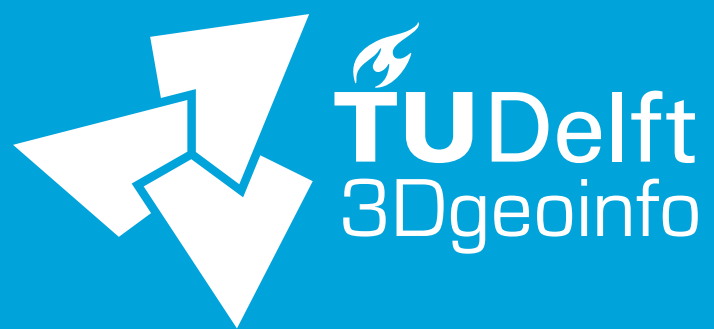


3D IMGeo

Do it yourself

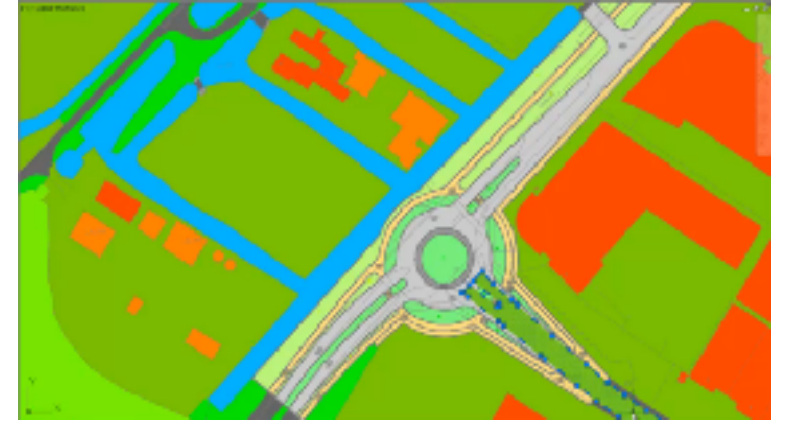
Jantien Stoter, Ravi Peters, Stelios Vitalis

Den Haag, 1 November 2017



3D IMGeo

3D IMGeo

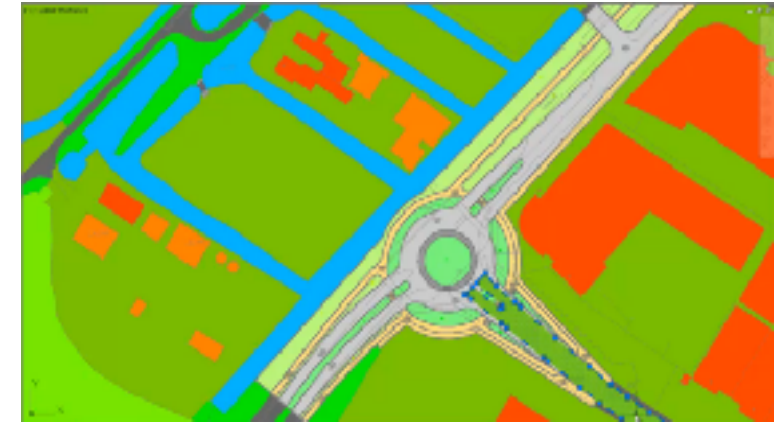


IMGeo

- Wegen, Water, Panden, (On)Begroeid Terreindeel

.....*geïntegreerd met*

3D IMGeo

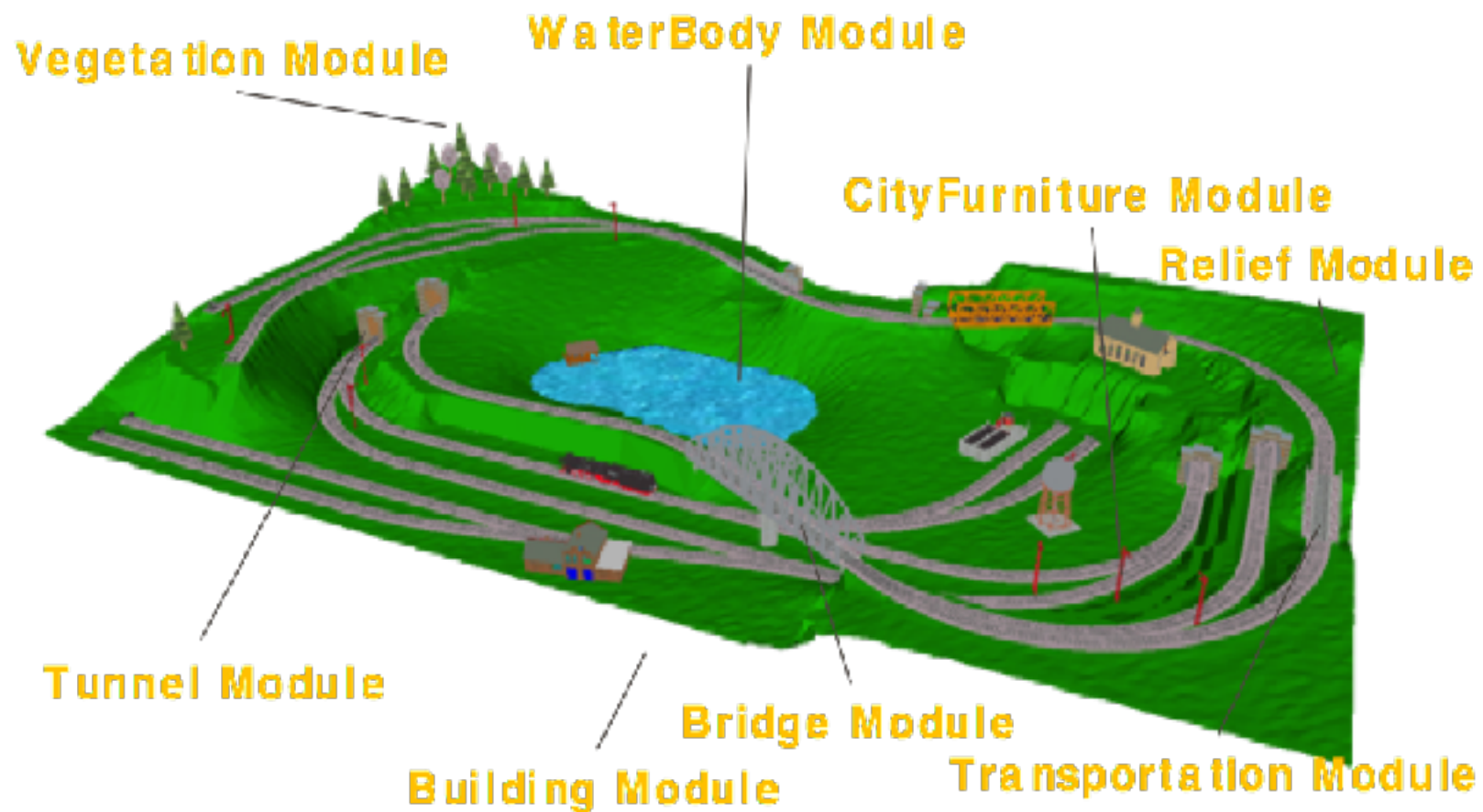


IMGeo

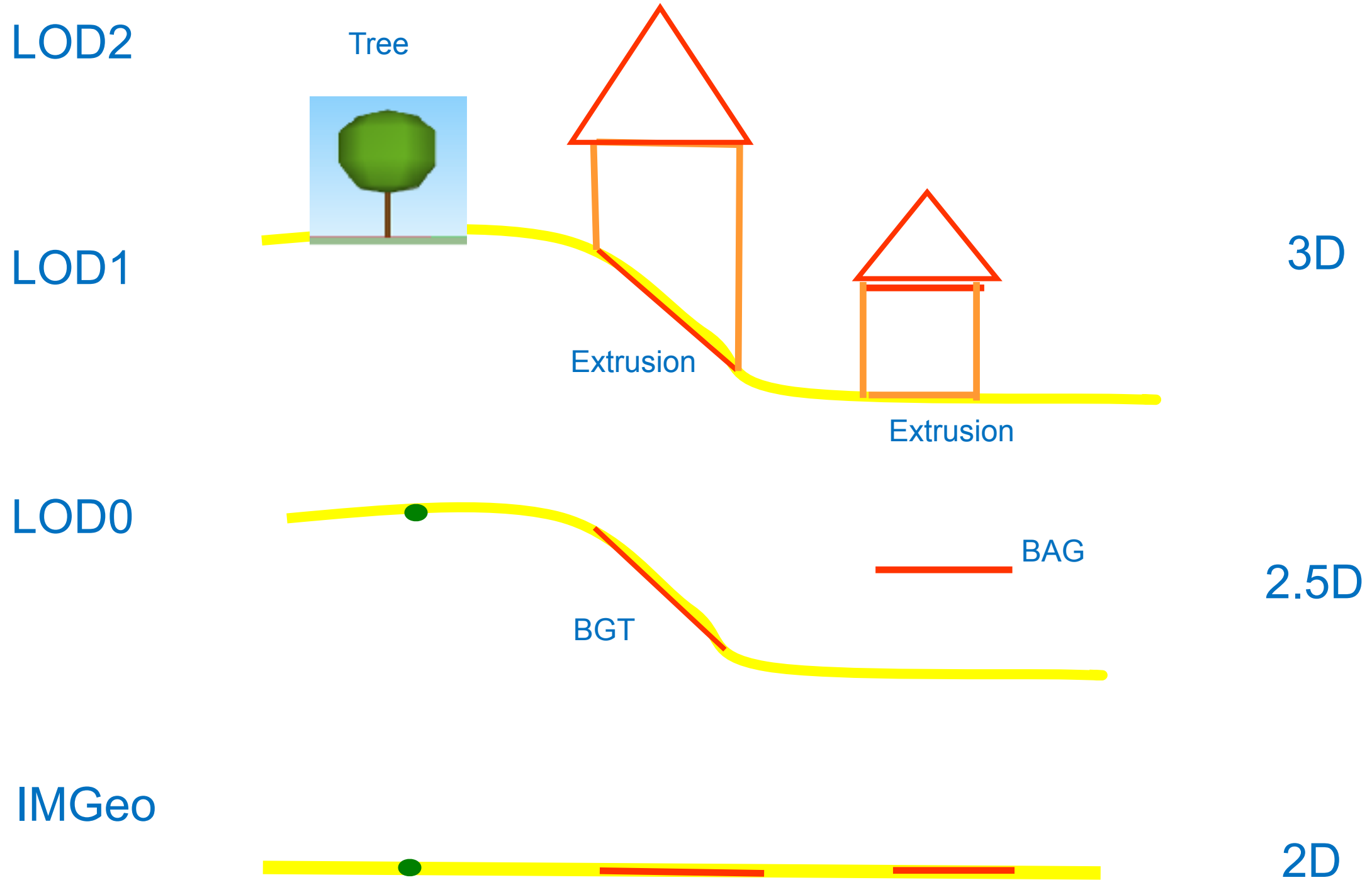
- Wegen, Water, Panden, (On)Begroeid Terreindeel

.....geïntegreerd met

CityGML



IMGeo: 3D is optional



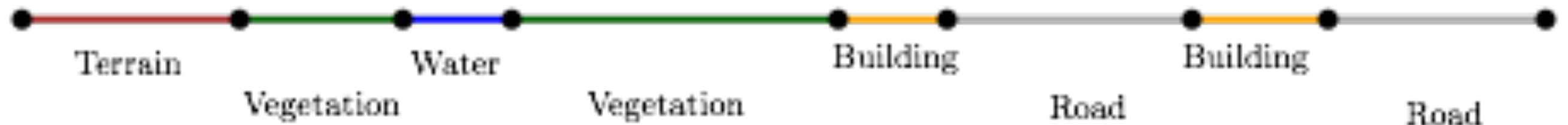
BGT input to 3dfier

Requires preprocessing

[https://github.com/tudelft3d/3dfier/tree/master/resources/
BGT_prepare](https://github.com/tudelft3d/3dfier/tree/master/resources/BGT_prepare)

3dfier

Input: any 2D datasets (eg TOP10NL or BGT)

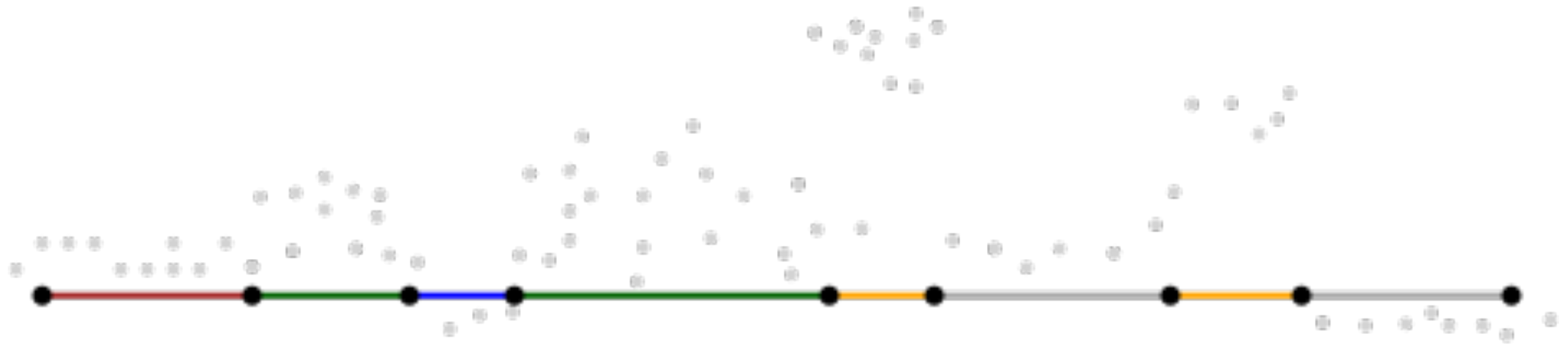


We assign each polygon to a class:

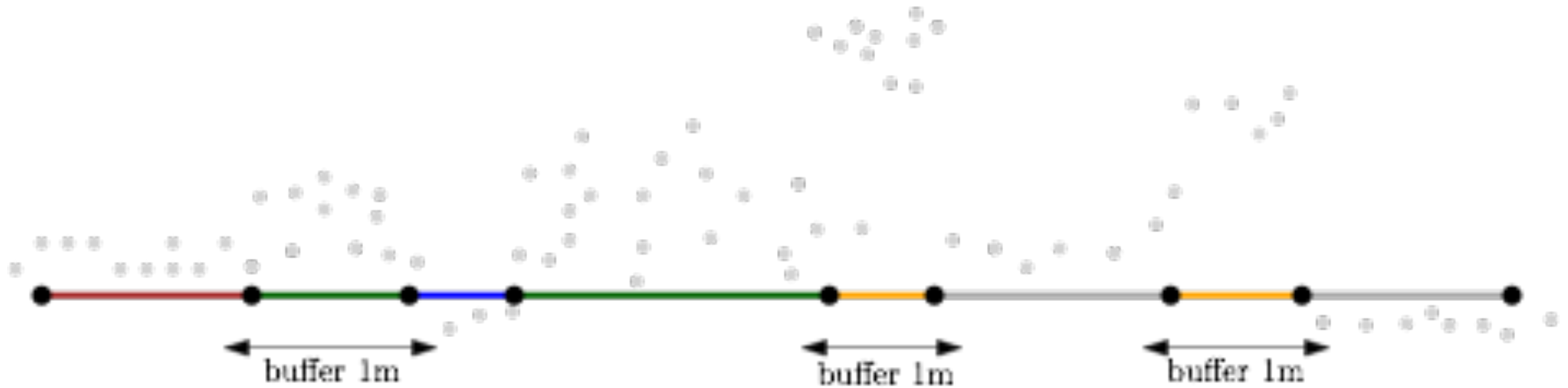
1. Building
2. Water
3. Road
4. Vegetation
5. Terrain
6. Separation
7. Bridge



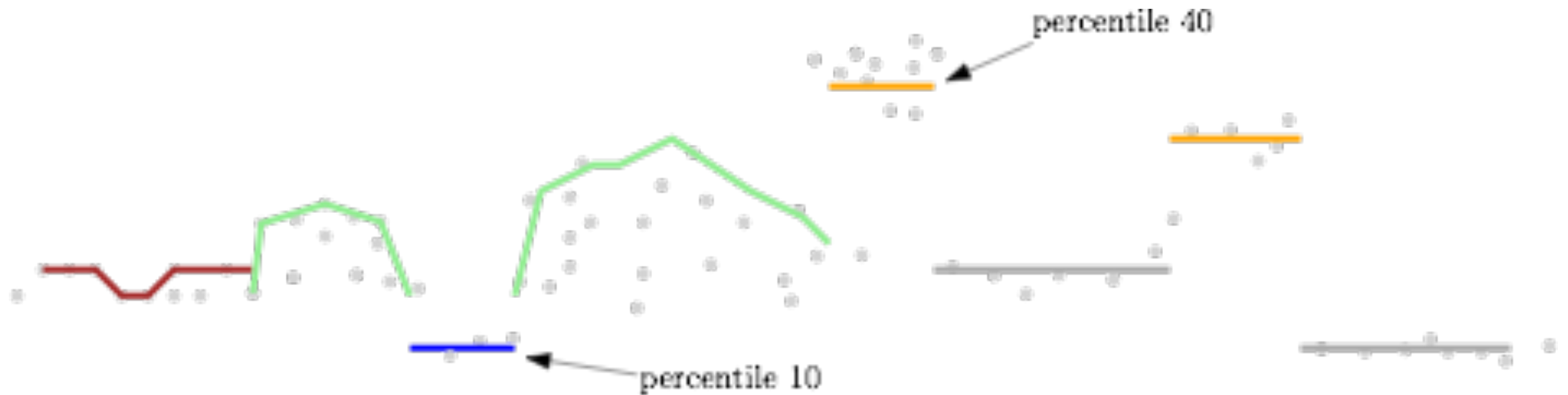
Assign each LiDAR point to polygons



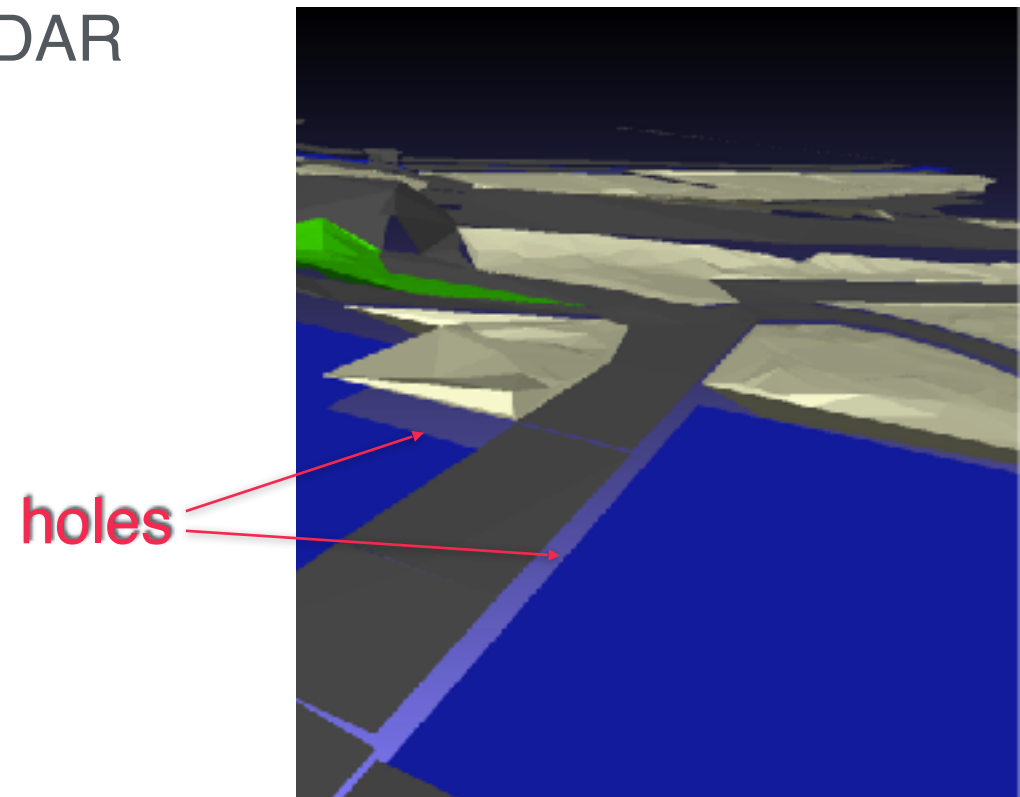
Assign each LiDAR point to polygons



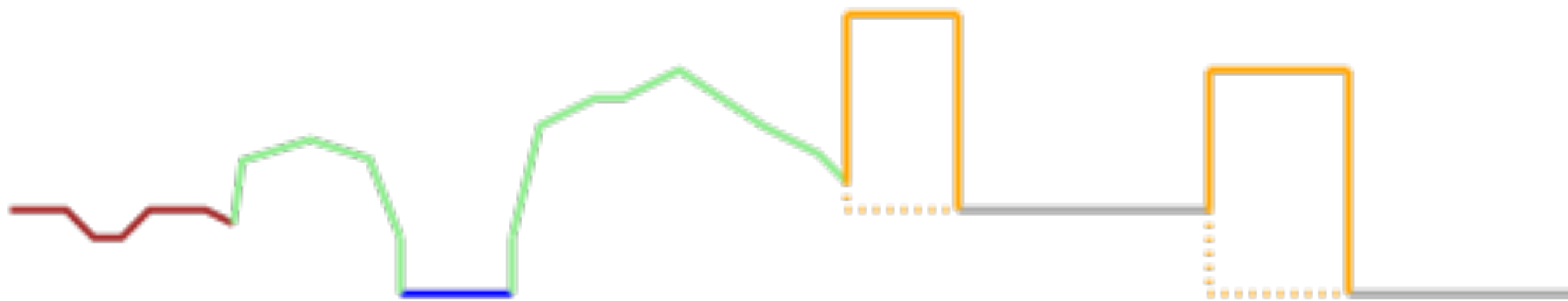
Lifting each polygon based on simple rules



Terrain and vegetation classes have LiDAR points added
Other classes only vertices are lifted



Stitching adjacent polygons with pairwise rules



Stitching adjacent polygons with pairwise rules

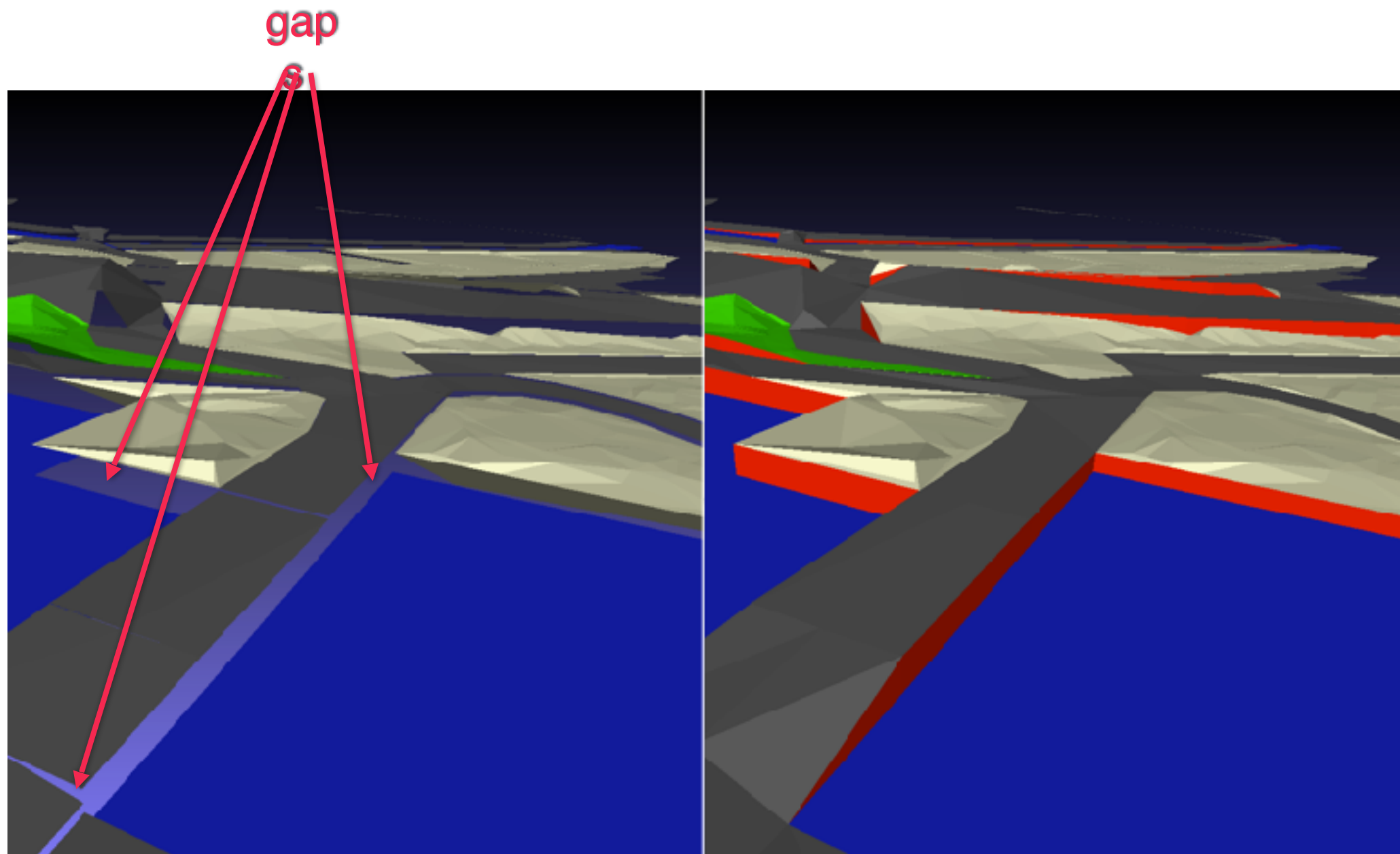


avg of both

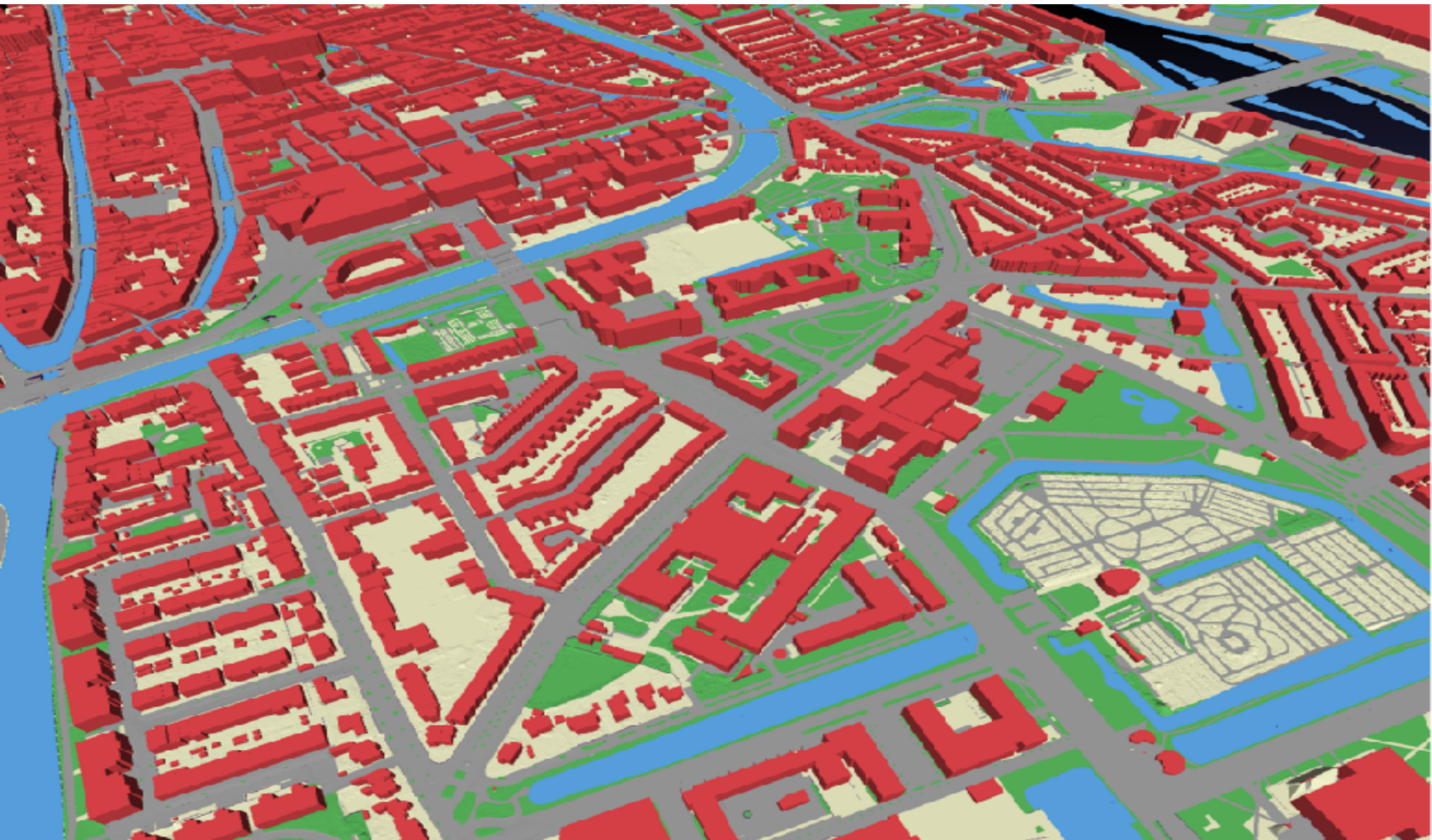
vertical surfaces added

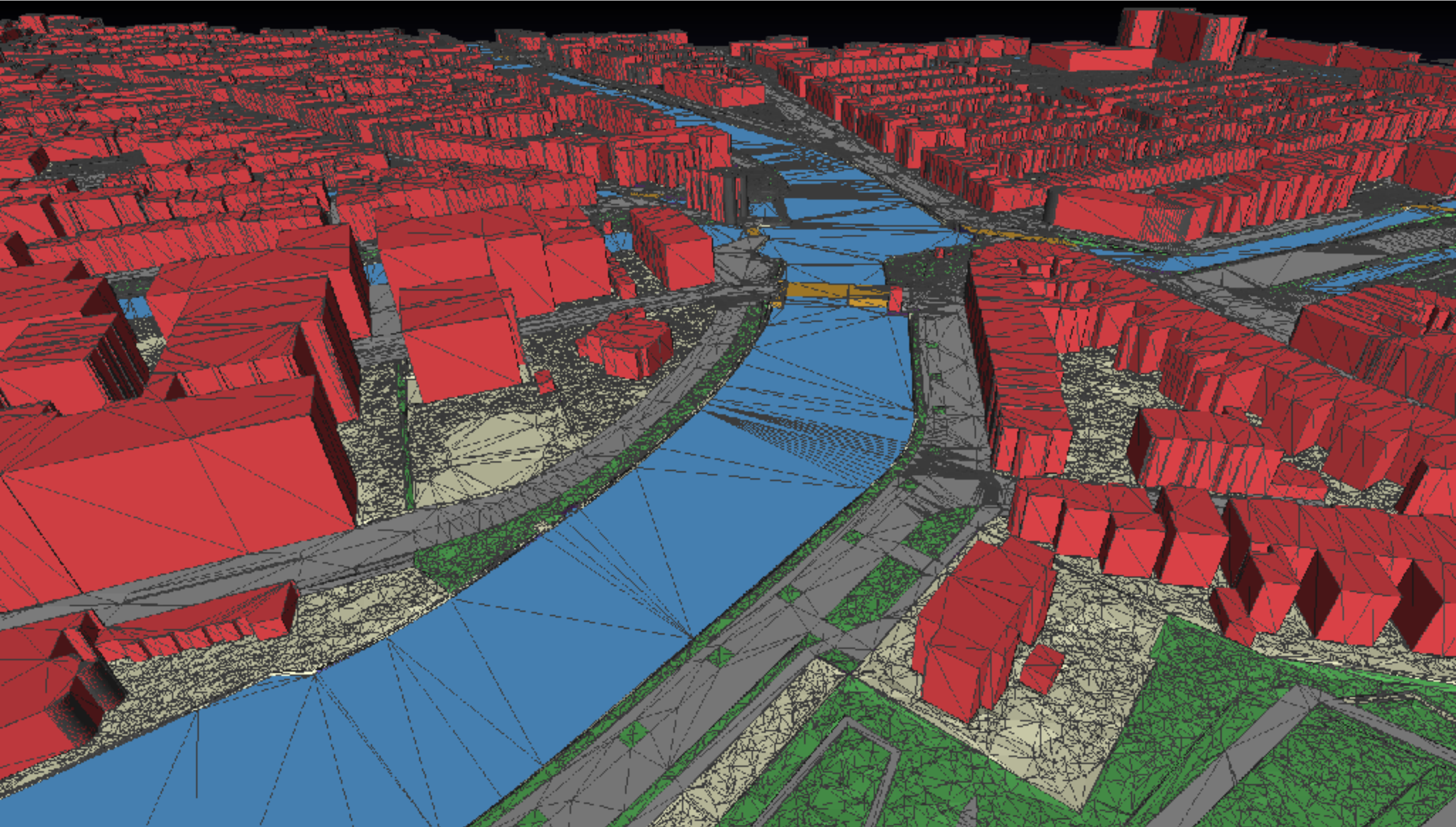
volume of buildings can be preserved

Stitching adjacent polygons with pairwise rules





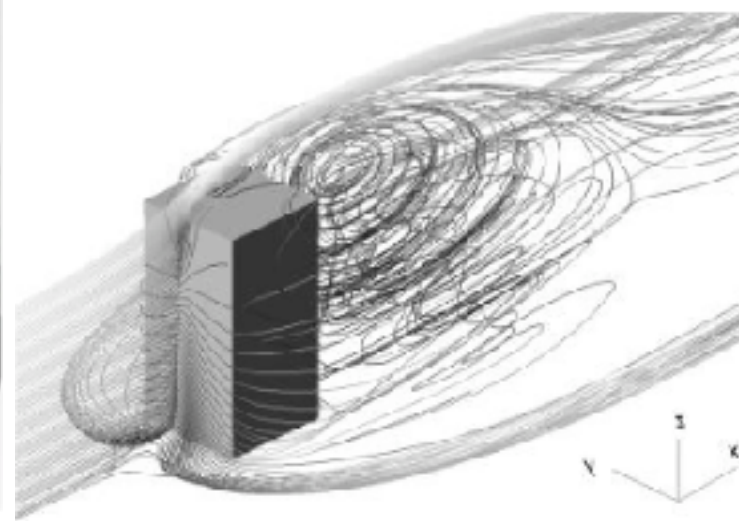
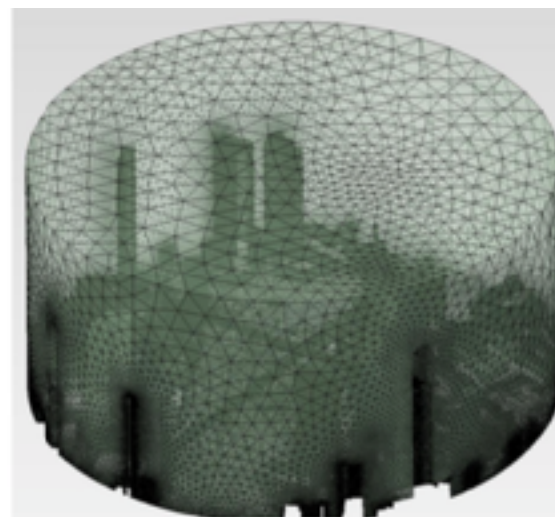
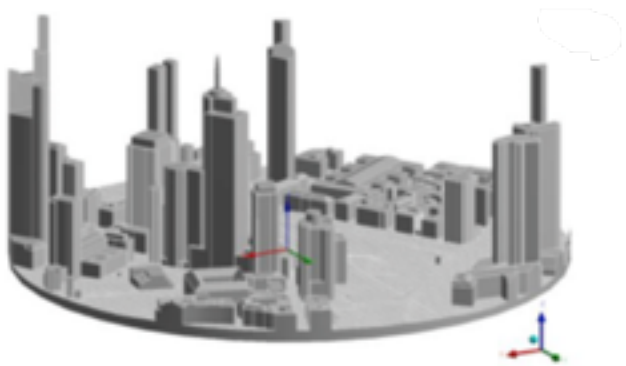
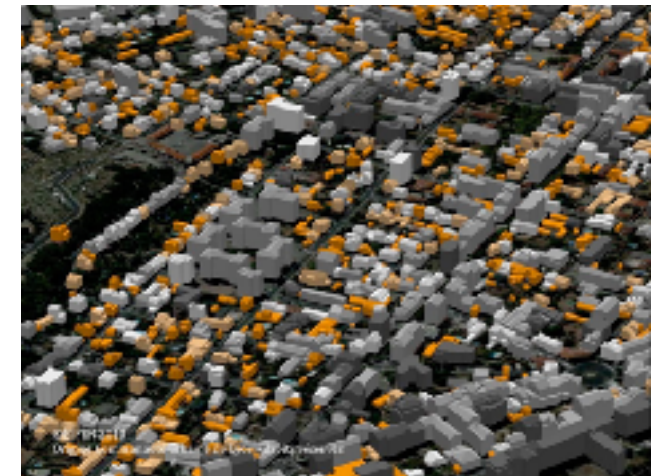
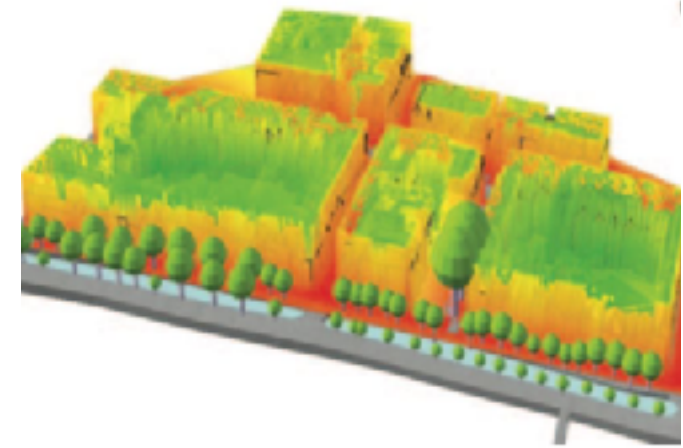




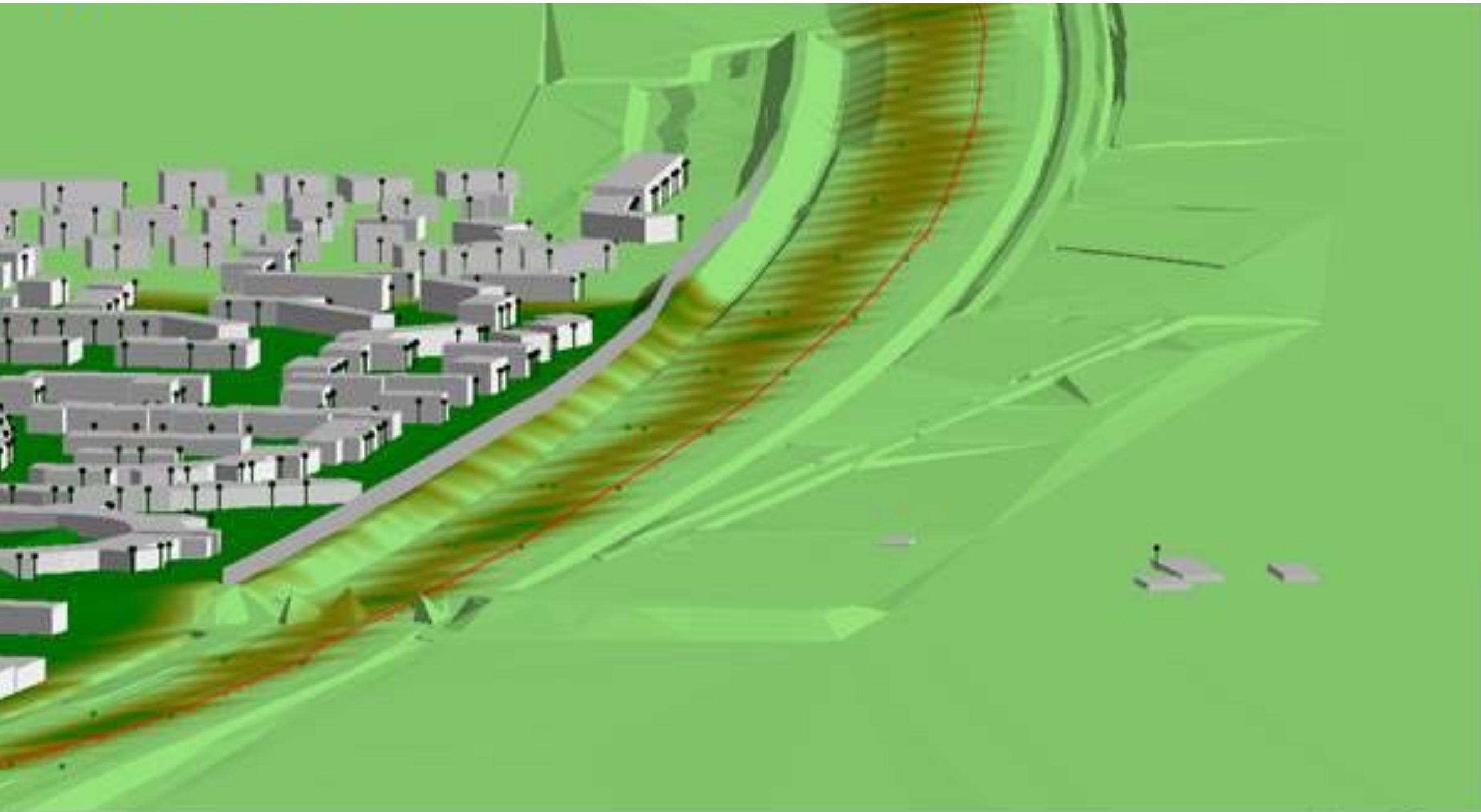
Applications

Opens the door to many simulations:

1. urban heat island
2. wind comfort for pedestrian at street level
3. wind loading on buildings
4. urban blast
5. crowd movement
6. urban flooding simulations



Sound modelling



3D dataset for sound

- Still in pre-project phase; discussion with stakeholders and specialists
- We all work together towards a common goal
- Entering development phase; testing ideas



Ministerie van Infrastructuur en Milieu



rivm

PDOK Publieke
Dienstverlening
op de Kaart



Rijkswaterstaat



Running 3dfier

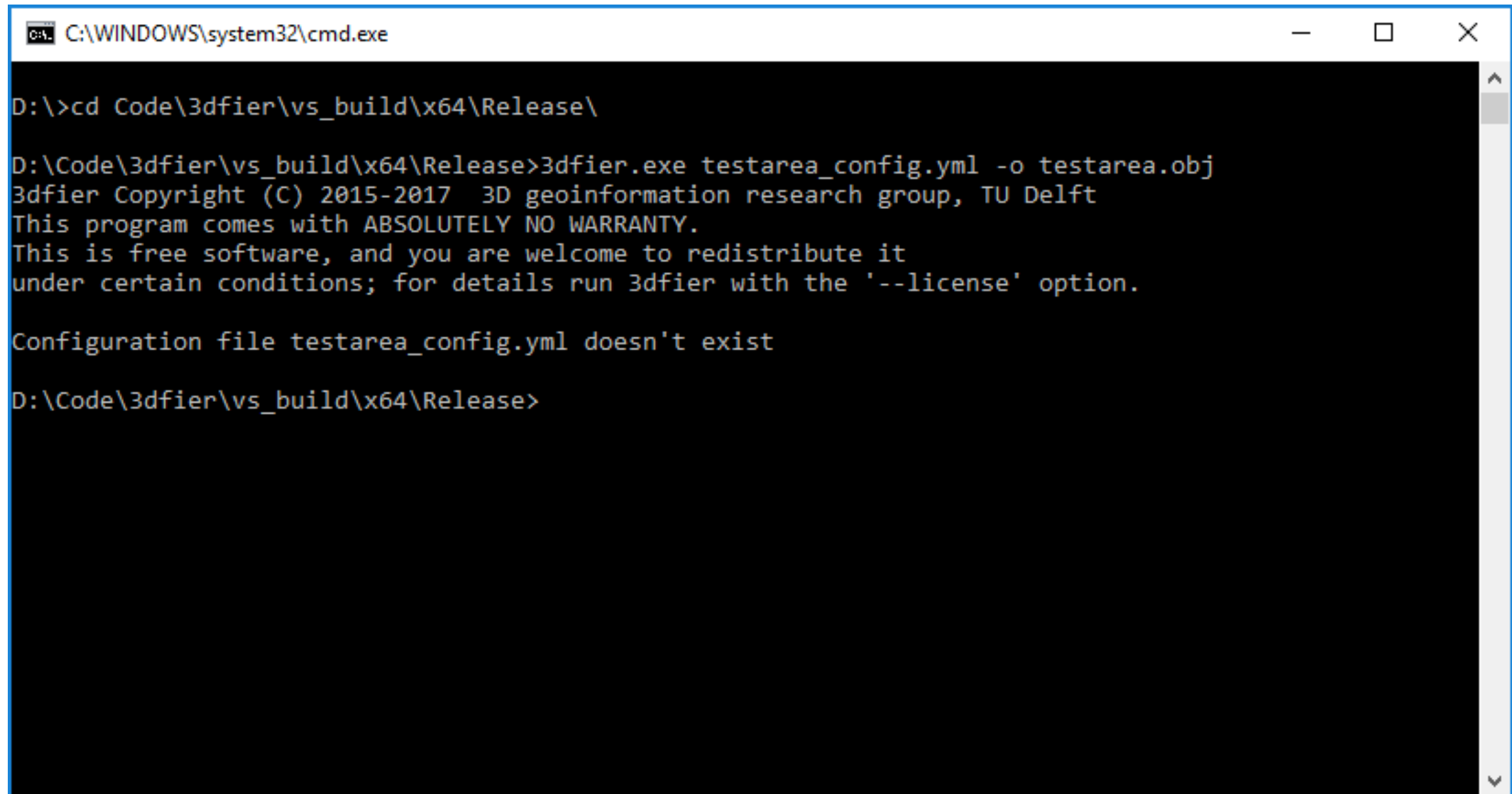
Download

3dfier Version 0.9.7 (Windows and MacOS)

<https://github.com/tudelft3d/3dfier/releases>

3dfier is a command-line program

So no fancy GUI

A screenshot of a Windows command prompt window. The title bar shows the path 'C:\WINDOWS\system32\cmd.exe'. The command prompt shows the following text:

```
D:\>cd Code\3dfier\vs_build\x64\Release\  
D:\Code\3dfier\vs_build\x64\Release>3dfier.exe testarea_config.yml -o testarea.obj  
3dfier Copyright (C) 2015-2017 3D geoinformation research group, TU Delft  
This program comes with ABSOLUTELY NO WARRANTY.  
This is free software, and you are welcome to redistribute it  
under certain conditions; for details run 3dfier with the '--license' option.  
  
Configuration file testarea_config.yml doesn't exist  
D:\Code\3dfier\vs_build\x64\Release>
```


3dfier YAML configuration

```
input_polygons:  
  - datasets:  
    - /Users/elvis/data/campus/partof.shp  
      uniqueid: FACE_ID  
      lifting: Building  
    - datasets:  
      - /Users/elvis/data/campus/another.gml  
      - /Users/elvis/data/campus/another2.gml  
      uniqueid: fid  
      lifting_per_layer:  
        Gebouw: Building  
        Terrein: Terrain  
        Waterdeel: Water  
    - datasets:  
      - /Users/elvis/data/bgt_oversbruggingsdeel.sqlite  
      uniqueid: gml_id  
      lifting: Bridge/Overpass  
      height_field: relatievehoogteligging  
      handle_multiple_heights: true  
  
lifting_options:  
  Building:  
    height_roof: percentile-95  
    height_floor: percentile-10  
    triangulate: true  
  Water:  
    height: percentile-10  
  Road:  
    height: percentile-50  
  Separation:  
    height: percentile-80  
  Bridge/Overpass:  
    height: percentile-50  
  Terrain:  
    simplification: 100  
  Forest:  
    simplification: 10  
  
input_elevation:  
  - datasets:  
    # - /Users/elvis/data/top10nl/schie/ahn2_u.laz  
    # - /Users/elvis/data/top10nl/schie/ahn2_g.laz  
    - /Users/elvis/data/top10nl/schie/ahn3.laz  
  omit_LAS_classes:  
    - 1 # Unclassified  
    - 6 # building  
  thinning: 10  
  
options:  
  building_radius_vertex_elevation: 3.0  
  radius_vertex_elevation: 1.0  
  threshold_jump_edges: 0.25  
  
output:  
  format: OBJ # OBJ-NoID, OBJ-BUILDINGS, CityGML, CSV-BUILDINGS or Shapefile  
  building_floor: false  
  vertical_exaggeration: 3
```

Input

Lifting and filtering

Input

Buffers

Output

3dfier tutorials

Usage of 3dfier

<https://github.com/tudelft3d/3dfier/wiki/General-3dfier-tutorial-to-generate-LOD1-models>

Extract data from OSM

<https://github.com/tudelft3d/3dfier/wiki/Extracting-building-footprints-from-OpenStreetMap>

Visualisation

- Using OBJ output
 - Meshlab [<http://www.meshlab.net/>]
 - Microsoft 3D Builder (Windows 8/10 only)
- Using CityGML output
 - azul (MacOS 10.13+ only) [<https://github.com/tudelft3d/azul>]