

# 2004 GIS Software Survey

Program Name	Autodesk Raster Design 2005	Autodesk Survey 2005	Autodesk Land Desktop 2005	Autodesk Civil Design 2005	GEOPAK Survey	Power Survey	InRoads Survey	MicroStation GeoGraphics
<b>Manufacturer/Distributor</b>	Autodesk Inc.	Autodesk Inc.	Autodesk Inc.	Autodesk Inc.	Bentley Systems Inc.	Bentley Systems	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
<b>Cost Per Seat</b>	Contact reseller	Contact reseller	Contact reseller	Contact reseller	Contact vendor	\$1499	Contact vendor	Contact vendor
<b>Date of First Release</b>	1996	1998	1998	1998	1996	2003	2000	1995
<b>SOFTWARE FEATURES</b>								
<i>Operating System/Network Support</i>								
- Network Client-Server Support	No	Win NT/2000/XP	Win NT/2000/XP	Win NT/2000/XP	Yes	Yes	Yes	Yes
- Server Operating System	Win 2000/XP	No	No	No	Win NT 4.0/2000/XP/98/ME	Win NT 4.0/2000/XP/98/ME	Win NT 4.0/2000/XP/98/ME	WinXP/2000/NT 4.0/98
- Client Operating System	None	No	No	No	Win NT 4.0/2000/XP/98/ME	Win NT 4.0/2000/XP/98/ME	Win NT 4.0/2000/XP/98/ME	WinXP/2000/NT 4.0/98
- Internet Server Enabled	N/A	No	No	No	N/A	N/A	N/A	Via Bentley Publisher
<i>Compatible Applications</i>								
- Third Party Applications Designed to Run on Software	N/A	Yes, by vendor	[3]	Yes, by vendor	Yes	Yes	Yes	Yes
- Total Solution Packages Available	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>GIS Data Administration</i>								
- Multi-user Edit Locking	Yes	Yes	Yes	Yes	N/A	N/A	Yes	[8]
- Versioning	No	No	No	No	N/A	N/A	Yes	[9]
- Metadata Maintenance	N/A	No	No	No	N/A	N/A	N/A	[10]
<i>Database Management</i>								
- Proprietary DBMS	No	No	No	No	No	No	No	No
- Relational Database Management System	No	No	No	No	Oracle, MS Access, SQL Server, Sybase, Informix	Oracle, MS Access, SQL Server, Sybase, Informix	Oracle, MS Access, SQL Server, Sybase, Informix	[4]
- RDBMS Spatial Data Warehouse	No	No	No	No	N/A	N/A	N/A	Oracle 8i/9i Spatial and Oracle 9i Locator
<i>Native Graphic Data Structure and Format</i>								
- Vector-Spaghetti	No	No	No	No	DGN, DWG, DXF	DGN, DWG, DXF	DGN, DWG	DGN, DWG, DXF
- Vector-Topologic	No	No	No	No	N/A	N/A	N/A	Oracle Spatial/DGN post processing
- Parametric	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- 3-D	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- TIN	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes, via Bentley GEOPAK Site module
- Grid	No	Yes	Yes	Yes	Yes	Yes	Yes	N/A
- Raster Image	Yes	Yes	Yes	Yes	[2]	[2]	[2]	[2]
<i>GIS Data Import/Export Utilities</i>								
- Direct Import Formats	N/A	[1]	[1]	[1]	N/A	N/A	Yes	DXF, DWG, MID/MIF, SHP, E00
- Direct Export Formats	N/A	[1]	[1]	[1]	N/A	N/A	Yes	DXF, DWG, MID/MIF, SHP, E00
<i>Readable Formats That Do Not Require Translation</i>								
- Import	[6]	DWG, LandXML, ASCII, FBK	DWG, LandXML, ASCII	DWG, LandXML, ASCII	[6]	[6]	Yes	Oracle Spatial, DGN, DWG
- Export	Image Formats, CALS, TIFF, PNG, BMP, JPG	DWG, LandXML, ASCII, FBK	DWG, LandXML, ASCII	DWG, LandXML, ASCII	[6]	[6]	Yes	Oracle Spatial, DGN, DWG
<i>GIS Data Entry and Editing</i>								
- Board Digitizing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Coordinate Geometry/Precision Entry	1-8 Decimal Places	0-8 decimal places	0-8 decimal places	0-8 decimal places	Yes	Yes	Yes	Via Bentley GEOPAK Site
- Electronic Survey Data Import	N/A	Yes	Yes, ASCII Coordinate files	Yes, with Survey Add-in	Yes	Yes	Yes	Via Bentley GEOPAK Site
- Heads-up Digitizing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Vectorization	Yes	Yes	Yes	No	N/A	N/A	N/A	Via Bentley Descartes
- Map Rectification	Yes	Yes	No	No	N/A	N/A	Yes	Yes
- Graphic Error Check/Correction	Yes	Yes	No	No	Yes	Yes	Yes	Yes
- Field Data Entry	N/A	Yes	Yes	Yes	Yes	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	Yes	Yes	Yes	Yes
- Global Symbol Change	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Thematic Mapping	Yes	Yes	Yes	No	N/A	N/A	Yes	Yes
<i>Geographic Query and Analysis Functions</i>								
- Attribute Query and Selection	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Map Measurements	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Address Matching	N/A	No	No	No	N/A	N/A	N/A	Yes
- Buffer Generation	N/A	Yes	Yes	Yes	N/A	N/A	N/A	Yes
- Point/Line-in-Polygon Analysis	N/A	Yes	Yes	Yes	N/A	N/A	Yes	Yes
- Polygon Overlay	N/A	Yes	Yes	Yes	N/A	N/A	Yes	Yes
- Network Analysis	N/A	Yes	Yes	Yes	N/A	N/A	Yes	Yes
- Raster Document Query and Access	Yes	With add-on	With add-on	With add-on	N/A	N/A	N/A	Yes
- Direct Access to Other GIS Format	N/A	Yes	Yes	Yes	N/A	N/A	N/A	SHP, MID, MIF, E00
<i>Terrain Data Processing and Analysis</i>								
- DEM Generation	No	No	No	No	Yes	Yes	N/A	Via Bentley GEOPAK Site
- Contour Map Generation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Via Bentley GEOPAK Site
- 3-D Display/Profile Generation	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Map Draping	No	No	No	No	N/A	N/A	Yes	Via Bentley Descartes
- Slope/Aspect Analysis	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Via Bentley GEOPAK Site
<i>Raster Image Capabilities</i>								
- Geometric Rectification	Yes	With add-on	With add-on	With add-on	N/A	N/A	Yes	Via Bentley Descartes
- Orthoimage Generation	Yes	With add-on	With add-on	With add-on	N/A	N/A	N/A	N/A
- Image Enhancement	Yes	With add-on	With add-on	With add-on	N/A	N/A	N/A	Via Bentley Descartes
- Spectral Classification	Yes	With add-on	With add-on	With add-on	N/A	N/A	N/A	N/A
<i>Application Development Language</i>								
- Proprietary Application Development Language	No	No	No	No	MDL, JMDL, Basic	MDL, JMDL, Basic	MDL, JMDL, Basic, C++	MDL, JMDL, MicroStation Basic
- Industry Standard Programming Environment	Yes, ActiveX	No	ActiveX, VBA, C++, Lisp	ActiveX, VBA, C++	C, C++, Visual Basic, JAVA	C, C++, Visual Basic, JAVA	C, C++, Visual Basic, JAVA	C, C++, Visual Basic, JAVA
<b>Extra Notes</b>	[7]	[2]	[4]	[8]		[7]		[11]
<b>Reader Service Number</b>	1	2	3	4	5	6	7	8

Numbers in brackets refer to notes (see page 51). N/A = Not Applicable

# 2004 GIS Software Survey

Program Name	Bentley Water	Bentley WasteWater	Bentley Publisher	Bentley Descartes	Bentley I/RAS B	Bentley PowerField	Bentley WorkPrint	Bentley PowerMap
<b>Manufacturer/Distributor</b>	Bentley Systems Inc.	Bentley Systems Inc.	Bentley Systems Inc.	Bentley Systems Inc.	Bentley Systems Inc.	Bentley Systems Inc.	Bentley Systems Inc.	Bentley Systems Inc.
<b>Manufacturer's Phone Number</b>	610/458-5000	610/458-5000	610/458-5000	610/458-5000	610/458-5000	610/458-5000	610/458-5000	610/458-5000
<b>Cost Per Seat</b>	Contact vendor	Contact vendor	Contact vendor	Contact vendor	Contact vendor	Contact vendor	Contact vendor	Contact vendor
<b>Date of First Release</b>	1999	1999	1996	1993	1992	2004	2004	2003
<b>SOFTWARE FEATURES</b>								
<i>Operating System/Network Support</i>								
- Network Client-Server Support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Server Operating System	Win XP/2000/NT 4.0/98	Win XP/2000/NT 4.0/98	Win 2000/NT	Win XP/2000/NT 4.0/98	Win XP/2000/NT 4.0/98	Win XP/2000/NT 4.0/98/Me	Win XP/2000/NT 4.0/98/Me	Win XP/2000/NT 4.0/98/Me
- Client Operating System	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	Win XP/2000/NT 4.0/98	Win XP/2000/NT 4.0/98/Me	Win XP/2000/NT 4.0/98/Me	Win XP/2000/NT 4.0/98/Me
- Internet Server Enabled	Via Bentley Publisher	Via Bentley Publisher	Yes	Via Bentley Publisher	Via Bentley Publisher	Via Bentley Publisher	Via Bentley Publisher	Via Bentley Publisher
<i>Compatible Applications</i>								
- Third Party Applications Designed to Run on Software	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes
- Total Solution Packages Available	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>GIS Data Administration</i>								
- Multi-user Edit Locking	[8]	[8]	N/A	N/A	N/A	N/A	N/A	N/A
- Versioning	No	No	N/A	Yes, via MicroStation	N/A	N/A	N/A	N/A
- Metadata Maintenance	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A
<i>Database Management</i>								
- Proprietary DBMS	No	No	No	No	No	No	No	No
- Relational Database Management System	[4]	[4]	[4]	No	N/A	[4]	[4]	[4]
- RDBMS Spatial Data Warehouse	Oracle 8i/9i Spatial and Oracle 9i Locator	Oracle 8i/9i Spatial and Oracle 9i Locator	Oracle 8i/9i Spatial and Oracle 9i Locator	No	N/A	[1]	Oracle 8i/9i, Spatial and Locator	Oracle 8i/9i, Spatial and Locator
<i>Native Graphic Data Structure and Format</i>								
- Vector-Spaghetti	DGN, DWG, DXF	DGN, DWG, DXF	DGN	DGN, DWG, DXF	DGN, DWG, DXF	DGN, DWG, DXF, MXD, SHP, LYR	DGN, DWG, DXF	DGN, DWG, DXF
- Vector-Topologic	Oracle Spatial/DGN post processing	Oracle Spatial/DGN post processing	Oracle 8i/9i Spatial and Oracle 9i Locator	N/A	N/A	Oracle Spatial (query-only)	[5]	[5]
- Parametric	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- 3-D	Yes	Yes	Yes	Yes	Yes	View-only	Yes	Yes
- TIN	N/A	N/A	N/A	Yes, via Bentley GEOPAK Site module	N/A	N/A	N/A	N/A
- Grid	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Raster Image	[2]	[2]	[14]	[14]	[17]	[2]	[2]	[2]
<i>GIS Data Import/Export Utilities</i>								
- Direct Import Formats	DXF, DWG, MID/MIF, SHP, EOO	DXF, DWG, MID/MIF, SHP, EOO	DXF/DWG	[14]	[17]	DGN, DWG, DXF, MXD, SHP, LYR	DGN, DWG, DXF	DGN, DWG, DXF, MXD, SHP, LYR
- Direct Export Formats	DXF, DWG, MID/MIF, SHP, EOO	DXF, DWG, MID/MIF, SHP, EOO	DXF/DWG	[14]	[17]	Read-only platform	DGN, DWG, DXF	DGN, DWG, DXF, SHP
<i>Readable Formats That Do Not Require Translation</i>								
- Import	Oracle Spatial, DGN, DWG	Oracle Spatial, DGN, DWG	Oracle Spatial, DGN, DWG	[14]	[17]	[3]	DGN, DWG, DXF	DGN, DWG, DXF, MXD, SHP, LYR
- Export	Oracle Spatial, DGN, DWG	Oracle Spatial, DGN, DWG	CGM, SVG, JPG	[14]	[17]	Read-only platform	DGN, DWG, DXF	DGN, DWG, DXF
<i>GIS Data Entry and Editing</i>								
- Board Digitizing	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes
- Coordinate Geometry/Precision Entry	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A
- Electronic Survey Data Import	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Heads-up Digitizing	Yes	Yes	N/A	Yes	Yes	N/A	Yes	Yes
- Vectorization	N/A	N/A	N/A	Yes	Yes	N/A	N/A	N/A
- Map Rectification	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes
- Graphic Error Check/Correction	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes
- Field Data Entry	N/A	N/A	N/A	N/A	N/A	Yes	Yes	Yes
<i>Map Design and Composition</i>								
- Interactive Map Composition	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes
- Annotation from Attributes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
- Global Symbol Change	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes
- Thematic Mapping	Yes	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	Yes
- Map Measurements	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Address Matching	N/A	N/A	Available via additional services	N/A	N/A	N/A	Yes	Yes
- Buffer Generation	Yes	Yes	Yes	N/A	N/A	Yes	Yes	Yes
- Point/Line-in-Polygon Analysis	Yes	Yes	Yes	N/A	N/A	Yes	Yes	Yes
- Polygon Overlay	Yes	Yes	Yes	N/A	N/A	Yes	Yes	Yes
- Network Analysis	Yes	Yes	Yes	N/A	N/A	Yes	Yes	Yes
- Raster Document Query and Access	Yes	Yes	Yes	N/A	N/A	Yes	Yes	Yes
- Direct Access to Other GIS Format	SHP, MID, MIF, EOO	SHP, MID, MIF, EOO	N/A	N/A	N/A	Yes	Yes	Yes
<i>Terrain Data Processing and Analysis</i>								
- DEM Generation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Contour Map Generation	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Yes
- 3-D Display/Profile Generation	N/A	N/A	N/A	Yes	N/A	Yes	Yes	Yes
- Map Draping	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A
- Slope/Aspect Analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<i>Raster Image Capabilities</i>								
- Geometric Rectification	N/A	N/A	N/A	Yes	Yes	N/A	N/A	N/A
- Orthoimage Generation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Image Enhancement	N/A	N/A	N/A	Yes	N/A	Yes	Yes	Yes
- Spectral Classification	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<i>Application Development Language</i>								
- Proprietary Application Development Language	MDL, JMDL, Basic	MDL, JMDL, Basic	MDL, JMDL, Basic	MDL, JMDL, Basic	MDL	MDL, MicroStation Basic	MDL, MicroStation Basic	MDL, MicroStation Basic
- Industry Standard Programming Environment	C, C++, Visual Basic, JAVA, VBA	C, C++, Visual Basic, JAVA, VBA	ASP, JAVA Script, JAVA, Visual Basic, C, C++	C, C++, Visual Basic, JAVA	Visual Basic	C, C++, Visual Basic, JAVA	C, C++, Visual Basic, JAVA	C, C++, Visual Basic, JAVA
<b>Extra Notes</b>	[12]	[13]	[15]	[16]	[18]			
<b>Reader Service Number</b>	9	10	11	12	13	14	15	16

Numbers in brackets refer to notes (see page 51). N/A = Not Applicable

# 2004 GIS Software Survey

Program Name	Geographic Transformer 5.0	Geographic Calculator 6.0	TransCAD 4.7	Maptitude 4.6	CARIS GIS	CARIS Carta	CEDRA AVseries [1]	ArcEditor	ArcView	ArcPad
<b>Manufacturer/Distributor</b>	Blue Marble Geographics	Blue Marble Geographics	Caliper Corporation	Caliper Corporation	CARIS	CARIS	The CEDRA Corporation	ESRI	ESRI	ESRI
<b>Manufacturer's Phone Number</b>	800/616-2725	800/616-2725	617/527-4700	617/527-4700	506/458-8533	506/458-8533	585/232-6998	800/447-9778	800/447-9778	800/447-9778
<b>Cost Per Seat</b>	\$899	\$499	\$2995 (Base), \$9995 (Standard)	\$495	Contact vendor	Contact vendor	Contact vendor	Call ESRI	\$1500	\$495
<b>Date of First Release</b>	1996	1993	1988	1995	1983	2004	1985	2001	1992	2000
<b>SOFTWARE FEATURES</b>										
<i>Operating System/Network Support</i>										
- Network Client-Server Support	Yes	Yes	Win 98/NT and above	Win 98/NT and above	Yes	Yes	Yes	Yes	Yes	No
- Server Operating System	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/NT/2000/XP/UNIX	Windows NT 4.0/2000/XP	Windows	No
- Client Operating System	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/NT/2000/XP/UNIX	Windows NT 4.0/2000/XP	Windows	Windows CE
- Internet Server Enabled			With TransCAD for the Web	With Maptitude for the Web	No	No	Yes	Via ArcIMS	Via ArcIMS	Via ArcIMS
<i>Compatible Applications</i>										
- Third Party Applications Designed to Run on Software							ArcView or ArcGIS	www.esri.com/partners	www.esri.com/partners	www.esri.com/partners
- Total Solution Packages Available			2 [1]	3 [2]			12	Numerous	Numerous	Numerous
<i>GIS Data Administration</i>										
- Multi-user Edit Locking	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
- Versioning			No	No	No	No	Yes	Yes	No	No
- Metadata Maintenance			Yes	Yes	No	No	Yes	Yes	Yes	No
<i>Database Management</i>										
- Proprietary DBMS			No	No	No	No	No	No	No	No
- Relational Database Management System			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- RDBMS Spatial Data Warehouse			Yes	Yes	No	Yes	Yes	[1]	[1]	No
<i>Native Graphic Data Structure and Format</i>										
- Vector-Spaghetti			Yes, can handle	Yes, can handle	Yes	Yes	Yes	Shapefile	Shapefile	Shapefile
- Vector-Topologic			Yes	Yes	Yes	Yes	Yes	Coverage, Geodatabase	Coverage, Geodatabase	No
- Parametric			No	No	Yes	No	Yes	Geodatabase	Geodatabase	No
- 3-D			Yes (surfaces)	Yes (surfaces)	Yes	Yes	Yes	Shapefile, Geodatabase	Shapefile, Geodatabase	No
- TIN			Yes	Yes	Yes	Yes	Yes	ESRI TIN	ESRI TIN	No
- Grid	Yes	Yes	Yes	Yes	Yes	No	Yes	ESRI Grid	ESRI Grid	No
- Raster Image	Yes	Yes	Yes	Yes	Yes	Yes	Yes	[2]	[2]	Yes
<i>GIS Data Import/Export Utilities</i>										
- Direct Import Formats	[1]	[3]	16, including TIGER/Line, DWG, DGN	16, including TIGER/Line, DWG, DGN	Yes	Yes	Yes	Over 40 standard formats	Over 40 standard formats	N/A
- Direct Export Formats	[2]	[3]	8, including Shapefile, MID/MIF	8, including Shapefile, MID/MIF	Yes	Yes	Yes	Over 40 standard formats	Over 40 standard formats	N/A
<i>Readable Formats That Do Not Require Translation</i>										
- Import			Oracle Spatial, ESRI Shapefile, MapInfo TAB	Oracle Spatial, ESRI Shapefile, MapInfo TAB	Yes	Yes		Over 40 standard formats	Over 40 standard formats	Shapefiles, Mr SID, BMP, JPG
- Export			Oracle Spatial	Oracle Spatial	Yes	Yes		Over 40 standard formats	Over 40 standard formats	Shapefiles, Mr SID, BMP, JPG
<i>GIS Data Entry and Editing</i>										
- Board Digitizing			Yes	Yes	Yes	No	Yes	Yes	Yes	No
- Coordinate Geometry/Precision Entry	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
- Electronic Survey Data Import	Yes	Yes	GPS points	GPS points	Yes	No	Yes	Yes	Yes	No
- Heads-up Digitizing			Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
- Vectorization			No	No	Yes	No	Yes	Yes	Yes	No
- Map Rectification	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
- Graphic Error Check/Correction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
- Field Data Entry	Yes	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	No
- Annotation from Attributes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
- Global Symbol Change			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Thematic Mapping			Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
<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	Yes
- Address Matching			Yes	Yes	No	No	Yes	Yes	Yes	Yes
- Buffer Generation			Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
- Point/Line-in-Polygon Analysis			Yes	Yes	Yes	No	Yes	Yes	Yes	No
- Polygon Overlay			Yes	Yes	Yes	No	Yes	Yes	Yes	No
- Network Analysis			Yes	Yes (best route)	Yes	No	Yes	Yes	Yes	No
- Raster Document Query and Access	Yes		No	No	No	No	Yes	Yes	Yes	No
- Direct Access to Other GIS Format	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
<i>Terrain Data Processing and Analysis</i>										
- DEM Generation			Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
- Contour Map Generation			Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
- 3-D Display/Profile Generation			Yes	Yes	Yes	No	Yes	Yes	Yes	No
- Map Draping			Yes	Yes	Yes	No	Yes	Yes	Yes	No
- Slope/Aspect Analysis			Yes	Yes	Yes	No	Yes	Yes	Yes	No
<i>Raster Image Capabilities</i>										
- Geometric Rectification	Yes		No	No	Yes	Yes	Yes	Yes	Yes	No
- Orthoimage Generation	No		No	No	Yes	No	Yes	Yes	Yes	No
- Image Enhancement	Yes		No	No	No	No	Yes	Yes	Yes	No
- Spectral Classification			No	No	Yes	No	Yes	Yes	Yes	No
<i>Application Development Language</i>										
- Proprietary Application Development Language	Yes	Yes	Yes (Caliper Script)	Yes (Caliper Script)	Yes	No		No	No	No
- Industry Standard Programming Environment			Yes (.NET)	Yes (.NET)	VB		[3]	[3]	[3]	VBScript, C/C++
Extra Notes			[37]	[40]				www.esri.com/arceditor	www.esri.com/arcview	[4]
<b>Reader Service Number</b>	17	18	19	20	21	22	23	24	25	26

Numbers in brackets refer to notes (see page 51). N/A = Not Applicable

# 2004 GIS Software Survey

Program Name	ArcGIS Survey Analyst	Surfer 8	Didger 3	MapViewer 5	GeoMedia/IntelliWhere [1]	ERDAS IMAGINE	MapInfo Professional	MapX Mobile
<b>Manufacturer/Distributor</b>	ESRI	Golden Software	Golden Software	Golden Software	Intergraph Mapping & Geospatial Solutions	Leica Geosystems GIS & Mapping	MapInfo Corporation	MapInfo Corporation
<b>Manufacturer's Phone Number</b>	800/447-9778	303/279-1021	303/279-1021	303/279-1021	256/730-7191 [2]	404/248-9000	800/327-8627	800/327-8627
<b>Cost Per Seat</b>	Call ESRI	\$599	\$329	\$249	Call for pricing information	\$2200+	Contact vendor	Contact vendor
<b>Date of First Release</b>	2003	2002	2001	2002	1997	1990	1985	2000
<b>SOFTWARE FEATURES</b>								
<i>Operating System/Network Support</i>								
- Network Client-Server Support	Yes			Yes	Yes	Yes	Yes	No
- Server Operating System	Win NT 4.0/2000/XP			Windows, Novell	[3]	Win XP/2000, Sun Solaris	MS Windows logo certified	No
- Client Operating System	Win NT 4.0/2000/XP	Win 98/Me/2000/XP	Win 98/Me/2000/XP	Win 98/Me/2000/XP	Win Me/XP/2000	Win XP/2000, Sun Solaris	MS Windows logo certified	[17]
- Internet Server Enabled	Via ArcIMS				Yes	No	Yes, via MapInfo Discovery	No
<i>Compatible Applications</i>								
- Third Party Applications Designed to Run on Software	www.esri.com/partners				Several	[7]	Numerous	Numerous
- Total Solution Packages Available	Numerous				Yes	Yes	Yes	
<i>GIS Data Administration</i>								
- Multi-user Edit Locking	Yes, with core ArcGIS				Yes	No	Yes, via database	No
- Versioning	Yes, with core ArcGIS				Yes	No	Yes, via database	No
- Metadata Maintenance	Yes, with core ArcGIS				Yes	Yes	Yes	No
<i>Database Management</i>								
- Proprietary DBMS	No			Yes	No	CellArray	[1]	No
- Relational Database Management System	Yes			Yes	[11]	[1]	Yes	Yes [6]
- RDBMS Spatial Data Warehouse	[1]			Yes	[11]	ArcSDE	[2]	No
<i>Native Graphic Data Structure and Format</i>								
- Vector-Spaghetti	Shapefile	Yes	Yes	Yes		Yes	Yes	Yes
- Vector-Topologic	Coverage, Geodatabase				[4]	Yes	No	No
- Parametric	Geodatabase				Yes	Yes	No	No
- 3-D	Shapefile, Geodatabase	Yes			Yes	Yes	Yes [3]	No
- TIN	ESRI TIN				Yes	Yes	Yes, via Vertical Mapper	No
- Grid	ESRI Grid	Yes			Yes	Yes	Yes [16]	No
- Raster Image	[2]	Yes	Yes	Yes	Yes	Yes	Yes [16]	Yes
<i>GIS Data Import/Export Utilities</i>								
- Direct Import Formats	Over 40 standard formats	[1]	[3]	[5]	[5]	[2]	[16]	No
- Direct Export Formats	Over 40 standard formats	[2]	[4]	[6]	[6]	[3]	[16]	No
<i>Readable Formats That Do Not Require Translation</i>								
- Import	Over 40 standard formats	SRF, GSI, GSB, BLN	PJT, GSI, GSB, BLN	GSM, GSI, GSB, BLN	[7]	[4]	[16]	Shape, ASCII
- Export	Over 40 standard formats	SRF, GSI, GSB, BLN	PJT, GSI, GSB, BLN	GSM, GSI, GSB, BLN	[8]	[5]	[16]	No
<i>GIS Data Entry and Editing</i>								
- Board Digitizing	Yes		Yes		Yes	Yes	Yes	Yes
- Coordinate Geometry/Precision Entry	Yes		Yes		Yes	No	Yes	Yes, with customization
- Electronic Survey Data Import	Yes		Yes		Yes	No	Yes	Yes
- Heads-up Digitizing	Yes, with ArcScan		Yes	Yes	Yes	Yes	Yes	Yes
- Vectorization	Yes, with ArcScan				Yes	Yes	Yes, via Vertical Mapper	No
- Map Rectification	Yes		Yes		Yes	Yes	No	No
- Graphic Error Check/Correction	Yes		Yes		Yes	Yes	Yes	No
- Field Data Entry	Yes				Yes	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	Yes	Yes	Yes
- Global Symbol Change	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Thematic Mapping	Yes			Yes	Yes	Yes	Yes	Yes
<i>Geographic Query and Analysis Functions</i>								
- Attribute Query and Selection	Yes, with core ArcGIS			Yes	Yes	Yes	Yes	Yes
- Map Measurements	Yes, with core ArcGIS		Yes	Yes	Yes	Yes	Yes	Yes
- Address Matching	Yes, with core ArcGIS				Yes	No [6]	Yes	No
- Buffer Generation	Yes, with core ArcGIS			Yes	Yes	Yes	Yes	No
- Point/Line-in-Polygon Analysis	Yes, with core ArcGIS			Yes	Yes	Yes	Yes	Yes
- Polygon Overlay	Yes, with core ArcGIS			Yes	Yes	Yes	Yes	No
- Network Analysis	Yes, with core ArcGIS				Yes	No	No	No
- Raster Document Query and Access	Yes, with core ArcGIS				Yes	Yes	Yes	No
- Direct Access to Other GIS Format	Yes, with core ArcGIS			Yes	Yes	Yes	Yes	Shape
<i>Terrain Data Processing and Analysis</i>								
- DEM Generation	Yes, with core ArcGIS				Yes	Yes	Yes	No
- Contour Map Generation	[5]	Yes			Yes	Yes	Yes, via Vertical Mapper	No
- 3-D Display/Profile Generation	Yes, with ArcGIS 3D Analyst	Yes			Yes	Yes	Yes, via Vertical Mapper	No
- Map Draping	Yes, with core ArcGIS	Yes			Yes	Yes	Yes	No
- Slope/Aspect Analysis	Yes, with ArcGIS Spatial Analyst	Yes			Yes	Yes	Yes, via Vertical Mapper	No
<i>Raster Image Capabilities</i>								
- Geometric Rectification	Yes, with core ArcGIS		Yes		Yes	Yes	[4]	No
- Orthoimage Generation	Yes, with core ArcGIS				Yes	Yes	No	No
- Image Enhancement	Yes, with core ArcGIS		Yes	Yes	Yes	Yes	Yes	No
- Spectral Classification	Yes, with core ArcGIS				Yes	Yes	Yes, via Vertical Mapper	No
<i>Application Development Language</i>								
- Proprietary Application Development Language	No	Scripter		Scripter	[9]	IMAGINE Developers'	Yes, MapBasic	No
- Industry Standard Programming Environment	[3]	C++, VB, Perl		C++, VB, Perl	Yes	Toolkit	[5]	[7]
Extra Notes	[6]				[10]	C/C++ with some COM		
<b>Reader Service Number</b>	27	28	29	30	31	32	33	34

Numbers in brackets refer to notes (see page 51). N/A = Not Applicable

# 2004 GIS Software Survey

Program Name	MapXtreme Java	MapXtreme 2004	Vulcan 4.5	Parcel Editor 8	ELT/5500	IMap	SOLO	TerraSync Professional Edition	GPS Pathfinder Office
<b>Manufacturer/Distributor</b>	MapInfo Corporation	MapInfo Corporation	Maptek Pty Ltd	NovalIS Technologies	Paragon Imaging Inc.	SOKKIA	Tripod Data Systems	Trimble	Trimble
<b>Manufacturer's Phone Number</b>	800/327-8627	800/327-8627	303/763-4919	902/423-1800	800/937-4544	913/255-3913	541/753-9322	408/481-8000	408/481-8000
<b>Cost Per Seat</b>	Contact vendor	Contact vendor	Contact vendor	\$2495 [1]	\$3995	\$1000 list	\$1000	Contact vendor	Contact vendor
<b>Date of First Release</b>	1998	1998	2003	1996	2001	2000	1998	2000	1995
<b>SOFTWARE FEATURES</b>									
<i>Operating System/Network Support</i>									
- Network Client-Server Support	Yes	Yes	No	Terminal server	Yes, FlexLM	No	No	N/A	Yes
- Server Operating System	[8]	Win 2000/XP/2003	N/A	Unix, W2K, NT Server	Microsoft Windows	N/A		N/A	Win XP/2000/NT/Me/98/95
- Client Operating System	[13]	[13]	Win NT/2000/XP	Win XP/NT/2000	Microsoft Windows	Win CE/NT/98/2000/XP	Windows CE/Mobile	[1]	Win XP/2000/NT/Me/98/95
- Internet Server Enabled	Yes	Yes	No	N/A		No	No	Yes	Yes
<i>Compatible Applications</i>									
- Third Party Applications Designed to Run on Software	Numerous	Numerous	No	ArcGIS		No	RTI - RealTime Forest Inventory	N/A	N/A
- Total Solution Packages Available	Yes	Yes	Yes	Full Cadastral office suite		Yes	Yes	N/A	N/A
<i>GIS Data Administration</i>									
- Multi-user Edit Locking	Yes, via database	Yes, via database	Yes	Yes		No	N/A	No	No
- Versioning	Yes, via database	Yes, via database	No	Yes		No	No	No	No
- Metadata Maintenance	Yes	Yes	No	No		No	No	No	No
<i>Database Management</i>									
- Proprietary DBMS	[1]	[14]	Isis	Geodatabase		No	No	No	No
- Relational Database Management System	[9]	[9]	No	Geodatabase		No	No	No	No
- RDBMS Spatial Data Warehouse	[10]	[10]	Via ODBC	Geodatabase		No	No	No	No
<i>Native Graphic Data Structure and Format</i>									
- Vector-Spaghetti	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
- Vector-Topologic	No	No	No	Yes		Yes	Yes	No	No
- Parametric	Yes	Yes	No	No		No	No	No	No
- 3-D	Yes, read-only	Yes, read-only from database	Yes	No		Yes	Yes	Yes	Yes
- TIN	No	No	Yes + solid triangulations	No		No	No	No	No
- Grid	Yes	Yes [16]	Yes	No		Yes	Yes	No	No
- Raster Image	Yes	Yes [16]	Yes	No	Native raster image support	Yes	Yes	Yes	Yes
<i>GIS Data Import/Export Utilities</i>									
- Direct Import Formats	[16]	[16]	[1]	[2]	[1]	[1]	[1]	ArcView Shapefile, Trimble SSF	[3]
- Direct Export Formats	[16]	[16]	[2]	[2]	NITF, GeoTiff and more	[2]	SHP, DXF, ASCII, CR5	ArcView Shapefile, Trimble SSF	[4]
<i>Readable Formats That Do Not Require Translation</i>									
- Import	[16]	[16]	[3]	[2]	[1]	[3]	UDF, SHP, MIF, DXF, DGN	Trimble SSF	Trimble SSF
- Export	[16]	[16]	[3]	[2]	[1]	[4]	UDF, CR5, SHP, DXF, ASCII	Trimble SSF	Trimble SSF
<i>GIS Data Entry and Editing</i>									
- Board Digitizing	No	Yes	Yes	Yes		No	No	No	No
- Coordinate Geometry/Precision Entry	No	Yes	Yes	Yes	[2]	Yes, no adjustments	Yes, no adjustments	N/A	Yes
- Electronic Survey Data Import	No	Yes	Yes	Yes		Yes	Yes	N/A	Yes
- Heads-up Digitizing	No	Yes	Yes	Yes		Yes	Yes	Yes	Yes
- Vectorization	No	No	No	Yes		No	No	No	No
- Map Rectification	No	No	Yes	Yes		No	No	No	No
- Graphic Error Check/Correction	No	No	No	Yes		No	No	No	No
- Field Data Entry	Yes	Yes	No	Yes		Primary function	Primary function	Yes	No
<i>Map Design and Composition</i>									
- Interactive Map Composition	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
- Annotation from Attributes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	No
- Global Symbol Change	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
- Thematic Mapping	Yes	Yes	No	No		Yes	Yes	No	No
<i>Geographic Query and Analysis Functions</i>									
- Attribute Query and Selection	Yes	Yes	No	Yes		Yes	Yes	Yes	Yes
- Map Measurements	Yes	Yes	No	Yes	Image and map measurements	Yes	Yes	Yes	Yes
- Address Matching	Yes [11]	Yes	No	Yes		No	No	No	No
- Buffer Generation	Yes	Yes	No	No		No	Yes	No	No
- Point/Line-in-Polygon Analysis	Yes	Yes	No	Yes		No	No	No	No
- Polygon Overlay	No	Yes	No	Yes	Full polygon overlays	Yes	Yes	No	No
- Network Analysis	Yes [12]	No	Yes	Yes		No	No	No	No
- Raster Document Query and Access	Yes	No	No	No		No	No	No	No
- Direct Access to Other GIS Format	Yes	Yes (Oracle Spatial, Shape)	No	Yes		Yes	Yes	No	No
<i>Terrain Data Processing and Analysis</i>									
- DEM Generation	No	No	Yes	No		No	No	No	No
- Contour Map Generation	No	No	Yes	No		No	No	No	No
- 3-D Display/Profile Generation	No	No	Yes + solid triangulations	No		No	No	No	No
- Map Draping	No	No	Yes	No		No	No	No	No
- Slope/Aspect Analysis	No	No	Yes	No		No	No	No	No
<i>Raster Image Capabilities</i>									
- Geometric Rectification	No	No	Yes	No	Yes	No	No	No	No
- Orthoimage Generation	No	No	No	No		No	No	No	No
- Image Enhancement	Yes	Yes	No	No	[3]	Yes	Yes	No	No
- Spectral Classification	No	No	No	No		No	No	No	No
<i>Application Development Language</i>									
- Proprietary Application Development Language	No	No	Lava	VB	Full API support with ELT/5500	Yes	Yes	No	No
- Industry Standard Programming Environment	Java and .Net languages	[15]	Perl	VB		Yes	Yes	No	No
<i>Extra Notes</i>									
<b>Reader Service Number</b>	35	36	37	38	39	40	41	42	43

Numbers in brackets refer to notes (see page 51). N/A = Not Applicable

# 2004 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 Inc.

1. ASCII, EOO, MID, MIF, ArcInfo coverage, ArcInfo Shape, DWG, LandXML, DGN, numerous data collectors.
2. Autodesk Survey is an add-in to Autodesk Land Desktop 2005. Survey adds bi-directional data collector support, traverse analysis, figures, basic coordinate geometry functions and annotation to Autodesk Land Desktop 2005.
3. Autodesk Raster Design, Autodesk Survey, Autodesk Civil Design.
4. Autodesk Land Desktop 2005 streamlines each phase of land development projects and provides a central location for project data that everybody on a team can access.
5. Autodesk Civil Design is an add-on for Autodesk Land Desktop 2005. The package includes tools to design roadways, grading plans, do hydrologic analysis, pond design and generate plan/profile sheets.
6. Image Formats, CALS, TIFF, GeoTIFF, SID, ECW, PNG, BMP, JPG, GeoSPOT, JPG2000, DOQ, DEM, satellite imagery.
7. Autodesk Raster Design 2005e is an add-on application to AutoCAD 2005, Autodesk Map 2005 and Autodesk Land Desktop 2004 that enables customers to easily edit, convert, and integrate scanned drawings and raster files into the digital design process.
8. Autodesk Civil Design is an add-on for Autodesk Land Desktop 2005. The package includes tools to design roadways, grading plans, do hydrologic analysis, pond design and generate plan/profile sheets.

### Bentley Systems Inc.

1. Oracle (query only); any ODBD compliant database (read/write).
2. Yes, GeoTIFF, ITIFF, JPEG, TIFF, HMR, RGB, RLE, TGA, PNG, BMP, CAL, IMB, CIT, COT, TGA, PCX, RS, MrSID, ECW, JPG2000.

3. Oracle Spatial, DNG, DWG, SHP, MXD.
4. Oracle, any ODBC compliant database.
5. Oracle Spatial/DGN post processing.
6. ASCII XYZ, TDS, Sokkia, Leica, Topcon, SMI, Geodimeter, C&G.
7. Power Survey is a Standalone application with CADD included. Power Survey includes: DTM Editing, Volume Calculations, exportation of Machine Control data formats.
8. Yes, when Oracle Bi/9i Spatial/Locator is used.
9. Yes, with limitations (utilizing MicroStation Design History).
10. Yes, e.g. through links between geometry and a SQL database.
11. 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.
12. 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.

13. 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.
14. GeoTIFF, ITIFF, JPEG, TIFF, HMR, RGB, RLE, TGA, PNG, BMP, CAL, IMG, CIT, COT, TGA, PCX, RS, MrSID, E.
15. Bentley 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 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 Publisher offers multiple publishing capabilities, from simple queries to enhanced navigation using server-side processing, to full features using the Bentley Publisher Viewer.
16. 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 keys and a fully customizable interface, MicroStation Descartes can be customized to integrate in workflows where automation and interface customization is required.

17. RLE, CIT, TGA, GP4, RT4, TIF, CAL, CRL, T29, MPF, RLC, LRD, HMR, ITIFF.
18. 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 to lines and symbols. Bentley I/RAS B is ProjectWise compliant and fully integrated into MicroStation.

### Blue Marble Geographics

1. JPG, JP2, BMP, PNG, TIFF, GeoTIFF, MrSID, ECW, BIL, BSQ, BSB, ADRG, CADRG.
2. JPG, JP2, BMP, PNG, TIFF, GeoTIFF, ECW.
3. DXF, DWG thru R2000, SHP, TAB, MIF, ASCII, SEG P1, dBase, XLS, LOTUS.

### Caliper Corporation

1. TransCAD for the Web, TransCAD for Great Britain.
2. Mapitude for the Web, Mapitude for Redistricting, Mapitude for Great Britain.

### CEDRA Corporation

1. Cedra A/Series includes AVland, AVsand, AVparcel, AVwater and AVcogo.

### ESRI

1. With ArcSDE: Oracle, MS SQL Server, IBM DB2, and Informix.
2. ESRI Grid, ESRI SDE raster, ESRI Raster Catalogs.
3. VBA (included) and COM compliant languages.
4. ArcPad is a field data collection technology for use on Windows CE handheld devices. For more information visit [www.esri.com/arcpad](http://www.esri.com/arcpad).
5. Yes, with ArcGIS Geostatistical Analyst & Spatial Analyst.
6. Since our extensions have to run on a version of our core GIS product you receive a huge array of

functionality. ArcInfo, ArcEditor, or ArcView can be used in combination with any extension to increase your productivity no matter what industry you are in.

### Golden Software

1. EMF, E00, DXF, DLG, LGO, LGS, BNA, CLP, WMF, SHP, MIF, BMP, JPG, PNG, TIF, TGA, PCX, DCX, WPG, PCT, GIF, and USGS SDTS TVP (DDF), XLS, DAT, SLK, WKx, WRx, CSV, TXT, BNA, GRD, DEM, HDR, DDF, DT0, DT1, DT2.
2. EMF, MIF, DXF, SHP, WMF, CLP, CGM, TIF, BMP, JPG, TGA, PCX, DCX, WPG, PNG, BNA, GIF, PCT, XLS, SLK, CSV, TXT, DAT.
3. GeoTIFF, TFW, RSF, EMF, BNA, DLG, LGO, LGS, DXF, PLT, CLP, WMF, DDF, SHP, MIF, E00, TIF, BMP, TGA, PCX, GIF, WPG, DCX, EPS, JPG, PCT, PNG, XLS, SLK, DAT, CSV, TXT, BNA, WKx, WRx, LAS, EMF, DAT, DXF, SHP, BNA, GIF, CGM, MIF, WMF, CLP, TIF, BMP, TGA, PCX, WPG, PNG, JPG, PCT and DCX.
4. GeoTIFF, SHP, MIF, DDF, E00, EMF, WFS, PNG, DLG, LGS, WPG, DXF, LGO, BNA, WMF, CLP, TIF, BMD, JPG, GIF, TGA, PCX, DCX, PCT, XLS, SLK, WK1, WK3, WK4, WKS, CSV, WRK, WRI1, DBF, MDB, DB, TXT, DAT.
5. SHP, MIF, BLN, EMF, PNG, DXF, WMF, CLP, CGM, TIF, BMP, JPG, GIF, TGA, PCX, WPG, PCT, DCX, BNA, XLS, CSV, TXT, DAT, SLK.

### Intergraph Mapping and Geospatial Solutions

1. GeoMedia Suite of Products and IntelliWhere Suite of Products.
2. US toll free phone number: 800/791-3357.
3. Win NTS 4.0/NTW 4.0/2000 Server/2000 Professional/XP Professional.
4. Yes, pseudo in core products. Complete with Dynnamo or 3rd party - radius topology.
5. OGC WMS, WFS, GML, ESRI shape, ArcInfo binary, MapInfo binary, Microstation DGN V7, Microstation DGN V8, AutoCAD DWG, DXF, MGE, MGD, Oracle Object, Framme, SQL Server, SmartStore, Text/ASCII, Access.
6. Microstation DGN, MapInfo MIF, Oracle Object, SQL Server, AutoCAD DXF, AutoCAD DWG, GML, ESRI shape.
7. OGC WMS, WFS, GML, ESRI shape, ArcInfo binary, MapInfo binary, Microstation DGN V7, Microstation DGN V8, AutoCAD DWG, DXF, MGE, MGD, Oracle Object, Framme, SQL Server, SmartStore, Text/ASCII, Access, all industry standard raster formats including Intergraph raster formats, JIFF, PCX, TIFF, GeoTIFF, MrSID, ECW, ESRI bip and bil, bitmap, CALS 24, Hitachi, IGS, USGS DOQ, DTED, USGS DTM.
8. Can export from any supported format.
9. No, can use any OLE/COM compatible language.
10. GeoMedia and IntelliWhere Products: GeoMedia, GeoMedia Grid, GeoMedia Image, GeoMedia Image Light Table, GeoMedia Objects, GeoMedia WebMap, GeoMedia WebMap Professional, GeoMedia WebMap Publisher, GeoMedia Parcel Manager, GeoMedia Professional, GeoMedia PublicWorks Manager, GeoMedia SMMS, GeoMedia Terrain, GeoMedia Transaction Manager, GeoMedia Transportation Analyst, GeoMedia Transportation Manager, GeoMedia Viewer (FREE), GeoMedia-Hansen Interface, SMMS, SMMS GeoConnect, IntelliWhere OnDemand, IntelliWhere LocationServer, IntelliWhere TrackForce.
11. Oracle, SQL Server, IBMDB2, Access.

### Leica Geosystems GIS and Mapping

1. Only through customization with Developers' Toolkit.
2. 100+ standard raster and vector formats.
3. 30+ standard raster and vector formats.
4. 50+ standard raster and vector formats.
5. ERDAS IMAGINE .img, TIFF, GeoTIFF, ESRI GRID,

Shapefile, Arc/Info coverage, Simple Personal Geodatabase.

6. Can be done using Developers' Toolkit.
7. ESRI ArcGIS, VLS Feature Analyst.

### MapInfo Corporation

1. Spatial Data support for MS SQL server and IBM Informix.
2. MS Access, MS SQL Server, Oracle, IBM Informix.
3. Read-only via database.
4. Yes, via Vertical Mapper and Geographic Transformer.
5. Integrated mapping via Visual Basic.
6. Pocket PC MS SQL support.
7. Embedded Visual C and embedded Visual Basic.
8. Win 2000, 2003, Unix, Linux, or any OS with Java VM jdk1.4 or higher.
9. Oracle, Microsoft SQL Server, IBM Informix.
10. Oracle Spatial, SpatialWare for SQL Server and IBM Informix.
11. Via MapInfo MapMarker.
12. Via MapInfo Routing J Server.
13. Any system with a web browser.
14. SpatialWare for SQL Server and IBM Informix.
15. All Microsoft .NET languages are supported.
16. Numerous formats supported.
17. Microsoft Pocket PC PDA systems.

### Maptek

1. ESRI shape, TIN and GRID; DGN; DXF; ASCII; Datamine strings, triangulations and databases; Micromine strings and databases; Surpac strings and triangulations; Esamine triangulations; Geocom strings; Phodat; Minex strings and triangulations; Petrosy DIG; Whittle 4X.
2. ESRI shape, TIN and GRID; DGN; DXF; ASCII; Datamine strings, triangulations; Micromine strings; Esamine triangulations; Pitbss; Eldps.
3. Vulcan databases (DGD & Isis) and ASCII.

### NovalIS Technologies

1. Subsequent seats \$1495.
2. DXF, DWG, Shapefile, GDB, Coverage.

### Paragon Imaging Inc.

1. NITF, GeoTiff, Shape, JPEG and more.
2. Accurate coordinate/precision entry.
3. Advanced image enhancement functions.

### SOKKIA

1. UDF, SHP, MIF, DXF, DGN, SIF, TIF, JPQ, DOQ.
2. DXF, ASCII, CR5, SHP, MIF.
3. UDF, SHP, MIF, DXF, DGN.
4. UDF, CR5, SHP, DXF, ASCII.

### Tripod Data Systems

1. ESRI Shape, MapInfo MIF, AutoCAD DXF, Intergraph DGN.
2. RTI Application available through LandMark Systems.

### Trimble

1. Windows XP/2000/NT/Me/98/95/CEv2.11/2.12/3.0/4.0.
2. The TerraSync software is a flexible GIS field data collection tool that can be used on a variety of field computers running Windows or Windows CE. The software is designed to integrate seamlessly with industry-standard GIS systems, and Trimble's GPS Pathfinder receiver range.
3. ArcView Shapefile, AutoCAD DXF, dBase, MapInfo MIF and Microsoft Access MDB.
4. ARC/INFO Generate, ArcView Shapefile, AutoCAD DXF, ASCII, MIF, MDB, DGN.
5. Trimble's GPS Pathfinder Office software supports all aspects of GIS data collection and data maintenance for Trimble's GPS Pathfinder and GeoExplorer systems.