

# 2005 GIS Software Survey

| Program Name  | Autodesk Map 3D 2006      | Autodesk Survey 2006     | Autodesk Land Desktop 2006  | Autodesk Raster Design 2006 | MicroStation GeoGraphics            | Bentley Water                      | Bentley WasteWater                 | Bentley Geo Web Publisher                  | Bentley Power Map Field      |
|---|---------------------------|--------------------------|-----------------------------|-----------------------------|-------------------------------------|------------------------------------|------------------------------------|--|------------------------------|
| <b>Manufacturer/Distributor</b>                         | Autodesk Inc.             | Autodesk Inc.            | Autodesk Inc.               | Autodesk Inc.               | Bentley Systems Inc.                | Bentley Systems Inc.               | Bentley Systems Inc.               | Bentley Systems Inc.                       | Bentley Systems Inc.         |
| <b>Manufacturer's Phone Number</b>                      | 603/621-3270              | 603/621-3270             | 603/621-3270                | 603/621-3270                | 610/458-5000                        | 610/458-5000                       | 610/458-5000                       | 610/458-5000                               | 610/458-5000                 |
| <b>Cost Per Seat</b>                                    | \$4,795                   | Contact reseller         | Contact reseller            | Contact reseller            | Contact vendor                      | Contact vendor                     | Contact vendor                     | Contact vendor                             | Contact vendor               |
| <b>Date of First Release</b>                            | 2005                      | 1998                     | 1998                        | 1996                        | 1995                                | 1999                               | 1999                               | 1996                                       | 2004                         |
| <b>SOFTWARE FEATURES</b>                                |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| <i>Operating System/Network Support</i>                 |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Network Client-Server Support                         | NA                        | No                       | No                          | Win 2000/XP                 | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - Server Operating System                               | NA                        | No                       | No                          | No                          | WinXP/2000/NT 4.0/98                | Win XP/2000/NT 4.0/98              | Win XP/2000/NT 4.0/98              | Win 2000/NT                                | Win XP/2000/NT 4.0/98/Me     |
| - Client Operating System                               | [1]                       | No                       | No                          | No                          | WinXP/2000/NT 4.0/98                | Win XP/2000/NT 4.0/98              | Win XP/2000/NT 4.0/98              | Any with a WEB Browser                     | Win XP/2000/NT 4.0/98/Me     |
| - Internet Server Enabled                               | NA                        | No                       | No                          | No                          | Via Geo Web Publisher               | Via Geo Web Publisher              | Via Geo Web Publisher              | Yes  | Via Geo Web Publisher        |
| <i>Compatible Applications</i>                          |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Third Party Applications Designed to Run on Software  |                           | Yes, by vendor           | [9]                         | Yes, by vendor              | Yes                                 | N/A                                | N/A                                | Yes  | Yes                          |
| - Total Solution Packages Available                     |                           | Yes                      | Yes                         | N/A                         | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| <i>GIS Data Administration</i>                          |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Multi-user Edit Locking                               | Yes [2]                   | Yes                      | Yes                         | Yes                         | [8]                                 | [8]                                | [8]                                | N/A  | N/A                          |
| - Versioning  | Yes, Oracle and ArcSDE    | No                       | No                          | No                          | [9]                                 | No                                 | No                                 | N/A  | N/A                          |
| - Metadata Maintenance                                  | Yes                       | No                       | No                          | No                          | [10]                                | Yes                                | Yes                                | Yes  | N/A                          |
| <i>Database Management</i>                              |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Proprietary DBMS                                      | No                        | No                       | No                          | No                          | No                                  | No                                 | No                                 | No   | No                           |
| - Relational Database Management System                 | Yes                       | No                       | No                          | No                          | [4]                                 | [4]                                | [4]                                | [4]  | [4]                          |
| - RDBMS Spatial Data Warehouse                          | Oracle Spatial and ArcSDE | No                       | No                          | No                          | [1]                                 | [1]                                | [1]                                | [1]  | [1]                          |
| <i>Native Graphic Data Structure and Format</i>         |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Vector-Spaghetti                                      | Yes                       | No                       | No                          | No                          | DGN, DWG, DXF, MXD, SHP             | DGN, DWG, DXF, MXD, SHP            | DGN, DWG, DXF, MXD, SHP            | DGN  | DGN, DWG, DXF, MXD, SHP      |
| - Vector-Topologic                                      | Yes                       | No                       | No                          | No                          | Oracle Spatial/DGN post processing  | Oracle Spatial/DGN post processing | Oracle Spatial/DGN post processing | Oracle 8i/9i Spatial and Oracle 9i Locator | Oracle Spatial (query-only)  |
| - Parametric  | Yes                       | Yes                      | Yes                         | No                          | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - 3-D   | Yes                       | Yes                      | Yes                         | No                          | Yes                                 | Yes                                | Yes                                | Yes  | View-only                    |
| - TIN   | Yes                       | Yes                      | Yes                         | No                          | Yes, via Bentley GEOPAK Site module | N/A                                | N/A                                | N/A  | N/A                          |
| - Grid  |                           | Yes                      | Yes                         | No                          | N/A                                 | N/A                                | N/A                                | N/A  | N/A                          |
| - Raster Image  | No                        | Yes                      | Yes                         | Yes                         | [2]                                 | [2]                                | [2]                                | [14]                                       | [2]                          |
| <i>GIS Data Import/Export Utilities</i>                 |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Direct Import Formats                                 | [3]                       | [7]                      | [7]                         | No                          | DXF, DWG, MID/MIF, SHP, E00         | DXF, DWG, MID/MIF, SHP, E00        | DXF, DWG, MID/MIF, SHP, E00        | DXF/DWG                                    | DGN, DWG, DXF, MXD, SHP, LYR |
| - Direct Export Formats                                 | [4]                       | [7]                      | [7]                         | No                          | DXF, DWG, MID/MIF, SHP, E00         | DXF, DWG, MID/MIF, SHP, E00        | DXF, DWG, MID/MIF, SHP, E00        | DXF/DWG                                    | Read-only platform           |
| <i>Readable Formats That Do Not Require Translation</i> |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Import  | [5]                       | DWG, LandXML, ASCII, FBK | DWG, LandXML, ASCII         | DWG                         | Oracle Spatial, DGN, DWG            | Oracle Spatial, DGN, DWG           | Oracle Spatial, DGN, DWG           | Oracle Spatial, DGN, DWG                   | [3]                          |
| - Export  | [5]                       | DWG, LandXML, ASCII, FBK | DWG, LandXML, ASCII         | [11]                        | Oracle Spatial, DGN, DWG            | Oracle Spatial, DGN, DWG           | Oracle Spatial, DGN, DWG           | CGM, SVG, JPG                              | Read-only platform           |
| <i>GIS Data Entry and Editing</i>                       |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Board Digitizing                                      | Yes                       | Yes                      | Yes                         | Yes                         | Yes                                 | Yes                                | Yes                                | N/A  | Yes                          |
| - Coordinate Geometry/Precision Entry                   | [6]                       | 0-8 decimal places       | 0-8 decimal places          | 1-8 decimal places          | Via Bentley GEOPAK Site             | N/A                                | N/A                                | N/A  | N/A                          |
| - Electronic Survey Data Import                         | [6]                       | Yes                      | Yes, ASCII Coordinate files | No                          | Via Bentley GEOPAK Site             | N/A                                | N/A                                | N/A  | N/A                          |
| - Heads-up Digitizing                                   | Yes                       | Yes                      | Yes                         | Yes                         | Yes                                 | Yes                                | Yes                                | N/A  | N/A                          |
| - Vectorization   | With Raster Design        | Yes                      | Yes                         | Yes                         | Via Bentley Descartes               | N/A                                | N/A                                | N/A  | N/A                          |
| - Map Rectification                                     | Yes                       | Yes                      | No                          | Yes                         | Yes                                 | N/A                                | N/A                                | N/A  | Yes                          |
| - Graphic Error Check/Correction                        | Yes                       | Yes                      | No                          | Yes                         | Yes                                 | N/A                                | N/A                                | N/A  | N/A                          |
| - Field Data Entry                                      | No                        | Yes                      | No                          | No                          | Yes                                 | N/A                                | N/A                                | N/A  | Yes                          |
| <i>Map Design and Composition</i>                       |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Interactive Map Composition                           | Yes                       | Yes                      | Yes                         | Yes                         | Yes                                 | N/A                                | N/A                                | N/A  | Yes                          |
| - Annotation from Attributes                            | Yes                       | Yes                      | Yes                         | Yes                         | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - Global Symbol Change                                  | Yes                       | Yes                      | Yes                         | No                          | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - Thematic Mapping                                      | Yes                       | Yes                      | Yes                         | Yes                         | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| <i>Geographic Query and Analysis Functions</i>          |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Attribute Query and Selection                         | Yes                       | Yes                      | Yes                         | N/A                         | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - Map Measurements                                      | Yes                       | Yes                      | Yes                         | N/A                         | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - Address Matching                                      | No                        | No                       | No                          | N/A                         | Yes                                 | N/A                                | N/A                                | Available via additional services          | N/A                          |
| - Buffer Generation                                     | Yes                       | Yes                      | Yes                         | N/A                         | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - Point/Line-in-Polygon Analysis                        | Yes                       | Yes                      | Yes                         | N/A                         | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - Polygon Overlay                                       | Yes                       | Yes                      | Yes                         | N/A                         | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - Network Analysis                                      | Yes                       | Yes                      | Yes                         | N/A                         | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - Raster Document Query and Access                      | No                        | With add-on              | With add-on                 | Yes                         | Yes                                 | Yes                                | Yes                                | Yes  | Yes                          |
| - Direct Access to Other GIS Format                     | Yes [2]                   | Yes                      | Yes                         | N/A                         | SHP, MID, MIF, E00                  | SHP, MID, MIF, E00                 | SHP, MID, MIF, E00                 | N/A  | Yes                          |
| <i>Terrain Data Processing and Analysis</i>             |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - DEM Generation  | Yes                       | No                       | No                          | No                          | Via Bentley GEOPAK Site             | N/A                                | N/A                                | N/A  | N/A                          |
| - Contour Map Generation                                | Yes                       | Yes                      | Yes                         | Yes                         | Via Bentley GEOPAK Site             | N/A                                | N/A                                | N/A  | N/A                          |
| - 3-D Display/Profile Generation                        | No                        | Yes                      | Yes                         | No                          | Yes                                 | N/A                                | N/A                                | N/A  | Yes                          |
| - Map Draping   | No                        | No                       | No                          | No                          | Via Bentley Descartes               | N/A                                | N/A                                | N/A  | N/A                          |
| - Slope/Aspect Analysis                                 | With Raster Design        | Yes                      | Yes                         | Yes                         | Via Bentley GEOPAK Site             | N/A                                | N/A                                | N/A  | N/A                          |
| <i>Raster Image Capabilities</i>                        |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Geometric Rectification                               | With Raster Design        | With add-on              | With add-on                 | Yes                         | Via Bentley Descartes               | N/A                                | N/A                                | N/A  | N/A                          |
| - Orthoimage Generation                                 | With Raster Design        | With add-on              | With add-on                 | Yes                         | N/A                                 | N/A                                | N/A                                | N/A  | N/A                          |
| - Image Enhancement                                     | With Raster Design        | With add-on              | With add-on                 | Yes                         | Via Bentley Descartes               | N/A                                | N/A                                | N/A  | Yes                          |
| - Spectral Classification                               |                           | With add-on              | With add-on                 | Yes                         | N/A                                 | N/A                                | N/A                                | N/A  | N/A                          |
| <i>Application Development Language</i>                 |                           |                          |                             |                             |                                     |                                    |                                    |  |                              |
| - Proprietary Application Development Language          |                           | No                       | No                          | No                          | MDL, JMDL, MicroStation Basic       | MDL, JMDL, Basic                   | MDL, JMDL, Basic                   | MDL, JMDL, Basic                           | MDL, MicroStation Basic      |
| - Industry Standard Programming Environment             |                           | No                       | ActiveX, VBA, C++, Lisp     | Yes, ActiveX                | C, C++, Visual Basic, JAVA          | C, C++, Visual Basic, JAVA, VBA    | C, C++, Visual Basic, JAVA, VBA    | ASP, JVA Script, JAVA Visual Basic, C++    | C, C++, Visual Basic, JAVA   |
| Extra Notes   |                           | [8]                      | [10]                        | [12]                        | [11]                                | [12]                               | [13]                               | [15]                                       |                              |
| <b>Reader Service Number</b>                            | 1                         | 2                        | 3                           | 4                           | 5                                   | 6                                  | 7                                  | 8  | 9                            |

Numbers in brackets refer to notes (see page 49).

| Program Name  | Bentley PowerMap             | Bentley WorkPrint          | Geographic Transformer 5.1 | Geographic Calculator 6.2 | TransCAD 4.7                                | Maptitude 4.7                               | CARIS GIS                 | CARIS Carta    | CEDRA AVland          |
|---|------------------------------|----------------------------|----------------------------|---------------------------|---|---|---------------------------|----------------|-----------------------|
| <b>Manufacturer/Distributor</b>                         | Bentley Systems Inc.         | Bentley Systems Inc.       | Blue Marble Geographics    | Blue Marble Geographics   | Caliper Corporation                         | Caliper Corporation                         | CARIS                     | CARIS          | The CEDRA Corporation |
| <b>Manufacturer's Phone Number</b>                      | 610/458-5000                 | 610/458-5000               | 800/616-2725               | 800/616-2725              | 617/527-4700                                | 617/527-4700                                | 506/458-8533              | 506/458-8533   | 585/232-6998          |
| <b>Cost Per Seat</b>                                    | Contact vendor               | Contact vendor             | \$899                      | \$499                     | \$295 (Basic), \$995 (Standard)             | \$495                                       | Contact vendor            | Contact vendor | Contact vendor        |
| <b>Date of First Release</b>                            | 2003                         | 2004                       | 1996                       | 1993                      | 1988  | 1995  | 1983                      | 2004           | 1985                  |
| <b>SOFTWARE FEATURES</b>                                |                              |                            |                            |                           |   |   |                           |                |                       |
| <i>Operating System/Network Support</i>                 |                              |                            |                            |                           |   |   |                           |                |                       |
| - Network Client-Server Support                         | Yes                          | Yes                        | Yes                        | Yes                       | Win 98/NT and above                         | Win 98/NT and above                         | Yes                       | Yes            | Yes                   |
| - Server Operating System                               | Win XP/2000/NT 4.0/98/Me     | Win XP/2000/NT 4.0/98/Me   | Win 98/NT and above        | Win 98/NT and above       | Win 98/NT and above                         | Win 98/NT and above                         | Win 95/98/NT/2000/XP/UNIX | Win NT/2000/XP | Win 95/98/2000/NT/XP  |
| - Client Operating System                               | Win XP/2000/NT 4.0/98/Me     | Win XP/2000/NT 4.0/98/Me   | Win 98/NT and above        | Win 98/NT and above       | Win 98/NT and above                         | Win 98/NT and above                         | Win 95/98/NT/2000/XP/UNIX | Win NT/2000/XP | Win 95/98/2000/NT/XP  |
| - Internet Server Enabled                               | Via Geo Web Publisher        | Via Geo Web Publisher      |                            |                           | With TransCAD for the Web                   | With Maptitude for the Web                  | No                        | No             | Yes                   |
| <i>Compatible Applications</i>                          |                              |                            |                            |                           |   |   |                           |                |                       |
| - Third Party Applications Designed to Run on Software  | Yes                          | Yes                        |                            |                           |   |   |                           |                | [1]                   |
| - Total Solution Packages Available                     | Yes                          | Yes                        |                            |                           | 2 [1]                                       | 3 [2]                                       |                           |                | 12                    |
| <i>GIS Data Administration</i>                          |                              |                            |                            |                           |   |   |                           |                |                       |
| - Multi-user Edit Locking                               | N/A                          | N/A                        | Yes                        | Yes                       | Yes   | Yes   | No                        | No             | Yes                   |
| - Versioning  | N/A                          | N/A                        |                            |                           | No  | No  | No                        | No             | Yes                   |
| - Metadata Maintenance                                  | N/A                          | N/A                        |                            |                           | Yes   | Yes   | No                        | No             | Yes                   |
| <i>Database Management</i>                              |                              |                            |                            |                           |   |   |                           |                |                       |
| - Proprietary DBMS                                      | No                           | No                         |                            |                           | No  | No  | No                        | No             | No                    |
| - Relational Database Management System                 | [4]                          | [4]                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - RDBMS Spatial Data Warehouse                          | [1]                          | [1]                        |                            |                           | Yes   | Yes   | No                        | Yes            | Yes                   |
| <i>Native Graphic Data Structure and Format</i>         |                              |                            |                            |                           |   |   |                           |                |                       |
| - Vector-Spaghetti                                      | DGN, DWG, DXF, MXD, SHP      | DGN, DWG, DXF, MXD, SHP    |                            |                           | Yes, can handle                             | Yes, can handle                             | Yes                       | Yes            | Yes                   |
| - Vector-Topologic                                      | [5]                          | [5]                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Parametric  | Yes                          | Yes                        |                            |                           | No  | No  | Yes                       | No             | Yes                   |
| - 3-D   | Yes                          | Yes                        |                            |                           | Yes (surfaces)                              | Yes (surfaces)                              | Yes                       | Yes            | Yes                   |
| - TIN   | N/A                          | N/A                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Grid  | N/A                          | N/A                        | Yes                        | Yes                       | Yes   | Yes   | Yes                       | No             | Yes                   |
| - Raster Image  | [2]                          | [2]                        | Yes                        | Yes                       | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| <i>GIS Data Import/Export Utilities</i>                 |                              |                            |                            |                           |   |   |                           |                |                       |
| - Direct Import Formats                                 | DGN, DWG, DXF, MXD, SHP, LYR | DGN, DWG, DXF              | [1]                        | [3]                       | 16, including TIGER/Line, DWG, DGN          | 16, including TIGER/Line, DWG, DGN          | Yes                       | Yes            | Yes                   |
| - Direct Export Formats                                 | DGN, DWG, DXF, SHP           | DGN, DWG, DXF              | [2]                        | [3]                       | 8, including Shapefile, MID/MIF             | 8, including Shapefile, MID/MIF             | Yes                       | Yes            | Yes                   |
| <i>Readable Formats That Do Not Require Translation</i> |                              |                            |                            |                           |   |   |                           |                |                       |
| - Import  | DGN, DWG, DXF, MXD, SHP, LYR | DGN, DWG, DXF              |                            |                           | Oracle Spatial, ESRI Shapefile, MapInfo TAB | Oracle Spatial, ESRI Shapefile, MapInfo TAB | Yes                       | Yes            | [2]                   |
| - Export  | DGN, DWG, DXF                | DGN, DWG, DXF              |                            |                           | Oracle Spatial                              | Oracle Spatial                              | Yes                       | Yes            | [2]                   |
| <i>GIS Data Entry and Editing</i>                       |                              |                            |                            |                           |   |   |                           |                |                       |
| - Board Digitizing                                      | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | No             | Yes                   |
| - Coordinate Geometry/Precision Entry                   | N/A                          | N/A                        | Yes                        | Yes                       | No  | No  | Yes                       | Yes            | Yes                   |
| - Electronic Survey Data Import                         | N/A                          | N/A                        | Yes                        | Yes                       | GPS points                                  | GPS points                                  | Yes                       | No             | Yes                   |
| - Heads-up Digitizing                                   | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | No             | Yes                   |
| - Vectorization   | N/A                          | N/A                        |                            |                           | No  | No  | Yes                       | No             | Yes                   |
| - Map Rectification                                     | Yes                          | Yes                        | Yes                        | Yes                       | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Graphic Error Check/Correction                        | Yes                          | N/A                        | Yes                        | Yes                       | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Field Data Entry                                      | Yes                          | Yes                        | Yes                        | Yes                       | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| <i>Map Design and Composition</i>                       |                              |                            |                            |                           |   |   |                           |                |                       |
| - Interactive Map Composition                           | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Annotation from Attributes                            | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Global Symbol Change                                  | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Thematic Mapping                                      | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| <i>Geographic Query and Analysis Functions</i>          |                              |                            |                            |                           |   |   |                           |                |                       |
| - Attribute Query and Selection                         | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Map Measurements                                      | Yes                          | Yes                        |                            | Yes                       | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Address Matching                                      | Yes                          | Yes                        |                            |                           | Yes   | Yes   | No                        | No             | N/A                   |
| - Buffer Generation                                     | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Point/Line-in-Polygon Analysis                        | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | No             | Yes                   |
| - Polygon Overlay                                       | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Network Analysis                                      | Yes                          | Yes                        |                            |                           | Yes   | Yes (best route)                            | Yes                       | No             | Yes                   |
| - Raster Document Query and Access                      | Yes                          | Yes                        | Yes                        |                           | No  | No  | No                        | No             | Yes                   |
| - Direct Access to Other GIS Format                     | Yes                          | Yes                        | Yes                        | Yes                       | Yes   | Yes   | No                        | Yes            | Yes                   |
| <i>Terrain Data Processing and Analysis</i>             |                              |                            |                            |                           |   |   |                           |                |                       |
| - DEM Generation  | N/A                          | N/A                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - Contour Map Generation                                | Yes                          | N/A                        |                            |                           | Yes   | Yes   | Yes                       | Yes            | Yes                   |
| - 3-D Display/Profile Generation                        | Yes                          | Yes                        |                            |                           | Yes   | Yes   | Yes                       | No             | Yes                   |
| - Map Draping   | N/A                          | N/A                        |                            |                           | Yes   | Yes   | Yes                       | No             | Yes                   |
| - Slope/Aspect Analysis                                 | N/A                          | N/A                        |                            |                           | Yes   | Yes   | Yes                       | No             | Yes                   |
| <i>Raster Image Capabilities</i>                        |                              |                            |                            |                           |   |   |                           |                |                       |
| - Geometric Rectification                               | N/A                          | N/A                        | Yes                        |                           | No  | No  | Yes                       | Yes            | Yes                   |
| - Orthoimage Generation                                 | N/A                          | N/A                        |                            |                           | No  | No  | Yes                       | No             | Yes                   |
| - Image Enhancement                                     | Yes                          | Yes                        | Yes                        |                           | No  | No  | No                        | No             | Yes                   |
| - Spectral Classification                               | N/A                          | N/A                        |                            |                           | No  | No  | Yes                       | No             | Yes                   |
| <i>Application Development Language</i>                 |                              |                            |                            |                           |   |   |                           |                |                       |
| - Proprietary Application Development Language          | MDL, MicroStation Basic      | MDL, MicroStation Basic    | Yes                        | Yes                       | Yes (Caliper Script)                        | Yes (Caliper Script)                        | Yes                       | No             | Avenue                |
| - Industry Standard Programming Environment             | C, C++, Visual Basic, JAVA   | C, C++, Visual Basic, JAVA |                            |                           | Yes (.NET)                                  | Yes (.NET)                                  | VB                        |                | Visual Basic/C++      |
| Extra Notes   |                              |                            |                            |                           | [37]  | [40]  |                           |                | [3]                   |
| <b>Reader Service Number</b>                            | 10                           | 11                         | 12                         | 13                        | 14  | 15  | 16                        | 17             | 18                    |

Numbers in brackets refer to notes (see page 49).

# 2005 GIS Software Survey

| Program Name  | CEDRA AVwater         | CEDRA AVsand          | CEDRA AVparcel        | ArcEditor                | ArcView                  | ArcPad                       | ArcGIS Survey Analyst       | IcoMap          | VectorEyes                    |
|---|-----------------------|-----------------------|-----------------------|--------------------------|--------------------------|------------------------------|-----------------------------|-----------------|-------------------------------|
| <b>Manufacturer/Distributor</b>                         | The CEDRA Corporation | The CEDRA Corporation | The CEDRA Corporation | ESRI                     | ESRI                     | ESRI                         | ESRI                        | Extract Systems | Full Circle Technologies Inc. |
| <b>Manufacturer's Phone Number</b>                      | 585/232-6998          | 585/232-6998          | 585/232-6998          | 800/447-9778             | 800/447-9778             | 800/447-9778                 | 800/447-9778                | 608/664-0570    | 617/367-3553                  |
| <b>Cost Per Seat</b>                                    | Contact vendor        | Contact vendor        | Contact vendor        | Call ESRI                | \$1500                   | \$495                        | Call ESRI                   | \$3,999         | [1]                           |
| <b>Date of First Release</b>                            | 1985                  | 1985                  | 1985                  | 2001                     | 1992                     | 2000                         | 2003                        | Jan-02          | May-02                        |
| <b>SOFTWARE FEATURES</b>                                |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| <i>Operating System/Network Support</i>                 |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Network Client-Server Support                         | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes                         | No              | Yes                           |
| - Server Operating System                               | Win 95/98/2000/NT/XP  | Win 95/98/2000/NT/XP  | Win 95/98/2000/NT/XP  | Windows NT 4.0/2000/XP   | Windows                  | No                           | Win NT 4.0/2000/XP          | No              | Windows 2000 Server           |
| - Client Operating System                               | Win 95/98/2000/NT/XP  | Win 95/98/2000/NT/XP  | Win 95/98/2000/NT/XP  | Windows NT 4.0/2000/XP   | Windows                  | Windows CE                   | Win NT 4.0/2000/XP          | Win NT/2000/XP  | Windows 98/XP                 |
| - Internet Server Enabled                               | Yes                   | Yes                   | Yes                   | Via ArcIMS               | Via ArcIMS               | Via ArcIMS                   | Via ArcIMS                  | No              | Yes                           |
| <i>Compatible Applications</i>                          |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Third Party Applications Designed to Run on Software  | [1]                   | [1]                   | [1]                   | www.esri.com/partners    | www.esri.com/partners    | www.esri.com/partners        | www.esri.com/partners       | ArcGIS          | No                            |
| - Total Solution Packages Available                     | 12                    | 12                    | 12                    | Numerous                 | Numerous                 | Numerous                     | Numerous                    | No              | No                            |
| <i>GIS Data Administration</i>                          |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Multi-user Edit Locking                               | Yes                   | Yes                   | Yes                   | Yes                      | No                       | No                           | Yes, with core ArcGIS       | No              | Yes                           |
| - Versioning  | Yes                   | Yes                   | Yes                   | Yes                      | No                       | No                           | Yes, with core ArcGIS       | No              | Yes                           |
| - Metadata Maintenance                                  | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | Yes             | Yes                           |
| <i>Database Management</i>                              |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Proprietary DBMS                                      | No                    | No                    | No                    | No                       | No                       | No                           | No                          | Geodatabase     | No                            |
| - Relational Database Management System                 | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | Yes                          | Yes                         | Geodatabase     | Yes                           |
| - RDBMS Spatial Data Warehouse                          | Yes                   | Yes                   | Yes                   | [1]                      | [1]                      | No                           | [1]                         | Geodatabase     | Yes                           |
| <i>Native Graphic Data Structure and Format</i>         |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Vector-Spaghetti                                      | Yes                   | Yes                   | Yes                   | Shapefile                | Shapefile                | Shapefile                    | Shapefile                   | No              | Yes                           |
| - Vector-Topologic                                      | Yes                   | Yes                   | Yes                   | Coverage, Geodatabase    | Coverage, Geodatabase    | No                           | Coverage, Geodatabase       | No              | Yes                           |
| - Parametric  | Yes                   | Yes                   | Yes                   | Geodatabase              | Geodatabase              | No                           | Geodatabase                 | No              | No                            |
| - 3-D   | Yes                   | Yes                   | Yes                   | Shapefile, Geodatabase   | Shapefile, Geodatabase   | No                           | Shapefile, Geodatabase      | No              | Yes                           |
| - TIN   | Yes                   | Yes                   | Yes                   | ESRI TIN                 | ESRI TIN                 | No                           | ESRI TIN                    | No              | No                            |
| - Grid  | Yes                   | Yes                   | Yes                   | ESRI Grid                | ESRI Grid                | No                           | ESRI Grid                   | No              | No                            |
| - Raster Image  | Yes                   | Yes                   | Yes                   | [2]                      | [2]                      | Yes                          | [2]                         | Yes             | Yes                           |
| <i>GIS Data Import/Export Utilities</i>                 |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Direct Import Formats                                 | Yes                   | Yes                   | Yes                   | Over 40 standard formats | Over 40 standard formats | N/A                          | Over 40 standard formats    | [1]             | Shape                         |
| - Direct Export Formats                                 | Yes                   | Yes                   | Yes                   | Over 40 standard formats | Over 40 standard formats | N/A                          | Over 40 standard formats    | [1]             | Shape, MIF                    |
| <i>Readable Formats That Do Not Require Translation</i> |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Import  | [2]                   | [2]                   | [2]                   | Over 40 standard formats | Over 40 standard formats | Shapefiles, Mr SID, BMP, JPG | Over 40 standard formats    | [1]             | .shp                          |
| - Export  | [2]                   | [2]                   | [2]                   | Over 40 standard formats | Over 40 standard formats | Shapefiles, Mr SID, BMP, JPG | Over 40 standard formats    | [1]             | .shp, MIF                     |
| <i>GIS Data Entry and Editing</i>                       |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Board Digitizing                                      | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes                         | No              | No                            |
| - Coordinate Geometry/Precision Entry                   | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes                         | Yes             | Yes                           |
| - Electronic Survey Data Import                         | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes                         | Yes             | Yes                           |
| - Heads-up Digitizing                                   | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | Yes                          | Yes, with ArcScan           | No              | No                            |
| - Vectorization   | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with ArcScan           | No              | Yes                           |
| - Map Rectification                                     | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes                         | Yes             | No                            |
| - Graphic Error Check/Correction                        | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes                         | No              | Yes                           |
| - Field Data Entry                                      | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | Yes                          | Yes                         | Yes             | Yes                           |
| <i>Map Design and Composition</i>                       |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Interactive Map Composition                           | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes                         | No              | Yes                           |
| - Annotation from Attributes                            | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes                         | Yes             | Yes                           |
| - Global Symbol Change                                  | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | Yes                          | Yes                         | No              | Yes                           |
| - Thematic Mapping                                      | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes                         | No              | Yes                           |
| <i>Geographic Query and Analysis Functions</i>          |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Attribute Query and Selection                         | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | Yes                          | Yes, with core ArcGIS       | No              | Yes                           |
| - Map Measurements                                      | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | Yes                          | Yes, with core ArcGIS       | No              | Yes                           |
| - Address Matching                                      | N/A                   | N/A                   | N/A                   | Yes                      | Yes                      | Yes                          | Yes, with core ArcGIS       | No              | Yes                           |
| - Buffer Generation                                     | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | No              | Yes                           |
| - Point/Line-in-Polygon Analysis                        | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | No              | Yes                           |
| - Polygon Overlay                                       | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | Yes             | Yes                           |
| - Network Analysis                                      | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | No              | Yes                           |
| - Raster Document Query and Access                      | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | Yes             | Yes                           |
| - Direct Access to Other GIS Format                     | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | No              | Yes                           |
| <i>Terrain Data Processing and Analysis</i>             |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - DEM Generation  | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | No              | No                            |
| - Contour Map Generation                                | N/A                   | N/A                   | Yes                   | Yes                      | Yes                      | No                           | [5]                         | No              | No                            |
| - 3-D Display/Profile Generation                        | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with ArcGIS 3D Analyst | No              | No                            |
| - Map Draping   | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | No              | No                            |
| - Slope/Aspect Analysis                                 | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with ArcGIS 3D Analyst | No              | No                            |
| <i>Raster Image Capabilities</i>                        |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Geometric Rectification                               | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | Yes             | No                            |
| - Orthoimage Generation                                 | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | Yes             | No                            |
| - Image Enhancement                                     | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | Yes             | No                            |
| - Spectral Classification                               | Yes                   | Yes                   | Yes                   | Yes                      | Yes                      | No                           | Yes, with core ArcGIS       | No              | No                            |
| <i>Application Development Language</i>                 |                       |                       |                       |                          |                          |                              |                             |                 |                               |
| - Proprietary Application Development Language          | Avenue                | Avenue                | Avenue                | No                       | No                       | No                           | No                          | VB              | Yes                           |
| - Industry Standard Programming Environment             | Visual Basic/C++      | Visual Basic/C++      | Visual Basic/C++      | [3]                      | [3]                      | VBScript, C/C++              | [3]                         | VB              | No                            |
| Extra Notes   | [4]                   | [5]                   | [6]                   | www.esri.com/arceditor   | www.esri.com/arcview     | [4]                          | [6]                         |                 |                               |
| <b>Reader Service Number</b>                            | 19                    | 20                    | 21                    | 22                       | 23                       | 24                           | 25                          | 26              | 27                            |

Numbers in brackets refer to notes (see page 49).

| Program Name  | Surfer 8           | Didger 3           | MapViewer 6          | GeoMedia 6.0               | G/Technology 9.3       | Image Analysis for ArcGIS      | ERDAS IMAGINE                  | Leica Photogrammetry Suite     | Vulcan 5                   |
|---|--------------------|--------------------|----------------------|----------------------------|------------------------|--------------------------------|--------------------------------|--------------------------------|----------------------------|
| <b>Manufacturer/Distributor</b>                         | Golden Software    | Golden Software    | Golden Software Inc. | Intergraph                 | Intergraph             | Leica Geosystems GIS & Mapping | Leica Geosystems GIS & Mapping | Leica Geosystems GIS & Mapping | KRJA Systems Inc./Maptek   |
| <b>Manufacturer's Phone Number</b>                      | 303/279-1021       | 303/279-1021       | 303/279-1021         | 800/791-3357               | 800/791-3357           | 404/248-9000                   | 404/248-9000                   | 404/248-9000                   | 303/763-4919               |
| <b>Cost Per Seat</b>                                    | \$599              | \$329              | \$249                | See vendor for pricing     | See vendor for pricing | \$3,500                        | \$2,200+                       | \$10,500+                      | Contact vendor             |
| <b>Date of First Release</b>                            | 2002               | 2001               | 2004                 | 1997                       | 1999                   | 2003                           | 1990                           | 2004                           | 2004                       |
| <b>SOFTWARE FEATURES</b>                                |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| <i>Operating System/Network Support</i>                 |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Network Client-Server Support                         |                    |                    | Yes                  | Yes                        | Yes                    | No                             | Yes                            | Yes                            | No                         |
| - Server Operating System                               |                    |                    | Windows, Novell      | Windows Server             | Windows 2000/2003      | Win XP/2000                    | Win XP/2000, Sun Solaris       | Win XP/2000                    | N/A                        |
| - Client Operating System                               | Win 98/Me/2000/XP  | Win 98/Me/2000/XP  | Win 98/Me/2000/XP    | Windows XP                 | Windows 2000/XP        | Win XP/2000                    | Win XP/2000, Sun Solaris       | Win XP/2000                    | Win NT/2000/XP             |
| - Internet Server Enabled                               |                    |                    |                      | Yes                        | Yes                    | Function of ArcGIS             | [3]                            | No                             | No                         |
| <i>Compatible Applications</i>                          |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Third Party Applications Designed to Run on Software  |                    |                    |                      | Yes, using public API      | Yes [2]                | No                             | [4]                            | PRO600, ORIMA                  | No                         |
| - Total Solution Packages Available                     |                    |                    | 1                    |                            | Yes                    | Extension to ESRI ArcGIS       | Yes                            | Yes                            | Yes                        |
| <i>GIS Data Administration</i>                          |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Multi-user Edit Locking                               |                    |                    |                      | Yes                        | Yes                    | Function of ArcGIS             | No                             | No                             | Yes                        |
| - Versioning  |                    |                    |                      | Yes                        | Yes                    | Function of ArcGIS             | No                             | No                             | No                         |
| - Metadata Maintenance                                  |                    |                    |                      | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| <i>Database Management</i>                              |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Proprietary DBMS                                      |                    |                    | Yes                  | No                         | No                     | Function of ArcGIS             | CellArray                      | No                             | Isis                       |
| - Relational Database Management System                 |                    |                    | Yes                  | Oracle, Access, SQL Server | Yes                    | Function of ArcGIS             | [5]                            | No                             | No                         |
| - RDBMS Spatial Data Warehouse                          |                    |                    | Yes                  | Yes, Oracle Locator        | Not required           | Function of ArcGIS             | ArcSDE                         | No                             | Via ODBC                   |
| <i>Native Graphic Data Structure and Format</i>         |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Vector-Spaghetti                                      | Yes                | Yes                | Yes                  | Yes                        | No                     | Function of ArcGIS             | Yes                            | Yes                            | Yes                        |
| - Vector-Topologic                                      |                    |                    |                      | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| - Parametric  |                    |                    |                      | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| - 3-D   | Yes                |                    |                      | Yes                        | Yes [3]                | Function of ArcGIS             | Yes                            | Yes                            | Yes                        |
| - TIN   |                    |                    |                      | Yes                        | No                     | Function of ArcGIS             | Yes                            | Yes                            | Yes + solid triangulations |
| - Grid  | Yes                |                    |                      | Yes                        | No                     | Yes                            | Yes                            | Yes                            | Yes                        |
| - Raster Image  | Yes                | Yes                | Yes                  | Yes                        | Yes                    | Yes                            | Yes                            | Yes                            | Yes                        |
| <i>GIS Data Import/Export Utilities</i>                 |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Direct Import Formats                                 | [1]                | [3]                | 29 standard formats  | Yes                        | Yes                    | [1]                            | [6]                            | [6]                            | [1]                        |
| - Direct Export Formats                                 | [2]                | [4]                | 25 standard formats  | Yes                        | Yes                    | [2]                            | [7]                            | [7]                            | [2]                        |
| <i>Readable Formats That Do Not Require Translation</i> |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Import  | SRF, GSI, GSB, BLN | PJT, GSI, GSB, BLN | GSM, GSI, GSB, BLN   | Yes                        | Yes                    | Yes                            | [8]                            | [8]                            | [3]                        |
| - Export  | SRF, GSI, GSB, BLN | PJT, GSI, GSB, BLN | GSM, GSI, GSB, BLN   | Yes                        | Yes                    | Yes                            | [9]                            | [9]                            | [3]                        |
| <i>GIS Data Entry and Editing</i>                       |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Board Digitizing                                      |                    | Yes                |                      | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | Yes                        |
| - Coordinate Geometry/Precision Entry                   |                    |                    | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | No                             | No                             | Yes                        |
| - Electronic Survey Data Import                         |                    | Yes                |                      | Yes                        | Yes                    | Function of ArcGIS             | No                             | No                             | Yes                        |
| - Heads-up Digitizing                                   |                    | Yes                | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | Yes                        |
| - Vectorization   |                    |                    |                      | No                         | No                     | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| - Map Rectification                                     |                    | Yes                |                      | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | Yes                        |
| - Graphic Error Check/Correction                        |                    |                    |                      | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| - Field Data Entry                                      |                    |                    |                      | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| <i>Map Design and Composition</i>                       |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Interactive Map Composition                           | Yes                | Yes                | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | Yes                        |
| - Annotation from Attributes                            |                    | Yes                | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | Yes                        |
| - Global Symbol Change                                  | Yes                | Yes                | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | Yes                        |
| - Thematic Mapping                                      |                    |                    | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| <i>Geographic Query and Analysis Functions</i>          |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Attribute Query and Selection                         |                    |                    | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | Yes                        |
| - Map Measurements                                      |                    | Yes                | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | Yes                        |
| - Address Matching                                      |                    |                    | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | [10]                           | [10]                           | No                         |
| - Buffer Generation                                     |                    |                    | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| - Point/Line-in-Polygon Analysis                        |                    |                    | Yes                  | Yes                        | Yes                    | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| - Polygon Overlay                                       |                    |                    | Yes                  | Yes                        | No                     | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| - Network Analysis                                      |                    |                    |                      | Yes                        | Yes                    | Function of ArcGIS             | No                             | No                             | Yes                        |
| - Raster Document Query and Access                      |                    |                    |                      | No                         | No                     | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| - Direct Access to Other GIS Format                     |                    |                    | Yes                  | Yes                        | No                     | Function of ArcGIS             | Yes                            | Yes                            | No                         |
| <i>Terrain Data Processing and Analysis</i>             |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - DEM Generation  |                    |                    |                      | Yes                        | No                     | No                             | Yes                            | Yes                            | Yes                        |
| - Contour Map Generation                                | Yes                |                    |                      | Yes                        | No                     | No                             | Yes                            | Yes                            | Yes                        |
| - 3-D Display/Profile Generation                        | Yes                |                    |                      | Yes                        | No                     | No                             | Yes                            | Yes                            | Yes + solid triangulations |
| - Map Draping   | Yes                |                    |                      | Yes                        | No                     | No                             | Yes                            | Yes                            | Yes                        |
| - Slope/Aspect Analysis                                 | Yes                |                    |                      | Yes                        | No                     | No                             | Yes                            | Yes                            | Yes                        |
| <i>Raster Image Capabilities</i>                        |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Geometric Rectification                               |                    | Yes                |                      | Yes                        | Yes                    | Yes                            | Yes                            | Yes                            | Yes                        |
| - Orthoimage Generation                                 |                    |                    |                      | Yes                        | No                     | Yes                            | Yes                            | Yes                            | No                         |
| - Image Enhancement                                     |                    | Yes                | Yes                  | Yes                        | No                     | Yes                            | Yes                            | Yes                            | No                         |
| - Spectral Classification                               |                    |                    |                      | No                         | No                     | Yes                            | Yes                            | Yes                            | No                         |
| <i>Application Development Language</i>                 |                    |                    |                      |                            |                        |                                |                                |                                |                            |
| - Proprietary Application Development Language          | Scripter           |                    | Scripter             | No                         | No                     | No                             | IMAGINE Developers' Toolkit    | IMAGINE Developers' Toolkit    | Lava                       |
| - Industry Standard Programming Environment             | C++, VB, Perl      |                    | C++, VB, Perl        | Yes                        | Yes, SQL, VBA          | Yes                            | C/C++ with some COM            | C/C++ with some COM            | Perl                       |
| Extra Notes   |                    |                    |                      | [1]                        | [4]                    |                                |                                |                                |                            |
| <b>Reader Service Number</b>                            | 28                 | 29                 | 30                   | 31                         | 32                     | 33                             | 34                             | 35                             | 36                         |

Numbers in brackets refer to notes (see page 49).

# 2005 GIS Software Survey

| Program Name  | TNTmips                      | Parcel Editor 8 & 9         | IMap                 | TopSURV GIS                | Topcon Tools               | Trimble GPS Analyst [1] | SOLO                      | GeoBlocks                  |
|---|------------------------------|-----------------------------|----------------------|----------------------------|----------------------------|-------------------------|---------------------------|----------------------------|
| <b>Manufacturer/Distributor</b>                         | Microlimages Inc.            | NovaLIS Technologies        | Sokkia               | Topcon Positioning Systems | Topcon Positioning Systems | Trimble                 | Tripod Data Systems (TDS) | Understanding Systems Inc. |
| <b>Manufacturer's Phone Number</b>                      | 402/477-9554                 | 902/423-1800                | 877/764-6848         | 925/460-1300               | 925/460-1300               | 800/480-0510            | 541/753-9322              | 919/515-3829               |
| <b>Cost Per Seat</b>                                    | [1]                          | \$2495 [1]                  | Contact Sokkia       | Contact vendor             | Contact vendor             | Starting from \$2,500   | \$1,000                   | Product-based              |
| <b>Date of First Release</b>                            | 1986                         | 1996                        | 2000                 | 2004                       | 2004                       | Oct-04                  | 1998                      |                            |
| <b>SOFTWARE FEATURES</b>                                |                              |                             |                      |                            |                            |                         |                           |                            |
| <i>Operating System/Network Support</i>                 |                              |                             |                      |                            |                            |                         |                           |                            |
| - Network Client-Server Support                         | Yes                          | Terminal server             | No                   | N/A                        | No                         | No                      | No                        | Yes                        |
| - Server Operating System                               | [2]                          | Unix, W2K, NT Server        | N/A                  | N/A                        | Windows XP/2000            | N/A                     |                           | Win NT/XP                  |
| - Client Operating System                               | [3]                          | Win XP/NT/2000              | Win CE/NT/98/2000/XP | Windows CE                 | Windows XP/2000            | Windows XP/2000/NT      | [1]                       | Win NT/XP/2000             |
| - Internet Server Enabled                               | TNTserver (separate product) | N/A                         | No                   | Yes                        | Yes                        | N/A                     | No                        | Yes                        |
| <i>Compatible Applications</i>                          |                              |                             |                      |                            |                            |                         |                           |                            |
| - Third Party Applications Designed to Run on Software  | None                         | ArcGIS                      | No                   | N/A                        | N/A                        | N/A                     | [2]                       |                            |
| - Total Solution Packages Available                     | Yes                          | Full Cadastral office suite | Yes                  | N/A                        | N/A                        | Yes                     | Yes                       | Yes                        |
| <i>GIS Data Administration</i>                          |                              |                             |                      |                            |                            |                         |                           |                            |
| - Multi-user Edit Locking                               | No                           | Yes                         | No                   | No                         | No                         | No                      | No                        | Yes                        |
| - Versioning  | No                           | Yes                         | No                   | No                         | No                         | No                      | Yes                       | No                         |
| - Metadata Maintenance                                  | No                           | No                          | No                   | No                         | No                         | Yes                     | No                        | Yes                        |
| <i>Database Management</i>                              |                              |                             |                      |                            |                            |                         |                           |                            |
| - Proprietary DBMS                                      | Yes                          | Geodatabase                 | No                   | No                         | No                         | No [2]                  | No                        | No                         |
| - Relational Database Management System                 | Yes                          | Geodatabase                 | No                   | No                         | No                         | No                      | No                        | Yes                        |
| - RDBMS Spatial Data Warehouse                          | Yes                          | Geodatabase                 | No                   | No                         | No                         | No                      | No                        |                            |
| <i>Native Graphic Data Structure and Format</i>         |                              |                             |                      |                            |                            |                         |                           |                            |
| - Vector-Spaghetti                                      | Yes                          | Yes                         | Yes                  | Yes                        | Yes                        | Yes, via ArcGIS         | Yes                       |                            |
| - Vector-Topologic                                      | Yes                          | Yes                         | Yes                  | No                         | No                         | Yes, via ArcGIS         | Yes                       | Yes                        |
| - Parametric  | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        |                            |
| - 3-D   | Yes                          | No                          | Yes                  | Yes                        | Yes                        | Yes, via ArcGIS         | Yes                       |                            |
| - TIN   | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        |                            |
| - Grid  | Yes                          | No                          | Yes                  | No                         | No                         | N/A                     | Yes                       | Yes                        |
| - Raster Image  | Yes                          | No                          | Yes                  | Yes                        | Yes                        | N/A                     | Yes                       | Yes                        |
| <i>GIS Data Import/Export Utilities</i>                 |                              |                             |                      |                            |                            |                         |                           |                            |
| - Direct Import Formats                                 | [4]                          | [2]                         | [1]                  | Arcview Shape, TPS         | Arcview Shape, TPS         | [3]                     | [3]                       | SHAPE, E00, MIF/MID        |
| - Direct Export Formats                                 | [5]                          | [2]                         | [2]                  | Arcview Shape, TPS         | Arcview Shape, TPS         | Trimble SSF             | [4]                       | SHAPE, E00, MIF/MID        |
| <i>Readable Formats That Do Not Require Translation</i> |                              |                             |                      |                            |                            |                         |                           |                            |
| - Import  | [6]                          | [2]                         | [3]                  | TPS                        | TPS                        | Same as ArcGIS          | [5]                       | SHAPE                      |
| - Export  | [7]                          | [2]                         | [4]                  | TPS                        | TPS                        | Same as ArcGIS          | [6]                       |                            |
| <i>GIS Data Entry and Editing</i>                       |                              |                             |                      |                            |                            |                         |                           |                            |
| - Board Digitizing                                      | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        | Yes                        |
| - Coordinate Geometry/Precision Entry                   | Yes                          | Yes                         | Yes, no adjustments  | N/A                        | Yes                        | N/A                     | Yes                       | Yes                        |
| - Electronic Survey Data Import                         | Yes                          | Yes                         | Yes                  | Yes                        | Yes                        | Yes, GPS data           | Yes                       | Yes                        |
| - Heads-up Digitizing                                   | Yes                          | Yes                         | Yes                  | Yes                        | Yes                        | N/A                     | Yes                       | Yes                        |
| - Vectorization   | Yes                          | Yes                         | No                   | No                         | No                         | N/A                     | No                        | No                         |
| - Map Rectification                                     | Yes                          | Yes                         | No                   | No                         | No                         | N/A                     | Yes                       | No                         |
| - Graphic Error Check/Correction                        | Yes                          | Yes                         | No                   | No                         | No                         | N/A                     | No                        | Yes                        |
| - Field Data Entry                                      | No                           | Yes                         | Primary function     | Yes                        | No                         | Yes                     | Yes                       | Yes                        |
| <i>Map Design and Composition</i>                       |                              |                             |                      |                            |                            |                         |                           |                            |
| - Interactive Map Composition                           | Yes                          | Yes                         | Yes                  | Yes                        | Yes                        | Yes                     | Yes                       | Yes                        |
| - Annotation from Attributes                            | Yes                          | Yes                         | Yes                  | Yes                        | No                         | Yes                     | Yes                       | Yes                        |
| - Global Symbol Change                                  | Yes                          | Yes                         | Yes                  | Yes                        | Yes                        | Yes                     | Yes                       | Yes                        |
| - Thematic Mapping                                      | Yes                          | No                          | Yes                  | No                         | No                         | N/A                     | Yes                       | Yes                        |
| <i>Geographic Query and Analysis Functions</i>          |                              |                             |                      |                            |                            |                         |                           |                            |
| - Attribute Query and Selection                         | Yes                          | Yes                         | Yes                  | Yes                        | Yes                        | Yes                     | Yes                       | Yes                        |
| - Map Measurements                                      | Yes                          | Yes                         | Yes                  | Yes                        | Yes                        | Yes                     | Yes                       | Yes                        |
| - Address Matching                                      | No                           | Yes                         | No                   | No                         | No                         | N/A                     | Yes                       | Yes                        |
| - Buffer Generation                                     | Yes                          | No                          | No                   | No                         | No                         | N/A                     | Yes                       | Yes                        |
| - Point/Line-in-Polygon Analysis                        | Yes                          | Yes                         | No                   | No                         | No                         | N/A                     | No                        | Yes                        |
| - Polygon Overlay                                       | Yes                          | Yes                         | Yes                  | No                         | No                         | N/A                     | Yes                       |                            |
| - Network Analysis                                      | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        | Yes                        |
| - Raster Document Query and Access                      | Yes                          | No                          | No                   | No                         | No                         | N/A                     | Yes                       | Yes                        |
| - Direct Access to Other GIS Format                     | Yes                          | Yes                         | Yes                  | No                         | No                         | N/A                     | Yes                       | Yes                        |
| <i>Terrain Data Processing and Analysis</i>             |                              |                             |                      |                            |                            |                         |                           |                            |
| - DEM Generation  | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        | No                         |
| - Contour Map Generation                                | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        | No                         |
| - 3-D Display/Profile Generation                        | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        | Yes                        |
| - Map Draping   | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        | No                         |
| - Slope/Aspect Analysis                                 | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        | Yes                        |
| <i>Raster Image Capabilities</i>                        |                              |                             |                      |                            |                            |                         |                           |                            |
| - Geometric Rectification                               | Yes                          | No                          | No                   | No                         | No                         | N/A                     | Yes [7]                   | Yes                        |
| - Orthoimage Generation                                 | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        | No                         |
| - Image Enhancement                                     | Yes                          | No                          | Yes                  | No                         | No                         | N/A                     | Yes                       | No                         |
| - Spectral Classification                               | Yes                          | No                          | No                   | No                         | No                         | N/A                     | No                        | No                         |
| <i>Application Development Language</i>                 |                              |                             |                      |                            |                            |                         |                           |                            |
| - Proprietary Application Development Language          | Yes, SML                     | VB                          | Yes                  | No                         | No                         | No                      | Yes                       | DELPHI                     |
| - Industry Standard Programming Environment             | Yes [8]                      | VB                          | Yes                  | No                         | No                         | Yes                     | Yes                       | DELPHI                     |
| Extra Notes   |                              |                             |                      |                            |                            |                         |                           |                            |
| <b>Reader Service Number</b>                            | 37                           | 38                          | 39                   | 40                         | 41                         | 42                      | 43                        | 44                         |

Numbers in brackets refer to notes (see page 49).

# 2005 GIS Software Survey Notes

## Summary of GIS Software Features

| SOFTWARE FEATURE CATEGORY                            | EXPLANATION   |
|--|---|
| <b>Geographic Data Management</b>                    | Database administration tools for managing data access by users, locking of data during edit and maintenance of metadata.   |
| <b>Tabular Attribute Data Management</b>             | Software environment and capabilities for storing and managing database attributes linked to map features in the GIS database. May involve use of a vendor-proprietary system for attribute storage or a commercial relational database management package.   |
| <b>GIS Data Import/ Export Utilities</b>             | Utility programs bundled with the GIS package for translation of GIS or CAD data to or from another format, including common industry-standard formats like DXF, SIF, DLG or SDTS.  |
| <b>GIS Data Entry and Editing</b>                    | A range of interactive and batch processing functions for entry of map data through such means as board digitizing, coordinate geometry entry (COGO), scanning and heads-up digitizing, along with capabilities for editing GIS data, performing error checking and resolution, map rectification and transformation of coordinate systems and map projections. |
| <b>Map Design and Composition</b>                    | Interactive capabilities for the design of map plots and displays, automatic creation of thematic maps and legends, and modifying map symbology and annotation for custom map displays.   |
| <b>Basic Geographic Query and Analysis Functions</b> | Basic tools for performing attribute or map-based queries and displays, basic distance and area measurements, query and access to scanned documents, buffer generation, polygon overlay operations and other query and analysis functions.  |
| <b>Network Analysis</b>                              | Spatial analysis operations based on linear networks (e.g., road or pipeline systems), including such operations as shortest path tracing and region allocation. Network analysis capabilities in GIS packages often allow users to design network models based on attributes of network segments.  |
| <b>Terrain and 3-D Data Processing and Analysis</b>  | Capabilities for storing three-dimensional data normally in a grid or triangular integrated network (TIN) format with functions for 3-D analysis such as contour mapping, 3-D display, draping of map features over a 3-D display, slope and aspect analysis, etc.  |
| <b>Raster Image Processing Capabilities</b>          | Capabilities for the manipulation and processing of raster images (e.g., digital aerial photos or orthophotography, satellite images), including functions for the import and rectification of raw imagery, digital image enhancement and automated classification of multi-spectral imagery.   |
| <b>Application Development Languages</b>             | Programming environment for customizing applications accessing software functions provided by the package, including proprietary languages included with the GIS software package or industry-standard tools (e.g., C++, Visual Basic, Delphi) that may be used for application development.  |

### Autodesk

- Windows XP Professional, SP 1 & 2, Windows XP Home, SP 1&2, Windows 2000, SP 4.
- DWG, Oracle and ArcSDE.
- ArcView Shapefile, ArcInfo Coverages and E00, GML (Geography Markup Language) version 2, GML (Geography Markup Language) Ordinance Survey of Great Britain MasterMap version 2, MapInfo MIF/MID, MapInfo TAB, MicroStation DGN, SDTS (Spatial Data Transfer Standard), VPF (Vector Product Format), Autodesk MapGuide SDF.
- ArcView Shapefile, ArcInfo Coverages and E00, GML (Geography Markup Language) version 2, MapInfo MIF/MID, MapInfo TAB, MicroStation DGN, VML (Vector Markup Language), Autodesk MapGuide SDF.
- Autodesk DWG, Oracle Spatial 9i & 10g, ESRI ArcSDE.
- With Civil 3D or Land Desktop w/Survey.
- ASCII, E00, MID, MIF, ARC INFO COVERAGE ARC INFO SHAPE, DWG, LandXML, DGN, numerous data collectors.
- Autodesk Survey is an add-in to Autodesk Land Desktop 2006. Survey adds bi-directional data collector support, traverse analysis, figures, basic coordinate geometry functions and annotation to Autodesk Land Desktop 2006.
- Autodesk Raster Design, Autodesk Survey, Autodesk Civil Design.
- Autodesk Land Desktop 2006 streamlines each phase of land development projects and provides a central location for project data that everybody on a team can access.
- Image Formats CALS, TIF, PNG, BMP, SID, ECW, JPG, JPG2000.
- Autodesk Raster Design 2006 is an add-on application to AutoCAD 2006, Autodesk Map 3D 2006, Autodesk Civil 3D 2006 and Autodesk Land Desktop 2006 that enables

customers to easily edit, convert, and integrate scanned drawings and raster files into the digital design process.

### Bentley Systems Inc.

- Oracle 8i/9i/10g Spatial and Oracle 9i/10g Locator.
- Yes, GeoTIFF, TIFF, JPEG, TIF, HMR, RGB, RLE, TGA, PNG, BMP, CAL, IMB, CIT, CTG, TG4, PCX, RS, MrSID, ECW, JPG2000.
- Oracle Spatial, DNG, DWG, SHP, MXD.
- Oracle, any ODBC compliant database.
- Oracle Spatial/DGN post processing.
- ASCII XYZ, TDS, Sokkia, Leica, Topcon, SMI, Geodimeter, C&G.
- Power Survey is a Standalone application with CADD included. Power Survey includes: DTM Editing, Volume Calculations, exportation of Machine Control data formats.
- Yes, when Oracle 8i/9i Spatial/Locator is used.
- Yes, with limitations (utilizing MicroStation Design History).
- Yes, e.g. through links between geometry and a SQL database.
- In the same way that MicroStation extends computer-aided design into an integrated engineering platform, MicroStation GeoGraphics transforms MicroStation into a comprehensive geospatial environment with premier mapping, data collection, editing, cleanup and analysis tools. MicroStation GeoGraphics allows users to integrate engineering and mapping applications on a single platform and extends the data capture and editing tools in MicroStation with a solid database interface and spatial analysis functionality. MicroStation GeoGraphics is a key engineering product that forms the foundation for geospatial applications. It significantly increases user productivity and offers an easy-to-use environment for geospatial

users. With this discipline-specific platform, independent software developers can take advantage of high-level functionality to increase application performance and reduce development time.

- Bentley Water is a comprehensive, high-productivity engineering automation solution for water network design and management. All operations of a typical water supply network—from mapping and design to administrative functions such as maintenance and record-keeping—are addressed through an integrated environment. Municipal engineers can create a detailed system of water lines, valves, consumption points and other user-defined system components, while maintaining crucial network connectivity. Functions are provided for the placement, editing and attribution of facility graphics. Dynamic, database-driven facility annotation enables users to change existing annotation via a simple update function.
- Bentley WasteWater is a comprehensive, high-productivity engineering solution for wastewater network design and management. All functions of a typical wastewater maintenance operation—from mapping and design to maintenance and record keeping—are addressed through an integrated environment. Municipal engineers can create a detailed model of storm water, sanitary and combined systems. The placement and edit functions create and maintain network connectivity, as well as distance, depth and connectivity of pipes and manholes.
- GeoTIFF, TIFF, JPEG, TIF, HMR, RGB, RLE, TGA, PNG, BMP, CAL, IMG, CIT, CTG, TG4, PCX, RS, MrSID, E.
- Bentley Geo Web Publisher is a powerful server-based application and a one-stop platform that allows users and implementers to publish their engineering information over the Internet. Bentley Geo Web Publisher allows dynamic viewing and redlining of DGN, DWG and MicroStation GeoGraphics projects and images from Web browsers in raster, vector or hybrid raster/vector format. It provides instant and universal access to valuable data, without requiring any change to existing workflows.

Bentley Geo Web Publisher offers multiple publishing capabilities, from simple queries to enhanced navigation using server-side processing, to full features using the Bentley Geo Web Publisher Viewer.

- Bentley Descartes is a comprehensive imaging solution for image mapping, visualization and raster-to-vector conversion projects. Designed for both production and visualization, Bentley Descartes is used worldwide by engineers and planners in many disciplines, such as civil engineering, plant design, mapping and architectural design. Part of the Geospatial product line, Bentley Descartes is used by governments and utilities for mapping, imaging and spatial analysis. Bentley Descartes adds high-performance raster operations to MicroStation, allowing warp, reference, resample, mosaic creation and 3D terrain draping to produce outstanding image scenes. Additionally, Bentley Descartes provides tools such as an integrated Optical Character Recognition (OCR) and Line Following engines, plus several tools to enhance and repair legacy drawings. Because Bentley Descartes is tightly integrated into MicroStation, it can be customized to integrate in workflows where automation and interface modification is required. MicroStation Descartes adds high-performance raster operations to allow warp, reference, resample, create mosaics and drape and produce outstanding image scenes. Additionally, MicroStation Descartes provides tools such as an integrated OCR and Line Following engines, plus several tools to enhance and repair legacy drawings. Offering an API of over 1,700 synchronous key-ins and a fully customizable interface, MicroStation Descartes can be customized to integrate in workflows where automation and interface customization is required.
- RLE, CIT, TG4, GP4, RT4, TIF, CAL, CRL, T29, MPF, RLC, LRD, HMR, ITIFF.
- Bentley I/RAS B is a powerful tool for organizations that work with scanned raster data. A proven raster editor, it offers a complete set of tools to meet the needs of engineers, architects, facilities managers and other professionals. Bentley I/RAS B is an essential element in any MicroStation workflow, as it is the ideal product to digitally archive, clean up or convert scanned drawings. With Bentley I/RAS B tools, you can restore and revise legacy drawings in raster format. Bentley I/RAS B includes a full suite of engineering tools to help in the conversion from raster to vector. A powerful Optical Character Recognition engine allows seamless conversion of raster text-to-text elements and automated conversion for lines and symbols. Bentley I/RAS B is ProjectWise compliant and fully integrated into MicroStation.

### Blue Marble Geographics

- JPG, JP2, BMP, PNG, TIF, GeoTIFF, MrSID, ECW, BIL, BSO, BSB, ADRG, CADRG.
- JPG, JP2, BMP, PNG, TIF, GeoTIFF, ECW.
- DXF, DWG thru R2000, SHP, TAB, MIF, ASCII, SEG P1, dBase, XLS, LOTUS.

### Caliper Corporation

- TransCAD for the Web, TransCAD for Great Britain.
- Mapitude for the Web, Mapitude for Redistricting, Mapitude for Great Britain.

### CEDRA

- ArcGIS or ArcView all versions.
- Shapefiles, coverages, DWG, DGN, Geodatabases.
- CEDRA-AVland is an ArcView GIS and ArcGIS extension, which provides the engineer functionality to perform surveying, COGO, contouring, traverse adjustments, stakeout, road design, earthwork, tax mapping and site modeling applications in an environment that integrates Civil Engineering and GIS. CEDRA AVland offers the engineer the ability to

take a project from field collection through design, construction and facility maintenance.

- CEDRA-AVwater is an ArcView GIS and ArcGIS extension, which enables the engineer to define the geometric configuration of a water distribution network, establish the materials inventory, introduce supply and demand loads, perform analyses and display pertinent results in graphic and/or tabular format in the US or SI units. Storage tanks, pressure regulating, sustaining and open/close valves, pumps, meters, etc. can be included in the model. CEDRA-AVwater interfaces with the KYPipe and EPANET (Versions 1 and 2) modelers.
- CEDRA-AVsand is an ArcView GIS and ArcGIS extension, which enables the engineer to create the geometric model of a storm water, wastewater or combined system, impose associated loads applying custom peaking factors to average daily contributions in US or SI units. Open channel and closed conduit flows may be computed, system adequacy determined, flow hydrographs generated, and stage-storage curves developed. Over thirty built-in conduit shapes are available, as well as the ability to define custom shapes. Static, dynamic, and backward analysis with one of the available modelers, CEDRA-AVsand or USEPA SWMM (Versions 4.31 and 4.4h).
- CEDRA-AVparcel is an ArcView GIS and ArcGIS extension, which enables the user to create, edit and manage three dimensional (high-rise condominiums) topological polygons of parcels for tax (cadastral) mapping, parcel maintenance and other applications that involve the manipulation of polygons and/or boundary information.

### Extract Systems

- Multiple formats supported.

### Full Circle Technologies

- Sold by portal, not by seat. Contact company.

### Intergraph

- Products included in GeoMedia technology: GeoMedia Viewer (FREE), GeoMedia, GeoMedia Professional, GeoMedia WebMap, GeoMedia WebMap Professional, GeoMedia Fusion, GeoMedia Grid, GeoMedia Image, GeoMedia Image Light Table, GeoMedia Objects, GeoMedia Parcel Manager, GeoMedia PublicWorks Manager, GeoMedia SMMS, GeoMedia Stereo Viewer, GeoMedia Terrain, GeoMedia Transaction Manager, GeoMedia Transportation Analyst, GeoMedia Transportation Manager, GeoMedia WebMap Publisher, GeoMedia-Haestad WaterCAD Interface, GeoMedia-Hansen Interface, Intergraph Map Publisher and ImageScout.
- Via public API and product-specific interfaces.
- Via third-party integration.
- Included in G/Technology; G/Comms (Industryware), G/Electric (Industryware), G/Gas (Industryware), G/Pipeline (Industryware), G/Water (Industryware), G/Administrator, G/Analyst, G/Assignment, G/Designer, G/MobileViewer, G/NetExport Server, G/NetPlot Server, G/NetViewer.

### KRJA Systems Inc./Maptak

- ESRI shape, TIN & GRID; DGN; DXF; ASCII; Datamine strings, triangulations & databases; Micromine strings & databases; Surpac strings & triangulations; Esasimne triangulations; Geocomp strings; Phodac; Minex strings & triangulations; Petrosys DIG; Whittle 4X, Microstation strings.
- ESRI shape, TIN & GRID; DGN; DXF; ASCII; Datamine strings, triangulations; Micromine strings; Esasimne triangulations; Pitboss; Eclipse, Whittle 4X, MicroStation strings.
- Vulcan databases (DGD & Isis) & ASCII.

### Leica Geosystems

- ADRG, ASCII Raster, ASRP/USRP, AVHRR Dundee, AVHRR ESA SHARP, AVHRR NOAA. Default to IMAGINE. DEM (USGS), DOQ, JPEG, DOQ, DTED, ERS, ERSON, ERSIS, Generic Binary, GRASS, GRD (Surfac: ASCII/Binary), IRS, JFIF (JPEG), LAN (ERDAS 7.x), LANDSAT 7 Fast L7A, NLAPS, PCX, Radarsat, Raster Product Format, SeaWiFS, SPOT CCRS, SPOT, TIF, TM Landsat, TM Landsat 7 HDF.
- DEM (USGS), DOQ, DTED, Generic Binary, GRID, JFIF (JPEG), PCX, Raster Product Format, Sun Raster, TIFF.
- Yes, requires IMAGINE Virtual Delivery Module.
- ESRI ArcGIS, VLS Feature Analyst.
- Only through customization with Developers' Toolkit.
- 100+ standard raster and vector formats.
- 30+ standard raster and vector formats.
- 50+ standard raster and vector formats.
- ERDAS IMAGINE.img, TIFF, GeoTIFF, ESRI GRID, Shapefile, Arc/Info coverage, Simple Personal Geodatabase.
- No. Can be done using IMAGINE Developers' Toolkit.

### MicroImages Inc.

- USS5000 / NAFTA, USS6000 international.
- Win NT/2000/XP, LINUX, Solaris, Mac OS X.
- Windows (all), LINUX, Solaris, Mac OS X.
- TIFF, GeoTIFF, ArcInfo GRID, DTED, JPEG, JPEG2000, PNG, MrSID, Landsat, SPOT, Shapefile, MapInfo, E00, Oracle Spatial, DLG, TIGER, MOSS, DXF among others.
- E00, Shapefile, DLG, Grass, MOSS, Oracle Spatial, TIFF, GeoTIFF, JPEG, JPEG2000, MrSID among others.
- E00, Coverage, Shapefile, JPEG, TIFF, GeoTIFF, DGN, DXF, DWG.
- E00, Coverage, Shapefile.
- C++, TntSdx (software development kit; free / all platforms).

### Sokkia

- UDF, SHP, MIF, DXF, DGN, SIF, TIF, JPQ, DOQ.
- DXF, ASCII, CRS, SHP, MIF.
- UDF, SHP, MIF, DXF, DGN.
- UDF, CRS, SHP, DXF, ASCII.

### Trimble

- Software extension for ESRI ArcGIS software.
- Uses ESRI Personal Geodatabase.
- Trimble SSF and Data Dictionary files.

### Tripod Data Systems

- PocketPC/WinCE/NT/2000/XP.
- RTI - RealTime Forest Inventory Systems available through LandMark Systems.
- ESRI Shape file, MapInfo MIF, AutoCAD DXF, Intergraph DGN.
- ASCII, CRS, DXF, SHP, MIF.
- UDF, SHP, MIF, DXF, DGN.
- ASCII, CRS, DXF, SHP.
- Through Desktop SW.

**POB does not assume responsibility for any errors or omissions that may be contained within the survey.**