

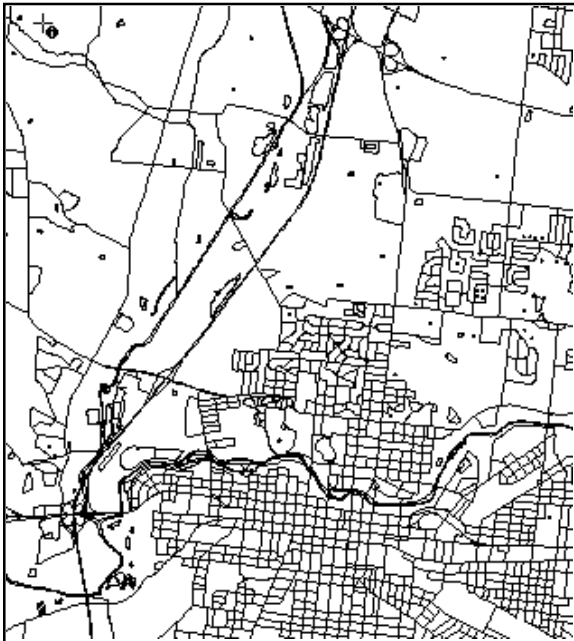
Digital Line Graph (DLG) FILES

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DEFINITION -- A digital vector file that contains features such as roads, streams, and elevation contour lines as points, lines or polygons. The DLG is also called a Topological Vector Profile (TVP).

FEATURES:

1. Boundaries - States, counties, cities, municipalities, and National and State forests
2. Hydrography - all flowing water, standing water, and wetlands
3. Public Land Survey System - public domain, some property boundaries
4. Roads and Trails
5. Railroads
6. Pipelines, Transmission Lines
7. Hypsography - topographic relief (contour lines).



DLG showing hydrography and roads near Springfield, Ohio

USES:

DLG data are structured to be used in geographic information systems (GIS) and are used for automated spatial analyses. For example, exact coordinates of latitude and longitude can be identified at any point on the DLG; lengths and angles of roads or streams can be determined; watershed boundaries can be delineated using the topographic contours; contributing areas of runoff to streams can be viewed and calculated; adjacent population and industrial centers can be identified. DLGs can be combined on screen with geographically referenced aerial photos called Digital Orthophotographic Quadrangles (DOQs) for more detailed identification and analysis of ground features.

MAP SCALES:

1. 1:24,000 - Large scale DLGs are produced from United States Geological Survey (USGS) 7.5 minute topographic maps. The viewable area of a 7.5 minute quadrangle starting at 39° 52' 00" N and 83° 44' 30" W would reach to 39° 59' 30" N and 83° 37' 00" W. Seven hundred ninety three of these quadrangles cover the State of Ohio. On the original paper quadrangle, one inch represents 24,000 inches (2000 feet, or 0.37 mi) of ground surface. This relation-

ship holds for the dimensions of the original paper map and describes the level of detail used in making the map. It does not apply to relative distances of maps viewed on screen.

2. 1:63,360 - Intermediate scale DLGs currently provide only hydrography and transportation data. One inch represents 63,360 inches (5280 feet, or 1.0 mi) of ground surface.
3. 1:100,000 - On these Small scale DLGs, one inch represents 100,000 inches (8333 feet, or 1.57 mi) of ground surface.
4. 1:200,000 - On these small scale maps, one inch represents 200,000 inches (16,666 feet, or 3.2 mi) of ground surface.

COORDINATE SYSTEMS:

The software used to view and manipulate DLGs recognizes and converts data between two systems:

1. Geographic - latitude/longitude in decimal degrees.
2. Planimetric - refers to map projection, such as Universal Transverse Mercator (UTM) or Albers Equal Area Conic, which differ in shape and distance distortion. Units are in meters.

CURRENT FORMATS:

1. Optional format. Coordinates are expressed as integer meters, in UTM coordinate system for 1:24,000 scale and 1:100,000 scale data
and Albers Equal Area Conic projection for 1:2,000,000 scale data.
2. Spatial Data Transfer Standard (SDTS).

The spatial content is equivalent to Optional format, but physical format and metadata content are different. The coordinate system is geographic for the small scale DLG data and planimetric for the large and intermediate scale DLG data.

3. DLGs were once distributed in Standard format, however, this format was difficult to use and is no longer supported.
4. DLGs are sometimes offered in Arc Interchange format, with extension e00. These can be readily used in GIS software.

AVAILABILITY:

DLGs in Optional format are available on 3 CDs for a fee from the OGRIP/GIS Support Center. It is free of charge to download it via FTP at <ftp://ftp.geodata.gis.state.oh.us/geodata/dlg/24000/>. Refer to the documentation inside the ftp directory to access the appropriate DLG for your location.

USGS makes 2M, 100K, and 24k DLGs in SDTS format available free of charge by ftp. To download files in SDTS format go to <http://edcwww.cr.usgs.gov/doc/edchome/ndcdb/ndcdb.html>. The 1:100,000 and large scale DLGs are available by CD, 8mm tape and FTP for a fee at: <http://earthexplorer.usgs.gov>. The web sites provide simple ways to locate your maps for your area.

PROCESSING THE FILES FOR USE IN GIS SOFTWARE:

1. SDTS format

SDTS files, with extension .ddf, can be read using DLGV32, a free Windows/NT program, available from <http://mcmweb.er.usgs.gov/drc/dlgv32pro/>. Files with the name "catd.ddf" are viewable, and all other files are support files.

In addition to the viewable files and their support files, you must download files from a master data dictionary (mdir) file, which are specific to the scale of the data and the version of the software used to produce the .ddf files, to “link” the files. The mdir files, with supporting documentation, are found at http://edcftp.cr.usgs.gov/pub/data/DLG/LARGE_SCALE/.

ArcInfo can read SDTS files with the .ddf extension after they are transformed using the SDTSImport subroutine, which can be downloaded free of charge from <http://www.esri.com/software/arcinfo/sdts.html>.

ArcView 3.2 comes with a utility that imports SDTS raster and point data, but DLGs are vector files. ArcView can import SDTS files which have been converted to AutoCAD files with .dxf extension or converted to shapefiles, with .shp extension. There are numerous options available for using SDTS files in ArcView. Extensive documentation and several freeware utilities for converting SDTS files with extension .ddf to files with extensions .dxf or .shp can be obtained from <http://software.geocomm.com/translators/sdts/>.

2. Optional format

ArcInfo and DLGV32 can use Optional format DLGs with extension “.dlg” directly.

ArcView requires conversion of Optional format files to shapefiles, with extension .shp, or to AutoCAD files, with extension .dxf. Numerous freeware conversion utilities exist. DLGLX, which converts DLGs to DXF, is available at <http://members.visi.net/%7Edddbunch/dlglx.htm>. A similar utility, DLG2DXF is available from <ftp://ftp.blm.gov/pub/gis/dlg>.

DLG2SHP is available at: <http://software.geocomm.com/translators/dlg/> or <http://www.gistools.com/>. This utility will change each

.dlg file into 3 .dbf files, 3 .shx files and 3 .shp files and place them in a folder with the suffix “shp”. When you add a shapefile to a view in ArcView, a table with a name such as “attributes of areas.shp” is linked to the view, however this file contains only polyid and the x and y coordinates of the center of each polygon. To use the area attribute data, for example, you must add a file from the “shp” folder called areaatts.dbf to ArcView’s table list. Join the files by selecting a common column name.

dlg21a.ave is an ArcView 3.x script, written by Mark Cederholm, which converts a .dlg file of lines, points (degenerate lines), or polylines to a shapefile, with attributes. The script and supporting documentation are available as one of the choices called DLG2SHP at <http://software.geocomm.com/translators/dlg/>. You will need to assign a button on the view tool bar to the script.

3. ArcInfo Interchange Files

Files with extension .e00 can be converted to coverages and other files for use in ArcView with the Import71 utility, available free of charge from ESRI. Go to <http://www.esri.com/acrscrips> and search for Import71.

PROJECTIONS: A USGS publication, Transverse Mercator Projections and U.S. Geological Survey Digital Products, July, 1997, by Larry Moore of the Mid-Century Mapping Center, discusses coordinate systems and projections. This publication is available at <http://mcmcweb.er.usgs.gov/drg/mercproj/index.html>. See also the glossary at <http://edcwww.cr.usgs.gov/glis/hyper/glossary/> for an explanation of the datum concept and terms.

REFERENCES:

Excellent documentation is available to aid users of DLG files.

<http://www.state.oh.us/das/dcs/gis/dlg/>
<http://www.esri.com/news/arcuser/798/dlgsources.html>
<http://www.directionsmag.com/tools/>
<http://www.esri.com/news/arcuser/1099/avmodel.html>
<http://www.esri.com/arcscripts/>
<http://www.gistools.com/>
<http://edcwww.cr.usgs.gov/doc/edchome/ndcdb/ndcdb.html>
<http://unr.edu/homepage/daved/gislinks.html>
<http://www.gisdatadepot.com>
<http://earthexplorer.usgs.gov>

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