FINAL REPORT OF THE
JOINT SUBCOMMITTEE STUDYING

SCIENCE AND TECHNOLOGY

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 81

COMMONWEALTH OF VIRGINIA
RICHMOND
1997

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Robert A. Omberg, Staff Attorney
Dana E. Dallas, Research Intern
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TABLE OF CONTENTS

REPORT OF THE JOINT SUBCOMMITTEE STUDYING SCIENCE AND TECHNOLOGY
to
The Governor and
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Richmond, Virginia
April, 1997

I. STUDY ORIGIN AND BACKGROUND

In 1993, House Joint Resolution No. 390 established a 23-member Science and Technology Task Force to report on the status of the recommendations of the 1983 Governor's Task Force on Science and Technology, to coordinate the development of a statewide strategic plan for science and technology, and to examine whether a permanent council on science and technology should be created. In 1995, House Joint Resolution No. 447 continued the Task Force for an additional year and expanded its initial mission to include consideration of recent and ongoing initiatives and recommendations of other organizations and task forces that were focusing on science and technology issues in the Commonwealth and to study opportunities and incentives for information and communications technology to meet public needs. The Task Force's final report was published as House Document No. 46 (1996).

House Joint Resolution No. 195 (1996) established a Joint Subcommittee to continue the work of the Task Force and enumerated nine study objectives for the Joint Subcommittee's consideration:

- **Study Objective 1:** "Consult with the Virginia Retirement System to develop ways to encourage VRS investments in venture and capital projects that will be fiscally sound and recognize VRS's fiduciary duty to handle the moneys entrusted to them with care and integrity."

- **Study Objective 2:** "Foster and encourage the evolution of a telecommunications infrastructure offering reasonable and affordable prices to the Commonwealth's public schools and to Virginia's public institutions of higher education."

- **Study Objective 3:** "Support and assist the Center for Innovative Technology in fulfilling its promise as a leader in science and technology for the citizens of Virginia."

- **Study Objective 4:** "Consider the feasibility of revising the standing legislative committees, creating science and technology committees for the House of Delegates and the Senate, and defining the structure of any such committees and their staffs."

- **Study Objective 5:** "Consider the need for and feasibility of establishing a Secretariat for Science, Information and Technology."

- **Study Objective 6:** "Consider the feasibility of establishing an authority, similar to the Rural Electrification Authority, to disseminate technology across the Commonwealth."

- **Study Objective 7:** "Examine the organization possibilities a technology secretariat or authority should have to promote conditions under which universal access to the information highway can be made available to all citizens of the Commonwealth."

- **Study Objective 8:** "Review the Commonwealth's statutes, regulations, and rules governing criminal and civil procedure to determine whether current law is sufficient to ensure enforcement of the Commonwealth's criminal and civil laws against both residents and nonresidents of the Commonwealth whose activities, including access to and the distribution of pornography, in Virginia are conducted principally by computer on the information superhighway or through other technological means."

- **Study Objective 9:** "Examine the digital signatures issue to determine whether Virginia should adopt legislation similar to that enacted in Utah or some other legislation that would facilitate the development of electronic commerce in Virginia."

To assist with its work, HJR No. 195 permitted the Joint Subcommittee to establish technical advisory committees (TACs) composed of persons with expertise in the matters under consideration by the Joint Subcommittee to serve without compensation. At the Joint Subcommittee's initial meeting on August 21, 1996, seven TACs were established, each of which was assigned one or more of the nine enumerated study objectives. Legislative members of the Joint Subcommittee served as liaisons to each TAC, and staff assistance was provided by agencies, departments, and institutions of the Commonwealth that were most closely associated with particular issues. Over 100 persons participated in the Joint Subcommittee's study through the TACs.

TACs met during the fall of 1996 upon the call of the legislative liaisons. Each TAC reported back to the Joint Subcommittee at its meeting on December 2, 1996. With slight modifications, the Joint Subcommittee adopted each TAC's report. Based on the reports, the Joint Subcommittee formulated its findings and recommendations and developed legislative proposals for the 1997 Session of the General Assembly.

II. TECHNICAL ADVISORY COMMITTEE REPORTS

A. TAC #1 (Virginia Retirement System)
Legislative Liaison: Senator Walter A. Stosch

Study Objective 1: "Consult with the Virginia Retirement System to develop ways to encourage VRS investments in venture and capital projects that will be fiscally sound and recognize VRS's fiduciary duty to handle the moneys entrusted to them with care and integrity."

1. SUMMARY

In the summer of 1996, the Venture Capital Roundtable was established by Robert T. Skunda, Secretary of Commerce and Trade, in part to address issues related to investment by the Virginia Retirement System (VRS) in venture and capital projects. The Roundtable, in supporting the creation of seed and early stage venture capital funds, worked with the Center for Innovative Technology to develop the design, structure, and capitalization strategy for the use of such funds. The funds will be used to promote the development of technology-based companies and the creation of jobs in the Commonwealth. The Roundtable resolved to seek the support of corporate investors and other entities with a vested interest in the strength of the Commonwealth's economy.

In September 1996, the Roundtable formally recognized the existence of these funds to be known as the Cardinal Venture Group. In October 1996, the Board of Directors of the Center for Innovative Technology endorsed the creation of seed and early stage venture capital funds to be professionally managed.

The Joint Subcommittee Studying Capital Access and Business Financing pursuant to House Joint Resolution No. 208 (1996) is currently considering additional details related to the Cardinal Venture Group. It is anticipated that members of the VRS will be invited to serve on the Board of Directors of the Cardinal Venture Group to provide their expertise and to encourage future VRS investment in the funds of the Group, if appropriate.

2. RECOMMENDATIONS

TAC #1 recommends that the Joint Subcommittee Studying Science and Technology:

- **Support the participation of the VRS on the Board of Directors of the Cardinal Venture Group; and**
- **Monitor the ongoing work and final report of the Joint Subcommittee Studying Capital Access and Business Financing for additional details related to the funds.**

B. TAC #2 (Education)
Legislative Liaison: Delegate Alan A. Diamonstein

Study Objective 2: "Foster and encourage the evolution of a telecommunications infrastructure offering reasonable and affordable prices to the Commonwealth's public schools and to Virginia's public institutions of higher education."

Because of the overlap between Study Objective 2 and Study Objective 5, the work of TAC #2 was combined into TAC #5. See Report of TAC #5, beginning on page 18.

C. TAC # 3 (Center for Innovative Technology)
Legislative Liaison: Senator Stephen D. Newman

Study Objective 3: "Support and assist the Center for Innovative Technology in fulfilling its promise as a leader in science and technology for the citizens of Virginia."

1. SUMMARY

The Center for Innovative Technology (CIT) has in the last two years demonstrated successful performance and leadership for serving the technology businesses in the Commonwealth. Reported results from CIT's customers (i.e., technology companies) indicate that CIT and its partners have assisted Virginia technology-based companies in creating or retaining 5571 jobs; assisted in the start-up, attraction, retention, or conversion (from a defense-oriented to a commercial-oriented company) of 130 companies; and assisted companies in achieving over $161 million in increased sales and increased capital funding.

Evidence suggests that CIT:

- Is a performance-based, market-oriented organization;
- Is regionally based and industry-driven;
- Demonstrates accountability; and
- Produces results of economic benefit to the Commonwealth.

CIT has identified the following critical issues of concern to the technology business community:

- Improving capital availability for technology companies, especially at the seed stage;
- Addressing the growing mismatch between the work skills needed by technology-based companies and the workers available; and
- Developing a strategic plan for science and technology in Virginia.

CIT has demonstrated success in providing short-term results; however, attention is needed in planning long-term investments in the Commonwealth's science and technology resource infrastructure. Currently in Virginia, several technology projects show promise as potential mid-term commercial investments which the Commonwealth should monitor and capitalize on when appropriate. Some of the emerging projects with mid-term commercial investment potential include:

- Applied Research Center (affiliated with Christopher Newport University, College of William and Mary, and Old Dominion University);
- Biotechnology Research Park (affiliated with Virginia Commonwealth University);
- Biotech Infomatics Center (affiliated with George Mason University);
- Free Electron Laser (operated by Thomas Jefferson National Accelerator Facility);
- Langley Full-Scale Wind Tunnel (affiliated with Old Dominion University);
- Smart Roads Project (affiliated with Virginia Polytechnic Institute and State University);
- Virginia Institute for Micro-Electronics (affiliated with University of Virginia);
- Virginia Modeling and Simulation Center (affiliated with Old Dominion University);

- Virtual Reality Center (affiliated with Virginia Polytechnic Institute and State University); and
- Wallops Island Space Flight Facility (operated by the Virginia Commercial Space Flight Authority).

The seed-stage funding issue is being addressed by CIT in conjunction with the Governor's Venture Capital Roundtable and the Joint Subcommittee on Capital Access and Business Financing. Utilizing a $500,000 general fund appropriation from the 1996 Session, CIT is developing a professionally managed seed capital fund to address this concern for emerging technology companies in Virginia. CIT intends to match last year's $500,000 appropriation with $500,000 it had previously set aside for this purpose. Plans call for leveraging this million-dollar public fund to a $15 to 25 million fund by raising private capital.

CIT has taken on a new role, in cooperation with the Virginia Technology Council and the State Chamber of Commerce, to stimulate thought among technology and business leaders about the role of technology in regional economic development. Technology summits, scheduled for January and May of 1997, will outline the steps needed to make Virginia a leading technology state. CIT is coordinating an effort that continues the work suggested by the 1983 Governor's Task Force on Science and Technology and the Governor's 1995 report, "Opportunity Virginia: A Strategic Plan for Jobs and Prosperity." The need for a long-term vision is compelling; therefore, coordinated, strategic planning in Virginia to capitalize on its existing technology resources and ensure Virginia's future competitiveness is the next logical step.

A particular issue discussed by TAC #3 deals with the pressing need for technology in the classroom. There is a concern about children and young adults moving into the workforce with the skills needed to compete. These skills must necessarily involve being adept in using computers. Linkages between schools and businesses involving internships, mentorships, and virtual classrooms might aid in this learning process. This issue is not CIT's alone to solve, and it is not clear what CIT's role should be.

2. RECOMMENDATIONS

TAC #3 recommends that the Joint Subcommittee Studying Science and Technology:

- **Urge continued (and perhaps accelerated) support for CIT's current and planned activities.**
- **Establish a "nurture" fund that will allow Virginia (through CIT) to capitalize on mid-term projects with commercial investment potential.**
- **Request CIT to advise the Joint Subcommittee about the continuing efforts and results of the technology summits being sponsored by CIT, the Virginia Technology Council, and the State Chamber of Commerce.**
- **Give attention to the development of skills needed by the workforce to keep up with the information age.**

D. TAC #4 (Legislative Standing Committee)
Legislative Liaison: Delegate Alan A. Diamonstein

Study Objective 4: "Consider the feasibility of revising the standing legislative committees, creating science and technology committees for the House of Delegates and the Senate, and defining the structure of any such committees and their staffs."

1. SUMMARY

Since 1992, 26 state legislatures nationwide have created 33 standing committees, subcommittees, or commissions on science and technology to confront the complex public policy and practical challenges presented by science and technology issues in the legislative process, most of which are still in existence today. (See Appendix 1.) Congressional leadership is provided by the Commerce, Science, and Transportation Committee of the U.S. Senate, the Science Committee of the U.S. House of Representatives, and the Internet Caucus of the House and Senate.

Despite what appears to be a preference for standing committees on science and technology, it is not recommended that the Virginia General Assembly create such committees at this time. However, the General Assembly should create some other type of legislative unit on science and technology to help it implement informed, long-term public policy and practical direction as the Information Age fully descends upon the Commonwealth. This report discusses several methods by which the General Assembly may choose to create such a unit and recommends four of them for further consideration.

2. SCIENCE AND TECHNOLOGY UNITS IN STATE LEGISLATURES

a. Legislative Committees

Committee organization, a relatively new governmental concept, has become a method by which a legislature's business can be screened and more ably handled.[1] The committee helps handle the complexity and volume of bills. The committee room may be the only place where a compromise acceptable to all interests can be reached.[2]

The function of a legislative committee is to carry out the will of the body that appointed the committee.[3] "A committee is commissioned not to instruct the public, but to instruct and guide" the legislative body.[4] Actions (e.g., reports, recommendations, etc.) of a legislative committee remain purely advisory and are subject to review. The committee's acts must be approved by the entire legislative body before the acts have binding force. Prior to this approval, the committee's

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[1] Keefe and Ogul, The American Legislative Process: Congress and the States (Prentice Hall, 1993), 170 (hereinafter "Keefe and Ogul").
[2] Keefe and Ogul at 172.
[3] Mason's Manual of Legislative Procedure (1989), § 615 (hereinafter "Mason's").
[4] Keefe and Ogul at 209.

acts are recommendations only.[5] Standing committees may also introduce bills within their general scope.[6]

Generally, a legislative committee may be selected in any manner in the absence of otherwise controlling provisions, and usually, legislative rules provide that the presiding officer appoint a standing committee. For example, all committees of the Virginia House of Delegates are established by the House Rules, and their members are appointed by the Speaker of the House or by a plurality of votes by ballot.[7] The motion for the selection of a committee should state the committee's purpose, number of members, and manner of member selection.[8]

The standing committees of the Virginia General Assembly consider and report on the matters specifically referred to them. When practicable, committees should suggest legislation arising under their subject-matter jurisdiction.[9] Standing committees conduct studies and hold hearings to receive testimony from bill patrons, agencies, program representatives, the public, and others as appropriate. In some instances, state agencies and commissions are required to report certain findings to the standing committees which have jurisdiction over the subject matter.[10] Occasionally, a special select committee is established; however, no select committee may consider any subject which properly falls within the province of a standing committee.[11]

The Virginia House of Delegates has 20 standing committees;[12] the Virginia Senate has 11.[13] None of the House's or the Senate's standing committees deal directly with science and technology issues. Legislation involving science and technology issues is assigned to the standing committee which is most closely associated with the subject area of the bill.

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[5] Mason's, § 615.
[6] Mason's, § 618.
[7] Rules of the House of Delegates (1994), I, 15 and 16 (hereinafter "House Rules").
[8] Mason's, § 600.
[9] House Rules, I, 18.
[10] See Va. Code §§ 30-70, 30-81, and 38.2-3608.
[11] House Rules, I, 18.
[12] The standing committees of the House of Delegates are: Agriculture; Appropriations; Chesapeake and Its Tributaries; Claims; Conservation and Natural Resources; Corporations, Insurance and Banking; Counties, Cities and Towns; Courts of Justice; Education; Finance; General Laws; Health, Welfare and Institutions; Interstate Cooperation; Labor and Commerce; Militia and Police; Mining and Mineral Resources; Nominations and Confirmations; Privileges and Elections; Rules; and Transportation. Committee membership ranges from five to 22 delegates; most committees have 22. A subcommittee of a 22-member committee must have at least five members.
[13] The standing committees of the Senate are: Agriculture, Conservation and Natural Resources; Commerce and Labor; Courts of Justice; Education and Health; Finance; General Laws; Local Government; Privileges and Elections; Rehabilitation and Social Services; Rules; and Transportation.

b. Other Science and Technology Legislative Units

(1) Establishment, Development, and Growth

The establishment of a science and technology unit begins with a recognition of the need to strengthen the legislature's capacity to analyze scientific and technological information and to knowledgeably deal with that information in a legislative context. Carl Sagan succinctly stated this need:

> "We've arranged a civilization in which most crucial elements--transportation, communication, and all other industries; agriculture, medicine, education, entertainment, and protecting the environment; and even the key democratic institution of voting--profoundly depend on science and technology. We have also arranged things so that almost no one understands science and technology. We might get away with it for a while, but eventually this combustible mixture of ignorance and power is going to blow up in our faces."[14]

Perhaps in the hope of defusing that explosion, the Carnegie Corporation of New York created the Carnegie Commission on Science, Technology, and Government in 1988 to "[help] government institutions respond to the unprecedented advances in science and technology that are transforming the world." In a recently published report, the Commission, as a result of its findings, made recommendations to help states shape their science and technology policies. To legislatures, the Commission recommended that "[e]ach state legislature should have access to a standing source of objective analysis of science and technology issues."[15]

Even as early as 1981, the National Conference of State Legislatures (NCSL) published a significant handbook on science and technology issues for state legislatures.[16] The stated goal was to make "objective, intelligible, and reliable information on complex issues more readily available to legislators" and to establish a process for identifying the science and technology issues confronting them. Areas of concern included: communications and information, energy, environment, human resources, legislative operations, natural resources, science and technology policy, transportation, and urban/regional development. These concerns--most if not all of which are still viable today--illustrate both the complexity and continuing nature of scientific and technological issues that presently challenge any legislative body.

External forces may also help legislatures recognize the need for establishing science and technology units. Such outside catalysts include a heightened awareness of the need to involve scientists and engineers in the political process; the growth of scientific, technological, and

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[14] Lubbers, "Better Regulations: The National Performance Review's Regulatory Reform Recommendations," 43 Duke L.J. 1176 (1994) (hereinafter "Lubbers").

[15] Science, Technology, and the States in America's Third Century, Carnegie Commission on Science, Technology, and Government, September, 1992, inside front cover and 11-13.

[16] Legislator's Handbook on Science and Technology Issues, National Conference of State Legislatures, Office of Science and Natural Resources, 1981.

technical organizations; and the political pressure from businesses and industries which manufacture or deliver services or products related to science and technology in our global marketplace.

Once the need is recognized, the definition of "science and technology" plays a significant role in the development of a science and technology unit. Most legislatures agree that a bill relating to the physical or biological sciences or engineering is a science and technology matter.[17] In addition, other issues (e.g., bills relating to the environment, energy, or health) may also fall within the definition. Generally, legislatures with science and technology units adopt a broad definition of science and technology to grant greater leeway on which to base studies and recommendations.[18]

As it develops, a major benefit of a science and technology unit is the growth of specialized knowledge. Most state legislatures lack scientific and technical knowledge within their bodies, individual legislators rarely have specific scientific or technical backgrounds, and few legislative staff personnel possess the necessary expertise to provide informed analyses.[19] (See Appendix 2 for occupational information about the members of the 1996 Virginia General Assembly.)

(2) Internal and External Approaches

In 1981, the research team of King and Feller compared the science and technology units in the state legislatures of New York, Illinois, Maryland, Massachusetts, Minnesota, Pennsylvania, South Carolina, and Virginia.[20] (See Appendix 3 for a historical summary of those units.) The researchers described the legislative approaches to seeking and processing scientific and technological information as "internal" or "external." The study determined that, nationwide, a majority of the science and technology units adopted an internal approach. The internal approaches include:

- Development of internal legislative staff.

The most prevalent internal approach to science and technology issues has been the development of an internal legislative staff that serves as the primary technical resource for the legislature, the liaison to external sources, or both. Internal staff development appeals to many legislators because legislators generally turn to their staffs as their most important sources of information. In addition, the internal staff can easily adapt the information into a format with which legislators are familiar, is more readily available and accountable to legislators than external sources, and

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[17] All 50 state legislatures have committees to deal with issues of communications and telecommunications. National Conference of State Legislatures 1995-96 Register.

[18] Ivy and Hogan, The State Science, Engineering and Technology Program, 6, National Conference of State Legislatures, 1981.

[19] King and Feller, "Science and Technology Organizations in State Legislatures: An Analysis and Study of Operating Experiences," Institute for Policy Research and Evaluation, Pennsylvania State University, December, 1981 (hereinafter "King and Feller").

[20] King and Feller at 16-28.

possesses other necessary capabilities, such as arranging hearings on an issue and acting as a buffer between the legislators and the external community.

An internal legislative staff approach is most likely to succeed if the staff combines sufficient scientific and technological training with an understanding of the legislative and political process. To succeed as information liaisons with external sources, the staff must effectively communicate with the scientific, technical, and political communities.

- Creation of a science and technology committee, subcommittee, or commission.

A legislative committee reviews the technical soundness and feasibility of all pending legislation containing definable science and technology components. In many states, the science and technology committee is associated with stimulating the state's economy through the support of science and technology-based industries. Maryland's newly formed science and technology subcommittee of the House Committee on Economic Matters is an example. The subcommittee's charge is to "take inventory of Maryland's high-tech companies and institutions and define problems in legislation that affect high-tech companies."[21]

- Use of interns, such as graduate students in science and technology-related fields, to serve as temporary legislative assistants.

The benefits of using interns, paid or unpaid, include: easily obtaining specialized science and technology information at no or low cost; "experimenting" with an internal approach before establishing a more permanent science and technology unit within the legislature; and establishing a link with the academic community. Potential disadvantages include frequent turn-over, inability to develop "institutional" knowledge and history, and administrative time expended in annual recruitment.

- Employment of a science advisor.

Experience revealed that science advisors served a largely ceremonial role and functioned only in a limited policy-making capacity. In addition, this one-person position frequently ended when the advisor terminated his job.

External approaches studied by the researchers include:

- Reliance by legislative staff heavily, if not exclusively, on external sources (e.g., universities, professional associations, etc.) to supply information and report on issues upon legislative request. In contrast to a true liaison role, the internal legislative staff in this approach merely acts as a passive clearinghouse for legislative requests by funneling them to external sources for resolution. The researchers found this to be an effective alternative for legislatures that do not employ a full-time professional staff.

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[21] Anderson, "Maryland High-Tech Gets Voice in Assembly," Washington Technology (July 25, 1996), p.40.

- Contracts with external information networks, such as the Model Interstate Science and Technology Clearinghouse, or partnering with other state legislatures to share a third-party service, such as the LEGITECH system.

(3) Success or Failure

King and Feller concluded that a combination of factors will determine the success or failure of a science and technology legislative unit; however, that determination may be mostly contingent upon the legislature's ability to initially address these issues:

- Organizationally, where does the placement of the unit best fit within the structure of the legislative branch?
- What is the scope of the unit's jurisdiction? What duties should the staff perform?
- What types of expertise are required? What level of compensation reflects the expertise demanded?

The organizational structure of the unit is crucial to its success. This includes a clear definition of "science and technology," a statement of the functions to be performed by the unit, and a determination of the size of the unit's staff and the unit director's role. A newly formed legislative science and technology unit will be hindered if its jurisdiction, oversight, and relationship with other units of state government are ill-defined.

Continuity of the legislative unit is vital. Long-range studies, projects, and goals are less susceptible to disruption if the unit is protected from changes in legislative leadership. Continuity also allows the capabilities of the unit to be known, understood, and relied upon by all legislators.[22]

Overall, two-thirds of the legislators participating in King and Feller's study felt that the science and technology units in their state legislatures were useful sources of scientific and technological information. The researchers also found that most legislators preferred to rely upon their internal legislative staffs for information.

Study participants were pleased with the political neutrality of the science and technology units. Neutrality and quality of information often led to major revisions of proposed legislation or identification of its technical unfeasibility. The areas most improved by having science and technology units were the accessibility to knowledgeable staff and the quality of public hearings and committee meetings.[23]

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[22] King and Feller at 11-25.
[23] King and Feller at 125-133.

3. SCIENCE AND TECHNOLOGY UNITS IN CONGRESS

a. Standing Committees and Subcommittees

Congressional tasks range from drafting and adopting legislation and approving appropriations to conducting oversight and investigative hearings. Due to the high volume and complexity of these tasks, most of Congress' work is carried out by its committees and subcommittees, currently numbering 250.[24] Standing committees are permanent units established by the Rules of the U.S. House of Representatives or of the U.S. Senate, and have specific legislative jurisdictions.[25] Generally, appropriate subcommittees review proposed legislation in particular areas within the committee's broader jurisdiction.[26]

Every congressional standing committee (except appropriations) may appoint clerical staff and six professional staff members.[27] The professional staff is appointed on a nonpartisan, full-time, permanent basis. A standing committee may also contract for the temporary or intermittent services of individual consultants to conduct studies or advise the committee on any matter within its jurisdiction.[28]

In the U.S. Senate, the jurisdiction of the standing Committee on Commerce, Science, and Transportation includes research, development, and policy on science, engineering, and technology.[29] The committee may also initiate comprehensive studies and is empowered to review all matters relating to science, technology, and communications. The Subcommittee on Science, Technology and Space assists the committee with its work.

In the U.S. House of Representatives, the jurisdiction of the standing Committee on Science includes the:[30]

- Department of Energy and all energy research, development, demonstrations, and projects therefor; federally owned or operated nonmilitary energy laboratories; and the commercial application of energy technology;
- Federal Aviation Administration and all civil aviation research and development;
- Environmental Protection Agency and all environmental research and development;
- National Oceanic and Atmospheric Administration and all marine research;
- National Institute of Standards and Technology and all standardization of weights and measures, and the metric system;

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[24] The Committee System in the U.S. Congress, Congressional Research Service, Library of Congress, Report 94-702 GOV, August 29, 1994.
[25] Id. at 176.
[26] Keefe and Ogul at 175.
[27] 2 U.S.C.S. § 72a(a) (1993).
[28] 2 U.S.C.S. § 72a(i)(1) (1993).
[29] The Congressional Standing Committee System, Congressional Research Service, Library of Congress, Report 92-707 GOV, September 14, 1992.
[30] Rule X of the U.S. House of Representatives, Section (1)(n).

- National Aeronautics and Space Administration and all outer space, including exploration and control thereof;
- National Space Council;
- National Science Foundation;
- National Weather Service;
- Federal Emergency Management Agency;
- U.S. Geological Survey;
- Astronautical research and development, including resources, personnel, equipment, and facilities;
- Science scholarships; and
- Scientific research, development, demonstrations, and projects therefor.

The Rules of the House also empower the Science Committee to review and study all laws, programs, and government activities dealing with nonmilitary research and development, which include activities at agencies such as the Department of Agriculture, the Department of Defense, and the National Institutes of Health. Four subcommittees assist the Science Committee in its work: Basic Research; Energy and Environment; Space and Aeronautics; and Technology.[31]

b. The Internet Caucus

In addition to standing committees and subcommittees, Congress created the Internet Caucus to educate and inform its members about the powerful and explosive phenomenon known as the "Internet" or "World Wide Web." The Internet Caucus is a joint, bipartisan forum comprised of nearly 50 members of Congress. The Caucus hopes to advance America's leadership in the digital world and to promote the Internet's growth. To assist in its work, the Caucus has formed an advisory committee which includes, among others, the Center for Democracy and Technology, the Information Technology Association of America, MCI, and the Information Technology Industry Council.[32]

4. FINDINGS AND RECOMMENDATIONS

In order to implement informed, long-term public policy and practical direction, state legislatures can no longer *delegate* their need for consistent, reliable, and accurate information about science and technology; they must demonstrate *leadership* in how such information is sought, processed, managed, and monitored.[33] The creation of standing legislative committees on science and technology is one method by which the Virginia General Assembly may choose to demonstrate such leadership; however, that method is not recommended at this time. The primary reason is that although some overlap exists, the jurisdiction of the General Assembly's standing committees generally tracks the executive branch secretariats and the departments, agencies,

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[31] "Agencies Under the Jurisdiction of the Committee on Science, U.S. House of Representatives," http://www.house.gov/science/democrats/agency.htm. (April 1996).
[32] Internet Caucus, http://www.house.gov./whit...rnet\caucus, October 8, 1996.
[33] Mechling and Fletcher, Information Technology and Government: The Need for New Leadership (John F. Kennedy School of Government, Harvard University, 1996), 31.

boards, commissions, councils, etc., within them. Because the present organization of the executive branch does not include a secretariat for science and technology, a more prudent course may be to await the results of the two-year study by the Joint Legislative Audit and Review Commission (JLARC) of the Commonwealth's data processing and related services and whether the need to establish a science and technology secretariat exists. If the structure of the executive branch of state government changes as a result of JLARC's study (or otherwise), the General Assembly may wish to revise its standing committee structure accordingly. A secondary reason is that since legislation involving science and technology is currently assigned to the standing committee which is most closely associated with the subject area of the bill, standing legislative committees on science and technology may increase fragmentation of science and technology issues within the General Assembly.

In lieu of creating science and technology standing committees for the House of Delegates and the Senate, the Joint Subcommittee on Science and Technology should recommend that the Virginia General Assembly:

- **Encourage chairmen of existing standing legislative committees to establish subcommittees, as necessary and appropriate, on particular issues or legislation related to science and technology within the committee's broader jurisdiction.**

Such subcommittees could examine the more detailed scientific and technological aspects of proposed legislation than time generally permits in standing committee meetings, thus increasing the overall level of knowledge about science and technology within the General Assembly. Moreover, the use of subcommittees within existing standing committees does not permit the scientific or technological component of proposed legislation to be separated from its substantive context. For example, the scientific and technological aspects of a bill relating to telemedicine could be examined by a science and technology subcommittee of the Senate Committee on Education and Health before the overall merits of the bill are decided upon by the full Committee.

- **Establish a Caucus on Science and Technology as a joint, informal, bipartisan caucus comprised of members from the House of Delegates and the Senate.**

Such a caucus could invite participation from businesses, industries, associations, organizations, governmental agencies, and individuals to help educate and inform its members about science and technology issues. The tremendous citizen participation in the HJR 195 study indicates a willingness and ability to participate in such a forum.

- **Create, by statute, a Joint Commission on Science and Technology in the legislative branch of state government.**

Such a commission could be modeled after Virginia's existing statutory legislative commissions. (See Appendix 4 for a listing and related information.) Additional drafting guidance could be provided by those states with existing or proposed commissions on science and technology. (See

Appendix 1.) Issues related to science and technology command a great deal of the General Assembly's time and attention. (See Appendix 5 for a listing of bills, resolutions, and reports from the last five General Assembly Sessions with a significant science or technology content.) There is a plethora of science and technology issues which will require thoughtful study and diligent monitoring in the years ahead. Examples include the taxation of electronic transactions--a topic which is currently being hotly debated around the nation--and plant-based biotechnology research and development--a topic of great interest among Virginia's tobacco farmers which is currently being explored by the Ad Hoc Committee on Supplemental/Alternative Plant-Based (Tobacco) Biotechnology Products of the A.L. Philpott Southside Economic Development Commission.

- **Continue, by joint resolution, the Joint Subcommittee on Science and Technology created pursuant to House Joint Resolution No. 195 (1996).**

In lieu of creating a Joint Commission on Science and Technology in the legislative branch of state government, continue the Joint Subcommittee for an additional year of study. It is recommended that the study objectives be revised and that the current membership and format (i.e., the use of technical advisory committees) be retained.

- **Encourage the General Assembly to continue to examine the appropriateness of and necessity for creating standing legislative committees on science and technology.**

The Joint Subcommittee on Science and Technology should send a copy of this report to the Chairman of the Joint Committee on Rules for the Committee's consideration during its ongoing study of the legislative process.

E. TAC #5 ("Universal Access"/Government Structure)
Legislative Liaisons: Delegates William W. Bennett, Jr. and James M. Scott

Study Objective 2: "Foster and encourage the evolution of a telecommunications infrastructure offering reasonable and affordable prices to the Commonwealth's public schools and to Virginia's public institutions of higher education."

Study Objective 5: "Consider the need for and feasibility of establishing a Secretariat for Science, Information and Technology."

Study Objective 6: "Consider the feasibility of establishing an authority, similar to the Rural Electrification Authority, to disseminate technology across the Commonwealth."

Study Objective 7: "Examine the organization possibilities a technology secretariat or authority should have to promote conditions under which universal access to the information highway can be made available to all citizens of the Commonwealth."

1. STUDY PLAN AND FINDINGS

Over 30 citizens volunteered to participate in TAC #5. The insight and information that they brought to our study was invaluable. In addition to the Division of Legislative Services, staff support was provided by the Council on Information Management, the Department of Education, the Department of Information Technology, the House Appropriations Committee, the Library of Virginia, and the State Corporation Commission.

TAC #5 met twice during the 1996 interim. At our first meeting on September 20, TAC #5 identified issues related to our study objectives and discussed them in a roundtable format. Among the issues identified and discussed were:

- What is the definition of "universal access?" Should universal access encompass short and long term goals?
- For what applications is universal access needed? What is the projected usage? Who are the projected users?
- What does Virginia's current telecommunications infrastructure map look like? Where are the gaps?
- What can Virginia learn from other states, e.g., Maryland, North Carolina, and Iowa, which have attempted to get ahead of the information technology curve?
- What can and should the Commonwealth do to facilitate and encourage universal access? What are the barriers?
- What is the effect of the Federal Telecommunications Act of 1996 on universal access?

At TAC #5's second meeting on October 30, several speakers explored these issues.

a. The Federal Telecommunications Act of 1996

The 200-page Federal Telecommunications Act of 1996 (FTA) has created what one speaker described as "random chaos" since its enactment on February 8, 1996, after a decade of Congressional work on the legislation. Succinctly stated, the Act is designed to open up competition in the local exchange market between telephone, cable, and other communications companies, primarily through the use of interconnectivity agreements. On August 8, 1996, the Federal Communications Commission (FCC) promulgated 700 pages of rules implementing the FTA. The rules include the rates which can be charged by local exchange companies for interconnectivity agreements. Lawsuits challenging the FCC's implementation rules have been filed in several federal courts. On October 15, 1996, the Eighth Federal Circuit Court of Appeals issued an injunction in a consolidated appeal which stayed the implementation of certain portions of the FCC's rules until their legality is decided.

The FTA created a "Federal-State Universal Service Joint Board" and directed the Board to make recommendations to the FCC on how "universal service" should be defined, what basic services should be included in "universal service," and when the FTA's goals in achieving "universal service" should be completed. The Board's recommendations, issued November 7, 1996, included a proposal to provide discounts of 40 to 90 percent for all but about three percent of the country's grade schools, at a cost capped at $2.25 billion per year. The media reported that this proposal was in response to President Clinton's support, during a campaign speech in mid-October, for giving schools and public libraries free basic access to the Internet through an "E" ("education") rate. Final rules are due from the FCC by May 8, 1997.

Despite the legal uncertainty which surrounds the letter of some of the FTA's implementation rules, a representative from the Virginia Cable Telecommunications Association encouraged Virginia to embrace the FTA's spirit, i.e., to open up competition in the local exchange market between telephone, cable, and other communications companies. State regulation of the cable industry's provision of cable television service was preempted by the FCC in 1994. However, with regard to telecommunications services, the industry's representative urged Virginia to continue its efforts to remove barriers to competition faced by cable companies in the local telephone exchange market.

An example is the arbitration process established by the State Corporation Commission (SCC) pursuant to the FTA to resolve disputes between companies regarding interconnectivity agreements. The cable industry views these agreements as opportunities to forge partnerships with local exchange companies to maximize Virginia's existing telecommunications infrastructure (e.g., fiber optic lines, coaxial and copper cable, etc.). At present, however, it may take up to nine months from a company's initial request for interconnection until the matter is resolved by the SCC. This process has been complicated by the Eighth Circuit's stay of some of the FCC's implementation rules, which, as discussed earlier, include the rates which can be charged by local exchange companies for interconnectivity agreements.

To its credit, the SCC is using the interconnectivity rates established in the FCC implementation rules as interim rates in its arbitration process so that protracted federal litigation does not

impede Virginia's progress towards introducing competition in the local exchange market. In fact, many interconnection requests have already been made, and the SCC is scheduled to resolve 10 additional arbitrations by January 21, 1997. It remains, however, very difficult for telephone, cable, and other communications companies to participate in arbitration, negotiate interconnectivity agreements, and make long-term business decisions because of the legal uncertainty surrounding some of the FTA's implementation rules.

As it relates to President Clinton's support for giving schools and public libraries free basic access to the Internet through an "E" rate, the manager of rates and costs in the communications division of the SCC indicated that, since 1995, the SCC has practiced "rate cap" (or "price cap") regulation among Virginia's large local exchange companies (Bell Atlantic, GTE, Sprint Centel, and United Telephone). Simply put, this means that the SCC establishes caps on the rates (or prices) that local exchange companies may charge for basic telephone services. In return, there are no restrictions (except for GTE) on a company's revenues and earnings. The SCC categorizes telephone services into three categories--basic, discretionary, and competitive--based on the nature and competitiveness of each service. Traditionally, the SCC has allowed only two classes of service: "residential" and "all other" (commonly referred to as "business").

All government agencies and institutions (e.g., schools and libraries) fall into the "business" rate category. Under its current statutory authority, however, the SCC may be able to establish other classes of service like an "E" ("education") or "G" ("government") rate.[34] In lieu of special classes of service being established by the SCC, other possible approaches include: (i) providing a discount to schools and libraries (like the 40 to 90 percent discount recommended by the Federal-State Universal Service Joint Board) and (ii) providing state government subsidies, in the form of grants or loans, to make up the difference between the reasonable cost to provide the service and the rate actually charged to schools and libraries (like the existing Rural Electrification Authority program).

b. Virginia's Existing Public Sector Networks

While other states may have to wait for the legal outcome of the FTA before advancing their information technology goals, Virginia is fortunate to have already established several public sector networks.[35] They are:

- **Commonwealth Telecommunications Network (CTN).** Managed by the Department of Information Technology, the CTN is currently Virginia's largest public sector network. The

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[34] The SCC's authority may be limited by Virginia Code section 56-234, which requires utilities to charge uniform rates under "like conditions" to prevent rate discrimination. To date, the SCC has only recognized two "like conditions": "residential" and "all other." Section 56-234 also exempts services to state government from SCC regulation. Language in the 1996-98 Budget Bill deems "communications services into public schools which are used for educational technology" as "state government" for purposes of section 56-234 (and 56-232). (See Item 140C.11.f1 at p. 1850 of Chapter 912 of the 1996 Acts of Assembly.)

[35] See, RoadMap to the Future: A Strategic Plan for Virginia's Information Technology Infrastructure, published by the Council on Information Management (June, 1995), pp. 22-24.

CTN is a shared physical utility network provided by MCI which extends around the state and supports applications established by the Departments of Corrections, Motor Vehicles, Personnel and Training, Social Services, and Transportation; the State Board of Elections; the State Supreme Court; and the Virginia Employment Commission. The network provides voice, data, and video services. Although few have purchased the CTN service, it is also available to local governments and schools.

- **Virginia Criminal Information Network (VCIN).** Owned and operated by the Department of State Police, this network serves the many criminal justice agencies in the state, local, and federal governments.

- **Network Virginia (formerly known as "Access Virginia").** This past summer, a seven-year contract negotiated by Virginia Tech with Bell Atlantic and Sprint created the Commonwealth's first high-speed network, which can carry thousands of simultaneous, two-way flows of voice, data, and video. By the end of 1996, the system should link 45 sites, including Virginia Tech, Old Dominion University, the Northern Virginia Graduate Center, and Virginia's 38 community college campuses. The system is based on Sprint's existing broadband fiber optic network in Virginia, with Bell Atlantic installing a new relay service technology that allows users to put voice, data, and video onto one communications line. Under the terms of the contract, Bell Atlantic is authorized to represent *all* of Virginia's local exchange companies, which means that Network Virginia can reach anywhere in the Commonwealth. That feature, in combination with its broadband capacity, indicates that Network Virginia can accommodate any of Virginia's schools, libraries, and state and local agencies which want to be on the system, regardless of their geographic locations and local exchange providers.

- **Virginia Satellite Education Network (VSEN).** As the Department of Education's statewide distance learning delivery service, this network is designed to address educational disparity in Virginia's public schools by providing access to comprehensive, advanced level courses for college-bound students unable to obtain necessary instruction at their own schools. During the 1996-97 school year, six studio sites, located in Fairfax, Henrico, Prince William, and Wise Counties, will broadcast daily courses in Latin, Japanese, English, Calculus, Statistics, and U.S. History through a one-way video, two-way audio system. Over 1600 students are enrolled in Virginia and 30 other states nationwide.

- **Southwest Virginia Education and Training Network, Inc. (SVETN).** Twenty-six of Southwest Virginia's 86 schools are currently linked to this digital fiber network which provides full-motion video and voice communications to each site. More than 100 instructors have been trained to teach on-line. It is anticipated that five more schools will join the network by the next school year.

- **Virginia Education and Research Network (VERnet).** A statewide network owned and operated by a consortium of its members, VERnet connects Virginia's educational institutions, several state agencies, industrial sites, and research facilities. VERnet also

provides gateways to other regional, national, and international computer networks. At its second meeting, TAC #5 received testimony about three specialized public networks which run off of VERnet's "backbone." They are:

- **Virginia Public Education Network (VPEN).** Administered by the Department of Education, VPEN is a statewide network available to Virginia's public elementary and secondary schools which permits them to send and receive information and instruction. About 70 percent of VPEN's 20,000 accounts are for teachers. (Students are not permitted to have their own accounts.) On average, 7500 daily connections are made to VPEN via a toll-free 800 number (4750/day), directly through VPEN's Internet homepage (2500/day), and, most recently, through a local phone call into the Department of Health's computer network (250/day). VPEN's connection to local phone lines through the Department of Health has increased the number of telephone lines into the network from 100 to 350 and doubled VPEN's availability from 12 hours a day to 24. VPEN estimates that within three years, 90 percent of Virginia's schools will have access to the Internet through VPEN. The network's development is guided by the Six-Year Educational Technology Plan for Virginia, adopted by the State Board of Education and published by the Department of Education, Division of Technology, in June 1996.

- **Virginia Library and Information Network (VLIN).** Administered by the Library of Virginia, this statewide network links Virginia's public libraries to each other and the Internet. Information is presented in text-only format (i.e., no maps, graphics, pictures, etc.). Access to VLIN, obtained through a local phone call or toll-free 800 number, is restricted to library staff. Public access to the Internet through VLIN is "mediated," which means that a library patron must give an Internet research request to a librarian, who, in turn, accesses the Internet through VLIN.

A handful of Virginia's public libraries provide direct dial-up service to the Internet through a modem connected to patrons' personal home computers. Other local libraries have chosen to provide direct public access to the Internet by placing personal computers in public areas of their libraries. A recent survey by the Library of Virginia revealed that, statewide, Virginia's public libraries have only 351 personal computers available to serve a total state population of 3,481,900. Nearly half of those computers (151) are available at the Norfolk Public Library as a result of a private donation. The Library of Virginia's survey dramatically illustrates the point that achieving "universal access" to the information highway requires more than just being able to affordably connect to it; it requires physical infrastructure like hardware (e.g., computers, servers, workstations, printers, and routers), software (e.g., Internet browser), user training and staff development, and funding for support and maintenance expenses.

- **Blacksburg's Electronic Village.** This project, a partnership between the Town of Blacksburg, Virginia Tech, and Bell Atlantic, was launched in 1991 and has been in operation for about three years. Out of a population of about 35,000, 19,000 citizens have gone "on-line." Users send and receive an average of eight electronic mail correspondences per day and spend an average of 78 minutes per day on-line. According to Blacksburg's

town manager, the goal of the project is to make the town's government more relevant to its citizens' lives. As such, future plans include expanding the on-line services to include obtaining building permits and dog licenses, paying taxes, and verifying a particular bus's exact location and time of arrival at a certain stop. Blacksburg's citizens are currently being surveyed to determine additional applications.

c. Other States

Also at its second meeting, TAC #5 received testimony on the experiences of Maryland, North Carolina, and Iowa in their attempts to get ahead of the information technology curve.

- **Maryland.** In 1995, the Sailor project grew to become a statewide telecommunications network which enables residents in all 24 counties to access the Internet from their personal home computers via a modem and a toll-free telephone call into the Maryland public library system. Up to 16 residents in each county can simultaneously access Sailor, which provides downloading, printing, and electronic mail. The idea for Sailor began in 1989, when Maryland published Toward the Year 2000: A Strategic Plan for the Maryland State Library Network, and was gradually phased in over the next six years. Funding during the initial years consisted of over two million dollars in federal money. Current annual operating costs total nearly one million dollars, about half of which is provided by the legislature in general funds and the remainder by federal and local funds and in-kind support. Sailor's long-term goal is for localities to fully fund the project through their local public libraries. Interestingly, Maryland has not relied exclusively on Sailor to serve its information technology needs. Other networks include the Maryland Distance Learning Network and the Maryland Education Technology Network. In addition, a two-county pilot project, Maryland Electronic Capital, links state, county, and local governments to each other and the federal government and is scheduled to include the entire state in the next three to five years.

- **North Carolina.** North Carolina's Information Highway began in the early 1990's with the primary goal of enhancing the state's economic development. Through its public procurement process, North Carolina contracted with Bell South to build a state-owned and -operated telecommunications infrastructure. The project, purported to cost millions of dollars in capital outlay, was deployed in 1994 on the theory that the mere existence of the network would stimulate demand and applications could be added later as more users signed on. At present, North Carolina's user projections have not been met, and although the state continues to fund the network's operating costs, the state legislature has threatened to eliminate funding for the project.

- **Iowa.** Similar to North Carolina, Iowa contracted with a private company (Fujitsu) to build a state-owned and -operated telecommunications infrastructure at a purported cost of $170 million. Currently, Iowa is trying to sell its network after realizing that it may be a larger project than the state can realistically handle.

2. RECOMMENDATIONS

Based on its findings, TAC #5 recommends to the Joint Subcommittee on Science and Technology that:

- **"Universal access" means making the information highway accessible to all citizens of the Commonwealth for no more than the cost of a local phone call. The long-term public policy vision embraced by "universal access" is best achieved by thoughtfully identifying and vigorously pursuing the accomplishment of short-term goals.**

This definition of "universal access" and the method by which to achieve it accommodates several important ideas considered by TAC #5 during the course of its study, including:

- "Universal access" includes two components: (i) connectivity to the information highway through a telecommunications infrastructure (e.g., fiber optic lines, coaxial and copper cable, space satellites, etc.) and (ii) physical infrastructure which includes hardware (e.g., computers, servers, workstations, printers, and routers), software (e.g., Internet browser, school curricula), user training and staff development, and funding for support and maintenance expenses. Given the symbiotic relationship between these two coequal components, support and development of one should proceed at roughly the same pace as the other.

- Any definition of "universal access" must recognize that new technologies emerge daily, perhaps even hourly. Thus, the temptation to define specific standards in any definition of "universal access" should be resisted. As a broad public policy vision, "universal access" must be flexible enough to accommodate--and indeed, encourage--scientific and technological advances and certainly should not become obsolete.

- "Universal access" and "universal service" are *not* the same thing and should *not* be used interchangeably. Since the initial enactment of federal telecommunications legislation in 1934, "universal service" has been a term of art used to describe the national goal of affordably supplying basic telephone service to any person who wants it. Indeed, about 97% of all Virginia households have basic telephone service. Thus, while the expanded goal of "universal service" pursued by the federal Telecommunications Act of 1996 may ultimately contribute to "universal access," the latter is a much broader public policy vision than the former.

- Perhaps the most important short-term goal towards achieving "universal access" is the identification of applications, usage, and users. The biggest lesson to be learned from North Carolina's multi-million dollar investment in its information highway may be that the mere existence of the highway ensures neither its demand nor its use. To determine application demands and functional uses, the Commonwealth could adopt "telecommunications infrastructure benchmarks." "The process by which the benchmarks are established should include participation by a variety of public and private interests to ensure that any assessment

accurately measures the broad range of functional requirements of users."[36] Identified among the emerging demands and uses which could be assessed and benchmarked are electronic commerce, education and distance learning, health care, electronic access to government, public safety, and telecommuting.[37]

- **Public sector information networks in Virginia should be aggressively promoted and actively encouraged.**

The establishment, development, and growth of Virginia's public sector networks indicates that "universal access" in the Commonwealth will be fulfilled by a "network of networks"[38] which serves the diverse, specialized, and sometimes overlapping needs of her schools, colleges, universities, libraries, governments, agencies, organizations, businesses, industries, and citizens. Thus, existing public sector networks should be aggressively promoted and the creation of new networks actively encouraged. However, duplicate effort, technologies, and infrastructure should be avoided in favor of cooperative partnerships which maximize existing resources. An example is the recent agreement between the Departments of Education and Health which provides enhanced access to the Virginia Public Education Network (VPEN) through the Department of Health's local phone lines.

- **The State Corporation Commission (SCC) should continue its efforts to open up competition in the local exchange market between telephone, cable, and other communications companies by studying: (i) the effectiveness of its current "rate cap" (or "price cap") regulation among Virginia's local exchange companies; (ii) the feasibility and projected costs of establishing (a) an "E" ("Education") rate for the Commonwealth's schools, colleges, universities, and libraries; (b) a "G" ("Government") rate for the Commonwealth's schools, colleges, universities, libraries, and all other state and local government agencies; and (c) discounts for the Commonwealth's schools, colleges, universities, libraries, and all other state and local government agencies; and (iii) the effect of the FTA and the FCC's implementation rules upon these approaches. The SCC should make an interim report of its findings and recommendations to the Joint Subcommittee or a successor joint subcommittee or entity thereof by November 15, 1997, and make its final report to the Governor and the 1998 General Assembly.**

This recommendation recognizes that the "random chaos" which currently exists in the wake of the Federal Telecommunications Act of 1996 will likely not begin to be resolved until the spring or summer of 1997. Thus, the introduction of legislation directed at the SCC on these matter seems premature at this time and may prove counterproductive as progress is made toward that resolution. However, regardless of the resolution at the federal level, dramatically changed conditions in the telecommunications industry since the passage of the FTA suggest that the SCC re-examine its current regulatory approach towards local exchange companies.

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[36] See, RoadMap at p. xii.
[37] See, RoadMap at pp. 4-17.
[38] See, RoadMap at pp. 3, 19-20.

- **The Library of Virginia should be requested to develop a five-year strategic information technology plan for the Commonwealth's public library system and to identify how that system will contribute to achieving the long-term public policy vision of "universal access." The plan should include specific findings and recommendations and the projected costs thereof, such as the minimum technological standards for Virginia's public libraries (e.g., per capita ratio of computer workstations to population served). To assist in the development of the strategic plan, the General Assembly should appropriate $600,000 in fiscal year 1997 to fund 12 pilot projects (two in each of the six regions of the Virginia Library Association which serve the Commonwealth). The Library of Virginia should make an interim report of its findings and recommendations to the Joint Subcommittee or a successor joint subcommittee or entity thereof by November 15, 1997, and make its final report to the Governor and the 1998 General Assembly.**

This recommendation recognizes the importance of Virginia's public library system in achieving "universal access" and the potential viability of Maryland's Sailor project as a model for the Commonwealth.

- **The study by the Joint Legislative Audit and Review Commission (JLARC) of the Commonwealth's data processing and related services should continue to be closely monitored.**

Item 14 of the 1996-98 Appropriation Act directs JLARC to conduct a study of data processing services for state agencies and institutions, including the feasibility and advisability of privatizing the state data center located at the Department of Information Technology. The study will also evaluate the effectiveness of statewide information technology planning and standards, telecommunications services, systems development services, and computer and telecommunications information technology operations of state agencies and institutions of higher education. The Budget authorizes JLARC to employ necessary consulting services and provides $450,000 for that purpose. The Gartner Group, a consulting firm based in Connecticut, has been retained. An interim report is due to the Governor and the General Assembly no later than January 1, 1997, and a final report no later than January 1, 1998.

While it appears that some centralized government entity should bear ultimate responsibility for the administration, oversight, and achievement of "universal access," the introduction of legislation during the 1997 General Assembly Session which restructures state government in this regard seems premature prior to the issuance of JLARC's final report.

- **The Joint Subcommittee on Science and Technology created pursuant to House Joint Resolution No. 195 (1996) should be continued for an additional year of study to refine the definition of "universal access," to monitor the ongoing study by JLARC, and to assist the SCC and the Library of Virginia with the studies they have been asked by the Joint Subcommittee to undertake.**

F. TAC #6 (Civil and Criminal Laws)
Legislative Liaison: Delegate Kenneth R. Plum

Study Objective 8: "Review the Commonwealth's statutes, regulations, and rules governing criminal and civil procedure to determine whether current law is sufficient to ensure enforcement of the Commonwealth's criminal and civil laws against both residents and nonresidents of the Commonwealth whose activities, including access to and the distribution of pornography, in Virginia are conducted principally by computer on the information superhighway or through other technological means."

1. SUMMARY

Discussion of the need for revision of the criminal and civil laws to keep pace with changes in technology raises varied and complex issues. In addition to the obvious matters involving free speech under the First Amendment, federal preemption, the impact of state legislation under the commerce clause, and the right to freedom from unreasonable searches and seizures under the Fourth Amendment, there are practical and constitutional considerations involving expectations of privacy and the meaning of public access. For example, does public access necessarily mean that the public has the right to demand or expect immediate publication via the Internet of all "public" information? Does the answer change depending on the type of information sought (e.g., land title records v. criminal conviction records)? Can a person sending a libelous electronic mail correspondence to a specified individual reasonably expect a greater degree of privacy than a person sending a post card via the U.S. Postal Service?

A greater range of input from attorneys who practice in various fields is needed to fully address the issues. The attorneys and users of the courts are in a position to see problems developing with the use of existing technology and the application of existing law to changing technology; they may envision methods to modify the law to facilitate the practice of law and otherwise avoid problems. TAC #6 has asked the Virginia Bar Association and the Commonwealth's Attorneys Association to solicit comments and suggestions from their membership for consideration.

Additionally, the Commonwealth's public policies, which have developed gradually, must be examined to determine if those policies fit current technology and vice versa. Any changes in the law should be considered only after the underlying policy rationale for the current law is examined. Change for the sake of change should not be undertaken. The basic law created today to deal with new technology, commercial transactions, record creation and management capabilities, etc., should continue to serve the people of the Commonwealth through the next century.

2. RECOMMENDATIONS

TAC #6 should be continued through the 1997 legislative interim to work with representatives of the practicing bar, the technology industry, academics, and other legal experts to:

- **Examine and formulate the public policy of the Commonwealth as it affects technological commerce and the impact of technological advances on the criminal and civil justice systems;**
- **Monitor the work being done on the federal level and in other states, in particular as those activities address regulation of Internet use and access, development of new criminal offenses, use of existing technology to create savings, and efficient use of judicial resources;**
- **Identify areas where the civil and criminal procedural and substantive law has not kept pace with technology; and**
- **Make recommendations for statutory changes which reflect the public policy of the Commonwealth and ensure the continued integrity, efficiency, and fairness of Virginia's legal system.**

G. TAC #7 (Digital Signatures)
Legislative Liaison: Senator Patricia S. Ticer

Study Objective 9: "Examine the digital signatures issue to determine whether Virginia should adopt legislation similar to that enacted in Utah or some other legislation that would facilitate the development of electronic commerce in Virginia."

1. INTRODUCTION

To establish the Commonwealth as an international leader in high technology development and application, the General Assembly must monitor and, when necessary, implement legislation to facilitate this growth. TAC #7 met on November 6, 1996, in Alexandria to study the need for enabling legislation governing the use of digital signatures. Members of the General Assembly, private industry, and state agency representatives all provided insight into the creation of a proposed "first step" for the legal recognition of digital signatures within the Commonwealth.

2. CURRENT USE IN VIRGINIA

Representatives from the private commercial sector described current applications of electronic commerce, particularly in the transfer of funds. Members reminded the advisory committee that every day over $ 2 trillion move globally through wire transfers, which use a form of digital signature as a security measure. The parties negotiate the protocol used in these transfers, as well as the assignment of any transactional risk.

The Virginia Department of Transportation (VDOT) discussed its pilot program involving the electronic submission of road construction bids. However the Virginia Public Procurement Act limits carrying this project to its full capability since a "pen and paper" signature must accompany all contracts awarded. VDOT's representative indicated that by the 1998 Session of the General Assembly, the Department will have the necessary technology to operate a fully electronic contract bid and award system if it has statutory authority to accept final contracts signed digitally.

3. POLICY CONCERNS

The evolution of technology, especially within the arena of electronic commerce, makes legislating digital signatures difficult. Legislation should not stifle technological advancements; however, it must protect consumers and privacy as well as inspire confidence in commercial transactions. The growing international market, fueled by the development and use of the Internet, requires legislation that is consistent and uniform to keep Virginia accessible to trade with any qualified source. State agencies are recognizing the potential cost savings of using electronic commerce to better serve the citizens of the Commonwealth, but cannot act fully on their projects because of current statutory requirements and limitations. A brief summary of them includes:

- **Privacy Protection.** TAC #7 expressed concern over the legal ramifications of third-party notary systems, created in states such as Utah for safeguarding the encrypted "private keys" needed to safeguard digital signatures. There is the potential for law-enforcement agencies to request notaries to the reveal the data needed to gain access to the private records maintained by these notaries. The TAC agreed that the potential liability associated with granting third-party access to private records would stifle the development of a private-sector electronic notary network. Moreover, if governments want to ensure access for law enforcement, they will be dictating the technology incorporated by the private sector.

- **Consumer Protection.** The anonymous nature of many Internet transactions concerned the TAC. The TAC recognized that commercial participants have the resources to protect themselves to a greater extent than consumers. The TAC suggested that this disparity be considered when drafting legislation.

- **Uniformity.** The national and international nature of commerce demands that any standards adopted have the capability of allowing transactions with other parties located outside the jurisdiction. A representative from the National Conference of Commissioners on Uniform State Laws reminded the TAC about the Commissioner's continuing work with the Uniform Commercial Code (UCC) and the need for conformity and clarity. Specifically, there is ongoing work on proposed UCC Article 2B, which governs the sale of goods and transactions in electronic information. The consensus was that any action taken by the Commonwealth should be consistent with other jurisdictions and model acts.

- **Encouraging the ongoing development of technology.** All members of the TAC agreed that no proposal should serve to stifle the development of more efficient technologies; hence, they recommended against requiring a specific technology. Instead, the TAC urged that any legislation be technology neutral, and it provided as an example, the current practices in the commercial sector. Involved parties negotiate private transactions, and the risk associated with the protocol is a factor in the transactions.

4. OTHER STATES

- **Utah.** Utah's Digital Signatures Act provides a detailed framework of law and regulation. Utah licenses and oversees certification authorities, who serve as digital notaries. Members of the TAC criticized the detailed regulatory approach, and pointed out that, as of this time, no individuals have applied for a certificate of authority, presumably because of the liability and risk associated with this detailed process.

- **California.** California's legislation involving digital signatures merely defines digital signature and states that the use or acceptance of a digital signature shall be at the option of the parties.

- **Florida.** Florida's legislation gives electronic signatures the same force and effect as a written signature, and gives the Secretary of State the authority to issue certificates to verify

digital signatures. The legislation also calls for the Secretary to study the issues related to expanding the use of digital signatures.

- **Massachusetts.** Proposed legislation in Massachusetts gives legal recognition to digital signatures and allows public agencies to use electronic records. The proposal authorizes the Secretary of State to operate and oversee systems to provide electronic certificates. The TAC agreed with the manner in which the proposed Massachusetts bill addressed digital signatures.

5. RECOMMENDATIONS

Following further discussion of the merits and problems with other approaches, the TAC recommended that the Joint Subcommittee on Science and Technology propose legislation which:

- **Adopts the manner proposed in the Massachusetts bill to address digital signatures;**
- **Authorizes the use of digital signatures by governmental units of the Commonwealth;**
- **Gives legal recognition to digital signatures; and**
- **Authorizes the development, by some entity of state government, of minimum standards for the use of digital signatures by the Commonwealth's agencies, institutions, and political subdivisions.**

III. CONCLUSION

The Joint Subcommittee extends sincere appreciation to everyone who participated in its study of science and technology and supported its legislative recommendations during the 1997 Session of the General Assembly.

Respectfully submitted,

Delegate Kenneth R. Plum, Chairman
Senator Stephen D. Newman, Vice Chairman
Delegate Alan A. Diamonstein
Delegate William W. Bennett, Jr.
Delegate James M. Scott
Delegate Robert E. Harris (deceased)
Senator Walter A. Stosch
Senator Patricia S. Ticer

APPENDIX 1.
State Legislatures Which Have Created Committees, Subcommittees, Or Commissions On Science And Technology*

HOUSE COMMITTEES - 6

Iowa: Technology.

Missouri: Science, Technology and Critical Issues. (Considers research and its applications, commercialization, and development; high technology; and issues of a critical nature to state government.)

New Hampshire: Science, Technology and Energy. (Considers energy and the application of technological advances to the legislative process and operations of state government; coordinates the flow of information about scientific and technical matters to legislative committees and state and federal agencies; suggests technological improvements to legislation referred to other committees.)

North Carolina: Science and Technology.

Oklahoma: Science and Technology.

Wisconsin: Trade, Science and Technology.

SENATE COMMITTEES - 9

Georgia: Science, Technology and Industry.

Hawaii: Science, Technology and Economic Development. (Considers new industry development, capital attraction, financial and technical assistance to businesses, ocean resources, high technology, telecommunications, and the regulation of public utilities and carriers.)

Iowa: Communications and Information Policy.

Massachusetts: Science and Technology.

Michigan: Technology and Energy.

Ohio: Economic Development, Technology and Aerospace.

Oklahoma: Science, Technology and Telecommunications.

Pennsylvania: Communications and High Technology.

Texas: International Relations, Trade and Technology. (Considers the legislative branch's access to scientific and technological information; advances in science and technology, including telecommunications, electronic business technology, and automated data processing; scientific research; technological development; and inter- and intra-state technology transfer. Oversees cooperation between state and local agencies and scientific and technological universities, colleges, and businesses.)

JOINT COMMITTEES - 9

California: Information Technology, Energy and Technology.
Information Technology in State Government.

Connecticut: Energy and Technology.

Florida: Information Technology Resources.

Kansas: Computers and Telecommunications.

New Jersey: Transportation Authorities, Telecommunications and Technology.
Oregon: Information Management and Technology.
Vermont: Information Technology Oversight.
Wisconsin: Information Policy. (The Assembly Committee on Trade, Science and Technology appears to have been this Joint Committee's predecessor.)

SUBCOMMITTEES - 2

Maryland: Science and Technology Subcommittee of the House Committee on Economics Matters. (A newly formed subcommittee comprised of seven House members and representatives from the high-tech community. Its primary focus is to inventory Maryland's high-tech assets and identify problems which high-tech companies face in proposed legislation.)
Minnesota: International Trade and Technology Subcommittee of the House Committee on Economic Development.

COMMISSIONS - 7

Connecticut: Information Technology. (Proposed in 1996 as an independent commission to oversee state agency information systems.)
Iowa: Telecommunications and Technology.
Maine: Science and Technology. (Also, the Maine Science and Technology Foundation, which is a partnership between business, research, education, and government.)
Mississippi: Science and Technology.
New York: Joint Legislative Commission on Science and Technology.
North Carolina: Technology.
Utah: Information Technology. (Reviews information technology systems, strategic planning, and hardware and software development in the school system; develops specific information technology objectives, policies, and procedures; coordinates short- and long-term information plans with state agencies.)

*Sources: National Conference of State Legislatures 1995-96 Register, State Legislative Leadership Committees and Staff 1993-94 (Council of State Governments, 1993), research through state legislatures' Internet home pages, and electronic mail correspondence with state legislative staffs. Note that most of the committees, subcommittees, and commissions listed here were formed no earlier than 1992; however, some may not currently be in existence or may be in existence under a different name.

APPENDIX 2.
Occupational Information About the Members of the 1996 Virginia General Assembly*

HOUSE OF DELEGATES

ARTIST - 1
ATTORNEYS - 39
BANKING/FINANCE - 3
BUSINESS - 22
CITY REGIONAL PLANNER - 1
CONSULTANT - 5
CONSUMER ADVOCATE - 1
EDUCATION - 9
FARMER - 2
INSURANCE - 3
MINING - 1
MINISTER - 2
PHARMACIST - 1
REAL ESTATE - 2
RETIRED - 3
SPEECH PATHOLOGIST - 1
TELEPHONE TECHNICIAN - 1
UNSPECIFIED - 2
VETERINARIAN - 1

SENATE

ATTORNEYS - 10
AVIATION - 2
BANKING/ACCOUNTING - 2
BUSINESS - 7
EDUCATION - 4
GOVERNMENT - 1
INSURANCE - 4
MINISTER - 1
OPTOMETRY - 1
REAL ESTATE - 2
WRITER - 1
UNSPECIFIED - 5

*Sources: 1996-1997 Manuals of the House of Delegates and the Senate.

APPENDIX 3.

Historical Summary Of Science And Technology Units in Selected State Legislatures[39]

- **ILLINOIS: Science and Technology Unit.**
  Created in 1973 as part of the staff at the Legislative Council. Composed of scientists and science-trained graduate interns, it prepared research reports, contacted legislative clientele, conducted seminars and workshops, and fulfilled spot research requests. All legislators had access to the Unit's services. Most requests originated through the Legislative Council. By 1981, problems included low visibility and lack of use by most legislators.

- **MARYLAND: Office of Science Advisor.**
  As part of the Department of Legislative Reference, it served both houses of the General Assembly. Because its role was highly reactive, it functioned without many operational or procedural guidelines. Problems included an ill-defined relationship with other legislative service units.

- **MASSACHUSETTS: Science Resource Office.**
  Created in 1975 as an agency within the legislative branch, it provided a range of services for both houses. It operated an inquiry service which provided short answers to technical questions from legislators and their staffs and networked with the scientific and technological community (e.g., colleges, universities, technical associations). Problems included large turnout by scientific community at seminars but low attendance by legislators; little overall legislative impact; low visibility as a result of early reorganization of Office; and various, conflicting visions of the Office's role.

- **MINNESOTA: Science and Technology Project.**
  Begun in 1976 with three components: the Science and Technology Research Office; the Joint Legislative Committee on Science and Technology; and the Science and Technology Resource Council. The Project responded to legislators' inquiries and research requests and was viewed as a legislative service organization. It followed written policies and procedures regarding its activities. In 1981, the legislature appropriated $146,000 to the Project. Some criticized the Project for being too technical and avoiding policy issues.

- **NEW YORK: Scientific Staff.**
  Created in 1971, it provided technical commentary on bills and assisted in drafting and revising legislation. In 1979, the internal scientific staff became part of the Legislative Commission on Science and Technology. By 1981, the Commission had 10 legislative members and a staff of 15.

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[39] King and Feller, "Science and Technology Organizations in State Legislatures: An Analysis and Study of Operating Experiences," Institute for Policy Research and Evaluation, Pennsylvania State University, December, 1981, at pp. 54-100.

- **PENNSYLVANIA: Legislative Office for Research Liaison.**
  Created in 1976 as a nonpartisan, independent staff unit, it originally served only the House and acted as a passive clearinghouse for legislative requests by funneling them to external sources (primarily colleges and universities) for resolution. Over the years, the legislature began to rely more on the Office's internal staff to answer requests and only relied on external sources for significant, technical, long-range reports. Major problems included low visibility and use by legislators.

- **SOUTH CAROLINA: Science and Technology Graduate Internship Program.**
  Created in 1978 to supplement legislative staff in areas related to science and technology, its problems included lack of financial support, interns with narrow viewpoints and little knowledge of the legislative and political process, recruitment difficulties, and low visibility.

- **VIRGINIA: Legislative Science Advisor.**
  In 1977, funding was received from the National Science Foundation to incorporate scientific and technological information into the legislative process. In 1978, a staff science position was created in the Division of Legislative Services. He provided research on matters related to science and technology to legislators in both houses, completed studies requested by standing or study committees and Division staff, and served as staff to standing committees and subcommittees dealing with science and technology. The position terminated about two years later when the advisor left the Division.

The following chronology supplements King and Feller's study of Virginia:

- **House Joint Resolution No. 7 (1977)**
  Established the Legislative Scientific and Technology Advisory Committee to plan and implement the Legislative Science Advisor project.

- **House Document No. 15 (1979): "Report of the Legislative Scientific and Technological Advisory Committee to the Governor and the General Assembly of Virginia"**
  Recommended that the Committee provide research, assessment, and recommendations on technologies applicable to the legislature and the legislative process; study how to tap the private sector into valuable sources of technical information; and study appropriate issues as the need arises.

- **1983 Governor's Task Force on Science and Technology in Virginia**
  Established to recommend ways in which Virginia could effectively retain and attract high-technology enterprises and assist citizens, communities, and institutions in preparing for societal changes resulting from the technological revolution. Its major recommendation was to create a policy advisory group of leaders from industry and education to monitor state agencies' performances in carrying out Task Force recommendations; provide guidance to the Governor and state agencies; assist in mobilizing efforts on the federal level; serve as ambassadors to high-technology industries considering a Virginia location; and review the plans and performance of the Division of Industrial Development in technology matters. The

Task Force recommended that the group be active in formulating policy, have high visibility, and be specifically identified with science and technology, and that the Governor should be closely involved, perhaps as Chairman.

- **Chapter 782, 1984 Acts of Assembly**
  Created the Innovative Technology Authority Act (§ 9-250 et seq.), which established the Center for Innovative Technology.

- **Senate Document No. 3 (1988): "Report of the Joint Legislative Audit and Review Commission on Information Technology in Virginia State Government"**
  Recommended that the General Assembly establish a supervisory board, called the Council on Information Management with a permanent, continuous planning process. The Council would set Virginia's information technology course and have authority to develop an information technology plan and establish policies to address information technology issues.

- **Chapter 424, 1988 Acts of Assembly**
  Created the Council on Information Management (§ 2.1-563.28 et seq.).

- **Senate Document No. 16 (1993): "Report of the Review Committee on the Performance and Potential of The Center For Innovative Technology"**
  Concluded that Virginia's strategic plans for science and technology are insufficient and recommended that the General Assembly adopt a resolution creating a task force to coordinate development of a statewide strategic plan for science and technology.

- **House Joint Resolution No. 390 (1993)**
  Established the Task Force on Science and Technology for two years to report on the status of the recommendations made by the 1983 Governor's Task Force on Science and Technology, coordinate the development of a statewide strategic plan for science and technology, and examine whether a permanent council on science and technology should be created.

- **House Joint Resolution No. 447 (1995)**
  Continued the Task Force on Science and Technology for another year and requested the Task Force to consider recent and ongoing initiatives of other organizations focusing on science and technology issues. Also, House Joint Resolution No. 714 (1995) asked the Task Force to study opportunities and incentives for information and communications technology to meet public needs.

- **House Document No. 46 (1996): "Report of the Joint Legislative Task Force on Science and Technology in Virginia"**
  Recommended that a joint commission for technology and education be established; the Task Force be continued to review technology dispersion and public policy; and the Center for Innovative Technology be considered the lead mechanism for planning and representing Virginia in economic development matters dealing with science and technology.

- **House Joint Resolution No. 195 (1996)**
  Created a joint subcommittee to continue and expand the work of the Task Force on Science and Technology.

APPENDIX 4.
Virginia's Legislative Commissions

Name of Commission and Number of Members	Statutory Authority	Created	1996-98 G.F. $	1996-98 MEL*
Joint Legislative Audit & Review Commission (15)	§ 30-56	1973	$4,767,458	34 positions
Virginia Coal & Energy Commission (20)	§ 9-145.1	1979	$ 42,640	**
Virginia Code Commission (8)	§ 9-77.4	1946	$ 521,860	**
Virginia Commission on Inter-governmental Cooperation (15)	§ 9-53	1936	$ 705,378	**
Virginia State Crime Commission (13)	§ 9-125	1972	$ 779,500	5 positions
Virginia Housing Study Commission (9)	Ch. 295	1970	$ 259,548	2 positions
State Water Commission (15)	§ 9-145.8	1980	$ 20,320	**
Commission on Population Growth and Development	§ 9-145.11	1990	expired 1995	staff as needed
Virginia Commission on Youth (12)	§ 9-292	1989	$ 429,050	3 positions
Chesapeake Bay Commission (7)	§ 62.1-69.5	1980	$ 256,680	1 position
Hampton Roads Sanitation (5) District Commission	Ch. 407	1940	$ 000.00	not specified
Commission on Virginia Alcohol Safety Action Program (14)	§ 18.2-271.1	1986	$2,024,198	6 positions
Small Business Commission (14)	§ 9-336	1995	$ 000.00	**
Joint Health Care Commission (16)	§ 9-311	1992	$ 925,200	5 positions

* Maximum Employment Level.

** Staffed by the Division of Legislative Services. The Division's MEL, which includes those of the Virginia Code Commission, is 53 positions in 1997; 54 in 1998.

APPENDIX 5.
Bills, Resolutions, and Reports With A Significant Science Or Technology Content, 1992 Through 1997*

Session	Total House	Total Senate
1997	39	16
1996	40	15
1995	20	08
1994	28	07
1993	11	06
1992	08	10
6-year total	**146**	**62**

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1997 Session

House Bills (25):

1571 Virginia World Technology Fair Commission
1623 Harassing e-mail
1624 Education; school-based access to information infrastructure
1638 Trade and commerce; information infrastructure providers; restrictions on use of service; penalties
1848 Training in educational technology
1849 Securities; registration exemption; offers communicated on the Internet
2005 Possession of telephonic device on school property
2042 License plates
2138 Joint Commission on Technology and Science
2268 Classifications of tangible personal property; computer equipment
2273 Classifications of tangible personal property
2285 Educational technology foundations
2314 Personal property tax; separate classifications
2421 Virginia Information Providers Network Authority
2481 Programs to promote educational opportunities
2517 State employee access to information infrastructure
2578 Leases of state land
2579 Fees assessed by circuit court clerks for information technology
2607 Communication towers
2617 Banking and finance; statements of financial condition; electronic filing
2767 Records of counties, cities and towns; storage of records

2770 Programs to promote educational opportunities
2802 Computer trespass
2850 Possession of telephonic device on school property
2915 Public service companies; rights-of-way

House Joint Resolutions (10):
444 Study; Commonwealth's public library system
467 New Century Region of Virginia
498 Study; science and technology
518 Study; 911 telephone exchange
566 Technology and Science Advisor
586 Computer literacy
603 Study; Commonwealth's workforce
635 Study; Commonwealth's telecommunications system
646 Communications towers in interstate highway rights-of-way
659 Study; need for high-technology workers

House Documents (4):
31 Telemedicine, Barriers to Implementation of; Report of Council on Information Management
32 Wireless Telecommunications Providers, Feasibility and Desirability of Leasing State-Owned Properties to; Report of Secretary of Administration
51 Telemedicine Services, Reimbursement for; Report of Council on Information Management
62 DNA Evidence, Admissibility, Reliability and Interpretation of; Report of Crime Commission

Senate Bills (9):
759 Property tax exemption by classification
880 Local technology zones
923 Trade and commerce; digital signatures
946 Trade and commerce; semiconductor performance grants
956 Court opinions; Internet access
1013 Public service companies; rights-of-way
1127 Offenses involving telecommunication devices
1128 Liability exemption
1191 Offenses involving telecommunication devices

Senate Joint Resolutions (5):
218 Study; need for certain high-technology workers
226 Study; scientific and technological assets
248 Study; genetic research
370 Study; compilation of computer indices
381 Study; video teleconferencing

Senate Documents (2):

10 Computer Databases, Analysis of Feasibility of and Cost Associated With Requiring Public Bodies to Compile Indices of Certain; Report of Department of Information Technology

20 Land Records, Feasibility of Modernizing; Report of Joint Legislative Audit and Review Commission

1996 Session

House Bills (25):

7 Government-owned computers; restrictions on sexually explicit content

8 Computers; school-based access to information infrastructure

9 Information infrastructure providers; disclosure of sexual content

16 Technology Council; terms of legislative members

168 Computer trespass

493 Semiconductor Memory or Logic Wafer Manufacturing Performance Grant Program

495 Semiconductor Wafers Manufacturing Performance Grant Program

496 Classification of semiconductor manufacturing machinery and tools

516 Solar photovoltaic manufacturing incentive grants

651 Industrial ethanol

678 Classification of tangible personal property; computer equipment

822 Trade and commerce; digital signatures

885 Household hazardous waste

963 Information technology trust fund; use by circuit court clerks

1018 Procurement of computer equipment

1023 Information Providers Network Act; created

1066 Enterprise Zone Act; eligibility

1097 Technology training for teachers, administrators, and librarians

1102 Division of Purchases and Supply; computer hardware contract list

1168 Technology Infrastructure Fund; created

1232 Toxics management

1250 Information network sites for General Assembly members

1271 Income tax, state; payment by electronic funds transfers

1512 Interstate ozone reduction agreements

1528 Council on Information Management

House Joint Resolutions (12):

53 Study; obstacles to implementation of telemedicine

54 Study; telemedicine reimbursement

64 Study; Agent Orange task force

89 Study; commerce and crime on the information superhighway

109 Study; reimbursement for telemedicine services by health program

129 Study; digital signature acts & issues related to electronic commerce

194 Technology development and entrepreneurship

195 Study; science and technology

224 Study; wireless telecommunications providers
225 Study; educational technology infrastructure
236 Study; structure of technology governance
237 Study; structure of technology governance

House Documents (3):
25 Internet, Development of a Prototype to Provide Legislative Information Via
46 Report on Science and Technology in Virginia
65 Information Held or Used by Governmental Agencies, State and Federal Law on Privacy, Confidentiality, and Mandatory Disclosure of

Senate Bills (13):
219 Electronic filings with circuit courts
238 Semiconductor Wafers Manufacturing Performance Grant Program
240 Solar photovoltaic manufacturing incentive
244 Electronic access to the Codes and Internet
250 Insurance; sharing information with NAIC databases
253 Semiconductor Memory or Logic Wafer Manufacturing Performance Grant Program
282 Income tax, state; payment by electronic funds transfer
326 Freedom of Information Act; index of certain computer databases
393 Technology Infrastructure Fund; created
507 Information Providers Network Act; created
511 Information network sites for General Assembly members
512 Electronic access to the Codes and Internet
584 Local technology zones

Senate Joint Resolutions (2):
50 Study; breast cancer susceptibility gene research
68 Study; index of certain computer databases

1995 Session

House Bills (10):
656 Technology Infrastructure Board and Fund created
906 Telecommunications goods and services
1215 Establishment of pollution prevention goal
1216 State agency pollution prevention plans
1221 Implementation of pollution prevention within state agencies
1649 Illegally disabling operation of computer software
1828 Technology Council
1842 Secretary of Commerce and Trade; Innovative Technology Authority
2104 Computer trespass; penalties
2312 Local technology zone

House Joint Resolutions (9):

188 Telecommunications services
276 Study; DIT computerized public access of legislative information
447 Study; Science and Technology Task Force
453 Agency pollution prevention planning
482 Study; access to Internet
516 Study; advanced information and communications technologies
617 Study; licensing radiologic technology practitioners
640 Study; Geographic Information Network
714 Study; advance information and communications technologies

House Document (1):

15 Internet, Assessing Need to Establish Protocols and Guidelines Regarding In-State Access to Myriad Files and Components Available Through

Senate Bills (5):

841 Council on Information Management
912 Contracts for local purchase of computers, software, etc.
975 Telephones and electronic communications systems in classrooms
985 Assistive Technology Loan Authority and Fund
993 Computer trespass; penalties

Senate Joint Resolutions (2):

333 Study; Assistive Technology Loan Program Task Force
352 Study; educational technology funding

Senate Document (1):

40 Government Information Policy, Current Statutes Governing

1994 Session

House Bills (18):

325 Recycling technologies; examine measures to enhance
395 Electronic securities business; regulated
583 Information technology equipment
583 Information technology equipment; fees for support thereof
656 Technology Infrastructure Board and Fund; created
725 Biotechnology Research Act; created
756 Telecommunication service companies; taxation
777 Computer Disclosure laws
778 Polygraph test; prohibition on use
809 Computer software; penalties
854 Children born from assisted conception
872 Home/electronic incarceration
906 Telecommunications goods and services
1199 Technology Council; created

1215 Pollution prevention planning by state agencies
1217 Technology Council; created
1221 Pollution prevention within state agencies
1251 Pollution prevention programs

House Joint Resolutions (8):
76 Internet
109 Infrastructure; Council of Information Management task force to develop statewide information infrastructure strategy
174 DNA analyses
175 Toxic substances data base
188 Telecommunications services; expressing sense of General Assembly concerning need to promote development of market environment
190 Study; Radiologic Technology Practitioners
247 Emissions inspections
276 Legislative information

House Documents (2):
31 Biotechnology Research Act
43 Underground Utility Damage Prevention Act

Senate Bills (4):
30 Home/electronic incarceration
120 Toxic substances data base
312 Technology Council; created
457 Technology Infrastructure Board and Fund; created

Senate Joint Resolutions (2):
157 Study; Educational technology funding and dissemination
173 Study; Pollution Prevention

Senate Document (1):
59 Report; Pollution Prevention

1993 Session

House Bills (4):
1431 Technology Council; created
1528 Electric cooperatives
1988 Biotechnology Research Park Authority Act; created
2136 Telecommunication devices and service; penalty for obtaining through fraudulent means

House Joint Resolutions (6):
390 Science and Technology Task Force established
457 NASA Space Station Freedom Program
516 Biotechnology regulatory framework and model legislation

556 Government information and public records
645 Model Energy Code
665 Study licensing of radiological technology practitioners

House Document (1):
66 Engineering and Technology Programs in Southside Virginia

Senate Bills (2):
322 Freedom of Information Act and records on computer or electronic data processing equipment
532 Innovative Technology Authority Act; purpose

Senate Joint Resolutions (3):
221 Waterworks Technical Assistance Fund
238 Government information and public records
278 Electric transmission lines, high voltage

Senate Document (1):
16 Innovative Technology, Performance and Potential of Center for

1992 Session

House Bills (4):
295 Freedom of Information Act; telecommunications systems
297 Freedom of Information Act; applicability to electronic meetings
1006 Licenses, taxes; computer electronic systems
1170 Telecommunications relay services; provisions

House Joint Resolutions (3):
138 Center for Innovative Technology; study
212 Communications network systems
217 Technical training; plan

House Document (1):
2 Experimental Technologies, Possible Establishment and Implementation of Appeals Process for Insureds Denied Coverage For

Senate Bills (9):
153 Privacy Protection Act; information systems
168 Telecommunications Board; members, duties
332 Freedom of Information Act; records on computer or electronic data
357 Child pornography; penalty for use of communications system
361 Freedom of Information Act; applicability to electronic meetings
443 World Technology Fair Commission; created
475 Licensing, Taxes; computer and electronic systems, sciences, etc.
494 Technology Council; created

509 Small Business Technical and Environmental Compliance Assistance Program; created

Senate Document (1):

13 Teleconferencing by Public Bodies

*Based on the researchers' subjective review of the Final Cumulative Index of Bills, Joint Resolutions, Resolutions, and Documents, 1992-1997. Key words such as "computers" and "telecommunications" readily identified science or technology content. However, bills, joint resolutions, resolutions, and documents were not read individually. Also note that some bills were passed by the General Assembly and some were not.

APPENDIX 6.
RECOMMENDED LEGISLATION,
1997 SESSION OF THE GENERAL ASSEMBLY

House Bill No. 2138: Joint Commission on Technology and Science. Creates the Joint Commission on Technology and Science as a permanent legislative agency. The Commission will consist of 9 legislators, 5 from the House of Delegates (appointed by the Speaker) and 4 from the Senate (appointed by the Senate Committee on Privileges and Elections). The Commission shall generally study all aspects of technology and science and endeavor to stimulate, encourage, promote, and assist in the development of technology and science in the Commonwealth and sound public policies related thereto. Passed as Chapter 847.

House Joint Resolution No. 444: Study; Commonwealth's public library system. Requests the Library of Virginia to develop a strategic information technology plan for the Commonwealth's public library system. Passed.

House Joint Resolution No. 498: Study; science and technology. Continues the joint legislative subcommittee studying science and technology. Passed.

House Joint Resolution No. 635: Study; Commonwealth's telecommunications system. Requests the State Corporation Commission (SCC) to (i) continue its efforts to open up competition in the local exchange market between telephone, cable, and other communications companies by studying certain issues related to the Commonwealth's telecommunications system and (ii) encourage the evolution of a telecommunications system which offers reasonable and affordable prices to Virginia's schools and libraries by monitoring and participating in FCC universal service proceedings and initiating such intrastate proceedings as may be required. Passed.

Senate Bill No. 923: Trade and commerce; digital signatures. Provides legal recognition for digital signatures; allows digital signatures to serve in place of notarized or acknowledged signatures when filing documents with executive agencies of the Commonwealth; and requires the Council on Information Management to promulgate regulations on or before September 1, 1998, on the use of digital signatures. Passed.

Senate Joint Resolution No. 218: Study; need for certain high-technology workers. Requests the State Council of Higher Education for Virginia (SCHEV) to examine the demand for computer scientists, engineers, and other technologically skilled workers in Virginia industry. The State Council is to assess employment needs for these technologically skilled workers in Virginia industry and to review and propose actions the Commonwealth, institutions of higher education, and the private sector might take to increase the number of enrollments and graduates in programs leading to technological competence, including but not limited to computer science, engineering and related fields. Passed.

Senate Joint Resolution No. 226: Study; scientific and technological assets. Expresses the sense of the General Assembly in connection with certain emerging scientific and technological

assets located in the Commonwealth and requests the Center for Innovative Technology to report on the status of such assets. These assets include the Applied Research Center, Biotechnology Research Park, Biotech Infomatics Center, Free Electron Laser, Langley Full-Scale Wind Tunnel, Smart Roads Project, Virginia Institute for Micro-Electronics, Virginia Modeling and Simulation Center, Virtual Reality Center, and Wallops Island Space Flight Facility. Passed.

970828408

HOUSE BILL NO. 2138

Offered January 16, 1997

A BILL to amend the Code of Virginia by adding in Title 30 a chapter numbered 11, consisting of sections numbered 30-85 through 30-88, relating to the Joint Commission on Technology and Science.

Patrons-- Plum, Bennett, Diamonstein and Scott; Senators: Newman, Stosch and Ticer

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Referred to Committee on Rules

Be it enacted by the General Assembly of Virginia:

1. That the Code of Virginia is amended by adding in Title 30 a chapter numbered 11, consisting of sections numbered 30-85 through 30-88, as follows:

CHAPTER 11.
JOINT COMMISSION ON TECHNOLOGY AND SCIENCE.

§30-85. Commission established; powers and duties.

The Joint Commission on Technology and Science (the "Commission") is hereby established as a permanent legislative agency of the Commonwealth. The Commission shall generally study all aspects of technology and science and endeavor to stimulate, encourage, promote, and assist in the development of technology and science in the Commonwealth and sound public policies related thereto. In addition, the Commission shall:

1. Evaluate the impact of existing statutes and proposed legislation related to technology and science in the Commonwealth;

2. Advise the General Assembly, Governor, and agencies, authorities, and institutions of the Commonwealth upon matters related to technology and science;

3. Investigate, research, and consider such issues related to technology and science as may be requested by the General Assembly or the Commission;

4. Make recommendations to the General Assembly and the Governor;

5. Consult with appropriate entities, public or private, on matters related to technology and science under the Commission's consideration;

6. Encourage research and development in technology and science;

7. Effectively disseminate to and receive proposals from appropriate entities, public or private, related to technology and science;

8. Coordinate its efforts with and assist the efforts of other agencies, authorities, and institutions of the Commonwealth;

9. Actively seek federal or other funds to carry out its purposes; and

10. Annually report its findings and recommendations to the General Assembly and Governor.

§30-86. Membership; terms; vacancies; chairman and vice chairman; expenses.

A. The Commission shall be composed of nine members, five of whom shall be appointed by the Speaker of the House of Delegates from the membership thereof and four of whom shall be appointed by the Senate Committee on Privileges and Elections from the membership of the Senate.

B. All appointments shall be for terms of four years. Vacancies occurring other than by expiration of term shall be filled for the unexpired term. Whenever any legislative member fails to retain his membership in the house from which he was appointed, he shall relinquish his membership on the Commission and the appointing authority who appointed such member shall make an appointment from his respective house to complete the term. Any member may be reappointed for successive terms. The Commission shall annually elect a chairman and a vice chairman from among its membership.

C. Commission members shall receive compensation as provided in §14.1-18 and shall be reimbursed from funds appropriated or otherwise available to the Commission for reasonable and necessary expenses incurred in the performance of their duties.

§30-87. Staff; cooperation and assistance.

Staff assistance shall be provided to the Commission by the Division of Legislative Services. All agencies, authorities, and institutions of the Commonwealth shall cooperate and provide such assistance to the Commission as the Commission may request.

§30-88. Advisory committees.

The Commission may establish advisory committees composed of persons with expertise in the matters under consideration by the Commission. Such persons shall serve without compensation but shall be entitled to be reimbursed from funds appropriated or otherwise available to the Commission for reasonable and necessary expenses incurred in the performance of their duties.

CHAPTER 847

An Act to amend the Code of Virginia by adding in Title 30 a chapter numbered 11, consisting of sections numbered 30-85 through 30-88, relating to the Joint Commission on Technology and Science.

{H 2138}

Approved April 2, 1997

Be it enacted by the General Assembly of Virginia:

1. That the Code of Virginia is amended by adding in Title 30 a chapter numbered 11, consisting of sections numbered 30-85 through 30-88, as follows:

CHAPTER 11.

JOINT COMMISSION ON TECHNOLOGY AND SCIENCE.

§ 30-85. Commission established; powers and duties.

The Joint Commission on Technology and Science (the "Commission") is hereby established as a permanent legislative agency of the Commonwealth. The Commission shall generally study all aspects of technology and science and endeavor to stimulate, encourage, promote, and assist in the development of technology and science in the Commonwealth and sound public policies related thereto. In addition, the Commission shall:

1. Evaluate the impact of existing statutes and proposed legislation related to technology and science in the Commonwealth;

2. Advise the General Assembly, Governor, and agencies, authorities, and institutions of the Commonwealth upon matters related to technology and science;

3. Investigate, research, and consider such issues related to technology and science as may be requested by the General Assembly or determined by the Commission;

4. Make recommendations to the General Assembly and the Governor;

5. Consult with appropriate entities, public or private, on matters related to technology and science under the Commission's consideration;

6. Encourage research and development in technology and science;

7. Solicit input from appropriate entities, public or private, on issues related to technology and science;

8. Coordinate its efforts with and assist the efforts of other agencies, authorities, and institutions of the Commonwealth;

9. Accept private or public funds to carry out its purposes; and

10. Annually report its findings and recommendations to the General Assembly and Governor.

§ 30-86. Membership; terms; vacancies; chairman and vice chairman; expenses.

A. The Commission shall be composed of nine members, five of whom shall be appointed by the Speaker of the House of Delegates from the membership thereof and four of whom shall be appointed by the Senate Committee on Privileges and Elections from the membership of the Senate.

B. All appointments shall be for terms of four years. Vacancies occurring other than by expiration of term shall be filled for the unexpired term. Whenever any legislative member fails to retain his membership in the house from which he was appointed, he shall relinquish his membership on the Commission and the appointing authority who appointed such member shall make an appointment from his respective house to complete the term. Any member may be reappointed for successive terms. The Commission shall annually elect a chairman and a vice chairman from among its membership.

C. Commission members shall receive compensation as provided in § 14.1-18 and shall be reimbursed from funds appropriated or otherwise available to the Commission for reasonable and necessary expenses incurred in the performance of their duties.

§ 30-87. Staff; cooperation and assistance.

Staff assistance shall be provided to the Commission by the Division of Legislative Services. All agencies, authorities, and institutions of the Commonwealth shall cooperate and provide such assistance to the Commission as the Commission may request.

§ 30-88. Advisory committees.

The Commission may establish advisory committees composed of persons with expertise in the matters under consideration by the Commission. Such persons shall serve without compensation, but shall be entitled to be reimbursed from funds appropriated or otherwise available to the Commission for reasonable and necessary expenses incurred in the performance of their duties.

970831408

HOUSE JOINT RESOLUTION NO. 444

Offered January 14, 1997

Requesting The Library of Virginia to develop a five-year strategic information technology plan for the Commonwealth's public library system.

Patrons-- Scott, Almand, Bennett, Connally, Darner, Diamonstein, Dillard, Hull, Lovelace, May, McClure, Mims, Moran, O'Brien, Plum, Puller, Rust and Van Landingham; Senators: Howell, Newman, Stosch, Ticer, Waddell and Whipple

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Referred to Committee on Rules

WHEREAS, "universal access" is the long-term public policy goal of making the information highway accessible to all citizens of the Commonwealth for no more than the cost of a local phone call; and

WHEREAS, the Virginia Library and Information Network (VLIN), administered by The Library of Virginia, is a statewide electronic network which links Virginia's public libraries to each other and the Internet; and

WHEREAS, VLIN information is presented in text-only format (i.e., no maps, graphics, pictures, etc.), and access to VLIN, obtained through a local phone call or toll-free 800 number, is restricted to library staff; and

WHEREAS, public access to the Internet through VLIN is "mediated," which means that a library patron must give an Internet research request to a librarian, who, in turn, accesses the Internet through VLIN; and

WHEREAS, a handful of Virginia's public libraries provide direct dial-up service to the Internet through a modem connected to patrons' personal home computers; and

WHEREAS, other local libraries have chosen to provide direct public access to the Internet by placing personal computers in public areas of their libraries; and

WHEREAS, a recent survey by The Library of Virginia revealed that, statewide, Virginia's public libraries have only 351 personal computers available to serve a total state population of 3,481,900 and that nearly half of those computers (151) are available at the Norfolk Public Library as a result of a private donation; and

WHEREAS, The Library of Virginia's survey dramatically illustrates the point that achieving the goal of "universal access" to the information highway requires physical infrastructure like hardware (e.g., computers, servers, workstations, printers, and routers), software (e.g., Internet

browser), user training and staff development, and funding for support and maintenance expenses; and

WHEREAS, in 1989, Maryland published Toward the Year 2000: A Strategic Plan for the Maryland State Library Network, and in 1995, Maryland's "Sailor" project grew to become a statewide telecommunications network which enables Maryland residents to access the Internet from their personal home computers via a modem and a toll-free telephone call into the Maryland public library system; and

WHEREAS, Maryland's Sailor project may serve as a model for Virginia's public library system to help achieve the goal of "universal access" in the Commonwealth; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That The Library of Virginia be requested to develop a five-year strategic information technology plan for the Commonwealth's public library system and to identify how that system will contribute towards achieving the goal of "universal access." The plan should include specific findings and recommendations and the projected costs thereof, such as the minimum technological standards for Virginia's public libraries (e.g., per capita ratio of computer workstations to population served).

Assistance may be provided to The Library of Virginia by the joint subcommittee on science and technology created by House Joint Resolution 195 (1996) or a successor joint subcommittee or entity thereof. Upon request, all agencies of the Commonwealth shall provide assistance to The Library of Virginia for this study.

The Library of Virginia shall complete its work in time to submit its findings and recommendations on or before November 15, 1997, to the joint subcommittee on science and technology created by House Joint Resolution 195 (1996) or a successor joint subcommittee or entity thereof and shall also submit its findings and recommendations to the Governor and the 1998 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

HOUSE JOINT RESOLUTION NO. 444

Requesting The Library of Virginia to develop a strategic information technology plan for the Commonwealth's public library system.

Agreed to by the House of Delegates, February 20, 1997
Agreed to by the Senate, February 19, 1997

WHEREAS, "universal access" is the long-term public policy goal of making the information highway accessible to all citizens of the Commonwealth for no more than the cost of a local phone call; and

WHEREAS, the Virginia Library and Information Network (VLIN), administered by The Library of Virginia, is a statewide electronic network which links Virginia's public libraries to each other and the Internet; and

WHEREAS, VLIN information is presented in text-only format (i.e., no maps, graphics, pictures, etc.), and access to VLIN, obtained through a local phone call or toll-free 800 number, is restricted to library staff; and

WHEREAS, public access to the Internet through VLIN is "mediated," which means that a library patron must give an Internet research request to a librarian, who, in turn, accesses the Internet through VLIN; and

WHEREAS, a handful of Virginia's public libraries provide direct dial-up service to the Internet through a modem connected to patrons' personal home computers; and

WHEREAS, other local libraries have chosen to provide direct public access to the Internet by placing personal computers in public areas of their libraries; and

WHEREAS, a recent survey by The Library of Virginia revealed that, statewide, Virginia's public libraries have only 351 personal computers available to serve a total state population of 3,481,900 and that nearly half of those computers (151) are available at the Norfolk Public Library as a result of a private donation; and

WHEREAS, The Library of Virginia's survey dramatically illustrates the point that achieving the goal of "universal access" to the information highway requires physical infrastructure like hardware (e.g., computers, servers, workstations, printers, and routers), software (e.g., Internet browser), user training and staff development, and funding for support and maintenance expenses; and

WHEREAS, in 1989, Maryland published Toward the Year 2000: A Strategic Plan for the Maryland State Library Network, and in 1995, Maryland's "Sailor" project grew to become a statewide telecommunications network which enables Maryland residents to access the Internet from their personal home computers via a modem and a toll-free telephone call into the Maryland public library system; and

WHEREAS, Maryland's "Sailor" project may serve as a model for Virginia's public library system to help achieve the goal of "universal access" in the Commonwealth; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That The Library of Virginia be requested to develop a strategic information technology plan for the Commonwealth's public library system. In addition, the Library shall identify how that system will contribute towards achieving the goal of "universal access." The plan should include specific findings and recommendations and the projected costs thereof, such as the minimum technological standards for Virginia's public libraries (e.g., per capita ratio of computer workstations to population served).

Assistance may be provided to The Library of Virginia by the joint subcommittee on science and technology created by House Joint Resolution No. 195 (1996) or a successor joint subcommittee or entity thereof. All agencies of the Commonwealth shall provide assistance to The Library of Virginia for this study, upon request. The Library of Virginia Foundation is authorized to accept and expend gifts, grants, donations, or in-kind contributions made to assist the Library's efforts to develop a strategic information technology plan for the Commonwealth's public library system.

The Library of Virginia shall provide an interim report of its findings and recommendations on or before November 15, 1997, to the joint subcommittee on science and technology created by House Joint Resolution No. 195 (1996) or a successor joint subcommittee or entity thereof and shall also submit its final findings and recommendations to the Governor and the 1999 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

970829408

HOUSE JOINT RESOLUTION NO. 498

Offered January 16, 1997

Continuing the joint subcommittee studying science and technology pursuant to House Joint Resolution No. 195 (1996).

Patrons-- Plum, Bennett, Diamonstein and Scott; Senators: Newman, Stosch and Ticer

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Referred to Committee on Rules

WHEREAS, House Joint Resolution No. 390 (1993) established a 23-member Science and Technology Task Force to report on the status of the recommendations of the 1983 Governor's Task Force on Science and Technology, to coordinate the development of a statewide strategic plan for science and technology, and to examine whether a permanent council on science and technology should be created; and

WHEREAS, House Joint Resolution No. 447 (1995) continued the task force for an additional year and expanded its initial mission to include consideration of recent and ongoing initiatives and recommendations of other organizations and task forces that were focusing on science and technology issues in the Commonwealth and to study opportunities and incentives for information and communications technology to meet public needs; and

WHEREAS, the task force's final report was published as House Document No. 46 (1996); and

WHEREAS, House Joint Resolution No. 195 (1996) established a Joint Subcommittee on Science and Technology comprised of eight legislators and five ex officio members to continue and expand the work of the task force and enumerated nine study objectives related to science and technology; and

WHEREAS, the joint subcommittee was assisted in its work by nearly 100 persons with expertise in the matters under consideration by the joint subcommittee who served without compensation on seven technical advisory committees; and

WHEREAS, legislative members of the joint subcommittee served as liaisons to each technical advisory committee and primary staff was assigned from among the Commonwealth's agencies and institutions most closely associated with particular issues; and

WHEREAS, the joint subcommittee has determined that further study is needed; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the joint subcommittee established to study science and technology pursuant to House Joint Resolution No. 195 (1996) be continued for an additional year of study. The joint subcommittee shall:

1. Assist with studies to be conducted by the State Corporation Commission, the Library of Virginia, and the Center for Innovative Technology and the State Council of Higher Education in Virginia on, respectively, certain issues related to the Commonwealth's telecommunications system, the development of a five-year strategic information technology plan for the Commonwealth's public library system, and the most effective and efficient means of developing a technology-literate workforce in the Commonwealth;

2. Monitor the study by the Joint Legislative Audit and Review Commission (JLARC) of the Commonwealth's data processing and related services as directed by Item 14 of the 1996-98 Appropriation Act; and

3. Work with representatives of the practicing bar, the technology industry, academics, and other legal experts to: (i) examine and formulate the public policy of the Commonwealth as it affects technological commerce and the impact of technological advances on the criminal and civil justice systems; (ii) monitor the work being done on the federal level and in other states, in particular as those activities address regulation of Internet use and access, development of new criminal offenses, use of existing technology to create savings, and efficient use of judicial resources; (iii) identify areas where the civil and criminal procedural and substantive law has not kept pace with technology; and (iv) make recommendations for statutory changes which reflect the public policy of the Commonwealth and ensure the continued integrity, efficiency, and fairness of Virginia's legal system.

The membership of the subcommittee shall continue as established by House Joint Resolution No. 195 (1996). Vacancies shall be filled by the Speaker of the House of Delegates and the Senate Committee on Privileges and Elections, as appropriate. The subcommittee may establish technical advisory committees as provided for in House Joint Resolution No. 195 (1996).

The direct costs of this study shall not exceed $7,000. An additional $1,000 shall be allocated for materials and resources, which shall be funded from the operational budget of the Clerk of the House of Delegates.

The Division of Legislative Services shall provide staff support for the study. Additional assistance shall be provided by the Center for Innovative Technology, Council on Information Management, Department of Education, Department of Information Technology, Office of the Attorney General, State Corporation Commission, State Council of Higher Education in Virginia, Supreme Court of Virginia, relevant committees of the Virginia State Bar, and the staffs of the House Committee on Appropriations and the Senate Committee on Finance.

All agencies of the Commonwealth shall provide assistance to the joint subcommittee, upon request.

The joint subcommittee shall complete its work in time to submit its findings and recommendations to the Governor and the 1998 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

Implementation of this resolution is subject to subsequent approval and certification by the Joint Rules Committee. The Committee may withhold expenditures or delay the period for the conduct of the study.

HOUSE JOINT RESOLUTION NO. 498

Continuing the Joint Subcommittee Studying Science and Technology pursuant to House Joint Resolution No. 195 (1996).

Agreed to by the House of Delegates, January 31, 1997
Agreed to by the Senate, February 19, 1997

WHEREAS, House Joint Resolution No. 390 (1993) established a 23-member Science and Technology Task Force to report on the status of the recommendations of the 1983 Governor's Task Force on Science and Technology, to coordinate the development of a statewide strategic plan for science and technology, and to examine whether a permanent council on science and technology should be created; and

WHEREAS, House Joint Resolution No. 447 (1995) continued the task force for an additional year and expanded its initial mission to include consideration of recent and ongoing initiatives and recommendations of other organizations and task forces that were focusing on science and technology issues in the Commonwealth and to study opportunities and incentives for information and communications technology to meet public needs; and

WHEREAS, the task force's final report was published as House Document No. 46 (1996); and

WHEREAS, House Joint Resolution No. 195 (1996) established a Joint Subcommittee on Science and Technology comprised of eight legislators and five ex officio members to continue and expand the work of the task force and enumerated nine study objectives related to science and technology; and

WHEREAS, the joint subcommittee was assisted in its work by nearly 100 persons with expertise in the matters under consideration by the joint subcommittee who served without compensation on seven technical advisory committees; and

WHEREAS, legislative members of the joint subcommittee served as liaisons to each technical advisory committee and primary staff and were assigned from among the Commonwealth's agencies and institutions most closely associated with particular issues; and

WHEREAS, the joint subcommittee has determined that further study is needed; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Joint Subcommittee Studying Science and Technology pursuant to House Joint Resolution No. 195 (1996) be continued for an additional year of study. The joint subcommittee shall:

1. Assist with studies to be conducted by the State Corporation Commission, The Library of Virginia, and the Center for Innovative Technology and the State Council of Higher Education for Virginia on, respectively, certain issues related to the Commonwealth's telecommunications system, the development of a five-year strategic information technology plan for the

Commonwealth's public library system, and the most effective and efficient means of developing a technology-literate workforce in the Commonwealth;

2. Monitor the study by the Joint Legislative Audit and Review Commission (JLARC) of the Commonwealth's data processing and related services as directed by Item 14 of the 1996-98 Appropriation Act; and

3. Work with representatives of the practicing bar, the technology industry, academics, and other legal experts to: (i) examine and formulate the public policy of the Commonwealth as it affects technological commerce and the impact of technological advances on the criminal and civil justice systems; (ii) monitor the work being done on the federal level and in other states, in particular as those activities address regulation of Internet use and access, development of new criminal offenses, use of existing technology to create savings, and efficient use of judicial resources; (iii) identify areas where the civil and criminal procedural and substantive law has not kept pace with technology; and (iv) make recommendations for statutory changes which reflect the public policy of the Commonwealth and ensure the continued integrity, efficiency, and fairness of Virginia's legal system.

The membership of the subcommittee shall continue as established by House Joint Resolution No. 195 (1996). Vacancies shall be filled by the Speaker of the House of Delegates and the Senate Committee on Privileges and Elections, as appropriate. The subcommittee may establish technical advisory committees as provided for in House Joint Resolution No. 195 (1996).

The direct costs of this study shall not exceed $7,000. An additional $1,000 shall be allocated for materials and resources, which shall be funded from the operational budget of the Clerk of the House of Delegates.

The Division of Legislative Services shall provide staff support for the study. Additional assistance shall be provided by the Center for Innovative Technology, Council on Information Management, Department of Education, Department of Information Technology, Office of the Attorney General, State Corporation Commission, State Council of Higher Education for Virginia, Supreme Court of Virginia, relevant committees of the Virginia State Bar, and the staffs of the House Committee on Appropriations and the Senate Committee on Finance.

All agencies of the Commonwealth shall provide assistance to the joint subcommittee, upon request.

The joint subcommittee shall complete its work in time to submit its findings and recommendations to the Governor and the 1998 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

Implementation of this resolution is subject to subsequent approval and certification by the Joint Rules Committee. The Committee may withhold expenditures or delay the period for the conduct of the study.

970830408

HOUSE JOINT RESOLUTION NO. 635

Offered January 20, 1997

Requesting the State Corporation Commission to continue its efforts to open up competition in the local exchange market between telephone, cable, and other communications companies by studying certain issues related to the Commonwealth's telecommunications system.

Patrons-- Bennett, Plum and Scott; Senators: Stosch and Ticer

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Referred to Committee on Corporations, Insurance and Banking

WHEREAS, there exists a need for the Commonwealth to foster and encourage the evolution of a telecommunications system which offers reasonable and affordable prices to Virginia's schools, institutions of higher education, and state and local governments; and

WHEREAS, on February 8, 1996, Congress passed the Telecommunications Act of 1996 ("TA 1996"), which is designed to open up competition in the local exchange market between telephone, cable, and other communications companies, primarily through the use of interconnectivity agreements negotiated by each states' public utility commission; and

WHEREAS, on August 8, 1996, the Federal Communications Commission (FCC) promulgated 700 pages of rules implementing TA 1996; and

WHEREAS, the FCC's rules include the rates which can be charged by local exchange companies for interconnectivity agreements; and

WHEREAS, lawsuits challenging the FCC's rules have been filed in several federal courts; and

WHEREAS, on October 15, 1996, the Eighth Federal Circuit Court of Appeals issued an injunction in a consolidated appeal which stayed the implementation of certain portions of the FCC's rules until their legality is decided; and

WHEREAS, TA 1996 created the "Federal-State Universal Service Joint Board" and directed the board to make recommendations to the FCC on how "universal service" should be defined, what basic services should be included in "universal service," and when the goal of TA 1996 to achieve "universal service" should be completed; and

WHEREAS, the board's recommendations, issued November 7, 1996, included a proposal to provide discounts of 40 to 90 percent for approximately 97 percent of the country's grade schools, at a cost capped at $2.25 billion per year; and

WHEREAS, the media reported that this proposal was in response to President Clinton's support, during a campaign speech in mid-October 1996, for giving schools and public libraries free basic access to the Internet through an "E" ("education") rate; and

WHEREAS, final implementation rules are due from the FCC by May 8, 1997; and

WHEREAS, since 1995, the State Corporation Commission (SCC) has practiced "rate cap" (or "price cap") regulation among several of Virginia's large local exchange companies (Bell Atlantic, Sprint Centel, and United Telephone); and

WHEREAS, through rate cap (or price cap) regulation, the SCC establishes caps on the rates (or prices) that local exchange companies may charge for basic telephone services but, in return, imposes no restrictions on a company's revenues and earnings; and

WHEREAS, the SCC categorizes telephone services of large local exchange companies into three categories--basic, discretionary, and competitive--based on the nature and competitiveness of each service; and

WHEREAS, the SCC has traditionally allowed only two classes of service: "residential" and "all other" (commonly referred to as "business"); and

WHEREAS, all government agencies and institutions (e.g., schools and libraries) fall into the business rate category; and

WHEREAS, §56-234 exempts services to state government from SCC regulation; and

WHEREAS, language in the 1996-98 Budget Bill deems "communications services into public schools which are used for educational technology" as "state government" for purposes of §§56-232 and 56-234 of the Virginia Code (see Item 140C.11.f1 of Chapter 912 of the 1996 Acts of Assembly); and

WHEREAS, the SCC's authority to establish other classes of service or to provide discounted rates may also be limited by §56-234 of the Virginia Code, which requires utilities to charge uniform rates under "like conditions" to prevent rate discrimination; and

WHEREAS, to date, the SCC has recognized only two "like conditions": "residential" and "all other"; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the SCC be requested to continue its efforts to open up competition in the local exchange market between telephone, cable, and other communications companies by studying by studying certain issues related to the Commonwealth's telecommunications system. Specifically, the SCC is requested to study the effectiveness of its current rate cap (or price cap) regulation among Virginia's local exchange companies by updating its previous studies on this issue. (See the evaluation of the SCC's experimental regulatory plan in case number PUC 920029, final order issued December 17,

1993, and the implementation of the SCC's alternative regulatory method in case number PUC 930036, final order issued October 18, 1994.) The SCC is also requested to study the feasibility, projected costs, and statutory or other impediments of establishing (i) an "E" ("education") rate for the Commonwealth's schools, colleges, universities, and libraries; (ii) a "G" ("government") rate for the Commonwealth's schools, colleges, universities, libraries, and all other state and local government agencies; and (iii) discounts for the Commonwealth's schools, colleges, universities, libraries, and all other state and local government agencies and the effect of the Telecommunications Act of 1996 and the Federal Communication Commission's implementation rules upon these approaches.

Assistance may be provided to the SCC by the joint subcommittee on science and technology created by House Joint Resolution 195 (1996) or a successor joint subcommittee or entity thereof. Upon request, all agencies of the Commonwealth shall provide assistance to the SCC for this study.

The SCC shall complete its work in time to submit its findings and recommendations on or before November 15, 1997, to the joint subcommittee on science and technology created by House Joint Resolution 195 (1996) or a successor joint subcommittee or entity thereof and shall also submit its findings and recommendations to the Governor and the 1998 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

HOUSE JOINT RESOLUTION NO. 635

Requesting the State Corporation Commission to continue its efforts to open up competition in the Virginia local and long distance telecommunications markets and to foster and encourage the evolution of a telecommunications system which offers reasonable and affordable prices to Virginia's schools and libraries by monitoring and participating in the Federal Communications Commission universal service proceedings and initiating such intrastate proceedings as may be required.

Agreed to by the House of Delegates, February 4, 1997
Agreed to by the Senate, February 19, 1997

WHEREAS, there exists a need for the Commonwealth to foster and encourage the evolution of a telecommunications system which offers reasonable and affordable prices to Virginia's schools and libraries; and

WHEREAS, on February 8, 1996, Congress passed the Telecommunications Act of 1996 (TA 1996), which is designed to open up competition in the local exchange market between telephone, cable, and other communications companies, primarily through the use of interconnection agreements approved by each state's public utility commission, and to permit local exchange companies such as Bell Atlantic and GTE to compete in the long distance markets; and

WHEREAS, on August 8, 1996, the Federal Communications Commission (FCC) promulgated 700 pages of rules implementing TA 1996; and

WHEREAS, TA 1996 created the Federal-State Universal Service Joint Board and directed the board to make recommendations to the FCC on how "universal service" should be defined, what basic services should be included in universal service, and when the TA 1996 goal to achieve universal service should be completed; and

WHEREAS, the board's recommendations, issued November 7, 1996, included a proposal to provide discounts of 40 to 90 percent for approximately 97 percent of the country's grade schools, at a cost capped at $2.25 billion per year; and

WHEREAS, the media reported that this proposal was in response to President Clinton's support, during a campaign speech in mid-October 1996, for giving schools and public libraries free basic access to the Internet through an "E" (education) rate; and

WHEREAS, final rules to implement the Universal Service Fund are due from the FCC by May 8, 1997; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the State Corporation Commission (SCC) be requested to continue its efforts to open up competition in the Virginia local and long distance telecommunications markets between telephone, cable and other communications companies. The SCC is also requested to monitor and participate in all FCC

universal service proceedings to attempt to ensure that the Commonwealth's schools, colleges, universities, libraries, and all other state and local government agencies receive the full benefits of the FCC's Universal Service Fund rules. The SCC should further attempt to ensure that any funding mechanism developed by the FCC to pay for the discounts available under the Universal Service Fund does not unreasonably export money from Virginia to the disadvantage of Virginias. In addition, the SCC is requested to take such steps as are necessary to carry out its responsibilities in implementing discounts to schools and libraries as required by TA 1996 and the FCC, including initiating such intrastate proceedings as may be required.

Assistance may be provided to the SCC by the Joint Subcommittee on Science and Technology created by House Joint Resolution No. 195 (1996) or a successor joint subcommittee or entity thereof. All agencies of the Commonwealth shall provide assistance to the SCC, upon request.

The SCC shall report its findings and recommendations on or before November 15, 1997, to the Joint Subcommittee on Science and Technology, or a successor joint subcommittee or entity thereof, and shall also submit its findings and recommendations to the Governor and the 1998 Session of the General Assembly as provided in the procedures of the division of Legislative Automated Systems for the processing of legislative documents.

978008408

SENATE BILL NO. 923

Offered January 15, 1997

A BILL to amend and reenact §§ 2.1-66 and 2.1-68 of the Code of Virginia and to amend the Code of Virginia by adding in Title 59.1 a chapter numbered 39, consisting of sections numbered 59.1-467 through 59.1-471, relating to trade and commerce; digital signatures.

Patrons-- Ticer, Barry, Couric, Edwards, Howell, Miller, K.G., Newman, Quayle, Saslaw, Stosch and Waddell; Delegates: Bennett, Diamonstein, Plum, Scott and Van Landingham

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Referred to the Committee on Commerce and Labor

Be it enacted by the General Assembly of Virginia:

1. That §§2.1-66 and 2.1-68 of the Code of Virginia are amended and reenacted and that the Code of Virginia is amended by adding in Title 59.1 a chapter numbered 39, consisting of sections numbered 59.1-467 through 59.1-471, as follows:

§2.1-66. Ex officio Secretary to Governor; in charge of division of records; information systems.

The Secretary of the Commonwealth, who shall be ex officio Secretary to the Governor, shall be in direct charge of the division of records, *and shall set standards and oversee policies and practices designed to ensure the reliability, accuracy, durability, and security of information systems within the executive department.*

§2.1-68. Keeper of seals of Commonwealth; duties generally.

~~He~~ *The Secretary of the Commonwealth* shall be keeper of the seals of the Commonwealth; keep a record of all executive acts, arrange and preserve all records and papers belonging to the executive ~~department~~ *branch*; be charged with the clerical duties of that department, and render to the Governor, in the dispatch of executive business, such services as he requires. ~~He shall;~~ record or register all papers or documents required by law to be registered or recorded in his office, and when required furnish a copy of any record in his office under the seal of the Commonwealth*; and make such rules and regulations as he deems appropriate to ensure the authenticity, integrity, confidentiality, and durability of electronic records created, sent or received from an agency.*

He is authorized to authenticate records of any court of the Commonwealth and of any department of the government. He shall keep a register of all city, incorporated town, county, and district officers, and when required give a certificate of the election and qualification of any such officer.

He shall make an annual report to the Governor, embracing (~~a~~*i*) the boards of visitors of all public institutions, and other boards appointed by the Governor; (~~b~~*ii*) all commissions issued under appointments made by the Governor, except commissions to notaries public; (*iii*) and such matters as the Governor requires. The reports shall be transmitted by the Governor to the General Assembly, printed as other such annual reports are printed, bound in a separate volume, and disposed of according to law.

CHAPTER 39.
DIGITAL SIGNATURES.

§59.1-467. Definitions.

As used in this chapter, the following words shall have the following meaning unless the context clearly indicates otherwise:

"Record" means information that is inscribed on a tangible medium or that is stored in an electronic or other medium and is retrievable in a perceivable form. The term "record" includes both electronic records and written records.

"Signed" or "signature" means any symbol or method executed or adopted by a party with present intention to be bound by or to authenticate a record, including electronic or digital methods.

§59.1-468. Admissibility of electronic record.

A. Where a law requires a writing or provides for certain consequences in the absence of a writing, that law is satisfied by an electronic record.

B. In any legal proceeding, nothing in the application of the rules of evidence shall apply so as to deny the admissibility of an electronic record into evidence on the sole ground that it is an electronic record or that the record has been retrieved in perceivable form. An electronic duplicate of a record, or any printout or other output in perceivable form, that accurately reproduces the original is admissible to the extent as the original record unless a genuine question is raised as to the authenticity of the original or in the circumstances it would be unfair to admit the duplicate in lieu of the original. In assessing the evidentiary weight of an electronic record, the trier of fact shall consider any relevant information or circumstances, including the manner in which the record was created, stored, and communicated and the reliability of the processes.

C. The recipient of a record may establish reasonable requirements with respect to the choice of medium, absent agreement to the contrary.

§59.1-469 Authentication of electronic signature.

A. Where law requires a signature, or provides for certain consequences in the absence of a signature, that law is satisfied by an electronic record.

B. In assessing whether an electronic signature was executed or adopted with respect to a record by a particular person, the trier of fact shall consider any relevant information or circumstances, including whether the electronic signature is unique to the signer, is capable of verification, is under the signer's sole control, is linked to the record in such a manner that if the data is changed the signature is invalidated, and whether the method used to create the signature was appropriately reliable for the purpose for which the electronic signature was used.

C. Where any law requires a signature to be notarized or acknowledged for filing with an agency, department, board, commission, authority, political subdivision, or other instrumentality of the Commonwealth, that law is satisfied by an electronic signature that meets standards established by the Secretary of the Commonwealth.

D. The recipient of a record may establish reasonable requirements with respect to the method used to sign the record.

§59.1-470. State agencies' use of digital signatures.

Every agency, department, board commission, authority, political subdivision or other instrumentality of the Commonwealth may create and receive electronic records in lieu of written records, and may also convert written records to electronic records and dispose of the written records as provided by the Secretary of the Commonwealth.

§59.1-471. Exceptions.

This chapter shall not apply when:

1. Its application would be inconsistent with the manifest intent of the parties; or

2. Its application would involve a construction of a law that is clearly inconsistent with the manifest intent of the law-making body or repugnant to the context of the same law, provided that the mere requirement of a "signature" or that a record be "signed" shall not by itself be sufficient to establish such intent.

2. That, on or before September 1, 1998, the Secretary of the Commonwealth shall adopt final regulations, pursuant to the Virginia Administrative Process Act (§9-6:14:1 et seq.), on the filing of records electronically as allowed by this act.

VIRGINIA ACTS OF ASSEMBLY -- CHAPTER ____

An Act to amend and reenact § 2.1-563.31 of the Code of Virginia and to amend the Code of Virginia by adding in Title 59.1 a chapter numbered 39, consisting of sections numbered 59.1-467, 59.1-468, and 59.1-469, relating to trade and commerce; digital signatures.

[S 923]

Approved

Be it enacted by the General Assembly of Virginia:

1. That §2.1-563.31 of the Code of Virginia is amended and reenacted and that the Code of Virginia is amended by adding in Title 59.1 a chapter numbered 39, consisting of sections numbered 59.1-467, 59.1-468, and 59.1-469 as follows:

§2.1-563.31. General powers of Council; powers and duties of Council.

A. The Council shall have the following general powers:

1. To make and enter into all contracts and agreements necessary or incidental to the performance of duties and the execution of its powers, including but not limited to contracts with the United States, other state agencies and governmental subdivisions of the Commonwealth.

2. To accept grants from the United States government and agencies and instrumentalities thereof and any source, other than any person, firm, or corporation, or director, officer, or agent thereof which manufactures or sells information technology equipment, goods or services. To these ends, the Council shall have the power to comply with such conditions and execute such agreements as may be necessary, convenient or desirable.

3. To prescribe regulations necessary or incidental to the performance of its duties or execution of its powers, *including such regulations as the Council deems appropriate concerning the use of digital signatures as provided in §59.1-469*; however, the provisions of the Administrative Process Act (§9-6.14:1 et seq.) shall not apply to such regulations.

B. The Council shall have the following powers and duties concerning the planning, budgeting, management and use of information technology resources. All agencies and institutions of higher education shall cooperate with the Council in the performance of its powers and duties:

1. To monitor trends and advances in information technology, to develop a comprehensive, statewide, four-year planning process, and plan for the acquisition, management, and use of information technology resources. The statewide plan shall be updated annually and submitted to the Governor. In developing and updating such plans, the Council shall consider the advice of the Department, and of agencies and institutions of higher education through the Advisory Committees to the Council provided for herein.

2. To provide agencies and institutions of higher education with information and guidelines in the development of information management plans and the preparation of budget requests for information technology resources.

3. To require agencies and institutions of higher education to submit information management plans to the Council and a copy to the Department. The Council shall have the authority to approve such plans and amendments thereto, including the Department's. All agencies and institutions of higher education shall maintain current information management plans which have been approved by the Council.

4. To monitor implementation of information management plans.

5. To direct the development and promulgation of policies, standards, and guidelines for managing information technology resources in the Commonwealth.

6. To review agency and institution budget requests for information technology resources and to recommend budget request priorities to the Department of Planning and Budget.

7. To direct the compilation and maintenance of an inventory of all information technology resources, including but not limited to personnel, facilities, equipment, goods and contracts for services.

8. To develop an approval process to ensure that all information technology procurements conform to the statewide information management plan and the information management plans of agencies and institutions of higher education. The Council shall be authorized to disapprove the procurements that do not conform to the statewide information management plan and the agency plans.

9. To establish statewide standards for the efficient exchange of electronic information and technology, including infrastructure, between the public and private sectors in the Commonwealth. In cooperation with the Division of Legislative Automated Systems, the Council shall also establish standards for public access to the Legislative Information System which standards shall include provisions for protecting the security and integrity of the system and the cost of public access.

10. To oversee and administer the Virginia Technology Infrastructure Fund created in Chapter 22.13 (§9-145.52 et seq.) of Title 9.

CHAPTER 39.
DIGITAL SIGNATURES.

§59.1-467. Definitions.

As used in this chapter, the following words shall have the following meanings unless the context clearly indicates otherwise:

"Digital signature" means an electronic identifier, created by a computer, intended by the party using it to have the same force and effect as the use of a manual signature.

"Signed" or "signature" means any symbol or method executed or adopted by a party with present intention to be bound by or to authenticate a record, including digital methods.

§59.1-468. Authentication of digital signatures.

A. Where law requires a signature, or provides for certain consequences in the absence of a signature, that law is satisfied by a digital signature.

B. In assessing whether a digital signature was executed or adopted with respect to a record by a particular person, the trier of fact may consider any relevant information or circumstances, including whether the digital signature is unique to the signer, is capable of verification, is under the signer's sole control, or is linked to the record in such a manner that if the data is changed the signature is invalidated, and whether the method used to create the signature was appropriately reliable for the purpose for which the digital signature was used.

§59.1-469. State agencies' use of digital signatures.

Every agency, department, board, commission, authority, political subdivision or other instrumentality of the Commonwealth may receive digital signatures in lieu of manual signatures, provided such digital signatures meet the standards established by the Council on Information Management. The use or acceptance of a digital signature shall be at the option of the parties. Nothing in this chapter shall require a public entity to use or permit the use of a digital signature.

2. That, on or before September 1, 1998, the Council on Information Management shall adopt final regulations on the use of digital signatures as authorized by this act.

970875408

SENATE JOINT RESOLUTION NO. 218

Offered January 9, 1997

Requesting the Center for Innovative Technology and the State Council of Higher Education to jointly study the most effective and efficient means of developing a technology-literate workforce in the Commonwealth.

Patrons-- Newman, Stosch and Ticer; Delegates: Bennett, Diamonstein, Plum and Scott

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Referred to the Committee on Rules

WHEREAS, there is a growing mismatch between the work skills needed by high-technology companies and the workforce available to provide those skills; and

WHEREAS, some people have suggested that Virginia's high-technology companies could hire 10,000 additional technology-literate employees today, if they could find such employees; and

WHEREAS, while Virginia's high-technology companies recruit employees from around the nation, it is difficult for such companies to compete with companies based in other technology-intensive locations such as California's Silicon Valley, Boston, Massachusetts, and Austin, Texas; and

WHEREAS, proficiency in Internet research, electronic mail, word processing, and database and spreadsheet programs is a prerequisite to becoming a technology-literate employee in the twenty-first century; and

WHEREAS, to provide the necessary computer training and equipment for all the Commonwealth's college students, teachers, principals, and guidance counselors may be an investment of millions of dollars and may return millions of dollars to the economy through wages and taxes; now, therefore, be it

RESOLVED by the Senate, the House of Delegates concurring, That the Center for Innovative Technology and the State Council of Higher Education be requested to jointly study the most effective and efficient means of developing a technology-literate workforce in the Commonwealth.

Assistance may be provided to the study by the joint subcommittee on science and technology created by House Joint Resolution 195 (1996) or a successor joint subcommittee or entity thereof. Upon request, all agencies of the Commonwealth shall provide assistance to the study.

The Center for Innovative Technology and the State Council of Higher Education shall complete their work in time to submit their findings and recommendations on or before November 15,

1997, to the joint subcommittee on science and technology created by House Joint Resolution 195 (1996) or a successor joint subcommittee or entity thereof and shall also submit their findings and recommendations to the Governor and the 1998 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

SENATE JOINT RESOLUTION NO. 218

Requesting the State Council of Higher Education for Virginia to study the demand for computer scientists, engineers, and other technologically skilled workers in Virginia industry.

Agreed to by the Senate, February 13, 1997
Agreed to by the House of Delegates, February 11, 1997

WHEREAS, proficiency in Internet research, electronic mail, word processing, and database and spreadsheet programs is a prerequisite to becoming a technology-literate employee in the twenty-first century; and

WHEREAS, the growth of technology-based businesses has been a driving force in the growth of the Commonwealth's economy over the past decade, as particularly illustrated in Northern Virginia, where the Northern Virginia Technology Council estimates that there are now more than 1,600 high technology companies employing some 170,000 workers who earn an average of more than $40,000 annually, collectively contributing more than $7 billion in wages each year to that region's economy; and

WHEREAS, while economists have projected the creation of thousands of new high-technology jobs, data indicate that there are many job vacancies currently existing in computer science, engineering and other related fields, prompting employers to go outside Virginia and even overseas to acquire trained personnel; and

WHEREAS, while Virginia's high-technology companies recruit employees from around the nation, it is difficult for such companies to compete with companies based in other technology-intensive locations such as California's Silicon Valley; Boston, Massachusetts; and Austin, Texas; and

WHEREAS, only 2,124 of the 24,000 students who graduated with bachelor's degrees from Virginia's colleges and universities in 1996 finished with computer science or engineering degrees; and

WHEREAS, the gap between marketplace demand for high technology workers and the available supply is threatening to stall the Commonwealth's pursuit of a vibrant economic expansion; and

WHEREAS, the Commonwealth lacks a framework for state-level policy and planning related to the role of the public schools and institutions of higher education in developing skills needed in the high-technology work force to ensure Virginia's long-term leadership in an economy based on technological knowledge; now, therefore, be it

RESOLVED by the Senate, the House of Delegates concurring, That the State Council of Higher Education for Virginia be requested to study the demand for computer scientists, engineers, and other technologically skilled workers in Virginia industry. In pursuing its study, the State Council shall assess employment needs for these technologically skilled workers in Virginia industry and shall review and propose actions the Commonwealth, institutions of higher

education, and the private sector might take to increase the number of enrollments and graduates in programs leading to technological competence, including computer science, engineering, and other related fields.

The State Council shall consult with state-supported and independent colleges and universities in the Commonwealth, the Center for Innovative Technology, the Department of Education, the Virginia Economic Development Partnership, and the Northern Virginia Technology Council.

All agencies of the Commonwealth shall provide assistance to the State Council for this study, upon request.

The State Council shall complete its work in time to submit its findings and recommendations to the Joint Subcommittee on Science and Technology, established pursuant to House Joint Resolution No. 195 (1996), or a successor joint subcommittee or entity thereof, and to the Governor and the General Assembly by November 15, 1997, as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

972812408

SENATE JOINT RESOLUTION NO. 226

Offered January 10, 1997

Expressing the sense of the General Assembly in connection with certain emerging scientific and technological assets located in the Commonwealth.

Patrons-- Stosch and Ticer; Delegates: Bennett, Diamonstein, Plum and Scott

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Referred to the Committee on Rules

WHEREAS, the Center for Innovative Technology (CIT) has demonstrated successful performance and leadership in serving technology-based companies and businesses in the Commonwealth; and

WHEREAS, over the last two years, CIT and its partners have helped to create or retain 5,571 technology-based jobs and have assisted in the start-up, attraction, retention, or conversion from a defense orientation to a commercial orientation of 130 companies; and

WHEREAS, companies and businesses assisted by CIT and its partners have achieved over $161 million in increased sales and increased capital funding; and

WHEREAS, evidence suggests that CIT is a performance-based, market-oriented organization which is regionally-based and industry-driven; and

WHEREAS, evidence also suggests that CIT demonstrates accountability and produces results of economic benefit to the Commonwealth; and

WHEREAS, although CIT has demonstrated success in providing "short-term" results, attention is needed in planning "long-term" and "mid-term" investments in the Commonwealth's science and technology resource infrastructure; and

WHEREAS, various emerging scientific and technological assets located in the Commonwealth show promise for commercial potential which Virginia should monitor, support, and capitalize on when appropriate; and

WHEREAS, included among those emerging assets are the Applied Research Center, Biotechnology Research Park, Biotech Infomatics Center, Free Electron Laser, Langley Full-Scale Wind Tunnel, Smart Roads Project, Virginia Institute for Micro-Electronics, Virginia Modeling and Simulation Center, Virtual Reality Center, and Wallops Island Space Flight Facility; now, therefore, be it

RESOLVED by the Senate, the House of Delegates concurring, That it is the sense of the General Assembly that Virginia monitor, support, and capitalize on such emerging scientific and technological assets located in the Commonwealth, when appropriate, through the Center for Innovative Technology; and, be it

RESOLVED FURTHER, That the Clerk of the Senate prepare a copy of this resolution for presentation to the President of the Center for Innovative Technology that he may be apprised of the sense of the General Assembly in this matter; and, be it

RESOLVED FURTHER, That the Center for Innovative Technology shall provide a report on the status of such emerging scientific and technological assets located in the Commonwealth to the joint subcommittee on science and technology created by House Joint Resolution 195 (1996) or a successor joint subcommittee or entity thereof on or before November 15, 1997.

SENATE JOINT RESOLUTION NO. 226

Expressing the sense of the General Assembly in connection with certain emerging scientific and technological assets located in the Commonwealth and requesting the Center for Innovative Technology to report on the status of such assets.

Agreed to by the Senate, January 24, 1997
Agreed to by the House of Delegates, February 20, 1997

WHEREAS, the Center for Innovative Technology (CIT) has demonstrated successful performance and leadership in serving technology-based companies and businesses in the Commonwealth; and

WHEREAS, over the last two years, CIT and its partners have helped to create or retain 5,571 technology-based jobs and have assisted in the start-up, attraction, retention, or conversion from a defense orientation to a commercial orientation of 130 companies; and

WHEREAS, companies and businesses assisted by CIT and its partners have achieved over $161 million in increased sales and increased capital funding; and

WHEREAS, evidence suggests that CIT is a performance-based, market-oriented organization which is regionally-based and industry-driven; and

WHEREAS, evidence also suggests that CIT demonstrates accountability and produces results of economic benefit to the Commonwealth; and

WHEREAS, although CIT has demonstrated success in providing "short-term" results, attention is needed in planning "long-term" and "mid-term" investments in the Commonwealth's science and technology resource infrastructure; and

WHEREAS, various emerging scientific and technological assets located in the Commonwealth show promise for commercial potential which Virginia should monitor, support, and capitalize on when appropriate; and

WHEREAS, included among those emerging assets are the Applied Research Center, Biotechnology Research Park, Biotech Infomatics Center, Free Electron Laser, Langley Full-Scale Wind Tunnel, Smart Roads Project, Virginia Institute for Micro-Electronics, Virginia Modeling and Simulation Center, Virtual Reality Center, and Wallops Island Space Flight Facility; now, therefore, be it

RESOLVED by the Senate, the House of Delegates concurring, That the Center for Innovative Technology be urged to monitor, support, and capitalize on such emerging scientific and technological assets located in the Commonwealth and to report on the status of such assets; and, be it

RESOLVED FURTHER, That the Clerk of the Senate transmit a copy of this resolution to the President of the Center for Innovative Technology that he may be apprised of the sense of the General Assembly in this matter; and, be it

RESOLVED FINALLY, That the Center for Innovative Technology be requested to provide the report to the joint subcommittee on science and technology created by House Joint Resolution No. 195 (1996) or a successor joint subcommittee or entity thereof on or before November 15, 1997 for inclusion in its report.

APPENDIX 7.
LIST OF TECHNICAL ADVISORY COMMITTEE PARTICIPANTS

TAC # 1 (Virginia Retirement System)

Jim Foxworthy Landmark Systems Corporation 8000 Towers Crescent Drive Vienna, VA 22182	phone: 703-902-8000 fax: 703-442-3836 email: jim.foxworthy@landmark.com
William H. Leighty, Director Virginia Retirement System 1200 East Main Street Richmond, Virginia 23219	phone: 804-344-3120, ext.120 fax: 804-371-0613
Ray Pelletier Executive Director Northern Virginia Technology Council 2214 Rock Hill Road, Suite 601 Herndon, VA 20170-4214	phone: 703-904-7878, ext. 102 fax: 703-904-8008 email: rpelletr@clark.net
Suzanne N. Richardson Managing Director Friedman Billings, Ramsey & Co., Inc. 1001 Nineteenth Street North Arlington, VA 22209	email: srichardson@fbr.com
David Sylvester, Esquire Hale and Dorr The Willard Office Building 1455 Pennsylvania Avenue, N.W. Washington, D.C. 20004	phone: 202-942-8400 fax: 202-942-8484 email: david.sylvester@haledorr.com
Bill Young 2404 Jackstay Terrace Reston, VA 20191-2619	phone: 703-860-4257

TAC #2 (Education)

Terry Atkinson, Budget Analyst House Appropriations Committee General Assembly Building, 9th Floor Richmond, Virginia 23219	phone: 804-786-1837 fax: 804-786-6081
Joseph Aulino, Director, MIS Virginia Department of Education Monroe Building 101 North 14th Street Richmond, Virginia 23219	phone: 804-225-2099
Robert H. Christie Open Systems Consulting 4430 Cub Run Road Chantilly, VA 20151-1429	phone: 703-968-9706
Pam Curry, Budget Analyst Senate Finance Committee General Assembly Building, 10th Floor Richmond, Virginia 23219	phone: 804-786-4400
John F. Graham, Jr. Vice President BTG, Inc. 1945 Old Gallows Road, Suite 700 Vienna, Virginia 22182	phone: 703-556-6518
Jay W. Harford 4206 Webster Court Annandale, Virginia 22003	phone: 703-367-1041
Hermann J. Helgert, Ph.D. Director, VA Campus School of Engineering and Applied Science The George Washington University 20101 Academic Way Ashburn, VA 22011-2604	
J. Michael Mullen, Deputy Director State Council of Higher Education James Monroe Building 101 North 14th Street Richmond, Virginia 23219	phone: 804-225-2610 fax: 804-225-2604 email: mullen@schev.edu
Ted G. Nanz, President Spot Image Corporation 1897 Preston White Drive Reston, VA 22091-4368	phone: 703-715-3100 fax: 703-648-1813

John W. Prohaska, Ed.D. Administrator Instructional Technology Integration Department of Information Technology Fairfax County Virginia Public Schools 4414 Holborn Avenue Annandale, Virginia 22003	phone: 703-503-7570 email: JPohaska@CHAPELSQ.FCPS.K12.VA.US
Steven G. Sachs Associate Dean Northern Virginia Community College 4001 Wakefield Chapel Road Annandale, VA 22003	phone: 703-323-3387
Gregory V. Selby, Ph.D. Old Dominion University College of Engineering and Technology Department of Mechanical Engineering 238 Kaufman/Duckworth Hall Norfolk, VA 23529	phone: 804-683-6363 fax: 804-683-5344 email: june@mem.odu.edu
Greg Weisiger, Virginia Satellite Educational Network Specialist Virginia Department of Education P.O. Box 2120 Richmond, Virginia 23218	phone: 804-692-0335

TAC #3 (Center for Innovative Technology)

Dean Bakeris AlliedSignal Aerospace AlliedSignal Technical Services Corp. 7515 Mission Drive M/S A3B13 Lanham, MD 20706	phone: 301-805-3635 fax: 301-805-3130 email: Dean.Bakeris@AlliedSignal.com
Dr. Patricia E. Brown, Director, Government and Community Relations Center for Innovative Technology 2214 Rock Hill Road CIT Tower, Suite 600 Herndon, Virginia 20170-4200	phone: 703-689-3026 fax: 703-689-3001 email: patsy@cit.org
Joseph Caravella 11621 Hunters Green Court Reston, Virginia 20191	phone: 703-860-1100
Mitchell J. Dresdner President, MjD Consulting, Inc. (Mailing Address Unknown)	phone: 703-803-5563 fax: 703-631-8073 email: mitch@yertle.fp.trw.com
R. Michael Hord 12393 Copenhagen Court Reston, VA 20191	phone: 703-476-6152
Glenn Hourahan Director of Technology Air-Conditioning and Refrigeration Institute 4301 N. Fairfax Drive Suite 425 Arlington, VA 22203	phone: 703-524-8800 fax: 703-524-6351 email: hourahan@DGS.dgsys.com
Juris Kelley CACI International, Inc. 1100 N. Glebe Road Arlington, VA 22201	phone: 703-841-7984 email: jkelley@hq.caci.com
Doug Lake Office of Naval Research 800 N. Quincy Street, Room 607 Arlington, VA 22217-5660	phone: 703-696-6567 email: laked@onrhq.onr.navy.mil
Jeannine Majde Office of Naval Research 800 N. Quincy Street Arlington, VA 22217-5660	phone: 703-696-4055 fax: 703-696-1212 email: majdej@onrhq.onr.navy.mil

Siva M. Mangalam, Chairman & CEO Tao Systems, Inc. 22 Enterprise Parkway Suite 150 Hampton, VA 23666	phone: 757-827-4434 fax: 757-827-4706
Alice Marie Marshall 4242 N. Second Road, #4 Arlington, VA 22203	phone: 202-508-0631
The Honorable Joseph T. May Member, Virginia House of Delegates P.O. Box 4104 Leesburg, VA 22075	phone: 703-777-1191
Jay Meriwether Arthur Andersen LLP 8000 Towers Crescent Drive Vienna, VA 22182-2725	phone: 703-734-4196 fax: 703-917-5382 email: J.A.Meriwether@ArthurAndersen.com
Dr. Judy C. Pearson, Director Northern Virginia Graduate Center VPI & SU 2990 Telestar Court Falls Church, Virginia 22042-1287	phone: 703-698-6000 fax: 703-698-6062
John W. Prohaska, Ed.D. Administrator Instructional Technology Integration Department of Information Technology Fairfax County Virginia Public Schools 4414 Holborn Avenue Annandale, Virginia 22003	phone: 703-503-7570 email: JPohaska@CHAPELSQ.FCPS.K12.VA.US
David Shilling, Vice President Computer Information Technology, Inc. 8150 Leesburg Pike, Suite 400 Vienna, Virginia 22182	phone: 703-847-7799 email: shilling@citi.com
Jacquelyn E. Stone McGuire Woods Battle & Boothe One James Center 901 East Cary Street Richmond, VA 23219	phone: 804-775-1046
David Sullivan, President Zonar Corporation 2915 Hunter Mill Road Oakton, VA 22124	phone: 703-255-3800

Ray Summerell 15274 Surrey House Way Centreville, VA 20120	phone: 703-849-0230
Keith Ward Office of Naval Research 800 N. Quincy Street Arlington, VA 22217-5660	email: wardk@onrhq.onr.navy.mil

TAC #5 ("Universal Access"/Government Structure)

William G. Broaddus McGuire Woods Battle & Boothe One James Center 901 East Cary Street Richmond, VA 23219	phone: 804-775-1085
H. Hollister Cantus ICF Kaiser International, Inc. 9300 Lee Highway Fairfax, VA 22031-1207	phone: 703-934-3875 fax: 703-934-9740
Dick Coyle, Director Strategic Business Planning Sprint 13221 Woodland Park Road Herndon, Virginia 22071-3020	phone: 703-904-2003
Jeffrey M. Crowder Computer Systems Senior Engineer VPI 1700 Pratt Drive Andrews Information Systems Building Blacksburg, VA 24061-0506	phone: 540-231-3900
Betsy Daily, Budget Analyst Senate Finance Committee General Assembly Building, 10th Floor Richmond, Virginia 23219	phone: 804-786-4400
Donn D. Dears 11303 Bright Pond Lane Reston, VA 20194	phone: 703-318-6579
Bette H. Dillehay, State Data Administrator Council on Information Management 1100 Bank Street, Suite 901 Richmond, Virginia 23219	phone: 804-786-8163 fax: 804-371-7952
David H. Driver, Director Division of Purchases and Supply Department of General Services 805 East Broad Street P.O. Box 1199 Richmond, VA 23218-1199	phone: 804-786-3846 fax: 804-371-7877 email: ddriver@dgs.state.va.us
James W. Dyke, Jr. McGuire Woods Battle & Boothe 8280 Greensboro Drive Suite 900, Tysons Corner McLean, Virginia 22102-3892	phone: 703-712-5000 fax: 703-712-5050

Richard Hack, State Manager, Network Services AT&T 4121 Cox Road Suite 204 Glen Allen, Virginia 23060	phone: 804-527-5433
William C. Hanchey, Jr., Vice President, Regulatory Affairs VA Cable & Telecommunications Ass'n 300 West Franklin Street Richmond, Virginia 23220	phone: 804-780-1776
Larry Hengehold, Vice Chancellor for Information Technology VA Community College System Monroe Building, 15th Floor 101 North 14th Street Richmond, Virginia 23219	phone: 804-225-2128
William Irby, Manager, Rates and Costs Division of Communications State Corporation Commission John Tyler Building 1300 East Main Street Richmond, Virginia 23219	phone: 804-371-9650 fax: 804-371-9069
Patricia A. Jackson, Director External Programs Office of the Vice President for Information Systems Virginia Tech 11 South 12th Street Richmond, Virginia 23219	phone: 804-786-8130 fax: 804-786-0590 email: pjackson@vt.edu
Thomas J. Kusiak, Director, Telemedia Div. Dept. of Information Technology 110 South 7th Street, 1st Floor Richmond, Virginia 23219	phone: 804-371-5918 fax: 804-371-5556 email: tkusiak.dit@state.va.us
David C. Lucien, President & CEO Interpro Corp 11735 Bowman Green Drive Reston, VA 22090	phone: 703-471-8993 fax: 703-471-8994 email: dlucien@interprocorp.com
William S. Mistr, Vice President for Information Technology Virginia Power P.O. Box 2666 Richmond, Virginia 23261	phone: 804-771-3944

Thomas F. Mullikin 2980 Fairview Park Drive #232 Falls Church, Virginia 22042	703-204-7466
George C. Newstrom EDS Government Services Group 13600 EDS Drive Herndon, VA 22071	phone: 703-742-2200
Lisa Hill O'Shea, Information Resources State Corporation Commission John Tyler Building 1300 East Main Street Richmond, Virginia 23219	phone: 804-371-9141 fax: 804-371-9211
Glynna K. Parde McGuire Woods Battle & Boothe 8280 Greensboro Drive Suite 900, Tysons Corner McLean, Virginia 22102-3892	phone: 703-712-5000 fax: 703-712-5050
Patricia Paulette, Ph.D. 6443 Sienna Court Falls Church, VA 22043	phone: 202-767-1344 fax: 202-767-4642 email: Paulette@anvil.anvil.nrl.navy.mil
Ray Pelletier Executive Director Northern Virginia Technology Council 2214 Rock Hill Road, Suite 601 Herndon, VA 20170-4214	phone: 703-904-7878 ext. 102 fax: 703-904-8008 email: rpelletr@clark.net
Rosemarie A. Piepenhagen, President & CEO Tapestry Consultants and TransTech Inc. 164 Connery Terrace SW Leesburg, VA 22075	phone: 703-777-8987 email: rpiepenh@osf1.gmu.edu
Irwin Price, Ph.D. Executive Dean, VA Campus The George Washington University 20101 Academic Way Ashburn, VA 22011-2604	

John W. Prohaska, Ed.D. Administrator Instructional Technology Integration Department of Information Technology Fairfax County Virginia Public Schools 4414 Holborn Avenue Annandale, Virginia 22003	phone: 703-503-7570 email: JPohaska@CHAPELSQ.FCPS.K12.VA.US
James T. Roberts, Deputy Director House Appropriations Committee General Assembly Building, 9th Floor Richmond, Virginia 23219	phone: 804-786-1837 fax: 804-786-6081
Elizabeth Roderick, Assistant Director Library Development and Networking Div. The Library of Virginia 800 East Broad Street Richmond, Virginia 23219	phone: 804-692-3761 fax: 804-692-3771 email: eroderic@leo.vsla.edu
Steven G. Sachs Associate Dean Northern Virginia Community College 4001 Wakefield Chapel Road Annandale, VA 22003	phone: 703-323-3387
Richard Seaman, Budget Analyst House Appropriations Committee General Assembly Building, 9th Floor Richmond, Virginia 23219	phone: 804-786-1837 fax: 804-786-6081
Gregory V. Selby, Ph.D. Old Dominion University College of Engineering and Technology Department of Mechanical Engineering 238 Kaufman/Duckworth Hall Norfolk, VA 23529	phone: 804-683-6363 fax: 804-683-5344 email: june@mem.odu.edu
Professor Edgar H. Sibley George Mason University, MSN 4A4 4400 University Dr. 430 Science &Tech 2 Fairfax, VA 22033-4444	phone: 703-993-1669 or 703-691-1507 fax: 703-993-1638 or 703-691-8948 email: esibley@gmu.edu
Sam Simon Issue Dynamics, Inc. 901 15th Street NW Suite 230 Washington, D.C. 20005	phone: 202-408-1400

Roger Stough George Mason University The Institute of Public Policy 4400 University Drive MS:3C6 Fairfax, VA 22030-4444	phone: 703-993-2268 fax: 703-993-2284 email: rstough@gmu.edu
Alvin Thomas Systems & Communications Technology, Inc. (Mailing Address Unknown)	email: ALTHOMAS01@aol.com
Robert R. Vieth McGuire Woods Battle & Boothe 8280 Greensboro Drive Suite 900, Tysons Corner McLean, Virginia 22102-3892	phone: 703-712-5000 fax: 703-712-5050
Nelson Worley, Director Library Development and Networking Div. The Library of Virginia 800 East Broad Street Richmond, Virginia 23219	phone: 804-692-3773 fax: 804-692-3771

Jocelyn West Brittin McGuire Woods Battle & Boothe 8280 Greensboro Drive Suite 900, Tysons Corner McLean, Virginia 22102-3892	phone: 703-712-5000 fax: 703-712-5050
Thomas C. Brown, Jr. McGuire Woods Battle & Boothe 8280 Greensboro Drive Suite 900, Tysons Corner McLean, Virginia 22102-3892	phone: 703-712-5000 fax: 703-712-5050
Steven Dalle Mura, Director, Legal Research Supreme Court of Virginia 100 North Ninth Street, 3rd Floor Richmond, Virginia 23219	phone: 804-786-6455
Walter S. Felton, Jr. Commonwealth's Attorneys' Services Council P.O. Box 3549 Williamsburg, Virginia 23187-3549	phone: 804-253-4146
Frank Ferguson, Deputy Attorney General Office of the Attorney General 900 East Main Street Richmond, Virginia 23219	phone: 804-786-2436
Robert E. Gregg, Esquire Hazel & Thomas P.O. Box 12001 Falls Church, Virginia 22042	phone: 703-641-4234
James M. Lewis McGuire Woods Battle & Boothe 8280 Greensboro Drive Suite 900, Tysons Corner McLean, Virginia 22102-3892	phone: 703-712-5000 fax: 703-712-5050
Steve A. Mandell The Mandell Law Firm Suite 630 Tysons Office Center 8133 Leesburg Pike Vienna, VA 22182-2706	phone: 703-734-9622 fax: 703-356-0005 email: MandellLF@aol.com

John M. Oakey, Jr. McGuire Woods Battle & Boothe One James Center 901 East Cary Street Richmond, Virginia 23219-4030	phone: 804-775-4336
Ron Palenski, Esquire Gordon & Glickson 2555 M Street, N.W. Suite 302 Washington, D.C. 20037-1302	phone: 202-861-2910 fax: 202-861-2901 email: rpalenski@ggtech.com
Marc A. Pearl Information Technology Association of America 1616 N. Fort Meyer Drive Suite 1300 Arlington, VA 22209-3106	phone: 703-522-5055 fax: 703-525-2279 email: mpearl@itaa.org
Mark E. Rubin Shuford Rubin & Gibney P.O. Box 675 Richmond, Virginia 23206	phone: 804-648-4442
David G. Shuford LeClair Ryan Joynes Epps & Framme 707 East Main Street, 11th Floor Richmond, Virginia 23219	phone: 804-343-4088
Daniel Lawrence Spar P.O. Box 3222 W. McLean, VA 22103-3222	phone: 703-761-1166 email: dspar@logicworks.com

TAC #7 (Digital Signatures)

Steve Ackleson Office of Naval Research 800 N. Quincy Street Arlington, VA 22217-5660	email: ackless@onrhq.onr.navy.mil
William J. Bridge, Clerk of the State Corporation Commission Tyler Building 1300 East Main Street Richmond, Virginia 23219	phone: 804-371-9672
Don Detmer, M.D. Senior Vice President University of Virginia The Rotunda Box 9016 Charlottesville, VA 22906-9016	phone: 804-982-2959 fax: 804-982-2977 email: ded2x@virginia.edu
Randy Dorman, Planning & Development Division State Corporation Commission Tyler Building 1300 East Main Street Richmond, Virginia 23219	phone: 804-371-9402
David H. Driver, Director Division of Purchases and Supply Department of General Services 805 East Broad Street P.O. Box 1199 Richmond, VA 23218-1199	phone: 804-786-3846 fax: 804-371-7877 email: ddriver@dgs.state.va.us
Emily Frye 132 Roberts Lane Suite 401 Alexandria, Virginia 22314	
Helen Gigley Office of Naval Research 800 N. Quincy Street Arlington, VA 22217-5660	email: gigleyh@onrhq.onr.navy.mil
Jorman Granger IBM Corporation 1051 East Cary Street Richmond, VA 23219	phone: 804-697-2430 fax: 804-697-2155

Tom Hicks Shaw, Pittman, Potts & Trowbridge 1501 Farm Credit Drive, Suite 3600 McLean, Virginia 22102-5000	phone: 703-790-7920 fax: 703-821-2397
Michael Horwatt Shaw, Pittman, Potts & Trowbridge 1501 Farm Credit Drive, Suite 3600 McLean, Virginia 22102-5000	phone: 703-790-7791
Pete Kolakowski Assistant Commissioner, Administration VA Dept. of Transportation 1401 East Broad St. Richmond, VA 23219	phone: 804-786-9950 fax: 804-786-2940
Marc Lipman Office of Naval Research 800 N. Quincy Street Arlington, VA 22217-5660	email: lipmanm@onrhq.onr.navy.mil
Jack Littley, Sr. Vice President BTG, Inc. 1945 Old Gallows Road, Suite 700 Vienna, Virginia 22182	phone: 703-556-6518
Rabi Madan Office of Naval Research 800 N. Quincy Street Arlington, VA 22217-5660	email: madanr@onrhq.onr.navy.mil
Bill Miceli Office of Naval Research 800 N. Quincy Street Arlington, VA 22217-5660	email: miceliw@onrhq.onr.navy.mil
Kenneth Mittendorff, Director Management Information Services Supreme Court of Virginia Administrative Office Third Floor 100 North Ninth Street Richmond, VA 23219	phone: 804-786-6455
John Pazik Office of Naval Research 800 N. Quincy Street Arlington, VA 22217-5660	email: pazikj@onrhq.onr.navy.mil

Hank Philcox DynCorp 2000 Edmund Halley Drive Reston, Virginia 20191	phone: 703-264-0330
Bill Poulos Electronic Data Systems 1331 Pennsylvania Avenue, N.W. Suite 1300 N Washington, D.C. 20004	phone: 202-637-6700
Gant Redmon 7 Rosecroft Avenue Alexandria, Virginia 22301	
Connie Ring, Esquire Atlantic Research Corporation 1577 Spring Hill Road Vienna, Virginia 22182	phone: 703-642-4250
John Saunders Digital Commerce Corp. 11180 Sunrise Valley Drive 4th Floor Reston, Virginia 20191	phone: 703-391-6300
Phil Selleh, Senior Consultant CSC 3170 Fairview Park Drive Falls Church, Virginia 22042-4501	phone: 703-204-8355
William R. Steward Household Financial Group 1730 K Street, N.W. Suite 1106 Washington, D.C. 20006-3868	phone: 202-466-3561
George Swygert, Vice President First Union National Bank 1970 Chain Bridge Road 3rd Floor, South Tower McLean, Virginia 22102-4099	phone: 703-760-6107
Perry Tancredi VeriSign 1 Alewife Center Cambridge, MA 02140	phone: 617-492-2816

Thomas P. Vartanian Managing Partner Fried, Frank, Harris, Shriver & Jacobson 1001 Pennsylvania Avenue, NW Washington, D.C. 20004	phone: 202-639-7200
Steve Walz, Policy And Planning Manager VA Dept. of Mines, Minerals & Energy 9th Street Office Building 202 North Ninth St., 8th Floor Richmond, Virginia 23219	phone: 804-692-3211 fax: 804-692-3237
Ben Wright, Esq. 3431 1/2 Granada Avenue Dallas, Texas 75205	