5 Open Street Map (OSM)

Let us learn

- Advantages of Maps.
- Mapping Basics.
- Online Mapping Editors.
- Android OSM Editors.
- Contributing to community through OSM.

5.1. Introduction

Map is a symbolic representation of a region. Maps contain information which is valuable to us. We can plan our activities accurately using Maps.

We can find the shortest route for a journey or search for locations such as schools, colleges, hospitals, hotels, restaurants, cafes, gardens, buildings, towns, cities, rivers, lakes, mountains etc. Most importantly, maps are extremely useful for rescue operations in calamities such as flood, earthquake and volcanos.

Most of the maps belong to various government departments, organizations or companies. It may take a long time to procure these maps for some useful purpose. Also there are certain restrictions on the usage of these maps. Hence there was a severe need to make the open map of the world available publicly which can be used by anyone for study, research or any other purpose. To fulfil this need, Steev Coast founded Open Street Map (OSM) in 2004.

Today millions of people not only use Open Street Map but also contribute to improve it. It is our duty to map our neighbourhood or the places we visit. Every small contribution is valuable. It will make the OSM project rich and beneficial to all.

It is easy to do simple mapping and contribute to Open Street Map. In map editor we have to draw or trace buildings, roads etc. with the help of Arial View taken from satellite or drone. Such set of images is called as **imagery**.

Fig. 5.1 : Satellite Imagery (Arial View)

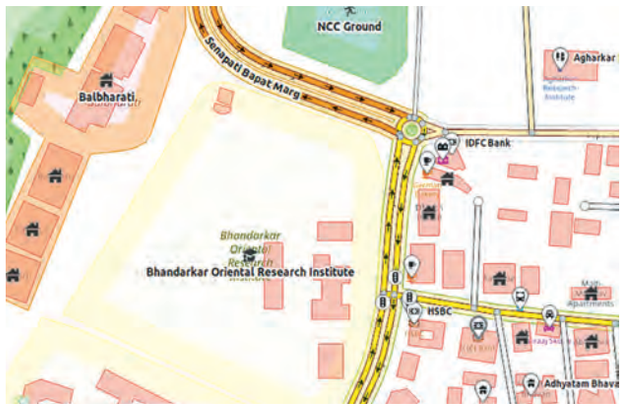


Fig. 5.2 : Standard Map, after tracing

Start Contributing to map roads, shops, etc : Let us learn and do few basic contributions

1. Go to openstreetmap.org and open an account.
2. Login to your account.
3. There is an interactive walk-through tutorial. Students are advised to go through tutorial.

   You can open the tutorial any time from the help option as shown in the following illustration.

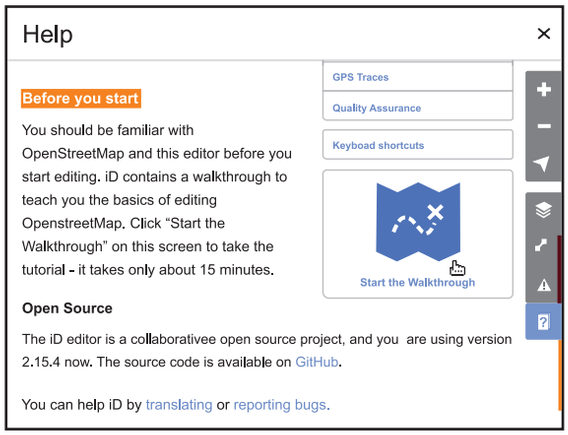


Fig. 5.3 : OSM tutorial

4. The site has three in-browser editors. First one is **iD editor,** which is simple and sufficient. We will use iD but you can use other editors as well. Select iD and proceed.

Fig. 5.4 : OSM Editor Selection

Note : Without editor selection, Arial View will not be available.

5. There are two main views that you should use - First is Arial view from satellite and the second is Open Street Map - standard view. You can switch back and forth through these two views or layers.
6. There are three important edits that you are supposed to do as your basic contribution.

- First is Point or Point of Interest (POI).This can be restaurant, cafe, chemist, Mobile repair shop, monument etc. There can be several such points in a building.

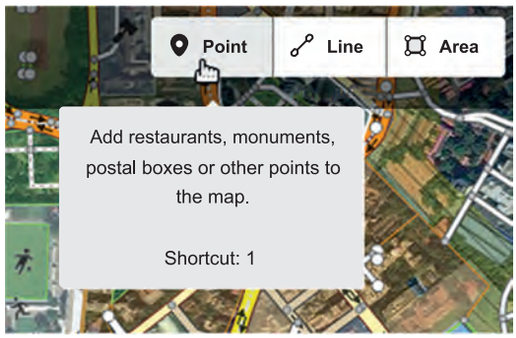


Fig. 5.5 : Point

- Second is Line (Road, Foot Over Bridge, Pipelines etc).

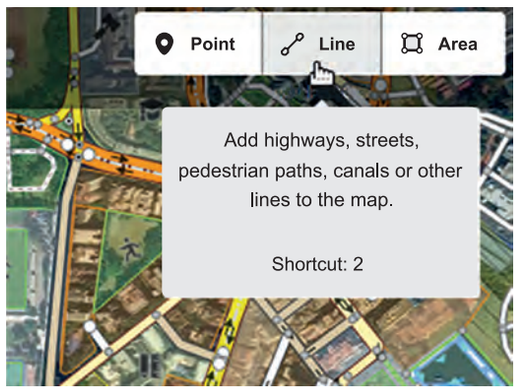


Fig. 5.6 : Line

- Third is Area (park, building, lake, pond, play ground etc),

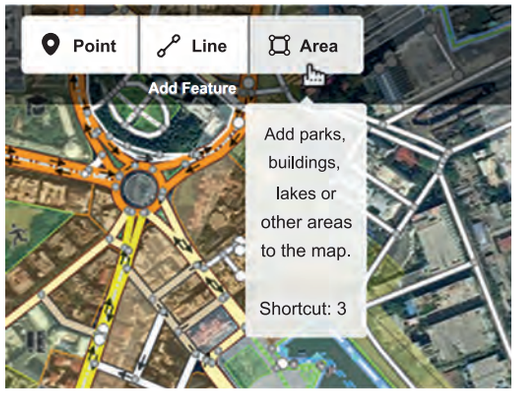


Fig. 5.7 : Area

Note : Ensure that you are logged in and iD Editor is selected.

7. Search any familiar place where you would like to contribute. Locate any building which is already having marked border. Identify it correctly from your local knowledge. This identification is most of the time easy if you already know its shape, size and surroundings.

8. Identify its name by nearby elements. Then click on it and in the resulting popup give its name say "xyz Mansion". Thats it ! This is your first contribution.

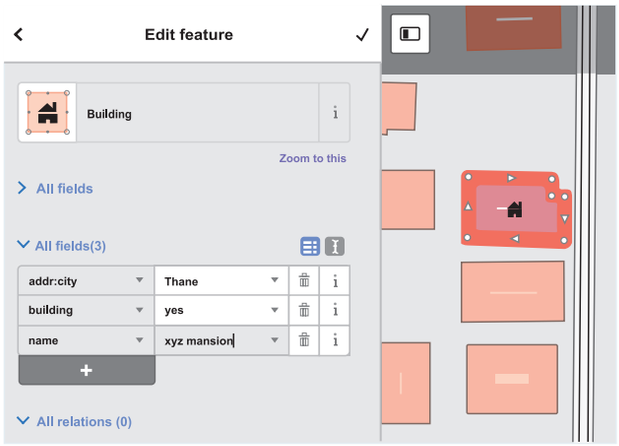


Fig. 5.8 : Edit Feature

9. If a building has no border, then switch to satellite image. Hit Area tool and make a closed rectangular or square region around it. Add more details if you wish, for example, level, height etc. You should right click the area object and click square option to refine the corner edges if required.

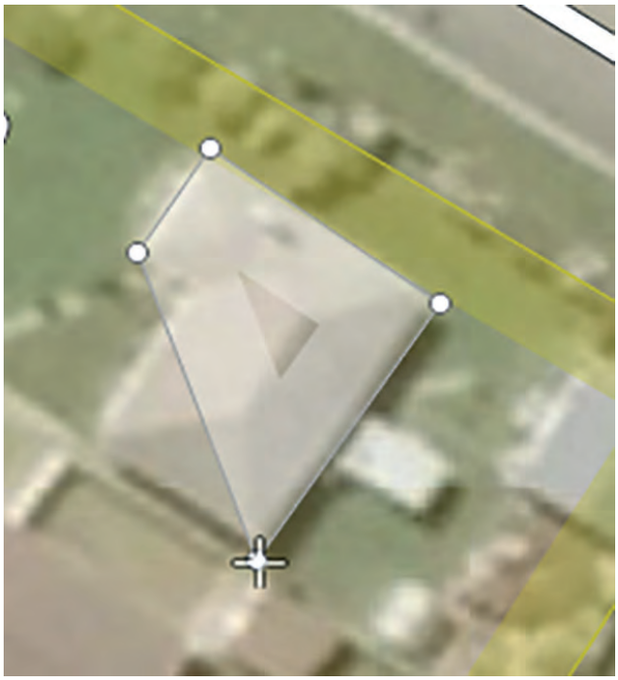


Fig. 5.9 : Building Mapping

10. Do the same for other areas like gardens, playgrounds, lakes etc. Points are also to be added at appropriate places so that the map will be even more useful to all.

11. If there are a few points of interests (POI's), add those too. For example if there is a Chemist shop in the building add point at appropriate place and tag with preset chemist. After a few edits you can save the changes using the save tab at top left

corner of the iD editor. All the edits up to now will be saved as a group called as Changeset. You have to put a comment or note about your edits, for example "Buildings near xyz school, Mumbai"

5.2. Mapping Basics

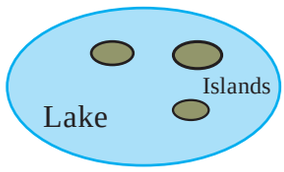
Most of the information on map is in the form of Basic Elements such as points (nodes), lines (paths or ways) and Areas (Shapes).

1. **Point or Node :** Point or Node represents the smallest object on map. It is usually a part of area or path or region. But sometimes, a point can represent a special object such as a tree, a shop or cafe, dispensary or junction or lamp-post etc. In such case it is called as Point Of Interest (POI). We assign tags (keywords) to such Points of Interests in order to give information about them. Any Point on a map has unique co-ordinates called as Latitude and Longitude.

2. **Lines or Ways :** Only points or nodes are not sufficient to describe information on maps. More complex objects like roads, rivers, boundaries are shown using Ways (lines or paths). Ways are the lines connected by nodes. The order of the points is important as this order determines the shape of the object and also direction or flow. Hence Way is an orderd list of nodes.

3. **Areas :** Apart from Points and Ways, there are Areas like Buildings, Parks, Playgrounds, Lakes on the map. They are represented by closed ways. Thus when first and the last node of a way coincide s we get an Area.

4. **Relation :** Although Point, Line and Area represent most of the objects on map, a few objects on map need a special type of element such as Relation to describe them. Relation is a combination of one or more of the basic elements viz point, line, area. For example, a building with open parking ground at the centre. Here there are two separate area elements used to descibe single object. Hence we combine them by a relation. In this case the relation used to combine two areas is called as Multipolygon. Another example of Multipolygon relation is lake with small islands.



Tagging

Tag in OSM is a kind of label which describes the geographical object on map in a uniform way. Tag is always given as key-value pair. More precisely key=value (K=V). Key represents specific feature and Value is the proper description of the feature. Only ASCII and lower case characters are used in keys. Underscore (_) is used for space.

Example1: 'building' Tag (building=yes) is the most frequently used tag and you

would use it most of the time as a beginner. There is a preset in iD so if you click on building, from the left popup box, the iD editor assigns building =yes. If you know more details about the building then you can also add addtional tags. Let us say this building is your school, then apply the tag amenity=school. You can even add the name of your school with tag name=xyz school. If you know that there are 4 floors (levels) in the school building, add the tag level=4

Example 2 : Park or Garden Tag. To tag the park use leisure=park. In addition it is better to give name and operator. For example

leisure = park,name = Mahatma Gandhi Udyan, operator = MCGM, Mumbai

Example 3 : Roads In open street map. All roads are termed as highways. So even footpath is also tagged as highway. Thus for a foot path you should tag highway=footway. Other tagging options are highway=residential, highway=service (access roads to buildings, industrial use, business parks), highway=territory (road connecting small villages) etc. For highly important roads of the country which we generally call highway, the special value **trunk** is used in open street map. See following Example.

Example 4 : Tagging Important Roads.

(Eastern Express Highway)

highway	trunk
lanes	5
name	Eastern Express Highway
oneway	yes
ref	NH48
Ref:old	NH3

Tasking Managers :

Tasking Manager is a free and open source software tool which divides the mapping work of certain area into small pieces (tiles) and distributes these tiles among mappers. As a result the mapping task can be completed in short amount of time without overlapping or conflicts. This is usually done in vulnerable areas that require urgent mapping but it can be used for regular mapping too. The idea was first used by Humanitarian OpenStreetMap Team (HOT).

MapRoulette :

Fixing small issues in OSM is an ongoing process. You should always fix small issues arising from your own mapping sessions or from others if you come across them. Sometimes a bridge is not put on upper layer, roads are not properly connected. Area is left without tag.

A Game-like Tasking Manager called as MapRoulette is developed to increase participation. You can compete with other mappers by completing as many tasks as possible. The MapRoulette site provides set of challenges to work on. You can enjoy the MapRoulette's game like experience and at the same time give your valuable contribution to the world.

List of few tasking managers ;

- http://tasks.hotosm.org/ – for Humanitarian OSM Team
- http://tasks.teachosm.org/ – for TeachOSM
- http://tasks.openstreetmap.in/ – for OSM India
- https://osm.earth – for OSM Earth

5.3. Java Open Street Map (JOSM) Editor

We have seen how to edit and contribute to open street map using iD editor. Let us take a look at other editors and tools by which you can contribute to OSM.

Java Open Street Map Editor (JOSM) is much more powerful than iD, Potlatch and other online editors. JOSM is a portable desktop application. Just download the jar file and execute. Java Runtime Environment (JRE) is required to run JOSM.

The main advantage of JOSM editor is that it allows offline editing. You first select an area that you want to edit. Download the selected area and then start editing. Since internet connection is not required, editing is faster. After you finish with editing, you can connect to the internet and upload your changes to OSM server.

Apart from offline editing, there are many more advanced features and plugins available in JOSM. Therefore many advanced mappers prefer JOSM to other editors.

5.4. Android Apps for OSM editing

With increasing popularity of Android Based smart phones many aplications have been created to assist you in contributing OSM. We take a quick overview of most useful apps for mappers.

1. **OsmAnd :** It is an offline navigation app with voice guidance. It is not a complete OSM editor but one can add and upload POI's. Also you can record and upload GPX files easily.
2. **Vespucci :** It is a fullfledge OSM editor. It works like JOSM. One needs to download an area and add points, ways and areas. Due to lack of mouse and small screen of the smartphone, it is not as efficient as desktop editors. But for field workers or at places where desktop computers are not available, Vespucci is an important and valuable tool.

5.5. Opening hours

Opening hours is often an important information for the map user. Small shops, supermarksets, parks, chemists etc are open at certain time of the day. There is a standrard format in which this information is filled in open street map.

Abbreviation	Day of week
Mo	Monday
Tu	Tuesday
We	Wednesday
Th	Thursday
Fr	Friday
Sa	Saturday
Su	Sunday

Examples :

1. General 5 day week : Monday to Friday from 11 am to 5 pm
   opening_hours=Mo-Fr 11:00-17:00
2. Multiple time intervals : Monday to Friday from 11 am to 2 pm and 3 pm to 5 pm
   opening_hours=Mo-Fr 11:00-14:00, 15:00-17:00
3. Multiple days :
   opening_hours=Mo-Fr 11:00-14:00, 15:00-17:00; Sa 11:00-14:00
4. Off on public holidays
   opening_hours=Mo-Fr 11:00-14:00, 15:00-17:00; Sa 11:00-14:00; PH off
5. Different hours on public holidays
   opening_hours=Mo-Fr 11:00-14:00, 15:00-17:00; Sa 11:00-14:00; PH 11:00-12:00

Summary

- Maps are useful in everyday life and also in calamities.
- Open maps, like OSM, are always accessible to all. So we should prefer them to closed commercial maps.
- We learned elementary map objects - point, line, area and multipolygon.
- We used in-browser editor iD to edit and contribute to OSM.
- Only basic mapping skills are needed to contribute to OSM.
- Tasking managers are very useful to divide mapping work and complete certain tasks in time,
- There are Android apps for using and contributing to OSM.
- Expert mappers often use advanced mapping editors like JOSM.
- Every small contribution to OSM is valuable.

Exercise

Q.1 Fill in the blanks.

1. In open street map several edits in one session are saved in a ----------
2. In open street map, POI stands for ----------

Q.2 Choose the most correct answer.

1. Following is an example of in-browser open street map editor.
   a) iD b) Libre Writer
   c) Emac d) Gedit
2. Follwing is an example of in-browser open street map editor.
   a) Ubuntu b) Nano
   c) Emac d) Potlatch

Q.3 Multiple Choice.

(Two Correct Answers)

1. Following two are in-browser editors.
   a) iD b) Nano
   c) Emac d) Potlatch
   e) inkscape
2. Following two are open street map tags
   a) iD b) buiding
   c) Emac d) Potlatch
   e) park

Q.4 Multiple Choice.

(Three Correct Answers)

1. Following three are basic elements in open street map.
   a) Point b) Histogram
   c) Colour d) Line
   e) Area f) Charge
2. Following three are tasking managers in open street map.
   a) HOT b) Maproullete
   c) Dolphin d) Line
   e) Synaptic f) TeachOSM

Q.5 Match the following.

A	B
1. Multipolygon	a) Imagery
2. Tag	b) iD
3. In-browser editor	c) Lake with island
4. Satellite	d) key=value

Q 6. Answer in brief.

1. What are the various applications of map ?
2. Distinguish between Open Street Map and closed commercial maps.
3. Explain any two basic elements of Open Street Map.
4. What is the purpose of tasking managers in OSM ?
5. Write a note on JOSM.