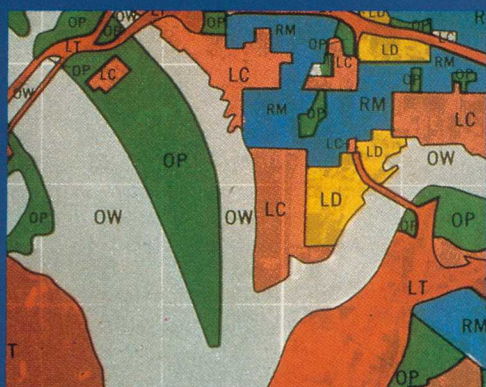# SDTS

Spatial Data Transfer Standard

Imagine how easy it would be to share data if we all spoke the same language.

Introducing SDTS, the new standard for the transfer of spatial data.

SDTS

Spatial Data Transfer Standard

Digital line graph (DLG) data supported by the TVP.

Digital elevation model (DEM) supported by the raster profile.

TIGER census data supported by the TVP.

Digital orthophoto quadrangle supported by the raster profile.

What Is the SDTS?

The Spatial Data Transfer Standard (SDTS) is a language for communicating spatial information. It was developed to allow U.S. Federal agencies to share spatial data among projects that use different hardware, software, and operating systems. It was adopted in 1992 as Federal Information Processing Standard (FIPS) 173 and is the standard for spatial data exchange for Federal agencies.

Advances in geographic information systems and spatial data handling have resulted in increased demands for digital data. However, the diversity in hardware, software, and data specifications, and the lack of interchange standards, have inhibited the transfer and exchange of data between producers and users. This diversity and lack of standards have resulted in duplication of effort and incompatible data sets. The SDTS is a solution to these problems.

The SDTS is a general standard. It has several advantages over the de facto exchange forms previously used for spatial data exchange. It was designed to be independent of any commercial application or system. It can be used for all spatial data types, not just some. It is independent of both media and operating systems.

The SDTS is an open standard intended to work with existing specifications rather than replace them and is designed to be easily integrated with other standards in the future. It is modular so that it can be easily modified as required by future changes in spatial data structures. The SDTS allows for user-defined extensions. The standard also is in the public domain so it can be freely adopted by State and local governments, commercial and academic institutions, and individuals.

The Grammar of SDTS

Like any language, the SDTS is a framework for expressing information, including the base components that are combined to create more complex structures and the rules for how the components are combined. The SDTS defines a series of modules for transfer. The SDTS global, data quality, attribute, spatial object, and graphic representation module classes can be compared to the parts of speech in English. Just as there are different types of verbs for the verb class in English—active and passive voices, present, past, and future tenses—there are different types of modules defined for each module class in the SDTS. For example, there are modules for primary and secondary attributes and spatial objects for raster, geometry only, topology only, and geometry and topology. The SDTS provides basic rules for combining modules to form a complete and unambiguous expression of spatial data, but like a language, it does not limit what is expressed.
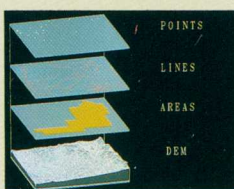
Is the SDTS Difficult To Use?

We all learned in high school English class that the rules for sentence construction are simple enough but that complex sentences can be very difficult to break down into component parts. So, too, the concept and basic SDTS specification are simple. The SDTS, however, is a flexible and comprehensive standard that offers the data encoder many options. As a result, data decoders must be able to detect and handle a large number of options. SDTS implementations can be complex.

The complexity of the SDTS is hidden to most users. As a specification for data transfer, the SDTS structure exists only as a bridge to move data from one computer system to another. Software on either end of the bridge converts internal system data structures to and from the neutral structure defined by the SDTS. This software removes the spatial data user from direct contact with the SDTS structure.
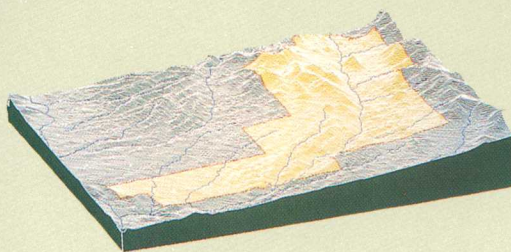
Are Commercial Vendors Supporting the SDTS?

Major vendors of spatial data and geographic information systems are aggressively supporting the SDTS. Providing an SDTS translator allows them to export a standard data form even when their internal structure is proprietary and allows them to import data from other systems that have either proprietary or nonproprietary data structures. Since the SDTS is mandatory for Federal agencies, most Federal spatial data will eventually be available in this form. Being able to offer their customers easy access to this wealth of information is a strong incentive to provide SDTS translators.

What Are Profiles?

SDTS profiles define the subset of the SDTS specification that includes the characteristics that are unique to a particular type of spatial data. For example, the Topological Vector Profile (TVP) of the SDTS identifies the SDTS subset of characteristics for vector spatial objects that have both geometry and topology.

Implementation of the SDTS is simplified for commercial vendors and users of custom systems through the use of profiles. Because a profile is limited to the specifications that are characteristic of one type of spatial data, the number of options that encoding and decoding software must handle is greatly reduced. However, each SDTS profile will share some characteristics with other SDTS profiles. Implementation of this standard can be incremental, each successive implementation of a profile building on previous ones. Only those profiles that are applicable to a particular system's environment need be implemented. The National Institute of Standards and Technology certifies conformance of commercial SDTS translators by profile.

How Do I Get More Information?

Some of what has been written about the SDTS is correct. Some is not. Will Rogers once said, "It's not what he don't know that bothers me, it's what he knows for sure that just ain't so." It bothers us, too, that there are some things people seem to know for sure about the SDTS that just are not so. Therefore, we are trying to make it easy to get the right information about the SDTS. Contact us, the designated maintenance authority for the SDTS, at the National Mapping Division of the U.S. Geological Survey. We maintain both printed and electronic information about the standard and will answer your questions. To inquire about specific commercial implementations of the standard, contact your vendor directly.

To contact the SDTS Task Force by mail, write to:

SDTS Task Force
U.S. Geological Survey
526 National Center
Reston, VA 22092

To send E-mail on the Internet, address to:
sdts@usgs.gov

To obtain electronic material on Internet via FTP, contact:

Internet address: sdts.er.usgs.gov
User ID: anonymous
Password: (your Internet address)
After Connecting: cd pub/sdts

U.S. Department of the Interior
U.S. Geological Survey