

**Technical Report Number: TR-VLRC-062310**

**Title: Development of a Strategic Plan for the Virginia Logistics Research Center (VLRC)**

**Prepared For:  
CRATER Planning District Commission  
ATTN: Dennis Morris  
Monument Professional Building  
1964 Wakefield St  
PO Box 1808  
Petersburg, VA 23805**

**Authors:**

**Thomas W. Mastaglio, Ph.D.  
Michelle Tomaszewski, Ph.D. (ABD)**

**Date:**

**07/13Dev/2010**

**Submitted by:**



**MYMIC LLC  
1040 University Blvd., Suite 100  
Portsmouth, VA 23703  
757.391.9200/757.391.9098 (F)**

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## 1.0 Introduction

This report was prepared for the Crater District Planning Commission (CPDC) under a contract to MYMIC LLC. Its purpose is to provide initial strategic direction for the establishment of a Virginia Logistics Research Center (VLRC) in the Crater Region. The major focus areas for the study was obtaining input in terms of a sense of stakeholder expectations, and collecting recommendations from individuals and that have previously expressed interest in seeing the VLRC established. This input was used to formulate recommendations for a pathway ahead for the VLRC. The authors analyzed the data through the lens of their experience and took the liberty of enhancing findings to derive the recommendations contained in this report based on their expertise and experience. The authors both have specific experience developing similar organizations. Dr. Mastaglio’s experience is in developing and advising other organizations technology-focused research centers; Dr. Tomaszewski has consulted for numerous not-for-profit organizations, assisting them develop their strategic plans and leading start up programs. Both individuals were fully vetted by CPDC staff in the course of awarding this study contract. This report will cover the study process and the strategic framework the authors recommend based on an analysis of the data collected from the VLRC stakeholders.

### 1.1 Summary of Study Findings and Recommendations

The following are the key findings and recommendations from this study:

- The VLRC should be established as an independent 501(c) 3 not for profit entity under the governance of a formally established Board of Directors representative of the key regional stakeholders. The appointment of members to this Board and initiating its meetings is a key first step toward establishing the VLRC.
- VLRC has the potential to establish itself as a unique national center for logistics related research and educational offerings and as such can brand the Crater Region as a center of excellence.
- A multi-disciplinary approach to organizing center activities will work best with formal membership from industry, academia, and government organizations willing to provide direct support to the center in the form of funding, project sponsorship, or other in-kind contributions.
- A dynamic Executive Director with strong industry ties supported by key staff functions in marketing, research, and stakeholder liaison relationships will be essential for sustainability. The center should initially operate under a hierarchical organizational structure and evolve to a networked structure after stabilization occurs.
- Near term projects to validate the center’s value proposition to the logistics community, both large companies and those local to the Petersburg region, will be needed to establish direction and reputation.
- Local government, the Commonwealth of Virginia, and other stakeholders should provide funding to establish the center and ensure continuity of operations during its first five years. Specifically recommend government agencies fund infrastructure while other stakeholders could fund research project and other specific support. The center should organize itself with the goal of being self-supporting after that period. Funding for a facility and center infrastructure should be pursued through Federal sources to include earmarks and grants.

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- Partnerships are key to the successful launch and long term viability of the VLRC. Partners must be willing to support the center in the beginning and derive a benefit from its existence over the longer term.

## 1.2 Purpose of Strategic Planning

The establishment of the VLRC is a major undertaking and that requires stakeholders to view the strategic planning framework as a living document, which requires frequent review and updates. The recommendations presented in this report are a roadmap that should be translated into a project management plan with assigned roles, time lines, and benchmarks in order to measure progress and adapt activities as necessary. In addition, this report and the earlier VLRC Feasibility Study should be made readily available to stakeholders and interested parties. Key to the success of the VLRC, in the short term, will depend on partners that are engaged and committed to its vision as a premier logistics research facility serving the interests of the military, private industry, and supporting workforce development in local communities. Building this brand and reputation for the center will be expedited if the VLRC Board of Directors and staff promote progress and demonstrate proactive measureable achievements during all phases of the start-up.

## 1.3 Study Process

The success of the Virginia Logistics Research Center (VLRC) rests on stakeholder engagement. Therefore, a qualitative approach to data gathering was selected in order to allow stakeholders optimal opportunity to contribute their expectations, experience, and opinions on VLRC's purpose, structure, and outcomes. An initial briefing with all interested parties from academia, local government agencies, private industry, and defense agencies which had participated in VLRC discussions and planning to date was held. The researchers then worked with Denny Morris of the Crater Planning District to identify those stakeholders who would be most involved in the stand-up of the center. These individuals were then interviewed in person (N=12), by phone (N=1) or participated in a survey online (N=14).

A briefing for the Virginia Port Authority Advisory Board and the Virginia Maritime Inland Transportation Committee provided an overview of the VLRC and gathered their input. These industry members were sent a follow-up survey. An effort was made to expand the data gathering to include potential future customers of VLRC that would have an interest in logistics research and planning, (N=5). Five companies completed the survey. Representatives from Government and Defense who were not interviewed were also surveyed. These netted responses from one City Manager and one Economic Development Agency staff member. In addition, a focus group was held with industry members of the Virginia Maritime Association Inland Transportation group (N=8).

The interview and survey data we collected was analyzed to arrive at our recommendations. That analysis was based on three factors:

1. Consensus opinions where a majority of respondents provided the same or similar input.

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2. Researcher expertise or knowledge where substantial clarification or detail would add to the value of the report.
3. Anomaly inputs which were particularly interesting, insightful, or suggested innovative approaches.

All of the data was reviewed, collated, and analyzed by the two authors to derive the strategic recommendation contained in this report. We developed these recommendations collaboratively in order to further improve consensus identification and reduce subjectivity.

## 2.0 Strategic Framework

This section addresses the VLRC strategic framework from a Vision and Mission perspective. The resounding theme in determining the vision of the center included a unique position and contribution to the field of logistics through research and education that would make it the only facility of its kind in the Nation. Respondents continually noted that the VLRC's focus would hinge on its mission and there were three areas of focus that arose repeatedly: the needs of the defense industry, industry innovation and developing a stronger logistics workforce pool.

**Recommendation:** Once the Board of Directors is stood up, a one-day retreat to establish a firm Vision and Mission statement, as well as benchmark an action plan for staffing and facilities timelines be held. The following vision and mission statements are straw men for the Board to initiate their discussions; they are based on the input from this study.

*Vision:* The VLRC will be a premier center for applied logistics research that uses a multi-disciplinary approach to leverage the best practices from government, industry and the military that measurably improves logistics operations in the Commonwealth of Virginia and contributes to National interests.

*Mission:* The VLRC will achieve its vision by:

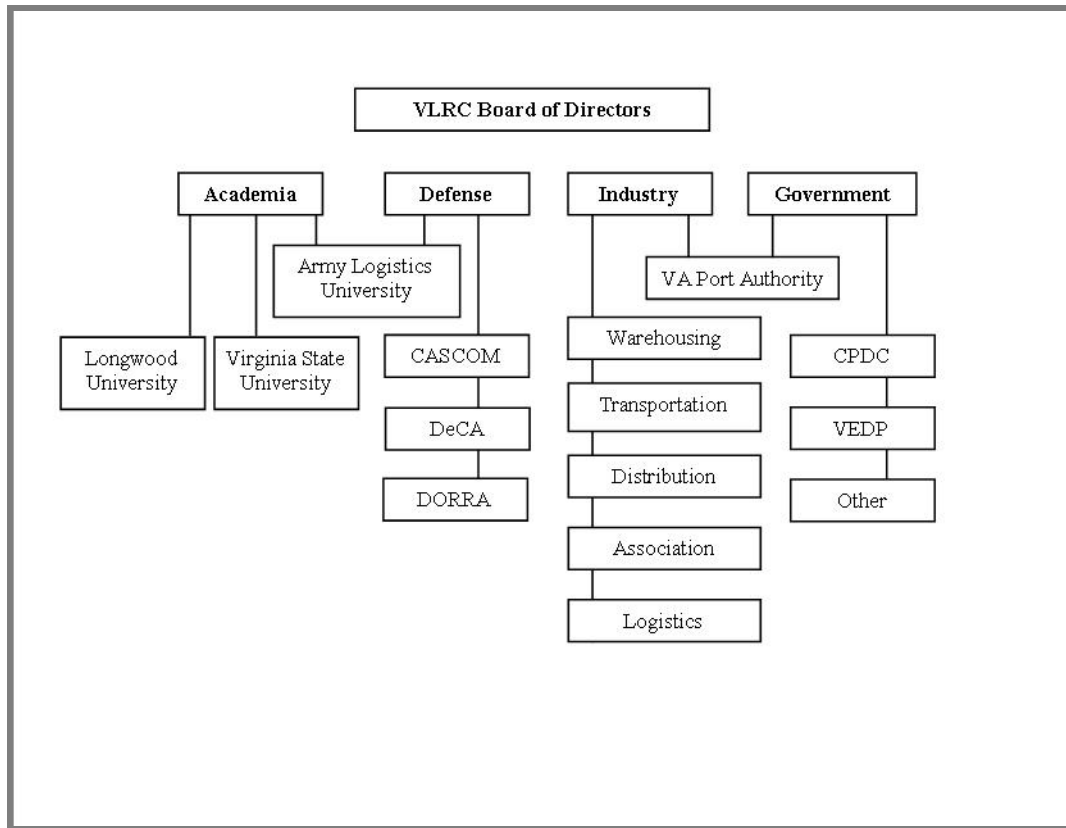
- Actively pursuing research projects for industry, government and the military, engaging them in applied research that leverages contributions from academia;
- Identifying and disseminating logistics issues for the purpose of leveraging applied research opportunities;
- Providing logistics professionals and companies access to the Center's resources, facilities, and research activities in a manner that supports the hands-on application of logistics knowledge and theory.

## 3.0 Operations Structure

The data clearly indicated an opinion that the VLRC should be organized as a separate independent entity as a 501c3 not-for-profit legal entity, with a Board of Directors to oversee progress and support recruiting of membership and facilitate partnerships. Some critical categories of membership on this Board of Directors were identified.

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1. They should be a strong group of decision makers and leaders from the logistics industry to advise and guide the staff,
2. They need to be able to facilitate autonomy and independence for the Executive Director and staff in order not to stifle the growth and innovation of the organization during its first five years.
3. The Board should include representation from: defense agencies, regional government entities, state government, economic development, companies that provide logistics and transportation services, private industry users of logistics services, such as warehousing, distribution, and port operators, and the three academic institutions that have been actively involved to date -- Longwood University, Army Logistics University, and Virginia State University. Figure 1 is a suggested organization chart for the BOD. One board member should be identified for each entity shown in this figure.
4. Each Board member should have equal representation and voice.



**Figure 1: Recommended Organization Chart for the BOD**

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5. In addition, each member of the initial Board should come from an organization that has or will make a specific investment in the VLRC. This can be in the form of direct funding or in-kind support; such as staffing personnel loaned to the center, donated equipment, or provision of facilities or technology.
6. Board members should fully commit to serving through the completion of the VLRC start-up phase. Duties of members includes serving on facilities or technology committees, coordinating information gathering events and forums, or soliciting new members from private industry to help sustain the Center.

Standing up the Board of Directors will be critical to the success of establishing the VLRC as viable entity. The following recommendations will support that endeavor:

1. Limit the Board to no more than 15 members initially. This will foster closer working relationships. Members should be fairly high-level decision makers in their organizations, although this will make convening meetings somewhat difficult.
2. Hire a consultant to form and chair an action and nominations committee comprised of key municipal leaders. That committee will establish a draft charter and guidelines for initial by-laws then solicit and accept nominations from stakeholder organizations to use in establishing the initial Board membership.
3. The Board should initially focus on defining and establishing the VLRC by-laws, then identify task leaders to organize start-up activities in the following areas: Hiring the Executive Director, Financing, Facilities, Research, Education, and Industry Engagement. The consultant should probably be retained to coordinate initial board sessions and activities.

Key staff criteria will be identified in the staffing section of this document; however there are some general notes on the structure and position of the 501c3 entity that deserve attention. The VLRC will be unique, in that it will take a multi-disciplinary approach to applied research, which serves to deliver products that leverage commercial practice and academic research in order to enhance military systems. This in turn will help improve commercial efficiencies, and also establish a regional transportation and logistics collaborative environment. In comparison to other logistics research programs we investigated, this will place the VLRC in a unique position. Other centers are singularly focused on either a single military customer or on the interests of the academic institution(s), to which they are affiliated. Our recommendation is that the VLRC be treated and viewed as a non-aligned center that is able to liaison amongst interested parties in a more neutral fashion. This will also aid in the successful management of agreements and intellectual properties in the best interests of members and partners in their projects.

The VLRC should create a membership process. Many companies that are interested in, or could benefit from, applied logistics research do not have capability to conduct research specific to their company. However, they do want access to the professional communications and research findings that will be generated by the VLRC. The Board should decide on an initial membership structure. We recommend that it be fee-based, and structured according to company size.

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Private industry is critical to the VLRC’s long-term success and will be key partners in the development of applicable and deployable logistics technologies and processes. Therefore, we recommend an Industry Advisory Group be established as soon as the Board of Directors is in place and the Executive Director is on board. This group will initially focus on: identifying potential and high-impact industry members, communicating VLRC’s Vision, Mission, and progress to industry groups, and advising the VLRC on research areas that have high potential fiscal payback and can be applied to both the commercial and defense sectors. The Advisor Group should be comprised of industry members and VLRC staff with VLRC Industry affiliated Board members taking a leadership role in its development and stabilization.

A concept suggested by some, but not a majority of, interviewees was to organize a separate Research Advisory Group. The goal of this group would be to consolidate information on the expertise resident in academia in the region, and available at other institutions with whom it would be beneficial to team with (e.g., Virginia Tech, William and Mary and University of Richmond). This group would create a tracking database of expertise accessible to all that will allow the VLRC to tap into the best sources to meet any research project’s needs. The group would also establish collaborative agreements between Universities to facilitate the sharing of expertise, thereby enhancing the collective research capabilities and capacity available to the VLRC from regional institutions. In addition, the group would aid the VLRC staff in vetting applied research opportunities in nascent technologies that can be developed and marketed. These opportunities would be presented to the Industry Advisory group and offered to center members. The Research Advisory Group should be comprised of researchers from academia, representation from the port, military logisticians, and other government representatives with expertise in transportation issues.

#### **4.0 Policy and Processes**

Once the Executive Director has been hired, a start-up set of Standard Operating Procedures should be established. Initially, this document will be reviewed twice yearly, and updated as often as necessary, to keep up with the VLRC growth activities. The initial set of policies to be established should include:

- By-laws,
- Intellectual Property Management Process, Review and Template Agreements,
- VLRC process and policy for interacting with Ft. Lee tenant units to account for Government regulations on competitor issues and contracting restrictions
- Personnel Policies,
- Accounting Methods and Practices,
- Internal Project Management and Communications,
- External Public Relations and Communications,
- Facilities Management

#### **5.0 Staffing**

A recommended initial staffing structure emerged from this study, mostly by respondent consensus. However, several alternative excellent recommendations were also noted that will

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support developing the strong collaborative partnerships required to make the VLRC a success. The consensus was an initial hierarchical structure with the staff reporting to the Executive Director (ED) who is accountable to the Board of Directors. Over the long term, respondents envisioned a flatter networked structure to help aid information flow and facilitate collaboration. We recommend that first the Board be organized and then recruit and hire the ED. The ED will be responsible for subsequent staffing decisions, but should include Board members in interview activities for executive level positions. The recommended order for hiring staff is as follows:

- 1) Executive Director,
- 2) Director of Business Development and Director of Research,
- 3) Part-time assigned/in-kind Liaisons to the Government /Military and to Industry,
- 4) Contracted (or donated) Legal Council,
- 5) Part-time assigned / in-kind Director of Education,
- 6) Operations Manager and Administrative Support Staff.

*Executive Director:* Ideally this individual will have a combination of military and industry experience in the logistics industry with a proven track record for creating collaborative partnerships across lines of competition and/or diverse interests. The Executive Director will be responsible for all aspects of start-up and have a strong personal network within the logistics industry in order to facilitate communicating progress and soliciting support and contributions. Initially, the Executive Director will also manage staffing the center, deal directly with business related issues, and provide facilities oversight. Board members with expertise in these areas should commit to supporting the ED in these areas.

*Director of Business Development:* Initially, this individual will develop the membership program to include: recruiting members, structuring a value proposition for joining the VLRC, and identifying funded project opportunities. Their near term focus will be on projects that could be funded by communities or agencies to directly enhance logistics research, analysis, and support capabilities regionally. In addition, they will pursue grants to fund research in logistics technology. This individual should have prior grant proposal and management experience at the federal level, and preferably in the defense arena. They must also have a proven track record in leading teams because they will need to involve staff and advisory committee members in their efforts. On a long-term basis, they will identify strategic funding activities that can be developed as signature events to brand the VLRC and Crater Region as leaders in logistics, such as an annual conference and specialized educational offerings.

*Director of Research (Hardware/Software):* There were some recommendations in the surveys and interviews to have researchers on staff, perhaps on a part-time basis initially, with expertise in certain areas of technology or logistics. A more common recommendation is to initially hire a lead researcher or director who could lay out a research road map to identify pertinent, immediate application areas then work with a team on identifying customers who will benefit from a specific project and are able to participate on a team. This person will organize research projects involving collaboration amongst the regional academic institutions and provide hands-on experience to professionals in educational programs. They will also be a key figure in the establishment of a Research Advisory Group, and help guide a scope-of-work for that group.

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*Director of Education:* Initially this person should be assigned part-time as a staff augmented from one of the participating academic institutions. They will develop a plan for educational opportunities and programs that the VLRC will sponsor and coordinate. It will be important for them to produce a full-scale road map of all existing relevant logistics-related courses and academic programs available locally from Universities and Community Colleges, and they must be committed to using their role in a neutral, equitable fashion with the VLRC's best interests in the anticipated outcomes.

*Government/Military Liaison:* This person could be on assignment from the military or a regional government agency. Their role would be to bring potential logistics clients into the VLRC, communicate progress, and strengthen relationships with the goal of achieving long-term support and involvement from local or national logistics management government and military agencies. This will be a short-term position to support the initial start-up of VLRC on a part-time basis with a future decision as to whether this staff member is needed on a permanent basis.

*Industry Liaison:* This person could be on assignment from industry, or someone who has worked closely with the logistics industry. It would initially be a part-time position until results and near-term efforts demonstrate the value of the VLRC to the industry. Over the long term, this position could conceivably evolve into a full-time position working with the Director of Business Development to help generate fiscal support, build industry membership, create special events for industry, and ensure the VLRC meets the applied research needs of private industry.

*Operations Manager:* Once the facility is up and staffed, the Operations Manager will coordinate processes, staffing issues, facilities, and activities related to the business management of the organization.

*Administrative Assistant:* We recommend that as soon as VLRC staff is hired, an administrative assistant with experience in scheduling, documentation, and event planning be recruited. Especially during the start-up, when executives will be tasked with a diverse array of activities, having a stable in-office presence will help with efficiency and preserve an image of being responsive and available to members and partners.

Some interviewees identified the need for a Communications or Marketing staff person. However, we recommend that initially having the Business Development Director working closely with the Government/Military and Private Industry liaisons to create marketing and communications deliverables is sufficient. This will be collaborative effort across the staff to meet the needs of the logistics community based upon a defined and targeted marketing strategy. All marketing efforts should focus on key center capabilities available to support customers, such as facilities access, technology access, end-products availability, and access to the most current and applicable logistics research. Once the VLRC reaches a point of self-sustainability, this will be a much needed position to continually and consistently promote the VLRC both regionally and nationally.

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## 6.0 Market Identification

Respondents were uniformly consistent in their suggestions on target markets. The following areas cover partnerships and initial marketing strategies. However, a complete plan and organized structure for deploying these initiatives is vital to continued relationship building and reducing duplication of effort. After an initial plan is developed, we recommend the use of a Customer Relations Management System to document relationships and monitor specific opportunities with customers. CRM systems ensure retention of institutional knowledge and relationships as organizations transition and grow. It also helps further develop and refine networks relevant to business development, allowing several members of the organization to establish and leverage relationships captured in the tool.

### 6.1 Partnerships

The three areas of logistics most often noted were warehousing, distribution, and transportation. During initial stages, it will be important for the VLRC to establish relevancy in the private industry markets. The larger companies usually have extensive logistics analysis and possibly research programs, while smaller firms do not have the resources necessary to conduct such activities on a regular basis. Therefore, it will be critical to initially establish small scale collaborative studies that have value for private industry while being of future utility to other partners, such as defense logistics agencies and community planners. An example that was presented by the industry focus group was to study the impact on businesses in terms of revenue and capacity by analyzing variance in traffic flow given three transportation solutions: gas tax, industry tax, or toll systems. This would aid planning for the entire transportation logistics industry, support planners, and could lead to the development of specialized planning tools or capabilities. Another focal point could be small scale projects that receive the fiscal support from larger firms and benefit the industry as a whole.

Another area where partnerships should be established is regional governments. The Petersburg area and surrounding municipalities stand to gain an economic benefit from both the VLRC and the continuing expansion of Ft. Lee. However, as a region it is not likely that they will be supportive of VLRC without a joint commitment, similar to those made through economic development partnerships. We recommend that each of the cities in the region contribute a nominal amount of funding to the VLRC annually and jointly decide to fund a regional impact study each year. These actions would fully commit these partners to the VLRC while ensuring they receive a direct benefit from center activities.

The partnerships VLRC establishes with academic institutions will be vital to the products it produces. A focused effort to bring VSU, Longwood, and the ALU into a working partnership is critical. These relationships would involve research faculty and students in the initial portfolio of research projects. However, the VLRC should also proactively communicate its activities (except where proprietary interests come into play) to other institutions with logistics research capabilities. These include, but are not limited to: William & Mary, Virginia Tech, Virginia Commonwealth University, University of Virginia, University of Richmond, and Old Dominion University. These Universities are already in partnerships with private industry and the military,

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therefore they can provide capability to the VLRC to disseminate best practice findings, and extend existing research into applied end products.

The regional community colleges should also be informed of activities that apply to the logistics programs they offer. Although these students are less likely to be engaged in research projects, they are prospects for continuing education beyond the Associate Degree level. These students, many of whom are affiliated with the military, may be optimal target groups for testing gaming systems and researching instructional methodologies. Therefore, the VLRC research team should pursue partnerships with these institutions just as they will with the universities because it can aid in the development of the emerging workforce.

A central critical finding is that it is important for the VLRC to establish a solid partnership with the defense facilities at Ft. Lee and Richmond. Although private industry work can help sustain the VLRC, it must produce products, systems, and processes that enhance the ability of the military to manage their logistics. This partnership with defense must include regular briefings on issues, data gathering from ground personnel, and a focus on enhancing the educational opportunities afforded to defense personnel. This partnership is also important from a facilities standpoint if the VLRC is to be located on or near Ft. Lee proper, which tends to be the general preference of all the respondents.

## 6.2 Marketing Efforts

From our interviews with a variety of VLRC constituents it became clear that the Staff and Board of Directors will need to be proactive in educating decision makers from government and industry sectors on the purpose and mission of the VLRC. Marketing will be most effective if conducted initially at the grassroots, person-to-person level to garner support and promote the potential rewards offered by the VLRC. We recommend the following initiatives once the Board of Directors is formed.

1. Attendance at forums, conferences, and events held by the other Modeling and Simulation Centers in the Commonwealth.
2. Attend economic development and small business center events to promote the facilities and programs being established by the VLRC.
3. Seek out speaking opportunities to industry groups, such as Virginia Port Authority Committees, local civic groups, and industry associations.
4. A monthly news letter to stakeholders on facilities progress, potential research, program development, and updates on new supporters.
5. Proactively schedule visits to the VLRC site for stakeholders, even while it is under construction; which promotes both involvements in the development phases as well as programming.
6. Host exploratory forums and focus groups to identify research targets from the very start of the facilities construction effort.

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Once the recommended liaisons are appointed, they should spend a majority of their time in the field arranging collaboration sessions, identifying potential projects, and signing up new members.

## 7.0 Research

The VLRC must clearly stick to an applied research agenda with the goal of producing usable products that can be commercialized, used for commercial interests, and/or transferred to military or defense systems. However, the Center may also provide expertise, resources, and facilities on a funded basis to entities that wish to conduct research in their own interests. In every case, intellectual property considerations should be made and agreements established that consider all terms of usage, access and duration of the activity.

### 7.1 Initial Projects

The most valuable target for initial research is identification of gaps to achieving an integrated systems approach to military logistics. From that analysis, the VLRC should select projects that offer a near win. This will aid in not only establishing Center reputation but also the collaborative, multi-disciplinary research practices needed with the VLRC. The VLRC should involve private industry in identifying the possible solutions and determining the best approach to researching best applied practices, suitable processes, or products. Securing research projects from private industry will take time and though they are critical to long-term sustainability, depending on industry projects as early success stories will be difficult. However, the engaged leadership at Fort Lee is committed to seeing the VLRC be successful and has specific ideas on potential research areas from the start. Therefore, focusing on one of these will help initiate the research agenda and provide the staff and partners an opportunity to demonstrate capability early on.

Another area of research would be to investigate Routes 460 and 58 as key logistics transportation corridors and rail transportation pathways. Both offer potentials for distribution, warehousing and transport that could be maximized by analytic modeling and simulation studies. This type of research is valuable to community planners in the effected localities and would provide an immediate return on their investment in the VLRC. It would also be a valuable initiative for private industry and the Virginia Port Authority because it would provide a baseline for further research and modeling and simulation efforts in areas such as port growth and expansion decision making. The next level phase of this baseline study could be a modeling and simulation platform that could analyze transportation, warehousing, and distribution decisions.

Finally, one area identified by private industry that would be valuable to companies is transportation policy analysis. Existing transportation data and research primarily focuses on impact at the citizen level. However, transportation companies need to know how changes in policy could affect their businesses. For example, how the different approaches to funding (gas tax, tolls, business tax) would affect routes, scheduling, and costs. This research would enable companies and Port operators to make proactive decisions regarding logistics planning and operational policies to reduce the potential negative impact the changes may have on profit margins.

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## 7.2 Long Term Research Project Recommendations

The VLRC will develop a process to stay informed on emerging research and theory that can be translated into applied research projects. However, some potential areas to watch were noted by respondents. One is the medical transportation and distribution system used by the Veteran's Administration. The VA is the largest purchaser and distributor of medical products in the U.S. and expansion of facilities and the improvement plan for its delivery system will require more efficient and highly integrated logistics systems. Another area of exploration may be in conjunction with the Department of Homeland Securities efforts to streamline tracking and response systems which require the integration of a diverse array of local systems into a more seamless system for prevention and response activity. Both of these areas are relevant to the VLRC because it will reside in an area with a strong military presence and serves regions with high value targets.

These research opportunities are noted because they indicate that the VLRC should not limit its perspective to regional interests. However, in the long term, the most value will come from engaging in cutting edge research with strong industry partners to uncover innovations that improve logistics systems and reduce transportation and distribution costs. Where intellectual or proprietary concerns are not of issue, these findings should then be vetted against existing gaps in military systems to test changes and recommend strategies for improvement.

## 7.3 VLRC Implementation Goals

### 7.3.1 Near Term – Two Years

1. Establish the Board of Directors, recruit, and hire the Executive Director.
2. Secure seed funding from local municipalities, Commonwealth of Virginia and other stakeholders.
3. Recruit and hire initial staff members.
4. Determine facilities location, configuration, and initiate build out.
5. Initial research project based on results gap analysis for Ft. Lee CASCOM initiated with primary academic partners and major private industry advisors.
6. Active outreach to recruit industry charter members.
7. Host a forum focused on logistics issues with participation from government, academia, and industry.

### 7.3.2 Long-Term – Five Years

1. Complete initial study to address gap issues in military logistics environment.

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2. Establish active Industry Advisory and Research Advisory groups.
3. Complete an analysis of regional transportation and planning, working with municipalities and private industry, to expand the study to address economic and infrastructure considerations.
4. Secure one major grant for applied research in logistics that expands on seminal work and the results of which have value to the military and/or private industry environment.
5. Host a conference on multi-disciplinary applied research in the field of logistics.

## **8.0 Financial Targets**

Critical to the VLRC strategy is developing a funding plan with diverse funding sources. As public policy and economic conditions change, one source for economic support may be more dependable than another, having a balanced approach to funding sources will reduce risk and vulnerabilities. For example, during economic upswings, companies often focus on production and devote minimal resources to research and development. On the other hand, during a recession, they could more likely be focused on networking and business development opportunities to increase their potential customer base. Such shifts are difficult to predict, but a strategy that diversifies funding sources will be more successful over the long term than one that is vulnerable to economic fluctuations. For example, we reviewed several similar research centers during this study that were substantially dependent on public funding, either academic institution support or direct state level funding and were forced to significantly cut back on their activities during the recent economic downturn. However, those which had a variety of funding sources were able to continue operations without dramatically altering their activities. Funding sources for the VLRC will evolve over time, however we identified three categories of funding that should be considered. In this section we also address the best sources for initial funding for the center.

### **8.1 Sustainment funding categories:**

#### **8.1.1 Public Funding:**

The VLRC should establish partnerships with the 11 localities in the Crater Region to obtain commitment from them for annual funding contributions as well an initial first year investment. This commitment should be small enough to be affordable by these government entities, but large enough that when pooled together they cover 25% of operational expenditures. We recommend a goal of \$25,000 per locality, or possibly a varying contribution based on population. In exchange, the VLRC will conduct one research project per year that benefits all of the localities, plus report to them on economic development outcomes directly related to VLRC operations.

The Commonwealth of Virginia should provide an operational funding stream during the initial five years. This will provide the VLRC sufficient time to increase project and program related revenue. This funding could be structured on a graduated scale, beginning with 75% of operational expenditures and decreasing annually to be replaced by other external sources and from overhead generated through project revenues. This will establish targets for

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projects and related activities to replace the state funding stream over time. Options for loan funding were identified; however they are not a recommended source during the center startup because of the non-profit structure of the VLRC. However, debt-based approaches might be feasible once the VLRC is stabilized and in need of funding to support growth and provide operating capital to support contract and project execution.

### 8.1.2 Private Funding

The VLRC will need a sustainment funding strategy that includes private industry membership dues. These dues could be scaled to organization size based on employment numbers, revenue, or industry category. Members would receive membership benefits, such as access to research facilities, special forums, and be allowed to provide their input in the form of voting rights on focus areas for VLRC research and education programs.

Another key component of private funding is revenue from some type of annual event(s) which bring members and the logistics community together to review research, network, and show support for the center. The VLRC should host an annual conference that features research project results, connects the emerging logistics workforce throughout the membership and related community, and provide opportunities for developing future collaborative research activities. The fiscal value of such an event is derived from the sponsorships companies provide in addition to attendance fees, which often cover little more than event expenses. Generally the first two years of such an event reap little more than costs, however if they are of high-quality and executed well, they show increasing revenue benefits from sponsorships over time.

Many large companies have affiliated non-profit foundations that support work in areas that benefit their industry. These private foundations should be a focus area for raising VLRC investment funding to support expansion, exploratory (internal) research activities, and branding/marketing activities.

### 8.1.3 Project Funding

The VLRC must establish an overhead rate to use in costing funded research projects. Over time, funding from the overhead generated on projects will be a primary source of support for center operations. This needs to be a specific goal for the BOD and Executive Director to ensure the long term operation of the Center.

Revenues from leased office space in VLRC, usage charges for center research or technology, and event fees will help offset operating costs. This particular funding source will be dependent upon the VLRC liaison staff creating strong relationships with businesses looking to incubate a presence in Petersburg area, new small business, Small Business Development Centers, and financial institutions in the region.

There will be some educational and information gathering activities that the VLRC will have to fund through its operational budget, such as research internships and gap identification focus groups. However, the revenue generated in other educational areas, such as hosting technology simulations for students, classes, and instructor seminars should help to offset the overhead expenditures of the center.

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The VLRC must establish a process for reviewing grant-funded programs in order to identify new avenues of research, as well as expand upon previous or on-going VLRC research with product development potential.

## 8.2 Initial Funding

The respondents indicated two sources of initial capital funding to set up the VLRC: Federal earmark funding and the National Science Foundation (NSF). We recommend pursuing a blended approach that also includes local government, Commonwealth, and stakeholder support to demonstrate regional and state commitment to the VLRC. Recommended strategies to consider include:

- Securing initial funding for development purposes from municipalities, the Commonwealth, and invested stakeholders to establish commitment and demonstrate progress. Often, capital funders, such as Federal agencies or Foundations, will not invest in physical structures and technology unless programmatic progress and demand can be demonstrated; this will require initial investments from the served community.
- A Federal earmark for the physical facility because a primary component of the VLRC's vision is to enhance and improve the logistics capability of the U.S. military, and (as recommended earlier) a preferred geographical location in close proximity to or on Ft. Lee. This funding would finance the VLRC building and associated infrastructure investment necessary to establish the Center.
- Another key component of initial set-up will be a substantial investment in both hardware and software technology. The NSF has a primary mission of increasing capacity and innovation in science and technology. Pursuing a grant for the initial technology infrastructure expenditures from the NSF would fit within their mission. Funding from NSF or a similar government agency could be leveraged into a partnership to identify optimal cutting-edge technology investments to support applied, multi-disciplinary research in the logistics field.
- Funding from a foundation, such as the Cameron Foundation, would help procure the resources necessary to stabilize staffing and bring in qualified researchers for initial projects. The first five years of development are critical to establishing VLRC relevance in the logistics community, demonstrating a solid value proposition for the center's existence with its stakeholders, and building a future research capacity. An initial investment in the resources needed to make the center operational is needed to provide VLRC the capital to pursue internal projects that result in capabilities being developed which can be leveraged to support funded projects and product development.

## 9.0 Intellectual Property

A brief review of intellectual property issues was conducted; however their scope and complexity are well outside the credentials of the authors. Intellectual property rights laws are designed to protect ownership of patents, trade secrets, copyrights, and registered trademarks by the inventors, creators, or authors of those inventions, trade secrets, literary works, or trademark designs or names (Bouchoux, 2002; Field, 2006; Lee, 2006; Nusbaum, Rubens, and Nguyen, 2009). Works prepared by commissioned contractors or by employees for their employers are

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considered the property of the business or person for whom the works were prepared (Lehman et al, 1995). In effect, intellectual property rights protect the financial incentive needed to encourage innovation, and with the advent of open source development philosophies and platforms, can be a complex issue to navigate. A summary of issues is provided herein; the following recommendations should be considered during the initial start-up period.

- An informational rights counsel should be retained or services obtained through contracted or in-kind support to: identify relevant IP issues, educate staff and partners, establish basic legal documents and formats for memorandums of understanding, and identify limitations to VLRC operations as a result of IP issues.
- There should be a systematic process for regular review of activity to identify any intellectual property issues.
- Information gathering during start-up that reveals potential research areas should be documented for future review of intellectual property issues.

Determining ownership of intellectual property can be a complex process—especially when creation of that property requires contributions from multiple persons or agencies. This requires Executive Leadership to take a proactive role in creating a culture that promotes fair and equitable exchange, while it protects the VLRC and its staff from conflicting interests. For example, contributors to a current project may depend, in part, on intellectual capital or trade secrets they acquired during employment or contractual agreement with another entity (Bolch, 2009). If the current project results in a product or service developed through patent or copyright infringement, the owner of that new product or service could be liable under intellectual property laws. The culture at the VLRC should be one of full-disclosure and honest, fair approaches to managing and negotiating IP issues.

Likewise, if contributors to current projects are not made aware of the proprietary nature of and the intellectual property ownership of their contributions—and are not asked to sign non-competition and/or non-disclosure agreements, those contributors may feel free to employ their newly acquired intellectual capital in future ventures with other entities, potentially resulting in a loss of proprietary capital or income for the Research and Development Center (Bouchoux, 2002; Bolch, 2009). Patent and/or copyright agreements must be created and signed by all research participants at the beginning of the development process (Hoffman). These agreements should be designed to protect the intellectual property rights of the Research and Development Center as well as all contributing research partners (University of Virginia, 2000).

Both the creation and maintenance of intellectual property protective measures require clearly defined standard operating procedures. First, intellectual property assets must be identified and valued; the risks to and impacts upon the VLRC Center, i.e., should an asset be infringed, should be quantified and categorized (Crawford and Strasser, 2008). Written permission for use of, or rights to intellectual property used during a development process, but not created by the VLRC, must be obtained from the property owner.

An intellectual property review committee, composed of VLRC stakeholders who are familiar with intellectual property laws, should oversee the creation and maintenance of IP templates for use in the documentation of all steps in the product development process (Crawford and Strasser,

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2008). Researchers and developers should continually evaluate these templates to document all innovations involved in the creation of the seminal or final product or service. Given the scope and complexity of intellectual property issues, we recommend that VLRC plan, in its initial development stages, to engage counsel either by contract or as an in-kind partnership to support the center develop intellectual property policies and guide management.

## 9.1 Continuous Improvement Plan

During the initial two-year start-up the Executive Director should conduct Quarterly Improvement sessions with the staff to identify any limiting practices or inefficiencies from becoming systemic over the long term. Initially, these could be conducted using a simple model, such as a SWOT assessment with a cost-benefits analysis. Subsequently, we recommend the VLRC conduct a stakeholder’s survey focused on one or two areas of improvement or new development. Conducting the same survey each year tends to net diminishing returns. One recommendation is to conduct surveys in rotation on: communications and expectations, product quality and application, and innovation areas. These will provide a foundation for the five year goals and establishing policies and processes. In addition, the VLRC staff should include in their Quarterly Improvement session any feedback or commentary they have received in order to identify potential areas of discontent or external recommendations for improving operations.

Additionally, a quality review of research products and educational programming should be conducted. In the case of research, this should be accomplished upon completing a project resulting in a study result or product. On the educational side this review should be conducted both during and after students have engaged in work with the VLRC. This is critical for mentoring or internship programs where it is possible to make adjustments and enhancements during a program to improve student outcomes.

## 9.2 Facilities

The Board of Directors will need to analyze facilities options and make a decision on location. Sufficient space will be needed to support envisioned staff administrative (office) and research activities as well as meeting areas. However, the following recommendations come from the VLRC stakeholders who were surveyed and they should be considered when in facilities planning.

- Ensure the space will accommodate private industry lessees, educational offerings that require access to technology and remote classrooms, meeting and work space for forum groups and technology-equipped centers for research.
- During the build out, the VLRC staff will need a temporary space from which to operate close to the final VLRC site.
- Seek sponsorships for specific space areas from private industry, such as the lobby, conference rooms or offices.

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- Facilities design should be flexible to enable adjustments to spaces based on need. For example, open area working spaces that have available room dividers in order to set-up temporary offices, forum sessions, or working group spaces.
- The facility should create space that is “creativity centered”. This space would be equipped with a variety of tools and resources for brainstorming sessions, research review meetings, and research vetting meetings. Such a space would have ample whiteboard space, media resources, and even a stock of mixed media supplies.

## 10.0 Summary

The VLRC concept is a high value target and enthusiastically supported by the stakeholders interviewed. It is universally seen as both a unique and key opportunity for the Crater Region that will leverage military activities in the area and the geographical location of the Crater region in terms of logistics and transportation industry activities. The Center should be focused toward becoming an independent activity that boasts strong partnerships with government, local and state government, academia, and industry. There is a significant opportunity for the region, under the VLRC leadership, to become a recognized center of excellence for logistics research, management support products and tools, and innovative ideas. To execute this vision we recommend the VLRC be established as a not for profit 501(c)3 with a board representative of its stakeholders, led by a strong Executive Director who is supported by a staff with capabilities in business development/marketing, research, and education. The center should be capable of independent (self-funded) operations within 5 years offering logistics educational opportunities within the region, specifically for DOD agencies, through its academic partners and conducting relevant applied research leveraging academic expertise that will directly benefit both the military and commercial industry. Partnered, liaison, collaboration, customer focused projects, and educational opportunities will be the main objectives and keys to the success for the VLRC to become a premier national center for logistics research and a critical asset to the Crater region to facilitate economic development in that area and for the Commonwealth at large.

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## Appendix A: Data Collection Sources

Name	Organization	Group	Interview or Survey
Mirta Martin	VSU	Academia	I
Dennis Morris	Crater Planning District Commission	Government	I
Bill Moore	CACSOM	Government	I
Mike Williams	Logistics Management Resources	Industry	I
Barbara Mroczkowski	U.S. Army Logistics University	Government	I
Pamela Leigh-Mack	VSU	Academia	I
Paul Barrett	Longwood University	Academia	I
Mike Lemhkuhler	VEDP	Econ Dev	I
David Canada	City of Petersburg	Government	I
Glenn Petrina	Defense Supply Center Richmond	Government	I
Michael Cooper	CUBIC	Industry	I
James Haug	Longwood University	Academia	I
Keith Williamson	VSU	Academia	I
Victoria Chung	Head, SimDev. & Analysis NASA	Government	I (phone)
Tim Williams	CASCOM Battle Lab	Government	SO
Jerry Clasey	Ace Hardware	Industry	SO
Tom Bandy	BandyWorks	Industry	SO
Emily Gupton	Virginia's Gateway Region	Econ Dev	SO
Pace Lochte	UVA Director of Economics	Academia	SO
Ronald O. White	Randy Forbes Office	Government	SO
Pamela Thompson	Prince George County	Government	SO
Conaway Haskins III	Senator Webb Office	Government	SO
Levin Sullivan	Crater WIB	Government	SO
Ed Daley	City of Hopewell	Government	SO
H. Russell Harris	Chesterfield County	Government	SO
Kevin Massengill	Dinwiddie County	Government	SO
Larry Constantine	Fort Lee Public Works	Government	SO
Ed Merkle	Virginia Port Authority	Industry	SO
Mark D. Wilder	Virginia International Terminals	Industry	SO
Joel Haka	CMA-CGM	Industry	SO
Joe Daughety	COSCO	Industry	SO
Katie Carney	Hipage	Industry	SO
Keith Helton	Givens	Industry	FG
Shirley Roebuck	Gilco Trucking	Industry	FG/S
Peter Trocchiano	APM Terminals	Industry	SO

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Bill Jackson	RJR-Dallas Mavis	Industry	FG
David White	Virginia Maritime Association	Industry	FG/S
Joe Harris	Virginia Port Authority	Industry	FG
Angie Eckhardt	Norfolk Southern	Industry	SO
Allen Campbell	Givens	Industry	FG/S
Bob Ewell	Port City Transportation	Industry	FG
Rhonda Armstrong	Port Norfolk Transport, Inc.	Industry	SO
Jane Mirmelstein	Port Norfolk Holdings, LLC.	Industry	SO
Jim Kozak	California Cartage Express	Industry	SO
Frank W. Borum	D.D. Jones	Industry	FG/S

SO = Survey Only

I = Interview

FG = Focus Group Member

FG/S = Focus Group Member who returned a survey