


contribute **house numbers**
to OpenStreetMap



The image features a logo on the left showing a grey house icon with a yellow magnifying glass over the number '3'. Below the logo is the text 'by ENAIKoon'. To the right is a stylized street map with several blue location pins, each containing a white house number: 8, 10, 14, 6, 9, 1, and 16.

Themes

- Why should I map house numbers and addresses?
- Which data models are used for house numbers and addresses in OSM?
- History of the Keypad-Mapper
- Software features
- Backend support for the house number mapper through ENAIKoon OSM services
- Byproduct:
contributions to the open source project opencellid.org
- Future developments

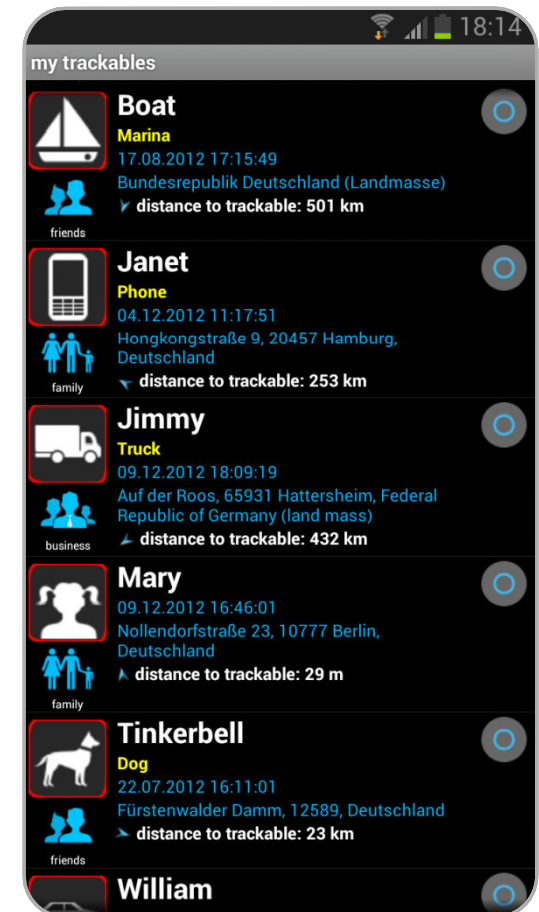


Why map house numbers and addresses?

- Many applications that use geospatial data require house numbers / addresses:
 - navigation programs
 - telematics solutions
 - geo-coding applications
 - reverse geo-coding

193 (193 / 193) 0:00 UTC, Immersend, dem@unimuenchen.de > Alle Trackables

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Opinions

- **Steve Coast (OSM founder)**

November 2012: once there are enough addresses in OSM there will be no reason to continue using proprietary maps

<http://stevecoast.com/2012/11/28/openstreetmap-addressable/>

- **Frederik Ramm (OSMF Board Member)**

December 2012: "I still don't think that addresses are of paramount importance. But I think I'll carry on recording them on the side, and occasionally involving friends and family as I did, and I hope that a few others will join me in that endeavour – if only to prove wrong the sentiment that "we can never get enough addresses through crowdsourcing".

<http://osm.gryph.de/2012/12/1000-addresses/#more-172>

- **Taiwanese OSM community**

October 2012: after the SOTM in Japan, a competition was held with the goal to map more addresses

http://wiki.openstreetmap.org/wiki/WikiProject_Taiwan/2012_Competition



"Today OSM is a great display map. It's routable too if you squint. But it's essentially not geocodable, you can't turn an address into a location.

If we fix that then there's really not a whole lot of point to ever using a proprietary map ever again."

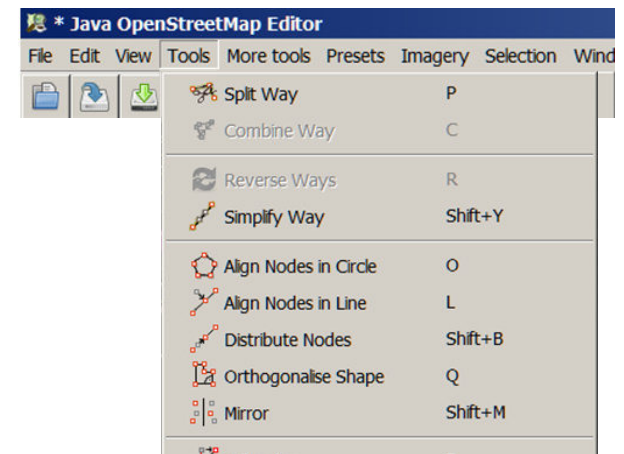
Data models

- Relations

In a relation, individual elements are brought together by describing relationships between these objects.

- ✓ smaller database
- ✓ no redundant data

- the mapper needs experience with relations
- not recommended for novice mappers
- high risk for accidentally corrupting relations



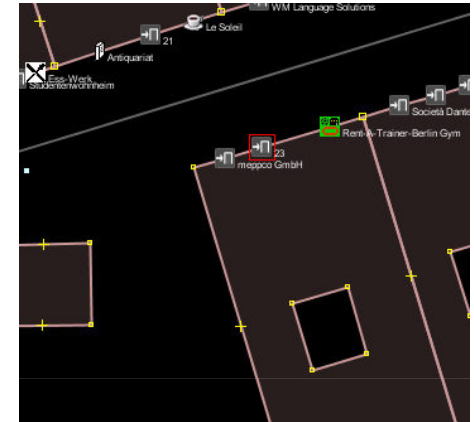
Data models

■ Karlsruher Model

- ✓ easy to understand, even for novices
- ✓ easy to process for the evaluation software
- ✓ not susceptible to inadvertent destruction of data

- redundant data in the database -->
 - risk of discrepancies
 - bigger database
- requires greater effort to change information on street names and postal codes

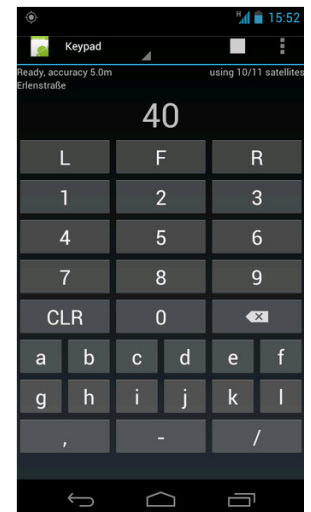
➔ Keypad-Mapper 3 uses the Karlsruher Modell



Annotation/Addresses ...	
Key	Value
addr:city	Berlin
addr:country	DE
addr:housenumber	23
addr:postcode	10777
addr:state	Berlin
addr:street	Nollendorfstraße
addr:suburb	Schöneberg
entrance	yes
wheelchair	no
+ Add Edit Delete	

History of the Keypad-Mapper

- **Version 1**
published at the end of 2010 by Nic Roets (South Africa)
nroets@gmail.com
- **Version 2**
published in the middle of 2011 by Cobra (Germany)
cobra_osm@yahoo.com
- **Version 3.0**
published February 2013 by ENAiKoon
msemm@enaikoon.de
- **Version 3.1**
published June 2013 by ENAiKoon
msemm@enaikoon.de



App details

- Platform: Android
- Active users: > 2,600
- Download at:
Google Play, ENAIKOON Server
- OSM wiki page:
German, English, Spanish, Italian, Latvian, Dutch,
Russian, Ukrainian
- Wish list for new enhancements: on the wiki page



Features: house number recording

The screenshot shows the Keypad-Mapper 3 app interface. At the top, the status bar displays signal strength, 36% battery, and the time 12:31. The app's header shows the current location: "Nollendorfstraße, 10777". Below this is a large white input box for house numbers. To the right of the input box is a vertical list of numbers: 12, 14, 16. Below the input box is a text field labeled "note for this location". At the bottom is a keypad with letters a-l, numbers 1-9, and symbols like comma, dash, slash, trash, and backspace. On the left side, there is a menu bar with icons for undo, GPS freeze, display GPS/compass, photo with GPS coord. in EXIF, and sound notification with GPS coord. Annotations with yellow lines point to various features: "Actual street and postal code" points to the header text; "Input box for house numbers" points to the large white box; "Menu bar" points to the left-side icons; "undo" points to the first icon; "GPS 'freeze'" points to the second icon; "display GPS / compass" points to the third icon; "photo with GPS coord. in EXIF" points to the fourth icon; "sound notification with GPS coord." points to the fifth icon; "Help" points to a question mark icon in the top right; "History: last 3 house numbers" points to the vertical list of numbers; "Input field for additional notes" points to the "note for this location" field; and "Keypad (layout depends on your screen size)" points to the bottom keypad.

Actual street and postal code

Input box for house numbers

Menu bar

- undo
- GPS "freeze"
- display GPS / compass
- photo with GPS coord. in EXIF
- sound notification with GPS coord.

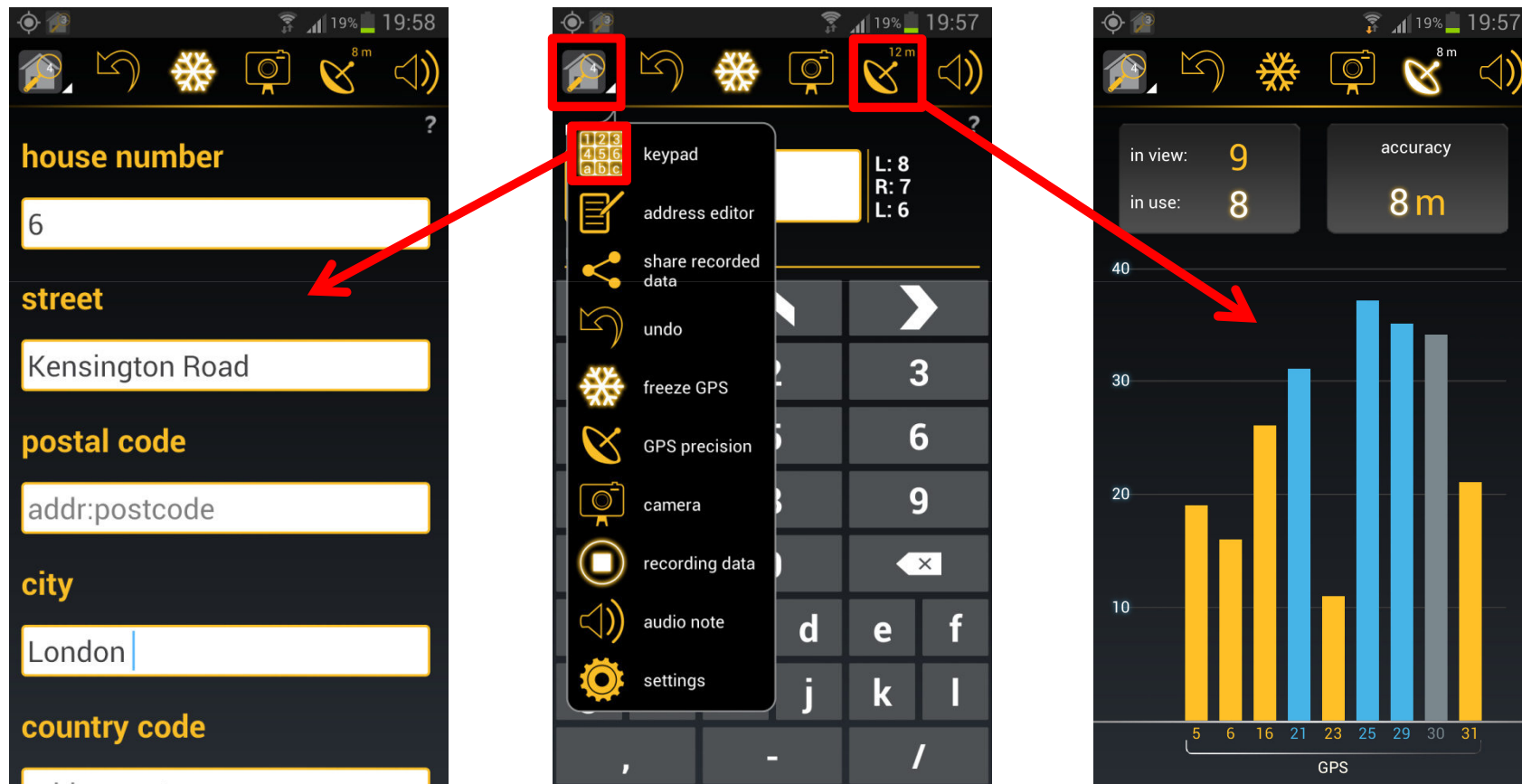
Help

History: last 3 house numbers

Input field for additional notes

Keypad
(layout depends on your screen size)

Features: address information and GPS accuracy



Configurable settings

Supported languages:

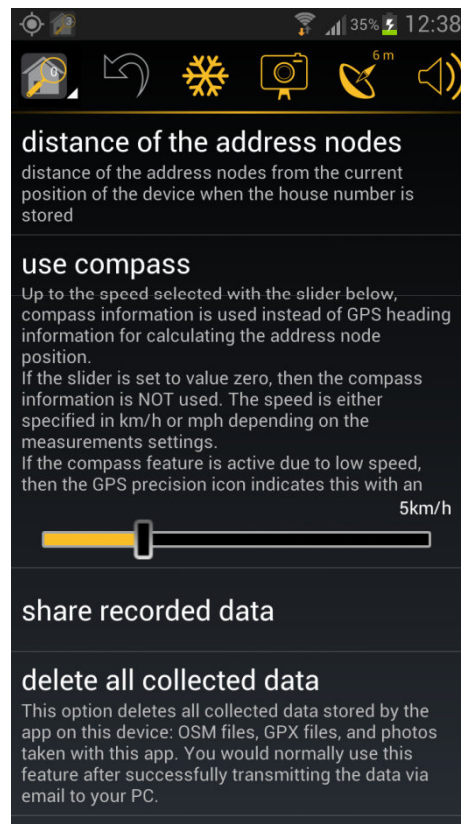
- German
- English
- French
- Greek
- Dutch
- Italian
- Polish
- Russian
- Spanish

Measurement systems

- metric
- imperial

Data can be sent as an e-mail attachment

Reports bugs of the app to the developers



Usage of compass for heading calculation instead of GPS at low speed

Distance of the address nodes at right angle to the direction of movement

“Standby Mode” of the display can be averted

GPS power saving mode

JOSM .wav file folder adjust

Delete the collected data after the data has been processed

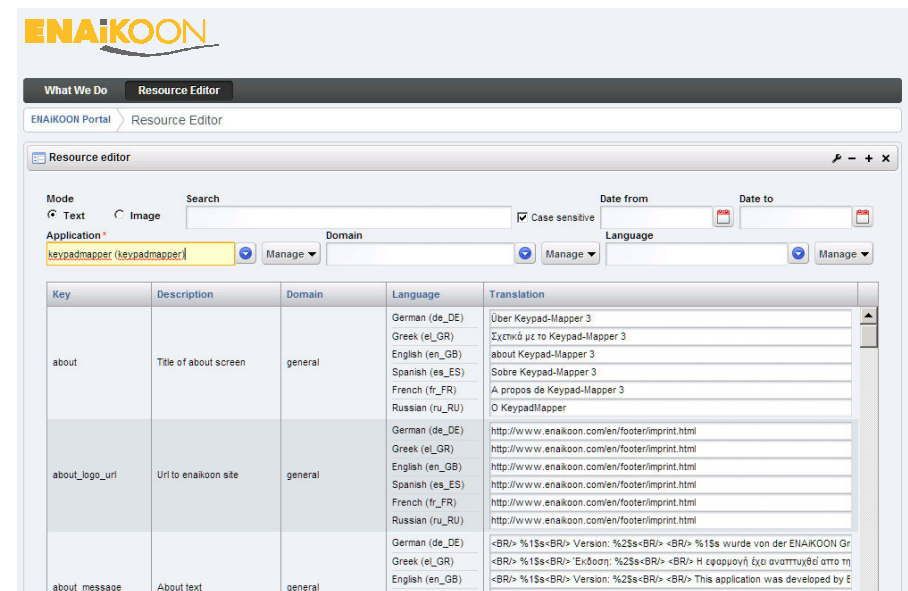
Backend

■ NOMINATIM

- reverse geocoding for the calculation of street names / area codes
- the app recalculates every 10 seconds
- 4 individual NOMINATIM servers
- regular data updates via DIFF files

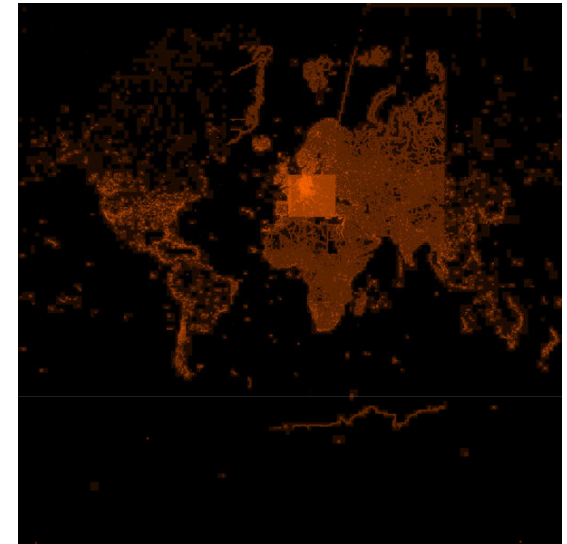
■ ENAIKOON resource editor

- more than 100,000 text resources (up to 18 languages)
- more than 10,000 graphic resources that are language dependent
- server-based resource management



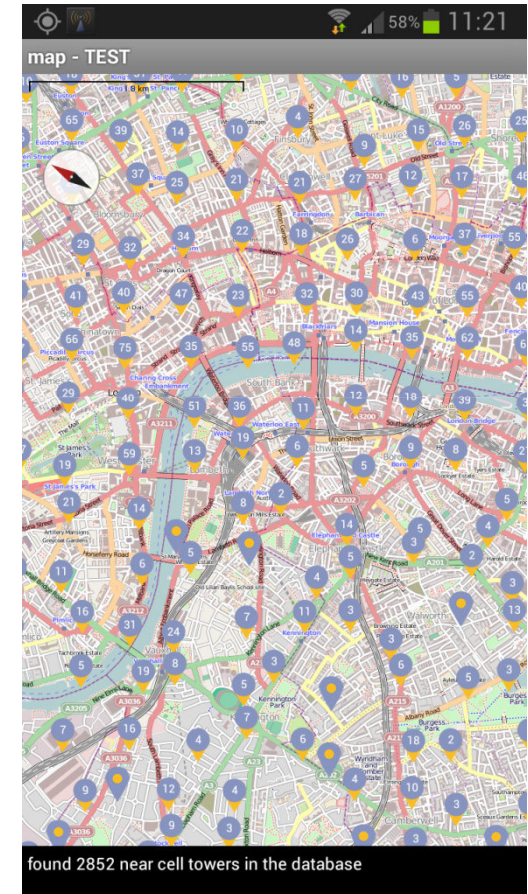
Further ENAiKoon backend capabilities

- **TIREX tile server load balancer**
3 individual tile servers with TIREX load balancers
- **OSRM Server**
3 individual OSRM servers with load balancers
- **Offline vector map data for MapsForge library**
3 individual servers for generating vector data
OpenGL implementation of MapsForge is currently under development



opencellid.org

- GPS positions from cell phone towers
- Complementary to OpenStreetMap
- OpenSource
Download the database at: www.opencellids.org/en/download/
- The largest OpenSource CellID database world wide
 - 2,700,000 known CellIDs
 - 400,000,000 measurements
 - over 1 million new measurements and 1,500 new cells every day
- Maintainer
Since March 2013, ENAIKOON is the maintainer of the project and owner of the domain



opencellid.org

Why is OpenCellID integrated with Keypad-Mapper 3?

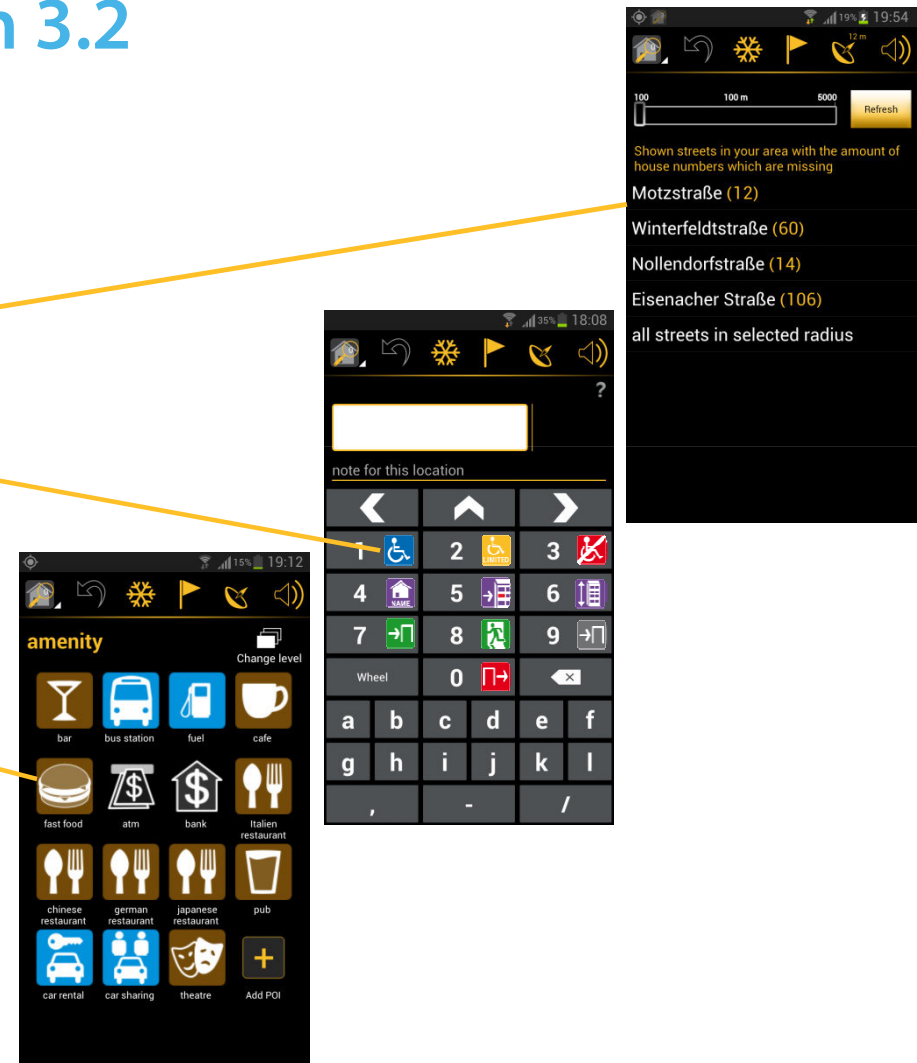
- valuable data source:
house numbers are often recorded
in residential roads where opencellid
data is urgently needed
- GPS is already active
- mapper will not become confused
from these extra features :
no interference with the app's
operation

The screenshot shows the OpenCellID website interface. At the top, there's a navigation bar with links: OpenCellID, background, download, inViu, and contact. Below this, there's a search bar and a link to 'cell location'. The main content area is titled 'CellID info' and includes several icons and labels: 'GPS positions of base stations' (satellite icon), 'Base stations with newly added measures' (tower icon), 'Recently uploaded measurements' (house icon), and 'Measures of a selected base station' (tower icon). There are also input fields for 'Date from' (01/16/2013), 'Date to' (01/21/2013), and 'Limit' (25000), with a 'SHOW' button. Below these are links for 'Heat maps', 'Statistics', and 'Search location'. On the right side, there's a large map of Germany with numerous red dots representing cell tower locations.

3 main features in future version 3.2

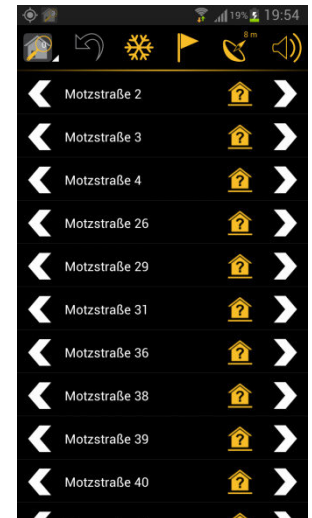
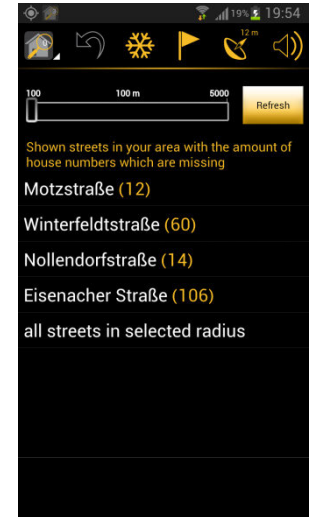
Planned completion date: Christmas 2013

- list of missing house numbers including false positive database
- configurable buttons on the keypad display
- POI editor
- configurable menu bar
- integration of geoChat
- UI improvements



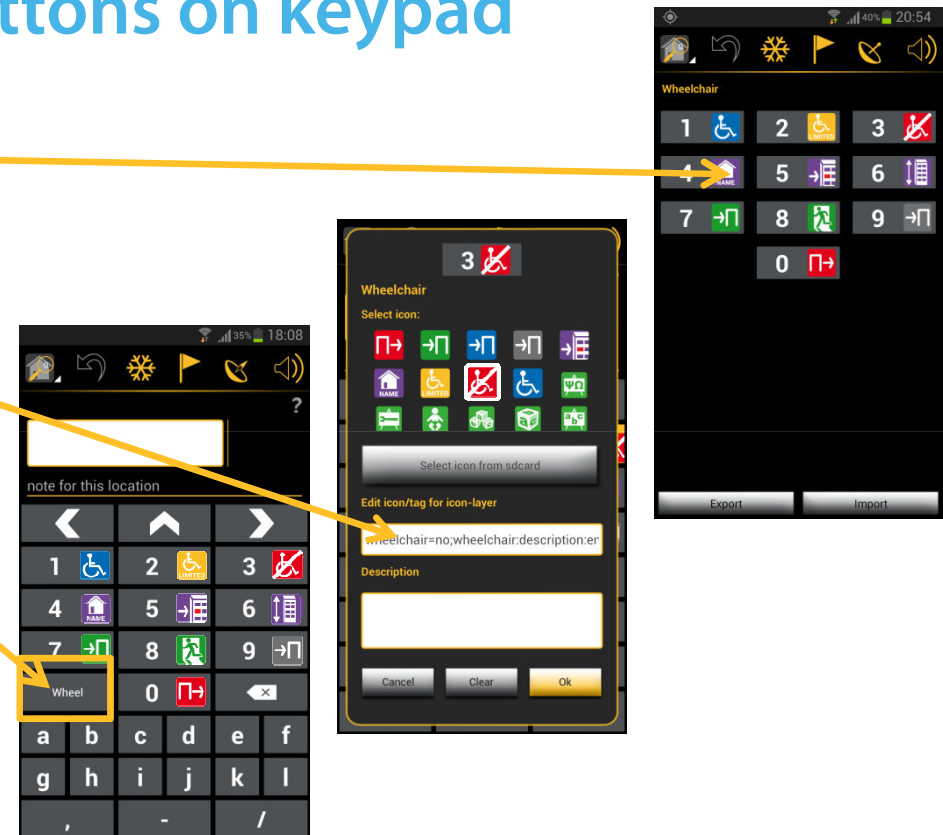
New feature 1: List of missing house numbers

- show streets around your position
- define the radius
- all streets with missing house numbers are shown in a list
- clicking on a street opens a list with the missing house numbers
- record a house number by clicking on the left or right arrow
- Hide a “missing house number” from the list if it does not exist and save it in a false positive database to avoid, that other mappers will search for it again



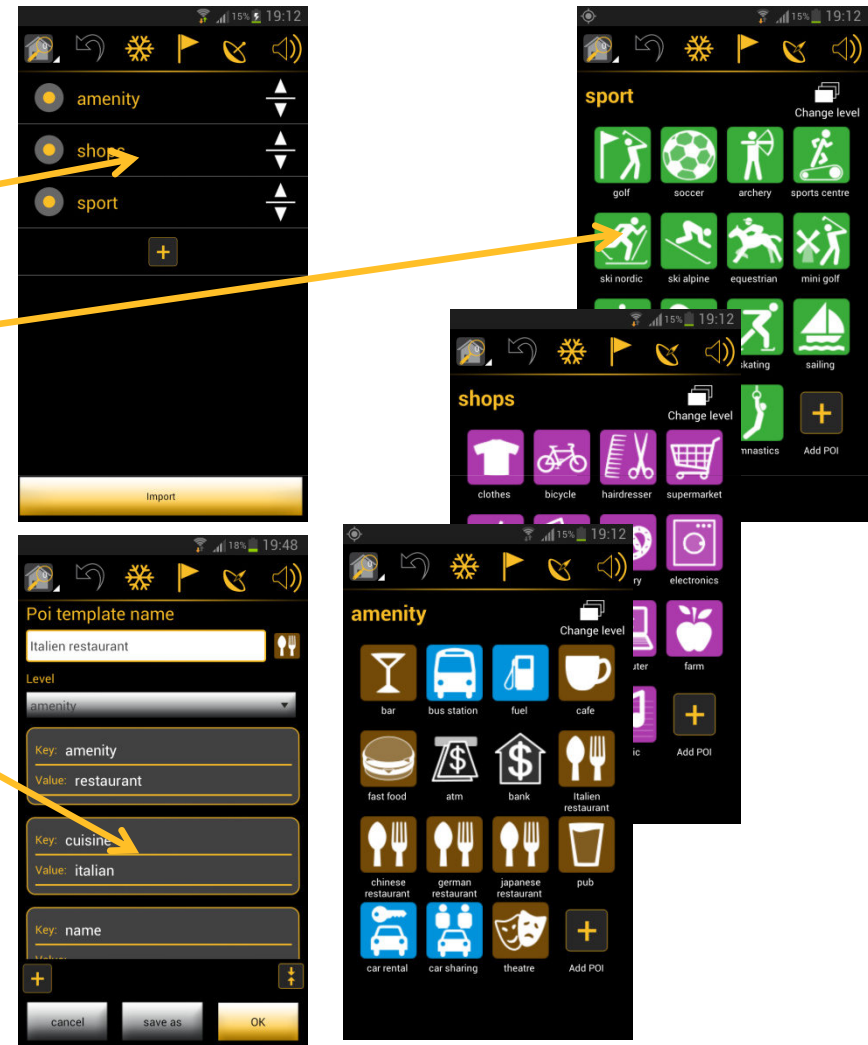
New feature 2: Configurable buttons on keypad

- define your own icons including multiple tags per icon with constant or variable value
- key:value pairs will be saved with the house number
- switch between different icon levels by tapping on a customisable shortcut
- export and import icon levels
→ the community can share icon level



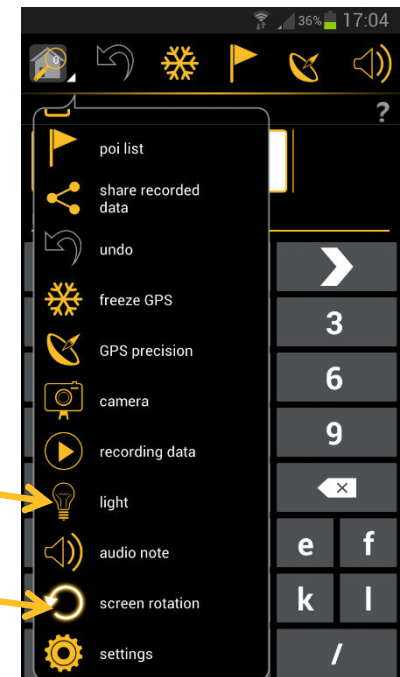
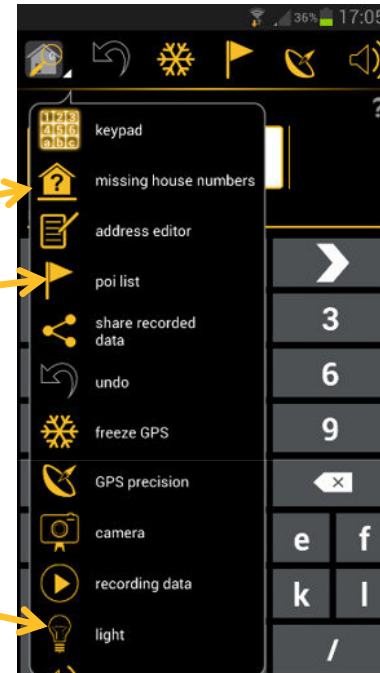
New feature 3: POI editor

- create multiple levels – activate and change sequence of levels
- arrange POIs to your preference
- editable keys + values
- values can be entered while mapping the POI
- Use your own icons
- export and import POI levels
- use POI levels of other mappers



UI improvements

- New menu options
 - missing house numbers
 - POI list
 - flash light on/off
- additional features
 - switch flash light on/off
 - configure screen rotation independent from phone settings



Future developments: Version 3.3

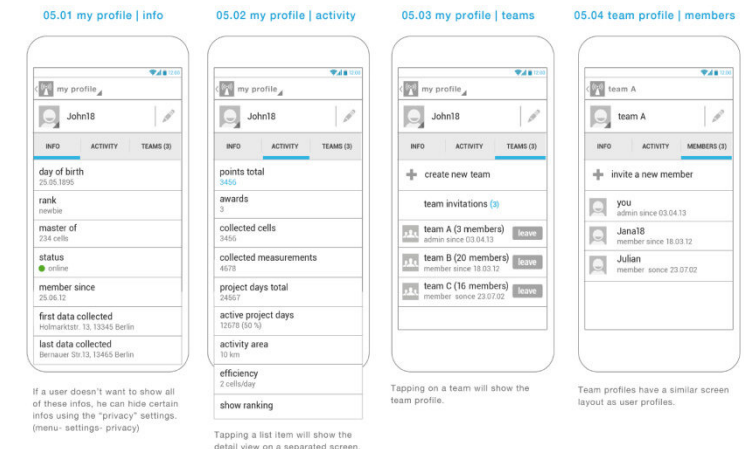
Planned completion date: Summer 2014

- Gamification:
 - more fun through
 - ✓ team building
 - ✓ challenges
 - ✓ ranking list
- Map integration:
 - reach additional mappers thru
 - ✓ display of the current position on a map
 - ✓ display of the total distance covered
 - ✓ display of the missing house numbers on the map
 - ✓ Precise positioning of the POI on the map

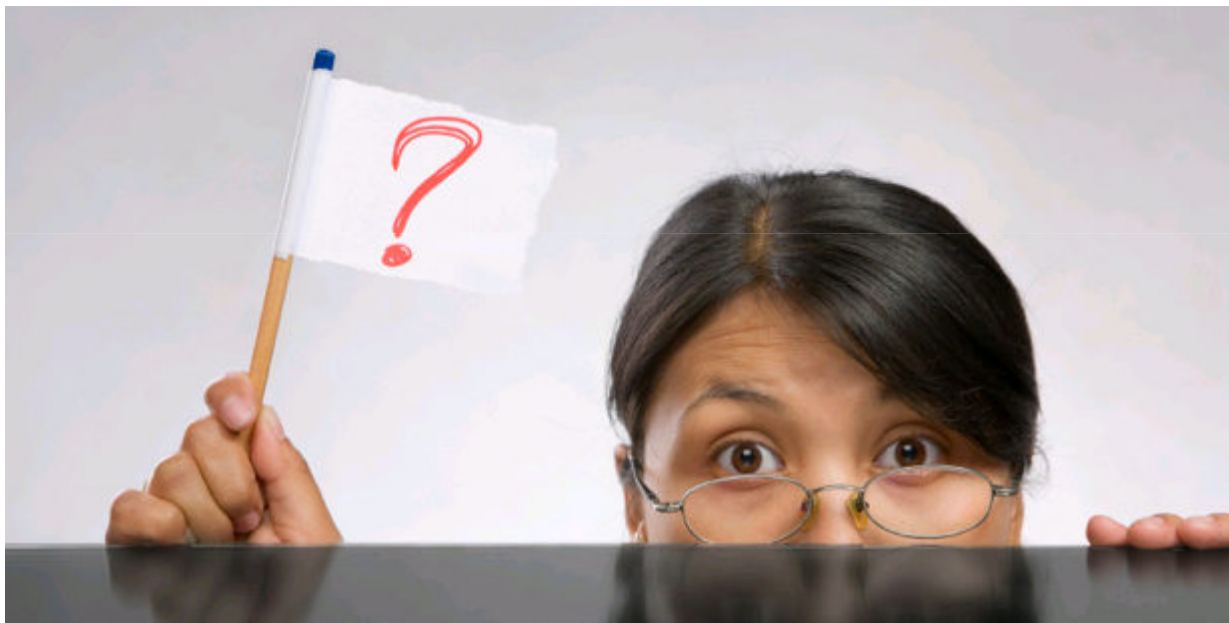
ranking x +

show all add new ranking

last 24 h	last 24 h in Berlin	new records	efficiency per h	in Europe	last week in Europe
1 John18 3456 points	3 John18 545 points	4 John18 327 points	10 John18 227 points	23 John18 127 points	23 John18 27 points
2 Julia56 456 points	4 Julia56 456 points	5 Julia56 456 points	11 Julia56 456 points	24 Julia56 456 points	24 Julia56 456 points
3 Marc7 6 points	5 Maria56 256 points	6 Maria56 256 points	12 Maria56 256 points	25 Maria56 256 points	25 Maria56 256 points
	6 Klaus56 156 points	7 Klaus56 156 points	13 Klaus56 156 points	26 Klaus56 156 points	26 Klaus56 156 points
	7 Romina6 6 points	8 Romina6 6 points	14 Romina6 6 points	27 Romina6 6 points	27 Romina6 6 points
	8 Julia56 6 points	9 Julia56 6 points	15 Julia56 6 points	28 Julia56 6 points	28 Julia56 6 points
		10 Maria56 256 points	16 Maria56 256 points	29 Maria56 256 points	29 Maria56 256 points
		11 Klaus56 156 points	17 Klaus56 156 points	30 Klaus56 156 points	30 Klaus56 156 points



How can I contribute?



Step 1: Read the OSM Wiki page

Keypad-Mapper 3



Keypad-Mapper 3 is an [Android](#) application dedicated to the rapid mapping of house numbers and address nodes.

This app is an enhanced version of [KeypadMapper2](#), which is based on the original [KeypadMapper](#) published by Nic Roets in 2010.

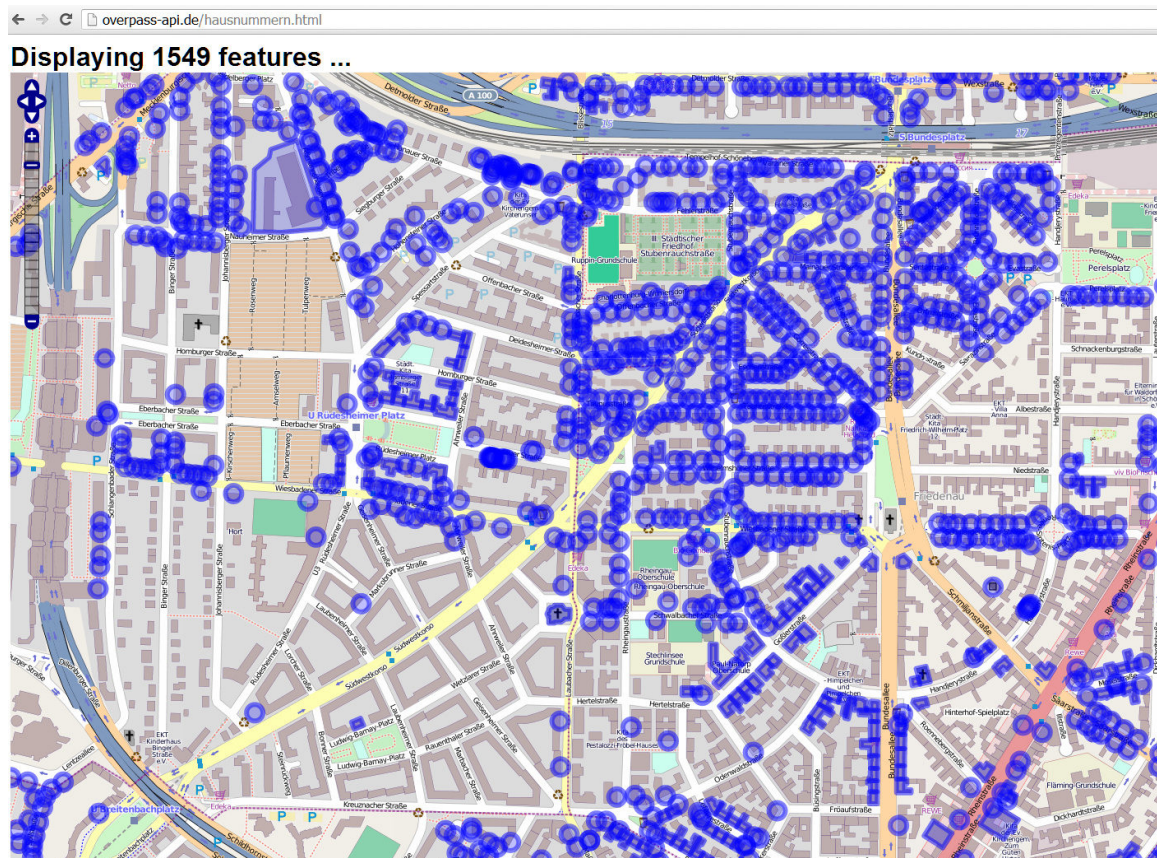
ENAIKoon would like to express their gratitude to Nic, who supported them during the implementation of the app's latest version with his ideas and patience.

Contents [\[hide\]](#)

- 1 available on Google Play and on the ENAIKoon server for download
- 2 quick start
- 3 new features in Keypad-Mapper version 3.1
 - 3.1 record voice note
 - 3.2 the RECORD button has been restored
 - 3.3 improved history
 - 3.4 the survey date is saved with each address tag
 - 3.5 optimized screen layout for larger screens
 - 3.6 LIFR and CLR on keypad screen replaced by icons
 - 3.7 improved usability
 - 3.8 additional settings options
- 4 features of Keypad-Mapper version 3.0
 - 4.1 menu icon 'address editor'
 - 4.2 menu icon 'keypad screen'
 - 4.3 freeze GPS position
 - 4.4 take photos
 - 4.5 additional test notes

http://wiki.openstreetmap.org/wiki/Keypad-Mapper_3

Step 2: Find an area with missing addresses



<http://overpass-api.de/hausnummern.html>

Step 3: Start mapping and have fun!

