

A Logistics Tipping Point?

Introduction

The author Malcolm Gladwell has used the term “tipping point” to describe the moment where various phenomena gain momentum in way that appears almost unstoppable. The concept is applicable in a wide variety of contexts, to ideas, products and messages. In business, a tipping point might be described at the moment in which a product or a theme begins to shoot straight up.

Gladwell does not assume that “tipping points” occur without a considerable investment of time, resources, strategy and capital or without significant promoters of a message or product- people that Gladwell calls connectors, mavens and salesmen.

But when a tipping point does occur, an idea or a product gains widespread acceptance and spreads, epidemic- like, in ways that could have hardly been conceived or imagined a few months or a few years earlier.

It could be said that the Richmond metropolitan area is **approaching** a tipping point in logistics- The region has a favorable location for shipping and distribution; it has existing logistics-related businesses from Hanover to Prince George; the region is home at Fort Lee to the Army’s central logistics training university; the Richmond metropolitan area is within one hundred miles of the East Coast’s deepest-water port in Hampton Roads; RIC is in the nation’s top sixty airports for cargo shipments; and there are a set of promising initiatives in an emergent stage that could bring a major research component to the region’s logistics effort.

The recent emergence of a set of complementary logistics initiatives in Richmond is indicative of the potential that the industry holds for the region. The development of the Port of Richmond, the creation of the Virginia Logistics Research Center, the construction of major Amazon facilities in Chesterfield and Dinwiddie counties, and the capacity to utilize the potential of the Army Logistics University at Fort Lee to promote economic development in the wider region all have major positive implications. Logistics also holds the potential for employing large numbers of area residents, a possibility that does not always accompany other forms of economic activity.

But it is a potential that will require collaboration, investment, and detailed execution if the tipping point is actually going to be reached. Each of these initiatives will require the public and private sectors and all levels of government- federal, state, regional and local- to work together.

The Richmond Region's Logistical Assets

The locational advantages of the Richmond region make logistics a natural point of emphasis, one in which the transport and distribution of goods is not simply a cost to be borne by the regional infrastructure, but is an economic development catalyst for the region broadly conceived.

A recent study for the Greater Richmond partnership by Market Street Partners succinctly outlines these infrastructure assets.

- The region is located at the convergence of four interstate highways (I-64, 95, 85 and 295)
- There are two Class I rail lines, CSX and Norfolk Southern in the area.
- We have delivery proximity to the East Coast and other national markets within a 24 hour period.
- We have growing service at Richmond International Airport (RIC) and proximity to Washington-Dulles.
- There is a significant opportunity for expanded intermodal capacity and double stacked clearance through Petersburg and between the Port of Virginia and Roanoke.

The Market Street Study also highlights the amount of logistics activity currently ongoing in the region.

- There are over 100 motor freight companies and brokers in the region.
- FedEx and UPS Freight have a significant presence.
- RIC now handles more than 85 million pounds of air cargo annually and its growing international business has enabled it to be designated as a Foreign Trade Zone.
- The Richmond region has historically had a manufacturing base that is crucially important to becoming a logistics center.
- Approximately 45,000 people out of the 650,000 Richmond MSA workers are in occupations relevant to Supply Chain Management, with nearly half the relevant occupations paying above the regional average of \$43,740.

- There is major employment in military aviation supply chain through Defense Logistics Agency: Aviation in Chesterfield County.

In the last year alone, a number of major developments have occurred.

- Amazon announced its decision to invest \$135 million to locate major distribution facilities in Chesterfield and Dinwiddie counties and quickly implemented it. The Dinwiddie facility is 1.1 Million square feet, costs \$50 million, and will create 350 jobs, the single largest job creating event in the county in 15 years. The Chesterfield facility, located at the Meadowville Technology Park, is a 1 million square foot facility, costs \$85 million, and will create 1000 jobs. Amazon's decision highlighted the advantages and the opportunities that exist in the region for the siting of distribution and warehouse facilities, opportunities that exist in eastern Henrico County, in the south side of the city of Richmond near the port, and throughout the Carter District along the existing and planned Route 460. In its aftermath, the Economic Development Director of Hanover recommended forming a public-private partnership to develop a "shovel-ready" site in his county to attract similar kinds of investment.
- The culmination of the build-out of Fort Lee as the center for logistics education for the U.S. Army and other military services is another major development. Less than 10 years ago, it appeared that Fort Lee would be significantly downsized in a round of BRAC actions. But a coalition of community leaders, the Virginia congressional delegation and the Crater District business community was successful in not only reversing the likely downsizing and bringing new people and investment to Fort Lee, but in redefining and repurposing the facility to become an indispensable part of the military's infrastructure as a logistic center.
- The Port of Virginia now leases the Port of Richmond (PoR) and has established the PoR as an essential component of its strategy to further the develop the Port of Virginia as a major player in the international trade arena. Twice-weekly barge service has been established from the PoV to the PoR and, in October, 2012, an announcement was made that barge service would increase to three time per week. The major user of the service is the Richmond-based company, MWV. This development has catalyzed dialogue and planning about the possibility of ultimately transforming the Port of Richmond and the surrounding location into a major inland port where significant manufacturing and distribution facilities locate.

- A number of major milestones have been reached in the effort to establish the Virginia Logistics Research Center (VLRC) on the model of the Commonwealth Center for Advanced Manufacturing (CCAM). The distinguishing feature of CCAM has been its success in developing a research model that links academic research to the identified needs of the business community, in this case manufacturing. Multiple companies from around the globe have agreed to support the research program at CCAM and to provide multiyear funding for its efforts. VLRC has received funds from the Commonwealth that could be used for start-up, has a set of founding academic partners, has developed a sophisticated business plan, and is starting a marketing-branding campaign.

The confluence of established assets and emergent initiatives highlight a number of key features of the logistics in our region.

Logistics is a business sector that spans and links the entire metropolitan area, from Hanover to Richmond to Dinwiddie.

The logistics industry can provide substantial employment opportunities across a large of occupations jobs and opportunities, from jobs that can be performed with on-site training, to those which can take advantage of emergent trends in advanced manufacturing, to others which utilize the research capacities at our colleges and universities.

Logistics is a business sector than can link the Richmond region to the increase in global trade, to the nation's defense priorities, and to the economic development emphases of the Commonwealth.

Port of Richmond

Virginia and the Rise of Global Cargo

The increase in global cargo has been a major contributor to the appeal and attractiveness of the logistics industry for nations, states and regions across the world. In 2011 alone, global cargo volumes rose by 11%. These are forecasted to increase 300% by 2040. In the U.S., containerized trade is growing twice as fast as the U.S. GDP. There are multiple drivers of this growth, but these include outsourcing, the rise of emerging markets, growing U.S. consumption, rapidly increasing exports, free trade agreements with South Korea, Columbia and Panama, and the increased number of ships going through the Suez Canal from India. (Keever, Presentation to Richmond Future)

These trends are very relevant to Virginia. The Commonwealth is currently positioned as of the top ports on the East Coast and in the country at large. The Port of Virginia has 13% market

share of the containerized volume on the East Coast, ranking third only behind New York/New Jersey and Savannah. Nationally, the Port of Virginia ranks 7th in containerized volume. It currently has 5% of the entire U.S. market share.

- The top exports moving through Virginia's ports are paper and paperboard, logs and lumber and other wood products, and agricultural products such as soybeans and poultry.
- The top exporting companies at the port are MWV, Archer Daniels Midland and Weyerhaeuser.
- The top imports at the port included furniture, auto parts, paper products and non-alcoholic beverages.
- The top import companies at the port are Target, Walmart, Home Depot and Red Bull. (Keever)

Expert opinion tends to believe that there may well be a further consolidation of winners and losers among American ports in the global trading competition. The largest ships that navigate the Panama Canal at this moment- Panamax ships- have a capacity of 4500 TEUS. (TEUS or twenty foot equivalent units is the standard measurement of cargo ship capacity.) The next generation of ships- the Post-Panamax vessels that will go through an expanded Panama Canal- have a capacity of at least 12,000 TEUS. As ships become larger and carry more containers, channels and terminals that can handle these vessels are likely to become far more successful, outpacing ports that do not have the channel depth to handle the ships or the related transportation infrastructure to move goods expeditiously from the port. (NADO Report: Freight Transportation and Economic Development: Planning for the Panama Canal Expansion)

Virginia is potentially positioned to be successful in this competition. The deepwater around our port allows large ships to regularly call on the Port of Virginia. And our channels and terminals can handle some of the larger containerships fully loaded, unlike any other port on the East Coast. At the moment, Virginia is the only port with channels deep access and access high enough to handle the Post-Panamax ships without dredging or infrastructure improvements. To be sure, other ports, on both coasts, are rapidly engaged in the process of making improvements in order to retain and upgrade their competitive positions. (NADO: Freight Transportation...) and, in our region, significant attention is being paid to the successes on the port in Savannah.

Virginia is not standing still and state government, the Port and private sector firms are taking steps to make the Commonwealth more competitive. These include constructing a new terminal at Craney Island, doubling the capacity of the central rail yard, examining the role of inland ports and initiating transportation projects that it will make it easier and quicker to move freight from the Port to the transportation routes and ultimately to customers. The Heartland Rail Corridor, for example, owned by Norfolk Southern and supported by a multi-state partnership, now enables cargo to be transported double-stacked all the way from the Port of Virginia to Ohio and onto Chicago. (NADO: Freight Transportation...)

Put simply, logistics is a major economic development emphasis for the Commonwealth of Virginia and the ongoing discussions between the Governor, the General Assembly and the local communities in Hampton Roads about the most appropriate means of operating the port are crucial to the Commonwealth's competitive position in this arena.

A Role for Richmond

The growing paid attention paid to international shipping and the increased prominence of the Port of Virginia has also drawn increasing attention to the role of inland ports, facilities that transfer goods between truck and rail. These can be, but are not necessarily adjacent to waterways. The National Association of Development Organizations notes that inland ports "often function as economic hubs, attracting warehousing, transportation, and logistics support services to help good move through the supply chain." The inland ports and the surrounding infrastructure are typically funded by a mix of public and private investment.

The Virginia Inland Port (VIP) in Front Royal is often cited as one of the most successful inland port operations. The VIP is located on 160 acres alongside 17,000 feet on on-site rail served by Norfolk Southern five days a week. Located at the junction of I-81 and I-66, the port itself has a small number of employees and limited warehousing capacity. It has a free trade zone designation and can provide customs functions. By 2010, the Virginia Inland Port handled nearly 25,000 containers. (NADO: Freight Transportation...)

The VIP makes a significant contribution to economic development in the Commonwealth. 39 major companies have located near the port. These include Family Dollar, Ford Motor Company, Home Depot, Kraft Foods, Rite-Aid, Lennox and Skyline Express. The adjacent facilities include over 8 million square feet of building and more than 8,000 employees.

There is an opportunity to transform the Port of Richmond (PoR) into Virginia's second major inland port. Unlike Front Royal, the PoR is located on a waterway and can accept barge service from the Port of Virginia. In addition, the venue surrounding the Port could provide 500-

600 acres of siting for transportation, manufacturing, and logistics firms. And it provides direct access to major north-south interstates as well as east-west routes.

In 2011, the Virginia Port Authority leased the Port of Richmond for five years, with options to renew the lease for three additional five year terms. The crane rental at the port was funded by the Secretary of Transportation and the Richmond Metropolitan Planning Organization supported the barge pilot project with a grant of almost \$4 million. The Port itself is operated by a third party, Port Contractors, Inc.

There is presently barge service- the 64 Express- from the Port of Virginia to the Port of Richmond. The service is operated by James River Barge line, a Norfolk Tug Holding. It began in December, 2008. Early supporters of the barge included MWV, Universal Leaf and Tobacco and Altria. In recent months, Mediterranean Shipping and other companies have utilized the service.

The service has also been marketed as an integral part of the Green Port sustainability initiative of the PoV. Tugs used in the barge operation burn ultra-low sulfur fuel, every container moved by barge is said to reduce diesel fuel consumption by 31 gallons, generate 38% less greenhouse gases than truck and 28% less than rail per ton-mile. In the first year of operation it saved approximately 12,000 truck trips, saving fuels, reducing emissions, and contributing to relieving congestion in the Hampton Roads area.

At its inception, the once-a-week barge service did not necessarily pay for itself and a coordinated effort was undertaken by both the private and public sector in the region to increase the number the number of barges per week. The recent decision to increase barge service to three times per week will make it possible for the service to be self-sustaining. It will also allow a business case to be made for improvements to the Port of Richmond itself, including updating cranes.

The opportunities for the Port of Richmond are similar to and perhaps even larger than those of the Virginia Inland Port. The City of Richmond has engaged consultants to begin consideration of the potential development of a logistics business park, a 600-700 acre development district that will be established in the area surrounding the port. The potential for the district is substantial. It could:

- Build upon the emerging relationship with the PoV with potential tenants.
- Enhance the broad range of warehousing/distribution initiatives ongoing in the region
- Link to the region's model for developing advanced manufacturing through CCAM

- Increase the competitiveness of existing firms by enhancing their supply chain capabilities
- Contribute to positioning the region as a center for global innovation

Fulfilling the Port's Potential:

The possibility of transforming the Port of Richmond into Virginia second major inland port should be seriously pursued.

- It is a logical way of capitalizing on the region's locational advantages.
- It provides an explicit linkage to one of the most important economic development initiatives being undertaken in the Commonwealth, the upgrading and marketing of the Port of Virginia.
- It builds upon an existing multi-million dollar investment that the region has made to bring barge service from the Port of Virginia to the Port of Richmond.
- And while inland ports themselves are not major employers, the private investment which the port can attract could provide thousands of jobs in a variety of areas, including transportation, warehousing, and even advanced manufacturing.

To realize this potential, there are numerous steps that will have to be taken, in both the short and intermediate terms, involving multiple actors in the both the private and public sectors.

1. Creating more business for the 64 Express barge service.

Making the 64 Express a success will initiate the next phase of dialogue regarding investment at and near the port. These investments include upgrading the crane service, improving the berthing areas, and enhancing access to the port itself for larger barges.

2. Infrastructure Analysis, Improvement and Investment Plan (Recommendations from Global Logistics, Ltd)

The ultimate success in developing the Port of Richmond into a major inland port will be related to the transportation infrastructure in the area- there needs to be a thorough analysis of the road system at and into the port and in the surrounding area where private sector companies may locate. A similar analysis needs to be undertaken of the rail system that will focus on capacity and clearance issues as well as interline switching.

A reasonable assessment of investments that are needed, the timetable to compete these investments, what the costs will be, and how these are likely to be borne and defrayed will be crucial.

3. Customer Identification and Marketing Plan (recommendation from Global Logistics, Ltd)

The competition for global freight among inland ports is competitive and promises to become more so. While Virginia and potentially Richmond have some important advantages, these will not substitute for the careful analysis of the potential, identification of the best niche and effective marketing to the private sector.

This will require ongoing cooperation between the Commonwealth, local and regional economic development offices, the City of Richmond, the PDCs and our private sector expertise. The region needs to consider the respective roles of these various entities and how best to coordinate these.

Fort Lee: The Home and Lifeblood of Logistics

The expansion of Fort Lee during the latest BRAC round is one of the region's most remarkable success stories. Originally slated to be downsized, a coalition that brought together Virginia's congressional delegation, state government leaders, local elected and administrative officials, and the Crater District's business community managed to demonstrate such foresight and community support that Fort Lee ultimately not only avoided downsizing, but was significantly upgraded, in terms of personnel, facilities, and centrality of its mission to the national security interests of the country.

The consequence of the BRAC 2005 decisions was to "direct realignment of the Transportation and Ordnance Schools to Fort Lee, VA. And to collocate these schools with the Quartermaster School, Army Logistics Management College (renamed the Army Logistics University), and Combined Arms Support Command Headquarters to create a Center of Excellence at Fort Lee, Virginia. The U.S. Army Ordnance Center and School moved from Aberdeen Proving Ground, Maryland. The headquarters of the U.S. Army Transportation center and School moved from Fort Eustis, Virginia. And the Air Force and Navy Culinary Schools and the Defense Contract management Agency also moved to Fort Lee. (Crater District PDC-Report on Fort Lee Expansion)

The meaning of this expansion is well captured on the base's website which notes "Welcome to Fort Lee-the Home of Logistics". Fort Lee is now the third largest training of the U.S. Army. It is estimated that **35% of the Army's personnel** will, at one time or another, be stationed or obtaining education/training at the complex.

The physical expansion of Fort Lee and the further specification of its mission around logistics in a dynamically changing global environment demonstrated what can occur when a thoughtful and concerted effort is conceived and implemented in the region and in the Commonwealth.

As the expansion indicated in the 2005 BRAC decision was implemented, a number of reports and studies have been produced that provide information and data about the extent of the growth at Fort Lee and the economic impact it has had on the entire region.

Pre-BRAC, Fort Lee has 7.5 million square feet of facilities. By 2011, this had expanded by more than 33% to 10.1 million square feet of facilities. The total planned build-out at Fort Lee by the end of 2013 will almost double the size of the facilities on the acreage to almost 14 million square feet. This includes 56 new facilities and 4 renovations. The total spending on direct BRAC and non-BRAC facility improvements in the 2007-2013 time period will be approximately \$2 billion. (Garrison Brief to House Armed Services Committee, October, 2011) Centerpieces of the construction include:

- A \$50 million Combined Arms Support Command (CASCOM) headquarters building
- The Army Logistics University, a 400,00 square foot building

A similar expansion is occurring with the number of personnel stationed at Fort Lee, temporarily receiving education and training at the base, and working at Fort Lee or at Fort Lee-related businesses.

- In 2008, the military population at the base was 4,556. In 2012, this was 4,694.
- In 2008, the number of civilian employees was 3,188. In 2012, this was 5,253.
- In 2008, the number of contractor employees was 1,316. In 2012, this was 2,799.
- In 2008, the number of family members was 12,059. This is projected to grow to 22,096.
- In 2008, the average daily student load was 4,223. In 2012, this 9,600.

Reports measuring the economic impact of Fort Lee on the surrounding communities indicate a similar exponential growth.

- In Fiscal Year '03, Fort Lee's estimated impact on the regional economy was estimated to be \$860 Million
- In Fiscal Year '12, Fort Lee's estimated impact on the regional economy was estimated to be \$2.4 billion. (The Economic Impact of Fort Lee)
- In Fiscal Year '03, the estimated tax impact of Fort Lee-related business was estimated \$57 million.

- In Fiscal Year '12, the estimated tax impact of Fort Lee-related business was estimated to be \$124 million
- In Fiscal Year '13, employment directly attributable to Fort Lee was estimated to be 12.28 % of the total employment in Chesterfield, Dinwiddie, Prince George, Colonial Height, Hopewell and Petersburg

The impact of the move of personnel to Fort Lee will be felt across the entire area. Estimates suggest that about 30% of those stationed at Fort Lee live in Chesterfield County and another 30% are divided between housing on the base itself and residents of Prince George County. Yet the access to eastern Henrico via 295 has resulted in a growing number of personnel living in Henrico County as well. (Crater District Report to Richmond Association of Realtors)

Currently, planning for a Joint Land Use Study is underway that will encourage cooperative land use planning between Fort Lee and its surrounding jurisdictions so that future civilian growth and development are compatible with the training and operational mission of the installation.

The Army Logistics University (Materials drawn from ALU website)

The Army Logistics University (ALU) is at the heart of the expanded activities at Fort Lee. The ALU's website notes that it home to three colleges and an Academy for military and civilian logistics leaders. The ALU is organized to provide Logistics education across the entire range of service personnel.

The Logistics Leader College is geared toward providing professional education for offices at the lieutenant through colonel level. The Logistics Leader College provides a wide range of courses that are calibrated to the specific responsibilities of officers at various levels. ranging from Basic Officer Leader courses to ones explicitly designed for individuals who will be assuming command of logistics operations.

- The College of Continuing and Professional Education provides logistics training for both civilian and military personnel in areas of joint, multinational, operational and strategic level logistics. It provides training to individuals at varying rungs at the career ladder. The Theatre Logistics program provides training for career military and civilian personnel who intend to pursue planning positions in sustainment formations while the Intern Logistics Studies program prepares High GPA civilian interns who have a strong interest in logistics an Army logistics career leadership positions.
- The Technical Logistical College conducts specialized training for quartermaster, ordnance and warrant officers who have substantial field responsibilities.

- The Consolidated Logistics Non-Commissioned Officers Academy is grounded in the recognition that logistics branches comprise 30-40% of the Army's enlisted forces. The Academy includes professional military education for all quartermasters, ordnance, transportation non-commissioned officers at the staff-sergeant and first sergeant levels.

The ALU also partners with a set of universities for graduate study in a variety of logistics-related areas and trains military personnel from more than 60 countries.

Defense Logistics and the Region

The focused activity at Fort Lee as the one of the largest providers of military education is good reason to be optimistic about its future. The Crater District Planning Commission has proven to be especially adept at anticipating potential challenges and organizing to address these successfully.

In addition, the attentiveness of Virginia's congressional leadership to both the national security and economic benefits of Virginia's strong relationship with the military will provide the Commonwealth and the region with an advantage in the competition among states for the continued siting and expansion of defense-related facilities. Given the likely continuation of BRAC and the budget constraints that the Defense Department will inevitably operate with in the upcoming decade, it remains crucially important for the region to continue to support Fort Lee and its activities.

The impact of the growth of Fort Lee continues to diffuse throughout the Richmond region. The expansion of the base's physical plant and the increase in the number of activities and personnel stationed there in it makes it an important part of the regional community. Fort Lee, as noted above, contributes to employment opportunities, to jobs for civilian contractors, to purchases in the community by individuals and families associated with the base, and to bringing spousal talent to the region. The standard method for assessing the overall contribution of the base is to produce economic impact statement that aggregate the ultimate effects of these activities.

Yet standard economic impact analyses do not fully capture the promise that the presence of the Army Logistics University at Fort Lee may hold for the region. What has begun to excite people is the prospect that the construction and further development of the ALU may be an integral feature of advancing logistics as a key component and driver of the regional economy.

How can the presence of the ALU attract firms that have logistics as a key focus? How can the presence of the ALU become a magnet for talent to be attracted to the region? How

can the universities in our region cooperate more fully with the activities at the ALU? And how can some of the talent developed at the ALU become, upon retirement, a key feature of the regional workforce? If the region can answer these questions successfully, it will truly **integrate the logistics innovations at Fort Lee** into a regional economic development engine.

Workforce Integration

It is generally acknowledged that individuals who have acquired technical expertise in the services and been successful within the military culture possess a skill set that is highly valued by employers in the private sector. Indeed, Virginia's exceptionally large veteran population is often seen by business considering expanding or relocating to a significant competitive advantage for the Commonwealth. In addition, spouses of individuals who are in the military are also viewed quite positively by employers.

The presence of Fort Lee and the Army Logistics University gives the Richmond region the opportunity to expand the available of highly skilled workers that can help to attract and retain employees. This is particular true of individuals who have associated with the ALU as staff, trainees, and faculty. Long-term, focused efforts to assist the military in out-placement of individuals who possess appropriate logistical training and skills should be an important of workforce development in the region. Creative initiatives, such as those that might permit departing military personnel to train with area companies, could give the region a distinctive appeal to employers seeking to relocate or expand in the region.

ALU-Regional University Partnerships

The ALU also provides a wonderful opportunity for the development of genuine partnerships between Richmond regional universities and community colleges and the educational activities at Fort Lee.

Until recently, the vast majority of universities that have had a major presence on the Fort Lee site or have had significant academic partnerships have not been ones located in the region or, for that matter, in the Commonwealth. The absence of a strong relationship has been surprising, given the importance of the defense industry to Virginia's overall economy and the interest that the Commonwealth has had in being a veteran-friendly state. Universities outside the Commonwealth and a number of proprietary institutions have been more aggressive in shaping programs that are accessible to men and women in the military services and in developing articulation agreements that utilized educational experienced acquired in the military toward degree credits. In addition, they have developed means for actively promoting these efforts among the relevant constituencies.

Fortunately, this situation is changing for the better. In the last few years, the Commonwealth has paid considerable more attention to the relationship between its public colleges and universities and military personnel stationed at bases in Virginia. It has taken a number of initiatives to make the interaction with current military personnel and veterans far more productive. At Fort Lee, universities in our region have established a more visible presence and others have created partnerships around specific programs that can be accessed by the personnel stationed there.

In 2011, the College of William and Mary reached an agreement with the ALU to offer cooperative graduate degree that could benefit the personnel at Fort Lee. Virginia State University has been extremely active in developing programs and partnerships with the ALU that can benefit students in both institutions. For example, VSU is creating three logistics-related degrees that are tied to SAP certification.

It is crucial for these partnerships to expand and for the regional higher educations to continue to develop collaborative efforts with the ALU. Moreover, it is also important for the relevant research and researchers who are on the campuses of the universities throughout the region to explore how connections- both formal and informal- can be made between the ALU and the logistical research community in Virginia.

Research Synergies

The presence of the Army Logistics University and the Defense Logistics Agency-Aviation in the Richmond region highlight the extraordinary role that the capacity to utilize state-of-the-art logistics occupy in the national security arena. While these facilities are not necessarily major research funders on their own, they do indicate how important logistical issues are in the defense industry and how extensive a market there might be for logistical innovations that can be applied to the broad array of challenges the military services face in moving people, personnel, data, transports, weapons, supplies and data to meet its global obligations and responsibilities, often on an emergency basis. The courses that are taught, for example, at the ALU and the leadership personnel that spend time at the facility could be valuable resources for researchers attempting to understand what the pressing challenges are for defense logistics in the actual fields in which the military operates.

Establishing partnerships by which academic and private sector researchers could better identify the challenges that the military faces in moving personnel, ordnance, and supplies and potentially test idea/concepts for meeting these could enable the Richmond area to develop a genuine niche in defense logistics that is synergistic with the activities at the ALU.

The Virginia Logistics Research Center

The Complexity of Logistical Processes

The business process related to logistics are numerous, complex, and an inextricably related to the bottom line performance of many companies.

A presentation that Universal Leaf provided to Richmond's Future offered a detailed and powerful illustration of this point. Universal has operations in 30 different countries on five continents. It ships to 500 customer locations worldwide and transports 4 million units annually. The company transports raw, semi-processed and finished tobacco products. It also transports tobacco by-products, plant waste, as well as seeds, fertilizer, wood, crop protection agents and various packaging materials. In doing this, the company is in regular interaction with governments, customs, forwarders, brokers, agents and many other third party and regulatory agencies around the world.

The ostensibly simple process of getting tobacco to the factory entails a host of complex activities and arrangements. Universal contracts with farmers to grow a specific volume and seed of tobacco. Origin technicians have to provide farmers with education about field preparation, growing practices and child labor laws. Farmers are provided with fertilizer, wood and crop protection agencies. Origin technicians also provide access to financial assistance such as rural credit loans. Inland freight requires origin technicians to coordinate loading schedules, to arrange for third party trucking transport to the purchasing station, and the coordination of trucking lines to deliver the purchased tobacco to the factory or storage warehouses.

Universal suggests that what logistics means to the company entails the following business processes:

- Organizing the complex process of planning, implementing and controlling the cost-effective flow of tobacco products and all related information.
- Managing the efficient transport and storage of tobacco products from their point of origin to the point of consumptions.
- Accurately capturing all associated costs, correctly invoicing customers and resolving all issues expeditiously.
- Efficiently integrating information technology with transportation, inventory, purchasing, processing, packaging, warehousing, and security.
- Understanding, keeping apprised of, and complying with government regulations across numerous countries and continents.
- Timely analysis of business information and more informed decision-making.

The presentation by Universal illustrates the critical importance of logistics to a global company's bottom-line and how the improvement of logistical processes can impact a firm performance.

The creation and development of the Virginia Logistics Research Center is intended to focus academic research on the practical issues that business confronts in the logistical space. In essence, it wants to create "transformational improvements in the design and analysis of logistical systems for military, commercial, consumer and emergency applications."

VLRC is being deliberately organized along the model of the Commonwealth Center for Advanced Manufacturing, a model that is intended to make academic research more relevant to addressing the practical challenges of businesses by bringing industrial, government agencies and academic researchers together under one unit. (VLRC Business Plan)

The CCAM model has been developed with the explicit attention of overcoming a number of the issues that have traditionally limited the business impact of academic-business partnerships.

In the first place, one of CCAM's basic purposes is to overcome the "valley of death" that has existed between basic academic research and product commercialization at which business traditionally excels. By bringing together business researchers and academics together, the model works to ensure that the challenges experienced by manufacturing firms are able to shape academic research in ways that issues such as scalability become incorporated at an earlier stage of the research process.

In addition, the CCAM model has developed a means of dealing with the intellectual property issues that have often bedeviled potentially fruitful collaborations between the private sector and university, especially those that are state-supported. A system has been put in place that enables the companies either to own the intellectual property or to retain a non-exclusive license.

The CCAM model places a strong emphasis student involvement and workforce development. It will involve students in research that have strong practical applications in the business arena. It brings them into a lab setting where they are simultaneously enhancing their scientific and commercial skills. It will also initiate an innovative workforce development model that provides training at facilities and on equipment that the trainees would actually use upon employment. (Johnson, Rosser, report on Advanced Manufacturing)

In a relatively short-term, CCAM has established itself as one of the most promising models for R&D at the global level. It has succeeded in recruiting a number of companies not only in Virginia but nationally and internationally to sign on as core sponsors. It has attracted grant

dollars from the Commonwealth and from entities such as the Tobacco Indemnification Commission. In March, 2012, President Barack Obama visited CCAM and the Rolls-Royce facility to highlight the extraordinary partnership that it represented and to cite it as the new model for business –university partnerships that he hoped could emulated in dozens of different environments around the country.

The VLRC is a deliberate effort to emulate the CCAM paradigm. It began as an initiative of three universities- Longwood, the University of Virginia and Virginia State University to take advantage of the growing logistical presence that was being established at Fort Lee, enabling a research component to complement the extensive educational programs offered at the base. Virginia Commonwealth University has recently joined as a 4th university partner. With a combination of state funding and internal reallocation of resources, each university is now in the process of hiring of faculty with specialties in logistics-based research.

The VLRC recently completed its business plan. It is a sophisticated document that speaks to the center’s value proposition, mission, siting, research use for the building, financing, and marketing to prospective members.

The business plan envisions a Center that that will utilize academic research to promote the rapid translation of logistical technologies from conception to commercial application that can benefit a wide range of private and public sector clients. The document notes that the VLRC members will include “governments, manufacturers, transportation companies, and suppliers as well as service providers from military, commercial, consumer and emergency applications.” (VLRC Business Plan)

Drawing explicitly from the CCAM, model the VLRC plan envisions different levels of membership. At the most general level, member entities will contribute to shaping and utilizing the results of the “generic” research produced at VLRC which is intended to advance shared logistical processes across a variety of industries. At a more engaged level of membership (Organizing Industry Members), VLRC sponsors will be able to shape and utilize the results of “directed research” that is geared toward the specific industry and competitive needs of the sponsor. By joining VLRC, the sponsor has the ability to direct research toward its competitive needs without having to build, staff and maintain a research unit of its own and without having to negotiate on a case-by-case basis the often tortuous allocation of intellectual property that has frequently arisen in direct relationship with universities. (VLRC Business Plan)

The plan identifies two potential sites for VLRC, - one is on the campus of CCAM and the second is at the Meadowville Technology Park in Chesterfield County where Amazon is locating one of its two local facilities. Both sites are located in the Richmond Metropolitan Statistical area. Both sites are adjacent to all the major roadways in the area. And both sites are within 15

minutes of defense logistical university located at Fort Lee and within 30 minutes of the Defense General Supply Center in Chesterfield County. (VLRC Business Plan)

The VLRC business plan calls for the construction of a 50,000 square foot facility and it specifies particular kinds of office use at the facility. There will be a mix of open, collaborative space with provision of secure space where proprietary research can be conducted. Research labs at VLRC will include a mix of high quality computational work and state of the art modeling and simulation equipment. (VLRC Business Plan)

The project staff at VLRC will be individuals with backgrounds in engineering, human behavior and economic modeling, risk assessment and logistics. They will work with both the research sponsors and the academic faculty and students to ensure that the academic assets are used in the most productive manner and provide timely delivery of project results.

Organizing Industry members agree to a five year term of support in which they will contribute \$300,000 a year and make an additional one-time payment of \$500,000 of in-kind contributions that can be equipment, hardware/software or services. They will also provide a one-time loan of \$150,000 to assist in start-up costs that will be repaid in the five years following the initial term. Members at this level also agree to house one full-time staff member at VLRC to work collaboratively with the Center's and promote the long-term interest of VLRC. (VLRC Business Plan)

Organizing industry members receive a seat on the VLRC Board of Directors and have the opportunity to be an Organizing Industry representative on the Operations Board that approves research projects. Most importantly, 50% of their annual fee can be allocated toward directed research that is directed by the member. Organizing Industry members will own the intellectual property that emerges from directed research and they will obtain a non-exclusive license from any generic research produced at VLRC. (VLRC Business Plan)

Tier One Industry members will join for a period of at least five years at \$200,000 per year. They will have a similar arrangement in regard to directed and generic research as the Organizing members. Half of their annual fee can be allocated toward directed research and they will obtain a non-exclusive license to generic research. They will also have an opportunity to serve on the board that determines VLRC generic research projects. (VLRC Business Plan)

Tier Two Industry members will also join for a period of at least five years at \$100,000 per year. They will have access to the generic research produced at VLRC and the non-exclusive license to such research. In addition, they will have the opportunity to serve on the Board that determines the generic research projects.

The Organizing University members will make a \$150,000 loan to the initial start-up fund. Each university will have a seat on the Board of Directors, the Operations Board and the Technical Advisory Council. Each university will join the Organizing Industry members in housing a full-time person at VLRC to help shape the research agenda and participate in activities that will generally advance the interests of the center. The universities will also agree to house a specified number of graduate students full-time at the center who will work on the generic and directed research projects while continuing to take most of their classwork on-line. (VLRC Business Plan)

Given the importance of the research that will be conducted at VLRC to specified governmental activities, the center will have a membership category for governmental associates. GA's will not be part of the annual fee structure but will enter into contractual arrangements such as Cooperative Research and Development Agreements.

VLRC has developed an ambitious revenue plan that projects an annual budget of more than \$14,000,000 over a ten year period. Research expenditures are projected to be at least 70% of the total revenue with administrative, facility and equipment costs accounting for approximately 30% of total expenditures.

By the end of the ten year period, VLRC is projecting to obtain 6 Organizing Members, 20 Tier Two members and a total of 36 members. Of the \$14M, it is expected that \$6,5M will eventually come for the fees associated with Organizing Industry, Tier One and Tier Two members. \$4.5M is forecasted to come from increasing success that VLRC will have in obtaining federal grants. The final \$3M is expected to come from Cooperative Research Agreement and contract research conducted by VLRC.

VLRC expects that the building on its ultimate site will cost approximately \$11.25 million and will be constructed by a developer that will lease the building back at a cost of approximately \$825,000 per year. VLRC also envisions purchasing \$1M in capital assets during its initial ten year start-up. (VLRC Business Plan)

While VLRC is in a start-up phase, its potential contribution to the economic development of the region's logistical capabilities is extremely significant because it enables the area to make the highest and best use of its intellectual capital as well as its physical location.

First, it is grounded in a model that is generally viewed as a globally innovative to linking high level academic research with the practical needs of industry in a manner that can benefit business, universities, and students.

Second, it has the potential for providing the region with a distinctive talent magnet for high level logistical activity, one that can attract firms that focus on logistics and where the region's

universities individual researchers who are seeking the best opportunity where they can perform their work.

Third, VLRC has the potential of capitalizing on the growth and development of Fort Lee as a logistical center by having a focus area in defense-related logistics. It makes what is happening at Fort Lee a more integral feature of the Richmond region and enable the area to have a defense-related specialty that can compete effectively for federal funds.

Fourth, along with CCAM, VLRC has the opportunity to produce a workforce educated in both scientific best practices and the actual needs of business.

Consider, for example, the VCU Brand Center. It has won numerous accolades from the highest level of industry for the quality of its business-centered education; its students have consistently competed and out-competed the most prestigious MBA programs in competitions focusing on innovation and creativity; and the Center has actually been ranked as one of the most innovative design schools in the country. The Brand Center has done this, in large part, because of an educational vision in which the student's experience replicates the environment of an actual brand business.

The vision animating VLRC is not dissimilar. It will have industry expertise on board; it will have continual collaboration between faculty and industry researchers; and it will expose students to a form of education that they are unlikely to experience almost anywhere else in the nation.

The powerful vision at the heart of VLRC will ultimately have to be realized through practical successes and the demonstrated capacity to establish the collaborations that it foresees. VLRC has contracted with a major Richmond-based branding agency, CRT Tanaka- to help develop its core brand and assist in its initial messaging initiative. Key features of VLRC's capacity to realize its potential will include:

- Successful translation of the CCAM model in business recruitment. The support shown by manufacturing companies for CCAM has been profoundly impressive. It will be critical for VLRC to achieve success in company recruitment as well, especially in terms of a lead firm.
- Successful development of university participation and creation of nationally competitive programs. Crucial to VLRC's success will be the participation of the major public universities in the region. In addition, it will be extremely helpful if the universities, either by themselves or, preferably, in collaboration are able to develop a logistics degree program with a genuine national and global profile, one that can attract students from across the globe.

- Successful creation of collaborations and research synergies with the Army Logistics University and the Defense Logistics Agency. The location of two major defense-related logistics enterprises in the region provides CCALS with a unique opportunity- its capacity to capitalize on this opportunity- in academic partnerships and in accessing the Defense Department's research priorities- will be an important measure of its success.

Action Steps: Getting to the Tipping Point

Bringing logistics to the tipping point in the Richmond region will involve a wide set of coordinated actions. Some of these, such as finding organizing sponsors for VLRC and developing the infrastructure around the Port of Richmond, will require investment of private and public dollars.

At the same time, not all of the issues involved with turning logistics into an engine of economic development are directly financial. In fact, a good portion of the ultimate success is related to what might be labeled social logistics: bringing people, institutions, sectors of the economy, and governmental entities together in ways that are innovative and effective, and then publicizing these successes- finding not only good ideas, but what Gladwell calls the "connectors," the "mavens" and the "salespeople" who make these take hold and gain prominence.

Here are a set of action steps that could move the region toward the logistics tipping point:

1. Focus on key short-term successes that can have long-term consequences: obtaining clients for the 64 Express barge service and recruiting a lead company to VLRC.
2. Develop a plan for port utilization that will enable it to acquire the funding for necessary equipment improvements.
3. Establish the viability of the Inland Port concept at the PoR and the surrounding area and develop a strategy/timetable for achieving it.
4. Develop a logistics degree program to be housed at VLRC that could have a similar national profile and industry support as the VCU Brand Center.
5. Complement this program with a Darden-like executive education program that could provide state-of-the-art logistics professional development to business leaders across the globe, one that would utilize the resources and professional expertise of Fort Lee and the Defense Logistics Agency-Aviation.

6. Create a public-private partnership (perhaps housed at a community college in the region) focused on transitioning veterans who have been trained at Fort Lee into the regional logistics workforce.
7. Market the Foreign Trade Zone at RIC more effectively. Prequalify local jurisdictions for free trade-zone status.
8. Brand the Richmond Region more effectively as a logistics center.
9. Establish a Logistics Round Table between ranking officials at Fort Lee and the Defense Logistics Agency-Aviation, community college and university participants at VLRC, regional business leaders, and key local/regional officials that will enable the region to monitor its progress in logistics and to become a leader in establishing civil-military partnerships.