SIEMENS

Integrated safety and security for smart cities

By Peter Löffler, Head Innovation and Industry Affairs, Siemens Building Technologies

Urbanization is one of the megatrends of our time. According to the United Nations, by the year 2025 it is estimated that the global population will have grown to over eight billion, with significantly more than half living in major conurbations. As people, and the infrastructure required to support them, are increasingly concentrated in urban spaces, this presents a number of challenges. The safety and security of urban environments is a basic prerequisite for modern cities to thrive and prosper. However, urbanization also increases the vulnerability of cities: terrorist attacks, crime, social unrest and heightened impact of natural disasters are just some of the safety and security issues that need to be addressed. The public and private sector have to work together to find effective solutions.

Authorities are faced with managing cities that are growing rapidly, evolving constantly and becoming increasingly complex, often developing organically to meet increased demands and changing social and economic patterns – often without any long-term strategic planning. Towering skyscrapers, packed transportation networks, multi-tenant buildings and untold thousands of people flocking to sports and entertainment venues mean that more and more people are being squeezed into ever tighter spaces. Anonymous crowds of people are ideal soft targets for criminals and terrorists, as illustrated so vividly during the recent attack in Boston. Smart city concepts, which are networked across all disciplines and where traffic, people and transportation flows can be controlled holistically, can provide a counterbalance.

In general, there is a clear correlation between the size of a city and its crime rate. The cost implications of criminal activity are significant: The World Bank has estimated that, depending on the country, the total cost of crime can be as much as 25 percent of the gross domestic product (GDP). According to estimates by the European Commission, even in the comparatively safe EU the costs associated with

crime and natural disasters account for at least 5 percent of the joint GDP.

The majority of these enormous costs are borne by the public sector. Civic authorities are responsible for delivering continued access to education, employment, health care, utilities and transportation, all of which have a fundamental need for safety and security. As business continuity becomes an ever greater issue in ensuring the ongoing economic prosperity of a city, the concept of "urban security" – protecting city residents and critical urban infrastructures such as airports, data centers, roads and power grids – takes on vital significance. Ultimately, urban safety and security gives cities advantages in the global competition for investors and well educated citizens who value their quality of life.

Resilient cities are better prepared

Each city has facilities whose protection is particularly vital. When such critical infrastructures are attacked or subject to a natural disaster, the consequences are far-reaching, as demonstrated so graphically by the flooding of the River Elbe in Germany and Hurricane Katrina in the U.S. Therefore, it is crucial that suitable preventive measures be taken to ensure the reliability and resilience of infrastructures and business processes. They must first help manage critical situations as efficiently as possible and then enable a quick return to normal operations.

Airports are a good example. As vital regional hubs they are prime potential targets for terrorist attacks, which would have a lasting debilitating effect on the entire region. The ever present threat to air travel, and the many national and international regulations subsequently passed to secure it, have led to a dramatic increase in the range of security solutions deployed. Today's airports are large and complex facilities which require a multi-layered security strategy – from the perimeter to the terminal buildings. A number of different technologies are typically used, including intrusion detection, wide-area video surveillance, access control and centralized management. These systems operate through an integrated command and control platform to provide day-to-day supervision of airport operations as well as coordinated and timely incident response.

Public facilities, including airports, are highly reliant on their IT infrastructure. For this reason, the protection of data centers has dramatically increased in importance and

is now part of virtually any critical infrastructure scenario. Similarly, there are very few organizations in the private sector which are not in some way or another dependent on data. Cyber threats are obviously an important part of the equation, but it is just as vital that network security measures be backed by physical security provisions. Again, the trend is towards integrated systems whose open architecture facilitates the development of ever "smarter" security solutions.

Safe evacuation of crowds

In cities, crowds occur much more frequently than in rural areas. Whether it is a busy train station during commuter rush hour or a major sporting event at a stadium, large numbers of people in a confined area present their own challenges in terms of safety and security. In the event of a threat, the first priority is to remove people from the source of danger. However, this is easier said than done: The right instructions need to be delivered in the right way and at the right time to avoid panic and to ensure people are evacuated as quickly and as reliably as possible.

Crowd simulation research has helped to identify how people react in different scenarios. Instructions based on real-time data and managed from a central command and control point have consistently proven to be the most effective. This relies on the different elements of safety and security systems working together and drawing information from a variety of sources to allow those tasked with responding to the incident to do so quickly and efficiently.

The four phases of the safety and security cycle

The sheer diversity of safety and security challenges faced by today's cities means that a holistic approach is becoming the strategy of choice. Solutions providers are moving away from standalone products and systems and towards networked solutions which cover all stages of the entire security concept. There are essentially four stages in the safety and security cycle: prevention, protection, response and recovery.

Prevention can be subdivided into two areas: prevention of emergencies or accidents, and prevention of crime. An example of the first area are fire safety and extinguishing procedures to ensure continuity of power supply in the event of a fire. Prevention of crime is a more wide-ranging field, particularly in urban environments where the threats are many and varied: vandalism and graffiti, anti-social behavior,

robberies, burglaries, political demonstrations, organized crime and political terrorism to name but a few.

Similarly, protection can be divided into two areas: protection of the physical infrastructure and IT networks, which are at the core of the smart city. Cities are a collection of urban infrastructures housing key resources such as universities, museums and churches, public buildings, private sector facilities including offices and production sites, transportation networks, and critical infrastructures such as airports and data centers. With the ever increasing role of IT in providing urban services, the protection of this "virtual backbone" is becoming more and more critical.

If an incident does occur, it is important to have in place the means and protective measures to respond immediately and effectively in this phase. The speed with which intervention resources are able to mobilize, and the clarity and immediacy of the information they have to work with, are vital factors, as are the coordination of the resources and the support provided to first responders.

How resilient and failsafe urban infrastructures ultimately are can be measured by how quickly normal operations are resumed after an incident. Getting back to a normal state of operation as quickly and as smoothly as possible is the objective, whether it is as simple as reopening a tunnel after a traffic accident or as complex as rerouting public transport after a terrorist attack on a strategically important building.

Integrating safety and security systems with command and control centers

By adopting systems which are able to integrate the different elements of the safety and security cycle, those responsible for protecting a city are able to do so much more effectively. The systems in place need to be able to accommodate the complexities of the city environment as well as the needs of the various stakeholders, from private-sector corporations to public authorities and intervention forces. In the event of an incident, particularly a major one, city authorities may well need to call on the services of several different law-enforcement or emergency agencies – from police and fire department to transportation and traffic management to private security resources. Only if those authorities have a complete overview of the situation and the available operating resources can they make meaningful

decisions on how to deal with the incident. By integrating a variety of systems – communication, automatic alarm, information and video surveillance systems – into a central command and control platform, comprehensive and consistent incident response can be achieved. This is at the very heart of a smart, resilient and safe city.

Conclusion

Cities are the central living and working spaces of today. With increasing urbanization, their significance and their contribution to the gross domestic product will continue to grow. To ensure these growing communities are safe and secure, intelligent concepts must be adopted along the entire safety and security cycle. Especially in times of shrinking budgets, authorities need to take a preventive and proactive stance in making strategic and tactical decisions by investing in intelligent solutions which maximize the efficiency of the limited personnel resources available for safety and security.

Cities are in global competition with each other. Investment in a city and its subsequent economic development will happen only if it is seen as a stable, secure and productive environment. Urban safety and security are key criteria, both for people deciding where to live and for businesses choosing where to invest.

Contact for journalists:

Siemens AG, Media Relations

Catharina Bujnoch, phone: +41 41 724-5677

E-mail: catharina.bujnoch@siemens.com

Follow us on Twitter at: www.twitter.com/siemens_press

The **Siemens Building Technologies Division** (Zug, Switzerland) is the world leader in the market for safe and secure, energy-efficient and environment-friendly buildings and infrastructures. As technology partner, service provider, system integrator and product vendor, Building Technologies has offerings for safety and security as well as building automation, heating, ventilation and air conditioning (HVAC) and energy management. With around 29,000 employees worldwide, Building Technologies generated revenue of 5.8 billion Euro. For more information, visit www.siemens.com/buildingtechnologies.