



POLITECNICO
MILANO 1863



ISISS Sant'Elia, Cantù – February 26, 2016

POLITECNICO DI MILANO
GEOlab – Como Campus



OpenStreetMap (OSM) and the Humanitarian OpenStreetMap Team (HOT)

Maria Antonia Brovelli & Marco Minghini

OpenStreetMap (OSM)



The OSM project (<http://www.openstreetmap.org>) was born in 2004 to encourage the creation of geo data that could be **free** to use and shareable with anyone.



The OSM Wiki guide: <https://www.youtube.com/watch?v=jeG49DxMsvw>

OpenStreetMap (OSM)



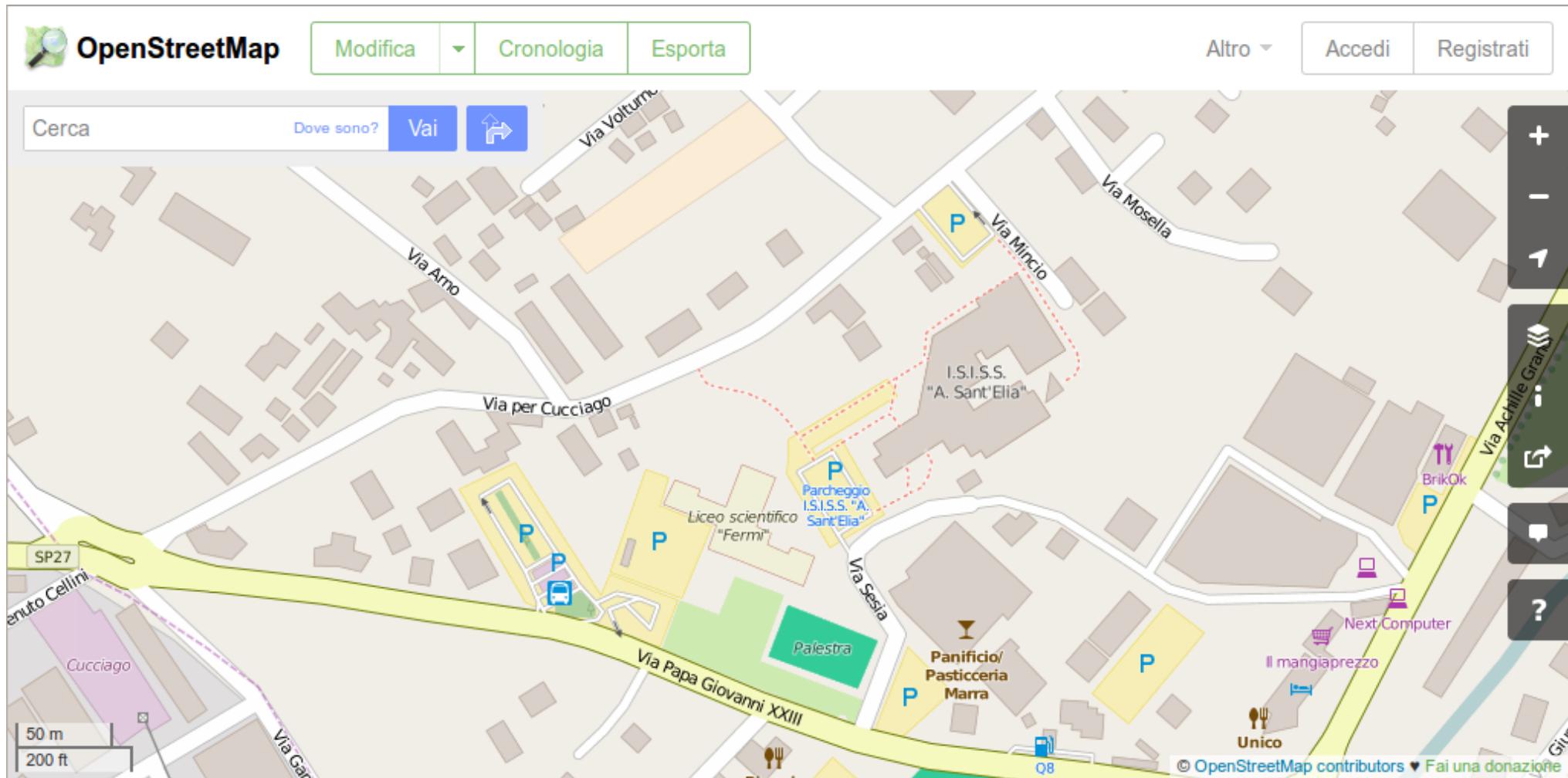
The OSM project (<http://www.openstreetmap.org>) was born in 2004 to encourage the creation of geo data that could be **free** to use and shareable with anyone.



10 years of OSM (2004-2014): <https://www.youtube.com/watch?v=7sC83j6vzjo>

What is OpenStreetMap?

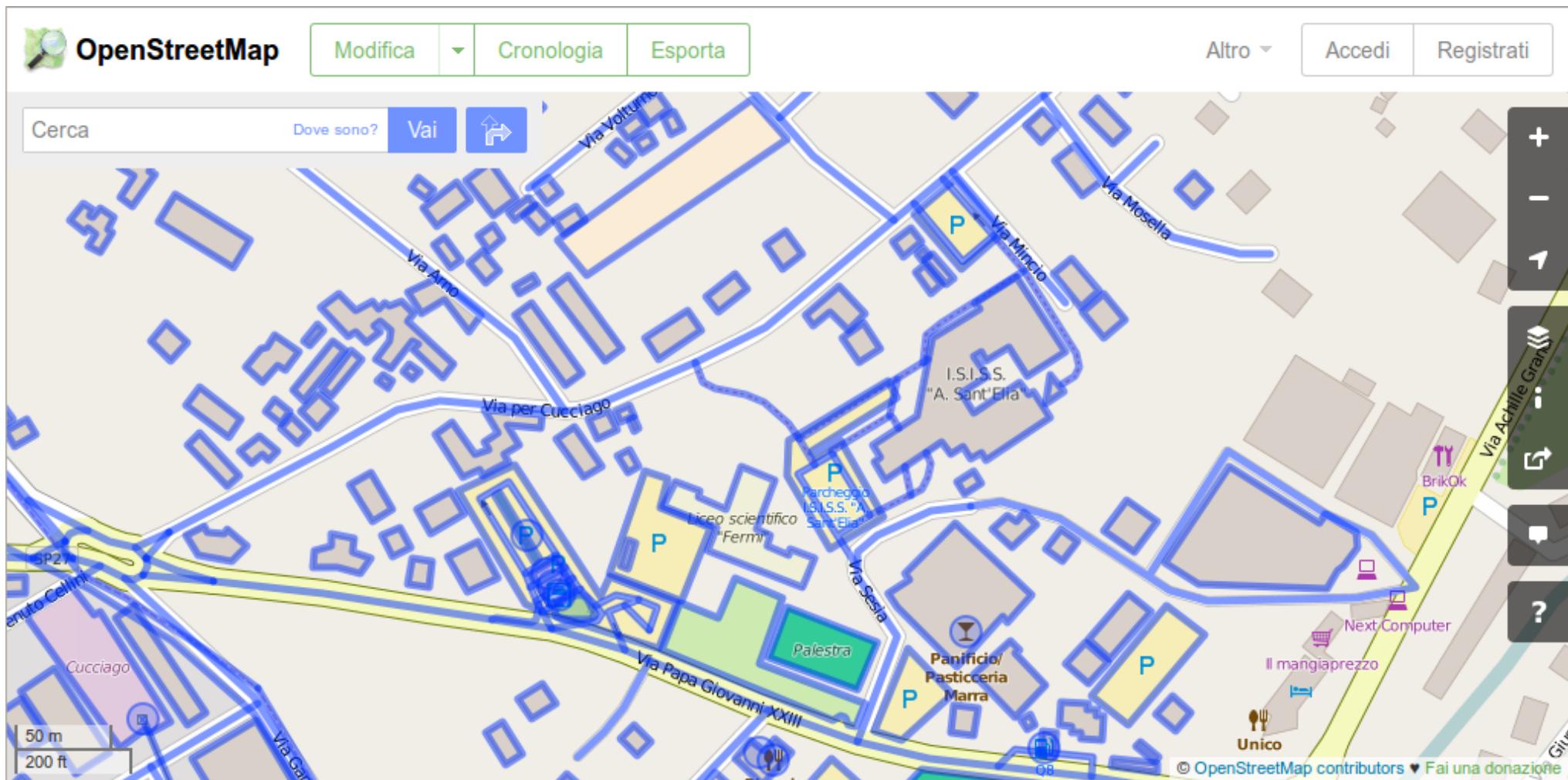
OSM is much more than a simple map...



<http://www.openstreetmap.org>

What is OpenStreetMap?

OSM is the largest world free spatial database: data are the main project output



<http://www.openstreetmap.org>

Why OpenStreetMap?

Geospatial data is not free in many parts of the world.

OpenStreetMap® is **open data**, licensed under the **Open Data Commons Open Database License (ODbL)** by the **OpenStreetMap Foundation (OSMF)**.

You are free:



To Share: To copy, distribute and use the database.



To Create: To produce works from the database.



To Adapt: To modify, transform and build upon the database.

As long as you:



Attribute: You must attribute any public use of the database, or works produced from the database, in the manner specified in the ODbL. For any use or redistribution of the database, or works produced from it, you must make clear to others the license of the database and keep intact any notices on the original database.



Share-Alike: If you publicly use any adapted version of this database, or works produced from an adapted database, you must also offer that adapted database under the ODbL.

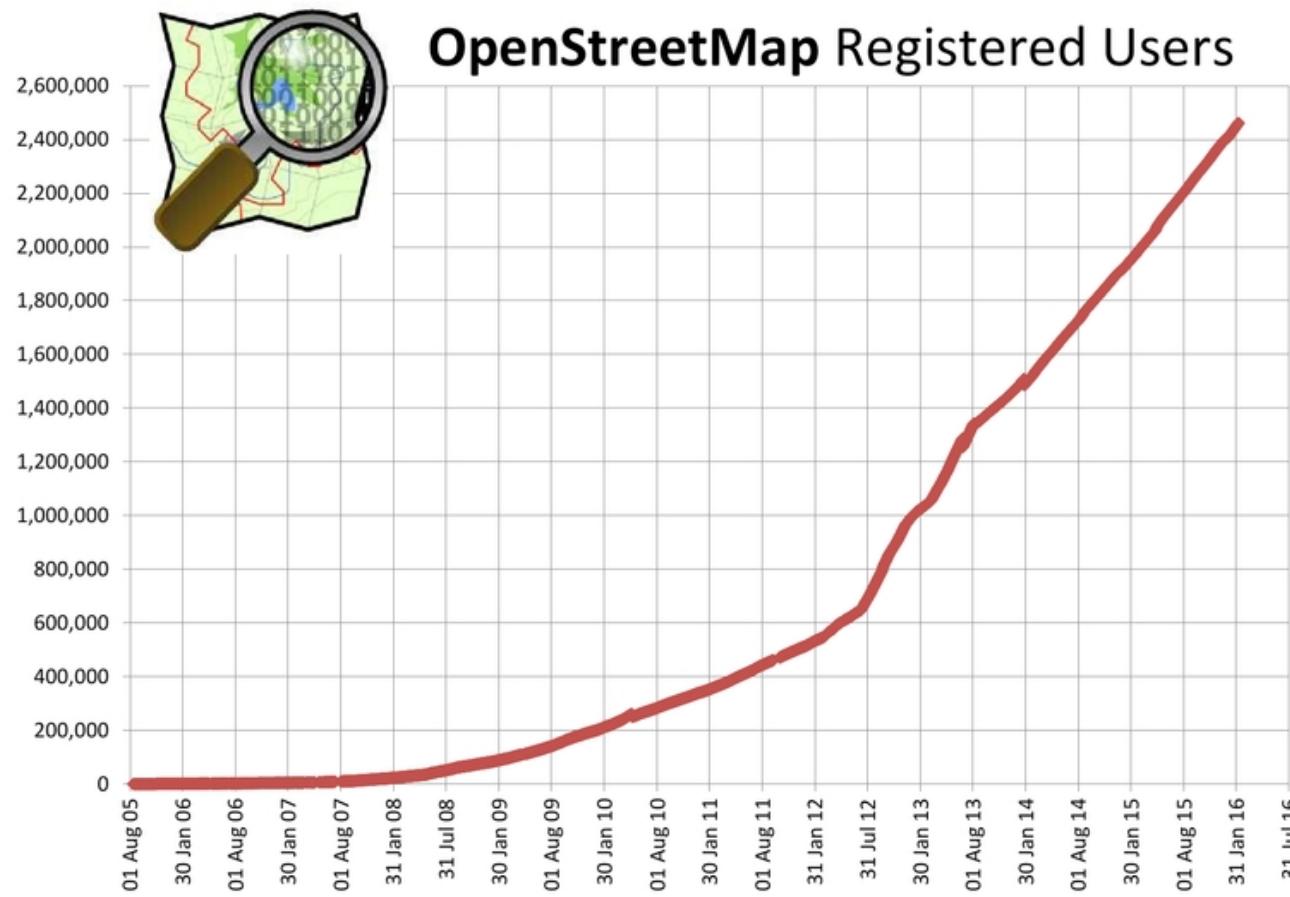


Keep open: If you redistribute the database, or an adapted version of it, then you may use technological measures that restrict the work (such as DRM) as long as you also redistribute a version without such measures.

<http://opendatacommons.org/licenses/odbl/summary>

OpenStreetMap Volunteers

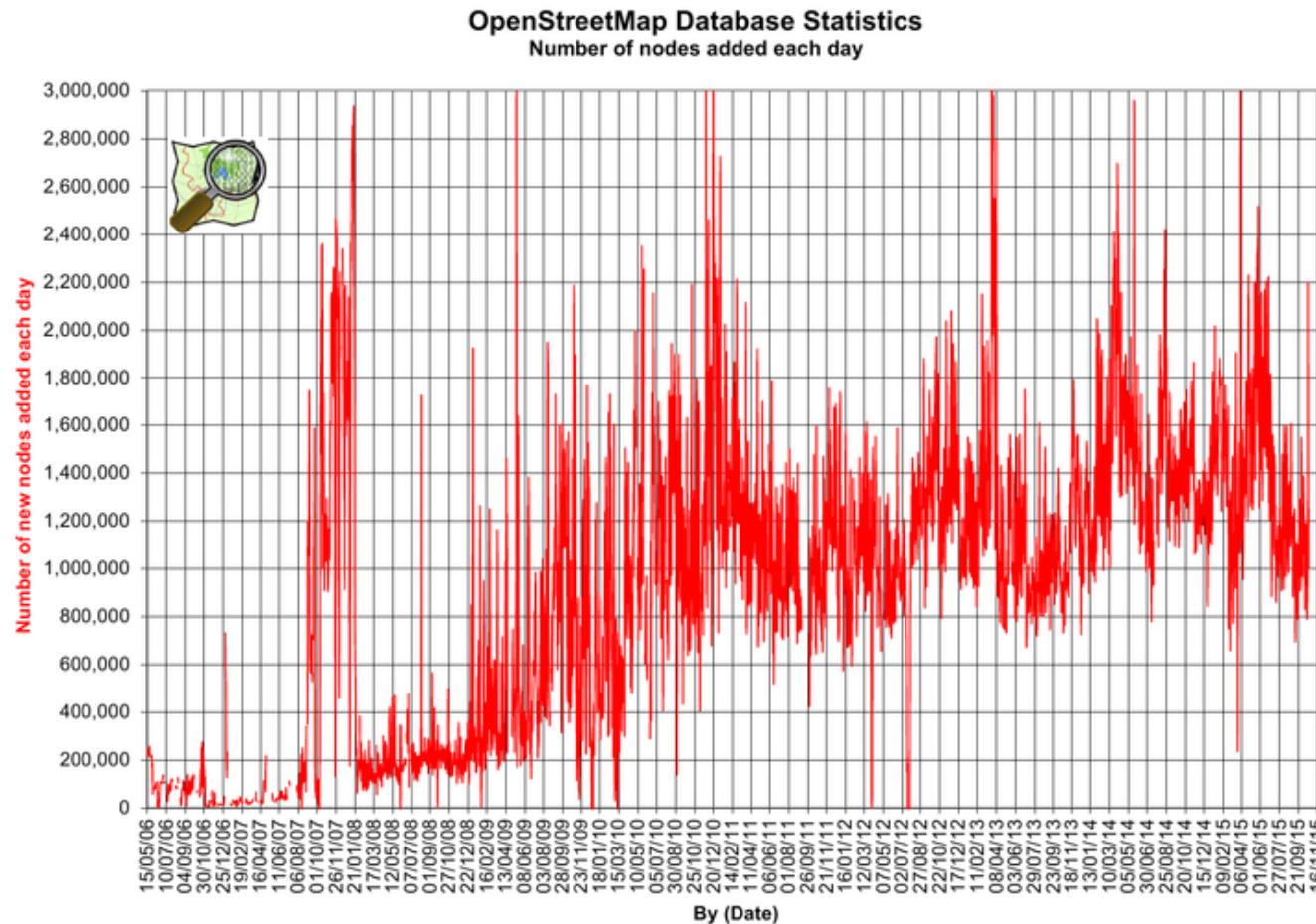
Anyone can contribute – from people without any geo-training/skills to highly skilled people and geo people



<http://wiki.openstreetmap.org/wiki/Stats>

OpenStreetMap Volunteers

Anyone can contribute – from people without any geo-training/skills to highly skilled people and geo people



<http://wiki.openstreetmap.org/wiki/Stats>

How to contribute to OpenStreetMap?

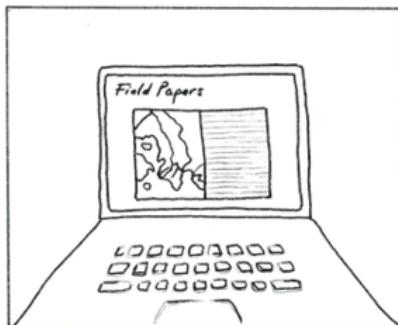
There are 3 ways to contribute data to OSM:

1. **Normal Mapping:** implies to have knowledge of the area to be mapped. Data are uploaded to the OSM database through specific software. This happens e.g. in mapping parties: http://wiki.openstreetmap.org/wiki/Mapping_parties

FIELD PAPERS

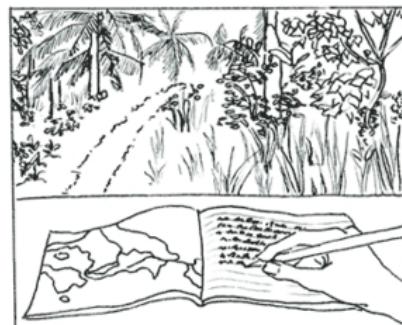
MAKE
an atlas to print **UPLOAD**
pages you've marked **WATCH**
recent activity **EXTEND**
with advanced tools **LOG IN**
or create an account

Welcome to Field Papers



[Make yourself an atlas](#)

Print out anywhere in the world.



[Take it into the field](#)

Make your notes and observations.



[Capture your notes](#)

[Upload](#) pages you've photographed.

GPS DEVICES



<http://fieldpapers.org>

How to contribute to OpenStreetMap?

There are 3 ways to contribute data to OSM:

1. **Normal Mapping**: implies to have knowledge of the area to be mapped. Data are uploaded to the OSM database through specific software. This happens e.g. in mapping parties: http://wiki.openstreetmap.org/wiki/Mapping_parties
2. **Armchair Mapping**: consists in digitizing elements (roads, buildings, etc.) in areas where users have no previous knowledge. Data are obtained from aerial/satellite imagery and uploaded to the OSM database using specific software → it is crucial to check the **copyright** of the data source used!



How to contribute to OpenStreetMap?

There are 3 ways to contribute data to OSM:

1. **Normal Mapping**: implies to have knowledge of the area to be mapped. Data are uploaded to the OSM database through specific software. This happens e.g. in mapping parties: http://wiki.openstreetmap.org/wiki/Mapping_parties
2. **Armchair Mapping**: consists in digitizing elements (roads, buildings, etc.) in areas where users have no previous knowledge. Data are obtained from aerial/satellite imagery and uploaded to the OSM database using specific software → it is crucial to check the **copyright** of the data source used!
3. **Bulk import**: consists of the direct upload of data that are already available with an open (and compatible) license → this method is not for beginners and can introduce big problems if not correctly performed!

<http://wiki.openstreetmap.org/wiki/Import/Catalogue>

How to contribute to OpenStreetMap?

OSM data consist of the combination of **geometries** and **tags**.

The OSM data model is organized into 3 types of elements:

1. **NODE**: a single point + tags

2. **WAY**: an ordered list of nodes + tags

- Polyline: initial and final nodes do not coincide
- Polygon: initial and final nodes coincide

3. **RELATION**: a logic group of nodes, polylines and polygons + tags

<http://wiki.openstreetmap.org/wiki/Elements>

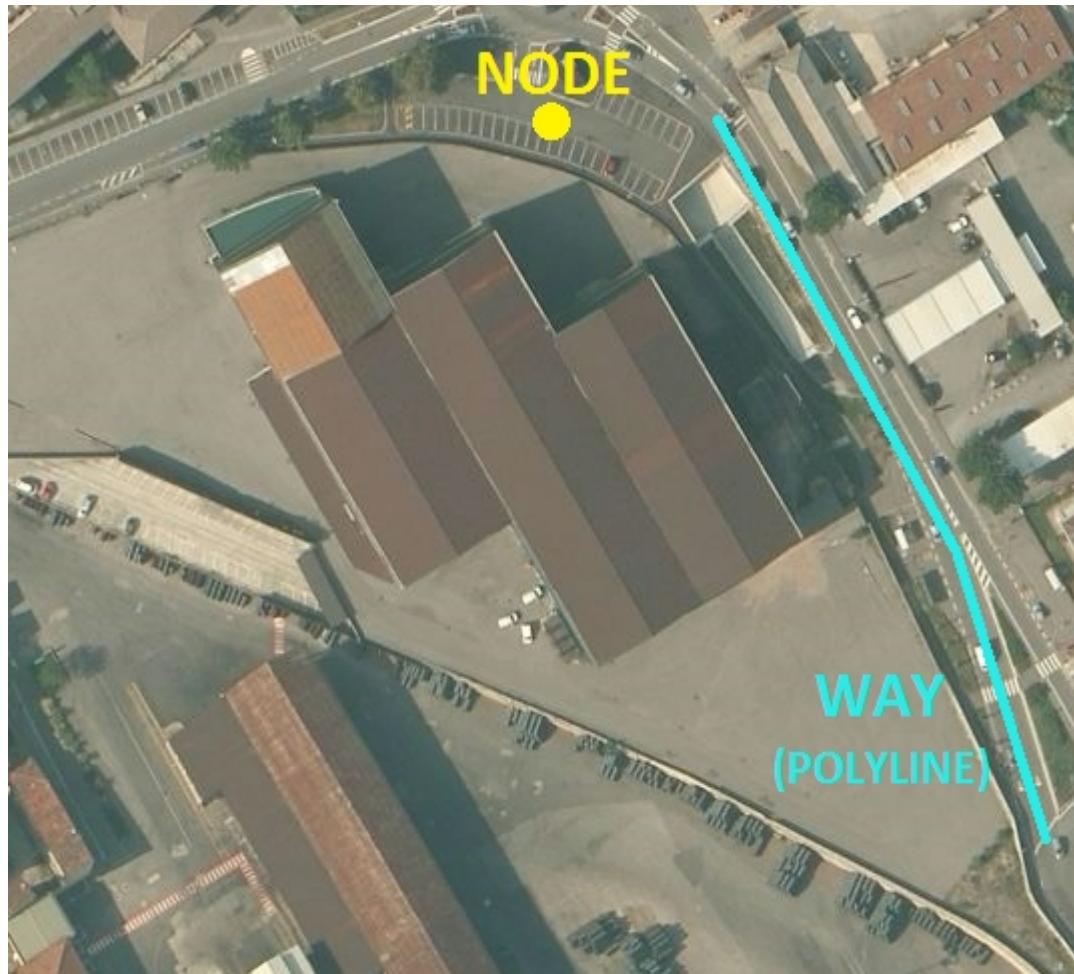
How to map with OSM?

1. Create the geometry of the feature – node



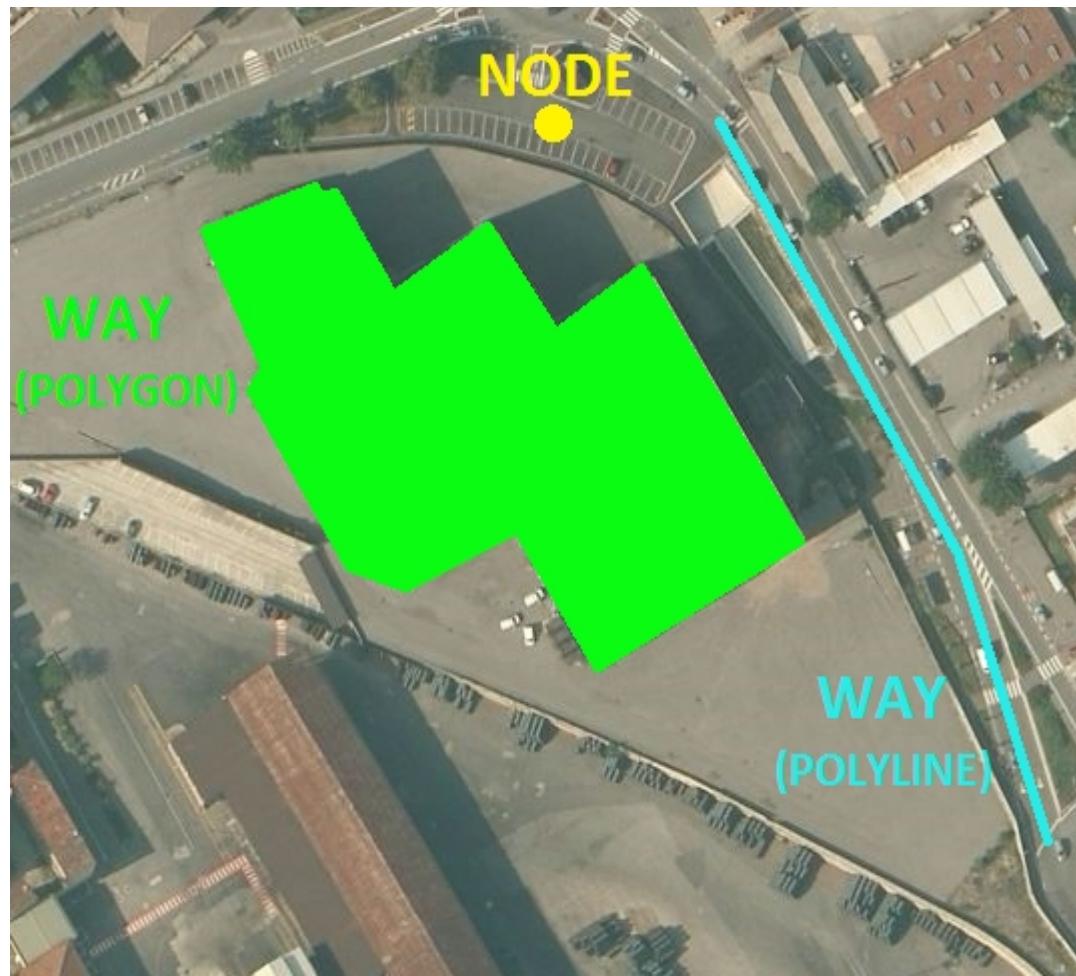
How to map with OSM?

1. Create the **geometry** of the feature – way (polyline)



How to map with OSM?

1. Create the **geometry** of the feature – way (polygon)



How to map with OSM?

2. Add tags to the feature

A tag is composed of a **key** and a **value** → EXAMPLE: building = hotel

KEY

VALUE

Key	Value	Element	Comment	Photo
Accommodation				
building	apartments		A building arranged into individual dwellings, often on separate floors. May also have retail outlets on the ground floor.	
building	farm		A residential building on a farm (farmhouse). For other buildings see below building=farm_auxiliary , building=barn , ... If in your country farmhouse looks same as general residential house then you can tag as building=house as well. See also landuse=farmyard	
building	hotel		A building designed with separate rooms available for overnight accommodation. Normally used in conjunction with tourism=hotel for the hotel grounds including recreation areas and parking.	
building	university		A university building. Use amenity=university for the whole university area.	

http://wiki.openstreetmap.org/wiki/Map_Features

How to map with OSM?

2. Add tags to the feature

The tag must be **verifiable**:

“...a tag/value combination is verifiable if and only if independent users when observing the same feature would make the same observation every time...”

<http://wiki.openstreetmap.org/wiki/Verifiability>

The **taginfo** service provides global statistics on OSM tags, and allows to detect the most common and used



<https://taginfo.openstreetmap.org>

<http://taginfo.openstreetmap.it> (Italian version)

How to map with OSM?

2. Add tags to the feature – node, way (polyline and polygon)



How to map with OSM?

2. Add tags to the feature – relation [EXAMPLE: the route and stops of a bus line]

RELATION

```
type = route
route = bus
name = B30
```



Let's start to map!

Many different editors are available to edit the OSM map:

- iD (Web-based Javascript editor)
- Potlatch 2 (Web-based Flash editor)
- JOSM (desktop-based Java editor)
- Vespucci (Android editor)
- many others, see <http://wiki.openstreetmap.org/wiki/Editors>



A test iD demo is available to play around with OSM edits without making real changes to the OSM map.

Open the following link, sign up and map:

<http://api06.dev.openstreetmap.org>

Wonderful guide for OSM beginners: <http://learnosm.org/it>

Let's start to map!

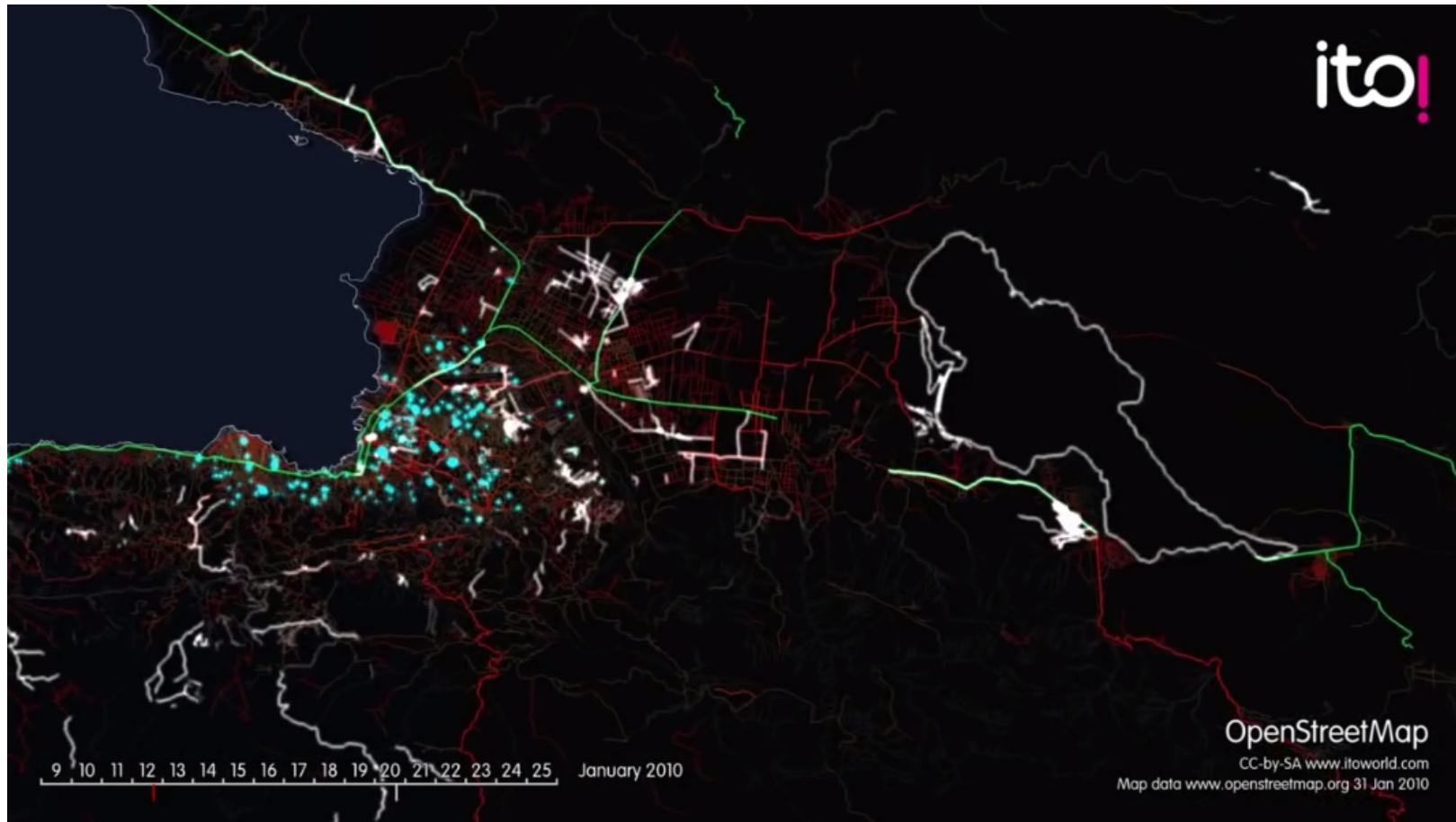
Show Me the Way allows to visualize in real-time the edits performed to OSM.



<http://osmlab.github.io/show-me-the-way>



The Humanitarian OpenStreetMap Team (HOT) has the objective of creating and providing free and up-to-date maps in case of **natural disasters** or **political crises**.



OSM edits after Haiti earthquake (2010):

https://www.youtube.com/watch?v=oNZ_ZBCTRqc



The screenshot shows the HOT website interface. At the top, there's a navigation bar with the HOT logo, language links (English, Français), and menu items: About, Updates, Projects, Get Involved, and Donate. Below the navigation is a secondary menu with Disaster Mapping, Community Development, Technical Projects, and Partnerships. The main content area features several maps and project descriptions:

- Ongoing projects**: A map of Eastern Afghanistan showing震中 (epicenter) and affected areas.
- Disaster Mapping**: A map of Nepal showing the 2015 earthquake response with numerous orange location markers.
- Eastern Afghanistan Earthquake**: A detailed map of the affected area in eastern Afghanistan.
- Nepal 2015 Earthquake Response**: A map of the Kathmandu region showing rescue operations.
- West Africa Ebola Epidemic**: A map of West Africa focusing on Liberia and Sierra Leone.
- Central African Republic Activation**: A map of Central African Republic showing emergency activation points.

<https://hotosm.org>, Twitter: @hotosm

Missing Maps project

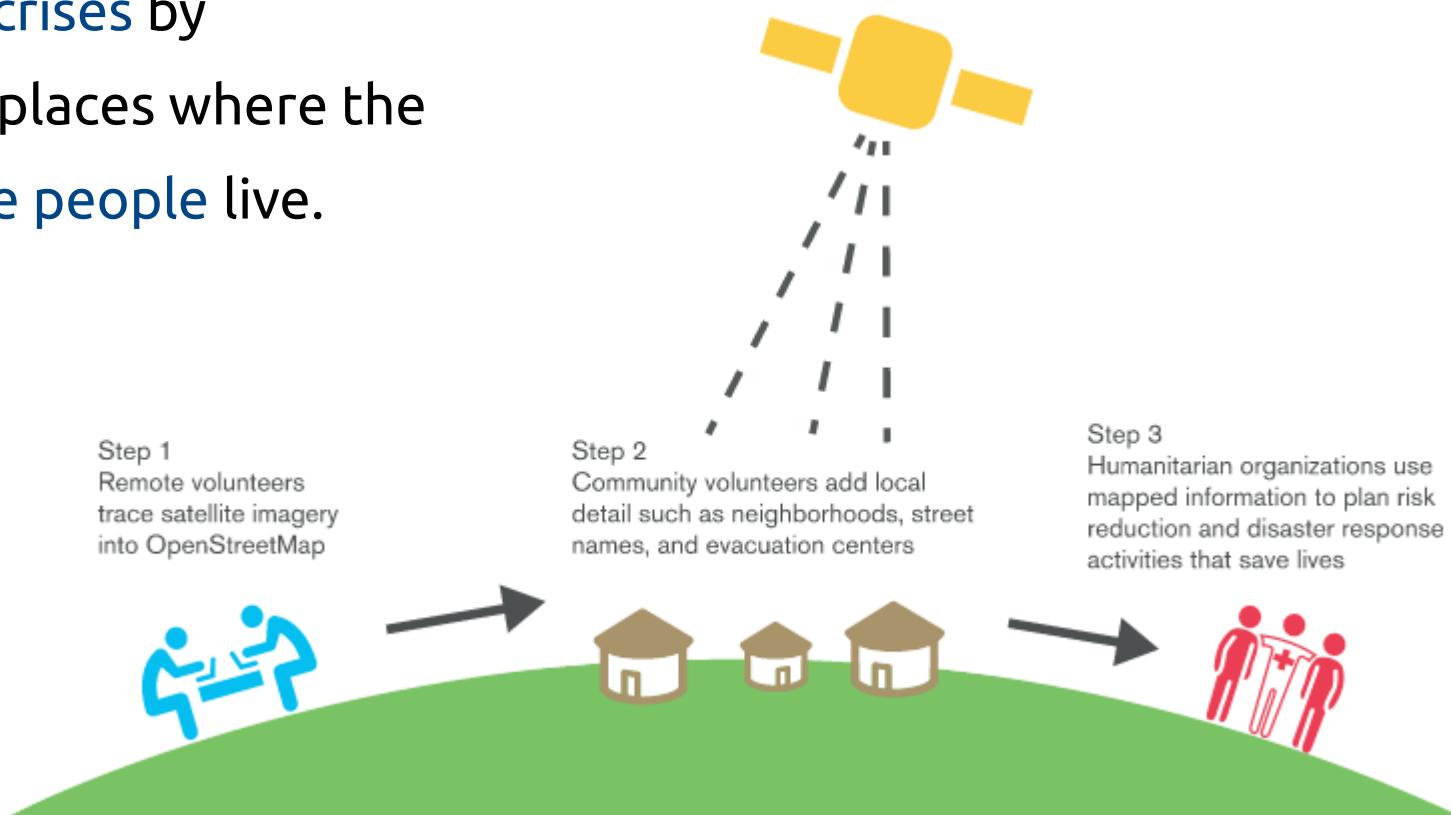


MISSING
MAPS

Whereas HOT maps in response to disasters and conflicts, the Missing Maps project maps **in anticipation of crises** by identifying the places where the most **vulnerable people** live.

FOUNDED BY: American Red Cross | British Red Cross | Humanitarian OpenStreetMap Team | HOT | Médecins Sans Frontières DOCTORS WITHOUT BORDERS

MEMBERS: cartong | The Netherlands Red Cross



<http://www.missingmaps.org>, Twitter: @TheMissingMaps

OSM Tasking Manager

The mapping job is divided into smaller tasks that can be completed rapidly. This approach facilitates the distribution of tasks to the various mappers in a context of emergency and allows to control the progress of the work done.

OSM Tasking Manager

Projects

Search

Sort by: High priority first ▾

#1335 Biu city - NE Nigeria crisis

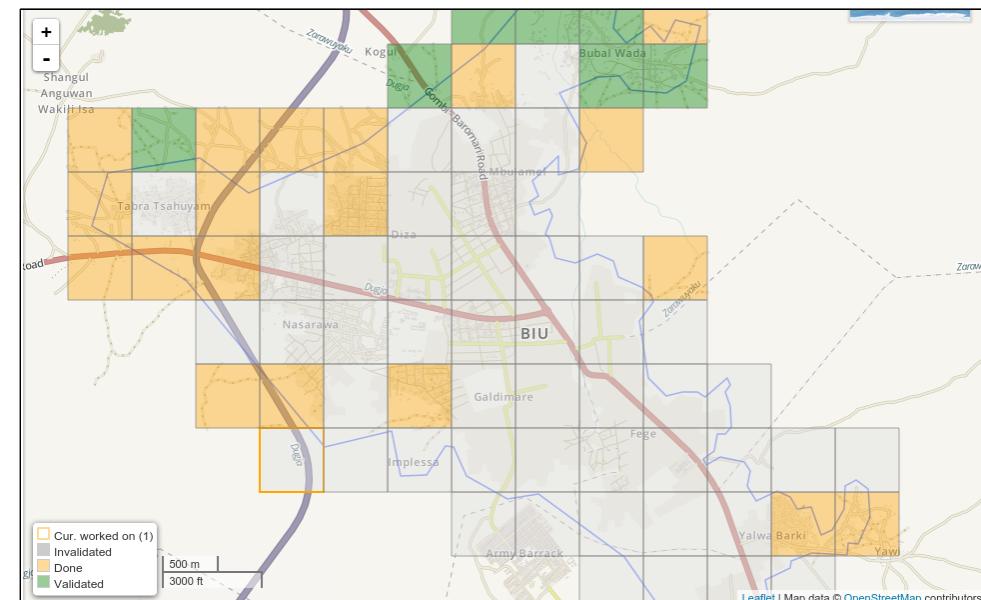
This task of the OpenStreetMap (OSM) and Humanitarian OpenStreetMap Team (HOT) projects in Northeast Nigeria aims at providing baseline data (buildings and roads) in Biu (towns and areas) to support relief efforts in the context of the on-going regional complex humanitarian crisis which affects the Northeast of Nigeria and the neighbouring countries.

Created by edvac - Updated about 3 hours ago - Priority: high

#1300 Afghanistan EQ Response 2015: Baharak, Jurm and Kishim Districts

In continuation to the response and recovery from the magnitude 7.5 earthquake that struck Afghanistan on October 26, 2015; HOT is requesting assistance to complete the road network and identify settlements in the Baharak, Jurm and Kishim Districts.

Created by russdeffner - Updated about 2 hours ago - Priority: high



<https://tasks.hotosm.org>

OSM Tasking Manager – instructions

- ✓ Type the task number on the search bar and click the task title

Please donate!

↗ OSM Tasking Manager

[About](#) [Italiano ▾](#) [Accedi tramite OpenStreetMap](#)

Progetti

Ordina per: Precedenza alla priorità alta ▾

#1053 Missing Maps: Unity State, South Sudan

Author: **Missing Maps**
Requesting Organization: **Missing Maps**
Priority: **Medium**



The Missing Maps project aims to map the most vulnerable places in the world (affected by humanitarian crises: disease epidemics, conflict, natural disasters, poverty, environmental crises). Building on HOT's disaster preparedness projects, the Missing Maps tasks facilitate pre-emptive mapping of priority countries to better facilitate disaster response, medical activities and resource allocation when crises occur.

South Sudan is one of the places prioritised by Missing Maps. So far, mapping in South Sudan has been conducted in response to Médecins Sans Frontières' requests for base mapping. The maps have been used by MSF to plan household surveys and rapid nutritional assessment, which both help provide vital information on the health of the population.

This task is the **second stage** of the Missing Maps providing pre-emptive mapping for South Sudan as a whole, beginning with **Unity State**. The aim of the task is to map **all buildings within the outlined residential areas**, ready for future tasks which will then focus on local roads, tracks and paths. The next step is to expand this pre-emptive mapping to other states within South Sudan.

Creata da [jowilkin](#) - Aggiornato 7 minuti fa - Priorità: media

Informazioni su Tasking Manager

OSM Tasking Manager è uno strumento di mappatura progettato e sviluppato per la mappatura collaborativa dell'Humanitarian OSM Team. Lo scopo dello strumento è suddividere un lavoro di mappatura in compiti più piccoli che possono essere completati rapidamente. Mostra quali aree hanno bisogno di essere mappate e quali aree necessitano di convalida della mappatura. Questo approccio facilita la distribuzione dei compiti ai vari mappatori in un contesto di emergenza. Permette anche il controllo del progresso e dell'omogeneità del lavoro svolto (ad esempio elementi da coprire, tag specifici da usare, eccetera).

New to Mapping?

Just jump over to [openstreetmap.org](#) create an account and then visit this tutorial [learnosm.org/en/beginner/id-editor](#)
Then come back here help map for people on the ground!

Questions About Tasks, Mapping or HOT?

If you have any questions about a project, a task or mapping in general please ask on our mailing list: [HOT E-Mail List](#)

Or visit us in our IRC Chat Channel, just select #hot from the pop down channel list: [OSM HOT IRC Channel #hot](#)

General inquiries and comments are welcomed at: info@hotosm.org

OSM Tasking Manager – instructions

- ✓ Under the **Description** tab you can read the general task description

Please donate!

[OSM Tasking Manager](#)

About Italiano ▾ Accedi tramite OpenStreetMap

#1053 - Missing Maps: Unity State, South Sudan

[Descrizione](#) [Istruzioni](#) [Contribuisci](#) [Attività](#) [Statistiche](#)

The Missing Maps project aims to map the most vulnerable places in the world (affected by humanitarian crises: disease epidemics, conflict, natural disasters, poverty, environmental crises). Building on HOT's disaster preparedness projects, the Missing Maps tasks facilitate pre-emptive mapping of priority countries to better facilitate disaster response, medical activities and resource allocation when crises occur.

South Sudan is one of the places prioritised by Missing Maps. So far, mapping in South Sudan has been conducted in response to Médecins Sans Frontières' requests for base mapping. The maps have been used by MSF to plan household surveys and rapid nutritional assessment, which both help provide vital information on the health of the population.

This task is the **second stage** of the Missing Maps providing pre-emptive mapping for South Sudan as a whole, beginning with **Unity State**. The aim of the task is to map **all buildings within the outlined residential areas**, ready for future tasks which will then focus on local roads, tracks and paths. The next step is to expand this pre-emptive mapping to other states within South Sudan.

[Istruzioni](#)

OSM Tasking Manager – instructions

- ✓ Under the **Instructions** tab you find the detailed instructions for mapping

Please donate!

[OSM Tasking Manager](#)

About Italiano ▾ Accedi tramite OpenStreetMap

#1053 - Missing Maps: Unity State, South Sudan

Desrizione Istruzioni Contribuisci Attività Statistiche

Entità da mappare ?
buildings

Commento del Gruppo di Modifiche ?
#hotosm-project-1053 Unity State, #SouthSudan #MissingMaps #Bing
#100mapathons #OSMGeoWeek

This is the **second stage** in providing pre-emptive mapping of Unity State in South Sudan, which focuses on mapping **all buildings within the residential areas**.

Please click on a task to start mapping. Each task represents one residential area within Unity State, whether a hamlet, village, or town.

Simply digitise the outline of the building and make sure you either **SQUARE** (shortcut key = 'S') the corners of square/rectangular buildings OR **ROUND OFF/CIRCLE** (shortcut key = 'O') any huts.

Then tag as building=yes or building=building .

[Click here for a tracing guide for this task!](#)

Once you've completed a task, please mark your task as done and select a new task.

If your area already has buildings mapped, please move on to a new task.

Please ask if you have any further questions.

[Inizia a contribuire](#)

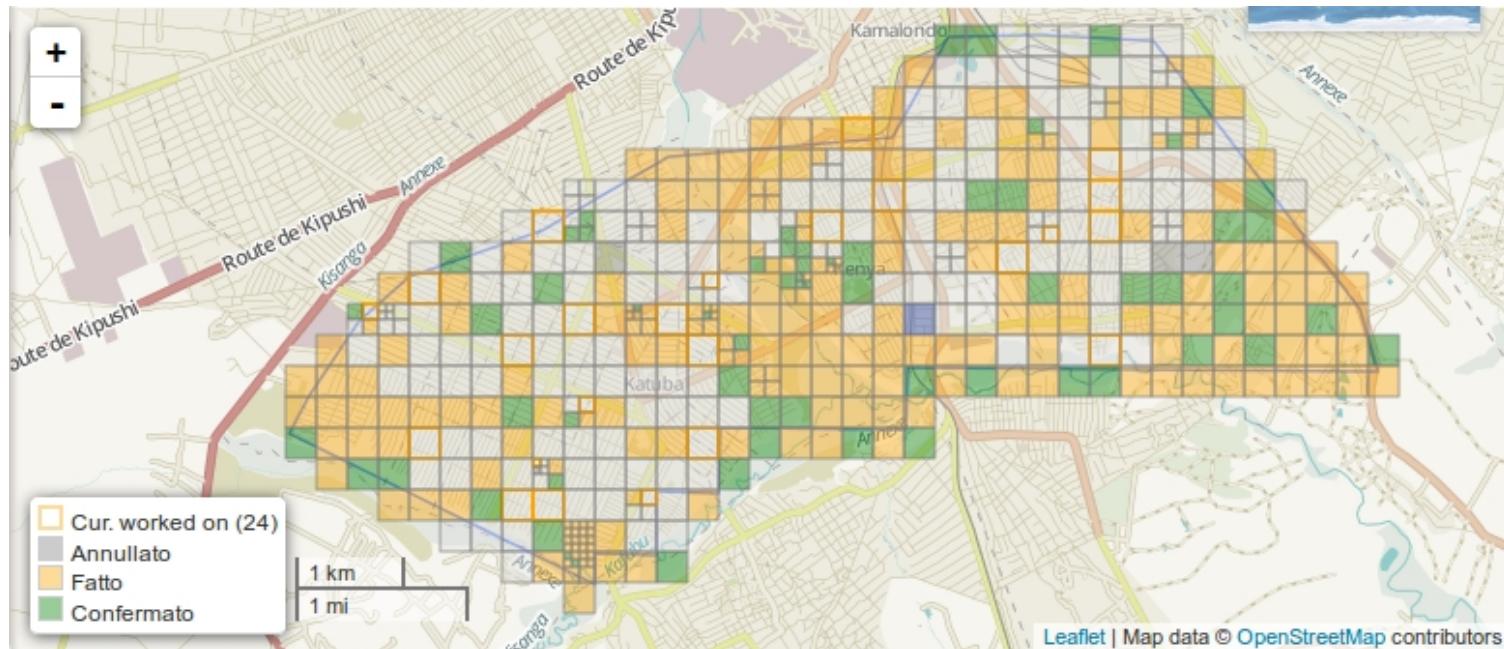
OSM Tasking Manager – instructions

- ✓ Under the **Contribute** tab you can start mapping (either by receiving a random subtask or by selecting a subtask on the map)

The screenshot shows the OSM Tasking Manager interface for task #1053 - Missing Maps: Unity State, South Sudan. The top navigation bar includes links for 'About', 'Italiano', and 'Accedi tramite OpenStreetMap'. A red banner on the left encourages donations. The main content area features a map of Unity State, South Sudan, with various subtasks marked as 'Cur. worked on (0)' (yellow), 'Annullato' (grey), 'Fatto' (orange), and 'Confermato' (green). A legend at the bottom left provides a scale from 3 km to 2 mi. On the right side of the map, labels for 'Rupkona Market' and 'Bentiu' are visible. The bottom right corner credits 'Leaflet | Map data © OpenStreetMap contributors'.

OSM Tasking Manager – instructions

- ✓ Under the **Contribute** tab you can start mapping (either by receiving a random subtask or by selecting a subtask on the map)
 - ➔ empty polygons represent areas where **mapping has to be completed** (if the border is orange the area is locked, i.e. a user is working on it)
 - ➔ yellow polygons represent areas where **mapping has been completed and is waiting for validation**
 - ➔ green polygons represent areas where **mapping has been completed and validated**



OSM Tasking Manager – instructions

- ✓ After login, select an empty polygon on the map and click Start mapping

Please donate!

[OSM Tasking Manager](#)

About Italiano ▾ Accedi tramite OpenStreetMap

#1254 - Missing Maps: Lubumbashi (south), Democratic Republic of Congo (DRC)

Descrizione Istruzioni Contribuisci Attività Statistiche

Task #84

[Inizia a mappare](#)

Sbloccato circa 18 ore fa

Commento lasciato da Nick Mason
Some buildings still left to map circa 18 ore fa

Bloccato da Nick Mason circa 19 ore fa

Sbloccato 13 giorni fa

Bloccato da Guehu 13 giorni fa

Sbloccato 13 giorni fa

Bloccato da Guehu 13 giorni fa

OSM changesets | [overpass-turbo](#)

Cur. worked on (23)
Annullato
Fatto
Confermato

500 m
3000 ft

Leaflet | Map data © OpenStreetMap contributors

OSM Tasking Manager – instructions

- ✓ Choose iD editor as the OSM editor to be used for mapping

Please donate!

[OSM Tasking Manager](#)

#1254 - Missing Maps: Lubumbashi (south), Democratic Republic of Congo (DRC)

Descrizione Istruzioni Contribuisci Attività Statistiche

Task #84

Bloccato da te. [Sblocca](#) 119 minuti rimanenti

Tip: Download the task in JOSM in order to see the current task better. Il compito è già caricato.

Lascia un commento

Modifica con

- JOSM
- iD editor**
- Potlatch 2
- Walking Papers
- Field Papers

Sblocca Segna questo compito come concluso

Bloccato da mingo23 meno di un minuto fa

Sbloccato circa 18 ore fa

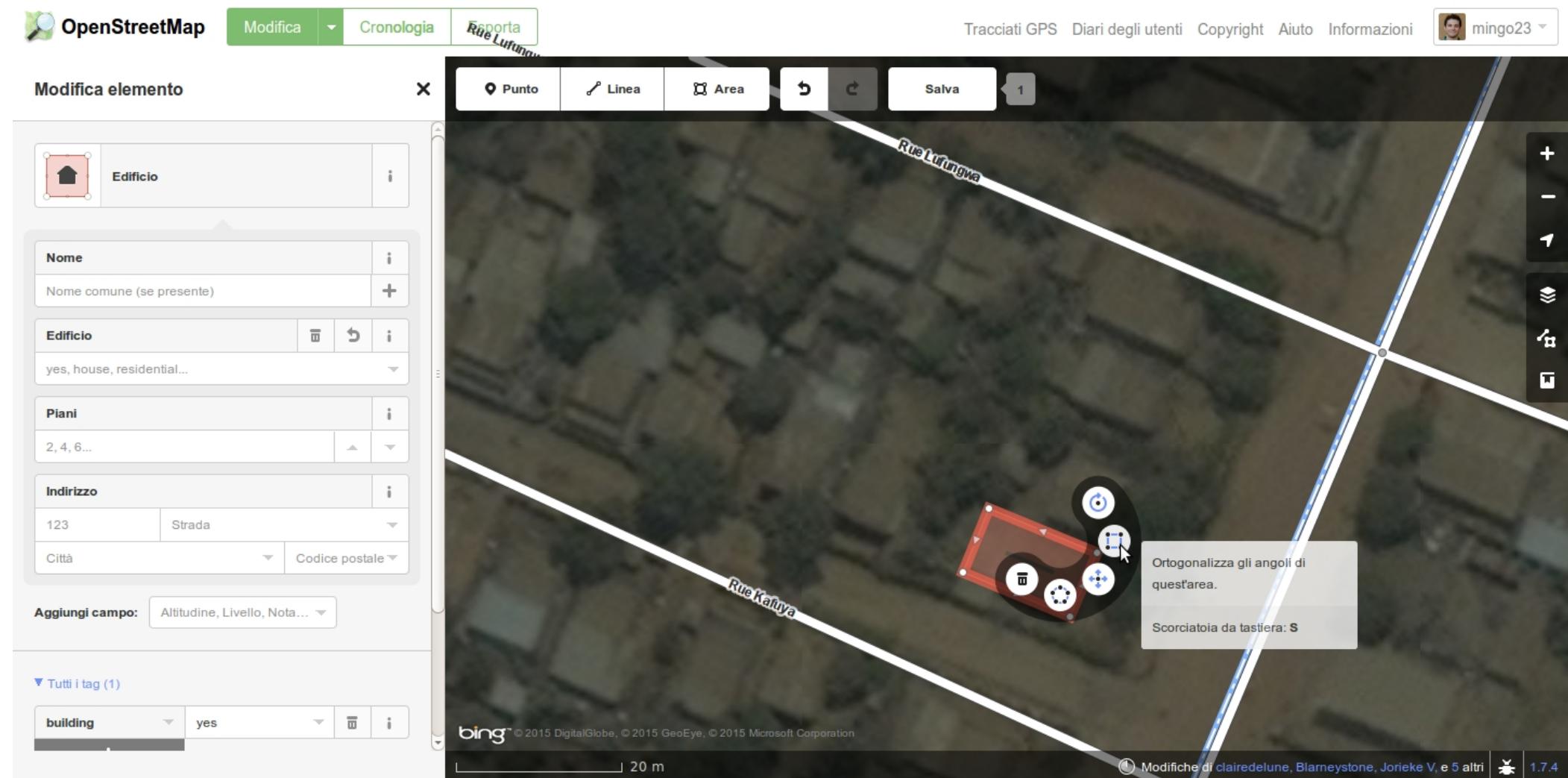
Commento lasciato da Nick Mason Some buildings still left to map circa 18 ore fa

Bloccato da Nick Mason tasks.hotosm.org/project/1254/task/84/lock

Leaflet | Map data © OpenStreetMap contributors

OSM Tasking Manager – instructions

- ✓ Draw the elements asked in the instructions (roads, buildings, etc.)



OSM Tasking Manager – instructions

- ✓ If there is still work to do in this area, press **Unlock**; if you think the work in this area is completed, press **Mark task as done**

Please donate!

[OSM Tasking Manager](#)

About Italiano ▾ mingo23 ▾

#1254 - Missing Maps: Lubumbashi (south), Democratic Republic of Congo (DRC)

Descrizione Istruzioni Contribuisci Attività Statistiche



Task #84

Bloccato da te. [Sblocca](#) 105 minuti rimanenti

Modifica con iD editor

Il compito è troppo vasto? [Suddividi](#)

Lascia un commento

[Sblocca](#) ✓ Segna questo compito come concluso

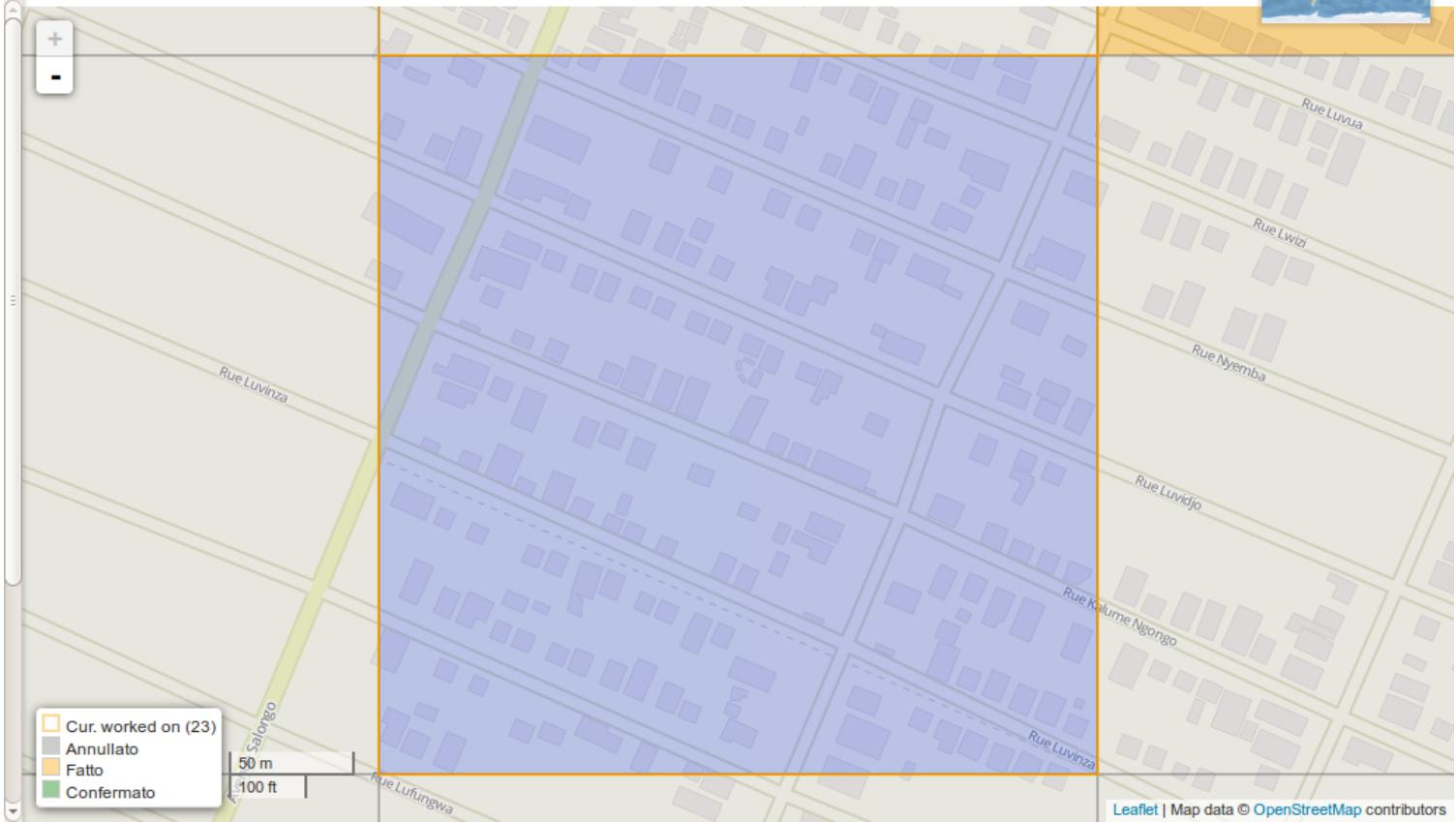
Bloccato da mingo23 circa 18 ore fa

Sbloccato circa 18 ore fa

Commento lasciato da Nick Mason
Some buildings still left to map circa 18 ore fa

Bloccato da Nick Mason circa 19 ore fa

Sbloccato 13 giorni fa



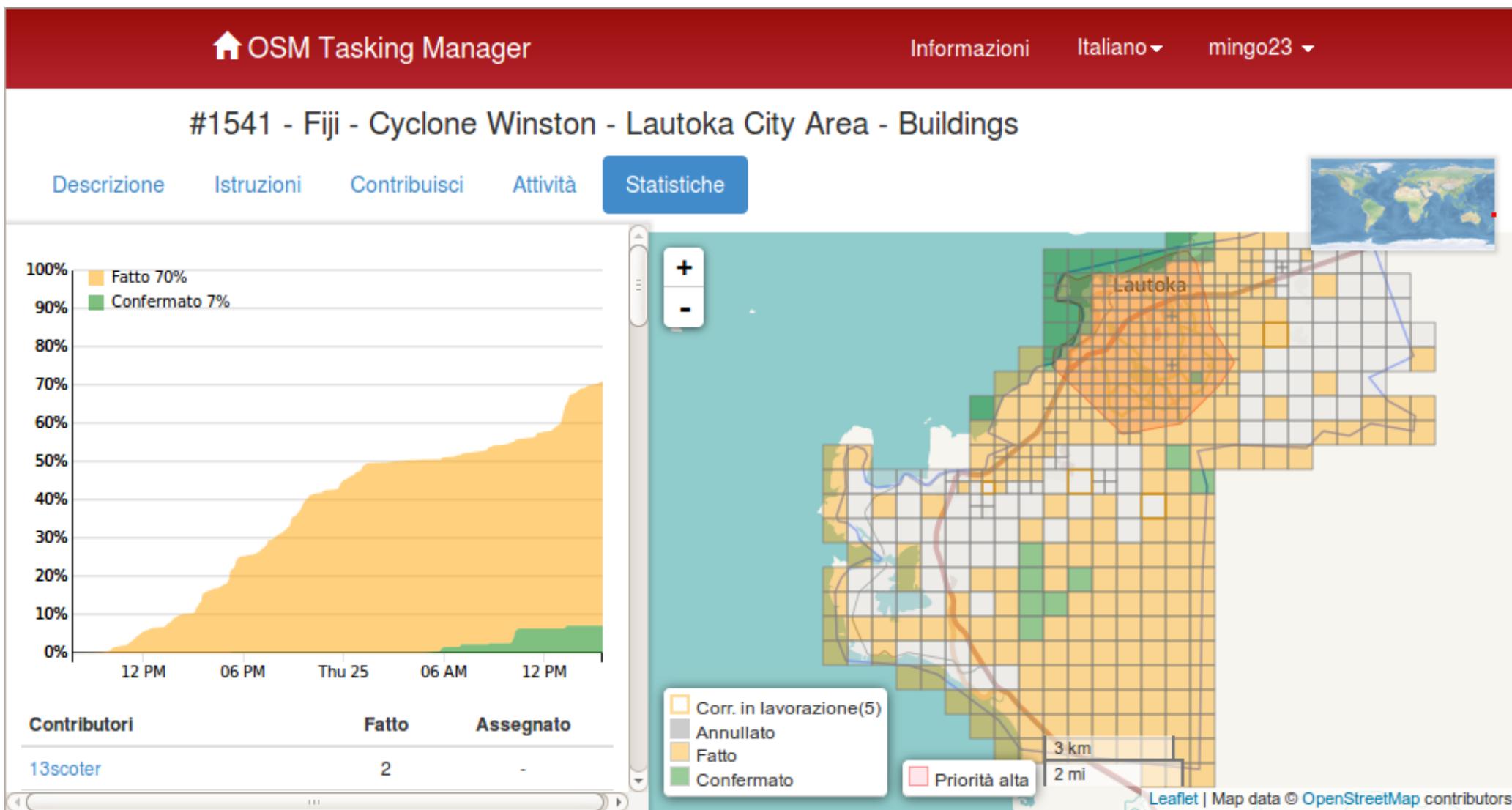
Leaflet | Map data © OpenStreetMap contributors

OSM Tasking Manager – instructions

- ✓ Experienced mappers can also check if yellow areas have been completed and [validate](#) them. If validation is positive, the areas become green.

OSM Tasking Manager – instructions

- ✓ Under the **Statistics** tab you can check mapping statistics



What else?

✓ Useful resources and mapping guides:

- ➔ video showing how to add buildings to OSM
<https://www.youtube.com/watch?v=VPJz-AucqF4>
- ➔ Missing Maps tutorial 4 beginners on how to get started with the Tasking Manager: <http://www.missingmaps.org/contribute>
- ➔ LearnOSM guide on humanitarian mapping with the Tasking Manager:
<http://learnosm.org/en/coordination/humanitarian>

✓ Using Twitter?

- ➔ please use **#osmgeoweek** and **#mapathonpolimi** in your tweets!



Thank you!

Maps can make the difference

Mapping is easy ...
... and mapping is fun :)

See you at Politecnico di Milano – Como Campus on
Wednesday, March 16 for a real humanitarian mapathon!

THANK YOU!

Marco Minghini

Politecnico di Milano, GEOLab – Polo Territoriale di Como
Via Valleggio 11, 22100 Como (Italy)



marco.minghini@polimi.it, @MarcoMinghini