

Safer Cities: Balancing Public Safety and Privacy



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Introduction

As cities look to recover from the COVID-19 pandemic, they are also addressing concerning knock-on impacts including an increase in crime and a marked uptick in road deaths.

The Council on Criminal Justice’s [July 2022 report](#) on the pandemic, social unrest, and crime in US cities concludes that “high rates of violent crime and increases in property crime require immediate action from law enforcement and policymakers”. The study of major US cities found that the homicide rate rose 39 percent since the first half of 2019, before the pandemic. Aggravated assault and robberies increased in the first half of 2022 compared to the first half of 2021.

Several cities have declared gun violence emergencies and the nation is on high alert in the wake of tragic school shootings.

Worrying patterns have also been observed on roads. In 2021, almost [43,000 people were killed](#) in motor vehicle crashes, the highest number in 16 years. The 10.5 percent jump over 2020 numbers was the largest percentage increase since the National Highway Traffic Safety Administration began its fatality data collection system in 1975.

Several factors have influenced these increases, meaning that a multifaceted approach is needed to tackle them, including public health and social interventions. Technology can also form part of the solution with cities deploying tools such as sensors, advanced lighting, cameras and artificial intelligence (AI) as part of holistic public safety strategies.

Thanks to increased federal funding, many US cities find themselves in a stronger financial position to make long-awaited infrastructure upgrades, and the Biden administration has been vocal on the need to address safety issues.

To make the most of their investment, taking an integrated approach enables cities to save money, labor and resources and to avoid visual clutter on streets. That’s why leveraging existing infrastructure such as streetlighting as a multifunctional platform for public safety tools and other applications is a growing trend.

The use of technologies such as sensors and cameras can also raise privacy concerns – this is prompting a growing push for transparency, including resident engagement and the creation of dedicated policies and oversight boards.

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Tools for safer cities

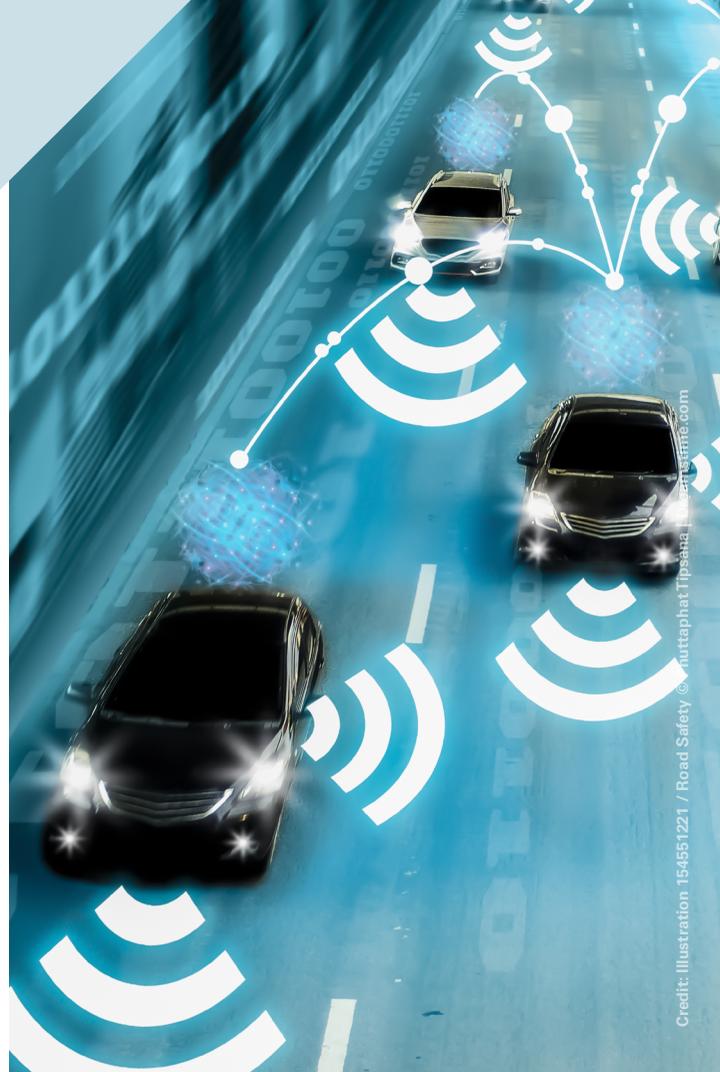
Due to its ubiquity, existing streetlight infrastructure is an important means to address many city priorities. These include reducing energy usage and costs with LEDs and smart lighting controls and deploying tools such as sensors and cameras for AI-driven traffic management, air and noise pollution monitoring, crime deterrence, and road safety.

Joseph Friedman, Director of Product Management at technology company Ubicquia, said: “Normally if cities want to put a camera, license plate recognition camera or sensor up, they need to get a permit, have a pole installed and run power to that pole. It’s expensive and time-consuming. Using plug-and-play streetlight systems enables a very quick deployment in a much more aesthetically pleasing footprint.”

There are over 40 million streetlights in the US, presenting many opportunities. LED and connected streetlights can save cities as much as 80 percent in energy costs, freeing up funding for other areas including safety.

Using plug-and-play streetlight systems enables a very quick deployment in a much more aesthetically pleasing footprint.

Joseph Friedman, Director of Product Management, Ubicquia



Road safety

US Secretary of Transportation Pete Buttigieg [referred to](#) the record number of traffic fatalities as a “crisis on America’s roadways,” and many communities are making Vision Zero pledges to eliminate traffic deaths and severe injuries as a priority.

Technology such as sensors, cameras and artificial intelligence analytics can play an important role. These systems can be configured to count and classify vehicles, bikes and pedestrians to inform road usage decisions and highlight high-traffic areas. In addition, cities can monitor road conditions, lane usage, and traffic patterns and flow to guide actions.

They can also receive alerts on issues such as wrong-way driving, near-misses, and other anomalies to enable them to address any immediate danger and make long-term planning choices.

Curbing crime

As they strive to reduce crime and ensure residents feel safer, city officials and police are looking for new and cost-effective solutions.

By May this year, at least \$10 billion in American Rescue Plan Act (ARPA) funding had been [committed](#) to public safety and violence prevention initiatives. This includes spending on safety cameras, body-worn cameras, and gunshot detection sensors.

As well as providing on-demand video evidence of crime, the latest cameras with AI analytics can help officials get ahead of public safety issues. Police can gain better awareness of a situation before they attend a crime scene and systems can be configured to detect unusual activity. This can help to deter crime in parks after dark, for instance, as well as enhancing protection in schools and secluded areas like parking lots.

ALPR

A growing number of cities and police departments are deploying automatic license plate recognition (ALPR) technology for a range of use cases including law enforcement, toll automation, and transport management and logistics. The solutions can also be used for access control and parking automation.

These examples demonstrate the breadth of applications and new analytics use cases that can easily be added to existing systems through software updates.

“It’s about letting the camera do more of the work,” said Tod Riedel, Director, Video Security and Access Control, State and Local Government, Avigilon.

“No one’s going to be able to watch these cameras 24/7, so you’ve got to let the analytics and the artificial intelligence kick in to help cities with their mission to keep citizens, visitors and employees safe.”

While many cities already have a robust camera network, filling in gaps via streetlights with built-in power and backhaul enables deployment in previously challenging locations.



CASE STUDY:

West Hollywood

As part of a broader [smart city transformation](#), the City of West Hollywood in California is piloting the use of its streetlight luminaires for smart city sensors and services.

The smart nodes have sensors configured to count vehicular and pedestrian traffic, detect noise levels, monitor parking demand, and measure environmental quality.

The pilot project will provide an opportunity to evaluate how these smart nodes can also provide additional public safety tools, such as sidewalk-facing security cameras.

West Hollywood’s smart city strategy includes the adoption of privacy guidelines which are integrated into procurement processes. Each project must outline what data is being collected, why it’s required, and how it will be used.

Jackie Rocco, Deputy City Manager for West Hollywood, said: “Intelligent data on traffic, bicycles, and pedestrians support public safety measures and our future planning development needs for our residents and visitors.”



Cutting crime

When it comes to linking technology and crime reduction, there are many variables and each city is unique, but some findings show:



Better street lighting can reduce crime by **21%** and serious crime by **36%**



Deploying a range of smart technologies could help to:

- reduce crime incidents by up to **40%**
- deliver 20–35% **faster emergency response times**
- reduce fatalities from homicide, road traffic, and fires by **8–10%**



Pan-tilt-zoom cameras can increase violent crime clearance rates by **80%**

The changing face of law enforcement

The use of new technologies also reflects trends in law enforcement in the US.

“I think all agencies right now are facing personnel, budget and resource limitations and they’re being challenged to use their existing resources more effectively,” commented Friedman. “In order to do more with less, agencies need to use technology as a force multiplier.”

He said advances in video quality and capabilities such as real-time alerts make it possible to monitor more areas and provide situational awareness to officers – such as knowing whether a suspect is armed. Automated tools can also speed up investigations.

“Consider the example of looking for a lost child,” said Friedman. Searching parameters such as ‘a child in a red shirt’ can give authorities a head-start much faster than a ground search from scratch.

Another growing trend is the establishment of real-time crime centers, where law enforcement agencies bring together tools such as networked cameras, body-worn cameras, automated license plate readers, gunshot detection, and data analytics. Some enable private camera owners to



Project Green Light, Detroit

Project Green Light Detroit is hailed by the city as a first-of-its-kind “public-private-community partnership.” It launched in 2016 at eight Detroit gas stations. Now over 400 businesses including shops, restaurants and apartment buildings have signed up. The businesses install connected surveillance cameras that stream video footage into Detroit’s Real Time Crime Center. They must also install green lighting and signage about the program.

Although the initiative has received some criticism over privacy, the city [reports](#) that incidents of violent crime have been reduced by 23 percent at all sites and 48 percent at the original eight sites.

make their footage accessible. The hubs are staffed 24/7 by officers and analysts to advance “intelligence-led” policing strategies, including getting ahead of problems, spotting trends, and responding faster.

Cities with real-time crime centers include Cleveland, New Orleans, Detroit, and Sacramento.

Holistic strategies

Raymond A. Martinez is a Managing Director at V2 Global consultancy where he specializes in public policy for law enforcement. He previously served as Assistant Chief of Police for Miami Police Department and Chief of Police at Miami Beach Police Department.

According to Martinez, cities are combining traditional methods for enforcement and prevention with new approaches. These include mental health professionals working alongside police, a focus on community engagement, and conflict resolution programs in schools and other community settings. They are also using technology to drive efficiencies.

“Manpower isn’t always a solution or financially feasible and governments and law enforcement can enhance their capabilities with technology. Cameras are at the forefront,” said Martinez.

“The important part is that it has to be a holistic approach, and you have to involve the community and the residents.”

CASE STUDY:

Ontario, California

Ontario in California is upgrading its streetlighting infrastructure as part of a five-year program to close the digital divide, including rolling out wireless services along with its fiber optic system.

The city recently deployed 12,500 Ubiquia UbiCells for smart lighting analytics and energy savings. Upgrading some of these to the new UbiHub product from Ubiquia will enable the city to offer low-cost Wi-Fi as a service as well as deploying cameras for public safety.

“We plan to leverage the UbiHub features by using the integrated and an external camera in our real-time crime center platform,” said Ron Ivie, President, Telcon Services, LLC, a connectivity systems integrator that is working with the city.

New pan-tilt-zoom (PTZ) cameras will be added in strategic areas to complement the city’s existing network. They will also provide pedestrian and car counting to support planning decisions on issues like congestion and road safety.

“The goal is to be able to be more proactive,” said Ivie. “Rather than putting a camera up on every intersection, we’re taking a strategic approach, combining video analytics, license plate readers and other technologies into the UbiHub interface so that we minimize the aesthetic footprint and have the backhaul.”

“But the key is being able to move quickly,” Ivie added. “We can roll out to an intersection and put up a couple of UbiHubs and a camera system within hours, where traditional systems take much longer, especially if fiber isn’t available.”

Ontario is also in the process of setting up an oversight committee and policy on how the data is gathered, stored and managed. Officials are collaborating with other cities and pulling together best practices.

“Public safety is not just the video,” said Ivie. “17,000 lights were upgraded to LED. We’re getting more visible light at night, reducing dark areas and we’re making sure that lights are repaired quicker. The lighting itself is also a benefit.”

Ethics and best practices

Consensus is building that transparency about smart city projects is critical to success, particularly for the use of cameras and other data-collecting systems.

Some cities report residents requesting additional public safety measures, often following crime spikes or incidents but there have also been many examples of backlashes against technology projects – especially when systems have been implemented without the opportunity for public scrutiny or have been introduced for one reason and then used for others.

“Every municipality is a little different,” said Martinez. “But the first thing that we tell everyone is that transparency with the community, making the community part of the conversation on any technology that may be deployed and its purpose, is key.

“This helps to take away any miscommunication or misconceptions. Cities are increasingly taking action to get ahead of these issues through policies, resident engagement processes, and other interventions.”

Following a long approval process, San Diego [recently passed](#) ordinances to establish a privacy advisory board and surveillance technology oversight policy. All new and existing surveillance technology must be reviewed by the Privacy Advisory Board and approved by the City Council. City staff will need to submit an impact report and use policy for each technology, and prior to this must hold community meetings where the proposed technology would be deployed.



All approved surveillance technologies will be reviewed annually.

Councilmember Monica Montgomery Stegge said at the time: “As elected officials, we must prioritize a balance of both public safety and civil liberties for the people we serve.

“The community wants to feel safe, and these oversight mechanisms over the city’s surveillance technologies bring us closer to transparency while improving safety for our residents.”

San Diego’s action follows in the footsteps of the City of Oakland which established similar mechanisms from 2016. Although the approach is not without challenges, Oakland leaders [say](#) the measures have improved trust and accountability.

Some cities are also beginning to [use signage](#) and messaging to boost transparency. This includes information about cameras and sensors, what data they are collecting, who’s collecting it, and how the information is being used. By scanning a QR code, residents can learn more about the technology, ask questions, and share their feedback.

Friedman believes the trust issue goes both ways.

“I think the perception of video surveillance has changed over the past couple of years,” he said. “Particularly with the proliferation of police body cameras, for example, the public is starting to realise that it protects everybody: police officers and the public.”

Technology: Privacy principles



Consult with residents and community groups early about public safety and possible solutions



Establish a policy for the collection, governance, and use of data from sensors, cameras and other systems



Consider establishing a privacy ethics board to guide technology decisions



Ensure transparency about where and how systems are used and consider using signage

More strategies for success

Integrated systems

As cities invest in upgrading their infrastructure, a long-term view is key. Adding sensors and cameras in a piecemeal fashion creates cluttered streetscapes and adds costs.

The latest streetlight solutions, for example, are an evolution of LED upgrades and smart controllers, supporting third-party equipment including cameras and license plate readers as well as options for integrated cameras, directional microphones, and neural AI processors.

An integrated approach offers better aesthetics and also makes better sense financially because the major cost of the unit and installation is only incurred once.

According to Northeast Group: “Some integrated solutions in the market today have the potential to cut in half the total costs from a piecemeal approach to smart city sensor deployments.”

Streetlights as assets

Because streetlights are serving a wider range of functions beyond simple illumination, the way they are managed within the city organization is also changing.

In Ontario, CA, for instance, a broadband division was formed for the management of external infrastructure such as fiber, towers, and streetlights.

“Anything that communicates throughout the city would fall under broadband, and IT would focus on internal aspects – the higher layers of the system,” said Ron Ivie, President, Telcon Services, LLC. The IT and the broadband division are working closely together on the streetlight camera deployment.

In other cities, streetlights are managed by the public works department or a cross-functional team.

“Some cities have multiple silos internally and a lot of moving pieces. What I recommend is that while all the groups have different objectives, a division needs to be formed to manage that asset.”

Managing streetlights as assets is also key to enabling new partnerships and models, with cities increasingly making their infrastructure including lights available to third parties to generate new services or revenue.

Funding

Having the right strategic alignment also strengthens the business case for technology

investments, and now is an important time as record federal funding flows to US cities.

While many cities have allocated the bulk of their funding from the \$1.9 trillion American Rescue Plan Act (ARPA), some still have dollars and flexibility remaining. Earlier this year, the Whitehouse issued a [factsheet](#) urging local leaders to dedicate more ARPA funding to community safety.

The \$1.2 trillion [Bipartisan Infrastructure Law](#), also known as the Infrastructure Investment and Jobs Act, includes \$550 billion in new spending. Key categories include roads and bridges, climate resilience and environment, clean energy, ports, water systems, airports, public transport, broadband, and electric grid.

In many cases, cities are deploying multiple use cases across multiple budgets on the same platform. Some public safety initiatives are linked with streetlight upgrades and broadband efforts, for example, and the IJA includes \$65 billion to help close the digital divide. It also provides almost \$38 billion to improve the safety of the US transportation system, including a \$5 billion [Safe Streets and Roads for All program](#).

Much of the IJA funding will be competitive and distribution will be in various stages depending on the type of program. Cities are urged to prioritize capital needs and develop a project pipeline and consider appointing an infrastructure coordinator to manage the flow of funds.

The Department of Justice also offers [funding opportunities](#) to support law enforcement and public safety activities in state, local, and tribal jurisdictions.

The [proposed Safer America Plan](#) could also make additional public safety resources available.

There are many other funding options that cities can explore for upgrading infrastructure such as streetlights, including local bank funding, municipal bonds, public-private partnerships, and infrastructure-as-a-service models. Because of the long-term, city-wide benefits, many cities also self-fund projects using existing operations and maintenance or capital budgets.

The time is now

The confluence of new funding programs, technology maturity and best practices for public engagement provide an important framework for cities looking to boost public safety while respecting the privacy of their residents.

Foundational steps to a project plan include auditing existing infrastructure assets, creating public participation groups and mechanisms, exploring federal funding programs, and engaging the right partners.

About Ubicquia

Ubicquia offers municipalities, utilities, and communication service providers cost-effective and scalable platforms for deploying smart city, connectivity, and smart grid solutions.

The Ubicquia® suite of streetlight-mounted smart city and connectivity platforms include UbiCell®, which enables smart streetlight control; UbiMetro™, a streetlight small cell that accelerates 4G and 5G network deployments; and UbiHub®, which delivers high speed wireless internet access and street level video and audio intelligence.

Ubicquia's smart grid platforms include UbiGrid™ DTM+, a platform to monitor a utility's distribution transformers and network in real-time; and UbiSmart™ AQM+, a sensor that monitors a city's air quality index, noise levels and environmental data.

Ubicquia's solutions install in minutes to help communities become smarter, safer, and more connected.

To learn more visit www.ubicquia.com