



DELIVERABLE

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D2.2 Report on engagement process of OSM community

- Data collection methods and requirements identification -

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Abstract (for dissemination)	CAP4Access develops and pilot-tests methods and tools for engaging the OpenStreetMap community, and encouraging those unfamiliar with the platform to gather and share spatial information with the view to improving accessibility of the built environment for people with limited mobility.
	This document outlines the project's conceptual relationship with OpenStreetMap, and describes the processes and outcomes of OpenStreetMap engagement as well as data collection activities. It builds on work described in earlier reports D1.1, D1.2 and D2.1, by assessing how end-user needs have been addressed through tool developments and data collection. The document also evaluates the strengths and weaknesses of current approaches taken, and contains the plans and next steps for each of the pilot cities in terms of OpenStreetMap engagement.
Keywords	Engagement, OSM, Wheelmap, data collection, accessibility, disability, mobility, usability, tools, testing, use, mobile

Statement of originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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Executive Summary

The main aims of Work Package 2 (WP2), of which this report forms a part, are three-fold: **engagement** of communities who form an integral part of the research carried out in this project and who will be actively involved in the development of CAP4Access tools and methods; **piloting tools**: pilot-testing tools developed in WP3, in and with local communities, and **evaluation**: assessing the efficiency and effectiveness of developed tools and evaluating the effectiveness and relevance of the project.

This document focuses on the **engagement** of the wider OpenStreetMap (OSM) communities, **data collection activities** with end-user and wider communities, and **requirements gathering** for OSM related tools. The wider OSM community includes both those active within OSM, but also people who have not already used OSM before and are unfamiliar with it. This document reports on the activities carried out both within and externally to pilot city case studies to engage both of these groups, and the process by which end-user needs identified in the first two years have been addressed through relevant tool development.

Also of critical importance has been the assessment of how OSM-related issues are conceptualised by end-user communities and secondary stakeholder groups. For example, issues surrounding open data have proven to be central in all the pilot sites, and many discussions with local authority groups have been had around the subject in each area. The release of open datasets related to accessibility are of key significance to OSM and CAP4Access. From a research perspective, consultations around the subject with local authorities have revealed key differences in attitudes towards and the legality of releasing open data, with local authorities in the UK for example being restricted by strict licensing clauses.

The project has met with a positive, often enthusiastic response from target communities within the four pilot cities and beyond. Activities including the international MapMyDay initiative have resulted in the project achieving strong visibility among the wider OSM community. Valuable experience has been gained in understanding and responding to the needs and preferences of the diverse stakeholder groups. These findings are continuously being fed back to the tool development component of the project (WP3) within the context of the overall approach of participative development taken by CAP4Access.

1 Introduction: Purpose of the Deliverable

The main aims of Work Package 2 (WP2), of which this report forms a part, are three-fold: engagement of communities who form an integral part of the research carried out in this project and who will be actively involved in the development of CAP4Access tools and methods; piloting tools: pilot-testing tools developed in WP3, in and with local communities, and evaluation: assessing the efficiency and effectiveness of developed tools and evaluating the effectiveness and relevance of the project.

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Chapter 2, *Context: CAP4Access and OSM,* provides an overview of OSM's relevance to and connection with CAP4Access, in terms of existing initiatives within the OSM community and areas of key interest in relation to accessibility. It also covers existing relationships with the OSM community that are held by consortium partners and their networks, and how these have been utilised to develop further links.

Chapter 3, *Engagement Activities and Outcomes,* explores engagement activities and initiatives that have been leveraged in each of the pilot sites and externally in order to involve the wider OSM community, and communicate project aims and objectives. As stated above, the 'wide OSM community' includes both those familiar with and active on the platform, but also groups who have not collected or entered data into OSM previously and are unfamiliar with it. Engagement activities have been tailored to meet the needs of both groups.

Engagement of *groups unfamiliar with OSM and related technologies* was largely undertaken by introducing OSM and data collection tools in various contexts, appropriate to audiences in each of the pilot sites to highlight the potential of these platforms. Groups engaged in OSM-related tools and issues have included school pupils, university students, social enterprise groups, local authorities and leisure organisations. Activities have enabled partners to evaluate appropriate methods of introducing data collection tools and reflect on the success of different approaches, such as mapping parties.

As the participatory research methodology which defines CAP4Access's approach prioritises participants' co-definition of all project activities, OSM engagement was, where possible, integrated into project initiatives which reflected communities' needs and interests identified in each of the pilot sites during years 1 and 2. Where possible, activities have been designed to bridge the technical interests of OSM contributors with specified priorities of end-user groups. This helped to ensure that the project, although centred on user communities, remained meaningful for both groups.

Chapter 4, *Evaluation*, analyses the strengths and weaknesses of engagement methods in each pilot site and externally. The chapter reflects on methods that have proven particularly successful, as well as some of the issues involved in bridging the technical and social needs and interests of different community groups.

The final chapter, *Next Steps*, outlines actions to be taken over the project's final year in relation to the OSM community.

2 Context: CAP4Access and OSM

Maps are highly influential tools that can shape and create people's experiences of their environment. Advances in computer technologies have seen mapping applied to tackle a range of environmental and humanitarian crises. These have frequently demonstrated the potential of open source online maps to drive processes of social innovation. Responses to such events have demonstrated how open access to forms of mapping can empower communities to tackle and acquire information about particular issues of interest.

OpenStreetMap (OSM) set out to create an open source repository of global geographic data. Founded in 2004 at University College London, the project has attracted over 2 million users (as of December 2015), and this number is rapidly increasing.

Like OSM, CAP4Access seeks to enable social innovation through collecting and sharing information freely through online mapping. OSM has been at the heart of CAP4Access's technical developments. The majority of tools developed by or utilised within the project are strongly linked to OSM – either as their platform, or as a secondary repository for the data they help to collect (as with Mapillary).

2.1 Existing connections with OSM

2.1.1 The GIScience research group

The GIScience research group of University of Heidelberg was established in 2010. Since then, there have been strong connections between the group and the (OSM) community. Particularly, there has been a research focus on methods for quality assessment of OSM data, which has been subject to several scientific articles published by the group¹²³⁴⁵⁶. The

¹ Neis, P. (2014): Von Qualitätsuntersuchungen zu Nutzungspotentialen gemeinsam zusammengetragener Geodaten. Kartographische Nachrichten, 64(3)

² Hochmair, H.H., Zielstra, D., and Neis, P. (2015). Assessing the Completeness of Bicycle Trail and Designated Lane Features in OpenStreetMap for the United States. Transactions in GIS, 19(1), 63-81.

group has organised the German speaking conference "Geoinformatik 2013"⁷, which featured a number of sessions on OSM related topics. The development of an open source online route planning service⁸ called OpenRouteService (ORS), which is purely based on OSM data is another core focus of the group. The service is used by the OSM community, who are also contributing to the development of the service by providing constant feedback⁹. Since the group offers an openly accessible API, it is also possible to develop tools based on ORS. As an example, the plugin¹⁰ for the well-known open source geographical information system (GIS) "Quantum GIS" may be mentioned. The plugin¹¹ has been developed for QGIS which makes use of the ORS to provide routing and accessibility analysis (where selected locations can be travelled to within certain time frames).

Further connections to the OSM community exist in the field of crisis mapping. The GIScience research group has organised several crisis mapathons¹²¹³ and set up crisis route planning services¹⁴. Moreover, members of the group are serving the OSM group with several tools that help to analyse the OSM contributors' activities¹⁵¹⁶ and OSM data quality¹⁷.

The benefit of these connections between the OSM community for the GIScience research group and the CAP4Access project is a constant bidirectional communication and learning process. By having close connections with OSM community, the GIScience research group can quickly learn about the latest developments and trends within the OpenStreetMap project, which feeds through to our developments in the fields of routing, navigation and data quality. For some of our developments, e.g. the implementation of dropped kerbs into OSM, the obstacle tracker and OpenRouteService, we directly use the great input provided by the OSM community to us. But also the other way around, the OSM community learns about new developments at the University of Heidelberg through the public announcements in the GIScience research blog and also the scientific publications having the OpenStreetMap database as an object of research. Last but not least, the GIScience research group serves the OSM community by providing and maintaining web services that are based on OpenStreetMap data, such as OpenRouteService¹⁸, OSMatrix¹⁹, OpenMapSurfer²⁰, etc.

³ Barron, C., Neis, P. & Zipf, A. (2013): A Comprehensive Framework for Intrinsic OpenStreetMap Quality Analysis. , Transactions in GIS, DOI: 10.1111/tgis.12073.

⁴ Neis, P., Zielstra, D. & Zipf, A. (2013): Comparison of Volunteered Geographic Information Data Contributions and Community Development for Selected World Regions. Future Internet. Vol. 5, pp. 282-300.

⁵ Neis, P., Goetz, M. & Zipf, A. (2012): Towards Automatic Vandalism Detection in OpenStreetMap. ISPRS International Journal of Geo-Information. Vol.1(3), pp.315-332. DOI:10.3390/ijgi1030315.

⁶ Neis, P., Zielstra, D. & Zipf, A. (2012): The Street Network Evolution of Crowdsourced Maps - OpenStreetMap in Germany 2007-2011. Future Internet. Special Issue "NeoGeography and WikiPlanning".

⁷ <u>http://geoinformatik2013.de/</u>

⁸ <u>http://openrouteservice.org/</u>

⁹ <u>https://github.com/GIScience/openrouteservice/issues</u>

¹⁰ <u>https://plugins.qgis.org/plugins/OSMroute/</u>

¹¹ <u>https://plugins.qgis.org/plugins/OSMroute/</u>

¹² <u>http://k1z.blog.uni-heidelberg.de/2013/11/17/impressions-from-haiyan-crisis-mapathon-at-heidelberg-university/</u>

¹³ <u>http://k1z.blog.uni-heidelberg.de/2015/04/30/nepal-disaster-mapping-heidelberg-university/</u>

¹⁴ <u>http://k1z.blog.uni-heidelberg.de/2015/04/28/disaster-openrouteservice-for-nepal/</u>

¹⁵ <u>http://hdyc.neis-one.org/</u>

¹⁶ <u>http://yosmhm.neis-one.org/#</u>

¹⁷ <u>http://koenigstuhl.geog.uni-heidelberg.de/osmatrix/</u>

¹⁸ <u>http://openrouteservice.org</u>

¹⁹ <u>http://osmatrix.uni-hd.de/</u>

2.2 Interest of OSM community in accessibility

The OSM community is open to including information about accessibility. There is a variety of documentation about how to integrate information about accessibility into OSM in the OSM Wiki²¹. The initiative that has probably created the biggest impact is Wheelmap²². The data about accessible places that is collected for Wheelmap is automatically added to the OSM dataset, and there has been discussion among active Wheelmap users about new features added to the platform (see *Wheelmap Toilet Feature*, p.44).

Wheelmap users actively discuss the implementation of new features in the site's forum²³. Here, key points include the incorporation of new categories such as 'behindertenparkplatz' [disabled parking] – voted for by 84 users, suggestions for collaboration with other relevant organisations, and requests to change symbols for particular categories.

In the field of route planning there are only a small number of projects that already take advantage of OSM. Two current examples are the projects m4guide²⁴ and Wheelnav²⁵. The goal of m4guide is to use OSM data for accessible route planning. The tool is in a prototype stage and currently only supports the district of Berlin-Mitte. The reason for this small test area is that the relevant OSM data is largely incomplete for most areas and for prototyping with complete data only small test areas are feasible. Wheelnav currently only supports pedestrian navigation to locations selected from Wheelmap. Thus, both of these related projects do not yet support route planning that is optimised for wheelchair users over large areas, which we are targeting with OpenRouteService.

3 Engagement Activities and Outcomes

In Deliverable 1.2's Plan for Engagement, the strategy for engaging wider OSM communities within CAP4Access was established. As well as ensuring that all new tools could be pilot tested on OSM, the document laid out how 'engaging and mobilising OSM developers and contributors, inside and outside of the pilot areas, to encourage participation in accessibility mapping' was a central crux of the project's engagement strategy (*Deliverable 1.2 Plan for Engagement, 17*). Engagement of the OSM community was also predicted to acquire 'an insight into user preferences and to generate ideas to be reflected in use cases'. Both aspects have been achieved in pilot site activities, and externally, through a range of engagement activities and initiatives.

Mapping for Change have also engaged the 'wider OSM community', including individuals previously unfamiliar with OSM and related data collection tools.

²⁰ <u>http://korona.geog.uni-heidelberg.de/</u>

²¹ <u>http://wiki.openstreetmap.org/wiki/Category:Walking_Disability</u>

²² <u>http://wheelmap.org/map#/?zoom=19</u>

²³ <u>http://wheelmap.uservoice.com/forums/31554-general</u>

²⁴ http://www.m4guide.de/

²⁵ https://itunes.apple.com/de/app/wheelnav/id1006634677?mt=8

The document set out a range of strategies for engaging OSM, both directly and through virtual methods. These along with additional measures will be described in the following sections, from the perspective of each pilot site and externally.

3.1 London

Mapping for Change have engaged the OSM community in CAP4Access through various virtual and offline engagement activities. These have ranged from general introductions to the project, to specific communications around a particular initiative or activity.

Initially, Mapping for Change sought to establish contact with OSM groups around London by conducting desktop research to identify local contributors. This involved reviewing OSM social media publications including Twitter and their Wikipedia site²⁶ to ascertain active individuals and popular areas.

To meet the Mapping for Change team and discuss accessibility issues in an informal context, key OSM figures were invited to join activities conducted for UN Enable Day, December 2014. This outreach event enabled Mapping for Change to provide the local mappers with an overview of the project, and to discuss key issues relevant to them, such as difficulties in the acquisition of PSI datasets. By establishing initial contact through this meeting, Mapping for Change have been able to communicate regular project updates to the local OSM community, predominantly through area mailing lists.

3.1.1 Co-Designing Mobile Accessibility App

On 19th June Mapping for Change teamed up with members from UCL <u>ExCiteS</u> research group - Ross Akin, an accessibility designer, Dr Catherine Holloway and Sarah Nicholson from UCL's <u>CEGE Dept</u>., and users of the <u>Queen Elizabeth's Foundation Mobility Centre</u> for a day long workshop. The idea was to co-design a mobile application that could enable users to identify and map barriers to accessibility within the urban realm using Sapelli; a mobile data collection and sharing platform designed with a particular focus on users with little or no prior ICT experience. Sapelli offers pictorial decision trees and icon-driven interfaces as opposed to the forms and check boxes traditionally used in many mobile apps.

The workshop commenced with a brainstorming session about the barriers encountered on a daily basis in the public realm and these were then classified into logical groups.

Participants headed out around Carshalton to capture photographic and audio material based on accessibility levels. <u>Mapillary</u>, the crowdsourcing application for geotagging photos was also used during the exercise. Going out and physically identifying issues was done primarily to explore whether there were missing gaps to what had already been identified as barriers, which indeed it did.

²⁶ <u>http://wiki.openstreetmap.org/wiki/London</u>



Exhibit 1: Brainstorming session / Classifying barriers

Exhibit 2: Accessibility Barriers Mapping



The exercises set the scene for the next step in the co-design process. Based on the different groupings that were further refined participants began to construct the decision tree which they decided should focus on what they were trying to achieve – crossing the road for example – and the identification of barriers that prevented them from achieving that particular goal. In the design of the decision tree people were keen to see that best practice and positive examples were also recognised and captured.





In the next step of the co-design process, the application was built based on the collaboratively constructed decision tree hierarchy. Icons were created by a designer with

experience in design for disability and older people. To reduce the scope for misunderstanding, where possible, the graphical language of existing signs and environmental markings were used in the relevant icons such as those describing controlled crossings, toilets and disabled parking bays. These were implemented, using the agreed decision tree structure, within the Sapelli application architecture. Exhibit 4 shows the design of the icons and their placement within the decision tree structure.





Following the first workshop, participants were then requested to use the app to log accessibility related points of interest (aPOI) in their journeys over a four week period, using either their own Android smartphone or one provided for by the project. The app collects information on the type of aPOI reported, location data, and if provided a photograph or audio description. For this study the data was transferred from the participants' phones at the end of the trial period. The collected data was then imported into the *Community Maps* mapping tool (see Exhibit 5).

All six participants were encouraged to participate in this activity, however only two completed the activity. One participant withdrew due to ill health; other reasons were not specifically stated.

A final workshop was used to gather feedback on the app. Participants were interviewed using open questions based on Nielsen's heuristics²⁷. The heuristics were used to provide a framework to ensure the questions covered key aspects of usability. Each participant was interviewed by a researcher, followed by a group discussion of the findings.

The feedback from the second workshop indicates that although the app has no feature to indicate the user's progress in navigating the decision space, the hierarchy was simple enough that they could navigate backwards and forwards with ease. The participants found that the barriers that they encountered during the trial were easily reported within the categories identified in the app. At this stage, no changes are proposed to the decision-tree structure.

The icon design and layout within the decision tree structure (see Figure 5) allowed wheelchair users with reduced manual dexterity to use the app, with a minor exception being the use of the camera facility at step 4. This requires the phone to be held and pointed at the object whilst also pressing a button to capture the image using both hands simultaneously, and it was suggested that this would be easier to achieve with a two-step process such as a button press and time delay to subsequently allow the camera to be positioned to capture the object.



Exhibit 5: Sapelli data displayed on Community Maps

The participants believed that the icons effectively represented the aPOIs to be reported, however they commented that the design of these could be made more attractive to encourage use of the app, particularly with younger users. Points of feedback related to the dullness and similarity of the colours, as well as the use of the specific shade of blue. The

²⁷ Nielsen, J. (1994). Heuristic evaluation. In Nielsen, J., and Mack, R.L. (Eds.), Usability Inspection Methods, John Wiley & Sons, New York, NY

shade of blue used is consistent with that used in disability symbols, and the participants associated the use of the colour within the app with placing a label on disabled users. They argued that this colour would be unlikely to be used predominantly in an app aimed at nondisabled people, and they did not wish to be treated any differently. Attractiveness is an important factor in motivating people to use an interface²⁸, therefore we propose to consider re-designing the icons in a way that the users consider to be attractive.

The final area in which improvements were suggested was in error prevention and recovery. The prototype app required global positioning system (GPS) to be enabled and functioning in order for a geo-referenced observation to be captured. GPS is used to provide location metadata to allow the aPOIs to be displayed within mapping technologies to provide information to support barrier-free route planning. However, participants asked for methods to capture aPOIs in areas without GPS coverage. Thus, we advocate for the need to explore alternative geo-location services such as WiFi positioning where applicable.

The future aim and goal for those who participated is that this application can be used by a wider audience to identify short-term and permanent barriers to accessibility which can then be directed to the relevant bodies responsible for addressing these issues. In addition, participants are also keen to see that the data collected could be used in a navigation app designed for wheelchair users. Data collected using Sapelli can be transferred into the CAP4Access obstacle viewer, and will subsequently feed into OSM. This is described in more detail in the following section on the National Trails (also see *Identification of requirements for tagging system,* p.24).

3.1.2 Mapping Parties

Access the National Trails

Engagement with the wider OSM community has also focused around particular project initiatives that are of relevance, such as *Access the National Trails*. A lack of accessibility information for leisure and recreation activities, such as walking and hiking, had been raised during end-user engagement workshops in year one. *Access the National Trails* arose out of these conversations, and its particular use of mobile applications was designed to bridge issues identified by the user community, with technical aspects which could engage OSM contributor audiences, whilst introducing new audiences to OSM and data collection.

The National Trails comprise of over 2000 miles of footpath and bridleway across England and Wales²⁹. The paths themselves are in various states of accessibility, but there is currently no official source of information regarding their suitability for wheelchair users and others with limited mobility.

²⁸ Sutcliffe A (2002) Assessing the reliability of heuristic evaluation for Web site attractiveness and usability. In: System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference on. IEEE, pp 1838–1847

²⁹ <u>http://www.nationaltrail.co.uk/</u>



Exhibit 6: Participants at the Eynsham workshop

Exhibit 7: Access the National Trails workshop participants



After liaising with various walking organisations, the social enterprise Walk Unlimited voiced their enthusiasm to participate and put Mapping for Change in contact with several National Trail officers. Access the National Trails was devised in order to collect accessibility information and raise awareness about accessibility in the context of walking. Two workshops were organised with walking organisations and interested local residents: one in Oxfordshire, the other in Yorkshire. In both, the volunteers were encouraged to use mobile applications to collect information: Mapillary, Sapelli and a newly-developed Obstacle Tagger (see D.3.4). The applications were selected due to their appropriate functionality, but also as they are directly of interest to the OSM community.



Exhibit 8: Screenshots of the Mapillary interface, showing an image captured near to the Eynsham workshop in Oxfordshire (top), and its corresponding position on the map (bottom)

Mapillary³⁰ is an application for crowdsourcing georeferenced photographs of all transport routes. The application for mobile devices works by capturing images that can either be set to automatically sample at a defined rate, for example every 10 seconds, or by manually capturing images as desired. Users can also specify the pace of travel by selecting walking or cycling, for example. Users across the world have been able to share images of their local walking, cycling and horse riding routes, and as of November 2015, over 42 million images have been uploaded to the server.

Mapillary is very simple to use, and the idea of these workshops was to demonstrate this by mapping a section of trail, and subsequently encourage participants to use the application in their spare time when out and about. Mapillary imagery of the routes can provide an overview of the path's accessibility by displaying the presence of key obstacles, such as gates, and an idea of surface type or slope.

These images are held under open license, meaning the OSM community is able to derive data and metadata from them and import this into OSM. Street view images can be used to derive information such as the presence of sidewalks (further details provided in section 2.2

³⁰ Personal Mobility & the Mobile Phone – Using smart technology to deliver Sustainable Mobility - See more at: http://www.civitas.eu/content/personal-mobility-mobile-phone-%E2%80%93-using-smart-technology-deliver-sustainablemobility#sthash.s3AqXgPp.dpuf

'Sidewalk detection experiment'), street furniture and surface type. There is already a wellestablished link between *Mapillary* and OSM³¹, with many OSM contributors regularly checking Mapillary for new updates. This has further been supported by the addition of a tool that allows Mapillary to be used as a source for editing OpenStreetMap via both OpenStreetMap iD editor and JSOM³².



Exhibit 9: Screenshot of MyAccessibleEU Mapillary account

A CAP4Access account was created to enable participants across the country to view the progress of their fellow contributors, and to build up a project-specific momentum on the Mapillary platform (see Exhibit 9). This also helped to familiarise any OSM contributors from the surrounding areas with the project activity.

Although Mapillary provides an excellent visual overview of a trail's accessibility, scrolling through several hundred photographs is not feasible from an end-user's perspective. Mapped details of specific barriers and obstacles would enable people to quickly scan a planned route and assess the extent of its accessibility.

Partners in the University of Heidelberg therefore developed a tool specifically for this purpose (see figure to the right) which, like Mapillary, would also be of interest to the OSM community. The newly-developed Obstacle Tagger's relationship with OSM is discussed in section 2.2 'identification of requirements for tagging system' and further details on the application's functionality can be found in D3.4 'Tools for Collective Tagging'.



³¹ <u>http://wiki.openstreetmap.org/wiki/Mapillary</u>

³² https://github.com/mapillary/UserGuide/wiki

Eynsham workshop

Here, 20 participants used Mapillary and the Obstacle Tagger to collect accessibility information.

Participants at the Eynsham workshop provided some critical but helpful feedback for the Obstacle Tagger application:

- Adding photo functionality: "it would be useful to take photographs of obstacles just writing 'there's a bridge here' isn't necessarily very helpful"
- Amending the zoom function: "I can't zoom in close enough to recognise where I am"
- Altering the screen proportions: "The map only covers a small section of the screen the box for writing descriptions is too big"
- Adding a 'my location' marker: "If I'm in an area that I'm not so familiar with, I won't be able to tell where I am on the app. It could do with having a 'my current location' icon to make sure the obstacles are getting tagged in the right place."

This was fed back to the team in Heidelberg, who implemented the changes for future workshops.

Thixendale workshop

After a successful co-design session in June, Mapping for Change decided to substitute the Obstacle Tagger for Sapelli in the second *Access the National Trails* workshop in Yorkshire to overcome Thixendale's lack of mobile reception. The My Accessible EU Obstacle Tagger requires a data connection to capture and upload data, but Sapelli has been designed for use in remote environments such as the Congo Basin, and can therefore be used with no data connection, making it ideal for capturing accessibility information in rural areas.

A tailor-made Sapelli project was designed for *Access the National Trails*. Sapelli is an opensource platform that facilitates mobile data collection and sharing and is run on Android devices (see *Deliverable 3.4* for technical details). In the context of the National Trails, the application enabled participants to capture information about the presence of obstacles using three simple steps: photograph of obstacle, provide text description, save.

Once this data has been exported from the mobile device, it can be imported into and displayed within *Community Maps* (see Exhibit 10). This data was then transferred to the Obstacle Tracker (the web version of Obstacle Tagger – see Exhibit 11). Using a small java script, the data from the comma-separated values file exported from Sapelli was read and then converted into requests within the Tagging API to create obstacles based on the information extracted. From here, it will be communicated to OSM contributors through the form of raised issues in the future (see Deliverable 3.4).



Exhibit 10: Sapelli obstacle data displayed in Community Maps





In Thixendale, there were 15 participants – all with little or no familiarity with ICT and mobile data collection tools.

Overall, a good amount of data was collected in both workshops. Over 27,000 metres of trail imagery were captured using Mapillary, and more images are added by participants every week. 80 obstacles such as gates, rivers and uneven surfaces have been marked using Sapelli or the obstacle tagger application. Mapping for Change are still liaising with National Trail officers in both locations, and have received confirmation that activity will continue into

2016, in order to cover more of the trails. These are now available to view online³³, and discussion is ongoing regarding their translation into OSM notes.

Overall, the event has proven to be sustainable, and Mapping for Change have been pleased with the level of interest shown from communities, particularly their ongoing use of both mobile tools. More workshops with other National Trail areas will be organised in 2016.

OSM Communication

After the mapping workshops, local OSM contributors were identified through the site <u>http://resultmaps.neis-one.org/oooc</u> – a map based interface which displays icons where OSM contributors are located. The functionality permits users to view contributors according to the amount of contributions they have made, the majority being 'Non-recurring <10 changesets'. You can also view the activity of each contributor to assess whether they are still active.



Exhibit 12: Screenshot of OSM contributor map, London

The amount of contributors varies highly by location (seeExhibit 12, Exhibit 13, Exhibit 14). We decided to focus on more experienced contributors initially, and de-selected junior and non-recurring from our search.

³³ <u>http://cap4navi.geog.uni-heidelberg.de/ObstacleTracker/</u>





Exhibit 14: Screenshot of OSM contributors, Yorkshire



We contacted 11 key contributors who had been active in the last 6 months around Yorkshire and Oxfordshire. We informed them about MyAccessible EU, the *Access the National Trails* initiative, and encouraged them to get involved by deriving data from Mapillary images, or collecting Mapillary data themselves.

3.1.3 MapMyDay

Mapping for Change participated in the global MapMyDay campaign by running a mapping event with Health and Social Care students from London South Bank, where Wheelmap was introduced and students were able to reflect upon the potential use of online mapping to empower people with limited mobility.



Exhibit 15: Health and Social Care students in London South Bank University

The session began with a series of insightful talks from wheelchair users. The speakers gave their perspectives on daily issues with accessibility – from people misusing accessible toilets, to trouble boarding buses. Students were asked to reflect on these accounts – many confessed to having used accessible toilets in the past. However, hearing the daily experiences of wheelchair users gave students a real insight into how their behaviour can compound people's problems with accessibility. Many commented that the speakers had "opened their eyes", and that hearing first-hand accounts had given them a much clearer perspective.



Exhibit 16: Waterloo station staff explain access improvements taking place

After some mince pies and coffee, we headed out in 8 teams of 8 to collect information on wheelchair accessibility in the area, predominantly using <u>Wheelmap</u>. Students took different roles in the groups – some taking photographs of barriers in the environment, some speaking to restaurant and shop staff about accessibility, and others venturing inside venues to assess their levels of accessibility for wheelchairs. Some really positive discussions were had with restaurant staff, who were keen to point out where work to improve accessibility had already been undertaken.

When we arrived at Waterloo, we heard about improvements taking place around the station to make it a more accessible environment. Members of the station staff explained that signage had been flagged as a problem (partly from our activities from last year's UN Enable Day mapping party. See Deliverable 2.1). They reported that enlarged and interactive signs were due to be installed around the station from January of 2016.

Feedback from students was generally positive. The active, outdoors nature of this activity led many participants to comment that it had "opened their eyes" – as getting out and experiencing accessibility first hand is much more persuasive.

Several technical issues were reported with Wheelmap, mainly log-in difficulties and closure due to 'technical faults'.

3.1.4 Open Data

One effective method of engaging and interacting with OSM contributors is around the topic of open data integration. Unfortunately, London's open data regulations stand in stark contrast to other pilot cities, particularly Vienna. A large portion of local authorities' and transport providers' spatial data is taken from Ordnance Survey, whose licensing agreements restrict them from being shared³⁴. Local authorities are part of a Public Sector Mapping Agreement (PSMA) with Ordnance Survey, which enables them to share data with other public service departments such as schools or the police, but not other organisations. Although a paradigm shift on this matter is anticipated, with more licensing surrounding datasets expected to become relaxed, there are still large restrictions on what is available.

To investigate the issue of local authority open data, a range of face-to-face and virtual communication has taken place. Mapping for Change have communicated extensively with the London boroughs of Camden, Southwark, Islington and Croydon in an attempt to acquire datasets of relevance to accessibility, such as slope and pavement width. Email and face-to-face communication has also taken place with Transport for London, who are in possession of datasets regarding major highways.

Unfortunately, licensing issues have prevented any accessibility-related datasets from being shared and integrated in London so far. After lengthy discussions with Camden Council, one potential solution was proposed: Camden offered to provide PDF/JPG maps giving an overview of surface type, etc. which could be used to aid the decision making process if we were to capture our own data. By looking at these PDF's, the idea was that Mapping for Change could assess which areas were already fairly accessible, with only a small range of barriers, and would therefore prove suitable routes for collecting data. However, the

³⁴ <u>https://data.gov.uk/derived-data-licensing-easing-third-party-restrictions-on-onward-data-use-open-data-user-group-novem</u>

extensive data collection this required was not a sustainable or scalable approach for the project's limited resources.

Exhibit 17: Screenshot of Environment Agency blog detailing release of LIDAR datasets



With the release of new datasets including the UK Environment Agency's LIDAR (Light Detection and Ranging) data³⁵, there will be scope to pursue this avenue in 2016.

3.1.5 Online communication and presentations

As discussed, the primary method of engaging with the OSM community has been virtual - which is appropriate to their needs and interests. Several specific outreach initiatives have been leveraged in this regard, and they are described below.

Idea exchange

Email and face-to-face communication with local OSM contributors has led to an interesting discussion about matters of interest to CAP4access. OSM contributors were able to share examples of relevant events they had attended or facilitated, such as a UCL MSc GIS students' mapping party³⁶ that they felt would provide useful guidelines for the future.

³⁵ <u>https://environmentagency.blog.gov.uk/2015/09/18/laser-surveys-light-up-open-data/</u>

³⁶ <u>http://wiki.openstreetmap.org/wiki/UCL_Masters_Student_mapping_party_Sept_2010</u>

Newsletters

The local OSM community have been invited to mapping parties and notified of other relevant events. Key local contributors have used the London OSM board to publicise events organised by Mapping for Change³⁷.

Presentations

In November, Mapping for Change presented CAP4Access and Wheelmap at CIVINET UK & Ireland MobiWallet event *Personal Mobility & the Mobile Phone – Using smart technology to deliver Sustainable Mobility* event in Birmingham³⁸, which was well-attended by local authority representatives from across the UK, and gave a further opportunity to discuss open datasets. CIVINET is a network in the UK & Ireland for public authorities and other organisations interested in sustainable mobility. Cheshire West & Chester local authorities expressed an interest in the potential of sharing data between their iTravelSmart Travel App and Wheelmap or other CAP4Access tools.

3.2 Heidelberg

In the Heidelberg pilot site we have engaged with the OSM community in multiple ways. Face-to-face interactions have happened via mapping parties, there have been public presentations of our research, and we have participated in open data related events, such as a hackathons. We have also had discussions about open data with representatives from local authorities.

Besides this we have also used online channels used by the OSM community, such as the OSM blog, mailing lists, Wiki and forum to discuss about our ideas and challenges as well as to present our developed tools to the public.

3.2.1 Mapping Parties and related events

Mapping Party at Heidelberg Castle – 30.04.2015³⁹

On the occasion of the European protest day for equal rights of people with disabilities, the Heidelberg advisory board of people with disabilities organised an event at Heidelberg castle. The GIScience group of Heidelberg University contributed by leading a mapping event at Heidelberg Castle garden. For the mapping event, a total number of 10 participants performed mapping of accessibility-related information for certain objects such as footways, stairs and their conditions, including surface, smoothness and incline.

³⁷ <u>http://wiki.openstreetmap.org/wiki/London#Upcoming_Events</u>

³⁸ <u>http://www.civitas.eu/content/personal-mobility-mobile-phone-%E2%80%93-using-smart-technology-deliver-sustainable-mobility</u>

³⁹ <u>http://k1z.blog.uni-heidelberg.de/2015/05/08/cap4access-team-active-on-the-european-protest-day-of-equal-rights-for-people-with-disabilities/</u>



Exhibit 18: Footage of the mapping event, and participants at the event itself

For this purpose, the participants were taught how to use data collection applications such as Mapillary and Vespucci (OSM editor for Android devices). The participants were divided into 4 groups in the different time slots. Overall, a total length of ways of 1600m has been covered with images for Mapillary and 15 ways got new tags for incline, smoothness and surface on OSM. The efforts related to the mapping of the accessibility of places and ways at Heidelberg castle became part of a short documentary produced by *Beirat von Menschen mit Behinderung Heidelberg* (Advisory Board of people with disabilities Heidelberg)⁴⁰ – thereby informing the public about the importance of mapping. As a follow-up to this event, we were able to encourage a student to work on producing castle accessibility maps (online and offline as printed map) as part of his bachelor thesis in geography.

Volunteering event: Merging volunteered and expert accessibility data – 13.10.2015⁴¹

On 13 October 2015, we hosted volunteers of SAP in the course of the "SAP month of service". The idea of this half day event was that these volunteers support us with their manpower to merge volunteered data about accessibility from wheelmap.org and expert data about accessibility from Heidelberg Hürdenlos (a local accessibility platform). Heidelberg Hürdenlos contains more than 1,000 places rated by experts regarding their accessibility (e.g. "Alte Universität").

Automation of such a data merging task can be quite challenging due to different names or missing addresses of the Points of Interest (POIs) in the underlying datasets. However, for

⁴⁰ <u>https://www.youtube.com/watch?v=_kY0vyWUpdk</u>

⁴¹ <u>http://k1z.blog.uni-heidelberg.de/2015/10/15/merging-volunteered-and-expert-accessibility-data/</u>

people with local knowledge, it is usually easy to decide which points belong to each other. In order to support this task, Sozialhelden have developed POIChecker.de which has been used by the volunteers.

During the half day event 516 of 1,026 POIs were matched which equates to over 50%. 110 POIs received new accessibility attributes, 190 POIs have been confirmed, 26 have been upgraded to a better accessibility category (yes or limited) and, unfortunately due to stricter standards of the expert data, 190 POIs have been downgraded to a worse accessibility category (no or limited).

Since the volunteers had different knowledge and experience with POIChecker and OpenStreetMap before the event, some of the edits have introduced errors to the OSM, which is a normal observation for such volunteering mapping events. We will check and correct these errors within the upcoming weeks and we will also use this experience to further improve POIChecker.

Exhibit 19: Participants use POIchecker (above) and screenshot of OSMatrix (below)



		Post-Event				
		Yes	Limited	No	Unknown	Total
	Yes	24	123	28	0	175
t I	Limited	2	67	39	0	108
Even	No	0	24	99	0	123
Pre-I	Unknown	9	56	45	2	112
	Total	35	270	211	2	518

Exhibit 20: Table showing amount of POI changes before and after the workshop

3.2.2 Online communication with OSM community

The GIScience group shares its news via blog. OSM related posts are available here: <u>http://k1z.blog.uni-heidelberg.de/tag/osm/</u> and here <u>http://k1z.blog.uni-heidelberg.de/tag/openstreetmap/</u>.

Some of the news has also been shared via the respective OSM news channels⁴²⁴³⁴⁴

Description of ORS profiles in the OSM Wiki

We are describing the way the data needs to be integrated into OSM in order to be useful for OpenRouteService⁴⁵ within the OSM Wiki⁴⁶. A description of the wheelchair profile, i.e. mainly the currently evaluated OSM tags, needs to be added.

Discussion about how to integrate data about dropped kerbs into OSM

We have moderated a discussion via the OSM mailing list about how to integrate data about dropped kerbs into OSM⁴⁷. As an outcome of this discussion, we have identified a preferred method to integrate kerbs into the OSM data model. We have documented this method in the OSM Wiki⁴⁸.

Identification of requirements for tagging system

One of the main concepts relating to the Collective Tagging tool being developed is that the information is intended to be introduced into the OSM via the Notes interface (see D3.4 for a more thorough description). As such, it has been important at the initial design stage to identify what requirements are perceived as important for the people who will actually enter the data – the OSM editors. To identify these requirements, a discussion was held in the

⁴² <u>http://blog.openstreetmap.de/blog/2015/04/wochennotiz-nr-248/</u>

⁴³ http://blog.openstreetmap.de/blog/2015/04/wochennotiz-nr-245/

⁴⁴ http://blog.openstreetmap.de/blog/2015/08/wochennotiz-nr-264/

⁴⁵ <u>http://wiki.openstreetmap.org/wiki/OpenRouteService#Used_OSM_Tags_for_Routing</u>

⁴⁶ <u>http://wiki.openstreetmap.org/wiki/OpenRouteService</u>

⁴⁷ <u>https://lists.openstreetmap.org/pipermail/tagging/2015-May/024270.html</u>

⁴⁸ <u>https://wiki.openstreetmap.org/wiki/Talk:Tag:footway%3Dsidewalk#How_to_model_sidewalks.2C_crossings_and_kerbs_with_respect_to_routing_applications.3F</u>

OSM developer online chat channel where a number of editors and developers described functionality that must be added to the tagging service before the OSM Notes API is used. These criteria included aspects relating to agreements to OSM terms of use, attempts to minimise repetition of information entered, and the ability to easily trace the source of the Notes (to the tagging service). This communication has already been taken into account in the design process of the Collective Tagging tool and used to generate a number of essential criteria (see D3.4).

Maintenance of Issue report system for OpenRouteService Development

The development of the wheelchair profile for OpenRouteService is one of the core development tasks in the CAP4Access project. In developing ORS (not only the wheelchair profile) we are in close contact with the OpenStreetMap community who are giving us relevant (critical) feedback for our development. We engage with the community by maintaining an issue report system⁴⁹ on an established development platform (Github). 227 issues have been reported so far⁵⁰. Most of them could be resolved.

GitHub	This repository			Explore F	eatures	Enterpris	ie Pri	cing		Sign u	p	Sign in
GIScience	e / openrout	eservice					⊙ Wa	atch 18	*	Star 27	¥ F	ork 23
<> Code	() Issues 23	1 Pull requests 1	-≁ Pulse 🔟 G	Graphs								
Q is:issue i	stopen		Labels Mileste	ones							Ne	w issue
① 23 Open	✓ 148 Closed				Author	- Labe	els +	Milesto	nes =	Assigne	e -	Sort +
TMC Lay #227 open	rer for Leaflet ed 5 days ago by T	enhancement imMcCauley + 3.0										
Add a ch #226 open	eckbox which ed 15 days ago by	allows to specify a n Rungee 🏾 🛉 3.0	ound trip enhancem	ent								
Incorrect #224 open	t time in stopo ed 24 days ago by	ver summary bug Rungee 🛉 3.0										
Add avoi #223 open	id tunnels for o ed 27 days ago by	car and heavy vehic Rungee 🛉 3.0	les profiles enhance	ement							Ŧ	
Add avoi #222 open	id paved roads ed 27 days ago by	for bike profiles e Rungee 🛉 3.0	nhancement								Ŧ	
Wheelch #217 open	air profile doe ed on 9 Oct by Run	s not support avoid	ing ferry connection	ns bug							4	
Restricti #216 open	ons Bounding ed on 8 Oct by Run	Box layer persist w	hen Heavy vehicle	profile is dea	activated	bug						
() Highlight #198 open	t way and surfa ed on 5 Aug by Rui	ace type information	for road segments	enhancemen	t							
Respons #194 open	sive Design (re ed on 2 Aug by bitt	eady for mobile dev	ces)									Ç 2
Add new #173 open	via point by po ed on 30 Jun by Ru	ulling a point from e ingee 🕆 3.0	xisting route. enhan	ncement								
0 Add seg	uence number	s to via point marke	rc enhancement									

Figure 23: Screenshot of OpenRouteService tasks in GitHub

3.2.3 Participation in Open Data Day Mannheim⁵¹

The GIScience group was part of the International Open Data Day. Open data enthusiasts all over the world teamed up to create new applications derived from open (not only governmental) data. The local open data day in Mannheim has seen 7 finished projects

⁴⁹ <u>https://github.com/GIScience/openrouteservice/issues</u>

⁵⁰ As of 22 December, 2015

⁵¹ <u>http://k1z.blog.uni-heidelberg.de/2015/02/25/giscience-group-participated-in-open-data-day-mannheim/</u>

including Wikipedia edit wars analyses, public transport visualisations, crowdsourcing, disaster speed mapping and OpenStreetMap data collection.



Exhibit 21: Participants at the Open Data Day in Manheim

On the day before the event, about 25 interested persons met for informal discussions regarding the application of open data in different domains including mobility, internet of things, linked open data, disaster mapping and accessible routing using OpenStreetMap/WheeImap.

OSM Quality Assurance editor

In cooperation with members of the OSM community, we have developed an extension for an OpenStreetMap quality analysis tool that shows streets that do not yet have relevant tags to be considered for wheelchair routing⁵².



Exhibit 22: Screenshot from the OSM Quality Assurance Editor

Sidewalk detection experiment

Tasks for the platform crowdcrafting.org were designed to detect sidewalks from Mapillary imagery using the power of the crowd⁵³. Volunteers were invited to contribute to this task. 568 images have been evaluated (each three times) by a total of 99 participants within a time period of about 4 weeks. The volunteers indicated for each of the images whether they contain a sidewalk only on the left/right side of the road, on both sides, or whether the

⁵² http://editor.osmsurround.org/

⁵³ http://crowdcrafting.org/project/detectsidewalkinformationfromstreetlevelimages/

images did not show a sidewalk at all. We are now analysing the results and how they can automatically be matched with OSM data.

Exhibit 23: Screenshot from the sidewalk detection experiment



Presentation of results and discussion with representatives of city

Members of the GIScience group at Heidelberg University were invited to a special event at Mannheim town hall. The city of Mannheim showed appreciation of the GIScience group's engagement work during the Open Data Day in Mannheim.

We presented the outcomes of the Open Data Day that were relevant for the CAP4Access project, and emphasised the need of open data to support accessible route planning. The first mayor of Mannheim was very impressed by the engagement of all of the involved "hackers" in the Open Data Day. Ideas raised by the developed applications were discussed and further support for similar events was announced. The city of Mannheim planned to start an Open Data portal by September 2015 where social data, geodata and election data shall be available under open data license. This has been delayed but will hopefully be released in 2016.



Exhibit 24: Members of the GIS research group present CAP4Access at Manheim town hall

The event was a great way to make some of the most important actors in our region aware of the advantages that Open Data has for the public.

Maintenance of Issue report system for OpenRouteService Development

The development of the wheelchair profile for OpenRouteService is one of the core development tasks in the CAP4Access project. In developing ORS (not only the wheelchair profile) we are in close contact with the OpenStreetMap community who are giving us relevant (critical) feedback for our development. We engage with the community by maintaining an issue report system⁵⁴ on an established development platform (Github). 227 issues have been reported so far. Most of them could be resolved.

SitHub This repository Search	Explore Features Enterprise Pricing	Sign up Sign in
GIScience / openrouteservice	© Watch	18 ★ Star 27 § Fork 23
Q is:issue is:open	Milestones	New issue
① 23 Open ✓ 148 Closed	Author - Labels - Mile:	tones • Assignee • Sort •
TMC Layer for Leaflet enhancement #227 opened 5 days ago by TirmMcCauley 7 3.0		
Add a checkbox which allows to specify a round trip matrix #226 opened 15 days ago by Rungee 93.0	hancement	1
Incorrect time in stopover summary bug #224 opened 24 days ago by Rungee + 3.0		8 🖂 e
Add avoid tunnels for car and heavy vehicles profiles #223 opened 27 days ago by Rungee +3.0	enhancement	T (2)
Add avoid paved roads for bike profiles enhancement #222 opened 27 days ago by Rungee \$3.0		a 194
Wheelchair profile does not support avoiding ferry con #217 opened on 9 Oct by Rungee \$3.0	nections bug	A 🗆 0
Restrictions Bounding Box layer persist when Heavy vertication and the second state of the second sta	ehicle profile is deactivated bug	a (2)
() Highlight way and surface type information for road seg #198 opened on 5 Aug by Rungee * 3.0	ments. enhancement	a 🗔
Responsive Design (ready for mobile devices) #194 opened on 2 Aug by bitther		Ç 2
Add new via point by pulling a point from existing route #173 opened on 30 Jun by Rungee * 3.0	enhancement	
Add convence numbers to via point markers enhancemi	ant	

Exhibit 25: Screenshot of OpenRouteService tasks in GitHub

3.2.4 Presentations

OSM Special forum at AGIT Salzburg

We have attended AGIT 2015 – "Symposium and Exhibit for applied Geoinformatics" in Salzburg. In the frame of the AGIT OSM Special Forum, we gave a talk regarding the current challenges of integrating a wheelchair routing graph. The session had about 100 participants who were interested in OSM activities.

⁵⁴ <u>https://github.com/GIScience/openrouteservice/issues</u>



Exhibit 26: Presentation at the OSM Special Forum

Talk at University of Education Heidelberg⁵⁵

The University of Education Heidelberg educates future teachers of geography. Thus, we took the opportunity to present our CAP4Access activities within a colloquium talk. The talk was entitled "Crowdsourcing for individual needs – the example of wheelchair routing". Besides a general introduction to the field of crowdsourcing, VGI and OpenStreetMap, our research and development activities within the CAP4Access project were presented, including Wheelmap and OpenRouteService. We are hoping for a multiplication effect when these students will teach pupils in the future.

Presentation of ORS wheelchair profile at Heidelberg Wheelchair marathon⁵⁶

We have used the occasion of the 13th international wheelchair marathon in Heidelberg to inform the public about our recent developments regarding wheelchair accessible route planning with OpenRouteService. We were thankful for the interesting conversations with people from Germany, Denmark, Japan, England and France and for their valuable feedback.

wheelchair marathon

Exhibit 27: GIS Research group members present the OpenRouteService at Heidelberg's wheelchair marathon

⁵⁵ http://k1z.blog.uni-heidelberg.de/2015/06/19/talk-at-university-of-education-heidelberg/

⁵⁶ http://k1z.blog.uni-heidelberg.de/2015/07/07/openrouteservice-at-the-heidelberg-wheelchair-marathon/

3.2.5 Thesis

Accessibility map of Heidelberg castle⁵⁷

We are currently running a bachelor thesis on the topic of wheelchair accessibility mapping using the example of the Heidelberg castle gardens. Heidelberg castle is the main tourist attraction of Heidelberg with approximately 1 million visitors per year. The thesis tries to combine additional OSM mapping in order to complete necessary information for routing (OpenRouteService) and accessible places (Wheelmap), and aims to produce a printed map that can be handed to visitors who wish to do accessible tours within the castle.

Exhibit 28: Heidelberg castle (left), cobbled surfaces by the castle (middle), castle's current state on Wheelmap (right)



3.2.6 Further activities

Discussion about Heidelberg open data

On 17th December we participated in a discussion about open data in Heidelberg within the city's #getthemayor⁵⁸ series – a citizen engagement forum. The discussion was initiated by the Open Data Rhein Neckar activists. We have articulated our needs for open data from the perspective of accessible routing, i.e. particularly data about sidewalks, dropped kerbs and incline that is under open license and thus compatible with OpenStreetMap. The local authorities were well-informed, open-minded and willing to take action. The Rhein-Neckar Zeitung (daily local newspaper, ~80.000 copies) reported⁵⁹.

Media coverage

As further engagement activities, we have initiated reports about our developed tools and the MapMyDay campaign in several local channels, including the social media channels of Heidelberg University (Facebook: ~30k follower, Twitter: ~7k follower)⁶⁰⁶¹⁶²⁶³, the student

⁵⁷ <u>http://k1z.blog.uni-heidelberg.de/2015/05/21/bachelor-thesis-about-accessibility-in-heidelberg-castle-gardens/</u>

⁵⁸ <u>https://holdenoberbuergermeister.de/?lang=EN</u>

⁵⁹ <u>http://www.rnz.de/nachrichten/heidelberg_artikel,-Open-Data-Wie-kann-Heidelberg-den-riesigen-Schatz-heben-arid,150405.html</u>

⁶⁰ https://www.facebook.com/uniheidelberg/posts/1012932902078746

⁶¹ <u>https://twitter.com/UniHeidelberg/status/677501218021883904</u>

⁶² <u>https://www.facebook.com/uniheidelberg/posts/1005928456112524</u>

newspaper of Heidelberg University ("ruprecht", ~10k copies)⁶⁴, the Rhein-Neckar-Zeitung (~80k copies)⁶⁵, a german-wide GIS blog⁶⁶⁶⁷ and Rhein-Neckar-TV (local broadcasting)⁶⁸ and the city of Heidelberg (Facebook: ~4k follower)⁶⁹. In each of these reports we are calling volunteers to support the OSM community in data collection.

3.3 Vienna

Throughout the last year the wider OSM community, i.e. not specifically people who already used OSM before, or are very active OSM contributors, have been engaged and approached in multiple ways. The following chapters describe different tool-testing and engagement activities with different stakeholder groups in Vienna. Stakeholders vary from students in a school, to assistants working with wheelchair users. In the first part, data integration efforts using the POIChecker, developed by Sozialhelden, are discussed. In the second part, pilot-site activities, including a mapping project with a local school and a workshop with end-users regarding the development of the local online platform berollbar.at are described.

3.3.1 Data Integration into OSM

POI Checker - Public Toilets Vienna

In May this year the toilet feature got introduced in Wheelmap – this enables users to separately rate the accessibility of a place and its toilet facilities.

The Open Government Data Platform in Vienna published data on the location and accessibility of public toilets located all over the city of Vienna⁷⁰. In order to support the new Wheelmap feature, increase the information about it for end-users in Vienna and to internally test the data integration tool POIchecker, developed by Sozialhelden, the Open Government Data on toilets has been integrated into OpenStreetMap (OSM).

Altogether 168 public toilets were added to OSM through matching them in POIchecker. Another 12 toilets that weren't in the database already have been newly added. The toilet locations added to OSM are geographically spread all over Vienna (please see Exhibit 29).

⁶⁴ <u>http://www.ruprecht.de/wp-content/uploads/2015/12/ru159_fertig.pdf</u>

⁶³ <u>https://twitter.com/UniHeidelberg/status/671708376934522880</u>

⁶⁵ <u>http://www.rnz.de/nachrichten/heidelberg_artikel,-Open-Data-Wie-kann-Heidelberg-den-riesigen-Schatz-heben-arid,150405.html</u>

⁶⁶ <u>http://geobranchen.de/mediathek/geonews/item/neue-openrouteservice-version</u>

⁶⁷ <u>http://geobranchen.de/mediathek/geonews/item/mapmyday-ab-03-dezember</u>

⁶⁸ <u>http://www.rnf.de/mediathek/video/mannheim-setzt-auf-open-data/</u>

⁶⁹ <u>https://www.facebook.com/heidelberg.de/photos/a.582366081779371.152939.486669988015648/</u> 1200456196637020/?type=3

⁷⁰ Link to the used data set on the Open Government Data Portal: <u>https://open.wien.at/site/datensatz/?id=d9f5e582-3773-4f0b-8403-5d34718f6cf7</u>



Exhibit 29: Screenshot of toilet feature on Wheelmap

During the data integration we had to repeatedly compare different online maps of Vienna in order to locate some toilets – through this we noticed that there were more toilets mapped on OSM (but with less indication about their accessibility) on the official map of Vienna. Issues that some end-users faced when using Wheelmap were uncertainties about how to map places that are indoors (e.g. in a metro station or parking garage). In addition, useful but missing information in the the OGD Data set referred to the opening hours of some toilet facilities – information about a toilet located in a car park or garbage collection area should include opening hours as those facilities are locked during certain times. Thus we will draw attention to this particular detail in upcoming pilot activities. Participants who engage in the process of mapping toilets in OSM / Wheelmap should also check whether information about opening hours is provided on site.



Exhibit 30: Comparing official Vienna city map and OSM to determine exact location of toilets



Exhibit 31: Screenshot of mapped toilets

Besides individual experiences, feedback regarding POIChecker was gathered, for instance input on some features e.g. the possibility to delete an added location which turned out to be wrong, or adding a new feature by copying information regarding latitude and longitude into the field.

3.3.2 Tool Testing 'on the ground' and capturing engagement processes

In order to engage end-users in testing the tools developed within 'CAP4access' and to better understand engagement processes, i.e. what are motivating factors for participation, we have had two major engagement activities in Vienna. Firstly, a mapping project with a local school, and secondly, cooperation with the Technical University of Vienna.

Mapping Project with local School

Already last year contact with the headmaster and some teachers was established by presenting the 'CAP4access' project and possible cooperation opportunities, including a mapping project with students. The mapping project aimed at testing mapping and visualization tools as well to better understand engagement processes of different stakeholders namely teachers and students in this case.

After internal discussions at the school the head of the adjacent residential facility was enthusiastic to do the mapping project with her students. Not only people from the residential facility took part, but also two classes comprising of an IT-class of students aged between 17-18 years and a class on leather design with students aged between 15-17 years. Altogether 39 students took part in the mapping project.

The mapping project consisted of three main steps:

- Introducing the Mapping Project to students at the residential facility and in class (end of September 2015)
- Active Mapping Phase of students and time to prepare blog posts and final presentations (October – beginning of November 2015)
- Final Presentations and Discussion (November 2015)

1) Introducing the Mapping Project

During the two introduction sessions at the school, the tools, tasks and process of the project were presented to the students. The tools introduced were Wheelmap and Obstacle Tagger (for specific tool descriptions, please see Del. 3.4), however no entry was made on the Obstacle Tagger during the project. Each student was given a 'mapping toolkit', including descriptions of how to use both Wheelmap and Obstacle Tagger, a task description and a step-by-step guide through the mapping project (e.g. role descriptions, deadlines). At the end of each session groups of 3-5 students were formed and places where they wanted to do the mapping were decided upon.

Exhibit 32: Introduction session at residential facility of the school

Exhibit 33: IT-class in front of the school before mapping activity



- In regards to the groups, a similar methodology as trialled on Dec. 3rd 2014 (please see Del. 2.1.) was used, namely to have students map in groups of 3-5 people and have different roles. Altogether four roles were introduced:
- a mapper ensures all places that are visited are mapped on Wheelmap or Obstacle Tagger
- an expert wheelchair user who makes other participants aware of barriers
- a photographer takes photos of the group and places visited during the activity

• a journalist – makes notes of the discussions within group

Only one participant was a wheelchair user. However, all groups could borrow a wheelchair for the mapping activity.

2. Active Mapping Phase

Students of both classes (IT and leather design) went out one morning in October to perform the mapping instead of attending class. During the mapping phase of approximately 5 weeks, we were contacted 2 times with technical questions regarding the Wheelmap. When the students met in front of the school that morning, each group was given a wheelchair provided by the school.

After their outdoor mapping activity each group had time until the beginning of November to prepare a short presentation (the format of the presentation, e.g. PowerPoint slides was not predefined). Students were told to have around 5 to 10 minutes to discuss their experiences and show photographs or short video clips.

In order to provide some guidance and structure for the presentations we sent four questions in advance:

- What was most fun about the mapping project?
- What was most surprising during the mapping action?
- What kind of difficulties did you encounter?
- How did people react?

In addition to short presentations, students of the IT-class had to write blog posts in German and English about their mapping experiences. Writing blog posts is part of their A-Level exam. Thus the opportunity to practice writing a blog post and to publish it on the berollbar.at platform was very much welcomed by the teachers. During the mapping phase the groups went out to different locations in Vienna, including Mariahilfer Strasse, the biggest shopping street in Austria, or the area around the school.



Exhibit 34: Visualisation of the mapping efforts during a certain period (22.09. – 11.11.2015)

The picture in Exhibit 34 displays the mapping efforts at one particular location in Vienna called Donauzentrum, a shopping mall, during the mapping period. As shown, in the visualisation tool, developed within 'CAP4access', users can set a time frame and zoom into specific locations to see how many places have been marked on Wheelmap in that place and time.

3. Final Presentations and Discussions

A presentation round was organised in the school to enable an exchange between all participating students and teachers, and gather verbal feedback from students. A short survey was also created in order to gather feedback from. All students, two teachers and the headmaster of the school joined to hear about each other's experiences and engage in the discussion. Most students prepared some slides with photographs and bullet points, except from a leather design group who made a puzzle (see figure 30) that was pieced together by the other students.



Exhibit 35: Puzzle designed by students of leather design class

Mostly, positive feedback from many students was given verbally especially the fact that "*it was something practical*", that each group had a wheelchair to test and were given the opportunity to feedback to the Wheelmap app. The idea brought up by students to introduce the mapping project especially to new students confirmed the overall positive feedback received by participants.

During the presentations, many students shared experiences of navigating through Vienna in a wheelchair that made them reflect upon and want to change aspects of their own past behaviour, such as using the elevator when there are other people waiting who need it more urgently.

For almost all students, it was their first experience of moving through Vienna sitting in a wheelchair: some reported commiserating stares from people on the street, while others found it fairly easy to navigate and experienced a lot of readiness to help from passers-by. A challenge for every group was to change the wheelchair user during the event, as it "felt strange to just get out of the wheelchair on the street". Many students decided to go to a

nearby side street. Often other passers-by looked very irritated or sometimes even angry when the students took turns in sitting in the wheelchair. When the students had the possibility to explain what they were doing they got positive feedback, however some people ignored the attempt from students to talk with them and just kept on walking.



Exhibit 36: Presentation of results by students

At the end of the presentation session, a short survey (with closed and open questions) was handed out to evaluate the project. Every student received a certificate at the end of the activity that can be added to future applications (see figure 31), and a cinema voucher was raffled off between all students.



Exhibit 37: Certificate given to every student at the end of the presentations

Survey Indicators and Results

With the students' survey we wanted to gain information on:

- Evaluation of educational effects of mapping project
 - o increase of interest in the topic of accessibility
 - o learnings and self-reflection

- o awareness of barriers and accessibility
- Evaluation of perceived importance of mapping
 - perception of mapping project
 - o likes and dislikes of the mapping experience
 - o importance mappers gave to accessibility before and after the activity
- Recommendations for Usability and Processes
 - o usability
 - o which functions were used
 - o planned usage of tools in the future
 - o general tool recommendations

The survey showed that the **perceived importance of accessibility increased for almost all students**: 18 thought of it as important or very important before the mapping project; 27 afterwards.

The most prevalent reason for increased perception of the importance of accessibility was the **opportunity to use a wheelchair** and gather experiences of what it is like to navigate in a wheelchair. Altogether, 23 out of 29 survey participants chose the opportunity to navigate in a wheelchair, followed by encountering physical barriers and contact with people as the reasons why their perception of accessibility had changed.

The main learnings from the mapping project for students can be summarised as **readiness to help vs. mercy**. Quote from a student: "*Helping wheelchair users is important, however no mercy or pitiful looks are necessary*." Through their own experiences of receiving pitiful looks as well as readiness to help from other people during the mapping exercise, students reflected upon the importance of helping and being aware of wheelchair users (e.g. when waiting for an elevator) but also on how views of them from others can often be perceived as pitying.

What did students like and dislike about the project?

The fact that each group could borrow a wheelchair was prominent again when students were asked what they liked most about the mapping project. The **experience of navigating in a wheelchair** was mentioned most, followed by the **opportunity to help others** (by entering information) and the fact that they could do **something practical outdoors**. The pitiful looks from other pedestrians and technical difficulties using the Wheelmap (e.g. deleting photos or problems creating an account) were the two main things students did not like about the project.

In regards to their future engagement and actions regarding accessibility more than half of the students will recommend the Wheelmap App to others, whereas only 5 would continue to use the App. Qualitative interviews would allow for more insights into reasons for continuing to use or not use Wheelmap. 1/5 of the students would read topic-related articles after the mapping project.

Usability of Apps

The majority of students didn't find it too easy to use Wheelmap (13 students thought it was 'less easy' and 8 students answered 'not easy' to use).

The functions mainly used on Wheelmap (ranked according to their frequency) were:

- #1 map place
- #2 taking pictures of places
- #3 enter new places
- #4 change categorisation of a place

Results from the survey help us to more clearly understand the factors which motivate students, along with the usability of apps, and will inform the design of the next mapping project with students. Conclusions for us regarding the design of such mapping activities include for instance, the **importance of self-experiences of navigating in a wheelchair**. Gaining experience individually proved essential for raising awareness and for participants to understand the importance of accessibility. Some **technical difficulties**, e.g. uncertainties about the delay in appearance of newly mapped places can be eliminated beforehand. Additionally, factors which encourage teachers to participate in such a project, including writing blog posts, can be used to approach other schools and promote the mapping activity.

3.3.3 Technical University Vienna – Students Mapping Urban Obstacles

After a successful cooperation last year (see Del. 2.1) with Urban Planning students from the Technical University Vienna we have formulated another bonus task, which enables students to gather extra points for their assessment at the end of the year. The bonus tasks aims to engage students in collecting data and reflecting about accessibility in the built environment. In discussion with the lecturer we decided to introduce the Obstacle Tagging Tool for the bonus tasks. The opportunity to feedback on a newly developed tool, add important data (in the form of 'issues') to Vienna's OSM and reflect on the OSM and OSM-Tags were appealing reasons to continue the cooperation between ZSI and TU University. The lecturer welcomed the fact that the obstacle tagger was also available in German, along with the new feature of being able to immediately take photos with the App.

Mapping Urban Obstacles

This year students are asked to map urban obstacles, for instance non-lowered sidewalks or temporary barriers such as construction sites. A task description sheet (see picture below) introducing the App and the task was handed out to students at the beginning of the lecture series (see Exhibit 38). Students can engage in this task from November until the end of January and upload their results on the e-learning platform of the University. Thus first results of the task and feedback regarding the App are expected for February / March 2016.

Exhibit 38: Task description sheet for students

Task Description: Mapping Urban Obstacles



The Obstacle Tagger is an app that enables you to map barriers for people with mobility impairments. With the app you can't only map durable barriers including high curbs (as applicable on left picture) stairs on sidewalks, but also temporary barriers like construction sites. The barriers are marked exactly on the OSM Vienna; you can add short description of barriers like: here are 3 steps upward or 30m long path with cobblestone. In addition to the

description of barriers you can also add photographs to give additional, helpful information to end-users who can assess the barriers better.

Task Description

- Get the app: Obstacle Tagger (only available for Android) In case you don't have Android, team up with another colleague.
- 2. Warming up: Map and describe three different urban obstacles:

Examples for obstacles: cobble stone path, stairs on sidewalk, temporary barriers: construction site; street Please consider: Obstacles should be there at least 4 months or longer, so please don't map the parked car on the sidewalk ©

 Reflecting: Think which OpenStreetMap (OSM) Tag would fit to your mapped obstacle. (http://wiki.openstreetmap.org/wiki/Map_Features) dafür passend wären.

Two options:

 In case you are standing in front of a path with cobble stone, which surface tag would best fit? Please find existing tags for surface here: http://wiki.openstreetmap.org/wiki/Key:surface

2) Maybe you can't always find suitable (and already existing) OSM tags for the obstacles, which Tag(s) can you think of to describe the obstacle?

4. Document the mapped barriers and describe it in the exercise table.



What happens with the collected information? The obstacles will be uploaded as open issues into OSM in the beginning of next year. You can see two issues on the left picture: the green one has already been edited and the other red issue not yet. All OSM users can edit these issues. So you are collecting important information to keep data in the OSM Vienna accurate and precise.

The bonus task was formulated in cooperation with Zentrum für soziale Innovation (ZSI). Your answers will give input to the project Cap4access – Collective Awareness Platforms for Improving Accessibility in European Cities & Regions. More info on: myaccessible.eu



3.3.4 Berollbar.at – Engagement through a local portal

Throughout the last year ZSI further developed the online platform berollbar.at, a local online portal which engages the wider OSM Vienna community in various ways. As shortly discussed in last year's deliverable (please see Del. 2.1) the platform berollbar.at aims to connect end-users with 'CAP4access' tools (e.g. Wheelmap, Obstacle Tagging App), report on pilot-site activities and engage interested groups to actively shape the platform according to their needs and interests, for instance with specific blog posts or topic suggestions.

Within the last months, specific actions related to further developing berollbar.at included:

- Research on already existing guides and online platforms on accessible hiking in Austria;
- Trial of different mapping tools and the display of two hiking routes;
- Adding descriptions of Mapping Tools in German;
- Feedback on Platform development and plans: Workshop with Vienna Assistance Association (WAG) March 2015;
- On-going reporting on project activities and events or topic-related articles in Vienna, e.g. our visit to the 1st Accessibility Day in Graz, June 2016;
- Engaging end-users to report activities in Vienna: publish blog posts from students participating in the school mapping project;
- Establishment of an official link to the 'CAP4access' website and MyAccessible.EU blog.

Exhibit 39: Screenshot of description of an accessible walking route in Vienna



3.3.5 Workshop at WAG

The workshop at the WAG (Wiener Assistenzgenossenschaft) took place in the end of March 2015 with 15 participants, including wheelchair users and assistants associated with WAG. The main goal was to introduce the berollbar.at platform to potential interest groups

and future users, get feedback, and better understand what users expect from such a platform in terms of topics and functionalities.

Additionally the available tools (Wheelmap and Obstacle Tagger Apps) and the topic of Open Data and its implications, like re-usability of data, were discussed with potential future OSM users.

Besides information on ongoing pilot-site activities and topic-related events in Vienna, another idea of berollbar.at is to serve as a platform where users can share and comment on accessible routes and paths. As there is no online platform like berollbar.at where users can share accessible routes and comment on them in Vienna yet, thus participants welcomed the initiative. Tool descriptions enabling to map accessible places have been uploaded on berollbar.at, as well as two examples of describing accessible routes. Some participants have been using Wheelmap before, but were interested in other mapping tools, like Obstacle Tagger (however the German version and the ability to upload photos on Obstacle Tagger were developed at a later stage). Participants stressed the importance to not only provide descriptions in terms of written language but also photographs or even short video clips of potential barriers including inclines or surfaces on the way or nice viewpoints during the walk. Such additional information enables users to better estimate whether they wart to and are able to try a (new) way or not.



Exhibit 40: Participants during WAG Workshop

As one participant and employee of the WAG summarised: *"We can improve accessibility bit by bit if everyone does something".* Adding places and information on Wheelmap was an example recurrently formulated by participants.

3.4 Elche

During last year, the city council of Elche with the support of Polibienestar Research Institute have developed different activities to raise the awareness of: (1) Elche decision-makers about the accessibility of the city and the needs of citizens with reduced mobility, and (2) Elche citizens about the tools available to promote accessibility inside their own city. As stated in the "Lessons Learnt" report, the changes in the political situation in Elche has delayed the activities planned and influenced the project implementation.

3.4.1 Changes to Political Situation in Elche and Open Data

The "Lessons Learnt"⁷¹ report delivered by Elche City Council and Polibienestar Research Institute focused on the strengths and weakness of CAP4Access's implementation in the city of Elche. This report explored how CAP4Access, a project facilitated by the city council, has the political support of the government to promote, develop and disseminate the different activities carried out by the project in the city. However, the government's participation also means that the project management is subject to the political changes in the city and to its internal policies. In this sense, the city of Elche sent data required from the city to the University of Heidelberg in order to provide the data needed to test the apps developed in the project.

Nevertheless the legal rights of this data is an issue that has been discussed throughout the whole year. With the change of government in May and the relevance of the Transparency Policy in the city, the treatment of the data has been changed during the project's development. At the end of the year, the policies relating to sharing the data in OSM for the objectives of the CAP4Access have become more relaxed. For that reason, the city of Elche is preparing a document that will allow the University of Heidelberg to use these data.

3.4.2 Communication with OSM

In relation to the OSM Community, Polibienestar has contacted different twitter profiles related to OSM in Spain during 2015: IG+Accesibilidad, gis&chips, geoinquietos VLC, OSM España, etc. They have supported the Mapping Party in Elche and disseminated it among their networks. Polibienestar plans to foster these contacts during 2016 by promoting their participation in the activities planned in Elche and engaging them to collaborate directly with the CAP4Access project and its tools.

In preparation of the mapping day in Elche in March 2015, the project undertook extensive fieldwork to add places not yet mapped onto OSM. In early February, 2016 about 800 so-called points of interest (Pol's) – shops and service outlets including doctor's offices, restaurants, bars, clubs and cafés, cinemas and so forth – were mapped onto OSM. The data collected included information on the type of businesses as well as their addresses, street numbers and exact locations. The team went about collecting data in Elche in two different ways. Some participants used pens and OSM print-outs on which Pol's were mapped street-by-street, and then entered the data using Potlatch 2, an OSM editor

⁷¹ https://ok-jira.iais.fraunhofer.de/wiki/download/attachments/4457136/Lessons%20learnt.doc?api=v2

software. Others used their IOS smartphones and entered data with a mobile app called Go Map!



Exhibit 41: POI coverage on OSM in Elche before and after CAP4Access fieldwork

As a result, the shops and stores in the historic centre of Elche are now fully covered on OSM (see Exhibit 41).

Contact with relevant associations

Contact has been made with policy makers and associations of people with disabilities and elderly people. It is important to mention in this sense that the elections and the change of the Government in May have delayed some of the activities planned between June and October. In this sense, the individual responsible for CAP4Access in Elche (Fini Garcia) had an internal meeting with the city councillor for disability in the city of Elche on the 30th November to present the project and engage this department in the project's development. She has expressed their intention to participate actively in the project's development and support the activities planned for the next year (2016).

An internal meeting between the councillor for disability, the project manager in Elche, the individual responsible for Social Affairs, Polibienestar and Kveloce is planned for January, to set up the plan for the last year of the project with concrete activities involving different target groups in the city.

Mapping Party

On the 14th March 2015, a mapping party was held. Prior to the event, different activities were developed to engage citizens to participate in the mapping party. As Elche's coverage in OSM was limited, a pre-mapping event took place in February to increase POI coverage in the city centre.

In addition, the team took hundreds of geotagged photographs for uploading onto Wheelmap, Mapillary and other platforms that are being considered as sources of data input for MyAccessible.EU tool development.

To promote the event, associations located in Elche were contacted through email and telephone calls, a press release was published, announcements were made on the website and social networks of the city, and there were in-person meetings with associations and policy makers, etc.

Overall, 15 people participated in the mapping party and more than 100 places were tagged in Wheelmap from the historical centre of the city (see figure 36). All the data collected were included in Wheelmap and are now available in OSM. The event was organised in the city centre because it was focused on assessing the accessibility of tourist places (public buildings, cafes, restaurants, and shops). This was a field identified as interesting in the D.2.1.





Other local awareness raising

Other relevant awareness raising events throughout 2015 included:

- Participation in the Día de la Rampa (Ramps Day) distributing leaflets and disseminating the project.
- Raising awareness of Elche business of different sectors (footwear, hotels, etc.)
- Translation into Spanish and dissemination of the tool "Historias del transporte en Elche" developed by Mapping for Change.
- Joining the campaign MapMyDay launched during the International Day of People with Disability.

Elche's city council and Polibienestar have introduced a diverse range of community and stakeholder groups to CAP4Access using their public networks, website and newsletters. Moreover, the city of Elche has different channels to engage their citizens in the project activities. These include the Consultancy Board of people with disabilities, the Consultancy Board of Elderly People, their traditional awareness raising events such as the Dia de la Rampa (Day of ramps) and yearly activities that the council organises in the framework of the International Day of People with disabilities.

Map My Day

Polibienestar contributed to the MapMyDay campaign by organising an internal mapping party with some of the members of the research team. During the event, two areas near to the institute (Valencia) were mapped by two teams using Wheelmap.

More than 50 places were tagged and new places included in OSM. Moreover, members of Polibienestar contributed to raise awareness about the accessibility of shops and bars when tagging.



Exhibit 43: One of the areas of the MapMyDay Mapping Party developed by Polibienestar in Valencia

3.5 Activities external to pilot sites

3.5.1 Wheelmap Toilet Feature

After extensive feedback from the community, Sozialhelden Board of Directors member Holger Dieterich put forward the proposal to implement a toilet tagging feature into Wheelmap. Often, a place of interest's classification on Wheelmap (accessible, nonaccessible etc.) was not reflected by the accessibility of that premises' toilet. Buildings rated as 'accessible' sometimes had inaccessible toilets, or vice versa. This feature would enable a separate tag to be added for a building's toilet, which required an appropriate tag to be incorporated into OSM.

OSM contributors voted on and approved this proposal⁷², which resulted in the feature becoming incorporated⁷³.

3.5.2 Advisory board

We are pleased to report that key members of the OSM community have shown interest in CAP4Access. Henk Hoff, a board member of the OSM Foundation, agreed to join the

⁷² <u>http://wiki.openstreetmap.org/wiki/Proposed_features/toilets:wheelchair</u>

⁷³ http://wiki.openstreetmap.org/wiki/Key:toilets:wheelchair

project's advisory board and attended our first board meeting this September (2015) in Madrid.

In this meeting, Hoff described his expectation that the OSM community would show strong interest in CAP4Access's work on visualisation and quality assessment of OSM data. With regard to CAP4Access' plan to integrate data on dropped kerbs into OSM, he asked to make sure that the data can be updated by other OSM contributors once a new version of the source database (OGD Vienna) will become available. There is some wariness in the OSM community against large-scale import of data, which is why the issue needs to be handled with care. This has been incorporated into our technical development.

3.5.3 MapMyDay

MapMyDay⁷⁴ was a global social event for accessibility initiated by Sozialhelden, which encouraged participants around the world to map three places they visited on Wheelmap.

The event was launched on December 3rd, 2015 to coincide with the UN International Day of Persons with Disabilities, and over 15,000 places were mapped within the first week. A detailed description of activities related to MapMyDay can be found in Deliverable D5.6 "Third Report on Exploitation & **Dissemination Activities**"



Direct Communication

Prior to the launch of "MapMyDay" Sozialhelden had contact with Henk Hoff, OSM Board of Directors, Harry Wood, OSM Communications and the OSM Operations Team to ensure a smooth functioning of MMD.

In the run-up to the event, Sozialhelden Board of Directors member Holger Dieterich attended wherecamp.de for informal talks with OSMers, including the founder of OSM, Steve Coast.

Online Communication with OSM

Various online communications called for support from OSM contributors:

- We placed a call for support on OSM Talk⁷⁵
- Mapping for MMD/Wheelmap was made the week task for OSM Germany⁷⁶
- Two calls for participation in MapMyDay were posted by OSM in their blog⁷⁷⁷⁸

⁷⁴ <u>http://www.mapmyday.org/en</u>

⁷⁵ <u>https://lists.openstreetmap.org/pipermail/talk/2015-November/thread.html#74987</u>

⁷⁶ <u>http://blog.openstreetmap.de/blog/2015/12/wochenaufgabe-barrierefreiheit-rollstuhlmapping/#comments</u>

⁷⁷ <u>https://blog.openstreetmap.org/2015/12/03/mapmyday</u>

⁷⁸ https://blog.openstreetmap.org/2015/11/14/osmgeoweek/

- This was also posted in a Japanese version⁷⁹
- MapMyDay mentioned on OSM Sub-Reddit⁸⁰
- There were calls for participation in MMD from national/regional OSM communities:
- OSM Sevilla⁸¹
- OSM Slovakia⁸²
- OSM Japan (OSM Advent calendar)⁸³
- OSM France (December 5)⁸⁴
- OSM Spain⁸⁵

15 prominent members of the OSM community followed the MapMyDay Twitter account⁸⁶.

Relevant articles and publications

Numerous online publications of interest to the OSM community also publicised MMD, including Open Data Sicily⁸⁷ and Charlemos Barriohacker⁸⁸.

An article was published in Directions Magazine (USA) – who publish geospatial news from around the world⁸⁹. They have also requested a full feature story for later covering MMD and Wheelmap.

3.5.4 Bonn

Through connections of CAP4Access coordinator empirica, the project managed to get a central part of Bonn, a medium-sized city in Western Germany, fully covered onto Wheelmap using volunteer contributors.

The fieldwork took place in what is known as the old city of Bonn, bounded by Kölnstraße, Kaiser-Karl-Ring / High-stade ring, Bornheimer Straße and Oxford Straße. Subject of the investigation were all places intended for public visitors, including shops, restaurants, cafés, personal service providers and public facilities. During spring and summer 2015, more than 300 new places were added to OSM (where they were missing before) and 200 POIs tagged on Wheelmap, including information on availability of accessible toilet facilities and photos taken of each place. The local OSM community was contacted to discuss the project.

⁷⁹ <u>https://blog.openstreetmap.org/2015/12/04/mapmyday-2/?lang=ja</u>

⁸⁰ <u>https://www.reddit.com/r/openstreetmap/comments/3v9q1u/mapmyday_openstreetmap_blog/</u>

⁸¹ <u>http://osgeo-org.1560.x6.nabble.com/OSM-MapMyDay-td5239556.html</u>

⁸² <u>http://comments.gmane.org/gmane.comp.gis.openstreetmap.region.sk/5923</u>

⁸³ <u>https://openstreetmap.jp/node/770</u>

⁸⁴ <u>http://openstreetmap.fr/aggregator</u>

⁸⁵ <u>https://twitter.com/openstreetmapes/status/672482668576141312</u>

⁸⁶ <u>https://twitter.com/simonecortesi, https://twitter.com/mappiamo, https://twitter.com/gborruso, https://twitter.com/Carto_Rabeyroux, https://twitter.com/OpenStreetMapIt, https://twitter.com/bertalanivan, https://twitter.com/Piersoft, https://twitter.com/PaoloBubici, https://twitter.com/osmcbba, https://twitter.com/osmgraz, https://twitter.com/OSMScotland, https://twitter.com/osm_be, https://twitter.com/OpenStreetMapMX, https://twitter.com/openstreetmapes, https://twitter.com/harry_wood</u>

⁸⁷ <u>http://opendatasicilia.it/2015/11/30/1125/</u>

⁸⁸ <u>http://opendatasicilia.it/2015/11/30/1125/</u>

⁸⁹ <u>http://www.directionsmag.com/pressreleases/mapmyday-people-worldwide-are-part-of-a-movement-for-more-accessibilit/459258</u>



Exhibit 44: Bonn's "old city" has been fully covered onto Wheelmap

Results from the investigation are to be published in local media, and are being discussed with stakeholders including representatives of citizens with disabilities, local politics and open data activists. Next steps, including public mapping parties in other parts of Bonn and distribution of wheelchair ramps supported by local sponsors, are already under preparation.

4 Evaluation

4.1 London

Mapping for Change have found that initiatives which bridge the interest of OSM and enduser communities to be the most successful and valuable. In order to continue to address the engagement of communities (as described in Deliverable 2.1⁹⁰), our aim was to use a variety of tools which contributed towards fulfilling end-user's needs, whilst reflecting the existing activities and interests of the OSM community.

Access the National Trails has been highly successful in this regard. The initiative helped to address communities' need for adequate accessibility data in the context of hiking, but also involved technical components which were of interest to OSM. Further, rather than being a one-off event with a short display of interest and activity from participants (and subsequent data for OSM integration), ongoing data collection using Mapillary and the Obstacle Tagger has demonstrated participants' enthusiasm and ensured the project's link with OSM is maintained.

Although communicating project aims and objectives more generally to the OSM community has been helpful and offers a wide reach in terms of the individuals informed, engagement around particular initiatives and OSM-related issues has proven more successful in attracting interest from the OSM community.

⁹⁰ <u>https://www.zsi.at/object/publication/3584/attach/CAP4Access_D2_1_Pilot_Plans.pdf</u>.

4.2 Heidelberg

During our work engaging with the OSM community we have observed that organised mapping events can have a low level of attendance if the mapping party is organised on its own. In order to get more people that are new to the project to participate in a mapping event, it makes sense to offer the mapping party in the scope of a bigger event (e.g. city festivals) that already attracts a high volume of people. However, it still makes sense to have such individual events since they can produce new valuable contacts. Moreover, people might be more likely to become long-term contributors if they have engaged on a more personal basis. Besides that mapping parties can be a good occasion to let the local press report and thereby also reach a lot of people.

Our participation in the open data hackathon has also lead to new contacts both from the OSM community and the local city authorities. While the latter were important to make the responsible persons aware of the data that is needed as open data for accessible route planning, the contacts to developers of the OSM community lead to quite efficient collaborations, since we could re-use their existing work.

Nevertheless, serving the online channels of the OSM community has a far wider reach and can make people aware of what is needed at comparably little cost. Thus, it makes sense to serve the OSM online channels on regular basis, such as the blog, the wiki, the mailing lists and the forums. Although feedback from the OSM community for some of our activities has been quite critical, the feedback is still very valuable and helps to improve our services.

Besides that we consider it very important to offer web services, such as OpenRouteService.org, that operate based on OSM data to showcase the effects of the contributions to the OSM database on e.g. wheelchair routing. Though it is difficult to estimate the actual effect, public web services can play an important role for the motivation of the contributors, since the impact of their volunteered actions becomes directly visible.

4.3 Vienna

In order to engage the wider OSM community in Vienna, several approaches have proven successful.

Firstly, *communicating mapping tools and ongoing pilot site activities* via our local portal berollbar.at has proven successful, as positive feedback was gathered during a workshop with the WAG (Wiener Assistenz Genossenschaft). Additionally students participating in the school project have written blog posts about their experiences to be published on the website which was a motivating factor. It proved helpful to have a local website like berollbar.at when communicating with various stakeholders, from wheelchair users to students or city officials.

Secondly, in terms of *tool testing and gathering OSM data* the mapping project triggered educational effects by combining technology with social issues, i.e. navigating in a wheelchair. The mapping project with the school also showed that Wheelmap was highly preferred over using Obstacle Tagger probably attributable to design and usability issues. Engaging groups who have not yet contributed to OSM, the mapping Apps (like Wheelmap) in combination with using a wheelchair collecting data.

Generally, we observed that mapping activities with a specific group, for instance pupils or students is successful when it is a longer-term activity. The activity thus needs to be well designed and thought through (e.g. providing information on tools; setting tasks and time frames).

4.4 Elche

As described previously, Polibienestar has contacted different twitter profiles related to OSM in Spain during 2015 in order to disseminate the project and, mainly, the activities developed in Elche: IG+Accesibilidad, gis&chips, geoinquietos VLC, OSM España, etc. They have supported the Mapping Party in Elche and disseminated it among their networks; this describes the active participation of OSM at Spanish level. Polibienestar plans to foster these contacts during 2016 by promoting their participation in the activities planned in Elche and engaging them to collaborate directly with the CAP4Access project and its tools.

Previously to the organisation of the Mapping Party, Elche's coverage in OSM was limited; so a pre-mapping event took place in February to increase POI coverage in the city centre. This limited coverage was also highlighted during the Mapping Party organised by Polibienestar in Valencia under the MayMyDay campaign. This reflects that more efforts to increase the POI coverage at both levels should be made.

Finally, in the organisation of the Mapping Party in Elche, different strengths and weakness are described in the "Lessons learnt" report. In summary, these kinds of activities receive substantial interest from local media, but it is difficult to involve participants, particularly people who do not have physical disabilities. The use of ICT is very attractive for young people but unfortunately during the Mapping Party only two young ladies used smartphones to tag places.

5 Next Steps

5.1 London

Obstacle Tagger and Local OSM

Once technical developments to the Obstacle Tagger are complete and obstacles marked will raise issues in OSM, Mapping for Change will be able to identify and communicate with local OSM contributors in areas of relevance.

Meet-ups

Mapping for Change will continue to advertise mapping parties and other workshops to local OSM contributors around London.

5.2 Heidelberg

Maintenance of Issue report system for OpenRouteService Development

We want to further maintain our issue reporting system for OpenRouteService in order to keep the OSM community engaged with us and giving as valuable feedback for the development.

Talk with Mayor of Heidelberg

We are planning to present CAP4Access in a short presentation within the framework of a discussion about the plans of Heidelberg for open government data.

Presentation of ORS/Wheelmap at Citizen Party in Heidelberg

We will present OpenRouteService and Wheelmap at a city quarter festival in order to make people aware of these services that we do not reach via the online channels that we serve.

Finish Wiki documentation of ORS

We are going to put the OSM tags relevant for wheelchair routing in the OSM Wiki.

Release Navigation app to public (including requesting feedback from OSM community)

At the point of second prototype delivery, an announcement will be made via existing channels regarding the Navigation App. At that point, the app will be fully functional with regards to generating routes and instructions and so it will be valuable to get feedback from users with regards to any improvements and bugs in the app. This release will primarily target both the OSM community and the target user groups within the pilot cities who are testing the Navigation App.

5.3 Vienna

Mapping Projects with local school

ZSI will continue to engage local schools in mapping activities, using Wheelmap and Obstacle Tagger.

Austrian Alpinist Association

ZSI are discussing possible cooperation and joint activities with Austrian Alpinist Association.

Tu Students

Analysis of Mapping Tasks with TU students: 'Mapping Urban Obstacles' (using Obstacle Tagger).

Berollbar.at

Further development of local portal, berollbar.at; share blog posts on going activities, events and content provided by end-users.

5.4 Elche

After the meeting on 30th December 2014 with the city councillor for disability, the city council and Polibienestar have agreed to organise a first event during January. Then, we will together define a concrete plan of activities to be developed along 2016. Among the preliminary ideas:

- Mapping party:
 - TOPIC: Accessible urban environment (using the Obstacle Tagger app)
 - TOPIC: Accessible tourism (using Wheelmap)
- Workshop with elderly people (digital literacy)
- Workshop with students (office of students with disability and students)
- Updating the lessons learnt document
- Awareness seminar of businesses contacted previously by email (hotels, footwear, etc.)

For all these activities, the team will consult previously to the related consultancy board: Consultancy Board of People with Disabilities or the Consultancy Board of Elderly People.