Many thanks to Geoffrey Arnold, Christian Burrell and also Roy Levien for sending me three different solutions to last month’s mathematical conundrum: given a line at a known orientation, at what point on the circumference of an ellipse would it be perpendicular to the curve? Thanks to their solutions, I was able rapidly to generate figures such as this one. And the result? You will have to wait for the July Map of the Month to find out. As a clue, I am exploring different design rules in relation to their compatibility with the structure of a famous city network, an oval network.

In the media, on the web

- A geographical track map of the New York City Subway, by a prolific local designer, is discussed by Gothamist. My concentric circles map of the network gets a mention.

- A transit map dominated by concentric circles has been released in Baltimore, Maryland. To my knowledge this is the first ever official use of such a design. It is discussed in Greater Greater Washington.

- DPI Magazine in Taiwan recently interviewed me for their Art Quarter special issue: Panorama of Illustrative Maps. It is beautifully assembled with many attractive designs, some well-known, and also some nice surprises. It doesn’t look easy to purchase, and the text is in Taiwanese, but it is perhaps worth obtaining for the illustrations.

Map of the Month: The five deadly sins of map design

When I give a presentation, I like to have a go at tailoring it to my audience. If this is taking place in a city, then a look at the local public transport maps is an obvious starting point. Sometimes I go further and create some original designs of my own. A really nice way to communicate good design is to investigate (deliberate) bad design, in which poor configuration of a map is taken to such an extreme that everyone can appreciate what has gone wrong, and hopefully people will then become sensitised to the frequent, but usually more subtle, aberrations of actual official versions.

Inevitably, London has featured most often on my illustrative maps, and for many aspects of bad design, familiarity with a city is needed in order fully to appreciate the adverse effects. Travelling by train across Europe to give a presentation in Vienna, I had plenty of time to think about using the U-Bahn network of this city to illustrate my points, and six simple maps were prepared and presented. On returning home, I worked on these some more, and here are the results.

First we need a baseline; a competent map in which the topographical distortion is defensible and not sufficiently severe to annoy anyone except the small minority of purists. Octolinearity is a good choice for this; most people will be expecting these angles, and the design criteria of coherence and harmony will be straightforward to adhere to.
From this baseline, poor *simplicity* (of line trajectories) is easy to demonstrate, and for this map (left), although it is slightly more topographically accurate, the utility added, in terms of information needed for planning a journey, is zero.

**Coherence** – how the lines relate to each other to make the overall design organised and orderly – is subtle and multi-faceted. A multilinear map (below) illustrates this criterion with angles chosen such that not one single line is parallel to any other.

*Harmony* refers to the overall visual aesthetics of a design, that are independent of usability, and I have long argued that decalinear angles are naturally discordant, so that a map designed in this way (below), no matter how carefully, will be visually attractive only to a minority of users.

The *balance* of a map can be ruined in many different ways, but below I have over-expanded the centre of the map, with the suburbs crushed into the periphery. Sometimes less is definitely more, and a centre should only be expanded as needed to for legibility.

The need to avoid conflict with people's mental maps of a city will be shown by any design that makes an audience of locals wince. For people who know Vienna, the map on the left twists up the city in all sorts of bizarre ways, but people who don't know this might feel that the design has no obvious shortcomings at all. Hence, a map with poor *topographicity* can really only cause distress to people who know the city well, provided that it is not also misleading people into taking inappropriate journeys.

Six maps of Vienna show what can go wrong when a designer doesn’t quite understand how a schematic map might assist a user to navigate a network. This exercise could be repeated for any city, and anyone who truly understands effective design should be able to produce recognisably good and bad maps like these to order. If I was commissioning a map, I might even ask the shortlist to create six prototypes for another city, just to ensure that I could find the right person for the job.

*My to-do list is still full to bursting point, but Map of the Month for July is completed and ready for release. To see it first, make sure you subscribe to my newsletter via my webpages at www.tubemapcentral.com.*

Max Roberts, mjr@tubemapcentral.com