

## Road Show Reports

Southampton (Ordnance Survey) 10 July '02, page 1

**The Design Group Road Show was hosted by the Ordnance Survey, in Southampton.**



There was a very good turn out, with delegates from all areas of cartography attending. As usual there were a range of discussions undertaken, as well as a practical exercise on designing maps for display on the WWW. Alan Collinson was unable to attend and was missed by all involved. Thanks go out again to the Ordnance Survey for generously hosting such a successful event.

### Education and Training Issues

The day began with a discussion on the state of cartographic education in Britain and the requirements of the cartographic profession for training and education.

The first session was requested through the BCS Education Committee. This committee is reviewing the whole range of education and training in modern cartography. In initiating the discussion Tim Fearnside, Chair of the Committee, set a number of questions to the delegates.

1. What does modern cartography offer to the user world?
  - Whither the map?
  - What is a cartographer today?
2. The modern role of education and training in the cartographic profession today is question of providing courses and syllabuses that satisfy the needs of the profession. Today this means instruction targeted at short-term skills, ongoing career development training and education, and in depth education courses and research opportunities. In addition retraining and "top-up" courses for newcomers to the profession from other disciplines is also required.
3. What role can training and education play in
  - promotion of the profession?
  - assisting users to gain maximum value from map data and products?
  - professional and career development?
  - addressing employers' needs?

Do we need specialist subject trained staff any more?

- Can staff required be suitably trained on the job?

Is the perceived/observed fast turnover of minimally trained staff acceptable?

- Is it economically viable or desirable to promote a career development structure to retain valuable staff?
- What happens when existing experienced staff leave?

What are the requisite skills nowadays?

- Can they be served by traditional courses or are they better served by short modular options from say a day's duration through to weeks of day release or equivalent?
4. Cartography's profile is rising, more and more applications of mapping science are creating a new realisation of the capabilities of cartography in conjunction with other spatial information and geomatics applications, but the questions raised above need to be addressed urgently.
  5. The layman seems to have a soft spot for maps and mapping and interest in cartography is heightened by books such as
    - Cowan, J., 1998, *The Mapmakers Dream*, Hodder
    - Sobel, D., 1998, *Longitude*, Fourth Estate
    - Keay, J., 2001, *The Great Arc*, Harper Collins
    - Winchester, S., 2002, *The Map that Changed the World*, Penguin
    - Harvey, M 2002, *The Island of Lost Maps*, Phoenix (Orion Publishing Group)
  6. Yet while everyone feels they can draw and perhaps read a map, we still see some dreadful examples alongside effective ('good'?) maps. This conundrum actually tends to reduce the status of cartography and mapmaking in the professional hierarchy. Another aspect to be addressed by the profession.
  7. Briefly the meeting considered 'What is a Good Map?'
    - Cartographers (obviously) make 'good' maps and others (possibly such as graphic artists and GIS 'rs) don't make good maps - do we have a case?
    - The difficulty is, if readers don't realise what a better map can do they accept others. Also since map 'value' is very much in the eye of the beholder, how can we be certain that the beholder appreciates the content and information provided? The "simple" communication model i.e. reality > cartographer's interpretation > map is no longer sufficient... we need to appreciate and train, not only cartographers, but also the users. If we don't promote our special way of seeing and reporting and presenting to users, cartographers will be left in the cold and others will carry on reinventing the cartographic wheel in our absence.
  8. Can we promote the profession's profile?
    - More publicity - blow our trumpet, be less conventional and more imaginative and innovative. Look considerably beyond the printed map into other applications and media.
    - Promote more research into mapping functionality and techniques especially applied research such as new techniques for PDA presentation
    - Enhance the experience of school children, teachers and students in using, learning about and appreciating maps. Raise profile of cartography in National Curriculum.
    - Assist existing employers and new potential cartographic employers by encouraging the development of a variety of different approaches to education and training.

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The average perception of a map in UK is of an OS product, probably a Landranger sheet (confirmed by student comments). This is not a desirable state of affairs even for the OS. It stifles their efforts to widen mapping opportunity and does not encourage interest in alternative supplier solutions. It is said "70% of the population have never bought a map" (OS figure). Therefore there is a huge number of theoretical customers out there to be won over.

## 9. Training

### Industry training and requirements

- UKHO: Training courses in form of BTEC and equivalents are drying up locally. They are seeking alternatives and have offered modules on marine cartography for accreditation by FIG/IHO. They would be quite happy to have BCS accredit courses as the major organisation in British cartography. (It was noted that BCS will offer their logo in future to register courses or events of cartographic relevance... The concept of accreditation is another matter!)
- The OS have also revived their cartography section and train staff over a range of scales and techniques. They will employ individuals from 4 GCSE level into their schemes. Often today they find graduates applying for such posts.
- The longer term outlook for career development is not well defined and actually soon moves from the practising cartography level into management, creating a demand for different skills.

This introduces the aspect of course content. There is a demand for cartographic skills, but also for the generic and transferable skills being promoted in all levels of training and education at present. In higher-grade courses, this clearly will require to extend into management skills.

Government training policies at present are based on employer driven requirements and focused on (industrial/ commercial) sector based training. This makes life for cartographic courses rather difficult since it ranges over a wider section of industries and commercial functions. It was suggested that the graphic design and information communication areas might provide a more realistic home than the older areas of building and construction, printing or publishing.

Historically it was suggested commercial map publishing benefited from trained individuals who moved on from government organisations, such as the OS. Today it is a different matter. Knowledge and skills are required from scratch, alongside initiative to develop abilities. But are these required skills actually based in cartography specifically?

It was noted that the industry generally displayed an apparent lack of innovative cartography. Is this due to production inertia, lack of ambition, pressure from clients, traditional tendencies. On an associated topic i.e. research, a lack of specialist investigation into innovative and creative cartographic applications and products was perceived.

## 10. Conclusion: The way forward

A vast range of options is possible from the educational point of view. For example, Part/full time courses, standalone modules/courses, on/offsite facilities, training vs information events, or web based distance-learning methods.

Government statistics from the DTI suggest a split for employee skills between

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- Design/creative 21%
- Production /technical 36%
- Administration/others 43%



Priority training areas for cartography could be divided into the following:

- Editing/ planning/ specification development
- Production methods/ technical implementation
- Design (including appropriate graphic design aspects)
- Administration/other.

In terms of content for standalone modules in particular, the content can be employer driven almost entirely while obviously a course presented by an institution may follow a required syllabus or be designed to attract a broader range of students than only cartographers.

[I would be interested to follow up this session with more contacts through the Corporate Members Group and other organisations in affiliated disciplines.](#)

[Some published details and statistics on training and reviewing educational approach.](#)

## [Opportunity for all in a World of change](#)

Opportunity for all in a world of change is the Government's White Paper on enterprise, skills and innovation. It sets out the next steps for Government in helping individuals, communities and businesses to prosper. A Summary of the White Paper is also available along with regional supplements, a manufacturing supplement, and the second edition of the UK Competitiveness Indicators. Associated documents cover Clusters, Broadband and Skills issues.

<http://www.dti.gov.uk/opportunityforall/>

To be successful, it is even more important for businesses and individuals to learn new skills, be more creative and innovative and use their knowledge to produce higher value added goods and services.

[http://www.dti.gov.uk/opportunityforall/pages/exec\\_sum.html#goal](http://www.dti.gov.uk/opportunityforall/pages/exec_sum.html#goal)

Employers must recognise their competitive position increasingly rests on how they develop and use the skills of all their people. Businesses must invest in new products, seek out new markets and develop new partnerships.

Equipping Individuals with the Skills, Abilities and Know-how

The Government will:

- enable students to learn in ways which encourage them to be more creative and enterprising;
- reduce the number of adults with literacy and numeracy problems by 750,000 by 2004 and spend an extra £150 million on literacy and numeracy training;
- invest £100 million to develop vocational specialisms in colleges and more resources in reformed Modern Apprenticeships, and rationalise vocational qualifications;
- train up to 10,000 more people a year in information and communication technology (ICT) skills through new advanced learning programmes and widen

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- the pool of recruitment into ICT by moving 5,000 unemployed people into ICT jobs over the next three years; and
- ensure that employers invest in the skills and talents of all by setting clear and auditable targets for training, investing £45 million in a smaller, stronger network of National Training Organisations and helping small firms to collaborate on training.

<http://www.dti.gov.uk/opportunityforall/pages/summary.html>



### The Different Styles of British Mapping and Schools of Design



After lunch we continued with a look at a variety of map examples brought in by those attending. A wide range of maps were displayed which fitted the criteria of 'examples that people perceived to be typical of British mapping or belonging to particular school of design.'

### Defining the Definitions - Convention

A session during which the use of convention was analysed followed the review of the map examples.

The positives and negatives of using convention, primarily in symbolisation and colour were discussed.

The positives of using convention included the increased communication of symbolised features if conventional forms and colours were used. Due to the familiarity of many symbols, often as a result of repeated use of styles based on those adopted by national mapping agencies, the user was perceived to gain a certain amount of security and as a result feel more comfortable in their use of the maps produced.

The negatives of using conventional styles is that there is a lack of innovation in the design of maps nowadays. Most maps appear to be a simile of those produced by the major map producers, and especially in maps used as navigational or general reference tools, there has been little change in the styles or approaches to their design over recent decades.

This stagnation in the field of design caused concern amongst those attending the design group as it was perceived that cartography has a need to move forwards if new markets are to be developed.

It was concluded that those conventions, which are known to increase the communication potential of the key map elements of a particular form of mapping, should be maintained. Whilst the design limits of other elements within the map should be pushed further, thus slowly expanding the boundaries of design.

Certain conventions were seen to be necessary, for example the employment of hill shading illuminated from the NW. If another direction was used, the form of the land changed dramatically, with valleys becoming ridges, etc. It was argued that this effect would only occur with those who were familiar with hill shading and a NW lighting effect. How would someone who had never seen hill shading employed on a map interpret the relief depicted with the illumination coming from different directions?

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The discussion on convention broadened to include the lack of innovation in cartographic design. People were asked where has innovation gone from cartography and why are we so afraid to step away from the accepted norm when designing new products? The answer given, especially from those attending from commercial cartographic companies, was that when designing

a new map there is neither the time nor the resources to increase the gamble taken on the success of the product by experimenting away from the norm. Basically if a style works then it will keep on being employed. The danger is that the market becomes saturated with maps that all appear to be the same and finally the number of people purchasing such maps will decrease. Therefore, innovation in the design of maps needs to be encouraged to broaden what is already known to be a small market, that of the map buying public (Through their research the OS have discovered that only 30% of people (UK) buy maps).

But the problem still exists that in the commercial world the luxury of experimentation often results in high costs and possible failure of a product. A possible solution is to encourage innovation in cartography through the educational establishments, encouraging students of cartography to push the design boundaries and offering support, maybe through BCS awards or sponsorship. Students not only have the opportunity to experiment with design without financial risks being taken, but have also not yet had their imaginations stifled by commercial pressures or the use of house styles.

Another worry was that the same form of mapping (styles) are employed what ever the display medium. For example maps for display on the WWW or for use with PDAs (Personal Digital Assistants), at present, all appear basically the same. The design of maps needs to be lead by the technology available and new a technology should facilitate new cartographic designs and thus the development of new conventions for use with those mediums. At the moment we seem to be thinking 'how can we fit conventional mapping into new technologies?', rather than 'what does this new technology allow us to do cartographically?'

This subject will no doubt be discussed again at future meetings.

### Mapping on the WWW

A number of examples of existing maps displayed on the Web were reviewed and everyone agreed that in most cases their design was not at all suitable for display on screen (although most of the examples were selected to demonstrate how not to design maps for display on the WWW). A number of key points were then explained which should be considered when designing maps for display on the WWW and these were applied during a practical exercise. The exercise involved the delegates looking at a series of paper products and then outlining the changes to the designs that would be necessary if the maps were to be displayed on the WWW.

'A Basic Guide to Design for the Web' was put together to aid in the practical exercise. [These notes can be seen on the next page.](#)



The Design Group intends to continue to give advice on issues relating to mapping on the WWW, for example, issues relating to the security of data and to copyright.

### Quiz

The Design Group Quiz was held as usual in a local port of refreshment. Those attending rounded up the day with a couple of drinks (soft for those driving) and the usual intellectual challenge that is the Design Group Quiz. Congratulations go to 'Umbrellas R Us'

the winning team.

## A Basic Guide to Design for the Web



The main factors that influence web map design include the user, the provider, the viewing environment and the map content (Kraak & Brown 2001). Many of the considerations involved in good web page/map design are inherent in cartographic design and therefore of common knowledge to the cartographer. However, there are a number of key elements that should be taken into account when designing maps, graphics, etc.

for display via the World Wide Web (WWW). A basic guide to some of these and especially those relating to cartography, are set out in the following (although not exhaustive) notes. The key point to remember is to test, test and re-test your designs before publishing them on the WWW.

Most web sites are designed to be viewed across a variety of platforms (Mac, PC, etc.) and browsers (Explorer, Navigator, etc.). Unless you can identify the main platforms and browsers that your audience will be using, it is important to design the included elements so that they can be viewed across those that are most commonly used. You will not be able to please everyone, but your designs should be accessible by the majority of your users. There is no point in including features, e.g. videos, sound, etc. if most of your audience do not have the facilities to access them.

Key elements to be considered when designing your Web pages

### 1. Navigation and User Friendliness

- It is important that your web site, and the pages that make it up, can be easily accessed and navigated through by your potential user. A web site is not like a book with a logical start and finish point. Within most sites the 'pages' are interlinked in what can be imagined as a spider web format, along with access out to other sites, e-mail links, etc.
- It is important for the user to feel that the organisation of your site is intuitive and therefore the closer you can make the site resemble the book, the easier your user will be able to navigate through its contents. Remember that it is how it appears to the user that is important, not how you have created it.
- It is very, very easy to put information on the WWW and therefore it is fundamental that all information contained is up-to-date and correct. A site (depending on subject) should be (obviously) updated on a regular basis and all e-mails relating to a site checked and responded to, if possible daily.

2. Most users like to have the feeling that they are dealing with human beings. To give the impression of human contact you should include some method of contact in your site, for example, e-mail links, contact details, etc.

### 3. Page Design/Layout

- When designing for hardcopy, you have certain restrictions: potential use/users, paper size, cost, etc. that influence the space available for your designs. When designing for viewing across the WWW your main restriction is screen size. There are many screen sizes now available, but in general (unless you can identify the average screen size of your potential market) you should base all designs on the average minimum screen size of 13" (9.83" x 8.07" (249.61 x 203.52mm)), giving you a working page size of 640 x 460 pixels, but please note that this area

will be reduced further as up to a third of the page can be taken up by the browser windows and title bars.

- It is best not to force your users to scroll excessively around the page to view the included detail. At all costs, horizontal scrolling should be avoided and although people are usually happy to scroll vertically down a page, you can aid in the navigation of the page and site by using internal links to key areas/subjects and designing your information/graphics to fit into screen-sized chunks.
- As with any form of design, there are four main elements that should be considered when designing the page contents and layout - these are alignment, proximity, repetition and contrast.
- Most users are not as familiar with navigating around web sites (especially as most sites vary greatly in format and appearance) as they are the bound book or flat sheet. It is therefore very important that you help the user as much as possible to navigate through the presented information. One way to do this is using link buttons, background colours, images, and formats, etc. that are the same throughout the page, adding to the consistency of the site's appearance. Try not to have too many navigation buttons as this will make it difficult for the user to remember all of their meanings, although you can use 'roll-over' text descriptions.
- There are many ways to help users to move around between different sections and pages of your site. You can use navigation (link) buttons or graphics, image maps (images with hot-spots links), internal and external links, page links (anchors), drop-down menus, separate link frames, etc. Whichever method you choose, be consistent in your design and get as many other people to test your site as you realistically can, to ensure that your site is logical and facilitates use.
- When designing a site, there is a vast amount of information that you can include - in fact the only real limits are your imagination and the server space that you can afford. However there is little point in including pages of information that have been done (often better) elsewhere, especially if the subject matter is not your core business, but simply supporting your subject matter. If you can find suitable information elsewhere on the WWW, it is a good idea to put links out to other sites from within your site. This allows you to focus on the main subjects and to give the users alternative or additional sites. The use of external links can be of a great benefit, but avoid their overuse and do not lead your user out of your site too early - for example by putting external links on the home page. You want to keep people on your site for as long as possible, without them feeling trapped.
- One of the main advantages of using the WWW is the speed at which you or your potential users can access information. One drawback of this is that people are very impatient and unwilling to wait for large, high resolution files to download. Try to keep file sizes to a minimum and/or use the various techniques available to aid the downloading of images, for example, using interlaced images that allow the graphics to build up in layers whilst the user is free to view the remainder of the page's contents.

## 4. Output

- The majority of users of the WWW do not have ready access to either colour plotters or output devices larger than A4. It is therefore important to design your pages and associated graphics to fit onto A4 pages and to be printable in black and white.

## 5. Testing

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- It is very, very important to test (view) your site on all of the platforms and through all of the browsers that your users are likely to use. The main reason for testing is to ensure that all of your designs are displayed correctly - for example, the colours, text styles, etc. are as originally designed.
- Another reason is to check that all of the files that make up the site (including all links, internal and external) are correct and active before you post the site to the host. The easiest way to do this is to copy all of the files to a new folder and view the site through a variety of browsers.

## Key elements to be considered when designing maps to be viewed on the WWW



Designing maps for the Web is a new and challenging task... cartographers must consider both the limitations and the opportunities of this medium... even experienced cartographers will have to adjust their map design habits." (Kraak & Brown 2001)

### 6. Resolution

- Images, including maps, photographs and graphics which are to be displayed on the WWW, should be generated and displayed at 72dpi, as this is the average user's screen resolution. Images set at a higher resolution will just take longer to download and the user will probably gain no benefit from the increased resolution on screen.
- If you wish to enable the user to print out a higher-resolution copy, it is best to have a printable (non-viewable) version saved at between 150 and 300dpi (depending on output device).
- The low resolution of images for screen viewing will mean that you may have to generalise your maps to a greater extent than if you were designing for output to hardcopy.

### 7. Colours

- When designing web pages and their contents you should be working in RGB. In HTML (HyperText Markup Language) colours are described in hexadecimal, for example #66FFCC
- Many colours are not viewable as being the same over the different browsers and platforms and in general only 216 of the 256 index colours (usually displayed by most monitors) can be said to be 'web safe'. Most web design/editing and graphic/illustration software will have their own web safe colour libraries.
- Contrast is important, not only for designing maps and graphics to be printed from the web, but also as the 'brightness' of screens varies. Not only do individuals have their monitors set up differently, but Mac and PC screens differ in their luminosity (Macs being brighter). The use of LCD displays on laptops (or projectors) can 'wash-out' colours, making them look paler than they would on a standard screen.
- Ideally maps should be designed with the colours selected varying in value, above changes in hue or chroma, as this will give the best contrast for printing in black and white.
- The low resolution of most screens also means that slight variations in colour are difficult to identify. Therefore the amount of contrast between colours should be greater than for printed products.

NB. Web safe colours relate only to flat (discrete) graphics, not to photographs (continuous images).



## 8. Text / Point and Linear Symbols

- Because of the lower resolution of the screen compared to hardcopy/printed products, you should increase the size of map text, symbols and lineweights.
- Many fonts may not be available to all of your users and therefore if you wish to use a particular font, type style or effect, it is best to convert map text to raster. When rasterising text, because of the low resolution of images for the web, it is important that text be no smaller than ten point, and that italic texts, text effects and dramatic changes in type orientation be avoided as text strokes may appear jagged and difficult to read.
- As with text you should avoid detailed point symbols and fine lineweights (especially on irregular linear symbols) that may appear fragmented or pixelated at low resolutions. Generalise all symbolisation to a greater extent than for hardcopy products.

## 9. Viewing area and Scale

- When designing the maps for inclusion on your site, as with the whole page, try to work in screen-sized segments, so that the user can view the whole of an area in one go. If you need to display a larger area than the screen size allows, show the whole area at a smaller scale allowing the user to select the areas they wish to see at larger scales.
- This selection can be achieved in a variety of ways, but the easiest is to use an image map, where the areas of the locator map can be clicked on and are links to larger-scale maps on a different page. This gives the user the illusion of 'zooming' into the map, whilst allowing you to design the maps at a variety of scales (with different levels of detail included) and still keep file sizes to a minimum.

TEST, TEST and re-TEST your site

I hope that these notes are of some help. The Design Group will expand on these elements at future meetings to include, for example, information on security and copyright.

### Susie Hart 2002

*Kraak, M-J & Brown, A (2001) Web Cartography New York, Taylor & Francis*  
*Cartwright, W et al (1999) Multimedia Cartography New York, Springer*