**Project Title –** Federal Geographic Data Committee (FGDC) Trail Data Content and Data Transfer Standard

**Date of Proposal –** June 28, 2006, modified February 1, 2007

**Type of Standard Proposed**
The FGDC-supported Trail Data Standard would provide, in two separate parts, a data content and data transfer standard for trails of all kinds:

- ✍ **Data Content** provides semantic definitions of a set of objects. This part specifies and defines the data elements associated with trails.

- ✍ **Data Transfer** describes how to produce or consume packages of data, independent of technology and applications that will facilitate moving data between agencies and systems.

**Submitting Organization**
National Park Service on behalf of the Federal Interagency Council on Trails

**Points of Contact**
David Duran, Acting Data Manager, GIS Division, National Park Service
Steve Elkinton, Chairperson, Federal Interagency Council on Trails

**Objectives**
These new standards would be created to meet the following objectives:

1. Describe a consistent and universal way to express the content of a trail data set or data element.

2. Codify some commonly used discrete units of trail information, referred to as trail elements or attributes, and thereby provide standardized terminology and definitions to alleviate inconsistencies in the use of trail elements and to simplify the documentation process.

3. Provide a method for documenting the content of trail information in order to facilitate trail data exchange and offer a migration path from legacy formats to standards-compliant ones.

4. Provide a statement of best practices for trail data content and data transfer.

5. Recognize, as a practical matter, that different users may require different levels of standardization.

**Scope**
Trails of all kinds, including Congressionally and Secretarially designated trails, are strongly recognized by the public and governmental agencies as important recreational and cultural resources. The National Park Service (NPS), the Bureau of Land Management (BLM), the

United States Fish and Wildlife Service (FWS), and the United States Forest Service (USFS) have worked for many years with each other and with States, local governments and trail organizations to promote and develop trails for the benefit of the public. Basic Federal trail authorities are found in the National Trails System Act of 1968, as amended (16 USC 1241-1251). Heretofore, there have been no universal standards within the United States for trail terminology and data attributes. However, inter-jurisdictional projects, promotion, and management all suggest the need for universal data standards.

Heretofore, there have been no universal standards within the United States for trail terminology and data attributes. However, inter-jurisdictional projects, promotion, and management all suggest the need for universal data standards. Trail data are used for administrative, wayfinding, emergency response, research, marketing, mapping, GIS, routing and navigation, and many other purposes. The NPS is not aware of any data content standards developed for trails generically. One exercise in this project will be to verify that this is true with state trail programs. In the absence of such standards, it is impossible to tabulate and summarize information about any inter-jurisdictional trail system, let alone the National Trails System as a whole. New FGDC Trail Data Standards would cover the core set of questions and data attributes identified in the draft Interagency Trail Data Standards (ITDS) Version 2 for trails of all kinds, and include attributes that address circumstances special to National Historic Trails and National Scenic Trails. They would not cover all possible trail data, but concentrate on interjurisdictional management and administrative trail data needs. New standards would apply only to trails within the United States, including all U.S. territories and outlying possessions.

English-language trail data, the FGDC Trail Data Standard could be implemented with the standard ASCII character set. To facilitate reproduction in the widest variety of media, the standards would be composed with the standard ASCII character set, even at the cost of simplifying the representation of certain non-English words. Other character sets, such as Unicode, are required to correctly represent trail data in other languages. The character set should be specified in the file-level metadata for any trail file.

The FGDC Trail Data Standards would fundamentally be a descriptive data storage and data processing standard. It is not intended to be an implementation guide for the development of a standards-compliant trail database. The standards would be textual descriptions and not include formal data models or Unified Modeling Language (UML) diagrams. These would serve as general guides to a standard database design. There are many ways to implement databases and applications, and the best way depends on local circumstances, rules, requirements, and regulations.

Implementation rules can be established and maintained in various ways, and it would be beyond the scope of the FGDC Trail Data Standard to provide specific guidance as to which way might be best under given circumstances. Subsequent to the acceptance of these standards, an implementation guide or use cases that concentrate on various data models, relationships, best practices, and implementation strategies could be developed as a companion to the standards if additional resources become available.

The FGDC Trail Data Standard would be intended for use within and among Federal, State, regional, and local government agencies, nongovernmental sectors, and the general public.

**Justification/Benefits**

Universal trail data standards will enable national, regional, State and trail-level managers and the public to use mutually understood terminology for recording, retrieving and applying spatial and tabular information. Data standards will make it easier for trail information to be accessed, exchanged and used by more than one individual, agency or group. Ease in sharing data increases the capability for enhanced and consistent mapping, inventory, monitoring, condition assessment, maintenance, costing, budgeting, information retrieval, and summary reporting for most internal and external needs.

The collection, storage, and management of trail-related data are important components of everyday business activities in many Federal and State land-managing agencies, trail organizations, and businesses. From a management perspective, trails data must often mesh closely with other types of infrastructure, resource, and facility enterprise data. For the public, using GPS and other instrumentation, standard data formats enable trail users to consistently and predictably find their way and understand trail conditions and hazards. Today, digital trail data are a necessity throughout a trail data management life-cycle, from system planning through application design, operations, and maintenance. Automating, sharing, and leveraging trail data through widely-accepted standards can provide a variety of important benefits:

- **Efficiency** – creating and gathering trail data in a single cycle management phase to be made readily usable in subsequent phases;

- **Compatibility** – compiling data from one project or discipline that can be compatible with other applications;

- **Consistency** – using the same standards, meshing data produced by one organization with that developed by another;

- **Speed** – hastening the availability of data through a reduction in duplicative efforts and lowered production costs (Applications can be developed more quickly and with more interoperability by using existing standards-compliant data);

- **Conflict resolution** – resolving conflicting trail data more easily if compliant to the same standards;

- **Technical details** – using a standards-compliant trail data repository to provide direction to data users regarding specific technical features.

**Development Approach**

In May of 2001, the Federal Interagency Council on Trails, based on a provision in the January, 2001, *Memorandum of Understanding for the Administration and Management of National Historic and National Scenic Trails*, assembled an interagency team of trail, data, and subject-matter specialists to develop national-level interagency trail data standards. This action stemmed

from a collective need to inventory, assess and map trail locations and trail resources across multiple jurisdictions throughout the United States. Over the next two years, the team developed the draft Interagency Trail Data Standards (ITDS) for trails of all kinds.

The draft Interagency Trail Data Standards were reviewed within the NPS, BLM, and USFS during May, 2003. They were open to review by partners from May 1 to June 30, 2004. Work to finalize ITDS is ongoing.

The following steps were undertaken to facilitate this effort:

1. A website was established to facilitate exchange and storage of materials, www.nps.gov/gis/trails
2. Teleconferences and in-person meetings were held
3. The draft was circulated for comment to all participating agencies and to other interested parties

Building on the content standards work of the ITDS team, this proposal requests technical and financial support from the FGDC for the completion of the ITDS and the creation and submittal of a Trail Data Standard through the FGDC formal standards approval process. The Standards Development Group will partner with a cooperator to research and draft the FGDC Trail Data Standard.

**Development and Completion Schedule**

FGDC Standards development occurs in 12 steps from initial standard proposal through FGDC adoption. Although funding is sought for a two-year period, the goal is to complete step 8 within 9 months from the start of the project and complete all steps within about a year.

| Step | Action | Date |
|---|---|---|
| Proposal Stage | | |
| 1 | Applicant develops proposal | June, 2006 |
| 2 | FGDC Standards Working Group (SWG) reviews proposal | February 20, 2006 |
| Project Stage | | |
| 3 | Set up project; Standards Development Group (SDG) established | Estimate 1 month |
| Draft Stage | | |
| 4 | SDG produces working draft | Estimate 1 month |
| 5 | Pre-public review of working draft | Estimate 1 month |
| Review Stage | | |
| 6 | SWG review and evaluation of the draft | Estimate 1 month |
| 7 | FGDC Coordination Group reviews SWG recommendation; announcement for public comment in Federal Register | Estimate 2 months |
| 8 | Public review | Estimate 1 month |
| 9 | SDG reviews public comments and produces a Public Response Document | Estimate 1 month |

| | | |
|---|---|---|
| 10 | SWG reviews revisions to draft and Public Response Document | Estimate 1 month |
| 11 | FGDC Coordination Group reviews SWG recommendation | Estimate 1 month |
| Final Stage | | |
| 12 | FGDC Steering committee reviews Coordination Group recommendation; standard approved and submitted for final publication and public release | Estimate 3 months |

The Standards Development Group will meet at a minimum of once monthly via conference call, or more often if necessary.

**Resources Required**

$20,000 for a cooperator through an assistance agreement administered by the GIS Division of the National Park Service. Appropriate field staff from the participating federal agencies will serve on the SDG.

**Potential Participants**

Standards Development Group (SDG) for the FGDC Trail Data Standard: core membership from the ITDS team with additional representation from other trail partners and stakeholders.

Participating Federal Agencies: Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Department of Agriculture Forest Service, National Park Service. Representatives from each of these agencies already serve on the Federal Interagency Council on Trails and the ITDS team.

Other Participants: North Carolina State University

Cooperative Support: a university Principal Investigator and research associate.

Reviewers: various trails groups; Federal, State, and local GIS groups and users; and the public (e.g., Appalachian Trail partners and clubs and state trail coordinators).

**Related Standards**

The proposed FGDC Trail Data Standard would be based on the content standard work of the ITDS team. Cursory research shows that a universal trail data standard has not been proposed or promulgated within the United States.

An example of a local attempt to address trail data standards includes "Minimum Mapping Requirements & Standards for Trail Data Collection & Location Maps in the Municipality of Anchorage Area", May 2003, http://munimaps.muni.org/common/IT_GIS_GPS_Trails_Standards.pdf. A specialized effort can be found in the Universal Trail Assessment Process (UTAP) http://www.beneficialdesigns.com/trails/utap.html .

Several related FGDC standards and informal agency- or bureau-level standards may already exist or are in development. These pre-existing standards and efforts will be considered or represented in this project.

Pioneering work has been carried out by the U.S. Department of Agriculture Forest Service with its Trail Assessment and Condition Surveys (TRACS), showing the valuable benefits of a consistent, "enter-it-once, use-it-often" approach to data management. The ITDS borrows heavily from TRACS. The proposed FGDC Trail Data Standard seeks to expand this universality nationwide beyond the limits of one agency or group.

Within the National Park Service, a trail data transfer standard is being developed based on the ITDS by the trails community in coordination with the GIS Division.

**Other Targeted Authorization Bodies**

This proposal to develop the FGDC Trail Data Standard does not target other standards-authorizing bodies.