REPORT OF THE
JOINT SUBCOMMITTEE STUDYING

The Feasibility of a State Coordinator for Mapping, Surveying, and Land Information Systems

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

Senate Document No. 17

COMMONWEALTH OF VIRGINIA
RICHMOND
1987

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on July 16 were reports from various state agencies and universities on their mapping and other land information activities. The thrust of this testimony was to demonstrate that while a considerable amount of activity is taking place and several state agencies make services available to localities, there is no one state office which provides coordination and standards for these state and local efforts or is clearly identified as the source of technical advice at the state level. The Subcommittee invited Mr. Donald P. Holloway, Director of North Carolina's Land Records Management Program, to its final meeting on September 16. The North Carolina Program is considered one of the best in the nation in assisting local governments to modernize their land records and build a base for additional information systems applications. The major focus of its activities seemed to the Subcommittee to be particularly applicable to the needs in Virginia which had been identified at the two earlier sessions. A brief description of the North Carolina program is included as Appendix A of this report.

SUMMARY OF RECOMMENDATIONS

As a result of its study, the Joint Subcommittee recommends that:

1. An Office of the State Coordinator of Mapping, Surveying, and Land Information Systems be established in the Office of the Governor, and that the Office of the Coordinator administratively be situated under the Secretary of Administration.

2. That the director of the Office be known as the State Coordinator. The State Coordinator should be appointed by the Governor, subject to confirmation by the General Assembly. The Coordinator in turn should be authorized an initial staff of three other professionals and the necessary clerical support.

3. The functions of the State Coordinator's Office should include providing technical advice and assistance to local governments and planning agencies in improving land records and land information systems, promoting the development of voluntary standards for such systems, carrying out directly or otherwise providing for training programs, and serving as a clearing house for information. The Office should not directly provide mapping or other types of services, however.

4. An Advisory Council on Mapping, Surveying, and Land Information Systems should be established to assist the Coordinator in the development of standards and otherwise to advise and consult with the Coordinator as to the promotion of land records and land information modernization in the Commonwealth. The Advisory Council should be composed of representatives of local governmental and planning organizations as well as representatives of various professional associations whose work is directly related to land information systems. The Council should terminate after a five year period unless legislative action is taken to extend its existence.

BACKGROUND

Land information systems collect, analyse, display, and exchange information on land and land-related resources that can be mapped. A broad range of data and technologies, both automated and non-automated, are included. Land records

Report of the

Joint Subcommittee Studying the Feasibility of a

State Coordinator for Mapping, Surveying, and

Land Information Systems

to

The Governor and the General Assembly of Virginia

Richmond, Virginia

November 1986

To: The Honorable Gerald L. Baliles, Governor of Virginia

and

The General Assembly of Virginia

A revolution is occurring in land records and land information systems technology and applications. The efforts of local governments and state agencies of the Commonwealth need to be coordinated, guided by minimum standards, and in many cases assisted by technical advice. In recognition of this fact, the Virginia General Assembly, through Senate Joint Resolution 80 of the 1986 Session, established this Joint Subcommittee to consider the feasibility of establishing a state coordinator for mapping, surveying, and land information systems.

Senate members appointed to the Joint Subcommittee were Wiley F. Mitchell, Jr., of Alexandria, who was the chief patron of SJR 80, and Virgil H. Goode, Jr., of Franklin County. Mitchell Van Yahres of Charlottesville, William S. Moore, Jr., of Portsmouth, and Charles R. Hawkins of Pittsylvania County were named from the House of Delegates. Citizen members appointed by the Speaker of the House included John H. Bartenstein, P.E., of Warrenton, Margaret S. Maizel of Clarke County, and the Honorable Robert C. Wininger of the Scott County Board of Supervisors. Senator Mitchell was elected Chairman and Mr. Van Yahres Vice-Chairman at the first meeting of the Joint Subcommittee.

The Joint Subcommittee held three meetings, all in Richmond. At the first meeting on June 10 the Subcommittee heard testimony from a number of local officials and representatives of the private sector which documented the growing involvement of localities with modern land information systems and the need for technical advice and assistance in their efforts. Highlighted at the second meeting

are a part of land information systems containing information such as boundaries, ownership, taxation, assessment, utility locations, transportation corridors, and other factors related to the use of property. The broadest application across the entire range of Virginia localities no doubt would be in the area of property maps and taxation and assessment records, but there are an almost unlimited number of resource identification, planning, and service delivery functions for which systems can be utilized.

The key is the development of good base maps, based on modern technology, for the locality. The investigation undertaken by this joint subcommittee indicates that several Virginia localities are already moving or perceive the need to move in this direction. Some of the larger localities may have the technical capacity to undertake this activity under their own initiative. Others, however, we found to be very much in need of advice and assistance as they explore the possibilities in this area.

Interest in these systems is rapidly increasing for several reasons. On the one hand, the availability of data and the capacity to use it have never been higher. The rapid expansion of highly accurate mapping, including the use of high altitude photography and satellite technology, provides a wealth and precision of information heretofore unavailable. A similar escalation in techniques for storing, manipulating, and displaying mapped data has occurred. On the other hand, state and local decision-makers, and the staffs and agencies which support them, find an increasing need for such information on which to base public policy decisions. A related interest is shared by an array of private groups who need data in order to make their own decisions as to site and facility location, environmental impacts, and the like.

A decade ago it appeared that the trend might be towards centralized, state-level land information systems. A joint subcommittee proposed to the 1980 Virginia General Assembly, for example, that a Virginia Resource Information System (VARIS) be established and subsequent efforts were made to create a Commonwealth Data Base program within the executive branch. Neither effort resulted in an ongoing program. While a few states have continued to move in that direction, the drive to establish state level systems generally seems to be on the wane. Various reasons are cited, including the magnitude of the task of creating centralized systems "from the top down," and the development of mini- and micro-computers and other technology which make it feasible for individual agencies, local governments, and private firms to develop their own systems. The result in the last decade has been both an expansion and a decentralization of land information systems.

The current effort in a number of states therefore is to develop mechanisms to coordinate these decentralized activities, to provide technical advice and assistance to local governments as they build their own programs, and to promote compatability and exchangability among systems being developed. In short, the focus is upon assisting and encouraging local governments and officials to develop their own programs.

EXISTING STATE EFFORTS AND THE NEED FOR A STATE COORDINATOR

The State Department of Taxation began a program after World War II to assist localities in preparing tax maps. According to the Department of Taxation, the

quality of base maps varies considerably, depending upon when the locality was mapped. Not all localities have maintained and updated the maps once they were turned over to them by the Department, and the existing maps thus may no longer be accurate. The maps are helpful in property identification but could not be used to legally identify property boundaries nor would the maps serve as a base for other uses. The Department of Taxation is to be commended for this long-standing service, undertaken at no charge to the locality. It is clear nevertheless that existing tax maps in many localities are less than perfect and do not reflect the degree of accuracy which is possible with today's technology.

The Virginia Department of Highways and Transportation perhaps is the state agency most actively engaged in the fields of surveying and mapping. The Department collects an extensive amount of boundary, ownership, and use information for land abutting highways and proposed highway projects. The Department also maintains federal and state geodetic control monumentation records. This type of information is available to governmental entities and to private surveyors and engineers, but it covers only limited areas of the locality. Also to be noted is that §33.1-222 of the Code of Virginia authorizes the Highway and Transportation Commissioner to prepare photogrammetric maps and plats of specific sites or areas at the request of local governing bodies, planning district commissions, industrial development authorities, public service authorities, soil and water conservation districts, and local chambers of commerce. Numerous projects have been undertaken at the expense of the requesting entity under this discretionary authority, but the projects necessarily must be of a limited scope and lower scheduling priority in order to avoid conflict with the larger mapping programs of the Department.

The Administrator of the Council on the Environment, on behalf of the Secretaries of Economic Development and Natural Resources, provided the following summary of activities by agencies within those secretariats. Information on the Virginia Coordinate System is located at Virginia Polytechnic Institute and State University. In addition to the program of the Department of Highways and Transportation, requests for preparation of photogrammetric maps or plats may be directed to the Department of Mines, Minerals, and Energy. The Department of Housing and Community Development has some base maps, although that department's production and data collection activities have been greatly reduced. The Division of Mined Land Reclamation is developing an "interactive surface model" project to assist mining applicants in seven coal-bearing counties to obtain hydrologic and geologic data to assist in permit application preparation and review. The Division of Mineral Resources cost-shares with the federal government the improvement of mapping coverage of the state. Landsat data is on file at the Virginia Institute of Marine Science and some geographic information is incorporated in an automated system at Virginia Tech. Census data is maintained by the Department of Planning and Budget and it would be feasible to map and automate that data. The Commission on Game and Inland Fisheries has an automated file of Virginia's fauna, and Virginia will shortly embark on a joint project with the Nature Conservatory to map the state's flora. While this list of activities probably does not exhaust the activities now carried out, it clearly illustrates that a number of state agencies are sources of information for local governments and other users.

Dr. Louis Manarin, the State Archivist, also pointed out that under the Virginia Public Records Act, the State Library Board has the authority to issue regulations and set standards for the creation, preservation, storage, filing, microfilming, management and destruction of public records for all state and local agencies. Dr. Manarin described a program of technical assistance, workshops, and the like which his office operates in pursuance of this authority. While the Joint Subcommittee perceived that the program was aimed at the standards and quality of the physical recording and reproduction of records and not directly at the content of data under land information systems or land records systems, Dr. Manarin's presentation reiterated the scope of current activity and illustrated another point of needed coordination with other programs.

Finally, it should be noted that many of the state's institutions of higher education are involved in research and service which have a bearing on land information systems. The activities of Virginia Polytechnic Institute and State University and the Virginia Institute for Marine Science perhaps are most readily identified from ongoing activity with which state and local agencies may be familiar. The Joint Subcommittee also received direct reports of various activities from the University of Virginia, Virginia Commonwealth University, and George Mason University, and is aware that other state universities have some interest or involvement.

From the above and other information which the Joint Subcommittee gathered on current activity by the Commonwealth and its agencies, the Subcommittee concluded that:

1. Scattered throughout state agencies and universities are a broad range of existing programs which could be useful to local governments, as well as to other state agencies and the private sector.

2. No state agency or office links localities and other users to these various programs, coordinates activities, or serves as a clearinghouse for information on services.

The Joint Subcommittee believes that local governments should be encouraged to move in the direction of modern land information systems as a matter of good public policy. At the simplest level, equity in the matter of property assessment and taxation will be promoted by the greater accuracy of property mapping. Testimony indicates that local governments usually find that the amount of taxable land increases when the more accurate systems are installed, so that there is some economic incentive to do so, but we believe that the equity factor is more important. Beyond property records and taxation, it is clear that local governments are being asked to make increasingly complex planning decisions and to consider an increasingly greater number of complex and interrelated factors in these decisions. Modern land information systems technologies can better enable them to do so.

The Joint Subcommittee also is convinced that the state should take an active part in assisting local governments and planning agencies in the development of modern land records and land information systems. It is important that a locality

which makes this investment first of all obtain the right product both in terms of the immediate need for the product it anticipates, such as property mapping, and in the ability to build upon that initial system for other uses, such as land use and planning information. The locality needs to know that the system in which it invests will have the capacity to meet its needs, but it likewise needs to insure that it does not invest in costly systems which are beyond the needs or capacity of the locality to utilize. While some local governments have the expertise to make these decisions, many others do not.

The Joint Subcommittee further believes that it is important to foster and promote attention to good standards. The state should not mandate standards, but model guidelines and standards should be available not only to assist the locality but to obtain maximum benefits from modernization in other areas. Cooperation and exchange of information between local governments, among levels of government, and with the private sector will depend upon the use of some common standards.

THE FUNCTIONS OF A STATE COORDINATOR

The Office of State Coordinator would have a role in providing technical advice to local governments, promoting the development of standards for land information systems, carrying out training programs, and acting as a clearing house for information. The purpose of the State Coordinator is not to conduct independent data collection programs or carry out mapping and surveying programs. The following items identify and briefly describe some of the key functions proposed for the Office. Appendix B contains a paper by the Virginia Applied Land Information Systems Technology Group which provides more detailed analysis of the potential functions of a State Coordinator. The Joint Subcommittee found the report of this ad-hoc organization, which was instrumental in bringing about this study, a useful starting point in formulating its evaluation of the proposal for a State Coordinator.

1. Provide expert technical advice to local governments. The State Coordinator would work with local officials who want to improve their land records systems to identify the most appropriate programs for that locality. The North Carolina program which the Joint Subcommittee investigated in some detail has been highly successful in assisting counties in that state through the various stages of implementing modern land information systems. Services include assistance in developing specifications for mapping, preparing requests for proposals, advice in negotiating contracts, quality control of base maps, and so forth.

2. Identify and develop needed model data and data quality standards. Some common standards are not only in the interest of the local government as it implements a program but are critical if information is to be shared on a multi-jursidictional, regional, or state level. Even where model standards already exist, indications are that they may be inadequate for present and future developments in land information technologies and systems. The State Coordinator could take the lead, in conjunction with users and professionals in the field, to identify and develop model standards which could be voluntarily adopted by local governments and other relevant bodies. The Joint Subcommittee is recommending that an advisory council to the coordinator be established with one of its major functions being to facilitate this process.

3. Develop and administer training programs. Adoption of modern land information systems is only a first step. Systems must be properly implemented and maintained, and they must be understandable to the non-technician, such as the local elected official, who uses the product. The State Coordinator's Office, perhaps in conjunction with state university resources, could provide training programs as a major function.

4. Provide information on the availability of maps, photography and other data. As stated previously, the Coordinator's function is not to provide direct mapping services, and as noted below the range of information for which the Office can serve as a clearing house is dependent upon the availability of certain personnel. Nevertheless, it should be within the Coordinator's official capacity to provide to local governments and other public and private users some catalogue of available services and data already collected by state, federal, or local agencies for a particular locality or for a particular application.

5. Identify duplication and recommend ways to improve mapping services by state agencies. As the previous description of existing state agency activity indicates, there are a number of mapping programs and services being presently carried out by state agencies. It appears, however, that no state agency or office has an overall responsibility for coordinating these activities. The Office of State Coordinator logically should be the lead office in bringing together the activities of the other agencies.

6. Coordinate access to federal and state data banks. Standards are necessary in order to facilitate the exchange of the data between various levels of governments and other users, and several efforts are underway at the national level to develop standards. The Coordinator could help Virginia localities to develop systems which would be compatible with the growing body of national data. This will eliminate duplication of effort and make more information available.

7. Provide geodetic services. The Office could coordinate federal, state, and local activities to establish an improved network of survey monumentation in the state, provide geodetic data or access to geodetic data to users within the state, and act as a clearinghouse for local, state, and federal agencies. Performance of this function, however, would be dependent upon the availability of special assistance. Specifically, the National Geodetic Survey currently offers a program which furnishes a Geodetic Advisor to an interested state by cooperative agreement on a cost-sharing basis of roughly half and half. If Virginia were to enter into such a cooperative agreement with NGS and place the Geodetic Advisor within the State Coordinator's Office, this function could be the special responsibility of the Advisor. Otherwise, it would be beyond the range of the Coordinator and staff recommended herein.

THE STATE COORDINATOR'S OFFICE AND ADVISORY COUNCIL

We recommend that the Office of State Coordinator be created as an independent office rather than be placed within an existing agency. The fact that several agencies operate programs which relate to land information systems leads to some consideration of placing the Office within one of those agencies. The more

compelling arguments against doing so include the difficulty of determining in which of several agencies the Office might be located and the danger that the program might too narrowly reflect the specific responsibilities of the particular agency to the detriment of the comprehensive scope of the program.

The Office of State Coordinator should be situated administratively within the Secretariat of Administration. The Department of Information Technology, with which the Coordinator will share some commonalities, is located within that secretariat. So is the Commission on Local Government, creating a precedent for placing an office with local interests there. Further, since the activities of the Office would touch upon and seek to coordinate those of many state functional agencies, there is some logic to placing the Office within the secretariat with staff rather than line responsibility.

A reasonable staffing level for the Office is anticipated to include four professional positions and one clerical position. The State Coordinator, who will be appointed by the Governor and confirmed by the General Assembly, should have both a formal degree and experience, preferably with local governments, in applied land information systems technologies. Appropriate education and experience would include one or more of the fields of engineering, surveying, cartography, land records development, photogrammetry, geodesy, or automated land information systems.

In addition to the customary initial expenses of a new program, two specific needs of the Office should be anticipated. Because of the emphasis upon consulting and advice and the obvious need for the Coordinator and staff to meet with local officials, adequate allowance for travel should be made in the budget allotment for the Office. The other activity which should be made possible from the outset of the Office is that of training. The budget should provide an adequate amount for the Office to plan and operationalize some training activities, either directly or perhaps under contract with state university resources. Overall, we believe that the Office can be staffed and begin operations at an annual cost in the neighborhood of $150,000.

Finally, we recommend that an Advisory Council to the Coordinator be appointed by the Governor. The Advisory Council would be composed of representatives from professional and private users, local governments, and planners and other agencies. Such a panel, it seems to us, is indispensable to the state coordinator in developing model standards, promoting modernization of land information systems, and bringing a clear focus to programs in the state.

INCENTIVE PROGRAM FOR LAND RECORDS MODERNIZATION

As noted in Appendix A, the North Carolina Land Records Management Program was established specifically to encourage the counties of that state to modernize their land records and a grant system was instituted to provide an incentive for counties to participate in the Program. The Joint Subcommittee does not recommend that a similar grant system be instituted in Virginia at this time. We do suggest that the State Coordinator at a later time could recommend that a similar program be established if he or she finds that a program would be feasible and beneficial.

VIRGINIA COORDINATE SYSTEM

A final recommendation which the Joint Subcommittee offers relates to the State Plane Coordinate System (Chapter 15 of Title 55.1 of the Code of Virginia). Initially, this chapter contained definitions and provisions relating to the Virginia Coordinate System of 1927. In light of readjustment of the North American Datum by the National Ocean Survey/National Geodetic Survey in 1983, the chapter was amended in 1984 to add the Virginia Coordinate System of 1983 to that of 1927. Property descriptions entered of record in land records and deed records need not be in terms of the coordinates, but land boundaries entered as purporting to be based on a coordinate system must be tied to one of the two systems. However, the 1984 amendments to the chapter also included a provision that the Coordinate System of 1927 should not be used after 1990 and providing that the 1983 system would be the sole system after that date.

While the Joint Subcommittee agrees that the later 1983 Datum should be included as a part of the State Coordinate System, we were not convinced that sufficient investigation took place at the time the law was amended in 1983 into the effort and cost which might be involved in requiring a shift or readjustment of all records now recorded under the 1927 System to that of the 1983 System by 1990, which seems to be the requirement imposed by the above-cited provision. We therefore recommend that §55-297.2 of the Code of Virginia be repealed so that either System may continue to be used. If there is a compelling reason to mandate a change, the State Coordinator in conjunction with the Advisory Council may so determine and recommend the necessary legislative action to a future General Assembly.

Respectfully Submitted,

Wiley F. Mitchell, Jr., Chairman
Mitchell Van Yahres, Vice-Chairman*
Virgil H. Goode, Jr.
Charles R. Hawkins
William S. Moore**
John H. Bartenstein, P.E.*
Margaret J. Maizel
Robert C. Wininger

* Separate statements follow

** Dissenting statement follows

STATEMENT OF DELEGATE MITCHELL VAN YAHRES

I concur in the recommendations of the Subcommittee with one exception. I believe that § 55-297.2, which specifies that only the 1983 Coordinate System may be used after 1990, should remain in the Code of Virginia. To repeal it now before any testimony was received to indicate a hardship would be premature. The State Coordinator should be instructed to determine if the facts dictate repeal and then make recommendations to the General Assembly.

STATEMENT OF MR. JOHN H. BARTENSTEIN

I concur in the recommendations of the Subcommittee. However, I believe that implementing the State Plane Coordinate System should be a significant part of the program and deserves greater emphasis than it has been given by the Subcommittee. The State Coordinator should be given a specific, affirmative responsibility to implement and promote use of the System. Under the Subcommittee's proposal, there is no requirement that the 1983 System be implemented, and implementation of either the 1927 or 1983 System is at best a minor part of the Coordinator's assignment.

DISSENTING STATEMENT OF DELEGATE WILLIAM S. MOORE, JR.

I regret that I am unable to endorse the report of the Joint Subcommittee. The use of modern technology to develop land records and land information systems clearly is desirable. In this regard, I agree that there is a need to develop some standards and that local governments may need technical advice in implementing these programs.

My dissent is based on the belief that these needs can be met without creating a new state agency and incurring the costs of establishing a separate office. I do not believe that we fully explored the alternatives available, such as designating one of the existing state agencies to assume these responsibilities or perhaps relying upon existing expertise and facilities at one of the state's several universities.

APPENDIX A

THE NORTH CAROLINA LAND RECORDS MANAGEMENT PROGRAM

The Land Records Management Program was initiated in North Carolina in 1977 to modernize and establish greater uniformity in local land records systems and to advise local officials on sound management practices. The statutory purpose of the Program was to conduct programs for the preparation of county base maps and property-line or cadestral maps. The Director of the Program may develop standards and specifications for recommendation to local government officials. Adoption of the standards is voluntary. A Land Records Advisory Committee composed of representatives of local government officials associations and professional associations was established to assist in administering the program.

The Program currently has a professional staff of four persons with varied backgrounds in civil engineering, photogrammetry, cartography, and public administration. When a North Carolina county's governing body elects to enter into the Program, the Land Records Management Program staff may provide various types of assistance to the local mapping program, including (1) assistance in developing a long-range mapping and records modernization plan, (2) preparation of requests for proposals for bids on the project, (3) evaluating responses to the requests for proposals, (4) suggesting the names of contracting firms, (5) preparing contracts for the county, and (6) reviewing all orthophoto maps prepared by contracting firms for quality control purposes.

Land Records Management Program staff also provide technical guidelines and advice for local registrars of deeds in computerizing their records. Training programs also are conducted for local officials.

By statute, the Land Records Management Program is authorized to offer matching grants of up to 50 percent of project costs to counties who wish to modernize their land records. However, the amount actually appropriated by the legislature has never allowed the Program to provide grants of that magnitude. The current appropriation of $325,000 allows the Program to offer grants of $1,000 to $8,000 annually to those counties participating in the program.

APPENDIX B

A PROPOSAL

TO

THE VIRGINIA GENERAL ASSEMBLY

TO ESTABLISH

A

STATE COORDINATOR FOR

MAPPING, SURVEYING AND LAND INFORMATION SYSTEMS

IN VIRGINIA

Prepared by

the

Virginia Applied Land Information Systems Technology Group

(VA LIST GROUP)

September, 1985

- SUMMARY -

As Virginia continues to grow rapidly, pressures for economic, cultural and natural resource allocations will grow also. At the same time, responsibilities for resource decisionmaking are increasing at the local level. Now more than ever, local officials need an enhanced capacity to develop technically defensible, reasoned and non-conflicting resource allocation policies.

This position paper proposes the creation of a State Coordinator's Office for Mapping, Surveying and Land Information Systems in Virginia.

The office will provide technical assistance to county governments, Planning District Commissions and others in the state who are using or who want use, land information and land information technologies.

The attitude of the office will be one of recommendation and not regulation. It will suggest standards to improve land information systems in general. This will identify technical requirements for local decisionmaking. The accuracy of property maps for instance, will be improved and this could equalize assessments and reduce conflicts over jurisdictional boundaries. Innovative revenue-raising programs could be identified. Economic development, utility and transportation planning will be facilitated. Natural resource data collection programs and information applications will be coordinated and scientifically supportable.

The office will coordinate training programs for personnel at all levels of government. This will help address the critical shortage of technically trained personnel in public service and it will educate officials about applications of information in the decisionmaking process. The specialized expertise of the private sector will be brought into public service and new markets for land information systems will be developed.

The office will act as a clearinghouse to exchange and deliver the wealth of information that is already available from federal, state, county and other agencies about Virginia's cultural, economic and natural resources. This will avoid unnecessary and costly duplication of existing information, make background data for information collecting programs usable and encourage innovative and coordinated applications of information in resource allocation decisions.

Proven systems of user fees have a great potential for making the costs of such an office negligible. Substantial monetary benefits will be gained through increased efficiencies in land information systems applications and land records management.

* * *

POSITION PAPER

THE NEED IN VIRGINIA FOR A STATE COORDINATOR FOR MAPPING, SURVEYING, AND LAND INFORMATION SYSTEMS

TO: Members of the Virginia State Legislature

Municipal and County Officials

Virginia State Agencies

Public and Private Organizations with an Interest in Improving Land and Other Resource Information in Virginia

FROM: The Virginia Applied Land Information Systems Technology Group
(Virginia LIST Group - see Attached List)

{Plus Other Groups to be Added}

SUBJECT: The Establishment of a State Coordinator's Office for Mapping, Surveying and Land Information Systems* in Virginia

DATE: September 1985

Background and Need

As Virginia continues to grow, pressures for decisions about natural, cultural and economic resources allocations are also growing. At the same time, new federalism strategies are increasing responsibilities of local officials to base their decisions upon technically defensible information and to find innovative solutions to increasingly more complex problems.

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* Land Information Systems are defined as broad range of systems and methodologies. They include data sets as well as automated (computer or machine-driven) and non-automated systems that can be used for collecting, analyzing, displaying and disseminating information that can be mapped. This information must be related to the land, and land-related resources.

The report of the *Governor's Commission on Virginia's Future*** addresses strategies to enhance Virginia's capacity to manage future challenges in the areas of Economic Development, Education, the Environment and Natural Resources, Human Resources, and Government and Planning. Of the 50 major recommendations of this commission, more than half would be significantly advanced by the establishment of an Office for a State Coordinator for Mapping, Surveying and Land Information Systems.

Policy and Roles

The principal responsibilities of the State Coordinator under a comprehensive program can be allocated within three major categories which focus on the ***application of land information and land information technologies*** in Virginia. They include:

- Developing of standards for land information systems,
- Designing and conducting training programs, and
- Acting as a clearinghouse for needed information.

A primary function of this coordinator would be to provide technical support for local governmental bodies, Planning District Commissions, and others who use surveying, mapping, geodetic control, natural resource, and land information systems. The Coordinator's office would also provide expert advice about data collection methodologies and programs. The office would provide the leadership and continuity necessary for establishing and updating statewide surveying standards, mapping standards, and recording standards for land records*** and land information systems in Virginia.

** Toward a New Dominion: Choices for Virginians (Charlottesville, VA: The Institute of Government, University of Virginia, 1984)

*** Land records systems are a subset of land information systems. They specifically contain information about property boundaries, ownership, taxation, assessment, utilities, transportation corridors and public policies and other factors which relate to the use of property. They may or may not be automated.

In addition, the office could help address the critical need for technical training of land information system specialists in the Commonwealth. The office has the potential for coordinating and/or providing the education and training for state and local government employees as well as officials who are involved in activities utilizing and applying land information.

It would also act as a public clearinghouse to deliver existing local level cartographic and geodetic information.

Once the office is established, local governments will have an entity from which to obtain expert advice on land information systems and their application. Information about geodetic control, surveying, property and natural resource mapping, and other needed technical information will be readily available.

The clearinghouse functions of providing cartographic information and geodetic data would be operational within a short time. Benefits to be derived from such an office therefore, would be immediately realized by local units of government.

The attitude of the office would be one of recommendation and not regulation. It would not override any existing responsibilities of state agencies. It would concentrate its efforts upon land information coordination and application. It would not be directly involved in land information research programs which belong in existing university and research facilities. However, it could aid in identifying those research programs which could improve applications of land information in the state.

The office would aid local governments and state agencies with technical assistance and advice but would not itself carry out data collection programs or independent mapping or surveying programs. It could, however, identify areas in the Commonwealth needing such attention. It could evaluate existing information and standards, and it could design cost-effective but comprehensive information collection programs that complement existing information. Such programs would provide data of sufficient quality and consistency as to allow individual data sets to be incorporated into regional, and if necessary, statewide data bases and resource information sets.

At least 17 states have a state surveyor, state cartographer or some similarly named position. Without question, the citizens of Virginia would benefit substantially also by having such a position.

Primary Functions of the Proposed Office

Primary functions of the proposed office would include but not necessarily be limited to the following areas:

- Providing expert technical advice to local governments;
- Providing an inventory of maps, aerial photographs and similar products;
- Identifying needed data sets and data quality standards;
- Supplying geodetic data
- Developing model standards
- Publicizing other statewide, general-user systems
- Developing and administering training programs
- Acting as a clearinghouse for local, state, and federal agencies
- Coordinating access to federal and state digital data banks

Brief descriptions of possible activities a State Coordinator might carry out in some of the above listed areas are discussed below.

(1) Expert Technical Advice

Local level governments need to improve their local land records systems and to acquire to capacity to implement modern land information systems.

There are numerous accepted methods for improving local land records such as parcel indexing systems that result in little or no net costs. Such systems can, in fact save governments millions in timely accessible record keeping. The State Coordinator could work with local

governments and state agencies in implementing those methods appropriate to local circumstances and needs.

A State Coordinator could also advise local officials about how to efficiently carry out base-mapping projects and inform project developers concerning the various alternative mapping methods available. The Coordinator would advise local governments about the use of parcel identifier numbers and the most appropriate indexing systems for their needs.

A further task for such a coordinator might be to assist in designing land records systems that would make tracking of revenues and costs associated with resource allocations and capital facilities more direct. Alternative accounting and computer-based applications could be designed to improve existing or to suggest innovative revenue-raising programs.

The Coordinator could suggest, in consultation with the State Office of Information Technology, specifications for hardware and software combinations to economically meet the land information modernization needs of local - and particularly, rural - units of government. The coordinator would work with local governments in evaluating systems and could aid in drafting contracts and setting specifications for suppliers. He or she could also aid in identifying needs to be addressed by private suppliers in systems development.

(2) Supplying Maps, aerial photography and other similar Information

Local governments need to know what information is available about their own resources and how to acquire it.

The Office of the State Coordinator would prepare informational booklets for each county in Virginia. The booklets will provide citizens with information concerning all map products, aerial photographs, digital data bases, and surveying and natural resource information already available from federal, state and other sources. This information would be compiled from numerous federal agencies, state agencies, local

government offices, and private suppliers of maps and land information.

(3) Coordinating and evaluating information quality for specific applications.

Natural resources such as watersheds and aquifers often transcend jurisdictional boundaries. Local governments often make decisions which affect natural resources and thus have far reaching impacts on neighboring communities. Natural resource data may or may not be collected by local jurisdictions in the decisionmaking process but comprehensive and consistent information is critical for decisionmaking needs - particularly within geographically broad resource areas. Local governments need guidance about the kind and detail of data to collect to support rational decisionmaking processes.

Policy needs should determine data and information collection programs. Current concern about water supplies shows that Virginia lacks needed information about water resources. New and uniform data collection programs for water resources would provide a rational basis for anticipated water resource policies. But a complete renovation of data may not be needed. The State Coordinator in consultation with the State Water Control Board, could evaluate the scale and degree of accuracy needed for mapping aquifers, for example, and suggest approaches to integrating this information with data already available from the U.S. Geological Survey, Health Department well reports, and other data to provide needed information about Virginia's water resources and needs.

(4) Providing Geodetic Services

Geodetic data (information accurately defining precise locations on the earth's surface) are needed and established by many federal, state and private agencies in Virginia. Such data are extremely expensive to develop, thus unecessary duplication can be very costly too.

Suggested geodetic services of the State Coordinator are as follows:

(a) Provide a central depository or access point for all geodetic data in Virginia including data from:

National Geodetic Survey,
U.S. Army Corps of Engineers,
Bureau of Land Management/U.S. Department of the Interior,
Forest Service, U.S. Department of Agriculture
The Tennessee Valley Authority
Virginia Department of Highways and Transportation,
Local surveyors and engineers,
Municipal planning and engineering departments, and others;

(b) Provide a point of contact for users requesting geodetic information within the state;

(c) Provide geodetic data for all users in Virginia with a minimum turn-around time using computer-readable files, data management systems for data retrieval, and automated publishing facilities;

(d) Coordinate activities of federal, state, and local surveyors to establish a densified (more closely-spaced) network of monuments with which to accurately reference surveys and to meet Virginia's surveying and mapping requirements. (This would reduce duplication of effort and save both time and funds);

(e) Coordinate long-range planning for densifying the existing network using Global Positioning Satellite methods or conventional survey traverse, triangulation, trilateration, or photogrammetric methods;

(f) Perform necessary computations for converting survey control to the Virginia State Plane Coordinate System and incorporate those results into the National Geodetic Data Bank;

(g) Preserve all control survey monuments meeting national accuracy standards and serve as a central depository to receive information for removal and resetting survey monuments and insure their preservation; and

(h) Prepare specifications for surveying methods to be used in survey network densification in order to meet the Federal Geodetic Control Commission specifications.

These functions could be carried out most effectively with the aid of a National Geodetic Advisor working under the direction of the State Coordinator. This is a particularly good time to initiate such a position because the National Geodetic Survey currently is willing to enter into a cooperative agreement with the State and furnish a Geodetic Advisor on a cost-sharing basis.

A central clearinghouse for geodetic data will be of most benefit to local governments, state agencies, and private engineering/surveying firms in Virginia if it is established in the near future for several reasons.

(a) The National Geodetic Survey, a component of the National Oceanic and Atmospheric Administration in the Department of Commerce has nearly completed the readjustment of the North American Datum (NAD83) which will provide new geodetic coordinates (latitude and longitude) and new state plane coordinates (X and Y) for all control stations in Virginia. It is important that all state agencies, utility companies engineering firms and local surveyors be aware of the significance of these changes and know how to incorporate them into their survey computations and data storage.

(b) The National Geodetic Survey is also readjusting the vertical control network (National Geodetic Vertical Datum) and, in another 3 years, new elevations will be provided for all control stations in Virginia.

(c) A revolutionary new technology is now operational for rapidly determining the latitude, longitude and elevation of any point within two hours with a high degree of accuracy. This method employs the Global Positioning Satellites (GPS), and is presently being used by the National Geodetic Survey and private firms. The cost per station is significantly lower than that of the previous method of triangulation, or trilateration. Thus, establishing control for base mapping is rapidly becoming more economical. Having a central clearinghouse to receive and process geodetic data will ensure quality and consistency among base mapping efforts throughout the state. Such consistency is critical in matching land information between adjacent resources areas and between mapping units of any

size.

(5) Developing Model Standards

Model standards that can be implemented by local governments would significantly decrease current inefficiencies in using local land record depositories and greatly increase the quality of the map products in those depositories.

Model standards should be developed for:

1. Indexing systems in local courthouses for recording boundary and subdivision plats;
2. Size, material and formatting standards for boundary plats:
3. Minimum requirements for surveyors in documenting and surveying evidence in the preparation of boundary plats;
4. Base maps and tax maps; and
5. Computer mapping, including cartographic features, data set quality, and data exchange.

Standards currently exist in Virginia for all of the above topics. In many cases they are only minimum requirements and can be of little help in upgrading the quality of land information. Furthermore, application of these standards may differ widely from locality to locality. This makes the exchange, compilation, and sharing of information on a resource-based multi-county, or statewide area very difficult. Furthermore, resulting disputes over jurisdictional boundaries have had significant and costly impacts upon local tax revenues and public services in many areas.

Many of the existing standards are outdated in respect to recent advancements in technology, and many standards have been developed primarily in a piecemeal fashion through the efforts over time of volunteers and professional societies. A comprehensive look at all the standards and their relations to each other is badly needed. Recent advancements in digital data bases, land information management, and automated plat and map drafting have made some of the existing standards inappropriate and cumbersome.

A State Coordinator for Mapping, Surveying, and Land Information Systems is a logical vehicle for making a comprehensive study and recommending model standards to local governments, state agencies, and state licensing boards.

(6) Coordinating access to federal and other digital data banks.

Information about natural, cultural and human resources are increasingly being collected in computer formats. The U.S. Department of Commerce's Census of Population, and the Agricultural Census contains needed digital (computer-based) information that can be mapped. Other agencies, such as the U.S. Geological Survey have data about water resources, geology and topographic features, for instance that is needed by local governments but it is mostly designed for and maintained in large mainframe-operated computer banks.

Computerized mapping efforts are on a rapid upswing in Virginia. Until recently, computerized map data have been prepared without regard to common definitions of the phenomena being mapped, the accuracy of the computerized data, or the potential benefits of sharing data with other agencies in need of the same information. At the Federal level, common definitions and codes are being developed for the most frequently used features appearing on topographic and other federal map products. The accuracy, precision and other aspects of computerized map qualities are currently being specified. Standards are being prepared to facilitate the exchange of computer map data among federal agencies, states, localities, universities and the private sector. The expected savings in eliminating duplication of effort by federal agencies alone are expected to amount to millions of dollars annually.

A comparable effort at the state level is needed as more map information is computerized and available to be shared among map information users. With standards in place, a logical extension of the responsibilities of the state office will be to serve as a clearinghouse for the exchange and access to digital map data in Virginia.

Proposed national standards are being prepared by two organizations: The National Committee on Digital Cartographic Data Standards of the American Congress on Surveying and Mapping, and the Federal Interagency Coordinating Committee on Digital Cartography. As standards are tested and implemented at the federal level, a state office should be charged with coordination of these standards. State standards should be compatible with federal standards in order to achieve additional benefits of data exchange between state and federal agencies. Information about these standards and their applications should be available to all local level digital data users.

(7) Technical Training in Land Information Systems.

There is a critical shortage of technically trained personnel in state and local public service. Furthermore, the vast majority of local officials who must be able to apply technical information in day-to-day decisionmaking are generally within the age groups that preceded the advent of automated land information systems.

The State Coordinator's Office should provide training programs for personnel in technical areas of land information systems as well as companion programs for local officials who use this information. The state coordinator's office could use university and public and private experts in developing training programs. In exchange, trainees could provide appropriate service within state and local governments. Land information application training programs for local officials could be coordinated through the Virginia Association of Counties and the Virginia Municipal League. This kind of program would directly serve several of the recommendations of the Governor's Commission on Virginia's Future.

A PROPOSAL TO THE VIRGINIA GENERAL ASSEMBLY FOR CONDUCTING A STUDY ON THE FEASABILITY OF ESTABLISHING A STATE COORDINATOR FOR MAPPING, SURVEYING AND LAND INFORMATION SYSTEMS

Study Objectives

We propose that a one-year study be carried out to determine whether the office of State Coordinator for Mapping, Surveying and Land Information Systems, would substantially benefit the citizens of Virginia; whether the position would significantly decrease state and local costs for services related to collecting, mapping, and accessibility of land information and to land records maintenance; and whether the position is likely to increase tax revenue by promoting accuracy and efficiency in current land records systems. We firmly believe the answers to all of these inquiries will be a strong YES.

Committee Constitution

The state legislative study committee should include representatives of state agencies who are intimately involved with land information collection and applications. Because of the wide applications and technical nature of such an office, the Legislative Committee should also utilize an Advisory Group of technically oriented individuals and specialists who would be willing to devote a significant amount of time to guiding the committee's work. Representatives should include local units of government and planning districts who are active in base mapping efforts or who are actively working towards modernization of land records and other land information systems. Professional societies such as the Virginia Association of Surveyors, and the Real Estate Section of the Virginia State Bar should be represented. Utilities and private interests such as the railroads and members of other associations who are already using land information systems such as the railroads and who are concerned with the condition of local land and natural resource information systems should also be represented.

Committee Staffing

Staffing for the Committee's work should be provided by Legislative Services and the Governor's office.

Information Solicitation

State agency input should be sought from at least the Department of Highways and Transportation; the Department of Taxation, Tax Mapping Division; the Department of Mines, Minerals and Energy, Minerals Resources Division, the Department of Conservation and Historic Resources and the Virginia State Library.

Virginia's technical Universities should be consulted as should Federal Agencies who collect and provide natural, cultural and economic resource information that can be applied to maps in Virginia. The Soil Conservation Service, and the Forest Service, in the U.S. Department of Agriculture; and the Geological Survey, in the Department of the Interior are examples. Local governments and state agencies who need technical assistance, who express an interest in utilizing such an office, or who are implementing programs to protect regional resources such as the Chesapeake Bay should be consulted.

Scope of Activities

After the study committee determines the scope of activities that should be pursued by the State Coordinator, recommendations should be made as to how many full-time individuals needed to provide the services required and where within the state governmental hierarchy the Coordinator should be housed. A very limited scope of responsibilities may result in the Coordinators Office being housed in existing facilities where access to ongoing support is available. Establishment of the Coordinator's Office at a high state level may be more appropriate. In each case, the study committee should draft specific legislation to transform their recommendations into reality.

State Coordinator's Office Staffing

The roles described above for this office demand unique staffing requirements. Technical capability of the staff with an emphasis on information application should be of paramount concern.

Qualifications of the State Coordinator and his or her staff should be developed depending on responsibilities identified. The individual must possess substantial cartographic and or mapping expertise as well as a broad understanding of the technical bases for land information systems. It is our hope that the Coordinator will have technical competence in the details of mapping, surveying and land information systems applications, needs, and problems.

Such an individual would be of maximum benefit to local units of government needing direct technical assistance.

We further envision that eventually a permanent State Coordinator's Advisory Committee will be established to provide guidance over time and set policies for that office.

Responses to This Proposal

Comments regarding this proposal or ideas expressed in it should be forwarded to either one of the following:

Ms. Margaret Maizel
Chair, VA LIST Group

Clarke County Planning Commission
Route 1, Box 570
Bluemont, Virginia 22012
703-955-3787 or 202-659-1851

or:

Professor Harlan J. Onsrud
221C Patton Hall
Department of Civil Engineering
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061
703-961-7146

APPENDIX C

SENATE BILL NO. ..... HOUSE BILL NO. .....

A BILL to amend and reenact §§ 2.1-1.4 and 2.1-51.27 of the Code of Virginia, to amend the Code of Virginia by adding in Title 2.1 a chapter numbered 43, consisting of sections numbered 2.1-714 through 2.1-718, and to repeal § 55-297.2 of the Code of Virginia, establishing an Office of the State Coordinator for Mapping, Surveying and Land Information Systems and permitting the continued use of either the 1927 or 1983 Virginia Coordinate Systems.

Be it enacted by the General Assembly of Virginia:

1. That §§ 2.1-1.4 and 2.1-51.27 of the Code of Virginia are amended and reenacted and that the Code of Virginia is amended by adding in Title 2.1 a chapter numbered 43, consisting of sections numbered 2.1-714 through 2.1-718, as follows:

§ 2.1-1.4. State offices.--There shall be in addition to such others as may be established by law, the following offices:

Office of the Secretary of the Commonwealth.

<u>Office of the State Coordinator for Mapping, Surveying, and Land Information Systems.</u>

Virginia Liaison Office.

§ 2.1-51.27. Agencies for which responsible.--The Secretary of Administration shall be responsible to the Governor for the following agencies: Department of Information Technology, Department of Personnel and

Training, Department of General Services, Compensation Board, Virginia Supplemental Retirement System, Secretary of the Commonwealth, Department of Employee Relations Counselors, Office of the State Coordinator for Mapping, Surveying, and Land Information Systems, and Commission on Local Government. The Governor may, by executive order, assign any other state executive agency to the Secretary of Administration, or reassign any agency listed above to another secretary.

CHAPTER 43.

OFFICE OF THE STATE COORDINATOR FOR MAPPING, SURVEYING AND LAND INFORMATION SYSTEMS

§ 2.1-714. Office created.--There is hereby created, in the Office of the Governor, the Office of the State Coordinator for Mapping, Surveying, and Land Information Systems.

§ 2.1-715. Appointment of State Coordinator.--The director of the Office shall be known as the "State Coordinator" and shall be appointed by the Governor subject to confirmation by the General Assembly as provided in § 2.1-41.2 of the Code of Virginia. The State Coordinator shall have certification or training and experience in one or more of the fields of engineering, surveying, cartography, land records development, photogrammetry, geodesy, or automated land information systems. The State Coordinator shall be authorized to employ such personnel and procure such professional services as may be necessary to perform the duties of the Office.

§ 2.1-716. Responsibilities of the Office.--A. The Office shall:

Provide technical advice and assistance as to the implementation, management, and improvement of land records and land information systems, upon the request of a local governing body or planning district commission.

Provide information concerning the availability from federal, state, or other sources of map products, aerial photographs, digital data bases, surveying and natural resource information, and other related resources.

Promote access to federal and other digital data banks through standards which are compatible with federal standards.

Develop and recommend model standards and requirements with regard to indexing, documentation, mapping and other aspects of land records and land information systems, in consultation with the Advisory Council on Mapping, Surveying, and Land Information Systems and such other state agencies as may be appropriate.

Develop and administer land records and land information system training programs for local officials and other personnel, or contract for the provision of the same.

Recommend ways of coordinating and improving mapping services and programs being carried out by state agencies.

B. To the extent feasible, the Office also may undertake appropriate efforts to promote the availability of geodetic services in the Commonwealth by:

Coordinating activities of federal, state, and local

agencies in densifying the state's survey monumentation network.

Assisting, upon request, in the implementation of the State Plan Coordinate Systems.

§ 2.1-717. Advisory Council.--An Advisory Council on Mapping, Surveying, and Land Information Systems is hereby created to assist the State Coordinator in the development of model standards and otherwise to advise and consult with the Coordinator on the activities of the Office. The Council shall consist of twelve members appointed by the Governor, as follows: one member each from the membership of the Virginia Association of Assessing Officers, Virginia Section of the American Society of Photogrammetry, Virginia Association of Planning District Commissions, Virginia Section of the American Society of Civil Engineers, Virginia Commissioners of the Revenue Association, Virginia Association of Circuit Court Clerks, Virginia Bar Association, Virginia Society of Land Surveyors, Virginia Association of Counties, and Virginia Municipal League; one member from the public utility industry; and one member from the public at large. The term of members of the Advisory Council shall be five years, and any vacancies shall be filled for the unexpired term.

§ 2.1-718. Termination of Advisory Council.--The Advisory Council on Mapping, Surveying, and Land Information Systems shall terminate as of July 1, 1992.

2. That § 55-297.2 of the Code of Virginia is repealed.