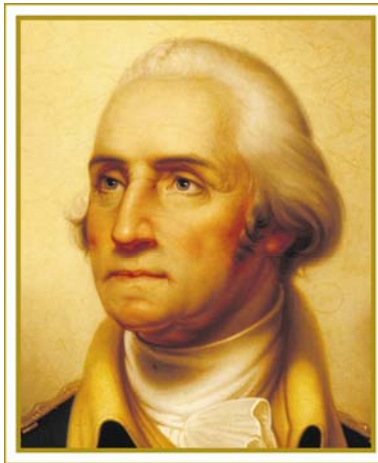


The George Washington University
Virginia Science and Technology Campus
A Plan for the Development of the Academic Enterprise



THE GEORGE
WASHINGTON
UNIVERSITY
VIRGINIA SCIENCE
AND TECHNOLOGY CAMPUS

submitted by

Task Force on Development of the Academic Enterprise
at the Virginia Science and Technology Campus

March 31, 2010

Executive Summary

The George Washington University Virginia Science and Technology Campus (VSTC) was established in 1991 with one building on 50 acres of land in Loudoun County Virginia. Today the campus includes four buildings on over 100 acres. As the campus prepares for its 20th anniversary, the time is right to create a new comprehensive plan for the campus. At the direction of President Steven Knapp, a three-part plan is being developed. This report provides a vision of the campus for 2020; a strategic analysis of the campus' strengths, limitations, opportunities, and challenges; and a set of goals, objectives, and next steps to guide the beginning of the journey toward that vision. A master plan for campus facilities and amenities and a plan for the positioning of The George Washington University in the Commonwealth of Virginia are under development.

The most significant strengths of the campus include

- recognition of the campus as a key university asset and complement to the Foggy Bottom campus by the GW leadership,
- space to create world-class research facilities and learning environments,
- location near a major international airport in an economically vibrant region with leading technology companies and interested potential partners.

While significant challenges remain to be overcome if the campus is to reach its potential, opportunities exist and will continue to emerge that will support growth in the academic enterprise of the campus and its contributions to GW's role in the Commonwealth of Virginia and to the economic development and quality of life of the Northern Virginia region.

The goals for the campus are as follows:

Goal 1. Expand sponsored research activity.

Goal 2. Increase enrollments in academic programs at the VSTC.

Goal 3. Systematically solicit support from corporations and foundations to enhance the VSTC's research enterprise, educational programs, and community engagement activities.

Goal 4. Implement a plan of government relations and community engagement that establishes GW as a significant and valued contributor to the development of public policy, workforce and economic development, and the quality of life in the Northern Virginia region and the Commonwealth of Virginia.

Goal 5. Develop a master plan for the VSTC that includes facilities that will support expansion of the research, educational, student services, University administrative, and community engagement enterprises of the VSTC, and amenities and a physical environment that will be conducive to and reflective of a vibrant university community.

The Virginia Science and Technology Campus has made great strides in the past three years toward achieving President Knapp's vision for the campus when he said in 2008,

"The Virginia Campus presents an extraordinary opportunity to expand the University's research activities in ways that will complement our efforts in Foggy Bottom and contribute to the economic vitality of the region."

With the ongoing commitment of the GW leadership, the faculty, and our strategic partners, the VSTC will continue to emerge as a major hub of research and development, education, technology transfer, and civic and cultural activity.

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A Vision of the Virginia Science and Technology Campus for 2020

The George Washington University Virginia Science and Technology Campus (VSTC) is a remarkably dynamic enterprise and environment. Events occur on a regular basis that have significant impacts on planning for the future of the campus. As a result, projecting a vision of the campus ten years into the future requires making assumptions that may prove to be either overly optimistic or unfortunately short-sighted. One cannot, however, allow the inherent unpredictability of such long-term assumptions to unduly temper one's boldness in forming a vision of the future. To do so places limits on our thinking and, in turn, on the potential of the campus.

In envisioning the future of the VSTC, there are certain assumptions that one can make with reasonable certainty. These include the following:

- The George Washington University will continue to emerge as a first tier research university.
- Science and technology will continue to develop at an ever increasing rate, placing corresponding burdens on universities and corporations to develop both personnel and facilities to maintain core activities and to pursue emerging areas.
- The demand for high quality education to prepare the work force of tomorrow will continue to increase, but access to this education will face challenges in terms of affordability and effective learning experiences. The best programs will be available to consumers in formats and locations that mitigate these challenges while providing students with resources that optimize their learning.
- A new science and engineering complex will have been constructed on the Foggy Bottom campus, but its research and teaching facilities will be operating at full capacity. Space will continue to be a challenge for GW, and the VSTC will continue to provide the most cost effective means of meeting this challenge, especially for the sciences and engineering.
- The global economy will have entered a new period of growth, fueled by new knowledge and technologies that emerge to address critical issues including population growth, energy, health care, environmental sustainability, water and food resources, and cyber and transnational security; and the economies of the Commonwealth of Virginia and Northern Virginia will be expanding as well.
- The George Washington University will be recognized as a major research university and a significant contributor to the economic and work force development of the Commonwealth and the region.

- The VSTC will be a vibrant hub of research and development, technology transfer, education, and cultural enrichment with a wide range of productive partnerships in the corporate, education, health care, government, and nonprofit sectors.

Given these assumptions, what might one then expect of the VSTC in 2020?

The VSTC will have developed into a true campus. There will be additional buildings, connected by a network of pathways and green spaces. There will be venues that promote collaborative learning and work activities as well as informal gatherings.

The campus will be a flagship for GW's commitment to sustainability. New campus buildings will be LEED certified. The campus will feature walkways and outdoor gathering places constructed in accordance with inclusive and sustainable design principles. A substantial portion of the energy consumed on the campus will be provided by solar arrays constructed on the campus and other renewable energy sources.

A new building will have been constructed that houses GW's transportation safety and security activities. This building will include a vehicle crash test track, vehicle modeling and digitization laboratory, and laboratories for testing new materials and components of vehicles that will enhance fuel efficiency while maintaining safety standards.

Research 1 will be dominated by, if not exclusively dedicated to, the GW Energy Institute. The number of faculty, research staff, post-doctoral fellows, and students working in the facility will have increased dramatically, perhaps reaching 150-200 individuals. The classrooms in Research 1 will have been converted to laboratories, collaboration venues, and/or office suites.

Research 2 will be home to the VSTC's nursing programs and other programs related to health care, including pharmacogenomics and health information technology. It will also include space for a computational biology research center. The classroom and laboratory space in Research 2 will be used exclusively by the health related programs. Should other health care programs emerge at the VSTC, a new building to house these programs may be planned.

In addition to health sciences programs, the VSTC will host academic programs that leverage the core research activities and facilities of the campus. Certificate and degree programs in energy science and technology, transportation safety engineering, high performance computing (HPC), and computational biology will utilize the facilities on the campus to provide unique educational opportunities for both traditional students and individuals working in

regional corporations. A program in quantum computing that draws on the strengths of the HPC and computational biology programs; along with those in computer science, mathematics and physics; will be offered on the campus. The program in Sustainable Landscape Design will use the campus for research and demonstration projects. New programs in a “fly-in” cohort format will have been added to the campus’ roster of executive style programs.

A new building will have been constructed that houses the educational programs in business, education, engineering, and other programs. Classrooms for these programs will have been consolidated in this building in order to facilitate support of advanced technology. This building will include a 300-seat auditorium, with video teleconferencing and content capture technology, and exhibit areas for public events. This building also will house the VSTC academic administration, the campus library, a student services center, and flexible learning environments that promote collaborative learning and pedagogical innovation.

The VSTC will have emerged as the hub of GW’s technology transfer enterprise. Robust partnerships with other universities, federal agencies and research labs, corporations, foundations, and other institutions will support the research and development activity on the campus. A new building will provide space for translational research, a business incubator, university-related start ups, and strategic partners.

In sum, the VSTC of 2020 will feature three new academic buildings that house advanced research and educational programs in the following areas:

- 1) transportation safety and security;
- 2) engineering, business, and education;
- 3) translational research and incubator.

The VSTC will be a model for the use of sophisticated technologies to extend learning opportunities beyond the boundaries of the physical campus. Technology will be used to export lectures, laboratory demonstrations, and collaborative learning experiences from the VSTC to Foggy Bottom and to locations around the world. Similarly, the curriculum available at the VSTC will be augmented by bringing instruction to the campus from experts at Foggy Bottom and other locations. The VSTC will be connected to the science and engineering complex and other research facilities at the Foggy Bottom campus using robust technologies that will facilitate collaboration among faculty and students and efficient transmission of large amounts of data. Video teleconferencing, content capture, and the use of other technologies to provide

remote access to content and interaction among faculty and students will be woven into the fabric of the VSTC's facilities and operations.

University administrative offices will have an increased presence on the campus. Building 2 will be used exclusively for administrative functions. Additional space for administrative functions may have been acquired or constructed. Technology will also be used to facilitate communication among administrative staff on GW's three campuses and at the University's off-campus education centers.

The VSTC will be recognized as a major contributor to the civic and cultural life of the region. It will serve as a forum for public policy discussions and as a venue for educational and cultural activities. As such, it will be viewed as a valued partner of Loudoun County, Northern Virginia, and the Commonwealth – a partner worthy of recognition and support.

The George Washington University

Virginia Science and Technology Campus

A Plan for the Development of the Academic Enterprise

Current Vision Statement for the Virginia Science and Technology Campus

As an integral component of GW's emergence as a preeminent research institution, the Virginia Science and Technology Campus will provide a unique environment in which the intellectual resources of the University will meld with those of its strategic partners to develop innovative responses to national and global challenges, while engaging in regional and state priorities.

Current Mission Statement

Research: Create centers and institutes of advanced study in which faculty, students, and strategic partners come together to engage in world-class research.

Education: Create innovative, collaborative academic programs that address regional, national, and global demand for higher education and that leverage the Campus' world-class research activities, technological infrastructure, and location.

Community: Develop strategic local partnerships to complement the growth of the region and enrich the quality of life in both the region and the Commonwealth of Virginia.

A Brief History of the Virginia Science and Technology Campus

The George Washington University established its Virginia Campus in Loudoun County in 1991 to meet the academic and research needs of the technology industry that was emerging along the Route 28 corridor in Western Fairfax and Loudoun counties. Since that time, the region has undergone rapid growth in both business activity and population.

The early years of the Campus were marked by some notable successes. The Graduate School of Education and Human Development established its Human and Organizational Learning (now known as the Executive Leadership Program) in Ashburn even before the first building opened on the Campus. This program took full advantage of the Campus' proximity to Dulles Airport to develop a one-weekend-per-month cohort program that remains a mainstay of the Campus' academic offerings. The School of Engineering and Applied Science also had early success with programs in electrical engineering and telecommunications, and continues to have successful offerings in electrical engineering and systems engineering. The School of Business has offered some form of an MBA program

and programs in management information system technology for many years. On the basic research front, the Physics Department conducted extensive research in nuclear physics in laboratories on the Campus. The National Crash Analysis Center was established in 1992 through a contract with the Department of Transportation, and an earthquake simulation lab was constructed in the late '90s.

While two buildings were added to the Campus in 2003, programmatic development of the Virginia Campus lagged behind that of the region from the late nineties until 2007. The University came to rely on a strategy of offering opportunities to develop research and academic programs at the Virginia Campus to faculty whose teaching and research were mainly based on the Foggy Bottom campus. This strategy yielded limited results because most faculty considered the travel time between the two campuses too great and the opportunities afforded by the local economy too limited to justify involvement on the Virginia Campus. This view of the Virginia Campus became embedded in the GW culture and became a major deterrent to development of the Campus, a circumstance encountered at the research campuses at several other universities.

The year 2007 proved to be a year of renewed interest and commitment for the Virginia Campus. The George Washington University Board of Trustees took a renewed interest in the Virginia Campus, and newly appointed President Steven Knapp determined that the Campus should be developed as a major complement to the Foggy Bottom campus. The position of Chief Academic Operating Officer (CAOO) for the Virginia Campus was created by EVPAA Donald Lehman, and Craig Linebaugh, who had served as the University's Associate Vice President for Academic Planning (AVPAP) for ten years, assumed the position on a full-time basis in January 2008 (He had served in the dual roles of AVPAP and CAOO from July 2006 – January 2008.).

Importantly, a new strategy for development of the Campus was implemented in 2007. Rather than rely on involvement by faculty whose primary work was done on the Foggy Bottom campus, the University committed to creating clusters of faculty and research staff whose work was based at the Virginia Campus. The models for this strategy were transportation safety [the National Crash Analysis Center (NCAC), the Center for Intelligent Systems Research (CISR)] in the research domain and the Graduate School of Education and Human Development's Human and Organizational Learning/Executive Leadership Program (ELP) for academic programs. Centers for advanced study in high performance computing (2007) and energy science and technology (2008) were established on the Campus. An academic program in Pharmacogenomics was established in 2006 through a partnership with Shenandoah University, and a second degree Bachelor's of Science in Nursing program was launched in 2009. Groups of faculty were established in residence on the Campus in each of these areas.

In spring 2009, CAOO Linebaugh recruited and EVPAA Lehman appointed a task force to develop an academic plan for the Virginia Campus. The task force was comprised of an executive committee and three working groups: research, educational programs, community engagement. In fall 2009, President Knapp

directed that, in addition to the academic plan already under development, a facilities and amenities plan that will be consistent with the academic plan for the Virginia Campus be developed under the auspices of Executive Vice President and Treasurer Lou Katz, and that a positioning plan for GW in Virginia be developed under the auspices of Vice President for External Affairs Lorraine Voles.

As part of this planning effort, the Virginia Campus was re-branded as The George Washington University Virginia Science and Technology Campus (VSTC) to better reflect the core academic activities on the Campus. As the University's science and technology campus, the VSTC hosts centers of excellence in critical areas such as energy science and technology, transportation safety, and high performance computing. The GW Virginia Campus combines its research excellence with more than 20 graduate degree and certificate programs in business, education, and engineering, and unique undergraduate programs in the health sciences. The VSTC also is the University's primary presence in the Commonwealth of Virginia, and the Campus administration is actively engaged in the life of the region. Activities hosted on the Campus that are open to the public contribute to the cultural, educational, business, healthcare, nonprofit, and governmental sectors of Northern Virginia.

Current State of the Campus and the Northern Virginia Region

Environment

External

The VSTC is located in Ashburn, Virginia, on Route 7 just west of the interchange with Route 28 in Loudoun County. The Campus is located in University Center, a 575 acre development zoned for research and development and residential uses. University Center currently includes the offices for 15 corporations; offices for Loudoun County government agencies; The Goddard School serving children from infancy through kindergarten; several service businesses (e.g., bank, coffee shop, pizza shop, hair salon); a hotel; the Northern Virginia Criminal Justice Academy; and approximately 2400 housing units including townhomes, condominiums, and apartments.

The Campus is located just 8 miles from Dulles International Airport and anchors the north end of Loudoun County Parkway. It is proximate to major development projects including One Loudoun (<http://www.oneloudoun.com/>), planned for nearly four million square feet of commercial and retail space including the World Trade Center Dulles Airport (<http://www.dullesworldtrade.com/>), and the 424-acre Kincora (<http://www.kincora-va.com/>). Within two miles of the VSTC are many excellent restaurants and the Dulles Town Center (<http://www.shopdullestowncenter.com/>). An interchange between Route 7 and George Washington Boulevard, a four-lane, divided street that is the main artery

within University Center, is under construction and scheduled to open in summer 2010.

The residents of both Loudoun and Fairfax Counties have among the highest median household incomes in the nation (Loudoun 2007 = \$107,207, Fairfax 2007 = \$105,241). In addition the Counties' residents (age 25 and older) have high levels of educational attainment with 55.2% (Loudoun) and 59% (Fairfax) holding a bachelor's degree or higher.

Loudoun has been one of the fastest growing counties in the nation since the late 1990s. It was ranked the fifth fastest-growing county in the nation since 2000 (2000-2008) and number two for jurisdictions with populations over 100,000.

The County is currently focusing on two significant industry clusters, Information and Communications Technology (ICT) and Life Sciences, as well as two industry overlays, Federal Government Contracting and International. *Moody's Economy.com* released the following information about the ICT cluster in January 2009,

The Dulles Technology Corridor, centered in Loudoun County, hosts the largest number of internet, satellite, and defense companies in the nation. These companies will benefit from the rising threat of cyber-terrorism as both private and public entities invest in greater security measures. Although *Moody's Economy.com* expects federal defense spending to slow down from its rapid pace this decade, government consumption related to cyber security will accelerate. Several of the area's top employers, including L-3 Communications Holdings and SAIC, are creating special units to address rising demand for security products.

Two Loudoun businesses, Equinix and NeuStar, were recently ranked numbers 16 and 17, respectively, on *Forbes Magazine's* "25 Fastest-Growing Technology Companies in America."

The Life Sciences cluster continues to focus on the HHMI Janelia Farm Research Campus, which is now three years old and staffed to approximately two-thirds capacity. Companies focusing in such areas as long-term preservation of research materials, medical device development, and RFID technology deployed in government and healthcare industries also continue to expand.

In addition to expansions at Orbital Sciences (space technology) and Telos (communications technology), Raytheon will be consolidating much of its Northern Virginia operations into 600,000 square feet of business space at the AOL Campus in Loudoun County. Other local companies, such as Rehau (Leesburg) and Prototype Productions, Inc. (Ashburn, VA) offer partnering opportunities in

technology transfer and commercialization ventures. All indications are, that as the economy recovers, the growth of Loudoun County will resume at a substantial pace.

Given the growth in population in Loudoun County, the school system is a growing employer in the area and will continue to be for the foreseeable future. Likewise, health care will be an expanding sector and will employ more people in a wide variety of positions (e.g., nursing, technology, management).

Internal

VSTC population

Students: 512 students were enrolled in VSTC programs in the Fall 2009 semester for a total of 2,815 credit hours (Source: Institutional Research). In addition to the students taking course work at the VSTC, approximately 50 graduate students are engaged in research on the Campus.

Table 1 shows the headcount and credit hours figures (Source: GW Factbook; <http://www.gwu.edu/~ire/>) for the past five fall semesters. These data include all students registered at the VSTC; i.e., the data include course enrollments, continuous research, and continuous enrollment.

Table 1. VSTC Enrollment and Credit Hours: 2005-2009.

Year	Enrollment	Credit Hours
2005	530	2,732
2006	510	2,406
2007	541	2,912
2008	617	2,912
2009	512	2,815

As can be seen, enrollment and credit hours reached a low point in 2006. This was the lowest enrollment at the VSTC in the past ten years. Enrollments increased in 2007 and 2008, but decreased in 2009. The reasons for the decrease in enrollment in 2009 likely include a decreased number of corporations offering tuition remission in an economic downturn, the lack of an Engineering Management and Systems Engineering cohort (One cohort graduated in Spring 2009; the next began in Spring 2010.), and the cancellation

of the Accelerated Master's of Business Administration cohort that was to have begun in Fall 2009.

Faculty: Approximately 70 faculty teach courses and engage in research on the Campus. These include faculty whose primary activity is based at the VSTC as well as those whose primary activity is based on the Foggy Bottom Campus.

Staff: Approximately 400 academic and administrative staff work on the Campus.

Facilities:

The VSTC currently is comprised of four buildings situated on approximately 101 acres. The total space in the four buildings is approximately 440,000 square feet distributed as follows:

Research 1: 71,000 SF on 50 acres; the original building opened in 1991

Executive Education center with 42-seat classroom, six breakout rooms, dining area, and serving kitchen

105 seat auditorium (hosts approximately 100 public and business events per year)

Laboratories for transportation safety, energy, pharmacogenomics, earthquake engineering and structure reliability, nuclear physics, electromagnetics, mechanical engineering, and high performance computing

Technology-enhanced classrooms; computer labs

Office suites for faculty and research scientists

Building 2: 204,000 SF situated on 40 acres along Route 7; acquired 2002

VSTC Library

The VSTC Library has a staff of 7 librarians and research assistants. It houses an electronic classroom and is a Cooperating Collection site for the Foundation Center.

Office suites for academic programs in business, education, health sciences

Center for Preparedness and Resiliency

Executive classroom

Technology-enhanced, video-teleconferencing (VTC), and computer classrooms

Office space for approximately 350 University personnel from administrative offices including ISS, Human Resources, Comptroller, Payroll, Supply Chain Organization, and the Registrar

Main University Data Center

NTSB Training Center: 86,000 SF on the original 50 acres. Constructed in partnership with the National Transportation Safety Board in 2003, currently leased to the NTSB

NTSB Training Center

Laboratories for accident investigation and reconstruction

Research 2: 77,000 SF situated on approximately 6 acres; acquired 2008

The first academic units moved into Research 2 in October 2009. The building now houses the VSTC Academic Administration, the NCAC's personnel and vehicle modeling and digitization laboratory, and the Pharmacogenomics faculty. Four technology-enhanced classrooms, one equipped for video teleconferencing, and five seminar rooms, one with video teleconferencing, were completed in January 2010. The Bachelor of Science in Nursing program, including the program's clinical skills laboratories, will move into the building in May 2010.

Research and teaching laboratories:

There has been a substantial increase in the number of square feet developed into working research laboratories and teaching laboratories at the VSTC over the past three years. Table 2 shows the square footage of active research and teaching laboratory space for the past four years and the projected amount for 2011.

Table 2. Square feet of active laboratory space at the VSTC: 2006 – 2011.

Year	2007	2008	2009	2010	2011
Square feet of research laboratory space	5,002	6,102	8,102	12,002	13,702
Square feet of teaching laboratory space	0	800	3,960	4,460	4,460

The main areas of growth in active research laboratory space have been in high performance computing, chemistry, and mechanical engineering. The chemistry and mechanical engineering growth has been mostly related to the establishment of the GW Energy Institute. The new teaching laboratory space was for the pharmacogenomics and nursing programs.

Campus Amenities:

Cafeteria

Fitness center

Three galleries for art exhibits

Student lounges

Wireless connectivity

Parking: Each of the four buildings provides ample free parking.

Handicapped accessibility: All four buildings are fully accessible to persons with disabilities.

Transportation: The Campus is served by a shuttle service that is provided through a partnership with HHMI Janelia Farm Research Campus and Loudoun County. This service operates between the West Falls Church Metro station and designated locations in Loudoun County. The Campus also is served by a direct shuttle service between it and the Foggy Bottom campus.

Research Centers and Institutes

The VSTC is home to the following research centers and institutes:

- Center for Intelligent Systems Research
 - Driving Simulator Laboratories
- Center for Nuclear Studies—Data Analysis Center
- Center for the Study of Learning
- Center for Preparedness and Resilience
- Earthquake Engineering and Structures Laboratory
- GW Energy Institute
- High Performance Computing Laboratory (HPCL)
 - Center on High-Performance Reconfigurable Computing
 - Institute for Massively Parallel Applications and Computing Technology
- Institute for Magnetics Research
- National Crash Analysis Center (NCAC)
 - NCAC Film Library
 - Vehicle Modeling/ Digitization Lab

These centers provide students and faculty with research opportunities that further bolster and support the academic programs on the Campus. They also afford opportunities for collaboration with local corporations, state and federal agencies, and other educational institutions.

External funding:

Table 3 shows the sponsored research expenditures at the VSTC for the past four fiscal years.

Table 3. Direct, indirect, and total sponsored research and training grant expenditures at the VSTC, FY2006-2009.

Fiscal Year	Direct expenditures	Indirect cost expenditures	Total expenditures
FY06	\$4,636,559	\$988,534	\$5,625,093
FY07	\$3,629,182	\$741,640	\$4,370,822
FY08	\$2,397,191	\$783,123	\$3,180,314
FY09	\$2,855,893	\$961,767	\$3,817,660

The FY2008 and FY2009 expenditures as shown have been adjusted to offset the Comptroller's office booking a \$2,347,768 adjustment against the VSTC expenditures in FY2008 and a \$117,966 adjustment in FY2009. These figures reflect the actual levels of expenditures. The adjustments were made to offset a reporting error regarding a \$5,000,000 award from Ford Motor Company that had been booked as pledge revenue in FY2003.

The trend for expenditures at the VSTC was downward over fiscal years 2007 and 2008. The major contributor to this downward trend was the decrease in expenditures related to homeland security. In FY2006, these expenditures were approximately \$876,376. In FY2007, they were only approximately \$68,000, and in FY2008 they were less than \$25,000. Inclusion of expenditures for two newly established areas of focus at the VSTC -- High Performance Computing and Energy -- reversed this trend for FY2009.

A detailed analysis of FY2009 expenditures reveals two important points. First, the NCAC accounted for 68 percent of the total sponsored research expenditures at the VSTC in that fiscal year. Second, the average expenditures for the nine principle investigators not affiliated with the NCAC was only \$138,269. This average is somewhat misleading in that the range of expenditures for this group was \$1,375 - \$584,162. It is significant to note that two investigators associated with core research areas at the VSTC, Professor El-Ghazawi (High Performance Computing) and Professor Hsu (Energy) accounted for \$584,162 and \$314,546 in expenditures, respectively. With the recent expansion of the high performance computing faculty

group, and further development of the energy institute, it is expected that the expenditures base will become distributed across a larger group of investigators.

Recent Developments:

- Transportation Safety: The Federal Highway Administration has renewed the National Crash Analysis Center cooperative agreement for five years at \$19 million.
- High Performance Computing: NSF awarded a \$1.1 million major research instrumentation grant to the HPCL to further increase the lab's capacity. Several other grant renewals and new awards, including a \$1.5M NSF grant jointly with Georgetown and University of Minnesota, were received. Two additional assistant professors joined the faculty in 2009, bringing the HPC group to four.
- The GW Energy Institute was launched in summer 2008. The founding faculty include Stuart Licht, an electrochemist and Stephen Hsu, a mechanical engineer. Adam Wickenheiser, a mechanical engineering faculty member, joined the institute in January 2010. Three more faculty, a physicist and two more mechanical engineers, are currently being recruited. As a team, working with other faculty members based at the Foggy Bottom campus, they will address a range of energy issues including new sources of sustainable energy and increased energy efficiency. Dr. Licht is working in solar conversion, fuel cells and battery storage. Dr. Hsu is focusing on micro-energy production such as solar panels and rooftop windmills and conducts research in nanomaterials as well.
- New electrochemistry, physics, and mechanical engineering labs were constructed in Research 1 in 2009. An energy efficiency laboratory was completed in February 2010. The NCAC vehicle modeling and digitization lab was relocated from Building 2 to Research 2 in January 2010.

Academic Programs

Academic degree and certificate programs are currently offered by five of GW's colleges and schools:

- **The School of Medicine and Health Sciences**: Pharmacogenomics, B.S.H.S.; Nursing, BSN;
- **The School of Business**: Business Administration, Accelerated MBA; Information Systems Technology, Executive M.S.; Information Systems Technology, M.S.;
- **Graduate School of Education and Human Development**: Higher Education Administration, Ed.D.; Educational Leadership and Policy Studies, Ed.D.; Human and Organizational Studies, Executive Leadership, Ed.D.; Teacher Preparation in Secondary Education, M.Ed.; Graduate Certificate in Leadership Development;
- **School of Engineering and Applied Science**: Computer Science, M.S., D.Sc.; Electrical Engineering, Accelerated, M.S., D.Sc. (3 specializations); Engineering Management and Systems Engineering, D. Sc.;

Telecommunications and Computers, Accelerated, M.S.; Graduate Certificate in Computer Security and Information Assurance;

- **College of Professional Studies:** Graduate Certificate or Master's degree in Landscape Design and Sustainable Design.

Recent Developments:

- A new doctoral program in Education Administration and Policy Studies was launched successfully in January 2009; a second cohort began study in January 2010. There are now 25 students enrolled in the program.
- A second bachelor's degree program in Nursing was started in August 2009. Twenty students were enrolled in the program. Forty students are planned for fall 2010, and 70 students for fall 2011.
- New video teleconferencing (VTC) classrooms have been constructed on the VSTC in order to allow classes to be conducted via VTC between the VSTC and Foggy Bottom campuses. Professor Stuart Licht is teaching the first ever course from the VSTC to Foggy Bottom in Spring 2010.

Community Engagement

The VSTC hosted a variety of events during the past year that were designed to enhance GW's role as a major provider of learning, civic engagement, and cultural opportunities. These events included the following:

- The Different Thinking series in partnership with the Loudoun Chamber of Commerce and the CEO Cabinet.
- Regional Transportation Forum with the Dulles Area Transportation Association (DATA) that featured comments by then candidate for US Senate Mark Warner.
- Loudoun Small Business Development Center's day-long program of workshops and presentations with approximately 250 attendees.
- 10th Congressional District Art Exhibit and Competition hosted in collaboration with Congressman Frank Wolf.
- Loudoun Chamber of Commerce's Technology Day with approximately 100 business leaders attending.
- Town Hall meeting with Virginia State Senator Mark Herring and Delegate David Poisson.
- Third annual Science, Technology, and Engineering Day in partnership with Loudoun County Public Schools, with approximately 140 sophomore, junior, and senior high school students and LCPS teachers participating. Recruited the first two corporate sponsors (Telos, Roadstar) for the event.
- Regional Artist Series in partnership with Gallery 222/Loudoun Academy of the Arts Foundation that included seven exhibits and receptions with an average attendance of 75.
- Reading by Pulitzer Prize-winning novelist Edward P. Jones, who will join the faculty of the GW English Department in fall 2010, with approximately 70 attendees.

- "Young Artist Series" in partnership with Loudoun County Public Schools: hosted an Art Teacher's Art exhibit and reception and three student exhibits and receptions representing a total of 18 elementary, middle, and high schools attracting approximately 550 students, parents, relatives, teachers, and principals.
- The Campus hosted nearly 100 workshops, seminars and other events conducted by a variety of corporations and government and nonprofit organizations.

Foundation Center Cooperating Collection

The VSTC Library is a Cooperating Collection site for the Foundation Center, the nation's most comprehensive listing of foundations that provide grants to various community organizations. During 2008-2009, the Library hosted 11 Foundation Center Cooperating Collection workshops with 148 total attendees. The Library also served 63 individuals seeking assistance with identifying sources of foundation funding.

Strategic Analysis

Strengths

University Involvement and Commitment to the VSTC

President Knapp is committed to expanding GW's involvement in the Commonwealth of Virginia. He views the VSTC as an integral part of the University and an important complement to the Foggy Bottom campus.

Vice President for Research Leo Chalupa is developing an entrepreneurial unit to work closely with the University's Office of Technology Transfer. He also is working to develop a center for advanced study in computational biology which will be housed at the VSTC.

Vice President for External Affairs Lorraine Voles has hired an experienced Virginia-focused government relations person, Bennett Blodgett, who has already made extensive contacts in the Northern Virginia region and across the Commonwealth.

The University Board of Trustees has created a permanent Board committee that focuses specifically on the University's operations and facilities in Virginia, including the VSTC. This Committee provides the VSTC with input and oversight for its strategic plan and reports to the full Board of Trustees regarding accomplishments and fulfillment of strategic goals. Committee members include:

- Nelson Carbonell, President and Chairman, Snowbird Capital; GW Engineering alumnus

- Mark Hughes, chair; retired as president of SAIC's system and network solutions group; GW Engineering alumnus
- Bobbie Kilberg, President, NVTC
- Ray Oglethorpe, former President, AOL Technologies
- Russ Ramsey, Chairman and CEO, Ramsey Asset management; GW alumnus; Chair, GW Board of Trustees
- Lydia Thomas, retired as president of Noblis; Ph.D. in biology

The University has stationed several key business units (e.g., ISS, Payroll, Comptroller, Procurement, Accounts Payable) with approximately 350 employees at the VSTC.

Space: The primary strength of the VSTC is its place within a major research university, and, moreover, a major research university that is seeking to dramatically enhance its research profile. While GW has invested substantially in new facilities to house its schools of business, international affairs, and media and public affairs, and has renovated facilities for its law school and several arts and sciences departments, it has not constructed major new facilities for its school of engineering and applied science and its basic science departments in more than 60 years. While the University has a new science and engineering complex for the Foggy Bottom campus under development, the VSTC will continue to provide a cost effective venue for the development of new science and engineering facilities that will complement those on the Foggy Bottom campus. Research 1 was designed to facilitate providing utilities to laboratories, and Research 2 has large open spaces that may be readily built out to provide space for research groups. In addition, the VSTC has many acres of undeveloped land on which up to two million square feet of new space could be developed [Source: Office of Real Estate]. This space could include laboratory and office space for new and expanded centers for advanced study, space for translational research and a commercialization incubator, and space for strategic partners and university-related start ups. Space also could be constructed for new and expanded educational programs. Such space could include classrooms, collaborative learning environments, computer labs, clinical simulation labs, and facilities to support distance education.

Location/Regional resources: The VSTC is located in Eastern Loudoun County which is home to the vast majority of businesses and residents in the County and, given current zoning regulations and growth plans, will continue to be the region of greatest growth and density in the County for the foreseeable future. The Campus is located within the Dulles Technology Corridor which is home to a wide array of corporations not only in the technology sector, but in other significant commercial sectors as well (e.g., communications, transportation, finance). The area proximate to the VSTC also features significant biomedical research (HHMI Janelia Farm Research Campus) and health care (Inova Loudoun Hospital) institutions.

Importantly, the VSTC is located only eight miles from Dulles International Airport at the intersections of three major transportation arteries (Route 7, Route 28, Loudoun County Parkway). The Dulles extension of Metro rail is to reach a location near the Campus by 2015.

Community support: Members of the GW academic administration are members of the Boards of such important Northern Virginia institutions as the Northern Virginia Technology Council, the Loudoun Chamber of Commerce, and the Committee for Dulles. GW employees also serve on the Loudoun Economic Development Commission and are involved in such regional organizations as the Community Foundation of Northern Virginia.

These efforts of the VSTC administrative staff to develop strong relationships within the region have begun to pay substantial dividends. The VSTC Advisory Council includes CEOs and the leaders of major educational, research, and healthcare institutions in the region. The Campus has forged partnerships with the Loudoun County Public Schools and local nonprofit and cultural organizations. Partnerships for R&D and technology transfer collaborations are under development, and leaders in the region have expressed strong interest in developing a business incubator. Sponsorships for the Campus' annual Science, Technology, and Engineering Day have been solicited from local corporations. The VSTC is now seen as a valued partner by the government, education, healthcare, and corporate sectors of the region – a partner that is to be supported as it seeks to expand its research and educational programs.

Cost of living/Community life: The cost of living in Loudoun County is lower than that of the District of Columbia and the Virginia and Maryland suburbs more proximate to the Foggy Bottom campus. Housing costs are lower than in those areas, and the County features an excellent public school system and a wide variety of recreational activities. As such, the region around the VSTC is especially attractive to young faculty and research staff being recruited to GW.

Campus amenities

The VSTC features a library, cafeteria, fitness center, and art galleries that enhance the work environment for GW employees and provide opportunities for community outreach. Further development of the Campus landscape and expansion of services to students and employees will increase the return on investment in the VSTC.

Limitations

Perception of the VSTC within the GW Community: The perception persists among a significant portion of GW faculty members, students, and administrators that the VSTC is too far from the Foggy Bottom campus to be a viable alternative for

research and study. This perception has sometimes resulted in a failure to respond in a timely manner to opportunities to offer educational programs and to develop research and development partnerships.

Budget: The number of classrooms and teaching and research laboratories on the VSTC has increased substantially in the past year; however, the budget to support both recurring operating costs and life cycle replacement of essential equipment has not increased proportionally. This lack of proportional funding creates a risk to both daily operations and the sustainability of facilities and functions.

Tuition and perceived value of academic programs: The educational programs offered at the VSTC, as well as at GW's educational centers in Alexandria, Arlington, and Hampton Roads, are under significant pricing pressure from other institutions, both public and private. Current practice is to discount tuition for students enrolled in certain programs at the VSTC and other GW educational locations in Virginia. This pricing discount makes it more challenging for schools and departments to achieve targeted margins on these programs. This situation has, in some cases, led departments to offer an insufficient menu of courses at the VSTC for students to complete a full degree program at the Campus. In other cases, programs have relied very heavily on part-time faculty to teach courses at the VSTC, thereby limiting students' exposure to GW's best full-time faculty. Expenses for programs offered at the VSTC, particularly faculty compensation, must be managed in a manner that enables the attainment of acceptable margins while assuring program quality. These issues require attention if all of the programs offered at the VSTC are to be consistently of a quality and perceived value that meet the expectations of prospective, as well as enrolled, students.

Student services: As the number of students conducting research and enrolled in educational programs on the Campus has increased, along with the range of hours during the week when students are on campus, student services (e.g., financial aid, technology support) have remained available on only a limited basis. Furthermore, the hours during which such services are available are not well aligned with the times when students are present on the Campus. In addition, the hours of operation of the campus cafeteria do not include any evening or weekend hours when the greatest number of students is on the Campus. As demand justifies, the hours of operation of the cafeteria should be increased to better meet the needs of students.

A Sense of Place: It is frequently remarked that the VSTC does not "feel" like a campus. A plan for the physical campus that promotes growth of the academic enterprise, that provides facilities for student and employee activities, that attracts visitors to the campus, and that clearly demonstrates GW's commitment in Virginia is needed. This plan needs to address expanded research and educational activity,

potential technology transfer and strategic partnership opportunities, transfer of additional administrative activity from the District of Columbia, and possibly student and faculty housing. An opportunity also exists to create buildings and landscaping that promote GW's sustainability efforts and that leverage the University's program in Sustainable Landscape Design and potential partnerships with other institutions of higher education, corporations, and government agencies.

Pedestrian mobility on campus: With the opening of Research 2, students, faculty, and staff are now routinely working in three buildings on the VSTC. The Campus library, cafeteria, and fitness center are located in Building 2 across George Washington Boulevard from the two main academic buildings (Research 1 and Research 2). The Campus is lacking in sufficient pedestrian pathways to provide safe, efficient movement among the three main buildings.

Opportunities

The perception of the VSTC as a significant contributor to the economic and work force development and to the quality of life in the Northern Virginia region, and in particular in Loudoun County, has changed dramatically in the past year. Senior VSTC academic administrative staff are actively involved with a wide range of corporations and other institutions and organizations.

Currently, efforts are underway to develop formal research and development partnerships with two corporations. Funding is being sought for the GW Teachers in Industry Project, a joint venture with the Loudoun County Public Schools (LCPS) and the Loudoun Economic Development Commission. A joint grant application with the LCPS and other regional corporations has been submitted to NSF. A grant application has also been submitted to Verizon.

The population and economic base of the region continues to develop in spite of the national and state-level economic downturn. The population of Loudoun County is expected to approach 290,000 by 2012 with an estimated median household income in excess of \$118,000 [Source: US Census Bureau]. The movement of major elements of corporations such as Volkswagen, Raytheon, SAIC, and potentially Northrop Grumman to Northern Virginia, along with the expansion of corporations such as Orbital Sciences and the establishment of institutions such as the Ignite Institute for Individualized Health, will offer excellent opportunities to develop R&D partnerships and to develop targeted educational programs. An Eduventures report, "Demand for Academic Programs in Loudoun County" (2008), identified the following areas as ones likely to have high demand:

- Computer science, mathematics, and information technology;
- Life sciences;

- Health and human services;
- Business management;
- Teacher preparation.

In particular, opportunities may exist to provide educational programs targeted at firms working with the Departments of Defense and Homeland Security and in the field of cyber security. These firms may also be interested in language training, organizational development, and various other fields. There will also be ample opportunities for student internships in a wide range of corporations.

The continuing development of the research enterprise at the VSTC is creating opportunities for expanded partnerships with both corporations and other universities. The modeling and simulation expertise of the NCAC creates potential collaborations with Virginia Tech and perhaps the University of Virginia. The NCAC also is developing a partnership with the National Center for Manufacturing Sciences that will likely lead to other partnership opportunities. The GW Energy Institute will almost certainly have extensive partnership opportunities with corporations and other universities as it continues to develop. The High Performance Computing Laboratory already has partnerships with both universities and corporate sponsors, and this list of partnerships should grow.

Opportunities may also emerge for additional collaborations and articulation agreements for educational programs. Several member colleges of the Council of Independent Colleges in Virginia are likely to be interested in potential collaborations with GW. The Northern Virginia Community College (NOVA) Sterling campus, which has an enrollment of nearly 10,000 students, is located only three miles from the VSTC. In addition, NOVA is reportedly interested in developing a new health sciences campus in Loudoun County.

The Loudoun County Department of Economic Development has identified “international business” as an area of emphasis. This focus, along with the presence of the World Trade Center Dulles Airport may yield opportunities for international collaborations as well. Creating the necessary infrastructure to foster new partnerships is essential. Involvement on the part of faculty members from the GW School of Business’ highly ranked Department of International Business would be beneficial to this effort while providing valuable learning opportunities to students.

As the VSTC continues to develop, opportunities for fund raising will increase. Naming opportunities for laboratories and buildings will become more attractive. Funds for endowed professorships in particularly successful areas may be attained. A coordinated effort involving the Office of Development and Alumni Relations and

the Office of External Affairs should be developed to leverage the successes of the VSTC.

Challenges/Threats

As noted above, responding in a timely manner to overtures from and opportunities with various sectors of the region is critical. A wave of new opportunities is presenting itself, and it is incumbent upon the GW faculty and administration to seize these opportunities if the University is to be recognized as a valuable partner in the region and the Commonwealth. If we fail to respond appropriately to these opportunities, other universities will surely fill the void left by GW's lack of responsiveness.

One means of mitigating the problems of incomplete curricula offered at the VSTC and an over-reliance on part-time faculty is to offer hybrid courses at the VSTC or courses that are taught via video teleconferencing (VTC) from the Foggy Bottom campus to VSTC classrooms. The VSTC administration has invested in VTC-equipped classrooms for the Campus, and there is a history of successfully employing VTC in partnership with Shenandoah University for the Pharmacogenomics program. The VSTC also has invested in enhanced support for its classrooms through GW's Academic Technologies unit. However, there remains a lack of VTC facilities on the Foggy Bottom campus, and Academic Technologies would need additional staff and operating and life cycle replacement funds to support such facilities. Absent these investments, educational programs offered at the VSTC will continue to be limited in terms of the breadth of available course work and the involvement of full-time faculty.

George Mason University (GMUs) recently received a gift of 37 acres of land in Loudoun County. While Virginia's and GMU's financial situation will likely preclude significant development of a Mason campus in Loudoun County in the near-term, it seems inevitable that GMU will seek to develop a Loudoun campus at some point in the future. It is incumbent upon GW to seize the current window of opportunity to establish itself as the major research university working with regional government agencies, corporations, health care providers, and nonprofit institutions in both R&D efforts and work force development.

Shenandoah University opened a new facility in Ashburn in 2009 that includes teaching spaces for its nursing program. On the other hand, Marymount and Old Dominion Universities have ceased offering course work in Loudoun County.

GW has in the past year offered its first undergraduate degree program in Virginia that is not in partnership with another Virginia independent university. There are other potentially fertile markets in Virginia for innovative undergraduate programs. In offering these programs; however, GW should be careful to maintain good

working relationships with the member institutions of the Council of Independent Colleges in Virginia (CICV) and with the State Council of Higher Education in Virginia. Collaboration on unique programs and articulation agreements between CICV member institutions and GW graduate programs may prove to be of benefit to both parties.

Strategic Goals and Objectives

Goal 1. Expand sponsored research activity

Goals for increasing research expenditures at the VSTC over the next 10 years have been aligned with the University Strategic Metrics for research expenditures. These goals are shown in Table 4.

Table 4. Goals for sponsored research and training expenditures at the VSTC: FY2012 – FY2020.

	FY009	FY2012	FY2014	FY2016	FY2018	FY2020
Total sponsored research	\$3,935,626	\$4,821,311	\$5,519,919	\$6,319,755	\$7,235,487	\$8,283,909
Total research expenditures	\$3,875,226	\$4,747,318	\$5,435,205	\$6,222,766	\$7,124,445	\$8,156,776
Federal Research and Development	\$3,187,890	\$3,905,302	\$4,471,180	\$5,119,054	\$5,860,805	\$6,710,036

Objective 1a. Formally charter the GW Energy Institute, complete hiring for planned positions (physics, mechanical engineering), and identify other key areas in which faculty positions should be created and filled.

Objective 1b. Construct the Advanced Impact and Materials Research Laboratories (AIMRL) and put in place an operating budget that will ensure the sustained full operational status of the facility.

Objective 1c. Combine elements of the NCAC, the GW Energy Institute, and the Earthquake and Structures Laboratory to create an interdisciplinary research group in materials science.

Objective 1d. Establish key metrics (e.g., external funding, refereed publications, licenses and contracts, graduate students completing dissertations and degree programs) for research productivity and reallocate laboratory and office space from centers and institutes that fail to reach targets to ones that will benefit from increased resources.

Objective 1e. Facilitate the generation and management of research proposals and grants by stationing at least one Sponsored Program Manager at the VSTC.

Objective 1f. Assess the need for technical support, including a machine shop, for the research operations at the VSTC and provide the needed support.

Objective 1g. Ensure the sustainability of the VSTC research enterprise by allocating sufficient funds to cover basic recurring costs (e.g., administrative staff, telephone, data connections, office and laboratory supplies, life cycle replacement of desktop computers) of the research activities.

Objective 1h. Establish formal partnerships with corporations and other institutions to collaborate on research and development projects.

Objective 1i. Establish one or two new centers for advanced study in areas (e.g., computational biology, health information technology) that will yield significant external funding and will contribute to the reputation and prestige of the University. In order to optimize the potential of success, each center should be built on a critical mass of faculty whose offices and research facilities are located at the VSTC.

Objective 1j. Develop a "Health Sciences Complex" at the VSTC that would include components of the School of Nursing, expanded Pharmacogenomics research and educational programs, an Institute for Health Information Technology, a National Institute for Tropical Medicine, and perhaps an expanded program in Pharmacy in collaboration with Shenandoah University.

Goal 2. Increase enrollments in academic programs offered at the VSTC

Goals for increasing enrollments in academic programs at the VSTC over the next 10 years are dependent on the demand for and optimal size of existing programs and the implementation of new programs. Goals for these two aspects of enrollment growth are shown in tables 5 and 6, respectively.

Table 5 shows enrollments (includes full-time, part-time, and continuous research) and credit hours for all programs offered at the VSTC in fall 2009. In addition, it shows target figures through 2020, projecting a five percent increase per biennium for both parameters.

Table 5. Target enrollments and credit hours for existing academic programs: 2010 – 2020.

	FY2010	FY2012	FY2014	FY2016	FY2018	FY2020
Enrollments	512	540	565	595	625	655
Credit hours	2,815	2,955	3,100	3,255	3,415	3,585

Table 6 shows projected enrollments for programs that are being discussed for implementation at the VSTC.

Table 6. Enrollments in potential new academic programs at the VSTC: 2010 – 2020.

School	Program	Degree	FY12	FY14	FY16	FY18	FY20
CCAS	Renewable Energy Science	M.S.	10	20	20	20	20
		Ph.D.		5	12	15	15
SEAS	Energy Engineering	Certificate	12	15	15	15	15
		M.S.	10	20	20	20	20
		D.Sc.		5	12	20	20
	Transportation Safety Engineering	Certificate	10	12	12	12	12
		M.S.	8	20	24	24	24
GWSB SPHHS SMHS Nursing	Health Information Technology	Certificate	10	20	30	30	30
		Executive Master's Program		15	25	35	35

Nursing	Four-year program	B.S.N.		40	60	80	100
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Objective 2a. Under the auspices of the College of Professional Studies, complete a thorough review of the marketing of programs offered at the VSTC and at the GW Education Centers in Virginia. Based on the results of this analysis, develop a comprehensive plan for marketing educational programs offered in Virginia that is fully integrated with a University plan for marketing off-campus programs.

Objective 2b. Interview/survey representatives from a variety of government and business sectors to identify areas of demand for cohort (single company or pooled) programs.

Objective 2c. Identify areas of demand for cohort “fly in” programs that leverage the VSTC’s proximity to Dulles Airport and, where programmatically and financially feasible, develop and offer additional programs.

Objective 2d. Develop a consistent policy regarding the balance between discounted tuition and student financial assistance for educational programs at the VSTC and the education centers.

Objective 2e. Develop the capacity to offer programs and course work in a variety of formats that may be attractive to prospective students, including limited residency and hybrid formats.

Objective 2f. Develop undergraduate and graduate certificate and degree programs that leverage the faculty and research activity based at the VSTC (e.g., energy science and technology, transportation safety engineering, high performance computing, health sciences).

Objective 2g. Develop and offer programs that more fully utilize existing faculty and facilities at the VSTC, including energy science and technology, a full B.S.N., and certificate and degree programs in Health Information Technology.

Objective 2h. Survey current students to determine services that they would like to have available at the VSTC and provide the key services as feasible.

Objective 2i. Implement technologies (e.g., video conferencing, content capture, Elluminate Live) that may be used to expand the number of courses which students may take as part of VSTC programs and which will allow students at any location to take courses originating at the VSTC.

Objective 2j. Establish the VSTC as an incubator for innovative “learning environments” and pedagogical approaches.

Goal 3. Implement a plan of government relations and community engagement that establishes GW as a significant and valued contributor to the development of public policy, the workforce and economic development, and the quality of life in the Northern Virginia region and the Commonwealth of Virginia.

Objective 3a. In collaboration with the Office of External Relations, develop strong relationships with elected state-wide representatives and officials, state senators and delegates from districts in which GW has a physical presence and/or a substantial number of alumni, and key appointed officials at the regional and state level.

Objective 3b. Expand the VSTC Advisory Council to include representatives from throughout the Commonwealth of Virginia.

Objective 3c. Enhance the visibility of GW in Virginia through a series of educational and cultural events that are open to the public. Emphasize events that showcase the research and educational programs at the VSTC.

Goal 4. Systematically solicit support from corporations and foundations to enhance the VSTC’s research enterprise, educational programs, and community engagement activities.

Objective 4a. In collaboration with the Office of Corporate Relations and the Office of Foundation Relations, specific school’s development offices, and faculty, develop a comprehensive plan for soliciting funding and other forms of support that will underwrite the programs and activities on the VSTC.

Objective 4b. Obtain sponsorships for selected VSTC community programs (e.g., Science, Technology, and Engineering Day; Young Artists Series; Regional Artists Series).

Goal 5. Develop a master plan for the VSTC that includes facilities that will support expansion of the research, educational, student services, administrative, and community engagement enterprises on the VSTC and amenities and a physical environment that will be conducive to and reflective of a vibrant university community.

Objective 5a. Construct a plan for the development of the facilities required to accommodate new centers for advanced study as they are created on the Campus.

Objective 5b. Establish a student service center with a physical presence in Research 2 and days/hours of operation that will provide the key services identified by VSTC students (Objective 2e).

Objective 5c. Enhance the functionality and visibility of the Campus through the construction of pedestrian pathways and outdoor gathering spaces and through the creation of “identity features” along George Washington Boulevard.

Objective 5d. Incorporate features in building and landscaping that support the University’s commitment to sustainability, including demonstration and research spaces that promote GW’s Sustainable Landscape Design program.

First Steps toward A Vision for 2020

Research and External Funding

1. Deploy a Sponsored Research Manager to the VSTC on at least a 50% basis, increasing time spent at the VSTC as indicated by demand for pre- and post-award support.
2. Execute formal partnerships with corporations (e.g., Prototype Productions, Inc.; Rehau) and other institutions (e.g., National Center for Manufacturing Sciences) to facilitate research and development activities at the VSTC.
3. Complete the charter of the GW Energy Institute.
4. Develop a center for advanced study in Computational Biology to be housed in Research 2 at the VSTC.
5. Increase the annual budget of the CAO and of individual research centers in order to cover standard recurring operating costs (e.g., office supplies, telephone, data connections) and life cycle replacement of non-allowable equipment (e.g., computers, scanners).

Academic Programs

1. Offer some form of an MBA program at the VSTC in which students may take all of the courses at the VSTC, either in person or via video teleconferencing, that are required for the degree, including courses in three or four of GWSB’s most popular “knowledge domains.”
2. Create and implement a marketing program for “GW in Virginia” in which the marketing of programs at the VSTC and the education centers are fully integrated with one another and with the overall marketing of GW graduate programs.

3. Develop certificate and graduate degree programs to be offered at the VSTC that leverage the research being conducted on the Campus. Specific opportunities exist in transportation safety engineering, high performance computing, and energy science and technology.
4. Develop certificate and degree programs in Health Information Technology to be offered at the VSTC.
5. Establish an "Academic Programs Venture Capital Fund," to be maintained at a minimum of \$25,000 per fiscal year, to provide support for the start up of new educational programs at the VSTC. This fund will be administered by the CAO in consultation with the Provost and deans.

Marketing and Outreach

1. In collaboration with the Office of External Affairs, expand "internal marketing" efforts to better inform GW faculty, students, and staff about the level of activity on the VSTC and in the surrounding area.
2. Create and disseminate a brochure that provides information about the current research and educational programs at the VSTC and plans for future development.
3. Create a new web presence for the VSTC.
4. Add new members to the VSTC Advisory Council.
5. Fully integrate the efforts to increase the visibility of the VSTC into the Office of External Affairs' activities to raise GW's profile in Virginia.
6. Develop a comprehensive plan to increase corporate and foundation support for VSTC research, educational, and community activities.

Facilities and Amenities

1. Submit a revised proposal to NIST for funding for construction of the AIMRL that addresses the issues raised in the reviews of the previous submission. In the meantime, explore additional funding options from the Department of Transportation and other government agencies and from corporations affiliated with the transportation industry (e.g., automobile manufacturers, tire manufactures, vehicle component manufacturers, insurance companies, rental car companies, vehicle service companies). Also, develop plans for partial completion of the AIMRL that could be executed with a budget of \$20-24 million.

2. Construct a nanomaterials laboratory in Research 1 in conjunction with the School of Engineering and Applied Science and the GW Energy Institute.
3. Add cooling capacity to the High Performance Computing Laboratory (HPCL) and construct a viewing area into the HPCL that encompasses Research 1, lab bays 324 and 326.
4. Construct additional mechanical engineering laboratories affiliated with the GW Energy Institute.
5. Construct a sidewalk between Research 1 and Research 2.
6. Develop sustainable landscape projects on the VSTC in collaboration with the CPS Sustainable Landscape Design program and external partners.

Appendix A

Virginia Campus Academic Planning Task Force

Executive Committee

Peg Barrett, Dean, Columbian College of Arts and Sciences

Kathleen Burke, Dean, College of Professional Studies

Leo Chalupa, Vice President for Research

David Dolling, Dean, School of Engineering and Applied Science

Jean Johnson, Senior Associate Dean for Health Sciences, School of Medicine
and Health Sciences

Craig Linebaugh, Chief Academic Operating Officer, Virginia Science and
Technology Campus

Alicia O'Neil, Senior Associate Vice President for Operations, Office of the
Executive Vice President and Treasurer

Educational Programs Working Group

Kathleen Burke, Dean, CPS

Richard Donnelly, Department of Information Systems and Technology Mgt,
GWSB

Ali Eskandarian, Senior Association Dean for Strategic Initiatives and
Research, CPS

Paula Harper, Virginia Campus Program Development and Management

Katherine Hunting, Associate Dean for Academic Affairs, SPHHS

Can Korman, Chair, Electrical and Computer Engineering, SEAS

Craig Linebaugh, Virginia Campus Chief Academic Operating Officer

Randall Packer, Associate Dean for Special Projects, CCAS

Virginia Roach*, Chair, Department of Educational Leadership, GSEHD

Kim Roddis, Chair, Civil and Environmental Engineering, SEAS

Murat Tarimcilar, Associate Dean for Graduate Programs, GWSB

Abdou Youssef, Chair, Computer Sciences, SEAS

*Chair of the Working Group

Research Working Group

Leo Chalupa, Vice President for Research

David Dolling, Dean, SEAS

Tarek El-Ghazawi, Electrical and Computer Engineering

Stephen Hsu, Professor of Engineering and Applied Science

Steve Kan, Director, National Crash Analysis Center

David Lerch, Director of Technology Transfer

Stuart Licht, Chemistry

Houston Miller, Chemistry

Allena Opper, Physics

Geralyn Shultz, Associate Dean for Research, CCAS: Speech & Hearing
Science

Pedro Silva, Civil and Environmental Engineering

Community Engagement Working Group

Scott Hamberger, President and CEO, Fortessa, Inc.

Ed Hatrick, Superintendent, Loudoun County Public Schools

Dana Kauffman, Special Assistant to the President, Northern Virginia
Community College

Randall Kelley, CEO, INOVA Loudoun Hospital

Cheryl Moore, COO, HHMI Janelia Farms

Larry Rosenstrauch, Director, Loudoun County Department of Economic
Development

Joe Travez, President, Prototype Productions

Lori Waters, Loudoun County Board of Supervisors, Broad Run District

Ed Zigo, CEO, Clarke-Hook Real Estate; Chairman, University Center

Property Owners Association

Appendix B

Report of the Research Working Group Virginia Campus Academic Planning Task Force July 30, 2009

Members of the Research Working Group (RWG)

Leo Chalupa, Vice President for Research

David Dolling, Dean, SEAS

Tarek El-Ghazawi, Electrical and Computer Engineering

Stephen Hsu, Professor of Engineering and Applied Science

Steve Kan, Director, National Crash Analysis Center

David Lerch, Director of Technology Transfer

Stuart Licht, Chemistry

Houston Miller, Chemistry

Allena Opper, Physics

Geralyn Shultz, Associate Dean for Research, CCAS: Speech & Hearing

Pedro Silva, Civil and Environmental Engineering

Virginia Campus Staff:

Craig Linebaugh, Chief Academic Operating Officer/GW Virginia Campus

Andrea Barnes, Special Assistant to the CAO (Staff)

Background

The GW Virginia Campus was established in Loudoun County in 1991 to meet the academic and research needs of the technology industries that were being established along the Route 28 corridor in Western Fairfax and Loudoun counties. Since that time, the Virginia Campus has grown into a robust center for innovative research, graduate education, and regional corporate partnerships. As the University's research and development campus, it hosts a dozen centers of excellence in critical areas such as energy science and technology, transportation

safety, and high performance computing. The GW Virginia Campus also combines its research excellence with more than 20 exceptional graduate degree and certificate programs in business, education, and engineering, and unique undergraduate programs in the health sciences.

Given the growth in academic programming and University President Steven Knapp's and the Board of Trustees' interest in expanding the campus in its regional and national significance, Craig Linebaugh, Chief Academic Operating Officer of the Virginia Campus, created a task force to develop a comprehensive academic plan for the Campus. The task force was comprised of an executive committee and three working groups: research, educational programs, community engagement.

The objectives/tasks assigned to the Research Working Group were as follows:

- review research expenditures for the Virginia Campus for the past four years;
- consider strategies for increasing awards and expenditures for research groups currently based at the Virginia Campus;
- review current laboratory space allocations and projected allocations based on current faculty searches;
- consider guidelines for lab space allocation;
- develop strategies for engaging potential corporate partners in R&D relationships;
- develop possible incentives for schools and academic departments to relocate/develop research programs at the Virginia Campus;
- consider possible operational impacts of expanded research programs (e.g., lab facilities, technical support, pre- and post-award support, administrative support);
- set goals for expansion of the research enterprise;
- identify strategies to achieve those goals and metrics by which progress can be assessed.

ENVIRONMENT

External

The GW Virginia Campus is located in Ashburn, Virginia, on Route 7 just west of the interchange with Route 28 in Loudoun County. The Campus is located in University Center, a 575 acre development zoned for research and development and residential uses. University Center currently includes the offices for 15 corporations; offices for Loudoun County government agencies; The Goddard School serving children from infancy through kindergarten; several service businesses (e.g., bank, coffee shop, pizza shop, hair salon); a hotel; the Northern Virginia Criminal Justice Academy; and approximately 2400 housing units including townhomes, condominiums, and apartments.

The Campus is located just 8 miles from Dulles International Airport and anchors the north end of Loudoun County Parkway. It is proximate to major development projects including One Loudoun which is planned for nearly four million square feet of commercial and retail space including a World Trade Center. An interchange between Route 7 and George Washington Boulevard, a four-lane, divided street that is the main artery within University Center, is under construction and scheduled to open in summer 2010.

The County is currently focusing on two significant industry clusters, Information and Communications Technology (ICT) and Life Sciences, as well as two industry overlays, Federal Government Contracting and International. *Moody's Economy.com* released the following information about the ICT cluster in January 2009,

The Dulles Technology Corridor, centered in Loudoun County, hosts the largest number of internet, satellite, and defense companies in the nation. These companies will benefit from the rising threat of cyber-terrorism as both private and public entities invest in greater security measures. Although *Moody's' Economy.com* expects federal defense spending to slow down from its rapid pace this decade, government consumption related to cyber security will accelerate. Several of the area's top employers, including L-3 Communications Holdings and SAIC, are creating special units to address rising demand for security products.

Two Loudoun businesses, Equinix and NeuStar, were recently ranked numbers 16 and 17 respectively on *Forbes Magazine's* "25 Fastest-Growing Technology Companies in America."

The Life Sciences cluster continues to focus on HHMI Janelia Farm, which is now three years old and staffed to approximately two-thirds capacity. Companies focusing in such areas as long-term preservation of research materials, medical device development, and RFID technology deployed in government and healthcare industries also continue to expand.

In addition to expansions at Orbital Sciences (space technology) and Telos (communications technology), a recent highlight is the April 1, 2009 announcement by Virginia Governor Tim Kaine that Raytheon will be consolidating much of its Northern Virginia operations into 600,000 square feet of business space at the AOL Campus in Loudoun County.

Internal

Campus population

Students: approximately 550 students are enrolled in Virginia Campus programs each semester. In addition, approximately 50 graduate students are engaged in research on the Campus.

Faculty: approximately 60 faculty teach courses and engage in research on the Campus.

Staff: approximately 400 academic and administrative staff work on the Campus.

Academic degree programs are currently offered by five of GW's colleges and schools:

- **The School of Medicine and Health Sciences:** Pharmacogenomics, B.S.H.S.; Nursing, BSN;
- **The School of Business:** Business Administration, Accelerated MBA; Information Systems Technology, Executive M.S.; Information Systems Technology, M.S.;
- **Graduate School of Education and Human Development:** Higher Education Administration, Ed.D.; Educational Leadership and Policy Studies, Ed.D.; Human and Organizational Studies, Executive Leadership, Ed.D.; Teacher Preparation in Secondary Education, M.Ed.;
- **School of Engineering and Applied Science:** Computer Science, M.S., D.Sc.; Electrical Engineering, Accelerated, M.S., D.Sc. (3 specializations); Engineering Management and Systems Engineering, D. Sc.; Telecommunications and Computers, Accelerated, M.S.;
- **College of Professional Studies:** Graduate Certificate or Master's degree in Landscape Design and Sustainable Design.

The Virginia Campus also is home to the following research centers and institutes:

- [Center for Intelligent Systems Research](#)
 - [Driving Simulator Laboratories](#)
- [Center for Nuclear Studies—Data Analysis Center](#)
- [Center for the Study of Learning](#)
- Center for Preparedness and Resilience
- GW Energy Institute
- High Performance Computing Laboratory
 - [Center on High-Performance Reconfigurable Computing](#)
 - Institute for Massively Parallel Applications and Computing Technology
- [Infrastructure Safety and Reliability Laboratory](#)
- [Institute for Magnetics Research](#)
- [National Crash Analysis Center](#) (NCAC)

- [NCAC Film Library](#)
- [Vehicle Modeling/ Digitization Lab](#)

These centers provide students and faculty with research opportunities that further bolster and support the academic programs on the Campus. They also afford opportunities for collaboration with local corporations, state and federal agencies, and other educational institutions.

Facilities:

Research 1: 71,000 SF; the original building opened in 1991.

Executive Education center

105 seat auditorium (hosts approximately 100 public and business events per year)

Laboratories for transportation safety, energy, nanotechnology, pharmacogenomics, infrastructure reliability and earthquake simulation, physics, electromagnetics, mechanical engineering, high performance computing

Technology-enhanced classrooms; computer labs

Office suites for faculty and research scientists

Building 2: 204,000 SF situated on 40 acres along Route 7; acquired 2002.

Virginia Campus Library

The Virginia Campus Library has a staff of 7 librarians and research assistants. It houses an electronic classroom and is a Cooperating Collection site for the Foundation Center.

Office suites for academic programs in business, education, health sciences

Center for Preparedness and Resiliency

Executive classroom

Technology-enhanced, video-teleconferencing (VTC), and computer classrooms

Office space for approximately 350 University administrative personnel

NTSB Training Center: 86,000 SF. Constructed in partnership with the National Transportation Safety Board in 2003, currently leased to the NTSB.

NTSB Training Center

Laboratories for accident investigation and reconstruction

Research 2: 77,000 SF situated on approximately 6 acres; acquired 2008.

This building is currently undergoing renovation. It will provide approximately 54,000 square feet of assignable space that will house technology-enhanced and VTC classrooms and seminar rooms, laboratories, office suites for academic programs and research institutes. It also will house GW's Bachelor of Science in Nursing program, including the program's clinical skills laboratories, and the Pharmacogenomics program.

Campus Amenities

Cafeteria

Fitness center

Three galleries for art exhibits

Student lounges

Wireless connectivity

Parking: Each of the four buildings provides ample free parking.

Handicapped accessibility: All four buildings are fully accessible to persons with disabilities.

Transportation: The Campus is served by a shuttle service that is provided through a partnership with HHMI Janelia Farm Research Campus and Loudoun County. This service operates between the West Falls Church Metro station and designated locations in Loudoun County. The Campus also is served by a direct shuttle service between it and the Foggy Bottom Campus.

Recent Significant Developments

Academic Programs

- The number of students enrolled in courses on the Campus increased by 20.3% in fall 2009 compared to fall 2008.
- A new doctoral program in Education Administration and Policy Studies was launched successfully in January 2009. Response was so strong that another cohort will begin in January 2010.

- A new second bachelor's degree program in Nursing will start in fall 2009. Anticipated enrollments are 25 students this fall, 40 students in fall 2010, and 70 students in fall 2011.
- New video teleconferencing (VTC) classrooms are planned for the Virginia Campus and Foggy Bottom campuses in order to allow classes to be conducted via VTC between the two campuses

Research

- **Transportation Safety:** The Federal Highway Administration has renewed the National Crash Analysis Center cooperative agreement for five years at \$19 million.
- **High Performance Computing:** NSF awarded a \$1 million major instrumentation grant to further increase capacity. Two additional faculty are being recruited.
- The **GW Energy Institute** was launched in summer 2008. The founding faculty include Stuart Licht, a chemist and Stephen Hsu, a mechanical and aerospace engineer. Three more faculty, a physicist and two more mechanical engineers, are currently being recruited. As a team, they will address a range of energy issues including new sources of sustainable energy and increased energy efficiency. Dr. Licht is working in solar conversion and battery storage. Dr. Hsu is focusing on micro-energy production such as solar panels and rooftop windmills.

University Involvement and Commitment to the Virginia Campus

The University has new leadership committed to developing the Virginia Campus and contributing to the economic growth of and quality of life in Loudoun County, Northern Virginia and the Commonwealth of Virginia.

Leo Chalupa has been appointed as GW's Vice President for Research. He plans to develop an entrepreneurial unit to work closely with the University's Office of Technology Transfer.

Lorraine Voles is GW's Vice President for External Affairs; she will be hiring a Virginia-focused government relations person. In the interim, the University has engaged McGuire Woods to assist in developing contacts in the Commonwealth.

The University Board of Trustees has created a standing committee that focuses specifically on the Virginia Campus. This Committee provides the Virginia Campus with input for its strategic plan and advocates to the full Board of Trustees on behalf of the Campus. Committee members include:

- Mark Hughes, chair; retired as president of SAIC's system and network solutions group; GW Engineering alumnus

- Bobbie Kilberg, President, NVTC
- Nelson Carbonell, President and Chairman, Snowbird Capital; GW Engineering alumnus
- Lydia Thomas, retired as president of Noblis; Ph.D. in biology
- Russ Ramsey, Chairman and CEO, Ramsey Asset management; GW alumnus; Chair, GW Board of Trustees
- Ray Oglethorpe, former President, AOL Technologies

Key Working Group Activities

Review of expenditures for the past four years

The RWG examined the expenditures for sponsored projects conducted mainly at the Virginia Campus for FY06 through FY09. Table 1 shows the direct, indirect, and total expenditures for these four fiscal years.

Table 1. Direct, indirect, and total sponsored research and training grant expenditures at the VSTC, FY2006-2009.

Fiscal Year	Direct expenditures	Indirect cost expenditures	Total expenditures
FY06	\$4,636,559	\$988,534	\$5,625,093
FY07	\$3,629,182	\$741,640	\$4,370,822
FY08	\$2,397,191	\$783,123	\$3,180,314
FY09	\$2,855,893	\$961,767	\$3,817,660

The FY2008 and FY2009 expenditures as shown have been adjusted to offset the Comptroller's office booking a \$2,347,768 adjustment against the VSTC expenditures in FY2008 and a \$117,966 adjustment in FY2009. These figures reflect the actual levels of expenditures. The adjustments were made to offset a reporting error regarding a \$5,000,000 award from Ford Motor Company that had been booked as pledge revenue in FY2003.

The trend for expenditures at the VSTC was downward over fiscal years 2007 and 2008. The major contributor to this downward trend was the decrease in expenditures related to homeland security. In FY2006, these expenditures were approximately \$876,376. In FY2007, they were only approximately \$68,000, and in FY2008 they were less than \$25,000. Inclusion of expenditures for two newly established areas of focus at the VSTC -- High Performance Computing and Energy -- reversed this trend for FY2009.

A detailed analysis of FY2009 expenditures reveals two important points. First, the NCAC accounted for 68 percent of the total sponsored research expenditures at the VSTC in that fiscal year. Second, the average expenditures for the nine principle investigators not affiliated with the NCAC was only \$138,269. This average is somewhat misleading in that the range of expenditures for this group was \$1,375 - \$584,162. It is significant to note that two investigators associated with core research areas at the VSTC, Professor El-Ghazawi (High Performance Computing) and Professor Hsu (Energy) accounted for \$584,162 and \$314,546 in expenditures, respectively. With the recent expansion of the high performance computing faculty group, and further development of the energy institute, it is expected that the expenditures base will become distributed across a larger group of investigators.

Strategies for increasing awards and expenditures for research groups currently based at the Virginia Campus

The working group identified three main strategies for increasing awards and expenditures by research groups based at the Virginia Campus:

1. Increase the number of faculty based at the Virginia Campus in selected areas in order to achieve a critical mass of investigators that can generate collaborative grant proposals and support larger numbers of post-doctoral fellows, graduate students, and a more substantial research infrastructure. This strategy has been implemented in high performance computing and in the GW Energy Institute.
2. Station pre- and post-award support personnel at the Virginia Campus to facilitate proposal generation and award management.
3. Make selective investments to support post-doctoral fellows and/or graduate students in areas identified as having particular potential to attract external funding to the Virginia Campus.

Laboratory space allocations and space allocation guidelines

As recently as 2006, the allocation of space in the Research 1 lab bays was lacking in a coherent plan that facilitated assignment of appropriate space for new laboratories. Over the past two years, a plan has been implemented that consists of the following three phases:

1. Relocate from Research 1 to Building 2 academic programs in Business and Education that do not require research labs;
2. Relocate selected labs (Physics, Mechanical Engineering), classrooms, and support functions within Research 1 in order to free additional space for research labs, to execute lab build outs that require more than 750 square feet of contiguous space (chemistry, mechanical engineering), and to accommodate lab functions (nano-scale measurements) that require particular locations (on first floor slab).

3. Construct labs for new faculty whose primary research activities will be conducted at the Virginia Campus.

Execution of the above steps have resulted in the relocation of all School of Business and School of Education and Human Development faculty, program offices, and specialized teaching facilities to Building 2. To date, approximately 6,000 square feet of laboratory has been renovated or is under construction in Research 1. With new hires in physics, mechanical engineering, and high performance computing, it is anticipated that up to an additional 2,000 square feet of lab space may be constructed in the next year.

Going forward, the allocation of lab space in both Research 1 and Research 2 will be determined based on two main factors:

1. External funding to support research to be conducted in the space;
2. Strategic investment in a selected area of research (e.g., energy, health sciences).

Develop strategies for engaging potential corporate partners in R&D relationships

The Northern Virginia region in which the Virginia Campus is located is home to a rich variety of corporations which conduct substantial research and development efforts. Most of these companies operate in the technology sector, potentially creating opportunities for collaborative research in computer and electrical engineering, telecommunications, data storage and transmission, and cyber security. In addition, the Loudoun County Department of Economic Development has identified information and communications technology, biotechnology, and international collaborations as areas for future growth and development. The One Loudoun development directly across Route 7 from the Virginia Campus will be home to a World Trade Center offering additional future potential for international collaborations.

The challenge for investigators based at the Virginia Campus will be to identify and develop partnership opportunities that will mutually benefit both the University and its partners. Faculty cannot be diverted from their core research agendas to pursue opportunities that are only peripherally related to their areas of investigation or that will provide minimal support. Conversely, faculty should aggressively seek opportunities for collaboration that will provide significant support to their research endeavors and ultimately contribute to the reputation and prestige of the GW research enterprise..

The Virginia Campus academic administration actively monitors activity in the region for meaningful opportunities for collaborative research. To the extent possible, the administration seeks to bring together faculty and future collaborators. In addition, the campus administration supports the development of research infrastructure to foster collaborative efforts as resources are available. For example, the Chief Academic Operating Officer invested approximately \$70,000 in preparing a proposal for submission to the National Institute for Standards and Technology.

A substantial amount of funds from the Virginia Campus Strategic Development fund, along with funds from the Campus operating budget, were invested in new research facilities in FY07, 08, and 09.

Develop possible incentives for schools and academic departments to relocate/develop research programs at the Virginia Campus

Historically, GW deans and faculty have considered the Virginia Campus too remote from the Foggy Bottom campus to offer a viable location for intensive research endeavors. While the Campus offered available space and resources to construct laboratories, the factors were deemed insufficient to justify the investment in time to travel between the two campuses on a regular basis.

As of 2006, only two research groups on the Virginia Campus had what could be considered a minimum critical mass of faculty and/or research staff. The theoretical physics group, while small, was able to support the work of the Center for Nuclear Studies—Data Analysis Center. Transportation Safety and Security maintained a more robust presence on the Campus with the [Center for Intelligent Systems Research](#) and the [National Crash Analysis Center](#) (NCAC), but this group included only one tenured faculty member. The situation regarding these two research areas remains unchanged at this time.

Beginning in 2007, a strategy was implemented to work with deans to develop areas of research at the Virginia Campus that could benefit from the space and other resources available. The strategy involves hiring a group of faculty in an area of research and providing them with laboratories, support for post-doctoral fellows and graduate students, and other forms of support to facilitate their research. One group that has been developed using this strategy is High Performance Computing (HPC). Professor Tarek El-Ghazawi and his post-doctoral fellows and graduate students relocated their research to the Virginia Campus in fall 2007. A new High Performance Computing Laboratory was also constructed at that time. A second faculty member was recruited in 2008, and two more have been added in 2009. These four faculty members, along with their post-docs and graduate students now form a critical mass in HPC.

The second area being developed using this strategy is energy science and technology. Senior faculty members have been hired in Chemistry and Mechanical Engineering. A physicist will soon join the group. In addition, searches are underway for two additional mechanical engineers. These five faculty will form the core of the GW Energy Institute which is expected to continue to grow over the next several years.

A critical consideration for the development of the research enterprise at the Virginia Campus is the provision of pre- and post-award support for principle

investigators. Placement of a research service coordinator at the Campus would provide the faculty based at the Campus with the same type of support that is available to faculty at the Foggy Bottom campus.

Consider possible operational impacts of expanded research programs (e.g., lab facilities, technical support, pre- and post-award support, administrative support);

As the research activity at the Virginia Campus increases so too does the need for increased technical and administrative support.

Set goals for expansion of the research enterprise

As shown in Table 1, total expenditures increased substantially in FY09 as compared with FY08. When data on FY10 expenditure becomes available, the trend in expenditures from FY08 through FY10 should be analyzed to identify the direction and magnitude of the trend in expenditure across these three fiscal years. Once these factors have been identified, the Provost, the Vice President for Research, the Chief Academic Operating Officer, and the relevant deans should establish appropriate goals for research expenditures attributed to the VSTC for FY12 – FY15.

Identify strategies to achieve those goals and metrics by which progress can be assessed.

Recommendations

1. Continue to develop the research agenda for the Virginia Campus through the development of centers and institutes for advanced study. Following on the model of high performance computing and the GW Energy Institute, recruit a critical mass of core faculty for each center. The expectation is that these faculty will be supplemented by research faculty, post-doctoral fellows, and graduate students who will be supported by external funds.
2. Station at least one Research Service Coordinator at the Virginia Campus to support faculty in the preparation and management of proposals for external funding.
3. Secure funding for the construction of the Advanced Impact and Materials Research Laboratories and complete construction of the facility.
4. As new research centers and institutes are established and new laboratories and buildings are constructed or acquired, develop appropriate staffing plans and operating budgets and equipment life cycle replacement plans to ensure that the new enterprises and facilities will be properly funded and that their full operations will be sustained.

5. Review the existing indirect cost distribution model and make any required modifications to ensure that necessary funding for operational budgets and life cycle replacement of essential equipment is in place.
6. Put in place space allocation guidelines that give the greatest consideration to external funding and research productivity as measured by appropriate metrics (e.g., referred publications, patents and licenses).

Appendix C

Report of the Educational Programs Working Group

Virginia Science and Technology Campus Academic Planning Task Force

June 16, 2009

The GW Virginia Science and Technology Campus was established in Loudoun County in 1991 to meet the academic and research needs of the technology industries that were being established along the Route 28 corridor in Western Fairfax and Loudoun counties. The VSTC has grown into a robust center for innovative research, graduate education, and regional corporate partnerships. As the University's research and technology campus, it hosts a dozen centers of excellence in critical areas such as energy science and technology, transportation safety, and high performance computing. The GW VSTC also combines its research excellence with more than 20 exceptional graduate degree and certificate programs in business, education, and engineering, and unique undergraduate programs in the health sciences.

Given the growth in academic programming and the University President's and Board of Trustees' interest in expanding the campus in its regional and national significance, Craig Linebaugh, Chief Academic Operating Officer of the VSTC, initiated development of a comprehensive academic plan. Specifically, the Educational Programs Working Group of the Virginia Science and Technology Campus Academic Planning Task Force was charged with:

- Assessing the demand for academic programs that can be offered at the VSTC;
- Assessing the viability of the current programs being offered;
- Developing models for program types and formats;
- Identifying specific content areas to be offered;
- Considering potential incentives for schools and academic departments to offer programs at the VSTC;
- Developing goals for program expansion and enrollments;
- Developing strategies for meeting these goals and metrics for assessing progress toward them; and
- Reviewing marketing strategies for academic programs at the VSTC. (D. Lehman, personal communication, January 12, 2009)

In addition, the Educational Programming Working Group was asked to

- Consider possible operational impacts of expanded academic programs (e.g., classroom and lab facilities, technology support, library, student services), (C. Linebaugh, personal communication, January 14, 2009).

The Working Group was composed of representatives from the College of Professional Studies; School of Business; School of Public Health and Health Services; School of Engineering and Applied Science; Graduate School of Education and Human Development; and the Columbian College of Arts and Sciences. (See Appendix A for a list of Working Group members). The Working Group met four times as a full group to gather information and share ideas. This report represents the synthesis of their work and recommendations.

The Working Group worked from the premise that the VSTC has the potential to be a viable and vibrant academic community, with the overall campus maintaining a mix of research, academic programming, and University back-office service, each of equal emphasis with respect to resource distribution. The recommendations in this report assume no new facilities, though they do suggest areas of possible expansion. Further, the Working Group's recommendations reflect the need to ensure fiscal viability of the academic programs on the VSTC, but also recognize that the University must invest in the academic infrastructure of the VSTC to ensure faculty and students who engage in teaching and learning on that campus are not subsequently penalized in terms of tuition support; promotion and tenure decisions; program integrity and continuity; and additional travel time to and from the main campus.

Environment:

External

In order to assess the viability of current programs and the demand for other academic programs at the VSTC, the Working Group reviewed demographic and other environmental data for the western Fairfax/eastern Loudoun corridor.

The GW VSTC is located in the Dulles Region of Northern Virginia which encompasses eastern Loudoun and western Fairfax counties. Given the proximity to Dulles Airport (within 10 miles) the Campus has a truly international reach.

The residents of both Loudoun and Fairfax County have one of the highest median household incomes in the nation (Loudoun 2007 = \$107,207, Fairfax 2007 = \$105,241). In addition the Counties' residents (age 25 and older) have significantly high levels of educational attainment with 55.2% (Loudoun) and 59% (Fairfax) holding a bachelor's degree or higher.

Loudoun has been one of the fastest growing counties in the nation since the late 1990s. It was ranked the fifth fastest-growing county in the nation since 2000 (2000-2008) and number two for jurisdictions with populations over 100,000, after Pinal County, Arizona. To better understand these rankings as they relate to city size, consider that by 2010, Loudoun will be bigger than today's cities of Corpus

Christi and Anchorage. By 2020, Loudoun will be bigger than today's cities of Minneapolis, Colorado Springs, and Raleigh, North Carolina.

The County is currently focusing on two significant industry clusters, Information and Communications Technology (ICT) and Life Sciences, as well as two industry overlays, Federal Government Contracting and International markets. *Moody's Economy.com* released the following information about the ICT cluster in January 2009,

The Dulles Technology Corridor, centered in Loudoun County, hosts the largest number of internet, satellite, and defense companies in the nation. These companies will benefit from the rising threat of cyber-terrorism as both private and public entities invest in greater security measures. Although Moody's' Economy.com expects federal defense spending to slow down from its rapid pace this decade, government consumption related to cyber security will accelerate. Several of the area's top employers, including L-3 Communications Holdings and SAIC, are creating special units to cater to rising demand for security products.

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In addition to expansions at Orbital Sciences (space technology) and Telos (communications technology), a recent highlight is the April 1, 2009, announcement by Governor Tim Kaine that Raytheon will be consolidating much of its Northern Virginia operations into 600,000 square feet of business space at the AOL Campus in Loudoun County.

Given the growth in the population in Loudoun County, the school system is a major employer in the area and will continue to be into the future.

GW's chief competition in the area is from George Mason University, Virginia Tech (in engineering), University of Virginia, and William and Mary.

Internal

The VSTC currently houses approximately 400 staff and faculty and 550 graduate students who enroll in over 3,200 credit hours annually. The Campus offers certificate and degree programs through five schools:

- **The School of Medicine and Health Sciences:** Pharmacogenomics, B.S. and Nursing, BSN (fall 2009);
- **The School of Business:** Business Administration, Accelerated MBA; Information Systems Technology, Executive M.S.; Information Systems Technology, M.S.;
- **Graduate School of Education and Human Development:** Higher Education Administration, Ed.D.; Educational Leadership and Policy Studies, Ed.D.; Human and Organizational Studies, Executive Leadership, Ed.D.; Teacher Preparation in Secondary Education, M.Ed.;
- **School of Engineering and Applied Science:** Computer Science, M.S., D.Sc.; Electrical Engineering, Accelerated, M.S., D.Sc. (3 specializations); Engineering Management and Systems Engineering, Accelerated M.S., D. Sc.; Telecommunications and Computers, Accelerated, M.S.; and Engineering Graduate Certificates in Computer Security and Information Assurance, Telecommunication Networks, Wireless and Mobile Networks.
- **College of Professional Studies:** Graduate Certificate or Master's degree in Landscape Design and Sustainable Design.

In addition to the current academic programs, the VSTC is home to a number of research centers, mostly in the area of engineering and applied science. These centers provide students and faculty research opportunities that can further bolster and support the academic programming on the Campus.

While in the past graduate students in Virginia were eligible for the Virginia Tuition Assistance Grants (VTAG), all programs are now being phased out of eligibility for those grants except students enrolled in programs related to the health professions. As a result all students in programs through SEAS, GWSB, GSEHD, and CPS will no longer be eligible for this assistance. Some students also receive tuition assistance through their employers this may be significant for some students; however, even employer tuition assistance is being cut in some areas.

Finally, The George Washington University main campus is land-locked and operates under strict prohibitions for future building development. That is, the campus can increase only in building density and cannot spread further into the city. The University is also subject to limits with respect to the number of students what may be enrolled on the Foggy Bottom campus at any given time. As a result, University expansion in student enrollment is dependent on developing other campus options apart from the Foggy Bottom campus.

Academic Potential:

The western Fairfax/eastern Loudoun corridor is growing and maturing at a very fast pace. Key industries are: information and communications technology, life sciences, and education. The region has strong economic potential and a fast growing population rivaling other mid-sized cities in the U.S. by the year 2020. The VSTC responded to these environmental conditions by offering the aforementioned degree programs and suggests future academic programming in the areas of engineering, education, allied health sciences and high performance computing with the potential of expanding on business programs at the campus.

When considering the potential of academic programming for the VSTC, the Working Group looked at both the short-term potential, encompassing the existing buildings and other resources over the next five years, and long term, beyond the next six years. The recommendations for programming are based on regional demand as well as the ability to utilize Dulles airport and local lodging for "fly-in" programs that can be national and international in scope.

A number of program delivery formats may be employed at the VSTC, and, indeed, many are already. Formats can range from full-time, open enrollment face-to-face delivery to cohort models. Cohorts may be comprised of students from one regional company or pooled from across companies. Students may take classes through a fly-in weekend executive program, or through blended models of face-to-face instruction on the weekend, coupled with intensive on-line instruction between face-to-face sessions. Programs can be offered as summer residency programs with online follow up or stand-alone short-course institutes. Programming may be entirely based at the VSTC, or may be based at the Foggy Bottom Campus, with specific course requirements at the VSTC. As will be discussed, the program delivery model, along with the variety of programs, is dependent on developing the academic infrastructure of the VSTC.

Currently weekend, cohort-type programming is at capacity, but the planned build out of four new technology-enhanced classrooms in the recently acquired Research 2 by December 1, 2009 will increase this capacity slightly. For the most part, further immediate development of academic programs should focus on Master's, certificate, and other short-course programs that can be offered during the day or weeknight. These programs would not be linked to the research that is currently being conducted at the VSTC, but would seek to develop in niche markets and may be geared toward professionals looking to "retool" in the current economy (as opposed to those who would retool at a community college). As such, the certificates may only have a "life" of a few years, while other certificate programs are created to replace them, depending on local needs. Another possibility is to attract enrollment in full-time, accelerated Master's programs that would be offered

during the day for a period of nine months, in conjunction with local industry; however, given the current economic crisis, it is unclear the extent to which such programming is currently viable.

College of Professional Studies

The College of Professional Studies currently offers courses in Landscape Design and Sustainable Design at the VSTC. Working in conjunction with the Academic Program Director and the Director of Educational Programs at the Campus, one part-time faculty member in the Landscape Design programs has responsibility for further developing offerings in these disciplines at the VSTC location.

Graduate School of Education and Human Development

In contrast to its original proposal of beginning a doctoral cohort every other year at the VSTC, the Educational Leadership and Policy Studies program is now committed to starting a new doctoral cohort every year at the VSTC.

Longer term education programs at the VSTC should, where appropriate, be integrally related to the research conducted at the campus. The degree to which programming is integrated with research will vary across schools. This requires:

- Employing a critical mass of tenure-accruing or tenured faculty at the VSTC who can both engage in research and mentor and teach graduate students.
- Employing nationally recognized faculty (as opposed to research scientists) at the campus. Such appointments will enhance the reputation of the department in which they reside.
- Linking research dollars at the VSTC to students through graduate assistantships and fellowships that are built into the research.
- Developing Master's programs that can serve as financial drivers at the site.

Areas for longer term curricular development at the VSTC include:

- Engineering in a variety of areas in the daytime in connection to the research being conducted on site;
- Project management and accounting in the evening;
- Allied health in the daytime for professional students;
- Education Administration at the Master's level in the evening.
- CPS graduate and professional programming through a variety of delivery modes, including fly-ins;
- Pending curricular approvals and further market analysis for Loudoun, CPS hopes to be able to offer a highly specialized bachelor's degree completion program in Integrated Information, Science and Technology.

Academic Infrastructure Needs:

In order for education programs to expand and thrive at the VSTC, a robust academic infrastructure must be created. Without such an infrastructure, the VSTC will always be considered a second-class, separate entity, which makes it a less desirable location for both faculty and students to engage in teaching and learning. A variety of issues need to be addressed.

Student tuition assistance

Currently, students at the VSTC do not have access to University tuition assistance. Further, full time students, who have on-campus financial aid, who take classes on the VSTC are automatically considered part-time students by virtue of the campus location, not the number of credits they are enrolled in. This is an immediate impediment to off-campus enrollment¹. The Working Group recommends that the University recognizes the VSTC as a main campus and assess student enrollment for graduate aide, based on the student, rather than where courses are taken. Unresolved is whether tuition pricing should be consistent throughout the University, each school, or specific to the VSTC. Currently there are a variety of tuition prices, based on the individual programs offered at the VSTC.

In addition, the VTAG program is no longer available for students who are not enrolled in programs related to the health professions. The absence of this grant award and the immediate institutional competition from state universities that have significantly lower tuition, suggests that financial assistance must be made available to students at the VSTC.

Program continuity

Course expansion on the VSTC can take the form of new degree or certificate offerings, so that all courses of a particular program are offered at the campus. In addition, programs that are primarily Foggy Bottom-based may choose to offer particular courses or sequences of courses at the VSTC. In both instances, program continuity should be a guiding factor. That is, an individual course should not be taught at the VSTC merely out of convenience with respect to classroom availability or faculty preference, but because the course, course sequence, degree, or certificate has been considered and designed within the context of the overall program. As such, if a particular course sequence is offered at the VSTC, at a given point within a degree program, this offering should be consistent from year to year so that students and faculty may comprehensively consider the VSTC courses in student academic advisement and course sequencing.

¹ It should be noted that ISO interpretation of the new SEVIS rules affecting F1 visa students are now causing problems with full-time versus part-time classification, particularly at off campus locations. This is further inhibiting enrollment on the VSTC.

Faculty promotion and tenure

First and foremost, in order for the off-campus locations to grow and thrive, off-campus faculty must be considered full-time, full-worth faculty. Faculty appointments off campus should be tenure-accruing in the same proportion as Foggy Bottom Campus program appointments. Faculty who primarily teach off campus should have regular and consistent contact with their Foggy Bottom-based departments and off campus faculty should be fully integrated into the VSTC research centers, where appropriate. Alternatively, the University may wish to consider rotating appointments in which faculty may be primarily located on the VSTC for a period of 1-2 years and then return to the Foggy Bottom Campus or locating entire departments on the VSTC. Irrespective of the specific arrangement, the focus has to be on the concept of one faculty in the program and department, with that faculty located at several campuses, or the VSTC, not *the* faculty at Foggy Bottom and lesser faculty elsewhere.

Office, classroom, and program space

Academic expansion at the VSTC is limited with the current building structure. Unless additional buildings are located on the VSTC, significant increases in on-ground programming will be limited. With the current classroom capacity (and growth projected through the build out of Research 2) student enrollment could potentially be tripled at the VSTC to approximately 1500 students. Such an increase in enrollment would require near optimal scheduling of the available facilities. As noted above, the Working Group feels that this type of expansion is limited to special niche certificate programs offered during the day or in the evening, Monday through Thursday, as the weekend cohorts already offered at the VSTC start on Friday during the day.

CPS intends to continue to offer the Landscape Design programs at the VSTC, and to enhance the current offerings through a requested showcase and research area (physical space on the campus). CPS has requested this research and showcase space to house student and faculty projects and to allow both students and faculty to conduct research. In addition to the showcase/research space, CPS also has requested some program administrative and instructional space for the Landscape Design programs. The additional office space will be used to house faculty and to promote, in particular, the Sustainable Landscape Design program in the Loudoun Western Fairfax location, as well as encourage community involvement in sustainability.

A number of CPS graduate programs are constructed as "limited residency" programs where students and faculty convene for limited amounts of time, usually at the beginning and end of the programs. The majority of coursework and research in these programs is completed as online learning. These programs tend

to attract national audiences who “fly in” for the residence portions of the program. To date, very few of these programs have been offered at the VSTC. However, with improved transportation, facilities, convenient hotel space, and, in particular, with the addition of an airport shuttle to and from the VSTC, CPS would agree to offer some of these types of programs at the Virginia Center. In addition to the airport shuttle, CPS would need some dedicated office and teaching space in order to run programs of this type, whose periods of residence generally overlap with portions of traditional semesters, but are much shorter. Ideally, CPS would build a revolving plan for such programs that would effectively utilize any dedicated space by consecutively scheduling “fly-in” programs in the available space.

There is interest in continuing to grow the engineering and applied science capacity through large engineering labs on the VSTC site. Given the Board of Trustees’ interest in seeking external funding for new construction, new buildings are likely to be built as special purpose, rather than general purpose facilities. This type of construction may assist engineering and science academic programming, but is unlikely to provide office or classroom space for students from GSEHD, GWSB, SMHS, and SPHHS and, thus, will limit academic programming expansion on the VSTC beyond the potential 1500 that can currently be taught with the three buildings and build out of Building 2.

In the future, the University may wish to consider not only constructing general purpose buildings on the VSTC, to expand academic programming, but also the potential of investing in short-term and faculty and graduate student housing on that campus. As noted, the campus, with its close proximity to Dulles airport and the expected expansion of the ICT and Life Sciences industries, provides opportunities to bring students in for intensive short-course programming. Further, GW has struggled to provide adequate graduate student and new faculty housing, typically offered by universities of GW’s caliber. While this type of housing may not be feasible on the Foggy Bottom campus, with enhanced between-campus transportation and the projected Metro line extension to Dulles airport, the VSTC provides an opportunity to provide housing and attract high quality faculty and graduate students.

Transportation

In order to expand the programming at the VSTC and ensure continuity between the Virginia and Foggy Bottom campuses, transportation must be as convenient, readily available, and affordable as it is between the Foggy Bottom and Mount Vernon campuses. This is both a short term and long term need. Regularly scheduled shuttle bus routes, with greater frequency, should be scheduled between the two campuses, to allow for expanded day time programming and to fully accommodate weekend and evening programming. Further, the buses should be

equipped with Wi-Fi service so that faculty and students can work on their way to and from the VSTC. Foggy Bottom-based faculty who drive to the VSTC should be eligible for mileage reimbursement for the distance between the Foggy Bottom campus and the VSTC.

Student life

To date, each academic program on the VSTC is providing its own student service support, acting as ombudsman to students in areas such as financial aid, registration, and graduation. The Working Group recommends the VSTC develop a Student Life/Student Services help desk that is staffed 12-9 during the week (or perhaps later), Monday through Friday, and 9-5 on Saturday, to accommodate the needs of the students, when they are at the facility. In this way, costs to individual programs will be diminished. In addition, over the long term, the VSTC should develop a bookstore, extended hour computer lab, and evening and weekend cafeteria to meet the needs of faculty and students. Student services, a bookstore and cafeteria are all important components of a fully functioning campus, which is the vision of the University.

Net tuition revenue distribution

In order for the VSTC to provide the infrastructure needed to fully support academic programs, the net tuition revenue distribution for new programs should be revised from the current model to provide some support for the VSTC. Currently the campus receives no direct revenue from programming. The Working Group recommends that over the next four years, the VSTC receives 12%, 12%, 10%, and 8% of the net revenue, with 8% each year thereafter. Schools, under this model would receive 40% (current)+10%, 40%+10%, 40% +7.5%, and 40% + 5 % thereafter. The revised net tuition distribution model approved for new and substantially expanded programs offered at the VSTC would return to the school 50% of the net tuition, instead of the current 40%, in each of the first three years of the program. In year four, the school will receive 47.5% of the net tuition; in years five and beyond, 45%. In this scenario, Academic Affairs will receive 10% less and the General Fund, 2.5% less after four years and each year thereafter. When implemented, this model will need to be coordinated with the other off-campus academic centers, to guard against unintended negative consequences.

In conclusion, the Working Group feels that there is a great deal of potential to develop the programming at the VSTC; however, academic programming in the future should be developed in a strategic fashion, with a full vision of the role of the VSTC in the context of the University.

Members of the Educational Programs Working Group

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Appendix D

Report of the Community Engagement Working Group

Virginia Campus Academic Planning Task Force

July 9, 2009

Members of the Community Engagement Working Group

- Scott Hamberger, President and CEO, Fortessa, Inc.
- Ed Hatrick, Superintendent, Loudoun County Public Schools
- Dana Kauffman, Special Assistant to the President, Northern Virginia Community College
- Randall Kelley, CEO, INOVA Loudoun Hospital
- Cheryl Moore, COO, HHMI Janelia Farms
- Larry Rosenstrauch, Director, Loudoun County Department of Economic Development
- Joe Travez, President, Prototype Productions
- Lori Waters, Loudoun County Board of Supervisors, Broad Run District
- Ed Zigo, CEO, Clarke-Hook Real Estate; Chairman, University Center Property Owners Association

Virginia Campus Staff:

- Craig Linebaugh, Chief Academic Operating Officer/GW Virginia Campus
- Joan Ziemba, Director, Corporate and Community Relations
- Dova Wilson, Marketing Communications Specialist, Corporate & Community Relations

Background

The GW Virginia Campus was established in Loudoun County in 1991 to meet the academic and research needs of the technology industries that were being established along the Route 28 corridor in Western Fairfax and Loudoun counties. Since that time, the Virginia Campus has grown into a robust center for innovative research, graduate education, and regional corporate partnerships. As the University's research and development campus, it hosts a dozen centers of excellence in critical areas such as energy science and technology, transportation safety, and high performance computing. The GW Virginia Campus also combines its research excellence with more than 20 exceptional graduate degree and certificate programs in business, education, and engineering, and unique undergraduate programs in the health sciences.

Given the growth in academic programming and University President Steven Knapp's and the Board of Trustees' interest in expanding the campus in its regional and national significance, Craig Linebaugh, Chief Academic Operating Officer of the Virginia Campus, created a task force to develop a comprehensive academic plan

for the Campus. The task force was comprised of an executive committee and three working groups: research, educational programs, community engagement.

The charge to the Community Engagement Working Group was as follows:

- Provide input regarding community perceptions of the Virginia Campus;
- Identify ways The GW Virginia Campus can contribute to the economic development and quality of life of Loudoun County, the Northern Virginia region, and the Commonwealth of Virginia through its academic programs, research and development, and community engagement efforts;
- Offer commentary on proposed plans for expanding the programs on the Virginia Campus.

ENVIRONMENT

External

The GW Virginia Campus is located in Ashburn, Virginia, on Route 7 just west of the interchange with Route 28 in Loudoun County. The Campus is located in University Center, a 575 acre development zoned for research and development and residential uses. University Center currently includes the offices for 15 corporations; offices for Loudoun County government agencies; The Goddard School serving children from infancy through kindergarten; several service businesses (e.g., bank, coffee shop, pizza shop, hair salon); a hotel; the Northern Virginia Criminal Justice Academy; and approximately 2400 housing units including townhomes, condominiums, and apartments.

The Campus is located just 8 miles from Dulles International Airport and anchors the north end of Loudoun County Parkway. It is proximate to major development projects including One Loudoun. An interchange between Route 7 and George Washington Boulevard, a four-lane, divided street that is the main artery within University Center, is under construction and scheduled to open in summer 2010.

The residents of both Loudoun and Fairfax Counties have one of the highest median household incomes in the nation (Loudoun 2007 = \$107,207, Fairfax 2007 = \$105,241). In addition the Counties' residents (age 25 and older) have high levels of educational attainment with 55.2% (Loudoun) and 59% (Fairfax) holding a bachelor's degree or higher.

Loudoun has been one of the fastest growing counties in the nation since the late 1990s. It was ranked the fifth fastest-growing county in the nation since 2000 (2000-2008) and number two for jurisdictions with populations over 100,000.

The County is currently focusing on two significant industry clusters, Information and Communications Technology (ICT) and Life Sciences, as well as two industry overlays, Federal Government Contracting and International. *Moody's*

Economy.com released the following information about the ICT cluster in January 2009,

The Dulles Technology Corridor, centered in Loudoun County, hosts the largest number of internet, satellite, and defense companies in the nation. These companies will benefit from the rising threat of cyber-terrorism as both private and public entities invest in greater security measures. Although Moody's' *Economy.com* expects federal defense spending to slow down from its rapid pace this decade, government consumption related to cyber security will accelerate. Several of the area's top employers, including L-3 Communications Holdings and SAIC, are creating special units to address rising demand for security products.

Two Loudoun businesses, Equinix and NeuStar, were recently ranked numbers 16 and 17 respectively on *Forbes Magazine's* "25 Fastest-Growing Technology Companies in America."

The Life Sciences cluster continues to focus on HHMI Janelia Farm, which is now three years old and staffed to approximately two-thirds capacity. Companies focusing in such areas as long-term preservation of research materials, medical device development, and RFID technology deployed in government and healthcare industries also continue to expand.

In addition to expansions at Orbital Sciences (space technology) and Telos (communications technology), a recent highlight is the April 1, 2009 announcement by Governor Tim Kaine that Raytheon will be consolidating much of its Northern Virginia operations into 600,000 square feet of business space at the AOL Campus in Loudoun County.

Given the growth in population in Loudoun County, the school system is a major employer in the area and will continue to be for the foreseeable future.

Internal

Campus population

Students: approximately 550 students are enrolled in Virginia Campus programs each semester. In addition, approximately 50 graduate students are engaged in research on the Campus.

Faculty: approximately 60 faculty teach courses and engage in research on the Campus.

Staff: approximately 400 academic and administrative staff work on the Campus.

Academic degree programs are currently offered by five of GW's colleges and schools:

- **The School of Medicine and Health Sciences:** Pharmacogenomics, B.S.H.S.; Nursing, BSN;
- **The School of Business:** Business Administration, Accelerated MBA; Information Systems Technology, Executive M.S.; Information Systems Technology, M.S.;
- **Graduate School of Education and Human Development:** Higher Education Administration, Ed.D.; Educational Leadership and Policy Studies, Ed.D.; Human and Organizational Studies, Executive Leadership, Ed.D.; Teacher Preparation in Secondary Education, M.Ed.;
- **School of Engineering and Applied Science:** Computer Science, M.S., D.Sc.; Electrical Engineering, Accelerated, M.S., D.Sc. (3 specializations); Engineering Management and Systems Engineering, D. Sc.; Telecommunications and Computers, Accelerated, M.S.;
- **College of Professional Studies:** Graduate Certificate or Master's degree in Landscape Design and Sustainable Design.

The Virginia Campus also is home to the following research centers and institutes:

- [Center for Intelligent Systems Research](#)
 - [Driving Simulator Laboratories](#)
- [Center for Nuclear Studies—Data Analysis Center](#)
- [Center for the Study of Learning](#)
- Center for Preparedness and Resilience
- GW Energy Institute
- High Performance Computing Laboratory
 - [Center on High-Performance Reconfigurable Computing](#)
 - Institute for Massively Parallel Applications and Computing Technology
- [Infrastructure Safety and Reliability Laboratory](#)
- [Institute for Magnetics Research](#)
- [National Crash Analysis Center](#) (NCAC)
 - [NCAC Film Library](#)
 - [Vehicle Modeling/ Digitization Lab](#)

These centers provide students and faculty with research opportunities that further bolster and support the academic programs on the Campus. They also afford opportunities for collaboration with local corporations, state and federal agencies, and other educational institutions.

Facilities:

Research 1: 71,000 SF; the original building opened in 1991.

Executive Education center

105 seat auditorium (hosts approximately 100 public and business events per year)

Laboratories for transportation safety, energy, nanotechnology, pharmacogenomics, infrastructure reliability and earthquake simulation, physics, electromagnetics, mechanical engineering, high performance computing

Technology-enhanced classrooms; computer labs

Office suites for faculty and research scientists

Building 2: 204,000 SF situated on 40 acres along Route 7; acquired 2002.

Virginia Campus Library

The Virginia Campus Library has a staff of 7 librarians and research assistants. It houses an electronic classroom and is a Cooperating Collection site for the Foundation Center.

Office suites for academic programs in business, education, health sciences

Center for Preparedness and Resiliency

Executive classroom

Technology-enhanced, video-teleconferencing (VTC), and computer classrooms

Office space for approximately 350 University administrative personnel

NTSB Training Center: 86,000 SF. Constructed in partnership with the National Transportation Safety Board in 2003, currently leased to the NTSB.

NTSB Training Center

Laboratories for accident investigation and reconstruction

Research 2: 77,000 SF situated on approximately 6 acres; acquired 2008.

This building is currently undergoing renovation. It will provide approximately 54,000 square feet of assignable space that will house technology-enhanced and VTC classrooms and seminar rooms, laboratories, office suites for academic programs and research institutes. It also will house GW's Bachelor of Science in Nursing program, including the program's clinical skills laboratories, and the Pharmacogenomics program.

Campus Amenities

Cafeteria

Fitness center

Three galleries for art exhibits

Student lounges

Wireless connectivity

Parking: Each of the four buildings provides ample free parking.

Handicapped accessibility: All four buildings are fully accessible to persons with disabilities.

Transportation: The Campus is served by a shuttle service that is provided through a partnership with HHMI Janelia Farm Research Campus and Loudoun County. This service operates between the West Falls Church Metro station and designated locations in Loudoun County. The Campus also is served by a direct shuttle service between it and the Foggy Bottom Campus.

Recent Significant Developments

Academic Programs

- The number of students enrolled in courses on the Campus increased by 20.3% in fall 2009 compared to fall 2008.
- A new doctoral program in Education Administration and Policy Studies was launched successfully in January 2009. Response was so strong that another cohort will begin in January 2010.

- A new second bachelor's degree program in Nursing will start in fall 2009. Anticipated enrollments are 25 students this fall, 40 students in fall 2010, and 70 students in fall 2011.
- New video teleconferencing (VTC) classrooms are being established at the Virginia and Foggy Bottom campuses in order to allow classes to be conducted via VTC between the two campuses

Research

- **Transportation Safety:** The Federal Highway Administration has renewed the National Crash Analysis Center cooperative agreement for five years at \$19 million.
- **High Performance Computing:** NSF awarded a \$1 million major instrumentation grant to further increase capacity. Two additional faculty are being recruited.
- The **GW Energy Institute** was launched in summer 2008. The founding faculty include Stuart Licht, a chemist and Stephen Hsu, a mechanical and aerospace engineer. Three more faculty, a physicist and two more mechanical engineers, are currently being recruited. As a team, they will address a range of energy issues including new sources of sustainable energy and increased energy efficiency. Dr. Licht is working in solar conversion and battery storage. Dr. Hsu is focusing on micro-energy production such as solar panels and rooftop windmills.

University Involvement and Commitment to the Virginia Campus

The University has new leadership committed to developing the Virginia Campus and contributing to the economic growth of and quality of life in Loudoun County, Northern Virginia and the Commonwealth of Virginia.

Leo Chalupa has been appointed as GW's Vice President for Research. He plans to develop an entrepreneurial unit to work closely with the University's Office of Technology Transfer.

Lorraine Voles is GW's Vice President for External Affairs; she will be hiring a Virginia-focused government relations person.

The University Board of Trustees has created a standing committee that focuses specifically on the Virginia Campus. This Committee provides the Virginia Campus with input for its strategic plan and advocates to the full Board of Trustees on behalf of the Campus. Committee members include:

- Mark Hughes, chair; retired as president of SAIC's system and network solutions group; GW Engineering alumnus
- Bobbie Kilberg, President, NVTC

- Nelson Carbonell, President and Chairman, Snowbird Capital; GW Engineering alumnus
- Lydia Thomas, retired as president of Noblis; Ph.D. in biology
- Russ Ramsey, Chairman and CEO, Ramsey Asset management; GW alumnus; Chair, GW Board of Trustees
- Ray Oglethorpe, former President, AOL Technologies

Community Engagement

The Virginia Campus hosted a variety of events during the past year, including the following:

- the Different Thinking series in partnership with the Loudoun Chamber of Commerce and the CEO Cabinet.
- Regional Transportation Forum with the Dulles Area Transportation Association (DATA) the featured comments by then candidate for US Senate Mark Warner.
- Loudoun Small Business Development Center's day-long program of workshops and presentations with approximately 250 attendees.
- Loudoun Chamber of Commerce's Technology Day with approximately 100 business leaders attending.
- Town Hall meeting with Virginia State Senator Mark Herring and Delegate David Poisson.
- Third annual Science, Technology, and Engineering Day in partnership with Loudoun County Public Schools, with approximately 140 sophomore, junior, and senior high school students and LCPS teachers participating. Recruited the first two corporate sponsors (Telos, Roadstar) for the event.
- Regional Artist Series in partnership with Gallery 222/Loudoun Academy of the Arts Foundation that included seven exhibits and receptions with an average attendance of 75.
- Reading by Pulitzer Prize-winning novelist Edward P. Jones with approximately 70 attendees.
- "Young Artist Series" in partnership with Loudoun County Public Schools: hosted an Art Teacher's Art exhibit and reception and three student exhibits and receptions representing a total of 18 elementary, middle, and high schools attracting approximately 550 students, parents, relatives, teachers, and principals.
- The Campus hosted nearly 100 workshops, seminars and other events conducted by a variety of corporations and government and nonprofit organizations.

Foundation Center Cooperating Collection

The Virginia Campus Library is a Cooperating Collection site for the Foundation Center, the nation's most comprehensive listing of foundations that provide grants to various community organizations. During 2008-2009, the Library hosted 11 Foundation Center Cooperating Collection workshops with 148 total attendees. The

Library also served 63 individuals seeking assistance with identifying sources of foundation funding.

Working Group Members' Observations

The members of the Working Group expressed the following observations about the Virginia Campus:

- Historically, the activities of the Campus have not been well publicized to the community. In particular, economic development and business organizations were not well informed about the research and development efforts taking place on the Campus.
- The research and academic activities on the Campus appear to have been scattered, lacking in specific focus areas.
- Efforts to reach out to the technology companies located in proximity to the Campus appear to have been limited.
- Businesses are seeking to develop their next generation of managers and leaders. This is an area in which GW should consider developing more focused programs.
- The Virginia Campus is well positioned to leverage GW's status as an internationally recognized university.
- The Campus lacks the "feel" of a university campus.
- The age of the students taking courses on the Campus represents a niche that should be exploited.
- Only recently has the campus administration exerted a role as an "educational" leader in the region, actively participating in a number of Loudoun and regional organizations.
- The relocation of back office units from DC to the Virginia Campus is viewed as potentially limiting academic program growth on the Campus.

RECOMMENDATIONS:

- Focus, focus, focus!!! Pick a few things and do them really well. These could include transportation safety, energy, and high performance computing.
- Establish a clear identity both programmatically and physically.
- Continue to build collaborations with businesses (e.g., auto manufacturers, insurance companies) interested in areas of research focus at the Virginia Campus
- Pursue international business opportunities. The Virginia Campus, with ready access to Dulles Airport, is well positioned to interact with the international business community. Loudoun County is trying to establish a niche as an international business community. The World Trade Center being established in the region may present opportunities for collaboration.
- Pursue new partnerships with the technology and biotechnology companies.
- Exploit the synergies among the focus areas; e.g., combine work in transportation engineering, energy, and high performance computing to assist in designing safe, more energy efficient automobiles.

- Capitalize on proximity to DC and DOD. Consider national security, including cyber security as a growth opportunity for educational programs, research, and external funding.
- Offer educational programs and research collaboration opportunities that align with corporate sector needs; i.e., what do businesses need to grow and succeed.
 - Businesses are looking to develop their managers to the next level; offer management-oriented programs.
 - Consider offering Innovation Leadership, Leadership for Technology, and Organizational Development programs.
 - Consider offering a master's degree program in public administration.
- Bring the classroom into the real world.
 - Develop the region as a lab for GW graduate students and/or faculty.
 - Develop student/faculty teams to work collaboratively with local government, business, and community organizations.
- Offer flexible and creative program delivery methods to better meet the needs of nontraditional students.
 - Offer more courses via video teleconferencing in order to expand offerings at the Virginia Campus.
 - Aggregate student demand from small(er) businesses to create viable cohorts; for example, work through the Loudoun Chamber of Commerce to create a "cohort" of students from different businesses that are Chamber members.
- Establish a greater regional role and presence in the Commonwealth.
 - Promote the Virginia Campus as a centerpiece for higher education, research, and intellectual life in the region and the Commonwealth.
 - Create more partnerships with other Virginia colleges and universities and with K-12 schools in the region.
 - "Market" the expertise of the faculty to local businesses and organizations.
 - Foster advocates and support for GW at the local, regional, state and federal levels.
 - Disseminate more materials about the programs and activities on the Campus.
 - Issue electronic newsletters and announcements.
- Create a more "campus-like" environment and feel that will present an image of a thriving university community.
 - Utilize landscaping, signage, and pedestrian walkways to create a campus that is attractive, modern in appearance, and "friendly" to students, faculty, staff and visitors.

- Consider programming that increases student presence and utilizes available classrooms during daytime hours.
- Consider a long-term plan to locate back-office administrative functions nonessential to the mission of the Virginia campus in less expensive flex-industrial space near the campus as additional space for educational and research programs becomes needed.