

# CROWDSOURCING AND VIRTUAL REALITY APPLICATIONS FOR PEACEKEEPING: STUDY CASES IN MOGADISHU AND TRIPOLI

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*State of the Map 2022,  
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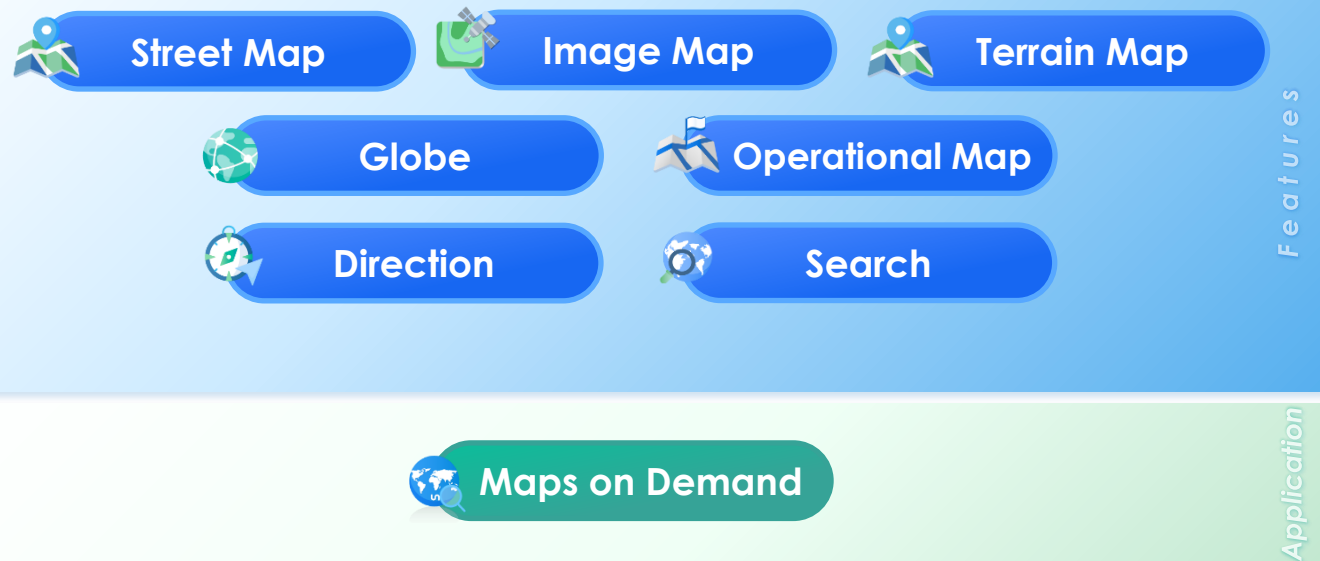
## What we do

The logistics base and peacekeeping operations



## UN Maps

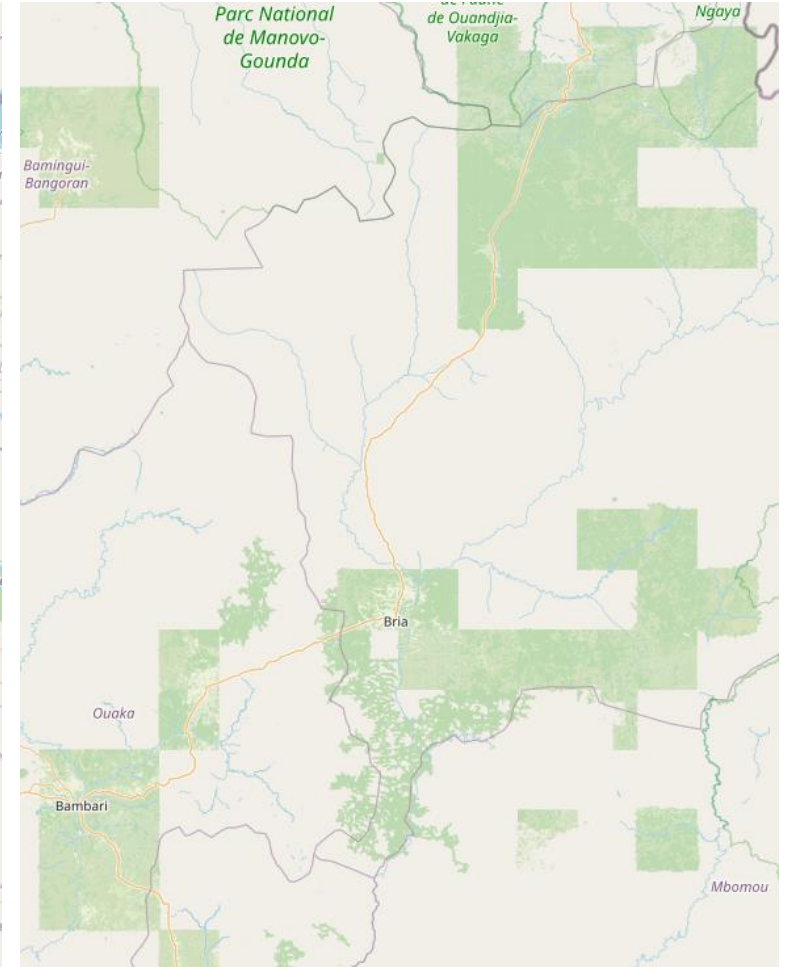
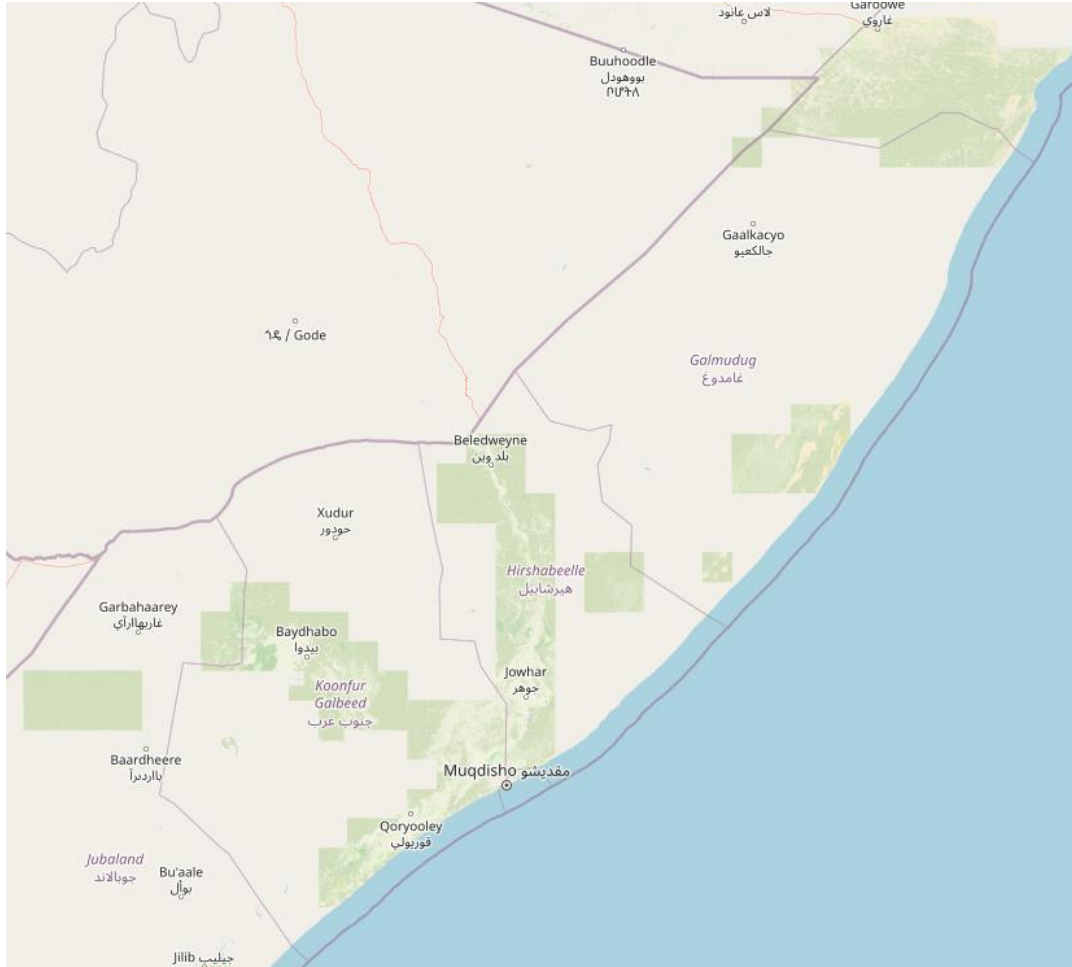
The 'Google Maps' of the UN



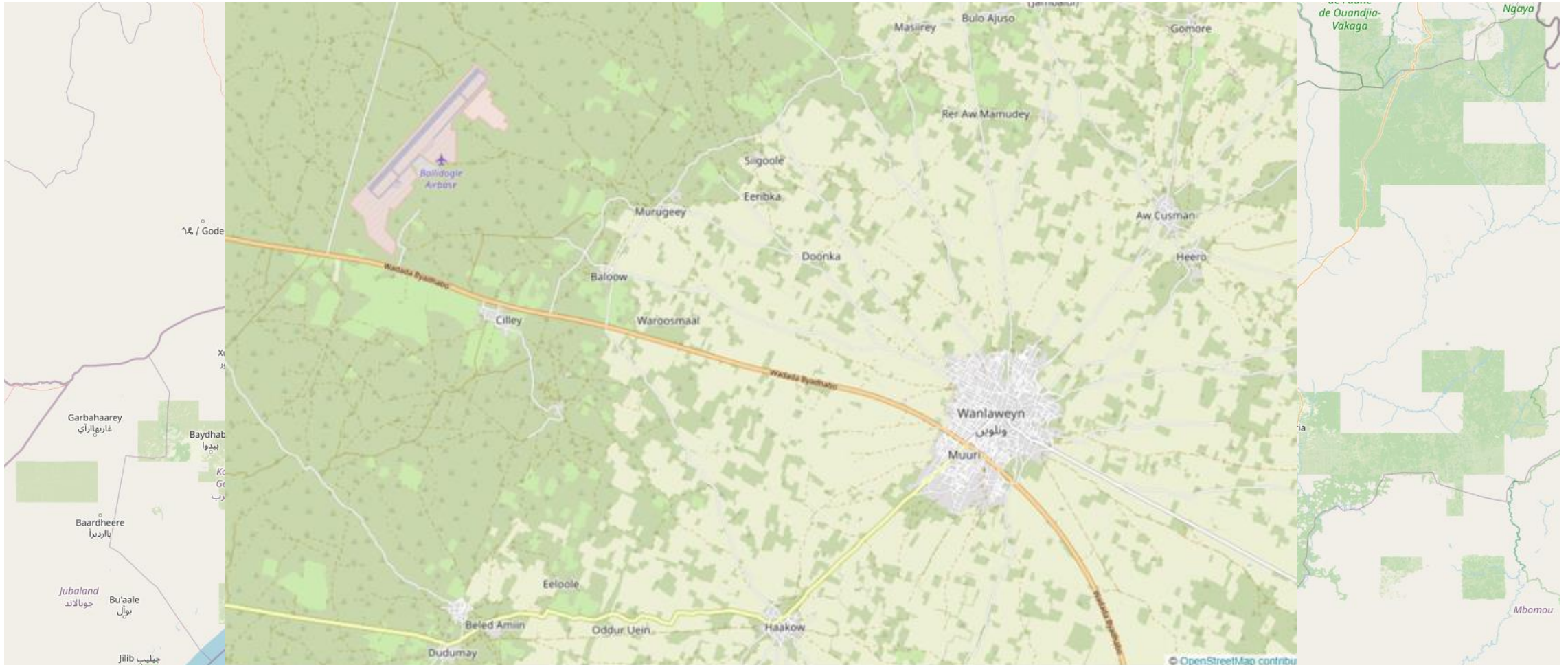


## UN Maps

The 'Google Maps' of the UN



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## Leveraging innovative technology

Virtual Reality (VR) applications and use cases

- Visualization around a shared simulated 3D view of an area of interest for strategic planning



### Operational Efficiency

Develop specialist skill-sets to be deployed as strategic or mission-level resources in a cost-effective manner



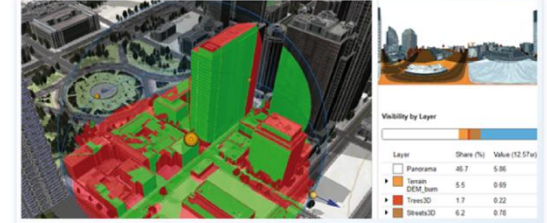
### Collaboration

Enable multiple users to safely collaborate around a shared simulated sandbox, from separate remote locations



### Safe training

Improve and ensure the delivery of training, especially in situations where safety and security are compromised



### Expanded Planning Tools

Allow users to provide / create on-the-fly input to planning, to trigger and shape their simulations in a realistic virtual environment



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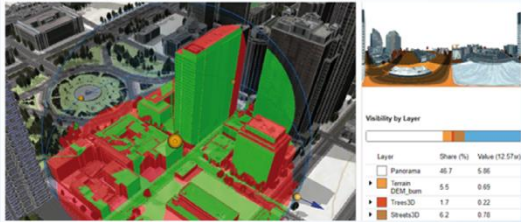
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## Yet another building mapping project?

Yes, but...

- Need for accurate information
  - Geometry and footprint
  - Building characteristics (height, levels, material, color, roof type)



### Roof shape

You can characterize the roof of a building using a catalogue of well-known roof types.













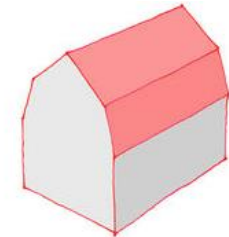

Image						
roof:shape	flat	skillion	gabled	half-hipped	hipped	pyramidal

Image						
roof:shape	gambrel	mansard	dome	onion	round	saltbox



#### Description

Roof shape type. 

Group: [Buildings](#)

Used on these [elements](#)



#### Requires

- [building=\\*](#) or [building:part=\\*](#)



## Yet another building mapping project?

Yes, but...

- Urban environment
  - Buildings are close to each other
  - Azimut for tall buildings
  - Comparison of imageries, offset correction



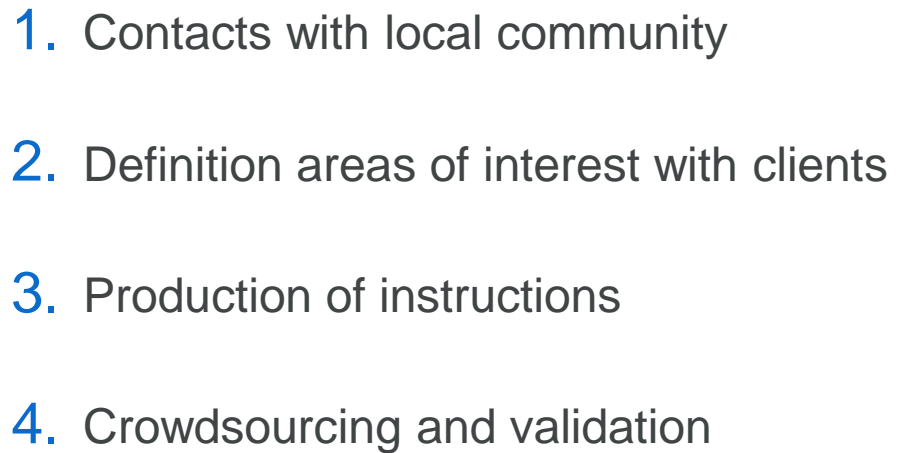
## Yet another building mapping project?

Yes, but...

- Security issues
  - Cannot fly drones. Often, cannot take pictures
  - Security concerns with civilians
  - Security policies







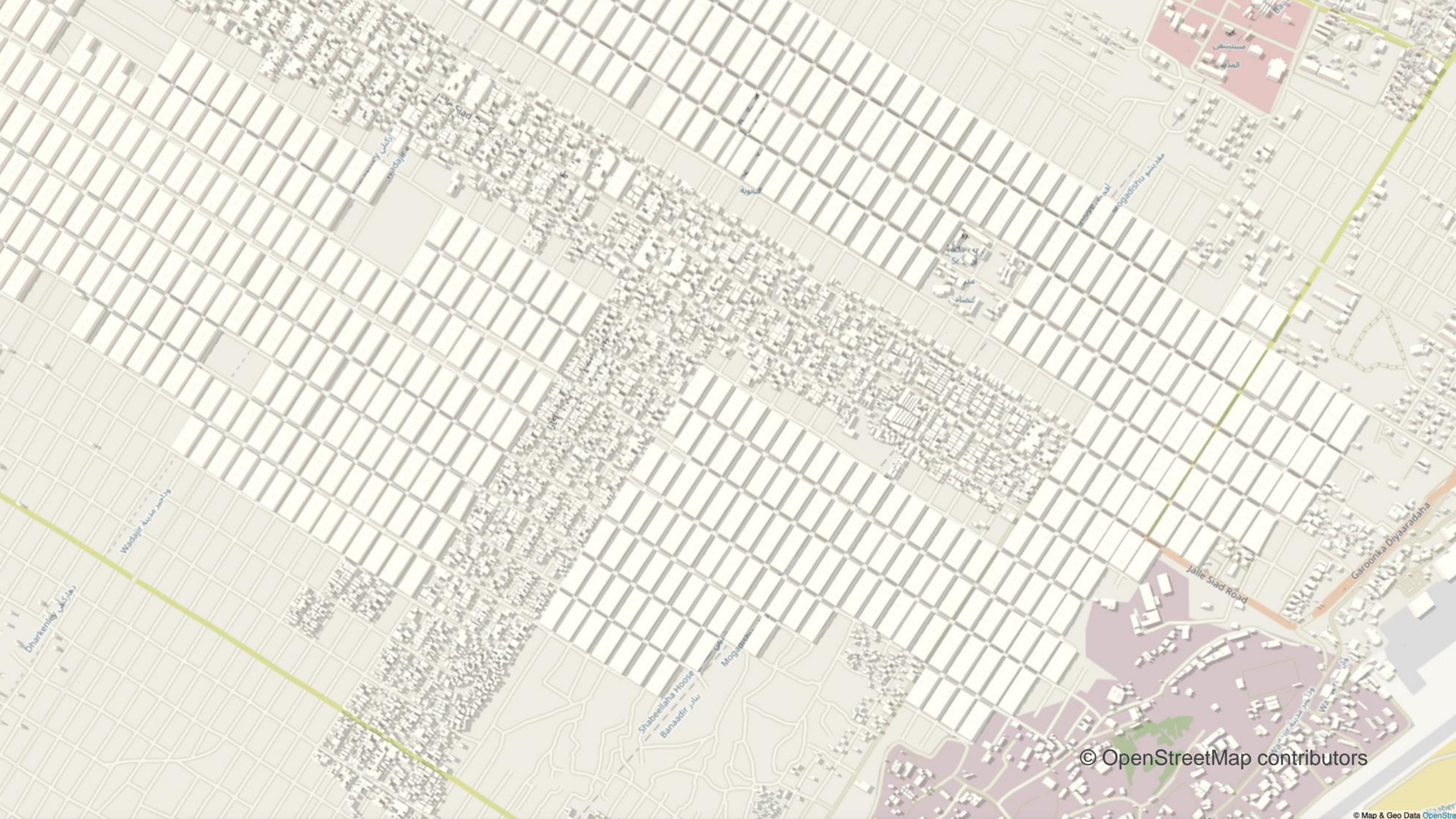


## UN Mappers community

Volunteers supporting peace and serving humanity









## Mogadishu

Over 50k buildings in few weeks



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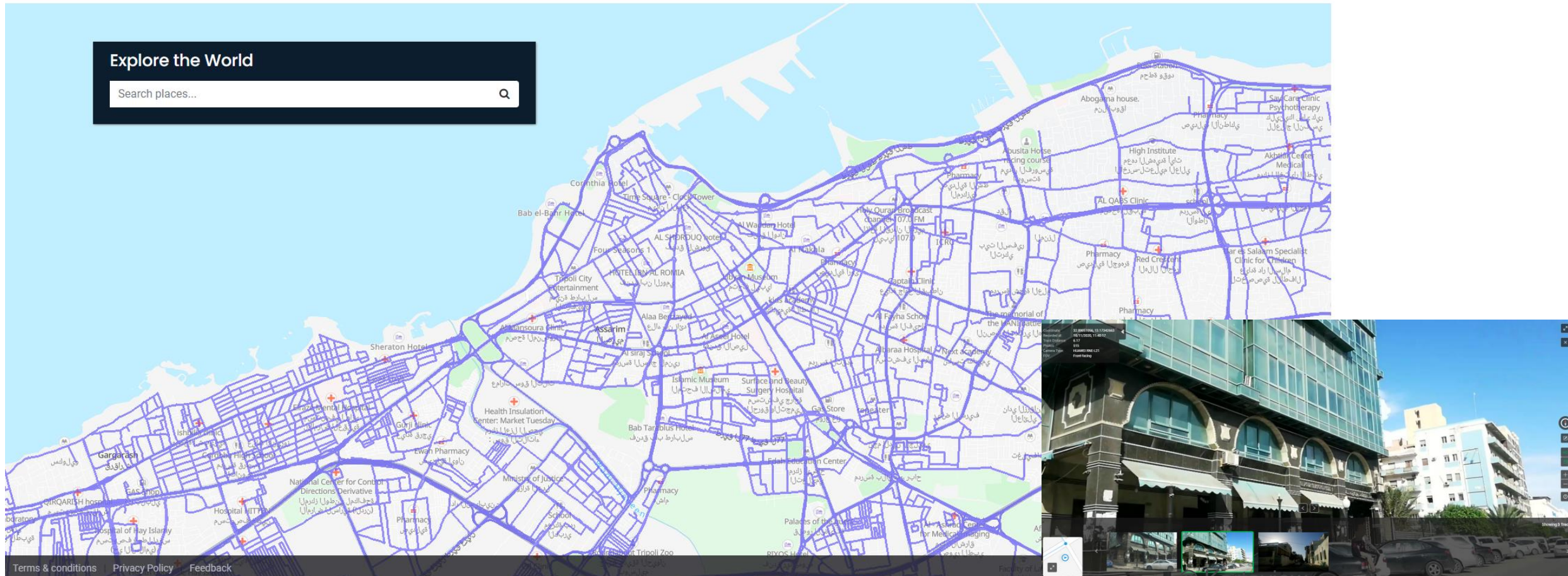
# Tripoli: OSM Libya as a key partner

Their contributions to Kartaview

KartaView

Leaderboard Blog

Sign In



## Tripoli: BuildingComplete

Tweaking of open-source Android applications



### Building Type

School, apartment, house, mosque...



### Roof Shape

Flat, gabled, round...



### Building Colour

White, grey, beige, blue...

### Building Level

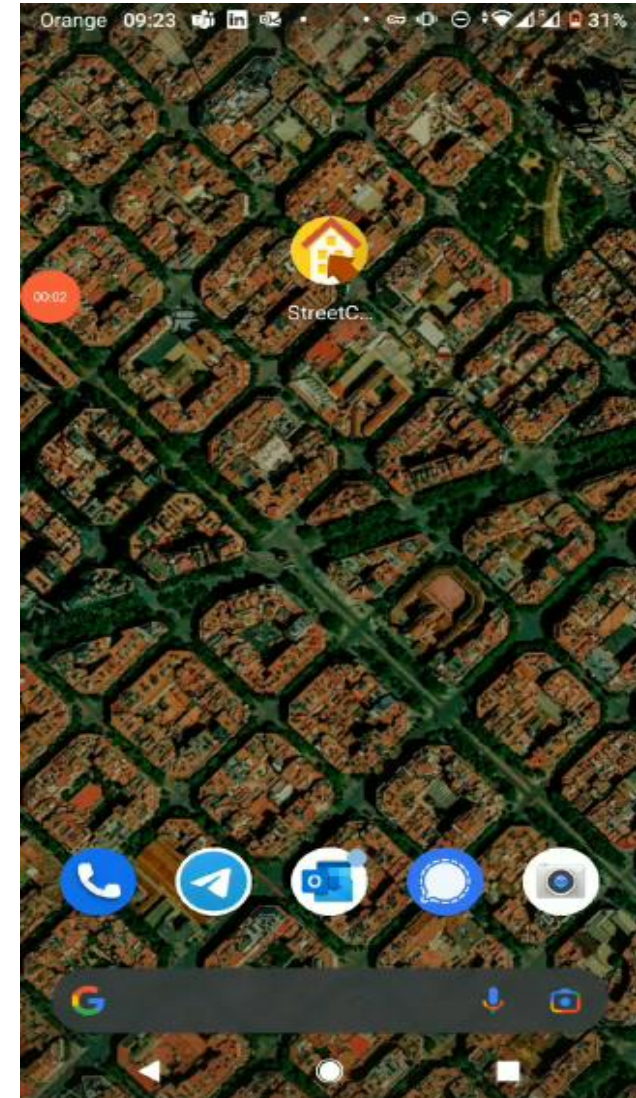


### Building Material

Cement blocks, bricks, concrete...



- And translations in Arabic

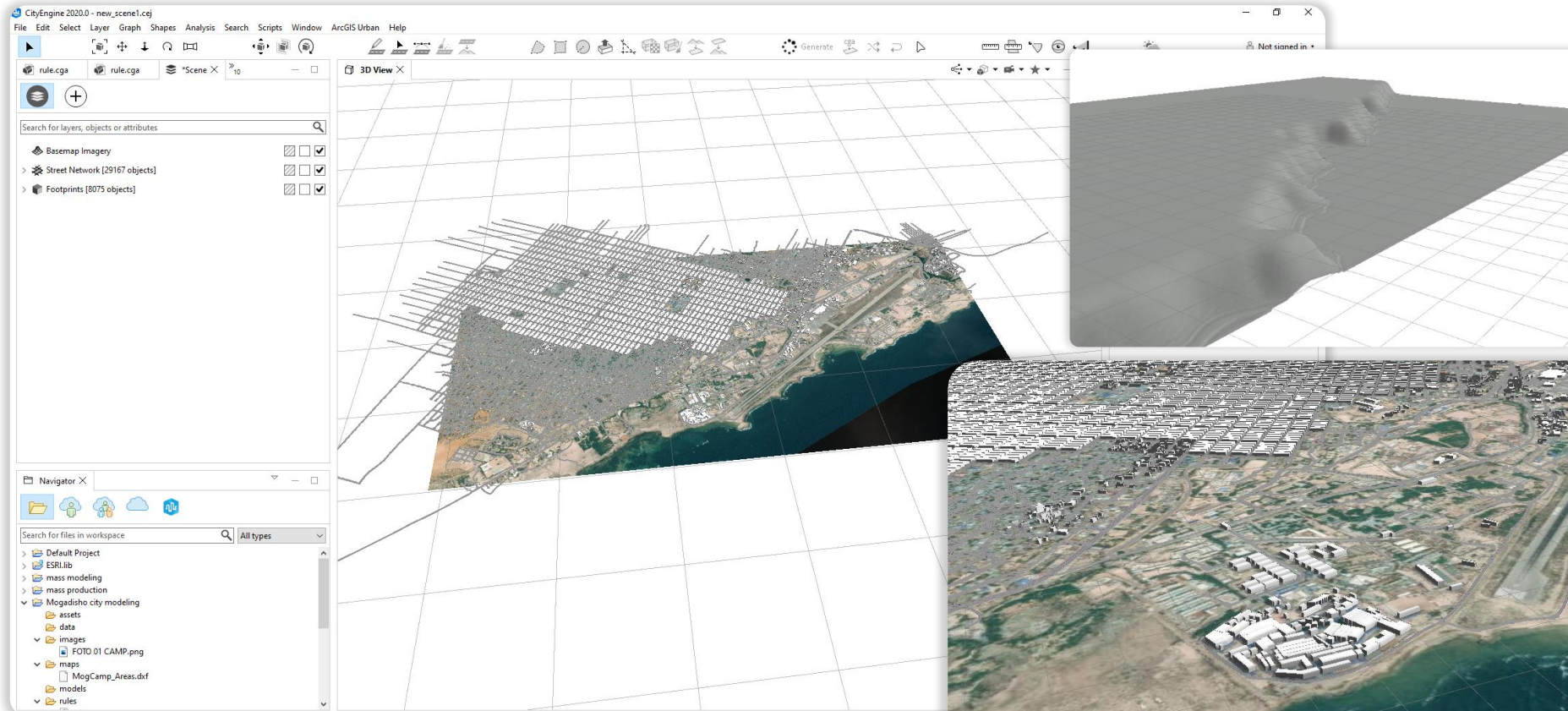


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## 3D modeling

Data ingestion and modeling of buildings

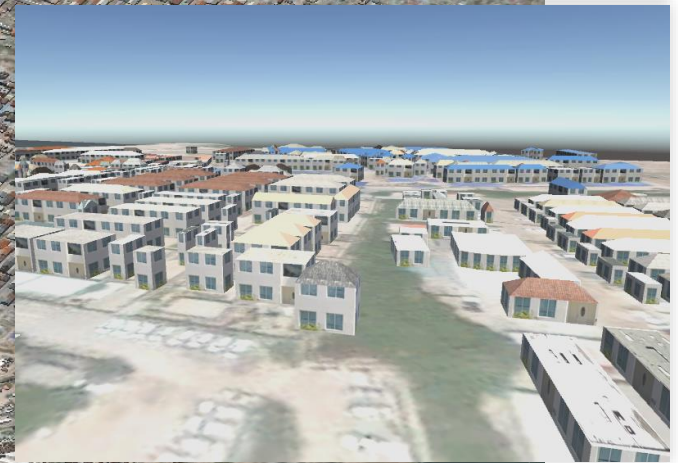
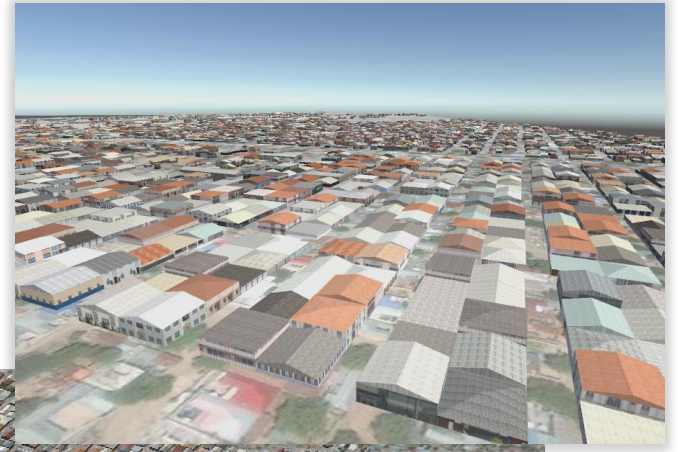


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## 3D modeling

Procedural modeling



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## 3D modeling

Texturing and enhancements





## In conclusion

Before the demo...

- Challenges:
  - Field mapping is dangerous and doesn't scale well. Could be useful for groundtruth
  - Many geospatial tools are denied
  - Coordination between IT-only and GIS teams
- Next steps
  - Perform large scale estimation of building heights
  - Perform small scale field mapping of building details
  - Train peacekeepers to edit field information
  - Explore further usage of street-level imagery



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