VIRTUAL
USA ™

Approaches to Statewide Collaboration and Information Sharing

Homeland
Security

Contents

Executive Summary

This document discusses new approaches to emergency response information sharing. With this information, local and state executives, and other decision makers can then best determine if their locality, state, or region should adopt a similar approach, and if so, how to begin the process.

In an effort to make our Nation a safer place, the U.S. Department of Homeland Security (DHS) encourages localities and states to embrace collaboration and information-sharing models. In 2009, DHS launched the Virtual USA (vUSA) initiative, which is helping to create a future where jurisdictions at all levels have the capabilities necessary to voluntarily share information with each other, as appropriate and authorized, regardless of the data format.

vUSA is not a DHS mandate. Instead, vUSA creates a cost-effective nationwide capability that significantly improves information sharing and decision making during emergencies and day-to-day operations. Based on current and emerging technologies, vUSA integrates existing information-sharing frameworks and technologies to enable collaboration at the local, tribal, state, and Federal levels by providing critical context for information – thereby making it actionable. Developed by the Command, Control and Interoperability (CCI) Division within the Science and Technology (S&T) Directorate of DHS, in partnership with the DHS S&T First Responder Technologies Program (R-Tech) and the response community, vUSA improves emergency response by ensuring practitioners at all levels have immediate access to the information they need to make decisions, when they need it.

vUSA is developing the technologies and operational guidelines necessary to share incident response information through existing systems and geospatial platforms in partnership with local, tribal, state, and Federal officials, as well as the vendor community. Through vUSA, homeland security and emergency management stakeholders are not only able to quickly access critical information from relevant sources, but also customize the display of information based upon their unique needs. Through improved situational awareness, the homeland security and emergency management communities are better equipped to save lives, protect property, and realize operational efficiencies.

President Obama's first Executive action in 2009 focused on increasing government transparency and reshaping the government according to the three core values of transparency, participation, and collaboration. A part of the White House Open Government Initiative of 2009, vUSA was one of only three Federal initiatives among the 20 current open government initiatives that were highlighted by the White House in its rollout.

Executive Summary

Virtual USA Principles In Action

Information sharing starts at the local and state levels. Two examples of states that have made significant advances in developing state collaboration and information-sharing systems are Alabama and Virginia. With these new systems, the two states are:

- Significantly increasing performance during emergency response

- Saving time and money

- Breaking down information silos between agencies, localities, and disciplines

Having successfully established statewide platforms for information sharing, Alabama and Virginia are strong models from which other states can learn and replicate their successes. This is not to say that other viable models do not exist. While not a comprehensive list, additional examples of successful statewide projects are outlined in Appendix B.

Alabama and Virginia enable statewide information-sharing capabilities within their states by creating a system that meets the needs of their end users. Alabama's effort, Virtual Alabama, provides a user-defined operating picture (UDOP) for state officials, including those involved in emergency response, economic development, natural resource management, agriculture, and transportation. Virginia's effort, the Virginia Interoperability Picture for Emergency Response (VIPER), provides emergency responders and emergency management officials with improved situational awareness and geospatial analysis features. Both systems demonstrate what can be possible through vUSA.

Virtual Alabama and VIPER succeeded because the project teams:

- Obtained executive support

- Consistently communicated with local end users to share the benefits of the system and obtain feedback

- Did not require agencies to use the system

- Enabled local end users to own and control their data

- Ensured the system was sustainable

- Developed the systems based on end-user requirements

- Built the systems to enable collaboration

- Provided the end users with operational use of the systems free of charge

Both states use maps to display data. Stakeholders find that when information is presented geospatially, it provides responders with greater context which in turn improves decision making and response activities. Alabama and Virginia are sharing information with other states in their regions through vUSA's Southeast Regional Operations Platform Pilot (SE ROPP). A second vUSA pilot is also underway in the Pacific Northwest. For more information on these pilots, please see Appendix A.

As vUSA focuses on meeting the ever-changing needs of emergency responders, the initiative itself must remain flexible to meet those needs. DHS employs an iterative process that involves working closely with emergency responders to identify broad information-sharing needs and solutions to meet those needs. Ultimately, this process and its solutions enable improved decision making, faster response times, and stronger coordination of disparate elements.

NATION

REGION

STATE

CITY
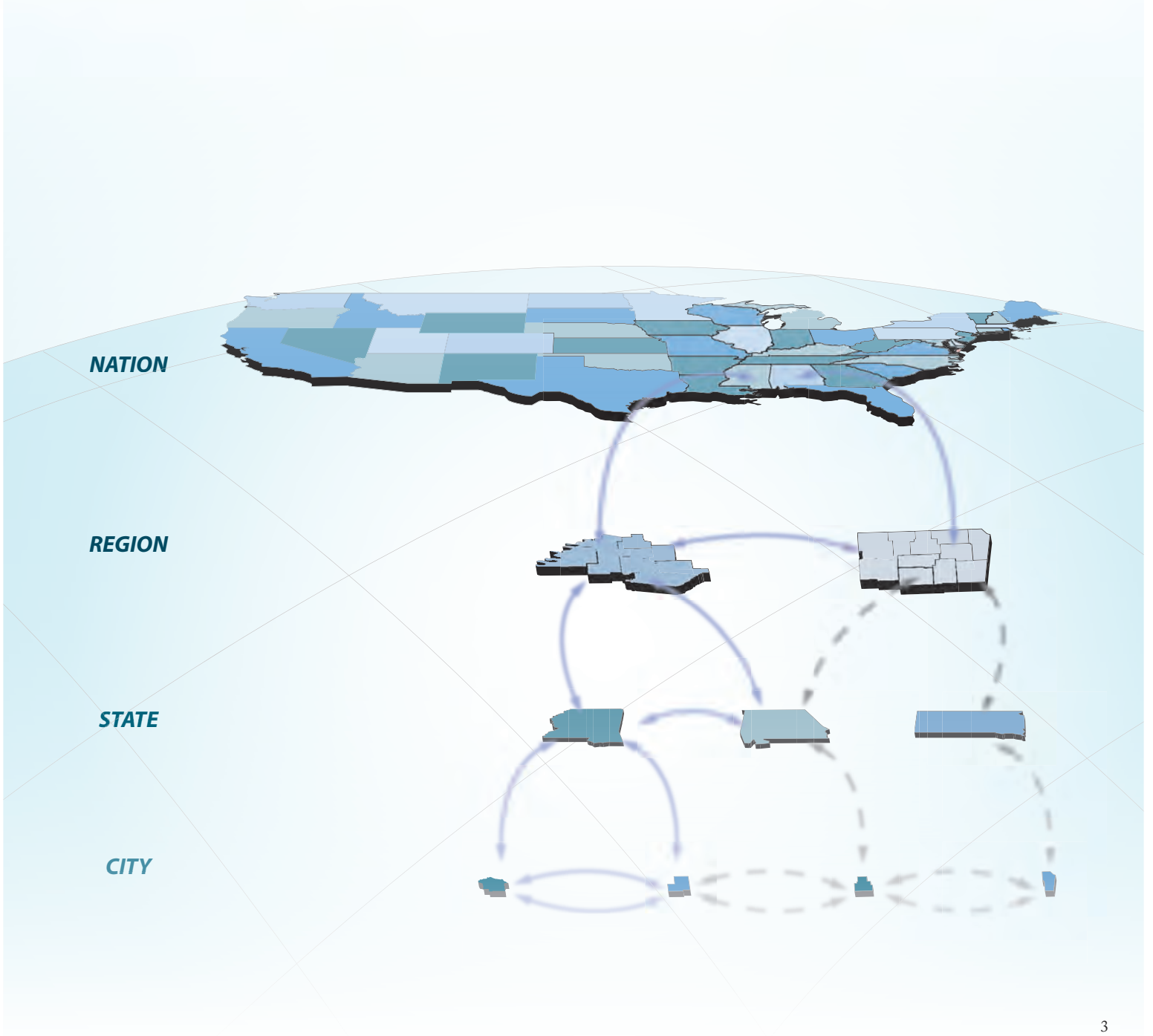
Purpose of the Document

The *Virtual USA: Approaches to Statewide Collaboration and Information Sharing* document is a high-level guide that provides local and state-level executives, and other decision makers, with a clear understanding of the benefits of statewide information-sharing projects, along with broad guidelines on how to embark on such projects. This document provides examples of how models such as Alabama and Virginia are working to bridge the gap between existing information silos and the vUSA vision of seamless information sharing across the Nation. This document also provides lessons learned from these states, which can help other states achieve their own vision for improved response through collaboration. Ongoing and future vUSA pilots and demonstrations being held across the country will lead to additional lessons learned and best practices.

The Current State of Cross-Agency Information Sharing

The need for real-time, actionable information is critical during day-to-day and emergency response operations, especially when multiple jurisdictions and disciplines interact. The information required to mitigate, prepare for, respond to, and recover from all-hazards incidents is often housed in disparate locations because information technology investment decisions have been made based on individual agencies' specific operational needs. Without the benefit of a national strategy or standards, this information is often trapped in silos, and as a result, potentially critical information does not make it into the hands of the people who need it the most.

These information silos:

- Force emergency response agencies to rely on outdated and incomplete information, preventing situational awareness and inhibiting responders from making fully informed decisions

- Prevent responders from having access to the most current information, when they need it, to make fully informed decisions

- Increase costs to emergency response agencies due to the need to replicate data in multiple systems

- Cause a lack of coordination among agencies and delayed response times as responders must wait for others to provide the information they need to do their jobs and save lives

Solving the Problem and Achieving the Vision

To overcome these problems, CCI partnered with R-Tech to create vUSA. CCI and R-Tech collaborate with local, tribal, state, and Federal agencies to promote a shift away from proprietary, siloed systems, to standards-based, open-architecture technologies that build upon existing systems. This shift will foster the integration of disparate technologies, business pro-
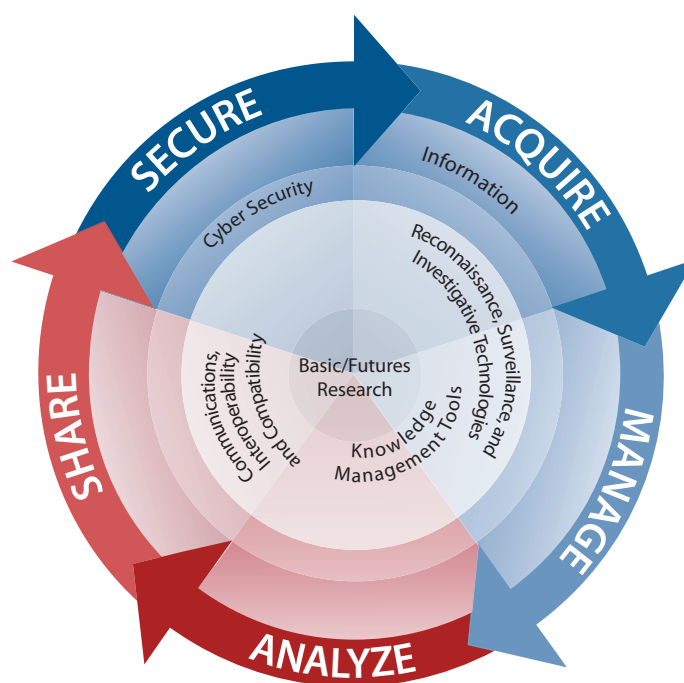

Figure 1: Information Life Cycle

cesses, and operational procedures across all aspects of the information life cycle – linking tools used for acquisition, analysis, management, sharing, and security of actionable data – within and across agencies (see Figure 1). More on the Federal role in promoting information sharing can be found in Appendix A.

Because many communities have invested significant resources into legacy platforms that cannot afford to be abandoned, vUSA uses a system-of-systems approach to connect these existing systems. As each state moves forward in developing information-

sharing and collaboration projects, CCI will gather and share these best practices and lessons learned with emergency responders across the Nation.

vUSA is not a DHS mandate forcing local and state agencies to abandon their existing investments and business practices. Instead, it is an initiative based upon the following foundational principles, that vUSA:

- Is not a DHS mandate, but is practitioner-driven, drawing on practitioner input with guidance and support from DHS

- Leverages existing data collected and maintained by local, tribal, state, and Federal agencies, and does not require the acquisition and warehousing of data

- Ensures that data ownership and control remains with the data owner

- Ensures that vUSA partners only share the information they want to share, when and with whom they want to share it

- Enables users to share information, regardless of the technology or system they currently use or plan to use in the future

- Integrates existing processes

- Builds upon existing open-source technologies while continuing to explore new and emerging open-source technologies

Benefits of Virtual USA

Providing emergency responders with the information they need, when they need it, enhances situational awareness, analysis, and decision making; thereby reducing response time and saving lives and property. Implementing a collaborative information-sharing project based on vUSA principles would result in the following benefits:

- Improved Decision Making – vUSA provides emergency responders with quick, easy access to increased quantities of information, provided in context to better ensure that the best decisions are made. A user-defined operating picture (UDOP) enables users to control and define what information they want to see so not to overwhelm them by a large amount of information at once.

- Faster Response Time – States too often rely on using phone, pen, and paper to obtain information, analyze data, share information, and coordinate response efforts. vUSA enables states to access data faster, analyze it quicker, and share it simultaneously with multiple parties of interest. In incident management, getting things done faster equates to saving more lives.

- Exponentially Stronger Coordination of Disparate Elements – The efficiencies provided by vUSA transform emergency response operations and automate many of the ways responders coordinate information on people, places, things, and events.

Other benefits are specific to jurisdictions that implement geospatial applications of vUSA. By using geospatial solutions, Alabama and Virginia for example have already realized the following benefits:

- Financial Savings – Agencies in Alabama and Virginia have the potential to save millions of dollars by leveraging existing data from other agencies across their states. In addition, agencies are better able to leverage existing staff supporting geospatial information systems (GIS), and are therefore able to reallocate skilled personnel to other important geospatial tasks such as data acquisition and analysis.

- Time Savings – Emergency responders and other users have seamless access to the information they need to do their jobs efficiently and effectively. They do not need to search multiple databases, make phone calls, or wait for other people to send data. The information is available on-demand, at the click of a button.

- Remote Access – Internet-enabled tools make information understandable and actionable for geographically dispersed stakeholders. Decision makers can watch an incident unfold on their computer screens live from a remote location, without making a phone call, going to another location to obtain information, or asking someone to create a time-consuming map.

- Information Presented in Geospatial Context – Viewing relationships between information expressed as data points on a map allows responders to better understand the severity of a situation and determine the best response strategy. For example, VIPER allows emergency managers to see real-time information about variables such as weather, shelters, traffic, and gas stations as icons on a map of a city. Depending on the data and the relationships between these data points at a given time, the state can determine the best evacuation routes during an emergency.

- Inter-Jurisdictional, Inter-Agency, and Inter-Discipline Situational Awareness – Jurisdictional, agency, and disciplinary boundaries often present data-sharing challenges; however, collaborative agreements allow data to be shared and presented in the user's visualization tool (in many cases, a map). This capability allows officials in one jurisdiction to virtually watch what is happening in the neighboring jurisdictions, throughout the region, and potentially in other states within their own context. The ability to watch an event unfold in a nearby jurisdiction empowers responders to prepare for a multi-jurisdictional response.

KEY DEFINITIONS

Geospatial: Of or pertaining to a geographic location, especially data

GIS: A computer system for capturing, storing, analyzing, and displaying geospatial information

Visualization: A graphic display of data (e.g., amounts can be visualized with bar charts and storm intensity visualized with different colors on a map)

Virtual USA Principles in Action

vUSA builds on the efforts of local and state agencies to acquire and share critical information on-demand, visualize the information and provide fast analysis, and support critical decision making. Below is a description of Virtual Alabama and VIPER, two successful state projects on which vUSA draws experience.
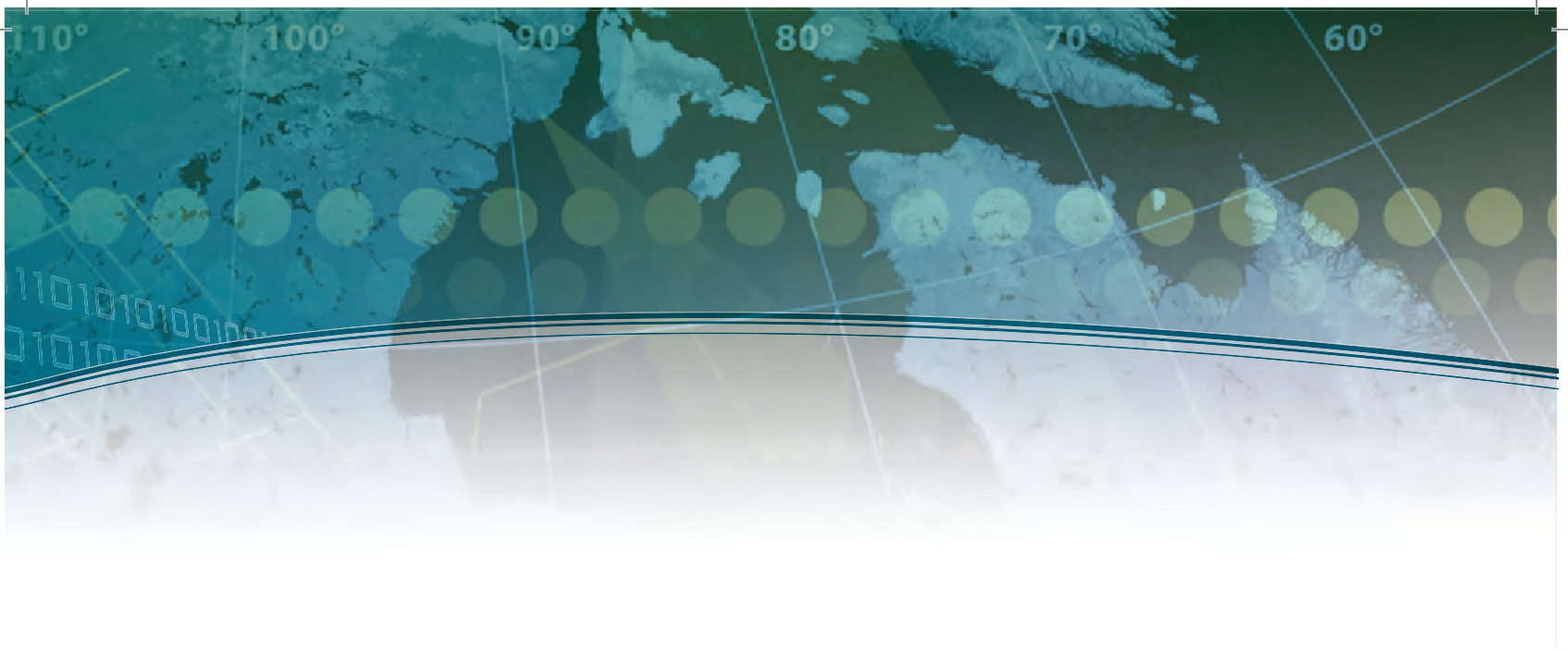
Virtual Alabama

The Problem

Figure 2: Before and After Images Illustrate Damages From a Disaster

In the aftermath of Hurricane Katrina in October 2005, Alabama Governor Bob Riley wanted to see before and after images of the Alabama coastline (see Figure 2), overlaid with property values, to help provide an assessment of the magnitude of the damages incurred by the hurricane. This assessment was an initial requirement to allow the state to make a disaster declaration and apply for relief funds to begin the rebuilding process. However, neither the governor nor anyone else had immediate access to the data needed to survey the hurricane's impact. The data did exist; in fact, state agencies and county revenue departments spent millions of dollars to obtain it. However, the data was not easily accessible—it was scattered across multiple state and county agency databases, and required days to find and obtain.

To solve this problem, the governor directed the Alabama Department of Homeland Security (AL DHS) to explore ways to use existing local and state imagery data to improve the government's ability to assess damage caused by disaster. Geospatial data was needed statewide for damage assessment, emergency management, and other uses. As a result, the Virtual Alabama program was created.

Virtual Alabama Functionality

AL DHS solicited the help of geospatial experts at the U.S. Space & Rocket Center's Geospatial Training and Application Center (GSTAC) in Huntsville, AL, to perform an analysis of available software and systems that could provide the necessary integration and visualization of disparate imagery and GIS data sources to accomplish the governor's goals.

The primary goal of Virtual Alabama was to create a visualization system that could provide:

- A common operating environment for the state

- Improved situational awareness

- Increased ability to quickly evaluate damage and provide disaster declarations

- An inventory of geospatial data asset holdings to evaluate gaps in information coverage and identify where vulnerabilities exist

Although Virtual Alabama is not a full GIS system, it does provide the ability to visualize analyses performed in GIS systems and to distribute analysis results statewide via the Web. Virtual Alabama provides a user-friendly, low-cost method for agencies across the state to visualize important information from multiple data sources while maintaining control of their data. Virtual Alabama not only supports enhanced situational awareness and understanding for the response community, it also supports the daily operational needs and mission requirements for more than 1,450 agencies across the state.

Virtual Alabama Implementation

Once the analysis was complete and a technical solution was identified, AL DHS and GSTAC (herein referred to as the Virtual Alabama team) looked to local agencies for heavy support and participation as local agencies are a large portion of the intended user community and often maintained the best quality imagery and GIS data. Obtaining the support and participation of the local agencies required a sustained effort that would develop into a grassroots effort with local champions and promoters. With executive support and leadership of the governor, Virtual Alabama then focused on being a bottom-up effort with clear benefits to users and the ability to meet local needs.

The Virtual Alabama team began seeking participation in Alabama by presenting the benefits of participation to local stakeholders. The key benefits included:

- A significantly reduced cost of acquiring and maintaining quality data

- A drastic reduction in redundant data acquisition efforts

- Free access to hundreds of data sources that can significantly improve the efficiency of each agency's business processes

- The ability to immediately visualize information from multiple data sources, with less time and energy required to locate it

The Virtual Alabama team requested access to available aerial imagery from local agencies, finding little resistance from local governments due to the clear benefits of participation.

In-person demonstrations of the software provided an important element used to show agencies how they could benefit and improve their specific missions by using Virtual Alabama. The Virtual Alabama team also made it clear to local agencies that participation was voluntary, the system is free for government users, and localities have complete control over what data they share. Local control and ownership of data was an important principle.

Virtual Alabama was not presented as a replacement for local systems, but rather as a way for local agencies to leverage their data—combined with information from other participating agencies—to increase their ability to visualize the necessary information to fulfill their respective agency's mission. The compelling case for adopting

Virtual Alabama as a way to collaborate and improve access to information statewide resulted in widespread use of the system. As potential users began to evaluate the system, they received frequent and enthusiastic support from the Virtual Alabama team. This was critical to spurring adoption of Virtual Alabama.

The Virtual Alabama team effectively developed partnerships with all 67 counties and created a visualization tool that provides all local and state government agencies in Alabama with free access to current, high-quality imagery and data that is critical to various government operations. The result is a statewide common operating environment that provides real-time situational awareness.

While Virtual Alabama began with an emergency management and homeland security mission, it now serves more than 5,000 users at more than 1,450 local, state, and Federal agencies. Its use has expanded to areas of:

- Public Safety

- Economic Development and Planning

- Natural Resource Management

- Environmental Management

- Agriculture

- Transportation

- Military

- Education

- Law Enforcement

The diversity of the participating agencies provide user access to up-to-date, robust spatial data sets, and real-time access to information such as live traffic video, estimated traffic speeds and volumes, in school video cameras, three-dimensional floor plans of buildings, real-time weather and storm tracking, automatic vehicle tracking, real time metrological sensors, and damage assessment information and imagery.

The state, in addition to increasing its information-sharing capabilities, also achieved significant savings by repurposing data and employing more efficient data acquisition strategies. In one case, decreasing GIS imagery costs from $7 million to $3 million per year saved an estimated $4 million. Virtual Alabama has enabled users across the state to access more information for less money.

Next Steps

The Virtual Alabama team is developing a training curriculum and increasing their ability to provide support and outreach to Virtual Alabama participants. The scope of Virtual Alabama is without limit and, as one user said, "Its potential is only limited by the imagination of the user."

One of the ongoing and more innovative initiatives for Virtual Alabama is the partnership between the AL DHS and the Alabama Department of Education to upload floor plans, emergency information, and video camera feeds from more than 1,500 K-12 schools in the state. After the initiative is completed, school safety information and real-time situational awareness will be available to all licensed educators and emergency responders on a need to know basis.

Virtual Alabama has provided clear benefits to its users. The power of the system combined with a low cost to the end user easily translates into a return on investment. Participating agencies now have a free tool that allows them to visualize their own data and access a wealth of data from others. There has been a clear improvement in the ability of government to respond to and recover from emergencies and provide faster, more effective government service.

Virginia Interoperability Picture for Emergency Response

The Problem

The VIPER project was initiated by a small team at the Virginia Department of Emergency Management (VDEM) after a 2008 incident in which wildfires occurred in more than 60 counties across the Commonwealth. The Virginia emergency operations center (EOC) received multiple reports of wildfires, but did not have a full understanding of the scope and scale of the situation. Like most state EOCs, the Virginia EOC relies heavily on information from multiple sources to develop situational awareness. In an effort to control the wildfire situation, the EOC operations staff requested that the GIS department develop maps pinpointing the location of the reported wildfires. By the time the GIS department was able to collect the data and plot it on a map, the data was no longer current or actionable. The need for information on-demand and the ability to provide that information in a spatial context led to the development of VIPER.

Before VIPER, the emergency management community relied on phone calls or multiple data sources and systems to assess a situation and its severity. This method of gathering information was time consuming and labor intensive. In addition, the information was often presented on multiple screens with little to no context regarding the geographic location of an incident or the impact on the surrounding area and citizens.

VIPER Functionality

In an effort to solve this problem, the VIPER team created an information-sharing environment to provide information quickly and within a geospatial context. The solution provided the what, when, and where of incidents as they occurred. To do this effectively required a cost-effective approach that leveraged existing investments in data and systems. In addition, the information required to make important emergency response decisions—which is often difficult to obtain—became more accessible.

The VIPER team wanted to create a system that:

- Gathered data from multiple sources, analyzed it, and presented the information within a geospatial context

- Provided the ability to see conditions as they developed (previously, this required requests to specialists in a GIS department, who in turn would perform the analysis and plot the information on paper maps)

- Allowed them to be more proactive and communicate an incident status to decision makers

- Supported Web access and did not impose heavy software or client licenses cost to local users

A key idea behind VIPER was to integrate large amounts of data and make it available to decision makers on-demand; however, large amounts of data can be overwhelming if not managed properly. The VIPER team developed a "reporting by exception" capability to address this issue. This data analysis capability allows users to only see what they want to see when specified conditions are met. Users can

create settings to display specific data when it meets a certain condition, such as highlighting areas on the map when the temperature drops below 36.5° F, the temperature at which roads freeze. This enables emergency responders to be on alert and to prepare additional resources to respond to traffic incidents before they occur.

The VIPER team also customized the system for specific incident types so that operations specialists could see only the "actionable" data needed to coordinate response for a specific incident type. For example, a hazardous material (HAZMAT) response coordinator needs to see specific information such as nearby critical infrastructure, schools, hospitals, and nursing homes. The coordinator also needs to know how long it will take to evacuate an area. The VIPER team interviewed operational subject matter experts to determine the information that these specialists need for their specific operational responsibility. The development team used this interview data to customize the system based on the emergency support function being performed, thus creating a UDOP.

Examples of data that can now be viewed and analyzed through VIPER include weather feeds, traffic cameras, traffic data, HAZMAT data, location of incidents such as fires and shelters, epidemic updates, demographic data, and critical infrastructures.

As illustrated to the right, a HAZMAT traffic report enables emergency managers in nearby jurisdictions to reroute traffic and coordinate response and recovery efforts with multiple agencies and jurisdictions that have access to VIPER. In addition, the governor and other officials can view up-to-date information about the incident (see Figures 3 and 4).
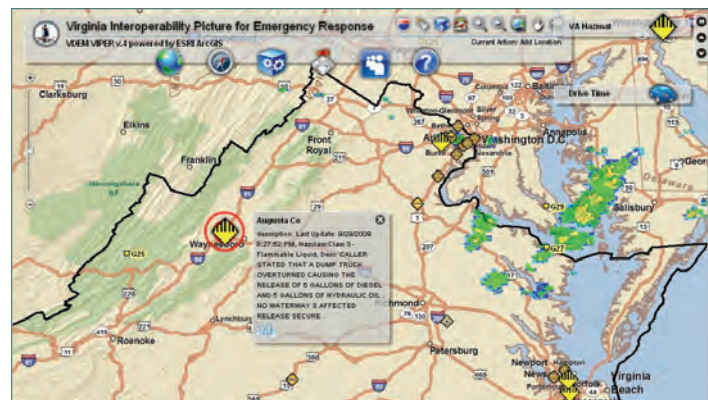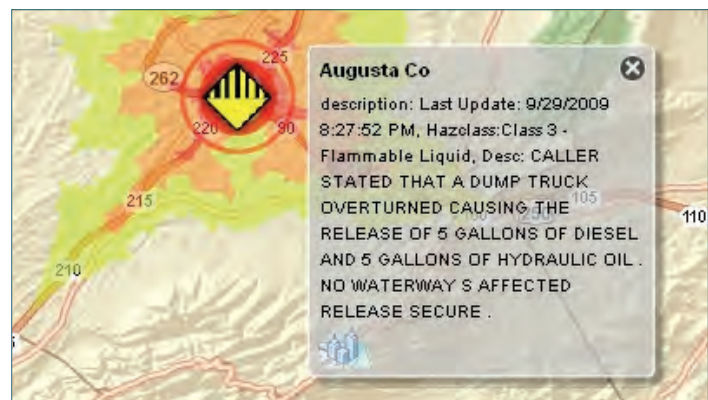

Figure 3: HAZMAT Incidents in Virginia

Figure 4: HAZMAT Incident Data

13

VIPER Implementation

The VIPER team realized the key to successful statewide VIPER implementation was a partnership between local and state emergency management and response agencies. Obtaining buy-in for VIPER at the local and regional levels took place when responders were made aware that the capability exists, yet were not required to use it.

The VIPER team conducted a rigorous outreach effort to inform all local and regional emergency managers that VIPER was available at no cost to provide situational awareness and help manage incidents. As more responders saw demonstrations and used VIPER, they realized that VIPER could significantly improve local response by providing access to information that previously took hours or days to obtain. In many cases, responders did not even know the information existed.

During the initial roll out, VIPER was used during exercises to help users become familiar with the application. Virginia Governor, Tim Kaine, saw VIPER in action during Tropical Storm Hannah in September 2008. The governor immediately requested a briefing for his Cabinet, detailing the application's benefits. Having the governor's executive-level support behind VIPER assisted in obtaining state agency participation and encouraging local participation in the project.

For agencies to begin sharing information, memorandums of understanding (MOUs) had to be established between agencies providing information and agencies viewing information. While time consuming to create, these MOUs helped identify what information would be shared and with whom, and ensured that the information would be used appropriately. The MOUs reflected the fact that locals own and control their data and decide who is allowed to view that data.

Next Steps

To meet the expanding needs of end users, the VIPER team is promoting the establishment of regional VIPER systems across the Commonwealth. These "mini-VIPERs" will enable information sharing and integration at the regional level while integrating with and leveraging the state system at VDEM. The result is the creation of a scalable, affordable information-sharing environment that supports local and state needs.

The VIPER team will help the regions establish their systems, but the mini-VIPERs will be owned, managed, and maintained at the regional level. Each region will determine what kind of information they want to share through VIPER, such as computer-aided dispatch data, tax records, assessments, and building permit information. The regions will also be able to decide what information they want to share with the state and what information they want to access from the state.
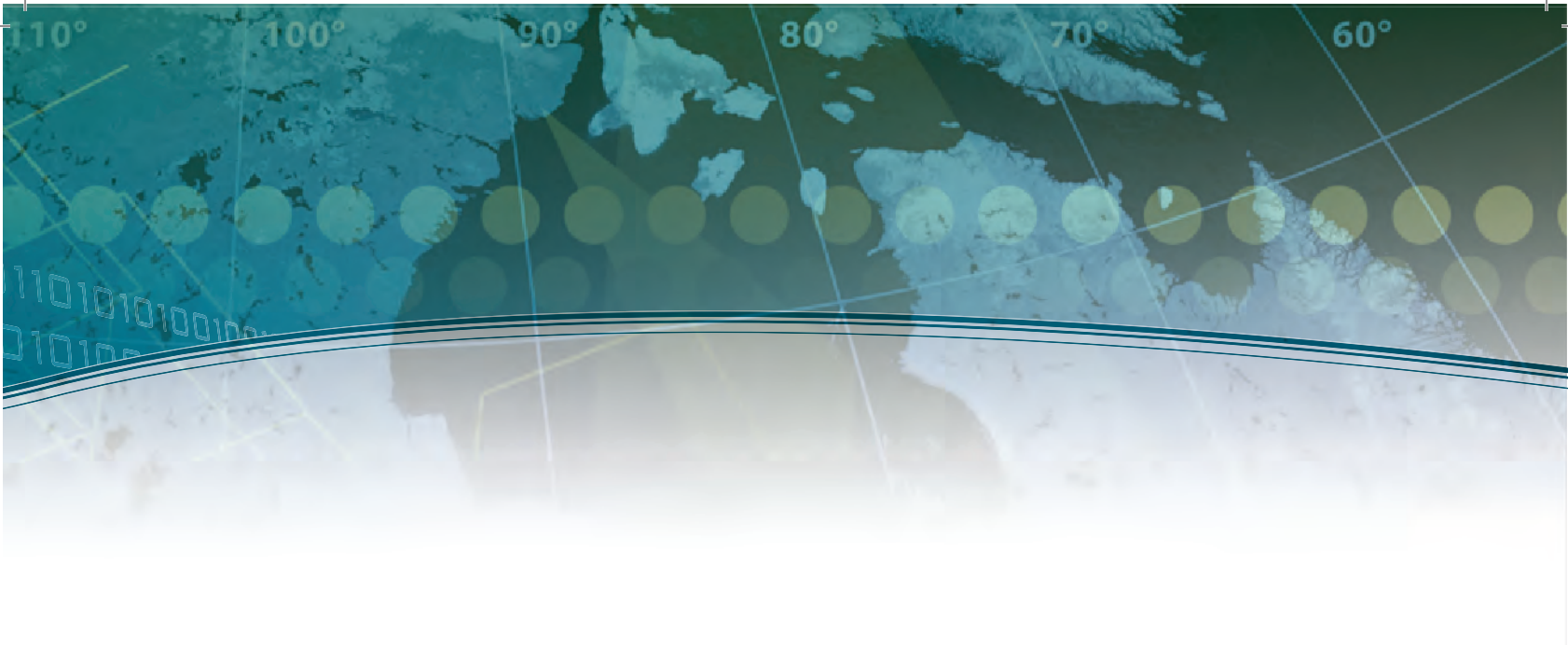
Emergency response has significantly improved in Virginia since VIPER's implementation, especially for communities that lack the resources to obtain emergency operations systems. VIPER not only provides functionality to agencies that do not have their own systems, but helps emergency management agencies across the state more efficiently manage incidents. Emergency managers now have on-demand access to incident-related information from across the state and can view the information anywhere they have Web access.

Considerations for Implementing a Statewide Collaboration and Information Sharing System

This section describes the fundamental lessons learned in implementing vUSA principles in Alabama and Virginia. They are included here as best practices to be considered by other states who wish to implement similar projects. These themes have been distilled from interviews with end users and program managers associated with either Virtual Alabama or VIPER. While this is not a complete list of the steps required to begin such a project, nor are they in a particular order, each area should be considered when establishing an information-sharing project. These best practices help project managers identify the criteria necessary for their project to be successful. The criteria will vary slightly for each project and the order in which they should be addressed will also vary. The best practices below are divided into categories, which are highlighted in bold text, followed by a high-level summary of each category, and conclude with more specific best practices in a bulleted list.

Identify Requirements

Identifying the information-sharing requirements of the targeted end users will save time, effort, and money throughout the implementation of the project. The following are key pointers to bear in mind when developing requirements:

- Coordinate with end users to identify requirements for information sharing during emergencies and day-to-day operations

- Prioritize requirements and determine which ones need to be addressed immediately

- Determine what information-sharing platform will best meet the end-user needs for information sharing

- Create a project roadmap to implement the prioritized end-user requirements

  - Identify the project's purpose, scope, and targeted end users

Obtain Support from Senior Management (Sponsorship)

Management support of the project shows end users and other involved parties that the project has a solid foundation and implies a high probability of success. Obtaining management support early in the project allows the project team to focus their time on implementation rather than obtaining buy-in from management.

- Identify senior management support and champions for the effort

  - Governor support of Virtual Alabama and VIPER enabled the project teams to obtain buy-in from local and state end users more quickly; however, local and state efforts can be equally successful with other levels of management support

- Outline a clear need or business case for the project that can be communicated to end users and management

  - Presentations to management should be tailored to each audience to provide education about the technology at a high level and identify potential ways it can positively impact them

    - Project managers often have one opportunity to communicate the value of their project to management and other stakeholders. Tailoring each presentation will best leverage this opportunity

      - e.g., when presenting capabilities to a fire chief, highlight the location of fire hydrants, the ability to obtain and display three-dimensional floor plans of buildings, and the ability to share up-to-date evacuation routes.

> *"Technology shouldn't drive business requirements; it should be other way around."*
>
> – VIPER Program Management

Obtain End User Participation

End-user involvement and meeting end-user needs constitute key factors in the successful dissemination of the information-sharing project across a state. Alabama and Virginia used two different approaches to obtain end-user participation. Alabama built a prototype system using publicly available data so they could show end users how the system operates and the potential benefits of sharing their own data through Virtual Alabama. Virginia built the first version of VIPER based on existing data used by the state EOC. Once VIPER was built, the project team shared it with regional and local EOCs to encourage their use and participation and to highlight how it could improve their mission.

"If you don't have the locals you have nothing. Keep listening to their needs or you build something that's not useful."

– VIPER Program Management

- Do not impose business processes on locals or disrupt existing operations

- Do not impose the system and methodology on locals

  – Provide the capability and let them decide if they want to use it

- If possible, provide early access to the system so end users become comfortable and can help identify potential uses

- Ensure the system is free to access for end users

  – Participation is easier to obtain when users can access the system and share information without incurring fees for access

Communicate Benefits with Potential End Users

The emergency response community will be more interested in participating in the project and sharing information if they have a clear understanding of how the project will benefit them and improve their mission. By demonstrating a prototype or live version of the system and presenting the benefits to potential end users using various forums (i.e., conferences, Web meetings, etc.), the emergency response community will likely embrace the concept and begin using the system.

- Create a strategy for engaging with local stakeholders

  – Continuous communication is key

    • Do not demonstrate it one time and expect them to use it

  – Create a timeline of meetings and conferences

    • Virtual conferencing technologies such as WebEx and GoToMeeting allow people to meet virtually and saves travel time and money

- Demonstrate your information-sharing platform to potential end users

  - Demonstrations spark interest and generate ideas for local use
  - Live data makes demonstrations more effective
  - Research the needs and challenges facing the intended audience and illustrate how the project will help meet those needs and resolve the challenges
    - Examples: Management-level users will appreciate that they can have an immediate situational awareness of an incident anywhere they have Web access. Emergency managers will appreciate the real-time access to traffic cameras, weather information, and location of resources and infrastructure all in one place to help them make quicker decisions during a critical incident

- Show potential end users the realm of the possible and let them know that the project team will do their best to meet the information-sharing needs identified by the user community

"Familiarity brings endorsement and acceptance."
– Virtual Alabama End User

Establish Governance

A solid governance structure is vital to the continued success and sustainability of the statewide information-sharing system. The system (and the implementation project for the system) must have the commitment and support from relevant staff, end users, and volunteers.

- Create a working group or governance structure that will move the project forward

  - Include end users, program managers, and technical staff
  - Define the scope of the effort, and create a charter and standard operating procedures
  - The working group should meet on a regular basis

- Establish MOUs among project participants

  - MOUs should be addressed sooner rather than later as it can be a time-consuming process
    - It would be helpful to have a staff person dedicated to this effort at the beginning of the governance-building phase

Ensure Local Control and Decision Making

Local control of data is one of the most important factors involved in a successful statewide information-sharing project. Local control provides users with the assurance that no one else can manipulate their data or view it without their permission.

- Locals should own (host), control, and maintain their data
  - They decide what they will share and with whom
  - Data should reside at database owner's location

Identify Funding Mechanisms

Virtual Alabama and VIPER are using a business model that enables end users to share information for free. While access to the systems is free for end users, the costs are absorbed at the state level which means a funding source must be identified by the state.

- Identify a funding mechanism for the effort
  - Start-up costs are generally low, but funding may still be needed for servers, staff, and ongoing maintenance
  - Grant funds can be used for start-up costs, but sustainable funding is required for ongoing maintenance and support

Train the Participants

Training end users on the information-sharing system provides direct involvement with the solution and allows users to identify new ways they can use the system to improve their mission. Because most people learn more easily through hands-on practice, in-person training is ideal. If in-person training is not feasible, training can also be provided using Web meetings or through Web-based training modules.

- Develop a training curriculum early in the project
  - Creating a training curriculum early will save time for the project team as more people begin using the system and the team loses the bandwidth to conduct individual training sessions
- Allocate time and funding to support training
  - This will save time when the system is in high function mode and numerous new end users need training

- Consider a combination of in-person and Web-based training

  - In-person training helps answer questions and fosters better communication
  - Web-based training allows for continuous training accessibility

    - Efficient for areas that may be difficult to access

    - Provides a method to quickly deploy training updates and refreshers

    - Provides the ability to simultaneously train a large number of end users

Provide Support Services

Because the initiation and maintenance of a statewide information-sharing project is labor intensive, staff should be identified and allocated to focus on the project.

- Allocate staff for project management, technical development, training, and outreach to locals

  - Example roles include GIS specialist, operational program manager, technical program manager, and a liaison with end users to coordinate outreach and training

- Provide an open forum for end users to share information with each other

- Provide a means for end users to give feedback to the project team

Use Common Formats

Common formats, or standards, enable data to be exchanged seamlessly across different information-sharing systems. Common formats include a shared under-standing of terminologies, technical standards, and standard operating procedures.

- Determine the best platform that will meet the information-sharing needs of the end users

- Use common feeds and formats

- Adopt non-proprietary standards

"If data isn't formatted in a way we can use, we have to do heavy lifting to get it to work. It's not a show-stopper, but there's a lot to do in the middle. There's a whole industry to create middleware to translate data, but we should fix this with a governance policy up front."

– VIPER Program Management

Design the System for End Users

The system should be designed based on end-user needs and should be easy to use so that technical and non-technical emergency responders can use it.

- Make the system simple to use

  - Do not put too much information on the screen

- End users only want to see what is important to their role and for their decision making process

- Tailor the system to the end-user needs

- Ensure all information is accessible through a single interface

  - This saves end-user's time and does not require access to multiple databases

- Make it scalable

  - Should support growth in the number of end users

- Ensure the tool is customizable by the end user to support their needs

Use an Incremental Growth Model

Alabama and Virginia both found the development model of starting with a basic functionality, gaining buy-in, and then adding functionality to be successful. This model allows the project team to create a basic tool to share with potential end users more quickly. It also enables the project team to build functionality as end users see the system and identify new ways they can use the system to improve their mission.

- Start small and scale out

- Add features incrementally

- Add end users and agencies incrementally

"The key is having overlays that meet my needs."

- Virtual Alabama End User

Participate in Existing Collaborative Communities or Create Your Own

In recent years, communities of end users, operators, and technical staff have come together to share their experiences, successes, lessons, and even programming code while implementing information-sharing solutions. Located across the Nation, these communities are working to bridge the information-sharing gap. vUSA is in the process of establishing a collaborative community to trade and share non-proprietary software code with program managers in other cities, regions, and states.

- Participate in information-sharing forums to learn about updates and troubleshooting tips

- Provide a collaborative environment for users to share ideas and methods for using the system in their operations

  – Users at the local level should create local-based communities to improve information sharing, share operating procedures, and learn how other agencies use the system during day-to-day and large scale incidents

For additional information on vUSA, please e-mail virtualusa@dhs.gov or visit www.firstresponder.gov/VirtualUSA.

Appendix A: *Federal Facilitation of Virtual USA*

CCI supports vUSA by developing processes, procedures, and methodologies through its five program areas: the Office for Interoperability and Compatibility; Cyber Security; Basic/Futures Research; Knowledge Management Tools; and Reconnaissance, Surveillance, and Investigative Technologies. CCI will share the best practices and lessons learned from these programs with emergency responders across the Nation as each state moves forward in developing information sharing and collaboration projects.

To provide information on demand, vUSA continues to draw on the experience of existing information-sharing projects at the city, state, and regional levels (see Figure 5), such as Virtual Alabama and VIPER, as well as other CCI and S&T programs. Statewide systems form a network; linking multiple disciplines, regions, and jurisdictions together. These systems will eventually lead to a nationwide system of systems, which is why this document focuses on the benefits and processes for building statewide information-sharing systems. vUSA will coordinate with end users and assist the applicable program managers in developing guidance that will better enable other states to collaborate and share information.

To further explore the applications of sharing information, vUSA is conducting city, state, and regional pilots that involve leveraging existing technologies and integrating standard operating procedures. Pilots include the SE ROPP and the Pacific Northwest Pilot; where vUSA is helping each pilot's participating states integrate existing platforms, visualization tools, and other data sets to allow their systems to interoperate and share information, regardless of the technology.

These pilots help create scalable and replicable models to enable effective multidisciplinary, multijurisdictional incident management across the Nation while leveraging existing infrastructures at the state and local levels. Leveraging and maximizing existing systems avoids duplication of past efforts and costly infrastructure investments. CCI supports the pilots through technical and policy assistance aimed at the development of an operational framework to enable information sharing across state lines; the documentation of new best practices for interstate information sharing governance, workflows, and visualization tools; and the demonstration of real-time regional information sharing that utilizes new technical solutions.
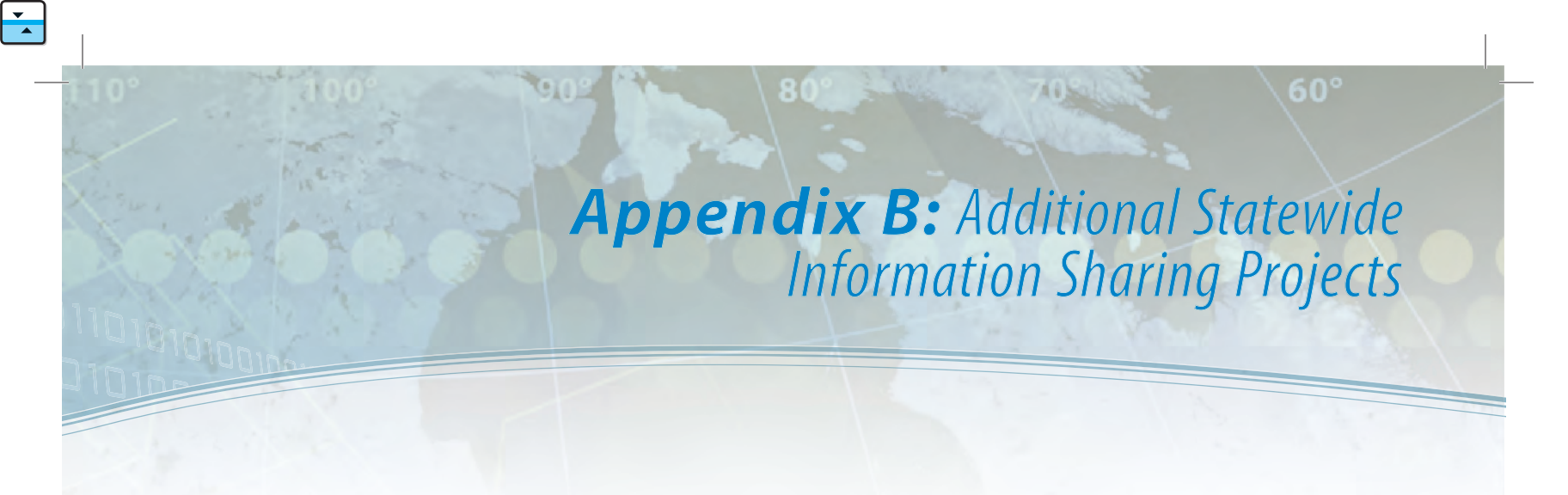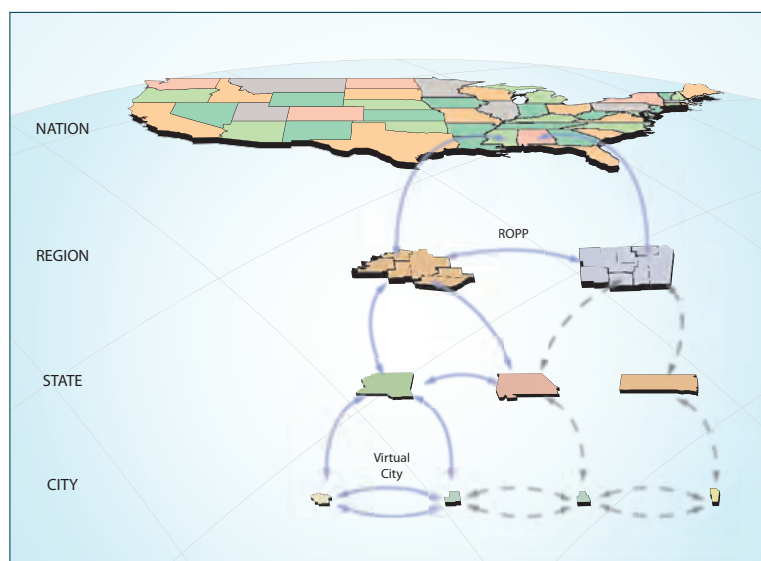

Figure 5: Scope of vUSA

For additional information on vUSA pilots, please e-mail virtualusa@dhs.gov or visit www.firstresponder.gov/VirtualUSA.

Appendix B: *Additional Statewide Information Sharing Projects*

While this document provides in-depth overviews of information-sharing projects in Alabama and Virginia, these projects are not the only efforts providing robust information-sharing solutions. Below are summaries of other state information-sharing projects that provide similar capabilities. Please note that this is only a sample list of statewide projects and is not comprehensive.

Florida

The Florida Division of Emergency Management is creating a geospatial information system for the Florida State Emergency Response Team (SERT) that will improve the way information is shared among the first responder and public safety communities and the public. The system, which is called the Geospatial Analysis Tool for Operations and Response (GATOR), is the result of collaboration among the Division of Emergency Management and SERT partners.

Building upon the success of a previous collaborative effort, this project expands the enterprise capabilities of SERT to communicate, collaborate, and coordinate operations and response across the state. A preliminary roll out of the application took place in September 2009 and is available at http://map.floridadisaster.org/GATOR. Further developments and enhancements are planned, including integration of U.S. National Grid data layers and tools, more real-time data layers like traffic and Web cameras, and access to information from mobile phones. In addition to accessing information available through the GATOR web site, Keyhole Markup Language (KML) files and Geographically Encoded Objects for Real Simple Syndication (GeoRSS) feeds are also available for visualization in other platforms.

Louisiana

Following the successful launch of Virtual Alabama, Louisiana launched a similar solution to provide a visualization tool that will allow emergency responders across the state to access data that was previously unavailable. Virtual Louisiana is customized to display only imagery and data created for Louisiana. Over the past few years, the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and several local governments have acquired high-resolution imagery and mapping data for its major urban areas, critical infrastructure, and key resources throughout the state. Virtual Louisiana provides a platform that allows those members of the emergency response community who are not trained on GIS software to view the information through a secure Internet-based application. This software allows all levels of government to share a common operating picture and view mapping data that was created by local and state government.

Virtual Louisiana is managed by GOHSEP and was launched in August 2007. Virtual Louisiana currently supports more than 2,000 users representing local, state, and Federal governments and more than 500 different agencies across all 64 parishes in Louisiana. Use of the program is limited to governmental agencies and designed primarily to assist emergency responders share a common mapping solution in response to any incident

Mississippi

Mississippi is creating a geospatial information system that will improve the way information is shared among the emergency responder and public safety communities. The system is called the Disaster, Incident, and Situational Collective Operations Virtual Environment Resource for Mississippi (DISCOVER MS) and it is the result of collaboration between Mississippi's Office of Homeland Security, Oak Ridge National Laboratory's Southeast Regional Research Initiative and Jackson State University's National Center for Biodefense Communications. DISCOVER MS became operational in November 2009.

The initiative is focused on breaking down information silos between agencies and localities. Data-sharing agreements form DISCOVER MS's backbone and end-user requirements determine its direction. The system will enable emergency responders to make better decisions as they plan for, mitigate, respond to, and help citizens recover from incidents and disasters. It will provide the right data at the right time in an easy-to-understand, user-defined context. DISCOVER MS will also be interoperable with Virtual Alabama and Virtual Louisiana.

Texas

Texas is another state creating a common operating environment for public safety and law enforcement stakeholders. In early 2007, the Border Security Operations Center (BSOC) within the Texas Division of Emergency Management (TDEM) recognized that law enforcement officers and sheriffs could not effectively share information along the U.S. and Mexican border when responding to incidents. The Texas/Mexico border extends for more than 1,200 miles and patrolling such a large distance requires a great deal of coordination among multiple agencies. To solve this problem, BSOC launched TxMap, a geospatial information-sharing solution with 90 participating agencies and 380 users. Thus far, it has been used primarily to secure the U.S. and Mexican border.

Spurred by this success and realizing that TxMap has broader applications, the Texas BSOC is extending TxMap across the state and will include other government agencies. Any Texas government agency will be able to use TxMap and participation will be completely voluntary. All emergency response agencies will be able to share information for free. TDEM hopes to make TxMap available to all state agencies by the end of 2010.

Alabama:

- Virtual Alabama Web site, including the Virtual Alabama Video

  http://dhs.alabama.gov/virtual_alabama/home.aspx

Florida:

- Florida Web site

  http://map.floridadisaster.org/GATOR

Mississippi:

- Mississippi Web site

  http://ncbc.jsums.edu/Projects/MSGEE/Default.aspx

Virginia:

- VIPER Video Channel

  http://www.youtube.com/user/vdemviper

If you would like to participate in a new working group to collaborate and share lessons learned with states that have established or are initiating statewide collaboration and information-sharing efforts, please contact virtualusa@dhs.gov or visit www.firstresponder.gov/VirtualUSA.

VIRTUAL
USA™

Developed by the U.S. Department of Homeland Security Science and Technology Directorate Command, Control and Interoperability Division in partnership with the response community, Virtual USA creates a cost-effective nationwide capability to significantly improve information sharing and decision making during emergencies and day-to-day operations.