VERMONT GEOGRAPHIC INFORMATION SYSTEM

HELPING VERMONTERS VISUALIZE CHOICE

TOWARD "VGIS 2000"

RECOMMENDATIONS
to the
1994 VERMONT
GENERAL ASSEMBLY
on a STRATEGY for VERMONT'S
GEOGRAPHIC INFORMATION SYSTEM

Howard Dean, M.D.
Governor

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December 1993

Vermont Center for Geographic Information, Inc.
206 Morrill Hall at the University of Vermont
Burlington, Vermont 05405-0106

Vermont Center for Geographic Information, Inc.

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VERMONT GEOGRAPHIC INFORMATION SYSTEM
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TOWARD "VGIS 2000" -- RECOMMENDATIONS TO THE 1994 GENERAL ASSEMBLY ON A STRATEGY FOR VERMONT'S GEOGRAPHIC INFORMATION SYSTEM

I -- Scope and Basis of this Report

PURPOSE and SCOPE

The Vermont Center for Geographic Information, Inc. (VCGI) prepared this report in order:

- To outline a Strategic Plan for the development of **VGIS 2000** -- an infrastructure of people, technology and geographically-referenced information in place by decade's end in support of economic development, natural resource protection, and a well-informed public;
- To describe VCGI goals, objectives and activities;
- To prepare for the Secretary of Administration a report on VCGI operations, expenditures and projections, and recommendations on the most effective manner of implementing the purposes of 3 VSA 20; and
- To report to the General Assembly on VCGI's investigation of the feasibility of charging fees for products or data;
- To provide the annual report to House and Senate committees which is required by 3 VSA 20(c).

STATUTORY BASIS

The 1988 Vermont General Assembly:

- called on the Governor to "develop a comprehensive strategy for the development and use of a geographic information system,"
- directed the Governor to "assure that all [relevant] data is compatible with, useful to, and shared with the G.I.S.," and
- required an annual report to "the house and senate committees on natural resources and energy concerning the data gathered, documents generated, and use of the information."

-- 3 VSA 20 (a-c)

The 1992 Vermont General Assembly:

- authorized the creation of a "Vermont not-for-profit corporation to be formed for public purposes to serve state, regional and municipal governmental entities, and thereafter to foster and facilitate, but not compete with, the development of private sector services for the provision of geographic information. . ."
- provided that "the corporation shall terminate on July 1, 1994, unless extended by act of the general assembly,"
- required "the corporation to investigate the feasibility of charging fees for products or data," and
- required that "On or before January 1, 1994, the secretary of administration shall report to the general assembly on the operations, costs, expenditures and projections of any corporations established under authority of this act, and recommendations on the most effective manner of implementing the purposes of 3 V.S.A. S 20."

-- Act 258 of 1992

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-- Act 258 of 1992

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II – VCGI Statement of Mission and Goals

The VERMONT CENTER for GEOGRAPHIC INFORMATION, INC.

The Vermont Center for Geographic Information, Inc. (VCGI) is a public, not-for-profit organization authorized by Act 258 of the 1992 General Assembly, and incorporated in the State of Vermont. VCGI is guided by **Executive Order 92-3A** and is governed by a Board of Directors of eleven persons.

VCGI's authority and the makeup of its Board are specified by **3 VSA 20**. Other provisions of **Act 258 of 1992** specify VCGI's authority to generate revenue, require that all VCGI records and meetings be held and conducted with Vermont "Public Access" and "Right to Know" statutes, require fiscal reporting, limit contract authority and establish June 30, 1994 as a "sunset" date for VCGI's authorization.

VCGI MISSION

Section 20 of Title 3 (Vermont Statutes Annotated, as amended) authorizes **"creation of one Vermont not-for-profit corporation to be formed for public purposes to serve state, regional and municipal governmental entities, and thereafter to foster and facilitate, but not compete with, the development of private sector services for the provision of geographic information to public and private users."**

The Vermont GIS strategy is implemented through Executive Order 92-3A (June 1992), which recognizes VCGI as a public instrumentality of the state ". . .for the purpose of fostering GIS development and use within Vermont." The Order directs VCGI to:

1) carry out the duties of the executive branch under 3 V.S.A. section 20,
2) develop procedures for access to the VGIS,
3) develop, publish, maintain and implement VGIS standards,
4) seek the consultation of institutions of higher learning, local government, local and regional planning, private business and industry and others,
5) ensure that data conforms to VGIS standards and is, upon request, made available to the user in a suitable format,
6) prepare a three year work plan which describes the goals, objectives and activities of VCGI and other cooperating state agencies and other public and private organizations,
7) assist in assessing VGIS financial needs and resources for cooperating state agencies,
8) protect the security and integrity of the VCGI information system and limit the liability of the State of Vermont,
9) notify the state librarian of the electronic services and products offered to the public,
10) act as the distributor and agent for any state agency, as well as for other public and private entities, which prepares GIS data or electronic products which are compatible with, useful to, and shared with VGIS, and

11) take care that the corporation shall heed all provisions of 3 V.S.A. 20.

VCGI provides important leadership and coordination functions within Vermont's de-centralized geographic information system. **Vermont's GIS program is a model program for other states because of:**

1) **development of GIS standards to assure compatibility,**
2) **the partnerships among VCGI, state and federal agencies, and**
3) **the regional service centers that provide spatial information and services for municipal governments.**

Revised VCGI MISSION (Proposed)

Act 258 contained provisions described on the preceding page which specified VCGI's governance, authority, procedures, and lifetime. These provisions arose from concerns expressed to the Legislature about the purposes which are appropriate for a publicly-funded corporation, and a desire for close control.

VCGI believes that the eleven "Powers of the Corporation" described above constitute a clear and cohesive set of goals. Further, **VCGI has demonstrated the success of a joint venture between the State and the University of Vermont. The General Assembly should take action to extend VCGI's mandate, to clarify or eliminate some of the limitations and constraints in the current statutory purpose, and to adopt the following mission statement:**

VCGI Mission Statement

- to **assure** that all VCGI data is of **high quality** and is **compatible** with, **useful** to, and **shared** with other public-sector and private-sector data users;
- to **encourage the same high standards** of quality and compatibility in other Vermont GIS cooperators;
- to **promote the efficient development and use of geographic information** by agencies of the state, its political subdivisions, Vermont businesses and citizens; and
- to **facilitate the growth of commercial services** within Vermont for the provision of spatial data, products, and services.

The attainment of this mission requires the operation of a core program of standards development, data dissemination, and quality assurance.

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III -- Findings and Recommendations

This section is intended to summarize specific fiscal, legal and policy and institutional **Findings** made by VCGI, and to summarize **Recommendations** on these points. Other sections of this report provide background information about Vermont's geographic information system and the details of several recommendations required by 3 VSA 20.

FINDINGS

I. Fiscal

A. Vermont's shareable geographic information system promotes economic efficiency:

- Several agencies or **groups can share the costs of joint data development**;
- Other government programs, commercial firms and the public-at-large benefit from the **low-cost re-use of the same data in other projects**; and
- The availability of shared data and technology **fosters new applications** and greater efficiency in existing public decision-making and commercial projects.

B. Authorization of fees at this time for use of Vermont's GIS information could generate little revenue, while possibly stifling demand for and use of this valuable asset by both public and commercial users. Further, such authorization would embroil GIS users in controversy, and would be costly and troublesome to administer.

C. State funding of Vermont's GIS (FY89-94) has been sufficient to start up a basic infrastructure of data, standards, systems, institutional arrangements, and trained personnel.

D. Greater efficiencies, more shareable information, and a higher return on Vermont's GIS investments were projected five years ago than have been achieved. These objectives can be achieved if the funding envisioned at that time can be invested.

II. Legal and Policy

A. Vermont's "public access" provisions predate widespread use of current technologies. Though modernization of statutes may be needed, spatial data has no quality which should make it subject to provisions different than those affecting non-spatial public records.

B. The stated policy of Vermont's "Access to Public Records" statute (1 VSA 315 et seq.) is unambiguous, and no compelling case can be made for exempting spatial data.

C. VCGI provides for archiving and distribution of digital spatial data. VCGI performs these tasks guided by policies and procedures which:

1. protect the security/integrity of information system(s) used to maintain the data investments;
2. assure data integrity by documenting the accountability of authoring agencies, and safeguarding against accidental or intentional corruption;
3. ensure recognition for the taxpayers who made financial investments in the data;
4. limit the liability (if any) of the agency which prepared or distributed the data;
5. encourage development of derivative and value-added products by other entities, and
6. provide equal access for all to data of uniformly high quality.

D. Federal copyright law is the most appropriate mechanism which VCGI can use to meet these objectives. State and local governments are not prohibited from exercising the rights reserved by Federal law to holders of copyright.[1] Reservation of copyright on original digital data developed by state or local governments has not been held contrary to state "public records" laws.[2] Federal law assures the press, educators and others "fair use" of copyrighted materials.[3]

III. Institutional

A. Vermont's has implemented a de-centralized geographic information system which has served its public agencies, businesses and citizens well for five years:

1. Coordination has been assured and standards have been implemented by assigning accountability to a single agency;
2. Access to expertise, data, and technical systems has been assured for local and regional bodies through Vermont's decentralized GIS service centers;
3. Commercial GIS services have been fostered through standards, data dissemination, and contracting for services (as much as public funding has permitted);
4. State agencies have invested in GIS capabilities as needs and funding have permitted, with shareability and compatibility of data maintained;
5. Vermont's quality of life and local control have been enhanced through the widespread dissemination of shareable public data and GIS technology.

B. Public agencies, businesses and individual citizens share the benefits which accrue from widespread use of a standardized geographic information system. Primary benefits of a system that provides standardized information are the tax dollars saved and efficiencies gained when information can be shared across users.

> "Access to, and efficient use of, information is now the cornerstone of business practice and the heart of all planning efforts. Information will be the fuel for the future economy in the same way that oil has been the driving force during this century."
> – from PATHWAYS TO PROSPERITY (A Strategic Outlook by the Governor's Commission on the Economic Future of Vermont), November 1989.
>
> * * * * * * * * * * * * * * * *
>
> "There's no question that if we increase our investment in infrastructure for tomorrow, that we'll do better. We need to do it in not just roads and bridges and water and sewer systems, but in new rail systems, new air transport systems, all kinds of things that are out there for us to do. An information highway, broadly defined, is infrastructure."
> – President-elect Bill Clinton, December 1992

C. Establishment of the Federal Geographic Data Committee (FGDC) by order of the President's Office of Management and Budget (OMB) has begun to address the sharing of compatible data across fourteen key federal agencies. VCGI can lead Vermont's participation in the National Spatial Data Infrastructure initiative for increased federal/state/private cooperation, as highlighted in Vice President Gore's "National Performance Review."

D. Use of GIS technology in government agencies, learning institutions and commercial enterprises is growing rapidly all over the country. **If Vermont is to remain competitive with other states in increasing government efficiency and cooperation, assisting sustainable economic growth, and protecting the quality of life, we must continue to invest in our GIS infrastructure.** A state center which fosters growth in these three key sectors meets Vermont's stated GIS policy objectives.

> "A common vehicle for facilitating technology transfer is the establishment of research and development centers associated with colleges and universities. These typically work with the local business community, focusing on specific technologies in which a state is believed to have a competitive advantage.
>
> "...investment by state government in these centers can attract substantial investment from the private sector, and can provide an excellent long-term return in improved economic competitiveness and eventual increased tax revenues."
>
> – from A CRITICAL LOOK AT VERMONT'S ECONOMY: PAST, PRESENT AND FUTURE, issued by the Vermont Business Roundtable, January 1993.

E. Vermont GIS policies and standards have promoted compatibility of systems, shareability of spatial data, and cooperation among GIS users at all levels. When developed by consensus, they are endorsed and used voluntarily by most users.

F. Standardized documentation is an integral part of all spatial data bases, and are crucial if users are to be informed of the data's origins and limitations.

RECOMMENDATIONS

Many of the policy issues considered here are matters of concern, under law, to public bodies other than VCGI. The VCGI Board has adopted these recommendations with regard to VCGI, but hopes they will be of interest to other public bodies.

I. Fiscal

A. During the next five fiscal years Vermont's Executive and the General Assembly should consider making investments sufficient to develop and assure compatibility of the remaining base data components of **Vermont's Spatial Data Infrastructure: VGIS 2000**. These critical infrastructure elements are: parcel boundaries, road names & address ranges, land cover, demographic information, and basic expenditure and activity data on state programs.

B. The General Assembly should continue capital expenditures for state-wide digital orthophotographs, which provide crucial base data and are one of the most useful and shareable investment Vermonters can make in their data infrastructure.

(Rapidly evolving technology and new Federal initiatives make uncertain any projection of multi-year costs, but total expenditures (Federal, state and local) of $2.5-$4.0 million are likely to meet goals IA-B. Public availability of these shareable data bases by decade-end is vital to Vermont's economic development, natural resource protection, and accountability for public expenditures.)

C. The General Assembly should continue to fund VCGI's "core" program of policies, standards, documentation, quality assurance and dissemination as necessary components of a shareable data infrastructure; annual funding at FY94 levels (approximately $215 thousand) will be sufficient if other funding partners (UVM, state and federal agencies) continue to participate.

> **"ACTION:: In partnership with state and local governments and private companies, we will create a National Spatial Data Infrastructure."**
>
> "Dozens of agencies collect spatial data -- for example, geophysical, environmental, land use, and transportation data. They spend $1 to $3 billion a year on these efforts. The Administration will develop a **National Spatial Data Infrastructure (NSDI)** to integrate . . .data sources into a single digital resource accessible to anyone with a personal computer. This resource will help land developers and conservationists, transportation planners and those concerned with mineral resources, and farmers and city water departments."
>
> -- Vice-President Al Gore, in From Red Tape to Results: Creating a Government that Works Better & Costs Less, September 1993.

D. VCGI should:

1. Continue to follow a policy under which VCGI's digital spatial data bases are available to the public at prices which recover just the labor, materials, and other direct costs incurred in making copies; and
2. Seek to adopt policies under which specialized information or services may be provided for any customer(s) if they are priced to recover all direct and indirect costs of providing such products and services[4], and if the provision of these products or services contributes to achieving the "core" VCGI mission;
3. Seek legislative guidance in capitalizing current State GIS assets and in implementing policies for depreciating and replacing technology assets according to generally accepted accounting principles.

E. Managers of federal, state, and local government programs in Vermont should give consideration to investments in shareable data compatible with Vermont GIS base data and which is necessary for the efficient operation of their programs.

II. Legal and Policy

A. The 1994 General Assembly should enact legislation stating the goals and reasons to implement a Vermont spatial data infrastructure by the end of the decade. The Act should preserve policy stated within **3 VSA 20** and should incorporate the strategy detailed in Executive Order 92-3A. Proposed statutory language is appended to this report.

B. Authorization of fees for GIS data and products would conflict with the intent of Vermont's "Access to Public Records" statute, could discourage use of a valuable data asset, and generate little revenue. The General Assembly should not authorize VCGI to charge fees for public records. No amendments to "Access to Public Records" statutes should be made that create distinctions between spatial and non-spatial information.

C. The General Assembly should authorize the following VCGI mission:

VCGI Mission Statement

- to **assure** that all VCGI data is of **high quality** and is **compatible** with, **useful** to, and **shared** with other public-sector and private-sector data users;
- to **encourage the same high standards** of quality and compatibility in other Vermont GIS cooperators;
- to **promote the efficient development and use of geographic information** by agencies of the state, its political subdivisions, Vermont businesses and citizens; and
- to **facilitate the growth of commercial services** within Vermont for the provision of spatial data, products, and services.

The attainment of this mission requires the operation of a core program of standards development, data dissemination, and quality assurance.

D. The 1994 General Assembly should extend the VCGI statutory mission beyond June 1994, with a sunset/review scheduled in five (5) years. VCGI should operate as a statutorily-recognized public, not-for-profit Vermont corporation.

1. VCGI should be subject to Vermont "Open Meetings" and "Access to Public Records" statutes.

2. Quorum requirements in the current statute have proven burdensome and unnecessary; VCGI should be subject to quorum and proxy requirements common to other state boards and commissions.

E. The VCGI program should consist of three elements:

1. provision of "core" services that facilitate the development and use of Vermont's geographic information investment by providing leadership, coordination, policies and standards, data development, and quality assurance;

2. dissemination of shareable and useful spatial data as public records; and

3. provision of GIS products and services to customers, so long as those services directly contribute to the VCGI "core" mission and so long as all direct and indirect costs of providing such products and services are recovered from those customers.

III. Institutional

A. Large and small Vermont businesses can use spatial data and products to make better decisions and save money. VCGI should help them to learn about and use this technology, should help foster the growth of Vermont GIS service providers to meet business demand, and should work with Vermont's Department of Economic Development to leverage Vermont's GIS infrastructure in attracting new "geomatics" businesses to locate in Vermont.

B. Commercial associations (Chambers of Commerce, regional development corporations, trade groups, etc.) and the Vermont Department of Economic Development should identify specific GIS partnership activities in order to foster growth of Vermont's GIS service businesses, and use of Vermont's spatial data infrastructure.

C. Vermont state agencies should learn about and cooperate with the efforts of their federal agency counterparts' activities within the Federal Geographic Data Committee (FGDC) established by OMB Circular A-16. They should work in partnership with VCGI to identify shareable information, to formulate working relationships, and to coordinate funding and technical plans.

D. Vermont's network of regional GIS service centers assures that all municipal agencies have access to the compatible local and regional data bases required by 24 VSA 4345(a). Their ability to "promote the mutual cooperation" and to "provide technical . . .assistance to municipalities" is a crucial part of Vermont's GIS infrastructure.

E. Vermont's public and private libraries should become partners with the state Department of Libraries and VCGI in providing community access to GIS information and products.

F. Vermont's higher education institutions should be partners with VCGI and the State in providing research, training, and education on the use of Vermont's spatial data infrastructure. Local school authorities and the state Department of Education should become partners with VCGI in using GIS technology to expand curricula in computer science, earth sciences, and the social sciences.

G. Associations of municipal and regional officials, the UVM Extension Service, and the Secretary of State should cooperate in providing assistance to town officials in assuring access to public records in digital form.

NOTES

1. See Dando, L.P., "Open Records Law, GIS and Copyright Protection: Life after 'Feist'," and Kidwell, J.A., "Open Records and Copyright Law."

2. Also see Dando, L.P. in URISA's Marketing Government Geographic Information.

3. **17 USC 107** -- Limitations on exclusive rights: *"Notwithstanding the provisions of section 106, the fair use of a copyrighted work, including such use by reproduction. . . or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright."*

4. Guidance from the industry-based Financial Accounting Standards Board and from the federal Office of Management and Budget provide specific technical guidance on computation of direct and indirect costs. The proper treatment of labor costs and other non-tangible cost elements is well-defined. VCGI may need to provide public bodies and citizens with more information on this topic.

IV.A – Report on VCGI Operations, Costs, Expenditures and Projections

PURPOSE of this SECTION

". . .the secretary of administration shall report to the general assembly on the operations, costs, expenditures and projections of any corporations established under authority of this act. . ."

– Act 258 of 1992

Operations

VCGI staffing consists of seven full-time employees and a half-time graduate fellow. VCGI staff are customer-service-oriented administrative and technical GIS specialists.

VCGI uses and is physically responsible for office furnishings, computers and software owned by or licensed to the State of Vermont. VCGI archives, maintains and distributes public information (spatial data bases) which are copyrighted by the State of Vermont. VCGI operates within space provided by the University of Vermont (UVM), and utilizes various UVM services that reflect VCGI's creation as a "joint venture" of the State and UVM.

VCGI operates a "core" of publicly-funded activities, which enhance information standards and availability for all. Beyond functions funded by the "core" support of the State and the University, VCGI provides services to public entities (as per 3 VSA 20(d)) when and as funds are available. VCGI seeks to recover the full cost of providing such services to those public agencies which have funding to support spatial data development. **VCGI provides only services which are referenced within our statutory and executive mission and does not offer services outside our mission which can be procured from commercial GIS service providers.**

VCGI operates according to an annual workplan divided into the following task groups:
I. **Administration** - Accomplish charges set forth in statute and Executive Order; formalize relationships with regional, state and federal agencies;

II. **Policies, Standards, Guidelines, Procedures** - Develop policies and standards through consultation and discussion with VGIS user community, review by the VCGI Technical Committee, and adoption by the Board.

III. **Data Development & Documentation** - Maintain & expand all systems required for the custody, maintenance, exchange and distribution of VGIS data. Pursue funds and provide leadership for data

development. Assist data developers in ongoing production of high quality data and documentation.

IV. **Application & Product Development** - Manage development of applications which provide "user-friendly" access to VGIS, and which provide specialized services of public value.

V. **Data Dissemination & Interchange** - Develop systems for the exchange of messages and spatial data between VCGI and others.

VI. **Outreach & Training** - Work with UVM/CE to direct education efforts at three target audiences: 1) town officials, 2) current users of the data, software and products, and 3) decision makers in government and business who may become customers or producers of VGIS data.

Costs and Expenditures

VCGI expenditures are detailed in the table on the following page, and can be grouped as follows:

- Staffing
- Office operating expenses
- Contracts
- Capital investments

The structure of gross employee costs is similar to that of state agencies: annual salaries plus about 29% in retirement, health and dental insurance, FICA, etc. VCGI follows employment policies and practices based on those available to state employees, and has sought the advice of state Departments of Personnel, and Finance & Management in doing so.

Contract data development expenditures were a high proportion of OGIS expenditures. With major funding cutbacks for the Vermont geographic information system starting in FY92, new contracts for publications or data development have been few and small. VCGI has entered into competitive bidding processes on several occasions in order to foster the growth of Vermont GIS service providers.

Office operating expenses for VCGI have been minimized in FY93-94 -- primarily through the provision of office space and utilities at UVM -- in contrast with high commercial lease costs carried by OGIS in FY 90-92. Some supplies, phone service, duplication, insurance, etc. are provided to VCGI -- at cost -- by UVM and/or State government.

FY93 financial results (unaudited) and the FY94 budget demonstrate that the VCGI "joint venture" strategy can meet important public program goals -- data development and coordination, support for research and education -- while stretching available public appropriations. In FY92 state appropriations made up 93.3% of OGIS revenues. **Just 55.7% of FY93 VCGI revenues came from state appropriations; the FY94 VCGI budget projects 45.3% of revenues from this source. VCGI partnerships provide a multiplier effect for scarce state funds.**

Vermont Center for Geographic Information, Inc. (VCGI)
Budget Comparisons: FY 1992 - FY 1994

		FY92 Actual	FY93 Budget	FY93 Actual	FY94 Budget	(1)
1	**RECEIPTS & CONTRIBUTIONS**					
2	State of Vermont -- FY92	$245,000	$185,000	$186,346	$210,700	
3	State of Vermont -- Balance Fwd.	$449,552	$22,147	$22,147		
4	University of Vermont	$20,217	$92,711	$94,676	$76,723	(2)
5	Project Revenues (Committed)	$12,060	$75,000	$49,322	$94,739	
6	Project Revenues (Uncommitted)		$16,069		$55,973	
7	Other Receipts (est.)	$17,412	$22,000	$21,612	$27,245	(3)
8	**GROSS RECEIPTS & CONTRIBUTIONS**	**$744,240**	**$412,927**	**$374,103**	**$465,380**	
9						
10	**DEDUCTIONS FROM GROSS**					
11	UVM Services	$20,217	$73,711	$80,158	$59,223	
12	Project Costs (Committed)				$51,614	
13	Cost of Sales	$7,973	$9,500	$26,219	$27,245	
14	**TOTAL DEDUCTIONS**	**$28,190**	**$83,211**	**$106,376**	**$138,082**	
15	**NET CONTRIBUTION**	**$716,051**	**$329,716**	**$267,727**	**$327,298**	
16						
17	**CASH EXPENDITURES**					
18	Salaries & Wages	$177,028	$192,704	$174,185	$199,385	(4)
19	Interns		$12,000	$5,986	$12,000	
20	Benefits	$39,436	$58,681	$42,323	$58,711	
21	**TOTAL EMPLOYEE EXPENSE**	**$216,464**	**$263,386**	**$222,493**	**$270,096**	
22						
23	Supplies & Operations	$46,077	$32,675	$24,626	$17,544	
24	Computing Expense	$12,214	$20,655	$2,522	$17,993	(5)
25	Equipment & Furnishings	$118,142			$8,000	
26	Data Development Contracts	$301,007	$13,000		$13,000	
27	**TOTAL OPERATING EXPENSE**	**$477,440**	**$66,330**	**$27,148**	**$56,536**	
28	**TOTAL CURRENT CASH EXPENDITURES**	**$693,903**	**$329,716**	**$249,641**	**$326,632**	
29	NON-CURRENT ADJUSTMENT			($24,254)		(6)
30	**NET SURPLUS / (DEFICIT)**	**$22,147**	**$0**	**($6,168)**	**$665**	

NOTES:

1) Column #1 show financial performance of the **Vermont Office of Geographic Information Services**, the state agency predecessor to the Vermont Center for Geographic Information, Inc. (VCGI). Columns #2-4 show VCGI performance.
2) Line #4 shows the total estimated value of all financial and in-kind support provided by UVM; line #11 shows the estimated value of all in-kind support.
3) Line #7 consists of receipts for the statutory cost of copying public data, including materials and labor,the purchase of software under State contract for distribution to public agencies.
4) Expenditures for 1993 staff salaries and benefits fall below budget and below 1994 projections because of vacancy savings; part-time temporary staff costs were therefore higher than budgeted.
5) Computing costs for 1993 were prepaid in 1992, providing for a major expense reduction for one year only.
6) Organizational transfer from OGIS to VCGI was accomplished at the start of FY1993, calling for a one-time adjustment to reflect receivables accumulated during FY92.

Investments in computer hardware and software were a large proportion of OGIS expenditures, but were eliminated in FY93-94. Vermont has benefitted from the virtual free-fall in the costs of acquiring basic GIS computer systems over recent years. But the technological environment changes rapidly, rendering equipment obsolete and resulting in the need for new equipment every few years.

Projections: Expenses

If VCGI continues to offer a core of public services and the capacity to provide support to other agencies for funded projects, we can project no dramatic change in the public expense for staffing or office operations.

Contract expenditures of past years were directly related to the State's ability to pay commercial firms to develop important data. Such work continues to be carried on by other programs or agencies (e.g. Tax Department-funded digital orthophotos.) Recommendation: continued investments in key information data bases must continue if **VGIS 2000** goals are to be met. Most such investments can be made most efficiently through competitive contracting with commercial providers. Whether or not VCGI is the contracting agency, any such contract work must adhere to relevant standards. Further, strict quality control procedures should be applied to guarantee that contract data products are shareable and compatible.

Expenditures for computer communications facilities, data storage, publication of data sets on optical media, and other assets will be necessary in subsequent years if VCGI is to operate efficiently and help citizens make the most of our public data. Recommendation: VCGI's financial plan for future years must include an equipment fund and accounting for 3-5 year depreciation / amortization of technology assets.

Projections: Revenues

State and UVM "Core" Appropriations -- VCGI should continue to seek a sustained base of financial support from State appropriations and UVM in order to provide Vermonters with assurances that their data investments are maintained, accessible, and of high quality. Support for this "core" mission should remain relatively level. "Core" funding will provide VCGI with funds to perform "core" functions," and will provide "match" for various federal funding sources.

Recovery of Costs of Dissemination of Public Records -- VCGI currently provides public and private users with copies of electronic data bases, for which VCGI recovers the statutory "actual cost" of copying. Revenues are small (just 6% of budgeted FY94 revenues) and will decline as new technologies -- optical media and high-speed networks -- make information dissemination less costly.

Project Revenues -- The bulk of VCGI project revenues for FY93-94 have come from large projects funded by federal and/or state agencies. Examples are the Northern Forest Lands Resource Inventory, the

regional Transportation Planning Initiative, and the Lake Champlain Basin program. Such projects are of a multi-year but limited duration; continued availability of any of them more than a year or two in the future is questionable. VCGI must retain the flexibility to respond to the needs of such projects and to shrink its operations should such funds not be available.

The development of a National Spatial Data Infrastructure is an emerging goal of the Clinton Administration. Current or new federal funds may become available to state organizations such as VCGI, but matching state expenditures will certainly be required.

Fees -- VCGI has been charged with investigating "the feasibility of charging fees" for GIS data or products. Section IV-B of this report for further details of VCGI's consideration of this possibility. Recommendation: VCGI believes that authorization of fees for Vermont's spatial information would generate little revenue and could stifle use of the data, by both public bodies and commercial users. No such fees should be authorized by the Legislature at this time.

As indicated in Section IV-B, VCGI can offer no projection or scenario for charges fees which is sufficiently credible to warrant risking the frustration of policy goals such as public access to information and widespread utilization of Vermont's GIS investment.

> "Funding governmental activities with tax dollars and then charging the users of these activities in order to recover their cost is a little like playing a shell game with dollars. In playing this game, the government wastes a lot of time and money trying to figure out how much to charge, keeping track of accounts, and collecting fees."
> -- Rep. George Brown (CA), Chairman -- U.S. House Committee on Science, Space and Technology, May 1993.

IV.B – Report on the Feasibility of Charging Fees for Products or Data

PURPOSE of this SECTION

". . .the corporation [shall] investigate the feasibility of charging fees for products or data, with such fees based upon the public investment in the data, or the expense of preparing the products to be sold, or the value of those products or data to the purchasers or to others, or any combination of such factors."

– Act 258 of 1992

Current VCGI Practices

Since December 1991 VCGI has operated a system for disseminating electronic and paper public records. A catalog of available data, publications and products, a price list, order forms, shipping, invoicing, and record keeping are parts of this system. A GIS data technician spends about 25% of an average work week filling orders submitted by customers. A review of two years' history of filling orders indicates that VCGI provides about 17 megabytes of computer data for each order, averaging three orders per week. Many orders can be filled quickly, but about one quarter require several hours to retrieve and prepare data.

During 1993 VCGI saw the first requests to "download" data over telephone or computer networks, and has implemented procedures to allow such customer-initiated data transfers while protecting the security of VCGI systems and data. VCGI expects growing demand, and plans to implement on-line facilities for customers to complete "downloads" without incurring the costs of computer media or staff intervention.

VCGI Directive

Act 258 of 1992 includes the directive cited above. It also charges that "[VCGI] . . .may charge such costs of reproduction of documents as allowed by 1 V.S.A. s 316, relating to access to public records and documents provided that any such charges shall be only for the direct costs of reproduction; . . ."

VCGI has operated according to Vermont's "Access to Public Records" statutes (1 VSA 315 et seq.), which allows a public agency to collect the "actual cost of providing the copy" of public records. VCGI collects:

1) a per-page charge for printed documents,
2) the actual cost of the diskette, tape or other magnetic media requested by the customer, and
3) the actual cost of staff time required to copy the information, computed to include wages and benefit costs.

The VCGI pricing policy and schedule were reviewed by the Secretary of Administration and approved by the VGIS Advisory Board prior to implementation in 1990, and have been reviewed by the Attorney General. **VCGI invoices based on this policy over two years have**

averaged under $20 per data request, as detailed in the 1993 VCGI Annual Report.

The "Public Records" statute goes on to say that "Nothing. . .shall exempt any person from paying fees otherwise established by law for obtaining copies. . .". The term "fee" is not further defined in this statute, but the section appears to distinguish a "fee" as some charge separate from and unrelated to whatever the actual cost of copying a public record might be.

Fees based on "public investment. . ."

Vermont lawmakers have invested over $2.96 million into creating a statewide, standardized information system involving state and regional agencies, local government, and commercial firms. In addition, many thousands of dollars have been invested by these entities, including non-state (local, federal, and private) funds. State appropriations for GIS are presented below:

	FY 89	FY 90	FY 91	FY 92	FY 93	FY 94	TOTAL
3 VSA 20 Appropriation	$750,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000		$4,750,000
Actual GIS Appropriation	$750,000	$750,000	$820,000	$245,000	$185,000	$210,700	$2,960,700
General Fund Transfer		$250,000	$50,000				$300,000
Other Programs			$105,000	$75,000	$75,000	$73,500	$328,500
TOTAL (by Year)	$750,000	$1,000,000	$975,000	$320,000	$260,000	$284,200	$3,589,200

A hypothetical fee structure intended to recover Vermont's GIS investment can be constructed, given a few conservative assumptions. For example:

Assumption #1: Only about 50% of total state expenditures ($1.5 million) are chargeable "investment." Vermont's $2.96 million expenditure has included investments in data and computer systems, but also includes operating costs (policy development, marketing, administration, maintenance, etc.).

Assumption #2: Amortize data and computer system "investments" over 15 years. Some spatial data bases require little maintenance; for example, town boundaries change little over time. Others, such as parcel ownership, change constantly. The initial "investment" in a particular database or computer component might be of very little value in as little as three years, but might last indefinitely with little maintenance expense.

Assumption #3: Demand for VGIS data will grow at rates of between 2% (low) and 10% (hi) per year for fifteen years. Most VCGI customers make repeated requests for new data over time (see Appendix C), and demand is growing.

Using these assumptions VCGI asked, **"What fees would VCGI have to charge if fees were to be based on recovering a $1.5 million public investment over 15 years?" To recover an average $100,000 per**

year VCGI would have to charge – using 1992-3 demand figures – an average fee of $935 per customer <u>or</u> an average fee of $667 per order, an increase of <u>3300%</u> over current charges. The projected fee decreases to $505 per order (using a "lo" growth rate of 2%) or to $176 per order (using a "hi" rate of 10%) in the fifteenth year.

Most data customers perform GIS work for multiple end-users; for example, a regional GIS service center or commercial contractor might do mapping analysis for dozens of town departments or committees. Such a fee burden could be spread among all such end users, but this practice would create intractable operational problems in licensing or verifying use.

Fees based on "the expense of preparing the products"

VCGI recovers the statutory "actual cost of providing the copy" of public records. Also, VCGI prepares customized data or software products for public agencies, for which we recover all direct operating expenses (travel, materials, printing, etc.) plus hourly staff costs. If reproducible products are derived from one-time service projects, those products are made available to others at the cost of copying.

- **Current VCGI practice does not include recovery of indirect costs** which could be considered part of the "actual" cost, including equipment depreciation, administration and marketing costs, etc.

- Another major cost component which VCGI doe not figure into its charges include the **"one-time" costs of developing systems or preparing data and products for copying.** Such costs might include software design, data base coding and quality assurance, etc.

If VCGI were authorized to charge fees based on total costs of preparing products, a scenario very much like commercial research and development would arise. For example, VCGI might seek to develop a computer software or data "product" with great sales potential. VCGI could use accepted business practices to project that $5000 of research, development and marketing costs could get the product to "the street," that production costs per unit would by $9.00, and that 100 organizations were likely to pay $59.95 for the product, roughly breaking even.

Such practices <u>could</u> be implemented at VCGI <u>if</u> two related policy questions could be answered:
1) How should excess funds be re-invested if VCGI were to sell 200 copies, with a net in revenues over costs of $5190?
2) How would such "products" legally be differentiated from other software, maps, reports, etc. which are considered "public records?"

Fees based on "the value. . . to the purchasers or to others."

GIS data and products are in many instances enabling new approaches, analyses, and decisions which could only be envisioned before GIS technology became relatively affordable. In other cases GIS technology is helping users to perform tasks with less cost than is possible with other methods. The economic "value" of such GIS applications may therefore be easier to assign, as they are clearly allowing the user to avoid a more costly alternative.

In many situations GIS data or map products might be highly valued by several parties with quite different goals and resources. As an example, a proposed development might be controversial, with the developer, a local planning body, and a citizens' interest group all seeking to use the same information. The developer might be in the best position to pay a fee and to know just how much of a fee would be worthwhile. For the other two groups, however, imposition of any level of fee might be beyond their fixed budgets or ability to obtain resources.

If VCGI were authorized to charge fees based on the value of the data or products, difficult policy questions would arise:

1) Should **different "classes" of customers** be established, with different fee structures for the same data or products?
2) Should the same fee levels be applied to all customers within a given "class," or **should some "ability to pay" test be applied?**
3) Should fees applied to classes of commercial users be **tied to profits or future re-sale value, through royalties?**
4) How would the continuing string of negotiations and settlements be managed, and at what cost?

Models for Setting Fees

Research into GIS literature reveals just four methods of setting fees for GIS data and products:

Commercialization -- The markets for commercial GIS data bases are growing continually; there are many commercial data products priced through traditional market methods;

Cost Recovery -- Public sector models for recovering costs are well defined. Canadian tradition does not include access to public records at reproduction cost, and several provincial agencies and "crown corporations" are at work with GIS cost recovery models.

Consortiums -- Typically several large public works and utilities agencies or companies share "up-front" investments in land base data; "access fees" are levied for those users who are not "equity" participants.

User Fees -- Finally, several recent statutes allow the setting of "reasonable" fees (see Appendix B: Survey of State GIS-related Statutes). None provides either principals upon which "reasonableness" should be determined or mechanisms for making such determinations.

VCGI Considerations

The VCGI Board has considered whether charging fees for GIS data and products is a practice that should be adopted, based on the policy and operational considerations that would arise. The Board does not believe that fees should be authorized at this time, taking the following considerations into account:

Access to Public Records Policy -- The stated purpose of Vermont statutes is plain but eloquent: **"Officers of government are trustees and servants of the people and it is in the public interest to enable any person to review and criticize their decisions. . .the provisions of this subchapter shall be liberally construed with the view towards carrying out [this] declaration of public policy." -- 3 VSA 315** GIS data and any saleable products developed using the data fall within the statutory definition of "records." Legislative action would be required to define and exempt such data and products. Such an exemption should be justified only if a related policy goal is more important than the stated goal of assuring widespread public access. VCGI cannot identify any such higher goal.

Revenue Potential -- VCGI has reviewed several models of assigning fee amounts, including a per customer charge, a per order fee (see above) and a per data base method. VCGI has asked, **"How much revenue would a $100 per customer annual fee raise?** or **"How much money would be generated if each data request had a $50 minimum order charge?"** Using current numbers of customers and orders, an annual "per customer" fee of $100 would raise $10,000. A "per order" fee of $50 would raise $7,500. VCGI is concerned that imposition of such fees would increase administrative problems and would depress the number of customers and their orders for VGIS data (see below). **VCGI questions whether any "reasonable" level of fees would raise revenues sufficient to warrant the policy change.**

Customer Opinion -- The "Survey of VCGI Customers" (see Appendix C) reveals some sentiment in favor of charging fees. It's clear that such beliefs were strongest when applied to customers "different" that the respondent; i.e. out-of-state customers, or "commercial" users.

One customer opposed to fees felt that taxpayers pay for roads and other infrastructure through general tax dollars, and said "As with traditional forms of infrastructure, the public, legislators, and the user community must always be reminded 'you get what you pay for.'" Numerous customers expressed a fear that fees would be necessary to fund continued GIS availability.

Flexibility of Demand -- GIS is a relatively new technology, introducing startup costs (primarily computer systems and trained personnel) for any business or public agency. Though GIS technology offers many potential productivity gains and profitable uses across a spectrum of potential users, investment in GIS use requires commitment. As noted earlier, many current Vermont GIS users may have fixed budgets and limited ability to find resources. **The great bulk of VGIS data use**

comes from Vermont towns, and the regional commissions and contractors working for them. Authorization of fees would only pass additional costs on to local government. VCGI is concerned that any level of fees may discourage use by current customers and the investments necessary for new customers to utilize Vermont's GIS assets.

The Role of Government -- GIS is one technology within which government data bases can be made compatible, can be shared, and can be useful to multiple customers -- both public and private. VCGI is concerned that Vermont's GIS assets not be asked to produce a financial return, any more than are our investments in more traditional infrastructure. **VCGI believes that a spatial data infrastructure available to the public without fees will produce immense returns in growth of the economy, protection of public resources, an informed populace, and improved commercial an public-sector decisions.**

Justification for Differentiating Access to Spatial and non-Spatial Information -- GIS products (reports, tables, analyses, maps) are indistinguishable from products derived from non-spatial databases -- in terms of their inherent utility, technology, or value. New technologies present different challenges of public access and use; these may call for refinements in the application of existing policy, but not fundamental change. Any policy based on a distinction between spatial and non-spatial information could shortly appear as hasty as would have been an attempt to distinguish typed documents from those which are embodied in the files of word-processors.

VERMONT GEOGRAPHIC INFORMATION SYSTEM
HELPING VERMONTERS VISUALIZE CHOICE

TOWARD "VGIS 2000" -- RECOMMENDATIONS TO THE 1994 GENERAL ASSEMBLY ON A STRATEGY FOR VERMONT'S GEOGRAPHIC INFORMATION SYSTEM

IV.C -- Report on Implementing the Purposes of 3 VSA 20

PURPOSE of this SECTION

". . .the secretary of administration shall report to the general assembly on . . .recommendations on the most effective manner of implementing the purposes of 3 V.S.A. S 20."

-- Act 258 of 1992

Purposes of 3 VSA 20 (1988)

Subsection (a) of Vermont's GIS authorizing legislation specifies eleven components that a Vermont GIS strategy should include. Summarizing the purposes embodied in those components:

- the statewide system should be guided by standards and developed according to set priorities,
- the system should include local and regional participation, and those participants should conform to standards, and
- private sector participation should be included.

Subsection (b) directs that **"all data. . .that is gathered by state agencies shall be . . .compatible with, useful to, and shared with the geographic information system established under. . .this section."**

Subsection (c) assures accountability to the General Assembly.

Purposes of 3 VSA 20 (revised 1992)

Subsection (d) provides legislative authorization for a revised Vermont GIS strategy proposed by the Governor. This subsection specifies the purpose of the proposed not-for-profit corporation: **"to serve state, regional and municipal governmental entities, and thereafter to foster and facilitate, but not compete with, the development of private sector services for the provision of geographic information to public and private users."** The section also includes seven conditions for the creation of the corporation, including governance, termination date, a requirement for an investigation of fees, etc.

Subsection (e) assures compliance with "Public Records" and "Open Meetings" laws, and specify the joint authority of the board.

Implementation Strategy

The purposes of 3 VSA 20 were implemented in June 1989 through the issuance of Executive Order 89-75. One of the presumptions stated by the Order was that **"it may be desirable to establish by statute an alternative non-governmental institution to manage geographic information activities."** The Order assigned to the VGIS Advisory Board the responsibility of submitting to the Governor a recommendation on this point by November 1991.

Following General Assembly passage of 1992 amendments to 3 VSA 20 the Governor issued Executive Order 92-3A, which:

- incorporated the responsibilities originally defined in the superseded Executive Order 89-75.
- established VCGI, and
- incorporated all provisions required by law.

Recommendation

The 1992 strategy was adopted in order to broaden the efforts of Vermont GIS coordination efforts beyond state, regional and local government. The University of Vermont and State Government committed to support of VCGI as a joint financial venture, and VCGI was directed to provide services to public agencies and foster development of Vermont's fledgling GIS service sector. Efforts to broaden participation in Vermont's GIS are even more relevant today, as an emerging Federal strategy seeks to create "partnerships" between Federal, state, local and commercial GIS users, and to define and create a **National Spatial Data Infrastructure (NSDI).**

The 1994 General Assembly should enact legislation stating the goals and reasons to implement a Vermont spatial data infrastructure by the end of the decade. The proposed act should preserve policy stated within **3 VSA 20** and should incorporate the strategy detailed in Executive Order 92-3A.

The General Assembly should continue to fund VCGI's "core" program of policies, standards, documentation, quality assurance and dissemination as necessary components of a shareable data infrastructure; annual funding at FY94 levels (approximately) will be sufficient if other funding partners (UVM, state and federal agencies) continue to participate.

The General Assembly should extend the VCGI statutory mission beyond June 1994, with a sunset/review scheduled in five (5) years. VCGI should operate as a statutorily-recognized public, not-for-profit Vermont corporation, with a directive to:

- provide "core" services that facilitate the development and use of Vermont's geographic information investment by providing leadership, coordination, policies and standards, data development, and quality assurance;
- disseminate shareable and useful spatial data as public records; and
- provide GIS products and services to customers, so long as those services directly contribute to the VCGI "core" mission and so long as all direct and indirect costs of providing such products and services are recovered from those customers.

The General Assembly should not authorize VCGI to charge fees for public records.

More detailed Recommendations are contained in Section III of this Report.

VERMONT'S SPATIAL DATA INFRA-STRUCTURE (VSDI)

Spatial Data Infrastructure: "The means to assemble geographic information that describes the arrangement . . .of features. . .on the Earth. The infrastructure includes the materials, technology, and people necessary to acquire, process, store, and distribute such information to meet a wide variety of needs."
-- National Research Council (Mapping Sciences Committee), 1992

A LOOK AT VERMONT'S FUTURE

The time is late spring of 1999. Vermont's economy has never rebounded with the vigor that characterized the 1980s. But the state budget has just been balanced for upcoming FY 2000, and employment has grown steadily. Vermont has been making steady investments in standardized public spatial data since 1988, and by now has in place the infrastructure that supports returns in all sectors.

Local Governments Improve Services using VSDI

Ten years ago (1989) the first Vermont towns -- Woodstock, Brattleboro, Montpelier, Morristown, and others -- began using spatial data for local planning. By 1992 parcel boundaries, zoning, roads, land use, historic sites, wetlands and much other spatial data was being used in town planning across Vermont. By 1994 ten towns in Windsor, Windham, Chittenden, and Lamoille Counties had voluntarily resolved road-naming inconsistencies, and had decided on town-wide address numbering to help with emergency services.

By 1996 Vermont was well on its way to implementing state-wide coordinated emergency services. Most towns utilized standards formalized by VCGI in cooperation with the US Postal Service and Bureau of the Census. Town committees worked with regional GIS service centers and commercial contractors, and local fire and ambulance services routinely used detail street address maps to provide fast service.

Today (1999) planners and regional development corporations rely on libraries of paper and electronic maps to help businesses view development opportunities, water/sewer capacity, and growth centers. Residents and visitors use color computer displays in the offices of many town clerks or libraries to view and seek information about transportation and social services, shopping and recreation.

VSDI: Savings for Corporations & Small Business

In the late 1980s marketers were planning how the upcoming 1990 census demographics could help sales analysis, and several Franklin County farmers -- with USDA assistance -- were using GIS maps of their farm fields to save money and minimize stream runoff. By 1992 engineers and surveyors across Vermont were incorporating use of public spatial data describing roads and parcel lines into work for their clients. Global positioning systems (GPS) technology was becoming affordable and made it increasingly easy to tie a customer's plans into public data bases -- thanks to cooperative work between Vermont's Transportation Agency and the National Geodetic Survey.

By 1994 information about Vermont's dozens of industrial parks was put into electronic maps, and several regional business surveys could be displayed and analyzed in GIS systems on the desktops of business siting consultants. Vermont's information infrastructure -- statewide standards, shared data, and strong GIS literacy among planners and local officials -- paid off in routine use of spatial data describing consumer buying habits, retail outlets, and potential suppliers and customers within five hundred driving miles of Vermont's borders. Business people outnumbered planners and government officials registered in UVM's non-credit GIS training courses.

Within two years (1996) the same locally-developed street address databases used to dispatch emergency vehicles now help Vermont's phone and utility companies to schedule installation and repair services efficiently -- saving money and increasing satisfaction for their customers. Computerized aerial photos (digital orthophotos) were available for eight counties, and state capital spending for the other six was approved. Most regional development maintained data base inventories of their industries, development sites and vacant buildings that could be viewed with local planning data and the orthophotos.

In 1998 the accelerated miniaturization and sophistication of palm-top computers made on-the-fly navigation and access to spatial customer data affordable for many businesses. Workers in on-the-road sales, service and delivery used the communications infrastructure continuously send/receive information about their locations, travel patterns, and customers near those routes.

Today (1999) Vermont's direct mail firms in the specialty foods, recreational equipment and travel industries maximize their advertising costs by analyzing the characteristics of their customers using spatial data. Tourist services businesses in Bennington, Waterbury and elsewhere share information about changing activities, promotions, and menus state-wide, and assist travelers with using touch-screen GIS terminals to see what's going on in Newport and Brattleboro next week.

Growth of New Businesses based on VSDI

By 1996 many Vermont Tech graduates had solid practical backgrounds in surveying, computerized drafting, and GIS, and were in demand by Vermont and out-of-state businesses. "Geomatics" became

a noticeable sector of Vermont's economy once several firms grew up or relocated to Vermont to take advantage of its skilled work-force and available data. Surveyors using global positioning systems, GIS planners and consultants, firms specializing in use of digital orthophotography, and marketing firms began to draw on each others' strengths, and to use Burlington as a northeastern base of operations. Most such firms started and have remained small and technical, but development of:

- research and development efforts in cooperation with UVM faculty,
- project partnerships with other specialized firms, and
- increasingly sophisticated marketing of value-added products and services

have allowed them to expand in Vermont.

State Government depends on VSDI

Ten years ago (1989) Vermont's Agency of Natural Resources (ANR), Public Water Supply Division, and Office of Geographic Information Services (OGIS) began cooperating to build spatial data. Working with data from federal agencies (USGS, EPA, and others) as a start, GIS began as a tool to display all the land-and-water-based resources for which ANR and the Division had responsibility.

In 1992 the Historic Preservation Division and Departments of Agriculture and Forests, Parks & Recreation began to build and use GIS. The Agency of Transportation began the integration of regional and state-wide data using GIS in its Regional Transportation Initiative (working with existing regional GIS centers) and in its internal management information systems design. By the end of 1993 programs in Housing, Water Quality, Air Toxics, Libraries, Travel, and Public Service began displaying and analyzing their data in easy-to-use, inexpensive desktop GIS systems.

The following year (1994) saw strategic network linkages between Transportation, Libraries, Natural Resources and VCGI. Data began to be shared routinely across programs, and there was renewed focus on assuring the quality and currency of these "corporate" data resources.

By 1995 VCGI and the Department of Libraries had provided widespread public access by placing "user-friendly" GIS terminals and small color printers in all the regional libraries and the Statehouse; they all shared databases maintained on a state agency network. Managers of welfare and training programs began to combine census data and state data on caseloads and unemployment to better understand service needs. Regional offices of Natural Resources and Transportation acquired desktop systems for viewing spatial data. Engineers and permit applicants were able to review project areas, view standardized data, and order maps to help with their projects.

Early last year (1998) most state agencies completed conversion to standard formats of public databases which summarize their caseloads, expenditures, and activities by one or more standardized geographical unit: the census block, town, district boundary or ZIP code. These map data are stored on a network data server along with documentation and other "base" data, simplifying analysis of activities across agency lines.

VSDI Enhances Public Access and Education

In 1994 Vermont's teachers began learning how to use "data exploration" computers in public schools; pilot programs (1995) in several communities employed GIS computers as crucial tools for student research in social studies and earth science. By 1996 public databases about Vermont were maintained on a statewide network accessible to schools, businesses and individuals through commercial network communications services. By 1998 Vermont was a leading state in meeting the 1993 Clinton/Gore goal of developing "a **National Spatial Data Infrastructure** to integrate [spatial] data sources into a single digital resource accessible to anyone with a personal computer. . .to help land developers and conservationists, transportation planners and those concerned with mineral resources, and farmers and city water departments."

Key Milestones in Vermont's Geographic Information System

April 1988	Vermont General Assembly passes "Act 200" -- comprehensive changes to statutes affecting local and regional planning. 3 VSA 20 call for a **geographic information system**, and public information which is "shareable," "compatible," and "useful." GIS funding of $4.75 million over five years is approved.
September 1988	Agency of Administration forms interim GIS Task Force; selects PlanGraphics, Inc. (Frankfort, KY) to prepare VGIS strategic plan; authorizes UVM/GIS work on soils data bases.
February 1989	Three volume "Strategic Plan" is prepared, based on interviews with Vermonters at many levels of government and planning, and in the private sector. The plan covers legal and policy issues, technical issues, data and applications development. First VGIS Annual Report is submitted to the General Assembly by Governor Kunin.
June 1989	Gov. Madeleine Kunin issues Executive Order 89-75 establishing an Office of Geographic Information Services (OGIS) within the Agency of Administration, and a 15-member VGIS Advisory Board chaired by the Secretary of Administration.
September 1989	OGIS funds pilot GIS projects at two regional planning commissions, two state agencies, and one local planning office.
November 1989	VGIS Advisory Board adopts policy on "Regional Planning Commission and Local Government Roles", plus various technical standards.
February 1990	First Annual Vermont GIS Conference held in Sherburne: local and state government, regional planning, and commercial concerns meet to learn about policy, data and applications.
April 1990	Vermont General Assembly takes no action on proposed legislation establishing GIS authority and structure; due to worsening state fiscal situation, FY91 GIS funding was cut back.
July 1990	OGIS initiates work on contractor selection for two large scale data development efforts: statewide road centerlines, and parcel boundaries for eighty towns.

September 1990	Vermont Agency of Natural Resources publishes long-term GIS planning document inventorying data layers needed to support Agency programs; foresees state funding problems in succeeding years; ANR/GIS unit supports programs in all ANR departments.
December 1990	OGIS commences operation of public data distribution system; publishes initial editions of VGIS Data Catalog and Handbook of Policies & Procedures. VGIS Advisory Board accepts subcommittee report on pricing and public access.
January 1991	FY92 Governor's Budget Requests contains strong support for continuation of GIS, but recommends funding 60% below prior year.
February 1991	OGIS finalizes "Memorandum of Understanding" with the last of twelve regional planning commissions to act as GIS Service Centers for every town in every part of Vermont.
March 1991	VGIS Advisory Board adopts policies on "Public Access," and "Pricing."
August 1991	VGIS Advisory Board adopts recommendation regarding future organizational structure, as required by Executive Order. Board proposes to Governor that a joint venture with UVM be initiated. Gov. Richard Snelling is succeeded by Gov. Howard Dean.
January 1992	Gov. Dean issues Executive Order 92-3, creating VCGI strategy; OGIS moves to Burlington; VCGI is incorporated, but inactive, pending review by General Assembly.
April 1992	General Assembly passes Act 258 modifications to 3 VSA 20, authorizing VCGI through July 1, 1994, along with reduced GIS budget and a directive to generate fiscal partnerships.
July 1992	VCGI commences operation with eleven-member Board of Directors. Board soon names 14-person Technical Advisory Committee representing sources of municipal, regional, University, state agency and commercial expertise.
December 1992	VCGI Board adopts policy respecting procurement of data, services and products from GIS service providers.
July 1993	VCGI closes first year with a small operating loss; approves operating budget with state funding reduced to less than 50% of anticipated expenditures. Board initiates process for providing recommendations to the General Assembly, as required by Act 258.
December 1993	VCGI Board adopts "Toward VGIS 2000" recommendations for consideration by Secretary of Administration. Highlights include recommendations for 5-year VCGI extension, no authorization of fees, and revised mission statement.

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APPENDIX B: SURVEY OF OTHER STATE STATUTES RELATING TO GIS AND PUBLIC RECORDS

Vermont statute **(3 VSA 20)** requires that "*the governor shall develop a comprehensive strategy for the development and use of a geographic information system.*"

Amendments added in 1992 also require that "*on or before January 1, 1994, the Secretary of Administration shall report to the general assembly [regarding] recommendations on the most effective manner of implementing the purposes of 3 V.S.A. S 20.*"

These amendments also provided for the creation of The Vermont Center for Geographic Information, Inc. (VCGI), and required its Board "*to investigate the feasibility of charging fees for products or data, with such fees based upon the public investment in the data, or the expense of preparing the products to be sold, or the value of those products or data to the purchasers or to others, or any combination of such factors.*"

Statutes, legislative proposals, and Executive Orders from other states can provide the VCGI Board, the Secretary, and the General Assembly with guidance in addressing policy issues raised by these requirements. The results are grouped according to several broad question areas, highlighting different approaches taken by Vermont and other states. The final page of the summary lists statutory citations from each state.

I. **What GIS organizational structures are established by state laws?**
   A. Establishment of "steering" or "advisory" committees -- KY, NB
   B. Establishment of an Office of GIS, and levying of appropriate charges fixed in a schedule by an Information Services Policy Board -- ME
   C. Authority of an intergovernmental group to impose and collect reasonable fees -- OR
   D. Authority to require a unified geographic information system for a locality -- VA

II. **How is GIS data treated in the context of state public records laws?**
   A. Setting of fees for electronic products and services as part of public access statutes; <u>not</u> GIS specific -- AK, CO, IN, IA, LA, OR
   B. Setting of fees for electronic products and services: GIS specific -- KY, ME
   C. Authority to copyright is acknowledged -- CO, IN
   D. Use of information by license/contract -- KY, ME

E. Limitations on state's duty to provide records:

1. Agencies may make "reasonable rules to prevent disruption" -- VT
2. Agency is required to provide copies in the form requested and to manipulate electronic data unless there is an "undue burden" -- LA

F. Limit agency liability; protect security of public records -- ME, VT

III. **To what degree do state laws allow recovery of costs?**

A. "Cost of copying" public records -- VT
B. "Manipulation of data" -- not to exceed the cost -- CO
C. Part of the costs of operating the system -- CO
D. "reasonable cost of computer, personnel time & printing cost" -- KY
E. "reasonable cost of labor required to respond to a request," plus cost of materials.

IV. **What statutory basis do states provide for charging fees for data?**

A. A fee for "reasonable portion of the costs associated with building and maintaining the information system. . ." -- IN
B. Basis of fees in KY include:

1. cost of time, equipment, and personnel in data base production,
2. cost to the agency of creation or purchase of the data base or GIS, or
3. value of the commercial purpose for which it is used.

C. Basis of fees in LA include:

1. providing copies of records requiring manipulation or modification, or
2. creating a product or service.

D. RI allows an assessment of fees to "pay costs incurred in connection with reproduction and handling as well as to contribute to the costs of maintaining and developing the data base."
E. Provision for uniform waiver of fees -- IN, CO

V. **Do statutes differentiate among classes or groups of users, or among the uses to which different customers will put the data?**

A. Recognition of the use of information for "commercial" purposes as different than other public records access -- AZ, KY

VI. **In authorizing cost recovery or fees, do statutes recognize the investment in data, the expenses of preparing GIS products and/or the value of the data to others?** See IV above.

STATE STATUTES, ORDERS & PROPOSALS

Arizona Statutes **Section 39-121.03** regarding request for copies; statement of purpose; commercial purpose. . .; definition

Alaska Statutes (Code of Civil Procedure) **Title 9, Section 09.25.110 et seq.** regarding public access to government information, setting of fees for electronic products and services;

Colorado Revised Statutes Annotated (1988 Repl. Vol.) **24-72-203 et seq.** regarding copyright and access to public records, manipulation of data and reasonable fees;

Indiana Senate Bill 365 (1992) re: Government electronic records, uniform fees for electronic products; allows for waiver of fee for public purposes. Fees must be based on cost, and agencies may hold copyright;

Iowa Revised Statutes **Section 22.2.3** re: establishment by a government body of "reasonable rates and procedures for the retrieval of specified records"

Kentucky Executive Order 92-1049 re: Establishment of geographic information advisory council to the Kentucky information systems commission natural resources and environmental protection cabinet (October 1, 1992).

Kentucky Revised Statutes **61.960 et seq.** re: geographic information system, use of public GIS data bases for commercial purposes, contracts and fees for use of data bases; and KRS **61.870 to 61.884** re: open records of public agencies.

Louisiana House Bill 484 (1992) re: public records, geographic information systems and the collection of fees for copies of public records requiring manipulation of data or specialized programming;

Maine Revised Statutes Annotated (1991) **12 MRSA 1751 et seq.** regarding the Office of Geographic Information Systems: allows levying of appropriate charges fixed in a schedule by the Information Services Policy Board, and requires that data be made available subject to a licensing agreement.

Nebraska, Revised Statutes of, **Section 81-2601 et seq.** regarding the Geographic Information System and GIS Steering Committee; meetings, duties and report.

Oregon Revised Statutes **Section 190.050 Fees for geographic data; uses** re: authority of an intergovernmental group to impose and collect reasonable fees, which shall be used for maintenance or for providing services

Rhode Island (1956) -- 1991 Supplement, General Laws of, **Section 38-2-4** regarding the cost of public records, including hourly rates for search and retrieval.

Rhode Island House Bill #?? (1992) re: Fee schedules for distribution or maintenance of GIS data, reproduction, handling, and a contribution to costs of data base development;

Vermont Statutes Annotated: **1 VSA 315 et seq.** -- Access to Public Records, and **3 VSA 20** -- Geographic Information System

Virginia, Code of: **Section 15.1-11.7** re: Authority to require a unified geographic information system for a locality

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APPENDIX C: RESULTS OF A SURVEY OF VCGI CUSTOMERS

In May 1993 VCGI distributed a questionnaire to all individuals and organizations which have ordered VGIS data since December 1990. Nearly half of those surveyed provided anonymous responses to a variety of questions about VCGI data distribution services, costs and policies. The results are summarized below.

I. RESPONDENT PROFILE -- Respondents were asked to indicate their state or region, and to characterize the activities for which they were requesting VGIS data and products. Figures 1 and 2 illustrate the characteristics of the entire VCGI customer base, and survey respondents. The majority of requests for VGIS data and products come from Vermont public agencies. Anecdotal information leads VCGI to believe that the majority of commercial requests -- from within and without Vermont -- have been made by firms working on behalf of Vermont public agencies.

State/Area	Total	%	Survey	%
Massachusetts	6	6%	1	2%
New Hampshire	5	5%	4	8%
New York	4	4%	2	4%
Vermont	84	79%	41	80%
Other N.E.	3	3%	3	6%
Other	5	5%	0	0%
TOTAL	107	100%	51	100%

Figure 1 -- VCGI Customer Geography

Group	Total	%	Survey	%
Public Agency	41	38%	30	59%
Not-for-Profit	3	3%	5	10%
Academic	15	14%	2	4%
Commercial	38	36%	11	22%
Personal	10	9%	3	6%
TOTAL	107	100%	51	100%

Figure 2 -- VCGI Customer Profile

Respondents were asked to characterize the frequency with which they have requested VGIS data and products. About **two thirds of respondents** had ordered from VCGI several times or more (Figure 3).

Never	4	7.84%
Once or Twice	13	25.49%
Several Times	21	41.18%
Regularly	13	25.49%
TOTAL	51	100.00%

Figure 3 -- Frequency of Orders

II. CUSTOMER SATISFACTION -- Most respondents indicated that they had requested publications, data or other VGIS materials. They were asked to rate VCGI on several measures of customer satisfaction, using a scale of **1** to **4** (**1** -- needs improvement, **2** -- adequate, **3** -- good, **4** -- excellent). The number of respondents and average rating on each measure was as follows:

- Clarity of instructions for ordering 45 / 2.82

- Responsiveness to your questions or problems in ordering 45 / 3.36
- Clarity of instructions for downloading data 41 / 3.20
- Completeness and usefulness of data documentation 42 / 3.02

Customers were asked: **"What suggestions do you have for improving VCGI instructions and forms, and the VCGI data distribution process?"** Some responses were:

- *On-line data requests would be useful, along with on-line viewing of data before ordering (on-line ArcView).*

- *Issue of accessing data on an on-going subscriber basis needs exploration. Also frequency of mailings notifying of improved data base needs attention.*

- *Data requests via electronic bulletin board.*

USERS of VGIS data were asked to provide their opinion of the data documentation provided with VGIS digital data, using a scale of **0** -- Not Applicable, **1** -- Incomplete, **2** -- Complete, **3** -- A Bit Too Complex, **4** -- Much Too Complex. **Forty (40) data users responded with an average rating of 2.08.**

PROVIDERS of VGIS data were asked their opinion of the VGIS Data Documentation Standard that we ask data providers to comply with, using the same scale. **Twenty-six (26) data providers responded with an average rating of 1.65.**

PROVIDERS of VGIS data also gave VCGI their opinion of the computer program (**GISDOC**) VCGI supplies to aid data providers in producing standards-compliant data documentation, using a similar scale: **0** -- Never used it, **1** -- Needs improvement, **2** -- Adequate, **3** -- Good, **4** -- Excellent. **Twenty-six (26) data providers responded with an average rating of 1.04.**

Many respondents also provided comments and suggestions on the VGIS "Data Catalog", the Data Documentation Standard and/or the **GISDOC** software. Some responses were:

- *We need a bigger notebook. We like the page numbering system and updates.*

- *Looking for a quality control indicator.*

- *The documentation standard is tailored too closely to pc platforms - the standard must be more portable across platforms or more than one standard structure should be developed.*

Customers were asked: **"VCGI is considering the purchase of another tape drive to provide a media format preferred by PC users. What tape drive brand and format do you currently use or plan to purchase, if any?"**

VCGI received twenty-six (26) responses to this question, within which were contained roughly twenty separate suggestions. Common themes included: use of Macintosh computer systems, CD-ROM drives, Bernoulli cartridges, and QIC format tapes.

III. CUSTOMER OPINIONS: REPRODUCTION COSTS & FEES -- VCGI currently adheres to Vermont's "Access to Public Records" statutes, which require that we provide public records (digital data and publications) at the "actual cost of providing the copy" (**1 VSA 316**). State law also requires that VCGI "investigate the feasibility of charging fees for

products or data" (3 VSA 20(d)), and submit a report in January 1994.

Respondents were provided with this and other information about VCGI policies and practices concerning "actual costs," average cost per order, and data distribution. They were asked **"Are you aware of these policies and practices?" Forty-one of fifty (41 of 50) respondents answered "Yes."**

Respondents were asked if they would describe the amounts VCGI charges for copying printed and digital information as: **1** -- too low, **2** -- about right, or **3** -- too high? **Forty-eight (48) respondents gave an average rating of 1.88.**

Respondents were asked: **"Do you believe that fees greater than the cost of copying should <u>never</u> be charged to <u>any</u> person or organization for use of publicly-funded digital information?"** Two-thirds of the respondents answered "No." **That is, thirty-six (36) of the forty-eight (48) people who responded agreed that some fees could be charged in some circumstances.**

Those who felt that fees greater than the cost of copying could be justified were asked if any of the following reasons could justify such fees:

- **12 respondents (37%)** agreed that such charges should help cover general operating costs for local and state agencies,
- **20 respondents (62%)** agreed that such charges should help cover the cost of acquiring systems necessary to archive and distribute digital data,
- **21 respondents (65%)** agreed that such charges should help cover the costs of creating public data bases or converting information from original sources into digital data form,
- **19 respondents (59%)** agreed that such charges should help cover the cost of updating available data bases, or
- **18 respondents (56%)** agreed that such charges should recover for the taxpayers a portion of the value derived from using the data and products for commercial purposes.

Respondents provided comments about why they think fees greater than the cost of copying should or should not be charged; some of them are as follows:

- *Profit-making enterprises should pay more for GIS since they're making money on it. Non-profit/state agencies should not have to pay extra.*

- *Cost of reproduction should include the cost of overhead of machines and people to store and distribute data. Development of data should be reimbursed (partially) by reproduction fee.*

- *Fees should be charged to keep the quality integrity of the data to keep up with new technologies.*

- *The system will slowly die.*

- *I feel that if greater fees are charged it may be financially possible to develop new data or update current data.*

- *This data is collected routinely by government; why should public (or other governments) pay a premium? Is government data development to be influenced by its marketability? I should hope not.*

VGIS data is used by Vermont citizens, agencies and businesses, and by those from other states. Respondents were asked, **"If fees greater than the cost of copying are to be paid, how much do you believe that non-Vermonters should pay in relation to Vermonters?"**

- **Fifteen (15) of twenty-eight (28) respondents -- 53%** -- indicated that non-Vermonters should pay about the same as Vermonters, while the others indicated that non-Vermonters should pay more than Vermonters.

Customers of VGIS publications, data and products fall into one of five customer groups. Respondents were asked to assume that the Vermont General Assembly were to consider charging fees greater than the cost of copying. For each of these groups, respondents were asked to indicate whether they believe that its members should be charged:

3 -- Higher fees than all or most other groups,
2 -- Fees about the same as the other groups,
1 -- Lower fees than all or most other groups,
0 -- No fees at all.

Thirty (30) respondents provided rankings for each group; the average response is given below:

• Public/Governmental Agency	1.16
• Not-for-Profit Organization	1.33
• Academic Institution or research organization	1.50
• Commercial concern	2.67
• Personal use (non-commercial)	2.17

Some respondents offered comments on their support or opposition to fees for these or "other" groups; some comments follow:

- *As with traditional forms of infrastructure, the public, legislators, and the user community must always be reminded "you get what you pay for."*

- *VGIS is a value added service organization and should recover reasonable revenues on behalf of its shareholders, the taxpayers of Vermont.*

- *While I would support fees greater than the cost of copying please note that our ability to pay for data is very limited for administrative reasons. Let me stress though, that this should only be a small amount over and above actual cost. As an example - on a $50 order, $5 for the above would be reasonable, on a $100 order, $15 is reasonable, etc. (Vermonters)*

- *Could there be a data sharing procedure so that people could donate data and in return get more bytes of data back than what they put in, this would encourage data production expenses to decrease.*

IV. CUSTOMER SUGGESTIONS -- Respondents were asked to provide any suggestions about what products or services they think VCGI should provide, or how VCGI can improve service to our customers. Selected responses follow:

- *VCGI has an opportunity to promote economic development in Vermont by collecting fees and promoting the business aspects of GIS systems and services.*
- *Put a suggestion section on the order sheet since that's when ideas are fresh in people's minds.*
- *GIS technical support (you have this informally and it's great) Network information - for example, if a customer wants a data layer you don't have, who does or might, or does it exits at all.*
- *Outstanding responsiveness & willingness to help. Don't change that.*

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APPENDIX D:
PROPOSED VCGI
ENABLING LEGISLATION

AN ACT RELATING TO A GEOGRAPHIC INFORMATION SYSTEM

Subject: Vermont Geographic Information System

Statement of purpose: This bill proposes to establish a public, not-for-profit corporation responsible for development and management of the Vermont Geographic Information System created by statute in 1988.

It is hereby enacted by the General Assembly of the state of Vermont:

Sec. 1. LEGISLATIVE FINDINGS AND INTENT
The legislature finds that:

(1) since 1988 Vermont has been implementing a comprehensive strategy for the development and use of a geographic information system (GIS).

(2) data gathered for or used within the geographic information system should be compatible with, useful to, and shared within the geographic information system.

(3) public access to government information is a fundamental right that operates to check and balance the actions of elected and appointed officials and to maintain citizen control of government;

(4) computers and electronic data bases have proliferated throughout government, raising issues regarding access to electronic information;

(5) to protect the individual's right to know, public records must be available at nominal cost; and

(6) increased electronic access to the state's information systems will enhance the delivery of public services, production of new products and services based on Vermont's investment in spatial information, and the availability of that spatial information throughout the state.

Sec. 2. REPEAL
3 V.S.A. 20, relating to a Geographic Information System, is repealed.

Sec. 3. 10 V.S.A. Chapter 161 is added to read:

Chapter 161. GEOGRAPHIC INFORMATION

6701. VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INCORPORATED; ESTABLISHMENT

(a) The State of Vermont shall support a comprehensive strategy for the development and use of a geographic information system including:

1) data and mapping standards;
2) potential applications and their priorities;
3) priorities for collecting and digitizing information;
4) geographic location standards for all data collection;
5) software and hardware;
6) management needs;
7) private sector cooperation;
8) costs and benefits of use;
9) financing considerations;
10) ways to make information gathered available to regional and municipal entities, commercial entities, the public, and others;
11) ways to assure that data gathered by governmental entities conforms to the geographic information system; and
12) an implementation schedule;

In order to develop and implement that strategy, and to ensure that all data gathered by state agencies that is relevant to the GIS shall be in a form that is compatible with, useful to, and shared with that geographic information system, there shall be created the Vermont Center for Geographic Information, Incorporated, hereinafter called the center.

(b) The center shall be a non-profit corporation and shall not have authority to issue any capital stock. The property of the center shall be used solely to promote its purposes as herein defined. The center shall assume title to property acquired by the state for the support of a geographic information system, but shall return title to such property to the state if the property is not used to promote the center's purposes as herein defined or upon any dissolution of the corporation. No part of the activities of the center shall consist of participating in or intervening in (including the publishing or distribution of statements) any political campaign on behalf of any candidate for public office. Upon any dissolution of the corporation, any assets remaining after payment of or provision for its debts and liabilities shall be distributed according to applicable provisions of State Law. No part of the net assets or net earnings of the center shall inure to the benefit of or be paid or distributed to any officer, director, or employee of the center, or to any donor to the center. The state reserves the right at any time to alter, amend, repeal or otherwise change the structure, organization, programs or activities of the center, including the power to terminate the corporation, subject to any limitation on the impairment of the obligations of any contract or contracts entered into by the center.

6702. DEFINITIONS

As used in this chapter:

(a) "VGIS" means the Vermont geographic information system developed pursuant to the comprehensive strategy developed by the center as required by 10 VSA 6701(a).

(b) "Electronic products and services" means computer-related services and products provided by the center, including:

(1) electronic manipulation of the data contained in public records in order to tailor the data to a customer's request, or to develop a product that meets the needs of customers;

(2) duplication of public records in alternative formats not used by the center, providing periodic updates of an electronic file or data base, or duplicating an electronic file or data base;

(3) provision of on-line access to an electronic file or data base or any form of electronic access to the information system of the center;

(4) provision of software developed by or for the center;

(5) generating maps, listings, or other standard or customized products from an electronic geographic information system.

(c) "Media" means the physical material on which written, printed, or electronically encoded information is stored.

6703. POWERS OF THE CENTER

The center shall have all the general powers conferred by Chapter 19, Title XI and all amendments thereto, and all other powers necessary, desirable, or incidental fully to effectuate its corporate purposes including but not limited to the power to acquire real or personal property by grant, gift, demise, bequest, or purchase, and to hold, lease, mortgage, or dispose of such property as the purposes of the center shall require.

6704. BOARD OF DIRECTORS

(a) The Board of Directors shall have the responsibility of the general management of and authority over the property, business and affairs of the center.

(b) The number of Directors of the center shall be eleven (11).

1. The Governor shall appoint six (6) Directors, who shall serve a term of 2 (two) years from the date of the first regular meeting of the Board; one (1) such Director shall be appointed as Chairperson. One (1) Director appointed by the Governor shall be nominated by and represent the regional planning commissions, and one Director shall be nominated by and represent the municipalities. The remaining four directors shall represent the interest of the agencies of administration, transportation, natural resources, and development and community affairs. Directors appointed by the Governor shall serve at the pleasure of the Governor subject to the provisions of 3 VSA 258 et seq.

2. The Chairman shall appoint to serve as Directors three (3) other persons knowledgeable in the use of GIS in higher education, who shall serve a term of two

(2) years from the date of the first regular meeting of the Board.

3. The Speaker of the House and the Senate Committee on Committees shall each appoint one (1) member to the Board. Legislative members shall serve until March 15 following the close of the biennium.

4. Each Director shall serve a term of 2 (two) years, except as specified in paragraph I.B above, or until the appointment of his/her successor. Vacancies occurring on the Board shall be filled by the appointing authority of the director being replaced. The Director so appointed shall serve for the remainder of the term.

(c) The Board of Directors shall meet no less than four times annually. The Board of Directors may provide, by resolution, the time and place for holding additional regular meetings. Additional regular meetings shall be held at the principal office of the center in the absence of any designation in the resolution.

(d) Special meetings of the Board of Directors may be called by, or at the request of, the Chairperson or any two (2) directors, and shall be held at the principal office of the center or at such other place as the directors may determine.

(e) Notice of any special meeting shall be given at least seventy-two (72) hours before the times fixed for the meeting, by written notice delivered personally, electronically, or mailed to each director at his/her business address. If mailed, such notice shall be deemed to be delivered when deposited in the United States mail so addressed, with postage thereon pre-paid, not less than seven (7) days prior to commencement of the above stated notice period. Any director may waive notice of any meeting. The attendance of a director at a meeting shall constitute a waiver of notice of such meeting, except where a director attends a meeting for the express purpose of objecting to the transaction of any business because the meeting is not lawfully called or convened.

(f) A majority of the number of directors serving at any time shall constitute a quorum for the transaction of business at any meeting of the Board of Directors, but if less than such majority is present at a meeting, a majority of the directors present may adjourn the meeting from time to time without further notice. Except as otherwise required, all actions by the Board shall be by a majority of those present and eligible to vote.

(g) By resolution of the Board of Directors, the directors may be paid their reasonable expenses, if any, of attendance of each meeting of the Board of Directors.

(h) Whenever any notice is required to be given to any director of the center under the provisions of these bylaws or under the provisions of law, a waiver thereof in writing, signed by the person or persons entitled to such notice, whether before or after the time stated herein, shall be deemed equivalent to the giving of such notice.

(i) The Board of Directors may establish an executive committee, a technical advisory committee, and other committees as it shall see fit.

6705. OFFICERS

(a) The officers of the center shall consist of the Chairperson, the Vice-Chairperson, and the Secretary/Treasurer. A vacancy in any office because of death, resignation, removal, disqualification, or otherwise, may be filled by the Board of Directors for the unexpired portion of the term.

(b) An officer shall preside at all meetings of the Directors.

(c) The Chairperson shall be a member of the Board of Directors appointed by the Governor of Vermont or, should the Governor not make such a designation within thirty (30) days of a vacancy in the office of Chairperson, shall be elected by the Directors until such time as the Governor's designation is made. The Vice-Chairperson and Secretary/Treasurer shall be elected by the Directors.

(d) The powers and duties of the Officers are specified below:

1. The Chairperson shall call and preside at regular and special meetings of the Board, serve as a non-voting ex-officio member of all committees except the executive committee, and shall have the powers and shall discharge the duties customarily and usually held and performed by a like officer of corporations similar in organization and business purposes to the center.

2. The Vice-Chair shall serve as Chair in the absence of the Chair.

3. The Secretary/Treasurer shall have the powers and shall discharge the duties customarily and usually held and performed by a like officer of corporations similar in organization and business purposes to the center.

6706. REPORTS AND AUDITS

On or before January 15 of each year, the center shall prepare and submit to the Governor a three year work plan which describes the goals, objectives and activities of the center and cooperating state agencies and other public and private organizations. The plan also should include estimated cost of each major activity of the center, and a report concerning data gathered, documents generated, and problems and opportunities for use of VGIS information. Control of funds appropriated and all procedures incident to the carrying out of the purposes of this chapter shall be vested in the board of directors. The books of account of the center shall be audited annually and a report filed with the secretary of administration not later than October first of each year.

6707. PURPOSES AND DUTIES

Within the limits of available resources, the center shall:

1) assure that all VCGI data is of high quality and is compatible with, useful to, and shared with other public-sector and private-sector data users;

2) encourage the same high standards of quality and compatibility in other Vermont GIS cooperators;

3) promote the efficient development and use of geographic information by agencies of the state, its political subdivisions, Vermont businesses and citizens; and

4) facilitate the growth of commercial services within Vermont for the provision of spatial data, products, and services.

The center shall operate a program of standards development, data dissemination, and quality assurance, and shall perform the following duties:

(1) Provide or ensure provision of geographic information products and services to Vermont citizens, to local and regional planning organizations, to state government, to the Federal government, and to private businesses and industries, either individually or in groups.

(2) Develop procedures for access to the VGIS. Those procedures shall ensure that VGIS data is readily available for the purposes of the Vermont Municipal and Regional Planning and Development Act (as amended), as well as for the support of efficient and economical geographic analysis and decision-making by government, business, and citizens of Vermont, at a reasonable cost and in reasonable forms.

(3) Develop, publish, maintain and implement such VGIS standards as are necessary to assure that data is compatible with, useful to, and shared with all users of VGIS data, including geographic data standards relating to scale, accuracy, coding, documentation, data format and physical media.

(4) In developing relevant policies, procedures, and standards, seek the consultation of institutions of higher learning, local government, local and regional planning, private business and industry and other members of the public with an interest in or knowledge of GIS technology.

(5) For all geographic data that is or may be useful to the center's customers, and that has been collected by any part of state government or generated with state support, ensure that such data:

(a) is developed and maintained so as to conform to VGIS standards; and

(b) upon request of a potential customer, is actually made available to the customer in a useable format in accordance with Vermont statutes regarding "Access to Public Records" (1 V.S.A. 315 et seq.) and related statutes.

(6) Assist in assessing VGIS financial needs and resources for cooperating state agencies, evaluating the adequacy of those financial resources to meet the goals of the three year VGIS work plan, and developing alternate sources of revenue for VGIS data acquisition.

(7) Enter into memoranda of understanding, form contracts and enter cooperative agreements for the development, acquisition, maintenance, distribution and marketing of GIS data.

(8) Include in any contract for electronic products and services provisions that:

(a) protect the security and integrity of VGIS information and of information systems that are shared by public agencies, and

(b) indemnify or limit the liability (if any) of the state of Vermont.

(9) Notify the state librarian of the electronic services and products offered to the public. The notification must include a summary of the available format options and the cost of such products and services.

(10) Retain archive copies and act as the distributor for any state agency, as well as for other public and private entities, which prepares GIS data or electronic products which are compatible with, useful to, and shared with VGIS.

(11) Assist the Secretary of the Agencies of Administration, Transportation, Natural Resources, Human Services, and Development and Community Affairs, and the Commissioner or Director of state departments and offices not within these agencies in the identification of information gathered within the respective agency, department or office which is relevant to Vermont's GIS. Working in cooperation with each organization that identifies such information, the center shall include components within the three year VGIS work plan. Such cooperation may include:

(a) Formulation of a "Memorandum of Understanding" between the organization and the center, setting out roles and the relationship between the parties,

(b) Periodic meetings to identify opportunities for improvement of VGIS information and applications gathered or used by the organization,

(c) Identification of funding strategies, technical procedures, data conversion plans, and application development projects in which the center can be of assistance to the organization.

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APPENDIX E: VCGI PUBLICATIONS AND PRODUCTS LIST

PUBLICATIONS

GIS for Vermont Communities: Applications and Concept; An Instructional Text for Citizen Planners in Vermont; October, 1990
Code: PB001 Cost: $50.00

* *VGIS Policies, Standards, Guidelines, and Procedures Handbook;* Subscription Order, January, 1991: Provides all VGIS users a common basis to carry out their GIS activities as described by the Vermont Statutes.
Code: PB002 Cost: $40.00

(If you would like to order sections from the *VGIS Handbook*, we can provide you with a table of contents. The cost for any of the sections will be .10/page.)

* *VGIS Data Catalog;* Subscription Order, February, 1991: A complete documentation on data and other data products available
Code: PB003 Cost: $40.00

VGIS Data Catalog Summary: A non-technical overview of data and other data products available
Code: PB004
1st copy free, additional copies at $3.00ea

GIS: Helping Vermont Communities Visualize Choice; A Non-Technical Overview of GIS for Vermont's Elected Officials and Citizen Planners, and the General Public; December, 1990
Code: PB005
1st copy free, additional copies at $2.00ea

GIS Needs Determination: Final Report for Phase I of Vermont's Comprehensive GIS Strategy Study; February, 1989
Code: PB006 Cost: $7.50

Providing Access to the Vermont Geographic Information System: Legal Framework, Functional Access, and Cost Price Model for Sale of Products and Services; February 1989
Code: PB007 Cost: $5.00

Conceptual System Design: Final Report for Phase III of Vermont's Comprehensive GIS Strategy Study; February 1989
Code: PB008 Cost: $5.00

Annual Report to the Legislature -- four publications, covering 1989 - 1993, issued in March of each year:
Code: PB009-89 Cost: $3.00
Code: PB009-90 Cost: $3.00
Code: PB009-91 Cost: $3.00
Code: PB009-92 Cost: $3.00
Code: PB009-93 Cost: $5.00

GIS Management plan for the Lake Champlain Basin Program - Executive Summary; March 1993, 20 pp.
Code: LCBP03EX Cost: $2.00

GIS Management Plan for the Lake Champlain Basin Program - Technical Report No. 3A; March 1993, 154 pp.
Code: LCBP03A Cost: $8.00

Handbook of GIS Standards and Procedures for the Lake Champlain Basin Program - Technical Report No. 3B; March 1993, 68 pp.
Code: LCBP03B Cost: $5.00

GIS Data Inventory for the Lake Champlain Basin Program - Technical Report No. 3C; March 1993, 44 pp.
Code: LCBP03C Cost: $4.00

APPLICATION PAPERS

Application Paper #1: Small Town ARC/INFO Applications: Plainfield, VT; December, 1991, 5 pp.
Code: AP001 Cost: $1.00

*** The first year subscription includes the binder, dividers and all sections, plus updates published during the year. Annual renewal provides the subscriber continuing updates and any new sections added. The annual renewal cost is $20.**

TECHNICAL PAPERS

Technical Paper #1: Using a "Low-End" pcarc/INFO Station for Digitizing; January, 1991, 1 page
Code: TP001 Cost: No charge for single copies

Technical Paper #2: How to Utilize Grand List Data in a GIS; February, 1991, 11 pp.
Code: TP002 Cost: $1.50

Technical Paper #3: Desktop Mapping/GIS Software Review; February, 1991, 11 pp.
Code: TP003 Cost: $1.50

Technical Paper #4: Evaluation of Orthophoto Derived DTM Data; March, 1991, 4 pp.
Code: TP004 Cost: $1.00

Technical Paper #5: VGIS Spot Pilot Project; March, 1991, 34 pp.(includes B&W and color figures)
Code TP005 Cost: $5.00

Technical Paper #6: Dos 5.0 Operating System; July, 1991, 7 pp.
Code: TP006 Cost: $1.00

Technical Paper #7: Integration of Idrisi Raster Land Cover Classifications with VT GIS 1:5000 Orthophoto Based ArcInfo Coverages; December, 1992, 9 pp.
Code TP007 Cost: $1.50

MAPS

Population Change: 1980 - 1990 for State of Vermont 1990 Population is listed in each town (11 x 17)
Code: MP001 Cost: $5.00

Median Adjusted Gross Income 1989 for State of Vermont (11 X 17)
Code: MP002 Cost: $5.00

PRODUCTS (Please specify disk size)

Vermont Town Menu System (VTMS): pc ARC/INFO Menu System SML.
Code: PT001 Cost: $15.00

VCGI/Lake Champlain Data Inventory: Run-time database of over 1100 information & data resources (GIS & non-GIS) available in Vermont & the Lake Champlain Basin (NY & VT). The database includes built in query and search menu functions; July, 1992.
Code: PT002 Cost: $5.00

GISDOC: A user interface program to make data layer documentation easier. The program runs on any MS-DOS compatible computer; January, 1992.
Code: PT003 Cost: $5.00

OTHER

List of area ARC/INFO Consultant Firms
Code: OT001 Cost: No charge

ORIGIN AND PURPOSE OF VERMONT'S GIS

The 1988 General Assembly amended Vermont's Municipal and Regional Planning and Development Act; these amendments contained 3 V.S.A. 20 (amended in 1992), which:

- called on the Governor to *"develop a comprehensive strategy for the development and use of a geographic information system," and*
- directed the Governor to *"assure that all [relevant] data is compatible with, useful to, and shared with the G.I.S.".*

VGIS: PUBLIC AND PRIVATE SECTOR COOPERATION

Vermont's GIS (VGIS) program is directed by the 11-member board of the **Vermont Center for Geographic Information, Inc.** (VCGI), made up of representatives of state agencies, local government, and regional planning; and representatives of the General Assembly and Vermont's higher education community. The staff and facilities of the Center are located on the campus of the University of Vermont. The Center is a corporation formed for public purposes, and operates within the limits of Vermont statutes on open meetings and public records.

State and federal agencies are key participants in VGIS, working under cooperative agreements with VCGI to develop data useful and shareable with local government and the private sector. GIS data and services are provided by **Regional GIS Service Centers** located at Vermont's regional planning commissions, and by over 30 commercial firms who use or develop data for use within VGIS.

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Gore, Albert (Vice President), From Red Tape to Results -- Creating a Government that Works Better & Costs Less, Washington, DC, September 1993.

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Minnesota Department of Administration, "*A Summary of the Minnesota Government Data Practices Act,*" St. Paul, September 1992.

Nebraska GIS Steering Committee, "*Draft Strategic Plan,*" Lincoln, May 1993.

Schreiber, P.C., "*Into the Information Age: Legal Considerations and Developments of Publishing Databases,*" published in Proceedings: ESRI User Conference 1993.

Stahl Eric M., *City Info System there for the Asking,*" published in the Bellevue (WA) Journal-American, June 19, 1993.

URISA (Urban & Regional Information Systems Association), Marketing Government Geographic Information, Washington D.C., July 1993.

Virginia, Commonwealth of (Council on Information Management), "*Report to the Governor and General Assembly: Geographic and Biological Land-Use Information and Mapping Systems Study,*" Richmond, October 1990.

Waters, N., "*The Price is Wrong: Charging for GIS Data and Software,*" in GIS World magazine: July 1993.

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VIII – Glossary of Terms

APPLICATIONS	The use of software, data, procedures and techniques in a series of steps that are then put into practice to solve a problem or perform a function.
DATA BASE	Any collection of related information -- including facts, measurements, classifications or value representations -- designed, organized, and stored to serve one or many users. A GIS database includes the position and attributes of geographic features that have been coded as points, lines, areas, etc.
DIGITAL DATA	Data represented visually as the binary digits "0" and "1", stored in a computer on a variety of media--magnetic tapes, disks, and even paper. In geographic processing, both the X and Y coordinates of lines and label characteristics are represented by numbers.
DOCUMENTATION	The description and format of data including definitions, codes, source, known limitations, fitness for use, date, update schedule, etc.
FEDERAL GEOGRAPHIC DATA COMMITTEE (FGDC)	The Federal Geographic Data Committee (FGDC) consists of representatives of fourteen federal agencies which have specific responsibility or use for different categories of spatial data. The FGDC was created by the Office of Management and Budget's Circular A-16, which addresses coordination of spatial data development and sharing efforts within the federal government.
GEOCODING	Translating geographic coordinates of map units (e.g. lines and points), into X, Y digits or grid cells.
GEOGRAPHIC INFORMATION SYSTEM (GIS)	System of computer hardware, software, and procedures designed to support the capture, management, manipulation, analysis, and display of spatially referenced data. (Also spatial information system, land information system, etc.)
GEOMATICS	The art, science and technologies involved in managing geographically referenced information, including its acquisition, storage, analysis and dissemination.
GEOREFERENCE SYSTEM	An X, Y or X, Y, Z coordinate system that locates points on the surface of the earth as a reference to points on a map. Systems include latitude-longitude, Universal Transverse Mercator, and State Plane Coordinate, etc.
GIS PRODUCT	Information stored and processed by a GIS system, which is then transferred to a physical media (paper, mylar, etc.) by a printer or other output device. (Example: a map or a tabular data display).
GIS SERVICE	The process of manipulating, summarizing, transforming or outputting GIS data, as performed by a person or a computer.
MAP	Graphic representation of the physical features (natural, artificial, or both) of a part or the whole of the Earth's surface, by means of signs and symbols or photographic image, at an established scale, on a specified projection, and with the means of orientation indicated.

METADATA	Metadata is "information about data;" that is, documentation or graphic samples that help the viewer to understand where the data came from, how good it is, and who says so.
NATIONAL SPATIAL DATA INFRASTRUCTURE (NSDI)	The means to assemble geographic information that describes the arrangement and attributes of features and phenomena on the Earth. The infrastructure includes the materials, technology, and people necessary to acquire, process, store and distribute such information to meet a wide variety of needs.
OFFICE OF GEOGRAPHIC INFORMATION SERVICES (OGIS)	Created by Executive Order 89-75, OGIS operated within the Vermont Agency of Administration between 1989 and 1992. VCGI is the successor organization to OGIS, and has many of the same responsibilities.
ORTHOPHOTOGRAPH	An aerial photograph having the properties of an orthographic projection. It is derived from a conventional perspective aerial photograph by simple or differential rectification so that image displacements and scale differences caused by camera tilt and terrain relief are removed.
SCALE	Relationship existing between a distance on a map, chart, or photograph and the corresponding distance on the Earth.
SPATIAL DATA	Information with a locational component.
SPATIAL RESOLUTION	Measure of the ability to separate closely adjacent objects. Also, the smallest area identified as a separate mapping unit.
STATE PLANE COORDINATES	A system of X, Y coordinates defined by the USGS for each state. Locations are based on the distance from an origin within each state.
VALUE-ADDED DATA PRODUCT	Computerized information which has been derived from other computerized information, but for which the value of work performed by a person or by a computer necessary to effect the derivation can be directly quantified.
VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INC. (VCGI)	Authorized by Act 258 of 1992, VCGI is a public, not-for-profit organization and charged by Executive Order 92-3A with coordination of Vermont's GIS strategy.

GLOSSARY SOURCES

This glossary was compiled from the following sources:

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2. *Understanding GIS, The ARC/INFO Method*, ESRI, 1990
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4. *Planning Manual for Vermont Municipalities*, Vermont Department of Housing and Community Affairs, 1987.
5. *Geomatics Industry Review*, Industry, Science and Technology Canada, 1992.
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