

## Real-Time Schematics

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Hosted at ITIS Holdings PLC



### Satnav for public transport

The goals of this work are to produce an automatic metro map layout tool suitable for use on mobile devices and to explore the use of such schematic drawings in road networks.

Travellers on public transport networks have long been used to schematic metro maps, such as that of the London Underground. These maps reduce the complexity of the network and so ease the tasks of route planning and navigation. However, graphic designers spend great effort when producing them by hand. We are attempting to produce such diagrams with automated layout methods.

### Technical approach

We are currently exploring the design of schematic networks, defining aesthetic features of the diagrams and adapting graph theoretical concepts to measure the quality of the maps. Such features include: **even spacing of stations, lines running at angles with 45 degree separation, and no occluded or ambiguous labels.** We will then attempt to optimize the layout using search techniques so that these aesthetics are improved in the map.

Other challenges include the intermittent connectivity (GPS and internet) on mobile devices, as well as reduced screen real estate and limited processor speed.

### Potential for exploitation

In recent years, there have been great increases in the use and capability of small Internet devices, and an imperative to improve the efficiency of the UK's transport infrastructure. Encouraging people to travel on public transport motivates our work on metro map layout. Smartphone app stores provide a ready exploitation route for such inventions.

We will also investigate schematics for road network data, alongside industrial experts. Possibilities for exploitation include applying schematics in satellite navigation systems to generate overviews of long routes. It may also be feasible to display alert information on sections of the road network, with a web based schematic diagram.

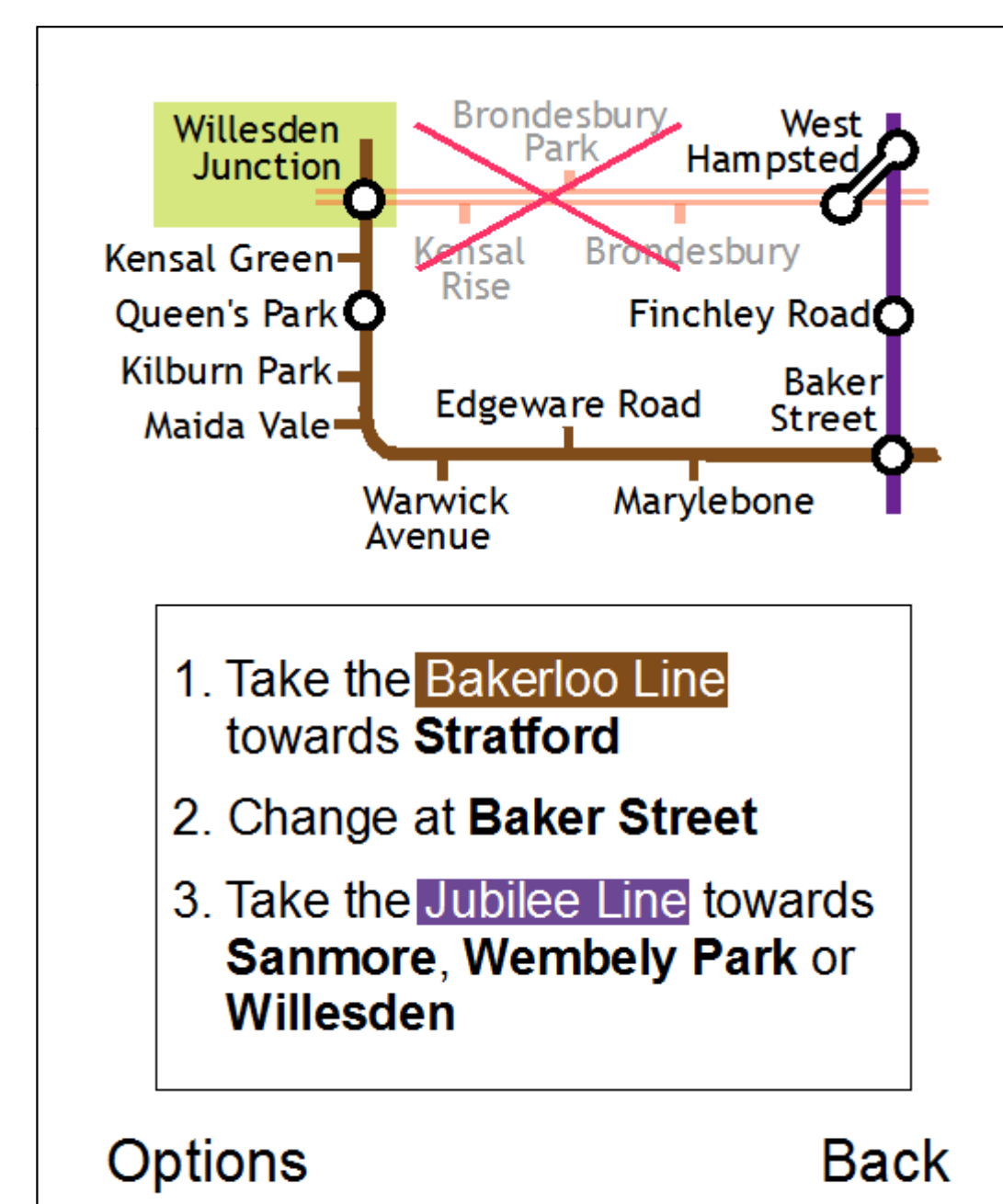


Fig. 1: Mock-up of route information

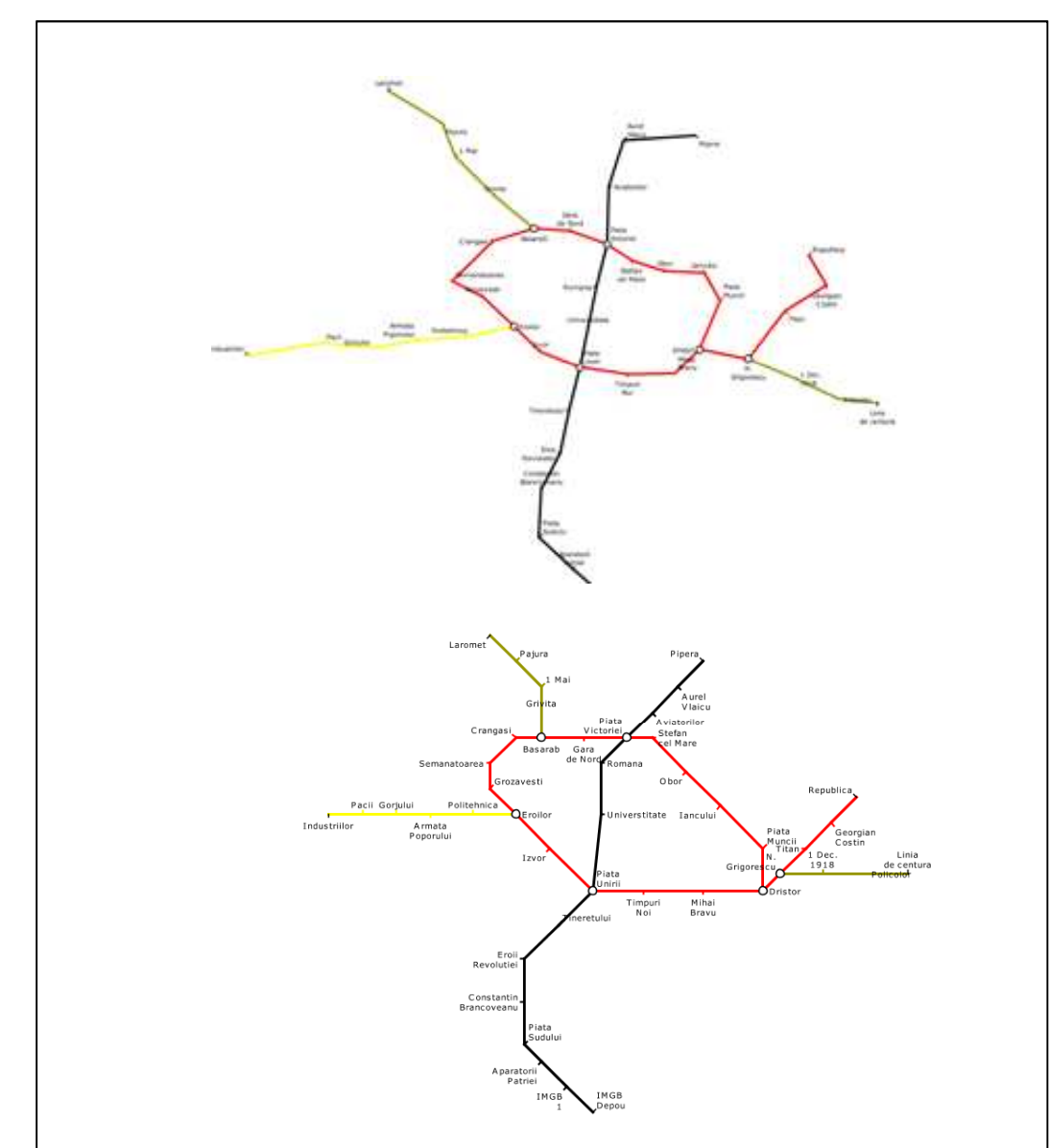


Fig. 2: Metro map layout for Bucharest. Geographical (top) and after layout (bottom)

### My Industry Fellowship...

Has allowed me to develop contacts with businesses that have a close interest in my work and has provided time to work on research relevant to industry.