A Free, Editable Cycle Map of Oxford

OpenStreetMap for Cyclox members

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1 Introduction

For those who haven't heard yet, Cyclox are hoping to produce an Oxford Cycle Map during 2009 which focuses entirely on cyclists' needs. The intent is to use OpenStreetMap[1] as the source of the raw map data because it is:

- Free to use: no licensing fee
- Open and editable: anyone can contribute and benefit
- Very complete for the city of Oxford; not too shabby for nearby villages
- Easy to adapt for special purposes like cycle maps
- Unrelated to previous Council efforts: we can do better ourselves

2 About OSM

OpenStreetMap is most easily described as "a free, editable map of the world". It's a map anyone can contribute to by editing the underlying data directly; in addition, anyone can benefit by reusing the data in almost any way they want. OSM data is licensed under the terms of a Creative Commons Attribution-ShareAlike agreement[6].

2.1 Why it exists

Geographical data is not free in many parts of the world, including the United Kingdom[4]. Typically the data is locked away behind walls of bureaucratic red tape, copyright law, commercial interest, or all three.

But the main reason is that the data can't be modified, adapted or built upon very easily, and most of the time you can't share what you do with others. Advances in technology like cheap GPS units mean you can now create your own maps, in collaboration with others and have none of the restrictions outlined above. The ability to do so allows you to regain a little bit of the community you live in - if you can't map it you can't describe it.

2.2 Copyright

A word about copyright, before we start. If you're going to contribute to OSM, you need to follow one simple guideline:

Do not use data from copyrighted maps or any other proprietary data! This means copying, tracing, or any other reproduction of an existing copyrighted work: copyright law forbids you from doing this; only the original copyright holder has the ability to make copies of their map or derive new works from it. For the OSM licensing model to work, and for the sake of the project as a

whole, we cannot accept copyrighted data. This even applies to side-by-side comparisons of maps: you can't copy street names off a Google or A-Z street map, for example.

There are a couple of sources of data that are either in copyright or have expired copyright that may be of use to this project. They both have their drawbacks, however:

- Yahoo! Aerial Imagery can be traced over, by agreement[5]. It's rather patchy, and nowhere near as sharp as certain competitors' satellite imagery, but it's a start. No street names, obviously.
- New Popular Edition Ordnance Survey maps from 1949[3]. Out of copyright: Crown Copyright lasts for 50 years post publication. Not especially high-res, and rather out of date, but useful for country footpaths, river courses and the like.

2.3 Existing OSM maps for cyclists

There is already an adaptation of the OSM data out there that's of relevance to cyclists: the OpenCycleMap[8] project created by Andy Allen (Figure 1). It highlights cycle routes and facilities while de-emphasising motorways and trunk routes, and also adds contours and shading. This project is great for planning a long-distance journey along NCN routes and country lanes, but focuses somewhat too heavily on approved long-distance Sustrans routes for use in the city of Oxford in my opinion. In addition, the contours - which look wonderful in green spaces outside the city, and which are very helpful there - somewhat confuse matters in dense urban environments.

Still, the project is evolving and takes a very broad-church view; plus of course the cartography is wonderful, and we'll be able to reuse parts of it to great effect. Go and take a look.

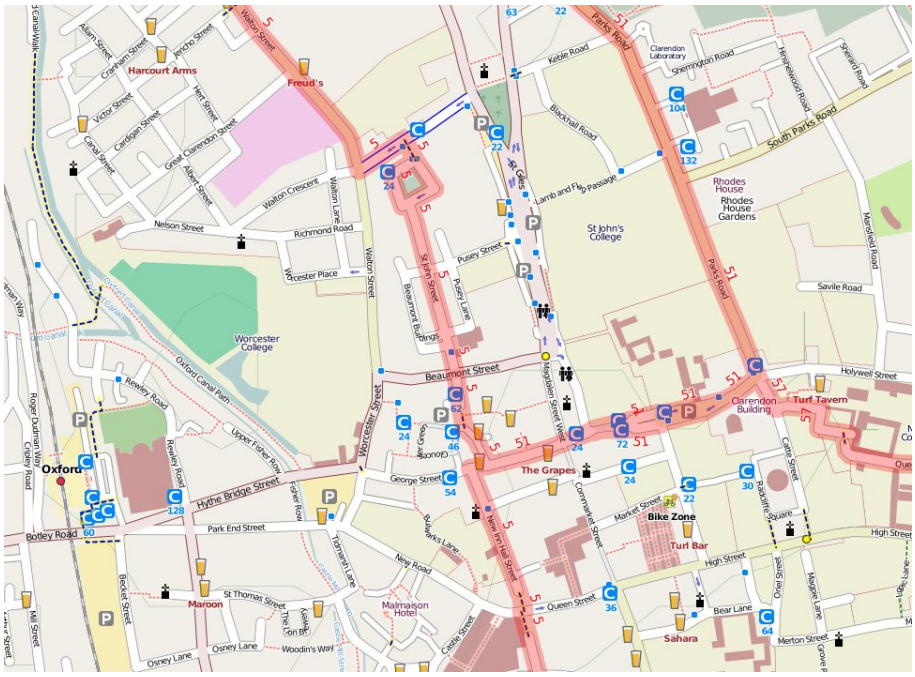

Figure 1: A sample of OpenCycleMap imagery. National and regional cycle routes are picked out with red overlays, and bicycle exemptions to one-way systems are marked with blue casings.

3 Cyclox and OSM

If Cyclox contribute to the map data directly, everyone benefits and the map will improve for everyone. At the same time, Cyclox benefit from the existing data and can improve it in a way

that's good for themselves. Not to mention the fact that the data is royalty-free, which means enormous scope for creating printed maps.

The OpenStreetMap processes and software tools can be a little daunting for first-time users, so we should address this.

3.1 The typical OSM workflow

The typical pattern for updating OSM for completely new, unmapped areas is as follows[2]:

1. Collect GPS data using a handheld GPS device
2. Upload GPS data to the OpenStreetMap website
3. Trace over GPS data to make nice, smooth lines on the map
4. Label data and add details street names, businesses, amenities...
5. Wait for the data to become visible on the main website, and use it!

However this is likely to be a bit of a heavyweight process for most Cyclox members, not least because of the high technical entry requirements and the need for a GPS. Luckily we needn't go to quite this level of gadgetty fiddliness for the Oxford Cycle Map - much of Oxford is already mapped to quite a high standard already. If you have a GPS device, by all means use it - they're becoming increasingly common in mobile phones and cameras, for example. But it's possible to help make a good map even if you don't have all the tools.

3.2 A possible alternative workflow

There should be no Cyclox member who cannot contribute somehow, and we should design the process accordingly. We can broadly split Cyclox members into three main categories:

- Tech-savvy users: may have the equipment and inclination to gather GPS data and notes by themselves. Cater for these people by organising small informal workshops and organising a web presence for the mapping project. Encourage the formation of a Core Mapping Group of willing and able people.
- Non-tech-savvy users: either don't have the gadgets necessary, or aren't confident enough with computers to use any of the OSM editor software. Work with these people by organising larger workshops and/or mapping parties: it should be possible to contribute with only a printout of the existing map plus a pencil and paper, provided the core group are willing to take in the corrections and upload them.
- The great in-between: anyone with a little technical knowledge and access to the Internet can contribute too; encourage these people to help out directly in the areas they're happy with. Cater for these guys with a mixed approach: invite to the informal meetings, special sessions at larger workshops going into more of the detail of how OSM store data and why we do things the way we do.

The important thing is to divide up any work to be done in a fine-grained fashion, and make sure that there are no bottlenecks in the process.

4 OpenStreetMap software

This section covers some of the tools used for creating OpenStreetMap maps, plus some of the neat things users have done in the past with our data. The software is all produced by OpenStreetMap contributers, and is typically Open Source or Public Domain itself - in other words, free to use for the purpose intended, or to adapt and modify for one's own ends or the benefit of everyone.

4.1 Editor software

Software for making edits to the raw map data in the OSM database is the primary focus of software development in OSM, and the first thing tech-savvy contributors are going to need. The two main ones are JOSM and Potlatch, though others exist.

4.1.1 JOSM

JOSM (Figure 2) is a large, heavyweight tool which can download OSM data, modify it, and upload the changed data back to the OSM website. It's cross-platform, very capable, and allows for very detailed high-quality cartography, but can be somewhat awkward to set up and use effectively. Many plugins, with rather confusing names.

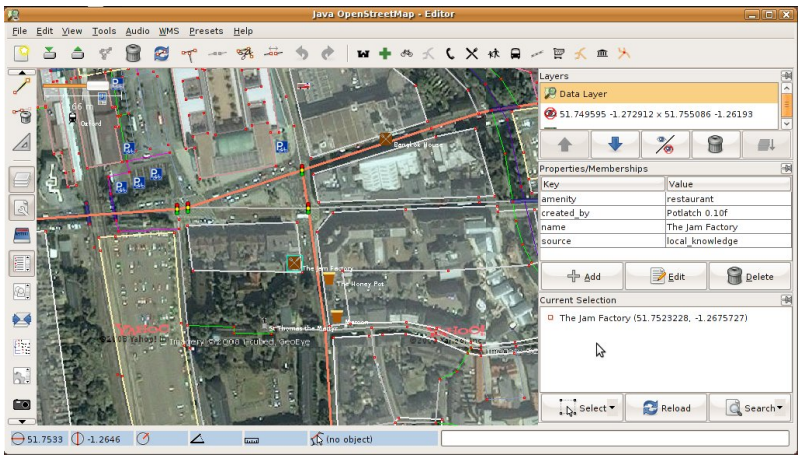

Figure 2: JOSM, the Java OpenStreetMap editor

4.1.2 Potlatch

Potlatch (Figure 3) is an editor which is built into the main OpenStreetMap website[1], and which can be accessed on the edit tab. It's rather less capable than JOSM, but allows all the basic stuff to be edited. Probably the best tool for tracing over slightly-misaligned Yahoo! imagery or NPE data. A little confusing for anyone without a printed cheatsheet to hand.

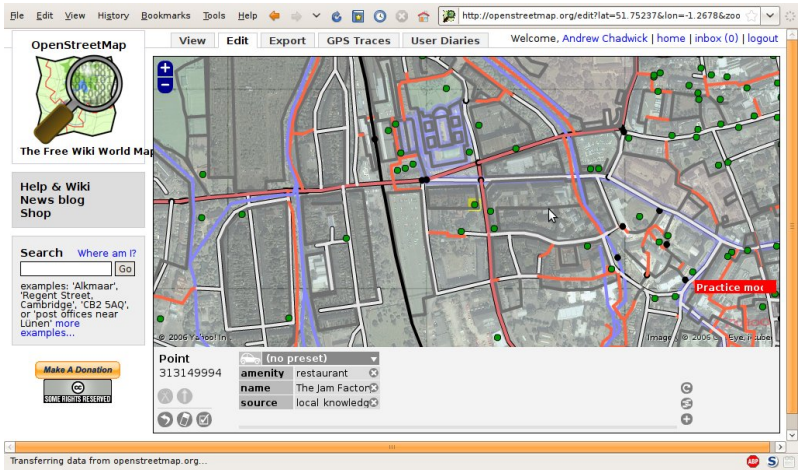

Figure 3: Potlatch, the built-in Flash editor on the website

4.2 Routing software

Tools for finding routes through the roads, lanes and tracks buried in the OSM data exist, but are somewhat in their infancy. Nevertheless, they make for interesting demonstrations of what's possible.

4.2.1 Gosmore

Gosmore (Figure 4) is a route-finding application with both a GUI and a command-line interface. It's slightly clunky to operate, and a bit intimidating to set up. Allows for fastest/shortest routes and bicycle/car/foot routes to be generated. Can be used as the basis of other apps, for example YOURS.

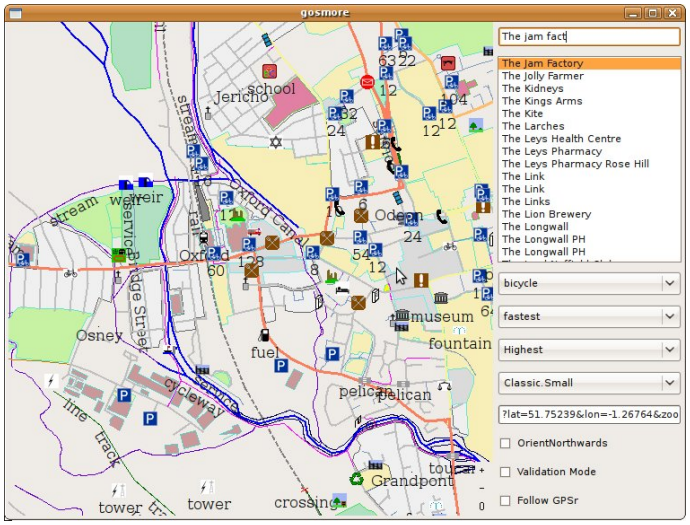

Figure 4: Gosmore, a standalone route-finding application

4.2.2 YOURS

YOURS[7] (Figure 5) is a website based around Gosmore which presents a regular scrollable, zoomable OSM map and allows the user to find routes across it. Very easy to use, and a good way of uncovering problems with access permissions in the underlying OSM db.

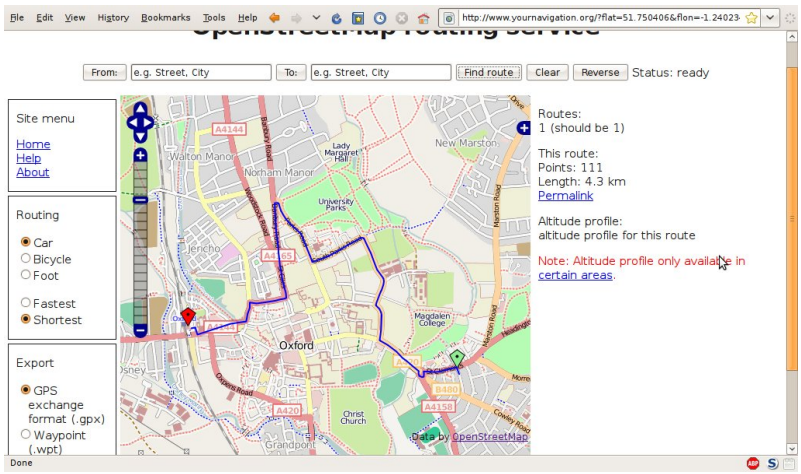

Figure 5: YOURS, routing website built on gosmore

4.3 Feedback and problem-spotting

4.3.1 OpenStreetBugs

OSB (Figure 6) is a website which gives users a very simple interface to marking the locations of problems with the map: inaccuracies, missing roads etc. People can even point out problems anonymously.

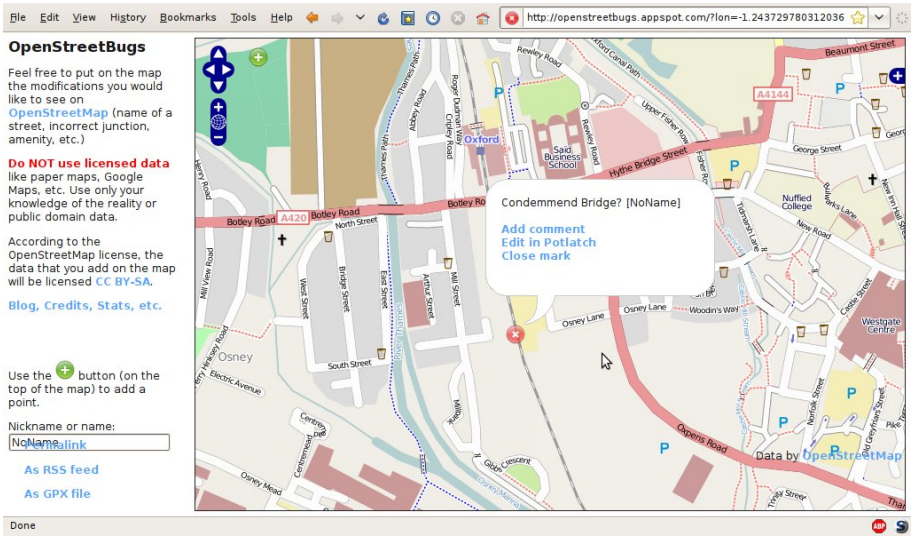

Figure 6: OpenStreetBugs in action

References

[1] The OpenStreetMap Foundation (as custodian). Openstreetmap. Web site. Available from World Wide Web: http://www.openstreetmap.org/ [cited Nov 27 2008].

[2] Multiple authors. Beginners' guide - openstreetmap wiki. Wiki page. Available from World Wide Web: http://wiki.openstreetmap.org/wiki/Beginners%27_Guide [cited Nov 27 2008].

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[6] Creative Commons. Attribution-share alike 2.0 generic. Web page. Available from World Wide Web: http://creativecommons.org/licenses/by-sa/2.0/ [cited Nov 27 2008].

[7] Lambertus. Openstreetmap routing service. Web site. Available from World Wide Web: http://www.yournavigation.org/ [cited Nov 27 2008].

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