if it is a false alarm, saving money in a typically resource-stretched public service.

Another important use is in crowd control. For example, during big events like concerts, exhibitions, sport events or public demonstrations, video surveillance can help to provide security workers with clear views of actions and gives them the ability to focus on certain areas or individuals. Adding special functionality can help to prevent crimes in large gatherings. One example where these features were successfully implemented is the metro in Moscow, where the cameras are able to detect suspects as well as hazardous objects.

CONTROLLING FLOW

In fact, these two objectives are affiliated because traffic is one of the biggest problems when it comes to (environmental) sustainability. But with video surveillance it's possible to monitor the traffic in a city, which can help to improve the traffic flow, therefore improving the air quality as well as decreasing pollution. It can even be used to monitor parking spaces, which would make it easier for people to find a free spot, further reducing traffic blocks as well. When it comes to safety on the roads, the possibility of license plate recognition helps to

> **REGULAR MAINTENANCE IS ESSENTIAL TO GUARANTEE SYSTEM HEALTH IN A SMART CITY**

detect cars and drivers with illegal licenses, missing insurance or even stolen cars.

Smart cities often share three common technological elements: data, connectivity and IoT sensors. All three create a network for an interconnected environment. Despite being key elements of a smart city, cameras are missing other 'senses', like hearing, feeling, tasting and smelling.

By adding these sensors that detect external conditions such as temperature, air and water quality as well as sound and noise pollution city authorities can collect valuable information that can help to solve common urban problems, for example measure and analyse the correlation of these pieces of data together. The cameras that are capable of running embedded applications are able to provide features such as rain detection, for example, and can also have a huge impact when it comes to traffic management or emergencies. Now it's possible to improve rescue countermeasures and direct the traffic so that there is less congestion or relate it to other data to get different information.

THE SURVEILLANCE FACTOR

As shown, video surveillance is an important factor when it comes to the transformation into a smart city. It allows us to us to keep the city running smoothly. However, if like the nervous system it becomes unhealthy or damaged, it will not be able to operate properly and failings will happen.

The biggest threat to a smart city is cyber attacks because they not only affect IT systems, but also the

TIME TO GET SMART

Andrea Sorri provides an introduction to the cities of tomorrow and wonders what it is that makes a city smart

Human beings have come a long way to become the intelligent creatures we are today. The key was and still is the ability to adapt to our environment by evolving new skills and biological attributes to improve our survival. This pattern is replicated in the progress we've seen in our technology-driven world. We're constantly developing and combining new technology and devices to improve our quality of life and adjust to our modern-day needs. The results of this gradual implementation of technology solutions include the Internet of Things and – in a broader application – smart cities.

But what exactly is a smart city? It's a question that has been asked a lot, but there is no common answer. The internet offers various definitions, but the core theme mainly stays the same: smart cities are emerging and offering a safer, more interconnected environment.

There are a lot of potential factors that can contribute to a city being considered smart, but they follow six key objectives around making a city more livable: efficiency of services, sustainability, mobility, safety & security, economic growth and the city's reputation.

Data, connectivity and IoT sensors create the network for an interconnected smart environment

To make a smart city run smoothly, authorities need to implement a solid infrastructure on which to run it. If you compare a smart city to a living creature, you could think of the transport channels as the veins and arteries allowing movement around the city; emergency services as white blood cells, attacking threats to keep the city safe and sound; the economy as the lungs keeping the whole thing breathing and moving and construction work as the skeleton and muscle growing the city; then the central nervous system that ensures each part of the 'body' is functioning properly and speaking to each other to work in unison, would be a video surveillance network. Video surveillance is a key feature for every smart city and can be a useful tool to reach the 'livability' objectives of a true smart city:

An interconnected smart city can lead to the reduction of crime: When an alarm is triggered it will go straight to the law enforcement headquarters and alert the emergency services company. This helps to reduce the response time and it's easier to determine

networks a smart city is based on. That includes critical infrastructure and physical services. Cities and governments must find ways of dealing with the risks of the ongoing digital transformation – now more than ever. The research underlines the need for adequate countermeasures in order to face these future challenges with resilience, response and forensic analytics as the backbone of this new approach.

At this point it should be stated that cyber security is a shared responsibility. In fact, teamwork is crucial when it comes to the fight against cyber crime and the protection of our data. Especially in

AN INTERCONNECTED SMART CITY USING VIDEO CAMERAS CAN LEAD TO A REDUCTION IN CRIME

a connected smart city where there are even more entry points to the networks.

Regular maintenance is essential to guarantee system health. Users must adopt effective cyber security measurements and choose safe passwords, which should be changed on a regular base. Manufacturers should not include intentional access points, such as backdoor channels, while the tools to detect cyber threats should be affordable and easy to use. Integrators and installers are responsible for

keeping all their devices and software protected and up to date. Remote access to installations should be limited and all devices being connected to the central system should be checked very carefully for viruses to avoid any kind of infection.

HANDLING NEW THREATS

With every new technology come new threats. What's important is the way we handle these threats. Cyber crime is nothing new and shouldn't scare people, but it should be advertised in an open way and the full risks made clear. Ultimately, it is important to adjust the security level to that required by digital transformation and raise awareness so everyone can contribute to safety.

Smart cities offer great opportunities for everyone. Although in the early stages currently, the aforementioned objectives are based on a deep understanding of the needs of citizens, the community and businesses. Smart cities will ultimately make the life of people easier. Video surveillance already has the power to increase safety as well as security and with the growing number of features (such as connectable sensors and tools), it can be easily applied to help achieve smart city goals.

Looking at the ongoing development in the field of technology, connectivity and the Internet of Things, the potential and possibilities will grow over the next few years. It remains to be seen what this next level of our technological evolution will look like and how it will influence our lives ●

Andrea Sorri – Director of Business Development for Government, City Surveillance and Critical infrastructures – has worked with Axis Communications for over 15 years and has a keen interest in technological systems that could have positive effects on society.

Video surveillance is a key feature of the smart city of the future