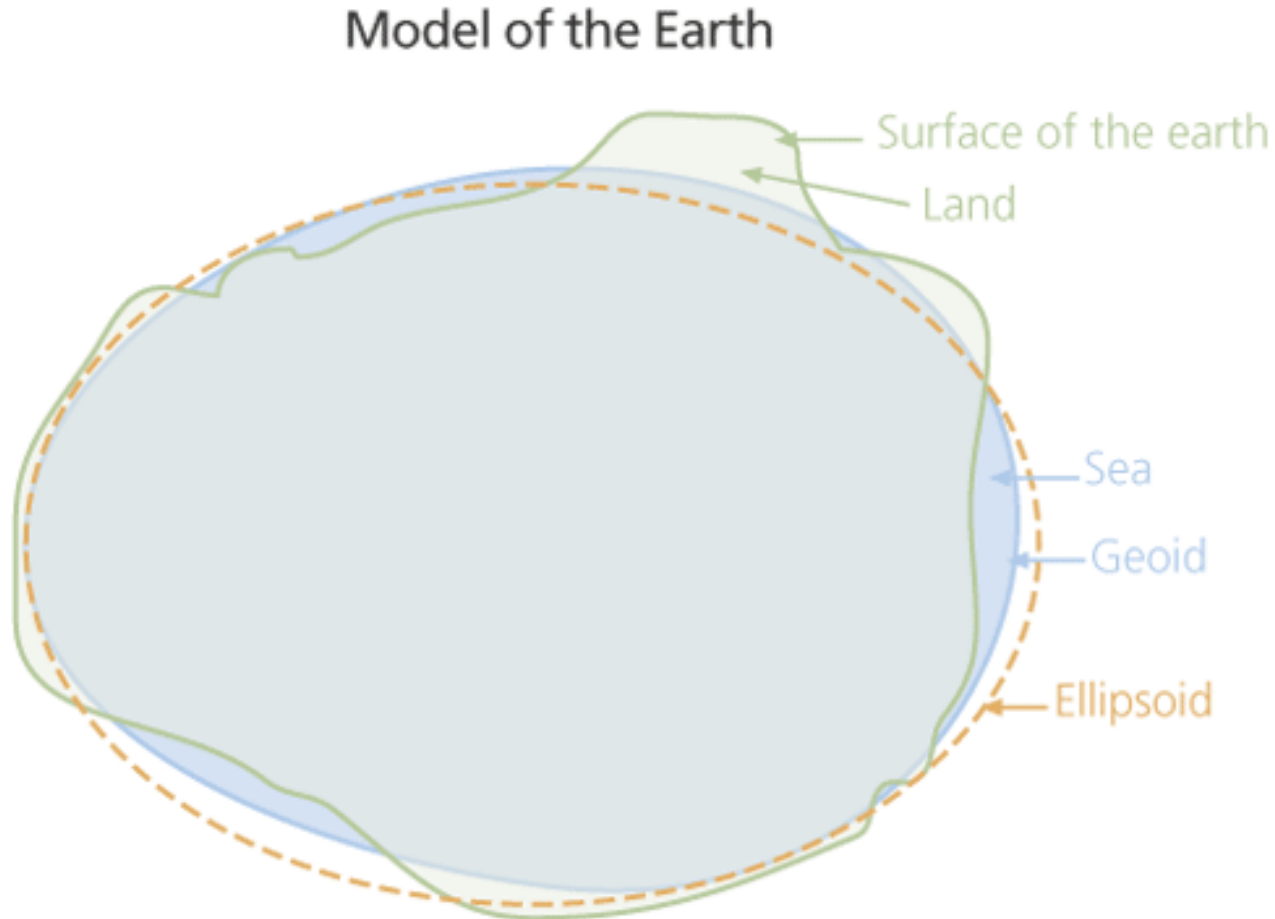


# Agenda

- Jorden – Plattform - Versionskontroll
- 3D-System för geografisk visning
- Teknik för visualisering av data
- Exempel annorlunda tekniker: Intelligent paper - Minecraft



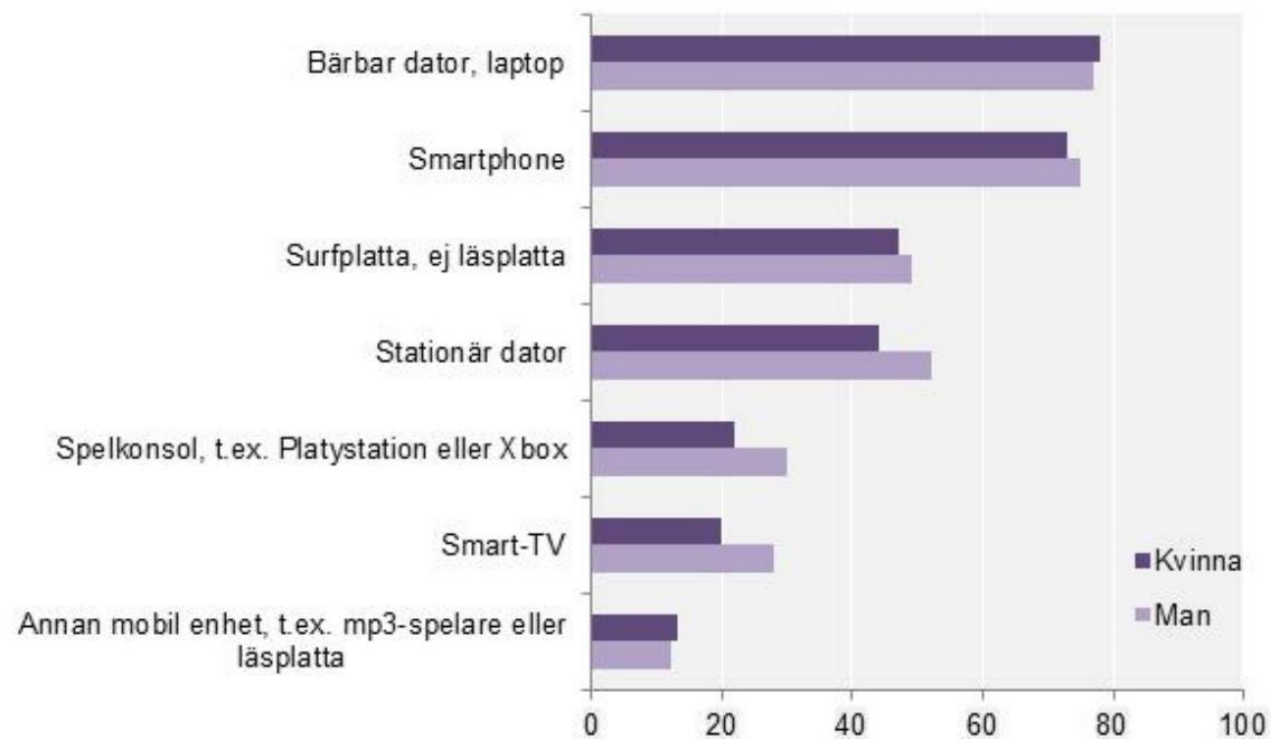
# Jorden



**Geoid** = Global eller lokal approximering av en nivå i jordens tyngdkraftsfält.

# Plattform

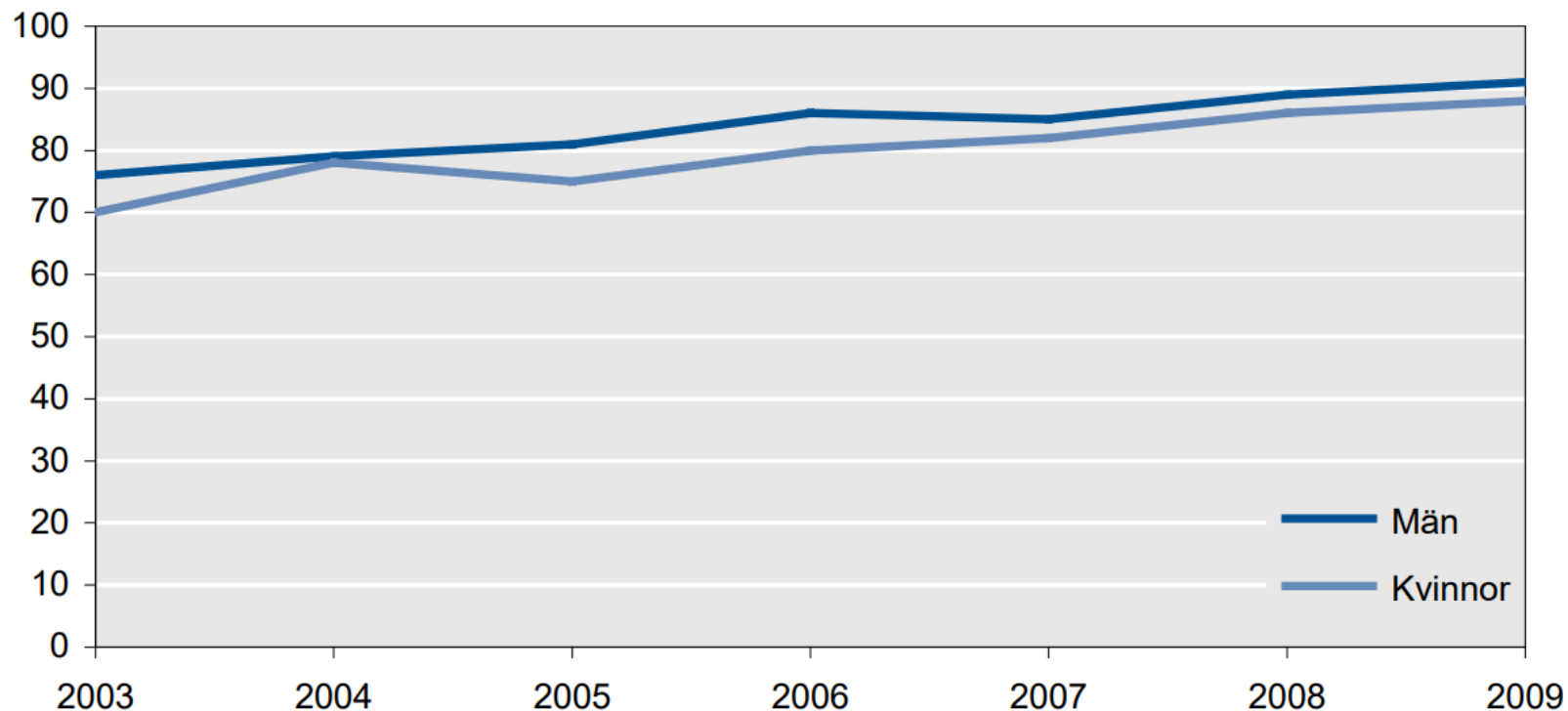
Utrustning som används för att ansluta till internet i hemmet. Andel personer i åldern 16-85



SCB, 2014

## Plattform: Papper eller digitalt?

**Diagram 1. Andel personer i åldern 16–74 år med tillgång till Internet i hemmet 2003–2009, efter kön, procent**



SCB, 2009

# Digitalt arbetssätt

- Hela processen är digital.
- Alla jobbar med samma information.
- Systemet hanterar versioner.
- Förändringar är spårbara.

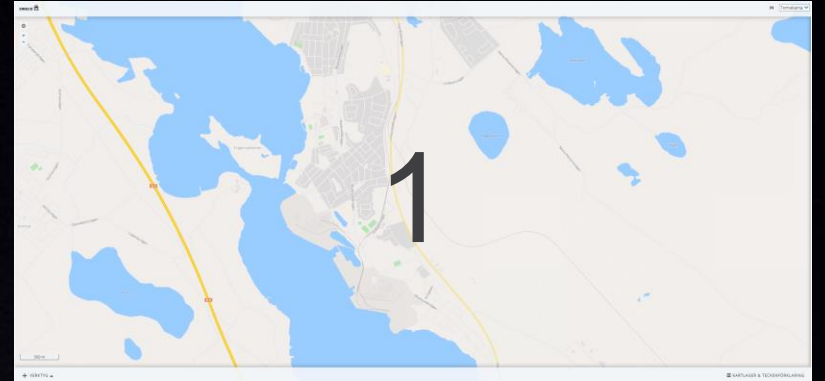


# Sweco Cube

1 - Öppna data

2 - Avtalsdata, tex. GSD

3- Geografisk förvaltnings- och  
projektinformation



# 3D-system idag

- Autodesk
- Bentley
- ESRI
- m fl





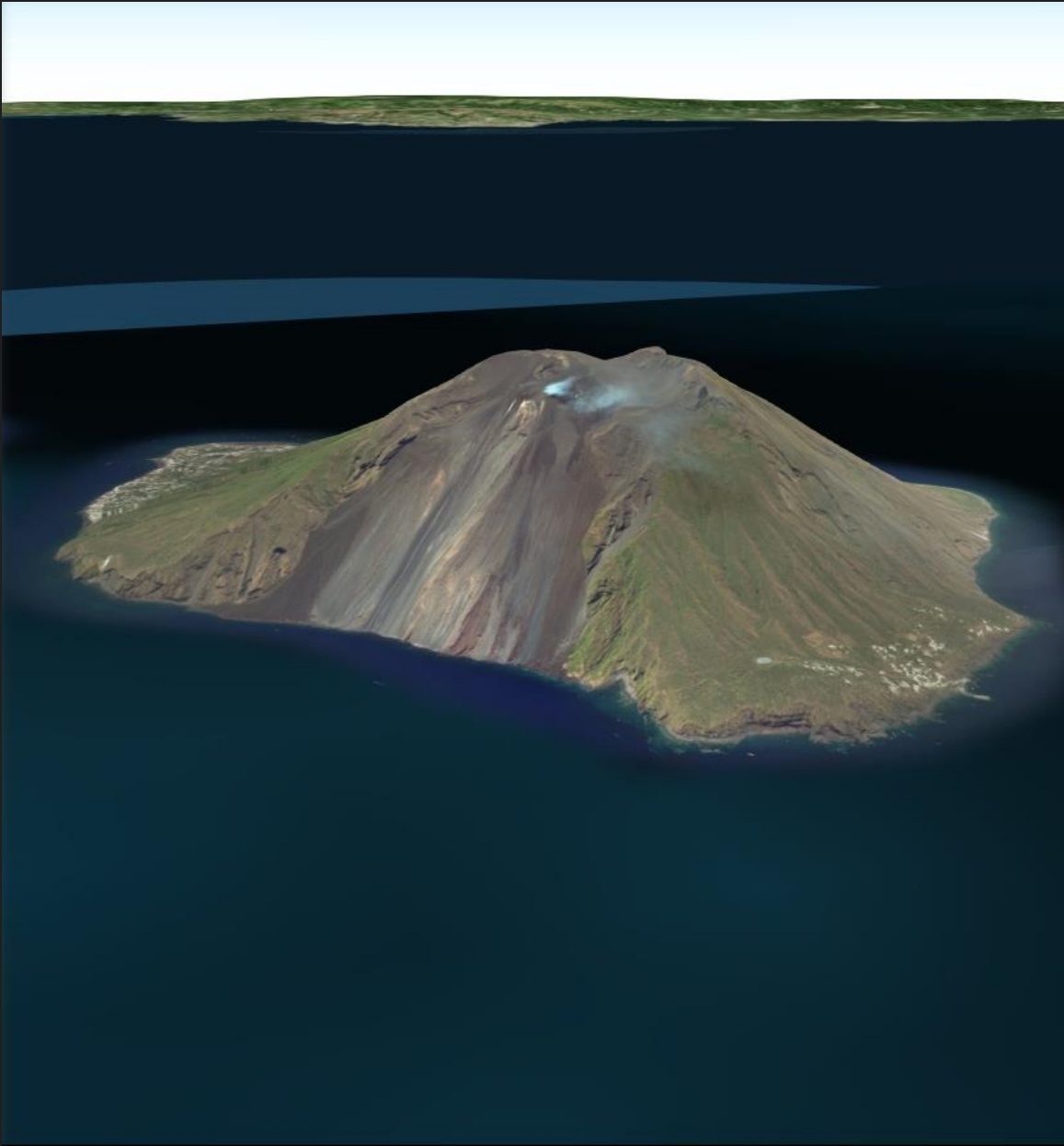
SGL: Ge





**City of Göteborg, Sweden**

Comprehensive Planning  
Chris Andrews, ESRI 2016



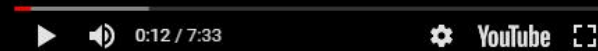
A story map



## Mountains of Fire

### ITALY: Stromboli

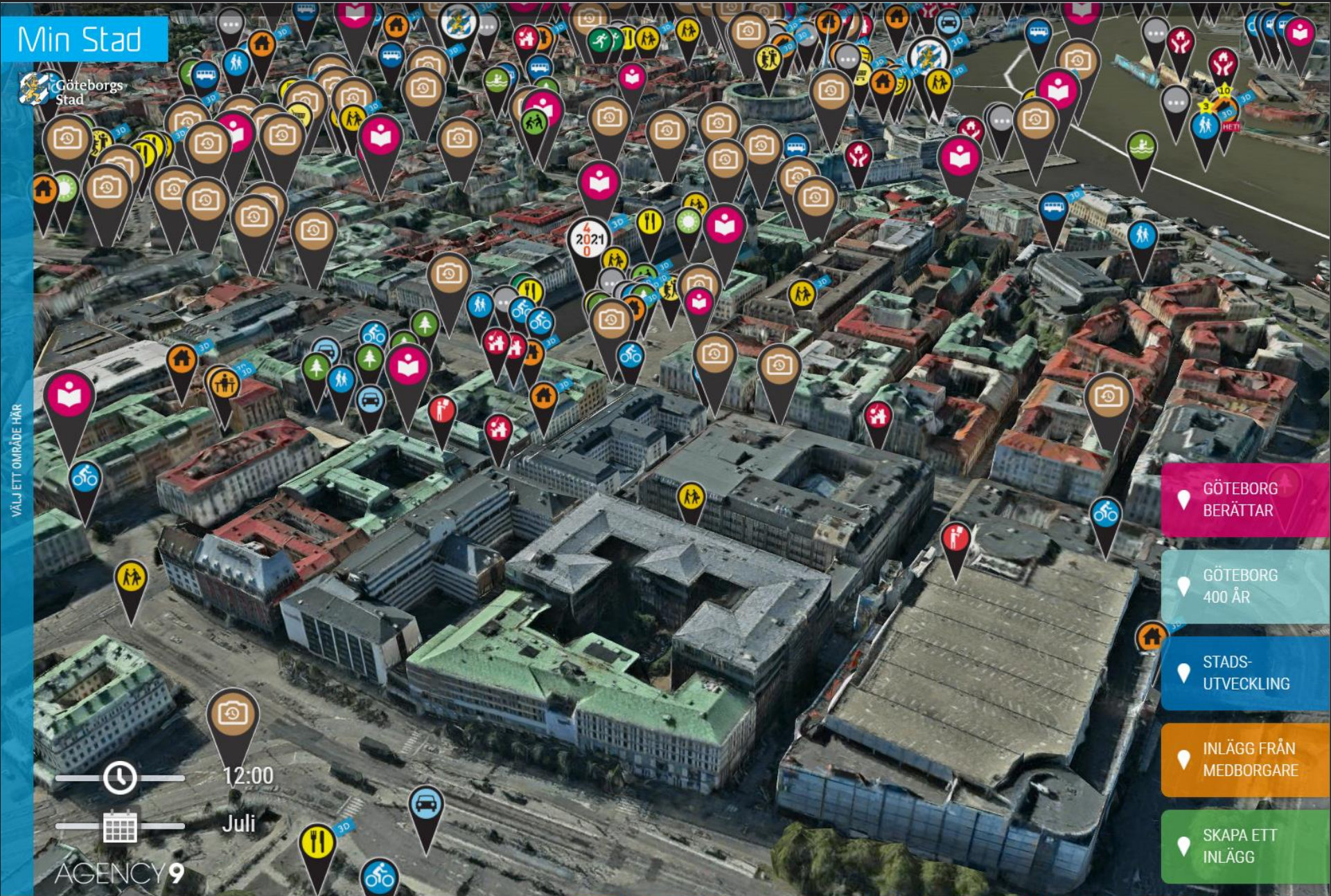
Stromboli : explosions et coulée de lave



Stromboli, a highly active volcano that dominates an island north of Sicily, has a penchant for hurling boulders—volcanic bombs—into the air. This violent, "strombolean" form of eruption has been observed on many other volcanoes worldwide. The island of Stromboli is inhabited (pan toward the northeast and southwest on the image at left), but most of the mountain's wrath is aimed seaward and toward the northwest.



16



Min Stad

Göteborgs Stad

VÄLJ ETT OMRÅDE HÄR

12:00

Juli

AGENCY 9

GÖTEBORG BERÄTTAR

GÖTEBORG 400 ÅR

STADS-UTVECKLING

INLÄGG FRÅN MEDBORGARE

SKAPA ETT INLÄGG

# Teknik

- VR – Virtual Reality



# Teknik

- AR = Augmented Reality



# VR – AR - MR



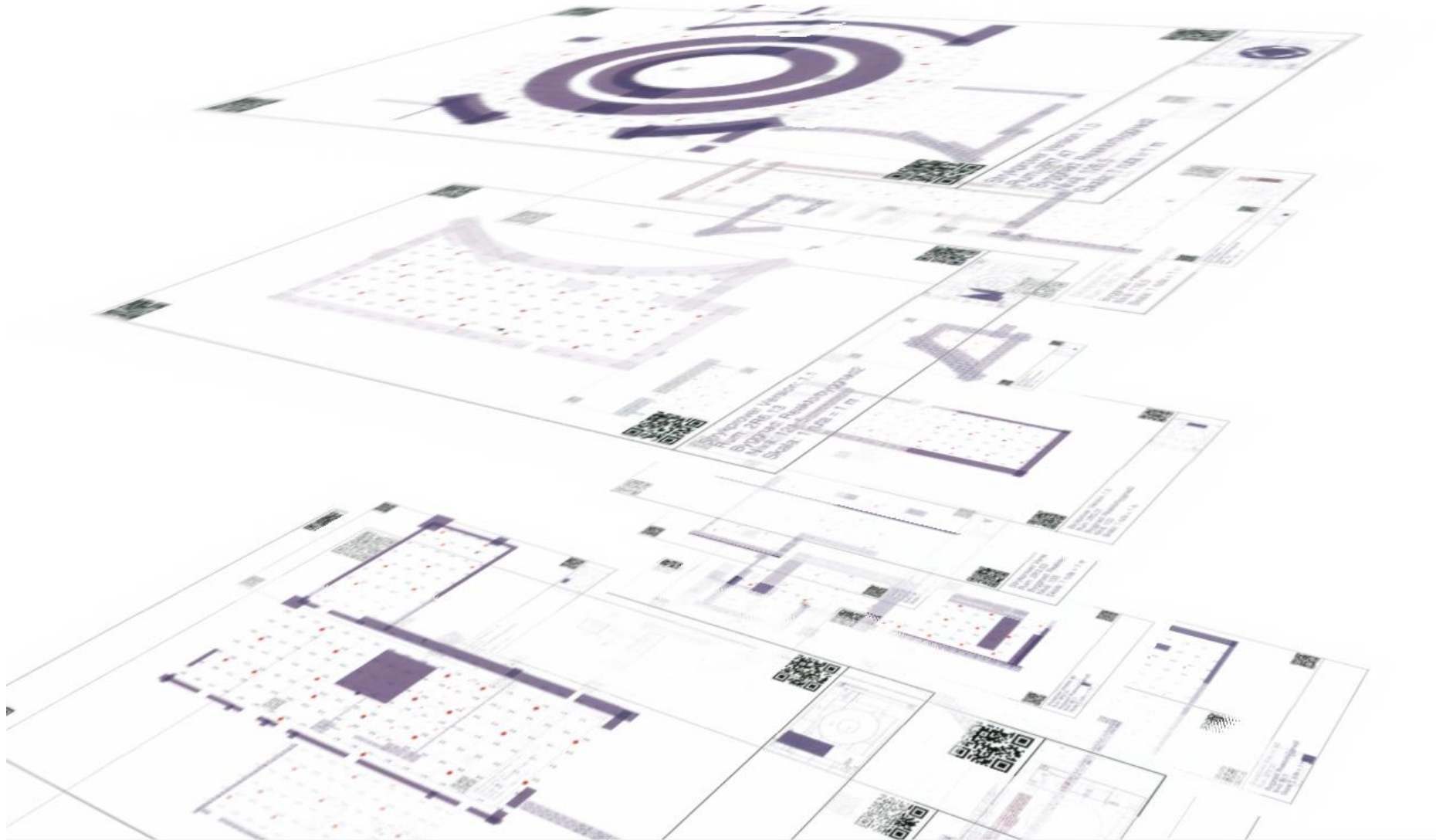




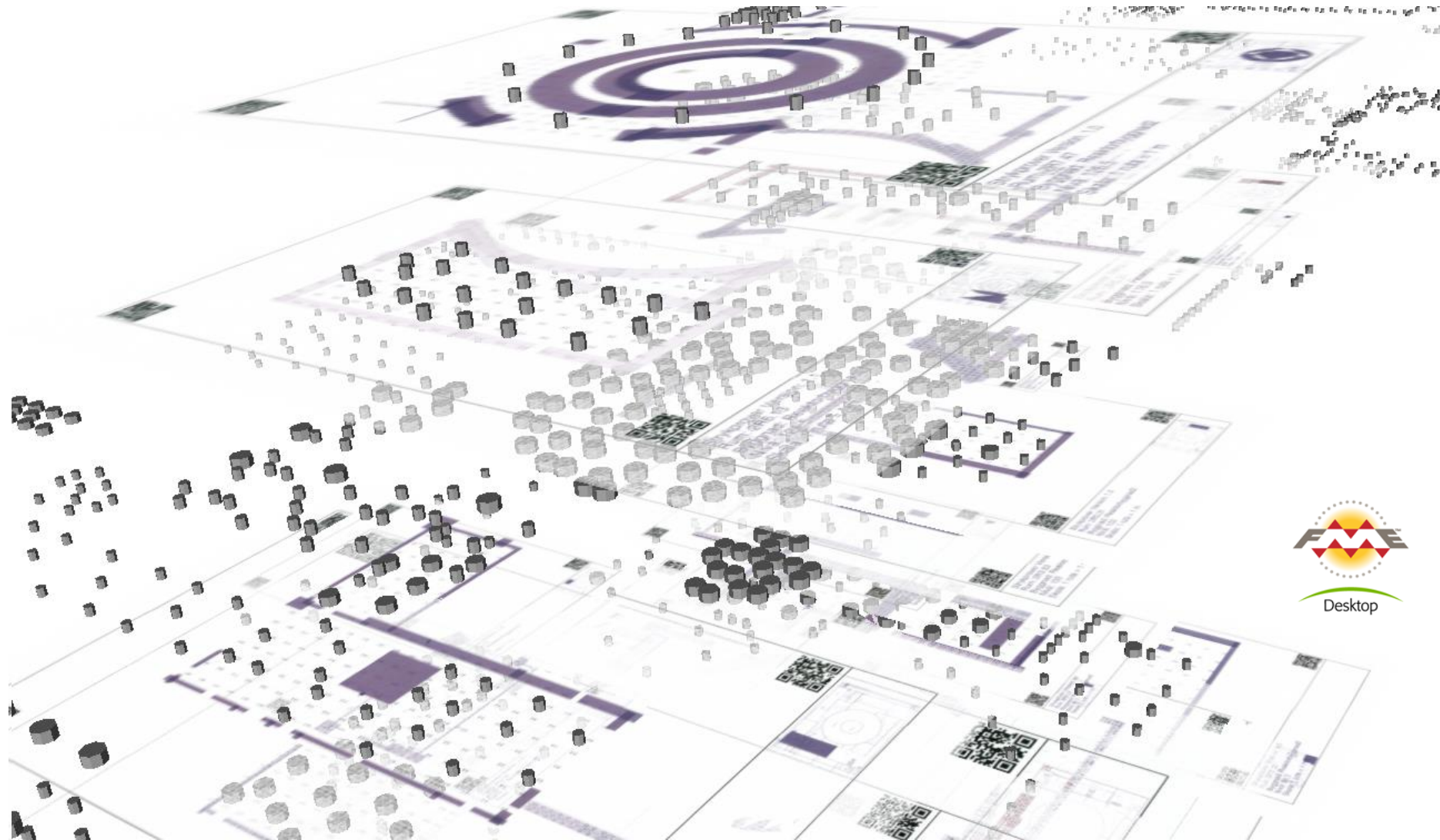
# Intelligenta papper



# Intelligent papers – indoor positioning



# Intelligent papers – indoor positioning





# Framtidens Kristianstad byggs i Minecraft

- En kopia av Kristianstad har byggts i datorspelet Minecraft. På torsdag ska 27 spelare släppas lösa i spelvärden för att bygga framtidens Kristianstad.

 0  0  0

KRISTIANSTAD 16 september 2014





A part of "Vilans Strandängar" - where the City of Kristianstad is focusing on sustainable urban planning. SWECO assisted by transforming LIDAR and 2D map data into a Minecraft-world open to the public. This process was setup in Spatial ETL (FME).



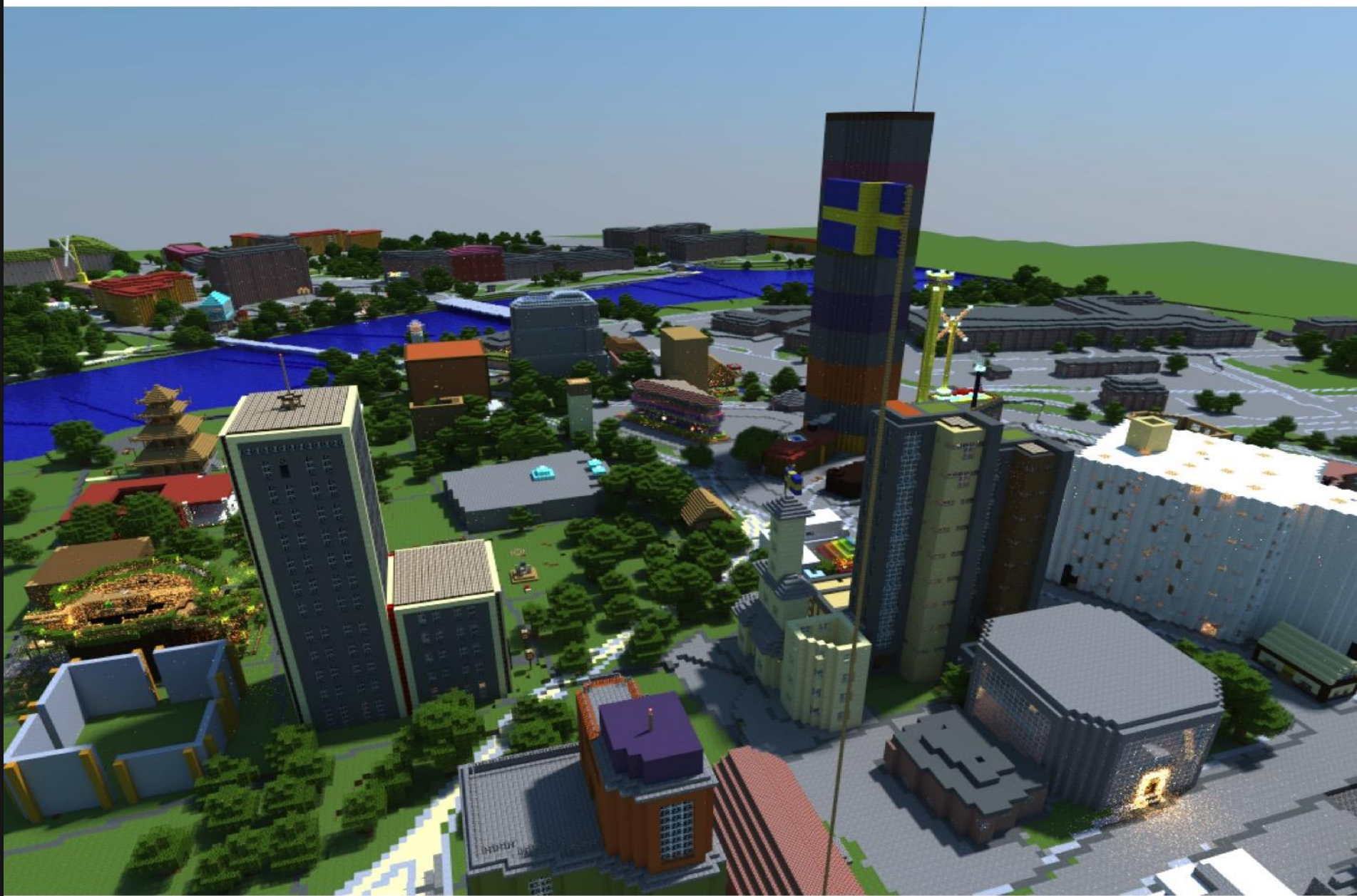


Players of the game gets a building permit for a property in the virtual City of Kristianstad. They can build whatever they want on their lot. The picture shows some colorful new buildings and also current vegetation and infrastructure.





Viewing buildings from street level reveals that young players in the City of Kristianstad can create designs that reminds of modern architecture.



The background shows current buildings in the City of Kristianstad. In the front the Minecraft world contains a mix of new and old architecture the players created.

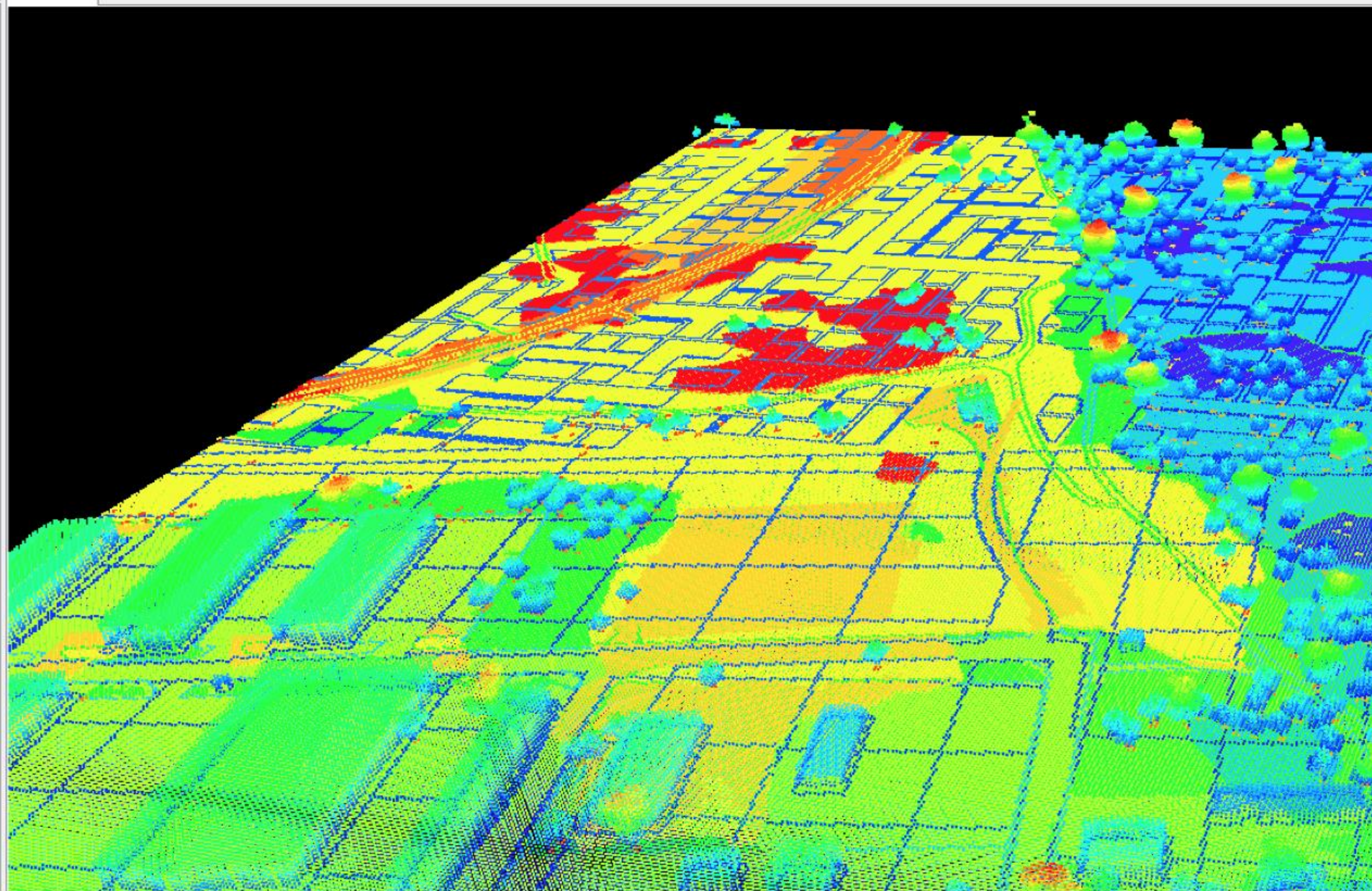


Play Control



View 1 x

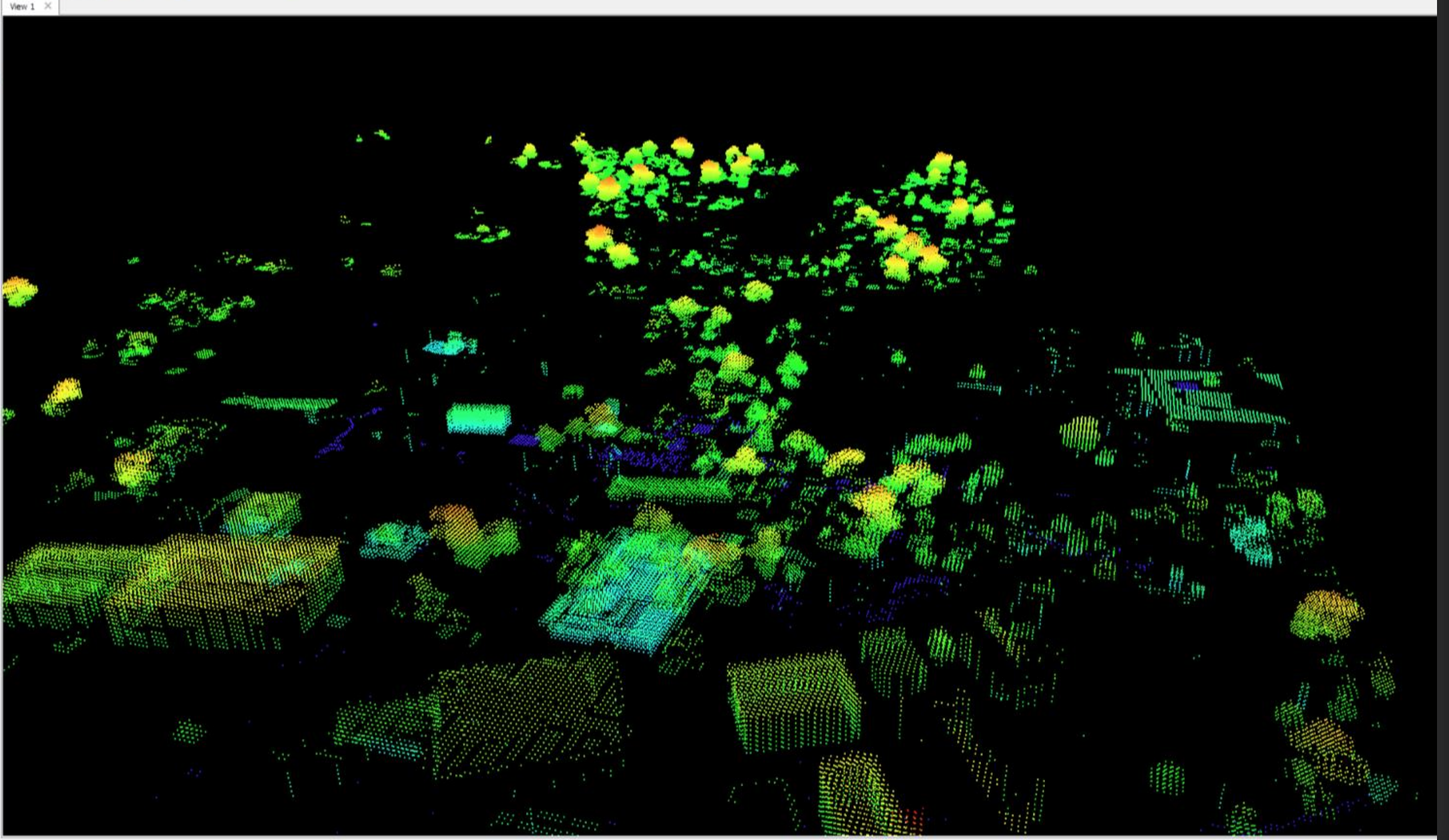
- View 1 (12)
- inspector [FFS] (12)
  - PointCloudSplitter\_Split\_1 (1)
  - PointCloudSplitter\_Split\_2 (1)
  - PointCloudSplitter\_Split\_3 (1)
  - PointCloudSplitter\_Split\_6 (1)
  - PointCloudSplitter\_Split\_7 (1)
  - PointCloudSplitter\_Split\_9 (1)
  - PointCloudSplitter\_Split\_17 (1)
  - PointCloudSplitter\_Split\_18 (1)
  - PointCloudSplitter\_Split\_20 (1)
  - PointCloudSplitter\_Split\_24 (1)
  - PointCloudSplitter\_Split\_82 (1)
  - PointCloudSplitter\_Split\_159 (1)





Play Control View 1 (3)

- inspector [FFS] (3)
  - Added (1)
  - Not\_changed (1)
  - Removed (1)

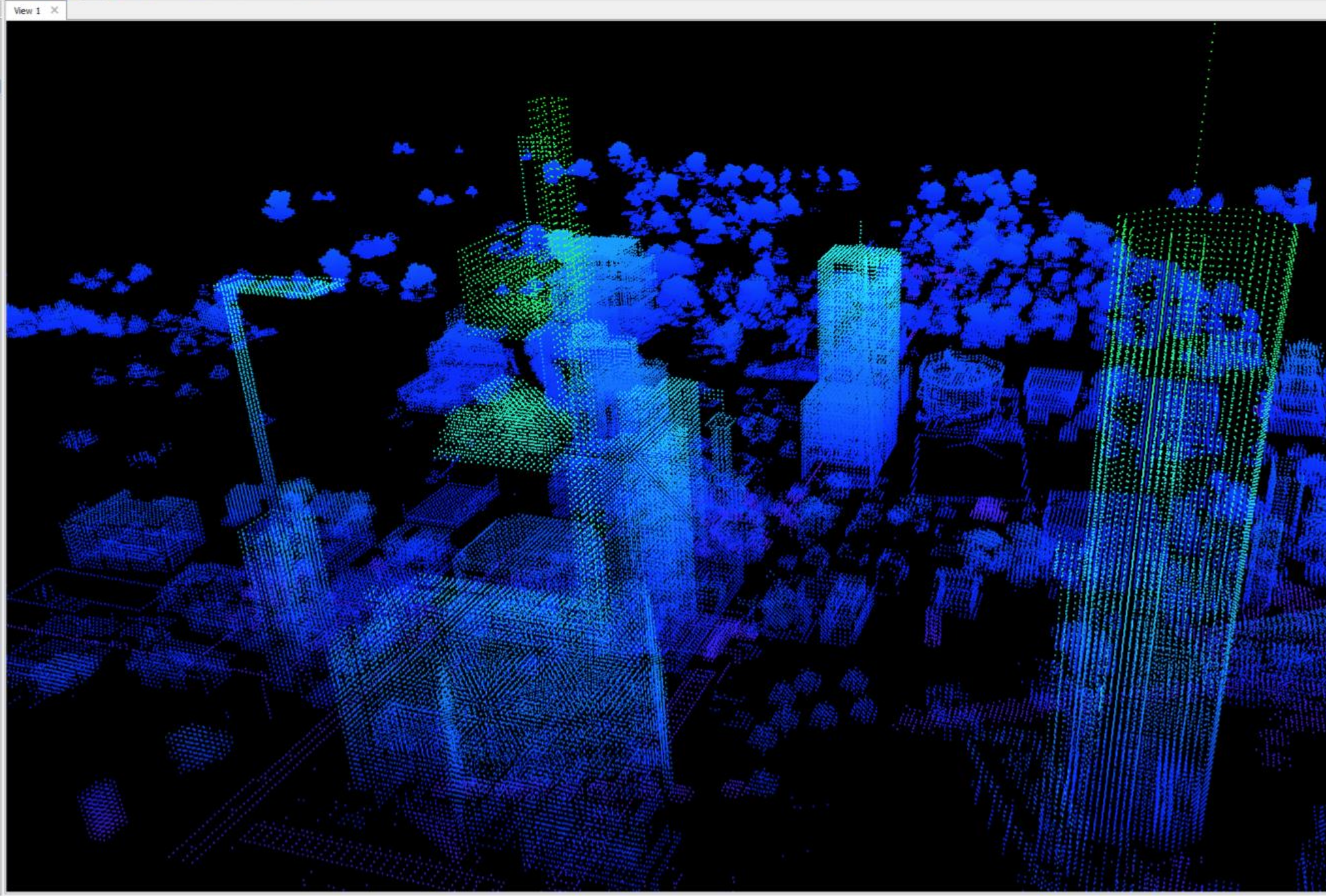




Play Control

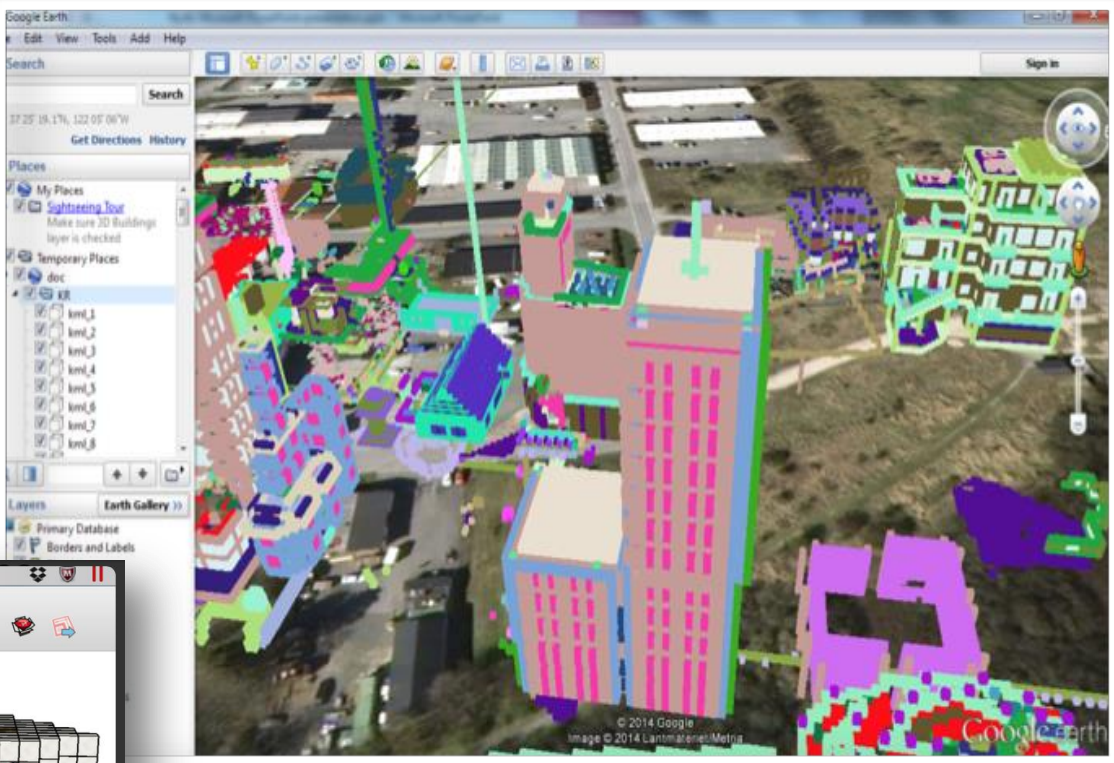
View 1 (3)

- inspector [FFS] (3)
  - Added (1)
  - Not\_changed (1)
  - Removed (1)

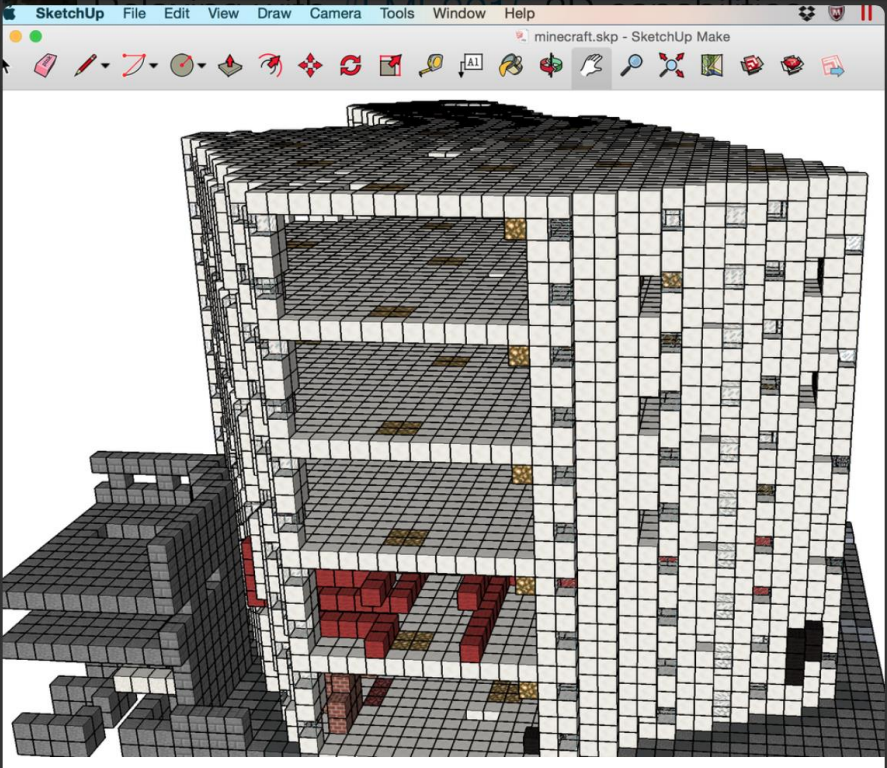




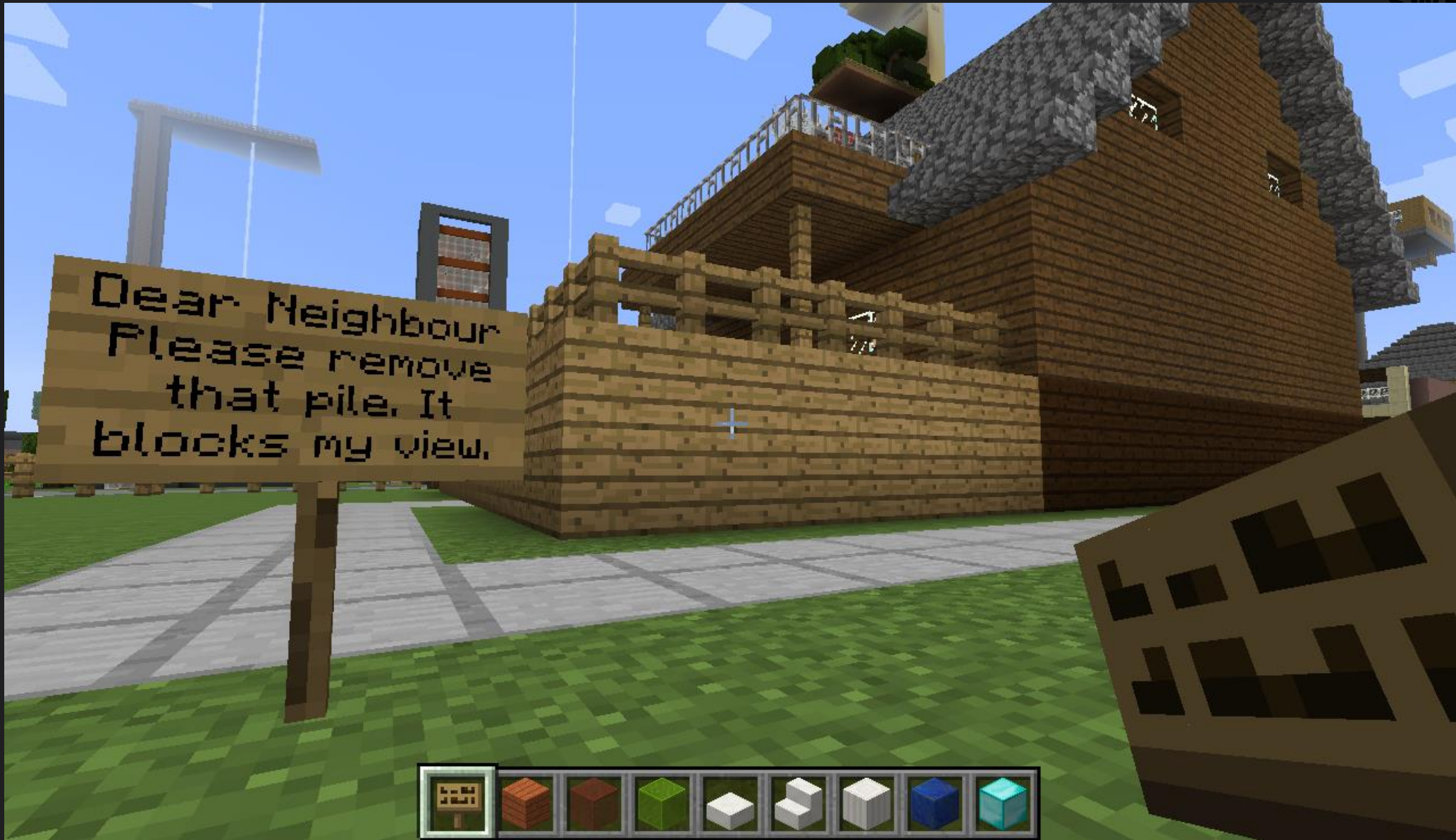
Native

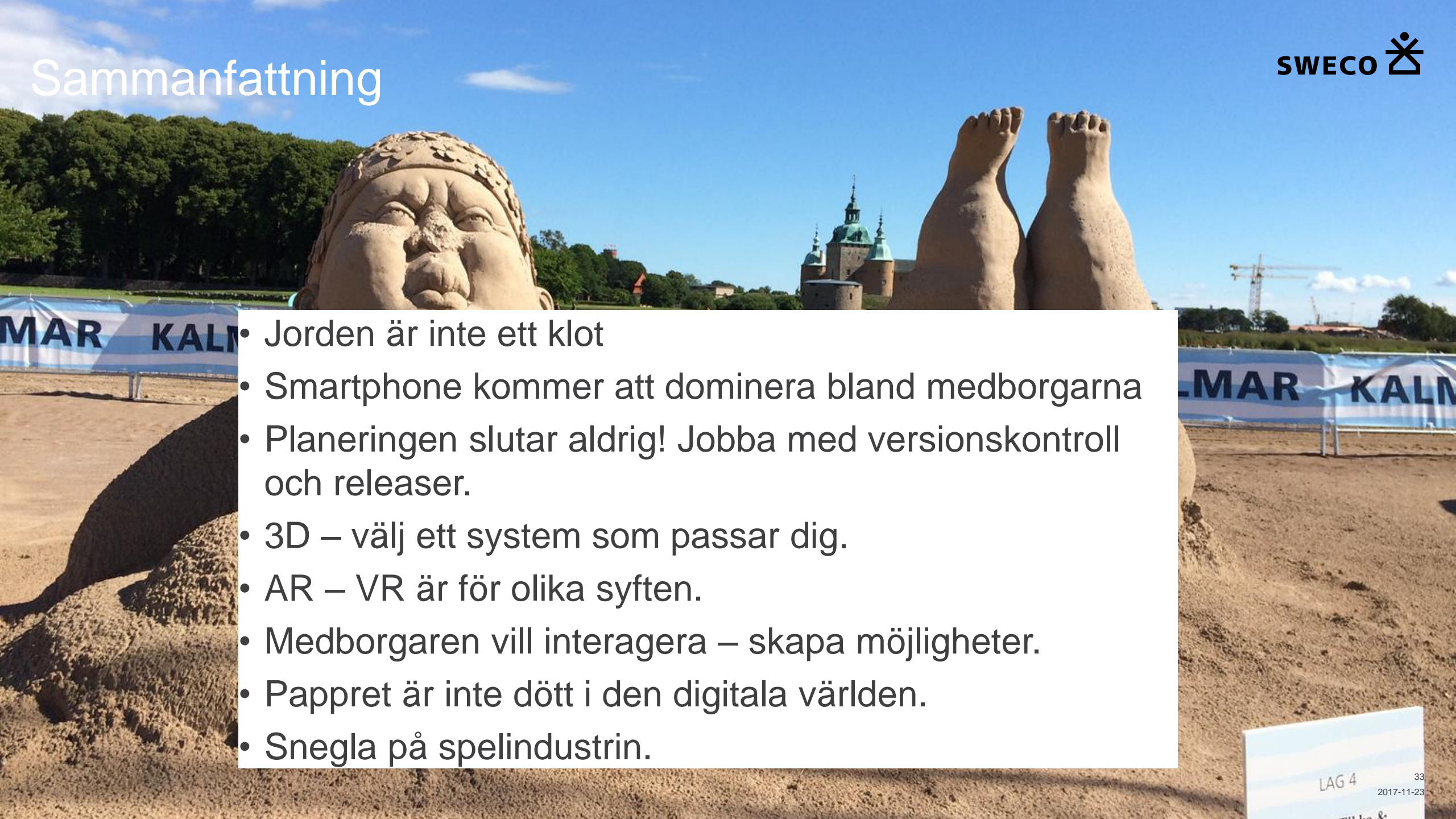


KML



Sketchup



- 
- Jorden är inte ett klot
  - Smartphone kommer att dominera bland medborgarna
  - Planeringen slutar aldrig! Jobba med versionskontroll och releaser.
  - 3D – välj ett system som passar dig.
  - AR – VR är för olika syften.
  - Medborgaren vill interagera – skapa möjligheter.
  - Pappret är inte dött i den digitala världen.
  - Snegla på spelindustrin.



Det som händer imorgon är troligen redan här idag

Tack för att ni lyssnade!

[Peter.rothstein@sweco.se](mailto:Peter.rothstein@sweco.se)



**SWECO**

