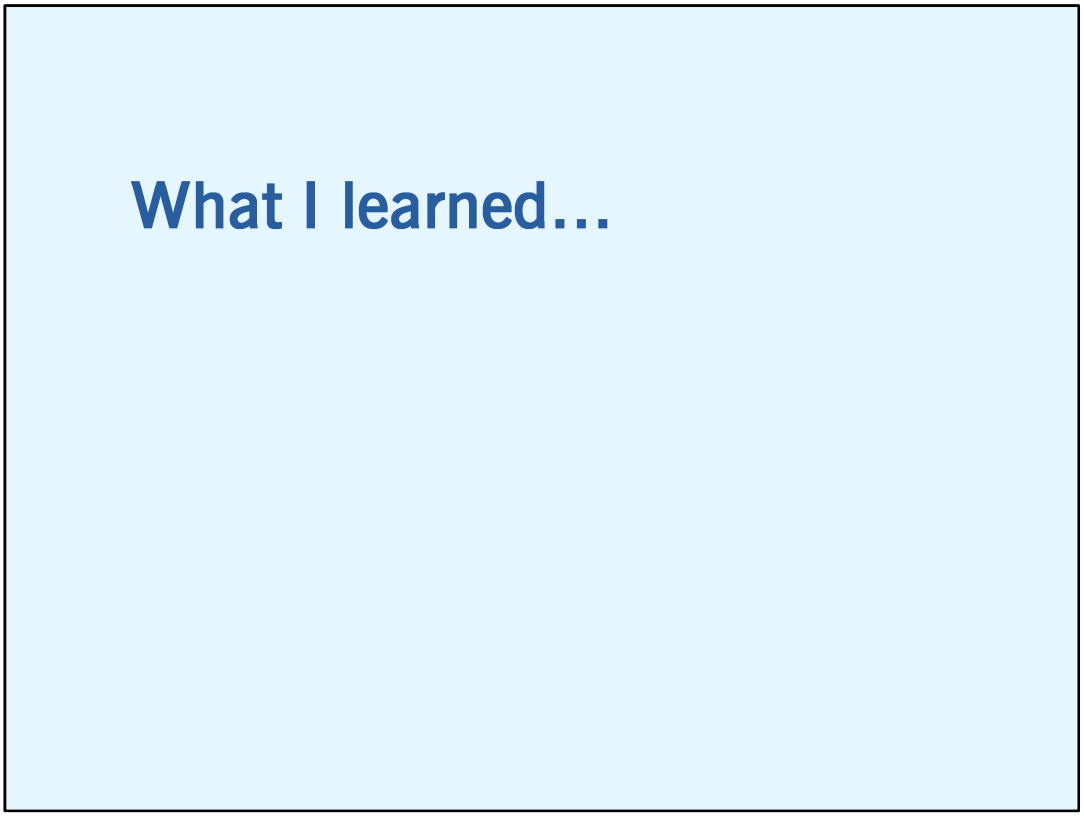


What I learned making a real map for real people on real paper for real money

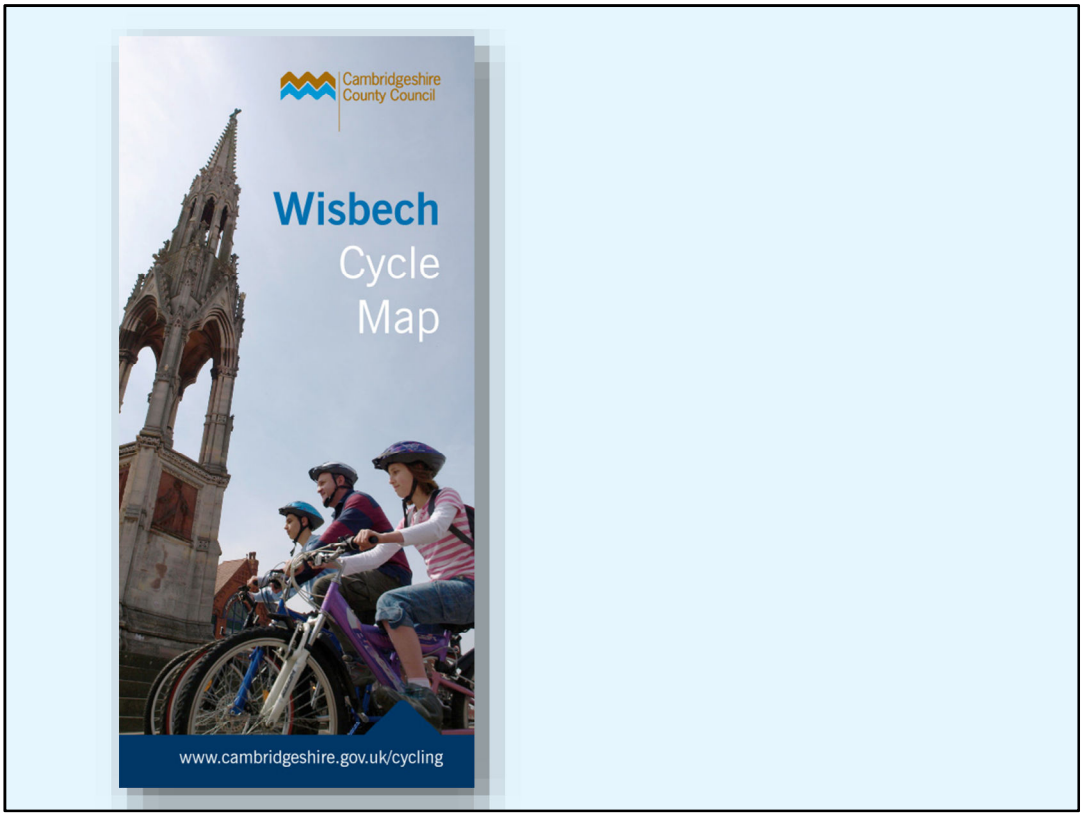
It’s a bit of a long title so let’s take it in stages…

David Earl

david@frankieandshadow.com
www.frankieandshadow.com

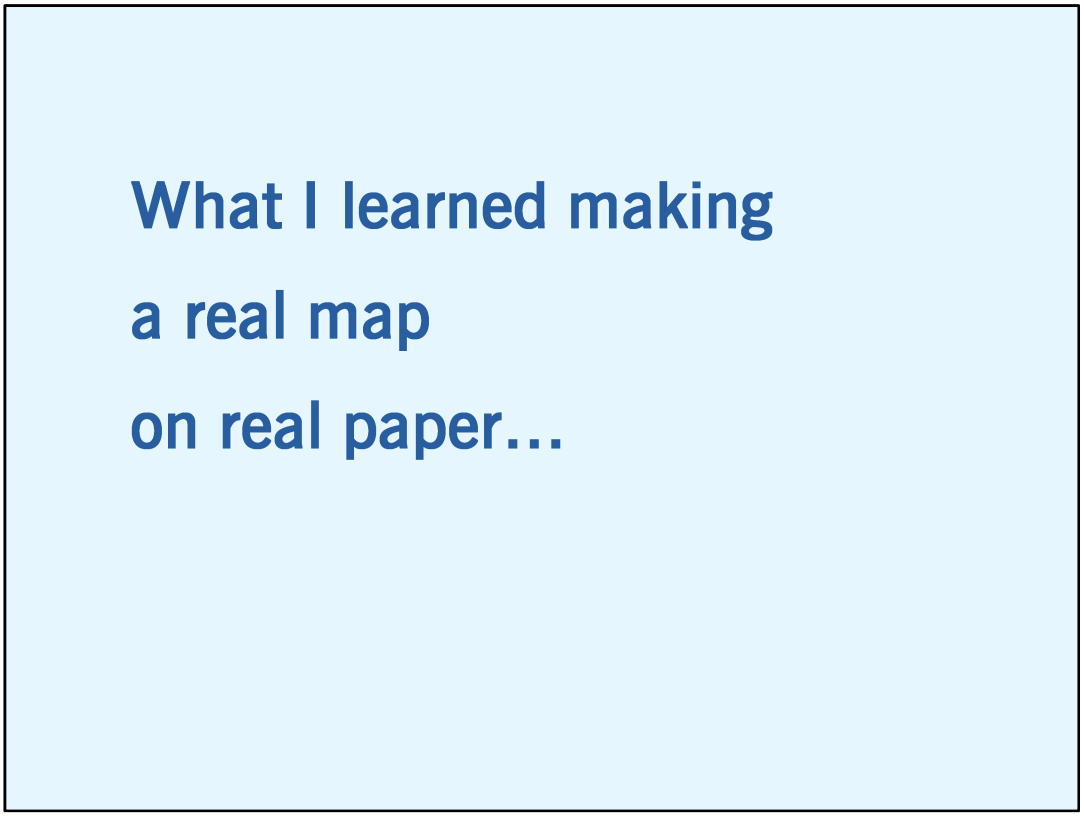
What *I* learned… so this is me

What I learned making a real map…



And here it is

And before anyone asks, the attribution

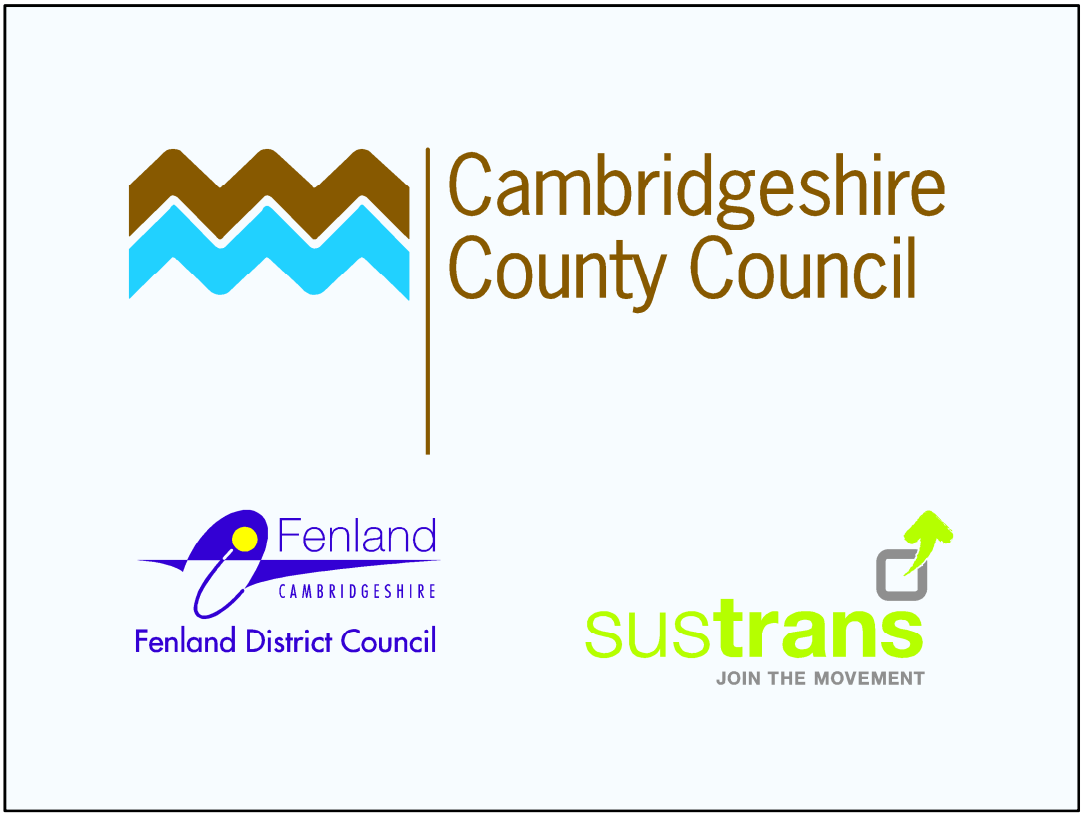


[shows paper map]

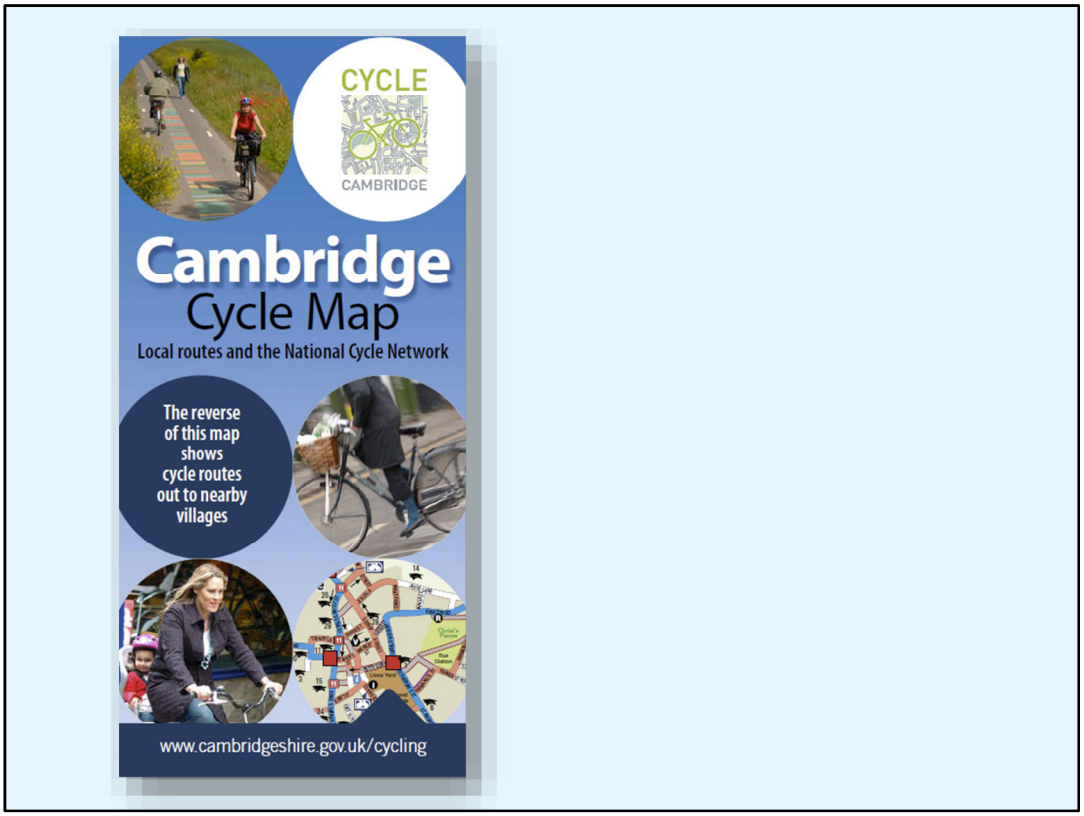
It's about 60 cm square made up of 18 1/3 A4 panels on each side. It's actually three maps: the main one is 1:10,000 of the town of Wisbech in Cambridgeshire and its necklace villages, then there's an inset of the town centre at 1:5,000 and a 1:50,000 map on the back of leisure cycling routes in the countryside around. There's also some background text, photos, a street index and the front and back covers.

What I learned making a real map on real paper for real people…

Real people…



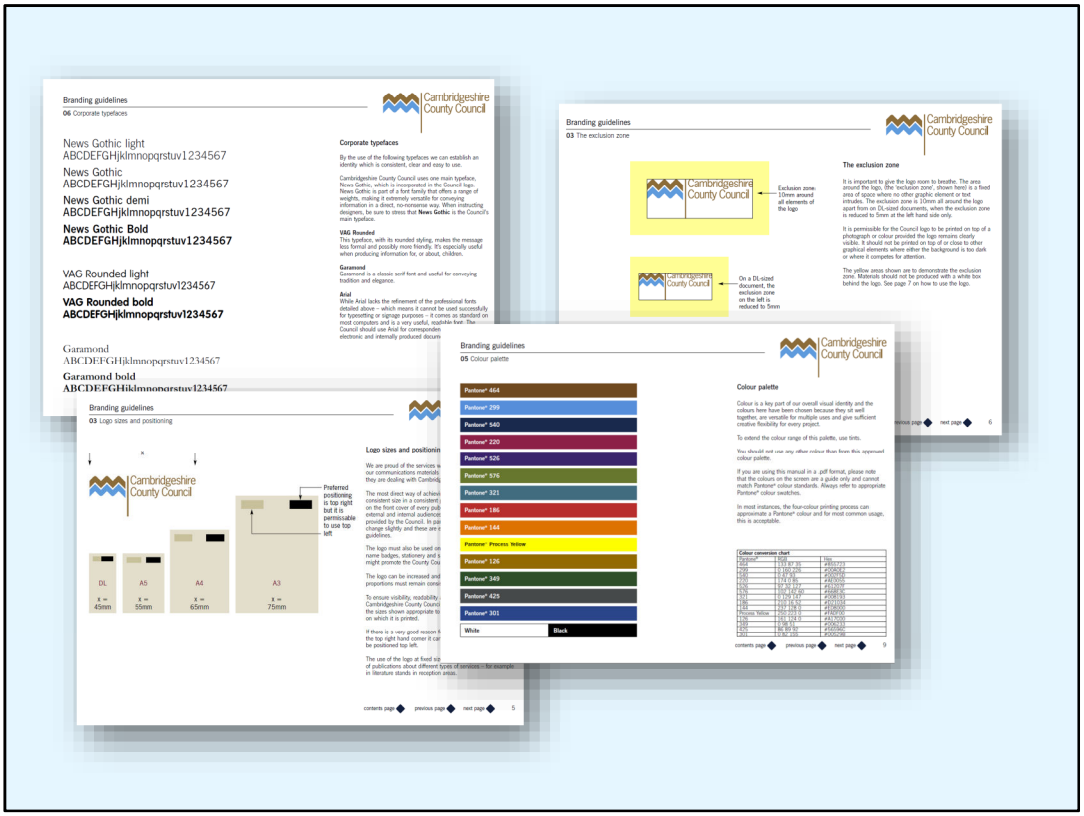
Here they are. My client was Cambridgeshire County Council, a local authority with an annual budget around half a billion Euros. Fenland District council and Sustrans, a UK cycling organisation, also made up a team reviewing and progressing the map.



There was also some context and history. The format and general style of the map was dictated by a current map of Cambridge, from an Ordnance Survey base map, which is in its fifth edition and was inherited from Cambridge City Council.

http://www.flickr.com/photos/21233184@N02/4691916694/

… and it came with a brief of what things had to be included



… and rules about corporate style: what fonts, colours and spacing I had to use

What I learned making

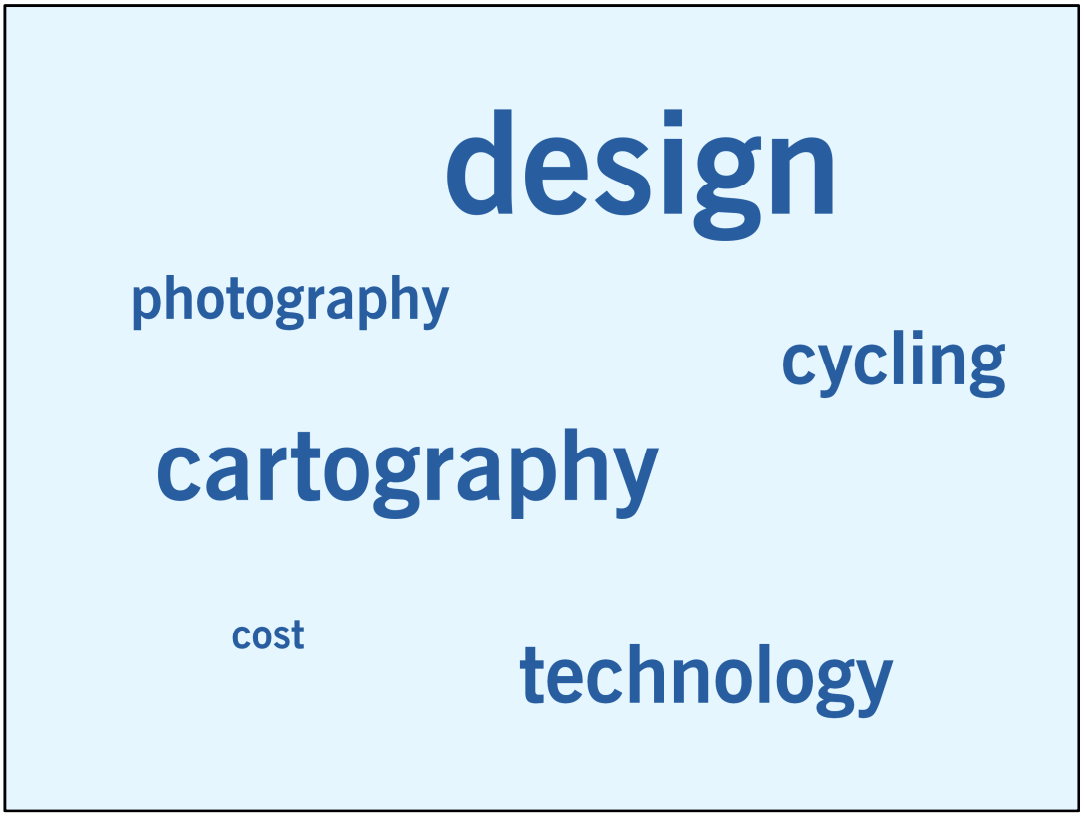
a real map

on real paper

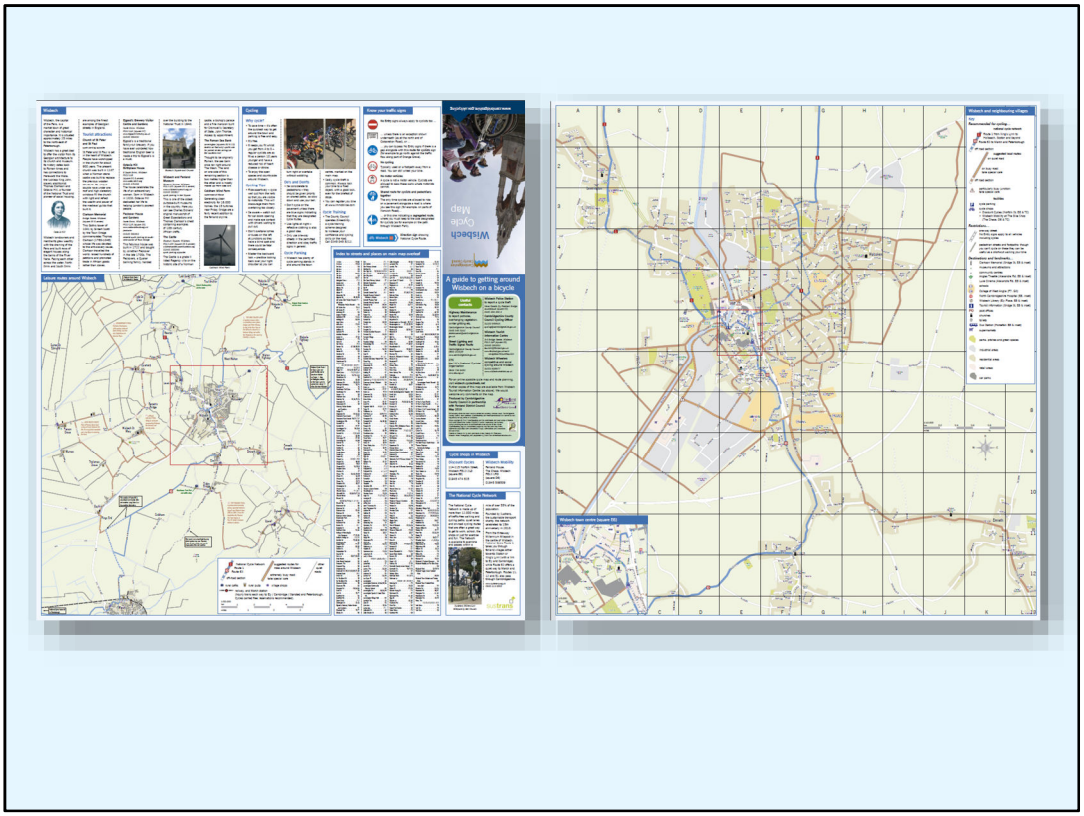
for real people

and real money.

And “real money”. I was paid for the layout and design, though not of course for the mapping and surveying. It was coincidence that we were just starting a systematic survey of Wisbech as the largest outstanding settlement missing from OSM in Cambridgeshire at the time this opportunity came up.



I got the contract because it is at the intersection of a range of my skills and interests. The reduced cost of the base map was a factor, though not a big one as far as I know, and that may well not be the case nay more with the release of free OS mapping.



So, here is the finished product.

What I learned…

What I learned…

… probably what professional cartographers already know

And actually, to be honest, a lot of it I already knew too, but I had to find a way of solving the problems I knew would arise.

So here are some of the things I dealt with…

Moving target

Thank you to…

Chris Dorling

Richard Moss

Tom Sutch

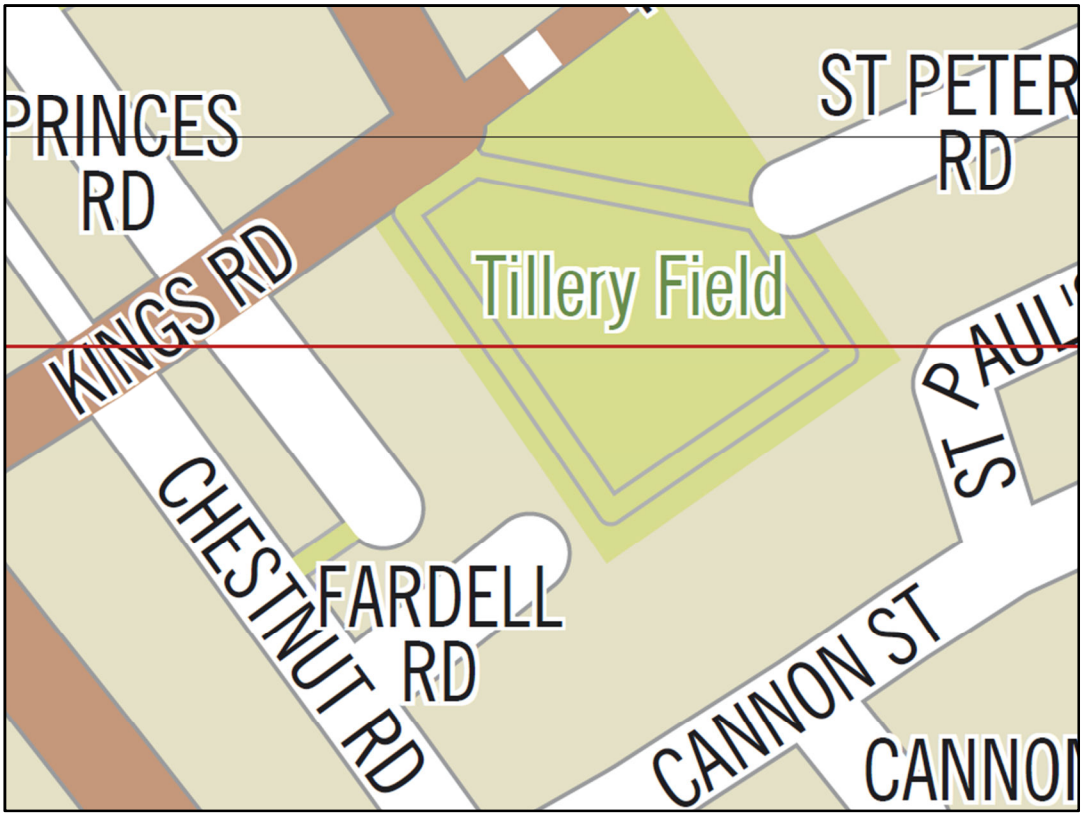
David Jordan

The map was being surveyed at the same time as it was being prepared. Five of us did the surveying in the worst that the vile cold winter could throw at us, so thanks to all of them for the hard work on days when we couldn't even stand up because of the ice.

This meant the OSM data was changing all the time I was trying to render it. It wasn't, therefore, possible to make a nice rendering and then tweak it in a vector editor like Illustrator or Inkscape. I had to go back to the original OSM data repeatedly.

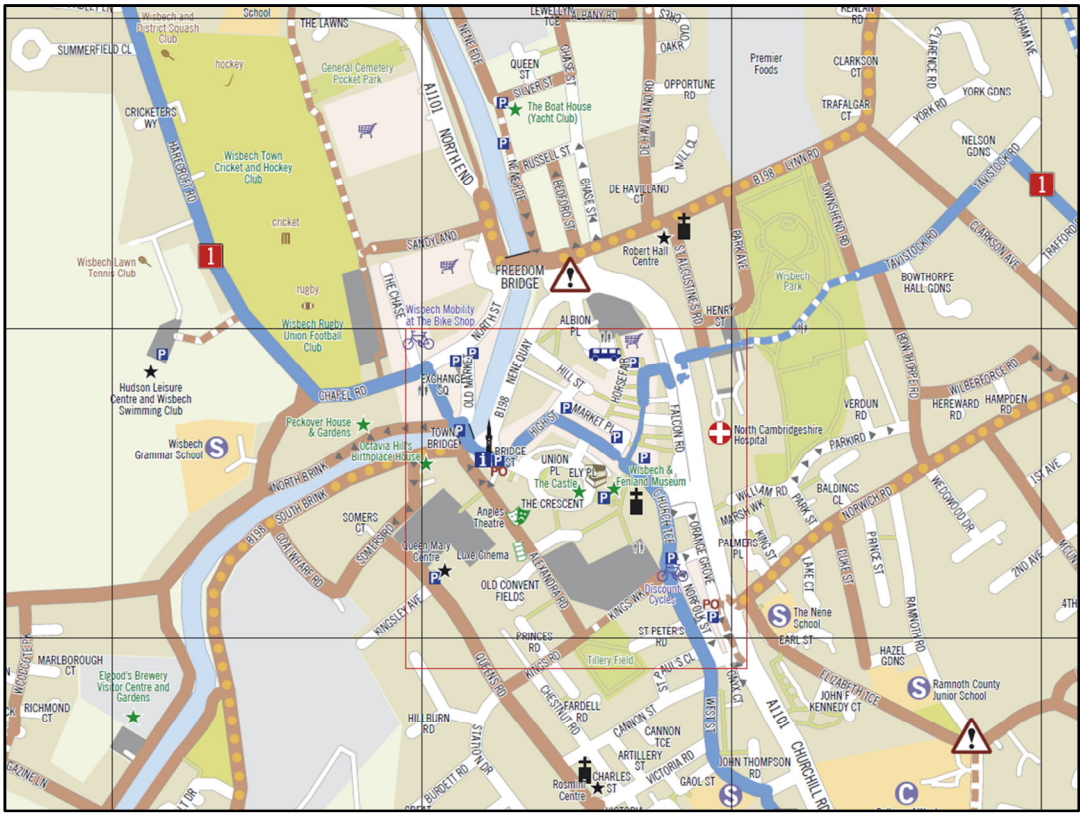
I also had to contend with strangers thinking they knew better than surveys from the ground. One persistent change was changing this from being a roundabout. We can argue about whether it is or not, but the problem was it affected my rendering to have it keep changing.

Local knowledge



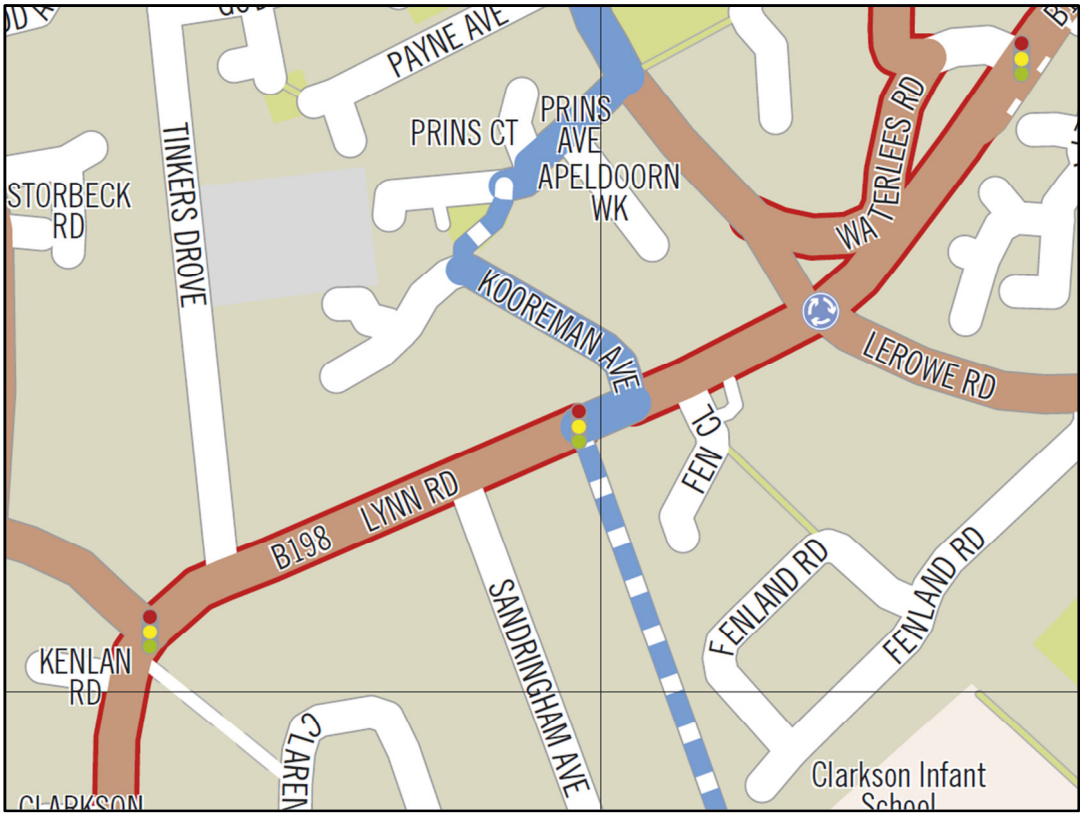
Some map detail, especially names, was very helpfully provided by the people on my review team. This little urban green space was a pet project of a councillor who was also very supportive of getting the map done. There was no sign board and internet searches revealed a possible historical name, but it was only the councillor who could provide the correct name. Likewise, who would know by just looking at it that Wisbech Town Football Club had moved from what looked like its ground and will move to what is currently an unsigned building site some time in the next year or two. Several street name corrections and typos were also very helpfully picked up by the team.

Completeness



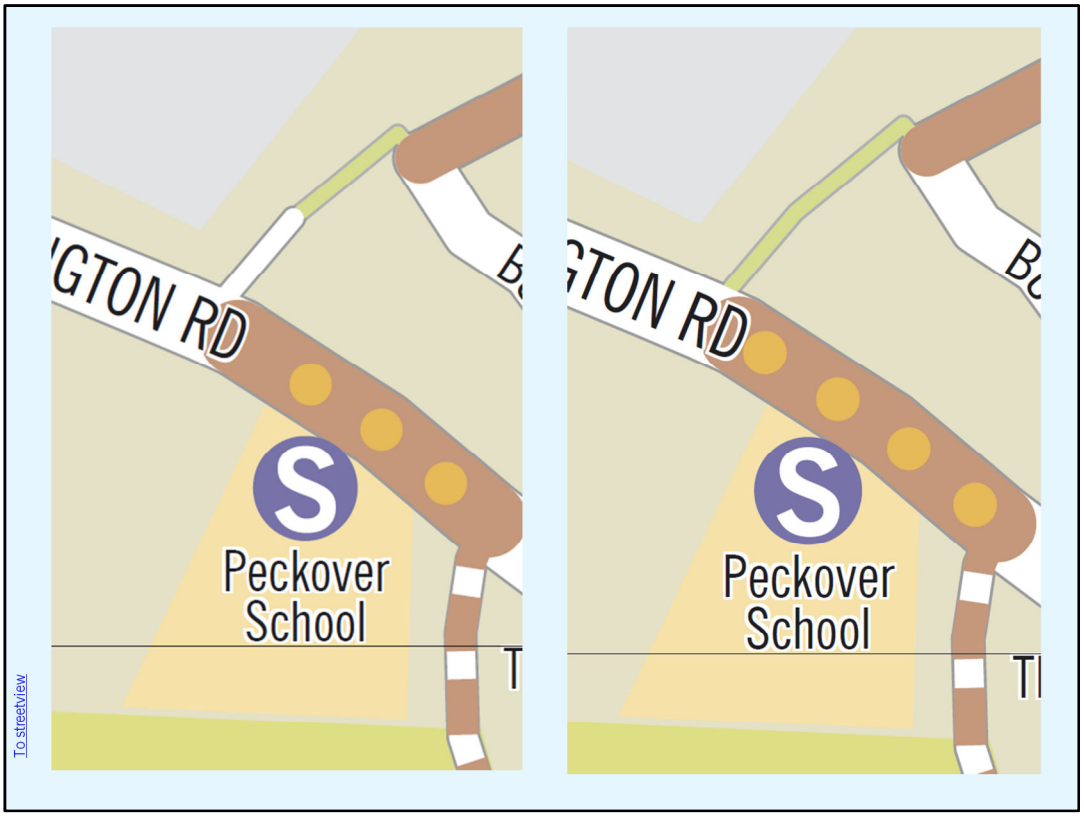
It was taken pretty much for granted that a street map had to show all the streets. However, there was a certain happy perversity about approaches to completeness on other things. This meant that people's interests and prejudices (meant non-pejoratively) had an influence. For example, we spent a while discussing which churches should be shown, captioned and/or omitted entirely. In the end we put those which were significant landmarks (and captions got decided by space limitations eventually).

Similarly, there was a demand to add all the sporting facilities in the northwest of this slide, but actively not to include tennis courts and bowling greens in the park to the east. A consequence is that I could not render everything in a particular class or tagged a particular way – I had to be able to be selective.

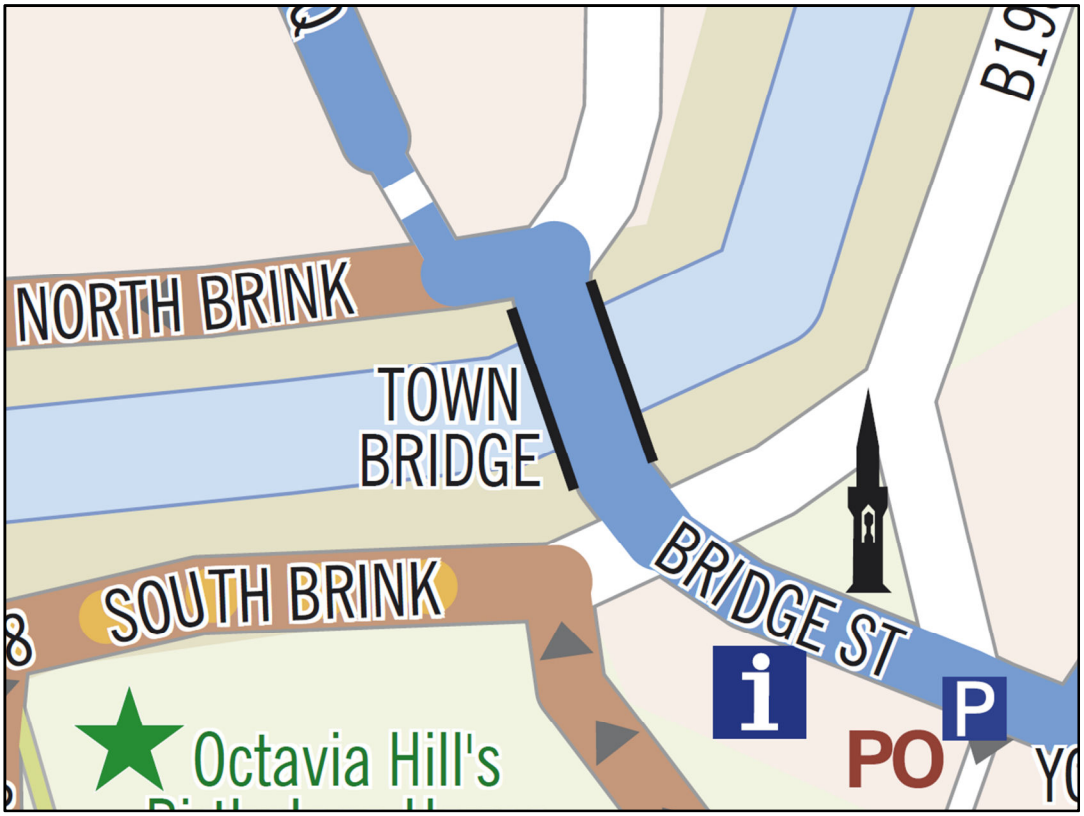


I thought it would be helpful for orientation purposes to show traffic lights and mini-roundabouts and helpful to cyclists to show location of signalled crossings on cycle routes. The panel disagreed, so this early rendering went by the wayside.

Truth

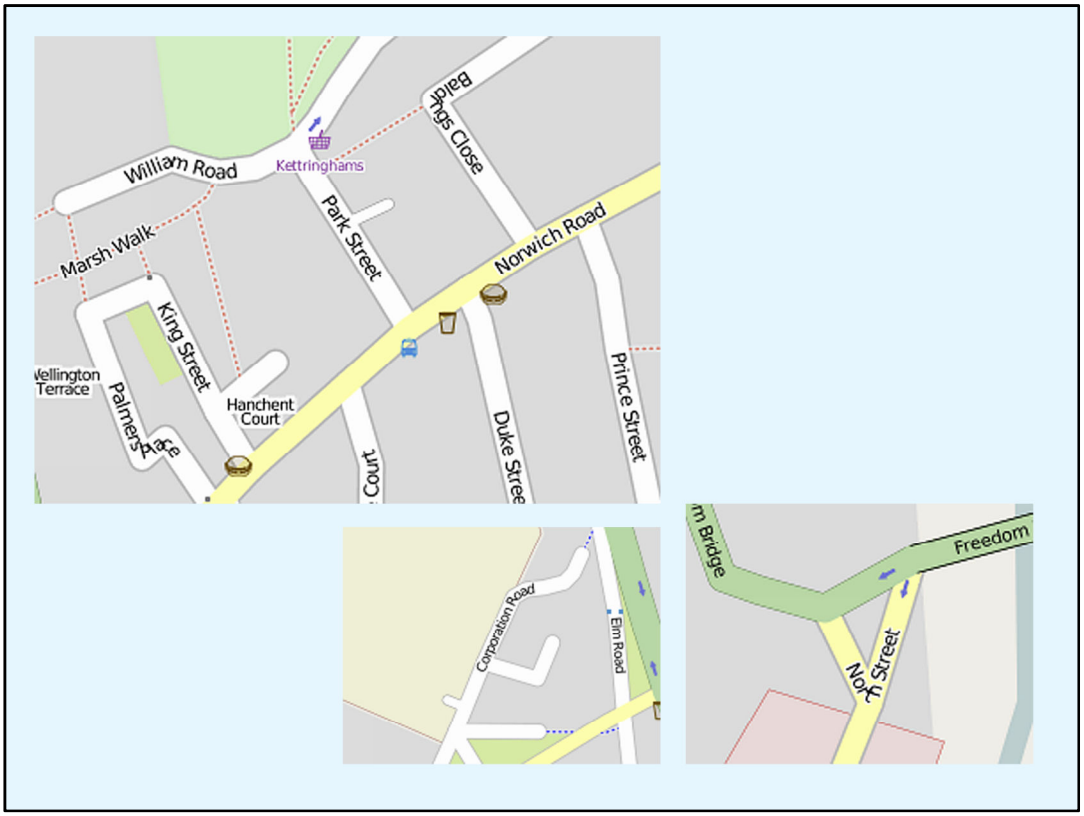


I was also asked to show things that were not literally true. For example, the left side shows the actual situation, where a path which was thought helpful as a short cut, starts out as a service road (actually the access to a pub car park, as can be seen from Google Street View, from the link on the slide). However, it ended up, after much discussion, as a footpath all the way through and that is how it is currently shown in OSM as well.

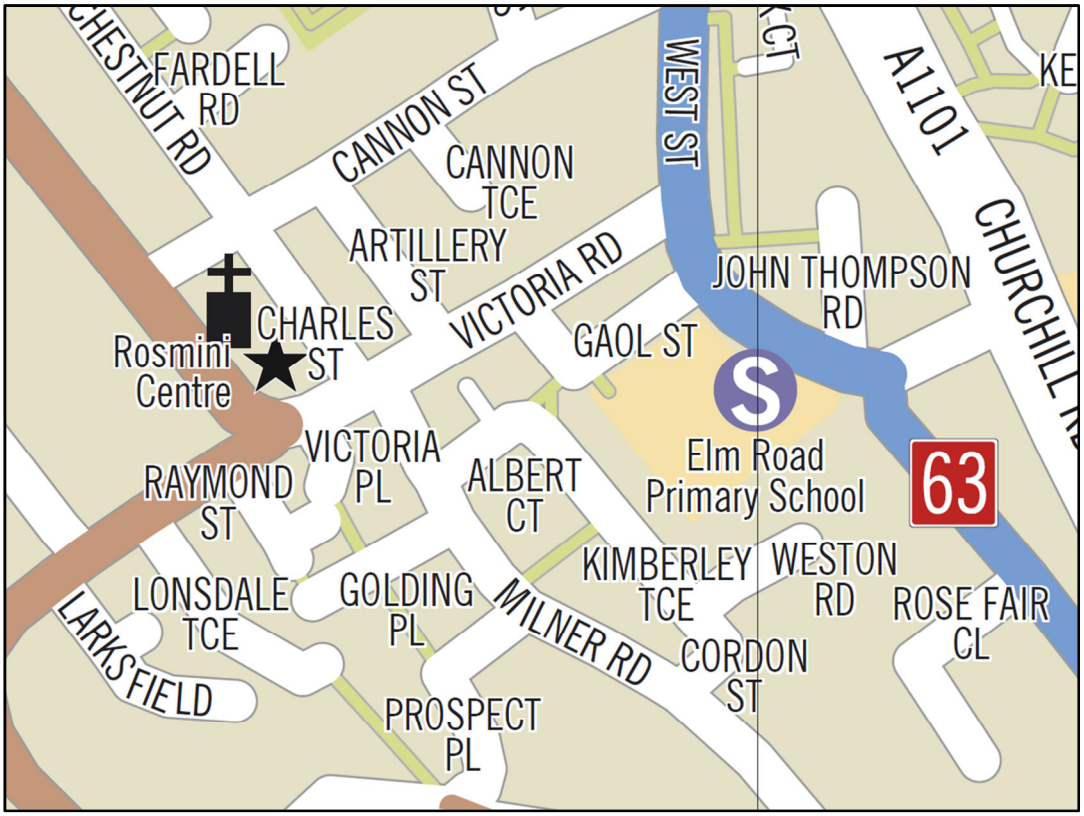


And this little cycle link north-west of Town Bridge has No Entry signs at end which strictly speaking cyclists must not cycle past – yet here we are on an official cycle map showing it as a cycle route – and not just any old route but part of the national Cycle Network. It turns out that the traffic order making this a cycle route is correct, but that the wrong signs were erected and there is now no money to correct the mistake.

Captions

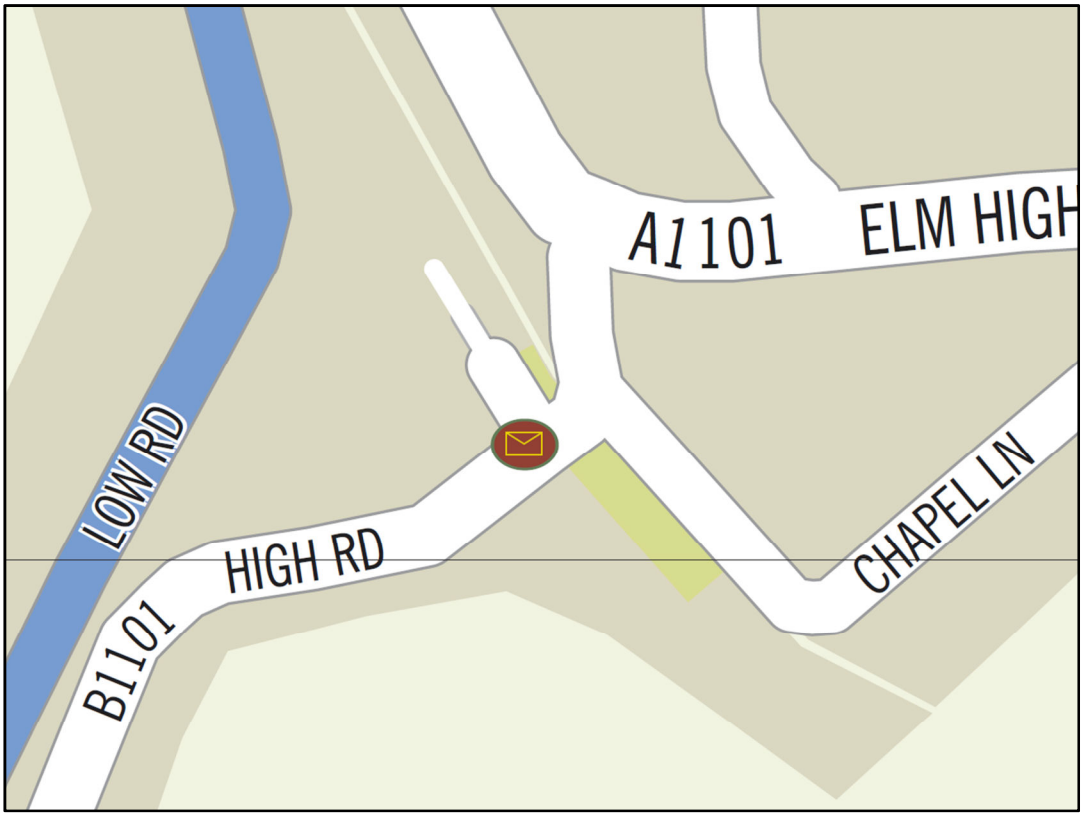


It simply isn't acceptable on a paper map to show captions like the abominations above from Mapnik – especially the one going around 120 degrees because of the idiom often used in OSM for this kind of branching approach to a roundabout. Also, I didn't want to clutter the map with one-way arrows for these kinds of structure. But how to identify them? In the end I augmented the data model with junction=approach. And for captions, I decided to slide them along to straight bits where possible and never to bend them more than 60 degrees. Nevertheless it is a hard problem to solve and my results aren't as perfect as I would have liked.



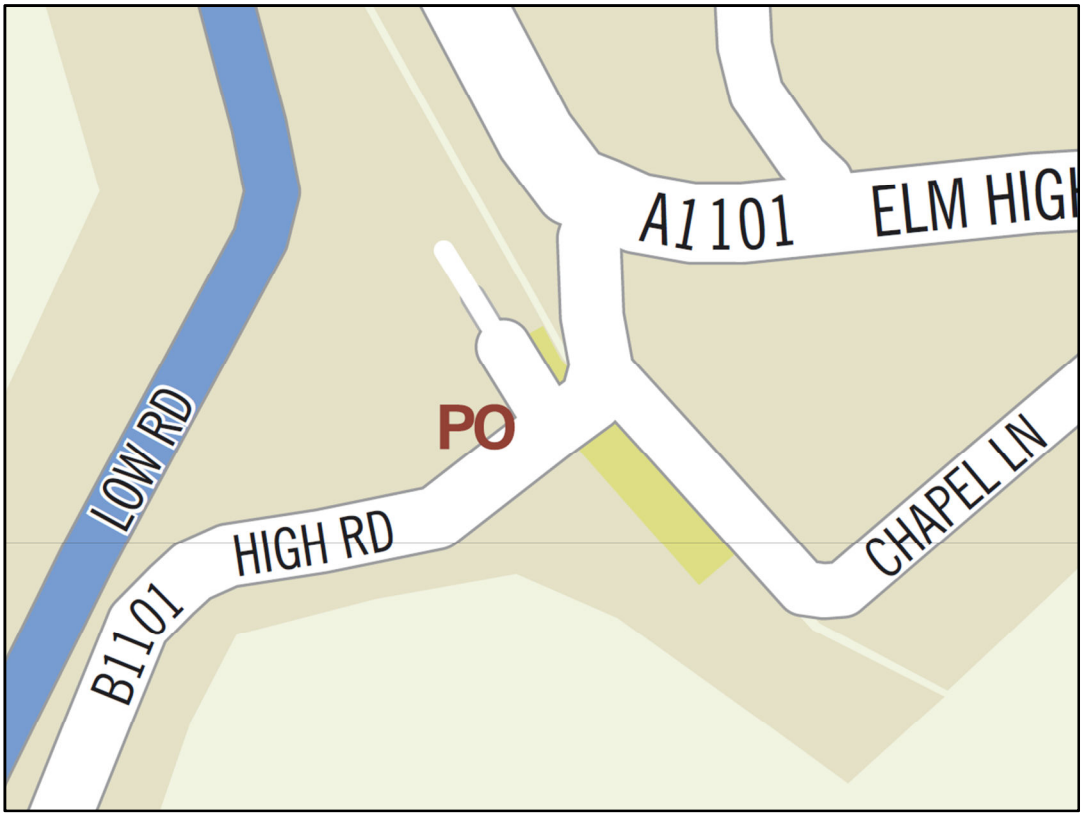
Some areas are very dense and the streets very short. When there isn't room for a caption either because it is too long, or too bendy, I used horizontal text instead. And I controlled the positioning. Because that is done with typing in offsets, and rendering to check each time took a few minutes, I failed to get some quite right: Fardell Road overlaps Chestnut Rd a bit and should have been shifted NE a bit more. Rose Fair Cl would have been better further S and Gaol St perhaps a bit to the SW. If I was doing this a lot, I'd write an interactive positioning tool.

Road widths

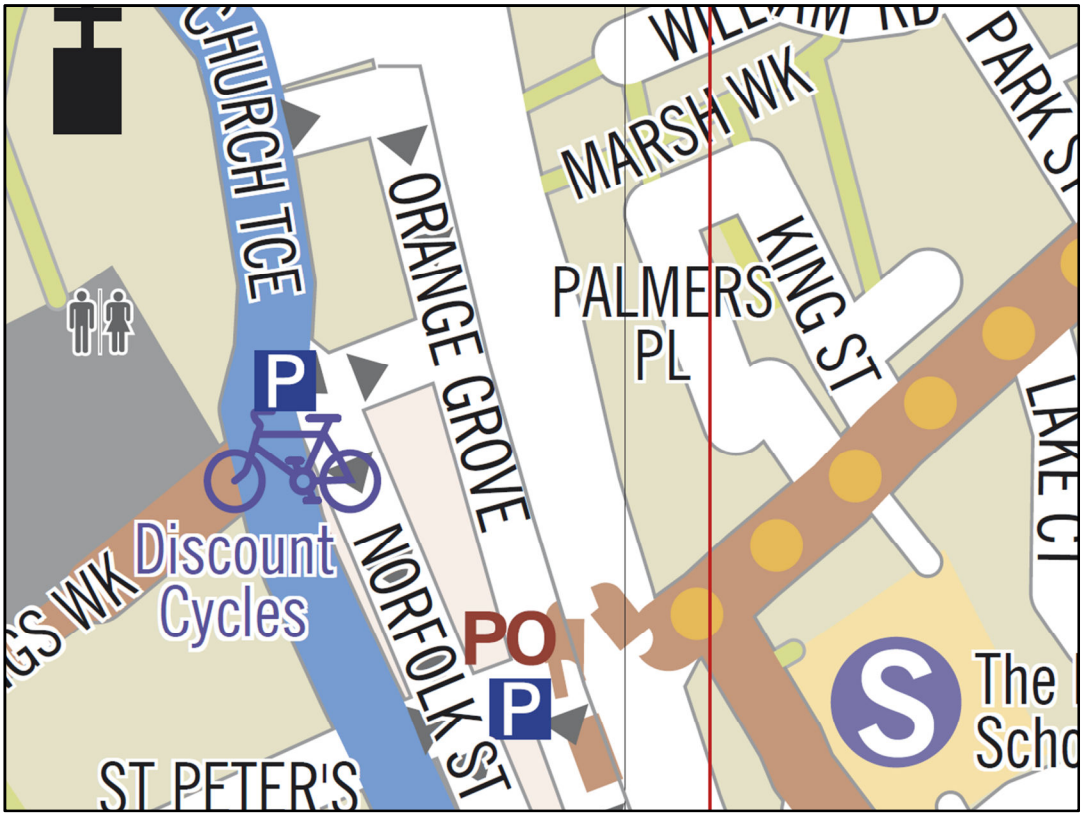


On a paper map road widths have to be exaggerated much more than on screen in order to allow large enough text for names to be readable. (This is also true at smaller scales on web maps, where road widths can be many hundreds of metres wide if interpreted literally).

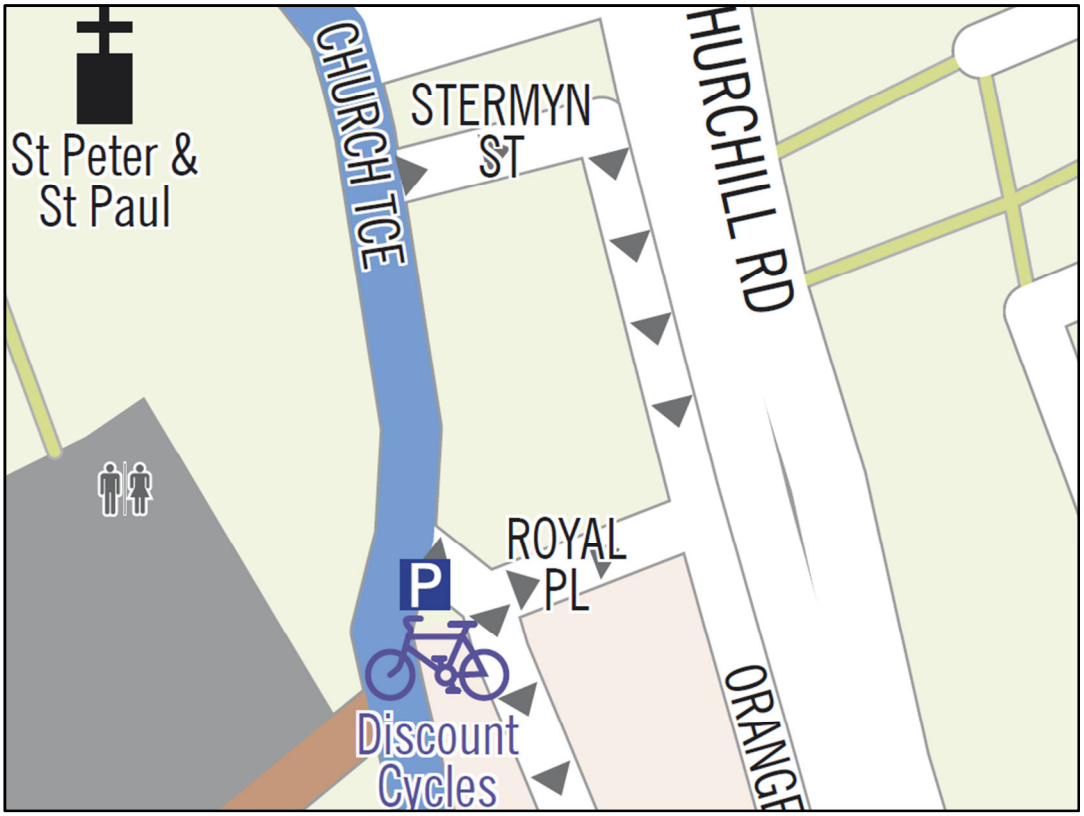
This leads to comments like “why is the post office in the middle of the road”? I think this could have been solved automatically, even in this case where it’s on a corner, but I actually did the shifting manually as with captions.



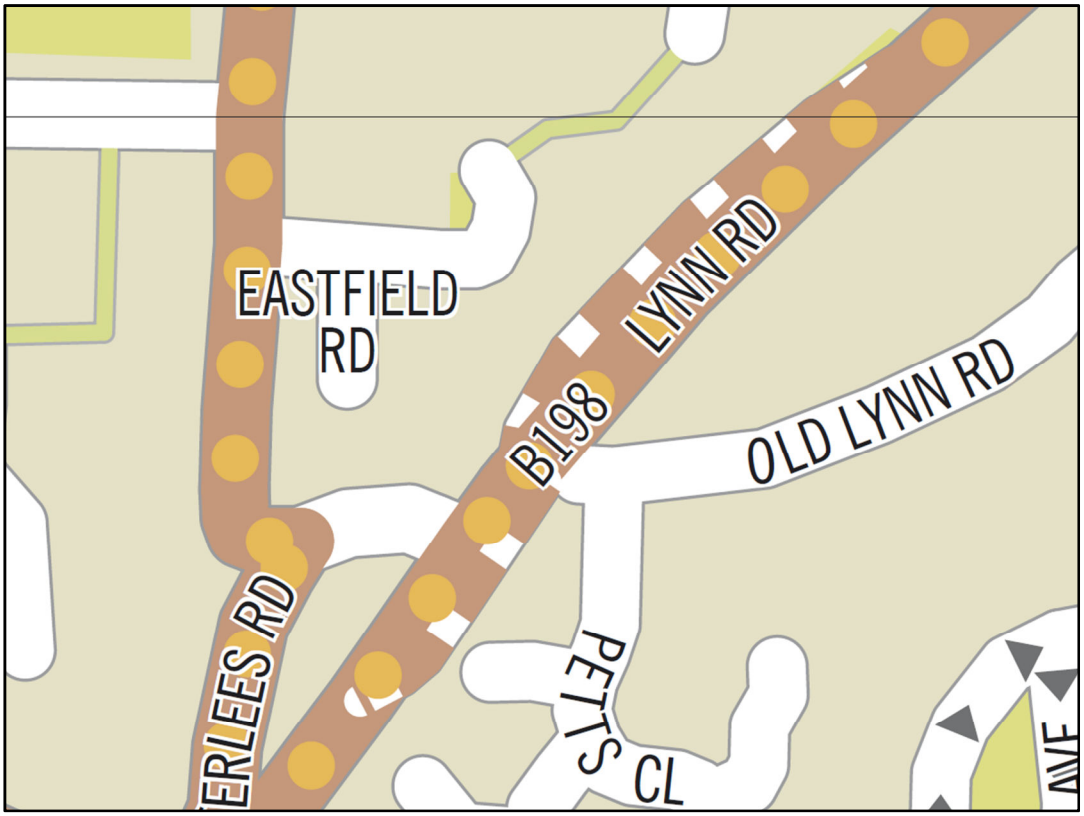
And this was the result. I changed the icon too by demand because, though I think it would have printed cleanly, on our proofs it just looked like a splodge.



I only actually modified the automatically rendered street graphics in one place. In this example, I added the line along the east edge of Orange Grove on top of the base map because otherwise the way painting algorithms work meant that it merged into the wide road adjacent to the east.

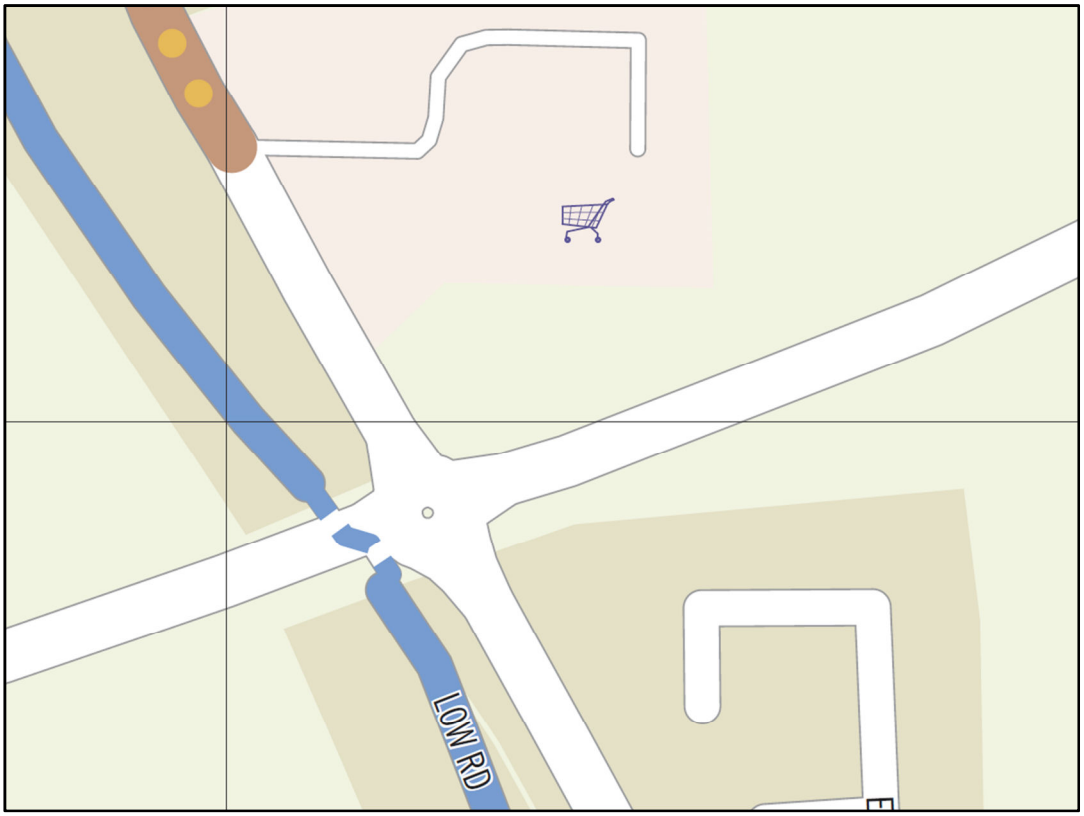


But that also led to artefacts in some cases, which in the end I accepted. For example the same area on the 1:5,000 inset gets these slivers between sides of a dual carriageway because the spacing of the carriageways isn't critically consistent. Again, a very hard problem to solve, even if the data model includes information that the two carriageways form part of a common street (see below)

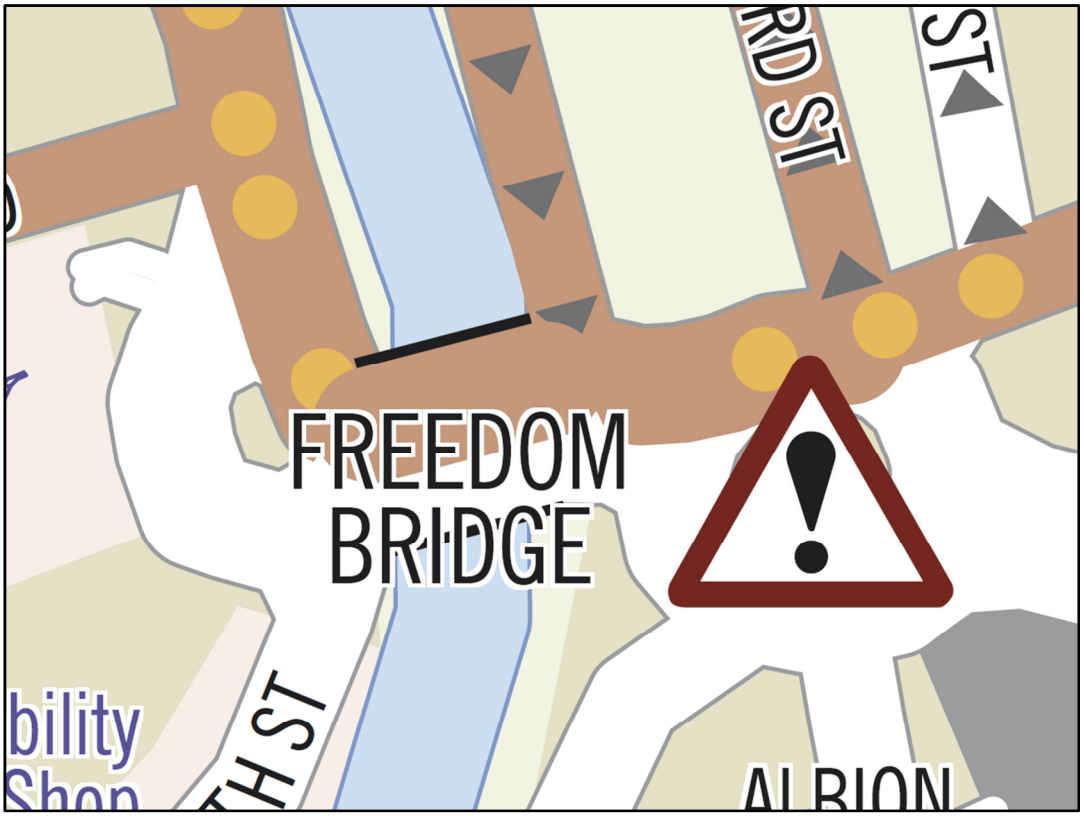

EASTFIELD
RD
B198
LYNN RD
OLD LYNN RD
ERLEES RD
PETTS CL
AVE

Automation

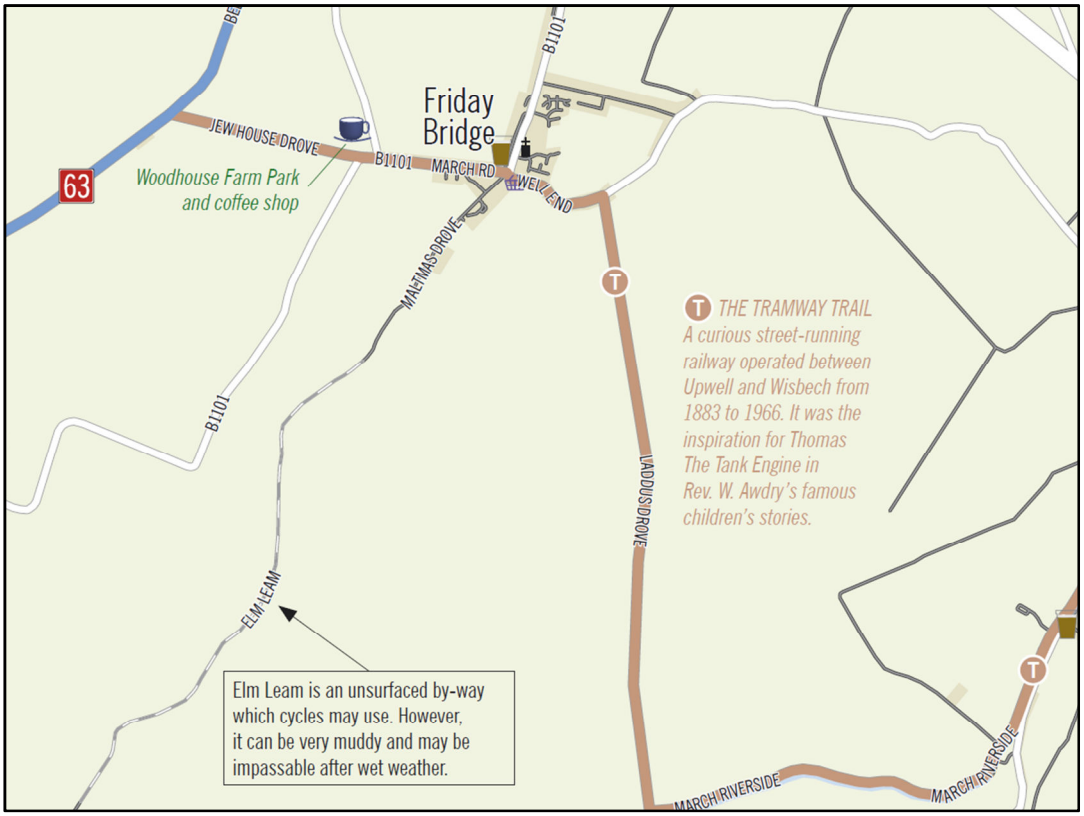
As you've probably gathered by now, I wrote my own renderer to do this. All our existing renderers make compromises and don't offer the control I needed over caption placement, which captions to omit and which to retain; and all work by rendering objects in certain classes, where I needed to show some and not others in the same class, for no obviously tag-able reason (the whim of the project team, essentially, which is what makes all the difference between making a product on spec and supplying one on demand to a specification, albeit a fairly loose one).



In some places I did augment the data model to avoid things like one way arrows on the lead-ins to roundabouts – whose islands disappear completely in any case when road widths scale up. So I used junction=approach on this.



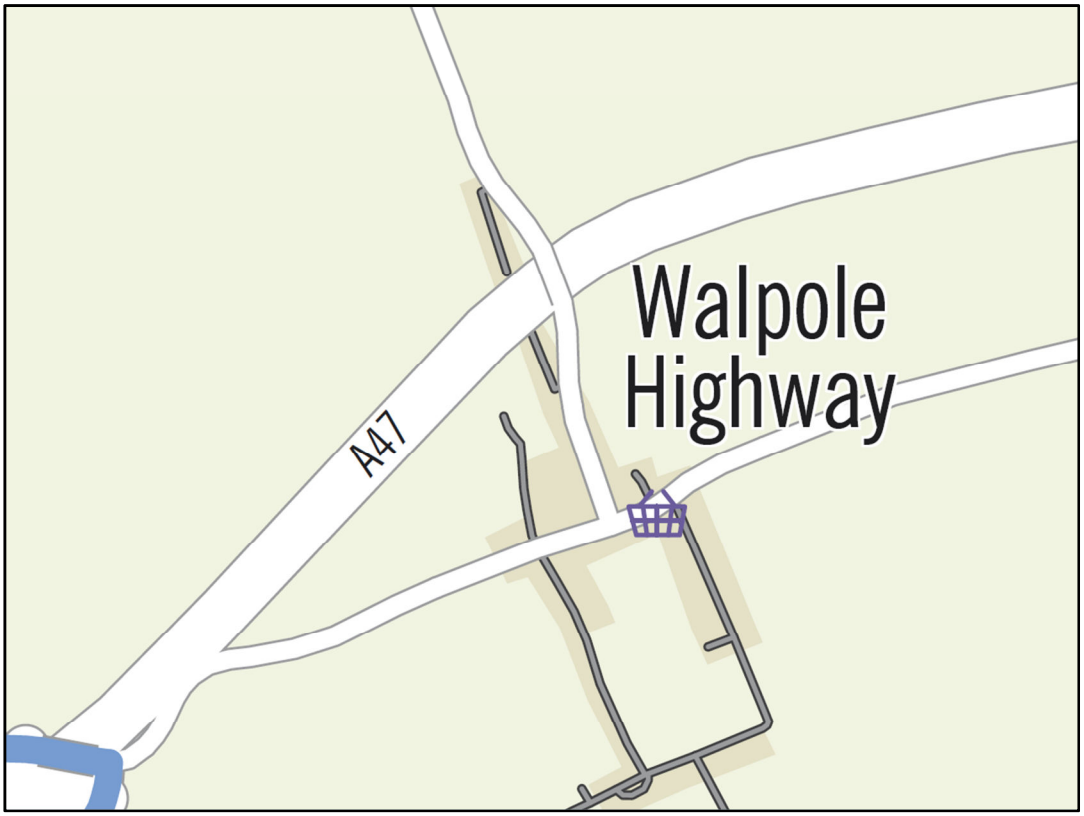
Similarly I didn't want to use one-way arrows on this almost-roundabout-cum-gyratory.



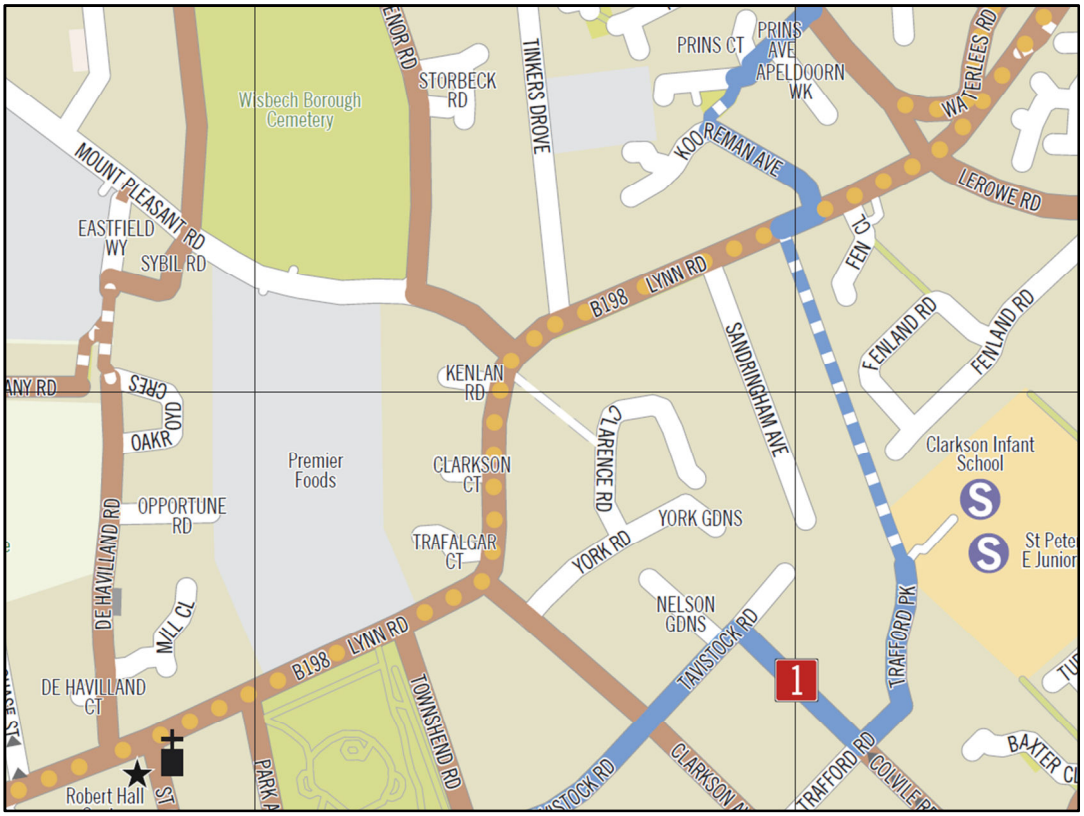
I only added manual graphics where they really weren't part of the map – like these notes about conditions, and the names we gave to the various routes – though I could have put the 'T' symbols and the like in automatically if it hadn't been quite a late decision to do this.

By the way, this is what the tramway looked like

Data model

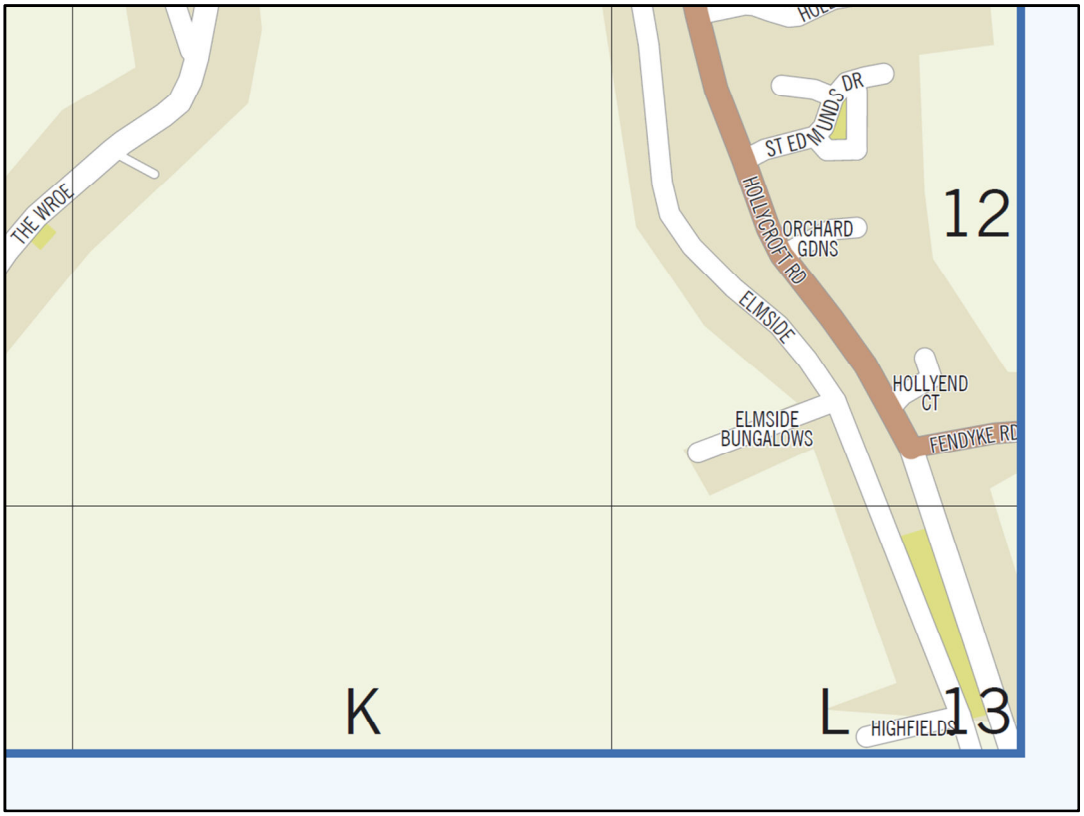


Our data model has certain features which make rendering more difficult than it needs to be. For example, any decent renderer has to determine what a ‘street’ is from the various ways which make it up, in order to position captions reasonably. We don’t know without adding to the data model (as I did do) when ways are part of the same dual carriageway, so captions get duplicated on opposite sides if done naively. Layers can produce little artefacts like the gap in the bridge above – only a small blemish, but offends my sense of design. And notice that exaggeration of road width has led to the bridge in the lower left being too short.



Here's an example of merging ways to form a street. Tavistock Road has to be split into (at least) two ways because one is part of NCN and the other not. The name, though, spans both (it would not fit otherwise, but someone looking at it would expect the caption to be easily shown).

Finite



Finally, a paper map has finite boundaries. Here the caption for Fendyke Road mustn't be half on the map, or just showing the first letter, just because the base map extends outside the page edges. I almost got it right too – except I forgot the 2pt blue border that was applied afterwards!

More unfortunate is that the paper was a given size and changing the scale to something odd, like 1:10,500 would have been silly. That meant I had to omit small parts of the two villages in the NW and SE of the map.

Would I make again

a real map

on real paper

for real people

and real money?

Would I do it again? Well I am doing – I'm producing another paper map this summer. If I end up doing lots more, I really need to make the somewhat ad-hoc tools I've developed so far be more robust and comprehensive. (for example, they don't know about coast for now).

There's lots of scope for this halfway house between manual tweaks and automated map production to increase the quality of graphic design we can achieve with our maps. Maybe there's even the basis for some production open source software in there eventually.