CONSENSUS FOR CHANGE

TRANSFORMING SAFETY THROUGH TECHNOLOGY

A global study from Motorola Solutions, conducted by Goldsmiths, University of London, about how the pandemic redefined expectations, accelerated innovation and changed our attitudes about technology for public safety.

REPORT | GLOBAL RESEARCH STUDY

MOTOROLA SOLUTIONS

INTRODUCTION

Motorola Solutions set out to understand how people feel about the role technology plays in keeping them and their communities safe. We also wanted to learn more about how organizations globally are using technology to maintain safety and what impact the global pandemic has on their requirements and plans.

Our goal was to establish a robust and well-evidenced understanding of what the public needs from public safety and enterprise organizations, to inform opinions of what it will take to keep us safe today and into the future.

We engaged a leading academic research team led by Dr Chris Brauer at Goldsmiths, University of London, who conducted an expansive global survey of 12,000 people and interviewed 50 public safety agencies, enterprises and industry experts across 10 markets.

The results were startling.

An overwhelming 88% of citizens globally want to see public safety transformed through the use of advanced technology.

By conducting this study against the backdrop of the pandemic, we learned a great deal about how people think and feel about safety. Many believe the safety measures and policies in place today are no longer adequate to meet new levels of risk.

The majority of us are prepared to do more to keep ourselves, our families and communities safe. We are also becoming more comfortable with public safety and enterprises using advanced technologies, including cloud-based solutions, video security and analytics and sophisticated software, to combat new threats.

However, that doesn't mean organizations have unconditional permission to innovate.

Survey respondents were clear that they expect safety technology to be used with the highest standards for transparency, security and accountability. They also want the benefits of using it to be clear. Without this, organizations will not earn the acceptance and trust they need for the wider use of safety technology. And without trust, they will have far greater difficulty achieving their goals.

In this paper, leading researchers examine how safety agencies and businesses can adapt to changing public attitudes and needs for safety and security. They also present case studies from organizations who are innovating to overcome complex challenges and succeeding with new approaches to public engagement.

Our shared global experience has galvanized us and strengthened our resolve to stay safe - and we are more aware than ever of the vital role that technology can play in achieving our goals.

We hope you enjoy this report and the insights it provides on making our world safer through technology.

Mahesh Saptharishi

Senior Vice President and
Chief Technology Officer,
Motorola Solutions

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EXECUTIVE SUMMARY

SAFETY EXPECTATIONS REDEFINED

This global study of 12,000 citizens across 10 markets (Australia, Germany, Italy, Malaysia, Nordics, Singapore, Spain, Taiwan, United Kingdom, United States) found that 88% of people want to see public safety transformed through the use of advanced technology.

Additionally, 74% of people believe that technology used by emergency services helps them to be more productive and efficient.

This is a watershed moment that identifies a broad consensus to make our world safer through technology and for how our safety providers deliver their services.

It changes the environment in which public safety and enterprise organizations operate and gives them greater permission to innovate, but only if they can align with contemporary public expectations on the use of technology for safety.

The research data reveals three defining trends that form the nucleus of the findings and connect public opinion to the use of technology for safety. They are:

- Expectations for safety have been redefined
- Innovation by public safety agencies and enterprises is accelerating
- The need for trust and transparency is growing

HOW EVOLVING THREATS INCREASE DEMAND FOR TECHNOLOGY

Although the general population has always cared about safety, our attitudes and behaviors have generally reflected the assumption that responsibility for it sits with governments and institutions.

The global pandemic changed all of that.

Now every public safety agency, medical service, transport company, school, commercial organization and community member form part of a wider collective facing the common threat of the pandemic. And they all have different perspectives about what safety means for them.

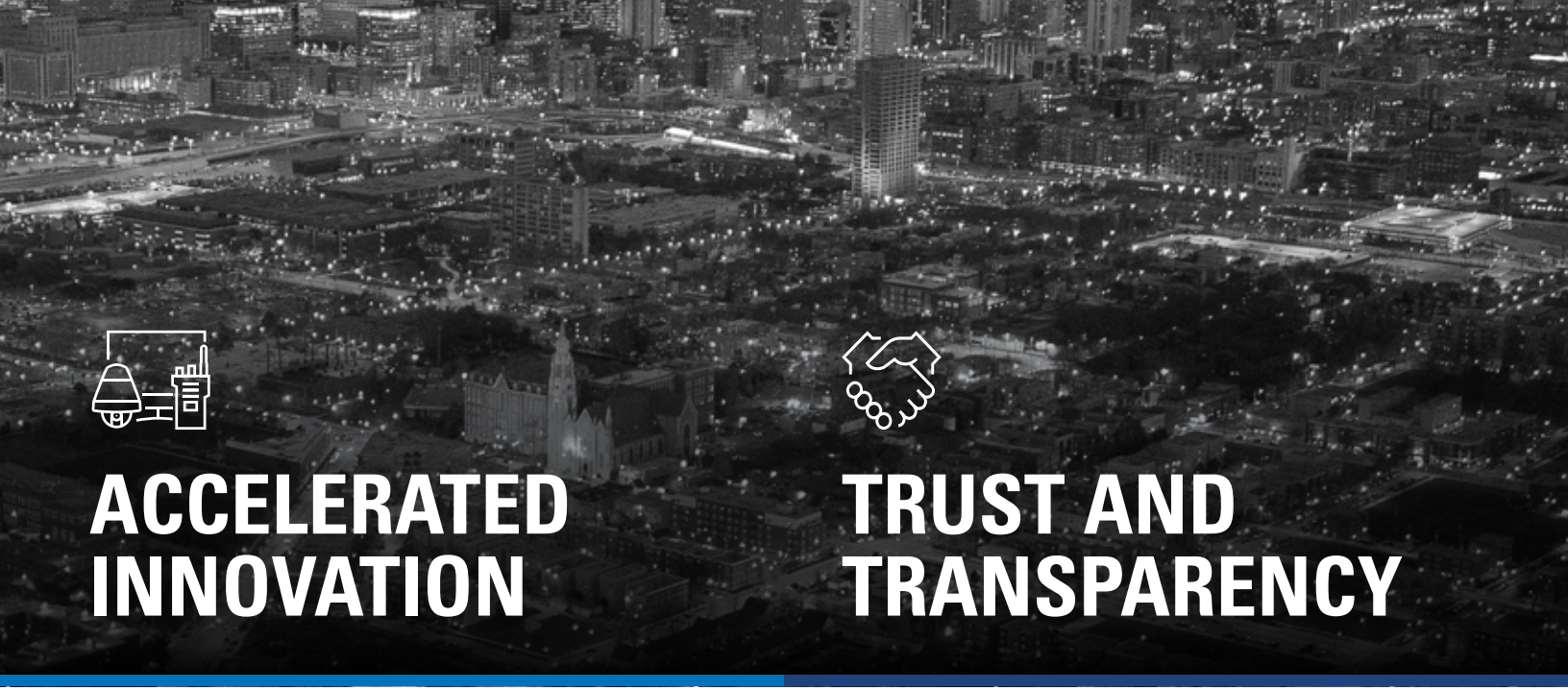
The pandemic changed our perspectives on how technology can be used to keep us safe too.

Citizens have not only seen an extremely dangerous virus sweep the globe, they've seen authorities innovate at considerable speed to keep them safe. They've also seen that it works.

Cloud-based technology, artificial intelligence (AI) and video cameras in communities and in businesses are not new — but the ways they can be used to provide public safety are.

Familiar technologies are being adapted to work in new ways — video security systems are detecting people with elevated temperatures, cloud technology is helping businesses maintain productivity during lockdowns and citizens are accessing new apps for everything from contact tracing to those all-encompassing video conferences.

THE PANDEMIC CHANGED OUR PERSPECTIVES ON HOW TECHNOLOGY CAN BE USED TO KEEP US SAFE.



ACCELERATED INNOVATION

HOW THE PANDEMIC IS TRANSFORMING TECHNOLOGY

Many public safety providers and commercial entities were planning for modernization through technology innovation before the pandemic. The adoption rate of technologies including video security, data analytics and software applications were all increasing, helping organizations to provide safety while maintaining their productivity.

The pandemic stress-tested how organizations respond to a crisis and created a constantly evolving set of public-health and security needs. That took technology innovation even further, showing every organization what is essential as well as what is possible.

Many adopted new ways of working and technology with great speed.

Innovations that might have taken years were delivered in just months, weeks and in some cases, only days.

Citizens too needed greater access to technology and digital skills to remain connected for work and social purposes. This further increased their expectations that public safety agencies should have access to technology that is at least as good, if not better, than what they have.

Emergency services and government authorities want to meet rising public expectations for safety. However, they also need to think more fundamentally about how to acquire, adopt and implement technology and the consequences of change. For them, the transition needs to be weighed against sizable risks, including the need to maintain the integrity of the criminal justice system and citizens' personal data.

TRUST AND TRANSPARENCY

WHY TECHNOLOGY MUST BE INCLUSIVE, FAIR AND UNDERSTOOD

Organizations and businesses cannot simply assume they have public consent to use new technologies. Citizens want and expect safety technology to be used in transparent, fair and inclusive ways and for the benefits to be clearly understood.

When the public understands and trusts both the technologies being used and the objectives of service providers using them, they also become more willing to share their own data. This results in the creation of richer pools of shared data and, ultimately, solutions that enable better outcomes for safety overall.

In fact, 75% of respondents say they are willing to trust the organizations that hold their information, so long as they use it appropriately.

CITIZENS WANT AND EXPECT SAFETY TECHNOLOGY TO BE USED IN TRANSPARENT, FAIR AND INCLUSIVE WAYS.

SAFETY EXPECTATIONS REDEFINED

HOW EVOLVING THREATS INCREASE DEMAND FOR TECHNOLOGY

- **New safety threats increase demand for technology**
- **Adapting technology to overcome new challenges**
- **Public expectations for safety are changing rapidly**

71% **say advanced technologies, such as video cameras, data analytics, cybersecurity and the cloud, are needed to address challenges of the modern world.**

NEW SAFETY THREATS INCREASE DEMAND FOR TECHNOLOGY

The results, compiled and analyzed by the Goldsmiths researchers, make it clear: the pandemic has caused the public to reconsider what it means to be 'safe.' With 88% of citizens wanting to see safety transformed through advanced technologies, there is greater opportunity for the use of solutions such as video, software, data analytics tools, cloud-based technology and cybersecurity solutions.

Another key finding from the survey is that almost three-quarters, 71%, of respondents think that bringing different technology types and systems together will enable greater speed and flexibility in how public safety agencies can respond. The same result, 71%, was recorded for commercial organizations needing access to technology to ensure the continuity of their services.

Key findings from the survey of 12,000 citizens globally include:

- **74%** agree using technology increases the productivity and efficiency of emergency services.
- **68%** say technology could be improved if citizens are able to have a say in how it is used.
- **71%** say advanced technologies, such as video cameras, data analytics, cybersecurity and the cloud, are needed to address challenges of the modern world.

"These results show that we have reached an inflection point in how citizens globally are thinking about technology and safety. Technology has kept us connected, entertained and productive throughout the pandemic. We have also observed the important way it has supported our public safety agencies and commercial industries in delivering their services while keeping us safe."

Mahesh Saptharishi
Senior Vice President and
Chief Technology Officer
Motorola Solutions

ADAPTING TECHNOLOGY TO OVERCOME NEW CHALLENGES

When the pandemic struck, authorities and enterprises needed to innovate at considerable speed to maintain safety and continue operating.

Research interviews found that organizations needed to adapt quickly and that video, software and analytics technologies could be used in new ways to protect workers and citizens.

Confronted by 1,350 attacks on its essential workers in the first half of 2020, one of the largest retailers in the U.K., the Co-op, equipped its frontline staff with more than 1,000 body-worn cameras across 250 stores. The cameras stream live video from the supermarket floor to the retailer's Security Operations Center at the touch of a button when a colleague is faced with an incident.

Police Scotland have been relying on technology for some time to improve the way they capture and store evidence and have saved many thousands of hours for their officers. It initially deployed smart mobile applications to enable officers to use their mobile devices instead of paper-based methods of filing reports and incident details. But it wasn't until the pandemic that they realized that the same technology could enable social distancing in the field.

Mass Rapid Transit Corporation, Malaysia (MRT) uses video and software technology to detect when a passenger with an elevated temperature arrives at the station entrance gate. This allows MRT to potentially avoid safety risks, highlighting how crucial technology has become during this pandemic.

"Over time, digital technologies have improved the way we capture and store evidence and have saved many thousands of hours for our officers. Due to the pandemic we realized the same solutions could enable social distancing in the field."

Superintendent Martin Gallagher
Criminal Justice Services Division
Police Scotland

PUBLIC EXPECTATIONS FOR SAFETY ARE CHANGING RAPIDLY

The study reveals a heightened public awareness of safety risks and the role of technology to address new challenges.

The pandemic has accelerated the adoption of digital tools, services and skills among all groups in society. Now, many citizens expect their public safety agencies to be able to access whatever technologies and tools necessary to respond quickly and effectively to threats.

This includes improved communication to meet emerging threats to public safety, which 68% of citizens agree emergency services need in the global survey. The ability to communicate instantly and securely among teams during a crisis is essential to ensuring the best public safety outcomes. Unlike consumer grade technology, emergency services also need their communication hardware and systems to perform reliably at all times and to be robust enough to withstand the heavy impacts of natural disasters and other major events.

Additionally, 71% of citizens say our public safety agencies need to be able to integrate fast and flexible systems to improve public safety outcomes.

With public safety agencies responding to increasingly complex threats, including the pandemic, they need technology and access to data to streamline and simplify the way they work. Where possible, any technologies introduced should help to reduce the burden on them by improving integration across their systems and maximizing their use of data. To have the greatest impact on safety, these improvements need to cover every aspect of an agency's operations - from their command and control environments, which manage and dispatch agency resources and analyze security risks, through to frontline responders who need to communicate seamlessly and respond appropriately in any situation.

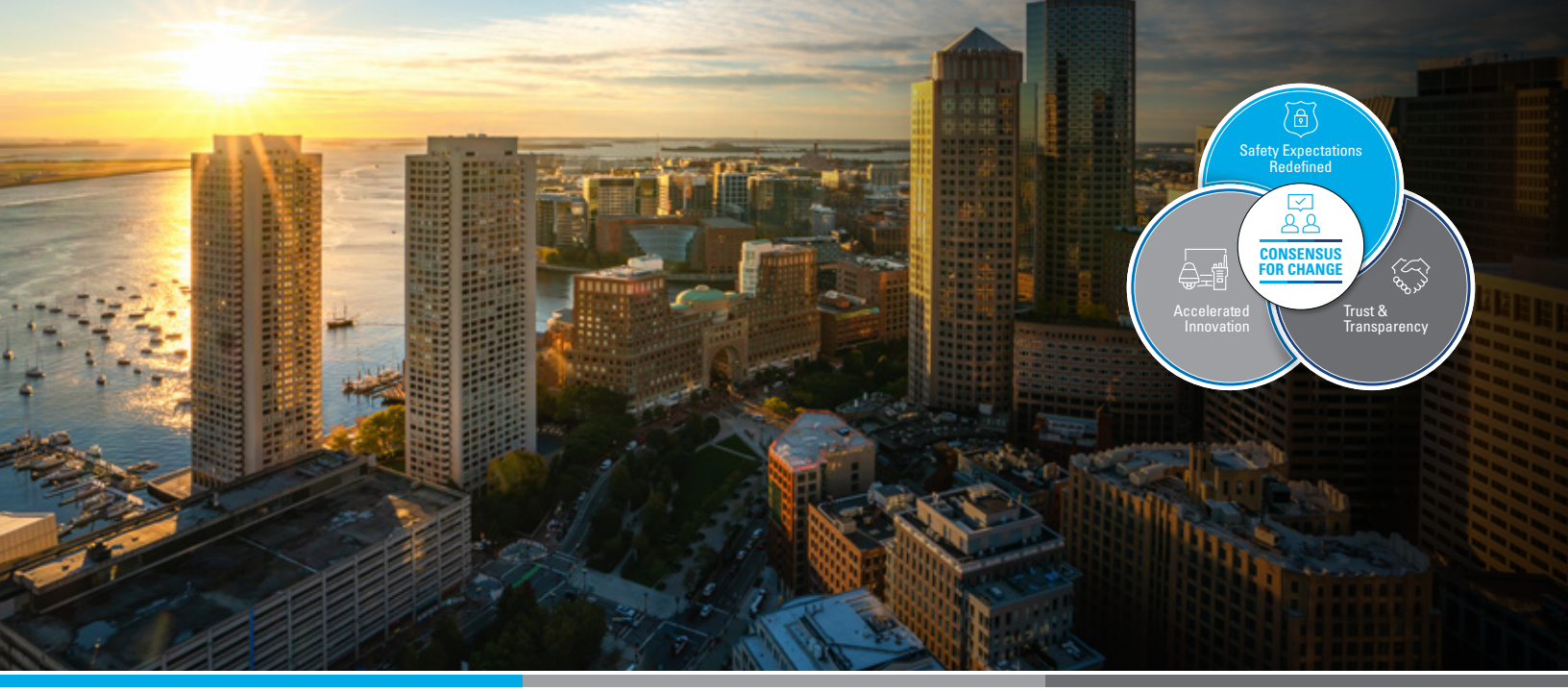
Dr. Barbara Held, Former Head of the Strategy Department at the Federal Agency for Public Safety Digital Radio (BDBOS) says the experience of the global pandemic has reinforced the need for technology modernization in the public safety sector.

GROWING PUBLIC AWARENESS AND EXPECTATIONS

Citizens are becoming more aware of safety risks and placing higher expectations on governments and public safety agencies to take action. They also expect their public safety agencies to have access to advanced technology to deliver their services.

Key findings from the survey of 12,000 citizens globally include:

- **75%** of citizens agree that technology increases productivity and efficiency of businesses.
- **70%** say that emergency services should be able to predict risk, a task made possible with advanced technologies.
- **68%** say the pandemic increased the need for safety technology.



BOSTON POLICE DEPARTMENT, UNITED STATES

Boston Police Department (BPD) is the oldest police department in the United States. It serves more than 700,000 citizens and employs 2,700 officers and staff across 12 district stations, special operations units, school police and teams of community service officers.

BPD relies on a mobile radio system for mission-critical communications, but when the pandemic struck, it needed to extend group communications offsite and to areas outside its radio coverage area for uninterrupted connection and collaboration.

CHALLENGE

The pandemic required unmatched levels of cooperation across the Boston Police Department and other public safety agencies in and around the city. However, it also required that BPD staff stay physically distant from one another, and support staff were asked to work remotely. Many lived outside the city and the coverage area of its radio network, which provides resilient and reliable voice communications for first responders in the field.

SOLUTION

To meet this challenge, BPD adopted a broadband push-to-talk service to extend group communications beyond the radio coverage area and to non-radio users across devices. The force had previously investigated the solution and, in response to the pandemic, cut implementation from a year to 72 hours. Once complete and connected to the land mobile radio (LMR) network, staff could monitor radio communications in the city from their homes.

BENEFITS

The new solution provided instant and interoperable communication to enable members of the force to continue serving the public while working safely and securely in their homes. Those staff maintained constant connectivity and communication with frontline responders in the field for operational continuity and organizational resilience throughout the pandemic. The BPD will continue to use the service post-pandemic to enhance communications across the department.

"Many of our people who had to work from home during the pandemic were not in the coverage area for radio communications. We accelerated the implementation of broadband push-to-talk on our computers and cell phones, so non-essential staff could continue to monitor radio communications within the city. Overall, the technology was adopted very well because everyone understood the implication - had this been implemented at a different time, I don't think the adoption would have been as quick or that users would be as accepting."

Shawn Romanoski
Director of Telecommunications
Boston Police Department

INNOVATION IN FOCUS: THE MINING SECTOR

Researchers from Goldsmiths University of London examined how the mining sector's long term investments in innovation enabled it to adapt to new safety risks and requirements caused by the global pandemic.

Mining organizations are known to be early adopters of new and emerging technologies to make their operations more efficient and safe and to counter the impacts of fluctuating commodity prices.

Over the past decade the sector has made considerable improvements through the ongoing use of technologies that enable reliable communication, automation and robotics.

This has delivered productivity gains across the entire mining life cycle, from mining exploration through to how the industry designs, builds and operates its infrastructure.

Rio Tinto, is a mining and metals company operating in 35 countries headquartered in London, U.K.

At the start of the pandemic Rio Tinto Aluminium implemented a back-up communications solution between its Integrated Operations Centre (IOC) in Queensland, Australia and its remote bauxite mine sites in the country to ensure critical communications are maintained during an emergency. Now, if the IOC becomes inaccessible for any reason, Rio Tinto can continue tracking mine production movements via its mission-critical radio system which feeds directly into the organization's Disaster Recovery Centre.

Rio Tinto has also used autonomous and remote technology for more than a decade to support safer and more efficient operations. This includes remote operation of its trucks, drills and trains which it says has helped to remove driver error and improve safety. The mining organization also uses AI to anticipate emerging COVID-19 risks in different geographies. This tool enables the miner to determine the best time to strengthen or relax control measures, such as when employees could safely return to offices in different jurisdictions.

Another global resources company with operations in the Asia Pacific region has been pursuing an ambitious automation program to reduce the number of staff on work sites and minimize their exposure to hazards.

The company uses cloud technology to automate much of its on-site machinery and estimates its use of autonomous blast hole drills in Australia has increased productivity by 25% while reducing maintenance costs by more than 40%.

The same organization uses cloud services and mixed reality headsets for video streaming from mine sites so that frontline staff can access technical support at all times via remote operating centers.

When the pandemic restricted travel in the mining sector, a number of companies discovered that their remote operation technologies were COVID-safe and compliant from the outset.

INIT, GERMANY

INIT creates integrated transport systems that use technology to make public transport more attractive, safer and more efficient. This ranges from command-and-control systems to transport planning tools and ticketing and fare management solutions. What all these systems have in common is that they rely on the secure and robust transmission of communications and data.

CHALLENGE

During the pandemic, transport operators urgently needed to understand the occupancy levels of vehicles and ensure that customers adhered to social distancing rules. It was important to enforce these rules in the moment, but it was also crucial to have a solid, data-driven understanding of usage and compliance patterns, to enable long-term planning of transportation networks.

SOLUTION

INIT redirected passenger counting data from sensors installed in its customers' vehicles to back-end systems to analyze usage patterns and monitor for safety and social-distancing compliance.

BENEFITS

Using statistical tools, INIT's customers were able to precisely plan their operations around social distancing requirements. They could monitor vehicles in real time to ensure compliance and use this intelligence to keep customers informed on real-time travel updates, via mobile apps and other channels.

"It has become increasingly important to provide precise and task-specific data to keep the public safe. The operators need it to plan their daily operations including planning for new stops, how many vehicles they need and contingency planning for unforeseen incidents. Passengers also want to access information about how their services are running via their mobile phones."

Klaus Janke
Managing Director
INIT

MUNICIPALITY OF MADRID, SPAIN

Recognized as one of the safest cities in the world to travel to, the Municipality of Madrid depends on safety technology to enable its police, ambulance and fire services to work efficiently. The city of Madrid provides information and public safety services across 21 districts. It is an open government that advocates for transparency, participation and open data.

CHALLENGE

Madrid's police, fire and ambulance services all use robust and resilient mission-critical communications for their daily work but they also face challenges with a lack of interoperable and streamlined communication between those agencies. The pandemic has further highlighted the need for emergency services to have access to more interoperable solutions to cope with surging demands.

SOLUTION

Emergency services in Madrid are now exploring ways to expand both the coverage and functionality of their mission-critical communications by connecting land mobile radio networks with broadband networks. This will enable different teams to connect instantaneously and reliably regardless of the network technology used.

The emergency services in Madrid are working together to deploy reliable and streamlined technologies to create processes to increase efficiency and synergy between all public safety agencies.

In addition to voice communications, in the future this may include broader collaboration and data sharing with video, images, and other data that first responders need to work safely and efficiently.

BENEFITS

The city's planned and careful approach will increase collaboration across different emergency services while also taking public attitudes into account to ensure sustainable technology that complies with privacy regulations.

"Robust, seamless and reliable communication between all members of our emergency services organizations is integral to keeping our frontline officers, citizens and tourists safe at all times, no matter where they are in the city. We have over 3.4 million residents to watch over, so we need reliable communications that give us the flexibility to connect with broadband services and scale as our organization grows in years to come."

Juan Jesús Muñoz Esteban
Head of Service for Security Systems
City of Madrid

NORWEGIAN EMERGENCY HEALTH SERVICE´S OPERATING ORGANIZATION (HDO), NORWAY

The Norwegian emergency health service's operating organization for Nødnett, Helsetjenestens Driftsorganisasjon for Nødnett HF (HDO), is responsible for the operation and management of control room solutions and radio communication terminals connected to emergency networks within Norway. The agency enables essential emergency communication between citizens and their health services and mobile radio communication for the health service.

CHALLENGE

During large scale events, health services face extreme pressure and need to communicate and coordinate their response with other emergency services, hospitals and authorities. The agency needed a way to unify its workflows across its data and communications systems to provide timely and reliable emergency services for citizens.

SOLUTION

The agency will upgrade its control room with cloud-based software in its own data centers to support virtual control rooms, unify its data sources and streamline the management of the systems.

The solution will provide greater collaboration for emergency teams and give them greater flexibility to manage emergency health situations as they arise.

BENEFITS

The advanced control room solution will support the vital work of the Norwegian Health Emergency Services across all medical centers and external outpatient treatment centers. It will increase efficiency and collaboration for staff, regional health authorities and the emergency medical communication centers. The solution can also help to increase cooperation between emergency and broader healthcare organizations.

"The new control room solution allows for significant improvements to efficiency and scalability, providing much-needed flexibility between mission-critical teams. These needs have long been in critical demand for the healthcare system and this solution will greatly improve our ability to respond to emergency calls."

Lars Erik Tandsæther
CEO
Helsetjenestens Driftsorganisasjon for Nødnett HF (HDO)

SAN DIEGO COUNTY SHERIFF'S DEPARTMENT, UNITED STATES

San Diego County Sheriff's department is the chief law enforcement agency in San Diego County, with more than 4,300 employees. The department provides law-enforcement, detention and court security services. It also performs civil processes, provides regional investigative support and tactical emergency response for more than one million county residents.

The county has a long history of embracing innovation, with a high saturation of technology within nearly every aspect of the organization. When the pandemic struck, however, it was traditional mission-critical voice communications that proved most essential to the agency's response.

CHALLENGE

Public safety agencies in many regions of the country use disparate radio communication systems from one jurisdiction to the next. This is problematic because incidents - crime, weather events, pandemics - don't stop at jurisdictional boundaries. The importance of interoperable communications was never more clear than it was when COVID-19 hit and emergency services were overwhelmed. This highlighted the struggles that some agencies had to communicate, collaborate and effectively share resources.

SOLUTION

San Diego County Sheriff's Department benefited from having a vast, mobile radio network connecting agencies within and around the county and by leveraging its experience in interoperable emergency response. The department will augment radio with data in the future, but insists that reliable and mission-critical voice communications will remain most important.

BENEFITS

An existing investment in radio interoperability meant San Diego County Sheriff's Department and neighboring public safety agencies were able to respond efficiently to the pandemic, listening to one another's radio traffic, seamlessly communicating and working together to address calls for emergency services.

"Interoperability allows us to communicate with other jurisdictions. Because of the way our voice radio system is set up, agencies can help each other out by listening to each other's radio traffic and taking over or handing off an incident as it moves across an area. Also, when there's a critical situation or incident, we're able to patch these separate agencies in such a way that the officers, as well as dispatch centers, are able to communicate seamlessly and exchange voice traffic easily."

Ashish Kakkad
Chief Information Officer
San Diego County Sheriff's Department

ACCELERATED INNOVATION

HOW THE PANDEMIC IS TRANSFORMING TECHNOLOGY

- Integrating technology to form a more complete picture
- High acceptance of new technologies to improve safety
- The pandemic has accelerated technological transformation
- Technology adoption trends

71% of citizens say our public safety agencies need to be able to integrate fast and flexible systems to improve public safety outcomes.

INTEGRATING TECHNOLOGY TO FORM A MORE COMPLETE PICTURE

Although emergency services and commercial organizations consulted for this research are using a combination of different technologies, many of them explained the benefits of integrating different technology types and systems. This included consolidating data from various sources to provide a complete picture of incidents, even as they unfold, and the ability to quickly share data across teams and with partnered organizations. System integration was cited as necessary to address complex challenges, improve collaboration and maximize the responsiveness of organizations.

Lake County Florida in the United States said that by creating a common platform for computer aided dispatch (CAD) system technology across multiple public safety agencies, it has created visibility and coordination to manage emergency response.

Among the most commonly used technologies that agencies and enterprises discussed in their interviews include:

- **Critical voice and data communications:** Providing instant and reliable communication and collaboration for day-to-day events as well as emergency management.
- **Command center software:** For handling of emergency calls from the public, as well as dispatching resources, incident response and records management.
- **Video security and access control:** Providing visibility and security across operations, accountability and transparency through the use of body-worn video cameras and detection of unusual events, threats or lost people or property through analytics.

"From a CAD perspective, the consolidation of fire and medical into one dispatch center for the 14 agencies was pretty big for us. So all of those agencies - all fire, all medical within Lake County - are on one system. That means we have consistent information to mobile data terminals along with consistent voice communications, policies and procedures. So it's been very positive for us."

Greg Holcomb
Office of Public Safety Support Director/
E9-1-1 Coordinator
Lake County, Florida

INTEGRATING TECHNOLOGY TO FORM A MORE COMPLETE PICTURE (CONTINUED)

Organizations can create multiple benefits by integrating these types of technologies across their operations, for example, to manage the series of necessary steps within the public safety workflows. This includes routing calls, dispatching emergency services, intaking data and managing post-incident investigations, analysis and prosecution. Traditionally, each part of the workflow has operated within its own disparate application, resulting in information silos that create barriers to sharing information and resolving cases.

Today, it is possible to eliminate these silos by integrating more applications so that information is made immediately available across applications as soon as it's collected. This helps agencies to save time while eliminating the risk of human error. By automatically collecting and correlating the influx of incident data from every source, including citizen multimedia, body-worn camera footage and emergency call information, public safety agencies can improve shared situational awareness, enhance collaboration between teams and build more complete case files to support prosecutions.

"At MRT we always educate our passengers about safety. We have complete coverage with our video system looking inside and outside of the trains, monitoring passengers as they move in and out of the carriages. Our passengers are OK with it because we have taken the time to explain it and educate them on how the technology is being used. It makes them feel safe and they are willing to comply with rules that they understand are there to protect them."

Mohammad Shazleigh Omar
Head of Section, Telecommunication Systems (Asset Operations and Management Department) Mass Rapid Transit Corporation

HIGH ACCEPTANCE OF NEW TECHNOLOGIES TO IMPROVE SAFETY

Citizens' opinions on the deployment of technology for safety in all markets is high. The majority of people surveyed remain positive about the usefulness of technologies to protect safety in a broad range of settings.

- **66%** say video cameras for security are equally useful at home, at work and in public places, reflecting the increasing acceptance of video in many aspects of daily life.
- **74%** agree that using technology increases the productivity and efficiency of emergency services - 75% agree it does the same for businesses.
- **66%** are open to new technologies that benefit public safety - even higher approval rates of 70% or more were identified in five of the 10 markets.

In some markets which made extensive use of technology during the pandemic, acceptance for the introduction of new and beneficial public safety technologies was even higher than these averages. In Singapore, for instance, where public-transport providers made extensive use of video analytics technology during the pandemic, openness to new public safety technologies is at 69%.

"When transport operators and the public gain access to new and innovative technologies it helps both parties. Some public transport operators experienced a downturn in passenger traffic of up to 80% because of the pandemic. Now technology keeps citizens informed and is restoring their confidence that it is safe to return to public transport."

Klaus Janke
Managing Director
INIT

THE PANDEMIC HAS ACCELERATED TECHNOLOGICAL TRANSFORMATION

In many situations around the world, the pandemic has accelerated both the adoption of new technologies and widened the ways technology is used. Providers in different countries have adapted their systems, often by migrating them to the cloud. This has enabled them to respond to crises with greater flexibility and robustness that may not otherwise have been possible.

At the same time, public awareness of the importance of safety technology has heightened, and by and large, citizens want to see more of these technologies used to protect their communities. Far from provoking a backlash, or significant levels of scepticism, the survey found high levels of public acceptance for technology to enhance safety.

This represents an important opportunity for public safety providers. High levels of public acceptance allow them to innovate, employing new technologies to improve their safety, efficiency and service delivery. Additionally, when the public responds positively to new deployments that prove their worth, it gives providers greater opportunity to increase public trust and to build better solutions over time.

Brian Fontes is the CEO of the National Emergency Number Association, an organization whose mission it is to foster the technological advancement and the implementation of a universal emergency telephone number system in the U.S. He says changing expectations for safety have contributed to citizens wanting to play a greater role in protecting their communities.

"Citizens now want more ways to interact with their emergency services, including the ability to share video, images and other data directly from their smartphones, just as they communicate with their friends and family," Fontes said.

Motorola Solutions' senior vice president and chief technology officer, Mahesh Saptharishi, said public safety providers should not underestimate the public need for data privacy to build trust.

"This is an important time in history where citizens are not only embracing the rapid innovation available to them, but they're also realizing the greater role they can play in supporting public safety. When organizations and service providers have the right strategies and safeguards in place to protect the public and their data, they can earn more trust and over time, greater social license to support the wider use of safety technology."

Mahesh Saptharishi
Senior Vice President and
Chief Technology Officer
Motorola Solutions

TECHNOLOGY ADOPTION TRENDS

In interviews with public safety industry experts, business leaders and other professionals, the researchers distilled a number of common trends and challenges in relation to the use of safety technology. These include:

BROADER ADOPTION OF CLOUD SOLUTIONS

Cloud technology had matured considerably before the pandemic, but not all public safety agencies were convinced of the benefits. Some organizations believed the cloud exposed them to greater security risks and potential for cyber attack than on-premises solutions or that the cloud was primarily for data storage.

When COVID-19 stimulated greater need for decentralized and remote operations, more organizations reconsidered their positions on cloud technologies. Multiple interviewees discussed how their increasing investment in cloud services is helping to boost their organizational responsiveness, resilience and flexibility.

Cloud-based technologies have also proven to be more economically viable than on-premise solutions and being software-based, cloud solutions are also easier to keep up-to-date.

Additionally, the ability to access freely available development tools in the cloud means that powerful new capabilities to tackle a variety of challenges can be built and deployed with considerable speed and scale.

In Norway, the emergency health service's operational organization for emergency networks, Nødnett HF (HDO), had to increase the number of operator positions in the control room solution by 10% at the start of the pandemic. This gave it the scalability and resilience it needed to handle the massive spike in demand for its services caused by the pandemic.

> *"In the future I don't think we're only going to see people working from home, but also very mobile workforces. The way public administration is delivered will change through the introduction of different infrastructure and services and even greater mobile connectivity, especially for frontline responders who will need access to more applications for secure and reliable mobile communication."*
>
> **Dr. Barbara Held**
> Former Head of the Strategy Department at the Federal Agency for Public Safety Digital Radio (BDBOS)

TECHNOLOGY ADOPTION TRENDS (CONTINUED)

INCREASING USE OF VIDEO FOR SAFETY

Organizations are using video security technology in a variety of ways to increase safety, security and to drive productivity across their operations. Police agencies, transportation providers and retailers are among those deploying body-worn video technology to increase transparency in all interactions between their workers and the public. Automatic license plate recognition technology has also been used by authorities to identify unauthorized vehicles at state borders, helping to detect potential breaches of lockdown orders and the spread of COVID-19.

Enterprise organizations discussed how they had augmented their video security solutions with software to identify people with elevated temperatures in high-risk areas including airports, as well as for detecting social distancing and mask-wearing compliance. Access control systems that provide enterprise security and authorize workers' access to buildings have also been coupled with video analytics. This provides valuable evidence trails to support contact tracing efforts. Access control systems are also becoming more sophisticated, securely identifying employees via their mobile phones and enabling them to unlock access to facilities simply by waving a hand in front of a reader.

In the U.S., Perry Township Schools turned to video and analytics to monitor social distancing within its facilities and ensure compliance.

THE GROWING POWER OF VIDEO ANALYTICS

Multiple interviewees from the public safety and enterprise sectors discussed how the wider use of video analytics technologies is helping them to increase safety and enhance productivity, as well as perform new tasks.

By identifying patterns within video footage, organizations have been able to respond faster in critical situations, get more information to workers and responders and gather valuable evidence.

Examples from the interviews include rail and other transport operators, schools and other organizations detecting people with elevated temperatures or who are not wearing face masks before they enter their premises.

The most advanced technologies are powered by AI and allow users to select individual images of people or objects which are able to be filtered out from masses of video footage: an extremely powerful operational management and investigative tool.

TECHNOLOGY ADOPTION TRENDS (CONTINUED)

GREATER NEED FOR INTEROPERABILITY AND DATA SHARING

A common challenge described by many public safety agencies is the lack of interoperable technology - in other words, technology that does not allow them to communicate or share data with other agencies, as well as incompatible systems which don't communicate with each other. When COVID-19 overwhelmed many agencies with a major influx in demands, those challenges grew.

Agencies with existing interoperable technology, including San Diego County Sheriff's Department, said those solutions enabled greater collaboration with other agencies and a more efficient crisis response.

Many agencies are planning for greater integration across their communications and data systems to streamline workflows as emergencies unfold. Among them is Columbia County which aims to create a common communications infrastructure to increase real-time communication across agencies.

There are two key aspects to interoperability:

- Enabling greater communication and data-sharing between different agencies.
- Breaking down the silos within an organization's existing systems to enable greater access and maximize the value of data.

Agencies need to act judiciously on interoperability and data sharing, weighing the benefits and risks of sharing more openly with others. Notwithstanding the challenges, agencies can improve their service delivery by sharing and correlating more of their data. Even the value of a small piece of data, such as a vehicle's license plate, increases exponentially if agencies can determine the history of that vehicle.

Citizens also want to be able to share information with emergency services to improve public safety outcomes. For example, a witness capturing an incident on a smartphone and uploading it as evidence to a public-facing police system.

> *"When all services across health, fire and police cooperate, they each have the same situational awareness, and they all know what's going on. That's what saves lives, and that will identify resources to help us or the people who need it. It's the effect of the nationwide emergency services network, Nødnett, and the other systems we have."*
>
> **Sigurd Heier**
> CEO
> Norwegian Directorate for Civil Protection (DSB)

TECHNOLOGY ADOPTION TRENDS (CONTINUED)

RELIANCE ON RESILIENT COMMUNICATIONS

Research interviews also found that organizations globally continue to depend on mission-critical voice communication as their foundation for operation-wide collaboration and resilience. Unlike cellular networks, the infrastructure is hardened for resiliency and reliability, and organizations control their radio networks and can scale them to provide additional capacity for secure, team-based communication. Communication systems are also evolving through integration with other technologies, such as mobile broadband, to extend the reach of radio communication to users of smartphones and other devices.

New Zealand City Forests' resilient communications system enabled its employees to exchange data and information in a way that was contact-free and compliant with COVID-19 work safety rules.

"In addition to accelerating technology adoption, the pandemic also revealed how established technologies can be highly adaptable, allowing users to quickly respond to rapidly changing and unexpected circumstances,'' said Motorola Solutions' senior vice president and chief technology officer, Mahesh Saptharishi.

"We're trying to get everybody on the same infrastructure so we can communicate better across organizations, including our schools and hospitals. That way, if there is an incident, we can all talk at one time versus having to relay the calls. The more you relay, the less information you have. Now everybody's getting the same information."

Lawrence Wilson
Central Communications Director
Columbia County, Florida

PERRY TOWNSHIP SCHOOLS, UNITED STATES

As the second fastest-growing school district in the state of Indiana, Perry Township Schools serve nearly 17,000 students across early learning and kindergarten academies and a variety of elementary, middle and two high school levels.

CHALLENGE

When Perry Township Schools identified gaps in its legacy video security system a year prior to COVID-19, they realized the need for real-time alerts of potential security risks to keep its students and staff safe.

SOLUTION

Shortly before the pandemic, Perry Township Schools invested in a comprehensive and integrated security system to enhance safety across all of its campuses. The integrated system leverages a combination of real-time alerts, instant voice communication and video analytics to notify administrators of suspicious activity, flag highly trafficked access points or quickly identify and locate students or individuals on campus.

When the pandemic struck, Perry Township Schools expanded these capabilities not only to monitor for student safety and standard risks, but to meet new COVID-19 safety requirements. This included the ability to monitor social distancing across its facilities and keep students safe with minimal disruption to their education.

BENEFITS

Video cameras integrated with communication and a command-and-control system provide alerts for staff when large groups of people gather. Employees are dispatched immediately to disperse groups of students if they are not maintaining safe social distancing practices. The school's leadership team was transparent about how this technology would be used and provide safety for the school community. Consequently, they received broad understanding and support for use of the system. Above all, the integrated system allows school personnel to stay connected with local law enforcement during emergencies and provide them with timely and accurate information.

"When we first introduced the technology to our community, we explained to parents in a public meeting that we did not intend to use it for surveillance. We emphasized why it was inherent to uphold our responsibility to be transparent, equitable and accountable with the new technology. When you make a big change like that you need to bring people along on the journey and help them to understand the need and the solution. We were able to share real examples of alarm triggers with parents and demonstrate how it made their children safer."

Chris Sampson
Associate Superintendent
Perry Township Schools

FIRE & RESCUE NEW SOUTH WALES, AUSTRALIA

Fire and Rescue NSW protects over 7 million people, in an area of Australia that's over three times the size of the whole U.K. The service responds to more than 129,000 emergencies a year. To do so, it fields around 7,000 firefighters, working across 335 stations with a fleet of over 700 vehicles.

CHALLENGE

Fire and Rescue NSW has responded to a wide range of serious events in recent years including the catastrophic 2019/2020 Australian Black Summer bushfires which burned an estimated 18.6 million hectares (46 million acres) and killed at least 33 people.

To maintain and improve its high standard of operational efficiency, the service needs technologies that are rugged and robust enough to withstand harsh Australian conditions. It also requires solutions to drive improvement in its response to major incidents and enable frontline and command center staff to work more efficiently in times of extreme pressure.

SOLUTION

Fire and Rescue NSW's Communication Centre handles emergency calls with a computer aided dispatch system that helps to identify the location of callers and the nearest and best resources to attend to an incident. It has also introduced GIS technology into its fire trucks with mobile data terminals to provide the caller's details, status messaging and turn-by-turn instructions to an incident.

Fire and Rescue NSW also depends on voice communications during major emergencies. It is currently exploring ways to extend the reach of its mission-critical voice communications via carrier and satellite links to support, firefighters working in extremely remote environments.

BENEFITS

Through a combination of advanced technologies, Fire and Rescue NSW can respond with great speed while maintaining high levels of safety for firefighters and the community.

The agency is also planning for the greater use of cloud technology and other solutions including biometric sensors to obtain vital information and live video streams from firefighters in the field.

"Firefighters already have so much to think about when they arrive on a scene – what's happened, who's injured, toxic gases, electricity lines and other hazards. They're thinking about all these things. If you introduce new technology, it's got to be seamless. The technology needs to keep them safe without them needing to actively think about it."

Paul Barnes
Director IT Operations & Communications
Fire and Rescue NSW

MASS RAPID TRANSIT (MRT), MALAYSIA

Mass Rapid Transit (MRT) is Malaysia's rail system and forms part of the city's public transport system together with other rail-based systems including light rail transit, trams, monorails and commuter trains used in urban areas.

CHALLENGE

Before the pandemic MRT Corp had begun using technology systems to help improve safety standards and support the development of its major civil construction projects for rail. When COVID-19 arrived, MRT also needed to limit the spread of the virus while ensuring social distancing practices were being maintained to protect passengers and staff.

SOLUTION

MRT has integrated a number of technologies to increase its safety and efficiency. It installed fixed video cameras on every train and station. Digital radios keep staff connected to instant team-based communication and data, providing fast access to incident details whenever needed. MRT also has a modern command-and-control platform that enhances its capabilities for incident handling and evidence gathering for successful case investigations and resolutions. Enhanced solutions such as body worn cameras for security personnel further improve security monitoring and safety for passengers during an incident, further increasing confidence among passengers commuting on MRT.

BENEFITS

The new system has streamlined the process of identifying and responding to potential security and safety threats. It has also made evidence gathering faster and more efficient through video analytics built directly into the cameras. With video analytics software capable of measuring a person's temperature, anyone at risk of spreading viruses can be refused access to the MRT network.

"Through CCTV video and software technology, it's actually possible for us to detect when someone with an elevated temperature approaches the station entrance gate. We can stop them before they board one of our trains, potentially avoiding a serious safety risk. Having that capability highlights just how crucial technology has become during this pandemic."

Mohammad Shazleigh Omar
Head of Section, Telecommunication Systems (Asset Operations and Management Department)
Mass Rapid Transit Corporation, Malaysia

TRANSPORT FOR LONDON, UNITED KINGDOM

Transport for London

Transport for London (TfL) is the integrated transport authority responsible for meeting the mayor's strategy and commitments on public transport in London including rail, tube and buses. This includes the day-to-day running of the Capital's public transport network and managing London's main roads.

CHALLENGE

There is a growing need for safety for both commuters and frontline staff in the London underground. TfL takes the safety and well-being of its passengers and staff seriously and recently launched a major stand against hate crime and abuse against its frontline workers. It estimates that 25% of violence and aggression incidents towards its staff are hate crimes.[2] Now it is introducing a series of measures to make public transport services more welcoming and safer for everyone. The need for safety and accountability has been particularly high since the pandemic and will continue as more passengers return to travel.

SOLUTION

TfL introduced body-worn video cameras, to monitor antisocial behavior and abuse against staff and passengers. By the middle of 2021, it had cameras at 270 of its stations. It has also made significant investments to improve its critical incident management center. The upgraded command-and-control system gives remote operational staff the ability to view the CCTV footage, assess potentially dangerous events and instantly alert blue-light emergency responders, when necessary.

BENEFITS

The new system gives control-center staff the information they need to direct the right responders to incidents, as quickly as possible. The combination of a state-of-the-art, back-end system and body-worn video cameras on the frontline enable TfL to capture evidence, and provides the software tools it needs to efficiently organize and search that evidence.

"We decided that body-worn video could have a positive impact in keeping our staff and passengers safe and making all journeys more comfortable."

Nicholas Allen
Technology Improvement Lead
Transport for London

2 https://tfl.gov.uk/info-for/media/press-releases/2021/june/tfl-takes-a-stand-against-hate-crime-and-abu

TRUST AND TRANSPARENCY

WHY TECHNOLOGY MUST BE INCLUSIVE, FAIR AND UNDERSTOOD

- **Building confidence and trust in emerging technologies**
- **Technology for community engagement**
- **Putting the public in public safety**
- **Police transparency and reform**
- **Public engagement trends**

68% **want to use technology to help emergency services - for instance, sharing images or video of incidents in their communities with public safety agencies.**

BUILDING CONFIDENCE AND TRUST IN EMERGING TECHNOLOGIES

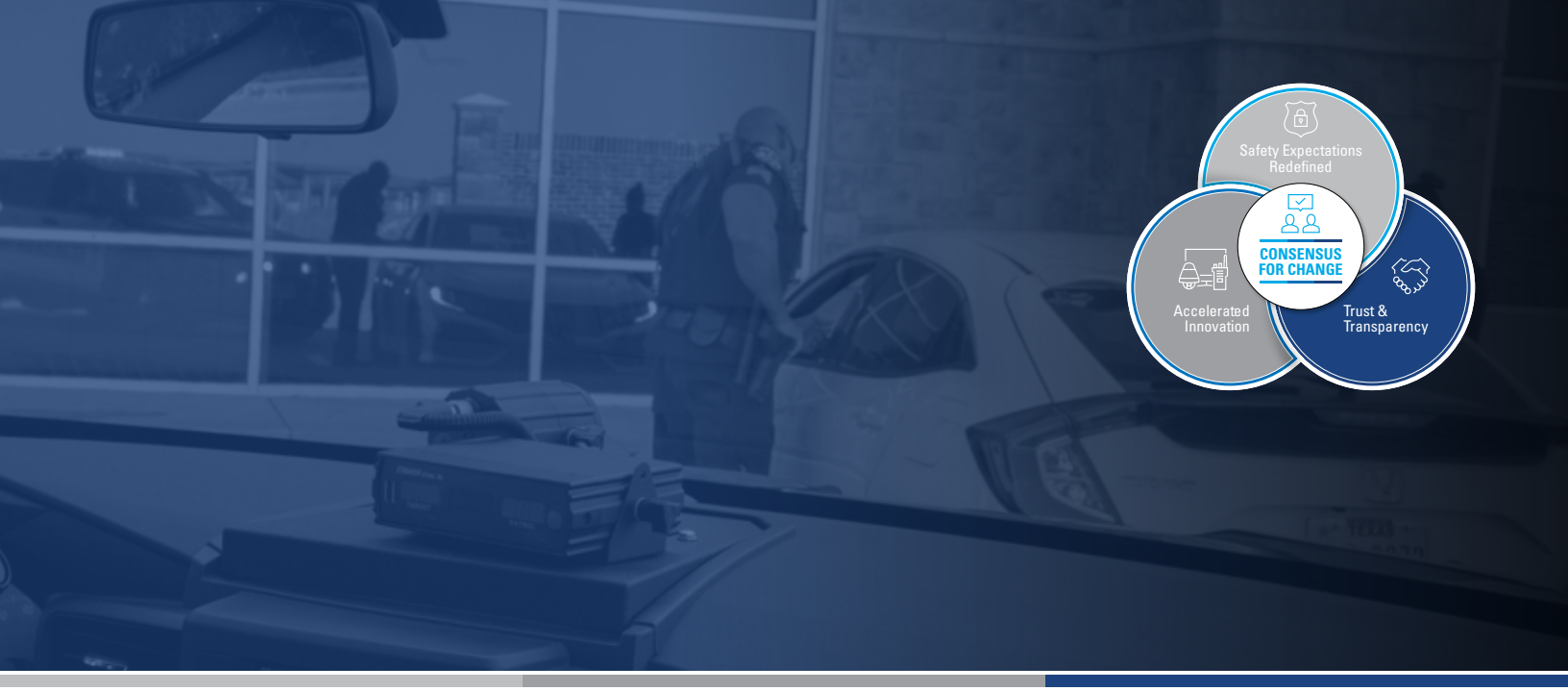
This research identifies a significant opportunity for public safety agencies and businesses to act on a global consensus to transform our safety through technology - but not at the expense of public engagement. Citizens want authorities to use safety technology in ways that are transparent, fair and inclusive and for the benefits to be easily understood.

As technology advancements move faster, it becomes increasingly difficult for governments to ensure their regulatory and legislative policies can keep up. That's when a greater onus is placed on emergency services and enterprises to fill the gap by increasing trust, transparency and accountability with the community.

Organizations must ensure they have sufficient protections in place for data security and that their employees receive adequate training on the use of safety technology. Extra efforts are required to build advocacy and trust in how new and evolving technologies such as AI are being used and what the benefits are.

"We have very clear rules for data privacy in Singapore. The security and safety of our passengers is also paramount to what SMRT and our public safety agencies are trying to achieve. New technologies, such as video cameras at the station, on the street and inside our trains, have yielded many good results to keep our customers and staff safe. They are successfully deterring crime and helping to bring criminals to justice. The vast majority of people welcome these technologies because we have taken the time to explain how they are making their rail journeys safer."

Leow Wee Lee
Head of Communication
Singapore Mass Rapid Transport



BUILDING CONFIDENCE AND TRUST IN EMERGING TECHNOLOGIES (CONTINUED)

Only then can organizations earn the trust and understanding needed to create a social contract with the community for the wider use and deployment of technology to protect their safety.

Key research findings show that citizens want and expect their data and privacy to be protected.

- **75%** of people say that they are willing to trust organizations that hold their information so long as they use it appropriately.
- **66%** of citizens globally say that it should be possible to both analyze data to protect the public while ensuring data privacy.

"When you explain to people how the system works, they feel much better. Nobody can go in and delete data, only the system is capable of deleting data, and it's audited," said Shawn Romanoski, Director of Telecommunications, Boston Police Department.

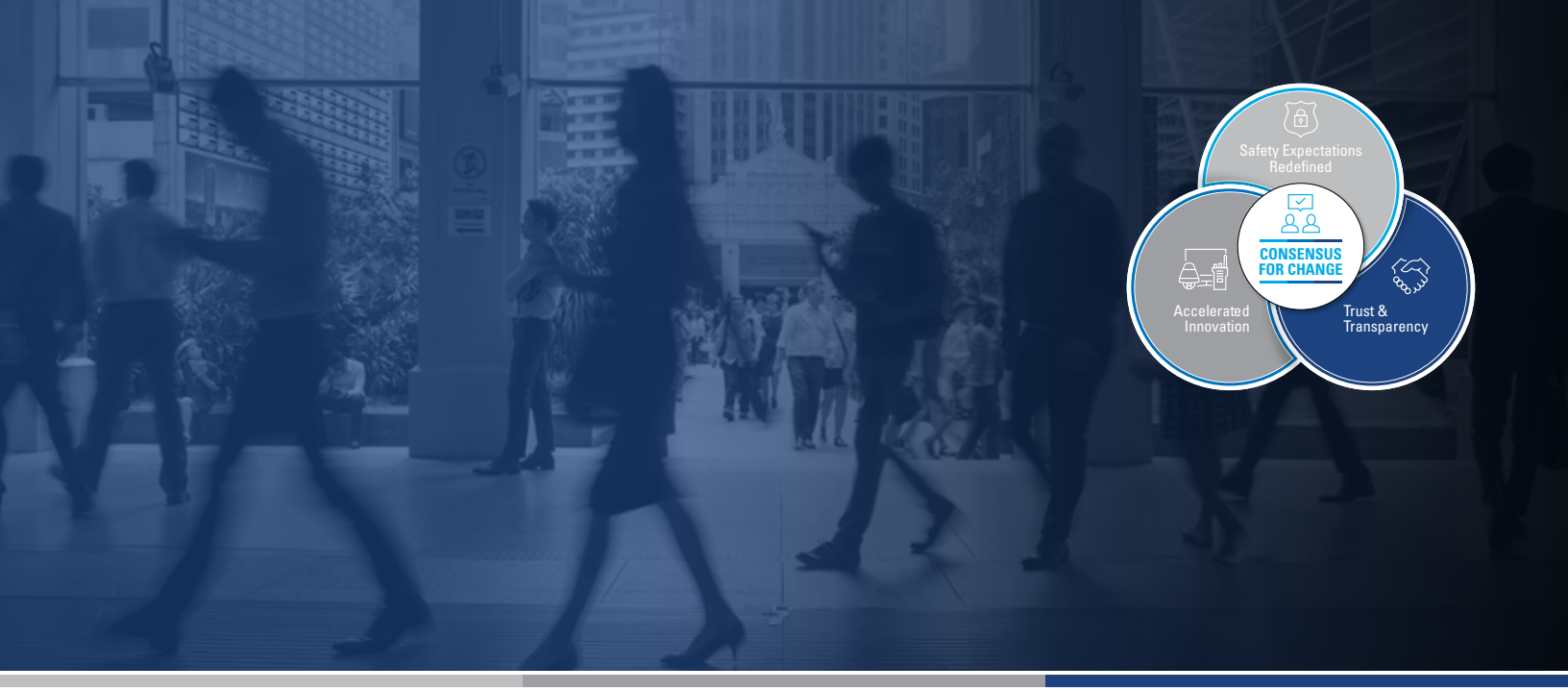
THE ROLE OF AI

Another theme from the research was concern over the use of AI. Just 52% trust AI to analyze situations of threat. More public education is needed to explain the benefits of AI and how, used responsibly, it can have profound and positive impacts on safety.

According to Motorola Solutions' senior vice president and chief technology officer, Mahesh Saptharishi, AI should never replace the role of people in critical industries such as public safety.

"One of the most powerful uses of AI is to support and enhance human decision making by eliminating manual and repetitive tasks that we simply don't have the time or attention span for," Saptharishi said.

"For example, AI could quickly sift hours of video to find a criminal suspect, the results of which can then be verified by a human who decides what to do next. Using AI in this way empowers people by giving them more time back to focus on other important tasks."



TECHNOLOGY THAT STRENGTHENS COMMUNITY ENGAGEMENT

Emergency service providers can increase community engagement and build trust and rapport through technologies that enable the public to easily share information about events that occur in their communities.

- **68%** of citizens say technology for safety could be improved if they are able to have a say in how it is used.

Some public safety providers are introducing more technologies that enable citizens to submit details about incidents, check the status of ongoing events as well as providing anonymous crime tip-offs using their mobile devices.

Enterprises are benefiting from technologies that increase public engagement too. INIT, a German based leader in intelligent public transport solutions has introduced a mobile app that provides real-time information to both transport operators and transport users.

"When transport operators and the public gain access to new and innovative technologies it helps both parties. Some public transport operators experienced a downturn in passenger traffic of up to 80% because of the global pandemic. Now technology is helping to keep citizens informed and is restoring their confidence that it is safe to return to public transport services."

Klaus Janke
Managing Director
INIT

PUTTING THE PUBLIC IN PUBLIC SAFETY

Although there is significant support among citizens globally for the increased use of technology to keep people safe, the majority of respondents also stressed their need to trust the public safety providers and organizations that use their data.

Citizens want a say in how their data is collected and used and they want to be informed about how it is protected and who has access to it.

Increasingly, people want to be treated as partners by the organizations that keep them safe and have access to their data. They want their concerns to be listened to and to know their concerns are informing both public policy and technology deployments.

Standout findings from the survey include:

- **82%** say data privacy is important to them. They want to know how public safety agencies and commercial entities are using their private data and to be assured it is being kept safe.
- **78%** want to know what type of data public safety providers are collecting about them. They want to be included in conversations about how that data is being used and protected.
- **66%** say they will trust safety technology if they understand and agree with its goals and values.

The benefits of building trust and transparency with society are clear.

When organizations respect citizens' needs for data privacy while also explaining the benefits of safety technology, they can discover far greater possibilities.

- **68%** want to use technology to help emergency services - for instance, submitting images or video of incidents in their communities with public safety agencies.

"The global pandemic caused us to reconnect with our fundamental human need for safety," Motorola Solutions' senior vice president and chief technology officer, Mahesh Saptharishi said.

"The experience galvanized us and also made us more aware of the contributions we can make to safety with the technology we use every day. If safety providers can meet citizens' needs for trust and transparency they can make cities safer with technology and people working together."

Mahesh Saptharishi
Senior Vice President and
Chief Technology Officer
Motorola Solutions

POLICE TRANSPARENCY AND REFORM

The murder of George Floyd in Minneapolis, Minnesota in May 2020 received global attention, shining a light on the long and systemic oppression of people of color. Calls for racial equality reverberated through society, corporations and governments, and nowhere were these more pointed than in widespread demands for responsibility and reform in law enforcement.

Police reform is a complex issue, and the work underway at agencies across the globe will be measured in years. However, meaningful change is happening today. Law enforcement agencies are heeding the call for greater transparency, open dialogue and citizen engagement. The officers interviewed for this research report spoke at length about efforts to be more forthcoming and inclusive in their approach to safety. As it relates to technology, there was agreement that citizens should question, understand and ultimately support technology based on community benefit and established trust in the officials who keep them safe.

"We need to be forward thinking and future thinking about how we engage individuals who have been underrepresented and underserved and discriminated against," said Gary Bell, director of emergency preparedness, Waukesha County.

> *"We haven't been transparent in the past. We haven't come forward and let folks know what we're doing, and we are paying dearly for it. We need to create a safe space for a dialogue to make sure that what we're planning from a technology standpoint is what the community truly needs."*
>
> **Gary Bell**
> Director of Emergency Preparedness
> Waukesha County

PUBLIC ENGAGEMENT TRENDS

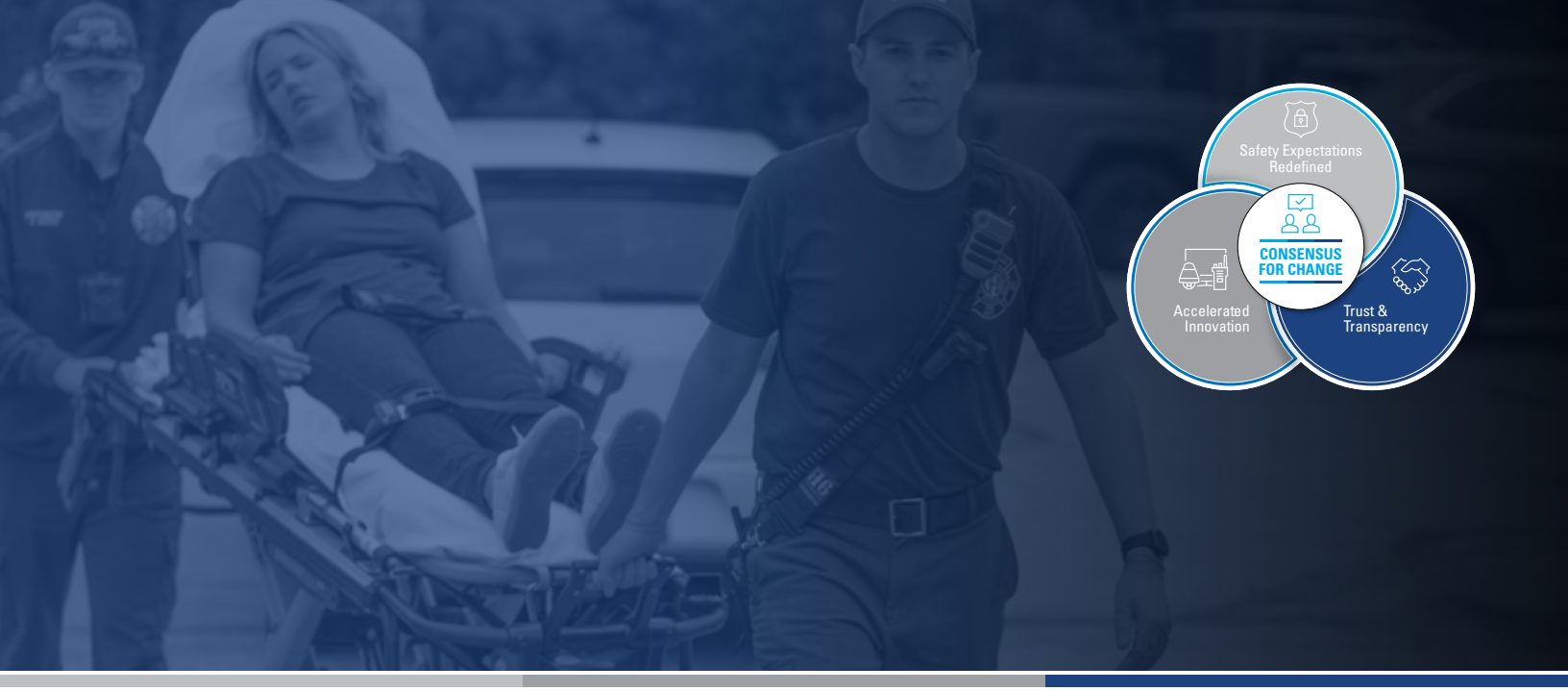
Several themes emerged around trust and transparency in interviews with public safety experts and business leaders.

Public safety providers who said they had the most success in deploying new safety focused technologies, say their willingness to engage communities and persuade citizens was an important factor.

The ability to persuade citizens and build trust is a vital part of an organization's growth, not only for the acceptance of technology but for organizational maturity overall.

Researchers found that the most successful safety providers discussed the following topics in their efforts to build community understanding and trust.

- **Clarity of Purpose:** Ensuring the public understands why the technology is being used, how it keeps citizens safe and benefits the wider community.
- **An Engaged Workforce:** Organizations need to engage their employees before deploying safety technology, so they understand and support it. Employees must also be able to articulate the benefits and privacy safeguards during any interactions with the public.
- **Acceptable Safeguards:** Appropriate limits must be in place to prevent safety technology from being used beyond the original intended purpose communicated to the public.
- **Conflict Resolution:** Members of the public should be encouraged to understand their privacy rights and what to do if they have a concern or complaint.
- **Communicate the Results:** Let the public know how the system is working and is keeping them safe. Provide reassurance, especially for individuals or groups that initially expressed reservations.



PUBLIC ENGAGEMENT TRENDS (CONTINUED)

This research finds that by prioritizing their community engagement strategies, organizations can earn wider public acceptance and ultimately, deliver better services and safety outcomes overall.

Motorola Solutions' Mahesh Sapthrishi added "There is no silver bullet for earning public trust and acceptance. It's a process of being open, transparent and consistent in all communications with staff and the general public."

"What we're seeing, is that the public is becoming more and more cognizant of emerging technology. What we're seeing, is far more educated and informed citizens. There's a healthy dialogue in that context - communities want to know and understand how these technologies are being deployed, how they are being used and the parameters around their use."

Ashish Kakkad
Chief Information Officer
San Diego County Sheriff's Department

NATIONAL EMERGENCY NUMBER ASSOCIATION (NENA)

National Emergency Number Association (NENA), promotes the implementation and awareness of 9-1-1, as well as international three-digit emergency communications systems around the world.

It is the only professional organization solely focused on 9-1-1 policy, technology, operations and education issues and has more than 16,000 members across the United States and internationally.

In the U.S., around 80% of 911 calls originate from smartphones. The public expects to be able to communicate with emergency call handlers using a wide range of media and channels, including voice, video and data communications.

NENA works with public safety agencies and industry providers to raise awareness of the need for new safety technologies and wants to see more next-generation public safety technologies implemented in the U.S.

"There are some parts of the U.S. that have already led the way on implementing the next generation 9-1-1 technology and who are embracing change to make their emergency centers more efficient while better serving the public,'' said Brian Fontes, NENA's CEO.

This is a large and complex challenge because there are thousands of public safety answering points with varying governance models across states, counties, towns, villages, tribal lands and the military systems.

"There is a growing need for national alignment on next generation 911 technologies in the U.S. We really need to get everybody on the same page because all of the data we can receive is extremely useful. As far as data is concerned, it can really save lives."

April Heinze
911 Operations Director

POLICE SCOTLAND, UNITED KINGDOM

Police Scotland is the second largest force in the U.K. It has a workforce of 23,000, across 13 local policing divisions. Each division encompasses response officers, community officers, local crime investigation, public protection and local intelligence.

CHALLENGE

The force was looking for innovative ways to give officers back time they spent updating manual record-keeping systems. They also wanted to simplify data-entry and retrieval in the field, so that officers could spend less time taking notes or looking for important information and more time keeping their local communities safe.

SOLUTION

Police Scotland implemented a comprehensive and flexible mobile application solution for frontline police officers. It gives officers direct access to local and national police databases including systems for command and control and Scottish Criminal History. This ensures they have the most up to date information at their fingertips at all times.

The technology is compatible with frontline devices — including voice and video endpoints — and has modules that enable simplified, streamlined data capture. For everything from crime reporting to the collection of witness statements, the smart application ensures that all necessary information is gathered at the right time and immediately entered into the system.

BENEFITS

The force estimates that using digital technology to capture information at the scene has saved in excess of 500,000 hours of police officers' time every year. It has also improved the organization's evidence gathering, storage and retrieval processes, greatly assisting throughout the judicial process.

"We had rolled out mobile technology for our frontline officers before the pandemic but it has been a game changer for us during the pandemic. It enabled our frontline officers to issue tickets for COVID compliance while maintaining social distancing in the field. Even though the new legislation was fast-tracked, the technology we were already using helped us to adapt instantly."

Superintendent Martin Gallagher
Criminal Justice Services Division
Police Scotland

AMBULANCE VICTORIA, AUSTRALIA

Ambulance Victoria (AV) provides emergency medical response to more than 6 million people throughout an Australian state spanning more than 227,000 square kilometres. The Emergency Management Unit coordinates AV's response to major incidents across the state including heatwaves, bushfires and floods.

Ambulance Victoria is an emergency service accustomed to performing under high degrees of pressure and scrutiny. The ambulance service is measured against numerous benchmarks for its response times as well as how its clinical interventions affect patients.

In an environment where expectations for fast and effective service delivery and the protection of citizens' private data are both high, AV believes technology innovation and patient care have now become inseparable. It uses a combination of technologies including secure, private voice and data communications to manage its workflows and satellite services to navigate the most direct route to a scene.

AV also aspires to centralize more data and communication across its entire service and is pursuing a vision to convert all of its ambulances into digital data hubs with "connected paramedics" also having access to reliable and seamless tools that work easily and integrate different technology types.

"We don't want our paramedics walking around like Robocop with 50,000 things hanging from their belts," says Anthony Carlyon, AV's Executive Director Operational Communications. "We want them to have the smartest tools at their disposal that allow them to focus on what matters most - delivering outstanding patient care without putting themselves or their patients at risk."

Like other emergency medical services in this report, the pandemic placed significant demands and pressures on AV. This has included new risks for paramedics and periods of extreme demand for ambulances while creating even greater volumes of data for the agency to manage.

Mark Rogers, Ambulance Victoria's Chief Operating Officer, said the increased adoption of telehealth services in Australia had helped to alleviate some of the pressure.

"Telehealth wasn't really a thing in Australia just over 12 months ago. Doctors weren't really using telehealth to treat their patients before, but after experiencing the pandemic, I don't think things will ever go back to the way they were. The increased use of public telehealth services has had a direct impact on increasing our availability to attend higher priority calls, especially in rural communities."

Mark Rogers
Chief Operating Officer
Ambulance Victoria

LOS ANGELES AIRPORT POLICE, UNITED STATES

Los Angeles Airport Police employs over 1,100 law enforcement and civilian personnel with a mission of ensuring safe and secure operations. Los Angeles International Airport, the world's third busiest airport, was handling more than 88 million passengers annually before the global pandemic.

CHALLENGE

As gatekeepers to the world, Los Angeles Airport Police relies heavily on technology to gather and store data that informs their incident response. In the past, outdated technologies, including a stand-alone computer-aided dispatch (CAD) system, lacked integration for data centralization and real-time information sharing internally and across multiple agencies.

SOLUTION

In response, LA Airport Police upgraded to an in-house CAD system, with a records management system (RMS), that integrates key information from different sources, including 911, the land mobile radio system, video cameras and data resources. The solution streamlines the capture, correlation and distribution of information and provides a real-time operational view of incidents. Further, its connection to the radio system allows for GPS tracking of radio users, so the department can dispatch resources more safely and efficiently.

BENEFITS

With integrated CAD and RMS technologies, LA Airport Police has accelerated its decision-making and moved the agency from reactive to more proactive threat assessment and management. The centralization of data has also allowed them to respond and resolve incidents more quickly and with greater collaboration from interoperable agencies. This has been paramount to the department's response to the pandemic.

"Although we've seen a reduction in the number of passengers since the onset of the pandemic, we've become increasingly reliant on the technology we use to meet operational needs. With technology adoption and integration, we've been able to validate and improve procedures and increase overall safety and efficiency."

Masis Sossikian
Captain
Los Angeles Airport Police

CONCLUSION

The major finding of this international research is a global consensus for change to transform safety through the use of advanced technology.

A formidable 88% of the 12,000 people surveyed across 10 markets agree with that sentiment. The remaining 12% who do not subscribe to the idea are not necessarily against it, they're just more pragmatic. They may not be convinced on how technology can improve safety and hold some reservations about impacts to their privacy and data.

Deeper analysis revealed that citizens will only support the wider use of safety technology if it is used in fair, inclusive and transparent ways.

The global pandemic is a shared experience that has caused seismic changes to public health and new expectations and responsibilities for safety. It has accelerated changes in our personal perspectives and catalyzed the adoption of new technologies.

A major global movement is now underway that supports making safety a collective responsibility among governments, industries and society. Its success depends on citizens, public safety agencies and commercial organizations all being able to trust each other.

The gap between safety objectives and technology is closing, but the only way to build a safe and sustainable future beyond the pandemic is to build it together.

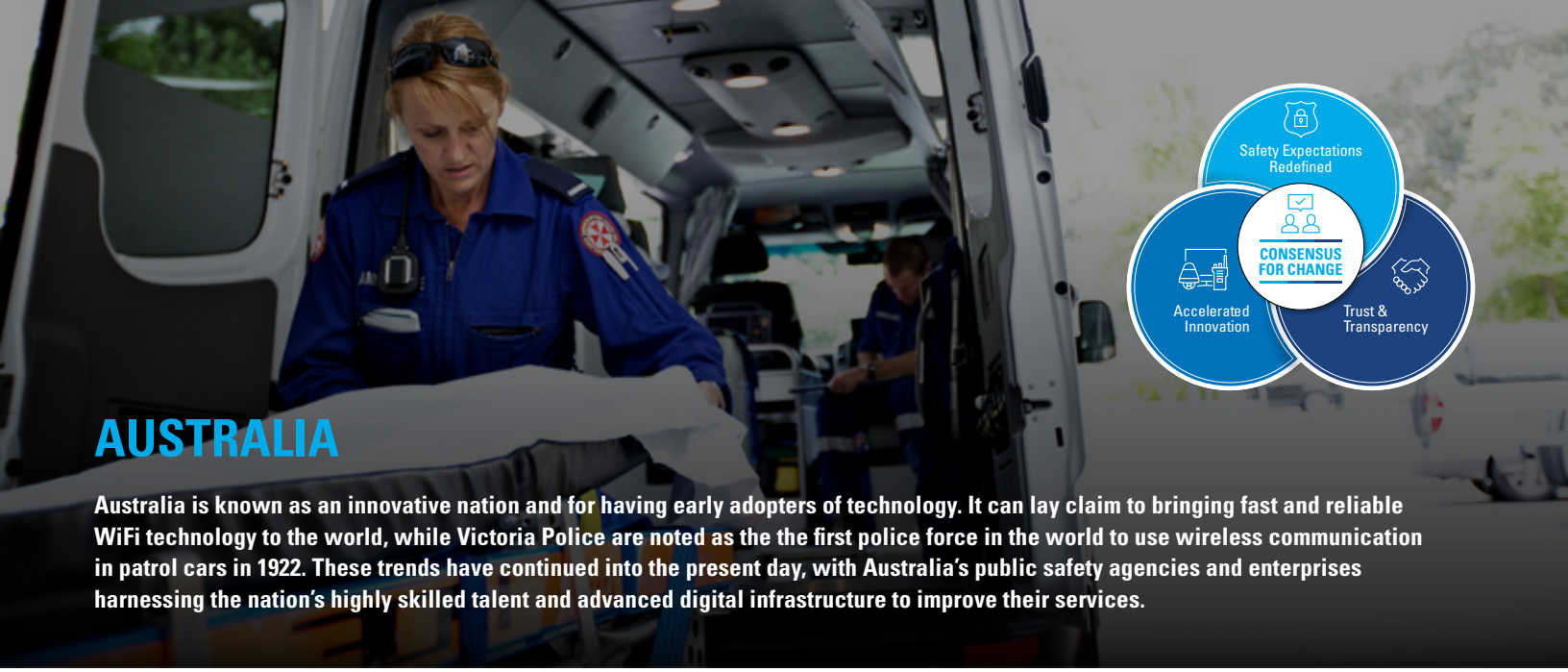
An overwhelming

88%

of citizens globally want to see public safety transformed through the use of advanced technology.

MARKET SPOTLIGHTS

Each market spotlight page contains survey analysis of three groups of people based on their sentiment for technology to transform safety.
For further information and descriptions of "catalysts", "advocates" and "pragmatists" identified through citizen surveys, refer to the Research Analysis - page 54



AUSTRALIA

Australia is known as an innovative nation and for having early adopters of technology. It can lay claim to bringing fast and reliable WiFi technology to the world, while Victoria Police are noted as the the first police force in the world to use wireless communication in patrol cars in 1922. These trends have continued into the present day, with Australia's public safety agencies and enterprises harnessing the nation's highly skilled talent and advanced digital infrastructure to improve their services.

AUSTRALIAN ATTITUDES TO TECHNOLOGY AND SAFETY

In general, Australians are positive about the role of technology in providing safety. Seventy percent say they want those who keep them safe to have access to advanced technology to deliver their services.

How technology is used also matters to Australians, with a significant 81% saying that data privacy is important to them.

Other significant findings from the research include:

- **74%** say it makes sense to use technology to predict safety risks.
- **73%** believe integrating fast and flexible technology will improve public safety.
- **69%** say video cameras are useful in public places but also at home and work.

Australia comprises a roughly equal split between what researchers describe as "catalysts" (**43%**) and "advocates" (**46%**). That is, those who want to see innovation applied to improve safety as well as those who are happy to see that change but don't necessarily want to lead it. Just **11%** were "pragmatists"; those who are reluctant to see more new technologies introduced to improve safety.

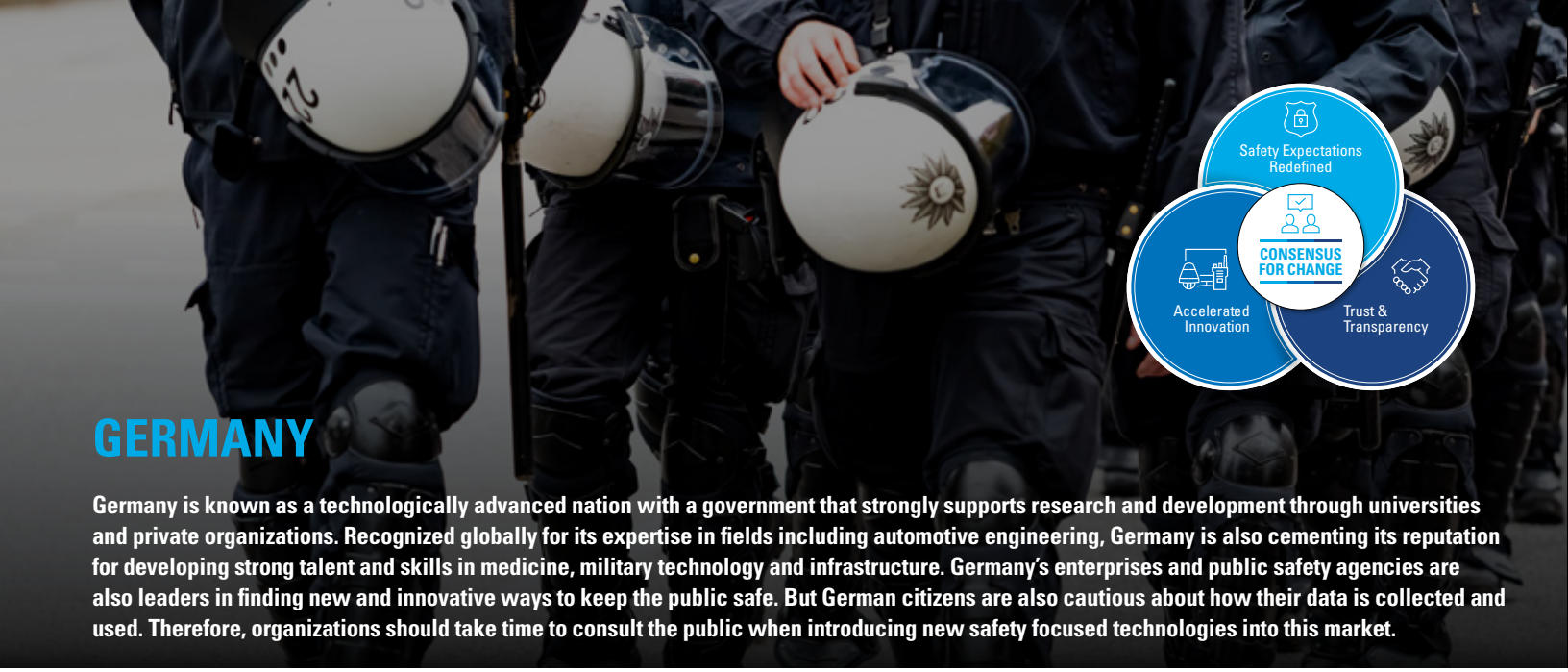
HOW LOCAL PUBLIC SAFETY ORGANIZATIONS ARE ADAPTING

"Secure digital communication has a safety aspect from our perspective because it transmits information and data back to the organization from the workforce in a number of ways. It can also support workers being able to do things like video streaming, helping them to provide better treatment and care for patients in the field."

Mark Rogers
Chief Operating Officer
Ambulance Victoria

"When a call comes in, our software now looks at the location and status of every appliance (fire truck) and displays the two closest available to the dispatcher, regardless of where they are. One of those could be an appliance that's just finished a job and is on its way back or it may be other appliances that are closer to that incident. It's been able to provide us with decision making support and improve how quickly we get to an incident."

Paul Barnes
Director IT Operations & Communications
Fire and Rescue NSW



GERMANY

Germany is known as a technologically advanced nation with a government that strongly supports research and development through universities and private organizations. Recognized globally for its expertise in fields including automotive engineering, Germany is also cementing its reputation for developing strong talent and skills in medicine, military technology and infrastructure. Germany's enterprises and public safety agencies are also leaders in finding new and innovative ways to keep the public safe. But German citizens are also cautious about how their data is collected and used. Therefore, organizations should take time to consult the public when introducing new safety focused technologies into this market.

GERMAN ATTITUDES TO TECHNOLOGY AND SAFETY

As a result of experiencing significant disruption in the twentieth century, it's not surprising that Germans are more protective of their privacy than citizens of other countries. The research found 65% of Germans want to see safety transformed through technology which is 5% lower than the U.S. or the U.K.

Germany is a federal state, with a strict separation of powers. The Bundespolizei, or federal police, enforce the law at a federal level. Healthcare is funded through statutory insurance and generally provided at a municipal or local level. Fire services are organized at the level of the individual states, rather than at a federal level.

In Germany 61% believe that technology is necessary for emergency services to ensure public safety, but that doesn't mean Germans are closed to innovation. Additionally, 57% say they want to interact with emergency services through digital technologies, reflecting a higher level of caution about the use of technology compared to other developed countries.

Other significant findings from the research include:

- **68%** agree with using technology to increase the efficiency of emergency services.
- **65%** of Germans agree that technology should be used to ensure business continuity.
- **60%** want to use technology to make their communities safer.
- **71%** say they need to be able to trust organizations that hold information about them.

In Germany, **12%** are "pragmatists", a high proportion for a developed market. There are **54%** classified as "catalysts" while just **34%** are "advocates". These results reflect the need for German citizens to be convinced about the usefulness and benefits of safety technology and how it protects their data.

HOW LOCAL ENTERPRISES AND PUBLIC SAFETY ORGANIZATIONS ARE ADAPTING

"One of our best products, a real-time passenger information and counting tool, has provided important information during the pandemic. It lets our customers know the occupancy levels in their vehicles and is also a statistical tool that helps them to plan their networks and operations. For passengers, it provides real time information about arrival and departure times on the devices that they carry in their pockets."

Klaus Janke
Managing Director
INIT

"In Germany we strive for perfection, the highest availability, the most secure technology and so forth. I think we should rather aim to reach 80% in these areas and just deliver good services. I'm also very much in favor of implementing satellite services to increase coverage instead of trying to get more and more fiber lines in every state. We should also increase collaboration and cooperation between government organizations and companies."

Dr. Barbara Held
Former Head of the Strategy Department
at the Federal Agency for Public Safety Digital Radio (BDBOS)

ITALY

Italy is often referenced as a global technology leader in industrial machinery and known for pursuing innovations including machine to machine communication, a fundamental capability for Industry 4.0. Italy is also a market with some of the highest numbers of people being open to innovation in public safety. Of all markets, Italians are also the most likely to support the use of predictive technology in public safety. This is coupled with a high level of openness to technology that benefits public safety.

ITALIAN ATTITUDES TO TECHNOLOGY AND SAFETY

There is a uniquely large gap between "catalysts" and "pragmatists" in relation to concerns around COVID-19. Italian "pragmatists" are far less likely to believe that the pandemic shows the importance of using technology to ensure public safety.

The Italian Ministry of the Interior is responsible for running the country's police and fire services. Healthcare provision is universal but is organized by Italy's regions. In Italy, 74% of citizens believe public safety agencies need technology to meet the challenges of a changing world.

Other significant findings from the research include:

- **78%** agree that emergency services should use predictive technologies.
- **78%** believe technology is necessary for the efficiency of emergency services.
- **73%** are open to technology that benefits public safety.
- **70%** want to be able to use technology that makes communities safer.
- **76%** say they need to be able to trust organizations that hold information about them.

In Italy, **47%** are "catalysts", **46%** are "advocates" while just **7%** are "pragmatists."

HOW A LOCAL ENTERPRISE ORGANIZATION IS ADAPTING

The Vado Ligure Port System in north-east Italy is one organization using a variety of technologies to manage its complex on-site operations and supply chain. The container terminal operates one of the world's most comprehensive port and integrated inland service networks. It plans to become the first fully automated shipping yard in Italy and is using a variety of technologies to achieve its goal. It is using a combination of video security, command-and-control software and automation technologies to monitor and control all loading, unloading and other activities at the port from the safety of the control room. It also uses a reliable voice communication system which is integral for instant, team based collaboration and to maintain resilience and safety across its onsite operations.

"The communications system has become an integral part of the terminals' day-to-day operations. It will also allow quick communications in case of terminal equipment maintenance issues and an efficient physical security and safety management."

Marina Klioukina
IT Manager
APM Terminals

MALAYSIA

Malaysia is one of the world's most digitally connected societies. With its strong technology and engineering talent base it is also a research and development hub for many global organizations. Malaysians too are quite open to innovation and the use of new technologies when the benefits are made clear. However, 17% of citizens are "pragmatists". They are not advocates of change and need to be persuaded that new technology will achieve its goals while protecting citizens' privacy.

MALAYSIAN ATTITUDES TO TECHNOLOGY AND SAFETY

In some respects, Malaysians — of all the markets surveyed by the research team — are the most open to the use of new technologies in public safety. In Malaysia, 78% of respondents said that advanced technologies, including video and data analytics, were required to address public safety challenges in the modern world.

Managed by the Ministry of Home Affairs, the Royal Malaysia Police (RMP) is the country's primary police force. It is one organization that uses a variety of technologies to maintain public safety. This includes secure, nationwide digitally encrypted voice communications and command center software to manage and coordinate its emergency response and resources. The police agency is also investing in video technologies including drones for threat prevention at the country's border areas to curb intrusion, smuggling and cross-border crime. It also plans to deploy body-worn video technology to help maintain safety and transparency in interactions between its frontline officers and the public.

In Malaysia, 70% say they're comfortable with safety technology being deployed in society. Other significant findings from the research include:

- **75%** are open to technologies that benefit public safety.
- **73%** believe integrating fast and flexible systems will improve public safety.
- **74%** agree COVID-19 has increased the need for public safety agencies to access communication technology.
- **68%** agree that emergency services have a greater impact with technology.
- **71%** say they need to be able to trust organizations that hold information about them.

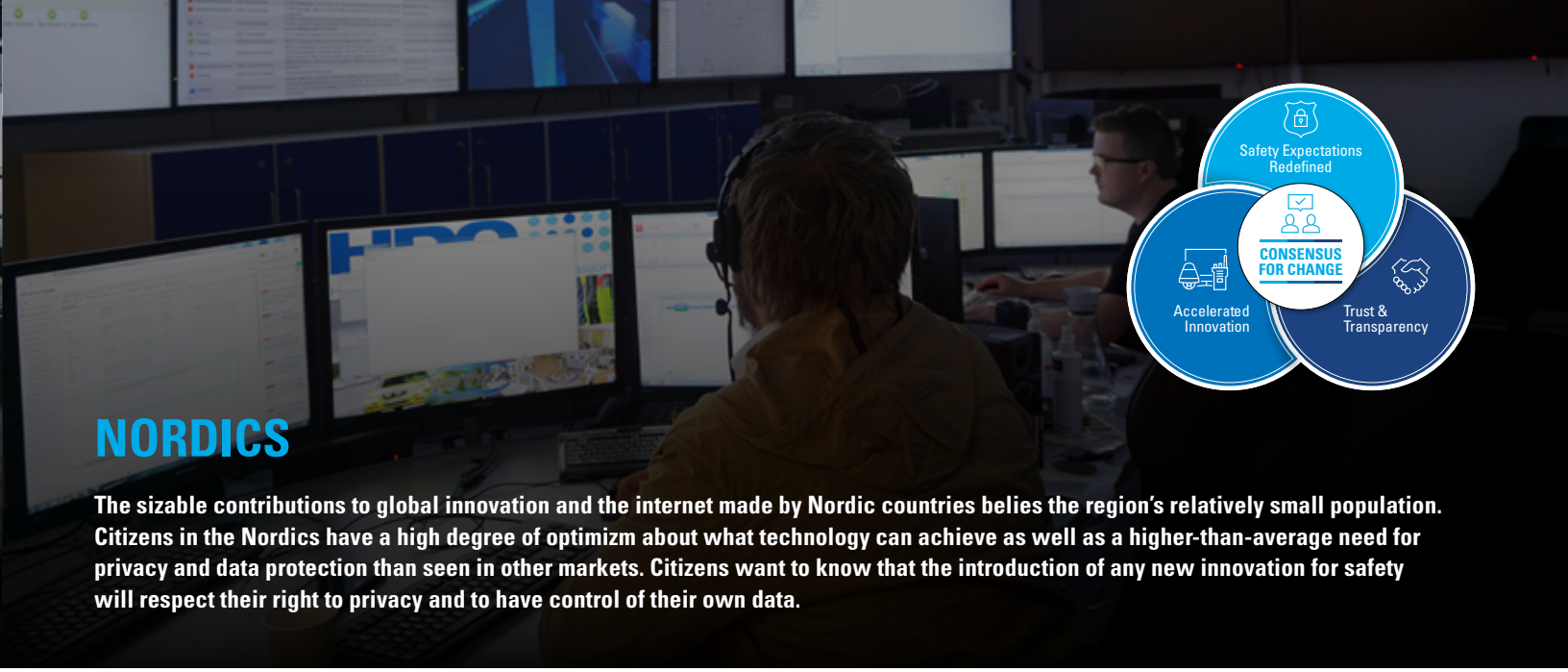
Malaysian survey respondents included "catalysts" (**42%**) and "advocates" (**41%**). Many people in Malaysian society believe public safety can be provided without compromising privacy.

HOW A LOCAL ENTERPRISE ORGANIZATION IS ADAPTING

"We have significant coverage of CCTV cameras on our trains and our passengers are OK with that because it helps them to feel secure and safe. Most importantly of all, we need to educate the passengers of the importance of safety and how we use technology so that they can enjoy reliable, secure and safe services every day."

"Our technology speeds up the way we provide safety and has improved our operation on a daily basis. When there's an incident, it only takes a few seconds to notify the train to stop at the station. New technologies have made it possible for staff to call an ambulance right away if a major incident occurs."

Mohammad Shazleigh Omar
Head of Section, Telecommunication Systems (Asset Operations and Management Department)
Mass Rapid Transit Corporation, Malaysia



NORDICS

The sizable contributions to global innovation and the internet made by Nordic countries belies the region's relatively small population. Citizens in the Nordics have a high degree of optimizm about what technology can achieve as well as a higher-than-average need for privacy and data protection than seen in other markets. Citizens want to know that the introduction of any new innovation for safety will respect their right to privacy and to have control of their own data.

NORDIC ATTITUDES TO TECHNOLOGY AND SAFETY

Attitudes to technology for public safety are quite varied in the Nordics. Survey respondents identified as "catalysts" were at 25% while 47% are "advocates" and 28% being "pragmatists."

This distribution across the three groups makes the Nordics unlike most other markets surveyed. With the largest percentage of respondents being "advocates" and a high percentage of them saying their data privacy is important, organizations need to invest time convincing citizens of the benefits of new technologies before deploying them.

To pave the way for more innovation, citizens in these markets need to see and understand how organizations can deliver better services and safety with technology while protecting privacy.

In the Nordics, 67% of respondents from Nordic countries say that using technology to create safe working environments ensures business continuity and productivity. Other significant findings from the research include:

- **70%** of respondents agree using technology increases the productivity and efficiency of emergency services.
- **67%** want to see technology used to transform how safety services are provided.
- **76%** of respondents say that the privacy of their data is important to them.

HOW A LOCAL PUBLIC SAFETY ORGANIZATION IS ADAPTING

"During the pandemic we were able to increase capacity for our most vulnerable control rooms by 10%. That was the first step. But during that stage, our response times were too slow, especially in the biggest municipalities with the largest cities. After dealing with this for a while, municipalities set up their own emergency call numbers. So this traffic was diverting traffic from the main emergency call lines back into local services."

Lars Erik Tandsæther
CEO
Helsetjenestens Driftsorganisasjon for Nødnett HF (HDO)

SINGAPORE

Singaporeans are highly optimistic about technology and how it can provide safety. Respondents have high levels of understanding and a good grasp of how technology works and can benefit them. They are also willing to support innovation so long as they understand how it can help them and protect their data.

SINGAPOREAN ATTITUDES TO TECHNOLOGY AND SAFETY

Citizens of Singapore embrace a strong safety culture and see their nation as one of the safest places in the world.

Singapore's Ministry of Home Affairs (MHA) which is responsible for agencies including police, law enforcement, border control and corrections are known collectively as the Home Team and work in close partnership with the community to keep Singapore safe and secure.

Many citizens of Singapore understand the important role that technology plays in keeping them safe. They trust their agencies and they want to play a greater role in supporting them in delivering public safety services.

One example of a technology that fosters closer partnerships between citizens and police is a live video streaming function that allows 999 emergency callers to stream live footage from the scene via their mobile phones back to a command center. The solution is currently being trialed by the Singapore Police Force and aims to provide officers with greater situational awareness before they arrive on scene.

Significant findings from the research include:

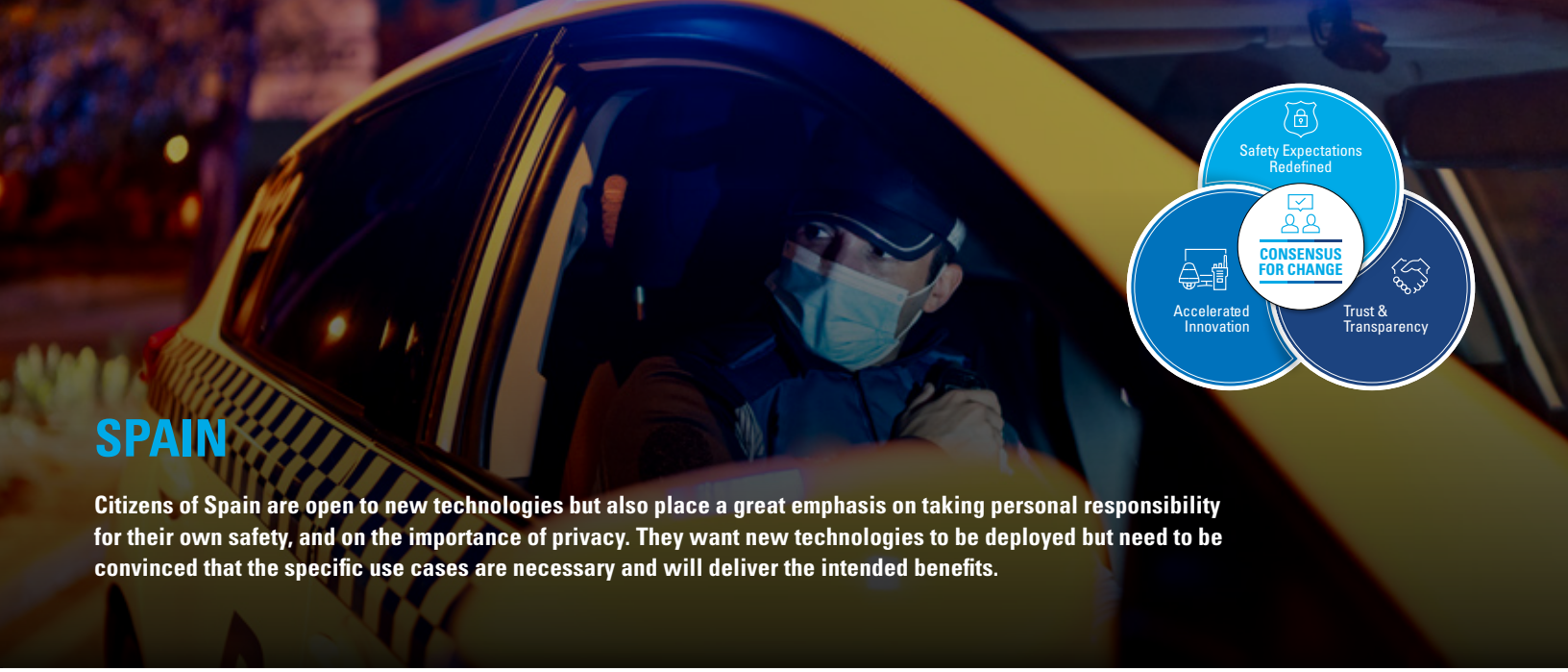
- **77%** of Singaporeans believe that technology is necessary to make emergency services efficient.
- **76%** say that using technology in public safety ensures business continuity and productivity.
- **73%** want to be able to use technology to help make their communities safer.
- **72%** say they need to be able to trust organizations that hold information about them.

Singaporeans are uniquely optimistics about the use of technology in public safety. In total, **92%** of respondents advocate for the use of technology to make Singapore safer.

HOW A LOCAL ENTERPRISE ORGANIZATION IS ADAPTING

"Crowd management is essential and paramount in running a railway, both during the pandemic and in normal times. Part of our digitalization journey is to create 'intelligent' stations for the future. We want to make the best use of technology to manage crowds and understand public behavior to help us deliver better services."

Leow Wee Lee
Head of Communication
Singapore Mass Rapid Transport



SPAIN

Citizens of Spain are open to new technologies but also place a great emphasis on taking personal responsibility for their own safety, and on the importance of privacy. They want new technologies to be deployed but need to be convinced that the specific use cases are necessary and will deliver the intended benefits.

SPANISH ATTITUDES TO TECHNOLOGY AND SAFETY

More than citizens in other countries surveyed, Spaniards regard safety as a personal responsibility. In Spain, 72% said they took precautions to protect themselves from both physical and psychological risk. This compares to just 55% who said safety technology is entrenched in society.

Other significant findings from the research include:

- **74%** of Spaniards say technology at work can ensure productivity and business continuity.
- **72%** believe integrating fast and flexible systems will improve public safety.
- **68%** want to play a role in ensuring the safety of their communities.
- **82%** say the privacy of their data is important to them.
- **77%** say they need to be able to trust organizations that hold information about them.

A significant 64% of Spaniards fall in the "catalysts" category, the equal highest proportion of "catalysts" in this survey, along with the U.K. However, a strong need for personal and data privacy is present in all three groups in Spain. Even technology enthusiasts need convincing that technology deployment is aligned with public interest.

HOW A LOCAL PUBLIC SAFETY ORGANIZATION IS ADAPTING

Juan Jesús Muñoz Esteban, Head of Service for Security Systems, City of Madrid, commenting on the municipality's project to expand and upgrade the digital radio system used by its emergency services, part of an effort to ensure Madrid keeps its reputation as one of the safest cities in the world.

"Robust and reliable communication between frontline officers and the rest of our organization is integral to keeping our officers and citizens safe, no matter where they are working in the city. We have over 3.4 million residents to watch over, so we need reliable communications that also give us the flexibility to connect with broadband services and scale as our organization grows in years to come."

Juan Jesús Muñoz Esteban
Head of Service for Security Systems
City of Madrid

TAIWAN

The people of Taiwan are generally optimistic about the effectiveness of technology for public safety. Around two thirds believe that using video security technology helps to prevent crime. A significant majority, 71%, believe that emergency services have the right technology to collaborate effectively and deliver their services.

TAIWANESE ATTITUDES TO TECHNOLOGY AND SAFETY

Citizens of Taiwan are well accustomed to the use of technology for safety. Having learned from the SARS outbreak of 2003, the Taiwanese government was quick to introduce technology to combat COVID-19.

Realizing the full significance of the pandemic the Taiwanese government instituted a wide-ranging public-health response[1]. Authorities introduced QR code scanning and online reporting of health symptoms for citizens.

All three archetypes — "catalysts", "advocates" and "pragmatists" — identify the COVID-19 pandemic as a key driver of change. This makes Taiwan unique among most markets surveyed.

Almost three-quarters of Taiwanese people think the COVID-19 pandemic demonstrates the need for increased communication within and between public safety organizations to respond more effectively to evolving risks.

As with most developed markets, data security and confidentiality are also a priority for Taiwanese respondents. In Taiwan, **79%** say data privacy is important to them and **74%** want to know what information is being collected about them.

Other significant findings from the research include:

- **74%** believe technology is necessary for the efficiency of emergency services.
- **73%** believe advanced technology is needed to address the challenges of a modern world.
- **70%** want to be able to use technology to help make their communities safer.
- **67%** say using technology to create safe working environments ensures business continuity and productivity.

49% of Taiwanese are "catalysts", while **36%** are "advocates" and the remaining **15%** are "pragmatists."

HOW A LOCAL PUBLIC SAFETY ORGANIZATION IS ADAPTING

"Through our radio system we can gather valuable IoT information. For example, identifying incidents that happen at various locations like a door being left open or the loss of power at one of our facilities. This kind of information helps to determine if there has been a security breach. That became even more important during COVID-19 lockdowns when fewer staff were moving around and inspections of some sites moved out from monthly to quarterly."

Anonymous comment from a local public safety organization

1 https://www.wired.co.uk/article/taiwan-coronavirus-covid-response

UNITED KINGDOM

Britons are part of a mature digital economy with high adoption of digital tools. Some of history's greatest inventors have also come from the British Isles. U.K. citizens also believe that full transparency and clear communication is a must when introducing new technology. More than eight in ten respondents said that privacy was a high priority for them. "Catalysts" represent 64% of all British respondents, indicating a very high level of acceptance for innovation and new technologies.

BRITISH ATTITUDES TO TECHNOLOGY AND SAFETY

In the U.K., citizens are generally positive about the potential of new technology with 70% saying they are open to new technology that will make them safer. However, levels of understanding are low. Just 56% of Britons say they understand how emergency services use communication technology to provide better service.

Unlike many similar countries, the U.K. does not have a centralized police force. The English regions and devolved governments in Edinburgh, Belfast and Cardiff all run their own forces. The same is true for both health and fire services.

Beyond the **64%** of British "catalysts," **31%** are "advocates" and just **5%** are "pragmatists."

Significant findings from the research include:

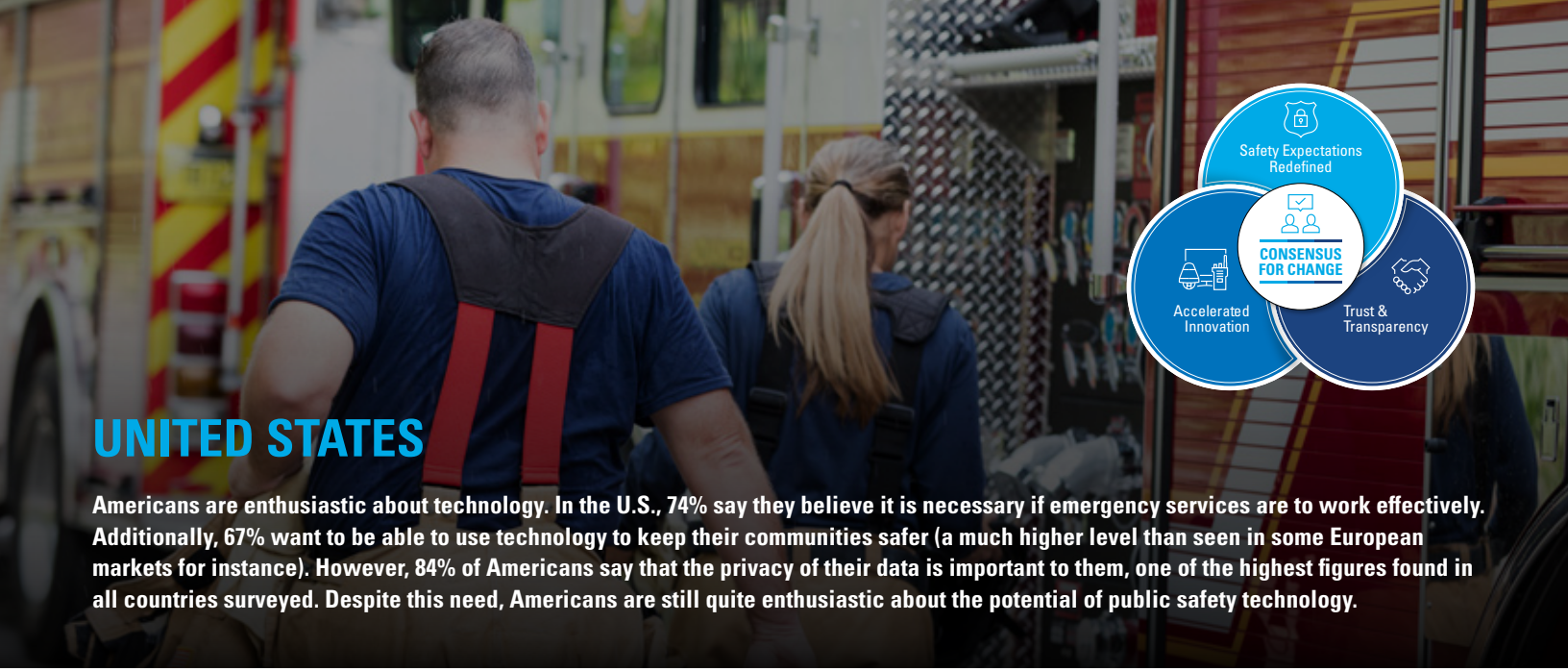
- **72%** believe integrating fast and flexible systems will improve public safety.
- **69%** think COVID has increased the communication needs of public safety agencies.
- **68%** agree that citizens should be able to use technology to help make our society safer.
- **78%** say they need to be able to trust organizations that hold information about them.
- **65%** agree that emergency services have greater impact with advanced technologies.
- But **81%** of respondents clearly identify that the privacy of their data is important to them.

HOW A LOCAL PUBLIC SAFETY ORGANIZATION IS ADAPTING

"Digital technology is reaching that stage where it can impact every aspect of peoples' lives. I think most people would agree with that. However, there needs to be more consideration of what that means for public safety agencies and services and how they perform their functions, right down to the very fundamentals."

"Today we're digitizing processes that exist. We're not thinking enough about changing processes beyond that. We need to re-evaluate which processes are most important and leverage the right technology to make them even better."

Superintendent Martin Gallagher
Criminal Justice Services Division
Police Scotland



UNITED STATES

Americans are enthusiastic about technology. In the U.S., 74% say they believe it is necessary if emergency services are to work effectively. Additionally, 67% want to be able to use technology to keep their communities safer (a much higher level than seen in some European markets for instance). However, 84% of Americans say that the privacy of their data is important to them, one of the highest figures found in all countries surveyed. Despite this need, Americans are still quite enthusiastic about the potential of public safety technology.

AMERICAN ATTITUDES TO TECHNOLOGY AND SAFETY

The majority of Americans, by quite some margin, are "catalysts." They see the potential of technology such as data analytics and fixed or mobile video. However, 62% of them strongly agree with the statement that privacy is important to them. Overall, "catalysts" are less certain in the U.S. than in other markets that it is possible to truly trust technology.

While there are federal law enforcement agencies, such as the FBI and DEA, most policing in the U.S. is organized at a state and municipal level. The same is true of fire services. Most healthcare is provided privately and funded through private insurance, though the federal government does provide some public coverage through the Medicaid and Medicare programs.

- In America, **70%** say that using technology to create safe working environments ensures business continuity and productivity.

Other significant findings from the research include:

- **70%** of the U.S. public want safety services to be transformed through technology.
- **67%** want to be able to use technology to help make their communities safer.
- **74%** agree using technology increases the productivity and efficiency of emergency services.
- **79%** say they need to be able to trust organizations that hold information about them.

There are **54%** of Americans identified as "catalysts," while **38%** are advocates, and **8%** are pragmatists.

HOW LOCAL ENTERPRISE ORGANIZATIONS ARE ADAPTING

Here are some things leaders of U.S. enterprise organizations have said about the changing role of technology in their work.

"The use of video has been accepted extremely well, and we have not had any pushback. What we found through all of this, especially with COVID, is that people want to be safe. We were very transparent from the very get-go of putting this video system in. We've built that trust with our folks and that's the way we do everything; communication is very high on our list. People trust us to do the right thing and because of that we have not had any pushback."

Chris Sampson
Associate Superintendent, Perry Township Schools

"To enhance our response to the pandemic, we prioritized the integration of a new radio system for a unified solution that would work across all three hospital sites. We expanded the number of radios we previously had, allowing more people to be connected across different locations than ever before."

Doug Buchan
Emergency Prepardedness Coordinator, Sinai Chicago

ACKNOWLEDGEMENT

The research included in this report was conducted by Motorola Solutions in partnership with Dr. Chris Brauer, director of innovation at Institute of Management Studies (IMS) at Goldsmiths, University of London in 2020/2021. The core team of economists, psychologists, data scientists and social scientists included Research Director Dr. Jennifer Barth, Dr. Nigel Guenole and Areej Ahsan. They used a mixed method approach to delve into various markets and their adoption of technologies to empower communities, public safety agencies and enterprises in order to collaborate in more powerful ways, creating communities where everyone can thrive.

RESEARCH METHODOLOGY

The research uses a mixed method approach to analyze how safety is changing globally across 10 specific markets (Australia, Germany, Italy, Malaysia, Nordics - Sweden, Denmark and Norway - Singapore, Spain, Taiwan, U.K., U.S.). The study considers emergency services', enterprises' and the public's views of safety and asks whether COVID-19 has changed both what safety means to society and how to respond to threats.

- An initial review of academic, industry and media and data sources expand the core research assumptions and leads, along with interviews with five subject matter experts, to the development of a research model. The model considered each group's knowledge of safety systems, their values, their beliefs about the trade-offs between technology and safety as well as their levels of trust in technology.
- Insights were gathered through a public survey sent out to approximately 12,000 respondents in 10 markets. Respondents were a representative sample of populations: Australia (1000), Germany (1000), Italy (1000), Malaysia (1000), Nordics - Sweden, Denmark and Norway - (1000), Singapore (1000), Spain (1000), Taiwan (1000), U.K.(1000), U.S. (3000). This provided findings around public sentiment.
- To gain insight into emergency services and enterprise safety concerns, interviews were conducted with 21 Motorola Solutions customers across 10 markets and a further 19 internal experts around key concepts, challenges and experiences.

Survey of

12,000

CITIZENS

across 10 markets globally with complex statistical analysis.

RESEARCH ANALYSIS

Analysis is based on a model developed by Dr. Chris Brauer, director of innovation at Institute of Management Studies (IMS) at Goldsmiths, University of London and his team of independent researchers at Smoothmedia Consulting Ltd. The model considered four key drivers of safety: knowledge of safety systems, values, beliefs about the trade-offs between technology, safety and privacy, and levels of trust in technology. Survey responses were analyzed through a cluster analytic approach using a composite variable made up of the mean level of support for technology to improve safety. Clusters were interpreted in each market by characterizing the classes according to the average pattern across members of each class with respect to their understanding or support for the key drivers of safety.

The survey analysis found three groups of people based on their sentiment for technology to transform safety. These groups form the basis of analysis for each market with insights into the key areas where they are strong, the challenges surfaced and the role technology plays as a crucial accelerant to societal change.

They are:

- **Catalysts**: Leaders of change who are committed to pushing cultural boundaries to enable a broader definition of 'safety'. They also want to see the greater use of technology to provide safety.
- **Advocates:** Those who are knowledgeable about the role of technology in society and who are usually accepting of changes - however, they are more likely to follow that change than lead it.
- **Pragmatists:** People who are concerned about privacy and often unaware of the benefits of technology. This group is harder to convince of the benefits of innovation.

Interviews with key stakeholders from enterprise and public safety organizations were analyzed through a system of coding and grouping. The research found that safety is a journey of changing responsibility from a single-stakeholder, reactive and output-oriented vision of safety to a multi-stakeholder, proactive and outcome-oriented relationship between emergency services, enterprise and the public.

REFLECTING THOSE DIFFERENCES ACROSS COUNTRIES CAN HELP PUBLIC SAFETY AND ENTERPRISES TO GAIN HIGHER LEVELS OF PUBLIC SUPPORT AND TRUST FOR THEIR SAFETY STRATEGIES AND TECHNOLOGY DEPLOYMENTS.

ORGANIZATIONS INTERVIEWED

Organizations interviewed

AUSTRALIA

Anthony Carlyon, Executive Director, Ambulance Victoria

Justin Dunlop, Operational Communications Director, Emergency Management, Ambulance Victoria

Mark Rogers, Chief Operating Officer, Ambulance Victoria

Paul Barnes, CIO, New South Wales Fire & Rescue service

GERMANY

Dr. Barbara Held, Former Head of the Strategy Department at the Federal Agency for Public Safety Digital Radio (BDBOS)

Klaus Janke, Managing Director, INIT

MALAYSIA

Mohammad Shazleigh Omar, Head of Section, Telecommunication Systems, Mass Rapid Transit Corporation, Malaysia

NORWAY

Lars Erik Tandsæther, CEO, Emergency health service's operating organization for Nødnett HF (HDO)

Sigurd Heier, CEO, Norwegian Directorate for Civil Protection

SINGAPORE

Leow Wee Lee, Head of Communication, Singapore Mass Rapid Transport

SPAIN

Juan Jesús Muñoz Esteban, Head of Service for Security Systems, City of Madrid

TAIWAN

A public safety organization in Taiwan

UNITED KINGDOM

Superintendent Martin Gallagher, Criminal Justice Services Division, Police Scotland

Nicholas Allen, Technology Improvement Lead, Transport for London

UNITED STATES

Ashish Kakkad, Chief Information Officer, San Diego County Sheriff's Department

Roderick Smith, Fire Chief, Atlanta Fire Rescue Department

Doug Buchan, Emergency Preparedness Coordinator, Sinai Chicago

Gary Bell, Director of Emergency Preparedness, Waukesha County, Wisconsin

Greg Holcomb, Office of Public Safety Support Director/E9-1-1 Coordinator, Lake County, Florida

Shawn Romanoski, Director of Telecommunications, Boston Police Department

Chris Sampson, Associate Superintendent, Perry Township Schools

David Kraus, County Manager, Columbia County, Florida

Lawrence Wilson, Central Communications Director, Columbia County, Florida

Masis Sossikian, Captain, Los Angeles Airport Police

EXPERTS

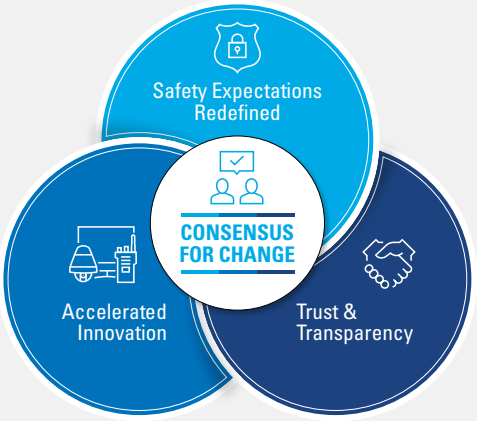
Prof Yu Chen, Associate Professor, Electrical and Computer Engineering, Binghamton University

Prof Sejun Song, Associate Professor, Computing and Engineering

Gary Machado, Executive Director, European Emergency Number Association

Brian Fontes, CEO, NENA

April Heinze, 911 Operations Director, NENA



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