Virginia Information Technologies Agency

INTEGRATED SERVICES PROGRAM BUSINESS PLAN

JANUARY 2007

VITA's Integrated Services Program

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Executive Summary

The Integrated Services Program (ISP) was established in the Information Technology Investment and Enterprise Services (ITI&ES) of the Virginia Information Technologies Agency (VITA) on May 15, 2006 at the direction of the Chief Information Officer (CIO). The ISP is the consolidation of the Public Safety Communications (PSC) and the Virginia Geographic Information Network (VGIN) Divisions as well as the Radio Engineering function of the previous Telecommunications Directorate. The goal of this reorganization is to leverage existing services and expand services to localities and public safety, more generally, to further the mission and vision of VITA.

As such, the following business plan has been created to guide the development of the ISP. Though it has an initial focus of the next12-24 months, it will be updated on a semi-annual basis to reflect changes in the needs of the customers of the ISP and to update work plans for each project in progress. ISP's Business Plan implementation strategy includes a focus on the following key components:

- An efficient shared services model that provides more cost effective solutions to small to mid-size state agencies and local government;
- An effective enterprise approach that aggressively pursues partnership arrangements, leveraging the Commonwealth's economies of scale potentials to acquire both capital and expertise;
- Definition of and adherence to a business-oriented value proposition; and
- An equitable and effective pricing strategy.

Since the *Code of Virginia*, requires the existence of the PSC and VGIN Divisions, the organization of the Divisions within the ISP will remain relatively unchanged, though additional positions will be requested in future budget years. Similarly, both the VGIN Advisory Board and the Wireless E-911 Services Board will continue to perform the same functions they did prior to the creation of the ISP and will be supported by the VGIN and PSC Divisions, respectively. In addition to utilizing the Boards in the same capacity, several communities of interest network (COIN) councils will be formed to more adequately represent the stakeholders throughout the Commonwealth in each discipline.

The ISP will continue work on several projects outlined in this plan. Additionally, the ISP will begin expanded services during the next year. However, it is important to note that no service within the ISP can be all things to all people. In order to remain focused on the implementation strategy listed above, some tough choices may be necessary about which services can or, maybe more importantly, cannot be provided by the ISP. The ultimate test will be whether the service provides the best return on the investment of time and funding.

Since much of the ISP is funded through the Wireless E-911 Fund, the ISP has a different funding source than the rest of VITA. However, the GIS services offered by the ISP are rated services and must collect sufficient revenue to support not only the delivery of the service, but also the basic operation of the VGIN Division. Though the service rates were approved by the Joint Legislative Audit and Review Commission (JLARC) in December 2006, they will not go into affect until July 2008, and are thus untested. While current usage patterns of GIS services seems to indicate the services will be self sustaining, usage patterns may change once state agencies are required to pay for service they currently receive for free.

One of the biggest challenges for the ISP will be ensuring participation from all required partners. Many of the projects of the ISP will require the active involvement of many stakeholders (as many as 158 different agencies), but the ISP does not have the authority to compel participation. Encouragement and incentives have been the best approach for the ISP so far, but it is difficult to ensure 100% participation with only these tools available. Another challenge will be getting state agencies to pay for services that they currently receive for free, especially when basic funding is unavailable in many of these agencies.

Overall the outlook for the ISP is promising. The team established within the ISP (most having joined VITA in the last 12 months) is highly skilled, trained and motivated. One key to the continued success of the ISP will be the investment into the development of staff to ensure that they maintain their sharp edge. The VITA/NG partnership will also be an excellent opportunity for the ISP. Additionally, the ISP enjoys strong relationships with many state agencies and local governments that can be leveraged by the partnerships as services are expanded in the future.

Overview

Creation of the Integrated Services Program (ISP)

Since its creation in 2003, the Virginia Information Technologies Agency (VITA), under the direction of the IT Investment Board (ITIB), has begun a significant transformation of the way IT services are provided within the Commonwealth. As part of this transformation, the Commonwealth's Chief Information Officer (CIO) has encouraged the pursuit of a number of synergies among VITA activities. Such joined efforts are also getting increased emphasis from the IT Investment Board, as reflected in the 2006 CIO Objectives set out by the Board.

To recognize and respond to that emphasis, effective May 15, 2006, VITA reorganized several existing programs into the Integrated Services Program (ISP). The ISP brings together the Public Safety Communications Division (E-911) and Virginia Geographic Information Network (VGIN) along with the two State radio engineers (formerly in VITA

Telecommunications) under one service delivery umbrella. The goal of this reorganization is to streamline and improve the delivery of existing and future services to our state agency and local government customers.

This does not mean that there will be a reduction of the services provided by any of the existing organizational units. Quite the contrary, services will be expanded over time. Each of the divisions, E-911 and VGIN, which are both established in the Code of Virginia, will continue to exist within the ISP with their current statutory responsibilities. Additionally, both boards, the VGIN Advisory Board and the Wireless E-911 Services Board, will remain unchanged. The advantages of the consolidation will be achieved through reducing the overlap between programs (such as with local government contacts) and leveraging the strengths of each program to benefit one another.

Business Description

The Integrated Services Program (ISP) is VITA's new consolidated, centralized program for delivery of services to public safety, local government and for geospatial services. ISP's responsibilities fall into three primary categories:

- Public Safety Communications Support, which includes support of the Wireless E-911 Services Board, providing technical assistance to all public safety answering points (PSAPs) and planning for the future of E-911;

- Geospatial Support, which includes support of the Virginia Geographic Information Network (VGIN) Advisory Board, coordination of enterprise geospatial services and establishment of a geospatial data library and catalog; and

- Radio Communications Engineering Support, which includes the management of radio frequencies for many state agencies, providing radio engineering services to state agencies and local governments and radio system acquisition support.

The *Code of Virginia* (§2.2-2025 through 2.2-2031) establishes the Virginia Geographic Information Network (VGIN) Division and the Public Safety Communications Division (PSCD) and assigns specific powers and duties to each. Though the Divisions have been consolidated into the ISP, each Division within the ISP must still meet these requirements of *Code*.

Governance

The ISP is organizationally located in the Information Technology Investment and Enterprise Services (ITI&ES) Directorate of VITA. The program's manager reports directly to that Director, who in turn reports to the Chief Information Officer (CIO) of the Commonwealth. The CIO serves as the chief administrative officer to oversee the operations of VITA, under the direction and control of the IT Investment Board (ITIB).

Though the ITIB is ultimately responsible for the operation of all of VITA including the ISP, two other Boards have a role in the governance of this program. The Wireless E-911 Services Board, which was established in 1998 (§56-484.13) to promote and assist in the deployment of wireless E-911, provides direction and planning for the PSCD though there is no direct supervisory relationship. However, since the CIO serves as the Chairman of the Wireless E-911 Services Board, this Board does exercise a great deal of influence of the activities of the Division. Similarly, the VGIN Board was created in 1997 (§2.2-2423) to advise the VGIN Division and coordinator on issues related to the Division's powers and duties. Again, no direct supervisory relationship exists to the Division or the VGIN Coordinator, but the CIO also serves on the VGIN Advisory Board and has often committed to advice provided by the Board.

Mission

VITA's Mission Statement embodies the basic charge set out in its 2003 enabling legislation as well as the intent of the Governor and General Assembly that the agency set an example for effective government transformation:

To provide information technology that enables government to better serve the public.

VITA's responsibilities fall into three primary categories:

- Operation of the IT infrastructure, including all related personnel, for the executive branch agencies declared by the legislature to be "in-scope" to VITA;
- Governance of IT investments, in support of the duties and responsibilities of the Information Technology Investment Board and the Chief Information Officer of the Commonwealth;
- Procurement of technology for VITA and on behalf of other state agencies and institutions of higher education.

VITA is a unique organization, pioneering a 21st century model for information technology governance and operational excellence. The creation of VITA represents the most comprehensive reform of state government information technology in the nation and firmly establishes Virginia as a leader in the use of technology in government.

With the motto "Expect the Best", we are signaling the dawning of a new day for IT in government - one filled with dynamic partnerships, progressive thinking, and an unfailing commitment to excellence.

Vision

VITA's vision is:

To be Virginia's preferred government IT partner.

- **Create value –** Provide enterprise IT services supporting the business of state government at the best return on investment, for our customers, stakeholders, and Virginia's taxpayers.

- **Improve the Commonwealth's competitive position in the national and world marketplace –** Harness opportunities to utilize technology to improve the availability, quality, and responsiveness of state services – seamless, friendly, anywhere, anytime – for our citizens and customers.

- **Create accountability for how public funds are spent on technology –** For VITA as well as for the entire executive branch.

- **Grow our employees –** Imbed opportunities for professional growth and development into the agency's organization and operations. Recognize and reward accomplishments.

- **Serve as the model for transforming state government –** Pursue streamlined business processes and innovative partnerships that revolutionize service delivery at significantly lower costs.

VITA provides outstanding service and technology solutions to support customers and address their business needs. We have a clear mission and vision of what we are building for our customers, our employees, and the citizens of the Commonwealth. You will be hearing it often because it encompasses and guides what we do and how we do it.

Strategic Goals

VITA has developed five (5) strategic goals for the agency over the next five years. They are:

1. Foster a culture that demonstrates our values

2. Partner with customers for mutual success

3. Protect the Commonwealth through IT security and public safety technology support

4. Understand and meet IT service expectations

5. Manage the investment of IT resources to support Commonwealth business objectives

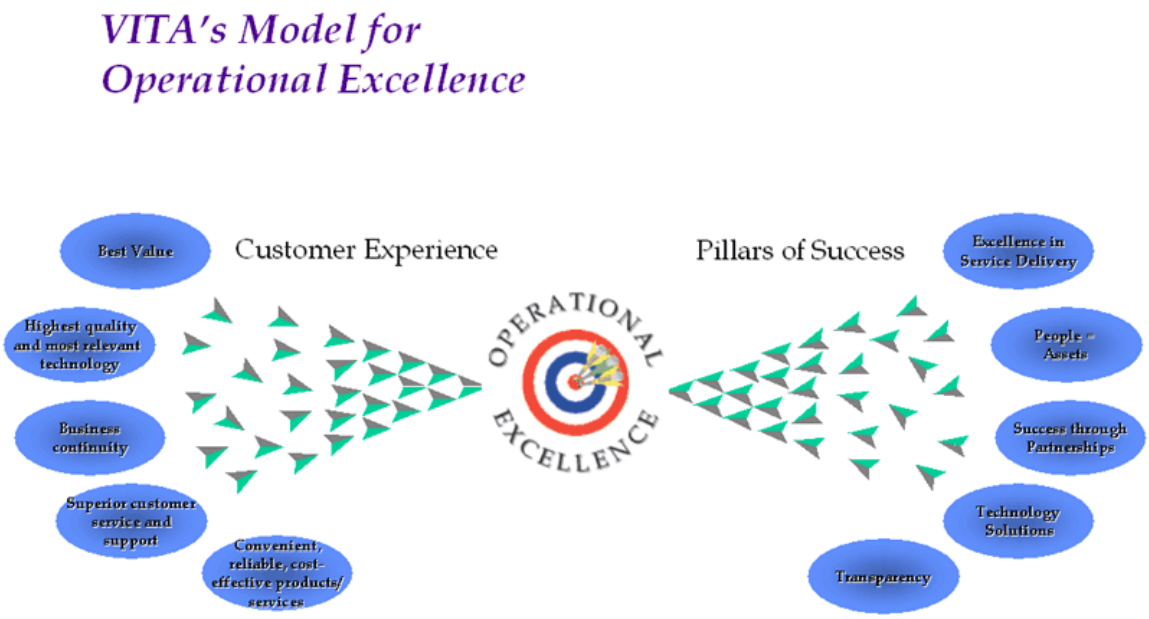
Although only one Division of VITA, the ISP must consider and support these strategic goals, as well as the vision and mission of VITA, within all programs and services offered.

Model for Operational Excellence

VITA's customers are both the agencies for which we provide IT services and the citizens of the Commonwealth who rely on us to spend their dollars wisely. They want services and solutions that work, are on time, are reliable, and are framed within a first-class network of customer support. VITA's model for Operational Excellence considers these customers and the pillars on which VITA will succeed. By being the best and most efficient in both cost and process, VITA will be a model for operational excellence.

To achieve operational excellence, we clearly define what VITA is and also what it is not. VITA is not currently focused on providing highly customized, single solutions. We focus on the solutions that can be developed once and utilized by many. VITA is not currently focused on embracing each and every cutting edge technology as it emerges. We will adopt new technologies when they provide a means to address specific customer needs.

With our focus on customers, the model takes a five-pronged ("pillared") approach and builds a unique and dynamic way of doing business within state government.



Five Pillars of Success

The five pillars on which VITA will build its success are:

- **Excellence in service delivery** – VITA customers can expect and have a right to demand the best in consistent and reliable delivery of solutions - what we promised, when we promised it.

- **People = Assets** – VITA's most important asset is people - talented, skilled state IT professionals who can deliver. They will be enabled through ongoing training, updating skills, and re-training throughout their professional careers.

- **Success through partnerships** – Our success will be celebrated as the product of a partnership between VITA, our customers, and our suppliers - working together to find new ways of getting things done.

- **Technology solutions** – VITA understands our customers' businesses and follows the rapid development and changes in technology. VITA applies new technologies to solve real business problems for our customers. We will deliver solutions, not just services.

- **Transparency** – There are two concepts to 'transparency'. One is that VITA's customers expect technology services to be like a utility ("the light switch") - something that is just there, yet is evolving and transforming over time. The other is that we want to operate according to open, consistent and clear practices and principles so that the process of planning, provisioning and delivering IT services is a 'glass house.'

Each pillar is a guiding principle for how the ISP will approach its work and the development of the agency.

Market Analysis

Place in the Marketplace

Though the Integrated Services Program (ISP) is not a for-profit business, it must generate sufficient revenue to sustain the services offered. It is not, however, the intent for the ISP to directly compete with commercial entities within Virginia. Instead, the ISP will provide services not currently available to all state agencies and local governments and will help those same users achieve greater economies of scale through centralized and regional procurements. Similar to other “buying cooperatives”, participation will be optional, but will allow many agencies to receive services that would otherwise be unaffordable.

The services offered by the ISP fall into one of four categories:

Consultative Services – Providing professional, unbiased technical assistance and consultation to customer agencies.

Hosting Services – Hosting data and/or applications within the VITA infrastructure that serve public safety or geospatial services.

Procurement Services – Managing public safety or geospatial services procurements that benefit the Commonwealth through a centralized approach to achieve the greatest economy of scale.

Enterprise Services – Managing services impacting public safety or geospatial services that involve multiple agencies within the Commonwealth.

The ISP will focus its efforts at the enterprise level to ensure that all state agencies and local governments can benefit from technology advances in the future.

Market Segments

State Agencies

For state agencies in-scope to VITA, many ISP services can appropriately be described as a regulated utility. Like a traditional utility, such as an electric power company, the ISP is the sole provider available within its franchised operating territory (i.e., the in-scope agencies). And just as the State Corporation Commission regulates electric power rates, VITA ISP's rates are directly regulated by JLARC. Therefore, this Business Plan is by necessity distinct from that of an IT service organization operating in an unregulated, private sector environment. It must, for example, accommodate serving customers that might be considered "unprofitable" in other environments, and at equal rates for the same services. VITA should also expect, as other regulated entities do, to be subject to periodic benchmarking by its regulatory body, to determine how efficient and effective it is relative to other similar organizations.

Currently, approximately twelve state agencies consume geospatial services from the ISP. However, preliminary studies shows that many other state agencies (including the executive and legislative branches as well as higher education) could also benefit from geospatial services in planning and analysis activities. A detailed analysis is required to identify specific services that would be required, but it is likely that many of these agencies would require similar services that could be satisfied with an enterprise application or service.

To this point, state agencies have not been a consumer of services from the Public Safety Communications Division. However, several state agencies operate emergency communications centers similar to a PSAP, which could consume services in the future. While this may not be a primary focus for the services provided, those agencies can benefit from the services also being offered to the PSAP community.

Several state agencies utilize the radio engineering services of the ISP for the design and management of agency radio systems. These services have included needs assessments, radio propagation studies, interference mitigation and Federal Communications Commission (FCC) filings. A few larger agencies, like the Virginia State Police, have their own radio engineers that provide these services.

Local Governments

Virginia's local governments include 95 counties, 39 cities, 190 towns, and numerous authorities and special districts. Many of these local governments are both existing customers and data providers to the ISP. Financial and technical assistance has been provided to every locality in Virginia that operates a PSAP. Additionally, GIS data has been provided to every locality for public safety and general government applications. The localities have also provided GIS data to the ISP for inclusion in the statewide road centerline data file. This partnership is essential to the continued success of both local and statewide efforts.

As localities have looked for ways to reduce costs, VITA's telecommunications contracts have proven very attractive to local governments. The ISP's potential to create significant economies of scale in acquiring and providing E-911 infrastructure and GIS services may be of interest to local governments beyond their current extensive use of state telecommunications contracts. Several locality administrators have expressed interest in exploring how the ISP might be a useful vehicle for providing more cost-effective, collaborative service provision.

Several localities have utilized radio engineering services from the ISP as a low cost alternative to hiring an engineering firm for basic assistance. Quite frequently, these services are requested to determine if an engineering firm is needed to resolve a problem. As an example, radio engineering services from the ISP may be used to identify a radio coverage problem and to identify potential solutions to the problem. Once the locality selects a solution, they will often need to acquire the services of an engineering firm to design the solution or manage its implementation. The ISP services will assist the locality in correctly identifying the problem and how to best proceed to a solution.

Citizens of the Commonwealth

While citizens are not typically viewed as a customer of a support agency like the ISP, there are two areas where the ISP does serve the public directly or indirectly with partner agencies. First is in the area of GIS data provision. The ISP hosts or maintains much of the enterprise GIS data for the Commonwealth. While this data has historically been inaccessible, the data must become more available to the citizens of Virginia. To accomplish this, the ISP will need to develop appropriate and sustainable methods of GIS data distribution. It is unrealistic to expect that ISP staff will be able to manually prepare data for every potential request, but tools and applications can be provided that will permit the citizen to generate their own data.

The second area where the ISP serves the public directly (or indirectly) is in the area of E-911 public education. Although several localities operate E-911 education programs, the most effective programs have proven to be those conducted at a regional or statewide level. The ISP must continue its leadership in the provision of E-911 education to the citizens.

Commercial Enterprises

The primary commercial market for ISP service is in the area of GIS data and services. Once viewed as a large potential for revenue, the reality has proven to be much less lucrative. Large commercial enterprises with national coverage are not interested in procuring GIS data from an individual state since they need a standard data solution that will serve their entire footprint. Smaller commercial ventures, who do not have the financial ability to pay for high accuracy data, are instead opting for data available from other free sources (Google Earth, Mapquest, etc.). Although these same Internet mapping providers are potential purchasers of data, they have instead proposed data sharing agreements and partnership. While this type of arrangement may be beneficial to the Commonwealth, it will not provide reliable revenue to support the ISP. It is incorrect to believe there is NO commercial market for the GIS data, but it will likely NOT be a significant source of funding. The ISP will continue to pursue possible partnerships that can benefit the Commonwealth through data sharing or making data available to the citizens where they use it most.

Strengths, Weaknesses, Opportunities and Threats

Strengths

- Staff Ability – The current staff within the ISP are highly-trained and motivated individuals. Each staff member has demonstrated that they have the knowledge, skills and abilities to perform the required work. However, over half of the current staff of the ISP has been with VITA for only about one year. Retaining this staff for continuity and sustainability will be a significant priority for the future.

- VGIN Advisory Board and Wireless E-911 Services Board – Though not supervisory to the divisions of the ISP, the Boards provide an established community of interest network (COIN) of the ISP to call upon for input, advice and feedback.

- Face-to-face Customer Relationships – A weakness of many state programs is their focus on the Richmond area. The ISP has expanded its focus through the establishment of regional coordination offices. Additionally, the ISP program attends the statewide professional conferences for public safety communications and GIS and conducts quarterly regional meetings with program stakeholders. The combination of the regional offices and the regular meeting schedules allows the ISP to maintain strong relationships with its customers, which cannot be achieved through email or even telephone conversations.

Weaknesses

- Historical Reputation – As a result of a number of projects that failed to deliver products or services within the promised parameters, the reputation of the VGIN Division has suffered in recent years. Though many of the problems encountered could be explained, the damage to the agency's reputation to

deliver was still impacted. It will be a challenge and will take time to restore the confidence of the customers most impacted by the failures of these projects.

- Service Support – As new services are deployed from the ISP, it is not yet clear the amount of support that will be available. While some internal resources exist to support new services, additional resources may be needed from other directorates within VITA or from its partners. As an example, VGIN has a technical manager for the GEP. However, as more applications are placed on this platform, the need for reliability and availability will increase especially when emergency management applications are deployed. With only one technical support person (the manager) within VGIN, additional depth of staff resources will be needed. It is unclear from where these additional resources will come.

- Lack of Basic Agency Funding – Although many of the services the ISP offers (or will offer) are provided at a significant cost savings over the same service from another provider, many of the potential customers are insufficiently funded or are not funded for the service at all. As an example, many agencies have a need for digital aerial photography for GIS development. Even though the ISP offers this to the agencies at a fraction of what it would cost from any commercial source, several agencies have indicated that they do not even have the funding to afford the ISP cost. Simply put, a cost savings is only a savings if the agency is spending the money to begin with. This is not limited to state agencies as many localities are not able to afford such services as disaster recovery or 24-hour monitoring of their current systems. This may result in a cost increase to the locality for these ISP services, but the service will be additional features not currently affordable to the locality.

Opportunities

- VITA/NG Partnership – The Infrastructure Partnership with Northrop Grumman will provide many opportunities for VITA, ISP and the Commonwealth in general. The modernization of the telecommunications network should provide the backbone for the E-911 network of the future as well as a host of other services like GIS applications and data. Additionally, the data centers being constructed in the partnership will provide locations from which to host PSAP and GIS services. The redundant nature of these centers lends themselves to disaster recovery and security that are essential to public safety applications like E-911 and interoperability.

- GIS/E-911 Synergy – Although each has its own mission and purpose, the PSC and VGIN Divisions have a great deal of overlap between the services they provide. By leveraging the similarities, and reducing duplication, the ISP can operate much more efficiently and provide better service to our customers. As an example, the PSC Division has established four regional offices throughout the Commonwealth to facilitate better communications with staff in Richmond. These same four offices have become an asset for the VGIN Local

Government Coordinator to reach out to the localities more directly, especially in areas remote to Richmond.

- Geospatial Enterprise Platform (GEP) – Established in 2005, the GEP has the potential to provide the infrastructure for geospatial services throughout the Commonwealth. While it was originally constructed to support the emergency management mapping application, the GEP can support a wide variety of applications and services. Since the platform is not yet being utilized to its full capacity, it is unclear if it will be embraced by the users, but it is a valuable asset as geospatial services are developed.

Threats

- Local Participation – Local governments are not required to participate in the services offered by the ISP. E-911 and GIS services are provided to localities and are consumed only if the locality views them as beneficial to their agency. In other words, the ISP must show a value to the local government beyond what the locality could achieve on its own. In order to achieve the greatest economies of scale and ubiquity of services, it is important that all localities participate. As an example, to sustain the road centerline project each locality must submit their data updates to the ISP on a monthly or quarterly basis. There is no legal or regulatory requirement for this submission, but if the data is not submitted, it impacts ALL users of the statewide roads database. There are similar services within the E-911 program that will require full participation to achieve ubiquity (such as next generation E-911), but incentives and demonstrated value may not be enough to convince all localities to participate.

- Customer Choice – Related to the participation in the provision of services is the issue of customer choice. There are few services that state agencies and localities are required to acquire from the ISP. Instead, they could choose to develop the capability themselves or purchase it from another vendor. While the intent is to be the service provider of choice for both state agencies and localities, if value is not demonstrated, the customers will go elsewhere for the services and the ISP will fail.

- Untested GIS Rate Structure – As required by the General Assembly, a rate structure for the Virginia Base Mapping Program (VBMP) was developed and approved by JLARC in late 2006. Up to this point, GIS services have been provided at no cost to the agency. Instead, they have been funded through a general fund appropriation. Beginning in July 2008, the VBMP and GIS services, more broadly, will need to be funded through the internal rate structure. The approved rate structure was established based on historical usage patterns; however, it is possible that agencies will change their usage patterns once they must pay for the services they consume. They may reduce the services and thus reduce the revenue generated by those services. Since FY2009 will be the first year that rates will be implemented, it will be difficult to predict the impact of the rate structure.

Strategy

ISP's Business Plan implementation strategy includes a focus on the following key components:

- An efficient shared services model that provides more cost effective solutions to small to mid-size state agencies and local government;
- An effective enterprise approach that aggressively pursues partnership arrangements, leveraging the Commonwealth's economies of scale potentials to acquire both capital and expertise;
- Definition of and adherence to a business-oriented value proposition; and
- An equitable and effective pricing strategy.

Each of these strategy components is further outlined below.

Shared Services Model

As technology advances, often small and mid-sized state agencies and localities are left behind because they lack the resources to implement them. By definition, shared services increase the economies of scale by bringing together a larger number of users into the acquisition of a single solution. By reducing the amount of infrastructure that is needed, cost to all users can be reduced. Additionally, it may make features available to users that may not otherwise have been able to afford them on their own.

A shared services model can be utilized for E-911 as well as GIS services. With recent advances, almost all of the systems utilized in a PSAP could now be provided through a shared services model. Customer premise equipment (telephone), computer-aided dispatch (CAD) systems, mapping display systems and voice logging recorders are the most likely to benefit from this approach as each has a significant infrastructure (servers, etc.) cost in addition to the client workstations. GIS services have similar infrastructure requirements that can prevent some agencies or localities from initiating a GIS program. Providing this infrastructure as a service reduces or eliminates the capital outlay from the agency and puts the technology within their reach.

Enterprise Approach

An enterprise approach is a commitment to look beyond the needs of one agency to the benefit to the enterprise as a whole. While some requirements are agency specific, many are requirements for several agencies within the enterprise. Rather than each agency focusing on their own requirements, and potentially duplicating the efforts of another agency, an enterprise approach would require coordination among

the agencies to ensure efficiency. While this approach can benefit application development, it can pay even greater dividends in the area of data acquisition and maintenance. As an example, many state agencies and localities need data regarding the road network within the Commonwealth. This data is generated by the localities and the Virginia Department of Transportation (VDOT). An enterprise approach recognizes the benefit of a single effort to develop this statewide data file and provide it to all who need it rather than allowing each agency to develop and maintain their own file. This approach may require individual users to do more than they would otherwise to satisfy just their needs, but the needs of the enterprise, and the efficiency to the enterprise must be considered by all participating.

Value Proposition—Operational Excellence

Value propositions, while common in the private sector, are not as uniformly used within government. Early in the process of establishing VITA, it became apparent that the value-add VITA would offer its customers would need to be well defined and equally well understood, in the marketplace context of operating as a regulated utility. If the ISP is to succeed as a service organization, it must ingrain in its staff the benefits expressed in its value proposition.

The ISP's customers are the agencies and localities for which it provides public safety communications and GIS services and the citizens of the Commonwealth who rely on the agency to spend their dollars wisely. They want services and solutions that work, are on time, are reliable, and are framed within a first-class network of customer support. By being the best and most efficient in cost and process, the ISP will be a model for operational excellence.

Achieving operational excellence requires a clear definition of what the ISP is and also what it is not:

- The ISP focuses on the solutions that can be developed once and utilized by many, but does not promote highly customized, single solutions.
- The ISP adopts new technologies when they provide a means to address specific customer needs, but does not embrace each and every cutting edge technology as it emerges.

Pricing Strategy

The pricing strategy within the ISP must be consistent with the following principles:

- Rates must be equitable;
- Rates must be reasonable and competitive;
- All customers consuming rated services must pay for those services;

- Customers providing data or services to the enterprise should receive some sort of credit for that effort;
- No charges will be made for services funded through other general or non-general funding sources (i.e. the Wireless E-911 Fund); and
- Rates must support the enterprise service required by the customers to ensure reliability and sustainability.

Organization

Organizational Approach

The ISP's organizational structure emphasizes expertise within each of its technology tiers, but encourages collaboration horizontally across the tiers to maximize customer service and efficiency. The ISP is organized into three divisions, the Public Safety Communications (PSC) Division, the Virginia Geographic Information Network (VGIN) and Radio Engineering Division, in which resources are shared to ensure that the most skilled or knowledgeable individual is used to address a customer's needs.

The PSC and VGIN Divisions are established by the *Code of Virginia* (§2.2-2031 and §2.2-2026, respectively) and thus must exist and perform the duties defined. The *Code* requires each Division to be headed by a Coordinator.

The defined duties for the PSC Division are fairly broad stated simply as:

> *"The Division shall provide staff support to the Wireless E-911 Services Board and encourage, promote, and assist in the development and deployment of statewide enhanced emergency telecommunications systems."*

The VGIN Division is created in *Code* as follows:

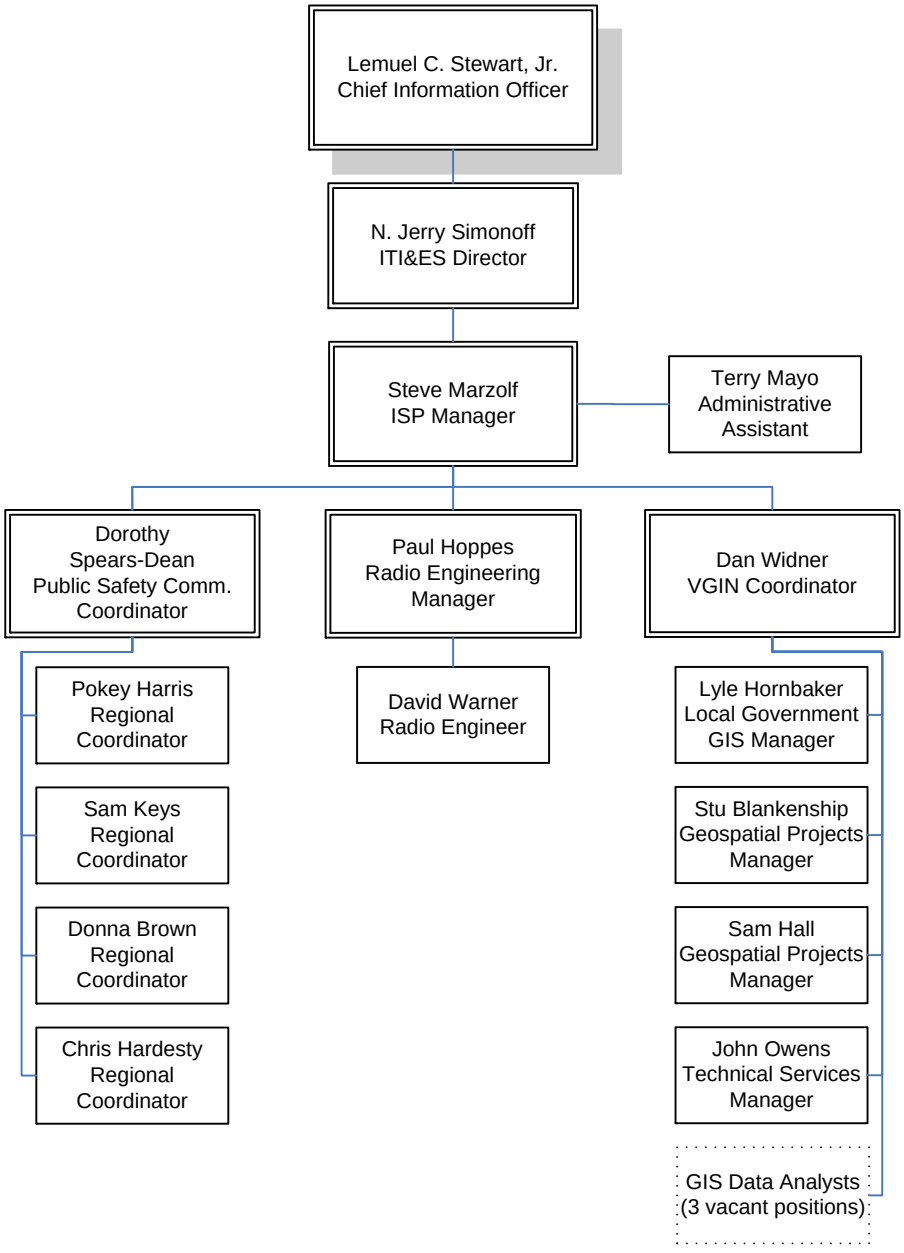
> *"There is established within VITA a Geographic Information Network Division (the Division), which shall foster the creative utilization of geographic information and oversee the development of a catalog of GIS data available in the Commonwealth."*

Subsequent sections of *Code* provide more specific powers and duties of the Division and the VGIN Coordinator, but all support the general purpose outlined above. VITA is authorized by *Code* (§2.2-2030) to establish a non-stock corporation to assist the VGIN Division with the development and acquisition of geographic data and statewide base map data; however, this authorization has not been exercised. To this point, there has been no identifiable benefit to using a non-stock corporation for development and acquisition of data. Further analysis is needed to determine if such

a corporation would benefit the distribution of data, but legislative change would be necessary to allow this.

Organizational Structure

The following is the desired organizational structure for the ISP:



Planned Organizational Changes

In addition to filling the three vacant GIS Data Analyst positions, several other positions were recommended in the FY2008 budget process for addition to the ISP. These positions are needed not to expand services but rather to sustain existing services. Existing staffing levels were based on estimated workloads before services

such as the regional E-911 coordinators or the road centerline data were offered. With experiential data, the following positions were requested:

1. A fourth GIS Data Analyst – The workload to maintain the road centerline data as well as other geospatial data will require four full time positions. This work is currently being performed by contractors, but since the work is consistent and steady, it is more cost effective to be performed by internal staff. This position will also be used to support the technical systems (as back-up to the Technical Services Manager) and to support the Virginia Emergency Operations Center (VEOC) during periods of activation. The only potential problem is with recruitment of qualified applicants. If this is a significant issue, contractors can continue to be used.

2. A GIS Data Manager – This position would act as a supervisor to the four GIS Data Analysts and would be responsible for the management of all data resident on the GEP. With potentially hundreds of data layers and providers of the data, an overall manager is needed to ensure the integrity and security of the GEP data.

3. Public Safety Communications Projects Manager – With the promotion of the Public Safety Communications Deputy Coordinator into the role of Coordinator, there is a need for a project manager within the Division. The Division is facing several critical projects over the next several years, including hosted PSAP services and next generation E-911, and lacks the staff resources to manage them. This position would support those efforts.

Use of Contactors

The ISP (and predecessor organizations) has relied on contractors for several years to augment in-house staff. Most frequently this augmentation was to supplement a workforce that was simply too small to accomplish the required tasks. With the additions noted above, the ISP will have sufficient staff to perform all duties currently identified or planned, and the use of contractors will be reduced greatly.

Contractors will still be necessary to provide services outside the ability of the ISP staff such as applications development, surveying or photogrammetry. These tasks will be narrowly defined to confine costs; will typically be in support of a specific project, and will be limited in duration to that project.

VGIN Advisory Board and Wireless E-911 Services Board

The VGIN Advisory Board and Wireless E-911 Services Board are established in the *Code of Virginia*, but have dramatically different duties and responsibilities. Staff support for both Boards is provided by the ISP, but that is where similarity ends. The VGIN Advisory Board is charged with providing advice to the VGIN Division on issues related to the powers and duties of the Division. The Wireless E-911 Services Board is responsible for providing funding and technical assistance for the deployment of E-911 and to planning for the future of E-911. Although neither Board is supervisory to

the Divisions of the ISP, they provide an excellent forum for the ISP to discuss issues and options with constituents. The relationship with each Board has been strong in the past; however, the ISP must continue to strengthen the relationship in the future by improving communications with the Board members and seeking greater guidance and support from the Boards.

Community of Interest Networks (COIN)

Though the Boards provide an excellent resource to the ISP, it is unrealistic to expect that they can represent all of the stakeholders within the Commonwealth. As a result, the ISP must utilize several additional COINs to ensure that all constituencies have input. Fortunately, some COINs already exist, either already formed by the ISP, or formed regardless of the ISP. An example of the former is the State Agency GIS COIN. This COIN brings together the largest GIS users among the state agencies to provide advice to VGIN staff. Additional COINs that are needed include:

- State Agency Radio Users Council
- E-911 Training Requirements Council
- Next Generation E-911 Planning Council
- E-911 Best Practices Council
- Local Government GIS Users Council
- GIS Imagery Users Council
- GIS Metadata/Library Council

Existing Projects

Wireless E-911 Implementation Project

Background

In 1996, the FCC released an order requiring wireless service providers to implement enhanced features and location technology on wireless telephone service. The implementation was to occur in two phases. Phase I provides the PSAP with the caller's telephone number and the address of the cell site receiving the call along with the orientation of the antenna, if the antenna is directional. Phase II provides the PSAP with the actual location of the caller within a defined margin of error depending on the location technology used by the provider. According to the order, the wireless

service provider had to implement Phase I within six months of a request from the PSAP. The timeline for Phase II was contingent on the location technology selected by the wireless service provider, network-based (triangulation) or handset-based (global positioning system – GPS). For the request to be valid, the PSAP had to be "ready" to receive the information from the wireless provider, which practically meant that most PSAPs had to upgrade systems and implement new systems to utilize the additional data elements.

To assist the localities, the General Assembly established the Public Safety Communications Division in 2000. The Wireless E-911 Services Board was created two years prior to distribute funding to the PSAPs and wireless service providers; however, the Board had no staff support and very limited resources to provide direct technical assistance to the PSAPs. With the establishment of the Division, the Wireless E-911 Implementation Project was born. Although not directly responsible for the deployments, the Division has had to work closely with the 126 independent local PSAPs (covering the 134 localities) of the Commonwealth to ensure ubiquity is achieved. Whether through direct assistance or managing consultants acting as local project managers, in collaboration with the Wireless E-911 Services Board, the Division has ensured that implementation has progressed as quickly as possible.

Current Status

One hundred twenty-nine (129) localities have implemented wireless E-911 Phase I (call back number and cell site location) with all of the wireless service providers serving the locality as of January 2007. Analyzing this by the number of wireless subscribers in each locality shows that over 99% of Virginia's wireless users now have Phase I service available to them from their wireless service provider and local PSAP. The remaining deployments are in localities still working to complete deployment of wireline E-911. It is interesting to note that many of these localities will be able to deploy wireless E-911 Phase I and II prior to the deployment of wireline E-911. As soon as the E-911 network and call answering equipment is in the PSAP, wireless E-911 calls can be routed to the PSAP with Phase I and II information. Several localities, including most recently Russell and Scott County, have chosen to implement wireless E-911 first to speed delivery of this life saving service. In fact, both have deployed wireless E-911 Phase II service.

As of January 2007, just over 98% of all wireless subscribers had access to the Phase II technology. Though the original FCC order required deployment to begin by October 1, 2001, every major wireless service provider sought and received a waiver of that requirement from the FCC. The waivers granted each provider an extension of time but did not relax the accuracy requirement nor extended the ultimate completion date for implementation, which was December 31, 2005 for 95% of all subscribers to have location equipped handsets. Unfortunately, none of the carriers met this deadline. In May 2006, Verizon Wireless was the first (and to date only) wireless provider to meet the 95% threshold. However, this is less an issue of wireless carrier performance than it is about customer choice. All of the actions of the FCC, Wireless E-911 Services Board and wireless providers rely on the wireless subscriber

purchasing the equipped handsets (for providers using the handset-based solution). Many of the wireless providers have fallen short of the 95% requirement established by the FCC; however, all indications are that the wireless providers are close to the goal, which requires the subscriber to take action to upgrade their handset

Path Forward

There is very little that needs to be changed or done for this project to be completed. Sufficient funding is available through the Wireless E-911 Services Board and technical assistance is available through the regional E-911 coordination offices established in early 2006. Outside consultants have been weaned from all implementation projects. While deployment of wireline E-911 is the primary delay with most of the remaining localities, a few of the localities will require gentle pressure to proceed. These localities have been identified and the regional coordinators are working with those localities to develop implementation plans.

With the only real requirement to finish the deployment of wireless E-911 being time, the focus must now shift to maintaining the service in those localities that have already deployed service, and ensuring that the deployed service meets the requirements of the FCC.

Action Steps

The following action steps shall be taken with regards to this project:

Action Step	Completion Date
1. Identify the localities in which the Public Safety Answering Points (PSAPs) have not implemented wireless E-911 as of July 1, 2005 (35 localities containing 7% of wireless subscribers).	**8/1/2005**
2. In collaboration with the PSAP, develop a plan to implement wireless E-911 as quickly as is practical.	**12/1/2005**
3. Provide sufficient funding through the Wireless E-911 Services Board to implement the developed plan.	**2/1/2006**
4. Provide staff or project management support to the PSAP to ensure that the locality plan is implemented on time and on budget.	**12/1/2006**
5. Monitor implementation progress through monthly reports provided by the staff supporting the deployments.	**12/31/2006**
6. Develop model PSAP best practices for procedures and training to support wireless E-911.	*3/31/2007*
7. Develop a plan for wireless E-911 testing and validation based on the current methodology under consideration by the FCC.	*4/1/2007*

Next Generation E-911 Project

Background

New challenges threaten to undermine the historical success of the E-911 system. The current system architecture will prevent the E-911 system from being able to meet those challenges. The E-911 network was designed to support E-911 service to the wireline telephone system. Unfortunately, the design has changed little since its introduction in the early 1980's, which was actually based on 1970's analog technology. This means the current E-911 system handles voice very reliably, but can only handle a very small amount of data. While this was adequate for the wired world of the 80's and 90's, wireline telephone service is now declining. Many citizens are converting their telephone service to wireless or other newer technologies. Many are not maintaining wireline service at all, opting instead for the more mobile wireless service or cheaper Voice over Internet Protocol (VoIP) services. As reliability of these services increases, more and more people will adopt them as their only telephone service. This shift has had a dramatic impact on Virginia's PSAPs.

Because of the large investments that had been made in the existing E-911 networks, when wireless E-911 emerged, the solutions for deploying wireless E-911 Phase I and Phase II were shoehorned into the existing wireline E-911 networks. However, with the advent of new telecommunications services such as VoIP, it is becoming increasingly difficult to shoehorn 21st century technologies into a 20th century infrastructure. It is also not practical to address with each new telecommunications service as a separate overlay to the existing E-911 network. The Commonwealth needs to begin planning now for the next generation E-911 system that will support the citizens regardless of the device, network protocol or location from which they request emergency services.

Current Status

There have been two significant developments in this project to help move the project forward. First, as a result of a 2006 legislative change, the General Assembly has assigned the Wireless E-911 Services Board the responsibility of developing a comprehensive plan for the future of E-911. This plan, to be developed in collaboration with the local PSAPs and other public safety stakeholders, will need to clearly address how planning and deployment of the next generation E-911 system will be executed. Since enactment of this legislation on July 1, 2006, the development of the comprehensive plan has not yet started. The FY2005 and FY2006 Annual Reports clearly articulate the problems trying to be solved by the next generation system, but do not offer a plan for the future.

The second significant development is that the Appropriations Act for the FY2007-08 biennium contains $1 million in each year for the development and deployment of improvements to the statewide E-911 network, which would include the next generation project. The Wireless E-911 Services Board must approve the expenditure of these funds and have already approved $75,000 for one project in Charlottesville with the University of Virginia, Texas A&M University, Columbia University and the

Texas state 9-1-1 program. Another project with Northern Virginia (NOVA) was started in early 2006, but has been on hold for lack of staff resources. This project was to deploy a portion of the statewide telecommunication network and implement three to six applications (including an E-911 application) on the network as a proof of concept. The applications have been identified by the PSAP managers in the region as follows:

1. Next Generation E-911 Application
2. Statewide GIS Data Sharing
3. Radio Interoperability Solution (COMLINC)
4. Computer-Aided Dispatch (CAD) System Interoperability
5. Emergency Operation Center Data Sharing (WebEOC)
6. External Data Receipt (OnStar or ADT Alarms)

This NOVA pilot project has not progressed past the point of defining these applications due to time limitations of staff resources. However, a new related project has emerged that is also driving the deployment of the underlying telecommunications network. The Virginia State Police (VSP), in partnership with the Commonwealth Interoperability Coordinator's Office (CICO), is designing and deploying a statewide radio interoperability system called COMLINC (Commonwealth's Link to Interoperable Communication). This system will link the disparate radio systems within the Commonwealth between and among state agencies and localities (including the statewide radio system, STARS). COMLINC will utilize the same type of telecommunications infrastructure as the next generation E-911 system allowing the network to be shared. However, this type of shared network approach will need to wait until the deployment of the enhanced statewide telecommunications network being designed and implemented under the VITA/Northrop Grumman (NG) partnership agreement.

Path Forward

Though delayed by staff resource availability, the delays have not harmed this project due to the prospects of new telecommunications technologies (specifically Multi-protocol Label Switching or MPLS) to be provided under the VITA/NG partnership agreement. Though an interim solution will be required for the COMLINC project, the next generation E-911 project can and should be timed to coincide with the deployment of the MPLS network. However, the pilot projects such as the NOVA project can and should continue to provide the basis for those deployments. To reduce staff commitment, contractor assistance or part time assistance should be considered to support this project and future next generation projects.

Additionally, staff should seek and support other partnerships that may support the next generation applications. The Blue Ridge region has sought a FY2008 wireless E-911 grant to implement an IP-based E-911 infrastructure and application. While led at a local level, it is essential that ISP staff coordinate efforts to ensure that lessons learned in this project can be applied elsewhere in the Commonwealth. It is equally

important that any regional projects can be incorporated into the larger statewide E-911 system in the future.

Action Steps

The following action steps shall be taken with regards to this project:

Action Step	Completion Date
1. Ensure the Commonwealth Interoperability Plan (developed by the CICO) includes an initiative in support of the statewide IP network.	**11/1/2006**
2. Ensure the needs of the next generation E-911 system are reflected in the statewide telecommunication plan though collaborating with the Service Management Organization (SMO).	*3/1/2007*
3. Reorganize the NOVA pilot project, with appropriate project management and oversight, in collaboration with the area PSAP managers.	*4/1/2007*
4. Establish a Board committee to develop the comprehensive plan for the future of E-911.	*2/9/2007*
5. Develop a "straw man" plan for the committee's consideration and revision.	*4/1/2007*
6. Facilitate several committee meetings and work sessions to finalize a recommended plan to the full Board.	*9/1/2007*
7. Obtain approval of the comprehensive plan from the Wireless E-911 Services Board.	*12/1/2007*

Hosted PSAP Services Project

Background

The concept of host PSAP services was born from a discussion of the Wireless E-911 Services Board regarding ways to leverage the economies of scale within the PSAP environment. The discussion was the result of several small PSAPs seeking greater funding due to the limited local resources to maintain existing PSAP services. Several Board members made the observation that if small localities lack the resources to maintain a PSAP then maybe several localities should consolidate their PSAPs to achieve greater economies. This concept was not palatable to all in the PSAP community due to loss of autonomy and local control of emergency services delivery.

Trying to develop ways of achieving greater economies of scale, but recognizing the PSAPs' reluctance for consolidation, the concept of hosted PSAP services was formulated. With this approach, VITA or its partner, Northrop Grumman, would host the servers and backroom equipment that operates the call handling positions within the PSAP. Using VoIP and the statewide IP network, the served PSAPs will connect to this equipment and receive the services. By sharing common systems, the PSAPs will be able to interoperate and share information more easily as well as having the

ability to redirect calls in the event of a PSAP evacuation or overload situation. Additionally, since the systems will be hosted in a tier III data center that is staffed 24 hours a day and 7 days a week, this service will provide routine maintenance, back-up and recovery services, which are not currently available to most small PSAPs. Other than using a shared system, the PSAP will still maintain their autonomous operation.

The hosted PSAP services option will be offered as an option to PSAPs replacing their current systems. Since no capital outlay will be required for the backroom equipment, this option will likely be attractive to many small PSAPs, but is contingent on the implementation of the statewide IP network and new data centers.

Current Status

The Southwest Virginia region was selected as a pilot for this service. Though the data center in that area is still over a year from completion, it is important to begin the planning process early. As a result, two meetings have been held in the region to propose the concept. The first meeting was in Wise County with area County Administrators, PSAP managers and members of the Industrial Development Authority (IDA). One outcome of that meeting was the recognition that the Regional Jail Authority Board may be an appropriate body to consider approaching for coordination. The Regional Jail Authority Board is comprised of the County Administrator, Sheriff and a Board of Supervisor member from each locality in the region. Though representing a slightly larger region than originally proposed, a second meeting was held with the jail board to propose the concept. Although well-received, many of the Sheriffs expressed reluctance considering anything that may reduce their control of the PSAP operations.

No clear direction was provided from this meeting. A visioning session was proposed as the next step if there was interest in the concept, but as a group, the offer was not accepted. Subsequent outreach indicated that there was some confusion over what was being proposed (full consolidation versus hosted services), but follow-up with the broader group has not yet occurred. Interestingly, though not part of the proposal, a few of the area PSAPs have sought assistance with a full consolidation study, but these groups have been much smaller representing 3-4 PSAPs and not all 11 in the region.

Path Forward

Outreach must be preformed to the region to re-establish contact with each of the localities. The County Administrator, Sheriff and PSAP Manager in each locality must be polled to determine their level of interest in proceeding with the visioning session. Assuming there will at least be support to continue with that step in the process, the visioning session must be scheduled to maximize the attendance and participation. The results of this session will drive much of the path forward from that point. It will depend on the scope of the developed shared vision as to the scope of the succeeding project. The project could include any or all of the following items:

1. Shared Customer Premises Equipment (CPE)
2. Shared Computer-Aided Dispatch (CAD) System
3. Regional Back-up PSAP Facility (also used for training)
4. Regional Emergency Operations Center (EOC)
5. Shared Support Systems (such as Records Management, etc.)

Inquiries have been made about host service from a number of PSAPs throughout the Commonwealth. Another area that could greatly benefit from this type of approach is the Northern Neck and Middle Peninsula region. Outreach should be preformed in this area to determine the level of interest for a similar pilot project in the eastern half of the state.

Action Steps

The following action steps shall be taken with regards to this project:

Action Step	Completion Date
1. Contact each locality in the Southwest region to determine their level of interest in participating in a visioning session for shared PSAP services.	*3/1/2007*
2. Schedule and conduct a visioning session with those expressing interest in the Southwest region.	*4/15/2007*
3. Schedule and conduct a meeting in the Northern Neck/Middle Peninsula to propose the concept of hosted PSAP services to gauge support for a project.	*3/1/2007*
4. Develop a project plan based on the results of the visioning session and the eastern introductory meeting.	*4/30/2006*

Virginia Base Mapping Program (VBMP) Imagery

Background

The goal of the VBMP is to provide a common database and format for the sharing of geographic information system (GIS) data. Driven by the need of local PSAPs to share data regionally for emergency response, the data is also available for other applications, including planning, analysis, and recovery.

In 2001, the Wireless E-911 Services Board provided VITA's Virginia Geographic Information Network (VGIN) nearly $10 million to capture digital orthographic (DO) imagery of the Commonwealth. The imagery consists of aerial photographs that have been adjusted for the curvature of the earth and elevation changes. This adjustment means the photography, when viewed in GIS, is extremely accurate, allowing distances and measurements to be taken directly from the photographs.

The imagery has provided a common base for the development of a statewide road centerline file and other data layers, also funded from the Wireless E-911 Services Board's original investment. The original plan was to update the imagery every four

years. Hosted as an enterprise database, the data is available to all state agencies and localities.

Current Status

The 2002 VBMP imagery was provided to the localities and several state agencies in 2003. Provided at no cost to the localities (due to the initial funding from the Wireless E-911 Services Board), state agencies that received the data only paid the cost of producing the data on DVD's or hard drives. The imagery has been loaded on the Geospatial Enterprise Platform (GEP), but is only being accessed by a small number of users such as the Department of Forestry's IFRIS application. Several copies of the imagery, which requires approximately 2 terabytes of storage, are being stored by other agencies throughout the Commonwealth for internal agency use.

In late 2005, a project to update the imagery was started. Unfortunately, due to a contracting problem, the contract was not executed until late in the "fly season" (the time period when there is no foliage and the sun is as high as possible – February through March in Virginia). As a result, the contractor was only able to capture 14% of the Commonwealth in 2006. The contractor is currently processing this data, which should be available by March 2007. There are several optional upgrades that are available to each locality (or others wishing to purchase them) such has higher resolution imagery, contours and structure locations.

Path Forward

The project to update the imagery will continue during the 2007 "fly season." The contractor will capture the remaining areas of the Commonwealth and begin processing the data. The data from the 2006 will be received from the contractor, integrated into the GEP and distributed to the localities. Before the contractor begins capturing the imagery for 2007, all attempts must be made to encourage localities to upgrade the product with the available options. Due to local budgeting restrictions, the localities must be given the maximum amount of time to plan for these upgrades, which also requires that they understand the value.

Additionally, partners must be sought if the localities are unable to afford these upgrades. As an example, a locality east of Interstate 95 must upgrade to the higher resolution imagery and purchase contour development to develop acceptable flood plain projections. This may, in total, cost a county as much as $300,000. Many of these same localities cannot afford this type of investment; however, since Hurricane Katrina, FEMA has been interested in developing more accurate flood plain maps and could be approached about providing some of the necessary resources. These partnerships must be identified quickly to be available in time for the 2007 imagery capture.

The complexity and shear size of the imagery project requires a redesign of the program after the 2007 imagery acquisition. To make the project more manageable, beginning in 2009, the project will be changed from acquiring imagery for the entire state once every four years to acquiring one-quarter of the state every year. No

imagery will be acquired in 2008 to allow time for proper planning and outreach to maximize the number of localities and state agencies that can take advantage of upgrade options. This change to a four-year project has a number of other benefits including the following:

1. Speeds product delivery to localities and state agencies, which has been a significant complaint from the localities causing some to locally acquire imagery in the same year as the VBMP project.

2. Allows "add-on" acquisitions for localities, state agencies or any other user to request acquisition of an area more often than is scheduled. Some localities acquire imagery every two years due to their growth. Another example would be if the Virginia Department of Transportation wanted the imagery for an interstate corridor every year to track the progress of a construction project. Since the planes would already be "in the air" acquiring other imagery in Virginia and the rates are based on the larger volume, the cost for these "add-on" acquisitions should be very competitive.

3. Permits greater competition since there are very few companies that can manage the acquisition of 43,000 square miles in one "fly season." Smaller imagery companies may be able to compete for the project. Additionally, splitting the project across four years provides a more stable revenue stream to the contractor rather than the "feast or famine" of doing the entire state every four years.

4. Provides a continually updated product for users. Once acquired, the imagery becomes dated and less valuable to the users. By acquiring the data on a more routine schedule, the data has greater value to those that need more up-to-date data. No area is updated more than once every four years (unless the locality or someone else funds it more frequently), but for those users concerned with the statewide dataset, there will be new data for part of the state every year.

Another change going forward within the imagery project is the availability of the data. In the past, this data has been tightly licensed and controlled. The reason for this was the intent to "market" the data to recover the cost of acquisition and fund future acquisitions. In the four years since this data has been available, only about $400,000 has been received from the sale of the data. Since this data is four years old and has not been effectively sold, it will instead be made publicly available. While this may have the impact of "wetting the appetite" of potential users for the more up-to-date 2006-2007 imagery, there is also a risk that those users will simply use the "free" data and never consider updating it. However, users that do not have a need for up-to-date data probably would not spend significant funding to acquire it.

Instead of focusing on the sale of the imagery as a product, the focus will be on the provision of services. As mentioned above, the existing imagery requires about two terabytes of storage and since the new imagery is a higher resolution, it is projected to

require about six terabytes. Few users will have the capacity to store this much data and should instead opt to consume the imagery from the ISP as needed from a web service. An imagery web service has been made available to satisfy this type of user. Other imagery web services exist such as Google Earth, and it should be noted that if made public, these companies may acquire the VBMP imagery for their product offerings. Rather than fight this eventuality, partnerships with such firms should be explored; especially since many Virginia citizens use such free services in their daily life.

The 2002 imagery will also be made available to the public in a number of other formats. In addition to the web service, a lower resolution version of the statewide imagery (one meter pixels) will be provided on six DVDs in a boxed set for $90. For those requiring the high resolution imagery, it will be made available on three 750-gigabyte external USB hard drives. Customers can purchase individual drives for $1,000, or all three for statewide coverage for $3,000. Since some users only require a few images for a small area, a file transfer protocol (FTP) site will be established on the GEP to allow the download of up to 25 images. This service will be bandwidth restricted to make the acquisition of large amounts of data impractical. Staff will consider custom requests for data at the cost of production, but with the cost of labor it will likely be less expensive for the customer to utilize one of the standard offerings.

To expand the use of the data and invest in the next generation of GIS professionals, the ISP will be donating 600 copies of the boxed set of DVDs to the K-12 school systems within Virginia. In 2006, ESRI, the major GIS software provider, executed an agreement with the school system to provide their GIS software at a very low cost. The provision of the imagery will give the school systems base data to display with this software that will add tremendously to the educational experience.

Action Steps

Action Step	Completion Date
1. Develop and release Request for Proposal (RFP) to select ortho photographic contractor to perform the work.	**12/20/2005**
2. Evaluate proposals and select top two candidates for negotiation.	**1/15/2006**
3. Negotiate and sign contract with the most favorable contractor.	**3/12/200**
4. Contractor acquires orthophotography during remainder of 2006 "fly season" (captured approximately 14% of the State).	**4/5/2006**
5. Contact localities to determine acquisition upgrades desired.	**10/1/2006**
6. Identify and approach potential partners for acquisition upgrades.	**10/1/2006**
7. Determine the methods for making the 2002 imagery data publicly available and implement them.	**11/1/2006**

8. Contractor performs post processing of acquired orthophotography.	**11/1/2006**
9. Develop 2002 imagery USB drives and DVD set products	**12/31/2006**
10. Perform quality control on the orthophotography received from contractor.	*2/28/2007*
11. Distribute 600 DVD sets to Virginia public school systems	*3/1/3007*
12. Establish 2002 imagery FTP server	*4/1/2007*
13. Distribute orthophotography to localities and update VBMP files.	*4/1/2007*
14. Contractor acquires orthophotography during 2007 "fly season" for the remainder of the Commonwealth.	*4/1/2007*
15. Establish the GIS Imagery Council (COIN) to begin development of the requirements and options for the 2009-2012 imagery project.	*4/1/2007*
16. Develop and release the RFP for the 2009-2012 imagery acquisition program.	*8/31/2007*
17. Contractor performs post processing of acquired orthophotography.	*12/31/2007*
18. Award contract for the 2009-2012 imagery acquisition project and begin development of project plan for its execution.	*1/31/2008*
19. Perform quality control on the orthophotography received from contractor.	*4/1/2008*
20. Distribute orthophotography to localities and update VBMP files.	*5/31/2008*

Virginia Base Mapping Program Road Centerline (RCL)

Background

The Road Centerline (RCL) Project is considered a critical component, along with the digital orthophotography, of the Virginia Base Mapping Program. The RCL will provide a consistent and seamless roadway transportation GIS data layer for use in the Commonwealth. The RCL project data will be maintained by VGIN at the statewide level. This is important so the data does not become out of date but remains a viable source.

The RCL data will be made available through the GEP. This platform consists of database and web servers that are available on a 24/7 basis. The RCL data will be served as an XML web map service. The RCL project is not responsible for the establishment and the maintenance of the GEP or the publishing of the web services. RCL is responsible for the maintenance and oversight of the road centerline data.

RCL data from the local governments will be maintained on either a monthly or quarterly basis, depending upon the ability of the local governments to provide their data. The RCL project will accept local government road centerline data as is and

VGIN will perform the statewide integration. VDOT will provide updates for the Interstate and Primary roadway systems on a monthly or quarterly basis. From a data perspective, VDOT is considered the source system of record for the Interstate and Primary roadway data and the local governments are the source system of record for all other roads.

Current Status

The initial RCL master file has been created from data provided from the localities and VDOT and data created from the 2002 digital imagery. Since this data was a snap shot in time, it needs to be updated and put into a "steady-state" maintenance process. To date, sixty localities have been completed through this update process. Additionally, VDOT is providing updates to the primary and interstate road network into the master RCL file.

Though some of the data is still 18 month old, it is, in most cases, better than any other statewide data available from other sources (i.e. commercial data). As a result, several state agencies have begun using the data in their business processes. While a few data quality issues have been identified, the data has proven to be of high quality and of value to the agencies. Since the file is continually changing, data quality issues will likely continue to be identified, and as they are resolved, the quality will continue to increase.

Path Forward

The largest threat to the success of this project will continue to be the participation of the localities in providing data. Since the primary users of the statewide data are state agencies, there is little payback to the localities to make the effort to provide the data. A recent change to the "steady-state" maintenance process greatly reduced what a locality must do to participate, but there are still many that have not complied with the request for the local data. Since the requested data is public information, it is unlikely a locality can refuse to provide the data, but options may need to be explored to encourage greater participation.

Action Steps

Action Step	Completion Date
1. Final development data delivered to VDOT	**3/23/2007**
2. Formal Project Close Out	**5/31/2007**
3. Begin transition from contractor support to in-house maintenance	**6/1/2007**
4. Steady state maintenance with in-house staff	**9/1/2007**

State Board of Election VERIS Interface

Background

The Commonwealth of Virginia State Board of Elections (SBE) has embarked on a project to replace its current aging Virginia Voter Registration System (VVRS) with a replacement system that will greatly improve the efficiency and effectiveness of the processes by which citizens of Virginia register to vote. The replacement system will be known as the Virginia Election and Registration Information System (VERIS). The ISP has entered into a strategic partnership with SBE to provide GIS services critical to VERIS operations. The GIS will match registration addresses to the correct voting districts and precincts in a real-time process and return to VERIS accurate and consistent information based on the current district and precinct boundaries in the GIS database. The GIS will also support web-based applications for use by local General Registrars to accurately maintain voting district and precinct information. The GIS will become the only consolidated source for district and precinct boundaries throughout the Commonwealth.

Current Status

Though an appropriate goal, the execution of this project has struggled. An insufficient user requirements process was conducted that resulted in both the ISP (and its predecessor) and SBE misunderstanding the requirements and the limitations of this partnership. After the initial development of a GIS application to support VERIS, issues were discovered with several basic assumptions used to design the system and with the precinct and district data that was available to support the system. In early 2006, new project teams were assigned from both the ISP and SBE. With the support of the contractor developing the application, a new scope of work was developed to correct the immediate problems and to conduct a more comprehensive user requirements process to identify any other issues and incorrect assumptions.

The precinct and district data were corrected, but during this process, additional data issues were discovered. Additionally, the users identified a number of requirements that had not been previously identified. As a result, there was no way the GIS functionality could be made ready for the deployment of the VERIS system. The GIS interface for VERIS was postponed as not to further affect the overall project schedule. The comprehensive requirements document has been developed and delivered to SBE with budgetary cost included.

Path Forward

It is now up to SBE whether to proceed with this project. It is quite likely that they will not. The existing project leadership from SBE will be leaving the project by April 2007 and it is unclear if new leadership will see the advantage to investing over $330,000 in the completion of the GIS interface for VERIS.

Even if SBE chooses not to proceed, a significant investment has been made in the development of voter precinct and district data. Before these data become unusable

due to their age, other users of this data should be identified. These could include the Department of Legislative Services or even other divisions within SBE.

Action Steps

Action Step	Completion Date
1. Periodically meet with SBE to determine their desire to move forward with the current user requirements document.	*4/1/2007*
2. Meet with other users of voter data to determine the value of the existing precinct and district data developed for VERIS.	*4/1/2007*

Emergency Management Mapping Application (EMMA)

Background

The Emergency Management Mapping Application (EMMA) (formerly called the VR3 System) is a secure Web-accessible GIS application designed to provide a simultaneous view of critical situations to multiple users on a local, regional, and even statewide basis.

Funded by the Governor's Office of Commonwealth Preparedness in partnership with the ISP and the Virginia Department of Emergency Management (VDEM), EMMA is designed to act as a single, comprehensive, "all hazards" foundation for geospatial data and as an analysis tools in support of homeland security and public safety across Virginia.

Included in the system are seamless, statewide, high-resolution aerial photography; critical geocoded databases (i.e., schools, hospitals, hazardous materials, critical infrastructure, response assets); and user-friendly access, viewing and analysis capabilities. EMMA can be integrated with specialized incident management and messaging systems and critical databases to provide simultaneous geospatial information support, visualization and mapping to multiple users.

Access to EMMA provides more consistent and reliable information to all potential users, whatever their physical location or responsibility, and is an extremely efficient platform to communicate and share data (i.e. incident locations, response plans, recovery activities).

Current Status

After an extensive evaluation of the available options, VDEM has selected the EMMA application developed by Towson University to meet their requirements. Since this is the only application currently available that would allow VDEM to directly interface with the National Capitol Region (NCR) and the State of Maryland, a sole source procurement was utilized. To further support the sole source approach, EMMA is the only known application that directly interfaces with WebEOC, VDEM's situational awareness application.

The initial scope of the project will be to deploy EMMA in the VEOC and the cities of Charlottesville, Virginia Beach and Richmond. Each instance of EMMA will be interfaced to the local instance of WebEOC as well as each other to share incident and resource information. The funding for this project is provided through two grant sources ($498,000 from the Department of Homeland Security for the VEOC deployment and $250,000 from the National Institute of Justice for the deployment in the localities). The scope of services from Towson has been finalized and a purchase order is being issued for their part of the project.

Path Forward

One of the critical paths for this project is the procurement of hardware as it is still unclear how best to proceed. For the hardware within the VEOC, a Request for Service has been issued with VITA Service Management Organization (SMO). While work is still progressing on the justification for the hardware to be implemented at the VEOC rather than the VITA data center, it is expected that this procurement will proceed without much delay. The hardware for the localities is much less certain. Since this hardware will be installed at each of the localities, it is out of scope of the managed services of the VITA partnership. Additionally, each locality has their own hardware standards and management processes that any hardware procurement must meet. Ensuring that the hardware meets all of the competing requirements will be a challenge.

Once the purchase order with Towson University is executed, Towson staff will be able to conduct a more detailed review of existing hardware and software available and will make recommendations to close any gaps. This will provide a better picture of the hardware path forward. Towson will also evaluate the available data and make recommendations for additional data development. It is likely that EMMA will be deployed with less data than desired, but a data development plan will be created that addresses any shortcomings identified.

Since the Towson EMMA is already in use in Maryland, its initial deployment in Virginia should not be a major challenge once the hardware and Virginia specific data issues are addressed. However, the interconnection of these independent instances of EMMA may pose a greater challenge. The issue is less about the technology to connect the systems, but rather about the policy issues regarding what should and should not be shared. It will be VDEM's responsibility to develop the appropriate policies for sharing data between the localities and the VEOC as well as between the VEOC, the NCR and Maryland.

Action Steps

Action Step	Completion Date
1. Develop the Scope of Work for EMMA from Towson University and execute a purchase order.	*2/15/2007*
2. With VITA SMO, develop the hardware pricing for the EMMA	*3/1/2007*

	hardware and order as necessary.	
3.	With Towson, evaluate existing local hardware and develop specifications for additional required hardware.	*3/15/2007*
4.	With Towson, inventory and evaluate existing data sources to determine those data to be included in the initial deployment of EMMA and those requiring additional development after deployment.	*3/15/2007*
5.	Implement EMMA in VEOC, Charlottesville, Virginia Beach and Richmond as stand alone systems.	*5/20/2007*
6.	EMMA training and acceptance	*6/1/2007*
7.	Development of data sharing requirements between implementations.	*6/1/2007*
8.	Development and deployment of EMMA integration within the Commonwealth.	*8/1/2007*

Existing Services

Wireless E-911 Services Board and VGIN Advisory Board Support

The ISP provides staff support to both the Wireless E-911 Services Board and the VGIN Advisory Board. This support includes the planning and execution of each Board meeting, ensuring compliance with all open meeting laws, managing travel expenses for Board members and tracking Board member contact information. Wireless E-911 Services Board meetings are scheduled every other month (odd months) while the VGIN Advisory Board meetings are quarterly.

Consultative Services

Regional PSAP Services

When the Public Safety Communications regional coordination offices were established in early 2006, it was unclear how they would be received by the PSAP community. While their creation was at the recommendation of several in the PSAP community, it was expected that it would take time before they were fully utilized. Interestingly, almost from their first week, the regional coordinators have been overwhelmed with requests for assistance. Since one of the coordinator positions was vacant until January 2007, the three remaining coordinators have had to cover the fourth region further stretching these resources.

With all four coordinator positions now filled and with a year of experience providing consultative services, each regional coordinator with the support of the PSC Coordinator must develop a plan for providing services in their region. To this point, the requests from the PSAPs have been controlling their efforts, but through effective planning, the requests for services can be better managed. During this planning process, some services may be identified that the regional coordinators can no longer

support, but the goal is to provide the consultative services to the PSAP that they need to be effective.

The regional service plans will be completed by October 2007.

Geospatial Services

Similar to the PSAP consultative services, geospatial consultative services have been provided to several state agencies. Whether related to a specific project or geospatial services more generally, the initiation of a service request comes from a customer with a question. These services have been much less extensive than the PSAP services and have rarely involved consultation with local government. It is unclear whether there is a demand for geospatial consultative services to the local government, but this is an area worthy of exploration. If embraced like the PSAP services, regional geospatial coordinators may be indicated, but this is likely years away.

Geospatial consultative services will continue to be provided to state agencies upon request on an ad hoc basis. If a pattern of requests from state agencies or increased interest is developed by the localities, then a greater formalization of the services will be appropriate. Quite simply, the reputation of the VGIN Division as a reliable source for assistance must be established before this will occur and it will take time for this reputation to be built (as it did with the PSC Division).

PSAP Educational and Training Services

Since the creation of the PSC Division in 2000, the Division has hosted several training opportunities for PSAPs. The training was less part of an overall training program and was more ad hoc based on requests received from the PSAP community. While some of the training was conducted by PSC staff, other training was provided through sponsorship of formal training courses conducted by a professional training organization such as the National Emergency Number Association (NENA). Whether developed in house or by an outside instructor, the training has historically been a reaction to a request by a region or a group of PSAPs.

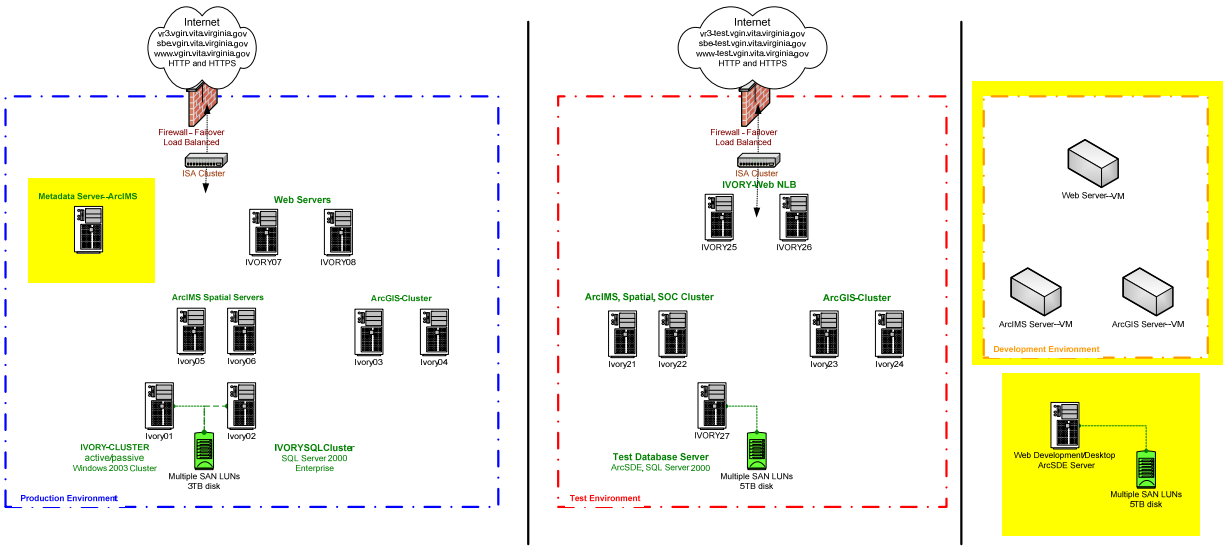
Rather than continue with this type of an ad hoc training program, the ISP needs to develop comprehensive PSAP training services that more proactively identify training needs and methods of satisfying those needs. This program must complement rather than compete with existing training programs from the Department of Criminal Justice Services (DCJS) as well as those provided by NENA and the Association of Public-Safety Communications Officials (APCO). During the development of this program, the ISP must identify partnerships (like those organizations already providing some training) for the delivery of the training. Innovative delivery methods must also be explored to address the limited training resources in most PSAPs. All regions of the Commonwealth must be able to avail themselves to the training in a cost effective manner. Holding one training class in Richmond will not effectively address this issue.

A training services plan will be developed by December 2007. Though historically the training focus has been on local PSAPs, the plan will consider the training

opportunities of the ISP more broadly. As a result, training services for GIS and radio engineering services will also be explored and included in the plan if appropriate.

Geospatial Hosting Services

The GEP provides a robust and stable platform for the hosting of geospatial data in an ESRI environment. Though initially consisting of just a production environment, a test environment has been added and a development environment is being deployed. The final platform design is as follows:



The GEP already hosts the 2002 VBMP Imagery and will host the 2006/2007 data as soon as it becomes available. Both the Department of Forestry and Dominion Resources consume a web service of this data. Other data on the GEP include the following:

- Statewide Road Centerline data
- Rail Transportation data
- The National Hydrography Dataset (NHD)
- 2005 Federal Department of Agriculture imagery data (leaf-on)
- National Geographic Topography data
- Basic Elevation data

As additional data is added to the GEP, more users will find the data of value to their operation. By accessing it from a central data library, each agency does not need to maintain an independent instance of the data. This has the potential to reduce their cost of storage. The focus needs to be on the addition of data that provides the biggest payback for the investment. The ISP must continue to work with the user communities through the GIS user councils (state agency and local government) to

determine those data that are most critical to the broadest number of users. These data must be added to the GEP to be available to all users.

In addition to hosting data for community use, the GEP can host agency specific data and applications to prevent the agency from having to establish their own geospatial platform. While there are some large users like VDOT that will likely be able to justify a dedicated platform due to capacity and performance issues, the vast majority of agencies cannot. While initially targeted to state agencies, this type of data and application hosting can also be provided to local governments as they have many of the same economies of scale challenges that a small state agency has. Again, large local governments like Fairfax County would not be customers of the hosted GIS services, but for many smaller localities it may offer a reasonable alternative to building a geospatial capability in-house.

Radio Engineering Services

Engineering Assistance

The Radio Engineering Division provides assistance to agencies and localities in the design of new systems, analyzing communications problems and recommending solutions, identifying sources and resolving interference problems.

Procurement Approval

Review of proposed communications systems and equipment procurement is necessary to prevent wasteful expenditure of resources. The personnel of many state agencies either consider themselves sufficiently knowledgeable to determine what is needed or rely upon the advice of other users or vendor representatives. This frequently results in requests for unnecessary equipment, systems which do not meet agency needs or combinations, which will function improperly or be incompatible with existing systems. This review also allows the Radio Engineering Division to ensure that there is a valid FCC license and that the frequencies being requested are authorized for use by the agency.

Radio Spectrum Management

Radio spectrum is a scarce and valuable resource, similar in many respects to land, and like land, there is only so much available and “they’re” not making more. The demand is extreme. The Federal Communications Commission (FCC) and international regulatory agencies have decreed that the practices of the past will no longer be tolerated and much more efficient usage is to be mandated. At the same time the federal government is moving in the direction of “deregulation”, which means that much of the control formerly exercised by the FCC in this area is passing to private associations, commercial interests and state governments. The states have been actively moving to meet these responsibilities. Virginia has been a leader in this regard and many, both inside and outside of state government, look to us for continued leadership and guidance in this area.

Approximately seventy four Virginia state agencies operate radio systems utilizing some two-hundred fifty radio frequencies. Many more radio users share frequencies within systems operated by other agencies/localities. The need for radio communications by state agencies is increasing continuously. Finding radio frequencies to accommodate the demand is becoming ever more difficult. Fortunately, modern technology makes it possible to utilize frequencies previously unsuitable for communication and to make increasingly efficient use of those traditionally employed. New frequencies and technologies require a significant higher level of administration and control. The Radio Engineering Division is heavily involved in the planning and development of procedures and systems to make more efficient use of radio spectrum and to implement newer technologies, when practical, so as to provide state government with the best possible radio communications. This capability exits nowhere else in the state government and is probably not available at any realistic cost anywhere else.

Licensing

Despite “deregulation”, the federal government still requires licensing in order to prevent total chaos in radio communications. The process has become infinitely more complex in the last three years and promises to continue to do so. The licensing process, in addition to the legal ramifications, provides a tool for controlling monetary expense and avoiding confusing and mutual interference among state government users. Licensing has become a major activity of the Radio Engineering Division. Significant procedures, and data sources have been developed, and most state agencies have come to depend totally on their expertise in this area. Past attempts to obtain this service from alternate sources (radio hardware vendors or commercial firms specializing in this activity) have often been problematic. The results are usually very expensive and serve the interests of others rather than the user agency. The Radio Engineering Division has gone from hand calculations on topographic maps and typing FCC applications to GPS coordination and on-line filing with the FCC.

FCC Polices, rules, regulations and trend setting for State & Local Government

The FCC rules and regulations governing Public Safety are constantly reviewed by the Radio Engineering Division. Although primarily focused on Title 47, part 90 FCC rules and regulations, the Division is also involved in other spectrum areas such as Fixed Earth Stations (satellite links) used in state higher education facilities. Immediate and future impacts to Public Safety and state government, as a whole, are reviewed, assessed and disseminated to various levels of management and governing bodies (i.e. 800 MHz rebanding, the narrow banding of part 90 frequencies by 2013 and its ramifications on all state and local governments, and 700 MHz). Other considerations that the ISP follows are FCC policies governing new technologies such as software defined radio (SDR), 4.9 GHz and how will this effect Public Safety operations and/or protocols.

State Wide Agencies Radio System (STARS) Support/Oversight

The ISP plays an important role in the spectrum management of STARS project. Besides serving on the various STARS committees, the Radio Engineering Division has oversight and/or insights on the various frequency assignments and uses on these frequency assignments around the Commonwealth of Virginia. The Division manages half of the state-controlled 700 MHz allotments granted to the states by the FCC. Additionally, the ISP provides guidance, policy, and frequency assignments to the other half of the 700 MHz assignments provided to the Virginia State Police (VSP)/STARS project.

Radio Site Acquisition Support

Sites suitable for communications use are an invaluable resource because such sites are not always readily available. Competition for such sites is great and costs to buy, lease or develop are often prohibitive, or at least represent a considerable portion of the total cost of the radio system. Commercial interests, particularly radio system vendors, often gain control of the better sites in a geographical area and restrict their use to systems using the vendor's products. Management of such sites is not restricted merely to providing space but requires detailed engineering of each system to ensure that all will operate satisfactorily without interference or other performance deterioration. The state is fortunate in having available for development a number of sites under the management of VITA.

- James Monroe Building: In a large metropolitan area such as Richmond, there are two general requirements which are often difficult to meet simultaneously: range (distance), which is basically a function of antenna height above the surrounding terrain: and the ability to penetrate to the interiors of the large downtown buildings, which is a function of proximity to those buildings. Presently in Richmond, only two radio sites meet both requirements and of these only the Monroe Building is available for state use. The site has an environmentally-controlled structure which houses 8 to 10 communications systems.

- MCI Sites: VITA has an agreement with Verizon Business (MCI) to allow us to install and operate radio systems at all present and future tower sites within the state, some twenty or more sites at present. Currently, these sites are not being utilized.

- Chesterfield County site at Bon Air: VITA has negotiated a contract with the county to allow us to place radio systems at their site on the Department of Corrections property. This is an exceptional site located on one of the higher elevations in the Richmond area and includes a 500-foot tower.

- Other Agencies sites: VITA has semi-formal arrangements with several other state agencies such as Department of State Police, Virginia Department of Emergency Management to allow us to place systems at their sites. VITA negotiates each site on an individual basis.

State Radio Frequency Planning and SOP Development

This is a relatively recent activity of the Radio Engineering Division. As discussed in the previous section on frequency management, the FCC has decreed that an entirely new, more effective planning procedure will be followed in allocating radio frequency spectrum. The new rules apply to a specific portion of the spectrum in the 700 MHz band.

The FCC has allocated to each state 96 narrowband channels in the 700 MHz band of spectrum and has given each state the authority to allocate and coordinate these frequencies. This will require not only statewide planning to allocate these frequencies efficiently, but will require coordination between the border states and Virginia. Initially 48 channels, or half the spectrum, have been allocated to the STARS project, and the other 48 channels are to be used to upgrade all the correctional facilities within the Commonwealth.

As a companion to the above 700 MHz frequencies, VITA has been allocated 1.2 MHz of interoperability frequencies in the 700 MHz Band for the primary use of interoperability between entities, states, localities, etc. Working in conjunction with the State Interoperability Executive Committee (SIEC), a plan will be developed to allocate these frequencies to localities with the Commonwealth.

Future Projects

Metadata Library Development and Implementation

Background

One of the primary legislative duties of the VGIN Division is to "oversee the development of a catalog of GIS data available in the Commonwealth" (§2.2-2026). However, the data catalog has not yet been developed. In discussions with the GIS user community, they identify the establishment of the data catalog and library of enterprise data as the simple most beneficial step that the ISP could take.

One issue that has hindered progress in the past has been in the selection of a solution. Historically, the problem has been that not all geospatial data is maintained in a single environment and no single product could extract metadata from multiple environments. While the nearly ubiquitous ESRI was able to provide a solution to extract metadata from data maintained in their environment, it did not support data maintained in other environments. A custom developed catalog system could accept metadata from data maintained outside of the ESRI environment, but not from ESRI maintained data. While metadata could still be manually entered in either solution, requiring this additional level of effort would likely reduce participation significantly.

Fortunately, in late 2006, ESRI introduced their Geospatial Portal Toolkit that addressed the acquisition of metadata from all data sources. Unfortunately, after evaluation, it was learned that the ESRI product did not meet VITA web standards for accessibility, design or security. While the accessibility and design issues could be

address at a reasonable cost, to meet the security requirements was cost prohibitive. A waiver from the security requirements was sought and granted until another option can be developed.

Path Forward

The ISP is in the process of executing a purchase with ESRI for the implementation of the Geospatial Portal Toolkit. ESRI has indicated that they can deploy the portal in ten weeks after they receive the purchase order. The only issue is whether the hardware will be in place to support this timeline or whether it may delay implementation. Of course, even with implementation of the portal, the project is not complete. While this will provide the tool to support both the data catalog and library, it will not define what data is to be entered and how it will be maintained. As a result, parallel to the deployment of the technology, there must be work on the policies that will support the use of this tool. Staff will create the GIS Metadata/Library Council (COIN) to provide guidance and input in the development of these policies. The goal will be to have basic policies in place and data entered into the portal as soon as it is deployed.

Action Steps

Action Step	Completion Date
1. Execution of ESRI PO for the Geospatial Portal Toolkit	*2/15/2007*
2. Creation of the GIS Metadata/Library Council	*2/28/2007*
3. Acquisition of required hardware to support the portal	*3/31/2007*
4. Development of policies and procedures for the acquisition and entry of metadata into the data catalog and data into the library	*4/15/2007*
5. Implementation of the Geospatial Portal Toolkit	*4/20/2007*
6. Conduct training on the use of the portal and the policies and procedures for data entry	*6/30/2007*

Needs Assessment of State Agency Geospatial Requirements

Background

To date, the VGIN Division has primarily interfaces with the 12 largest state agencies GIS users. While a few smaller agencies have made inquiries, the vast majority of the executive branch agencies have not sought ay kind of GIS support. A study of geospatial needs was conducted in 2003 to support the need for an enterprise approach, but only the largest users were interviewed and the study stopped short of identifying specific geospatial needs in smaller agencies that are not currently being met. This project would be to conduct a complete needs assessment of all in-scope agencies to determine all geospatial requirements. Anecdotal and experiential evidence seems to indicate a large number of requirements that may be able to be

satisfied with a few enterprise solutions, but a more detailed analysis is needed before a plan to meet the requirements can be developed.

Path Forward

The ISP has the staff expertise necessary to perform the required needs assessment. The data gathering for the assessment will be acquired through interview and focus groups of users. The primary focus will be on users that have not historically been users of GIS. Rather than focusing on how these agencies would use GIS, the interviews will instead focus on understanding their business process and whether it is a candidate for GIS services. Experience has shown that many users have difficulty making the connection between GIS technology and their existing business process. They often cannot determine how it could benefit them. By understanding their business process, ISP staff can determine how best to integrate GIS technology.

Action Steps

Action Step	Completion Date
1. Develop a interview instrument for the needs assessment	*6/1/2007*
2. Identify potential interview candidate agencies	*7/1/2007*
3. Conduct interviews and focus groups	*10/1/2007*
4. Analyze interview results and develop the needs assessment	*12/31/2007*

E-911 Effectiveness Study

Background

In 1996, the FCC passed the first order requiring wireless telephone service providers to implement location technologies that would allow public safety answering points (PSAPs) to locate 9-1-1 callers in an emergency. Like other states, Virginia decided to address this project from a statewide prospective implementing a wireless E-911 surcharge and creating an administrative body to administer the funding. To date, over $120 million has been allocated to local PSAPs and wireless carriers to deploy this potentially life saving service. Virginia has been a national leader and has now successfully deployed the service to about 95% of the wireless subscribers in Virginia.

Study of Needed Accuracy

A revision to the FCC order in 1999 established the accuracy requirement the wireless service provider must meet to be compliant with the order. The requirements were not based on the needs of public safety, but rather reflect the expected performance of the promising technologies of the time (Global Positioning Systems (GPS) and triangulation/time difference of arrival (TDOA)).

- Handset Based Solution
    - Global Positioning System (GPS) in handset
    - 50 meters / 67% of the calls

    - 150 meters / 95% of the calls

- Network Based Solution
    - Triangulating based on at least three cell sites
    - 100 meters / 67% of the calls
    - 300 meters / 95% of the calls

The order was passed 18 months prior to ANY deployments of location technologies, so no one was sure how the systems would perform in the field. As a result, the requirements are somewhat arbitrary having been based on the research of the solution providers. They may or may not reflect the level of accuracy actually required to locate a 9-1-1 caller during an emergency. Some in the PSAP community believe much greater accuracy is needed (sub-meter with elevation). However, there is no clear indication that this improved accuracy would result in improved service to the citizen in need. In simpler terms, would we save more lives with greater accuracy. The research question would be to identify the optimum accuracy level (regardless of location technology used) to maximize public safety. The results of this study will be published nationally and will be provided to the FCC as they continue to wrestle with the accuracy testing issue.

Evaluation of Virginia's Performance

Any time public funds are utilized there is a need to ensure that the funds are well spent. When over $120 million is expended, that need is greater to ensure accountability and responsible government. While some benefits of an investment in the E-911 system may be hard to measure, we can also not accept the old argument that "if we save even one life, it was all worth it." While there are few services provided by government more important than public safety, and thus the citizen's ability to summons help in an emergency, there are many important services of government, and each must be evaluated for its benefit to the service delivered. As a result, we seek an objective evaluation of the overall wireless E-911 program to determine its impact on the delivery of public safety services in the Commonwealth. More simply stated, what is the current state of wireless E-911 service delivery versus what it would have been had there been no wireless E-911 program. It is not sufficient to simply count the number of wireless E-911 calls and surmise that the service has been improved to each of these callers. The question is whether all of the investment made to date (by the Commonwealth, the PSAPs and the wireless carriers) has actually improved the service to the callers (processed faster, more accurately, etc.).

Finances

Funding Sources

General Funds

Though there are General Funds in the ISP budget in the current biennium, it is likely that these funds will be removed in the next biennium due to the imposition for rated services in support of the GIS activities. In the current budget, general funds support part of the operating costs of the VGIN Division as well as part of the VBMP Imagery Project costs.

Wireless E-911 Fund

In accordance with Section 2.2-3031 of the *Code of Virginia*, the cost of the PSC Division, which for the purposes of funding includes the Radio Engineering Division, is funded through the Wireless E-911 Fund. Additionally, the Appropriations Act includes several earmarks for Wireless E-911 funding to support other programs. Within the ISP, the VGIN Division receives $300,000 each year in the current biennium to support the VBMP RCL Project and $800,000 each year to support the VBMP Imagery Project. The VSP also receives $3.7 million from the Fund to support their communications activities.

Internal Service Funds

Internal Services Funds have not historically been utilized in the ISP. Due to Appropriations Act language, the ISP was required to establish a rate structure for GIS services to go into effect by July 1, 2008. To allow agencies the maximum time to prepare for these new rates, the rate structure was established in November 2006, but will not be implemented until July 1, 2008.

GIS Fund

The GIS Fund is a non-reverting fund established in *Code* (§2.2-2028) to support the VGIN Division's activities. Rates paid by agencies in the future, as well as any fees or charges received from VGIN, now are deposited into the GIS Fund.

Rated Services

Geospatial Services Rates

Background

In 2001, the Wireless E-911 Services Board provided $9.8 million to the Virginia Geographic Information Network (VGIN), a division of one of VITA's predecessor agencies, to acquire high resolution digital orthophotographic imagery for the entire Commonwealth. VGIN was able to fully fund the first digital orthophotographic effort with a one-time fund balance.

The Wireless E-911 Services Board needed this digital orthophotography product as a resource for local public safety answering points (PSAPs) who must be able to locate 9-1-1 callers with wireless devices. For that reason, within its initial investment, the Wireless E-911 Services Board also funded the development of a companion statewide digital road centerline (RCL) file that provides a single, integrated street file with addressing information compiled from over 150 source agencies throughout the Commonwealth.

The value of this data, which represents a snap shot in time, also degrades with time. With growth and development, the imagery provides a less and less accurate view of the environment and thus must be repeated every four years.

While the Wireless E-911 program has continued to support the geospatial program, it can no longer fully fund the cost of a statewide update. As a result, when it was time to repeat the digital orthophotography in 2006, general fund appropriations were approved by the General Assembly to augment the annual Wireless E-911 funding, with the understanding that, via Item 421 C of the Appropriation Act, an ISF rate structure would be established to fund this effort in the future.

Funding Methodology

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Program Costs

The proposed rates to support the Commonwealth's geospatial program can be broken down into four initiatives:

- Road Centerline (RCL) - $350 per month per use or application
- Digital orthophotography (DO) imagery: High-Resolution - $667 per month per use or application; Low-Resolution - $2,500 per month (unlimited users) – This assumes provision of statewide data. Areas less than the entire state would be charged based on the percentage of the area with 10% increments.
- Geospatial Enterprise Platform (GEP) — i.e., the hardware, software and networking that provides the data to customer agencies - $200 per month per use or application/data layer (10 uses/data layers maximum)
- Coordination of data sharing and development – cost included in other initiatives – no specific rate

These costs are calculated on projected agency use based on historical usage patterns. However, since agencies have not had to fund these initiatives in the past, usage patterns may change as agencies perform cost benefit analyses. If agency participation reduces, options exist to reduce imagery resolution and frequency of acquisition to better match the value shown to the user agencies (including localities).

Another potential is that additional agencies will choose to participate and will seek geospatial services. Additionally, there is some potential to market these initiatives to commercial entities. Expansions into new agencies and commercial entities will take time to evolve and additional funding will be necessary to expand the platform to meet demand. However, over the long term, greater participation will cause these rates to reduce. The following is a list of expected agency participation:

It should also be noted that the proposed rates are exclusive of fees for hosting agency-specific GIS applications and associated databases, which are covered, as with other applications, under other applicable VITA rate structures.

Radio Engineering Services Rates

Funding Methodology

In the past, the Radio Engineering was funded through one of two sources. The first was through consultative services, which were billed based on an hourly rate based on the individual engineer providing the service. The second source of funding was from a telecommunications contract offered by VITA. As a result, any state agency that utilized this contract was not charged. However, this second funding source was lost with the transfer of the radio engineering to the ISP. As a result of the increased focus on radio engineering services to PSAPs and public safety agencies, this second source of revenue was replaced by the Wireless E-911 Fund within the existing funding levels of the PSC Division. In other words, no additional funding was required

above the existing special fund allocation to the PSC Division. However, since state agencies are no longer contributing to this function through the telecommunications contract, a new methodology is needed to reflect the services being provided.

Program Costs

The primary cost in this function is the salaries of the radio engineering manager and the radio engineer. While there is some cost for their supplies and supporting costs, it is negligible.

Rate Development

A new rate structure must be developed for the radio engineering services beyond the existing hourly rates for personnel. To develop this rate structure, the yet to be formed State Agency Radio Users Council will be utilized. While it is doubtful that any agency will look forward to the development of a new rate, giving them input into the "least objectionable" such rate will hopefully make it better accepted when it is implemented. The goal must be to develop this new rate structure by July 2007 so that agencies can include the impact into their next budget request. The rates would not go into affect until FY2009.

Training/Travel Plan

Methodology

The ISP is somewhat unique in that there are two type of training/travel required to maintain proficiency with the projects and services of the program. Since the project and services of the ISP support very specific applications (as opposed to information technology more generally), the staff of the ISP must be proficient in both their professional discipline as well as the discipline of the ISP customer. As an example, the project manager for EMMA must maintain his/her skills as a GIS professional at the same time he/she is building an understanding of emergency management. By attending emergency management training, he/she will not only be in a better position to understand the requirements of the users, but he/she will also be able to interact with the emergency management community, which builds support and credibility with that community.

Since the creation of the ISP is still new and has generated many questions, ISP staff will also be attending state conferences in force for the coming year. This is not as much for the educational development of the staff as it is for networking with the broadest group of customers. If attendance at the state conferences was simply for educational purposes, one or two attendees could bring pertinent information back to the remaining staff and pass it on. However, using the regional PSC coordinators as an example, they need to attend each of the two state E-911 conferences since many of the region's constituents will be at those conferences. While another regional coordinator may be able to cover them at a high level, they would not be able to conduct any significant business at the event. These conferences provide an

excellent forum to reach a large number of customers without losing time (and expense) driving from customer site to customer site.

Another goal of training/travel in the coming year is the cross pollenization between the divisions of the ISP. This means sending GIS staff to E-911 conferences and vice versa. This will allow each division to learn the functions of the other and will lead to greater synergy in the ISP.

Since these needs for training will require additional travel, the ISP will minimize the length of each trip. Instead of staying for the entire event, trips will be more focused and shorter. This will allow staff to have the benefit of training/travel at the same time reducing the cost to the Commonwealth. Most of the state training events have a minimal registration fee, but lodging is the major expense. As a result, every attempt will be made to find local training opportunities or ones that can be accomplished in a day trip or with only one night of lodging (within the government per diem).

As a general rule of thumb, each ISP staff member will be permitted one major training opportunity per year. The major event would typically be one of the national conferences or user group meeting. Additionally, each staff member would attend the two state conferences for their professional discipline (PSC or GIS) and one for the other discipline. Again, every attempt will be made to reduce the amount of time spent at each event while trying to maximize productive time. The VGIN and PSC Coordinators would additionally be able to attend a second major conference and/or event to make presentations on Virginia's programs and successes and to participate in the national professional organizations representing state agencies (primarily the National Association of State 9-1-1 Administrators (NASNA) and the National States Geographic Information Council (NSGIC)).

Again, this is a rule of thumb and should not be treated as an absolute. Additionally, training or travel may be needed to serve on professional committees or to make presentations about Virginia's programs and successes.

The ISP Manager will attend some of the events with ISP staff, but will not determine which until local commitments are determined closer to the events.

2007 Training/Travel Plan

State Conference/Events		
Event	Location	Attendance
Virginia Association of Mapping and Land Information Systems (VAMLIS) Conference	Richmond, VA	All VGIN Staff, PSC Coordinator, two PSC Regional Coordinators, one radio engineer
Virginia Emergency Number Association Conference	Virginia Beach, VA	All PSC Staff, VGIN Coordinator, two VGIN staff
Virginia Planning District Commission (VAPDC) GIS Conference	Virginia Beach, VA	All VGIN Staff, PSC Coordinator, two PSC Regional Coordinators

Virginia Association of Public-Safety Communications Officials (APCO) Conference	Roanoke, VA	All PSC Staff, VGIN Coordinator, two VGIN staff, one radio engineer
Virginia Emergency Management Association (VEMA) Conference	Williamsburg, VA	EMMA Project Manager
Virginia Emergency Medical Services (EMS) Conference	Norfolk, VA	One PSC Regional Coordinator

National Conference/Events		
Event	Location	Attendance
National NENA Conference (and NASNA meeting)	Charlotte, NC	PSC Coordinator, two PSC Regional Coordinators
National APCO Conference	Baltimore, MD	PSC Coordinator, two PSC Regional Coordinators, two radio engineers, VGIN Coordinator
NSGIC Mid-Winter	Annapolis, MD	VGIN Coordinator
NSGIC National Conference	Madison, WI	VGIN Coordinator
NASNA Interim Meeting	Washington, DC	PSC Coordinator
NASNA Fall Meeting	TBD	PSC Coordinator
Geospatial Integration for Public Safety Conference	New Orleans, LA	One PSC Regional Coordinator
APCO Mid-Winter Conference	Orlando, FL	PSC Coordinator, one PSC Regional Coordinators
All Hazards Forum	Baltimore, MD	PSC Coordinator, EMMA Project Manager
ESRI Users Forum	San Diego, CA	VGIN Coordinator, VBMP Imagery Project Manager
Urban and Regional Information Systems Association (URISA) Conference	Washington, DC	VGIN Coordinator, VGIN Local Government Coordinator
National Emergency Management Association (NEMA) Conference	Oklahoma City, OK	EMMA Project Manager
American Society for Photogrammetry & Remote Sensing (ASPRS) Conference	Tampa, FL	VBMP Imagery Project Manager
American Planning Association 2007 National Conference	Philadelphia, PA	VGIN Local Government Coordinator
Interop IT Conference	New York, NY	VGIN Geospatial Technical Manager