# TABLE OF CONTENTS

Executive Summary  
Problem Definition  
San Francisco’s Current Practices and NGO Partners  
MISSING PERSONS  
LAW ENFORCEMENT  
OFFICE OF THE CHIEF MEDICAL EXAMINER  
REUNIFICATION  
SAN FRANCISCO GOVERNMENT ORGANIZATIONS  
NON-GOVERNMENTAL ORGANIZATIONS  
CONCLUSIONS ON CURRENT PRACTICES AND NGO PARTNERSHIPS  
Alternatives  
ALTERNATIVE A: UNIFIED VICTIM IDENTIFICATION SYSTEM  
UVIS MODULES  
UVIS FOR SAN FRANCISCO  
ALTERNATIVE B: REDDINET  
ALTERNATIVE C: NATIONAL LIBRARY OF MEDICINE  
ALTERNATIVE D: CRM  
Criteria for Evaluating Protocols and Systems  
RELIABILITY AND SECURITY OF COLLECTED MISSING PERSONS DATA  
COLLECT, ORGANIZE, AND SHARE DATA ON MISSING PERSONS  
COORDINATION AMONGST GOVERNMENT AND NON-GOVERNMENT ACTORS  
Analysis of Alternatives  
EVALUATION MATRIX  
ALTERNATIVE A: UVIS  
EFFECTIVENESS OF DATA COLLECTION, ORGANIZATION, AND RETRIEVAL  
DATA SECURITY AND PRIVACY  
SIMPLE AND EFFICIENT INTERFACE  
DATA SHARING AND SYNERGY  
REGIONAL AND SCALABLE VERSATILITY  
IMPLEMENTATION FEASIBILITY
**POLITICAL AND LEGAL FEASIBILITY**  
- UASI GRANT  
- ALTERNATIVE B: REDDINET  
- ALTERNATIVE C: NATIONAL LIBRARY OF MEDICINE  
- ALTERNATIVE D: CRM  
**Recommendation**  
- Implementation  
  - CHAMPION  
  - COORDINATION  
  - TRAINING  
**Appendices**  
- APPENDIX A: SYSTEM REQUIREMENTS FOR RFI  
  - RELIABILITY  
  - SECURITY  
  - INTERFACE  
  - SHARING  
  - SCALABILITY  
  - IMPLEMENTATION  
- APPENDIX B: SYSTEM SCREENSHOTS  
  - UVIS  
  - REDDINET  
  - NATIONAL LIBRARY OF MEDICINE  
  - CRM EXAMPLE  
- APPENDIX C: KEY CONTACTS  
- APPENDIX D: UVIS CASE STUDY – RENO, NEVADA  
- APPENDIX E: UVIS LICENSE  
- APPENDIX F: LIST OF PERSONS CONTACTED  
- APPENDIX G: RESOURCES
EXECUTIVE SUMMARY

The Bay Area has not experienced a large-scale disaster since the Loma Prieta earthquake in 1989. There is a 50 percent probability that an earthquake of 6.7 magnitude or higher will occur in the San Francisco Bay Area by 2039.\(^1\) If an earthquake equal in magnitude to the 1906 San Francisco were to occur during business hours, the U.S. Geological Survey estimates that there could be 5,900 fatalities.\(^2\) It is highly likely that the Bay Area will confront a disaster of natural or manmade origin in the foreseeable future. Comprehensive emergency management strategies determine how the region can mitigate the impact of disaster incidents.

Existing emergency management plans for San Francisco lack a coordinated post-disaster missing persons process. The current process relies on a Google form created by the San Francisco 311 Customer Service Center (311) in cooperation with the Office of the Chief Medical Examiner (OCME) to account for missing persons reported to 311. The OCME is not prepared to accommodate significant call volume. The San Francisco Police Department (SFPD) also collects missing persons reports. Existing technology does not facilitate coordination between these parallel systems. The American Red Cross Safe and Well program collects and disseminates information about citizens who register themselves as safe and well.

311 asked us to investigate alternative systems that (a) collect and organize missing persons information collected through a call center, (b) identify “found” people, and (c) share the information with requisite City agencies. We established eight principal criteria related to evaluate alternatives’ ability to reliably and securely collect, organize, and share missing persons data and to co-ordinate amongst government and nongovernment actors.

We recommend that 311 implement the Unified Victim Identification System (UVIS).

If San Francisco is unable to license UVIS, 311 should collaborate with the Office of Contract Administration to create a request for information (RFI). The goal of the RFI is to clarify the best process and partners to create a customized missing persons system. In their current forms, other systems that we have analyzed have strong points yet prohibitive limitations. The RFI would invite responses from ReddiNet, the National Library of Medicine, and other organizations. Responses should address gaps related to reliability, security, interface, sharing, scalability, and implementation.


PROBLEM DEFINITION

In the event of a natural or manmade disaster in San Francisco, the City and County of San Francisco (the City) would expect an extraordinarily high call volume from people reporting missing persons. The residents, businesses, and visitors whom 311 serves would contact the Office of the Chief Medical Examiner (OCME), the police department, or local hospitals. These calls would detract from the capacity of these crucial organizations to focus their resources on responding to the disaster. OCME approached 311 with a request to develop and implement a post-disaster missing persons process.

311 is the primary interface between (a) City and County of San Francisco municipal departments and agencies and (b) San Francisco’s approximately 826,000 residents, workers in and visitors to the city. Among its functions, 311 provides non-emergency response information and communications support to the government and community. 311 also resolves information and service requests (including 16,397 cases in 2013), integrates information across government agencies, and performs reporting and analysis to improve government service delivery.

“Every phone line [at the Office of the Chief Medical Examiner] was utilized and callers got busy signals. The system was overwhelmed…the call volume required personnel to divert resources from other primary tasks.”

– Acting Medical Examiner’s Administrator at the OCME

San Francisco has not seen a large-scale disaster since the 1989 Loma Prieta earthquake. That disaster killed 63 people in Northern California,\(^3\) injured 3,757,\(^4\) and left as many as 12,000 homeless.\(^5\) \(^6\) The current Acting Medical Examiner’s Administrator at OCME reported to us that, in 1989, “every phone line [at OCME] was utilized and callers got busy signals. The system was overwhelmed. Investigators were dispatched to death scenes. The call volume required personnel to divert resources from other primary tasks.”\(^7\)

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\(^{7}\) We interviewed Christopher Wirowek on April 8, 2014.
The likelihood of another large-scale natural disaster occurring in San Francisco in the foreseeable future is relatively high. There is a 50 percent chance of a magnitude 6.7 earthquake occurring in San Francisco over the next 30 years.\(^8\) U.S. Geological Survey (USGS) earthquake prediction models estimate that, no matter where the earthquake originates among the major Bay Area fault lines, social and economic disruption will surpass the Loma Prieta earthquake.\(^9\) These likely scenarios predict up to several thousand fatalities, and between 16,000 and 150,000 uninhabitable residences, across the affected region.\(^10\) San Francisco is also a potential target for terrorist attacks.

Other urban centers have faced the challenges of identifying missing persons after a disaster. The 2005 London subway bombing generated more than 4,000 calls within the first hour alone.\(^11\) Following September 11, approximately 40,000 persons were reported missing. Hundreds of detectives worked for months to track down leads from the United States and 88 countries and it took two years to identify the remains. The number of fatalities was eventually determined to be 2,752.\(^12\)

*After Hurricane Katrina, explained Woodworth, while the systems “meant well,” they “didn’t talk to one another,” they were “highly inaccurate,” they “did not collect the right data” and “there was no privacy.”*

In 2005, Hurricane Katrina demonstrated the importance of a coordinated and government-led missing persons protocol. Brent Woodworth, now the President of the Los Angeles Emergency Preparedness Foundation,\(^13\) explained that the ad-hoc creation of several missing persons systems created confusion and compromised public safety. While the systems “meant well,” they “didn’t talk to one another,” they were “highly inaccurate,” they “did not collect the right data” and “there was no privacy.”

The recent experience from the 2013 Boston Marathon bombings demonstrates why effectively managing these problems is a vital component of the overall emergency management strategy. The Mayor’s 24 Hour Constituent Service\(^14\) was expecting to receive around 80 calls the day of the marathon. Instead, they received 8,600 calls in 24 hours. This 1,000 percent increase led to the creation


\(^10\) Ibid.


\(^13\) According to the Foundation’s website, Brent Woodworth is a leader in global risk and crisis management. He worked at IBM for 32 years, where he managed worldwide crisis response team operations. We interviewed Woodworth on March 16, 2014.

\(^14\) The Mayor’s 24 Hour Constituent Service provides an equivalent service to San Francisco 311. The main difference is that they have a 10 digit phone number instead of a 311 or 211 number.
of 2,400 records in the makeshift Google Doc they created. Those 8,600 calls led to only 28 matches of missing people. When calling in to the service, many people experienced delays or busy signals for 10 to 20 minutes before they were able to speak to an operator.\(^\text{15}\) Without establishing a plan to deal with this volume ahead of time, San Francisco can expect a similar situation.

Hastily constituted systems often do not take measures to protect information. Poorly coordinated systems create inefficiencies; families and friends need to report missing persons to several organizations. Worried friends and relatives also make multiple reports for the same missing person, necessitating a system’s ability to easily identify duplicate entries.

Most people are skeptical of government systems that collect identifying information. For example, many people living in California are undocumented residents. Some may not feel comfortable sharing their information with a government organization, even in the aftermath of a disaster. Even if the purpose of the information collection seems clear, the public must perceive government’s use of their information to be in accordance with its purpose. They must also believe that their privacy will be protected.

It is important to comment here on the scope of our analysis; we evaluate a range of systems rather than explore different ways to modify the Google-based system currently in place. 311 and OCME’s temporary fix—an informal system based on Google Docs—presents new issues withoutremedying enough existing problems. Two specific issues bear mentioning:

1. Google does not “make any commitments about the content within [its] services, the specific functions of the services, or their reliability, availability, or ability to meet [users’] needs.” In practice: a disaster occurs, 311 and OCME use Google Docs, the system fails, and Google makes no commitment to fixing it or to ensuring that it functions in the way that 311 and OCME intend. Google can change the functionality of the system without warning.

2. The most concerning aspect of the Google form: Google retains a license to use the information that is uploaded to their system.\(^\text{16}\) There are limitations on this use, of course, but they are broadly defined and ill-suited to a system that government uses to collect information on missing persons.

Officials in Boston used a makeshift Google form after the 2013 Boston Marathon bombings. They report that it did not perform the way they needed it to and that they are investigating other options.\(^\text{17}\)

\(^{15}\) We interviewed Justin Holmes on April 22, 2014.

\(^{16}\) See, for example, Google Terms of Service at http://www.google.com/intl/en/policies/terms/. “When you upload, submit, store, send or receive content to or through our Services, you give Google (and those we work with) a worldwide license to use, host, store, reproduce, modify, create derivative works (such as those resulting from translations, adaptations or other changes we make so that your content works better with our Services), communicate, publish, publicly perform, publicly display and distribute such content.”

\(^{17}\) We interviewed Justin Holmes on April 22, 2014.
There are more secure methods for storing information about missing persons, such as servers or a cloud controlled by the City and County of San Francisco, not Google. For this reason, we expanded the scope of our analysis beyond recommendations on how to improve the existing Google form. We do not consider a Google form to be a viable alternative.

The issue of ‘control’ is central to other implementation and political feasibility questions. Nongovernmental organizations (NGOs) such as the American Red Cross and Google Crisis Response assist in locating missing persons post-disaster. For logistical reasons, these organizations are often unable to share unabridged data with emergency responders in real-time. Additionally, several people with whom we spoke indicated that large NGOs are unlikely to share their data because sharing may diffuse their donor base. When we asked emergency management departments about NGOs and data sharing, the answer was not encouraging: don’t have high expectations. This is concerning given many government agencies’ reliance on the American Red Cross. It’s important to note that most disaster management specialists with whom we spoke indicated that American Red Cross will continue to play an important role—they have a congressional mandate to collect information post-disaster. The key is to improve the coordination between government and NGO agencies.

In its capacity as an information aggregator and the principal public communications interface of the municipal government, 311 can:

1. Ensure reliability and security of collected missing persons data;

2. Help Bay Area emergency responders collect, organize, and share data on missing persons post-disaster; and

3. Improve post-disaster coordination amongst government and non-government actors in the Bay Area.

Our report analyzes the nature of this opportunity and the ways in which 311 could best collaborate with other organizations to locate missing persons post-disaster and reunify families.
SAN FRANCISCO’S CURRENT PRACTICES AND NGO PARTNERS

Disasters are sometimes difficult to anticipate. It is difficult to predict exactly when an incident will occur, the regional scope of an incident, and the type (natural or manmade). In order to understand the analysis of various proposals for a post-disaster missing persons strategy, it is important to unravel how the current network of players would respond in the event of a disaster in San Francisco and the Bay Area. In other words, without any change in strategy, what would the response look like, which systems would be activated, and what challenges would this current process create when dealing with such a disaster. In this section, we outline the key municipal government players and NGO partners and their current roles in victim identification and family reunification.

Missing Persons

In the event of a disaster in San Francisco, there is not currently a system for sharing missing persons information across constituencies.

Law Enforcement

In the event of a disaster with significant numbers of missing persons, law enforcement personnel would record missing persons reports in the Missing and Unidentified Persons System (MUPS), a state-run system that shares information with the National Missing and Unidentified Persons System (NAMUS) run by the Department of Justice. The system allows the Governor’s Office of Emergency Services to use the Department of Motor Vehicles photo database to provide images of people that may otherwise be difficult to obtain.\(^1\)\(^8\) Only law enforcement personnel are authorized to close missing persons cases on MUPS/NAMUS after an individual is found and interviewed by a law enforcement investigator in person.

MUPS/NAMUS are used by law enforcement agencies that do not share information with outside agencies other than coroners’ offices and medical examiners. Law enforcement, coroners,\(^1\)\(^9\) and medical examiners are the only sources of information input as well as the only sources for closing a missing persons case. An important distinction between MUPS/NAMUS and other missing persons systems is that its scope as a state/national system used for all missing persons cases means that the systems do not segregate cases of missing persons for a single incident. Commingling missing person reports from a disaster incident with the backlog of missing persons cases from around the country needlessly complicates case management.

\(^1\) Photos are matched manually. The system does not currently have an automated face recognition feature.

\(^1\) Most coroners’ offices are part of sheriffs’ departments, so the duties and privileges of coroners’ offices often overlap with law enforcement.
Office of the Chief Medical Examiner

To record ante mortem information about missing persons after a disaster, OCME would use data collected through a Google form created by 311. In a mass casualty incident, OCME does not expect to be able to manage the increased call volume without compromising other services the office provides, most notably investigating deaths throughout the city and managing the various remains coming into their office. OCME would rely on 311 for intake of ante mortem data from the surge of callers that would be expected.

The existing Google form involves intake of information that would need to be re-entered when completing official missing persons reports that would be reported to other agencies, such as MUPS used by law enforcement. This process creates confusion for citizens who have to distinguish between providing information to 311 for input into the Google form and filing out an official missing persons report with SFPD. Search capabilities would be limited to what can be accomplished through Google text search capabilities and would not involve more interactive search functions.

A common refrain from data managers is that the data coming out of a system is only as good as the data going in. This is a particular concern with the Google form that would be utilized by 311 and OCME in the event of a disaster. The querying functions do not currently have the capability to distinguish between “brown hair” and “hair brunette” due to the limited search capabilities and free text entry design of the Google form. Duplicate entries due to inconsistency in data entry would limit the effectiveness of the Google form in the event of a disaster. It is also important to note that the current form system would be challenging not only for citizens calling in during a stressful situation, but also for the call center operators who would complete the intake of information. With reliance on free text entry, as is the case with current form, operators have to spend more time typing information and/or figuring out how they can be consistent so that all people can be accounted for in an effective manner.

While ease of use is an important part of any proposed system, as noted in the Problem Definition above, there are privacy and legal concerns involved with city agencies relying on a private company for the maintenance and security of their information.

For mass fatality incidents in which federal government assistance is requested, OCME would use the Disaster Mortuary Operational Response Team (DMORT) Victim Identification Profile (VIP), which collects both ante mortem and postmortem data. If the federal government activates a DMORT for a San Francisco incident, OCME would need to re-enter the ante mortem data collected through the Google form into DMORT VIP, which would be an inefficient use of resources.
Reunification

Many emergency management officials believe that social media will eventually obviate the need for government or NGOs to be involved in reunification. Currently, however, government works with NGO partners on reunification issues. NGOs will remain involved for the foreseeable future.

San Francisco Government Organizations

In a disaster, SFDEM would be the lead agency for all initiatives, including reunification. Under the guidance of the SFDEM, representatives from different agencies would meet to develop a coherent plan of action. In addition to the SFDEM, the agencies involved in reunification would include: Police Department (missing persons), OCME (decedents), 311 (information dissemination and collection), Human Services Agency (unclaimed minors), Department of Public Health (hospital patients). These government agencies, with the assistance from the American Red Cross, will collaborate to set up Family Assistance Centers, which will form the nucleus of reunification efforts.

Non-Governmental Organizations

American Red Cross

American Red Cross operates the “Safe and Well” website used for family reunification after a disaster. Safe and Well allows members of the public to either register themselves as “Safe and Well” or search for loved ones. Officials at the American Red Cross’ national headquarters determine whether or not to launch a Safe and Well incident page after a disaster. While Safe and Well is available at all times, it is important to note that generation of a dedicated incident page depends on a determination by a national NGO, which may conflict with the interests of the City. In the event of a large-scale natural disaster that displaces a significant quantity of people, Safe and Well would likely be activated. In an event that is confined to a specific area and number of people, the American Red Cross may not activate Safe and Well and local government would have no say in the matter. For example, a dedicated incident page was not deployed for the March 2014 building collapse in East Harlem.

However, it is important to note that the Safe and Well website is always up and available for use in a disaster of any size or scope by simply using the “other” option. It has bilingual (Spanish and English) and mobile capabilities and is included in the entire range of Red Cross emergency mobile applications. If a specific disaster is not in the drop-down menu, the option “Other” is always usable; however, the public may not know that the option is available if American Red Cross is not involved. Classifications about whether or not a disaster will lead to a standalone site on the American Red Cross site depend on cost estimations made by Red Cross officials (Levels 1-3 with 3 being most severe). However, events with a particular level of national attention may also receive Level 3 classification.
The Safe and Well program also includes specific modules for people with pre-existing health conditions and those that cannot be expected to declare themselves as safe and well, known as Emergency Welfare Inquiries as opposed to General Welfare Inquiries. These individuals pre-register their personal information with Safe and Well, enabling Local American Red Cross chapters to dispatch teams (Safe and Well Information Field Team [SWIFT]) to locate those individuals post-disaster.

SFDEM currently relies on the Safe and Well program for the reunification of missing persons. This practice can both be viewed as beneficial and limiting. The benefits to relying on a system that is outside the purview of the City is that it does not require City personnel or public resources to operate. It is also relatively easy to use. Entering someone as safe and well only requires basic biographical data and also allows for selection of a message to display to loved ones. After someone has registered with the system, loved ones can search for them by name and last known address or phone number. As these are free text fields, it is important to note that they require precise entry to avoid duplication, which is difficult to ensure in the event of a disaster or if addresses or phone numbers change frequently.

Officials may have concerns that reunification of some individuals is not desirable, for example, due to concerns about domestic violence or other legal issues. With relatively little information, someone could use Safe and Well to try to verify the whereabouts of a person that they are restricted from contacting.

It is also important to note that the American Red Cross is not always willing to share information with involved local governments. In the Bay Area, information sharing occurs on an ad hoc basis and is not automated. Without coordination between City agencies and the American Red Cross, the City may not be able to access the information it wants/needs in order to synchronize records of those reported safe and well with records of persons reported missing. The balance between ease of use and complete access to information may limit how the City mobilizes various groups in the event of a disaster.

We understand that SFDEM and the local American Red Cross chapter have a close working relationship, and we anticipate that the American Red Cross will remain a pivotal partner in the disaster management process, particularly as it relates to family reunification.

**Google Crisis Response**

The involvement of Google Crisis Response after a disaster would be similar to American Red Cross with their Safe and Well system. Google Crisis Response's system involves two primary tools: Google Crisis Map and Google Person Finder. Google Crisis Map provides a Google Map tailored to the particular incident. For example, it can show location and capacity at various shelters serving particular communities. Google Person Finder allows individuals to post and search for the status of relatives or friends affected by a disaster. The program also lets press agencies, NGOs, and others contribute to the
database and receive updates by using the Person Finder application programming interface (API) based on the Person Finder Interchange Format (PFIF) open standard. It is difficult to speculate the extent to which this tool would be useful for a government agency, as the ability for the City to contribute information is limited due to privacy concerns. However, right now San Francisco does not have a system in place for bringing the data presented on the Google Crisis Map into a City database.

Conclusions on Current Practices and NGO Partnerships

After considering the layout of systems that would be activated in the event of a disaster in San Francisco, it is evident that there are many different actors, each with a different system that catalogs missing persons and/or reunifies families. There is a network of city/county, regional, state, and national public agencies that will work alongside various NGOs to accomplish the task of identifying victims and reunifying loved ones post disaster.

One benefit of the current system is that all of the aforementioned agencies have a system they are familiar with from a technological, operational, and financial standpoint. However, the fact that there is no central system where all information can be collected, disseminated, and analyzed raises some significant concerns for public officials. Immediately following a disaster, callers would likely inundate OCME, SFPD, SFDEM, 311, and the American Red Cross with missing persons reports. Currently, if someone calls OCME to inquire about a missing person, the caller would first give information to the OCME and then be directed to SFPD to file a missing persons report, which would involve repeating much of the same information. SFPD would use the information they collect to import data into MUPS/NAMUS as required by law.

These lists would be separate from information collected by the American Red Cross at their shelters and on their website as people identify as “safe and well.” It is also expected that people would use Google Person Finder concurrently with these other systems. There is no process in place to integrate these various lists. Each database is technologically distinct and it is unclear how or how much information would be shared across organizations. Without a central government-run system that is well advertised to the general public, systems like Safe and Well and Google Person Finder may become heavily relied upon. Under current conditions, San Francisco has limited influence over the missing persons reunification process.

Essentially, this makes it impossible to quickly know with certainty who is missing, who has been found, or who is deceased. This is not only an issue within San Francisco, but would also impact the other Bay Area counties that would likely be affected by either the disaster itself or by having some residents involved in the incident.
ALTERNATIVES

Alternative A: Unified Victim Identification System

The Unified Victim Identification System (UVIS) is a comprehensive disaster management system that manages and coordinates activities related to missing persons reporting and victim identification after a disaster. Following September 11, New York City officials decided that they needed a way to efficiently collect missing persons reports and share information between emergency responders and investigators following a mass casualty incident. In the days after September 11, New York City collected approximately 40,000 missing person reports on paper. It took hundreds of detectives months to track down leads on missing persons and two years to identify the remains of decedents. In response to the problems encountered after September 11, the New York City OCME secured grant funding from the Department of Homeland Security and contracted with Connecticut-based consulting firm ICRA Sapphire Inc. to develop UVIS. Because the development of UVIS was federally funded, New York City OCME licenses UVIS free of charge to government agencies throughout the country.

In New York City, UVIS enables a centralized communications and data collection system to connect New York City’s 311 Call Center, OCME, New York Police Department, and other agencies throughout the city, in order to develop an accurate manifest of potential victims following a disaster. By creating a single report for each missing person, UVIS builds a centralized manifest of potential victims, accessible to all agencies involved in the victim identification process. This centralized manifest provides for multiple reports of the same missing person to be consolidated and refined as law enforcement and medical examiner personnel and others gather and analyze data.
UVIS Modules

UVIS consists of 11 modules that provide for the input of ante mortem and postmortem data, as well as other record tracking functions. The ante mortem modules include: call center, missing persons, and family assistance center. The postmortem modules include: disaster morgue, mortuary management, disaster victim identification, and UVIS dental identification. Other modules support public relations, records, disaster field operations, and health care facility self-reporting.

ANTE MORTEM MODULES

Call Center Module

Following a disaster, if City officials decide to deploy UVIS for reporting missing persons, a message is broadcast to the public with a contact number to call with information about loved ones believed to have been involved in the incident. The public is directed to call 311, or another number for callers outside of the city.

Operators in the 311 Call Center collect specific information about the person(s) being reported missing such as name, age, and gender, as well as information about the caller, including the relationship to the person being reported missing. A typical call is taken in less than 3 minutes. The contact information collected during the initial call can be used to contact a victim’s family to provide follow-up information.

From the information collected, UVIS assigns incident likelihood values to each case by grading missing persons reports based on specific questions about the incident, which can be customized for any incident.

Missing Persons Module

History has shown that individuals potentially involved in an incident may be reported missing as many as 100 times by family, friends, and co-workers. Missing person reports of the same person may appear to be different cases for a number of reasons, such as name misspellings, multiple submissions from different sources, duplicate submissions from different agencies, etc., resulting in highly inflated and inaccurate numbers of victims early on in an incident.

The UVIS Missing Persons module mitigates the issue of multiple reports by consolidating “like” reports to facilitate generation of a confirmed missing persons list. To help in identifications, UVIS enables detectives to compare and link similar missing persons reports.

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20 In San Francisco, follow-up information would likely be provided by DPH personnel and not 311 operators.

The Missing Persons module also enables law enforcement to coordinate with OCME personnel to schedule and track appointments for interviews with the families of missing persons. UVIS generates DNA and Evidence Collection reports to capture detailed data. Photographs and documents can be uploaded to UVIS so that personal items can be returned to family and friends sooner than otherwise possible.

The Missing Persons module also provides law enforcement and OCME leadership the ability to create and manage Task Lists to avoid duplication of effort.

Family Assistance Center Module

The UVIS Family Assistance Center (FAC) module manages Victim Identification Center functions within FACs, which are facilities opened following mass-casualty incidents to manage casualty and medical examiner affairs, provide information, and make available support services to the family and friends of victims.

After a mass-casualty incident, OCME is charged with the recovery, cataloging, storage, and identification of human remains. To complete the identification process, postmortem data, which is primarily collected in the morgue, must be compared with ante mortem data, which is collected in the Victim Identification Center housed within a FAC.

The UVIS FAC module supports the interviewing of family and friends of victims in order to collect the necessary ante mortem data to support victim identification efforts. After a missing person report is collected in the Call Center module, loved ones of victims are interviewed at FACs to collect more detailed ante mortem data, such as photos and DNA samples. UVIS facilitates the credentialing and registration process, and tracks the interview appointment queue. The receptionist at the FAC can call up missing person reports by the reference number assigned in the Call Center module.

To reduce unnecessary interviews, the FAC module provides a “Found!” function, which disseminates information when a reported missing person is found. A Detective must identify the reported missing person and provide a last name and a contact number for possible follow-up.

The FAC module allows interviewers to enter most information with a click to add a “check” mark or select from a drop-down menu. Searchable free text fields are available for notes or unique information. The system displays all data in real time and provides a full audit trail including time stamping and identification of who changed what. UVIS generates a report for each ante mortem interview detailing the information and personal effects provided by the family in support of the identification of their loved one.
POSTMORTEM MODULES

Disaster Morgue Module
The Disaster Morgue module tracks the movement of remains as they are processed through the stations of a disaster morgue. The following disaster morgue stations are included in UVIS: intake, triage, x-ray, photography, pathology, fingerprints, DNA, anthropology, evidence, and exit review. UVIS user access is restricted to the stations for which the user has been assigned privileges.

Mortuary Management Module
The Mortuary Management module supports record keeping, storage, and release of remains by utilizing a case numbering system to track the physical location of remains in real time. The module allows for managers to identify new locations to be utilized for temporary storage of remains when an incident results in a large number of fatalities.

Disaster Victim Identification Module
The Disaster Victim Identification module provides a platform to facilitate the process of comparing ante mortem records collected at FACs, and postmortem records collected during morgue processing. The module allows investigators to sift through data using a variety of search capabilities. Searches can be based on any combination of criteria, such as age, sex, tattoos, personal effects, or contextual data obtained during the interview and investigative processes.

This module is capable of facilitating death certification whether or not remains are found. After remains are identified, requests for notification of next of kin may be submitted via UVIS. All family communications and interactions are recorded and all visits are logged creating a comprehensive view of the entire victim identification process.

UVIS Dental Identification Module
The UVIS Dental Identification module (UDIM) is used by the Forensic Odontologist during a disaster. This module enables detailed charting, the ability to conduct advanced searches, and the ability to look for anomalies. This module automatically synchronizes ante mortem and postmortem data with other UVIS modules. When a dental identification is made, UDIM automatically sends the information to the Disaster Victim Identification module for final review.
OTHER UVIS MODULES

Public Relations Module
The Public Relations module automatically updates centralized reports and provides officials with information about the number of persons: 1) reported missing; 2) verified and confirmed to be missing; 3) found alive; 4) identified as deceased; and 5) working on the incident to identify victims.

Records Module
The Records module tracks all paper-based documents providing a “Chain of Custody”. The module assigns barcode labels to all files and folders for tracking purposes, facilitates the check-in and check-out of files and folders via scanning of the barcode, and allows for scanning and uploading documents.

Disaster Field Operations Module
The Disaster Field Operations module allows scene investigative and recovery teams to input data into UVIS while in the field. Information necessary in the identification process is immediately viewable for comparison with ante mortem records collected at FACs, and postmortem records collected in the morgue. If Internet connectivity is unavailable at disaster sites, the Disaster Field Operations module can capture data offline and synchronize with the main database when connectivity becomes available.

Health Care Facility Self-Reporting Module
The Health Care Facility Self-Reporting module was developed to ease the burden on health care facilities associated with managing numerous decedents by facilitating the recovery, transport, storage, tracking, and identification of decedents during an event. In a declared public health emergency such as a pandemic influenza, health care facilities also have the ability to self-report naturally occurring deaths through UVIS.
UVIS for San Francisco

UVIS was developed for the scale of operations in New York City. New York City OCME has approximately 600 personnel, whereas the San Francisco OCME currently has 35 personnel. San Francisco lacks the resources to train for and use all of the UVIS modules, particularly the postmortem modules, which come with a license from New York City OCME.

Once the original system is licensed from New York City OCME, San Francisco is free to modify the software to suit the specific needs and capabilities of the Bay Area with no approval necessary from New York City. For example, San Francisco could implement only the ante mortem UVIS modules (Call Center, Missing Persons, and Family Assistance Center), which require limited training to deploy effectively.

Clark and Washoe counties in Nevada adopted only the ante mortem modules while in the process of modifying the postmortem modules of UVIS to fit their size and capabilities. Washoe County deployed the ante mortem modules after the 2011 Reno Air Races crash, which facilitated the collection of missing person reports and cross-agency coordination. Clark and Washoe counties are currently working with the software vendor, ICRA Sapphire, to simplify the postmortem modules so that the postmortem side is easier to use and mirrors the ante mortem side and to ensure that it fits the needs and capabilities of their 72 personnel.

New York City requires jurisdictions that license UVIS to remove all New York City logos and identifiers from the software interface, which can be done through a contract with the software vendor. All other modifications are made at the discretion of the jurisdiction that licenses UVIS. Upon licensing UVIS from New York City, San Francisco could opt to start with the version modified for use in Nevada, which is designed for a scale of operations that is far more similar to San Francisco than New York City. Clark and Washoe counties’ version is expected to be available by the end of 2014.

ReddiNet (discussed below as Alternative B) is a system that expands the functions and purpose of UVIS’ Health Care Facility Self-Reporting module, by identifying hospital based victims both alive and deceased. Since health care facilities in San Francisco and five other Bay Area counties are already using ReddiNet, ideally the developers of UVIS and ReddiNet could make the two systems interoperable. The developers of UVIS and ReddiNet have indicated that this is technically feasible and are willing to explore the idea further.

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23 We interviewed John Fudenberg on April 11, 2014.
24 We interviewed John Fudenberg on April 11, 2014.
**Alternative B: ReddiNet**

The San Francisco DEM EMS Agency licensed ReddiNet in 2014. ReddiNet was developed by the Hospital Association of Southern California with the goal of facilitating information exchange among hospitals, emergency medical service (EMS) agencies, paramedics, dispatch centers, law enforcement, homeland security, public health officials and other health care system professionals in local and regional communities. ReddiNet is advertised as “a custom-built, all-hazards emergency medical communications tool designed by and for first responders.” Besides San Francisco, five other Bay Area counties have recently licensed this software for use by their hospitals.

The system is built around various modules, most notably the Mass Casualty Incident module (MCI) that keeps track of all patients admitted into hospitals. While many of the other modules are more specific to the management of hospital resources, the MCI module can potentially be customized to manage the missing persons database to improve communication between hospitals and other city agencies. The MCI module provides an interface for tracking people going in and coming out of each hospital and health care facility that uses the system. For example, it can be used to route ambulances from one hospital that does not have capacity to one that does. In a large-scale incident, having this level of coordination across Bay Area UASI counties would be valuable in ensuring that everyone who is found gets the care they need, but also to effectively monitor who is in which hospital.

Currently, the MCI module does not include a direct access for a call center to create missing persons records in ReddiNet. However, customization is possible and preliminary conversations with their client services and executive staff have demonstrated the capability to customize the system to align with the needs of 311. With the knowledge of the UVIS antemortem modules as a guide, a customized ReddiNet would be a viable option for San Francisco. Customization is not only possible at the system wide level, but also at the county level. If counties had particular needs or wanted data presented in a particular manner, they could work with ReddiNet to customize the interface while retaining the portability of the data between UASI counties.

A customized ReddiNet system for San Francisco should mimic the functionality of the ante mortem modules of UVIS at a minimum. However, there are aspects of ReddiNet that provide additional capabilities. First, the direct line of communication with hospitals and other public health organizations operating on the same system will allow for coordination between agencies. Second, ReddiNet offers

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25 We interviewed Linda Tripoli on April 28, 2014.
26 The Counties in California that have licensed ReddiNet are: Alameda, Contra Costa, Solano, Lake, Marin, San Luis Obispo, Santa Barbara, Ventura, Kern, Los Angeles, Orange, San Bernardino, Riverside, Imperial (including Yuma regional in Arizona), San Francisco, and Napa.
27 Emergency management workers expressed that this is a highly desired feature and would have been extremely useful after the Asiana Airlines crash in 2013, when there was considerable confusion as to the whereabouts of many of the victims.
satellite expansion capabilities with the help of its agreements with Hughes Network Systems or existing satellite agreements. This could be used to ensure the missing persons process does not go offline if the local system is compromised by power outages.

**Alternative C: National Library of Medicine**

The Communications Engineering Branch within the R&D division of the National Library of Medicine (NLM) has developed a package of tools for the public and hospitals to use to locate people in large-scale disasters as part of their Lost Person Finder project. The goal of the project is to manage the surge of inquiries about the missing that occurs after a disaster when staff are particularly busy with clinical care for the patient surge.

The National Library of Medicine developed People Locator and TriageTrak to serve these purposes. The People Locator system is a “community wide” system, which means it was designed to allow the public to easily report and search for missing loved ones. The TriageTrak system is a “hospital-based” system. It was developed with the needs of health professionals dealing with a massing influx of patients in mind. The web-based systems are available via NLM’s website and dedicated web apps (i.e., ReUnite and TriagePic). The People Locator system was first deployed for the 2010 Haiti earthquake and was used most recently for Typhoon Haiyan in the Philippines.

The People Locator system allows the public to upload photos and metadata (e.g., name, age, location, health status) for missing persons, search for missing persons, and indicate when the person is found. Direct search operations can be conducted both anonymously and as a registered user, with more specific information provided to authorized users. There are also notification features that allow information to be disseminated to interested parties. As seen in the figure below, this system allows for various sources of input (web and mobile), various media (text and photo), and incorporation of Google Person Finder data into the database due to shared use of the People Finder Interchange Format (PFIF). This means that the system can write to and from Google Person Finder according to the specifications laid out by NLM. Using the ReUnite app that NLM developed, both registered users and the general public can submit information using face detection and other advanced tools (e.g. face detection capabilities). NLM claims to have adequate network infrastructure and capacity for remotely hosting the system for a locality such as San Francisco depending on the preferences of the interested agencies.
Alternative D: CRM

We know of at least one jurisdiction, the City of Denver, that has developed a homegrown missing persons reporting system that links with their existing customer relationship management (CRM) system. Denver’s system emerged after conversations with the Police Department in regards to school shootings. They started with a data management and file-sharing system called webEOC and then customized that system to allow for school attendance records to be imported and referenced in the event of a school shooting. The system is available to all City agencies that are granted access. Privileged users can either generate incident reports or search for individual records. The conduit for communicating and reporting information between the database and the interested parties is a form within the CRM. San Francisco could use the Denver program as a template and customize a module within their CRM.

We understand that 311 has the capability to provide SFPD, Sheriff, and OCME access to a “lightweight” version of the Lagan CRM that would allow privileged personnel at these agencies to input or view cases. This could also be accomplished through a web-based form that could facilitate the submission of reports directly into the 311 CRM.
CRITERIA FOR EVALUATING PROTOCOLS AND SYSTEMS

We have identified eight principal criteria to evaluate alternative solutions to this problem. The criteria are clustered according to main objectives and ordered most important to least important. We offer specifics on the weighting of the criteria later in the report with the analysis of the alternatives.

Reliability and security of collected missing persons data

1. Effectiveness of data collection, organization, and retrieval
   - System’s added value when deployed
   - The ability to restrict dataset to information regarding disaster (e.g., data should not be inextricably combined with missing person data from the whole country spanning many years)

2. Data security and privacy
   - Security of data and protection against its misuse

Collect, organize, and share data on missing persons

3. Simple and efficient interface
   - Interface design should enhance users’ ability to
     - Rapidly enter data (e.g., comprehensive drop-down menus with ‘other’ option)
     - Perform advanced searches
     - Relay comprehensive up-to-date information
   - Interface design should facilitate expeditious user training

4. Data sharing and synergy
   - The ease with which emergency responders and other privileged authorities access shared data
   - Centralized data collection
   - Automated information aggregation (e.g., combining data collected by multiple organizations)
Coordination amongst government and non-government actors

5. Regional and scalable versatility
   - The extent to which the program may be adapted to a localized versus region-wide disasters (geography)
   - Similarly, usefulness in small-scale versus large-scale disasters (casualties)

6. Implementation feasibility
   - Complexity of the implementation process, and expected length and cost of that process
   - Compatibility with existing information and communications technologies (ICTs)

7. Political feasibility (e.g., resistance to change)
   - Political and legal feasibility
   - The length of time and resources required to acquire and license systems

8. Bay Area Urban Areas Security Initiative (UASI) grant
   - The Bay Area UASI is more likely to fund program implementation than program development
   - The timeline for development, licensing, or implementation also influences UASI funding decisions
   - UASI has indicated a preference for programs that have been tested in other jurisdictions
ANALYSIS OF ALTERNATIVES

Evaluation Matrix

We evaluated alternatives on a 5-point scale for each criterion, where 5 meets the criterion to the greatest extent possible and 1 fails to meet the criterion. We weighted criteria to calculate an overall score. These scores are our attempt to quantitatively synthesize our analysis; they are intended for illustrative purposes only.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
<th>Unified Victim Identification System (UVIS)</th>
<th>ReddiNet</th>
<th>National Library of Medicine</th>
<th>CRM</th>
</tr>
</thead>
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<td>Effectiveness of data collection, organization, and retrieval</td>
<td>20%</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Data security and privacy</td>
<td>20%</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>4</td>
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<tr>
<td>Simple and efficient interface</td>
<td>20%</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Data sharing and synergy</td>
<td>20%</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Regional and scalable versatility</td>
<td>5%</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Implementation feasibility</td>
<td>5%</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Political and legal feasibility</td>
<td>5%</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Bay Area Ureas Security Initiative (UASI) grant</td>
<td>5%</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>4.25</td>
<td>3.45</td>
<td>3.1</td>
<td>2.95</td>
</tr>
</tbody>
</table>
Alternative A: UVIS

Our analysis assumes that San Francisco would choose to implement a modified version of UVIS, such as the version developed for Clark and Washoe counties in Nevada, that has already been scaled down from the original New York City version.

Effectiveness of data collection, organization, and retrieval

UVIS is a highly effective tool for collecting, organizing, and retrieving data when there is coordination among government agencies and crisis response organizations to avoid duplicative efforts. UVIS allows real-time input of missing persons reports and ante mortem data primarily using drop-down menus and check boxes to minimize user error and duplicate records for the same person. Data can be entered into UVIS at call centers, family assistance centers, the incident site, disaster morgues, and health care facilities. Cases are tracked with reference number and barcode systems, and are linked to a particular incident rather than commingling with missing persons information collected in national databases over many years. Medical examiner, law enforcement, and public health personnel can both access and input pertinent information directly through UVIS. The integration of ante mortem and postmortem data and family contact information in one database facilitates victim identification and faster return of remains and personal belongings to families.

Data security and privacy

UVIS data is stored on government-controlled servers and is only accessible to personnel with assigned privileges. UVIS incorporates a full audit trail of who did what and when.

Simple and efficient interface

The ante mortem UVIS modules (i.e., Call Center, Family Assistance Center) have intuitive interfaces that require little to no training for call center workers or interviewers to use properly when deployed. The postmortem modules (i.e., Disaster Field Operations, Disaster Morgue, Mortuary Management, Disaster Victim Identification, Dental Identification) in the original version licensed from New York City require substantial training and many personnel to use effectively. The version being modified for Clark and Washoe counties, which could be implemented by San Francisco, addresses the interface challenges of the postmortem modules by scaling the system down so that it can be used by agencies with limited staffing and training.

28 We interviewed John Fudenberg on April 11, 2014.
29 Ibid
Data sharing and synergy
Assuming buy-in from agencies involved in disaster recovery prior to an incident, UVIS allows real time data sharing between 311 call centers, medical examiners, police departments, and health care facilities. Due to the sensitive nature of ante mortem and postmortem data, the data is accessible only to privileged personnel and cannot be shared with the public or NGOs. Sharing UVIS data with government personnel outside of San Francisco would likely require Memoranda of Understanding (MOUs) with other cities and counties to allow access to San Francisco’s servers. Jurisdictions outside of San Francisco would also need a UVIS license in order to access the system.

Regional and scalable versatility
UVIS is available to public jurisdictions that license it. UVIS could theoretically be licensed by the State of California or by each of the Bay Area UASI counties and data could be shared across jurisdictions with MOUs. UVIS can be deployed for both small- and large-scale disasters.

Implementation feasibility
Implementing UVIS requires significant interagency collaboration. All agencies that take missing persons reports must agree to shift reporting to UVIS, otherwise the system will not fulfill its purpose. The cost and timeline for implementing UVIS varies by jurisdiction. It took about two years for the Clark and Washoe counties in Nevada to implement UVIS. Although there are no direct licensing or equipment costs, implementation costs depend on cost of customization, local staff resources to lead the implementation effort, and staff training.

SFPD and the American Red Cross may be resistant to change for fear of losing influence over the process. Some law enforcement agencies and coroners/medical examiners are satisfied with MUPS and DMORT, respectively, and are concerned that they lack the resources and staffing to implement a new system, even if the new system would reduce their workload during an incident. Some players are only concerned about their own purview and are not interested in pursuing a regional, cross-agency solution, so it might be a difficult to get them on board. Many agencies are also wary of new technology being pitched to them; however, when incorporating a new system, agencies prefer systems that have already been implemented and deployed (i.e., field tested).

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30 We interviewed John Fudenberg on April 11, 2014.
31 We interviewed Lori Higdon on April 11, 2014.
32 We interviewed Pat Otellini on March 31, 2014.
Political and legal feasibility

The feasibility of licensing UVIS depends on the flexibility of the legal department in the licensing jurisdiction. New York City OCME's license is non-negotiable and must be accepted “as is” by the jurisdiction seeking a license. The state of California was prevented from signing the licensing agreement three years ago because the office of the legal advisor refused to sign the licensing agreement. The license includes an indemnification clause that requires the licensee to hold the City of New York harmless in the event of a dispute. Many jurisdictions have been unwilling to sign the agreement due to this clause.

Once licensing is complete, New York City OCME provides the software, including source code, on a disk.

UASI Grant

UVIS has already been developed and has a relatively successful track record elsewhere. It is more likely that San Francisco or other governments in the region would be able to secure grant funding for implementing UVIS than for developing a new system from the ground up.

Since there are up-front costs associated with modifying UVIS, this alternative would provide additional justification for grant funding from UASI. The up-front costs depend on the extent of modifications to the software provided by New York City OCME. An official in Clark County, Nevada, reported that small-scale, front-end modifications needed for the ante mortem module cost roughly $20,000 to $30,000 and that they have a $5,000 annual maintenance contract with the software vendor, ICRA Sapphire.

Alternative B: ReddiNet

ReddiNet is a hospital-centered patient tracking solution that has already been implemented in various Bay Area UASI counties. Six of the 12 Bay Area UASI counties already have license agreements with ReddiNet. The fact that the hospitals and public health agencies in about half of the regional counties are already on board is a potentially promising sign for the implementation feasibility and regional scalability of the system. Also, ReddiNet has already offered a region-wide messaging service for the remaining Bay Area counties free of charge that would allow messages to be sent back and forth between emergency responders. In other words, there are examples of how the ReddiNet system is regionally scalable if only the counties that have already licensed the system are on board.

33 We interviewed Bruce Lyle on April 21, 2014.
34 We interviewed John Fudenberg on April 11, 2014.
35 We interviewed Caroline Thomas-Jacobs in March 2014.
36 We interviewed John Fudenberg on April 11, 2014.
However, since ReddiNet is a product of the Hospital Association of Southern California, it is geared towards the needs of hospitals, rather than call centers, law enforcement, and medical examiners. The existing modules focus on the capabilities needed by hospitals and public health officials to keep track of patient intake and discharge, not on managing a surge of calls in the event of a disaster. At this time, this system does not have the capability for immediate integration with a call center. However, ReddiNet has expressed an interest in devising a 311-integrated system for the Bay Area. ReddiNet is currently working with medical professions in Southern California about how to use the system with their Family Information Center (FIC), which is dedicated to providing information about the status of loved ones to families. This system would have some similar requirements to the call center missing persons system and could be incorporated into a preexisting project. This is another example of how ReddiNet has placed a priority on improving how reunification is streamlined into their system.

Data security is also well incorporated into ReddiNet. Permission is granted to government agencies exclusively. Because the system includes private patient records for medical organizations, HIPAA compliance is an important component to the system. EMS agencies were vital in the development phase of the system and ensuring the legality and usability of the system for emergency services has been at a premium. While security of data is something that ReddiNet has thought a lot about, it will be up to the various agencies involved in filling out and maintaining missing persons reports to get on board with another system outside of their routine operating procedures.

ReddiNet users are required to pay a membership fee for the use of the product. However, since some San Francisco agencies have already licensed the product, the greatest potential cost of implementing this alternative would be from the customization of the system to create new modules for the missing persons and the call center. A clearly specified list of requirements is necessary for ReddiNet to provide a specific cost estimate and timeline.

As San Francisco and other counties in the region have already licensed ReddiNet, the licensing issues present with UVIS would not be an issue with ReddiNet. The greatest challenge comes in working through a customization of software and ensuring that 311’s Lagan CRM can communicate effectively with ReddiNet so that operators can quickly and efficiently input information that can later be used for cataloging missing persons in order to manage the disaster in a more effective process.
Alternative C: National Library of Medicine

The NLM system is already operational with both web and mobile apps. Even if San Francisco did not partner with NLM to develop a customized system, the existing system could be deployed for a mass casualty incident. As it stands, the system has only been used for large-scale domestic and international disasters. The same system that would be used for an earthquake in Haiti would be used in San Francisco. In a mass casualty incident with possibly hundreds of thousands of missing people, trying to account for the living may take priority over positive identification of decedents. The existing system is designed for ease of use, so the personal information collected is very basic, including only name, age, gender, status, and last seen address, and does not collect other ante mortem information like hair color and eye color that is important for victim identification. This means the system as it stands may not provide the detail that San Francisco would desire for a localized disaster, which may only affect one building, for example. The missing persons location services that NLM provides is just one piece of the organization’s overall mission. It will be up to San Francisco to disseminate information about the system and make sure that, in the face of a crisis, residents will know where to go.

The developers at NLM have expressed a willingness to partner with 311 to customize the system depending on San Francisco’s system requirements. As a federal research organization, NLM could modify their system for a lower cost than would be charged by a private software vendor. NLM would determine whether they have the capacity to make San Francisco’s desired modifications upon review of the City’s requirements sheet. At this time it is unclear whether San Francisco would have the authority to activate the system for a local incident, or if someone from 311 would have to call NLM (located in Bethesda, MD) and request system activation. Also, similar to ReddiNet, it is unclear at this time how the call center component of 311 would be integrated into a customized People Locator system for San Francisco.

The NLM system is scalable at the regional level as it would not require additional costs to provide access to officials in other Bay Area counties, although coordination and agreement with agencies within and beyond San Francisco would still be necessary. It is important to note that NLM is operated as a federal research facility. They are not explicitly in the business of system administration or client service. Getting all counties on board with a system they have never used before that they cannot customize at the drop of a hat requires coordination so that when the disaster actually occurs every UASI county is ready to spring into action.

An important consideration with the NLM system is how it manages data from a security and privacy standpoint. The system’s usability in small, domestic disasters as well as massive international disasters means that developers were not relying on any particular set of privacy laws during the development
phase. In other words, the software was not designed to address concerns over protecting patient information that is stored in TriageTrak. Information on both reporters and those reported is stored in the database and alerts are set up to inform people making reports about the status of particular individuals. In a mass scale disaster, concerns over whether information falls into the wrong hands may not be as much of a concern in comparison to a localized emergency in San Francisco where you will want to protect information about hospitals where people are held. This is particularly important when considered in the context of pre-existing federal laws like HIPAA. Relying on the NLM system will require conversations about data privacy so that patient information is disseminated to the people who need that information and kept out of the hands of those who are not privileged to view it.

While there are significant data security and privacy challenges to be addressed, one of the greatest benefits to the NLM system is that it could be deployed today. Even while customizations are developed, if the City and the rest of the Bay Area UASI counties instructed the public to use NLM in the event of a disaster, the People Locator system could serve as a stopgap measure to manage a portion of the missing persons process.

**Alternative D: CRM**

The CRM-based option is highly customizable, cost effective, and does not require any contracts with external entities. However, this option assumes that there are people within 311 and OCME who are willing and able to map data fields from the missing persons report that is currently in the Google form into a CRM report. Also, ongoing support for the system would have to be provided in-house. If the system is to be scaled across the region, some of the smaller counties may not have this level of capacity.

For this system to be successful in San Francisco it would have to be accessible to other key agencies like OCME and SFPD. This is a coordination issue, as all parties who involved in missing persons reporting (311, OCME, SFPD) would have to be committed to using this standardized system, and accounts would have to be provided to people that currently do not have direct access to the Lagan CRM currently in use by 311. If information is not input into the same place, the system would not address data sharing needs.

From a regional scalability standpoint, the data would be stored within the 311 CRM and would only be sharable between different counties on an ad hoc basis, such as through Memoranda of Understanding (MOUs). 311 could decide to grant access to a “lightweight” version of the CRM that would include the missing persons report or a web-based form. Capabilities exist in the CRM to allow for residents to interact with the web-based form to input missing persons information. Since not all counties are on
Lagan CRM, it is difficult to imagine how an automatic regional sharing system could function with this alternative.

This alternative would allow 311 to keep all reporting and data in house without having to rely on external organizations for implementation success. However, this means that development and system administration is entirely in the hands of 311, which would require resources for regular upkeep even if rarely used.

RECOMMENDATION

We recommend that 311 implement the Unified Victim Identification System (UVIS).

If San Francisco is unable to license UVIS, 311 should collaborate with the Office of Contract Administration to create a request for information (RFI). The goal of the RFI is to clarify the best process and partners to create a customized missing persons system. In their current forms, other systems that we have analyzed have strong points yet prohibitive limitations. The RFI would invite responses from ReddiNet, the National Library of Medicine, and other organizations. Responses should address gaps related to reliability, security, interface, sharing, scalability, and implementation.\textsuperscript{37}

IMPLEMENTATION

Regardless of whether 311 decides to pursue UVIS or the RFI, the success of the initiative depends on three factors. 311 must engage a champion, coordinate with interested parties, and train all personnel.

Champion

San Francisco needs to identify a high-profile official in City government who can leverage their seniority to motivate the various players throughout the city and across Bay Area county governments or possibly the state of California. An appropriate champion should be a person: 1) in senior management at SFDEM, OCME, SFPD, or 311; and 2) who is highly respected by the other departments. Ideally, this person would have the political clout to overcome potential licensing hurdles and political obstacles.

Coordination

The key players in a post-disaster missing persons process in San Francisco are SFDEM, SFPD, and OCME. These key players need to be on board from the beginning in order for any of the suggested solutions to work. Whoever accepts missing persons reports (i.e., SFPD, OCME) needs to agree to

\textsuperscript{37} For ease of reference, Appendix A outlines requirements that RFI drafters should consider.
route post-disaster missing persons reports through the 311 Call Center in order to collect and store all data in one place. Some police departments are hesitant to give up any responsibilities. Without law enforcement cooperation, the purpose of getting missing persons data collected in one database is defeated. The champion should frame the proposed solution as a means to relieve overburdened first responder personnel in a disaster scenario.

It is also important to ensure cooperation with other government agencies and NGOs throughout the process. The champion must ensure coordination with DPH, Human Services Agency, and the American Red Cross with respect to planning, implementation and/or deployment of a new system. In any disaster setting, NGOs will be on the scene to assist, regardless of the role that government intends them to play. Persons designing a new system need to acknowledge, accept and plan for the involvement of NGOs.

**Training**

Government officials who have been involved in responding to a disaster stress the importance of training personnel in whatever system is adopted. They emphasize that the real value of a system is not the bells and whistles, but that people are comfortable using it and can operate it under pressure. It is important to have all personnel who will be involved in disaster response participate in regular training through tabletop exercises such as disaster simulations.
APPENDICES

Appendix A: System Requirements for RFI

Reliability

- Allow for standardized submission and reporting of data in real time.
- Privileged personnel can search database according to basic demographic information.
- Capacity for efficient intake of information with thousands of calls in a 24-hour period.
- Medical examiners and coroners can retrieve ante mortem data to help identify decedents.
- Provides biographical data fields required by OCME and other agencies to identify missing persons (i.e. hair color, eye color, height, weight, past injuries, defining characteristics like tattoos or marks).
- Provides web-based access so that system is operable when operator is not at primary workstation.

Security

- Health Insurance Portability and Accountability Act (HIPAA) compliant.
- Ownership of data is not subject to private control.
- Provides tracking of who edits and views records and makes reports.

Interface

- Requires minimal training for operators to effectively intake information.
- Mobile application capabilities.
- Includes module for 311 to generate missing persons reports.
- Includes Family Assistance Center (FAC) module for integrating ante mortem information collected during interviews of loved ones.
- Incorporates a “found” function for removing missing persons that are found alive.
- Maximize use of drop-down menus and minimize use of free text fields to improve search functionality across descriptive characteristics.

Sharing

- Allows for information to be input and tracked by a wide range of local agencies.
• Pulls data from non-governmental organization data sources, like Google Person Finder and other systems with accessible API code.

• Information can be relayed to individuals searching for missing people as well as government agencies trying to track missing people.

• Public health institution (i.e., hospitals, clinics, etc.) patient information can be imported into the system.

Scalability
• All 12 Bay Area UASI counties can input information and share between counties.

• If region cannot technically be brought onto the same system, then information can be exported and exchanged in a widely used format.

Implementation
• Availability to San Francisco and the Bay Area region in a timely manner (TBD).

• Software licensing agreement fits with legal restrictions of San Francisco and the rest of the Bay Area UASI region.
Appendix B: System Screenshots

UVIS
National Library of Medicine
CRM Example

## Appendix C: Key Contacts

<table>
<thead>
<tr>
<th>Organization</th>
<th>Name and Title</th>
<th>Phone</th>
<th>Email</th>
</tr>
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<tbody>
<tr>
<td><strong>City and County of San Francisco</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department of Emergency Management</td>
<td>Alicia Johnson, Resilience and Recovery Manager</td>
<td>(415) 487-5021</td>
<td><a href="mailto:alicia.johnson@sfgov.gov">alicia.johnson@sfgov.gov</a></td>
</tr>
<tr>
<td>Police Department</td>
<td>Captain Joe McFadden</td>
<td>(415) 553-9826</td>
<td><a href="mailto:joseph.mcfadden@sfgov.org">joseph.mcfadden@sfgov.org</a></td>
</tr>
<tr>
<td>Department of Public Health</td>
<td>Dr. Naveena Bobba, Director of Public Preparedness and Repsonse</td>
<td>(415) 556-5939</td>
<td><a href="mailto:naveena.bobba@sfdph.org">naveena.bobba@sfdph.org</a></td>
</tr>
<tr>
<td>Human Services Agency</td>
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<td><a href="mailto:benjamin.amyes@sfgov.org">benjamin.amyes@sfgov.org</a></td>
</tr>
<tr>
<td>Office of Chief Medical Examiner</td>
<td>Christopher Wirowek, Acting Medical Examiner's Administrator</td>
<td>(415) 553-1798</td>
<td><a href="mailto:christopher.wirowek@sfgov.org">christopher.wirowek@sfgov.org</a></td>
</tr>
<tr>
<td><strong>California State and Counties</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CA Governor's Office of Emergency Services</td>
<td>Dennis Smithson, Assistant Chief</td>
<td>(916) 317-0397</td>
<td><a href="mailto:dennis.smithson@caloes.ca.gov">dennis.smithson@caloes.ca.gov</a></td>
</tr>
<tr>
<td>Orange County Office of Chief Medical Examiner</td>
<td>Bruce Lyle, Assistant Chief Deputy Coroner</td>
<td>(714) 647-7444</td>
<td><a href="mailto:blyle@ocsd.org">blyle@ocsd.org</a></td>
</tr>
<tr>
<td>Marin County Sheriff's Coroner's Office</td>
<td>Lt. Keith Boyd</td>
<td>(415) 827-8202</td>
<td><a href="mailto:kboyd@marinsheriff.org">kboyd@marinsheriff.org</a></td>
</tr>
<tr>
<td><strong>UVIS</strong></td>
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<tr>
<td>Clark County Office of the Coroner/Medical Examiner</td>
<td>John Fudenberg, Assistant Director, President of the international Association of Coroners and Medical Examiners (IAC&amp;ME)</td>
<td>(702) 455-3385</td>
<td><a href="mailto:fud@clarkcountrynv.gov">fud@clarkcountrynv.gov</a></td>
</tr>
<tr>
<td>New York City of the Office of the Chief Medical Examiner</td>
<td>Frank DePaolo, Assistant Commissioner for Emergency Management</td>
<td>(212) 447-2738</td>
<td><a href="mailto:fdepaolo@ocme.nyc.gov">fdepaolo@ocme.nyc.gov</a></td>
</tr>
</tbody>
</table>
## Post-Disaster Missing Persons Process

<table>
<thead>
<tr>
<th>Organization</th>
<th>Name and Title</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York City of the Office of the Chief Medical Examiner</td>
<td>Naeem Ullah, Chief Information Officer</td>
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<tr>
<td>ICRA Sapphire</td>
<td>Richard Zboray, President</td>
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<tr>
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<td><a href="mailto:ltipoli@hasc.org">ltipoli@hasc.org</a></td>
</tr>
<tr>
<td>National Library of Medicine</td>
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<td>(301) 496-4496</td>
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</tr>
<tr>
<td></td>
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<tr>
<td></td>
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</tr>
<tr>
<td>Other Contacts</td>
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<td><a href="mailto:justin.holmes@boston.gov">justin.holmes@boston.gov</a></td>
</tr>
<tr>
<td></td>
<td>Joan Kelley-Williams, Director of International Services</td>
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<td><a href="mailto:joan.kelley-williams@redcross.org">joan.kelley-williams@redcross.org</a></td>
</tr>
</tbody>
</table>
Appendix D: UVIS Case Study – Reno, Nevada

The Washoe County Medical Examiner and Coroner’s Office deployed UVIS after the Reno Air Show plane crash on September 16, 2011. Thirty thousand people, including 2,000 local school children on a field trip and 400 volunteers, attended the air race show. The EMS plan in place included crash units and on-scene medical and supervisory units.

At 4:26 p.m., the tower announced a mayday call. One minute later, an airplane crashed into spectator box seats. At 4:26 p.m., authorities declared a mass casualty incident.

Eleven people died. Seventy-three were injured. Fifty-four patients were transported via ground and air. Authorities identified all remains within the week. UVIS tracked eighty-four incident victims. They conducted sixteen interviews at the Family Assistance Center, and identified eleven deceased using fingerprint, dental, and radiograph records.

Nevada 2-1-1 received a request to initiate a disaster response at 8:07 p.m. 2-1-1 began receiving calls immediately; it logged approximately 2,000 calls. The incident was the first time that Nevada 2-1-1 was activated as a disaster call center. Calls were routed to 211 for in-state callers as well as through the business lines of Crisis Call Centers to provide nationwide access for filing missing persons reports.

Over 1,400 missing persons reports for almost 650 missing persons were entered into UVIS. Local law enforcement agencies and Washoe County Coroner’s Office monitored UVIS simultaneously. 2-1-1 engaged 35 volunteers and 24 paid staff: 59 percent of call-takers were volunteers. Volunteers and paid staff collectively spent 1,004 hours taking calls. Almost 600 of 2,000 calls were from outside of Nevada, as well as many international calls. Callers included witnesses of the crash, first responders needing emotional support, people injured in the crash, and family members of the deceased needing bereavement counseling and information.

The Family Assistance Center was activated on September 17, 2011 at 4:30 a.m. It was operational at 11:00 a.m. It’s role was to support the Medical Examiner objective of bringing resolution to families. It included greeters, a reception area, ante mortem interviews, logistical support, mental health resources, and public information.

Four call centers took reports using UVIS: the Medical Examiner’s office, the Crisis Call Center, Nevada 2-1-1, and the Regional Emergency Operations Center. They used three UVIS modules: Call Center, Family Assistance Center, and Missing Persons. They did not offer the postmortem module.

To develop this case study, we consulted other case studies prepared by the Regional Emergency Medical Services, Nevada 2-1-1, and Naeem Ullah of the New York City OCME. We also spoke with Debbie Grant-Reed from Nevada 2-1-1 and John Fudenberg from the Clark County Coroner’s Office.
What worked? Authorities activated UVIS in a timely manner. UVIS was accessible to call centers via the Internet. It was used to track all victims, dead and alive. Information technology equipment was available to most centers. Pre-planning and exercises proved critical to overall success of the emergency response.

Nevada 2-1-1 did encounter challenges. Their ante mortem data collection lacked guidance. They had not done any extensive training in UVIS prior to the event. Staff could have benefited from more extensive training with the UVIS system. They did not have sufficient IT equipment for effective field operations. They needed a command-post vehicle. UVIS had not been previously integrated with Medical Examiner case management software; this caused dual entry inefficiencies. The case demonstrated the important of correct name spelling.

It would have been useful to have both local and long distance telephone numbers. Prepared scripts for calls in the immediate aftermath of the disaster would have helped. In the first hour after the incident, call sheets were not standardized. There were also some challenges related to collating multiple missing persons reports, exporting reports from UVIS, and logging calls in the community operating system.
Appendix E: UVIS License

LICENSE AGREEMENT

between

THE CITY OF NEW YORK, acting by and through its Office of Chief Medical Examiner,

as Licensor,

and

[County, State], acting by and through its [Name or Coroner/Medical Examiner Officer] as Licensee.
Table of Contents

1. **License** .................................................................................................................. 1
   A. Scope of License .................................................................................. 1
   B. Limitations ......................................................................................... 1

2. **Representations and Obligations** ......................................................................... 2
   A. Confidentiality ..................................................................................... 2

3. **Intellectual Property** .............................................................................................. 2
   A. Ownership .......................................................................................... 2
   B. Customization and Modification ......................................................... 2

4. **Warranty and Indemnification** ................................................................................ 3
   A. Warranty ............................................................................................ 3
   B. Licensee’s Indemnification Obligation .................................................. 3

5. **General** .................................................................................................................. 3
   A. Entire Agreement .............................................................................. 3
   B. Applicable Law and Forum ............................................................... 3
   C. Assignment ....................................................................................... 3
   D. Disclaimer ....................................................................................... 3
AGREEMENT made this ___ day of __________________, 20___ between
The City of New York (the "City"), a municipal corporation established under the laws of
the State of New York, acting by and through its Office of Chief Medical
Examiner ("Licensor"), located at 421 East 26th Street, New York, NY 10016 and
[County, State], acting by and through its [Name of Coroner/Medical Examiner]
("Licensee"), located at [Address of Licensee].

WITNESSETH

WHEREAS, Licensor employed a contractor (Sapphire International,
Inc.) to create certain computer software, commonly referred to as the
Unified Victim Identification System (also known as "UVIS"), as well as
accompanying user manuals and other documents (collectively, the "Software"); and

WHEREAS, Licensee desires to acquire from Licensor, and Licensor
desires to grant to Licensee, a perpetual, non-exclusive, non-transferable license to
utilize the Software, on the terms and conditions set forth in this Agreement.

NOW THEREFORE, in consideration of the promises contained herein,
the parties agree as follows:

1. License

   A. Scope of License

      Subject to the terms and conditions set forth herein, Licensor hereby
grants to Licensee a perpetual, non-exclusive, non-transferable license to use the
Software on any of its computers, and at any data center location and on more than one
computer at a time, solely for Licensee's governmental business purposes, particular to the
[Location and/or Purpose], and in no event for any use that is commercial in nature.
Licensor may also, at its discretion, from time to time provide to the Licensee
additional modifications or enhancements made to the Software. Licensee shall, at no charge,
provide to the Licensor any and all changes, enhancements, or modifications that are
made to the Software and Licensee agrees that Licensor shall have the right
utilize, incorporate, adopt and/or share any such changes, enhancements, or modifications.

   B. Limitations

      Licensee may not sell, assign, lease, encumber or otherwise transfer the
license or the Software, or any part thereof, or sublicense the Software to any other
person, entity or governmental entity, including but not limited to, any political
subdivisions of Licensee or any other State or municipal authority or corporation, without
the written consent of Licensor. Before using the Software, Licensee agrees to remove
all New York City logos, references, and identifiers, including, but not limited to, those
of the New York City Office of Chief Medical Examiner and New York City Police
Department. Licensee shall retain the application name Unified Victim Identification
System on the Software, as well as on any changes, enhancements, or modifications
made to the Software, and the name Unified Victims Identification System shall appear on
the Software at all times.

License Agreement OCME / Licensee
Date: [Enter Date]
2. **Representations and Obligations**

   A. **Confidentiality**

      Neither party shall, without the written consent of the other party, communicate confidential information of the other party, designated in writing or identified in this Agreement as such, including all information pertaining only to the Software, to any third party. Each party shall protect such information from inadvertent disclosure to any third party in the same manner that it protects its own confidential information, unless such disclosure is required by law. Licensee agrees to notify Licensor immediately upon receipt of, and prior to responding to, any request for confidential information of Licensor, including information pertaining to the Software, pursuant to subpoena or other applicable law and to give Licensor, at its discretion, a reasonable opportunity to object to such production.

3. **Intellectual Property**

   A. **Ownership**

      Licensor retains all rights, title, interest and ownership (including copyright ownership) to, the Software, as well as any copies, updates, and modifications of the Software. Licensor expressly represents that it owns and possess all rights, title and interest (including copyright ownership) in the Software, and any copies, updates and modifications thereof. Licensor retains all rights of copyright ownership in the Software, and any copies, updates and modifications thereof, including but not limited to, the right to reproduce, publish, sell, license and distribute the Software, and any copies, updates and modifications thereof.

   B. **Customization and Modification**

      Licensee shall have the right, at its own expense and subject to the provisions of this Agreement, to customize or modify the Software in order to maximize the value of the Software to Licensee for the governmental purposes authorized by this Agreement. Notwithstanding the above, or any other provision within this Agreement, Licensee shall not undertake to customize or modify the Software, or utilize the Software in conjunction with other software or hardware, in such a manner that may reasonably be anticipated to infringe upon the Intellectual Property rights of any third party.
4. Warranty and Indemnification

A. Warranty

THE SOFTWARE IS LICENSED "AS IS" AND LICENSOR DOES NOT MAKE, AND LICENSEE HEREBY WAIVES, ANY EXPRESS OR IMPLIED WARRANTIES OF ANY NATURE INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

B. Licensee's Indemnification Obligation

Licensee shall, at its sole expense, defend, indemnify and hold Licensor and the City harmless from and against any and all claims, fines, penalties, damages, losses, liabilities, awards and costs (including legal fees and expenses) from a third party arising out of any use or modification, whether legal or illegal, by Licensee of the Software.

5. General

A. Entire Agreement

This Agreement constitutes the entire understanding and agreement of the parties with respect to its subject matter; and there are no representations, promises or agreements between the parties except those found in this agreement. Any amendments to this Agreement must be in writing and executed and delivered by both parties.

B. Applicable Law and Forum

This Agreement and the performance hereunder shall be governed by and construed in accordance with the laws of the State of New York without regard to its conflicts of laws provisions. By execution of this Agreement, the parties consent to submit to the jurisdiction and venue of the courts of the State of New York in New York County, and the federal courts located within the City of New York.

C. Assignment

This Agreement and the rights and duties hereunder shall not be assignable by either party except upon the written consent of the other party.

D. Disclaimer

Licensee agrees to waive any and all claims related to the installation, maintenance, and utilization of the Software and shall be solely responsible for any and all use of the Software. The City of New York and the Office of Chief Medical Examiner disclaim any and all liability with respect to the installation, maintenance, and utilization of the Software by the Licensee.
IN WITNESS WHEREOF, the Licensor and Licensee have duly executed this Agreement.

City of New York (Licensor)  
Office of Chief Medical Examiner  
421 East 26th Street  
New York, NY 10016  

[County, State] (Licensee)  
[Name of Coroner/Medical Examiner]  
[Address Information]  

By:  
Acting Chief Medical Examiner  
(Print)  

By:  
[Title] (Print)  

By:  
Acting Chief Medical Examiner  
(Signature)  

By:  
[Title] (Signature)  

Date: ____________________________  

Date: ____________________________  

STATE OF ) ) ss:  
COUNTY OF )  

On the day of , 20__, before me the undersigned, personally appeared , personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument as the CITY OF NEW YORK, acting through its Office of Chief Medical Examiner, and acknowledged to me that he/she executed the same in his/her capacity, and that by his/her signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Notary Public or Commissioner of Deeds  

Notary Public or Commissioner of Deeds  

APPROVED AS TO FORM  
BY STANDARD TYPE OF CLASS  
BY THE OFFICE OF CORPORATION COUNSEL  

Effective from November 25, 2013 to November 25, 2014
Appendix F: List of Persons Contacted

1. Alameda County Coroner’s Office – Lt. Riddick Bowers, Coroner’s Bureau Unit Commander
2. Alameda County Emergency Medical Services Agency – Jim Morrissey, Terrorism Preparedness Coordinator
4. Albuquerque 311 Call Center – Ester Tenenbaum, Division Manager
5. Albuquerque Department of Emergency Management – Roger Ebner, Director
6. American Red Cross – Bob Lirtzman, Senior Volunteer Partner, Safe and Well Linking
7. American Red Cross – Joan Kelley-Williams, Director of International Services
8. Austin 311 Call Center – Cindi Perez, Manager
9. Bay Area Urban Areas Security Initiative – Caroline Thomas-Jacobs, Regional Project Manager
10. Boston Mayor’s 24-Hour Constituent Service – Jeannine Cottola, Manager
11. Boston Office of the Medical Examiner – Kristine Cavicchi, Chief of Staff
12. Boston Police Department – John Cronin, Detective
13. British Columbia Coroner’s Service – Bill Inkster, Identification Analyst
14. California Department of Justice – Hunter Ahlderg, MUPS Administrator
15. California Department of Justice – Mark Larzelare, Program Technician
17. California Governor’s Office of Emergency Services – Carla Simmons, Chief Information Officer
18. California Governor’s Office of Emergency Services – Dennis Smithson, Assistant Chief
19. California Governor’s Office of Emergency Services – Stephen Sellers, Assistant Director of Response Section
20. Chicago 311 Call Center – Audrey Mathis, Director
21. Chicago Department of Emergency Management and Communication – Bill Schatz, Deputy Director
23. City of Boston – Justin Holmes, Interim Chief Information Officer
24. Clark County Information Technology Department – Lori Higdon, Senior Business Systems Analyst
25. Clark County Office of the Coroner/Medical Examiner – John Fudenberg, Assistant Director
27. Contra Costa County Office of the Sheriff – Marcelle Indelicato, Senior Emergency Planner
30. Google Crisis Response – Ka-Ping Yee, Software Engineer
31. Google Crisis Response – Nigel Snoad, Product Manager
32. Houston 311 Call Center – Frank Carmody, Assistant Director
33. ICRA Sapphire, Inc. – Richard Zboray, President
34. King County Department of Public Health – Ashley Kelmore, Response Planning Manager
35. King County Medical Examiner's Office – Colin Jones, Program Manager
36. Los Angeles 311 Call Center – Donna Arrechea, Director
37. Los Angeles Emergency Preparedness Foundation – Brent Woodworth, President/CEO
38. Louisville Department of Emergency Management – Jody Duncan, Public Information Officer
39. Marin County Sheriff's Coroner Office – Keith Boyd, Lieutenant
40. Maryland Office of the Medical Examiner – Dawn Zulauf, Chief Investigator
41. Miami Dade County 311 Call Center – Jorge Gomez, Manager
42. Miami Dade County 311 Call Center – Liz Silva, Community Information and Outreach
43. Miami Dade County Office of Emergency Management – Curtis Sommerhoff, Assistant Director
44. Miami Dade County Office of Emergency Management – Sherry Capers, Emergency Management Coordinator
45. Minneapolis 311 Call Center – Don Stickney, Director
46. Monterey County Department of Emergency Management – Sydney Reed
47. Montgomery County 311 Call Center – Leslie Hamm, Director
48. Napa County Sheriff – Captain Steve Blower
49. National Library of Medicine, Communications Engineering Branch – Dr. George Thomas, Branch Chief
50. National Library of Medicine, Communications Engineering Branch – Michael Gill, Electronics Engineer
51. National Library of Medicine, Communications Engineering Branch – Dr. Sameer Antani, Senior Scientist
52. Nevada 211- Debbie Grant-Reed, Washoe County Director
53. New York 311 – Joseph Morrisroe, Executive Director
54. New York City Office of the Chief Medical Examiner – Dennis Mazone, Director, Special Operations Division
55. New York City Office of the Chief Medical Examiner – Emily Carroll, Mass Fatality Management Plan Coordinator
56. New York City Office of the Chief Medical Examiner – Frank DePaolo, Assistant Commissioner for Emergency Management
57. New York City Office of the Chief Medical Examiner – Mimi Mairs, Legal Department
58. New York City Office of the Chief Medical Examiner – Naeem Ullah, Chief Information Officer
60. Oakland Fire Department – Genevieve Pastor-Cohen, Senior Emergency Services Coordinator
61. Open 311 – Philip Ashlock, Founder
62. Orange County Sheriff’s Department – Bruce Lyle, Assistant Chief Deputy Coroner
63. Puget Sound Regional Catastrophic Preparedness Grant Program – Lisa Kaye, Manager
64. ReddiNet – Linda Tripoli, Client Liaison
65. Sahana Software Foundation – Ramindu Deshapriya, Member
66. San Antonio 311 Call Center – Alan Heatherley, IT Services
67. San Benito County Coroner – Captain Tony Lamonica
68. San Bernardino Coroner's Office – Rocky Shaw, Lead Supervising Deputy Coroner
69. San Francisco Department of Emergency Management – Alicia Johnson, Resilience and Recovery Manager
70. San Francisco Department of Emergency Management – Bijan Karimi, Emergency Services Manager
71. San Francisco Department of Emergency Management – Mary Magocsy, EMS Coordinator
72. San Francisco Department of Public Health – Dr. Naveena Bobba, Director, Public Preparedness and Response
73. San Francisco Department of Public Health – Lann Wilder, EMT-P, Director of Emergency Management
74. San Francisco Fire Department – Jesus Mora, IT Director
75. San Francisco Human Services Agency – Benjamin Amyes, Emergency Response Coordinator
76. San Francisco International Airport – Jeff Airth, Airport Emergency Planning Coordinator
77. San Francisco Office of the Chief Medical Examiner – Christopher Wirowek, Acting Medical Examiner’s Administrator
78. San Francisco Police Department – Cpt. Joe McFadden, Emergency Communications Division Liaison Officer
79. San Francisco Police Department – Lt. Mike Duderoff, Missing Persons Unit
80. San Francisco Resilience – Pat Otellini, Chief Resilience Officer
81. San Jose Coroner’s Office - Dalia Rodriguez, Administrative Director/Coroner
82. San Jose Fire Department, Office of Emergency Services – Joanne Bartholdy, Staff Specialist
83. San Jose Office of Emergency Services – Coleen Mulholland, Acting Director
84. San Mateo County – Brian Molver, Department of Emergency Management
85. San Mateo County Coroner's Office – Emily Tauscher, Deputy Coroner
86. San Mateo County Office of Emergency Services – Jeff Norris, District Coordinator
87. Seattle Department of Public Health – Ashley Kelmore, Response Planning Manager
88. Seattle Fire Department – Joshua Pearson, Lieutenant
89. Seattle Human Services Department – Jill Watson, Emergency Management Planner
90. Solano County Department of Emergency Management – Don Ryan, Emergency Service Manager
91. Sonoma County Coroner – Gregory Stashyn, Sergeant
92. Sonoma County Fire and Emergency Services Department, Emergency Management Division – Zach Hamill, Emergency Coordinator
93. Travis County Office of the Medical Examiner – Leanne Courtney, Forensic Nurse Senior Investigator
95. Vancouver 311 Call Centre – Darcy Wilson, Manager
97. Virginia 211 – Mary Ellen Hutcherson, Northern Virginia Outreach Manager
99. Washoe County Coroner’s Office – Rudy Bein, Deputy Coroner
100. Washoe County Health District – Christina Conti, Public Health Emergency Response Coordinator
101. Washoe County Medical Examiner Coroner’s Office – Dr. Ellen Clark, Chief Medical Examiner
Appendix G: Resources


ADDENDUM

Seattle:
Ashley Kelmore: Public Health

UVIS was not a good fit. They will encourage people to register with Google People Finder and Red Cross Safe & Well to help with reunification, and have staff assigned to review such databases regularly to help with the missing person’s list. Internally, they are using the term ‘unaccounted for’ in the early days of an incident – they might be in a hospital, deceased, in a shelter, or at home and unaware people are looking for them. For their purposes, once they have identified all the likely deceased, scoured hospital and shelter lists and other (i.e. law enforcement) databases, anyone who is still unaccounted for will be considered official missing persons and turned over to law enforcement.

They have trained their 211 operators to serve as initial call takers to pull in some basic information about possible missing persons. That information is entered by them into PIER - http://www.wittobriens.com/go/doc/2000/1579915/PIER - they use if for other call center functions in-house during an emergency, and exported for comparison with hospital, shelter, ME and other lists. There are other components and protocols that they haven’t yet fully built out, but they welcome the chance to talk more about it.

Virginia

Mary Ellen Hutcherson: 211: Northern Virginia Outreach Manager
- They have a patient locator/Family Reunification System
- Can find anyone in any hospital in VA
- Built custom database by SiteVision
- All EMS personnel trained to use hand held devices
- 211 operators are trained to enter information into database and search
  - they are a 24/7 call center and 211 can work remotely
- Information on unconscious victims taken re: 7 different characteristics
- In the event of a death “match” operators take info and a specially trained rep from OCME will call them back
- The system was born out of the Virginia Tech shootings – victims taken to so many different hospitals hours away from the university – officials had no idea where to tell parents to look for their kids
- 211 does not do any vetting of caller – they will give information re: location of victim to anyone who is looking for it – regardless of protective orders, they do not give medical information (they do not have access to it). No HIPAA concerns.
- 211 is main information source in a governor's declared emergency
- training is very simple for operators – drill 4x per year
- Hired Site Vision to create system for them in 2007 – state mandate – state paid.
- Second module does family reunification – working on that now
Site Vision
Mr Shannon Carr
- Health Information on site only shared with hospital personnel
- Family Assistance center use
- 7 data points only, with ranges (no open fields)
- Simple to use: register user, password, 2 min to train, read prepared script (written by lawyers)
- Focused on hospital use, not OCME
- Implementation was easy – all hospitals in VA are members of the Hosp Assoc
- They did a customized version for Georgia (but without the 211 application)
- Virginia owns the code – maintenance costs are lower