

A History of Spatial Data Coordination

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1. Introduction

One of the most important policy documents for the coordination of geographic information in the United States is the Office of Management and Budget (OMB) Circular A-16. The current revision of the Circular was issued in August 2002 after it was endorsed by The FGDC Steering Committee in June 2001.

While the circular has great potential to enhance geographic data coordination and to stimulate organizational change, the effort entailed to make progress in this area is difficult and should not be underestimated. Spatial data coordination efforts in the United States (U.S.) have been going on for over 100 years. The remainder of this paper examines the historical evolution of Circular A-16 and then quickly reviews previous reports on spatial data coordination to show the scope of the coordination predicament.

2. Coordination History

The need for a coordinated approach to surveying and mapping in the United States dates back to the 1840s (NRC, 1981). The evolution of OMB Circular A-16 began in 1906, when President Theodore Roosevelt signed an Executive Order (EO, 1906) creating the U. S. Geographic Board. The Board was given advisory powers and all Government projects were to be submitted to the Board for advice. The goal of the Board was to avoid duplication of work and improve the standardization of maps.

In 1919, Woodrow Wilson issued an Executive Order (EO, 1919) establishing the Board of Surveys and Maps. Its purpose was to make recommendations to the President and to Federal agencies to coordinate map making and surveying activities of the Federal government. The advisory powers of the U. S. Geographic Board were transferred to this new Board. A noteworthy element of the Executive Order was the provision to invite the “map using public” to meetings for “conference and advice.” Another interesting element was the provision for a central information office that was to furnish all maps and survey data information within the government as well as from other sources.

As the previous two executive orders show, the U. S. Government has long been interested in coordinating surveying and mapping activities in order to avoid duplication of effort, to have standardized maps, to have information about maps readily available regardless of its source, and to engage the non-governmental sector in the coordination process.

Source	Year	Description
Executive Order	1906	Created U. S. Geographic Board.
Executive Order 3206	1919	Created a new Board of Surveys and Maps that took over the responsibilities of U.S. Geographic Board.

Executive Order 9094	1942	Abolished Board of Surveys and Maps and authorized Director of OMB to perform the functions of the Board.
OMB Circular A-16	1953	Described responsibilities of Federal agencies with regard to the coordination of surveying and mapping activities.
A-16 Exhibits A,B,C, & D	1953-1964	Attachments to A-16 that outlined programming and operations for specific activities (Topographic Mapping, National Atlas, Geodetic Control, International Boundaries). Some Exhibits were revised.
A-16 Revised	1967	Better described responsibilities of Federal Agencies to provide leadership and coordination.
OMB Memo 83-12	1983	Established coordination of Federal digital cartographic data programs.
A-16 Revised	1990	Established Federal Geographic Data Committee and expanded Circular to include more programs
Executive Order 12906	1994	Established the National Spatial Data Infrastructure (NSDI).
A-16 Revised	2002	Strengthened coordination responsibilities of Federal agencies and incorporated NSDI into the Circular.
OMB Memo M-06-07	2006	Required agencies to designate Senior Agency Official for Geospatial Information (SAOGI) at Assistant Secretary-level.

Table 1. Evolution of OMB Circular A-16

In 1942, the Board of Surveys and Maps was abolished and the Director of the Bureau of Budget (now OMB) was given the authority to perform the function of the Board (EO, 1942). Thus, the responsibility to coordinate surveying and mapping within the U. S. Government was transferred to OMB and has remained there.

Robert Randall joined OMB in 1940. He was elected President of the American Congress on Surveying and Mapping in 1941. He was responsible for the production programs of all mapping and charting activities of the U.S. government until 1960.

3. Circular A-16 Issued

In 1953, the Bureau of Budget (now OMB) issued the first Circular A-16 to Federal agencies (OMB, 1953). Its simple goal was to ensure that surveying and mapping needs of the Federal government, state government, and general public were met. Also, Circular A-16 aimed to ensure that duplication was avoided and that data was provided

expeditiously. Furthermore, the Circular correlated the programming of mapping operations within the budgetary process through the use of attached Exhibits.

The initial Circular A-16, included an Exhibit A titled “Procedures for Programming and Coordination of Federal Topographic Mapping Activities.” The Exhibit set forth many details; for instance it stated that as each Department was to establish a liaison with OMB, provide quarterly reports, and provide performance and cost reports, among a host of other details.

From 1953 through 1964, OMB issued several Exhibits and some revisions to the Exhibits (OMB; 1953A, 1958, 1960, 1961, 1964). In addition to Topographic Mapping, Exhibits were issued to cover National Atlas, Geodetic Control, and International Boundaries.

The use of the Exhibits has ended. Exactly when they ceased to be used is not clear, but it is estimated to be in the early 1960’s. Circular A-16 has been revised three times—first in 1967, again in 1990, and more recently in 2002.

In the 1967 revision, one of the significant changes was that agencies were given more responsibility for the coordination of related activities. Agencies were to exercise government wide leadership in coordinating, planning and executing its programs and the activities of other Federal agencies. Further, each agency was to establish standards, procedures, agreements and whatever else was necessary to carry out its responsibilities under the Circular. It is clear that OMB was devolving the responsibility for coordination to individual agencies.

The National Archives and Records Administration (NARA) has 8 linear feet of records of the Federal Board of Surveys and Maps and successor units in the Bureau of the Budget from 1919 to 1963. These textual and cartographic records are housed at NARA’s facility in College Park, MD.

4. Federal Geographic Data Committee

In 1983, issues concerning the use and coordination of digital spatial data arose. Thus, OMB issued a memorandum (OMB, 1983) providing guidance to Federal agencies and creating the Federal Interagency Coordinating Committee on Digital Cartography (FICCDC). This memo signifies a policy acknowledgement of the transformation from hard copy to soft copy surveying and mapping products and techniques. OMB called on agencies to coordinate digital data activities, to develop standards and specifications, to increase data sharing, to enhance data for multiple use, and to facilitate data use by the private sector. With the emergence of digital technology a renewed need to coordinate emerged.

In part because the OMB memo creating FICCDC had a sunset provision, the need to further revise Circular A-16 came forward and, in 1990, OMB issued another revision to Circular A-16 (OMB, 1990). One of the significant changes in the revision was the

establishment of an interagency coordinating committee, the Federal Geographic Data Committee (FGDC). Also, the revised Circular extended coordination to digital spatial data. The Circular calls upon FGDC to promote distributed data base systems that are national in scope, to encourage the development and implementation of standards, to promote cooperation and coordination among all sectors that are collecting, producing, or sharing spatial data. Additional agency programs are referenced in the Circular (more than in the Exhibits). This revision of the Circular continues to place responsibilities on individual agencies, while expanding to specifically include digital spatial data.

The Executive Order establishing the National Spatial Data Infrastructure (NSDI) was issued in 1994 (EO, 1994). In short, NSDI includes leadership roles, Clearinghouse and Metadata functions to search for and find geospatial data sets, data standard activities, establishment of a digital geospatial framework, and partnership strategies for data acquisition. These activities are designed to develop the spatial data infrastructure for the U.S. The FGDC plays a key role in the development of NSDI, and more importantly, NSDI is the prime focus of FGDC activities.

In 2002, OMB issued its third revision to Circular A-16. There were two primary reasons for the revision. First, there was renewed interest in spatial data, particularly in government where it had been estimated that between 80 and 90 percent of all government information has a spatial component. Second, OMB had shown renewed interest spatial data coordination. In July of 2000, OMB, in cooperation with FGDC, held a public roundtable regarding spatial data coordination. This meeting, along with an internal FGDC (2000) report “Improving Federal Agency Geospatial Data Coordination” stimulated interest in revising the Circular.

Within the 2002 revision, (OMB, 2002) there were many changes to the A-16 Circular. The Circular expanded responsibilities to include more government programs—not just the traditional mapping programs. Language throughout the document was strengthened saying that agencies needed to coordinate, whereas previous language was not as compelling. A new “Benefits” section was also added. Furthermore, a new section incorporating NSDI was added. Agency responsibilities were broken out more clearly and were updated. OMB’s role in the FGDC was strengthened having them serve as the Vice Chair, while the Department of Interior remained the Chair. Several appendices were added. The most significant appendix is the one that breaks out data themes with the responsible agency, thus there is a clear lead for each data theme. The 2002 version of the Circular is a significant improvement over the previous 1990 Circular.

In 2006, OMB issued a memorandum (OMB, 2006) to further improve coordination efforts. Each agency is required to designate a senior official to oversee, coordinate, and facilitate the agency’s geospatial activities, investments, and policies. The memorandum states that the senior official should be at the Assistant Secretary level and serve on the FGDC Steering Committee. It should be noted that at OMB, in 2002, the Geospatial One-Stop project was included in the Electronic Government initiative. And, to further advance Electronic Government, in 2006, OMB included a Geospatial Line of Business in its Line of Business initiative.

This brief background shows that there is a long history regarding geographic data coordination in the U.S. While technologies have changed, the basic policy goals have remained consistent, like the need for standards and the need for broad representation from various sectors into the coordination process.

4. Other Important Reports

It is important to realize the extent of formal reports that have been made about coordinating mapping efforts. While this section does not provide any in depth information, it does show that there have been many reports and studies.

Perhaps the most significant report was issued in 1934 by the Science Advisory Board, which was entitled; “The Mapping Services of the Federal Government.” The report summarizes 15 prior studies, and makes recommendations to the President. Many future coordination efforts are predicated on this report.

The National Academy of Sciences has looked at geospatial coordination issues many times going back to at least 1878. A few of the more recent reports include:

- *Need for a Multipurpose Cadastre (1980)*
- *Federal Surveying and Mapping: an Organizational Review (1981)*
- *Toward a Coordinated Spatial Data Infrastructure for the Nation (1993)*
- *Weaving a National Map: Review of the U.S. Geological Survey Concept of the National Map (2003)*

The Government Accountability Office, and its predecessor, has studied spatial coordination issues several times. These include:

- *Opportunity for Savings and Better Service to Map Users Through Improved Coordination of Federally Financed Mapping Activities (1969)*
- *Duplicative Federal Computer-Mapping Programs: A Growing Problem (1982)*
- *Geographic Information Systems: Information on Federal Use and Coordination (1991)*
- *Global Positioning Technology: Opportunity for Greater Federal Agency Joint Development and Use (1994)*

In general, the above reports highlight coordination challenges as well as offer recommendations.

OMB issued a significant report in 1973 that highlighted mapping coordination issues.

- *Report of the Federal Mapping Task Force on Mapping, Charting, Geodesy and Surveying (1973)*

This report provided various options for improving coordination, with advantages and drawbacks for each option provided.

The National Academy of Public Administration issued a major report in 1998.

- *Geographic Information for the 21st Century: Building a Strategy for the Nation (1998)*

This report made over 50 recommendations for improving coordination.

This is a rapid review of earlier reports on spatial data coordination. These reports show the scope of the coordination issue and the difficulty in achieving an effective coordination for spatial data.

5. Conclusions

Many of the coordination policies that we have today have well-established roots. While the technology has markedly improved, many of the policy goals are the same as in the past, including standards, having an authoritative geospatial information source, and having broad participation in the coordination process.

Coordination of geographic data is important and the need for such coordination is well established. However, ways to improve the organizational effectiveness of often stove-piped organizational structures within the Federal Government are needed, as are ways to stimulate cross agency coordination and collaboration. History has shown that improving coordination and fostering organizational change that will benefit the development of the NSDI is difficult. If it was easy it would have been done 100 years ago.

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