



MERG:
**Mountain Empire Regional Geographic
Information System Project**

Washington County, VA

**2011 VACO Achievement
Awards**

2011 VACO ACHIEVEMENT AWARD

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Program Overview:

MERG is a collaborative regional project involving five (5) counties and one (1) city: Lee, Russell, Scott, Smyth, Washington and the City of Bristol, VA. The MERG project has created a secure and accessible regional data repository which includes data, web mapping and map services. It streamlines the process for data sharing among localities and the state through development of a regional GIS data replication system in near real-time. It significantly improves public safety in a large region of the state, and is the largest regional geographic data repository project in the Commonwealth of Virginia.

Definition of Problem/Challenges:

The partner localities shared a common challenge in improving response time to 9-1-1 calls. The area is significantly mountainous and largely rural. Within the 2,505 square miles covered by the MERG project, there are numerous areas of sparse population and difficult access. 5,440 miles of roads, 97,066 addressed structures and 182,975 citizens depend upon the six government entities in a variety of public safety events, which rarely adhere to county lines. Public safety answering points (PSAPs) can be affected by the terrain, particularly when calls originate from cellular telephones. Frequently, the area has need for coordinated response across government boundaries. For example, Scott County transferred 949 emergency 9-1-1 calls to other jurisdictions in 2010. Mapping, and particularly current and correct mapping, can be critical to effective response. Prior to project implementation, the area's characteristics, lack of coordination and dependence upon paper maps could hamper and delay public safety response. The MERG project was designed to enable sharing

and upkeep of current GIS data across jurisdictional boundaries, thus enhancing emergency response and providing critical backup capabilities.

Each locality in MERG brought a different level of technology infrastructure and expertise to the table. The span included very robust GIS applications with experienced staff to beginning GIS applications with no in-house staff. All the localities faced the same challenge of lack of funding.

As with any regional local government collaboration, there are many risks that can impede the success of the overall project: The MERG team members identified the challenge early in the process and made the decision to build the project on a foundation of accountability, leadership and trust.

Description of the Project:

The end goal of the MERG project is to provide a regional data repository with a **simple, cost effective** way to share and access near real-time data, creating immediate measurable benefits realized in delivery of public safety services, sustainable costs and creation of web services that are owned by MERG. The short term objective was to provide current GIS and mapping support to public safety personnel across governmental boundaries. The long term objective is to design a data repository that is not limited to GIS-based data. The full vision of this project is to create the foundation of data sharing, services, transferring, backups, etc. for the region's public safety and overall planning endeavors.

The greatest challenge to interoperable communications in the region was the lack of local funding and the lack of jurisdictional information systems support. The challenge was addressed by building a regional team to qualify for a regional project grant through the Virginia E9-1-1 Wireless Board grant program. The regional team included a Sheriff, a County Administrator, a Fire Chief, GIS professionals, Information Systems professionals, Emergency Management Directors, and E9-1-1 Coordinators. The grant program provided the \$775,000 grant award that enabled the MERG vision to become a reality. Because the funding was made available to the MERG team, there was a

heightened sense of accountability that fostered an attitude of innovation and success. Every dollar spent was leveraged for additional benefits and return on investment for its constituents. The result of this process was that the team actively sought ways to capitalize on the grant investment. MERG was able to accomplish an infrastructure that supported not only this project's objectives but also many other value adds—such as creation of a web-based information portal, data backup and recovery of other data systems for the jurisdictions.

Built upon the variety of strengths within the partner jurisdictions, the MERG leads used basic team building techniques to set the standard across the region. Goals included leverage of individual talents and public/private partnerships to effectively and efficiently implement skill transfer, infrastructure standards, and quality of service. Smaller, economically challenged members received more time, expertise and funding to bring the jurisdiction up to the standards of the MERG project.

The project raised the level of security for many of the MERG partner networks. Best practices in infrastructure and security design used on the MERG project became the foundation for those jurisdictions which were just beginning to build a wide area network. MERG provides better service at a lower cost through a regional share model, providing extensive value added benefits to all stakeholders.

The MERG team used industry and government best business practices to procure, negotiate, install, implement, budget, evaluate and document the entire project process -- in other words, on time and under budget. A structured project management approach was followed throughout the project. Every jurisdiction member was fully engaged and accountable in the decision making process.

How it Works:

The project had two industry partners, King Moore, Inc. and World View Solutions. Both partners caught the vision of the project and were instrumental in providing a “fleshed-out” concept

with simplicity and economy at its core. Both partners were selfless in producing products and services that met the requirements of MERG without tying MERG to either partner after the project was completed. The concept of creating a regional mapping data model from various localities while **allowing each locality to retain their current data scheme** is definitely an exciting aspect of the project. The simplicity of the concept assured the project would be sustainable across municipalities with limited Geographic Information System (GIS) and/or Information Technology staff. The project eliminated the possibility of “rip and replace” and capitalized on the localities investment in their current systems.

Each of the six localities involved are now connected through a secure Virtual Private Network. On a local level this was a significant step. This VPN is up and running 24/7 allowing each locality to send and receive updated data. Each day the regional model is updated as localities key the system that new data is available. Before this system was developed, a locality could spend days contacting neighboring localities to send their GIS data layers and then going through the process of merging all the various data formats into one data model. Due to this time consuming process, many localities would either not have the data of surrounding localities or only update once every year or more. Today, mapping data from other jurisdictions transfers from each local server. At the end of the process each locality has one seamless data set (roads, addresses, boundaries, hydrology, flood hazard, etc.) of all the surrounding localities. The data model can be used to aggregate GIS data for any group of localities. The MERG group contracted to have the processes and procedures created using an OSI-approved open source licensed programming language called Python. The approved open source license is free to use. As the owner of the Python contracted work, MERG can share it with other jurisdictions and agencies.

The project successfully implemented industry standards of creating a Geodatabase model with address locators that work on a regional basis. It implemented address locators capable of refining addresses using ESN’s (Emergency Service Numbers). This allows 911 calls to be located

accurately on a regional basis where possible duplicate addresses exist between localities. The project also meets the industry standards for Open Standard Requirement for Software.

Results:

The citizens of the six MERG jurisdictions are the primary beneficiaries of improved services from MERG through the various Public Safety Answering Points (PSAPs). Dispatchers now share near “real time” GIS mapping with responders, including updated roads, centerlines, parcel and E9-1-1 addressing information available at the dispatcher position. Responders and emergency coordinators, formerly reliant on paper maps that were rarely current, now receive map data which is updated nightly as changes occur. The immediate benefit is the ability to shave seconds from life threatening incidents. In reality, mapping without borders can reduce response time by hours in remote locations when E9-1-1 wireless and wire line calls are received.

Administratively, GIS technicians at each jurisdiction are freed from the time consuming task of continually reaching out to bordering neighbors in an effort to obtain data that is often outdated before it is available to the PSAP. Emergency coordinators and other county administrators also now share connectivity, frequent communication and planning for new uses of this agile data repository.

MERG easily supports the vision and the practice of VGIN’s statewide geospatial clearinghouse, which sources authoritative data from the localities to share information regionally, statewide, multi-state and federally. MERG data is available to support state efforts through a single point of contact versus the time and effort of reaching out individually to the localities involved. Consequently the local authoritative data flows into statewide road centerline data and becomes part of collaborative state-led efforts with commercial data providers such as Navteq and TomTom and web mapping applications such as MapQuest, Bing and ESRI. The result of the MERG collaboration is delivery of the most accurate and current data, available to both citizens and government.

Awards Criteria:

The creative design of the overall MERG project affords it to be used across other jurisdictions and agencies – even across state lines. (The City of Bristol, Tennessee adjoins the region and now is in discussion with state planners and the MERG team.) The process design for aggregating data is not GIS specific and can be used across platforms and disciplines within the ESRI compatibility spectrum. The process services and web services have been developed for and purchased by the MERG project. A MERG II project is past the planning phase and is now seeking funding sources for a geographic regional project that is not contiguous with the original MERG region.

MERG implements a “**come as you are**” GIS approach. Whether members have a simple or very sophisticated GIS program, participation is easy. The flexible, scalable platform development and secure, firewalled network eliminated previous barriers to service improvement.

The MERG project shines as a leading practice in Virginia due to both the government to government project collaboration and the leveraging of simple yet advanced technologies of the ESRI v10 software. It is a classic case of the business need driving the technology and not the other way around as it is so often. Organizational hurdles melted away because of the unifying regional need. The PSAP Grant Program provided the perfect funding opportunity. The v10 ESRI software made the technical solution easily attainable, sustainable and expandable. The entire project concept dovetailed with ongoing efforts at the state level.

With its service oriented architecture, growth into new forms of data is enabled. The original grant wisely has been used to build a platform that does not depend upon further funding or staffing to expand. The regional cooperation is a model for other government entities.

Appropriately, the citizen rarely if ever knows of the technology which supports the business of improving E9-1-1 response. However, this innovative use of technology has met the business need and stands ready to assist any citizen in need during public safety responses.

The MERG project is an excellent example of local, regional and state cooperation – and innovation. Even in a tight economy, participants focused on improving operations to benefit their

citizens and employees. Project implementation followed best practices throughout, from clear identification of the business problem to project launch. The business need clearly drove the technology.

The MERG project is innovative in its approach, funding, flexibility and growth potential. The participants united to achieve a common goal that went far beyond the boundaries of any one of the government entities involved. The grant funds were wisely used to create a platform that will not require budget or staff increases to maintain or expand the system. The end result is a highly functional system that is scalable, flexible and adaptable.

The implementation of MERG marks significant improvement in public safety for the residents of the region. Its high degree of collaboration/cooperation enables capability not previously available and not achievable by any single participant. It is notable for its innovative approach, and for the cooperation which is a true hallmark of the project.