

An aerial photograph of a city skyline, likely Auckland, New Zealand. The image shows a mix of modern skyscrapers and older, more traditional buildings. A river or harbor is visible in the lower-left quadrant. The sky is clear and blue. The text is overlaid on the center of the image.

**Safe City:  
An Integrator's View, Lessons  
Learned, Challenges and How  
a Safe City Should Function**

**New Zealand Security Association  
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## Safe City:

# An Integrator's View, Lessons Learned, Challenges and How a Safe City Should Function

### Introduction

As part of the larger, 'Smart 'Connected' City' programme, 'Safe Cities' is a huge subject which, at its heart, focuses heavily on video surveillance. In this hand out, which coincides with the presentation, you will find further details regarding the points covered from what I personally believe to be a safe city and how this should function before covering challenges faced during the process and the lessons learnt from this. Finally, you will find information on the process of 'SNAP' and how this can be put into practice.

### Case Studies

#### 1. Newcastle City Centre

In the early 90's, due to the regularity of alcohol fuelled incidents in Newcastle, the police force decided to install six black and white PTZ cameras in the 'Bigg Market' area which at the time, housed over 22 bars, clubs and restaurants. Linked by free space microwave transmission, to the police station, the cameras were mounted on buildings where power was derived to feed both the camera and microwave, making it easily manageable from a project point of view.



Due mainly to its operational scope – to reduce alcohol related anti-social behaviour and public disorder – the scheme proved to be reasonably successful and resulted in a number of arrests and successful prosecutions.

Although the installation of CCTV did not completely stop crimes from happening – realistically, a near impossible task – they did help in the detainment of the offenders and led to arrests and sentences being given. With the success of the scheme apparent, in 1997, 2020 Vision Systems won a competitive tender to upgrade the initial scheme, this was known as the 'Safer Cities Programme', part of a wider initiative designed to address and reduce crime and the fear surrounding it.

## Case Studies continued...

### 2. Edinburgh City in View

The second case study is 'Edinburgh City in View', an interesting project which it is believed was the first to integrate a number of disparate systems; bringing together the existing City centre, Scottish Parliament and six surrounding town systems and networking them back to a new Police Force Communications Centre (FCC), the largest in Scotland at the time.

The integration allowed FCC staff to gain access and control any of the CCTV cameras in the network for investigation following emergency calls and enquiries. The system was linked to GIS mapping, ANPR number plate recognition and all camera streams called up at the FCC were automatically recorded and all the systems were able to operate independently.

Again, this system proved a success due to the clear definition of the objectives and the stakeholders, who, in this case, were the police. In the words of the project leader, Detective Sergeant Ian Lusk of Lothian and Borders Police,

*'The installation was borne out of the necessity to have numerous and diverse CCTV feeds into the new Force Communications Centre. This was by no means an easy system to design, due to five different local authorities having different matrices requiring integration to inter-communicate. It is in our opinion, truly innovative and has achieved the desired objectives of Lothian and Borders Police.'*



## What is a Safe City?

If you were to ask this question, you would likely receive many different answers, however my personal opinion is that the Safe City objective is about creating a secure, pleasant and welcoming environment for the inhabitants of a city to prosper and grow and enjoy an improved quality of life.

Safe City is about the prevention and the detection of crime and public safety issues. It is clear that video surveillance plays a key role in fighting crime and protecting public spaces.

It is valuable in the 'operational management' of urban spaces and is designed to improve community safety and the early identification and management of crime, as well as emergencies and other disruptive incidents, such as;

- Terror/Bomb Threats
- Assaults
- Public disorder/riots
- Graffiti and vandalism
- Drug dealing
- Fly tipping and littering
- Burglary and theft
- Anti-social behaviour

Essentially, the aim of this is to reduce illegal activity and to better manage disasters such as fires and flood; however it is also beneficial in the monitoring of traffic and motor offences, ensuring rules such as bus lane enforcement are adhered to. Another important use is that through this system, the identification of those considered dangerous or to be a potential threat to the safety of others, would be able to be made and monitored, ultimately limiting the level of risk.

*'Safe city is about creating secure, pleasant and welcoming environments for a city's inhabitants to prosper, grow and enjoy improved quality of life.'*

*'A city that is safe, secure and resilient; planned and functioning with minimum disruption from crime or disasters.'*



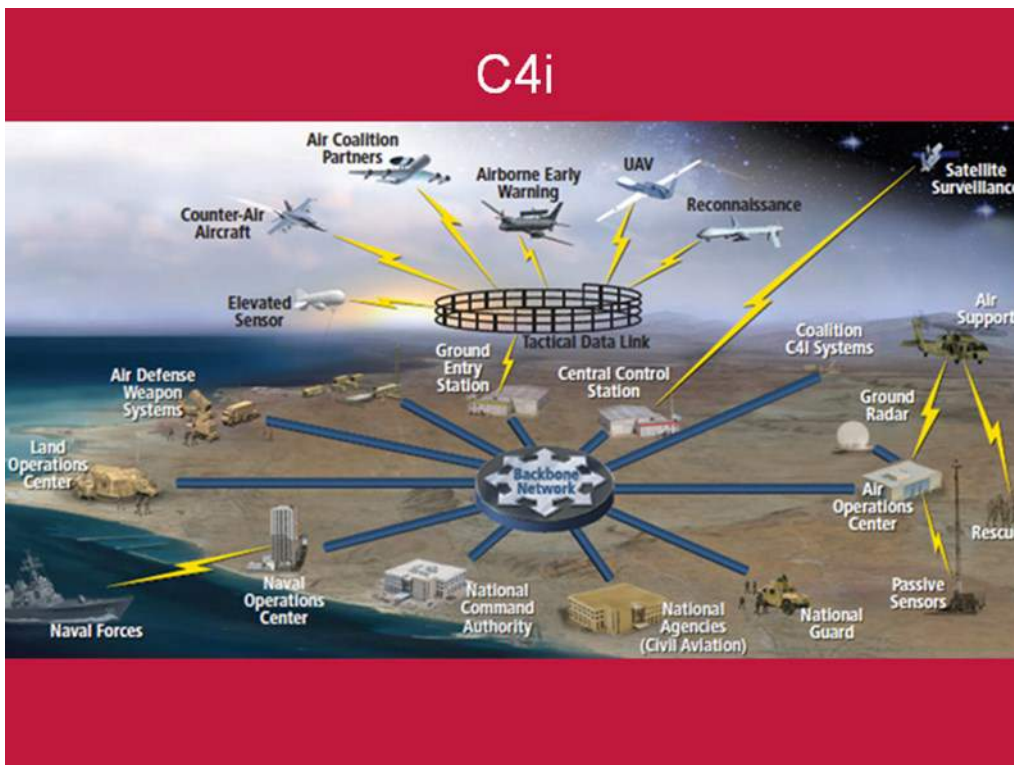
## The role of the Integrator

As an integrator, the role in 'Safe City' is all about deploying video surveillance and complementary systems to gather intelligence and then sharing it with the emergency services and authorities who require it so they are able to make informed decisions and proceed with the correct response.

It is about installing the right hardware – cameras, access control, alarms, gunshot detection etc., and software – video management, analytics, recording devices to collect, analyse and process the data and transfer it to those that need it.

Safe City can be compared to the Military's **C4i**, which started life as **C2 Command and Control** and refers to the military commanders directing and controlling their battle forces. C4i extends this principal to command, control, communications and intelligence, a complex 'system of systems', generally using high tech commercial 'off the shelf' equipment and devices (COTS), to provide information superiority and the ability to use this information advantage to get an efficient and appropriate response in any given situation, based on up to date intelligence.

## How a Safe City Should Function



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## The role of the integrator continued...

While the military may use C4i in the battlefield to direct tanks, drones and warships alongside its troops, the concept also works in civilian life and, more specifically, within Safe City. It is all about situational awareness, gathering intelligence with the upfront questions being the most important – what information do we need to collect? When and where do we need that information? And what decisions does it lead us to make?

It is vital to know who carries the authority to make the call and ensure instructions are carried out correctly. Were we to slip back into military parlance, we know that since the end of the Cold War, the world has become less safe in so many ways. There are new risks and threats in terms of criminality, terrorism and even austerity. It is a different world now; global events have created a need for more sophisticated security systems and a need to match the increase in public demand for safer environments.

It's all about

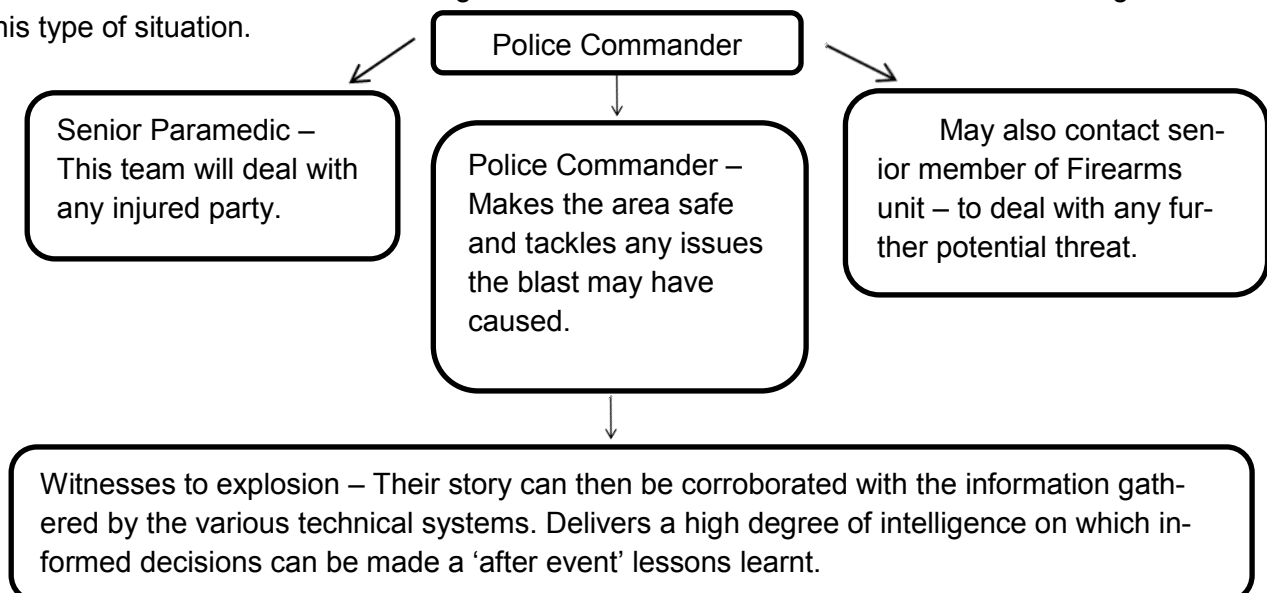
*'Knowing what's going on so you can do something about it,' (Adam 1999)*

or, to put it another way

*'What you need to know, not to get caught out' (Jeannot et al, 2003)*

### C4i in Practice

As an example, we will use a major incident such as the explosion of a bomb in a street or other crowded area; the chain of command would need to be determined for things to remain in control. Below is a flow chart showing the assumed chain of command which would be given in this type of situation.



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**C4i in practice continued...**

In this situation, the computing and communications equates to the data gathering and processing technologies. For us, on the one hand, it is down to the cameras to gather visual images from target areas and would, ideally, be supplemented by other data collecting devices – making the system multi-dimensional and placing fewer onuses on the Control Room operator by automatically drawing their attention to specific events or issues so they can make a decision on the action which needs to be taken – also GPS mapping, gas detection or gunshot detection for example and video analytics configured to instantly detect and report exceptions to the norm – these exceptions might be a build-up of irregular crowds, entry or trespassing to forbidden areas, a detection of an object left behind, the recognition of known faces or perhaps vehicle identification plates.

The modern control room approach will be more proactive, providing the operators with the intelligence provided by the various systems and devices. This information will in turn be shared, as appropriate beyond the control room for example, to Police HQ Gold Command for overall authority or to local hospitals A&E department for advanced planning of handling the injured. Using portable display devices such as smart phones and tablets and even broadcasting pertinent information via social media ensures quick delivery of the message and also reassures and provides information on how to get to safety.



## **Challenges Faced & How to Solve Them**

A Safe City is a complex task and often frustrations and unrealistic expectations will arise, some of these challenges include;

- **Identifying the project champion** – This is completely necessary for success, making sure to identify this person from the get go is key – This should be someone with authority who will drive the project forward, is able to liaise with all of the relevant parties, make informed decisions and keep the programme on track.
- **Politics** – There are a number of financial and political conflicts when it comes to City Surveillance as everything about this kind of environment is constantly changing and growing, from the potential threats, the government and the amount of money assigned to the budget.
- **Defining stakeholders** – Stakeholders could be system users, those tasked with making the concept of a safe city real and those who need to implement it; identifying the different roles and defining their specific objectives will minimise loss of interest and will also develop a more clear understanding between the different parties involved – All of these are required to ensure project success, if one stakeholder fails then the project fails too.
- **Setting clear objectives** – It is important to do this immediately and to ask the question: **What are your primary goals?** This is about managing expectations – use the **Five W's** to gain a full understanding of what it is that you want to achieve.
  - What information do we want to capture? What do we want to see?
  - Where do we want this information to be gathered from?
  - When do we want this information to be gathered from?
  - Who needs this information?
  - Why do they need this information?



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### Challenges Faced & How to Solve Them continued...

- **Threat Landscape** – Identifying the likely threats of the area in which you are working allows you to work out the specifics of the job – however it is important to bear in mind that threats and vulnerabilities change – working with a good surveillance partner will ensure you are one step ahead of this.
- **Technology changes** – Technology is moving at such a rapid pace, working with an integrator who understands the sector and can add value by integrating the system with other systems as they develop or emerge, preferably with a long term partnership basis rather than a simple tender return.
- **Logistics** – There is a long list of these problems, many which are unexpected and simply cannot be avoided – i.e. working in a high risk area – though what may or may not happen cannot be predicted, working with the local police and authorities can be of use. Technical problems will also arise, the major one being finding a suitable power source – It is often a battle between the power company and council or the building owner and the council – This is usually considered low priority to these organisations so it can be time consuming.
- **Security of the infrastructure** – The world of IP has made video transmission easier and more cost effective; however it has also brought security problems. The network design must be optimised for the transmission of video, high bandwidth/bitrate, but also secure from hacking. There are serious flaws in some surveillance networks which have the potential to be easily exploited by terrorists or criminals.

## **SNAP**

Due to the challenges which come with developing and implementing a Safe City project, we coined 'SNAP' to help in making 'SNAP' decisions regarding these problems. This consists of four key areas;

1. **Sustainability**
2. **Necessity**
3. **Accountability**
4. **Proportionality**

### **Sustainability**

Sustainability is paramount to the implementation and long term operational success of any CCTV project. You need to ask:

- Are capital funds required and are they available to implement any proposed surveillance scheme?
- Are the operational costs and streamed revenue funding budgeted for management, supervision and monitoring staff realistic?
- Is funding for ongoing maintenance and post- warranty service/repairs available?
- Is the project partnership funded? i.e. other departments such as Health and Safety or Marketing who could use the information provided by the system in shopping trends.

### **Necessity**

There is no doubt Video Surveillance is a proven valuable tool in 'operational management', but it is not a remedy against all ills as some might have you believe. It is important to clearly identify the problem which needs to be addressed – why is CCTV required and what is it going to achieve? This is where the **Operational Requirement (OR)** comes in. It's a non-technical document describing what is to be observed, the level of detailed information required and most importantly, why?

- Is the system designed to deter, prevent, detect or prosecute?
- Is it proactive, reactive – or both?
- Is the system continually manned or unmanned, and used only after an incident is reported to provide post-incident information?
- What's the systems' scope? i.e. prevention and detection of crime, public safety, etc. (It should be noted that this is a requirement under the Data Protection Act)

What are the areas to be covered, and what degree of coverage is required?



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## SNAP Continued...

### Accountability

- Accountability covers the legal implications of introducing video surveillance. We're all governed by increasing legislation which places increased responsibility on those operating and using video surveillance.
- Using the OR document to identify what, where, when, by whom and in particular the why of a CCTV system.
- What processes/controls are being deployed in the monitoring, recording and processing of the video images?
- Does the monitoring facility have suitable infrastructure and operate to a Code of Practice which meets Best Practice and complies with legislation such as the Data Protection Act?

### Proportionality

Question how appropriate CCTV is as a solution to a problem. Consider the following points:

- Is CCTV appropriate given the location and environment and the problem to be addressed?
- Have other solutions been investigated and discounted?
- Is the number and quality of cameras sufficient and reasonable?
- How will images be transmitted? i.e. fibre, LAN/WAN, etc.
- What are the logistical implications? Where will power be derived? What civil work is needed? Is the lighting suitable or will additional lighting or IR lamps be required?
- Have local planning regulations been addressed?  
SNAP provides a framework and a structured process for the application of Video Surveillance in Safe City projects.

In other words, is there a crime problem or reason for installing Video Surveillance and what is the impact of the installation? Will it create a better environment or would an alternative solution be more beneficial?



### **Summary—The steps towards a Safe City**

- Get the right project lead and design team - the reason CCTV was successful in the North of England was down to the police employing a technical expert, ex-military intelligence and BBC engineer who could liaise technically and operationally between all parties.
- Get the right stakeholders on-board and the political will.
- Make sure the Capital Expenditures (CAPEX) budget is available and at the right values and Operating Expenses (OPEX) for operating the system and ongoing servicing and changes in threats and technology – Nothing spoils a project faster than lack of finance.
- Clearly define the operational parameters, and make use of analytics and data processing software or your operators will be overwhelmed by the sheer amount of data they need to handle.
- Employ and stick with a good integrator who uses quality hardware; build trusting relationships with the various technology vendors; network infrastructure, analytics, data processing, communications etcera, it will save money long term.

**To sum up in two words: Trust and Cooperation.**

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