SIX-YEAR PLAN 2014-16 THROUGH 2018-2020

COMMONWEALTH CENTER FOR ADVANCED LOGISTICS SYSTEMS

(A joint initiative of Longwood University, the University of Virginia, Virginia State University, and Virginia Commonwealth University)

NOTE: Because this plan is for a Center involving four universities, the State Council of Higher Education format for the Six Year Plan has been modified.

B. Strategies – describe in more detail strategies proposed in the spreadsheet. (Additional information on funding for all four universities is also included.)

The Commonwealth Center for Advanced Logistics Systems (CCALS), formerly known as the Virginia Logistics Research Center (VLRC), has been established to provide industry with transformational improvements in the design and analysis of logistics systems for military, commercial, consumer, and emergency applications. CCALS is a Virginia non-stock corporation founded jointly by Longwood University, the University of Virginia, and Virginia State University. Virginia Commonwealth University joined CCALS in 2012. CCALS is currently located in Prince George, Virginia, and will eventually be housed in a specially designed facility near Fort Lee, Virginia.

CCALS has been incorporated as a 501 (c) (3), not-for-profit, non-stock corporation, chartered to conduct research and development (R&D) for the creation of efficient, cost effective, and dependable logistics systems. The CCALS mission is to create transformational improvements in the quality and cost of logistics systems that solve practical problems for industry and government.

CCALS develops solutions that significantly improve the ability to move goods and services from the point of creation to the point of consumption. The applied research focus of the CCALS is integrated logistics systems and its economic cost and dependability. The underlying technologies used and developed to support the CCALS research focus include modeling and simulation and global public policies and practices.

A unique feature of CCALS is the collaborative research environment designed to accelerate the transition of technologies from creation to product implementation. CCALS members can include industrial manufacturers, transportation companies, and suppliers, as well as service providers from military, commercial, consumer, and emergency applications. The CCALS research staff works closely with its members on industry and government directed research projects that address critical challenges in the development of advanced logistics systems. Close communication between sponsors and research staff ensures timely delivery of results that can be
transitioned quickly to commercialization. Integration of CCALS staff with its academic partners, including Longwood University, the University of Virginia, Virginia State University, and Virginia Commonwealth University, ensures that projects leverage the resources of the universities for the benefit of members.

The value proposition of CCALS is the access provided to solutions that will significantly improve the competitive position of its members. All members are able to access the results of generic research funded by a portion of member fees to address the needs of a broad spectrum of members. This funding mechanism allows companies to share the risk associated with performing research by combining their resources into larger projects. Certain members are also able to perform directed research, a type of research that allows companies to work directly with CCALS staff on projects that address the needs of that member. The value of directed research to the member is the access to an efficient research organization and the equipment to be housed in the CCALS facility. The organization of CCALS enables research to be performed at a lower cost than building the capability internally, and access to specialized equipment enables efficient transition of research from CCALS to product implementation.

The objective shared by the CCALS members is to catalyze problem solving and innovations in logistics systems. A key differentiator of CCALS is the focus on applied R&D; that is, innovation and testing in a solutions-focused environment that can be rapidly migrated into a member’s operations to add value to a member’s bottom line.

CCALS adds value by streamlining access to intellectual property. Members who fund generic research are entitled to a non-exclusive, royalty-free license of intellectual property generated from all generic research. Members who fund directed research own any intellectual property generated from sponsored projects, thus ensuring their competitive position that results from CCALS activities.

CCALS also leverages significant investments in faculty, students, and equipment at the member universities. The CCALS business model contemplates growth of CCALS to a membership of 35 companies within 10 years, with associated annual research growth to over $16 million. CCALS is expected to create over 50 full-time jobs in this 10-year period, and support the activities of more than 70 students per year enrolled in programs at the academic institutions.

CCALS is designed to fill the gap between basic research and product commercialization. This is accomplished in part by placing members from all stages of the product development pipeline into the same facility to work collaboratively. Universities, including their students, will work together in CCALS to bridge the gap between basic research and commercialization and bring new ideas to fruition in the marketplace.

The CCALS research program is focused on three main objectives:

- To create new solutions to logistics problems for a variety of customers including military, government, commercial, and consumer.
- To translate those new solutions into commercial practice that solves the real needs of the logistics industry in practical ways.
- To focus on the logistics system with an emphasis on the word “system.”
The CCALS research focus is on five main topics as they relate to logistics systems:

- “Big data” analysis and integration
- Cyber security
- Quality control
- Cost containment
- Demand forecasting

A key tool in conducting research in all areas is modeling and simulation, which involves four main objectives:

1. Development of accurate models to be used in simulations
2. Extraction of data from real processes as needed for models and simulations
3. Understanding and characterization of human interfaces and their impact on logistics systems
4. Development of simulation frameworks to support the required multidisciplinary modeling and simulation needed in logistics systems

To support the research program, CCALS has established industry membership tiers:

- Members who join CCALS during its formative development stage and agree to a long-term commitment become Organizing Industry Members. Along with Longwood University, University of Virginia, Virginia Commonwealth University, and Virginia State University, Organizing Industry Members have a seat on the Board of Directors that sets overall governance policies, strategy, and organizational structure and membership fees. The Board of Directors also approves all additions to the CCALS membership.

- Organizing Industry Members join CCALS for a minimum of five years; however, a longer term relationship is expected because of the value CCALS provides to members. Annual membership fees will be initially $300,000; and 50 percent of the fee can be applied to directed research at CCALS that is directed by the member. Organizing Industry Members and Organizing University Members contribute to the start-up costs of the CCALS by each providing a one-time fee of $150,000.

The strength of CCALS is its collaborative research environment that combines the expertise of industry, government, and university members. Membership fees fund two types of research projects, each with a specific value proposition for the sponsor:

- All members contribute to a generic research pool that funds a set of projects chosen by the members to solve problems of interest to multiple industry partners. The value proposition of generic research is the amplification of resources that occurs by pooling member resources and taking advantage of the unique facilities available to CCALS members. Research staff at CCALS form project teams that work closely with industry sponsors to respond quickly to the needs of the members. Intellectual property developed from all generic research is available to all CCALS members via a non-exclusive, royalty-free license.

- A subset of members contributes a portion of their membership fee to fund directed research. Directed research projects are funded by a single sponsor, or a partnership of sponsors, and the results are shared only with that collection of sponsors. The value proposition of directed research is the ability of a sponsor to hire a team of CCALS
technical experts that may utilize the unique facilities in CCALS. The value proposition is enhanced significantly by the fact that sponsors own any intellectual property developed as a result of directed research.

CCALS is an applied research center focused on accelerating the development and commercialization of logistics systems solutions. The focus of the CCALS research program is to provide the foundation for transformational step changes in logistics systems. As an expected result, CCALS Industry Members:

- Become part of a collaborative research community that sets the direction of future technology developments for logistics systems.
- Become integrally involved with the leading technology developments in logistics systems; and receive a right to a non-exclusive, royalty-free license to all intellectual property developed through the membership supported generic research program.
- Are able to direct the work of CCALS research staff in directed research projects and own the intellectual property that results from directed research.
- Have access to academic faculty as well as their students who will be future employees in the logistics industry.

CCALS works with its industry and government partners to establish workforce adaptability metrics that support a variety of competitive advantages for logistics services including quality improvement, better customer service, learning curve acceleration, and economy of scope and depth. The research laboratory space will be a mix of computational laboratories and hands-on large scale data mining and management laboratories. A typical research team can consist of 1 or 2 principal scientists, 1 or 2 senior research scientists, 3 to 4 graduate students, and 1 to 2 undergraduate students. Twelve to 15 research teams can be involved.

The CCALS project staff can include scientists and engineers with expertise in the field of human behavior modeling, economic cost modeling, risk assessment, utility theory, cyber security, and logistics services. The project staff works directly with research sponsors to ensure excellent communication and timely delivery of project results. CCALS staff also works closely with the faculty and students of university members to ensure maximum leveraging of the academic assets for the benefit of CCALS members.

The initial members responsible for the development of CCALS include:

- Crater Planning District Commission
- Virginia State University
- Logistics Management Resources
- Virginia Economic Development Partnership
- Longwood University
- University of Virginia
- LMI
- Virginia Commonwealth University

**ROLES OF FOUR INSTITUTIONS IN CCALS:**

- Longwood University, Virginia State University, the University of Virginia, and Virginia Commonwealth University have been involved in the formation of the CCALS and formed the initial Board of Directors.
• All four institutions are responsible collectively for recruiting several business corporations as Organizing Industry Members, with each business paying a membership fee of $300,000 annually.
• All four institutions are dedicating a full-time equivalent faculty member for CCALS research that will work in multi-university collaborative research teams.
• Undergraduate and graduate students from all four institutions are involved in research projects.
• The Business Schools of Longwood University and Virginia Commonwealth University bring in the “soft side” of Modeling and Simulation, which includes the areas of transportation, points of purchase, cyber security, cost containment, and coordination.
• The Engineering Schools of the University of Virginia and Virginia State University bring in the expertise of their engineering and mathematics faculty to explore technology-intensive knowledge transfer and management within logistics service networks and related workforce planning and agility metrics, as well as legal and public policy programs.

RETURN ON INVESTMENT:
At CCALS, industry defines the problem, shares the costs, owns the solution and connects with top talent in four ways:

• Industry leverages real-world experience and university expertise to develop transformational logistics solutions.
• Shared costs, potential research tax credits and dedicated facilities minimize R&D expense and risk.
• Industry-focused IP policies accelerate the transfer of laboratory innovation to solution implementation.
• Collaboration with universities ensures industry input on curriculum and workforce development.

Additionally, CCALS reduces turnover and recruitment costs by providing unprecedented access to a highly qualified, skilled and motivated workforce in Central Virginia, a region increasingly driven by logistics-related organizations. CCALS’ collaborative environment also increases access to key customers and prospects.

BENEFITS:

• By providing a pipeline to high tech jobs through internships and graduate assistantships, CCALS provides an environment where enhanced workforce development can take place.
• Continued funding allows each university to provide a greater depth of research talent that enable a response to industry driven projects and job growth.
• By increasing the number of faculty FTEs in the logistics and supply chain management field, universities are able to grow enrollments in relevant undergraduate and graduate courses, and increase the number of students successfully completing these high tech, high demand degrees.
• Job growth in the logistics sector increases employment related income tax revenue, as well as boosts sales tax generation as employees spend earnings.

ACHIEVEMENTS:

1) The founding members developed a 33 page working document business plan, vetted and approved by organizing university members.
2) Several universities secured state financial support in their base budgets to support CCALS.
3) Mr. Mark Manasco was appointed initial President and Executive Director.
4) A branding platform and marketing materials were developed with the public relations firm CRT/Tanaka.
5) Founding members retained law firm for legal services, formed the organization and assisted in negotiating the various membership agreements.
6) The law firm created CCALS as a legal (IRS submission and approved) Non Profit 501 (c) (3), appointed Board of Directors and complied with all IRS organizing requirements.
7) A website, www.ccals.com, was launched.
8) The first two organizing industry members, LMI and LMR, joined CCALS.
9) An initial research roadmap was developed.
10) University members have made sales calls on other organizing members (Dollar Tree, Owens & Minor, Maersk, Virginia Port Authority, Dominion Power, Amazon, Northrop Grumman and UPS) – secondary steps are already in place for these organizations to become industry members if they join.
11) Two Government Associates, Crater Planning District and U. S. Army CASCOM, joined CCALS.
12) An office was established in Prince George, VA.
13) Actionable plans have been developed for a build-out of a permanent facility similar to the Commonwealth Center for Advanced Manufacturing (CCAM).
14) The first logistics research program with LMI, McLean, VA has been defined and initiated – research to begin Fall 2013.
16) Board members and other important stakeholders served as guest speakers at several trade association conferences.
17) Dean Paul Barrett (Longwood University) was an invited keynote at the IX International Logistics Congress in Izmir Turkey and addressed the new CCALS model for unprecedented collaborative, low / shared cost research and outcome based workforce and economic development in the region; Ohio State, University of Michigan and other notable European Universities have expressed interest in the model.
18) The Longwood Logistics Center (LLC) was developed as part of its commitment to CCALS:
   a. Appointed an Executive Director and hired an administrative assistant
b. Hired a new faculty asset, Dr. Jay Cho, with a PhD from the University of Arkansas and more than 20 years in the South Korean and US military as a logistics expert

c. Established a Collaboration Hub in Fall 2012 with capabilities to facilitate virtual streaming video and audio meetings with remote CCALS partners and industry partners for research project management

d. Initiated the plans for a SAP Alliance/GIS/Modeling and Simulation Lab for relevant supply chain management/logistics skills for students; first wave of new technology for the lab is to be in operation in Fall 2013

e. Created and catalogued a Supply Chain Management Endorsement (SCME) academic offering for students starting in Fall 2013

f. Launched its outreach programs in logistics to high school students in Fall 2012 in the surrounding counties to spark enrollment growth in Longwood’s SCME

g. Served as a guest speaker (Executive Director) at several trade association conferences for marketing/branding purposes

h. Set up branded marketing material (brochures, etc.) and a web-site http://www.longwood.edu/business/logistics.htm to extend their marketing outreach

19) Virginia State University (VSU) expanded its academic degree offering in Information and Logistics Technology (ILT) as part of its commitment to CCALS
   a. ILT program is introduced to Fort Lee students

20) Barry Johnson, the University of Virginia (UVA) L. A. Lacy Distinguished Professor in Engineering and Senior Associate Dean for Research in the School of Engineering and Applied Science (SEAS), stepped down from the board of directors for the Commonwealth Center for Advanced Manufacturing (CCAM) to take a board of directors role with CCALS
   a. Opened its search for a Logistics Research Systems Analyst as part of its commitment to CCALS

21) Virginia Commonwealth University (VCU) expanded technical strength in existing International Business Certificate related to worldwide logistics as part of its commitment to CCALS
   a. Opened its search for a Logistics Research Faculty Asset

UNIVERSITY FUNDING FOR CCALS:

Longwood University:

FY 2015: $250,000
Longwood University allocated $250,000 from funds appropriated by the 2012 General Assembly to the College of Business for the CCALS one-time membership fee and for personnel and operating expenses related to the operation of CCALS. The University will continue to fund
(Longwood University FY 2015 Continued):

$250,000 through the base budget for CCALS for the hiring of faculty and other operating costs*.

FY2016: $250,000

The University will continue to fund $250,000 through the base budget for CCALS for the hiring of faculty and other operating costs*.

University of Virginia:

FY 2015: $150,000

The University of Virginia provided $150,000 from funds appropriated by the 2012 General Assembly to CCALS for the one-time membership fee. The University will continue to fund $150,000 for expenses related to the University’s work with CCALS.

FY2016: $150,000

The University of Virginia will continue to fund $150,000 for expenses related to the University’s work with CCALS.

Virginia State University:

FY 2015: $325,000

Virginia State University allocated $325,000 from funds appropriated by the 2012 General Assembly to the School of Engineering, Science, and Technology for the CCALS one-time membership fee and for personnel and operating expenses related to program offerings at Fort Lee and operation of CCALS. The University will continue to fund $325,000 through the base budget for program offerings at Fort Lee and research support and operating costs* for CCALS.

FY 2016: $325,000

The University will continue to fund $325,000 through the base budget for program offerings at Fort Lee and research support and operating costs* for CCALS.

Virginia Commonwealth University:

FY 2015: $219,375 Incremental

Virginia Commonwealth University will allocate $159,375 (includes salary and benefits) for one FTE faculty position that will be committed to the CCALS operation and $50,000 for operating costs*.

FY2016: $219,375 Incremental

Virginia Commonwealth University will continue funding of $159,375 (includes salary and benefits) for one FTE faculty position that will be committed to the CCALS operation and $50,000 for operating costs*. 
**OPERATING COSTS:**

When using the term “operating costs” below, the following cost elements are included: administrative support and travel; professional development; outreach efforts at high schools and community colleges to promote university enrollments; curriculum and course work development for academic programs for university students; efforts to engage university students in internships aligned with industry partner research projects in order to provide students an applied path to their logistics careers; and costs related to direct support of CCALS generated project orders.