in030250

Proposal for Project to Develop a Revision to an Existing ANSI/INCITS Standard

1. Source of the Proposed Project

1.1 Title: Spatial Data Standard for Facilities, Infrastructure, and Environment (SDSFIE), revision of INCITS 353:2001

1.2 Date Submitted: January 30, 2003

1.3 Proposer: The members CADD/GIS Technology Center for Facilities, Infrastructure, and Environment (i.e., U.S. Air Force (Center for Environmental Excellence), U.S. Army (Assistant Chief of Staff for Installation Management), U.S. Army Corps of Engineers, U.S. Marine Corps (USMC LFL), U.S. Navy (Facilities Engineering Command), Defense Logistics Agency, General Services Administration, U.S. Coast Guard.)

2. Process Description for the Proposed Project

2.1 Project Type: Continuous revision (Project Type: R): The process used that will constitute changes to this ANSI standard, is based on an existing web-based system that allows user inputs and recommended changes to the existing standard. The CADD-GIS Standards Working Group (SWG) evaluates and provides recommendations to the Board of Directors, on projects funded to expand the standard, and user inputs, for incorporation in the next revision to the standard. This is an existing and dynamic system, and the URL to access this site is: http://tsc.wes.army.mil/ This standard will be re-visited on an annual basis, and a compilation of the changes made to the standard will be provided to ANSI/NCITS as appropriate. Other government agencies involved in the development, use, maintenance, and update of this standard include the US Army Corps of Engineers, US Air Force, US Navy, the US Marine Corps, EPA, GSA, NASA, State Department, Cost Guard, and the Defense Logistics Agency. There is also an interest on the part of the Corps of Engineers to migrate to UML. This conversion will be developed incrementally and is expected to take a few years to complete. However, since we are looking at doing annual updates to this standard, this will be a topic revisited frequently.

2.2 Type of Document: Standard

2.3 Definitions of Concepts and Special Terms:

A/E/C	Architectural, Engineering, and Construction
AM	Automated Mapping
AM/FM	Automated mapping/facilities management
Attribute	Descriptive or characteristic information (data) concerning a particular graphical object or entity type.
Attribute Table	A relational database table containing attribute data.
Bit-mapped	Also raster image. A digital image made up of pixels (on-screen dots).
CADD	Computer-aided design and drafting
Cell/block	An association of elements that can be stored and placed as a group and then manipulated as a group of individual elements.
Crosshatch	A specific configuration of hatch lines used to aid in delineating graphical features.

DEM	Digital Elevation Model
DTM	Digital Terrain Model
Domain Table	A database table containing domain values.
Domain Value	A standard "valid" or "allowable" value for a specific attribute. Includes units of measure, materials, methods, dispositions, classes, status, phase, etc.
Entity Class	Sub-Grouping of features and database tables with an Entity Set for data management purposes. Each Entity Class constitutes a separate map or drawing file.
Entity Set	Broad grouping of features for data management purposes.
Entity Type	A grouping of "real-world" objects or features with similar data characteristics.
FGDC	Federal Geographic Data Committee
FM	Facility Management
GIS	Geographic Information System
GPS	Global Positioning System
Line style/type	A specific line pattern which type has vector properties and is used to delineate between different graphical entities that are represented by lines or polygons.
Pattern	A specific configuration of lines, dots, or other graphical objects used to aid in delineating graphical features.
SDTS	Spatial Data Transfer Standard
SDSFIE	Spatial Data Standard for Facilities, Infrastructure & Environment
TSSDS	Tri-Service Spatial Data Standards (superseded by SDSFIE)
TSFMS	Tri-Service Facility Management Standards (superceded by FMS)
USACE	U.S. Army Corps of Engineers

2.4 Expected Relationship with Approved Reference Models, Frameworks, Architectures, etc.: This Standard is anticipated to generally comply with the ISO standard for Geographic Information. (Since this standard is still in the drafting stages no exact determination is possible at this time.) This Standard will be modeled using IDEF1x data models tools. This Standard is a different type of standard than the Spatial Data Transfer Standard (SDTS); however, this Standard generally agrees with the Entity/Attribute/Domain logical data model defined in SDTS.

2.5 Recommended NCITS Development Technical Committee: GIS technical committee (L1)

2.6 Anticipated Frequency and Duration of Meetings: Quarterly Meetings

2.7 Target Date for Initial Public Review: February 2003.

2.8 Estimated Useful Life of Standard: 10 years or more.

3. Business Case for Developing the Proposed Standard

3.1 Description. This document contains a data dictionary *(data model)* for depicting geospatial features and data in a GIS schema. Geospatial features graphically depict "real-world" phenomena in a GIS at their "real-world" locations (coordinates). This update encompasses the comments of a number of users this past year. Improvements to the standard include the incorporation of FGDC's "Utilities Data Content Standard" (FGDC-STD-010-2000), the U.S. Department of Transportation (DOT) National Pipeline Mapping System (NPMS) Standard, the U.S. Department of Commerce, National Oceanic & Atmospheric Administration (NOAA), National Geodetic Survey (NGS) Monument Data, and additional U.S. Department of Interior Bureau of Land Management (BLM) Data. This update also contains 26 themes (or entity sets), an additional 950 attributes, and 746 new list domain values, among other additions.

3.2. Existing Practice and the Need for a Standard.

The collection, storage, management, and analysis of geospatial data are critical components of a GIS. Geospatial data can be stored in a number of ways (i.e., paper, microfilm, and/or electronically) which may not be readily accessible and usable, or easily shared with, or reported to others. GIS technology can provide cost-effective and efficient tools to apply and manage such data. However, careful planning and the use of a consistent "non-proprietary" GIS standard are necessary to provide the capability to share data between organizations, and to achieve the full potential offered by GIS technology. For most organization that use GIS technology today, their geospatial data is stored in a proprietary database schema (or a schema created in an “ad hoc” fashion.) This existing practice effectively “locks” these organizations into a single proprietary solution (or in the case of the “ad hoc” schema often a poorly designed and non-standard solution.)

This Standard provides a non-proprietary “data dictionary” and data model for geospatial information that can be easily implemented within commercial “off-the-shelf” GIS technology. The expansion of this Standard supports the ability to create a standards-based, interoperable database schema across a greater number of user base.

3.3. Implementation Impacts of the Proposed Standard.

3.3.1 Development Costs: $50k

3.3.2 Impact on Existing or Potential Markets:

The update to this Standard will have a positive impact on GIS tools and on the spatial database marketplace. This Standard allows organizations that are first implementing GIS technology to get started with considerable less database design and implementation costs. It will also allow organization to better manage their geospatial data. Because this Standard will supports a cost-effective solution to implementing an interoperable, standards-based geospatial database schema, it will enable more organizations to “get started” using commercial GIS and spatial database technology.

This update to the existing standard will also impact positively on the GIS application and spatial database services marketplace. It will provide a mechanism for those companies to provide a more cost-effective, standards-based solution for their services.

3.3.3 Costs and Methods for Conformity Assessment:

The CADD/GIS Technology Center is considering developing tools (potentially in cooperation with industry) that support conformity testing. The conformity testing would be done on a “self test” basis. The costs associated with this type testing would be minimal if testing tools are developed and readily available.

3.3.4 Return on Investment:

As this is an update to the existing standard, the Return on Investment (ROI) should be estimated as before. The metric calculated was a ROI in the form of a Benefit/Cost Ratio = 812.8 (based upon FY98 Analysis for SDSFIE). This metric was determined using Kaplin & Martin’s approach to determining a ROI.

3.4 Legal Considerations

3.4.1 Patent Assertions:

Patents are under development on the SDSFIE and FMS software, schema, and graphical data modeling methodology.

3.4.2 Dissemination of the Standard or Technical Report:

The SDSFIE and FMS are updated annually, and disseminated on CD-ROM and Internet by the CADD/GIS Technology Center. The CADD/GIS Technology Center will continue development, and dissemination of the SDSFIE and FMS through the Federal Government.

An existing MOU delineates the roles and rights of all parties in the use and distribution of this standard update. This MOU is still enforce and is applicable for this and all subsequent updates to the initial standard.

Updates to the ANSI/NCITS standard will be updated by The CADD/GIS Technology Center annually. The ANSI/NCITS standard will be disseminated by ANSI.

4. Related Standards Activities

4.1 Existing Standards: SDSFIE, FMS, ISO 19110 Geographic Information – Feature Catalogue Methodology, FGDC Wetland, Soils, Vegetation and Cadastral Data Classification and Content Standards.

4.2 Related Standards Activity: SDSFIE and FMS. The CADD/GIS Technology Center will continue to provide annual updates to the SDSFIE and FMS.

5. Units of Measurement used in the Standard: Not measurement sensitive.