Rapidly Improving Public Warning Systems in America

Testimony to
The House Select Committee on Homeland Security
Subcommittee on Emergency Preparedness and Response

Hearing Entitled
Emergency Warning Systems: Ways to Notify the Public
in the New Era of Homeland Security

Wednesday, September 22, 2004

By
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I wish to thank the subcommittee and specifically Congressman Shadegg for calling this hearing to discuss public warning, an issue of great importance to public safety and Homeland Security in America today.

I personally have worked on public warning issues for 41 years and was a senior leader at the United States Geological Survey for 27 years. I chaired a Committee of Federal government employees under the Office of Science and Technology on warning and was founding Chairman of the Partnership for Public Warning. I am convinced we can improve current warning capability significantly in a very short time if we work together.

Hundreds of very knowledgeable and talented people throughout our society have sought ways to improve public warning over many years. Their work has come to focus on what I will discuss today. The fundamental problem is the need for teamwork among the wide variety of stakeholders and I sincerely hope this Committee can help bring the American people what they deserve and expect – timely, accurate, official information to help them deal with natural and manmade disasters. While the country has been fixated on terrorism since 9/11, recent events remind us that Homeland Security also involves responding to major, frequent, tragic natural disasters.

Warnings save lives. They empower citizens with knowledge of what is happening or what is about to happen. People at risk can then make wise decisions about what to do to reduce loss of life and property and how to best deal with adversity. First responders can then decide on the most effective ways to respond. The Media can provide more detail from a basis of up-to-date knowledge.

Today, if we needed to warn people that a dirty nuclear device had just been detonated on the Mall and that they should avoid downtown Washington, we could only reach directly perhaps 30% of those who need to know using all means of warning currently implemented. And the time delay could be many minutes when every second counts. If we needed to warn of a tornado in the middle of the night, we might only reach a few percent of the people directly at risk. Also current warning systems tend to warn more people not at risk than those directly at risk, dulling their response to future warnings.

We live in the midst of a digital revolution where tens of millions of our citizens carry cellular telephones and other devices that could warn them no matter where they are or what they are doing. Many types of electronic signals are being broadcast locally and from space that could trigger a wide variety of electronic devices to warn people when they are directly at risk. We are technology enabled. **Technology is not the problem.**

It is a severe national problem that we are not using modern technology effectively to save lives and reduce losses from natural and manmade disasters in America. While I know there is a desire to do so, I believe it is frustrating for all involved that collectively we have not been able to make the simple fixes needed to solve this serious problem.

So what is the problem? Simply put, the problem is teamwork -- getting the major stakeholders to work together. The need for teamwork or "unity of effort" related to Homeland Security were highlighted over and over in the recent 9/11 report.

An effective warning system involves most Federal Agencies, thousands of State and local agencies, dozens of industries, thousands of companies. An effective warning system sooner or later involves every person and organization across the country that is at risk.

I am sure each of you has been visited by companies who have THE solution for public warning. As founding Chairman of the Partnership for Public Warning, I received many telephone calls from company Presidents who said that we were irrelevant because they had already solved the problem. It usually took only a few minutes to help them realize that they had an important solution but that it was a small part of the larger problem.

There are hundreds if not thousands of American entrepreneurs who have developed impressive techniques for warning people. Technology is not the problem. The problem is the lack of a national warning infrastructure and the teamwork to implement it. When industry has a place from which to received official warnings securely and reliably, they can deliver those warnings in an impressive number of ways. You will unleash the immense imagination and capabilities of American industry when they can clearly see a market and when they can relay real-time warnings with no liability for warning content.

In just a few years we could reach the point where your car radio suddenly is interrupted or turns on to say:
> "Major traffic accident 5 miles ahead at intersection of 495 and 50." Or
> "Tornado 10 miles west heading toward you." Or
> "Chemical explosion at 9:02 am near Metro Central. Stay at least 5 miles away."

This is not science fiction. This is all readily possible with current technology, with good old American marketplace competition, and with a national warning infrastructure.

What do I mean by a national warning infrastructure? This does not need to be some big government program. This does not need to be some massive pile of hardware built specifically for warning. We simply need to utilize better public and private systems we already have. We need to create a logical framework that will enable future systems being built and maintained for other reasons to provide warning capability.

Warning messages are very low bandwidth. They require very few bits and bytes of information. They can easily be multiplexed within digital signals broadcast for quite different purposes. For example, the public television stations of the Association of Public Television Stations (APTS) are implementing a fully digital television broadcasting network across the country. When finished, more than 95% of the American population will be able to receive these signals. APTS has made many presentations here on the Hill detailing its stations' offer to use a small piece of their digital spectrum not only to carry warnings, but to broadcast more detailed information about imminent disasters and disasters under way. These signals could be received by much more than televisions. These signals could be received by any type of electronics in your pocket, on your wrist, in your home, in your car, at work, at play. And this is just one example of a major national infrastructure built and maintained for other reasons that can provide a national warning infrastructure at no additional cost to Federal, State, or Local governments or to the American people.

A national warning infrastructure needs to consist of four critical components:
1. Secure reliable input from all official sources of warning information.

2. Encoding of messages into a standard digital format or protocol that can be readily distributed and processed by small computers.
3. A multi-stranded pipeline or backbone that can instantly and reliably send these messages to all types of delivery systems.
4. Wide varieties of delivery systems that can automatically re-broadcast or address these messages to those directly at risk and to others who need to know.

Many of these elements exist and a prototype national warning infrastructure is already operating in the States of Arizona and Washington and will soon be operating in a majority of States.

With cross-jurisdictional confusion on the Federal side, many concerned people, local government organizations, and private companies have banded together in a Consortium to implement an AMBER Alert Web Portal that exponentially improves delivery of warnings of abducted children and demonstrates clearly how each of the four critical components for a warning infrastructure can be implemented and can work together to improve warning systems immediately.

This consortium grew out of a pilot project led by the state of Washington in partnership with several other states including Arizona. It was started over 20 months ago with a combined investment in technology and development of $4 million dollars. What is remarkable is that all the key stakeholders State and local Police, the State Broadcasters Associations, media, major corporations, Emergency Managers, Departments of Transportation, Border Control agencies and many others openly agreed to participate and all contributed significant insight and have taken important leadership and ownership in its development and now its success. (You have a recent Press Release noting the successful activation and homecoming of a missing child.).

Major corporations like ESRI have contributed dynamic mapping software that plots in real time the region in which the abductor and child could be located. Symantec has contributed the security software and procedures to assure the system is not misused. Hewlett Packard and Intel have contributed hardware and financial support. Limelight Networks and Protus have contributed digital communications capability that demonstrates capacity to manage a national alert network. The AMBER Alert Consortium is based on a variety of agreements signed by all parties on who is responsible for what and how the various pieces all fit together. It has been very successful at building teamwork among a large number of companies and organizations that have and continue to contribute time, money and expertise. This has been done in a way where all software and hardware is in the public domain and controlled by the States.

The AMBER Alert Web Portal Consortium has been unanimously supported by the National Alliance of State Broadcaster Associations and is operational in both Arizona and Washington State. Final training and implementation is underway in 12 additional States and many more have expressed a desire to join. Most importantly, a number of States and stakeholders in the process have expressed publicly that they are looking forward to the expansion of the AMBER Alert Web Portal Consortium to respond to other alerting needs since all the major stakeholders are in place and the Portal was designed by its founders to be scalable. This Consortium demonstrates clearly how technology and teamwork locally and nationally can be combined successfully to implement a National All-Alert Warning Infrastructure.

While I greatly admire what the AMBER Alert Web Portal Consortium has done, I am not here today to promote any one system, I am here to assist you in crafting a vision of how a public warning

capability in this country can be improved very rapidly with some leadership and with contributions from a broad spectrum of players. The methods demonstrated with AMBER Alerts can readily be scaled up to all-alert.

If we go back to the four critical components of a national warning infrastructure:

1. **Inputs**: All-hazard public warning requires secure reliable inputs from police, fire, emergency managers, Homeland Security, the National Weather Service, the U.S. Geological Survey, the U.S. Coast Guard, critical facilities such as chemical or nuclear plants, and many other sources. The AMBER Alert Consortium has demonstrated a secure format that enables the official to initiate an alert directly from the incident or information source.
2. **Standard format**: The Common Alerting Protocol (CAP) has been developed under the OASIS standards process specifically for transmitting all types of warning information. CAP is implemented in Internet Protocol, the common communication protocol used by nearly all digital electronics. The AMBER Alert Consortium is CAP compliant.
3. **Pipeline or backbone**: This has been implemented over wired, wireless, and satellite-based public Internet and private networks. It can easily be implemented over State Emergency Communication Networks, NOAA Weather Wire, NOAA Weather Radio, the Emergency Managers Weather Information Network (EMWIN), etc. The AMBER Alert Consortium has demonstrated that such a digital signal sent via Internet or any land or satellite-based digital network, can be used to directly trigger all Emergency Alert System (EAS) encoders across the country and thus be broadcast on all land-based radio and television transmitters or by cable television. A national presidential message of unlimited length can also be streamed in this way. The AMBER Alert Consortium has tested such a network using Internet and is pursuing the use of a satellite system used by most commercial broadcasters to disseminate alerts.
4. **Delivery Systems**: These are already being provided by numerous vendors including email, pagers, fax, auto-dial telephone calls, auto-dial Short Message Service to cellular telephones, digital signs along highways and in other locations, websites, etc. Some NOAA Weather Radio receivers and some new televisions can turn themselves on and set the volume to announce warnings. New technologies such as wrist-watches and pocket computers are being introduced that can relay warning messages. Cell broadcast that can transmit warnings to all cellular telephones within one or many cells is being introduced in many states in 2004. All modern digital electronics such as radios, televisions, portable music players, computers, automobile navigation systems and such could easily turn themselves on and announce warning information specifically to those at risk once a standard signal is available across the country. The AMBER Alert Consortium has built this interconnectivity with these re-broadcasters and is providing them live feeds for all their different modes of communication. Industry is now beginning to see a market and how they can receive a secure official stream of warning information that they can relay without liability for content.

Thus a National All-Alert Warning Infrastructure can rapidly improve public warning and provide a smooth path to modernize the EAS and other existing national warning capabilities.

The purpose of an alert or warning is to get the attention of people at risk so that they can seek more detailed information and decide on appropriate action. The AMBER Alert Consortium demonstrates a web portal that contains all detailed information instantly after it is available to officials. This information shows up not only on an official website for each state, but is fed directly and automatically onto the website of media and others who request the links as well as news desks,

emergency operation centers, etc. Thus a National All-Alert Warning Infrastructure can not only improve delivery of warnings, but can provide a continuing stream of official information as the crisis develops. Different delivery systems could offer different levels of detail as required by the user.

There is another very important function a National All-Alert Warning Infrastructure could provide: instant notification of officials nationwide or in any region. The system could address telephones, pagers, faxes, email, etc. to any list of government officials. An encrypted message could be broadcast nationally and as new receivers are being developed, could be received and released only to authorized officials within certain affinity groups. Many government agencies are buying such service now, but the services are typically not compatible between agencies. A National All-Alert Warning Infrastructure could feed the information to these service providers for dissemination. With appropriate planning, this means that in the future when most pieces of electronics are capable of receiving and announcing warnings, these same pieces of equipment when owned by legislators, first responders, emergency managers, health officials, and such could announce to them official messages not released to the general public.

Consider a scenario where terrorists planted a person infected with smallpox on a major international airliner and infected people were quickly scattered across the country. When the presence of the Small Pox virus was identified, all appropriate officials across the country could be notified instantly no matter whether at work, at home, traveling, or enjoying recreation.

A warning distributed in standard digital format can readily be used to trigger devices to warn the hearing or sight impaired. As new receivers are built, they could easily turn the digital codes into any language.

The options are many. The intent of the National All-Alert Warning Infrastructure is to deliver official information instantly to service providers who could disseminate the information to the people at risk. Public warning can be improved exponentially if we work together adopting some basic standards.

Finally, I would like to give you some background for what I have explained today. This comes from a long history of studies and pilot efforts by a wide variety of people. As I stated earlier, I personally have worked on warning issues for 41 years and was a leader in the United States Geological Survey for 27 years.

In the 1970's there was considerable scientific evidence that earthquakes might be predictable and Congress established the National Earthquake Hazard Reduction Program. I was fortunate to be able to do much of the staff work in developing and implementing that program. As Chief of the Branch of Earthquake Mechanics and Prediction, we worried in considerable detail on how do you tell people that an earthquake could occur soon that may kill 3,000 people, but we are only 5% certain? What happens if you had warning information but failed to release it? What happens if you release it, no earthquake occurs, but significant loss resulted? These questions are quite similar to some issues we face today with respect to terrorism. Physical and social scientists worked intently on these issues. Many studies were done. Since World War II, a vast body of knowledge and experience has been developed on how to warn people in ways that they will take the most appropriate action. Unfortunately little of this expertise has been applied to Homeland Security issues.

In 1997 and 1998, I was fortunate to chair a working group under the Subcommittee on Natural Disaster Reduction within the Office of Science and Technology. We included the Federal government employees most involved with and experienced with warnings in each of the relevant Federal agencies. Our report "Effective Disaster Warnings" was reviewed by all relevant Federal Agencies before release. This report has been widely acclaimed. It explains what exists and what could exist. It is considered as the foundation upon which to build a modern national warning system. Chapter 6 (The Universally Encoded Digital Warning) was the basis for the Common Alerting Protocol, now a national warning standard under the OASIS Standards Process.

The primary recommendation of this Federal working group was the need for a Public/Private Partnership to move warning forward. In late 2001, after I had retired from Federal service, I heard of a group interested in forming such a partnership. I ended up being the founding Chairman of the Partnership for Public Warning. MITRE Corporation contributed start-up money. I volunteered 60-80 hours of labor a week for 18 months, and FEMA finally contributed some funds. Thus I personally funded about one third of the effort. We established a board of 16 trustees from leaders in warning in government, industry, and academia. We met regularly and held several multi-day workshops bringing together the people from across the country who were most experienced in warning issues. We interfaced with the Office of Homeland Security and all of the Federal Agencies with responsibilities for warning. We talked with many on Capitol Hill and worked with the Natural Hazards Caucus to put on a very well attended informational luncheon on warning. We published several reports that have been well received and that help us all focus on the key issues.

What I have presented today is a logical result of all of this effort and much more on the part of those across the country who are concerned with and experienced with public warning. There are thousands who work hard to keep current systems working as best as possible, who have worked on many committees to seek ways to improve current systems, and who are eager to make our homeland safer through effective warnings. Teamwork is not easy to build, but we all fervently hope you will join us in this effort to save lives, reduce losses, and reduce trauma from natural and manmade disasters throughout America.

ADDENDA:

Effective Disaster Warnings

> Report by the Working Group on Natural Disaster Information Systems
> Subcommittee on Natural Disaster Reduction
> National Science and Technology Council Committee on Environment and Natural Resources
> November 2000 (www.sdr.gov/NDIS_rev_Oct27.pdf)

Working Group on Natural Disaster Information Systems

Peter Ward	**Chairman,** Seismologist and Volcanologist, U.S.Geological Survey
Rodney Becker	Dissemination Services Manager, National Weather Service
Don Bennett	Deputy Director for Emergency Planning, Office of the Secretary of Defense
Andrew Bruzewich	CRREL, U.S. Army Corps of Engineers
Bob Everett	Office of Engineering, Voice of America, International Broadcasting Bureau, U.S. Information Agency
Michael Freitas	Department of Transportation/Federal Highway Administration

Karl Kensinger   Federal Communications Commission, Satellite and Radio Communications Division
Frank Lucia   Director, Emergency Communications, Compliance and Information Bureau, Federal Communications Commission
Josephine Malilay   National Center for Environmental Health, Centers for Disease Control and Prevention
John O'Connor   National Communications System
Elaine Padovani   National Science and Technology Council, Office of Science and Technology Policy, Executive Office of the President
John Porco   Office of Emergency Transportation, Department of Transportation
Ken Putkovich   Chief, Dissemination Systems, National Weather Service
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Carl P. Staton   National Oceanic and Atmospheric Administration, NESDIS
David Sturdivant   Federal Communications Commission
Jay Thietten   Bureau of Land Management
Bill Turnbull   National Oceanic and Atmospheric Administration
John Winston   Federal Communications Commission

Executive Summary and Recommendations

People at risk from disasters, whether natural or human in origin, can take actions that save lives, reduce losses, speed response, and reduce human suffering when they receive accurate warnings in a timely manner. Scientists are developing more accurate and more numerous warnings as they deploy better sensors to measure key variables, employ better dynamic models, and expand their understanding of the causes of disasters. Warnings can now be made months in advance, in the case of El Niño, to seconds in advance of the arrival of earthquake waves at some distance from the earthquake. Computers are being programmed to respond to warnings automatically, shutting down or appropriately modifying transportation systems, lifelines, manufacturing processes, and such. Warnings are becoming much more useful to society as leadtime and reliability are improved and as society devises ways to respond effectively. Effective dissemination of warnings provides a way to reduce disaster losses that have been increasing in the United States as people move into areas at risk and as our infrastructure becomes more complex and more valuable.

This report addresses the problems of delivering warnings reliably to only those people at risk and to systems that have been preprogrammed to respond to early warnings. Further, the report makes recommendations on how substantial improvement can be made if the providers of warnings can become better coordinated and if they can better utilize the opportunities provided by existing and new technologies. Current warnings can target those at risk at the county and sub-county level. The technology presently exists to build smart receivers to customize warnings to the users'; local situation, whether at home, at work, outdoors, or in their cars. It should also be possible to customize the information for trucks, trains, boats, and airplanes. The problem is to agree on standards and dissemination systems.

Disaster Warnings: Technologies and Systems

Disaster warning is a public/private partnership. Most warnings, including all official warnings, are issued by government agencies. Most dissemination and distribution systems are owned and operated by private companies. Liability issues make it problematic for private entities to originate warnings. Public entities typically cannot afford to duplicate private dissemination and distribution systems.

Effective warnings should reach, in a timely fashion, every person at risk who needs and wants to be warned, no matter what they are doing or where they are located. Such broad distribution means utilizing not only government-owned systems such as NOAA Weather Radio and local sirens, but all privately owned systems such as radio, television, pagers, telephones, the Internet, and printed media. If warnings can be provided efficiently and reliably as input to private dissemination systems, and if the public perceives a value and desire to receive these warnings, then private enterprise has a clear mandate to justify the development of new distribution systems or modification of existing systems. What if a warning-receiving capability were simply an added feature available on all radios, televisions, pagers, telephones, and such? The technology exists not only to add such a feature, but to have the local receiver personalize the warnings to say, for example, "Tornado two miles southwest of you. Take cover." What does not exist is a public/private partnership that can work out the details to deliver such disaster warnings effectively.

The Emergency Alert System (EAS) is the national warning system designed primarily to allow the President to address the nation reliably during major national disasters. All radio and television stations (and soon all cable systems) are mandated by the Federal Communications Commission (FCC) to have EAS equipment and to issue national alerts. The stations and cable

systems may choose whether they wish to transmit local warnings and they may also delay transmission for many minutes. The warnings consist of a digital packet of information and a verbal warning of up to two minutes in length. The EAS interrupts normal programming or at least adds a "crawl" to the margin of the television screen. Program producers and advertisers want to minimize unnecessary interruptions. As a result, only a modest percent of severe weather warnings issued by the National Weather Service are relayed to citizens by available stations. The warnings that are relayed may only apply to a small part of the total listening area but are received by all listeners. When people receive many warnings that are not followed by the anticipated events, they tend to ignore such warnings in the future.

The information and technology revolutions now underway provide a multitude of ways to deliver effective disaster warnings. Digital television, digital AM radio, and FM radio offer the capability to relay warnings without interrupting programming for those not at risk. Techniques exist to broadcast warnings to all wireless or wired telephones or pagers within small regions. Existing and planned satellites can broadcast throughout the country and the world. The Global Positioning Satellite (GPS) systems are providing inexpensive ways to know the location of receivers. The technology exists. The problem is to implement standards and procedures that private industry can rely on to justify development and widespread distribution of a wide variety of receivers.

Recommendations

This report provides the background information to justify the following recommendations:

1. **A public/private partnership is needed that can leverage government and industry needs, capabilities, and resources in order to deliver effective disaster warnings.** The Disaster Information Task Force (1997) that examined the feasibility of a global disaster information network has also recommended such a partnership. The partnership might be in the form of a not-for-profit corporation that brings all stakeholders together, perhaps through a series of working groups, to build consensus on specific issues for implementation and to provide clear recommendations to government and industry.

2. One or more working groups, with representatives from providers of different types of warnings in many different agencies, people who study the effectiveness of warnings, users of warnings, equipment manufacturers, network operators, and broadcasters, should develop and review on an ongoing basis:
   - A single, consistent, easily-understood terminology that can be used as a standard across all hazards and situations. Consistency with systems used in other countries should be explored.
   - A single, consistent suite of variables to be included in a general digital message. Consistency with systems used in other countries should be explored.
   - The mutual needs for precise area-specific locating systems for Intelligent Transportation Systems and Emergency Alert Systems to determine where resources can be leveraged to mutual benefit.
   - The potential for widespread use of the Radio Broadcast Data System (RBDS) and other technologies that do not interrupt commercial programs for transmitting emergency alerts.
   - Cost effective ways to augment existing broadcast and communication systems to monitor warning information continuously and to report appropriate warnings to the people near the receiver.

3. **A standard method should be developed to collect and relay instantaneously and automatically all types of hazard warnings and reports locally, regionally, and nationally for input into a wide variety of dissemination systems.** The National Weather Service (NWS) has the most advanced system of this type that could be expanded to fill the need. Proper attribution of the warning to the agency that issues it needs to be assured.

4. **Warnings should be delivered through as many communication channels as practicable so that those users who are at risk can receive them whether inside or outside, in transportation systems, or at home, work, school, or shopping, and such.** Delivery of the warning should have minimal effect on the normal use of such communication channels, especially for users who will not be affected.

The greatest potential for new consumer items in the near future is development of a wide variety of smart receivers as well as the inclusion of such circuits within standard receivers. A smart receiver would be able to turn itself on or interrupt current programming and issue a warning only when the potential hazard will occur near the particular receiver. Some communication channels where immediate expansion of coverage and systems would be most effective include NOAA Weather Radio, pagers, telephone broadcast systems, systems being developed to broadcast high-definition digital television (HDTV), and the current and Next Generation Internet.

A National Strategy for Integrated Public Warning Policy and Capability

Partnership for Public Warning, May 16, 2003 (ppw.us/ppw/docs/nationalstrategyfinal.pdf)

Executive Summary

Public warning empowers people at risk to take actions to reduce losses from natural hazards, accidents, and acts of terrorism. Public warning saves lives, reduces fear, and speeds recovery. Its success is measured by the actions people take.

Warning is an important element of providing for public safety. Public safety is a fundamental duty of municipal, county, and tribal government and, for larger hazards, of state and Federal government. Public safety is also the responsibility of citizens to take action not only to protect themselves and their loved ones, but also to make society safer through their jobs and community activity.

The American people believe that a public warning system exists. While current warning systems are saving lives, they are not as effective as they can be or should be. This document explains the inadequacies of our national warning capability and charts a course for improving current warning capability to provide what the American people need and expect.

The National Weather Service issues the majority of public warnings in the United States and has developed sophisticated warning procedures and systems. The National Oceanic and Atmospheric Administration (NOAA) Weather Wire System operated by the Weather Service and the National Warning System operated by the Federal Emergency Management Agency (FEMA) provide ways to collect and distribute warning information to emergency managers and other key personnel nationwide. The Emergency Alert System and NOAA Weather Radio provide ways to deliver warnings to some of the people at risk. A wide variety of other warning systems reach people at risk around critical facilities such as dams, chemical plants, oil refineries, and nuclear facilities. Many private businesses will deliver warnings to subscribers through telephones, wireless devices, and email.

A basic concern with current public warning systems is that they do not reach enough of the people at risk and often reach many people not at risk. Few local emergency managers or first responders have effective ways to input information and warnings directly into these systems. Warnings from different sources are rarely available to all warning systems in a given region. Many of the systems are not interoperable. There are very few standards, protocols, or procedures for developing and issuing effective and interoperable warnings. Warnings from different sources use different terminology to express the same issues of risk and recommended action. Even the national Emergency Alert System has increasing inconsistencies and increasing potential points of failure due to decreased funding, failure in some localities to develop state and local plans for proper utilization, and recent introduction of new codes in a non-standard manner.

All stakeholders involved in public warning should be represented in developing an effective national public warning capability. The Federal government needs to provide leadership, but cannot do it alone. The primary responsibility for warning resides with county, municipal, and tribal government, but they often need state and Federal assistance. Scientists, intelligence experts, and other authorities develop warning information on regional, national, and even international scales. The news media relay and explain warnings, and the broadcasters and cable operators operate the Emergency Alert System. Industry plays a key role in developing, building, refining, and operating warning systems. Certain industries also provide public warnings around critical facilities. Many professional and trade associations as well as nonprofit organizations and volunteers represent the needs of various groups involved in delivery or utilization of warnings.

Our national warning capability needs to be focused on the people at risk at any location and at any hour, be universally accessible, safe, easy to use, resilient, reliable, and timely. Numerous technologies exist to do this and in many ways technology is the easiest part of the solution. The bigger challenges are to provide accurate, understandable, specific, and informative warnings and to develop procedures and processes for collecting and disseminating those warnings in standard and secure ways.

For warnings to be readily available to all people at risk, no matter where they are or what they are doing, the warning capability should be ubiquitous, but in an unobtrusive manner that respects privacy and individual choice. This requires partnership and teamwork among all the different stakeholders. An effective warning strategy must enable industry to develop a wide range of market-based solutions. Industry needs a clear statement of government intent and clearly articulated standards that specify required interoperability for a national warning capability. Industry will be naturally motivated to augment basic interoperability with competitive capabilities and refinements. Industry also needs an official stream of all-hazard warnings that industry can deliver without liability for the content. An effective warning strategy must also integrate efforts by government not only to issue warnings but also to deliver them..

States, counties and municipalities have developed disparate alert networks at a cost of hundreds of millions of dollars; these networks are not particularly effective, are not interoperable, and will be difficult to consolidate. To alleviate this unduly expensive and massive duplication of effort, national policy should be adopted calling for partnership in linking all stakeholders and the public with critical community-specific information that can be used to save lives and reduce losses. A public/private partnership is needed to develop the policies for and implementation of a national warning backbone that will deliver a stream of all-hazard warning information using standard terminology and procedures to a wide variety of warning delivery systems for any region. Such a capability should leverage existing and developing public and private network capabilities.

The President and Congress need to make public warning a national priority, assign lead responsibility to the Secretary of Homeland Security, appropriate the necessary funds to engage the suitable stakeholders effectively to develop national standards and protocols, and set deadlines for implementation. Public warning should also be made a priority for other federal programs so that information is gathered in a manner that will support this endeavor.

Working together in partnership, the stakeholders should assess current warning capability, carry out appropriate research, and develop the following:
- A common terminology for natural and man-made hazards
- A standard message protocol
- National metrics and standards
- National backbone systems for securely collecting and disseminating warnings from all available official sources
- Pilot projects to test concepts and approaches
- Training and event simulation programs
- A national multi-media education and outreach campaign

If we the stakeholders act now, each and every American at imminent risk can have immediate access to warnings, knowledge of how to take appropriate action, and a choice on selecting what information is delivered and under what circumstances.

Although this document deals with national strategy, the authors of this draft feel it is important to estimate initial costs required to bring it to fruition. A significantly improved national public warning capability can be up and running within two years, at a Federal outlay of no more than $15 million annually. The majority of initial Federal funding should be used to initiate and support stakeholder involvement in developing interoperable standards and procedures for an all-hazard warning capability. Then state and local money can help in developing specific details of local warning input and industry can play a major role in developing consumer products for delivery of the warnings. Large amounts of additional Federal funding should not be required. Thus the strategy is that most federal government costs are up front … to prime the pump.

Many key stakeholders are already making an investment and effort and have laid the groundwork for a federal authority to step up to the challenge. All stakeholders have a shared duty and obligation to act. September 11th taught us that the unthinkable is no longer an excuse for delay. Future tragedies – whether natural or man-made – are not a matter of if, but when. Lives can be saved and losses reduced through effective public warning. Americans expect their government to protect them and believe an effective warning capability exists. However, an effective warning capability does not exist, and it is only as matter of time before our nation will come to wish it did.

Appendix 1: Report Writing Committee And Reviewers

The following individuals initially drafted this report:
 Christine Alex -- National Weather Service, National Oceanic and Atmospheric Administration, Dept. of Commerce
Kenneth Allen -- Executive Director, Partnership for Public Warning
Art Botterell -- Moderator, Common Alerting Protocol Working Group
Ray Chadwick -- President, ClassCo Inc.
Joanne Donnelan -- National Center for Missing and Exploited Children
Gary Dubrueler -- Shenendoah County, Virginia, Emergency Management
Darrell Ernst -- Lead Defense Space Systems Engineer, The MITRE Corporation
Eric Forsman -- EMCOM, National Emergency Alert Notification System
Tom Hughes -- ComCare Alliance
Douglas J. Lowe -- Teledyne Brown Engineering
Frank Lucia -- Federal Communications Commission, retired
Roland Lussier -- Comlabs
Kevin McCarthy -- Reverse-911
Dr. Andrew Michael -- U.S. Geological Survey, Department of Interior
Efraim Petel -- President, Hormann America, Inc.
Kendall Post -- Chief Technology Officer, Alert Systems

Kenneth Putkovich -- Chief, Dissemination Systems, National Weather Service, NOAA, Dept. of Commerce
Richard Rudman -- Partnership for Public Warning
Jeffrey Sands -- The MITRE Corporation, also the Partnership for Critical Infrastructure Security
Greg Sink -- Vice President and General Manager, Federal Signal Corporation
Rick Tiene -- Vice President, Roam Secure Inc.
Dr. Peter Ward -- Chair, Board of Trustees, Partnership for Public Warning
Stan Wentz -- State and Local Coordination Branch, Emergency Preparedness and Response, Dept of Homeland Security
Walt Zaleski -- National Weather Service Southern Region, NOAA, Department of Commerce

Each of these people participated based on their extensive experience. They do not necessarily speak from the position of their organizations.

While many people have reviewed the draft of this report, the following offered specific comments that have been used to improve the report. Again they speak from their experience and do not necessarily speak from the position of their organizations:

Doug Allport -- President, Allport Group
Stephen Ambrose -- Office of Earth Science, NASA
Bernice Carr -- FEMA Operations Center, Emergency Preparedness and Response, Department of Homeland Security
Alan Clive -- Civil Rights Program Manager, Emergency Preparedness and Response, Department of Homeland Security
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Jeng Mao -- National Telecommunications and Information Administration, Department of Commerce
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Ted Miller -- HCJB World Radio Engineering Center
Dr. Nancy Mock -- Associate Professor, Department of International Health and Development, Tulane University
John Mullin -- Office of Safety and Mission Assurance, NASA
Hiroaki Nakaya -- Section Chief, Disaster Response, Forecast Center, Japan Meteorological Agency
George Nichols -- Vice President, Dialogic Communications Corporation
Bob Oenning -- E911 Administrator, Washington State Military Department, Emergency Management Division
Gary B. O'Keefe -- Latah County Idaho Disaster Services Coordinator
Scott Pace -- Deputy Chief of Staff, Office of the Administrator, NASA
Deborah Potter -- Executive Director, NewsLab
Dr. John Powers -- Senior Consultant, CCRI, former Executive Director, President's Commission on Critical Infrastructure Protection
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Ralph Swisher -- Emergency Preparedness and Response, Department of Homeland Security

Les Taylor -- National Weather Service, National Oceanic and Atmospheric Administration, Department of Commerce
Craig Tiedman -- Office of External Relations, NASA
Chris Warner -- Founder and CEO of Earth 911 network
Douglas "Bud" Weiser -- Cellular Emergency Alert Services Association
Herb White -- National Weather Service, Dissemination Services Manager, NOAA, Department of Commerce
George Wilcox -- Corporate Liaison, National Oceanic and Atmospheric Administration, Department of Commerce

STATE OF WASHINGTON PROVES NEW NATIONAL AMBER ALERT PORTAL WORKS

*AMBER Alert Portal is credited with quickly spreading the message
that led to the location and return of a missing Seattle child*

Seattle, WA – August 23, 2004 – The successful recovery of a missing child in Washington is being hailed as the first use of the AMBER Alert Web Portal system. State broadcasters rebroadcast the alert activated by Seattle Police on August 15th in less than two hours.

"We're very excited that the Web Portal worked just as it was intended to," stated Mark Allen CEO for the Washington State Broadcasters Association. "Tremendous amounts of work have gone into the development of this portal and from the broadcaster's side all of that effort proved more than worth it with today's results."

Time is the enemy - 74% of the abducted children who wind up as a homicide statistic, meet this fate within the first three hours of abduction. The AMBER Alert Web Portal simultaneously activates forms of communication engaging and empowering broadcasters, citizens and numerous organizations with real-time information directly from the first responder, in this case the Seattle Police Department.

"We are very pleased with the new system and its potential," stated Captain Fred Fakkema of Washington State Patrol. "This activation illustrated how powerful the new system is and how quickly information can be disseminated instantaneously," he explained. "It is rewarding to know that the information supplied by the portal directly to broadcasters is what led to this happy ending."

Once information is entered by a law enforcement official in to the Portal, the system disseminates this live data and updates to all affected parties including law enforcement agencies, broadcasters, transportation departments for road signs, 511 networks, probation officers, Megan's Law officials, border agencies, utilities, transit authorities, 911 operators, and any other organization that can engage people in the search for the missing child. Now even citizens can sign up on WashingtonAMBERalert.com or nationally at AMBERAlert911.com and receive the alert via any communication device directly from the activating law enforcement agency.

The AMBER Alert Web Portal is intended to ultimately be a deterrent to child abduction by enabling every possible person to receive immediate alerts thereby having everyone possible looking for a missing child.

To date Washington is the first state to activate the web portal system and with training in Arizona completed and a statewide test of the portal set for August 23st the Arizona system will be live in shortly after that. Other states signed on to participate in the Portal System are: Connecticut, Hawaii, Louisiana, Maine, Mississippi, Missouri, Montana, Nevada, New Jersey, Oklahoma and Oregon. Several other states are actively pursuing becoming part of what is envisioned to quickly become a seamless national network

As stated by Mr. Allen "once everyone is fully engaged in this unprecedented effort we will send a strong message that if you are even thinking of abducting a child within a matter of minutes *we will all be looking for you.*"