

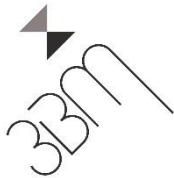
GIS to BIM using Dynamo

How to load 3D GIS data into Dynamo?

How to do location analysis in Dynamo/Revit?

Maarten Vroegindeweij

3BM (Labs)/ Domera

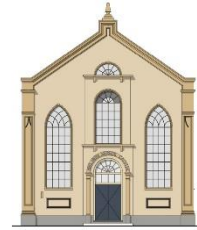


DOMERA
Thuis op het water



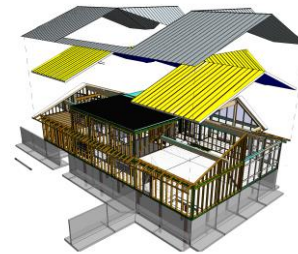
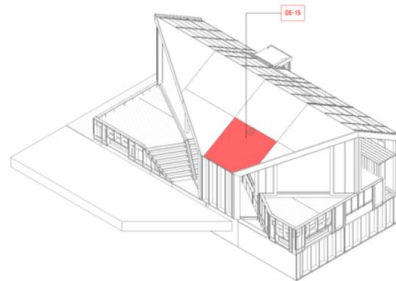
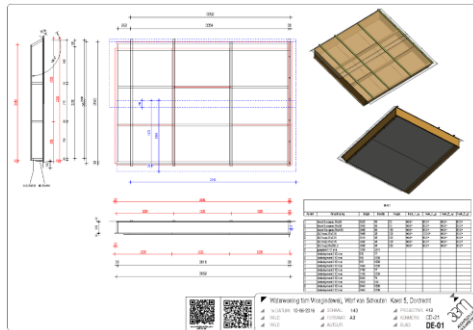
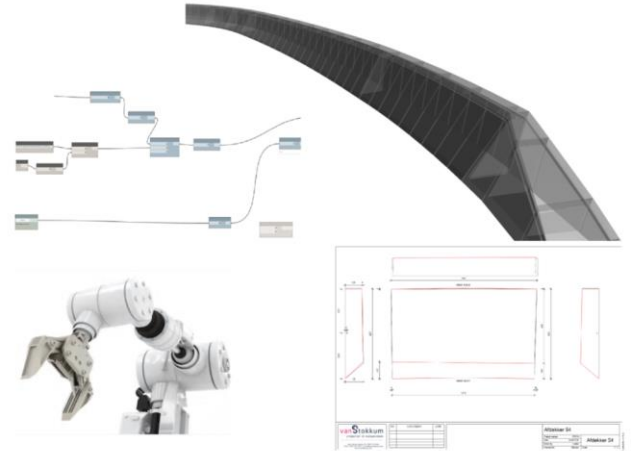
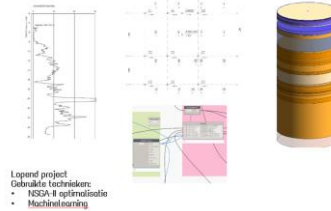
About 3BM

- Consulting engineers since 2009
- www.3bm.co.nl
- Structural-, Wood Framing, Façade and Prefab Engineering, Monuments



About 3BM Labs

- Digital Fabrication/Drawing Automation
- Software Development
- Computational BIM
- Optimisation
- Dynamo Consultancy



To learn

- GIS/Rasterdata/Vectordata
- Where to find relevant data for The Netherlands?
- How to load this data into Dynamo?
- How to combine vector and rasterdata

Contents of this presentation

1. Intro GIS



2. Rasterdata

Location Analysis
using Dynamo

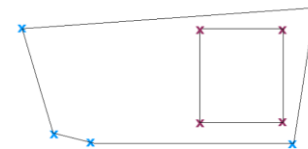


4. Conclusion & more information

PDOK

3. Vectordata

Vectordata / 3D BAG,
AHN3, BGT



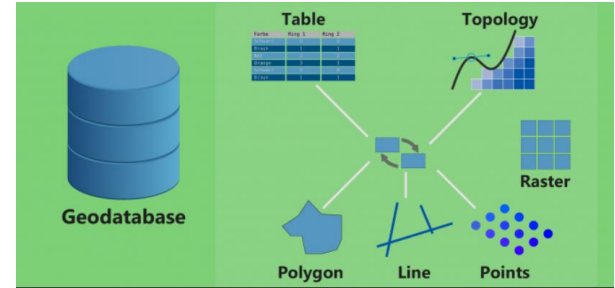
1. Intro GIS



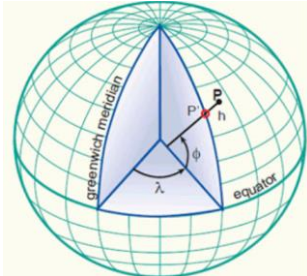
Maps

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<wfs:FeatureCollection xsi:schemaLocation="http://www.opengis.net/wfs/2.0 http://service=WFS&version=2.0.0&request=DescribeFeatureType&typeName=bag%3A
pand.xml" id="http://www.w3.org/2001/XMLSchema-instance" xmlns:bag="http://ba
- <wfs:member>
- <bag:pand gml:id="pand.318800">
- <bag:identificatie>6431000002037963</bag:identificatie>
- <bag:bouwjaar>1965</bag:bouwjaar>
- <bag:status>Pand in gebruik</bag:status>
- <bag:gebruiksdoel>winkelruimte, woonruimte</bag:gebruiksdoel>
- <bag:oppervlakte_min>80</bag:oppervlakte_min>
- <bag:oppervlakte_max>175</bag:oppervlakte_max>
- <bag:santal_verblijfsobjecten>4</bag:santal_verblijfsobjecten>
- <bag:geometrie>
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106505.9 434472.5 0 106500.9 434472.9 0 10
- <gml:exterior>
- <gml:LinearRing>
- <gml:pos list>106496.561 434466.171 0 106500 4
106505.9 434472.5 0 106500.9 434472.9 0 10
- </gml:LinearRing>
- </gml:exterior>
- </gml:Polygon>
- </gml:surfaceMember>
- </gml:MultiSurface>
- </bag:geometrie>
```

Webserver



Geo Databases

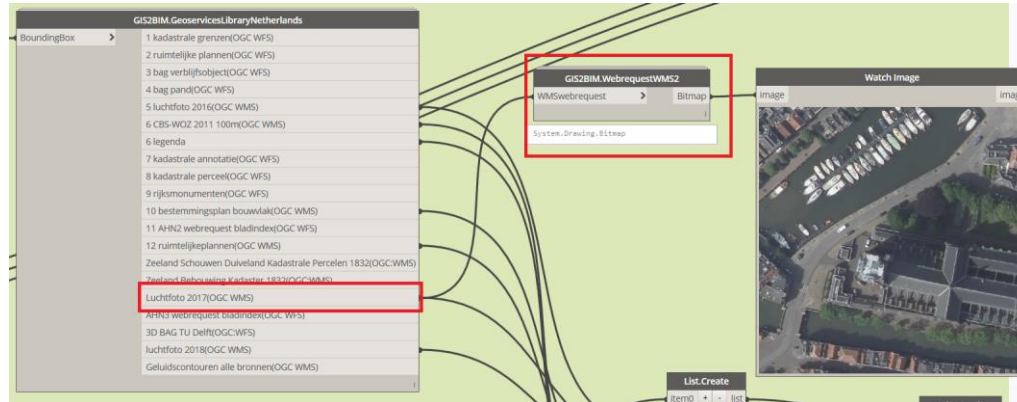
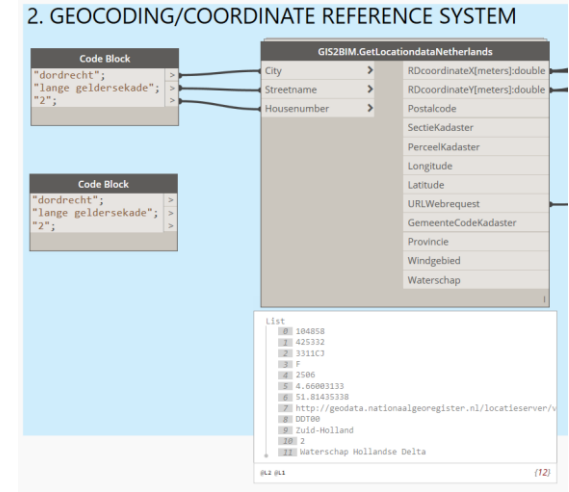


Coordinate Reference Systems

EPSG network WGS84
Foss4G interpolation WFS
GDAL irregular Grass
Shapefile Spatial
Inspire Qgis
ArcGIS PDOK
Esri Infravorks
PostGIS Ogr2ogr CRS

2. Rasterdata

- Geocoding/CRS
- Web Map Service(WMS)
- Web Map Tile Service(WMTS)
- Live Dynamo



2. Web Map Service(WMS)

Request&Response

<http://geodata.nationaalgeoregister.nl/>

luchtfoto/rgb/wms?

&request=**GetMap**

&VERSION=**1.3.0**

&STYLES=**default**

&layers=**2018_ortho25**

&bbox=**104783,425257,104933,425407**

&width=**3000**

&height=**3000**

&format=**image/png**

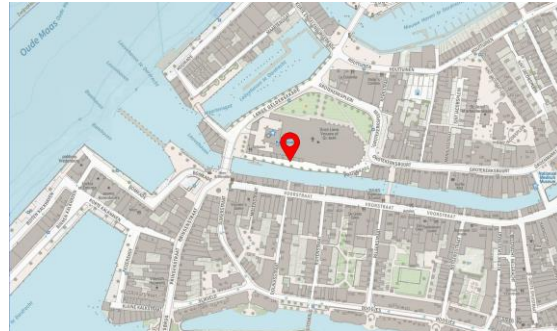
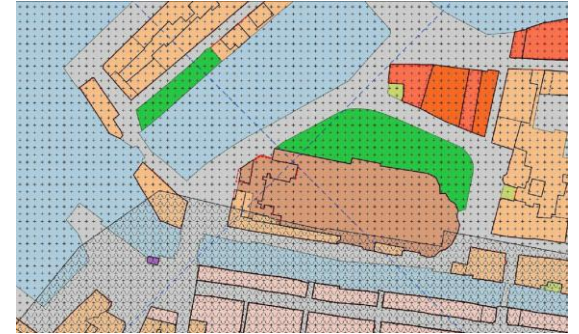
&crs=**EPSG:28992**



2. Location Analysis

- Use a lot of WMS, WFS, WMTS services together to create a location analysis report inside Revit

-OPEN IN REVIT-

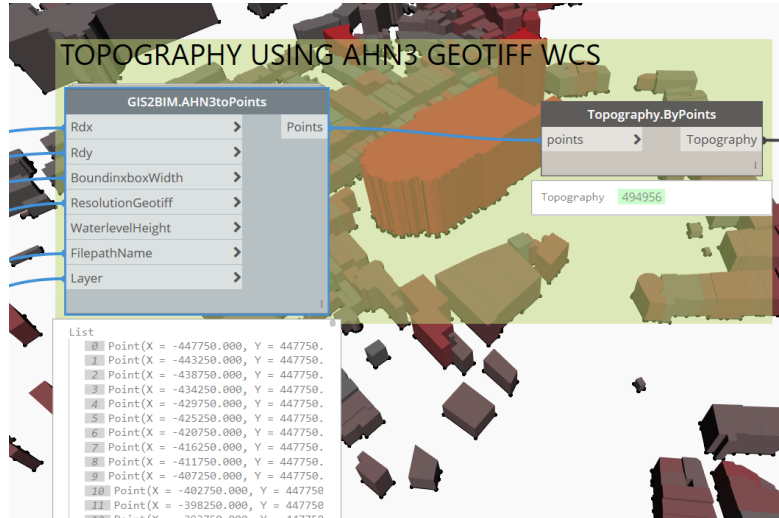
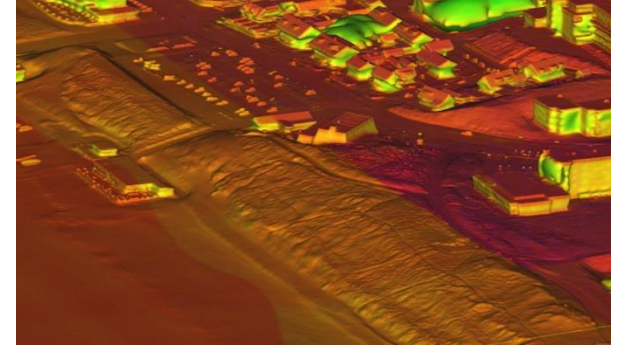


2. Other applications ;-)



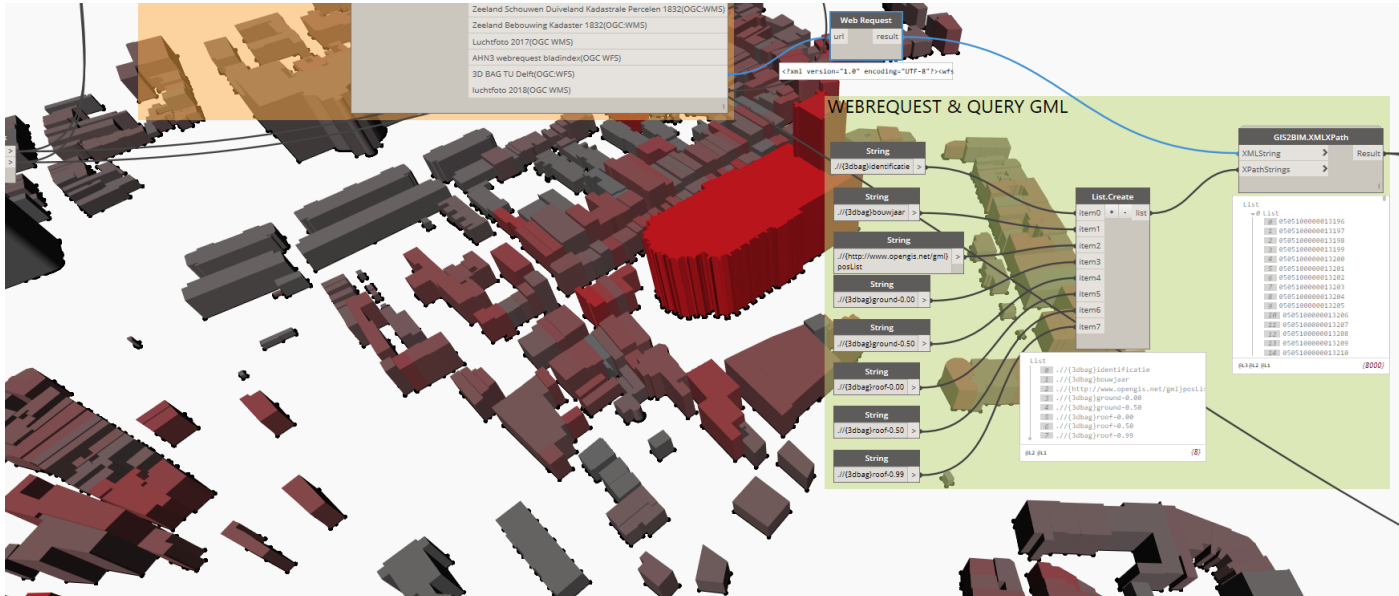
3. Vectordata: AHN3 WCS GEOTIFF

- AHN3 pointcloud data
- Geotiff



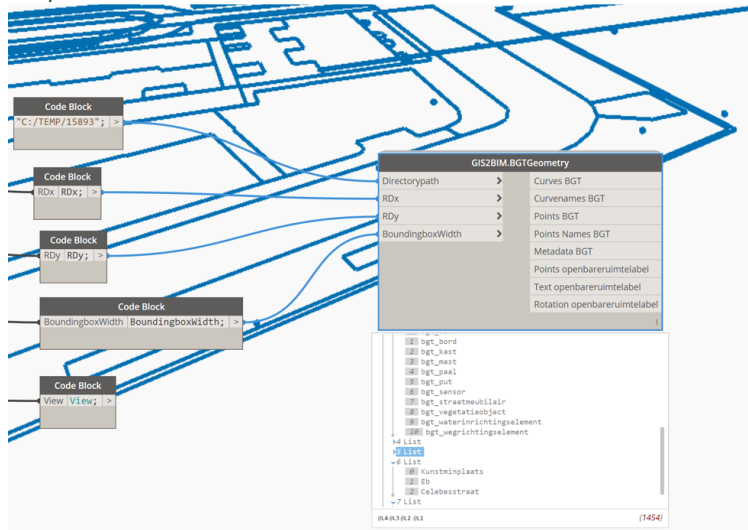
3. Vectordata: 3D BAG

- 3D BAG: server TU Delft: <http://3dbag.bk.tudelft.nl/>



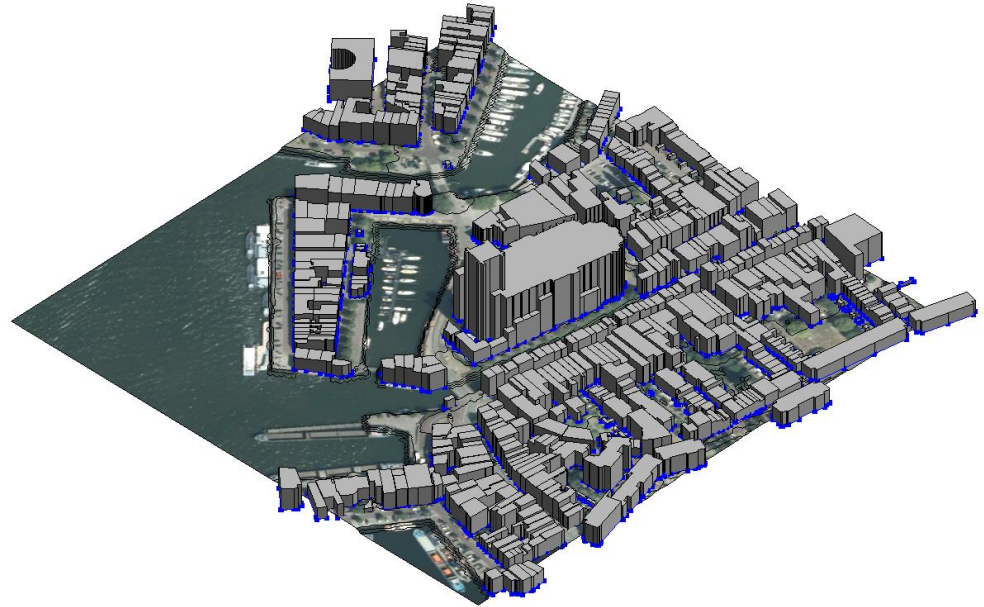
3. Vectordata: BGT

- WFS(not available anymore)
- Download (slow)



3. Combine AHN3 & 3D BAG & WMS & BGT

- Live Dynamo



4. To remember

1. Geocoding
2. Raster/Vector
3. WMS: Web Map Service(Raster)
4. WMTS/TMS: Web Map Tile Service(Raster)
5. WFS: Web Feature Service(Vector)
6. ARCGIS REST API Raster/Vectordata via ArcGIS API
7. BAG: (Buildings in The Netherlands)

4. To write down: Dynamo Packages

Dynamo Packages

ELK:	for converting Open Streetmap Data
MeshToolkit:	for loading meshes
Spring Nodes:	convert ToolkitMesh to Mesh
DynamoGIS:	importing Shape Files
DynaMaps:	load OSM data(new!)
GIS2BIM:	for WMS/WFS/WMTS/TMS requests and geoservices.
Revit addin:	Mesh Import from OBJ files

Opensource software

LASzip:	Quickly crop, transform pointclouds
Cloudcompare/Meshlab	Surface Reconstruction Algorithms

4. GIS=Data, Other sources

Data

PDOK

<https://www.pdok.nl/datasets>

Nationaal Georegister

www.nationaalgeoregister.nl

INSPIRE Data Europe

<http://inspire-geoportal.ec.europa.eu/>

Open Street Maps:

<http://www.openstreetmap.org>

Forum

<https://geoforum.nl>

More Information

Gentle introduction to GIS:

[QGIS-site](#)

BILT Europe Presentation:

[Github](#)

Wiki GIS2BIM:

[GIS2BIM](#)

Questions?

Find me at:

- <https://revitstructure.blogspot.com>
- www.3bmlabs.nl
- www.3bm.co.nl
- www.domera.nl



Download presentation and datafiles from:

<https://github.com/DutchSailor/blog/tree/master/Bouwtechniek%20%26%20Revit/2019-06%20AHN%20Geotiff%20BAG%203D%20%26%20Locatieanalyse>