
MEMORANDUM

TO: MEMBERS OF THE JCOTS NANOTECHNOLOGY ADVISORY COMMITTEE
FROM: LISA WALLMEYER, EXECUTIVE DIRECTOR, JCOTS
SUBJECT: NOVEMBER 10 NANOTECHNOLOGY MEETING
DATE: 11/9/2005

In compiling the results of the nanotechnology recommendations survey that I sent out in late October, staff has worked on summarizing the various topics and issues that received the most support for continued discussion and recommendation to the Joint Commission on Technology & Science. The various issues and approaches are outlined below. This memo is not meant to advocate for any or all of the proposals discussed; instead, it is meant to serve as a guide for discussion at Thursday's meeting, and to set forth the form that many of these proposals might take.

Economic Development

The items that received overwhelming support in the responses centered around possible economic development initiatives and items. By way of background, § 58.1-439.14 already creates tax credits of up to \$500,000 per taxpayer for technology-related research and development activities in tobacco-dependent localities. A possible approaches to creating additional, more general economic incentives might include:

- Adding new language to § 58.1-3506 relating to local taxation of personal property. This section sets forth several classes of property that a locality may tax at a rate lower than the general taxation rate for personal property. New language might create a separate classification for "equipment used primarily for research, development, production, or provision of nanotechnology for the purpose of developing or providing products or processes for specific commercial or public purposes, including, but not limited to, electronics purposes; medical and health related purposes; aeronautics purposes; environmental purposes; manufacturing purposes; or defense and homeland security purposes. For purposes of this section, nanotechnology equipment means equipment directly used in activities associated with the measurement, control, or manipulation of matter at the molecular level."

Research, Development & Commercialization

- A Biotechnology Commercialization Loan Fund program exists at § 2.2-2233.2 of the Code of Virginia. The purpose of the program is to provide loans to finance technology transfer and commercialization activities related to biotechnology inventions made solely or in cooperation with an institution of higher education in the Commonwealth. The

Governor's Advisory Board for the Virginia Biotechnology Initiative recommended the creation of the program, with a goal of assist in the commercialization of academic research -- and thus positively impacting economic development and the creation of new jobs in the Commonwealth. However, no funds were appropriated to the Fund in the 2004-2006 budget. The issues and obstacles facing the commercialization of biotechnology research and nanotechnology are very similar, and many members of the Nanotechnology Advisory Committee have expressed a need for more and better facilitation of academic research advances through to commercialization. Therefore, the advisory committee might recommend to JCOTS that the loan program be amended to include nanotechnology commercialization activities in addition to biotechnology-related activities, and that funding be included in the next budget.

- A Technology Research Fund also currently exists in the Code at § 2.2-2233.1. The intent of the Fund is to attract public and private research to state institutions of higher education to increase technological and economic development in Virginia. Money from the fund is intended to match federal and private grants received by the institutions of higher education. The Fund specifically applies to research in areospace, biotechnology, energy, environment, information technology, high performance manufacturing, telecommunications, and transportation. The language of the fund does allow for research in other relevant fields to be approved -- which would presumably include nanotechnology. Like the Loan Fund described above, the research fund also currently lacks funding. The advisory committee might recommend to JCOTS that nanotechnology be explicitly included in the list of approved research, and that funding be included in the next budget.
- Michigan has developed a program whereby recipients of Small Business Innovation Research Grants, federally-funded grants administered by the Small Business Administration, may apply for state matching funds. The advisory committee might recommend that JCOTS continue to research how to establish and fund a similar program in the Commonwealth, including identifying which state agency might administer such a program. For more information about SBIR grants, please see <http://www.sba.gov/sbir/indexsbir-sttr.html>
- Another recommendation that received support in the survey is the need to better facilitate the transfer of academic research advances through commercialization. Pennsylvania has been cited as a leader in this arena through the creation of Ben Franklin Technology Partners, a state-wide network designed to advance the development of Pennsylvania's knowledge-based economy. Specific information is available at www.benfranklin.org. The creation of a similar program in Virginia would involve considerable planning and coordination with various stakeholder agencies, and would require identification of a funding source. The advisory committee might recommend that staff begin work on identifying and creating a plan to assess the feasibility of this approach in Virginia, and to include substantial follow-up and discussion through JCOTS during the 2006 Interim.

- Closely tied to the need to better transfer academic research is concern over existing intellectual property policies at state institutions at higher education. Another advisory committee, under the leadership of Delegate Cosgrove, has reviewed SB 1053 (2005) that addresses this issue. The preliminary recommendation of that group is to eliminate specific procedures and rules that must be followed by universities in addressing intellectual property assignment issues in conducting research with private entities. The proposed approach would instead simply require each institution to develop guidelines and policies about its intellectual property policies that will guide negotiations when entering into research contracts. The goal of this approach is to provide a flexible mechanism for conducting research in a free-market setting, leaving discretion to the parties in developing contracts. The only outstanding issue is what entity should provide guidance to the universities in establishing these guidelines. Currently, by statute the State Council on Higher Education in Virginia establishes guidelines, but discussion remains as to whether the General Assembly or some other entity should assume this role in order to emphasize the importance of economic development. If it agreed with this approach, the advisory committee could endorse this approach in concept to JCOTS.

Education

The importance of effective science, math, and technology education at all levels at the Commonwealth's schools and institutions -- from elementary school through doctorate programs -- has been a common theme running through the discussions of the advisory committee this year. Not surprisingly, several items that received high scores on the survey relate to education.

- As mentioned by Delegate Cosgrove at the last advisory committee meeting, he plans to introduce a resolution that would create a legislative study aimed at reviewing and recommending specific science and technology-related education initiatives. Specific topics for review would be to examine the possibility of establishing regional schools modeled after the successful Thomas Jefferson High School for Science and Math in Northern Virginia, and to ensure that all students in the Commonwealth have access to quality science and math education that would adequately prepare them for college level science and technology programs. In addition, the study would examine the possibility of establishing grants and loans for undergraduate and graduate students at state institutions of higher education that could be forgiven if the graduate works in the Commonwealth in a technology-related field for a certain number of years after graduation. The advisory committee could recommend that JCOTS endorse this study when presented to the General Assembly during the 2006 Session.
- At the second meeting during the Interim, the advisory committee received a presentation from Dr. James Groves at the University of Virginia concerning the development of the Virginia Partnership for Advanced Nanotechnology Education. The program involves distance learning that utilizes the knowledge and resources at state institutions of higher education throughout the Commonwealth. The program is designed to stimulate workforce development by providing science and engineering graduate students as well as those working in nanotechnology-related fields with access to cutting-edge nanotechnology courses. It has been suggested that the advisory

committee recommend at budget item of \$300,000 per year from the General Fund to support this program.

- At the third meeting during the Interim, the advisory committee received a presentation about the FIRST (For Inspiration and Recognition of Science and Technology) Robotics competitions held at Virginia Commonwealth University, and the growing demand for and popularity of these competitions. Speakers discussed the important role such programs play in providing hands-on experience in the sciences for students and in stimulating an interest in careers in technology and science. It has been suggested that the advisory committee recommended that \$250,000 be included in the budget for each of the next two fiscal years to make the Commonwealth a partner in the competition (along with FIRST, NASA-Langley, Infineon Technologies, and other private entities) and to expand the current competition, allowing for additional participation by Virginia schools.