TIEMS Annual Conference 2011

Keynote Speakers

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1. THE ROMANIAN EMERGENCY MANAGEMENT SYSTEM

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Abstract

The Romanian Emergency Management System is a mechanism of multi-stakeholders which provides coordination and response in case of emergencies, and serves as an advocate for prevention and disaster risk reduction at different levels. The objectives of the creation of the NEMS are the setting-up, organization and management of emergencies, as well as the procurement and coordination of human, material and financial resources.

The new emergency management system represents an integration of all respective Romanian and international expertise and lessons learned. This system has the form of a hierarchic, with a single command structure – the General Inspectorate for Emergency Situations.

The General Inspectorate for Emergency Situations (GIES) is the main tool for the coordination of all organizations involved in emergency management, according to the existing national and international legal framework. It is a subordinated to the Ministry of Administration and Interior and is organised centrally (the general inspectorate) and regionally (the subordinated county inspectorates for emergency situations). The main functions are to set and maintain the preparation for, response to, and recovery from disasters. Approximately 30.000 non-commissioned officers man the fire engines, search and rescue teams, CBRN teams, height and water rescue teams, emergency medical teams and also support structures such as: logistics, human resources, administrative, media etc.

The GIES is a result of the merge between the Civil Protection Command and the Military Firefighters Corps in 2005. Prior to that, the Civil Protection Command was tasked in the population protection in case of disaster and also in case of armed conflict (early warning, sheltering, evacuation, mass care, intervention a.s.o.).

By bringing together the two above mentioned structures all activities were rendered more efficient. The main reason for this efficiency boost was that the civil protection disaster management responsibilities and lessons learned were merged with the intervention resources of the firefighters structures. This pattern was successfully applied to countries like Hungary, Croatia, Slovenia, Bulgaria, the Czech Republic and Poland, and Romania makes no exception.

2. Failures and Successes Observed in 2011 Tohoku Japan Earthquake

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Abstract

This paper presents the results of a field investigation of the unprecedented disaster of the tsunami caused by the M 9.0 Tohoku Taiheiyo oki earthquake. Loss of over 15,000 lives is expected. Direct damage alone is estimated to be over $300 billion. The financial impact will be far greater. The author visited devastated cities one day after the earthquake to collect critical information for response, recovery and reconstruction. Much can be learned from success and failure of Japanese practices in tsunami preparedness.

An extensive seawall system constructed to mitigate the tsunami risk failed. Although advanced tsunami warning system saved more than 500,000 people, highly essential structures were not protected from the seawall failure. Breach by the tsunami compromised the emergency generator system in Fukushima nuclear plant and caused eventual meltdown of the nuclear reactors. The tsunami destroyed the large fuel tanks in Kesennuma causing the ignition of leaked fuel in the bay burning a major area of the city.

The implication for the rest of world, including the United States, is significant. Worst-case scenarios must be understood and contingency plans must be developed. The design decision risk must be communicated to stakeholders and the public. Cost-effective, resilient, engineering solutions must be developed to make cities sustainable.

3. Future Public Safety Communication Systems

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Abstract

How new technology supports existing processes within the emergency sector – a holistic view of technology and crisis management. Background: There has been a major leap in technology the last decade. How can this leap transfer into saving lives and minimize damage? Based on experience from 20 countries we found there is a common understanding of the challenges, but no common way of evaluating how new technology can be implemented in a cost efficient way. The holistic view: To be able to give an answer to this one must focus on the total process of each kind of incident: from the inbound 112 call through the analysis and decision making at the command centre to the

communication with the citizens. Used in the right way technology can support, not only communication to citizens, but also logistic functions and two way channels for enhanced performance of crisis handling. Using existing bandwidth within the mobile networks to support a broader range of information exchange between control room and first responder is equally important. Additional information could for instance be live updated maps with points of interest (location of people, structure of buildings etc.). Controlling the network is also of great importance. If you control the network in a crisis situation you will be able to let all necessary communication take advantage of available capacity. How to choose solutions: Different technological solutions will give alternative support for the processes used for each type of crisis. What should be the basis for choosing technological solutions? In this presentation we focus on how the change in Mobile phone networks from 2G/3G to LTE (4G) will result in a huge potential for both inbound and outbound 112.

4. The Application of Internet of Things (IOT) for a "Smart" Emergency Management System in China

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Abstract

Public safety emergency management capacity is an important indicator of the modernization degree to major cities. It is directly related to people's lives and property, social stability and the safety of state.

At present, emergency management system is in a rapid development stage in China. In against snow disaster in South China in 2008, May-12 Wenchuan earthquake, Beijing 2008 Olympic Games, November-15 Big fire in Shanghai and other big events, emergency management system has played an important role in disaster prediction, emergency reporting and commanding, rescue implementation etc.

The emergency management system for public safety has been listed into the prior areas of long-term development plan in China. The internet of things (IOT) technology is one of the foundations for the function of disaster prevention and can be useful for the next-generation emergency management system (or "smart" emergency management) because of its comprehensive advantages.

This presentation mainly discusses how to use the IOT technology in emergency management system, including application framework, solutions, and cases description.

Attendees will learn how the traditional emergency management system turns to be a smarter platform by adopting IOT technology into applications like preliminary surveillance, early warning system, and intelligent rescue tracking etc.

5. Global Disaster Management Education

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Abstract

The fact that the population of the globe is rapidly growing concomitantly with the ever-increasing reality of natural and man-made disasters is not coincidental. Civil strife, stress on the natural world, immense need for energy, and rapid rise of economies in developing countries are the result of this convergence. As the largest countries struggle with the pressing need for disaster management, there has been an increasing interest in structured and consistent disaster management education of first responders and emergency managers. Developing nations have a critical need for structured learning programs. In the United States, although there has been great activity in creating academic programs at all levels, there is work on standardization yet to be done.

An international perspective must be taken on what the most important knowledge and skills would be for basic training in emergency management. First is the need to clearly define critical global competencies, followed by development of courses in which to provide knowledge and skill. This paper identifies and critically examines competencies that are common between nations, and describes a four course series that will provide a foundation on which international emergency management can be built. It is based on a combination of current research, perceived required competencies, existing courses, and expert deliberations on core knowledge. There is great respect for the experiences possessed by all nations, as well as the wealth of knowledge possessed by indigenous populations that must be applied.

Such an intense international academic undertaking is possible through TIEMS, due to its reputation, its membership, and the expertise it represents. A global perspective and merging of academic needs with practical application is vital. Despite the wide range of countries, cultures, and languages, a common platform exists for emergency management.

6. Information Systems to Support on Site Emergency Response Operations

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Abstract

This presentation introduces the methodologies of establishing an information system for supporting on-site emergency response operations from three perspectives: end-user requirement gathering,

information acquisition, and information presentation. Gathering comprehensive user requirements is never an easy job. Cognitive Task Analysis (CTA) is a way of capturing human centered requirements in information system design. A CTA-based Goal Directed Information Analysis (GDIA) is introduced in this talk, which consists of seven clearly defined, repeatable steps that help the practitioner to extract information requirements. The first three steps are specifically preparing for establishing an adequate goal hierarchy, and the following four steps are focusing on refining the goal-decision-information (GDI) diagram. The comprehensive user requirements are obtained from this set of GDI diagrams. Information acquisition is a key component in any emergency response system. This talk will cover how to use the latest developed wireless technologies in the information gathering and acquisition. An UK government funded research project SafetyNET is used here as an example. When the first responders arrive on site, they have very limited information about the building, occupants and the location of the hazard. They do not know if they need to enter the building, whether it is safe to enter and how to most efficiently deal with the hazard. SafetyNET has addressed this need. Procuring the right information at the right time, in the right format, and to get it to the right people is a challenge, as poor designs can lead to response systems that are not used, are ineffective and in some cases dangerous to the emergency personnel. The third part of this presentation explores how situation awareness oriented design is used for on-site emergency information presentation. The on-site dynamic information that could be presented to emergency personnel is examined through the use of three situation awareness levels. Examples are shown in the presentation.

7. Integrated Disaster Information Analysis for Compound Disaster Risk Assessing

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Abstract

Around the world, people are being faced with environmental threats and challenges to water related issues such as water scarcity, floods, storms, droughts. Recently, flash flood, typhoons have been increasing and intensity of them also increasing due to climate change. In recent decades, around the world, catastrophic disasters such as hurricane Katrina, cyclone Nargis have occurred frequently causing a massive loss of life and negative long-term social, economic and environmental consequences. Out of damage from natural disasters in recent decade, more than 60% is due to typhoon in Korea. For last 10 years from 2000 to 2009, the annual damage cost is estimated about USD 1.8 billion and the annual recovery cost is about USD 3.0 billion from water related disasters in Korea. Timely information analysis and warning dissemination is main issues on disaster risk management. To analysis compound and complex disasters, information sharing between organizations or communities and integrating various formatted information from different systems are very important. This presentation is focused on the GIS based disaster risk management system develop by National Emergency Management Agency (NEMA), Korea for information sharing and disaster risk assessing. NEMA developed National Disaster Management System (NDMS) as a comprehensive nationwide GIS based disaster information analysis system to assess disaster risk and support decision making for all disaster management processes in terms of prevention, preparation, emergency response and recovery through information sharing and transferring based on IT technology, information analysis with GIS. In the GIS based disaster risk management system, monitoring data, simulation results and images information from CCTV and satellite are integrated and

analyzed for assessing compound disaster risk and supporting timely decision making. The warning massages are disseminated by Cell Broadcasting Service (CBS), caption system using exclusive intranet, PC, cellular phone, FAX, messenger and twitter to people who being on dangerous area. To analysis integrated information and assess disaster risk of severe and broad disasters connecting with neighborhood community, sharing disaster information and technology at country and global level is important and needed. For this, NEMA hosted 4th Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR) in Incheon, Korea on 25-28 October 2010 with the special partnership of UNISDR. More than 900 participants from 53 countries in Asia-Pacific region, International Organizations, UN agencies and NGOs adopted Incheon Declaration and agreed Incheon REgional RoadMAP (REMAP) and Action Plan. To follow the action plan of 4th AMCDRR, EMA has been developing a global platform as a platform of the platforms for sharing information and transferring technology related to Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA).

8. TIEMS Member Service on Research Activity

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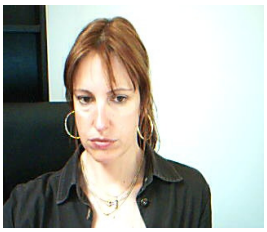

Abstract

While emergency management began in the context of improving the performance of organized events, emergencies by definition represent a disruption of such designs, providing a promising new domain for future work: the theoretical essence and practical needs of disorganizations. Recent reflections of emergency management focused on a particular sector within the field of emergency response. However as boarder body emergency management does not benefit from cohesive ongoing research stream of investigations. The thematic network of **TIEMS** brings together research institutions, universities, industry and public authorities in the emergency management area from Europe and even Worldwide seeking to achieve the following objectives:

- create an institutionalized platform for exchange of scientific information (in particular, research in progress), for pooling of (partly common, partly contrasting) experience and for facilitating research cooperation among European researchers and experts in the domain of emergency management;
- foster a better understanding of the (common and different) needs and backgrounds of emergency management, particularly with a view to the impacts of environment;
- identify how research can be the best support of operations under emergency conditions;
- establish a standard for the next generation EMERGENCY LIFECYCLE MANAGEMENT SYSTEMS with key focus on handling disasters and environmental impact effectively and efficiently.

9. ADAPTIVE LEARNING IN DISASTER MANAGEMENT FOR COMMUNITY AWARENESS AND RESILIENCE: THAILAND CASE STUDY ON TSUNAMI EARLY WARNING AND MITIGATION SYSTEMS

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Abstract

The Adaptive Learning in Disaster Management for Community Awareness and Resilience (ALDC) Project under IOC/UNESCO was initiated to focus on enhancing people's learning and participation in the planning and coordination of disaster warning, preparedness, response, mitigation, and recovery to build up awareness and resilience at the community level. The project has provided strategic integrated models and approaches for national interagency government departments and all relevant stakeholders for implementation at the community level. The project activities targeted approximately 24 village locations in six Andaman coastal provinces of Thailand affected by the 26 December 2004 tsunami. The project duration was two years from January 2007 to December 2008, with a total cost of US$ 242,857.

The project has a bottom-up approach because local communities have better knowledge at their locality than others. With collective information, local knowledge can be integrated with technical know-how from experts in disaster management and relevant areas to establish local plans for preparedness and response that can be adapted for individuals to avoid or run away from disasters in time of crisis. This is to promote the learning process for local disaster risk management, targeting school children, teachers, the Sub-district Administrative Organizations, village leaders and government officers from different departments that are potentially exposed to hazards. The three components of the adaptive learning process for school and community-based management include their adaptive learning for school and community work plan development, ways to reduce risks in the school and community, and assessment of the preparedness and response by carrying out tsunami early warning and evacuation exercises. The process was initially started at schools, while the project then focused on communities where the schools were located.

10. A Breakthrough in the Earthquake Disaster Mitigation Education

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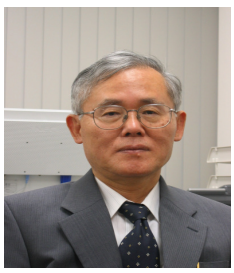

Abstract

We in Japan have a long history of the disaster mitigation education and training practices. People tend not to be eager to education and training or preparation for the threat except special counties of

recent experience of large disaster or of considerable threat for serious danger. Japan started practical utilization of the so-called earthquake early warning (EEW) whole of the country October 2007. The EEW uses network seismic data at some 1,000 sites. The present system can afford the warning from several to tens of seconds before the coming of the large seismic wave of intensity 5+ (Japanese scale) for general public, and/or of much smaller ones for delicate and fragile facility as semi-conductor production factory.

During course of the development of the system, it is recognized that the EEW has both direct usefulness to decrease the possible disaster for human damage as well as properties, and the indirect ones to increase consciousness toward the disaster. The system itself can have double functions of helping people to take emergent actions before arrival of disastrous secondary seismic waves and training of prompt actions when the shock is not enough severe as causing damages. At present there is no practical earthquake prediction, so that the experiences to have alarming before the big shock induce a kind of mental shock. The strong impression of those people tends to change attitude to the disaster mitigation efforts. They begin to fix the furniture in the house, prepare emergent goods for the risk, and discuss how to response toward the assumed threat among family.

Training should have periodical characteristic and also have random ones to maintain the awareness of people. In this point the so-called the EEW for general public and that for high rank user should be both used to increase mental preparedness for the disaster mitigation.

11. Istanbul Earthquake Rapid Response System: Current Practices and Future Developments

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Abstract

Potential impact of large earthquakes on urban societies can be reduced by timely and correct action after a disastrous earthquake. Rapid estimation of ground shaking, induced intensity, damage and loss maps throughout a geographic area with earthquake location and magnitude information combined with recorded ground motion parameters and local geology data provides valuable tool for emergency response and public information.

Along the history, Istanbul was exposed to many damaging earthquakes (Ambraseys and Finkel, 1991). Between 4th and 19th centuries there were 32 earthquakes in Istanbul. Approximately, in every 300 years Istanbul is exposed to a very intensive earthquake.

It is expected that the source of earthquakes which will affect Istanbul province intensively will be active faulting system in Marmara Sea. The probability of a devastating earthquake occurrence in Marmara Sea in the following 30 years is 60% (Parsons and others, 2000).

In order to assist in the reduction of losses in a future disastrous earthquake in Istanbul a dense strong motion network, Istanbul Earthquake Rapid Response System – IERRS, has been established in 2002. One hundred of the strong motion recorders are stationed in dense settlements in the Metropolitan area of Istanbul in dial-up mode for Rapid Response information generation.

The current methodology developed for near real time estimation of losses after a major earthquake and applied in IERRS consists of the following general steps:

1) Rapid estimation of the ground motion distribution using the strong ground motion data gathered from the instruments;

2) Improvement of the ground motion estimations as earthquake parameters become available and

3) Estimation of building damage and casualties based on estimated ground motions and intensities.

12. NATECH DISASTERS IN ROMANIA

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Abstract

There is growing evidence of the fact that in the last decades natural disasters at global level had an increasing frequency of occurrence and more significant consequences. Furthermore, there are also many studies which show an increasing number of natural disasters which trigger technological disasters (known as NATECHs). NATECH disasters pose severe risks and their significant negative consequences affect local communities around the world. This paper briefly presents the NATECH concept and summarizes the definitions from the literature perspective. The NATECH concept is strongly related to the vulnerability concept, which indicates the potential of the system to suffer losses or to be affected by the negative consequences of extreme events.

The situation of the NATECH disasters in Romania is also presented. Romania is a European country characterized by a diversity of natural hazards: heavy rainfalls and snows, floods and flash-floods, earthquakes, landslides, mudflows etc. Following a number of unfortunate combinations between these factors and different deficiencies associated to the industrial operator, a series of negative events can occur, which in specific cases can become severe NATECH disasters, causing human loses and significant material damages. The consequences of these NATECH disasters can be reduced through an extensive preparedness and efficient risk emergency situations management.

13. INTEGRATED MONITORING, INFORMING AND PUBLIC WARNING SYSTEM FOR EMERGENCY SITUATION IN ROMANIA

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Abstract

The management of the emergency situations that are generated by floods, risky meteorological phenomena, hydro-technical construction related accidents and accidental pollution events is a national level interest activity since we are to take into account not only their occurrence frequency, but also the amplitude of the consequences such risk situations might trigger.
The floods that have lately occurred in many countries as a result of the climatic modifications that have been registered, more often than ever, during the past ten years, have led, based on an increased social responsibility attitude, to the appearance of a new concept that refers to the floods risk approach.

As far as Romania is concerned, the protective actions taken against floods represent a domain that is settled by means of Rules that are related to the management of emergency situations that have been generated by floods, risky meteorological phenomena, hydro-technical construction related accidents and accidental pollution events.

"The owners, holders of any title, of dams and of any other hydro-technical constructions whose damage or breakdown might endanger the population, their material goods, social objectives and the production facilities, or might even cause prejudice to the environment, are compelled to assure the maintenance of such dams or hydro-technical constructions, to carry out reparation works to the above mentioned, to properly operate them, to equip them with the AMC that are necessary for the running of the UCC activity of these ones, to install population alarm – warning systems in case of danger situations, and to organize the monitoring, intervention and vindication activities so that to be consistent with the regulations that were approved by means of the authorizations related to the water administration, the protection plans against floods, and against any other risk situations, as well as to be consistent with any other regulation documentation in force".

A special part, in setting the acoustic alarm system, the areas and the population evacuation ways, as well as the removal of the population's goods, is incumbent on the emergency situation local inspectorates with whom the above mentioned owners, as well as the engineers, shall collaborate, and from whom they shall, subsequently, obtain the approvals that such local inspectorates might request.

For the population alarm – warning system to be efficient under emergency situations, it is compulsory to monitor, round the clock, the risk factors, and further on, to send the data that refers to the critical threshold exceeding to the local Dispatchers whose responsibility is to monitor the emergency situations, as well as to assure the interconnection of such information with the local inspectorates' operational centers in view of a common management of the risk situations.

This presentation briefly presents the architecture of the only national level integrated system that has been adapted to the international concept of population acoustic warning, system that has been designed to alarm the population of the areas that are likely to be flooded further to the bursting of the dykes that are administered by SC Hidroelectrica SA. – who stands not only for the biggest energy producer of Romania, but also for one of the most important dam owners of our country. The unitary alarm – warning system was achieved by SC ROKURA SRL, based on the "turn-key" principle, and it includes: equipment supply and installation, realization of the necessary civil constructions, interfacing, putting into operation, training and maintenance.

14. ROMANIAN EMERGENCY MANGEMENT INFORMATION SYSSTEM ARCHITECTURE

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Abstract

The Romanian Emergency Management Information System – **EMIS** - (**SMISU-RO)** is an integrated system with a distributed architecture designed to support decision makers to make rapid decisions:

- Collecting data about the emergencies from all institutions involved in emergency management
- Exchanging of information and collaboration between parties involved for an enhanced decision making
- Gathering and sharing information between the organizations involved in the management of the emergency situations based on a user defined access
- Effectively communicating information between institutions
- Maintaining the emergency plans covering all emergency phases
- Maintaining an up-to-date database of all necessary human (point of contacts and intervention teams) and material resources
- Assessing the emergency situations and damages
- Executing the emergency plans and procedures
- Notifying the involved parties and report the situation
- Initiating, coordinating and monitoring search and rescue missions
- Coordinating medical assistance
- Managing the resources needed for interventions
- Coordinating evacuation and sheltering
- Recording all the transactions for post event audit and after actions reviews
- Maintaining relations with media/public relation
- Coordinating of post-event operations

The paper will presents in detail the features of the system and how it was integrated into National Emergency Situations Management System in Romania

15. Business continuity vs social responsibility in critical infrastructure protection

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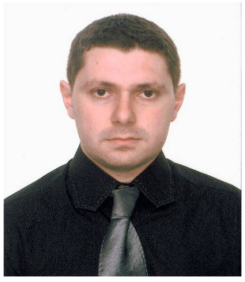

Abstract

Purpose - We are all witnessing a major financial crisis; the banking system is a critical infrastructure worldwide.

Findings – The effects of the crisis led to a reverse phenomenon of critical infrastructure in nationalization of leading banks in the United States, Germany and United Kingdom in order to ensure economic stability of those states.

Methodology/approach - The partnership between Government and critical infrastructure operators, the risk-based analysis, the evaluation and investment interdependencies should be key-issues in the strategic vision for the states that aim sustainable development.

Research implications - The two concepts are in most cases known and defined correctly, the real issue is that between entities governed by the two concepts are sufficiently strong synergies that should lead to a risk management proactively

Practical implications - Our objectives are to identify the most important issues about risks and threats and critical business processes, in order to implement clear procedures, safety and security measures.

Originality/value –Integrated security management and identification of risks are particularly important in strategies for protecting citizens, taking into account the negative impact it may have partial or complete disruption of activity of critical infrastructure.

Key words: risks, critical, business

16. RISK REGISTRY AND ITS APPLICATION IN ROMANIA

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Abstract

The risk register represents a risk management system where risks are processed starting with a simple listing, appointment of risk responsible and implementation of the surveillance procedures, a quantity and quality evaluation, an elaboration of risks decreasing plans, of contingency plans of risk response plans, but also of the corresponding flows regarding the management of these intra- and inter-institutional plans and monitoring the implementation of the specific measures.

The system is based on the WEB technology and it integrates a GIS server. It is designed in order to run multi-organizational with the purpose to manage natural risks that imply the competences of more organizations. The system also has an engine for flows and procedures that can be implemented according to the specific needs of each organization or each risk. It ensures secured access elements, notification, organization on groups and/ or user roles, etc.

17. TECHOLOGIES AND CONCEPTS FOR URBAN SAFETY

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Abstract

By 2050, nearly three quarters of our planet will live in cities. The increment of inhabitants in the cities implies an increasing demand in vital services as transport, health, education or personal security. For all cities and regions competing in the global market place, safety and security are crucial factors in determining overall quality of life. Moreover, protecting citizens is the first duty of a state and also a priority for the success of businesses, communities and civil society at large.

In recent years, several cities' Town hall authorities, police and fire brigade managers have made a great effort in applying innovative approaches and new technologies to help reduce emergency response time and urban crime. However, there is still a need to enhance technologies already applied in the public safety area.

New capabilities could help make urban public safety systems not just more connected and efficient, but smarter. Instead of merely responding to crimes and emergencies after the fact, smart new systems should analyze, anticipate and actually working to prevent them.
Cities framework for urban safety is divided in four main groups depending on their functionality.

Situational awareness – sensors classification based on their functionality.

Command Centers – defines how the input data is processed and how to detect anomalous behavior.
Ad-Hoc networks – deploy an array of sensors in strategic points.

Alerting technologies to citizens – send emergency messages through telecommunication networks.