

MapPoint and Maptitude Destinations Known

Grant Ian Thrall and Susan Elshaw Thrall

This column reviews and provides evaluations of geospatial software and data.

Maptitude 4.1 from Caliper Corporation (www.caliper.com) is a general purpose, full-featured GIS software program designed for creating and editing maps and analyzing geographic data. The product includes three CDs of data: U.S. Streets Data, U.S. Geographic Data, and World Geographic Data. Caliper provides 90 days of technical support. We evaluated the product on our laptop computer, which has Microsoft Windows 98 and an Intel Pentium Pro II, 400-MHz processor, 128-MB RAM, and 24X CD-ROM. Maptitude 4.1 is available directly from Caliper Corporation for \$395. The DVD version is \$595 and includes all of the standard 4.1 data plus Block Groups, Block Centroids, County Sub-divisions, Telephone Exchanges, U.S. and World Digital Elevation Models, and Congressional Districts. The product is also available in Chinese and Spanish editions.

When Caliper Corporation released Maptitude version 1.0 in 1995, the software's price and functionality made it a ground-breaking product. Maptitude was the first full-featured GIS program to bundle and integrate the entire TIGER/Line street files and the U.S. Census of Population and Housing data into a product — all for less than \$400 (US). Comparable software at that time was more than \$1,500, and comparable data sets also cost about \$1,500.

Now at version 4.1, the Maptitude product still sells for the same price. Today, though, as revealed in the accompanying MapPoint 2001 commentary, other software vendors are catching up with Maptitude in terms of bundled data. (See Table 1 for a list of data included with Maptitude 4.1). Some other GIS software programs offer the same range of features and functionality as Maptitude 4.1,

too, such as routing and contouring, but only as additional cost add-ins. Maptitude 4.1 remains one of the most full-featured desktop GIS software programs (see Figure 1) on the market, and its valuable software features are hard to beat.

Talk about functionality

Maptitude 4.1 reads Excel spreadsheets, dBASE files, and text files directly. It is ODBC compliant, so it can read other ODBC compliant data sources, including Access, Btrieve, DB2, Informix, Ingres, InterBase, NetWare SQL, Oracle, Paradox, PROGRESS, SQLBase, SQL Server, and Sybase.

As with earlier versions of Maptitude, release 4.1 also includes translators allowing users to import geographic data from most other desktop mapping, GIS, and computer-aided design software programs (see Table 2). Maptitude also includes translators for many common government file formats, such as the U.S. Census TIGER/Line files. Maptitude 4.1 is GPS

ready, allowing the user to track and record location and build geographic databases.

Full-featured desktop GIS software offers more functionality than entry-level desktop GIS products. With Maptitude 4.1, that wider range of GIS functionality allows users to find answers to such questions as: What is the shortest driving distance between each customer and a proposed new retail site? What is the average driving distance between all customers and a

Glossary

GISDK: GIS developers kit

GPS: Global Positioning System

ODBC: Open database connectivity

OLE: Object linking and embedding

SQL: Structured query language

TIGER: Topologically Integrated Geographic Encoding Reference



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TABLE 1 Maptitude 4.1 includes a wealth of geographic data.

U.S. DATA DESCRIPTION

Areas of Dominant Influence
 High Resolution County Boundaries
 Low Resolution County Boundaries
 Designated Market Areas
 U.S. Highways
 U.S. Interstate Highways
 Landmark Boundaries
 Point Landmarks
 Metropolitan Statistical Areas
 Census Place Boundaries
 Census Place Centroids
 U.S. Populated Places
 High-Resolution State Boundaries
 Low-Resolution State Boundaries
 Medium-Resolution State Boundaries
 U.S. Streets '98

Census Tract Boundaries
 Cities and State Capitals
 Railroads
 Water Features
 1990 3-Digit ZIP Code Boundaries
 1990 5-Digit ZIP Code Boundaries
 1997 5-Digit ZIP Code Centroids

WORLD DATA DESCRIPTION

10-Degree Grid, 20-Degree Grid
 30-Degree Grid, 5-Degree Grid
 10-Degree Area Grid
 Important Latitudes
 World Airports
 World Cities and Capitals
 World Places
 World Populated Places

World Gazetteer
 Provinces
 High-Resolution Country and Territory Boundaries
 Low-Resolution Country and Territory Boundaries
 World Coastlines
 Point Elevations
 Line Elevation Contours
 5-Minute Digital Elevation Model
 World Highways
 World Railroads
 World Utility Lines
 High-Resolution World Rivers
 Low-Resolution World Rivers
 Worldwide Lakes and Glaciers
 Antarctic Landmarks

FIGURE 1
 The software provides advanced desktop GIS functionality, allowing complex data analysis, and has a friendly graphical user interface.



TABLE 2 Maptitude supports import and export for the following geographic formats.

- ❖ Arc/Info
- ❖ ArcView
- ❖ Atlas GIS
- ❖ AutoCAD DXF
- ❖ Defense Mapping VPF and ITD
- ❖ Digital line graph
- ❖ Etak MapBase
- ❖ Intergraph DGN
- ❖ MapInfo MIF/MID
- ❖ TIGER/Line
- ❖ Ordnance Survey NTF

through the creation of the thematic map (see Figure 2).

Macro ability

Geographic analysis can be a time-consuming process when the user must repeat the same steps. The boredom of a repetitive process can lead to errors. That is the situation when deriving demographic characteristics relative

resulting in a more professional map output than would be possible with entry-level desktop GIS software.

Creating thematic maps with Maptitude is a straightforward process. For evaluation purposes, we chose to produce a map of per capita income by census

tract in Alachua County, Florida. The required county and census tract boundaries are part of the included TIGER/line files. Per capita income is provided by the U.S. Census of Population and Housing data set, which is included in Maptitude's data bundle and is already assigned as attributes to the boundary files. Maptitude's Map Wizard then guides the user

retail site? What is the count of customers within a 0.5 mile along a 10-mile stretch of the Interstate? What does the density surface of customers look like in a three-dimensional representation, as a contour map, or as a point-density map? Also, in terms of thematic mapping, Maptitude 4.1 gives the user more control over fonts, symbols, and other thematic objects,

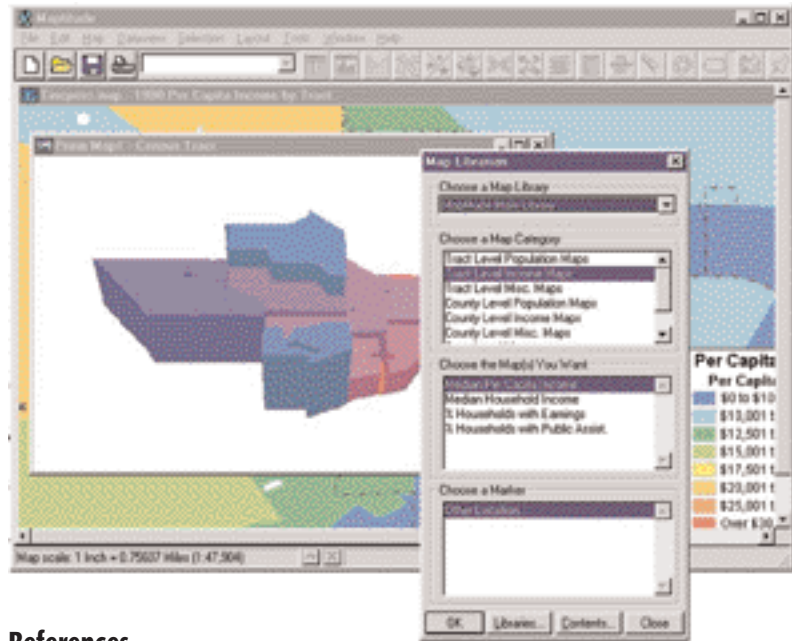
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thematic maps using demographic information and HUD data (Thrall and Golant, 1998).

Web enabled

All of Maptitude's standard capabilities are available for use on the Internet with Maptitude for the Web, available separately. It includes the development tools necessary to design, test, and publish interactive map applications on the Internet. The product works on Windows 95, 98, or NT and 2000 with a Web server. Maptitude for the Web produces HTML output and does not require installation of additional application server software or browser plug-ins.

Combining Maptitude's bundled data — which allows most users to start performing GIS analysis almost right away — with Maptitude for the Web and GISDK promises to keep Maptitude 4.1 at the forefront of desktop GIS technology.



References

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FIGURE 2 With Maptitude's Map Wizard as a guide, we quickly created this map of per capita income by census tract in Alachua County, Florida.

MapPoint 2001

Microsoft knows that location is important to business. Therefore, the company believes that mapping must be part of its business productivity software suite as a Microsoft Office companion. Microsoft's drive to fill significant market niches led it to gradually begin building its geography and mapping division. The division has rolled out several consumer mapping products including MapPoint 2000, which debuted last year (see G. Thrall, 1999; S. Thrall, 1999). Microsoft has clearly established its footprint in the geographic technologies market.

Microsoft's lineup of geographic and mapping technologies now includes:

- ♦ Streets & Trips 2001, a consumer mapping product containing 6.3 million miles of streets and highway data for the U.S. and Canada, address-to-address routing functionality, and information to help individ-

MapPoint 2001 from Microsoft (www.microsoft.com/mappoint) is a business mapping companion for Microsoft Office. An upgrade from MapPoint 2000 released last year, MapPoint 2001 integrates all of the same functionality and data available in Microsoft's other geographic products, including Streets & Trips 2001. The product includes streets, demographic information, and a variety of business contact information. MapPoint 2001 is available in a North American version (U.S. and Canada) and a European version obtainable in English, French, Spanish, Italian, and German. Both versions are said to contain the same array of functionality and data. The product supports NMEA 2.0 or later GPS functionality; a GPS device is not included. GPS display is limited to laptop use and does not work with handheld computers. Application development requires that MapPoint 2001 be installed on the user's computer. We performed our evaluation using the North American version on our laptop computer, which has Microsoft Windows 98 and an Intel Pentium Pro II, 400-MHz processor, 128-MB RAM, and 24X CD-ROM. Microsoft MapPoint 2001 is available at most software retail outlets. List price is \$249 (U.S.). Upgrade price from MapPoint 2000 is \$50 (U.S.).

Glossary

OLE: Object linking and embedding

VB: Visual Basic

uals plan road trips. The European version offers the same features but includes 1.7 million

miles of European roads. The product is available in English, French, Spanish, Italian, and German.

- ♦ MapPoint 2001 is a business-mapping product containing the same data and functionality as Streets & Trips 2001 but adds demographic

information and thematic mapping capabilities. Streets & Trips 2001 is fully integrated into MapPoint 2001 and is available in both North American (U.S. and Canada) and European editions.

By any other name . . .

Had MapPoint 2000 been a release from any other technology firm, we would not have been impressed. But



FIGURE 1 MapPoint 2001 enables a user to search for the fastest or shortest driving routes or select preferred roads for travel.

FIGURE 2 We conducted a search for all restaurants within a 30-mile proximity of Vail, Colorado. Because of the mountainous terrain, driving distance can be much further than MapPoint 2001 indicates.



the importance of Microsoft in the software industry requires us to pay close attention to what goes on in Redmond, Washington.

To benefit from the product in a small business environment, users of the 2000 version had to move among several of Microsoft's geography products. The more than 140 people who make up Microsoft's mapping and geography team paid attention to user feedback on that product, which led to this new and improved 2001 version.

MapPoint 2001 allows users to create thematic maps with mapping wizards. Users can import data for thematic maps from Microsoft Access, Excel, and Outlook messaging and other client information. MapPoint 2001 also allows users to link by way of the Internet to commercial data vendors to add a variety of demographic and business contact information. Users can share maps created with MapPoint 2001 with other Microsoft software, such as PowerPoint, Word, and FrontPage, using drag-and-drop functionality.

In addition to personal use, Microsoft also wants client-oriented professionals and business analysts in

TABLE 1 Driving instructions from Vail to Leadville, Colorado

Time	Mile	Instruction	For
9:00 AM	0.0	Depart Vail	0.4 miles
9:02 AM	0.4	Bear LEFT (West) onto Big Horn Rd	1.9 miles
9:08 AM	2.3	At I-70 Exit 180, turn RIGHT (East) onto I-70 [U.S.-6]	15.8 miles
9:23 AM	18.2	At I-70 Exit 195, turn RIGHT (South) onto SR-91	22.2 miles
9:50 AM	40.4	Continue (South) on US-24 [N Poplar St]	1.9 miles
9:53 AM	42.3	Arrive at Rooster Cogburn's Steakhouse [1531 U.S. Hwy 24, Leadville, CO 80461, Tel: (719) 486-2763]	

Summary: Driving distance: 42.3 miles, Total travel time: 53 minutes, Driving time: 53 minutes, Cost: \$2.79

- ❖ Integration with GPS devices
- ❖ Most current U.S. and Canadian streets provided by Geographic Data Technologies, Compusearch, and Navigation Technologies Corporation
- ❖ Com add-in capability to allow for customization
- ❖ OLE object model to enable MapPoint 2001 integration with Excel, Access, Word, and the VB development system
- ❖ 50 demographic fields, such as income, gender, age, and ethnicity
- ❖ Drawing tools that allow users to annotate maps prior to exporting

A novel feature in MapPoint 2001 is a Feedback Wizard that allows users to communicate concerns to Microsoft via the Internet. With the wizard, users can inform the company about updated or inaccurate road and street information.

MapPoint 2001 supports three map styles. The user can choose to work with one or a combination of styles. A road map displays street and highway information. Terrain maps display large physical geographic features, conveying a sense of elevation, vegetation cover, and land-use type. Data maps present thematic information, such as average household income.

The product includes demographic data from Claritas, Inc. The data available will differ by country, but generally include population, households, population in group quarters, average household size, average household income, median age of total population, and population by various age ranges. Data are available at a geographic scale of postal

both large and small firms to use MapPoint 2001. Microsoft's entrée into this market should benefit from the widespread use of its Office software suite — which includes Excel spreadsheet, Word word processor, and Access database manager — within the business community. Microsoft Office is one of the leading software suites for home use as well, giving the company further advantage as it targets this new market.

In addition to being fully integrated with Office, MapPoint 2001 makes use of Microsoft's Visual Basic (VB) programming language. So, if an individual who has MapPoint installed develops a VB application, that application can use MapPoint 2001 functionality and features.

So what do you get?

New or improved MapPoint 2001 features include:

- ❖ Radius and oval drawing tools
- ❖ Canadian streets
- ❖ Better integration with palm and handheld computers

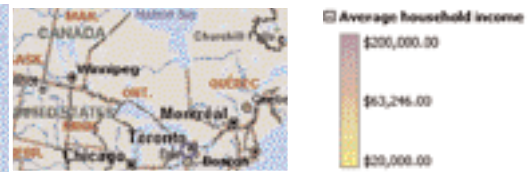


FIGURE 3 Microsoft pulled off a coup by including Canadian data in its product. We used it to simultaneously display streets and household incomes in Hamilton, Ontario.

code, metro area, city, state, or province. MapPoint 2001 provides data for four time periods: 1980, 1990, current year, and five-year projection.

Using MapPoint 2001

Overall, MapPoint 2001 has a more refined and stable feel than its predecessor. The product is now capable of address-to-address routing, including routing to addresses on residential streets. The user can choose between fastest route, shortest route, or preferred roads. Preferred roads bias the routing toward particular street types. This can be handy if one prefers scenic drives or high-speed state highways to Interstates or limited access highways. Figure 1 shows a route map from Vail, Colorado, to a restaurant in Leadville, Colorado. Table 1 lists the routing instructions and gives the distance as 42.3 miles.

Figure 2 shows a 30-mile radial search around Vail. Microsoft allows users to perform proximity searches to derive business-to-business contact lists by geographic vicinity and create trade-area maps as well. However, from the radial search, MapPoint 2001 indicates the same restaurant described in Figure 1 and Table 1 as being only 26.5 miles from Vail, even though the driving distance was calculated as 42.3 miles. This is because the product uses straight-line, as-the-crow-flies mileage to perform proximity searches. Regrettably, there is no option to query by proximity using estimated drive time or road distance measurements, even though MapPoint



FIGURE 4 We used the text-box feature to annotate this map with the location of McMaster University.

2001 includes these algorithms.

In mountainous Colorado terrain, drive time is more relevant for this type of application. This may cause some confusion for novices of mapping technology, and Susan Thrall mentioned the same problem in the previous review of Microsoft's related software product, TripPlanner 98 (S. Thrall, 1998).

Maps for Canada

Microsoft has added some Canadian content to MapPoint 2001. Unlike the United States, the Canadian federal government does not place its geographic street data into the public domain, so end users have had limited access to Canadian geographic data. Microsoft has pulled off a real coup by including Canadian data with this product. We look forward to using the European version for this same reason.

To illustrate the Canadian data, we zoomed-in on Hamilton, Ontario, and simultaneously displayed streets and a thematic map of average household income. Figure 3 shows major streets. MapPoint 2001 automatically adjusts the features to display as the user zooms in or out. Figure 4 shows more Canadian street detail and demonstrates the ability to add text graphics, which we did to denote the location of McMaster University.

A tempting next step

MapPoint 2001 is a valuable upgrade of Microsoft's earlier product. Even though Microsoft has yet to establish itself as a serious contender in the desktop GIS market, MapPoint 2001 demonstrates the company's view that mapping and geographic analysis are important, both for home use and as a business tool.

Still, there's room for improvement in Microsoft's geographic technology offerings. MapPoint 2001 is not a full-featured desktop GIS program. (For a commentary on a product that is a full-featured GIS, see the accompanying review of Maptitude.) Therefore, the product does not offer home and business users the flexibility required for geographic analysis and thematic mapping. Nevertheless, this user-friendly product could tempt those who are new to the world of geographic technology to dive deeper into the geospatial realm and seek out even more functionality available in other products.

References

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