

# Caliper Corporation

PROFILE AND SOFTWARE REVIEW: No. 2

*A new name has appeared in the UK GI market – Caliper Corporation. With its Maptitude commercial geographic information and analysis software package priced at a very affordable £400, this new entrant looks well positioned to expand the market for GIS even more widely throughout the UK and, in the process, help more enterprises adopt GIS technology and incorporate it into their IT armoury. John Fox-Clinch looks at the company and its products and learns more about its plans.*

## Origins and company development

Who is Caliper Corporation, where does it come from and why have most of us in the UK not heard of it before? The company, whose global headquarters are in Boston, Massachusetts, was founded in the early 1980s. In addition to being a GIS vendor, it is also a consulting and R&D provider offering professional services in quantitative management consulting, transportation and decision-support systems development. Caliper has fast-growing user bases not only in its home marketplace of North America but also in South America, Australia, parts of Asia, South Africa and in Europe, with a strong user base in Italy. It has tens of thousands of users worldwide in many different fields, including government, education, business, retail, the financial sector and in location-based services.

But it is Caliper's broad range of GIS products, and their highly competitive

pricing and functionality, that have really put the company on the map globally. The company attributes its international success to the low cost of its products, their ease of use and flexibility and the easy access they provide to bundled data – and it is this combination that the company now wants to bring to the UK. Caliper's products all run within Microsoft Windows 98, Me, NT 4.0, 2000, or XP. Caliper perceives a significant, untapped demand for a fully functional desktop GIS for £400.

## Product portfolio

Caliper has a complete family of GIS products:

- Maptitude, a full-featured geographic information system
- GISDK, a software development kit
- TransCAD, a transportation geographic information and analysis software package
- A full range of web applications.

## Maptitude

So, what are the features of Maptitude, the company's flagship product? Maptitude not only costs around a third as much as rival packages but, the company claims, it provides all the functionality you would expect from a desktop GIS such as overlay, network analysis, 3D and thematic mapping, geolocating capabilities, queries and labelling in a single, easy-to-use and easy-to-learn program. The company emphasises that its Maptitude documentation gets positive reviews from educators and other users because of its clear explanations and frequent, applied tutorials using supplied data.

Other features include context-sensitive, on-line help that employs a table of contents, extensive key-wording and other tools to make it easy to get help when you need it. Also, users can organise saved maps into one or more map libraries for quick and efficient data exploration and access. Geographic files can be

directly displayed in ESRI Shapefile, MapInfo TAB file, and Oracle Spatial formats. The system can also import Ordnance Survey NTF data and Intergraph Design (DGN) files, among many others. In addition, users can add imagery layers to maps using a variety of popular formats including GeoTIFF, LizardTech's MrSID and Earth Resource Mapping's ECW images. Maptitude also supports many other import and export formats to make it easier to create maps, undertake analysis and to migrate from existing systems.

## GISDK

GISDK routines are accessible via OLE Automation with Windows development products, setting up a pathway for users to implement a web solution. Consequently, if users wish to program and add new capabilities, or to make things easier for other users, GISDK makes this possible and is now included with all Caliper's software. It lets you:

- create a simple add-in with a dialogue to handle a specific task
- create new menus and toolboxes
- use Maptitude as an Automation Server for applications from another programming language.

The standard bundled data pack – which, it is claimed, is as good as any available with comparable software – has a comprehensive library of worldwide maps on CD, including boundaries (see 'Maptitude data' panel for further details).

## TransCAD

Caliper's other main product family is based on TransCAD, a GIS designed specifically to support transport applications such as planning, facilities management, public transit and logistics. It is used widely in both the public and private sectors for transportation database development and maintenance, demand forecasting, operations management, and vehicle routing and scheduling. It also has

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### MAPTITUDE DATA

**Current bundled data supplied with Maptitude includes:**

- world boundaries
- cities and populated places for the world, including a gazetteer of almost two million places
- highways
- railways
- airports
- rivers and water features
- pipelines and transmission lines
- provinces
- grids
- important latitudes
- elevations and elevation contours
- the Universal Transverse Mercator (UTM) zones and the Universal Polar Stereographic zones
- a detailed world coastline file (1:250,000)
- a point database of landmarks for Antarctica.

**You can view developments in Caliper's UK data set via a web application at [www.maptitude.co.uk](http://www.maptitude.co.uk)**

## Caliper's products and plan

**Howard Slavin, president of Caliper Corporation, is something of an Anglophile, having gained a PhD at Cambridge University – and a fondness for Britain and its beer. He attributes the decision to enter the British marketplace to the increasing maturity of Caliper Corporation's products which, he believes, are now a highly attractive proposition for UK GIS users. We asked him about his thinking behind Caliper's flagship product, Maptitude.**

For many years, GIS was a tool that could only be usefully applied through additional customisation. We wanted Maptitude to do certain basic things through an interface that did not necessitate programming. Consequently, the range of operations Maptitude offers includes easily locating customers on a map and analysing sales by district, without the user being forced to program the functionality themselves or to buy expensive add-ins. From the beginning we wanted GIS to be affordable and simple to use in a business environment. One of our early design goals was to make it simpler to use than a spreadsheet – and it is.

### What was the key to your early success?

In the US, there was a history of people taking public domain datasets from the US government, repackaging them in their own format and putting large price tags on them. In the days when such data was typically

derived from mainframe tapes we developed some very good compression technology for geographic datasets and were able to transfer data direct to CD, thus bringing the notional cost down to just over a dollar per copy.

When we introduced the first version of Maptitude at \$395 in the 1990s it came bundled with data which, if you'd purchased it separately, would have cost \$40,000. That was just for the data. So we have been pivotal, for example, in making map-based census data widely available to Americans – in fact, we have quite a lot of users in the Census Bureau itself. The fact is that where the price of data is modest, a lot of people will find many uses for it, and this cheap data provision model is something we are pursuing in the UK. In relation to this our UK dataset, which is under development, will be viewable via an online web application at [www.mapitude.co.uk](http://www.mapitude.co.uk)

### Why come to the UK now?

Although the first version of Maptitude was strongly keyed to the US, over the years we have put in place features that make it highly suitable for the UK market. For example, Maptitude supports the OS NTF file format and also incorporates our programmable scripting language. So we are now providing the tools that British users might need to turn this into something they would like to see – it is improved and ready for third party developers.

Mapitude works rather nicely with enterprise databases, and because it works with ESRI and MapInfo files, as well as Oracle, it is ready to be a good corporate citizen. This makes it a lot more interesting for IT people everywhere.

### What other factors have influenced you?

The cost of data has been prohibitive in the UK and until that problem was solved, it did not matter whether the GIS was inexpensive or not because the *data* was too expensive. We have now reached agreement with several suppliers and are planning to create our own Maptitude dataset for the UK, which will include geolocation functionality and boundary data with associated demographic information.

### Is Maptitude easy to use?

For a high-end GIS it is surprisingly approachable. Schoolchildren use it in the US, although its main educational users are in colleges and universities rather than lower schools.

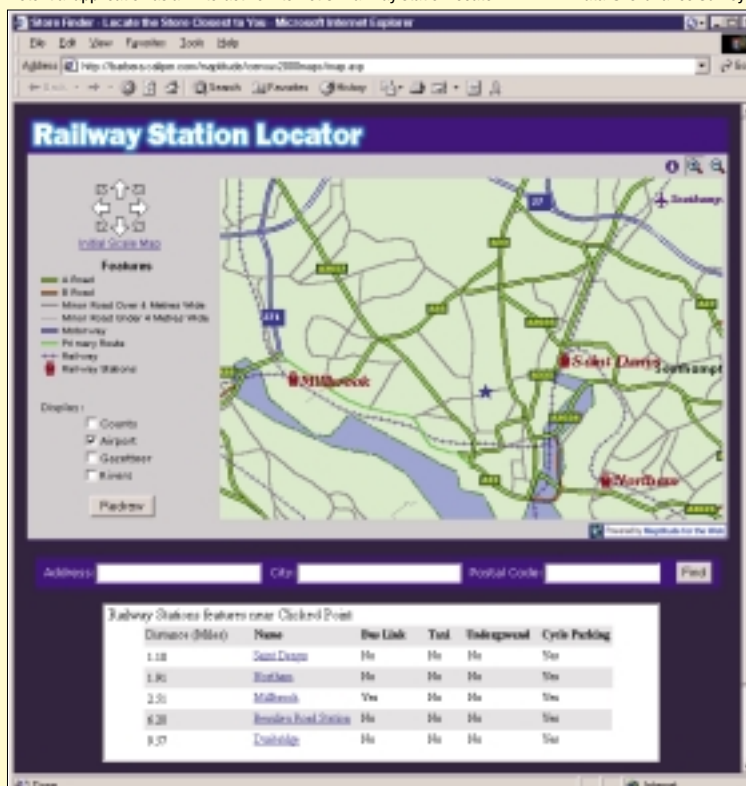
### What level of service do you provide?

Our service desk responds immediately to any questions and our aim is certainly to get back to users the same day with a solution to their problem. We pride ourselves on the speed and excellence of this service – good customer care is very much a part of the reason we have been so successful.

**There is an independent user discussion group at <http://groups.yahoo.com/group/Mapitude/>**

Potential application as an interactive Internet UK railway station locator.

Data © Ordnance Survey



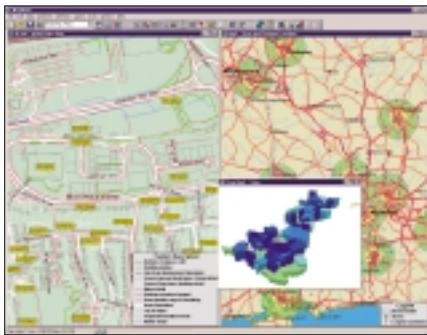
## Mapitude for Redistricting

A specialised, more expensive version of Maptitude is widely used by all levels of government in the US for a process called redistricting. This is more familiar to UK government users as boundary revisions and, since the UK is said to have more administrative boundary changes per year than the rest of the European Union put together, Maptitude for Redistricting looks set to have a bright future given its competitive pricing. The product includes all the tools needed to build and analyse boundary revisions. The software has a custom menu system and toolbox that enables users to create a new plan from a map, a template or an existing plan. It also allows users to display that plan as district boundaries or a thematic map, import plans from other GIS formats and export data to an equivalency file in dBASE and other industry-standard formats.

Users can also:

- compute measures of compactness and check for completeness and contiguity
- zoom to unassigned polygons or discontinuous portions of a district to verify the integrity of a plan.

Privileged access to data in the UK academic and public sectors would make the use of Maptitude for Redistricting especially valuable to researchers and the Boundary and Local Government Commissions.



Potential application as an interactive Internet UK railway station locator. Basingstoke Data © Ordnance Survey  
many potential uses in local government; for example, it can perform route planning for public services such as refuse collection, ambulance routing, bus services, traffic management and planning.

### Web support

Working with the web is, of course, a prerequisite for any GIS system today. Maptitude for the Web provides interactive access to maps and data on websites. Retailers can use it to show customers where to find the closest store; government agencies can provide the public with easier access to data; and businesses can give their employees access to geographic analysis tools. Users can create a map using a Mapplication

template that provides tools and links for moving around a map, finding locations such as addresses, cities or postal codes, finding features near a clicked point, and displaying information about map features. In short, it is suitable for map designers, website designers, website programmers and website administrators and, since it is not tied to any specific format, users can keep abreast of changing web standards and protocols. Similarly, TransCAD for the Web can create maps and has special capabilities for designing and running interactive map applications and location-based services on the web.

### Database integration

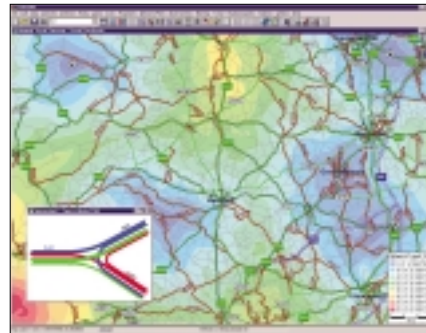
Caliper's internal data window format – dataviews – provides relational database functionality allowing multiple joins, multiple selection sets and complex live formulaic analysis. Users can also read data from dBASE and FoxPro files and from text files, import data from Excel, and access data from spreadsheets and database management systems using Open Database Connectivity (ODBC). Thus, users can open Oracle tables via ODBC sources, or Maptitude can directly read and display map features stored in an Oracle database.

### Prospects

Caliper deals with its customers directly and is offering UK users the same level of sales and technical support that it offers US users. This can be accessed via telephone and email over the period paid for. Maptitude includes 90 days of technical support; TransCAD includes telephone technical support and upgrades for one year. In fact, Caliper is so confident about its support and the ease of use of its technology that it offers a one-month, money-back guarantee for Maptitude if customers are not satisfied.

[www.caliper.com](http://www.caliper.com)

Drive-time buffers and an intersection diagram produced in TransCAD. Road data (Copyright) Bartholomew.



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# Autodesk MapGuide 6

Robert Barr *reviews Autodesk MapGuide 6, a widely used Internet mapping application that, he argues, has much to commend it.*

## When GIS met the Internet

The rapid development of the World Wide Web from about 1993 sent a shudder through the GIS industry. Desktop GIS products such as ArcView and MapInfo were proving to be both popular and profitable. Yet, most of the installed desktops were being used primarily for viewing maps or querying databases, despite the high licence costs and the demands that the software placed on the machines of that era. The arrival of a technology that had the potential to replace high-cost software and machines with a solution that could be used with any machine equipped with a web browser was not necessarily going to be welcomed by the software developers.

## Mapping on the web

The web was designed from scratch as a medium for both graphics and text. Purists keen to use scarce bandwidth economically on low-speed network connections scorned graphics-rich web environments, but, with relatively few exceptions, web designers increasingly used more and more graphics in their pages. The first facilities simply placed an image at a defined location on the web page. However, image maps were soon developed which allowed a degree of interaction. Defined areas under the image acted as the graphical equivalents of text hyper-links and allowed a user to interact with the image.

This arrangement allowed maps to be published on the

web and information to be linked to regions of the map. For information that doesn't change much, such an arrangement can be quite sufficient. In fact, current versions of MapInfo provide facilities for producing image maps and associating data through the links.

The image maps technique works well when only small amounts of information are involved and they only need to be viewed at one scale. However, any change of scale or panned view involves additional images, and these can multiply into a large number of static pages, which need to be generated, stored and updated. While initially impressive, this is no substitute for the versatility of a desktop GIS.

## Remote control

To extend the capabilities of GIS onto the web, a more powerful technique had to be found. Most of the GIS vendors took one route. They provide what is effectively a remote control facility with

which the user is able to specify the map they need over the web. This is usually done by presenting an initial map on the opening pages of a map-enabled website. The user can then interact with this map (the position of a pointer on an image can be returned by the browser to the web server). The user's 'commands' are relayed to the web server where they are interpreted and passed to a map server, effectively a remote controlled GIS. The map server then generates a new map image 'on the fly' by using the GIS engine to carry out all the necessary operations and create a new vector map, which is then converted into a raster image and returned to the web browser.

This operation can be fast except for one inevitable bottleneck. The raster images created are large, unless they are only going to fill a very small part of the web page. The limitations of the web technology force the designers to take an inherently efficient internal data format in the GIS, the vector map, and expand it into a wasteful raster image for transmission to the browser. On a fast local network this is not necessarily a problem, though it does contribute to congestion, but on the web it can turn into the World Wide Wait. Until the standards for the web are developed to include vector graphics standards such as SVG (Scalable Vector Graphics), there is no generic solution to this problem.

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*Where the industry goes, one can be sure that MapGuide will either already be there or will soon follow.*

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In 'Viewer' mode the MapGuide Author application shows the map publisher exactly what the user will see on the screen and offers the same set of controls.

