Welcome to my September 2014 newsletter. August was another quiet month, although the end of the heatwave means that there are now plenty of interesting designs in progress. As a result of some of the responses to my map of the month for August, I have now turned my attention to Boston, with three maps this month for you. There are several other exciting developments in the pipeline, so do look out for the October newsletter.

**On the web**
- Two of my designs feature in an article about mapping Berlin’s transport from Slow Travel Berlin. Berlin Global also has an article that mentions my reconstructed S-Bahn map from my April newsletter.
- Airline maps are a fascinating contrast to rail maps. Intended more for publicity than for planning: the older ones were never intended for personal network navigation in the way that a railway map is. It used to be the job of a travel agent to plan your journey and buy your tickets for you. The Atlantic Citylab ran an article in which they asked me for comments, and this feature was also translated into German.
- Some surprises, an article about my work on a Slovakian design website and another from an urban magazine in Hungary.

**Map research**
- Almost 400 people have taken part in my online internet survey, but only 15% of them are female! As before, it would be really good to have opinions and evaluations from more women, and so any help in spreading the word would be much appreciated. The survey takes around 15 minutes to complete, and you can access it at www.tubemapcentral.com/survey. I am hoping to have around 500 responses by Christmas, and when I reach this target, I will close the survey down. I am now developing a new version, this time using Berlin maps.
- In tandem with the survey, I now have some very interesting data collected by two MSc students at the University of Essex. Expect a major publication next year, full details when the internet survey closes.

**Maps of the month: Step by Step in Boston (Part 1)**

Boston has an old, but relatively small subway network, with three heavy-rail lines and a network of trams that go underground in the city centre. It is not a system that has caught my attention from a map design point of view, but the some of the responses to my New York Subway map last month made me think again. Some people have a very low tolerance of any geographical distortion on a railway map, and they have expressed their feelings about my work robustly. In contrast, the city of Boston recently shortlisted six subway map designs and invited the public to vote for their favourite (this can be a bad idea). Surprisingly, the winning design is one of the most geographically distorting diagrammatic maps I have ever seen.

Overall, the winning map, now the official design, has quite a nice shape, although the centre is a little bit over-expanded and diffuse – the most important part of the map should capture attention – and this particularly affects the Silver Line bus routes. High frequency bus services are included on the official map, although it is really the wrong scale to do this, and there are a couple of nasty spots (at Harvard Avenue and Reaville) where the configuration is open to confusion. The main problem is the Green Line streetcar routes on the west side of the map, deviating so much from geographical reality that local users might find this disturbing, or even misleading. A good diagrammatic map should simplify reality without going beyond people’s geographical comfort zones. If users reject a map and use an app to plan a journey instead, then it doesn’t matter how easy the map is to use, the design has failed. So, I asked myself the following question:

*Is a simple, coherent diagrammatic map of the Boston rail network possible, such that it includes all of the Green Line stops, and without too much geographical distortion?*

To answer this question, I started another design sequence. Anyone who wishes to really understand the elements of a rail network, and how they relate to each other and to the structure of the city, should embark on one of these. A series of maps should be prepared, each with the same design priorities, investigating the effects of different rules on the appearance of the map. So far, I’ve done this for London, Berlin, and Washington, DC, with at the very least hexalinear, octolinear, curvilinear, and multilinear attempts for every one (Madrid is next on my list). Looking at a geographical map of Boston, I didn’t see straight lines, This old
city has none of the grid structure of more recent American settlements, and the routes of the railway lines reflected this. Hence, a curvilinear design was my starting point, trying to simplify the line trajectories by smoothing away sharp bends and meanders. The result is not too bad geographically, and the qualities of these design rules are displayed at their best: sweeping gentle curves create an inviting, flowing design.

Most people expect diagrammatic maps to be linear, and so with an affirmative answer to my original question, the next step was to explore these systematically, trying to identify angle combinations that particularly match the structure of the network, thus permitting the simplest possible straight line trajectories. Two different angles are required to show the Green Lines well, and so dodecalinear was my next attempt (horizontal, vertical, and 30° and 60° diagonals). As ever, the different angles must be used with care: diagonals at different angles can clash with each other, and so it is easy for such a design to lose coherence, with the result that the benefits of the simple straight line trajectories are outweighed by the poor overall shape of the map.

Even with six different angles to choose from, in some cases bends in the lines are still necessary, and so my next attempt was multi-linear (any angles permitted). This certainly allows the straightest line trajectories of all, but users can find the waywardness of these maps disconcerting, even when usability studies show that individual designs are perfectly easy to use. Such maps can be tamed, for example, by keeping lines parallel where possible, but the overall sacrifice in coherence for the gain of a small improvement in line straightness is probably not warranted for a relatively simple network.

The Boston sequence concludes with at least three more maps and an overall evaluation in my October newsletter. You can subscribe to this at my web pages www.tubemapcentral.com.

Max Roberts, max@tubemapcentral.com