Discover how emergency management personnel are using mapping, search, and collaboration tools from Google to achieve optimal situational awareness before, during, and after a disaster or emergency.

Written by Caron Beesley
About this Guide

When disaster strikes, access to information is critical. It gives emergency responders the intelligence they need to make informed decisions while ensuring the safety and well being of the public. The problem is that finding, aggregating, and sharing available data across multiple IT systems and stakeholders – in the office and in the field – is easier said than done.

In this eBook we’ll explore how information management and collaboration tools from Google help emergency management teams achieve unparalleled situational awareness before, during and after a crisis. We’ll also share case studies from groundbreaking programs, such as Virtual Maine and Virtual Alabama, the Red Cross, and more.

• **Learn** how to stay ahead of “predictable surprises”
• **Explore** how the public sector can leverage secure cloud – and GIS-based apps to find and access critical data and collaborate in emergency situations
• **Discover** how to manage information overload during times of crisis
• **Understand** how geo-location and Google API tools can assist with day-to-day homeland security and law enforcement efforts

About DLT Solutions

DLT Solutions partners with Google Enterprise to deliver the most innovative geospatial, search, and collaboration technology to the Public Sector. By offering Google Earth and Maps Enterprise, Google Search Appliance, and Google Apps for Government we can help government agencies overcome current challenges, remain compliant, and save money, allowing them to focus resources on the core mission.

For more information, contact us at google-solutions@dlt.com or 1-877-385-3581
Google Emergency Response Tools for Govies™

Presented by DLT Solutions and Google
# Table Of Contents

Chapter 1: Assessing your Needs ................................................ page 1

Chapter 2: Geospatial Intelligence – Building a Common Operating Picture for Situational Awareness ...............page 4  
  — The Challenges of Sharing GIS Data  
  — Assessing Options for a Common Platform  
  — Case Study: Virtual Maine and Virtual Alabama

Chapter 3: Comprehensive Search – Finding Information, Resources and People in Times of Crisis ......................page 17  
  — The Challenges of Searching for Information in a Crisis  
  — How to Increase the “Findability” and Relevance of Information  
  — Case Study: American Red Cross

Chapter 4: Making Fast, Informed Decisions with Real-Time Collaboration Apps ........................................... page 21  
  — The Role of Cloud-Based Productivity and Collaboration Apps  
  — Putting Government Data Security First  
  — Case Study: Virginia General Assembly  
  — Case Study: Uniformed Services University of the Health Sciences

Chapter 5: Beyond Disasters – Breaking Down Silos for Transparency of Data Day-to-Day ....................... page 32  
  — Geo-location Tools for Offender Tracking  
  — The New Trend for Predictive Policing controls with Acceptable Risk  
  — Crowd Sourcing Apps that Aid in Crime Prevention  
  — In a Nutshell – Balance Security Controls with Acceptable Risk

Chapter 6 - Conclusion ................................................................. page 34

Additional Resources ............................................................... page 35
Chapter 1
Introduction – Assessing Your Needs

Each day emergency management and homeland security officials face new challenges. In recent years, it seems that these challenges have only become more complicated – from mutations in flu viruses to power outages and natural disasters that have a society-wide impact and, of course, we’re just learning to understand the depth of the challenge of cyber intrusions.

But new capabilities can enhance response efforts. Take the Boston Marathon bombings, for example, in the spring of 2013. The power of visualization and the integration of our digital world created actionable information, provided citizen engagement, and demonstrated how critical communications can increase and enhance organizational response.

Information is essential during a crisis – yet assimilating, querying and using that data to make informed decisions continues to be a challenge, from pinpointing the nearest hospitals to communicating emergency information across disparate teams. Even in times of non-crises, access to useable and accurate information plays a key role in the development of mitigation, preparedness, response, and recovery programs.

Many of the disasters and emergency events we face today are almost incomprehensible based on our past experience and are becoming known as “black swans” – unpredictable, with a dramatic impact, yet after they happen they seem to have been able to be predicted. In fact, “black swans” are often called “predictable surprises”.

This is the range of events and scenarios that first responders and homeland security professionals are dealing with today, and it raises a series of very urgent questions that need answers in the very earliest phases of a response:
What's happening?

How bad is it?

Where are the target hazards?

Who needs “what”? Where is “what”?

Where are our people?

Can I get information in near real-time?

Can this be put onto a map?

How can we engage the public to answer these questions?

Answering these Vexing Questions – Visualizing and Disseminating Data During a Crisis

So what role can visualization, search and collaboration technology play in answering these vexing questions?

In this eBook we will discuss how emergency management and response teams can leverage cost-effective tools from Google that can help them access, share and act on critical information before, during, and after a disaster or emergency.

We all know Google for its ability to turn GIS data into actionable information through mapping tools such as Google Earth. But it’s more than that. Google has been responding to natural disasters since Hurricane Katrina in 2005 by making information such as storm paths, shelter locations, emergency numbers, and donation opportunities easily accessible.

First responders can also use Google technology to streamline internal operations and get information to the public as quickly, broadly, and effectively as possible with Google Earth, Google Maps, Google Apps, Google Search Appliance, and more. These tools help provide a common operating picture of relevant information such as the position of first responders, potential threats, critical resources and important
infrastructure that can be shared by more than one command. This common operating picture facilitates collaborative planning and assists all echelons in achieving situational awareness at all times.

Google has a long history of supporting the public sector in its emergency management and law enforcement efforts. In fact, Google and the Google Crisis Response team, in particular, has a long history of partnering with government agencies, NGOs and commercial organizations to publish and share authoritative information that can help make a difference during a crisis. Writing for Mashable, author Ben Parr describes that relationship:

“…the connection built today between Google and the U.S. Government is refreshing. Google and other social apps have a great deal to offer government employees in terms of speed, efficiency, and engagement.”

Ben Parr, Mashable

Google also counts the government among its users. Organizations such as NOAA, GSA, the U.S. Coast Guard Academy, and Naval Academy, as well as state and local agencies in 44 states use Google technology to build more transparent systems, improve services for their citizens, and reduce costs.

In this eBook we’ll explore how Google technology and tools can and has helped many of these agencies overcome the challenges of sharing data across disparate teams, stay one step ahead of “predictable surprises”, increase the “findability” of vital information, keep citizens informed, and make fast, informed decisions.
Learn about:
— The challenges of sharing geospatial intelligence data across disparate teams
— How cloud-based technologies can help emergency personnel stay one-step ahead
— Building a common operating picture for disaster analysis and response - Virtual Maine and Virtual Alabama

In this chapter we’ll explore the limitations of traditional GIS mapping systems and how new cloud-based visualization and mapping tools are changing the way that data is analyzed, shared and used to support government intelligence efforts. We’ll also look at how the state of Maine has developed a common operating picture that integrates GIS and other essential data to help public safety and emergency responders stay one-step ahead.

The Challenges of Sharing GIS Data

Sharing geospatial information is a critical component of many emergency management and homeland security missions.

GIS software provides powerful capabilities for analysts and response teams, but sharing geospatial intelligence with personnel outside the GIS department has been a struggle, for a number of reasons.

Government Use Cases for Geospatial Mapping

- Common operating picture for disaster response, such as location of affected disaster area, displace citizens, food supplies, and drinking water
- Location of assets such as aircraft or personnel
- Climate data
- Roads and bridges
- Satellite or aerial images of crops
- Disease outbreaks
- Economic data by region
Unfamiliar Interface

GIS client software is typically designed for experts, not employees who use geospatial data in their daily work. Learning to use a complex GIS interface requires formal training, increasing costs and prolonging the time needed for new employees to become fully productive.

Static maps lack interactive controls

The maps that traditional GIS systems produce must be distributed to agency employees on paper or as PDF files, and users have no way of knowing if the information is current. If the GIS department distributes new maps once a week, employees might be working with information that changed six days ago. Another drawback is that PDF maps are not generally sized for viewing on mobile devices, such as tablets and smartphones.

Static maps also lack the interactivity that users have come to expect. Users who rely on geospatial data to make decisions want the ability to drill down, zoom in and out, scroll to see adjacent areas, and turn layers on and off to focus on information pertinent to their role. For example, the map of a disaster area might have two layers—one with aerial photography useful to teams assessing damage, and another with the locations of displaced residents needing food or shelter. Each team would need to be able to view individual layers, as the information pertains to their mission.

Inability to upload data from mobile devices

Legacy GIS applications also cannot directly accept new imagery and data from the field. Instead, users provide information to the GIS team to input when they have time. Ideally, users in the field monitoring floods, for example, could capture video, photos, voice, and text on tablets and smartphones, and then add it to a map layer in near real-time — or at least the next time they sync.
High costs

Legacy GIS applications typically require costly physical infrastructure for storing the GIS data catalog, including:

- **Server infrastructure** – Processing geospatial data is a compute-intensive task that requires powerful servers.

- **Storage** – Satellite or aerial imagery requires vast amounts of storage. The same data set may be replicated on multiple servers in the same or different agencies, further increasing storage costs.

- **Management** — Staff must be assigned to patch server operating systems, keep applications up to date, and back up the data catalog. The use of multiple geographic projections and formats further complicates management.

New Approach: Augmenting Existing GIS Systems with a Cloud-Based Common Operating Picture

Google and Google Maps are ubiquitous tools used in our everyday lives, but Google also offers solutions in its familiar interface that allow agencies to increase the value of their on-premise GIS systems and data. Take, for example, Maine Emergency Management Agency (MEMA) which has developed a comprehensive, common operating picture that layers location-based information onto a single virtual globe – Virtual Maine (vMaine). MEMA is in the process of deploying vMaine to 700 people across all levels of government.

The state of Alabama has also developed a secure common operating picture for personnel involved in disaster response program – Virtual Alabama. Built on Google Earth Enterprise, Virtual Alabama was conceived for homeland security and emergency management, but is now also used for economic development, environmental management, and conservation of natural resources.

Here’s how vMaine and Virtual Alabama came about.
Virtual Maine

When a state or region experiences a major weather event such as a hurricane, blizzard or tornado, numerous agencies and organizations must work together to manage the crisis. For instance, when Super Storm Sandy battered the U.S. East Coast in 2012, thousands of workers were called into action, including fire and rescue personnel, utility workers, public health officials, and workers at all levels of state and local government. Typically, each of these groups maintains its own geographical data and works in a silo to ensure its own portion of the rescue and recovery is completed.

But Google technology is making it easier to share data across a standard platform, allowing these diverse groups to truly collaborate and communicate in real-time about damages and recovery progress. This is the case in Maine.

GIS and geospatial technologies have always played a key role in helping Maine become safer and more secure. However, until recently, these visualization tools were available only to a few state workers. The Maine Emergency Management Agency (MEMA) team and other government agencies relied almost exclusively on Esri software, a relatively complex solution that was used only by the state’s GIS specialists. MEMA needed a comprehensive common operating picture that layers location-based information – everything from utility outages, floods, transportation conditions, electric power status, and locations of hazardous materials – onto a single virtual globe.

Christopher Kroot, manager of GIS applications at the Maine Office of GIS was familiar with Google Earth Enterprise (a solution for creating and publishing customized Google Earth databases on private networks) and saw it as an affordable and easy-to-use tool for combining disparate data and making it accessible and useable by non-GIS experts.

Virtual Maine was born.
Results

The vMaine system integrates disparate geographic data from several agencies while also incorporating FEMA alerts, electrical outages, closed streets and roadways, and even details about hospitals, nursing homes, and other critical facilities in the affected area and available resources nearby.

Because the system is mobile, emergency workers can access vMaine on their phones or other mobile devices while in the field to see what areas have already been covered by first responders and which ones are still in need. The system is also integrated with Red Cross data, so it includes all kinds of necessary information such as the locations of emergency shelters, which can be updated with real-time availability.

vMaine also includes Keyhole Markup Language (KML) files showing geographic data as well as imagery, terrain, and live feeds from power companies; the WebEOC crisis-information-management system; the Statewide Incident Management System; 511 near-real-time transportation information alerts, such as road closures; National Oceanic and Atmospheric Administration (NOAA) meteorological data; and U.S. Geological Survey (USGS) data, such as fires, stream gauges, and more. All of this data promotes true, real-time situational awareness.

Figure 1 through Figure 3 depict how vMaine tracks and identifies a potential flood in upstate Maine and the downstream impact on population centers and critical power and gas supply routes.

Figure 1 - vMaine Flood Scenario based on USGS stream gauges. Mouse roll-over capabilities provide critical flooding data to emergency response teams.
Figure 2 – vMaine overlay of USGS flood data combined with Google Earth imagery and GIS information pin points specific flood threat.

Figure 3 - Utility overlays show presence of electric sub-stations and gas lines downstream that may be impacted by flooding. This data allows emergency management teams to quickly hone in on high-risk areas and infrastructures for early-warning purposes.
MEMA is deploying the vMaine globe to other government agencies and organizations throughout the state, including mobile command centers, county government entities, hospitals, and others – totaling over 700 potential users.

For the State of Maine, the Google platform is powerful enough to integrate large volumes of GIS data into a consistent, effective, and secure graphical display. The result – a common operating picture, real-time situational awareness, and streamlined, day-to-day operations, all based on affordable and familiar Google technology.

Learn more about Virtual Maine

For more information and a demo of Virtual Maine, check out: Google Earth Reveals the Bigger Picture in Emergency Response, an on-demand webcast presented by Maine Emergency Management Agency and DLT Solutions.

Virtual Alabama

In 2003, Alabama was one of the first U.S. states to establish a cabinet-level Department of Homeland Security (ALDHS). ALDHS’ mission is to coordinate with federal, state, local and private sector officials to collect and analyze information regarding terrorist threats and activities, protect lives, and safeguard property across 67 counties, a Native American tribe, major waterways and nuclear plants, a port and 28 other critical assets. Delivering information to first-line responders is a critical part of its mission.

In the past, sharing homeland security information within the government, even between departments, was tricky due to the information’s sensitive and proprietary nature. The ALDHS found itself facing the following challenges:

- Fear that sensitive data, such as the locations of critical infrastructure, would leak
- No secure platform for sharing data as departments and agencies often favored secrecy over transparency
• Reluctance to share information making it difficult for government officials and emergency teams to respond effectively to emergency situations, since they have no common data set or means of communicating across departments or teams
• Limited information sharing leading to overlapping expenses as departments separately acquired the same sets of data

One of the first assignments handed to ALDHS in 2003 was to better understand what critical homeland security data the state already possessed and, by extension, what data it should focus on acquiring. Data inventory surveys indicated that state agencies had already collected massive amounts of imagery and geospatial data under contract in prior years. But how could this data be shared, analyzed and made useful across numerous departmental lines? A secure, common information sharing platform on which to compile and evaluate the data that different departments and groups had collected was clearly needed. Given a significant wealth gap across the state’s counties, this information-sharing platform also needed to be relatively inexpensive so that ALDHS could offer it free of charge to county governments. In turn, each of the county governments would be motivated to share and upload their local information to the platform.

Assessing Geospatial Options for a Common Platform

ALDHS approached the Alabama Geospatial Training and Application Center (GTAC) at the U.S. Space and Rocket Center to assess geospatial options for this common platform.

They agreed that the end product not only needed to be affordable and internet-based, but also absolutely secure and easy to use. After reviewing several solutions, ALDHS chose Google Earth Enterprise since its intuitive interface was accessible to users not trained as GIS specialists, and it was powerful enough to integrate large volumes of GIS data into a consistent, effective graphical display.

Virtual Alabama Facts
• User base includes more than 2,100 users
• 550 agencies utilize the tool to visualize resources and infrastructure
• County and municipal government’s now supply approximately 80 percent of the state’s geospatial data thanks to the adoption of Virtual Alabama
• Data shared extends beyond disaster management to include education, economic and agriculture segments
After winning approval from the state government in July 2006, the Virtual Alabama program was born.

Using Google Earth Enterprise, Virtual Alabama helps the state assemble, display, evaluate and share data with state, county and municipal governments, including emergency responder teams and law enforcement. One neat example involves historical aerial photography. After a recent tornado, officials could look at pictures of towns before and after to respond to emergencies and also to help insurance companies estimate damage.

Despite initial worries that state, county and municipal governments would be reluctant to share their data, rapid program adoption by some of the poorest counties in Alabama – many of which had never seen their county mapped in a unified geospatial system – spurred more affluent counties to quickly follow suit in bouts of friendly competition. Since program launch, the Virtual Alabama user base has grown to more than 2,100 users representing over 550 agencies across the state. County and municipal governments now supply approximately 80 percent of the state’s geospatial data.

Equipped with the Google Earth platform, ALDHS has been able do such things as model hazardous explosions with resulting plume possibilities, allowing department officials to plan public evacuation routes more effectively. With the enhanced situational awareness provided by such data, ALDHS officials can not only plan more effective disaster response scenarios, but emergency teams are better equipped to respond to crises because they have access to accurate data shared by all emergency response teams.
Figure 4 - A red and yellow cloud plume overlaid on a Google Earth aerial map helps first responders assess and rehearse for disaster scenarios.

Figure 5 - The National Sex Offender Database is fully-mapped into Virtual Alabama providing authorities with virtual tagging of offenders to their residential addresses.
Success Factors

Key to the success of Virtual Alabama is that fact that contributing groups have no fear of redistribution of data, explains Chris Johnson, Vice President of Geospatial Technologies at GTAC1.

Because of this level of security, Virtual Alabama has created a community of users across government lines that are dependent on each other. “The strongest part of this program is not the hardware, the platform, or the data collection, but the community of users that has given strength to the program,” says Ms. Johnson. Moreover, she notes, “we see Google Earth Enterprise as a keystone to this program” for a number of reasons, not the least of which is usability. “We call it a twelve-year-old program,” she adds, “because any twelve-year-old could use it. We hope you don’t mind.”

Other agencies are taking note. The Environmental Protection Agency’s Greenversations blogger Molly O’Neill blogged: “…Virtual Alabama started as a Homeland Security project that has been adopted by the entire state. …its success lies in the fact that there is an organization in place well adapted to constantly harvest data – a data fusion center. This is my take away … seeing Virtual Alabama as a best practice… something we at EPA can certainly learn from.”

Other States are Catching On

<table>
<thead>
<tr>
<th>How Virtual Alabama is Being Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Common operational picture for emergency personnel</td>
</tr>
<tr>
<td>• Emergency evacuation routing</td>
</tr>
<tr>
<td>• Situational awareness</td>
</tr>
<tr>
<td>• Vehicle and asset tracking</td>
</tr>
<tr>
<td>• Implementation of protective measures during events</td>
</tr>
</tbody>
</table>

1 Google Case Study: Alabama builds a secure common operational picture for the entire state with Google Earth Enterprise
Other emergency management organizations have found Google’s geospatial solutions equally helpful in designing their own solutions. For example, the State of Florida uses Google to make information available to the public before, during and after weather events. And the San Diego Red Cross uses Google geospatial solutions to maintain real-time information; share documents, maps, and data; and provide alerts, task planning, resource tracking and performance metrics during a disaster.

Much of this success comes down to the fact that Google’s geospatial solutions:

• Are simple to use and most users are familiar with the platform already
• Are accessible anywhere, anytime from a desktop or mobile device
• Support community engagement and make it easy to share information with the public
• Are cost effective because they use existing resources and data
• Can operate disconnected behind a firewall or in an air gapped classified facility
• Allow users to optimize a common operating picture

About Google Earth Enterprise

Google Earth Enterprise connects geographic data to people, work, and processes by providing a fast and simple-to-use interface for non-specialist users to explore and interact with massive datasets of their own geospatial data.

How it works

Google Earth Enterprise uses some of the same concepts and technology that is used to serve Google Maps to millions of users and brings it to an organization’s or agency’s data, allowing easy and secure access through the Google Earth Enterprise client or through a browser using the Google Earth API or Google Maps API.

Google Earth Enterprise is comprised of two distinct software packages that work together to build and host private Google Earth and Google Maps layers. Users can view these maps using the Google Earth Enterprise Client or in a browser like Google Maps.
Complimentary Solutions

Google Earth Enterprise is one of several Google Earth and Maps Enterprise products used in government to make location-aware decisions. The following are several examples of Google products at work:

| **Google Maps Engine** | Google Maps Engine is a cloud-based service for storing, processing and visualizing terabytes of GIS information on maps through the familiar Google Maps/Earth interface. Google Maps Engine also allows agencies to obtain access to the world’s largest geospatial database, including maps, satellite views, and 45-degree imagery. Map layers are delivered from the cloud, so authorized agency personnel can access and update information from anywhere, using any device. Processing new inputs to the data catalog is faster, the result of Google’s vast computing resources. In addition, cloud computing lowers storage costs for the data catalog. Like other cloud applications, Google Maps Engine is provided as a service, so agencies avoid capital costs for hardware and software. Capacity can also be scaled up or down based on demand, only paying for what is needed. Google also takes care of server maintenance and backups. Perhaps one of the biggest advantages of Google Maps Engine is its familiar interface, making it simple for agency personnel to add, search for, and access imagery and vector and terrain data without worrying about staff training or change management issues. Agencies and organizations are billed based on storage and page views. There are no client software licensing costs, and no capital or operational expense for servers and storage. |
| **Google Maps API** | Google Maps API is a collection of APIs that enable agencies and organizations to overlay their own data on a customized Google Map. GIS teams, emergency personnel and first responders can create web and mobile applications with Google’s powerful mapping platform including satellite imagery, street view, elevation profiles, driving directions, styled maps, demographics, analytics and an extensive places database. |
| **Google Maps Coordinate** | Google Maps Coordinate is a workforce management tool that improves the efficiency of an agency’s mobile emergency management teams. People are shown on a Google Map, making it easy to assign tasks to the nearest available team member. By getting real-time visibility into where teams are and what jobs they are doing, emergency response tasks can be scheduled in a smarter, more efficient way. |
Chapter 3: Comprehensive Search – Finding Information, Resources and People in Times of Crisis

Learn about:
— The challenges of searching for information across websites and data repositories during an emergency
— How to increase the findability and relevance of information
— How the American Red Cross keeps citizens linked to the right information during a crisis

In times of crisis, fast and reliable access to information and resources is critical – this is true whether you are part of an emergency management unit or a citizen in need.

Emergency management and homeland security personnel rely on vast and disparate data sources to help them make informed decisions – in the office and in the field. These include databases, public websites, intranets and extranets, spreadsheets, word processing documents, PDFs, GIS data, and more. With such vast repositories of data, making emergency response data “findable” can be a challenge – especially in situations when the public and first responder teams need instant access to up-to-the-minute information about disaster support resources, the location of personnel and citizens, and so on.

To help address these challenges, more and more agencies are turning to the power of Google to help them make fast, accurate decisions and disseminate agency knowledge. Google’s business is built on search – with a particular focus on findability and relevance.

Universal Search is the key to tapping into the incredible foundation of knowledge that exists within an organization. Not only are inefficiencies reduced and productivity increased, but emergency management teams can become more streamlined by breaking down silos and making secure knowledge sharing from within as easy as finding information on the Web.
Google’s Enterprise Search Provides Fast, High Quality Search Functionality

Google Enterprise Search helps agencies strengthen their ability to access and disseminate knowledge, and can help citizens and first responders find the valuable resources and information they need, when they need it.

**Google Search Appliance** (GSA) allows users to execute universal searches through one familiar search box, returning content results from a multitude of sources that includes intranets, web servers, portals, file shares, databases, content management systems, real-time data in business applications, and cloud-based systems (Google Apps, Google Search, and Twitter®). With its ability to search for information stored in over 220 file types across multiple enterprise systems, the GSA is a relatively simple, highly scalable intranet search solution.

GSA enables emergency management personnel to make full use of their resources to achieve their mission.

GSA can also be integrated with Google’s geospatial visualization tools, allowing massive amounts of GIS data to be quickly and effectively parsed, providing users with “need-it-now” mission knowledge that makes the critical difference during and after a disaster.

Additionally, with **Google Site Search**, agencies can incorporate the familiar Google search functionality into critical websites and deliver fast and relevant search results. Google Site Search can be customized to reflect an agency’s or department’s branding. Simple to set-up, Google Site Search also lets agencies customize and highlight relevant information so that visitors can find the results they need – particularly useful during an emergency situation.
Case Study: The American Red Cross Improves Search and Keeps Citizens Informed with Google Search Appliance

Google Search Appliance and Google Site Search enable both emergency management professionals and constituents to quickly and easily search and access the documents they are looking for. Case in point, the American Red Cross, who relies on its public-facing websites and its intranet to keep citizens, employees and volunteers informed about its activities. During a disaster, its main website, www.redcross.org experiences a huge surge in traffic – up to 200,000 hits a day – and, quite literally, underpins everything the organization does. During a crisis, the website is often updated to replace the regular home page with an emergency template populated with content designed to help citizens leverage its resources.

With such a heavy reliance on its website for delivering information, the American Red Cross needed a faster search system that would deliver better results than its legacy CMS-based search tool which used a meaning-based context model driven by questions, phrases, or sentences, rather than keywords. This approach often failed to deliver relevant results. In addition, the connector linking the previous search engine to the CMS was slow – meaning it could take up to 10 seconds to deliver a search result.

With a wealth of resources to be searched, including photos, videos, and multi-lingual resources, the American Red Cross knew it had to find a better way for people to search and find relevant information – both on its external site and its intranet.

The American Red Cross selected Google Search Appliance as a solution to its challenges. It deployed two GSAs, one in a production environment and another as a backup – all in one weekend.
Speaking in a Google Case Study, Ivan Chou, Web Applications Engineer for the American Red Cross had this to say: “Out of the box, the search results from the GSA were excellent,” he says. “We did almost no tweaking on our end, and our users comment on how pleased they are that the right search results come straight to the top. Now if you type in Haiti earthquake or CPR classes, you get back just what you are looking for in the first page – and results are returned in a few seconds versus ten.”

“Search has been more popular after deploying the GSA, and has been driving a higher number of page views,” says Chou.
Chapter 4
How to Make Fast, Informed Decisions with Real-Time Collaboration Apps

Learn about:

— How emergency management teams can make fast, informed decisions with cloud-based productivity and collaboration apps

— How these apps put government data security first

— Google Apps at Work: Virginia General Assembly and the Uniformed Services University of the Health Sciences

Making fast, informed decisions – whether at their desks or in the field – is an increasing challenge for emergency management and law enforcement officials. Why? Information overload is one issue, and it’s a theme we touch on throughout this eBook. The volume of information that agencies and departments are dealing with is ever-increasing, but traditional technologies aren’t keeping up. Finding and accessing the right information, when it’s needed, has become a big challenge.

Another critical factor in emergency management and response is collaboration. In times of disaster and even in day-to-day emergency management, real-time collaboration between distributed teams and organizations is critical.

Lastly, anywhere access to people and information is something we take for granted in our personal lives thanks to the proliferation of smart phones, tablets and social media. But how to government officials leverage this type of access to be more productive?

Google Apps for Government puts Security First

• Segregated system for government data
• FISMA accredited
• SAS70 Type II certification
• Data stored in continental U.S.
• Data encrypted at rest
Cloud-based Google Apps – a suite of enterprise-level email and collaboration tools – not only address these challenges, they also dramatically lower the total cost of ownership by storing information securely and accessibly in the cloud. This chapter will discuss how emergency management and law enforcement officials can leverage the power of Google Apps to focus on their mission, and not on IT.

**Google Apps for Government**

When you think of Google and email, Gmail is probably the tool that springs to mind. But it’s more than that. Google Apps includes the power and productivity offered by Gmail plus an integrated toolset of real-time document creation, management, collaboration, archiving and ediscovery capabilities; a personal, group, and enterprise-wide calendar; IM, voice and video chat; easy-to-build project web sites (HTML not-required), and more.

All of these tools are widely deployed in small and enterprise businesses across the globe, but what makes Google Apps for Government different?

**Security**

Cloud security is a critical issue for government agencies. Google Apps for Government includes dozens of security features specifically designed to keep mission-critical and sensitive data safe, secure and in an agency’s control. This segregated system, for government customers in the U.S. only, was the first multi-tenant cloud-based application suite to receive FISMA accreditation (moderate level) from the U.S. federal government. Google also has a SAS70 Type II certification. In addition, Google provides segregated systems for government data. Effectively, the data is hosted on a separate infrastructure to Google Apps for Business or Education. Also, all data is stored in the continental U.S. and is encrypted at rest.

**Government Adoption is Widespread**

*Government in 45 states* including state agencies, police departments, cities and counties, as well as federal agencies such as NOAA, GSA, the U.S. Coast Guard Academy, and Naval Academy, all use Google’s secure, reliable workplace tools for increased collaboration and information sharing.
Reduced Licensing Costs

The entire Google Apps suite is available at a low annual cost per user (less than $50), providing cost savings of as much as 50% annually for many government organizations.

Low Infrastructure Costs

As a cloud-based solution, agencies don’t need to buy or maintain servers. Everything can be managed from a single interface so agencies spend less time managing their IT infrastructure.

Increased Employee Productivity

Going back to the challenges of managing information overload, cross-boundary communication and collaboration, and the need for anytime, anywhere access to data and people – Google Apps helps agencies work faster and smarter by making it easy for everyone – employees, partners, vendors – to collaborate effortlessly.

Google Apps at Work – Virginia General Assembly

To spotlight what Google Apps can do for government agencies and, specifically, how these productivity tools can be adopted within a traditional IT environment, the Virginia General Assembly’s technology agency – the Division of Legislative Automated Systems (DLAS) and, a separate yet-related team, the Virginia Senate IT department – shared their challenges and outcomes in this webinar: Leveraging Google Apps for State and Local Government.

This use case typifies the experience of many agencies and departments, whether their mission is emergency management-related or otherwise. Here are some key learning moments from their use case:

“… (using Google Apps) was as simple as going home and opening a browser. You don’t need a client or a desktop or a connection to a specific server or database…enter a URL and password, anywhere, and there’s your mail, there are your Google Docs.”

Troy Crawford, Network Analyst, Virginia General Assembly
DLAS provides IT support and services to 11 legislative agencies and commissions and was seeking to transition from Lotus Notes to a new email solution in order to simplify licensing costs, reduce the administrative overhead involved in managing an on-premise service (and a multitude of servers), increase mobility, and enhance continuity of operations planning. DLAS also faced the growing challenge of dealing with managing Lotus Notes across a multitude of different Microsoft Windows environments, Apple Mac computers, as well as a range of disparate mobile devices.

For DLAS, Google Apps’ Gmail service provided low total cost of ownership per user, massive email storage capability per user (25GB), no hardware on-site, and seamless upgrades within the cloud.

DLAS also quickly recognized that Google Apps would streamline and expedite the process of setting-up and managing the variety of client systems in use across DLAS’ user population.

And, because Google Apps is hosted in the cloud, even if a catastrophic event occurred, the data would be secure and available anytime from anywhere.

**Migrating to Google Apps**

Migration to Google Apps began in 2008 and included a pilot project to compare the Lotus Notes and Google Apps side-by-side to demonstrate the benefits of making the move to Virginia Senate staff. By 2010, all DLAS staff, supported agencies, and the Virginia Senate had converted to Google Apps.

DLAS also leveraged Google’s Notes Migration Tool to transfer contacts and calendar data. DLAS was also able to retain the 11 different domain names in place across the General Assembly thanks to Google’s multi-domain functionality which allows email administrators to manage all domains under one administrative account.

**Seamless User Training and Familiarization**

From a user perspective, each user was given access to Gmail and offered training prior to the completion of the migration in order to familiarize themselves with its features.
The implementation of Google Apps within the Virginia Senate (a separate agency) was a little different. A survey of users showed that many were already using Gmail and were familiar with the interface. As a result, the migration occurred at a departmental level. Prior to the implementation, each department was provided with Google’s “Life After Notes” guide which walked them through key tasks and actions in the Gmail environment in the context of how they would have done it in Lotus Notes. Following these meetings, departments were switched over to Google Apps and received formal training from Senate IT staff.

“Learning a new system is always challenging…but we also wanted to show our users the range of customization they had at their fingertips,” explained Troy Crawford, DLAS Network Analyst. “We also wanted to show them that (using Google Apps) was as simple as going home and opening a browser. You don’t need a client or a desktop or a connection to a specific server or database…enter a URL and password, anywhere, and there’s your mail, there are your Google Docs.”

How DLAS and the Virginia Senate have benefited from Google Apps

“Some of our users have more than one calendar, some even have up to 10 and they really enjoy being able to synch their calendars to their mobile phones,” said Troy Crawford.

“As an administrator, it’s great to be able to spend some time on other projects versus having to worry about server crashes or trying to make sure that data is getting backed-up and stored every night. Our helpdesk receives fewer calls… it’s really benefitted us as an IT agency quite a bit.”

From a cost savings perspective, once the application conversion from Lotus Notes is complete (three to five years), the agency expects to save 66 percent in licensing costs alone. In addition, the migration to Google Apps has freed up server space and 60 percent of hard drive space previously used by Notes has been designated to other services in the virtualized data center. A Blackberry® Enterprise Server was also decommissioned.

2 Note: You can use the email address that matches your organization’s name and web address: you@youragency.gov.
Google Apps at Work – The Uniformed Services University

The Uniformed Services University of the Health Sciences (USUHS) is the Nation’s federal health sciences university. With over 3,000 billeted and approximately 6,000 non-billeted faculty, staff, and students, the University is committed to excellence in military medicine and public health during peace and war.

As USUHS continued to grow and technology evolved, the University began looking at alternative options to its existing on-premise Novell email system. USUHS wanted to enable more effective collaboration, but still maintain the tight security controls required by the Department of Defense (DoD).

Technology changes daily and USUHS knew with the right email solution and the right team in place, it could do so much more. Without much flexibility built into its system, USUHS had to take multiple steps to get even the easiest collaboration tasks completed. Their email system didn’t offer anything more than basic messaging and lacked storage capacity.

Finding the Right Combination of Tools and Expertise

Towards the end of 2011, the University formed a committee of experts from different departments to review alternative options to its existing email system and address organization-wide challenges — reduce operating costs, consolidate disparate systems, and ultimately create a better workflow.

The committee set three main objectives:

- Improve communication and collaboration while adding additional storage
- Provide better integration with the existing learning management system (LMS)
- Reduce costs
USUHS evaluated cloud, hosted and on-site options, but ultimately decided to conduct a pilot. They contracted with DLT Solutions for the acquisition of 3,700 licensed seats and migrated to Google Apps for Government from its existing Novell GroupWise and Microsoft Exchange 2003 environments. DLT brought on leading cloud services brokerage, Cloud Sherpas, to help execute a seamless migration.

In addition to the need for a more modern email solution, USUHS was looking at ways to collaborate more closely within study groups as well as among faculty and staff. For example, keeping track of the ever-changing flow of information would require users to build a spreadsheet, send it out to 40-plus people via email, and as updates were made, one person would try to keep up with version control. A better way to work together was needed.

It was when the University added all of its other non-email requirements, it pushed toward selecting Google. With a straight Exchange, USUHS would have had to add additional costs for storage of the networks. After reviewing its options, USUHS found that so many things it wanted came with Google Apps for Government.

**Efficiencies Beyond Email**

In addition to Google’s email application, USUHS implemented other applications including Calendar, Chat, Drive and Sites.

With Google Drive, documents live in the cloud, so USUHS’ team could update documents at the same time, eliminating version control. Google Apps allowed team members to access spreadsheets and other important documents from any location. For USUHS, this was a game changing way to approach a shared project.

The new environment increased government transparency by allowing faculty, staff and students complete access to email and information on demand, vastly improving efficiency and collaboration.
Going Beyond to Keep Data Safe and Secure

For USUHS, this wasn’t an “out of the box” implementation. As the implementation progressed, DLT and the University discovered additional security challenges. For users to collaborate on tasks and other project documents and deliverables, the University needed to maintain DoD-mandated security controls.

One critical component of the overall email solution was the unique requirement to have Google Apps for Government fully Common Access Card (CAC)-enabled and digital signature and encryption capable. This would include the ability to utilize CAC for authentication purposes for the Google Apps for Government suite.

To move forward with the added layer of security, modification was needed. With the support and expertise of DLT and its team of solution partners, the cross-talk capability — a SecureAuth SAML-bridge — was deployed. Even with the added challenge, DLT was able to draw on its numerous internal and external resources to deliver the hardware needed to set up the SecureAuth SAML-bridge.

Throughout the implementation, DLT worked closely with its network of cloud partners, allowing the team to keep the project on time and provide flexibility to meet the strict security demands mandated by the DoD.

Impact

Google Apps and DLT have enabled USUHS to successfully streamline its internal communications process, which has resulted in enhanced collaboration. Users are now able to gain secure access to accurate and updated information, improving operations for faculty and staff and providing improved communications with its students. They are also able to quickly create, edit and share calendars to one or dozens of colleagues and classmates, and even telecommute. USUHS found that faculty and staff could work just as efficiently even if they didn’t have their standard government-issued laptop with them. With Google Apps, users can gain access through CAC login and can see their documents and emails via the cloud.

“Google Apps provides robust security and privacy features including encryption, advanced spam, virus and phishing protection and physically secure data centers, as well as 99.9 percent uptime.”
“USUHS found that switching to Google Apps would save the university approximately $55,000 in capital expenses/maintenance fees year-over-year and $30,000 in personnel resources annually,” says Greg Mullin, director of public sector, Cloud Sherpas, a DLT Solution Partner and Google Enterprise 2011 Partner of the Year. “Google Apps provides robust security and privacy features including encryption, advanced spam, virus and phishing protection and physically secure data centers, as well as 99.9 percent uptime.”

**Added Benefits**

- **Mobility** - Access information from any location and any device 24/7.

- **Productivity** - With 70-80 distributions lists that were in various stages of accuracy, Google Apps tools enabled USUHS to tie the Google groups and the memberships for those groups back to the University’s corporate central database.

- **Collaboration and Transparency** - Users have found that Google Apps collaboration features such as calendar overlay and Google Docs allow for more transparent work processes.

- **Storage** - With 122TB of storage in the cloud provided by Google for email and other data, the University’s faculty has also been able to take advantage of its video capabilities.

USUHS also took advantage of the Google APIs Discovery Service, which offers a central location to find applications programming interfaces. The service includes one year of archived email storage where users no longer need to call tech support to gain access to outdated or accidently deleted emails. The added feature will save hundreds of man-hours by eliminating a large percentage of email restore requests.

**Did you Know?**

Email-as-a-Service is the simplest and most mature cloud based productivity platform covered under The Federal Risk and Authorization Management Program.

As an awardee of the GSA Email-as-a-Service BPA, DLT Solutions delivers Google Apps for Government Email-as-a-Service solution, migration, support services and a quicker procurement path. DLT Solutions can help you reduce Infrastructure management resource demands, software costs, and eliminate underutilized hardware while increasing reliability and employee productivity.

For more contract details go to BPA Contract #GS00Q12AEA1008
Google Apps

The following screen captures demonstrate the unique information management, collaboration and real-time communication capabilities of Google Apps Gmail, Calendar and Documents.

Figure 6 - The familiar Google Apps Gmail interface - with 25 GB of storage, rich search functionality which helps agencies manage information load (search emails by individual, by file name, and more). Labels also allow users to file emails into folder structures. Users can also seamlessly respond to emails via chat and communicate via video chat or via a mobile device video capability.

Figure 7 – Conduct a real-time video conference with colleagues within the Google Apps Gmail inbox in just one-click. Alternatively you can call anyone, anywhere with the embedded web-based phone call function.
Figure 8 - Create documents and edit them with co-workers or team members in real-time. Use the chat feature to collaborate and enter information in one document at the same time.

For a full overview of these and other features of Google Apps, including Sites, Slides, Vault (for arching and ediscovery), Drive (share files and access them from anywhere on a Mac, PC, or mobile device) and more, visit Google Apps for Government.
Chapter 5
Beyond Disasters – Breaking Down Silos for Transparency of Data Day-to-Day

Learn about:
— Tools that can help law enforcement to search and map the geo-location of offenders
— The new trend for predictive policing
— How custom Google apps can support crowd sourcing as a crime-prevention/response resource

Mapping, visualizing and sharing data clearly affords a host of benefits when planning and responding to crisis events, but what about the day-to-days tasks that emergency management and homeland security teams face? With the sheer volume of information that’s out there today, how can teams organize that data better and present it in more meaningful ways so that they can make informed decisions within a geographic context? Organizing the world’s information and making it universally useful and accessible is core to Google’s mission. Hopefully this eBook has shed some light on the many tools and applications from Google that can help.

For example, the Google Search Appliance and Google Maps when used together, allows law enforcement officials to index information internally and instantly search and map the geographic location of known offenders.

Likewise, as we discussed in Chapter 2, emergency responders can use Google Earth Enterprise to build a common operating picture during emergencies that provides real-time systems to visualize state assets, infrastructure and imagery across hundreds of agencies. Virtual Maine and Virtual Alabama being two examples of these types of deployments.
Another day-to-day law enforcement use case of Google technology comes in the form of predictive policing. Currently the Los Angeles Police Department uses analysis to predict where crimes may occur based on historical data such as the event, place, and time of previous criminal activity. This provides for efficiencies in the deployment of police officers to known-crime hot spots.

Crowd sourcing or user-generated content is also helping agencies respond to criminal incidents whereby good Samaritans can share information or imagery of a crime via their mobile apps using Google APIs and custom law enforcement apps developed using Google’s open source technology.
Chapter 6: Conclusion

Let’s recap.

Google’s mission is to “… organize the world’s information and make it universally accessible and useful.”

For the public sector this mission underpins a range of technologies that provides a significant operational and cost advantage.

In this eBook we saw how Google Earth Enterprise has enabled emergency management teams in Maine and Alabama overcome the challenges of sharing geospatial intelligence across multiple teams, agencies and even countries – with a ubiquitous and low-cost tool. Thanks to Google Earth Enterprise, these states have succeeded in building a common operating picture that brings together GIS and other data to help public safety and emergency responders stay one-step ahead, during and after a disaster.

We’ve also seen the role that tools such as Google Search Appliance can play in helping agencies search and access critical information in emergency situations, as well as increase the “findability” and relevance of information across vast repositories of data. As a result, agencies can break down massive silos of information and speed up the delivery of information internally and with the public at large.

Access to information is important, but it brings with it the challenge of information overload which can quickly compromise the ability of emergency responders to access and assimilate data and collaborate effectively – at the office or in the field. Google Apps for Government addresses many of these challenges by providing a low-cost, cloud-based solution for productivity and collaboration – helping emergency management teams to make fast, informed decisions, backed by the power of Google’s FISMA-accredited security features.
Going beyond disaster situations, Google tools also help emergency management personnel with day-to-day tasks, from geo-locating known offenders with Google Search Appliance and Google Maps to soliciting feedback from the public on criminal incidents with Google API-based crowd sourcing apps.

Thanks to the breadth of continued innovation by Google – both in the lab and in partnership with government agencies – emergency personnel have an unparalleled opportunity for optimal situational awareness based on a common operating picture across teams, infrastructures, data sets and sources, and more.

Additional Resources

The Google Solutions Team
goole-solutions@dlt.com
877-385-3581
www.dlt.com/google

Google.com Public Sector Resources
www.google.com/enterprise/apps/government/

Google Public Sector and Elections Lab
www.googlepublicsector.blogspot.com
Work the Way You Live

Improve productivity, reduce costs, and spend more time focused on your core mission with innovative solutions from Google Enterprise:

• **Find what you need, fast** and connect your employees and constituents with the information they care about.

• **Visualize your agency's data** and improve decision making with Google Maps and Earth Enterprise.

• **Work better, together** with Google Apps, a cloud-based productivity suite that connects your employees anywhere on any device.

Learn more at [www.dlt.com/google](http://www.dlt.com/google)
Google Emergency Response Tools for Govies™ addresses many of the questions emergency management personnel have about how they can overcome the challenges of achieving heightened situational awareness – both day-to-day and in an emergency. We discuss, using real-life examples, how these teams can leverage cost-effective tools from Google to access, share and act on critical information before, during, and after a disaster or emergency.