

Axis network audio solutions for smart cities

# The sound of a safer and more efficient city

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# Add audio for a more livable city

## The combined power of network surveillance and audio voice messages

In the smart city discussion, network video surveillance cameras and other IoT sensors often take center stage. But what about audio? In combination with network cameras, network audio can add a great deal of value in the quest to improve the quality of life for city residents and visitors. First-class network audio systems that deliver voice messages should play a central role in the ecosystem of a smart city. Using sound effectively, cities can greatly improve urban security, public safety, and even city operations – not to mention ambiance. All of which are improvements that greatly contribute to the ultimate goal of the smart city: making cities more livable.

[Read more >](#)

# 3 good reasons to add audio

Network audio adds value to your city by helping you communicate clearly at the right time, in the right places.

**1**

## Audio for safety

You can use signals, prerecorded or live messages to safely and reliably deliver warnings and crucial safety information. Audio is an invaluable tool for delivering up-to-the-minute information and instructions to the public in emergencies.

**2**

## Audio for security

Network audio adds value to your network surveillance system by helping you act on what you see. It lets you proactively deter crime by responding immediately and intervening remotely with prerecorded or live messages. You can set up your system to trigger prerecorded messages in response to potential criminal activity or to notify an operator or guard to speak directly to a culprit.

**3**

## Audio for operational efficiency

Network audio is a great tool for delivering non-critical information and supporting your operations. For simplicity and cost-efficiency, you can use a single system for paging, public address, guidelines and regulations.

# 3 flexible ways to add audio

Choose between three types of audio messages to make your city smarter, safer, and more livable.

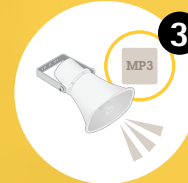
## 1 Live voice message or manually triggered prerecorded message



1 Camera, sensor or personal warnings trigger notification to administrator



2 Administrator evaluates the information and speaks live through the speaker or triggers a prerecorded message manually



3 Live voice message or manually triggered prerecorded message is played

## 2 Prerecorded message triggered by an event such as motion detection



1 Camera detects and sends command to speaker to play prerecorded message



2 Speaker plays prerecorded message

## 3 Scheduled prerecorded message



1 Audio management software used for administration of scheduling, zoning and content management



2 Speaker plays prerecorded message

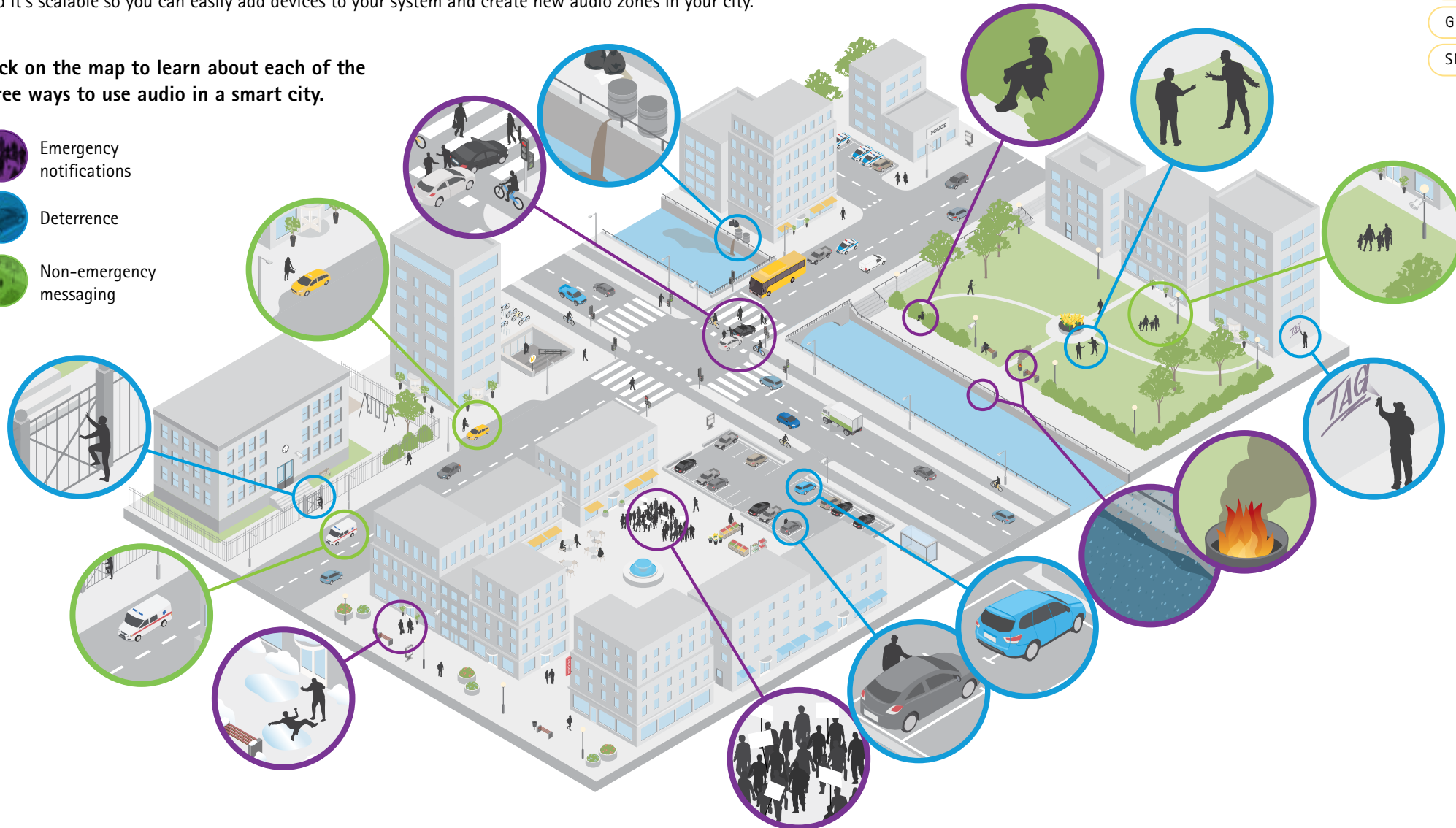
“ Using sound effectively, cities can greatly improve urban security, public safety, and even city operations. ”

# Audio at work in a smart city

How can you put audio to work in your city? You can deliver critical information right where it's needed in an emergency. You can proactively deter crime. And you can provide non-critical information that improves the way people experience life. Network audio is so flexible that you can adapt it to new purposes as they arise. And it's scalable so you can easily add devices to your system and create new audio zones in your city.

Click on the map to learn about each of the three ways to use audio in a smart city.

-  Emergency notifications
-  Deterrence
-  Non-emergency messaging



# Keep people safe

For a city to be truly livable, residents and visitors alike have to feel safe. And that means you need a system you can rely on in an emergency. It's crucial that audio instructions and warnings come through loud and clear, without distortion. Because network audio systems are 100% digital – from source to speaker – clarity isn't lost along the way. You can easily create and manage zones to ensure information is delivered exactly where it's needed. And remote testing lets you proactively check that your system is working when it matters.

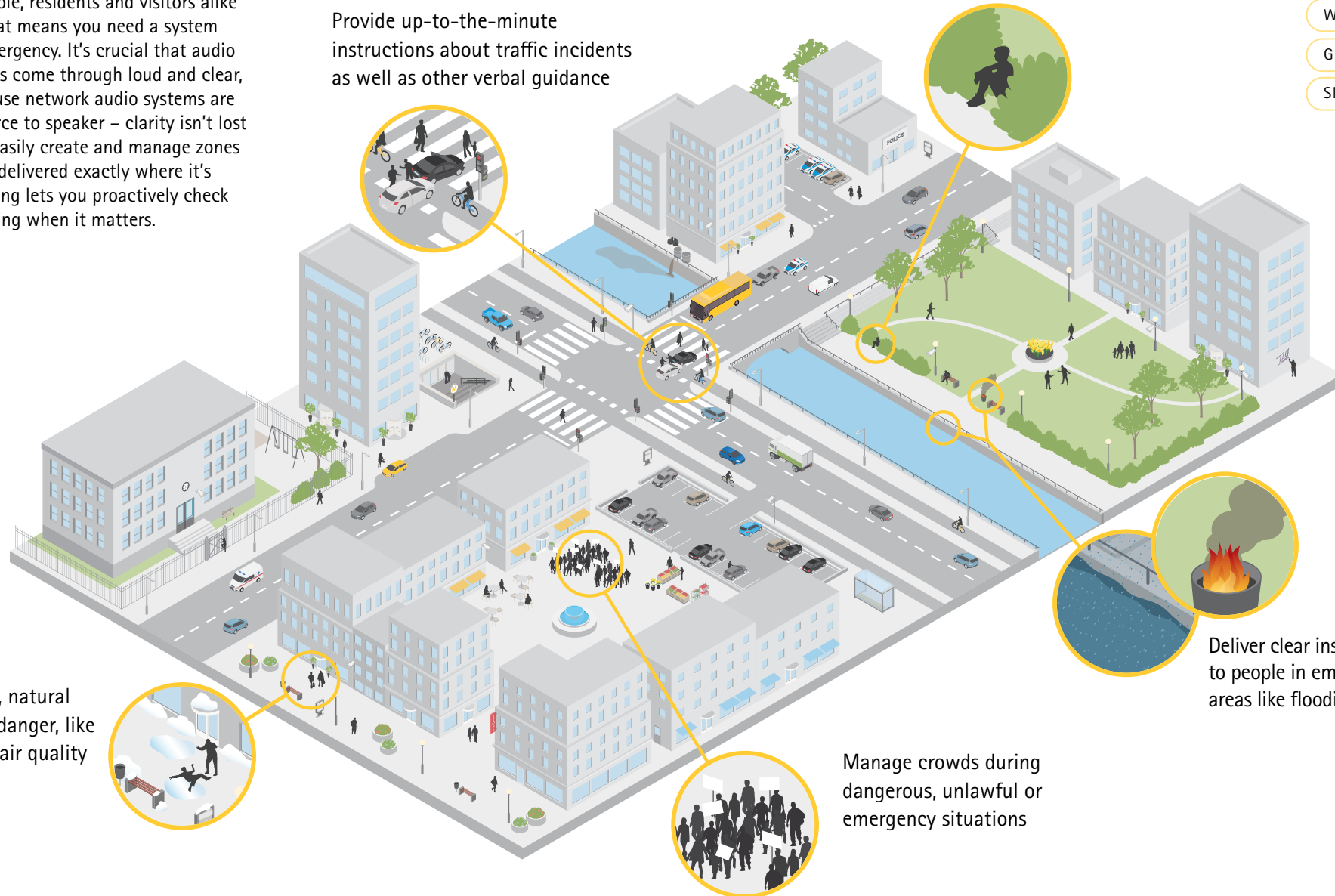
Provide up-to-the-minute instructions about traffic incidents as well as other verbal guidance

Use live audio messages to speed up the search for a missing child

Warn for extreme weather, natural disaster or environmental danger, like earthquakes or dangerous air quality

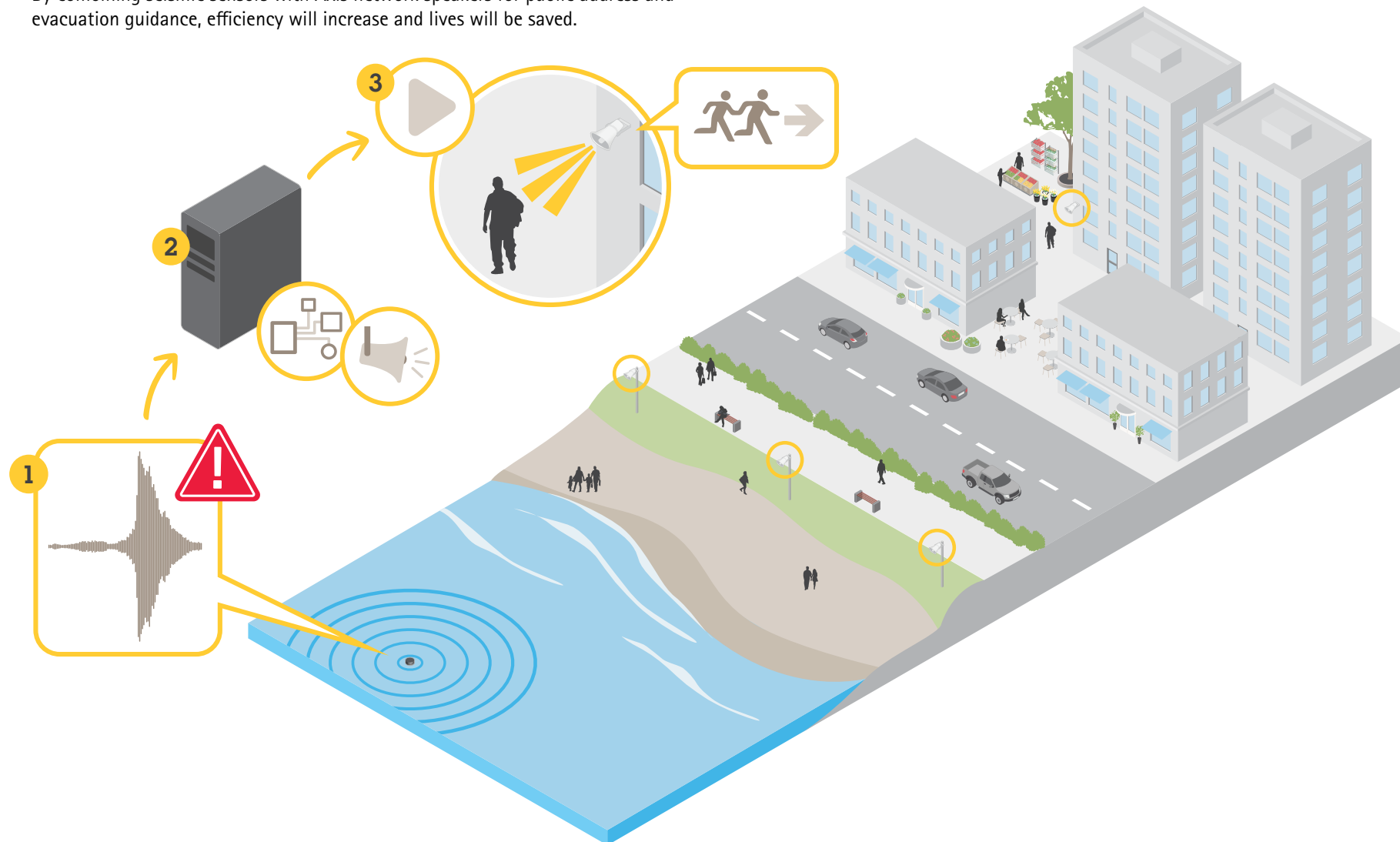
Deliver clear instructions to people in emergency areas like flooding or fire

Manage crowds during dangerous, unlawful or emergency situations



# Warnings save lives

In an emergency situation, like during an earthquake, each second counts. By combining seismic sensors with Axis network speakers for public address and evacuation guidance, efficiency will increase and lives will be saved.



## How it works:

- 1 Detect**  
Seismic sensors detect activity and trigger a warning
- 2 Public address**  
The warning activates a public address system with Axis speakers in case of danger.
- 3 Evacuate**  
An immediate, prerecorded audio alert from the Axis speakers helps residents to evacuate and prepare for earthquakes

# Stop crime in its tracks

Network audio lets you proactively deter crime when you add it to your video-based security system with analytics. It's possible to define triggers that activate warnings or alarms that can stop intruders in their tracks or alert personnel of their presence. Law enforcement officials or security staff can then visually verify the nature of every incident remotely, and act appropriately. Which means you can avoid the cost and wasted manpower of responding to false alarms and can even cut back on expensive routine patrols. In other words, your city can work more efficiently and get the most out of too-often limited resources.

Prevent illegal dumping and monitor waste management

Break up fights and stop suspicious behavior before it escalates

Tell potential intruders they're about to enter a restricted area – and warn them away

Tell vandals or graffiti taggers to stop and leave the scene

Manage parking violations

Manage crowds and visitors

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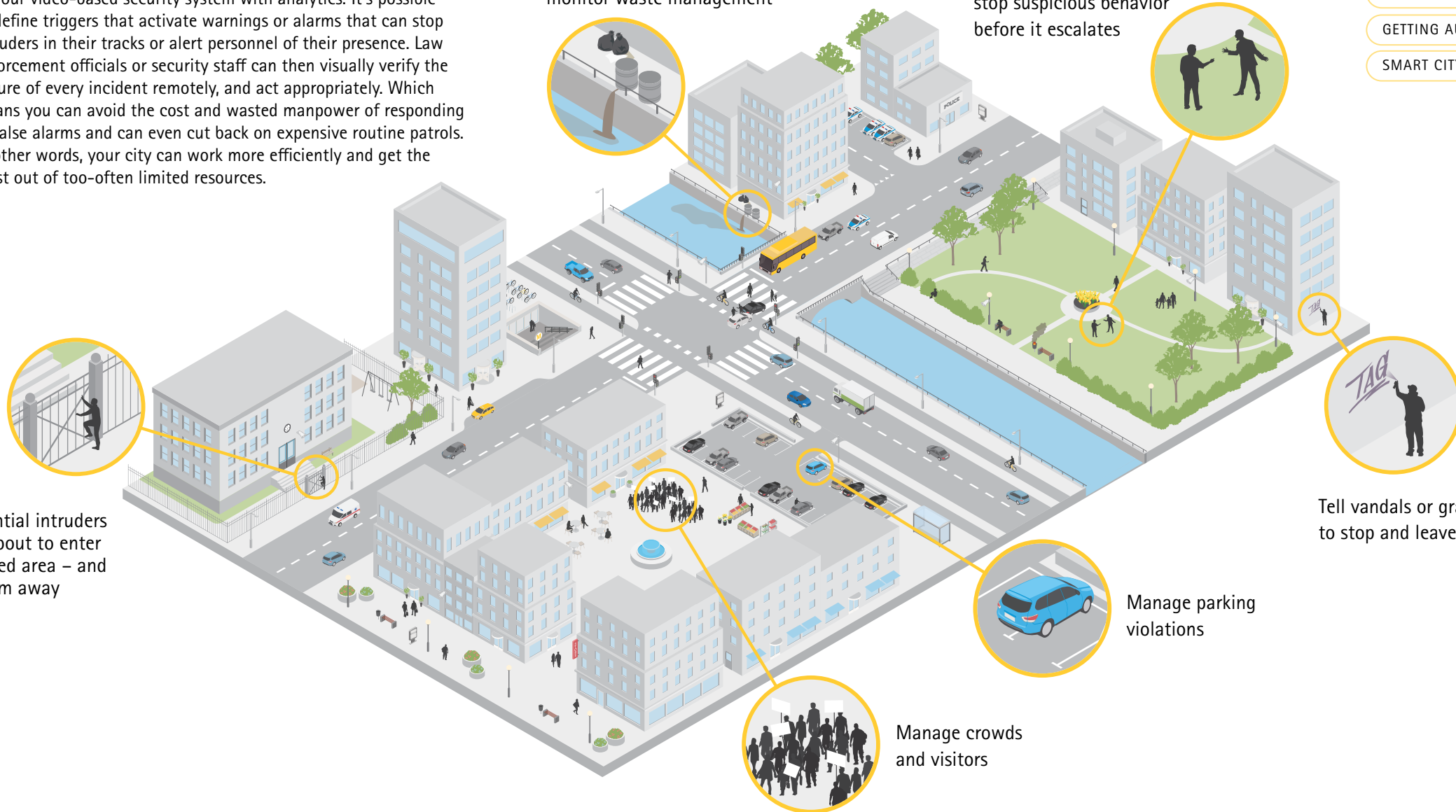
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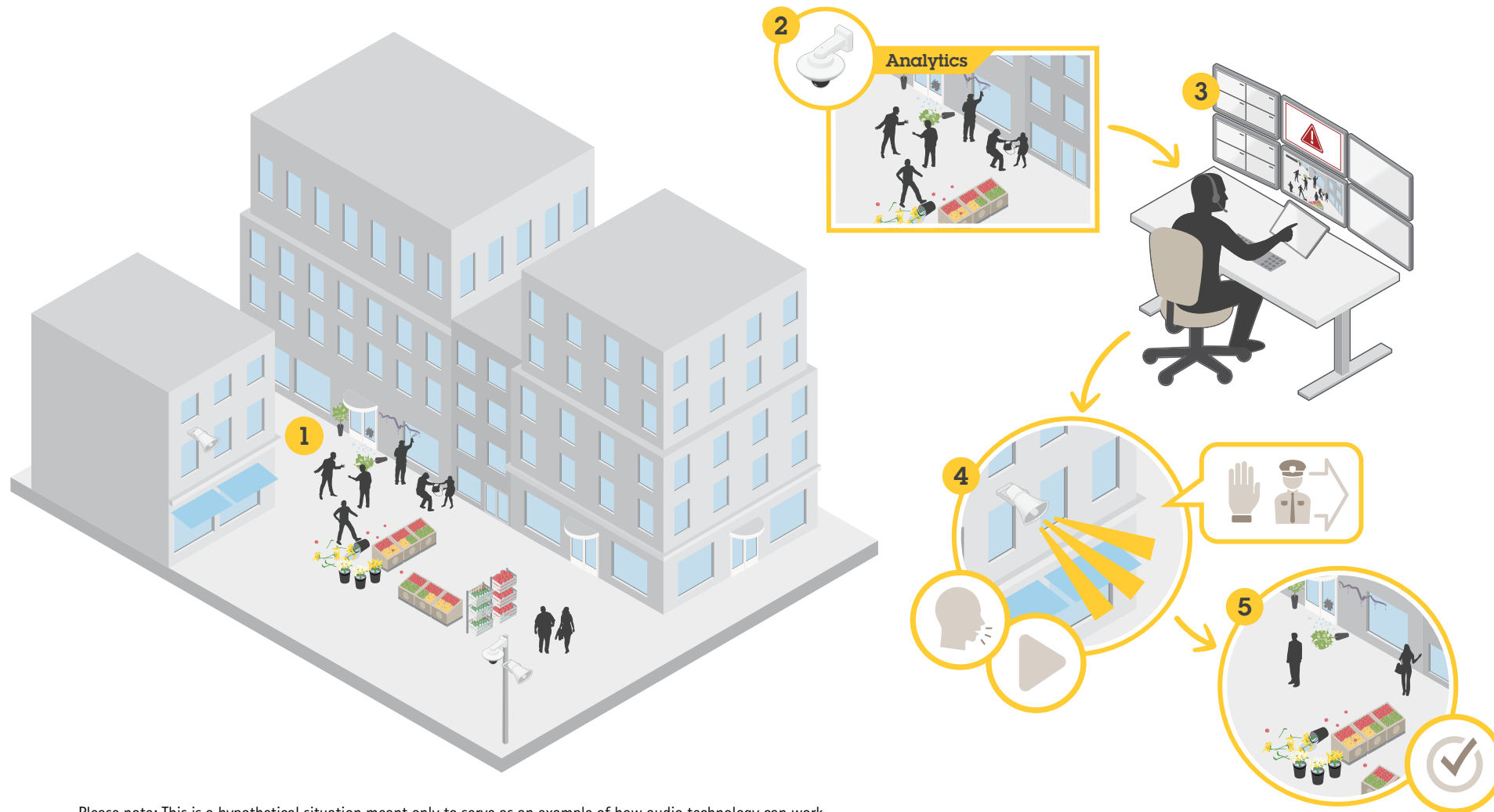
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# Fight crime proactively

You can end a fight or stop a vandal, for example, before the damage is done. One way to do it is with event-triggered voice messages. In this case, adding audio to your video surveillance system lets you respond immediately with a verbal warning – long before police or security staff could hope to arrive at the scene. Often, this is enough to send bad actors scurrying, deterring the crime and eliminating the need for additional security measures.

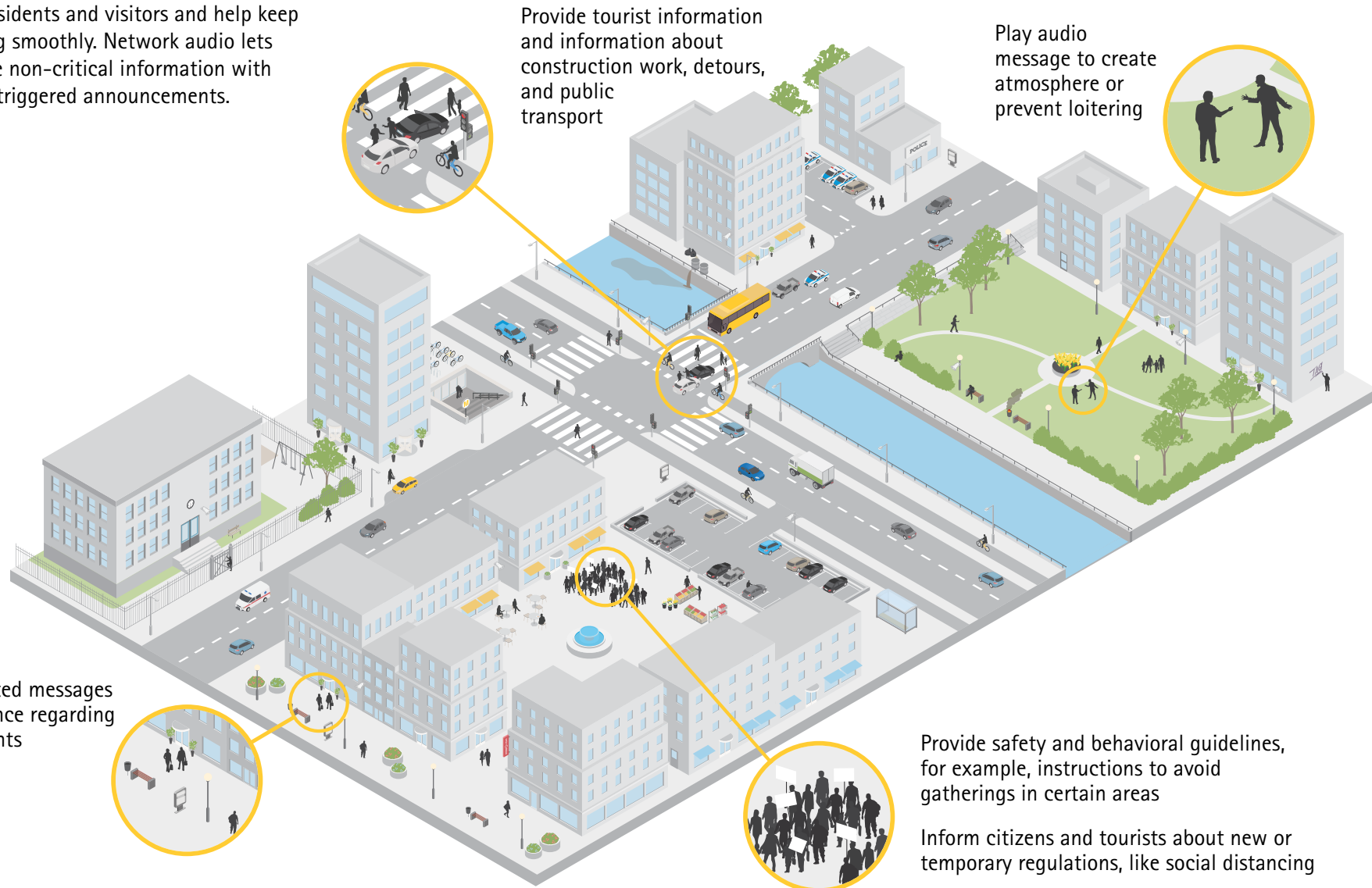


## How it works:

- 1 Incident occurs**
- 2 Detection**  
Camera, sensor or personal warnings triggers notification to administrator
- 3 Monitor**  
Administrator monitors situation and uses the audio system to deter the incident
- 4 Notification**  
Speaker plays a live or prerecorded message saying: "stop otherwise we will send security staff"
- 5 Response**  
Administrator monitors when individuals desist and leave the scene. Case closed.

# Communicate, inform and guide

The right information at the right time can improve the experience of residents and visitors and help keep your city functioning smoothly. Network audio lets you provide valuable non-critical information with scheduled or event-triggered announcements.



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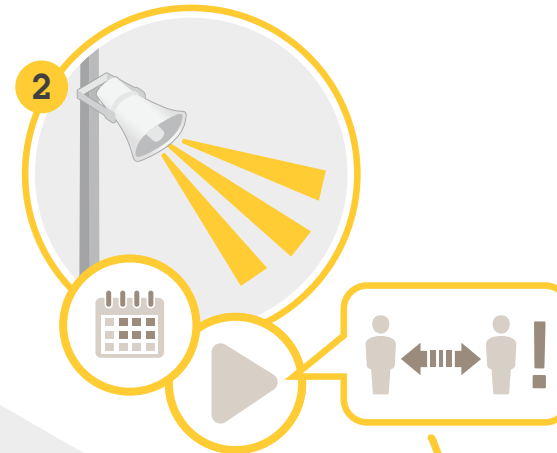
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# Get your message out

Making sure people don't stand too close together can be an important public health consideration. One solution is to use scheduled messages to remind them to maintain social distancing.



## How it works:

- 1 Small area with high foot traffic
- 2 Information and reminders  
Scheduled messages to maintain social distancing are played
- 3 Response  
People remember to keep a safe distance



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# Axis network audio solutions for smart cities

Selecting an advanced network audio solution can ensure that important communication takes place at the right time, in the right place, and with the sound quality needed to keep citizens safe and secure.

Choosing the right combination of audio equipment, network surveillance cameras, and advanced analytics is key. Axis offers solutions and products to cover every scenario and keep your city running smoothly – from delivering clear information in emergencies to perimeter protection, vandalism prevention and parking violation deterrence.

Learn about our audio solutions and the products they consist of on the following pages.

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## Emergency notifications

Protect people and keep them safe

### Challenge

To swiftly deliver crucial information, including warnings and instructions to residents in an emergency.

### Solution

Network audio helps you deliver instant warnings and lifesaving information during an emergency. When a camera, or a sensor detects an emergency event, it can either trigger a speaker to automatically play a prerecorded message or trigger a notification to be sent to an administrator. The administrator can then evaluate the situation via the camera and either deliver live warnings and instructions, or manually trigger a prerecorded message. Live or prerecorded messages can also be delivered in response to eye-witness reports or various emergency warning systems.

### Axis audio products and software

AXIS C1310-E Network Horn Speaker, Axis audio management software, 2N SIP Mic.

### Potential input source

Camera with analytics, sensor, eye-witness reports and emergency warning systems.

### Other products

3rd-party mass notification system, VMS.

## Deterrence

Reduce crime

### Challenge

To reduce crime (by monitoring city streets, parking lots, spaces around buildings, parks, and so on).

### Solution

Adding audio to your video surveillance systems lets you intervene to stop unwanted activity before it's too late. When a camera detects an unwanted event, it can either trigger a speaker to automatically play a prerecorded message or trigger a notification to be sent to an administrator. The administrator can then evaluate the situation via the camera and either deliver a live warning, or manually trigger a prerecorded message.

### Axis audio products and software

AXIS C1310-E Network Horn Speaker, Axis audio management software, 2N SIP Mic.

### Potential input source

Camera with analytics.

### Other products

VMS.

## Non-emergency messaging

Communicate, inform and guide

### Challenge

To keep residents happy and your city running smoothly and efficiently.

### Solution

Scheduled, prerecorded messages can be used to provide residents with non-critical information. Zone management, content management and scheduling functionality can be combined to ensure that the right messages are distributed in the right places at the right time.

### Axis audio products and software

AXIS C1310-E Network Horn Speaker, Axis audio management software.

### Potential input source

N/A.

### Other products

3rd-party mass notification systems.

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## Axis network speakers

Axis network speakers are complete high-quality audio systems in a single unit. They are perfect for live or scheduled voice messages for proactive security and to keep people safe.



AXIS C1310-E Network Horn Speaker. Outdoor speaker for long-range speech.

In our speaker portfolio, we also have a range of speakers for indoor usage.



## Axis audio management software

Audio management software lets you efficiently manage and control your audio system regardless of size and complexity.

Built into the speakers, AXIS Audio Manager Edge is the best choice for small and mid-sized basic systems, while AXIS Audio Manager Pro is best for larger, more advanced systems.

Our audio management software functionalities include: zone and content management, scheduling, health monitoring, volume and user management

## Axis audio system devices

Audio system devices enable easy migration to network audio while protecting the value of your legacy investment.

AXIS C8033 Network Audio Bridge is a combined audio encoder and decoder and AXIS C8210 Network Audio Amplifier is an edge device, transforming any passive speaker into a network speaker.



## 2N SIP Mic

2N SIP Mic is an all-in-one network microphone console that gives you a smart and easy way to turn your Axis network speakers into a complete public address system.

2N SIP Mic is ideal for live or prerecorded announcements and paging.



## Axis network cameras

We offer a wide range of network surveillance cameras, including fixed box, PTZ, and multi-sensor cameras.



## Axis video management software

Our software is designed and validated to perfectly match Axis products and features. Our solutions are easily adapted to your business, and can seamlessly expand with your needs.


AXIS Camera Station



## Analytics

We work with a vast network of partners to provide analytics to suit all kinds of requirements and challenges – turning Axis devices into sophisticated tools you can use to better protect people and property and make informed decisions about your business or operations.





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# Why Axis?

**Almost all cities have a smart city agenda. And although their priorities will differ according to the unique challenges they face, they all have the same goals: to create ways to use data and resources more efficiently and make cities safer, more secure, and more livable.**

Axis innovates for a smarter, safer world. With our long experience and industry-leading expertise we play a vital role in the transition to smarter cities by providing scalable and innovative camera and IoT solutions, including network audio solutions, for public safety, urban mobility and environmental monitoring. On the next page, you can read about the seven key reasons why Axis is the perfect network audio solution provider for your smart city.

# 7 key reasons to choose Axis

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## 1 Experience – we're not a new kid on the block

We invented the category of network cameras way back in 1996, demonstrating Internet of Things (IoT) capabilities decades before IoT became a thing. Today, we're doing the same for network audio.

## 2 Quality in everything we do

Creating a smart city is a long-term vision, so you want something that's reliable and built to last. Axis products are manufactured with outstanding durability, functionality, and safety, thoroughly tested and ready to perform in any city environment. And with Axis, you can always trust that you get reliable sound and video quality.

## 3 Scalable and flexible

The needs of your city may change and grow over time. And change can present challenges when it comes to adapting and expanding infrastructure. With Axis network technology, this isn't an issue. Simple installation, integration and management, and the fact that our solutions connect to your standard network make it easy to grow and adapt your solution.

## 4 The freedom of an open platform

Our open application platform, AXIS Camera Application Platform (ACAP) gives you access to a myriad of solutions customized for your precise needs. It also ensures easy integration and interoperability with systems you already have in place.

## 5 The power of partnerships

Axis is committed to a partnership approach. We work with a vast number of well-vetted hardware and software providers across the globe, each bringing its own knowledge and expertise to our open platform.

## 6 Remote monitoring and maintenance

The nature of smart cities means networks are spread over a wide area. Axis products and solutions are designed for remote monitoring, management, and maintenance. So authorities have a constant view over what's working and what's not and can remedy issues quickly and efficiently.

## 7 Global presence, local support

Axis has the world's largest installed base of network video and audio products with staff and close partners and in more than 50 countries. This global perspective and involvement with smart city projects across the globe makes us well-equipped to serve your needs anywhere.

“ Simple installation and audio management make it easy to grow and adapt your solution.



# Getting smart with audio

Voice services and audio communication are increasingly used together with cameras and analytics in network surveillance systems.

And for a good reason. The human mind reacts to sounds the same way today that it always has. It either makes us feel safe or prepares us for fight or flight. Using the right sound at the right time can produce useful reactions – which makes audio a powerful tool for improving safety and security.

## Five reasons why audio gets people's attention:

- 1 Humans can't shut their ears – thus, your message will always be listened to.
- 2 It's in the human DNA to react quickly to sounds implying danger.
- 3 Sounds can also be used to make people feel safe and relaxed.
- 4 The human voice can be used differently to get your message across.
- 5 The human voice is more effective than signs at getting people's attention.

“ As human beings, we can't shut our ears, which means that the right sound to the right person at the right time can be a very powerful communication tool.

Margareta Andersson,  
Sound Architect, Efterklang, Stockholm, Sweden

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# The impact of sounds on the human brain

Historically, the human voice has been used to send information that needs extra attention. Similarly, different sounds can be used to put people in the right mood. With modern audio technology, people can be made to feel safe, for example by letting them know someone is watching.

Various sounds have also always been used to signal danger. Barking dogs have protected farms. Bells, drums, and trumpets have sounded alarms warning of hostile attacks. Today, network audio can be used to signify danger.

We asked Margareta Andersson, Sound Architect at Lexter Sound Design in Stockholm, Sweden, to share her insights on audio as a powerful tool to improve safety and security.



## Why does sound have such a great impact on humans?

"When we lived outdoors, we had to trust our senses to survive. Our eyes, taste buds, and ears told us what was safe or not – these so-called genetic memories still linger in our DNA," says Andersson. "For example, everyone reacts the same way when we hear a baby crying. We instantly know the baby needs to be cared for. Similarly, we all know that the loud sound of thunder or a growling animal implies danger. And our brain quickly sends signals to our body to either stay and fight or to run away. On the other hand, a bird singing or the sound of water – like soft rain or a running stream – makes us feel relaxed.

## Why is audio communication sometimes more effective than visual communication?

"Hearing is something of a human navigation tool. When we can't navigate our surroundings using our eyes – if it's dark, for instance – our ears tell us what's happening," says Andersson. "To give an example: where I live, there's a car park where a prerecorded voice tells drivers that the building is equipped with camera surveillance. There's probably a sign providing the same information, but honestly, I've never read it. But the voice message keeps my senses alert," she says.

## What are your thoughts about using sounds in surveillance situations?

"Voice messages are effective when you want to inform or give instructions, while loud noises create physical discomfort and signal a sense of emergency," Andersson says. "Voice messages addressing specific individuals, for example, a speaker voice saying, 'You there in the red T-shirt, take a step back,' will often have a daunting effect due to the direct nature of the message." Andersson also says that humans react differently depending on what type of voice is conveying the message. "From a purely technical point of view, a female voice tends to get perceived as easier to understand due to its higher vocal register."

“ A combination of audio and visual communication is generally the best solution if you want to get people's full attention.

Margareta Andersson,  
Sound Architect, Efterklang, Stockholm, Sweden

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# Stories of smart cities that made audio an integral part of their solutions

On the following pages, we share actual stories from cities like yours. They're stories of cities that have experienced firsthand the benefits of working with Axis and our global network of integrators to make audio in combination with network surveillance an integral part of becoming safer, more secure, more livable – and smarter.

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## City of Vicente López, Argentina



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**“ This audio solution helps us to create a better outdoor experience for our visitors, providing them a space that enables them to enjoy their free time in a safe place.**

Santiago Espeleta, Secretary of Security of the Municipality of Vicente López.

## Tel Aviv, Israel



[Read more >](#)

**“ It's clear that Smart City is the future and with this solution we've established the foundation for it.**

Avi David, Tel Aviv municipality, Manager, control and command center

# A rock-solid foundation for safety for Vicente López, Argentina

## THE CITY: Vicente López, Argentina

Vicente López, an Argentinian city of 360,000 citizens, has made an extensive Axis surveillance system with integrated audio components— an integral part of their ambitious 10-year plan for a safer, more secure city.

## THE SOLUTION: Over 1,000 Axis network cameras, Axis 2-way intercoms, and Axis network horn speakers

Safety spots (emergency poles) an IP speaker on top and a 2N anti-vandalism 2-way intercom, integrated with Milestone XProtect® VMS (so when the button is pressed, the closest PTZ camera points straight at that spot).

## THE CHALLENGE: creating “safety paths” for students

The city of Vicente López in Argentina wanted to build a rock-solid foundation for making their residents feel safer. The idea was not just to have a certain number of network cameras and network audio devices in place. Rather, it was to have less crime and more trust between the city and its citizens – to have cameras and audio devices always up and running, protecting the people of Vicente López. One particular goal at the top of the city officials' list was to establish “safety paths” for students to go to and from school, to bus stops, train stops, and major avenues. Another was to deter crime with audio.



## THE RESULTS

Vicente López has implemented “safety paths” for students to go to and from school, to bus stops, train stops, major avenues, etc. These safety paths have video surveillance coverage, panic devices in local stores around the school route, and “safety spots.” The “safety spots” consist of emergency smart poles, with integrated technology and two-way intercoms. With this, they have been able to deter crime with audio and improve a sense of public safety. Undersecretary for Public Safety Martin Gasulla says, “With the audio solution, our citizens feel we are taking care of them. This is particularly relevant in the current pandemic. If the public sees that you are making a city work better, then that's the return on your investments.”

“ Vicente Lopez has implemented a number of emergency smart poles, with integrated technology and two-way intercoms.

Martin Gasulla  
Undersecretary for Public Safety  
Municipality of Vicente López

“ With the audio solution, our citizens feel we are taking care of them. This is particularly relevant in the current pandemic. If the public sees that you are making a city work better, then that's the return on your investments.

Martin Gasulla  
Undersecretary for Public Safety, Municipality of Vicente López



# Giving a voice to Tel Aviv's coastal surveillance system

## THE CITY: Tel Aviv, Israel, on the Mediterranean

With 13 beautiful beaches and a 14-kilometer-long promenade, Tel Aviv's coastal area is packed with residents and tourists throughout the long Mediterranean summer.

## THE SOLUTION: Pole-mounted combination of two or three AXIS C1310-E Horn Speakers and one AXIS P56 PTZ Network Camera

Steel poles, at 80-meter intervals, each with two to three Axis horn speakers and an Axis PTZ camera.

## THE CHALLENGE:

In 2013, the municipality of Tel Aviv began installing an extensive Axis network surveillance system with integrated analytics. From the start, they've been exceedingly happy with the system, which is used for security purposes and other applications. So, when Axis presented its audio system in 2015, city officials quickly realized it would be an ideal complement to their Axis cameras. They saw an opportunity to deter crime and provide emergency warnings throughout the city and – not least – to provide both emergency and non-emergency information and instructions along the city's extensive beaches.



## THE RESULTS

Tel Aviv installed steel poles topped with Axis horn speakers and PTZ cameras at 80-meter intervals along its 14-kilometer-long coastal promenade. The horn speakers primarily play scheduled prerecorded messages and prerecorded deterrent warnings triggered by the camera's analytics. For example, they remind people of the danger of entering the sea when lifeguards are off duty. City officials note the value of adding a "voice" to their surveillance system became particularly apparent during the Covid-19 lockdowns when they used prerecorded messages to disperse the public in restricted areas. In addition to the audio poles along its beaches, there are similar installations in Tel Aviv's parks, markets, and other congested areas.

“ Prerecorded messages are used to remind the public of the danger of entering the sea when the lifeguards are off-duty.”

## About Axis Communications

Axis enables a smarter and safer world by creating network solutions that provide insights for improving security and new ways of doing business. As the industry leader in network video, Axis offers products and services for video surveillance and analytics, access control, intercom and audio systems. Axis has more than 3,800 dedicated employees in over 50 countries and collaborates with partners worldwide to deliver customer solutions. Axis was founded in 1984 and has its headquarters in Lund, Sweden.

For more information about Axis, please visit our website [www.axis.com](http://www.axis.com).