



HAMPTON ROADS Research Partnership

Hampton Roads Research Partnership *2007 – 08 Summary*

The Research Partnership operates with support from its members and the U.S. Department of Commerce/ Economic Development Administration (EDA). Presently there are two active EDA grants: one is a University Center grant (through NSU, \$250K over 3 years), which allowed the startup of two technology clusters in Sensors and Modeling & Simulation; and an Economic Adjustment grant (through HRP, \$915K over 2 years), which enables the acceleration of the two original clusters and the start of a new one in BioScience. The efforts are focused on connecting colleges and universities to regional businesses with the goal of greatly expanded technology-based economic development.

Dr. Lee Beach continues to direct the overall project. The Communications and Outreach contractor, JSS Consulting, has led a substantial planning effort for HRRP communications. This has involved the production of a new website and brochure which is being used extensively to promote the technology clusters, and a re-branding of HRRP. The new branding tag line, Partnering for Prosperity, emphasizes the primary function of HRRP: to bring universities and industry together for economic gain.

The partnering theme was featured in a regional event on April 9, as a part of Research Expo 2008. This is an annual all-day event which provides opportunities for faculty and students from ODU, NSU, and EVMS to exhibit their research results. More than 1300 attended. At the suggestion of the HRRP Bioscience Cluster Leader, a new industry-focused component was added, called Corporate Connections. Both Research Expo and Corporate Connections received strong coverage in the print media, including the *Virginian-Pilot* and *Inside Business*.

As a bottom line, more than 200 companies are involved in HRRP Cluster activities, and more than 100 of those received at least eight hours of "assistance" from HRRP members. Many are involved in collaborative ventures; this program is having an impact! A summary of cluster activities follows.

Modeling and Simulation (M&S)

The Modeling and Simulation (M&S) cluster is led by the Virginia Modeling, Analysis and Simulation Center (VMASC) at Old Dominion University (ODU) under the direction of Dr. John Sokolowski, VMASC Director of Research. Currently there are approximately 40 collaborating members focusing on economic development activities. Three sub clusters are supported by the HRRP program.

The medical sub cluster is currently interviewing leaders in the medical community in Hampton Roads. The purpose of these interviews is to identify the top problems facing the local healthcare community and to identify the expertise we have locally to solve those problems. Several funded medical M&S research projects are underway in partnership with Eastern Virginia Medical School. These projects include development of 1) a virtual operating room for contextual training, 2) a maternal-fetal heart rate simulator to improve the detection of ominous events, 3) the use of M&S visualization techniques to treat chest deformities, and 4) virtual pathology to augment training with standardized patients. As a result of research in this sub cluster, a commercial firm has licensed the technology that is supporting the standardized patient assessment and will commercially develop and market this capability.

Three funded projects are underway in the Transportation Sub-Cluster. They include developing a hurricane evacuation model for Hampton Roads, a cargo analysis study for the Hampton Roads area, and a critical infrastructure study that includes the effects on transportation from disruption of other key infrastructures. VMASC has used matching funds to purchase over \$50,000 of transportation modeling software to aid in this research effort. The cluster has engaged state and local planning agencies to assist in developing transportation analysis necessary for attracting future business to the region. The cluster also

organized a committee of transportation related professionals as the Transportation M&S Cluster workgroup.

The Game-based Sub-Cluster is focusing on developing technology that will allow M&S to be used to teach high school subjects such as math (particularly Algebra I) and History. The sub cluster lead is applying for a MacArthur Foundation grant to fund this effort. Interest in this area by K-12 through graduate-level educators has been very high, and the application is anticipated to grow substantially. Cluster leaders and NASA Langley sponsored two 1-½ day M&S professional development workshops at the VMASC Experimentation Lab for over 60 of the region's high school mathematics and biology teachers. They were trained to use commercial off-the-shelf software in teaching high school math.

The following are additional tangible outcomes in M&S:

- The Office of Naval Research funded a proposal entitled, "Development and Validation of a Physical Performance Prediction Model," for \$251k over 2.5 years. In FY'08, funding was increased from \$100k to \$211k.
- Computer Sciences Corporation funded a project entitled, "Motion Induced Fatigue," for \$160K for one year. The effects of fatigue on skeletal muscle will be modeled.
- Dr. Mark Scerbo obtained funding from SimQuest to study the relative benefits of visual and haptic feedback in virtual reality systems.
- Dr. Mark Scerbo received funding from the Carolinas Medical Center to study secondary-task measures of surgical workload in support of the Surgical Education Center for Excellence in Surgical Education, Research and Training grant.
- MYMIC, a local HUBZone certified, service disabled, veteran-owned small business, created an engineering position to focus on developing a medical modeling and simulation area within MYMIC. This engineer was trained through Old Dominion University's modeling and simulation masters degree program.

Sensors

Sensors have been an area of regional focus for several years, largely through the efforts of the Hampton Roads Technology Council and HRRP. However, as a cluster it is in its initial stage relative to M&S. Mr. Bill Bean, director of the College of William & Mary's (CWM) Technology & Business Center (TBC), has provided leadership for the successful development of a Sensors Cluster. To aid in the development of the cluster, an economic impact and opportunities study has been initiated to determine the most effective structure for the Cluster and to help define ways to assist industry development.

Two sub-clusters have been identified from preliminary research: Laser Optics and Wireless Technologies, resulting in one produced workshop and one

scheduled workshop. Four events have been held, and another is scheduled in November 2008. In each program the objective is to bring together university and company representatives to stimulate various kinds of partnerships.

1. *December 07: Sensors World Conference & Expo, Williamsburg, VA.* This was a major national conference attracting over 220 attendees from a broad spectrum of sensor manufacturers and users. HRRP was one of a number of sponsors, but the Sensors Cluster played a major role in planning and producing the program.
2. *March 08: Wireless Technologies Workshop, Norfolk State University;* This was a hands-on workshop limited to approximately 40 attendees and comments by participants have been very favorable.
3. *April 08: Corporate Connections Forum at Research Expo 2008*
4. *May 08: Technology Forum on Structural Fatigue Measurements,* scheduled at National Institute of Aerospace, Hampton; approximately 60 participated
4. *November 08: Laser Optics workshop* in planning.

A cluster goal was to create 10 new university-company linkages. At least 11 have been created, including: Pressure Systems to Christopher Newport University, five new industry partners for VIMS, Innovative Wireless Technologies to Norfolk State University, Northrop Grumman VASCIC to CWM, Alion Science & Technology to CWM, TransOcean to CWM, Tellus Applied Science to CWM.

The Sensors Cluster contact database has been expanded to include website addresses and other information. More than 50 companies and 200 individuals are involved. Links to useful sites has been distributed separately but will be added to the database to increase its usefulness.

BioScience

Bio-Science is in the “start-up” phase as a technology cluster, and is leveraging existing relationships between EVMS (cluster lead, Dr. William Wasilenko) and ODU, CWM, and JLab.

A Steering Committee (SC) has been established. To assist in the process of identifying the most promising areas of BioScience, and to explore their economic potential, an economic development study has been initiated. Angle Technology Inc. was selected through a competitive process to conduct the study, which is scheduled for completion in October 2008. The results will be essential for setting a viable strategic path for the cluster.

The cluster has fostered and assisted a number of new partnerships between companies and bioscience researchers in the area. Several of these include.

1. Assisted one company in partnership with a university researcher that recently received an NIH grant for technology development. This grant has led to the hiring of one local technologist.
2. Promoted partnerships between two university researchers and a biomedical products company in the area that has led to a contractual agreement between the parties with the intent of helping the company expand its applications and planned grant submissions.
5. Assisted a biomedical product company to partner with a biotechnology company with the intent of developing new products.
6. Facilitated interactions between a university manufacturing center and a university researcher for the intent of developing a biomedical product prototype.
7. Facilitated discussions between a scientific instrumentation company and a marine science center aimed at developing new research applications and instrumentation.
8. Instrumental in developing a new bioscience laboratory at Jefferson Lab's Free Electron Laser to foster interdisciplinary collaborations with the aim of developing new medical applications and technologies using laser light.

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