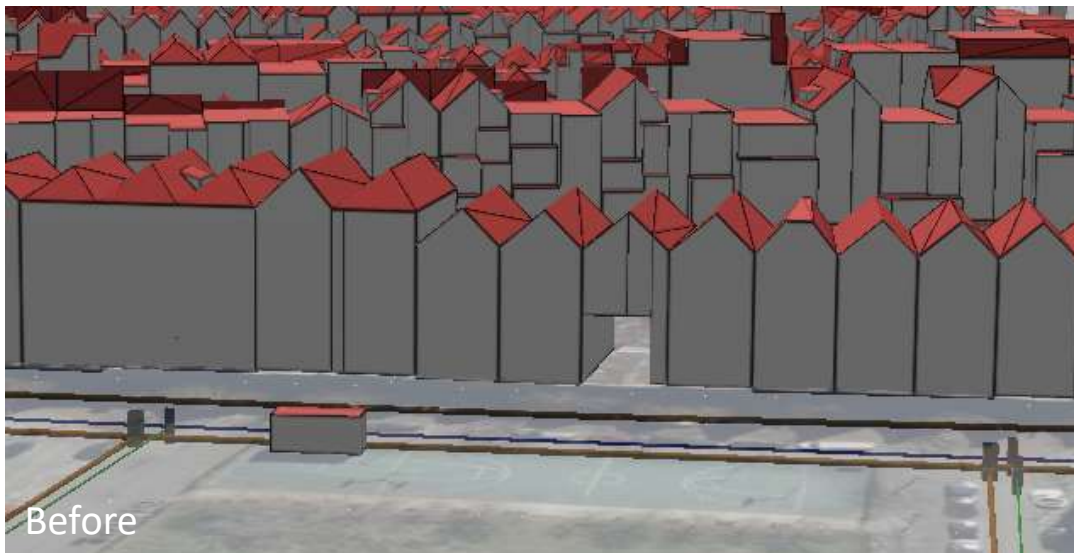
Before

After

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Updating 3D buildingmodel: adding more detail

3D information about buildingunits in a building using rich 3D datasources like IFC en Lidar (and 2D floorplans)

Before

After

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Updating a 3D buildingmodel

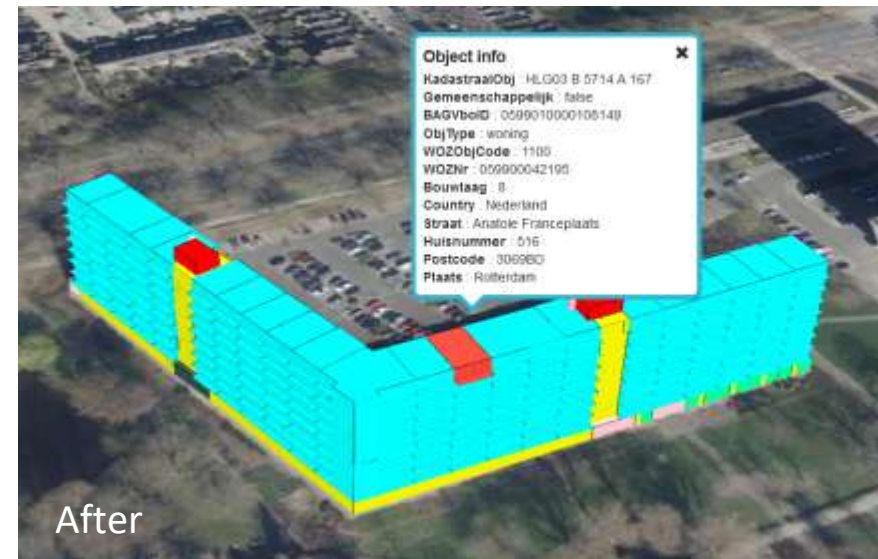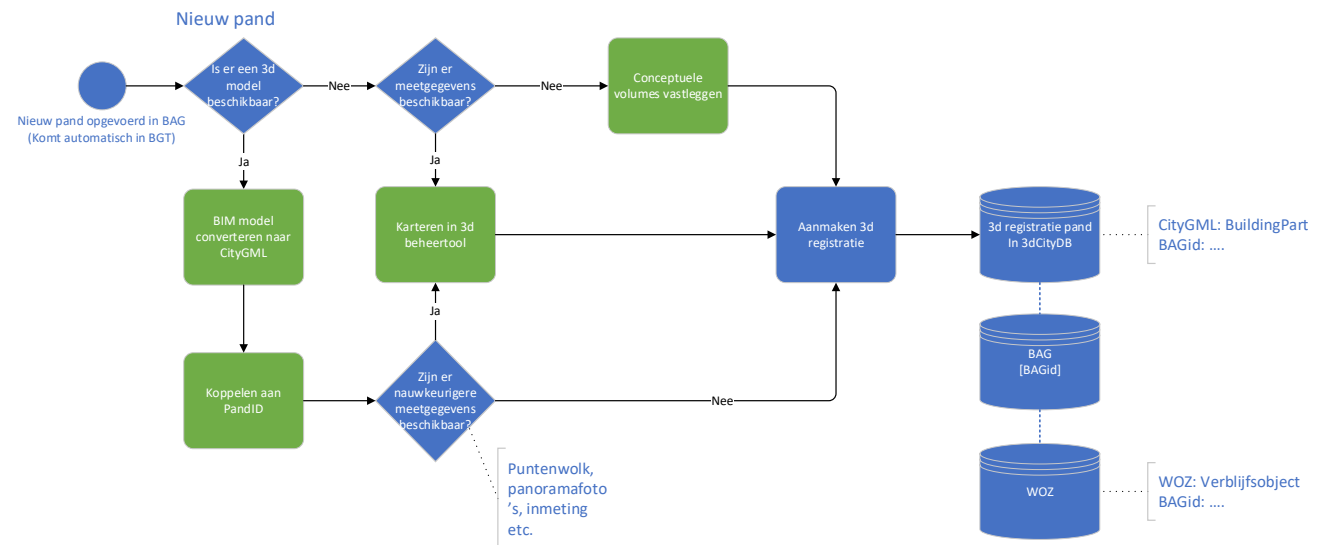Starting with the current process ("2D -triggers) and using an existing datamodel (IMBAG)

Adding up-to-date 3D data in the day to day operations:
- (mobile obtained) Pointclouds (both street and arial and exterior and interior)
- BIM / IFC (planned and as built)
- Aerial and 360' data
- 2D floorplans (if available)

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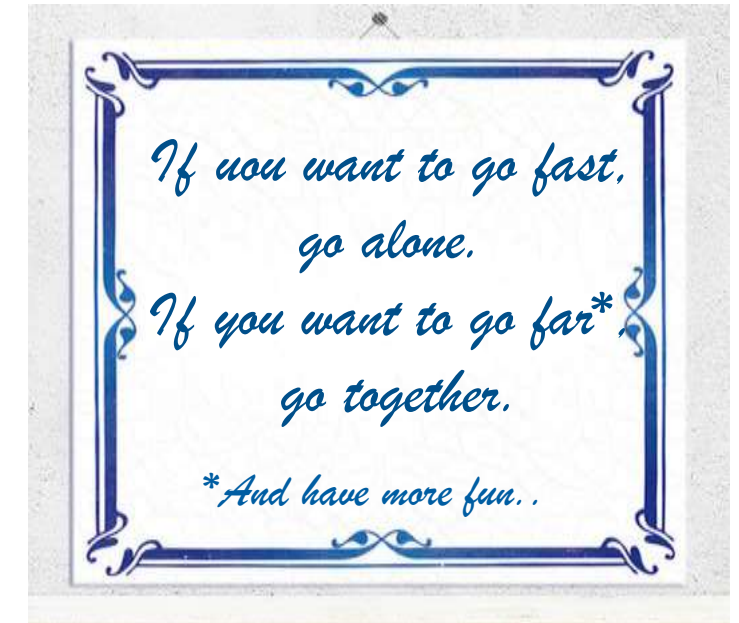
What did we deliver and learn?

- Usefull insights in (the complexity and opportunities of) a process for updating 3D data in practise.

- Relevant input on new data gathering techniques which helps to innovate and improve the management of local (3D-) geo-datasets

- A first approach for creating a national standard data model for registration and unlocking of local 3D data (which contributes to a more accurate and up-to-date 3D Basemodel of the Netherlands)

- Over 30 "products" in a toolkit waiting for further development and implementation by other municipalities

If you want to go fast, go alone.
If you want to go far*
go together.
*And have more fun..

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All results available

1. All results are available on the T3D test setup and storymap (also available in english) (https://www.totaal3d.nl/)

2. T3D website / T3D knowledgebase on Alkem.io (https://alkem.io/t3d/dashboard)

3. Toolkit T3D (https://alkem.io/t3d/dashboard)

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Questions?

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