

Vermont GIS 2005: A Status Report

Annual Report of the Vermont Center
For Geographic Information, Inc.
And the
Vermont Geographic Information System

January 2005

For
Governor James Douglas
And
Vermont House and Senate
Appropriations Committees

Provided By the
Vermont Center for Geographic Information, Inc.

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January 14, 2005

Honorable James Douglas
The Statehouse
Montpelier, VT 05602

Dear Governor Douglas,

The Vermont Center for Geographic Information, Inc. (VCGI) is pleased to provide you with the Vermont Geographic Information System's (VGIS) Annual Report, **Vermont GIS 2005: A Status Report**. This year's report focuses on the successes relating to the statutory requirements of our organization as well as some of our notable achievements in GIS data and technologies.

Significant achievements for the past year include:

- Completion of the first and only Local Scale (1:5,000) statewide river and stream data set meeting USGS National Hydrographic Data (NHD) standards in the country.
- Providing Vermont Emergency Management (VEM) with an Internet Mapping capability to support their operational readiness in the Emergency Operations Center.
- Yearlong GIS data and mapping support to the State's Regional Planning Commissions and Towns.
- Development of a statewide census data mapping capability for use by Town Planners as part of a partnership with the University of Vermont's Center for Rural Studies.
- Continued financial and technical support for the completion of the Vermont Statewide Soil Data Survey to be completed to SSURGO national standards.

Every year presents its own challenges and opportunities and 2004 was no different in that respect. The staff at VCGI worked hard to be flexible and creative in taking advantage of strategic opportunities when they arose. We used the same flexibility and creativity in meeting the financial and programmatic challenges of the past year. Overall, I believe we can count 2005 as being successful in areas of data development and community support as you will see in the following report. Unfortunately, very little forward movement was made in the statewide integration of an enterprise GIS capability. As we have in previous years, VCGI continues to advocate for a statewide enterprise GIS capacity to help reduce program costs and eliminate data collection redundancy. In the past, Vermont has often led the way for States in adopting new GIS technologies. We should follow the lead of other states in this case and move to statewide enterprise GIS enterprise technology adoption even if it is only as a phased implementation.

Copies of this report have been distributed to the Vermont General Assembly and to agencies participating in the Vermont GIS. Please feel free to contact me at any time if you have any questions or comments.

Sincerely,

David F. Brotzman
Executive Director
davidb@vcgi.org

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This report could not have been prepared without the comments and contributions of the Vermont GIS community, including Vermont’s regional planning commissions, commercial GIS firms, and numerous state and federal agencies. I would also like to acknowledge the VCGI staff for their assistance in the production of this document.

David F. Brotzman, Executive Director

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I. Year in Review

a. Organizational Accomplishments

David Brotzman, Executive Director

Participation in Federal Initiatives

In 2004 VCGI again focused on our responsibility to connect Vermont to the National Data network initiatives. VCGI has always been active in our support of the National Spatial Data Infrastructure (NSDI) since its inception. In 2004 we were successful in winning a grant with USGS to develop a partnership on the new National Map initiative. The National Map is the next incarnation of the NSDI concept and our participation will provide exposure to Vermont's robust GIS community.

VCGI was also successful in winning a grant with the Federal Geographic Data Committee (FGDC) to develop an OpenGIS Compliant Web Feature Service. On this project we are teamed with ESRI, a leading developer of GIS software. The resulting application will increase the flexibility and sophistication of Web Mapping software technology and further standards based application development.

Most notably, in 2004 we completed the first and only 1:5000 statewide, Local Scale, Hydrographic data set done to National Hydrographic Data (NHD) standards. This project was funded in large part by USGS and took over three years to complete. The real significance of this project is in the many uses that various in-state agencies and groups have found for this data. The professionals at the Agency of Natural Resources have begun integrating this data into their business processes. This river and stream data is becoming the foundation for a more accurate environmental assessment and modeling capability. This has been a tremendous project for the state and the resulting data will provide value for many years to come. The challenge for the future is maintaining the data and keeping it current.

Expansion of State Partnerships

VCGI works hard to maintain relationships with those in the GIS community in Vermont. We try to support Agencies and Departments in State government that are just starting out with GIS or are looking for support in using the technologies. In 2004 the Vermont Emergency Management Department made great strides in utilizing GIS to support their operational readiness. VCGI now supplies VEM with a 24/7 Internet Mapping capability for their Emergency Operations Center. This Internet mapping capability is very simple in design yet it enables VEM a much greater situational awareness during an emergency. This capability is very similar to some of the more sophisticated Internet mapping capacity found in other state and federal installations. The VEM – VCGI partnership continues to pay real dividends for Vermont.

VCGI has had a long relationship with the Vermont Agency of Transportation (VTrans). VTrans is the largest and most sophisticated user of GIS data in all of the State agencies. This past year VCGI, VTrans and the Regional Planning Commissions (RPCs) teamed to collect data on the state's bridge and culvert information. VTrans is the leading organization in this effort. VCGI provides technical guidance, data review and integration. The RPCs work with the towns to do the collection themselves or coordinate local collection efforts. This data collection effort is a good example of inter-organizational teamwork in state government and could be seen as a model for future efforts similar in scope.

b. Data and Project Related Activities

Steve Sharp, Senior Project Manager

Mike Brouillette, Senior Project Manager

Tom Williams, Project Manager

Data Development

- Transportation Data

Vermont Agency of Transportation and VCGI completed several collaborative initiatives this year. A new Linear Referencing System (LRS) layer (LRS2004) was developed in support of VTrans' Route Log System. VCGI generates a LRS data layer annually based on the latest route information and road centerline data. VTrans uses the Route Log System to inventory and monitor the condition of Vermont's transportation infrastructure.

VTrans utilizes the VT Highway Mapping System (HMS) to maintain Vermont's road centerline data layer (TransRoad_RDS). The data is submitted to VCGI annually for review (QA/QC). VCGI's review provides an independent check, which helps to assure and verify the integrity of the data. VCGI completed QA/QC of 2004 RDS updates in 2004 (sampling of 50 towns only). The 2004 data was loaded into the VGIS Data Warehouse, enabling VGIS users to download Vermont's latest road centerline data.

Eighty-six local culvert datasets were integrated into the statewide bridge and culvert layer this year, bringing the total coverage to ninety-six towns. VCGI will be working with VTrans and the RPCs to integrate additional culvert data in 2005. VTrans has also received funds to develop a bridge and culvert inventory software package for RPCs and municipalities. VCGI, along with several other agencies comprising the VT Interagency Bridge & Culvert Team, are collaborating with VTrans on this important initiative.

- Dam Data

Working cooperatively with the Hydrology section of the State Agency of Natural Resources and the University of Vermont, VCGI has dramatically increased the location accuracy for 80% of the dams present in the Vermont Dam Inventory (VDI). Combined with a highly accurate surface water data layer, the VDI can now be used more effectively for diverse efforts such as Emergency, Flood Hazard and Fisheries management.

- Emergency 9-1-1 Data

Data managed by the Emergency 9-1-1 board are continually updated and VCGI worked with the board to ensure data quality and a bi-monthly update of these data, e.g., driveways, Emergency Service Agency Locations, E911 Site locations and Road center lines etc., to the Vermont Geographic Information System (VGIS).

- Hydrography Data

At the end of a three-year partnership with the United States Geological Survey, VCGI has finalized a high-resolution surface water data set for the entire state called the Vermont Hydrography Dataset (VHD) and is consistent with a format being used nationally. This format or "data model" is very robust and comes with a set of tools that have been applied by ANR to reference their data to the VHD so that different sections can view their data in relation to each other.

Using point data with elevation information from the state orthophotography program, VCGI has created a statewide "hydrologic ally correct" grid for generating catchments at any point(s) of interest. This grid more accurately reflects stream and lake features in the VHD and the ability to create catchments allows users to conduct a large variety of additional analysis to support many different objectives.

- Political Units

VCGI revised the "master" boundary data layer (BNDHASH). BNDHASH includes county, town, village, and Regional Planning Commission boundaries in a single integrated dataset. Changes included Revised RPC boundaries (Upper Valley-Lake Sunapee towns allocated to Two Rivers-Ottawaquechee) Missing villages added (Groton, Northfield, S.Ryegate, and Townshend), other boundary improvements (eg: Essex Junction Village updated using data provided by town).

- Wetlands

Statewide coverage for the National Wetlands Inventory data set became available in 2004. VCGI acquired all of the quad based data and incorporated it into the VGIS. VCGI staff then appended the quadrangle based NWI data to a single continuous data set to aid analysis of large wetland areas. A consistent statewide wetlands data set is useful for planners and landowners in identifying the approximate locations of wetlands.

- Soil

The Natural Resources Conservation Service of the USDA introduced an updated data format for the SSURGO soil data. Known as SSURGO2, the new data format is modeled as a relational database. Although the soil data has not been spatially improved, the new format allows for the soil data to be integrated more easily with desktop database applications. VCGI acquired all of the SSURGO2 data available for the state and integrated it into the VGIS. This will prove useful to the greater GIS community as more GIS applications store and process data in relational database formats (ArcSDE). The SSURGO2 data model has proven itself to be complex even to experienced soil data users. The updated NRCS Top 20 Soil Data Attributes table was acquired and integrated into the VGIS. This table breaks out the top 20 most requested soil attributes and presents them in a convenient format. To allow greater access to important soil data characteristics, VCGI created several datasets derived from SSURGO2 data. ONSITE is a pre-selected subset of SSURGO2 certified soil data depicting onsite sewage disposal ratings of Vermont soils. SOAG is a pre-selected subset of SSURGO2 soil data depicting prime agricultural soils in Vermont. Both datasets are intended to save data users countless hours of data processing.

- School Locations

In 1997 Vermont's Regional Planning Commissions digitized the locations of the schools in their region using aerial orthophotos, existing GIS data, and road maps. Maps of school locations were sent to each School Supervisory Union for verification of school location and name. The data created by the RPCs was appended to one statewide dataset by VCGI. In 2003 the data layer was revised by VCGI using an updated list of schools from the VT Department of Education. In 2004 VT Department of Education updated and validated the locations of the schools and corrections were implemented by VCGI. This updated dataset is valuable in accessing Vermont resident's accessibility to educational facilities.

Data Products

VCGI revised the *VT Topographic Maps (1:24,000 Edition)* CD product in 2004. The 2004 revision included a number of enhancements:

- 41 revised map quadrangles.
- 37 additional map quadrangles (which weren't included in the original release).

Many of the revised quads are available at a higher resolution (500 dpi) and include expanded color palettes (better replication of original USGS topo map) and ArcGIS/ArcView 8.x support.

VCGI developed a GIS tool called the *Culvert Tool Kit*. The tool includes template files used to collect bridge and culvert data at the RPC/Local level in conformance with the VGIS Bridge & Culvert Data Standard (VGIS Handbook: Part 2 - H). The intent is to promote greater data compatibility between towns by providing them with a template to start. Several RPCs have already used the tool.

The GIS Starter Kit was updated in 2004. All of the vector data contained on the CD was converted to the more "easy to use" Shapefile format. Data layers that were updated were replaced with the most current version. This product still represents the best starting point for new GIS users in the community. The Vermont Soil Data CD was updated to include the new SSURGO2 data format. The derivative data layers Onsite and SOAG were also added to the CD.

Standards Development

- **VGIS Bridge and Culvert Data Standard**

VCGI worked with the Vermont Interagency Bridge and Culvert Team (VIBCT) to revise the *VGIS Bridge & Culvert Data Standard*. A Technical Working Group (TWG) was formed to advise the VIBCT. The TWG included representatives from VTrans, ANR, VCGI, RPCs, academia, and private sector. The TWG has completed its work, and will be forwarding its recommendations to VCGI's Technical Advisory Committee. The VGIS community will be given an opportunity to review and comment on the proposed changes in early 2005.

- **VGIS Road Centerline Data Standard**

VCGI's Technical Advisory Committee (VTAC) revised the VGIS "Road Centerline Data Standard" to reflect technical and organizational changes in the maintenance of Vermont's road centerline data layer (RDS). The VTAC worked with the VGIS Community on this revision. The change will be implemented by the Vermont Agency of Transportation.

- **Global Positioning System (GPS) Guidelines**

In conjunction with a Technical Advisory Committee (TAC) focus group representing various state agencies and the private sector, VCGI has created a set of guidelines to help guide the consistent and accurate capture of field data using GPS. These guidelines address the growing need for guidance as GPS technology has greatly extended the capacity of individuals to capture data in recent years.

Projects

- **Agency of Natural Resources - Impaired Waters Characterization**

Using the VHD and "hydrologically correct" grid VCGI worked with the ANR Water Quality Division (WQD) to delineate catchments for 42 impaired stream segments and characterize them by Land Cover/Land Use, Soils and average slope. By defining the spatial extent of lands that influence the impaired waters, WQD staff utilizes the information in their assessment of non-point pollution sources and remedial allocation efforts, i.e., Total Maximum Daily Load (TMDL). This project is a good example of how the base data layers, developed in previous efforts, can be applied to environmental objectives.

- **Environmental Protection Agency - Network Readiness Grant**

In an effort to enrich the VHD, VCGI has partnered with the ANR to develop flow regime attributes, e.g., the "intermittent" or "perennial" nature of a surface water body. Flow regime affects a wide variety of surface water processes, e.g., stream flow, sediment transport, erosion and aquatic habitat etc. Each of these processes can affect one or more state agency, from the Vermont Agency of Transportation (VTrans) for its effects on bridges and culverts and flooding, the WQD Biomonitoring and Aquatic Studies Section for aquatic wildlife implications and the Department of Agriculture, Food and Markets for managing riparian buffers as part of accepted agricultural management practices. This information will also help national agencies such as US Geological Survey and United States Forest Service and individual towns, conservation commissions and the Regional Planning Commissions to meet water related state regulations and conduct planning activities.

- **Vermont Emergency Management (VEM) – Ad Hoc Support**

VCGI has worked extensively with Vermont Emergency Management to aid them in using VGIS data. VCGI staff have developed web based mapping tools that are used in VEM's emergency operations center. These web-based tools allow VEM personnel access to VGIS data from any location with an Internet connection. VGIS base data is an effective tool for emergency management. Critical decisions can be made based on the geographic dispersion of the population or government infrastructure, possibly saving many lives or millions of dollars in resources. VCGI staff has also helped VEM's flood mitigation efforts by providing customized local flood data. Utilizing high-resolution elevation data, VCGI was able

to provide VEM with highly accurate flood data that would not have otherwise been available. This flood data helps flood mitigation planners to better visualize potential public flooding hazards. VCGI continues to work with VEM staff to enable the effective use of VGIS data in their emergency operations.

- University of Vermont, Center for Rural Studies – Indicators Online

VCGI continues working with the Center for Rural Studies at the University of Vermont to update and maintain the Vermont Indicators Online website. VCGI staff designed and implemented a web based mapping application that displays US Census statistical data for Vermont. This important resource allows town and regional planners to visualize current statistical data for their region and can help decision makers understand cultural and economic conditions that affect their constituents.

VCGI Technology Upgrades

VCGI's website was completely redesigned in 2001. Changes since then have been primarily limited to content. However, VCGI made some enhancements to the VGIS Data Warehouse "custom download" tool in 2004. The *VGIS Custom Download Tool* allows you to view and download data for a specific area of interest (clip & zip). The new version of the tool is more stable, and includes additional options that make it easier for the user to get what they need.

c. Outreach Activities

Leslie Pelch, Outreach Coordinator

Events

Much of the outreach done by VCGI centers on events that we organize, participate in, or attend. The events range from those designed for GIS users to those focused on professionals such as teachers, foresters, and municipal officials. VCGI's goals at these events are to raise awareness among those less knowledgeable about GIS, and/or to provide professional development opportunities to GIS professionals and novices.

The events that VCGI **organized** in FY 2004 are the following:

- July - VT Spatial Data Partnership (VSDP) Roundtable - Professional development conference, 80 people attended, 11 different sessions offered.
- GIS Day - VCGI held an Open House and posted information about other events going on around the state on our web site as well as including it in a Press Release that was sent out. 10 people attended the VCGI Open House.
- Legislative Outreach – Outreach Coordinator and VSDP members set up displays and engaged state legislators in conversations about GIS in Vermont. 15 legislators and other (lobbyists) stopped to talk about the displays.
- January - VSDP Roundtable - Professional development conference, 76 people attended, 14 different sessions were offered.
- VT GIS EXPO – The EXPO moved to the Wyndham Hotel in Burlington in 2004, in the hopes that we could offer exhibitors and attendees a more convenient layout and better access to the internet. Most people were pleased with the location and layout. About 250 people attended, which was an increase in attendance of 18% from 2003.

The events that VCGI **participated in and attended** are the following:

- New England Society of American Foresters Conference (Burlington) – Outreach Coordinator staffed a booth at this event and talked with foresters about using GIS in their work. Outreach Coordinator also attended several sessions and learned more about how GIS is already being used in forestry applications in New England.

- Northeast Arc Users Group Conference - We participated and had a booth display at this conference of 500 GIS professionals.
- VT League of Cities and Towns Town Fair – Outreach Coordinator staffed a booth at this event which draws hundreds of municipal officials.
- Municipal Officers Management Seminars (held on four different dates in different locations around the state)- Outreach Coordinator coordinated a session with the 4 local RPC GIS specialists focusing on how GIS can be used in the municipal office, and providing information about available resources. There were 10-30 participants at each of our sessions.
- VT Alliance for the Social Studies Annual Conference – Outreach Coordinator staffed a display booth at this conference for around 125 social studies educators.
- Vermont Chapter of the Appraisal Institute meeting - Outreach Coordinator coordinated GIS presentation to 25 appraisers. Presented an introduction to GIS in Vermont along with CCRPC GIS specialist.
- Town Officer Education Conferences (held on five different dates in different locations around the state) - Outreach Coordinator coordinated a session with the 5 local RPC GIS specialists providing an introduction to maps and GIS. There were 10-30 participants at each of our sessions.
- Coordinated Vermont presenters for Northern New England Chapter of the American Planners Association Workshop focused on GIS.

Other Efforts

In addition to events organized and attended, there are ongoing activities that support VCGI's outreach efforts. Publications, member organizations, the website, response to information requests, and information management are all aspects of maintaining the web of connection that VCGI provides to the existing and potential GIS community in Vermont. Our other efforts are the following:

- Managed organizational publications such as VCGI brochure, VSDP brochure, 16 page introduction to using GIS in Vermont, data standards brochure, municipal mapping guidelines brochure, listing of GIS consultants etc. – all have been revised and reprinted as necessary.
- Provided support to VT Spatial Data Partnership (VSDP) – Maintained membership list and sent out member renewal materials, coordinated efforts such as Roundtables, Legislative Outreach, VT Map Calendar, and Outstanding Achievement Award.
- Newsletter – Outreach Coordinator wrote and collected articles for the quarterly VGIS News, put it together, and had it printed and mailed to over 700 subscribers.
- Mail List Database – The mail list requires continuous updating, and since the number of records has exceeded 2000, we may look into whether a purge/clean-up is in order.
- Ad Hoc responses to requests for information and resources – Outreach Coordinator responded to several requests per week that ranged from clarification of what GIS is, to descriptions of how the data download process works, to providing the names and contact information of people and organizations doing data development projects.
- Updated and improved sections of the VCGI website - The community resources section of the web site, as well as the various help pages are always being evaluated and updated.

d. Business Review

Linda Ladd, Business Manager

RFP for Audit Services

In March 2004 an RFP was released to secure audit services for the organization as prescribed by the Vermont State Auditor's Office. The RFP was distributed to five firms in the Burlington area and five firms in the Montpelier area. The deadline to respond was April 1, 2004. Of the ten firms, three responded via letter that they would not be submitting a proposal; five provided no response and 2 submitted proposals.

VCGI Executive Director David Brotzman and Business Manager Linda Ladd reviewed both proposals. Cost proposals remained sealed until review, ranking and discussion of the technical proposals were complete. Cost proposals were then reviewed, ranked and discussed.

Selection was completed based on criteria established in the RFP. The firm of JMM & Associates, of Burlington, was selected, contingent upon approval from the Vermont State Auditor's Office. The approval was received and JMM & Associates was notified they had secured a 4-year contract, subject to annual review and recommendation by VCGI and the Vermont State Auditor's Office, the satisfactory negotiation of terms, and the annual availability of State funding in support of the organization. Both firms submitting proposals were provided written notification of the outcome of the process.

VCGI's New Medical Plan

VCGI researched the options available to them for about eighteen months before finalizing plans for a new medical insurance plan. All options were evaluated from self-insurance to fully insured and the new Health Reimbursement Accounts (HRA) and Health Savings Accounts (HSA) options. The goal was to continue to provide employees with good coverage while reducing cost to the organization and the employee, and keeping the overall goal of the benefits package intact.

The final option selected is a high deductible PPO (Preferred Provider Organization) offered by CIGNA through the Vermont Association of Chamber Executives, and is combined with an HRA account that is administered by Choice Care Card. In addition, the percentage of premium paid by VCGI decreased from 80 % to 75 %. Employees are still expected to see savings from \$500 to \$1200 in premiums. Both Executive Director David Brotzman and Business Manager Linda Ladd will continue to monitor the new plan and make adjustments as necessary to maintain the overall goals of the benefits package.

Accounting Changes

During 2004 VCGI began accepting credit cards. Currently, cards are accepted in person or via fax. VCGI does not foresee acceptance of credit cards via the Internet. In February 2004 VCGI began using computer-generated checks to streamline the accounts payable process.

Personnel Changes

In July 2004 Tom Williams was promoted from GIS Technician to GIS Project Manager. Tom has been with VCGI since May 2000, beginning on a part-time basis and becoming full-time in October 2000.

During 2004 there were several changes in the membership of the VCGI Board of Directors:

- Robin Siss, CIO and Commissioner of the Department of Information and Innovation, replaced Patricia Urban, former CIO, as Chair of the Board
- Denise Fehr, CIO and Commissioner of the Department of Information and Innovation, replaced Robin Siss, who resigned from State office, as Chair of the Board
- Michelle Penca, Director of Finance and Administration, replaced Hobart Selle as representative of the Agency of Transportation
- Kevin Behm, Addison County Regional Planning Commission, replaced Kevin Geiger, Two Rivers Ottauquechee Regional Commission, as representative of the Regional Planning Commissions
- Michael Gilbar of the Vermont League of Cities and Towns was named to the vacancy for Municipalities
- John DeLeo, Lyndon State College was named to the vacancy for higher education.

II. VGIS – Status Report on Vermont’s Geographic Information System

VCGI’s 2005 Annual Report provides the Governor, the Vermont General Assembly, and our citizens with information about Vermont’s steady progress in building a high quality Vermont Spatial Data Infrastructure. This section of the Annual Report Provides a status on ten of the dozens of data layers available to the public in Vermont. These ten layers are considered nationally to be the foundation for a comprehensive spatial data infrastructure and are often called *Framework Data* for their critical role in the national data model.

a. Digital Orthophotography

Orthophotographs are detailed aerial photographs from which all distortion has been removed. Since 1975 Vermont has provided orthophotographs, funded through the Vermont Tax Department, showing taxpayers their land and buildings at 1:5,000 scale. These pictures have a wide variety of uses. They can be reliably measured and they remain an important tool for town planners in local planning and development. The number of uses and the number of users for this product continues to increase as the public becomes more sophisticated in the use of technology. Since 1994, these photos are being made available in both digital and hardcopy format.

Some towns and cities also have, at their own expense, contracted to purchase additional orthophotography at larger scales and better resolution, usually 1:1,250 scale. The larger scale enables greater ground feature clarity and definition. Towns or Cities such as Barre City, Randolph Village, Burlington and Winooski have taken advantage of purchasing the larger scale imagery in the past. Many of the towns in Chittenden County teamed together to purchase a suite of high-resolution imagery products during 2004. Those products will be available through the Vermont Mapping Program in early 2005. The number of towns that purchase spatial imagery on their own will only increase in future years as costs go down and new imagery products become available.

Status: In the Fall of 2001, Vermont completed statewide digital orthophoto coverage. Updated imagery has not been taken since that original statewide coverage was completed. This data has been made available to the public since that time. The existing, statewide, orthophotos have inevitably begun to lose some of their value, as they get older. In some parts of the state the most recent orthophoto coverage is only as recent as 1994. It is important for the State to keep reasonably current statewide orthophotography available in the future. This program is a tremendous asset to the Towns and Villages of Vermont that often cannot afford to purchase orthophotography on their own yet rely on it to support their property tax mapping and planning efforts. Without State support of a statewide program only those towns that have sufficient economic resources available will be able to afford this valuable resource. In 2004, the Legislature approved funding for updated orthophotography in the Rutland and Windsor County area of the state, the area of the state that currently has the oldest coverage. Maintaining the orthophoto program in Vermont should be a priority for the state.

The statewide orthophotos provide a common, accurate base upon which the important state and local issues of resource management, economic development, pollution control, emergency management, among others can be better understood. Other states have begun to recognize the value of orthophotography but the number of states that have developed statewide coverage increases every year. Several states have undertaken programs that provide updated statewide coverage every two years. Vermont should consistently support a five-year statewide update plan.

b. Transportation Data

Vermont’s Transportation data layers consist of road centerline, railroad, bridge, and other transportation critical information (ex: traffic volume, accident locations, etc.) The quality of transportation data overall in Vermont continues to be recognized as being very high. The state continues to maintain two primary

road centerline data layers; one maintained by the 1) Vermont Agency of Transportation (VTrans), and another maintained by the 2) Enhanced 911 Board (E911). VTrans and E911 have specific application requirements, which have resulted in the creation of two distinct data layers. VTrans' road centerline data layer identifies all public and most private roads, including road class, surface type and route number. E911's version includes some of the same attributes, with the addition of all public and private roads as well as road name and address range information. E911 maintains a separate layer depicting long driveways to facilitate emergency response.

VTrans, with support from VCGI, the RPCs and others, maintains a statewide bridge and culvert layer. The layer includes all known bridges in the state of Vermont, and all major culverts (>6ft.) on Interstate, US and State highways. Local culvert data has also been integrated into the statewide layer for a number of towns.

Status: The transportation data in the state is in very good condition. It is reasonably accurate, robust, and up to date and it is being integrated into new more sophisticated and automated processes by VTrans at a promising rate. While the maintenance of two distinct road centerline layers in the state has not been a problem it does result in a level of unnecessary duplication of effort to maintain them separately. VCGI recognizes that VTrans and E911 have clearly different data needs and responsibilities. However, many aspects of road centerline data remain common to both organizations. Cost savings, data accuracy and other efficiencies can be gained as a result of integrating road centerline data maintenance processes between these two organizations. To this end, several years ago, VCGI developed a federally funded road centerline data maintenance model that enabled both VTrans and E911 to take some advantage of each other's maintenance efforts with minimal effort. We would like to see these organizations take advantage of this model in order to increase efficiencies and bring the two road centerline data sets more in line with each other.

This situation of multiple road centerline data sets is going to get worse. The US Census Bureau has funded collection of a national road centerline data set to a higher accuracy standard than is currently used in Vermont. VCGI, VTrans and E911 as a team proposed to Census that it would be wiser to take the existing road centerline data in Vermont and spend the money to upgrade that. Census went ahead and did an independent collection of road centerline data across the state without using the existing state data as a starting point. Unfortunately, this means there will be a third distinct statewide road centerline data set available. The potential greater positional accuracy of the road data is desirable but it will not integrate well with other existing state data layers such as hydrography, boundaries or cultural features already collected. What happens from this point is still unknown. The VCGI led team with VTrans and E911 continues to talk with Census about this issue and press them to work better with the state in the future.

c. Land Cover

Accurate land cover spatial data allows Vermonters to better visualize the choices in issues ranging from economic growth to natural resources protection. Land cover data shows areas broken down into many sub-categories of Forests, Wetlands, Water, Rock, Cleared Land, and Urbanized Landscapes. When combined with other spatial data land cover data enables us to make important observations about our productive lands, protective ecosystems, and where we should consider encouraging development.

Status: Statewide land cover data suitable for use at county or regional scale mapping and analysis has been derived from satellite imagery (LANDSAT), and is highly compatible with similar data for New York and New Hampshire. The data was completed in September 1997, after years of effort by the contractor and the VCGI staff, with funding support from the Lake Champlain Basin Program, the Northern Forest Lands resource Inventory, and the EPA. The Spatial Analysis Lab at the University of Vermont has also completed a 2002 land cover data set for the state that specifically identifies publicly and privately owned conserved lands. Only parts of this data is available to the public through VCGI as privacy issues remain that relate to land ownership for some of the property. Additionally, USGS has

undertaken a small-scale source (30 meter imagery) based collection of land cover data in the Northeast US in support of a National Land Cover/Land Use data set. This data is expected to be available in 2005. Lastly, in 2003, the Farm Services Agency completed an imagery-based survey of farmland across Vermont as part of a nationwide effort. This information is complete but not yet available to the public due to privacy issues.

It would seem from these efforts that the state has an adequate amount of land cover data available. Unfortunately, this is still not true. Much of the available data is of too small a scale to be applicable at the town or city level. A large scale, single standard statewide land cover data set remains one of the most sorely needed data types in the state. This is becoming particularly critical in areas where development and land acquisition rates have increased. Researchers at UVM have undertaken several land cover definition projects that will help define specific areas or land types within the state and the Lake Champlain Basin Program has recently undertaken an effort to create land cover data in the Lake Champlain Basin. While up to date land cover data is important to all areas of the state we have to recognize that some areas of the state have large acreage of tree cover or undergo much slower rates of land cover change. For this reason it seems the most prudent approach to land cover definition in the state may be based upon rates of land cover change and need or similar criteria.

d. Regulatory Wetlands

Wetlands are a key feature needed both by town planners, environmental officials and commercial interests such as land developers. They are necessary for identifying growth centers, areas to protect, and areas suitable for development. A standardized statewide wetlands data set allows both public and private interests to identify areas of possible regulatory concern. This data is a valuable resource and a starting point in the permitting process but it does not take the place of the accuracy and superior analysis of in-the-field assessment.

Status: The state of Vermont uses maps originally provided in the late 1970s by the National Wetland Inventory (NWI) program to show the approximate locations of wetlands regulated by the state of Vermont. In addition, Vermont's Significant Wetlands Inventory (VSWI) includes many of the wetlands delineated on the NWI data. The complete VSWI database and the official wetlands maps produced by the Vermont Agency of Natural Resources are maintained and updated through field checking by ANR personnel. This data is then recognized by Vermont Wetland Rules. The statewide wetland database is complete and ANR performs a check of each individual town map before the release of certified copies.

While current wetland data is serviceable in meeting the current regulatory needs of the State, the positional accuracy of this data remains an issue. More accurate data would reduce the need for field checks and eliminate unnecessary regulatory issues and contention between landowners, land developers, environmental interests and those in the state charged with maintaining wetland regulations. A statewide effort to collect wetlands at a minimum scale of 1:5,000 would allow the wetland data to integrate accurately with the state's existing framework data sets.

e. Cadastral or Parcel Data

In 1988, Vermont's five-year GIS Plan identified digital municipal parcel boundaries as a fundamental need to support town planning and development. Dozens of towns have invested in high quality parcel maps over the years, and state funding (1989-91) supported conversion of existing paper property maps into digital data. Digital parcel data help municipal officials to perform a more accurate property tax assessment. Towns link the parcel data to their Grand Lists and then are able to have detailed tax information. Municipal tax officials, realtors, planners, and property developers use this data to show taxpayers how proposed development or changes in municipal services and regulations will affect them. In many towns, parcel data helps to assure fair tax distribution, plan services, provide public notices, and many other municipal functions. As Vermonters apply increasing scrutiny to their relative property tax burden and planning and zoning issues increase in visibility, those towns without digital parcel data are at

a distinct disadvantage in providing information to their citizens and assuring equitable distribution of financial burdens.

Status: In 2002, VCGI collected information from the Regional Planning Commissions regarding the status of digital parcel mapping in VT. Not surprisingly Chittenden County leads the way with 100% coverage of digital parcel data, while northeastern and northwestern counties generally have coverage in the range of 50%. This difference is likely due to the greater development pressure found in Chittenden County as well as the availability of a higher level of financial resources. Across the state there is only a gradual increase in towns that have moved to digital parcel records. Statewide coverage is still below 70% to our knowledge. The slow rate of increase is likely to continue, given no other changes in the situation and without the availability of funding support to towns for the purpose of upgrading their parcel records.

f. Elevation Data

Elevation data in Vermont consists of Digital Elevation model (DEM) data and land contour information. DEM data provided by the USGS has been distributed by VCGI for years. Contours were generated from the DEM and these can be effectively used to show general topography. The need for accurate elevation data in Vermont is becoming more and more apparent. Accurate, large scale, digital elevation data is required for stormwater analysis, land modeling and a large number of land use related issues. It is also necessary for the creating 3 dimensional representations of the surface for visual and analytical purposes.

Status: Updated and accurate Digital Elevation Model data with 60 meter spacing between the elevations is available for the entire state. The data was created as part of the statewide orthophotography program and conforms to the 1:5,000 scale orthophotography. 1:24,000 scale based gridded digital elevation data created by USGS is also available. 1: 250,000 scale based gridded data is also available statewide, but it is rarely used because of the scale.

During 2004 VCGI created a new higher density statewide elevation DEM by densifying the existing 30-meter elevation point spaced elevation grid to a 10-meter elevation point spaced grid. This is a process whereby more densely located elevation points are estimated based upon those measured elevations that are around them. It doesn't make a more accurate elevation model, but it does make a more useable dataset that can be used for high scale applications. From this data VCGI also created another DEM that was hydrologically correct meaning that corrections were made to the model that assured all data hydrographic features, such as rivers and streams, can be represented as flowing down hill or in a more natural manner. In 2004 many of the towns in Chittenden County teamed to acquire a highly accurate LASER acquired elevation survey of their towns. The use of this new elevation product called LIDAR is becoming very common in urban and suburban areas. It is still very expensive for large area data acquisition. However, it is highly accurate, often accurate to a few centimeters, and the elevation points are much more dense.

Elevation data by nature does not require updating as often as other data types such as transportation or hydrography. However, the need for more accurate data does increase as users find more sophisticated ways of using the data. For large areas of the state the current 60-meter or 10-meter densified DEM data may prove sufficient. As information quality pressures increase in more or newly developed areas around the state better and more accurate elevation products will be needed. These situations should be considered and funded on an as needed basis after reviewing the merits of each proposal. As this data is collected it should be made available to the public for reasonable costs.

g. Soils

For many years the State of Vermont has shared with the Natural Resources Conservation Service (NRCS) of the US Dept. of Agriculture the costs of Vermont's Cooperative County Soil Survey. NRCS soils scientists' work county by county, taking detailed samples of soil characteristics, agricultural and septic suitability, slope and many other aspects of the soil. After years of checking, testing, and map

making this information is published in county soil survey publications. These publications are in great demand for farmers, foresters, land developers, planners and others.

Status: Twelve counties in Vermont now have a digital soil survey that is available through VCGI and NRCS. The counties with digital survey data in Vermont are Addison, Bennington, Chittenden, Franklin, Grand Isle, Lamoille, Orange, Rutland, Washington, Windham, Orleans and Windsor. Ten counties in Vermont have nationally (SSURGO) certified soil data. The counties with SSURGO certified digital soil data are Addison, Bennington, Franklin, Grand Isle, Lamoille, Orange, Rutland, Washington, Windham, and Windsor. The soil surveys for Chittenden County are out of date and don't meet SSURGO or VCGI standards for soil surveys. A new survey of Chittenden County is advised in order to update the older existing data. NRCS is looking at ways to reduce the costs of determining soil attribution through increased automation and remote sensing. This may also allow the soil scientists to continue their analysis work when winter weather would prohibit standard field analysis techniques.

The remaining counties are scheduled to be completed and submitted for SSURGO certification according to the following schedule as long as funding remains at current levels.

2005 Caledonia County
2010 Essex County

h. Hydrography

VCGI, in partnerships with various state and federal partners, has made the development of quality hydrographic data across the state a priority over the last few years. This data that includes items such as rivers, streams, lakes, ponds, wetlands, and dams is a very valuable resource for every agency, city, town, consultant or citizen that uses digital spatial data in their work. As hydrography related issues such as storm water run off, pollution control, emergency mitigation and response, local and regional planning, land development, transportation planning and many more become higher priorities in the state this data increases in value.

Status: The rivers, streams, lakes, and ponds that carve and drain Vermont's rugged landscape are now accurately represented at a consistent 1:5,000 scale throughout the state. 2004 was the last year of a three-year hydrographic data development contract between VCGI and USGS to create a statewide high quality Vermont Hydrographic Data (VHD) data set. This data is fully integrated into the state's other 1:5,000 scale data. Over the last three years the hydrographic data was upgraded for accuracy of delineation and attribution at the sub basin level and made to conform to National Hydrographic Standards (NHD). Vermont is the only state in the country that has statewide data at 1:5,000 scale that meets NHD standards.

VCGI continues to work to develop partnerships within the state to take and integrate the 1:5,000 scale VHD data into their business processes. The Agency of Natural Resources has begun several initiatives that rely on the VHD data as a common framework for the representation of other information. VTrans has also integrated the VHD data into its suite of spatial data products. The existence of a high quality data product such as the VHD enables the user to perform more accurate data analysis and engenders a desire for other data types to be of equal quality.

i. Geodetic Control

Geodetic survey horizontal and vertical control points are generated from National Geodetic Survey data maintained by the Vermont Agency of Transportation – Geodetic Survey Unit.

Status: This data set exists statewide primarily in association with the state's road network. Additionally, the Geodetic Survey Unit maintains a Continuously Operating GPS Reference Station (CORS) at 133 State Street in Montpelier. GPS users download the data and typically use it to 'correct' the GPS data that

they have collected in the field in order to generate more accurate coordinates. As of June 1996 Vermont's CORS has been included in the Federal CORS Network.

j. Political Units

Political units consist of boundary information for political entities such as towns, counties, supervisory unions, administrative boundaries, legislative districts (house and senate), etc.

Status: Statewide coverage defining Town, County, Regional Planning Commissions, Supervisory Unions and School Districts are available through VCGI. VTrans' Downtown and Urban area designated boundaries are also available. State Senatorial and House district boundaries data that reflect the 2002 legislative redistricting efforts are available. Again in 2004 VCGI updated the location of many town boundaries by reviewing boundary changes in state statute and contacting many of the towns or RPCs directly. Those changes were then verified by a second source before they are integrated into the currently available boundary data for the state. The level of quality of the states political units data is generally good and it meets the needs of the current standard of the rest of the state's spatial data at 1:5,000 scale. However, there are still areas in the state where towns or political units are not in agreement on the location of a particular boundary. Until those disputes are resolved and all of the old state records are reviewed and reconciled for accuracy the data remains incomplete.

III. VCGI's Strategic Direction and Work Plan

a. Mission

VCGI will pursue a comprehensive strategy for the development, maintenance and use of the Vermont GIS, and provide GIS services and support to all Vermonters.

b. Goals

VCGI will accomplish its mission by:

- Assuring that all VGIS data is of high quality and is compatible with, useful to, and shared with other public -sector data users.
- Encouraging the same high standards of quality and compatibility in other Vermont GIS cooperators.
- Promoting the efficient development and use of geographic information by agencies of the state, its political subdivisions, Vermont businesses and citizens.
- Facilitating the growth of commercial services within Vermont for the provision of spatial data, products, and services.

c. Vision

As VCGI moves to meet the new challenges of the future it needs to broaden its role by facilitating the *use* and *analysis* of spatial information.

d. Organization

In January 1992, Governor Howard Dean, M.D. issued an executive order establishing VCGI as a non-profit corporation under the authority of a Board of Directors. The Board includes twelve directors appointed for two-year terms to represent state agencies, regional planning commissions, local government, higher education, private sector and both chambers of the Vermont General Assembly. The Board has the responsibility for general management of and authority over the property, business and affairs of the center.

VCGI is located in Waterbury, VT. It is currently staffed by an Executive Director, Business Manager, Outreach Coordinator, two Senior Project Managers, and a Project Manager. VCGI serves as a clearinghouse for Vermont GIS data.

e. Strategic Direction

Since its inception, the Vermont Center for Geographic Information has focused its efforts on developing data, policies and standards; implementing a web-based data clearinghouse for the electronic distribution of data; and providing outreach, networking, and information exchange for the Vermont GIS community. These *core activities* are essential functions for the success of GIS in Vermont. As VCGI continues to meet the needs of a changing business area it needs to broaden its role beyond the development of data toward the facilitation of the use of spatial information. VCGI's *strategic direction* is described below:

- 1. State and Regional Leader**- VCGI will serve as a state and regional leader in GIS. VCGI will pursue opportunities that showcase VCGI at the state, regional and national level. Making Vermont a demonstration state will provide greater opportunities for funding and provide users with GIS application examples. As the GIS market in Vermont is relatively small, regional leadership will provide "export business" for VCGI and its partners.
- 2. Private Industry Partnerships** - As an enhancement to our export business strategy, VCGI will seek out GIS projects and funding that are suitable for partnering with the private sector. With VCGI serving as project manager, this will enable us to take on larger contracts with

partners and/or subcontractors, and bring in the private sector as appropriate. We will be able to create markets for private industry.

3. Educational Partnerships - VCGI is expanding its partnering efforts with the University of Vermont (UVM) and other educational institutions (including state and private colleges). We will continue with this direction, as this type of partnering enhances our opportunities to present a stronger solution to projects that include a GIS component.

4. Resource to Organizations in the State - VCGI will participate in a Geographic Information Committee with State Agencies. VCGI sees this as a way to facilitate the reduction of redundant activities among different State agencies.

5. High Tech Investment - VCGI seeks to become a regional test center for new, cutting edge, GIS technology.

6. Revenue Distribution - VCGI would like to have its revenue distribution such that it receives less than 40% of its total revenue from its State appropriation. In addition, no single grant or contract will be greater than 20% of VCGI's project revenue. The goal is to not be dependent on any one contract or project.

7. Maintenance Contracts - As VCGI continues in its role as the data clearinghouse for VGIS data, it needs to transition from the initial phase of establishing data sets for distribution, into the phase of data maintenance. Providing data that is up-to-date and of quality will enhance our data dissemination efforts. VCGI will provide direction for data stewards regarding funding opportunities and technical support for data maintenance issues.

8. Stronger Coordination with Regional Planning Commissions (RPCs) and towns in the area of GIS - Services that VCGI can provide include coordinating the development of a comprehensive statewide parcel data layer and providing training on VGIS technical issues.

9. New Markets - VCGI has historically worked with traditional GIS segments: state and local government, and education. VCGI would like to explore opportunities in new arenas including but not limited to healthcare and real estate.

10. Organizational Upgrade - VCGI will seek to upgrade its internal databases, software control and Internet presence over the next few years. The Internet has become an increasingly critical component for data access within the GIS community and for VCGI to be responsive to the wide range of users it is necessary for us to expand our current online capacity.

f. Three Year Work Plan

All work plan items are referenced by subgroup heading to the Strategic Plan item(s) they support. Individual work plan items identified at the end with a (R) are persistent items that should occur every year of the plan. Work items bulleted with such identification are seen as items that do not reoccur every year of the plan period.

Internal Programmatic Activities

Administrative - (Strategic Plan – 10.)

- Support the development of business processes that assure fiscal and programmatic responsibility within the organization through continuous reevaluation of existing practices. (R)

- Provide infrastructure and organizational support for VCGI Board of Directors and VCGI Technical Advisory Committee (TAC). (R)
- Produce internal budget and Work Plan an annual basis. (R)
- Secure services for and assist in annual financial audit by CPA firm in accordance with State requirements.
- Produce and deliver annual report for Governor and General Assembly in accordance with statutory requirements. (R)
- Uphold employee morale and perform performance evaluations for all employees on a yearly basis. (R)
- Enable staff training and development for all employees to improve skills necessary for their position at VCGI in accordance with individual development needs. (R)
- Perform accounting and human resource functions in accordance with State and National standards for a 501(c)4 organization. (R)

IT Systems - (Strategic Plan – 5 and 10)

- Provide continuing system administration for all of the organization’s IT systems. (R)
- Support or improve information accessibility for the VGIS user community. (R)
- Upgrade or replace 1-2 staff workstations per year. (R)
- Scope and purchase new firewall hardware to upgrade the current security infrastructure.
- Research and develop means to accurately track human directed website usage.
- Develop full IT System Maintenance and Upgrade Plan and implement the plan on a yearly basis.
- Produce and maintain a desktop software inventory of software licensed to VCGI. (R)
- Perform web site and server maintenance. (R)
- Create an overall IT development and maintenance policy.
- Maintain data distribution systems (front-end/backend components of VGIS Data Warehouse). (R)

Policies, Standards, Guidelines, Procedures – (Strategic Plan - 1 and 4)

- Continue the development of policies and standards through dialogue with VGIS user community, review by the VCGI TAC, and adoption by the Board of Directors. (R)
- Review and Update existing Policies, Standards, Guidelines, and Procedures as defined in the VCGI TAC’s “VGIS Handbook Revision Matrix”. (R)
- Provide review support to specific Federal standard development efforts that relate to Vermont. (R)
- Develop and adopt GPS user guidelines.
- Develop, with the participation of other state entities, a standard for critical infrastructure data.
- Develop and adopt Surface Water guidelines for Vermont based on NHD standards.

VGIS Data Related Activities

Data Development - (Strategic Plan - 1,4, 5,8 and 10)

- Develop a statewide hydrographic data layer based upon the existing NHD that gives the user only the feature geometry and critical attribution.
- Advocate for the use of Homeland Security funding to support the development of critical infrastructure data within the state.
- Provide technical and QA/QC support to RPCs/towns developing bridge and culvert data and integrate the RPC’s/town’s data into Vermont’s statewide bridge/culvert layer.
- Assist ANR River Corridor Management Section with Geomorphic Assessment Database
- Complete development and QA/QC of statewide Dam data.

- Develop revised Long Trail data layer, make it available on VGIS and create a data partnership with trail data maintainers such as the Green Mountain Club and Green Mountain National Forest.
- Develop an ArcGIS E911 geocoding service, and bundle it with E911's data.
- Meet with all of the data providers in Vermont to review status of data development and maintenance activities. (R)
- Develop advocacy program in support of statewide parcel data development.
- Continue development of geospatial Dam data layer and make available on VGIS.
- Advocate for the development of an updated LCLU statewide data layer.
- Put together a funding team to enable the provision of 2003 NAIP Imagery on State Plane coordinate system.
- Support Land Use/Land Cover data development and Help Coordinate the Effort Statewide.

Data Maintenance - (Strategic Plan – 1,4,5,7,8 and 10)

- Review all systems required for the custody, quality control, maintenance, access to and dissemination of VGIS data on a continuing basis. (R)
- Pursue funding and provide leadership for data maintenance. (R)
- Identify *data stewards* for all data distributed via the VGIS Data Warehouse. (R)
- Develop and implement a continuing business process that reminds *data stewards* to provide VCGI with updated copies of their data.
- Develop a criteria based process that identifies data currency and further consider development of successive, time based data distribution archival strategies.
- Create and implement a maintenance plan for VCGI source data layers.
- Review the VGIS data storage strategy, make recommendations and implement a strategy (May be connected to year 1 implementation of server upgrade plan.).
- Facilitate improved, coordinated road centerline data maintenance between E911, VTrans, and U.S Census Bureau.

Data Documentation – (Strategic Plan – 1, 4, 5, 7, 8 and 10)

- Develop and maintain an in-house metadata maintenance manual.
- Evaluate how VCGI currently manages metadata. Identify potential enhancements and implement.
 - Consider using Style Sheets to render metadata on website
 - Evaluate Relational database vs. XML based approach
- Modify VGIS Data Warehouse metadata records to comply with www.geodata.gov metadata guidance.
- Provide data stewards with assistance with metadata development. (R)
- Maintain metadata for VGIS data as current. (R)
- Maintain NSDI (VT) Metadata clearinghouse node (including GEODATA.GOV) as current. (R)

Data Dissemination and Interchange – (Strategic Plan - 1, 4, 5, 7, 8 and 10)

- VGIS Data Warehouse Enhancements
 - Change default download format to shapefile (except for multi-feature datasets such as VHD, BNDHASH, etc.).
 - Evaluate potential of ArcIMS Data Delivery Extension, and implement as needed.
- Post the following datasets on the VGIS Data Warehouse;
 - LANDSAT.
 - 24K NHD.
- Increase the level of integration with National data distribution initiatives and standards such as OGC, USGS and FGDC. (R)

- Notify users or new/updated data as they become available. (R)
- Post DEM and hydrologic derivatives generated from 1:5,000 scale elevation sources to the VGIS.
- Create and post new contour data derived from 1:5,000 scale DEM.
- Post Census 2000 data to the VGIS website.
- Advocate for statewide Enterprise Data Sharing Model for state's GIS data.

Outreach Activities

GIS Community Support and Coordination – (Strategic Plan - 1, 3, 4, and 8)

- Increase awareness about GIS, VCGI, and other GIS resources in Vermont among the general community while supporting information exchange and professional development among current GIS professionals through participation in a variety of yearly activities, publication and dissemination of paper and electronic documents, sponsorship of events, and interaction via email, phone, and in person. (R)
- Provide direct education efforts to: 1) town officials, 2) current users of data and data products, 3) K-12 educators, and 4) decision makers in government and business as resources allow. (R)
- Design and implement a program that provides GIS training for the public and state employees.

Community Events - (Strategic Plan - 1, 3, 4, and 8)

- Organize and support biannual VSDP Roundtable. (R)
- Participate, distribute materials and present at the Annual Northeast Forest Resource Planners Association Conference (held in Burlington this year).
- Participate and distribute materials at the Annual Northern New England Chapter of the American Planners Association Conference.
- Participate and distribute materials at the Northeast Arc Users Group. (R)
- Participate and distribute materials at the VT League of Cities and Town's Town Fair. (R)
- Support Municipal Officers Management Seminars (held on three different dates in different locations around the state with hands-on training activity. (R)
- On GIS Day, hold an Open House, solicit information about other events going on around the state. (R)
- VT Alliance for the Social Studies Annual Conference, display booth at this conference for educators and offer Mapping Our World for sale to educators who are interested.
- Set up displays and engage state legislators in conversations about GIS in Vermont at the Legislative Outreach. (R)
- VT GIS EXPO - Plans for this year include a more effective and efficient initial solicitation and packet of forms, an expanded exhibit area with pipe and drape booths, and more successful internet connections.
- Provide introduction to maps and GIS session with the RPCs at the Town Officer Education Conferences. (R)
- Participate in the VermontFest Conference.

Other Outreach Efforts - (Strategic Plan - 1, 4, 8, 9 and 10)

- Manage organizational publications such as VCGI brochure, VSDP brochure, 16 page introduction to using GIS in Vermont, data standards brochure, municipal mapping guidelines brochure, listing of GIS consultants etc. (R)
- Provide support to VT Spatial Data Partnership (VSDP). (R)
 - Help the VSDP become more independent and self-directed.
 - Institute voting to elect steering committee members by FY 2006.
- Provide quarterly newsletter and switch to electronic format (PDF). (R)

- Update and maintain mail list database. (R)
- Upgrade and perform Biennial Customer Survey.
- Support GIS Certification efforts by members of the VT GIS community through process education. (R)
- Provide Ad Hoc support to community requests for information and resources. (R)
- Expand and improve the community resources section of the VCGI web site.
- Provide technical materials and presentations to professional groups. (R)
- Expand the recipient list for data availability announcements.
- Seek presentation opportunities at appropriate National conferences. (R)
- Support National States Geographic Information Council Activities through participation. (R)
- Support educational and project development efforts at the Institute for the Application of Geospatial Technologies through participation. (R)

Project and Contract Related Activities

Federal Initiatives – (Strategic Plan - 1, 3, 6, 9 and 10)

- EPA - Enhance the Vermont Hydrography Dataset with “flow regime” attribution through a National Environmental Information Exchange Network grant.
- FEMA Flood Map Modernization – Continue to work with ANR personnel on the development of the state’s Map Modernization plan.
- Pursue funding possibilities with BTS Geospatial One Stop-TP initiative.
- Pursue grant supporting Lake Champlain Research Consortium with the National Biological Information Infrastructure.

State Initiatives - (Strategic Plan - 1, 2, 3, 4, 5, 6, 9 and 10)

- Support continued and coordinated bridge and culvert data development statewide.
- Support the Agency of Natural Resources adoption of the Vermont Hydrographic Data framework into their business processes.
- Continue yearlong support to E911 data development and distribution activities. (R)
- Research a statewide parcel data development approach through strategy conversations with the community.
- Sustain the following Agency and UVM contract support initiatives;
 - Pursue Phase II of VEM Emergency Planning and Response Database System.
 - Offer 1 year of free ArcIMS hosting to RPCs to develop local web mapping capacity.
 - Develop CRS/ Library Internet Map application and pursue continuous improvement goals.
 - Rollout next version of Indicators Site and participate in Site review activities.
 - Create and Discuss Mitigation Data Development plans with VEM.
 - Create and Discuss Emergency Planning and Response Database System Phase I plans with VEM.

Data Product Development Activities - (Strategic Plan - 1, 4, 6, 9 and 10)

- VT Hydrography Data “Starter Kit” DVD to include 5k DEM, hydrologic derivatives, VHD and new contours.
- Create Vermont Interactive Mapping Website (“VTmapper.org”), Provide base map with simple functionality such as zoom, pan, and print.

IV. Financial Overview

Act 204 of 1994 (10 VSA Chapter 8) calls for the development of a comprehensive GIS strategy for Vermont, and established the Vermont Center for Geographic Information, Inc.

§ 122. 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. . .

In order to develop and implement that strategy, and to ensure that all data gathered by state agencies that is relevant to the VGIS shall be in a form that is compatible with, useful to, and shared with that geographic information system, there is hereby established a nonprofit public corporation to be known as the Vermont center for geographic information, hereinafter called the center, as a body corporate and politic and a public instrumentality of the state.

§ 126. 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.

10 VSA 126 require that *“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.”*

The following financial statements have been excerpted from the report and provided by auditors engaged by VCGI. Technical notes accompanying these statements, or copies of the complete report may be obtained from VCGI.



VT License #92-000171

**INDEPENDENT AUDITORS' REPORT ON COMPLIANCE AND ON INTERNAL
CONTROL OVER FINANCIAL REPORTING BASED ON AN AUDIT OF
FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE
WITH GOVERNMENT AUDITING STANDARDS**

DONALD L. MORRISSETTE, CPA
KEVIN J. MARCHAND, CPA
SHERRY M. PREHODA, CPA
BARNEY K. MCLEAN, CPA
RANDALL L. SARGENT, CPA

To the Board of Directors of
Vermont Center for Geographic Information, Inc.
Waterbury, Vermont

We have audited the financial statements of Vermont Center for Geographic Information, Inc. (a nonprofit corporation) as of and for the year ended June 30, 2004, and have issued our report thereon dated July 13, 2004. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States.

Compliance

As part of obtaining reasonable assurance about whether Vermont Center for Geographic Information, Inc.'s financial statements are free of material misstatement, we performed tests of VCGI's compliance with certain provisions of laws, regulations, contracts, and grants, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance that are required to be reported under *Government Auditing Standards*.

Internal Control over Financial Reporting

In planning and performing our audit, we considered Vermont Center for Geographic Information, Inc.'s internal control over financial reporting in order to determine our auditing procedures for the purpose of expressing our opinion on the financial statements and not to provide assurance on the internal control over financial reporting. Our consideration of the internal control over financial reporting would not necessarily disclose all matters in the internal control over financial reporting that might be material weaknesses. A material weakness is a condition in which the design and operation of one or more of the internal control components does not reduce to a relatively low level the risk that misstatements in amounts that would be material in relation to the financial statements being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. We noted no matters involving the internal control over financial reporting and its operations that we consider to be material weaknesses.

This report is intended solely for the information and use of management, board of directors, and federal awarding agencies and is not intended to be and should not be used by anyone other than these specified parties.

JMM & Associates, Inc.

July 13, 2004

JMM & ASSOCIATES ■ CERTIFIED PUBLIC ACCOUNTANTS

309 College Street ■ PO Box 385 ■ Burlington, VT 05402 ■ 802 658 0043 ■ FAX: 802 658 0103 ■ JMM@JMMCPA.NET



VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INC.
STATEMENTS OF REVENUE AND EXPENSES AND CHANGE IN NET ASSETS
FOR THE YEARS ENDED JUNE 2004 AND 2003

REVENUE	2004	2003
State of Vermont grant	\$376,992	\$370,360
Project income	\$146,678	\$163,907
GIS EXPO income	\$9,582	\$4,544
Reproductions and resale of items	\$4,092	\$3,576
Interest and miscellaneous income	\$5,030	\$3,856
TOTAL REVENUE	\$542,374	\$546,243
DIRECT COSTS		
Direct Labor	\$164,496	\$181,729
Payroll taxes and employee benefits	\$59,400	\$59,839
Costs of projects and reproductions	\$13,854	\$10,736
Subcontract costs		
	\$103,222	\$87,745
TOTAL DIRECT COSTS	\$340,972	\$340,049
OPERATING EXPENSES		
Indirect salaries and wages	\$91,451	\$80,219
Payroll taxes and employee benefits	\$35,022	\$27,958
Rent	\$26,316	\$26,316
Travel and training	\$7,526	\$6,024
Computer support and maintenance	\$12,066	\$13,105
Depreciation	\$10,688	\$17,705
Professional fees	\$11,538	\$11,613
GIS Expo Expenses	\$9,251	\$5,697
Telephone	\$4,237	\$4,390
Relocation Expense	\$0	\$270
Office Expense	\$5,068	\$5,152
Utility Expense	\$1,847	\$2,217
Miscellaneous	\$1,761	\$1,293
TOTAL OPERATING EXPENSES	\$216,771	\$201,959
TOTAL DIRECT & OPERATING EXPENSES	\$557,743	\$542,008
CHANGE IN NET ASSETS	(\$15,369)	\$4,235



VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INC.
BALANCE SHEET
JUNE 30, 2004 AND 2003

	ASSETS	2004	2003
CURRENT ASSETS			
Cash - undesignated		\$41,174	\$65,960
- capital reserve		\$30,000	\$30,000
Accounts receivable		\$27,583	\$30,203
Prepaid expenses		\$7,163	\$8,725
TOTAL CURRENT ASSETS		\$105,920	\$134,888
PROPERTY AND EQUIPMENT, NET		\$7,194	\$15,402
TOTAL ASSETS		\$113,114	\$150,290
LIABILITIES AND NET ASSETS			
CURRENT LIABILITIES			
Accounts payable		\$449	\$796
Accrued expenses		\$7,065	\$5,657
Accrued wages		\$2,900	\$10,200
Accrued vacation		\$10,971	\$7,656
Deferred project income		\$12,919	\$31,802
TOTAL CURRENT LIABILITIES		\$34,304	\$56,111
TOTAL LIABILITIES		\$34,304	\$56,111
NET ASSETS			
Unrestricted - Board designated for capital reserve		\$30,000	\$30,000
Unrestricted - Undesignated		\$48,810	\$64,179
TOTAL NET ASSETS		\$78,810	\$94,179
TOTAL LIABILITIES AND NET ASSETS		\$113,114	\$150,290



VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INC.
COMPARATIVE BUDGETS
FY 2004 AND FY 2005

	FY04	FY04	FY05	% Change
	Actual	Budget	Budget	FY04– FY05 Budget
Income				
Reproduction/Resale & Misc. Inc.	\$ 17,845	\$ 16,400	\$ 18,050	10.06%
Project Income	\$146,678	\$160,000	\$236,465	47.79%
State Grant Income	\$376,992	\$376,992	\$376,992	0%
Interest Income	\$ 859	\$ 1,000	\$ 1,500	50.00%
GROSS INCOME	\$542,374	\$554,392	\$633,007	14.18%
Direct Costs				
Cost of Reproduction	\$15,110	\$2,150	\$3,079	43.21%
Cost of Projects	\$222,640	\$227,562	\$255,453	12.26%
Subcontract Costs	\$103,222	\$110,800	\$123,321	11.30%
TOTAL DIRECT COSTS	\$340,972	\$340,512	\$381,853	12.14%
Net Operating Income	\$201,402	\$213,880	\$251,154	17.43%
Operating Expenses				
Indirect Salaries	\$91,451	\$88,448	\$91,732	3.71%
Payroll Taxes	\$7,882	\$7,414	\$7,761	4.68%
Employee Benefits	\$27,140	\$26,228	\$31,122	18.66%
EMPLOYEE EXPENSE	\$126,473	\$122,090	\$130,615	6.98%
General Office Expense	\$75,546	\$80,475	\$83,707	4.02%
Travel Expense	\$3,978	\$6,500	\$6,500	0.00%
Board Expense	\$85	\$50	\$125	150.00%
Depreciation Expense	\$10,688	\$11,500	\$7,785	-32.30%
OTHER EXPENSE	\$90,298	\$98,525	\$98,117	-41%
Total Operating Expenses	\$216,771	\$220,615	\$228,732	3.68%
NET INCOME (LOSS)	(\$15,369)	(\$6,735)	\$22,422	-432.9%