

# Use of open cartography and open tools for navigation purposes on Ebola emergency response. Case Western Area.- DRAFT

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## Introduction

This document describes the use of Open Software and Open Data to provide support on navigation to the ambulances and support cars that works on the Ebola Virus Disease Response in Western Area (urban and rural) in Sierra Leone. It describes the use of mobile solutions, printed maps and laptop apps to provide accurate information useful for localization of the services and probable EVD cases in the most populated district in Sierra Leone, and operated by Handicap International. Also is an orientation to other districts to implement similar processes with similar objectives.

The solution is oriented on using Open Code Software and OpenStreetMap cartography, produced by Humanitarian OpenStreetMap Team (HOT). Please refer to acknowledgement section for details.



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## Background

The Ebola Virus Disease EVD Outbreak in West Africa has been by far the biggest challenge to health systems in the affected countries, and the International Community expressed the commitment. The National governments, the international community, volunteers and local communities are working together to stop the outbreak and build local capacity, looking forward to a sustainable and resilient zero new EVD cases. The work is based on four pillars: case management, surveillance and contact tracing, social mobilization and safe and dignified burials.

Sierra Leonean government have the National Ebola Response Centre NERC as the coordination institution for EVD response, and works in coordination with the District Ebola Response Centers DERCs with the support of UNMEER and several other counterparts.

Western area district is divided in Rural and Urban. A huge mechanism for appropriate transportation of probable EVD persons is established, and includes strict protocols on using Personal Protective Equipment PPE, and decontamination of the ambulances, and other support vehicles. To have a better recognition of the field and streets is an added value to the operators of the transportation. For Western Area Handicap International is in charge of the administration of that process.

HOT is a network of volunteers who works in the Digital Humanitarian Network framework to provide open and shareable cartography of areas affected by natural disasters or armed violence, starting in 2010 in Haiti earthquake and in several emergencies after that including EVD outbreak. Now a highly compressive cartography is available for the most of the affected areas. Also there exists tools to use that



cartography in several devices including mobile phones, with navigation purposes.

Also is important to mention that the operations center have limited access to internet, so the establishment of an offline solution is desirable.

## Description of the needs and solutions proposed

After some meetings between the operators, UNMEER and NERC Information Management Unit, this strategy is proposed to be implemented.

### Paper maps

Is important to have printed maps with different zoom levels for operational purposes. UNMEER/NERC IMU produced and print maps in A0 format using the OSM base data of the Western Area. The scale used is 1:9500 and 1:10.00. The printed maps were given to the operators and are available to download in Humanitarian Response. The maps were produced using ArcGIS and Quantum GIS.



### Mobile apps

As is mentioned, an offline solution is desirable. After checking the options UNMEER/NERC IM team selected OSMAND as the navigation tool that uses OSM cartography and allows to find locations and navigate. OSMAND have a free version that is compatible with the information needs of this exercise.

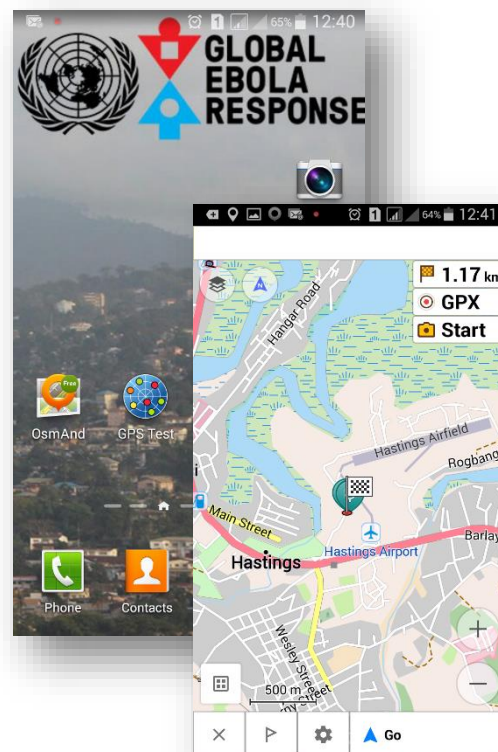
UNMEER/NERC setup and provide Smartphones donated by the private sector, using OSMAND and with the OSM cartography ready to be used.

### Smartphone devices

UNMEER provided Smartphones Samsung SIII received as donation from the private sector.

### Laptop solution

The ambulance dispatcher have laptops with limited access to internet, but also After some consultations with the OSM/HOT team members, the tool "Atlas" provided by Talent S.A. was selected as the Laptop offline option. Atlas is a Java map and navigation application using offline vector maps that uses GraphHopper for offline navigation purposes.



## Training

UNMEER/ NERC IM team is providing training on using the tools and devices. Also this document is shared and published for future references. Please see the training plan attached to this document.



Participants of the training in Hastings field operated by Handicap International. Western Area.

## Contacts

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## References

This is the list of resources used in this implementation. User manuals and guidelines are available in each webpage

### Cartography

As mentioned UNMEER/NERC IM used OpenStreetMap data, produced by HOT.

- About OpenStreetMap <http://www.openstreetmap.org/about>
- About HOT <http://hotosm.org/about>
- About Digital Humanitarian Network <http://digitalhumanitarians.com/about>

### GIS tools

ArcGIS and Quantum GIS were used. Quantum GIS is an Open source tool and ArcGIS is privative and requires the payment of license.

- About Quantum GIS <http://www.qgis.org/en/site/about/index.html>
- About ArcGIS <https://www.arcgis.com/features/> ArcGIS is produced by ESRI who have the “ESRI Disaster Response Program” and is also member of DHN  
<http://digitalhumanitarians.com/content/esri-disaster-response-program>

### Mobile app

- About OSMAND <http://osmand.net/>, and the tool is available in the next app stores:
  - Google Play
    - OSM Free version: <https://play.google.com/store/apps/details?id=net.osmand>
    - OSM Plus: <https://play.google.com/store/apps/details?id=net.osmand.plus>
      - When installed please download the Sierra Leone Map
        - Tap in the square with 4 small squares at the bottom left
        - Tap in the cogwheel at top right
        - Tap on “Manage Map files”
        - The message “This free OSMAND version is limited to 10 downloads... available 10 files to download” -> tap in “OK”
        - Tap in “All Downloads”
        - In “type to filter” write “Sierra” (the system will filter the list and will show “Sierra Leone”
        - Check the box near “Sierra Leone”
        - Tap in the bar “DOWNLOAD (2)(8 FILES LEFT)”
        - Wait for the files to download. The first time the app will download also the world view.
  - Amazon Apps
    - [http://www.amazon.com/gp/product/B00D0SEGMC/ref=mas\\_pm\\_OsmAnd-Maps-Navigation](http://www.amazon.com/gp/product/B00D0SEGMC/ref=mas_pm_OsmAnd-Maps-Navigation)
  - Itunes
    - <https://itunes.apple.com/us/app/id934850257>

- The files can be downloaded using the App, but also can be copied in the Android folder */storage/extSdCard/Android/data/net.osmand/files/osmand*
- the files extension is .obf
- The app MyAppSharer is also being used for the setup of the devices. This app helps to share the installers between Android devices. Using this app is not necessary to use internet for the customization.
  - Google Play  
<https://play.google.com/store/apps/details?id=com.yschi.MyAppSharer&hl=en>

## Desktop app

- About Atlas [http://wiki.openstreetmap.org/wiki/Atlas\\_\(navigation\\_application\)](http://wiki.openstreetmap.org/wiki/Atlas_(navigation_application))
  - Downloadable from <http://www.talent.gr/public/atlas/>
  - Produced by <http://www.talent.gr/>
- Files:
  - The compatible files are available in the MapForge project <http://download.mapsforge.org/> and the version used was download from <http://ftp-stud.hs-esslingen.de/pub/Mirrors/download.mapsforge.org/maps/>
- [The system requires Java for operation](#)

## Other tools

Those are other tools evaluated in this process

- <http://www.androidmaps.co.uk/>
- <http://download.geofabrik.de/>
- <https://github.com/mapsforge/mapsforge>
- <http://vatavian.github.io/vataviamap/>
- <http://www.turboirc.com/tgps/>
- <https://code.google.com/p/gpsvp/downloads/list>
- <https://github.com/mapsforge/mapsforge/blob/master/docs/Getting-Started-Map-Writer.md>
- [https://play.google.com/store/apps/details?id=com.mapswithme.maps.pro&referrer=utm\\_source%3D0-2065864\\_1](https://play.google.com/store/apps/details?id=com.mapswithme.maps.pro&referrer=utm_source%3D0-2065864_1)
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## Training plan: Use of Smartphones and Open Cartography for finding places in Western Area

At the end of the training the users will know:

1. How to use maps in paper and in digital support
2. How to operate a smartphone,
3. Will understand how the GPS system works
4. How can find a place in the map, and how navigate using smartphones and laptop app.
5. Also will know where those maps are coming from and how get access more information.

### Agenda

1. Brief Introduction on Maps (paper and digital)
2. Brief Introduction to GPS system
3. Brief Introduction to Smartphone: basic procedures for navigation purposes
  - a. Package content
  - b. Battery charge
  - c. Turn on
  - d. Basic configuration
  - e. Activate geolocation
  - f. General care
4. Using GPS Test
  - a. GPS satellite signal view
  - b. Satellite position and constellation view
  - c. Geolocation view
  - d. Speed view
  - e. Time view
  - f. Settings
5. Using OSMAND: Offline navigation app for Android
  - a. Starting the app
  - b. Understanding the interface
    - i. Zoom levels, position,
  - c. Search
    - i. POI
    - ii. Address
    - iii. Coordinates
  - d. Navigation
6. Using Atlas: Offline system for accessing the maps in Windows
  - a. Installing the app
  - b. References