

WHITE PAPER

# THE POWER OF THE NEXT-GENERATION WORK CENTER

State and local governments elevate decision-making through the collection and analysis of diverse data streams.



## EXECUTIVE SUMMARY

As societies undergo dramatic transformation through technology, state and local agencies are discovering the power of data-driven decision-making. Whether their focus is on public safety, emergency management, terrorism, cybersecurity or transportation, agencies must marshal a continually evolving set of resources, deploy them as quickly and effectively as possible, and chart a course for optimal results.

The challenge, of course, is that the richest decision-making resource — data — is dynamic and complex. To address that challenge, agencies are enhancing existing work centers such as emergency operations and fusion centers with next-generation technologies. These next-generation work centers (NGWCs) incorporate intelligent, responsive ecosystems that integrate multiple data streams into a single,

cohesive picture, allowing users to assess a situation in real time and make decisions accordingly.

NGWCs use data-rich endpoints, such as video surveillance cameras and connected sensors; visualization solutions, analytics software and situational awareness platforms that transform data into actionable insights; collaboration solutions that connect decision-makers, regardless of location; and supporting infrastructure, such as network, storage and compute solutions.

In the enterprise, data is a powerful advantage as organizations pursue digital transformation. This is no less true for agencies — perhaps more so, given that public safety and well-being are at stake. Today, the extent to which agencies optimize data may be the single biggest determining factor in how quickly and effectively they can achieve the mission at hand.

## The Next-Generation Work Center

When the [New York City Police Department opened](#) the country's first [Real-Time Crime Center](#) in 2005, it offered rapid, unprecedented access to billions of records, maps and images. Fifteen years later, that combination of breadth and speed remains a salient feature of RTCCs, with one major difference: The scope of data now available to state and local agencies is exponentially larger, spurred by advances in mobility, digital connectivity and the Internet of Things.

Fortunately, agencies' ability to glean insights from data — using visualization, analytics and artificial intelligence (AI) — is also more sophisticated. These capabilities, when assembled under the umbrella of RTCCs and other next-generation work centers (NGWCs), enable agencies to leverage data for better, faster decision-making.

The operative word is "faster." NGWCs facilitate data analysis in real time, the optimal speed for public safety operations. Agencies responsible for law enforcement, emergency management, transportation safety, terrorism response and cybersecurity require timely, accurate and thorough information to make decisions. Without it, they are at a disadvantage against criminals, natural disasters and other threats.

In a hypothetical example in a [2019 report by the National Institute of Standards and Technology](#), researchers explained how the creation of an Emergency Incident Data Hub could improve the speed and coordination of first responders across jurisdictions and disciplines during a major natural disaster, such as an earthquake.

The EIDH would serve as a platform to connect the informational, physical and

personnel resources of all participating agencies. For example, firefighters looking to rescue victims trapped inside a shopping mall could access floor plans and the mall's security camera system via the police department, streaming the information to a situational awareness dashboard and to tablets used by individual responders. In addition to helping responders plot an access route to reach the victims, the information would be stored for analysis later, so authorities could improve their response efforts in the future.

For these and other applications, technology serves as a force multiplier, in the field and in NGWCs.

A [recent study](#) of the Strategic Decision Support Centers in Chicago, published by the RAND Corporation for the Chicago Police Department and the U.S. Department of Justice, found that SDSCs add structure to a decision-making process that previously was ad hoc and reliant on inconsistent information.

"As a result, policing decisions can be made with a much higher level of quality — timelier, more complete and more accurate — than was typically possible before," researchers write.

The goal of NGWCs, of course, is to achieve better outcomes: solve crimes, mitigate natural disasters, identify and apprehend terrorists. The RAND study found that SDSCs did, in fact, reduce crime while enabling officers to respond to crime in [new ways](#).

The [U.S. Department of Justice describes](#) the mission of RTCCs as empowering agencies to "capitalize on a wide and expanding range of technologies for efficient and effective policing." The DOJ also notes that RTCC deployment

**1.1**  
**BILLION**

The number of physical security IoT endpoints projected to be in use worldwide in 2020<sup>1</sup>

should be considered “an evolving process that will change as time passes, as lessons are learned, and as new resources and technologies become available.”

That recommendation is reflected in the nature of the data that agencies incorporate into decision-making. NGWCs integrate data from both traditional sources, such as government databases and criminal records, and emerging sources, such as streetlight sensors and IP-enabled video

cameras equipped with AI-enhanced analytics. NGWCs bring all this data together for timely, holistic analysis, situational awareness and decision-making that leads to better outcomes.

## The Key Elements of the Next-Generation Work Center

Technologies supporting NGWCs include surveillance video cameras and video management systems; data analytics software, situational awareness platforms and visualization solutions; and network, storage and compute infrastructure.

**Visualization solutions:** For NGWCs, data visualization is more than an amenity. It is “one of the fundamental tools of modern data science,” according to the [Harvard Data Science Review](#). Dashboards, graphics and geospatial representations allow viewers to recognize trends or patterns that may not be apparent in spreadsheets or narratives.

In NGWCs, video walls provide a focal point for observation and analysis. These massive visual displays can provide a single image or display multiple inputs simultaneously. In the [Memphis Police Department's RTCC](#), a video wall comprising 36 display units spans 130 feet, easily accommodating camera feeds, computer-aided dispatches and interactive maps.

**Video cameras and sensors:** For NGWCs with a law enforcement focus, surveillance video cameras are a primary asset.

As 5G coverage expands, the number of IP-enabled cameras is poised to jump. [Gartner projects](#) that the largest market for 5G IoT solutions worldwide will be outdoor surveillance cameras, reaching an estimated 2.5 million units in 2020 and 11.2 million units by 2022.

Cameras help agencies deter crime, track and gather evidence, and identify suspects and witnesses. In Florida's Hillsborough County Sheriff's Office, the [Eye on Crime unit](#) keeps tabs on more than 100 cameras that, paired with license plate readers, helped to recover 81 stolen vehicles and arrest 39 suspects in the first six months of 2019.

The surveillance objective will determine the right camera for the task and the right configuration of built-in analytics and other features. Panoramic cameras are often used to gather information on traffic accidents, for instance, whereas detectives collecting investigative evidence may rely on the details provided by pan-tilt-zoom cameras. A [2020 report from the Urban Institute](#), which studied the Milwaukee Police Department's camera deployment, noted that officers generally preferred a combination of panoramic and PTZ cameras.

Connected sensors also are on the rise, driven in large part by smart city initiatives to improve municipal services. Sensors can be a rich source of information for NGWC activities — a development that led [one expert to observe](#) that “in many ways, the smart city movement is providing the infrastructure necessary to increase public safety.” [The San Diego Police Department](#), for example, has augmented about 100 investigations with data from streetlight sensors.

**Video management software:** Video management software, powered by sophisticated algorithms and machine learning capabilities, lets agencies correlate video under a single interface for viewing, recording, management and analysis.



## Better Data, Better Decisions

The plurality of data that informs decision-making has expanded quickly and continues to grow. In the business world, the ability to wield data for superior decision-making is a striking differentiator.

“Armed with the tools to inform our decisions with reams of digital information, we are able to select an optimal outcome among a complete set of simulated scenarios,” [writes the founder of Ascend Venture Capital](#).

Today's market rewards those who recognize business intelligence as a strategic asset and deploy IT resources accordingly. Shareholders and consumers expect businesses to leverage data for their benefit — an expectation that's beginning to shift to the public sector.

Some of the data sources relevant to NGWCs include:

- Cellphone records
- Computer-aided dispatch records
- Criminal information databases
- Emergency communication systems
- Evidence management databases
- Federal, state and local databases
- Geographic information systems
- GPS tracking
- In-vehicle cameras
- In-vehicle toll devices
- License plate readers
- Meteorological data
- Police interview room video
- Police officers' body-worn cameras
- Road, traffic and parking lot sensors
- Surveillance cameras
- Traffic flow trends and accident data
- Transportation cameras
- Utility sensors

Because video analytics applications can analyze visual data in real time — including data from multiple feeds and multiple points in time — they empower NGWCs to pivot as a situation evolves. In concert with other technologies, such as criminal information databases, VMS can arm officers with real-time information that permits a safer, faster response.

AI-enhanced video analytics capabilities, such as automated pattern recognition, support a variety of applications, including license plate readers, detection of suspicious activities and objects, and identification of changes between two images — all tasks that could be crucial to an investigation but are difficult to accomplish manually.

**Data analytics and situational awareness platforms:** The volume of data available to agencies is a major asset, but only to the extent that users can access the information they need, when they need it. Analytics software separates superfluous information from high-value insights that advance a goal. Similarly, situational awareness platforms integrate disparate data sources into a single view in which data becomes visible and actionable.



The approximate percentage of large police departments in the U.S. that deploy automatic license plate recognition systems<sup>2</sup>

The most advanced platforms, powered by AI and deep learning, are often cloud-based, in part because many organizations lack the technical proficiency and resources to layer their own AI tools onto a platform, but also because vendors may prefer to keep AI algorithms proprietary. While still emerging, these tools continually improve as the technology matures and as machine learning capabilities calibrate their performance.

**Collaboration solutions:** The ability to connect decision-makers is an important feature of NGWCs. Solutions include videoconferencing, web-based

teleconferencing and secure texting systems designed for smaller groups.

When an NGWC serves as a crisis response hub, collaboration tools can be lifesaving. For example, after a natural disaster or other event that causes multiple injuries, video collaboration solutions can enable frontline professionals to relay information to emergency department staff at nearby hospitals. With this information, hospital staff can begin triage care even before patients arrive, which can save lives.

**Data center infrastructure:** Networking, storage and compute solutions connect and power the disparate elements of an NGWC into a cohesive system. Unlike the comparatively static environment in which many enterprises operate, NGWCs engage with environments that are dynamic and mobile. The network edge is fluid, just like a city itself. Accordingly, advanced networking provides the flexibility and reliability that allow agencies to match the mobility of their communities.

In [New Orleans](#), the RTCC takes in feeds from more than 400 IP-enabled cameras, supported by more than 500 integrated service routers designed to withstand environmental conditions. The routers support both LTE wide area network cellular and wireless local area network connectivity. The more that NGWCs rely on remote endpoints to collect data, the more they will need high-functioning wireless and fiber-optic networks.

NGWCs that prioritize video require a robust server and storage architecture, sufficient to process and record data-heavy video files. That said, new cameras are more efficient than older models, placing fewer demands on storage and networks. An NGWC could potentially lower its data center requirements by upgrading camera systems.

## Use Cases for the Next-Generation Work Center in State and Local Government

While all NGWCs enhance collaboration and decision-making, their technologies, operation and participation vary according to their primary objectives.

### Real-Time Crime Centers

RTCCs empower officers, detectives and analysts to leverage real-time and historical data for the most timely, effective response to any given situation. This contrasts with traditional



## In Focus

Surveillance cameras yield a wealth of information that may be impossible to capture any other way. Yet the conditions under which agencies must capture video footage can be challenging.

Camera selection, placement and configuration are crucial. The [Urban Institute notes](#) 10 features to consider when choosing surveillance cameras: bandwidth, embedded analytics, frames per second, mobility, power consumption, remote control, resolution, light spectrum, viewshed and zoom capabilities.

Camera types include:

- **Pan-tilt-zoom:** PTZ cameras are programmable, so they can be set to move in response to triggers (e.g., turn and zoom in the direction of a detected gunshot). As the name implies, they have variable motions, albeit with a limited viewshed of 35 degrees.
- **Panoramic:** Panoramic cameras lack the mobility of PTZ units but have a wider viewshed (typically at least 180 degrees). Agencies often pair panoramics with PTZs, using the former for a wide view and the latter for details.
- **Bullet:** As stationary cameras that support zooming, these are often used to obtain a detailed view of an area of interest.
- **Automatic license plate readers:** AI software produces digital images of license plates that can be stored or compared in real time (for example, against a database of stolen vehicles).

policing, in which officers often have limited access to information and routinely experience delays before they are able to gather relevant details.

For example, if a dispatcher receives a report of an armed person walking down a city street, the police department will send patrol cars to the location while RTCC staff start gathering and analyzing data to support officers' on-scene response. Video surveillance, quickly sifted with the aid of analytics software and displayed on a video wall alongside mapping programs and databases, helps officers answer critical questions: What direction is the person traveling? What is the description of the suspect? What can officers learn about prior arrests, gang connections or other affiliations? All of this information, accessed in real time, allows officers to maximize safety and effectiveness.

Common wisdom says that the first hours after an incident are the most important in enabling officers to solve the crime. A key objective of RTCCs is to gather information quickly to take advantage of that valuable window. In some circumstances, with the right technologies at their fingertips, officers may even be able to stop crimes before they occur.

## Transportation Centers

Data analysis in transportation centers supports real-time traffic management and long-term problem-solving. As with RTCCs, video walls and VMS solutions figure prominently in transportation center technologies. Transportation professionals tackle diverse concerns, from the use of smart city solutions

to reduce pedestrian deaths in Las Vegas to automated digital signage alerts and highway access controls that keep drivers safe when fog descends on the Tennessee mountains. In the future, transportation centers will help communities understand and manage autonomous vehicles.

Data-driven decision-making is essential to transportation in part because the way that people move from point A to point B has become more complicated. On-demand ride-sharing apps are an obvious development, but today's travelers also use more transportation options — even for a single trip. Planners can optimize the complexities of multimodal travel via integrated analysis of data from traffic sensors, weather systems, social media, databases and other sources. The more data they have at their disposal and the more easily they can adapt transportation services to current conditions, the more effectively planners can make decisions that increase public safety and quality of life.

In Santa Clara County in California, about 500 video surveillance cameras collect traffic counts that feed into a [Traffic Management Center](#) for real-time analysis and automated adjustment. The system increases safety as well as efficiency: When a smart sensor detects a pedestrian in a crosswalk, for example, it automatically extends the signal to provide more time for the person to navigate the intersection safely.

## Emergency Operations Centers

In a natural disaster, public safety depends on fast, accurate data in emergency operations centers. EOCs, staffed by local, state and federal agencies, balance agility and thoroughness to ensure their decisions are the right ones. To achieve that goal, analyses integrate data from meteorological models, connected sensors, road closure and power outage reports, geolocation data from smartphones, and social media, among many other sources. Like RTCCs, EOCs emphasize real-time analysis, including that provided by video surveillance systems.

In New York, the Division of Homeland Security and Emergency Services partnered with the State University of New York's Albany Visualization and Informatics Lab to elevate the state's [2019 Hazard Mitigation Plan](#). Data, connectivity and visualization emerged as key features. The new plan "transitions from a static planning document updated once every five years to a data-rich suite of web-based planning tools that is continuously updated through local hazard mitigation planning, state agency programs and projects, and a variety of data resources," planners write.

Approaches like these can dramatically improve the decision-making that allows EOCs to guide communities safely through a crisis.

## Fusion Centers

Fusion centers emerged after the Sept. 11 terrorist attacks to better coordinate responses to threats spanning multiple jurisdictions. Most fusion centers are statewide or located in major urban areas. Because of the nature of the crimes they target — including terrorism, drug trafficking and street gangs — participants may include state and local agencies, federal agencies such as the FBI and U.S. Secret Service, tribal governments and private-sector partners.



## Surveillance and Privacy Issues

As the number of surveillance cameras and the use of recognition analytics increase worldwide, so do concerns about privacy. Agencies can be proactive by implementing privacy policies, being transparent about camera use and engaging community members.

The American Civil Liberties Union, for example, has raised privacy concerns about real-time crime centers. Some of those concerns relate specifically to capabilities that make RTCCs so effective for law enforcement: automatic license plate readers, pan-tilt-zoom cameras and the ability to use multiple cameras to track the movements of people who are not criminal suspects.

In some states, RTCCs have been the subject of lawsuits. One factor driving these responses is the perception of a marked jump in surveillance. By 2021, according to [IHS Markit projections](#), the U.S. will have 85 million cameras in place, most in retail and commercial facilities.

Government and law enforcement leaders can take steps to increase the likelihood that citizens will view surveillance cameras generally, and RTCC analyses specifically, as a public safety asset rather than a threat. The Urban Institute recommends that agencies develop privacy-related practices and policies and solicit input from communities likely to be affected by surveillance programs (through public meetings, focus groups or surveys).

A primary function of fusion centers is to assess "suspicious activity reports," particularly those related to crime and terrorism. As a consequence, the ability to analyze and act upon data from a wide variety of sources is imperative, and one reason that fusion centers rely heavily on data visualization. Analytics software helps practitioners assemble large volumes of information (spanning critical infrastructure, satellite imagery and crime databases, among other areas), thereby eliminating some of the silos that hampered these efforts in the past.

### Cyber Intelligence Centers

Data is an essential defense against network intruders and an increasingly necessary one as attacks against state and local governments persist. Such attacks could be both disruptive to day-to-day operations and potentially deadly should they affect public safety or transportation services.

Advanced security solutions, such as threat intelligence platforms and security information and event management software, can deliver extensive data to IT and security teams,

but NGWCs provide a central hub to view, analyze and act upon that information. These centers also expand the number of inputs that agencies can incorporate into decision-making, such as official databases, digital forensics and social media. For smaller governments without a deep cybersecurity bench, regional NGWCs provide access to expertise and the rapid response that cybersecurity incidents require.

### Joint Task Force Centers

Joint task force centers are often used by the military to assemble agencies and specialists in response to a specific need. The Joint Task Force-National Capital Region, for example, leads security for major national events, such as the annual State of the Union address, which requires interagency coordination to ensure the safety of the public and the concentrated presence of government officials. As with fusion centers, joint task force centers allow a more coordinated response, making data analytics software, visualization solutions and collaboration technologies essential.

### CDW: We Get State and Local Government

CDW's solution architects have worked with state and local governments across the country to plan, deploy and manage solutions that achieve critical objectives in public safety, emergency management, transportation, cybersecurity and administration. We specialize in the design and deployment of integrated solutions that work together efficiently and effectively to support desired outcomes and to position agencies for success.

CDW's experts can help with the following components of NGWC deployment:

- **Hardware:** Displays, video walls, video cameras and devices
- **Software:** Database, analytics, work management and video management platforms
- **Data center:** On-premises and offsite networking, storage and compute infrastructure to connect and support center operations
- **Collaboration:** Cloud, hardware and software for videoconferencing; enterprise collaboration, messaging and email; and voice
- **Security:** Orchestrated security solutions to protect critical data assets

### CDW Can Design, Orchestrate and Manage a Comprehensive Infrastructure Strategy

CDW's simple, smart, scalable and flexible services portfolio provides a fully automated and managed infrastructure across your entire network, whether on-premises, hybrid or in the cloud.



#### DESIGN for the Future

Consult with our team of technology experts to plan a solution that fits your unique needs and optimizes operational impact.



#### ORCHESTRATE Progress

CDW Amplified™ Infrastructure services help you build and deploy your custom infrastructure utilizing best practices.



#### MANAGE Operations

Our world-class, certified staff monitors and manages your infrastructure 24/7/365 to ensure operational efficiency and security.

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