

21ST CENTURY

Fire and Emergency Services



ICMA

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Acknowledgments

Thank you to the entire group Subject Matter Expert and the CPSE and ICMA staff that brought their experience, insight, and dedication to the development of this white paper.

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Introduction

The changing role of local government and its impact on the 21st Century Fire and Emergency Services

As the role of the federal government shifts away from responding to everyday needs, local governments have also begun addressing such issues as climate change, affordable housing, homelessness, immigration, the opioid epidemic, and behavioral health. This reality has led local fire and emergency services to become the health and safety net for communities. The DNA of fire departments is to respond to EVERYTHING and help EVERYTIME. While fires may be diminishing due to better engineering, codes, and enforcement along with an increased focus on community risk reduction activities, calls for service are up for every department. These calls are for help, and the calls received today are much boarder in scope. The services required often fall outside the traditional scope of fire and emergency services. Yet these departments are uniquely positioned to respond to such calls. This paper outlines several critical issues that are impacting local governments today and others that will have an effect over the course of the next three decades. Additionally, it outlines initiatives that local government and the local response agency will need to consider to remain viable in the future. The objective is to remain relevant for our jurisdictions, have the greatest impact in a rapidly changing environment, be sustainable, and address the needs of the whole community — its residents, businesses, governing body, and the personnel who will be tasked with carrying out the mission.

The speed of change

Regardless of how long you have been a part of a community – whether serving in local government, living there, or owning a business there – if you reflect on the changes you have witnessed, you will agree that the speed of life has transformed dramatically. A reflective look shows just how much the fire and emergency services have evolved in just the last two decades. From the equipment in use, new applications in technology, changes in the workforce, use of social media, the speed of information, and the shift and



“The whole 20th century, because we’ve been speeding up to this point, is equivalent to 20 years of progress at today’s rate of progress, and we’ll make another 20 years of progress at today’s rate of progress equal to the whole 20th century in the next 14 years, and then we’ll do it again in seven years. And because of the explosive power of exponential growth, the 21st century will be equivalent to 20,000 years of progress at today’s rate of progress, which is a thousand times greater than the 20th century, which was no slouch to change.”

Ray Kurzweil, American Author, Inventor, and Futurist

increase in the calls responded to -- all have made for a dramatic difference as we transformed into the 21st century fire and emergency services.

The political dynamic at all levels of government in the past, while still challenging, was less polarized and much more collegial than exists today. This shift has resulted in organizations needing to position their efforts at times as much to address political dynamics as to do what is best for the community.

In the 21st century fire and emergency services are destined to experience much more change than the last several generations. Along with this rapid change, there are several critical global issues that will have long-term impact not only on the fire and emergency services but on local government as well. Thus, the purpose of this white paper is to not only spur dialog around these critical issues, but also to motivate local government to prepare and position their organizations for these anticipated changes. If organizations hope to maintain their effectiveness and remain sustainable in the future, they must act today to address these issues and develop the organizational bandwidth needed to resolve them.

Co-Chairs Statement

It has been our honor to co-chair the 21st Century Fire and Emergency Services White Paper on behalf of the International City/County Managers Association and the Center for Public Safety Excellence. With more than 70 years of experience in local government between us, we bring a depth of perspective in the role and the importance of local government to every resident, visitor, and those passing through a local community. In the course of our careers, we have experienced a significant amount of change and realize the importance of this white paper to the future of the fire and emergency services.

This white paper is a culmination of several years of discussion between our two organizations and more than two years of work that included seven focus groups at national and regional conferences and two online surveys. Combined these efforts provided more than 1,200 responses from labor, fire department leadership, and city/county managers. That information was coalesced by a group of subject matter experts (SME)

comprised of city managers, fire chiefs, and associated industry professionals to provide the structure for this white paper.

It is our hope that this white paper stirs debate, creates dialogue, and promotes the critical conversations needed about the changes facing our next generation of leaders -- not only in the fire and emergency services but also in the entirety of local government. While local government leaders have always faced change, it has never been greater, more rapid, or occurring within an more unforgiving political environment.

This white paper outlines eight emerging issues that will have either positive or negative impacts on local government and the fire and emergency services, depending on how they are handled now and in the future. Two critical themes have emerged that must be addressed today to provide a healthy and sustainable environment for the future.

- First, the past strategies of deferring conclusive action on critical issues with short-term solutions and leaving them for the next set of leadership is not a sustainable strategy for the future. To continue to do so will worsen the eventual correction(s) that will have to be made.
- Second, we must begin recruiting talent with the mindset, skill sets, and resolve to help build a core organizational culture that can adapt and respond to rapid changes and that are not vested in a 20th century fire service paradigm or antiquated local government bureaucracy.

While there are challenges, the next 30 years hold great potential to refine and improve how services are provided at the local level. It is our hope that this white paper will help achieve that result.

Representing the Center for Public Safety Excellence

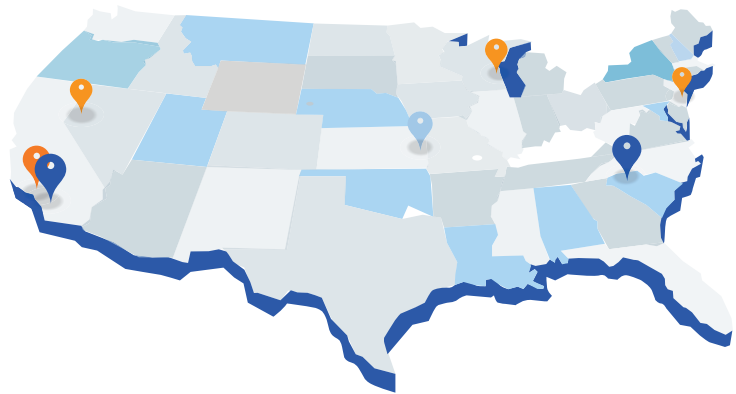
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White Paper Development Process

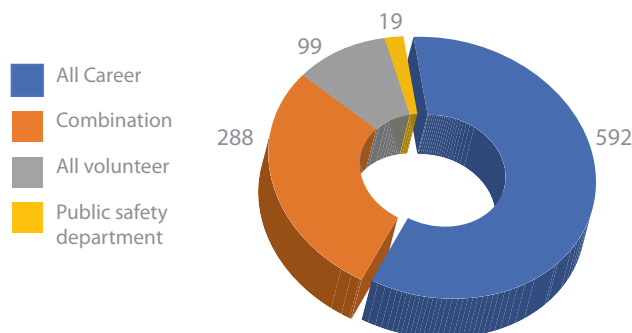
The SME group did not work in a vacuum in developing the white paper. From the onset, the importance of engaging numerous and diverse voices was repeatedly expressed. Seven in-person feedback sessions were held between January and May 2019. Coupled with the two web surveys, this generated feedback from more 1,200 fire and emergency services professionals and local government management professionals.



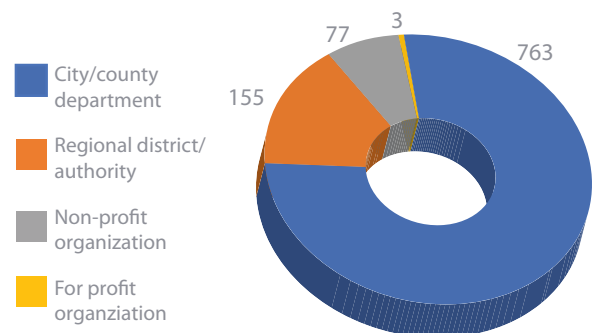
- January 2019 – International Association of Fire Fighters Affiliates Leadership Training Symposium, Los Angeles, CA
- February 2019 – ICMA Southeast Regional Conference, Greenville, SC
- March 2019 – CPSE Excellence Conference, Garden Grove, CA
- March 2019 – ICMA West Coast Regional Conference, Reno, NV
- March 2019 – ICMA Mountain Plains Regional Conference, Omaha, NE
- April 2019 - ICMA Northeast Regional Conference, New Brunswick, NJ
- May 2019 – ICMA Midwest Regional Conference, Evanston, IL

In the web surveys administered by both CPSE and ICMA, identical patterns for fire and emergency services organization and staffing models emerged.

Staffing model | all respondents



Organization model | all respondents



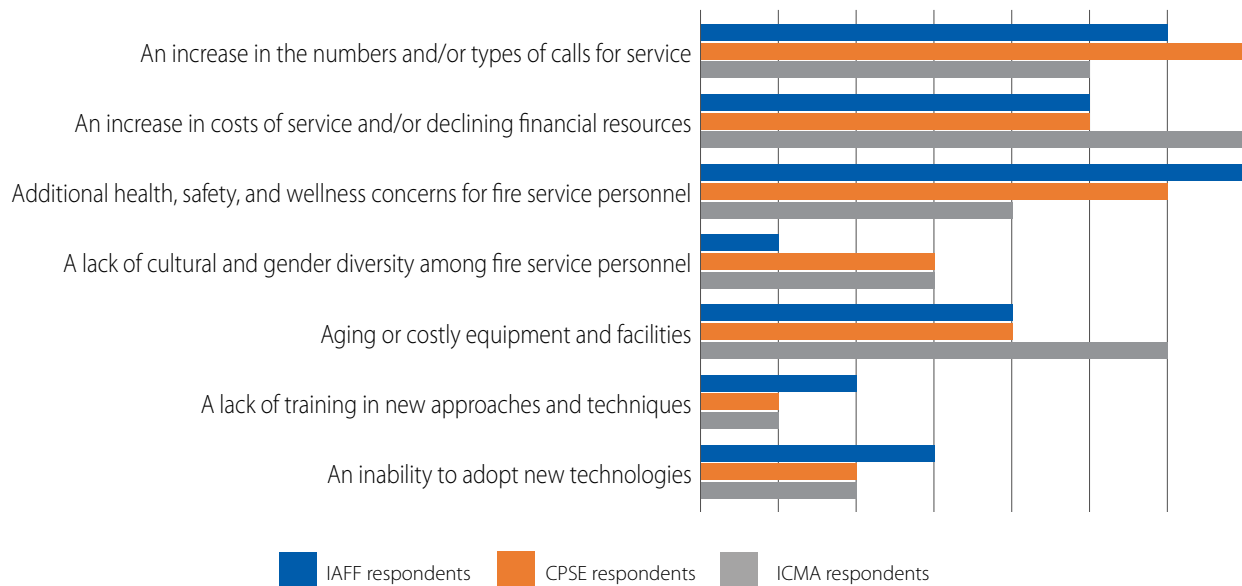
Expected future challenges for the fire and emergency services

Attendees at the IAFF feedback session were asked the same question as CPSE and ICMA survey respondents: Thinking about the fire and emergency services in your community, what are some of the major challenges that you expect your department to face in the future? While the exact order of the provided challenges differed among the groups, three expected future challenges rose to the top for ICMA groups – an increase in the number and/or type of calls for service, an increase in costs of service and/or declining financial resources, additional health, safety, and wellness concerns for fire

and emergency services personnel.

The SME group saw an interesting connection between the highest rated future challenge of all three groups. CPSE respondents noted increased demand for services as the top future challenge, while ICMA respondents were most concerned with how to continue to supply fire and emergency services in an era of increased costs and declining financial resources. The IAFF respondents indicated that health, safety, and wellness of fire and emergency services personnel would be most impacted in the future.

Comparison of expected future challenges



How can the fire and emerge IAFF services innovate and be sustainable?

The three most important ways to facilitate a culture of innovation in the fire and emergency services were the same for both CPSE and ICMA respondents. During the IAFF feedback session, attendees were asked what changes in skills would be necessary for the fire and emergency services in the future. An overall increase in training emerged as a major theme during the in-person feedback session. Specific examples of training

varied from enhanced medical training focused on new drugs and techniques, to increased decontamination training, and training with and on new technologies (e.g. virtual reality-based scenarios, unmanned aerial vehicles, and electric/hybrid vehicles). A frequent response for necessary future skills were leadership skills -- ranging from public speaking, program development, strategic thinking, and research.

Three most important ways to facilitate a culture of innovation in the fire and emergency services

Encouraging greater use of data to assess and use of analytics to solve complex community problems

Ensuring that the services are up to date on the latest professional education, training, and credentialing

Creating a spirit of partnership between the fire and emergency services and local government management

Given the unique perspectives of IAFF, CPSE, and ICMA respondents, the SME group was not surprised to learn that, when asked to select the three most important changes the fire and emergency services must implement to remain viable in the future, responses

from the three groups began to diverge. While the environments they work in are identical, the changes impacting them are similar, and they agree on the ability of the fire and emergency services to innovate, their specific solutions were very different.

Most important changes to be implemented

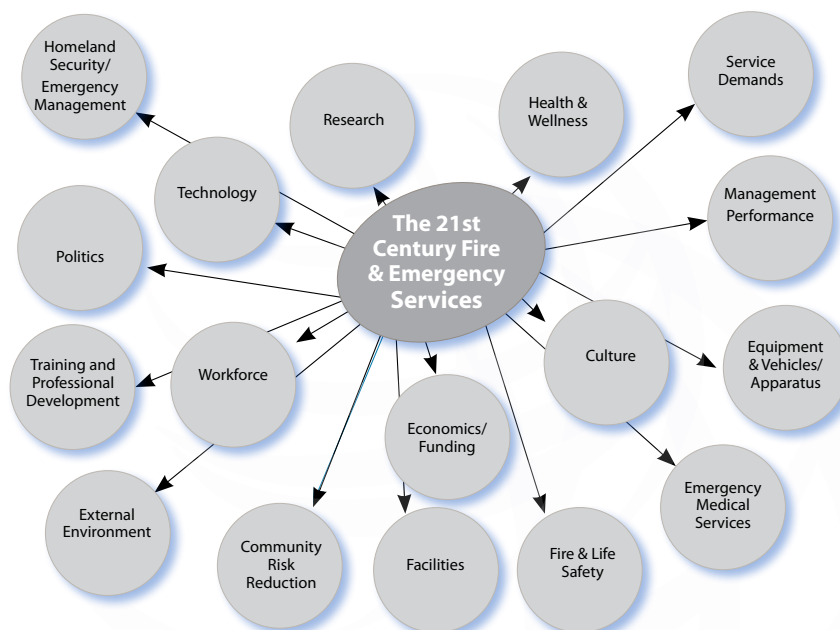
	IAFF	CPSE	ICMA
1	Increasing awareness and resources dedicated to personnel health and wellness	Identifying and implementing community risk reduction efforts	Researching and implementing alternative service delivery options
2	Increasing professional development opportunities for personnel	Increasing usage of data and data analytics	Identifying new partnership opportunities with neighboring jurisdictions and private and/or nonprofit organizations
3	Researching and implementing time and life-saving technologies	Fostering a culture of innovation in the department and among personnel	Fostering a culture of innovation in the department and among personnel

Forces impacting the 21st Century Fire and Emergency Services

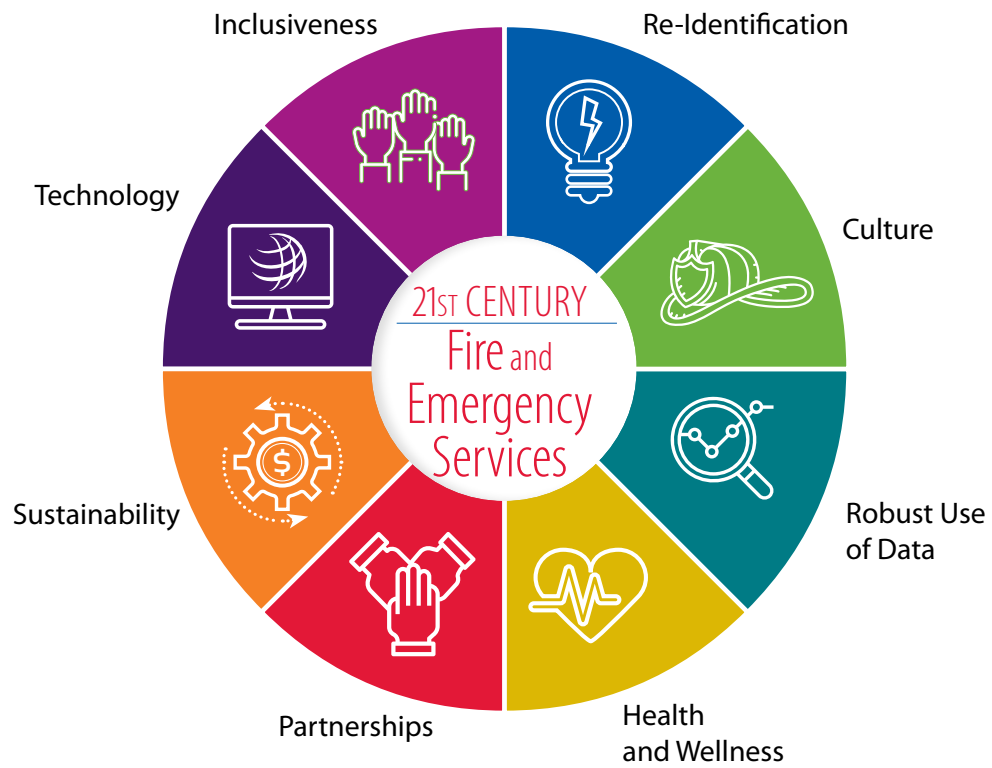
When we began the process of creating a vision for the fire and emergency services in 2050, the SME group began to brainstorm the specific factors having significant impacts today and how they could change the profession's appearance in 30 years. Over the last decade, local governments have witnessed an emerging set of issues including changing political dynamics within the community we serve, new expectations from the electorate, a demand for greater transparency, and a continual shifting of services from the federal and state level to local government. These dynamics have realigned the services we provide. The following graphic illustrates the initial brainstorm of factors that are impacting the 21st century fire and emergency services today and will continue to do so into the foreseeable future. While each will individually impact the fire and emergency services of the future, collectively these create the most change this profession has ever seen.

As the SME group investigated each area of influence, eight overarching themes emerged. These are areas of such importance that each individually, or collectively, will create significant stresses and shocks within the existing fire and emergency services. The SMEs reviewed the survey and in-person sessions feedback and determined that the feedback could be categorized into eight critical issues for the fire and emergency services in the next 30 years. These critical issues demand attention if the fire and emergency services is to thrive in the future:

1. Re-identification of the fire and emergency services
2. Culture of the profession
3. The robust use of data
4. Health and wellness threats
5. Opportunities for partnerships
6. Sustainability challenges
7. Technology advancements and adoption
8. Inclusiveness of the fire and emergency services



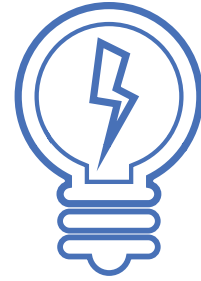
Initial brainstorm of factors



**Forces impacting the 21st Century Fire and
Emergency Services**

CRITICAL ISSUE A:

RE-IDENTIFICATION



Re-identification is the action of establishing a new identity for the fire and emergency services. Today, most agencies that respond to medical emergencies, fires, rescues, and many other types of calls still carry the legacy name “fire department.” The fact is that for most agencies, fire response is less than 5 percent of the call types to which they respond. As the fire and emergency services begin to expand their services into mobile integrated health care, and many other related service deliveries, the legacy name fire department may no longer be relevant. While reidentification is not uncommon in the corporate world, this will be an emotional issue for this profession. Even so, creating a new identity is essential for the service to remain relevant and sustainable.

Initiative 1: Celebrate the heritage of the fire and emergency services while recognizing that services provided have evolved and will continue to experience significant changes over the next 30 years.

Strategies:

1. Explore changes to agency names to better reflect the services provided.
2. Engage storytellers and fire and emergency services experts who can provide a modern perspective of the adaptability of the fire and emergency services.
3. Recognize that the fire and emergency services are well positioned to be the hub of service delivery outside the typical emergency response system.
4. Establish focus on the community as the organizational priority.
5. Implement risk reduction, medical and injury prevention, and related social service support efforts for their community.
6. Provide for better service to the customer, through the deployment of personnel with the appropriate skills needed for the service(s) to be provided. For example, use advanced medical providers, social workers, mental health professionals, and other support service providers as a component of an agency's resource deployment.

Actions

- Exalt and reward internal and external activities that support risk reduction and medical and injury prevention efforts.

Case Study: Mesa Fire & Medical Department (MFMD)

Location: Mesa, AZ

Coverage Area: 511,000 residents over 138 square miles

No. of Employees: 561

Annual Calls for Service: 68,000



With more than 75 percent of calls for service being medical in nature, in 2012 the department re-identified itself by changing its name to Mesa Fire & Medical Department. Building from this name change, MFMD began reidentifying itself in additional ways. These include deploying smaller medical response units, partnering with crisis counselors to staff a behavioral health unit, and coordinating regular immunization clinics that provide free vaccinations to the insured. MFMD has developed a community outreach division focused on reducing non-emergency 911 calls by providing education and social services. This division conducts such varied functions as training children on CPR, safe driving, and installing grab bars in homes.

CRITICAL ISSUE B:

CULTURE

Culture is often defined as the learned behavior patterns of people – including what they think, say, do, value, and feel. Professional culture is the pervasive values, beliefs, and attitudes that characterize a profession and influence how it operates. The culture of the fire and emergency services is built upon a strong legacy and is steeped in tradition. These traditions are deeply engrained in the way services are provided, the image of the fire and emergency services, beliefs about how it should look, and in many cases, who should be included. The culture often drives decisions that are counter intuitive to what is best for the long-term health of the organization or the provision of better services to the customer. At its worst, the focus on tradition results in resistance to change, adaptation, and/or innovation. This creates a tremendous risk for the emergency services over the next 30 years, as we are entering a period of time which will undoubtedly be an era of rapid change. Successful organizations will be able to adapt quickly, try new things, be willing to fail, and be accountable for the outcomes the organization needs to achieve.

In the private sector or local government, agility will be the new capital for organizations as we move into the next three decades. As W. Edwards Deming once stated, “It is not necessary to change. Survival is not mandatory.” This is a great reminder that all organizations are vulnerable if they fail to adapt to their changing environment. As we look to the future, the rate of change will be faster than ever, and culture will play a significant part in an organization’s ability to sustain through such a period of rapid change.



Initiative 1: Enhance alignment between community, elected officials, management, labor/volunteer representatives, and overall workforce.

Strategies:

1. Create a process that allows for goal setting, strategic planning, and periodic feedback by all stakeholders of the community and the members of the organization.
2. Encourage regular communication between all stakeholders on strategic issues, while continuing to address operational issues through the established chain of command.
3. Embrace the differences in generational understanding and approach to issues to be successful in addressing the opportunities and challenges that will face organizations in the future.
4. Foster alignment between the community, elected officials, management, labor/volunteer representatives, and the overall workforce to create a culture of inclusion, adaptability, and innovation.
5. Establish a mechanism within the agency to monitor and promote cultural awareness and sensitivity reflective of the culture of the community served.

Initiative 2: Promote an organizational environment that is adaptable, open to change, innovative, and focused on continuous improvement.

Strategies:

1. Select and promote leaders and managers in the organization who model the desired organizational behavior of self-assessment and continuous improvement.
2. Encourage members of the organization to be engaged in outside organizations, both professional and community based.
3. Adopt a philosophy that promotes seeking out the best industry practices of other professional organizations and establish a process by which the organization can evaluate those practices and implement those that are relevant in their own organization to improve performance.
4. Develop an organizational culture that embraces continuous improvement for the organization and its employees.
5. Recruit and hire employees who demonstrate the necessary knowledge, skill sets, and abilities to develop an effective and innovative organizational environment.

Initiative 3: Establish organizational expectations for employee education, credentialing, and continued professional development.

Strategies:

1. Encourage and provide incentives for personal growth through a comprehensive organizational professional development plan that includes training and education, that is incorporated into the requirements for promotion to leadership positions, and that results in the increased professionalism of the fire and emergency services.
2. Develop a professional mentoring process to assist individuals in creating and achieving their professional development plan.
3. Develop a reverse mentoring program where new employees engage with senior leadership to familiarize them with the latest technologies and thought processes of the emerging workforce and community.
4. Establish a process to continually assess the skills, knowledge, and abilities needed by the organizational workforce to meet the changing community demands for service, to meet the external challenges placing pressures on the organization, and to help address the changes and innovation that are occurring or will need to occur in the agency.

Case Study: Charleston Fire Department (CFD)

Location: Charleston, SC

Coverage Area: 150,000 residents over 104 square miles

No. of Employees: 401

Annual Calls for Service: 24,000

Serving one of the most historic cities in the United States, CFD is steeped in a rich history and tradition. An unfortunate part of its history is the 2007 Sofa Super Store fire that resulted in the line of duty deaths (LODD) of nine CFD firefighters. Since then CFD strategies have taken two distinct paths: those that advance the modern fire department and those that reinforce what it means to be a CFD firefighter. A recent recruit class was tasked with researching every LODD in the department's history, CFD has become a leader in incident command, fire tactics, and regional partnerships through strong strategic planning and a focus on constant improvement. Such traditions as company pride and badge pinning ceremonies remain integral to CFD's culture.



CRITICAL ISSUE C:

ROBUST USE OF DATA

Data are individual units of information. In analytical processes, data are represented by variables. Although the terms data, information, and knowledge are often used interchangeably, each has a distinct meaning. While there have been significant improvements in data use during the last 20 years, the fire and emergency services have just scratched the surface of the full potential of using data effectively to manage daily operations and make decisions based on an agency's desired outcomes. Available data is often limited due to the poor documentation of an incident by the officer responsible for filling out the report. The exception to that is medical response, which requires substantially greater documentation due to medical and legal oversight. Therefore, establishing systems to ensure collection and management of quality data is critical if it is to be used effectively. Over the next 30 years, the amount of data available to the profession will transform the way the service operates, not only in emergencies, but in all the services provided. Smart cities, smart buildings, medical biometrics, artificial intelligence, predictive analytics, and real-time streaming insights into data are all on the horizon along with many others not yet imagined. Just think of where data use was 30 years ago and where it is today. We can only imagine what it will be like in 30 years. However, if the fire and emergency services hope to harness the true power of data, there has to be a transformation of mindset and culture to leverage data for effective decision making.



Initiative 1: Utilize quality data for evidence-based decision making to assess and produce the best outcomes.

Strategies:

1. Educate and develop accountability for company officers, field inspectors, educators, and others deployed to capture the appropriate data at the incident to provide information that can be analyzed to achieve the organization's desired outcomes.
2. Champion a federal requirement that all fire and emergency services agencies regardless of size and structure be required to complete a National Fire Incident Reporting Systems (NFIRS) report for each call and submit to the state or federal government.
3. Champion a substantial update to NFIRS to become a more relevant and technologically robust system or replace it with another system capable of integrating with new innovative data systems to provide advance analytics, and support evidence-based decision making, built upon the receipt of quality data for local agencies.
4. Leverage technology(s) to assure real-time data capture and analytics that provide insights for use by fire departments at the local level.
5. Assure a process is in place to track physical and traumatic event exposure(s) for all response personnel.

Initiative 2: Implement advanced data analytics to make informed decisions.

Strategies:

1. Employ advanced analytics to assist in making predictive and prescriptive decisions that are focused on the outcomes the agency is trying to achieve.
2. Cultivate a data-driven culture that utilizes data insights to modify strategies, deployment models, and programs.
3. Ensure departmental personnel are aware of public disclosure laws, rules, and best practices in providing data to other organizations, the media, and the general public.
4. Establish best practices for data cleansing and for tracking data access to safeguard its integrity.
5. Establish clear roles and responsibilities among city data managers, private-sector data collection entities, and records management software (RMS) companies.
6. Establish a clear definition of the data ownership the agency produces.

Initiative 3: Develop comprehensive records management systems (RMS) to collect and analyze data effectively.

Strategies:

1. Urge RMS vendors to design systems that bring together all data needs in the agency into an integrated platform, that can provide analytical evaluation for the data collected toward the outcomes trying to be achieved by the agency.
2. Establish data warehousing best practices for collecting data from multiple data sources, including RMS, for complete and faster data analysis.
3. Require department IT managers to use best practices and transmission law(s) relevant to cybersecurity, data collection, and storage.

Initiative 4: Focus on developing outcome-based data for all measurable operations and functions within the organization.

Strategies:

1. Develop an outcome-based performance measurement system consisting of four elements:
 - The goals of the agency to support the health and welfare of the community.
 - The performance metrics relevant to the goals the agency is trying to achieve
 - The benchmark level of performance the agency is striving to achieve.
 - The consequences for the agency and the community being served if the goals are not met.
2. Use aggregated data to inform and improve system performance.
3. Champion legislative changes to allow for sharing of patient data between hospitals and responding agencies and encourage interagency cooperation to promote the evaluation of patient outcomes based upon the entirety of the response to that patient.

Case Study:
Edmonton Fire Rescue Service (EFRS)

Location: Edmonton, AB

Coverage Area: 972,000 residents over 303 square miles

No. of Employees: 1,300

Annual Calls for Service: 55,000



Combining incident data with non-fire databases (such as census and other demographic information) EFRS has harnessed insights to guide planning, development, and community risk reduction. EFRS conducted longitudinal analysis of river rescue operations before and after the closure of a station located along the North Saskatchewan River. Highlighting the negative impact on the outcomes of the rescues following the closure compelled the City Council to reopen the previously closed station. Cross referencing of response data with fire investigator's data has determined the locations for EFRS' smoke alarm program. EFRS robust use of data has aided other governmental entities namely the geocoding of overdose events and naloxone administration by firefighters for the provincial government showing the impact of recently opened supervised consumption services.

CRITICAL ISSUE D:

HEALTH AND WELLNESS

The increase in emergency responder health concerns including post-traumatic stress (PTSD/PTSI), and other health related problems is a critical issue for the profession. Daily exposures in the fire and emergency services include sleep disruption and deprivation, the continual witnessing of tragic events, and exposures to toxic environments. These exposures are all contributing factors to the increased cancer rates in firefighters and their predisposition to many health-related issues and psychiatric disorders, including suicide. To understand the interrelationship of all these factors and their impact on response personnel will require research specifically directed at fire and emergency personnel, necessitated by the fact that similar research conducted in other professions will likely be discounted and not be accepted by the 21st century fire and emergency services. While use of battle-worn gear has been a source of pride for many in the service and is embedded in the tradition and culture of the profession, it has contributed to extended exposure to toxins and many of the health-related issues experienced by fire and emergency services personnel. As such, decontamination plays a vital role in protecting fire and emergency services personnel and their long-term health. The focus for decontamination goes beyond the emergency scene and includes all the transport mechanisms (e.g., personal protective equipment (PPE), hand tools, hose, and apparatus) and facilities where exposure is intensified because of extended time frames and other exposure pathways (e.g., respiratory, dermal, and digestive). Further, there is a real concern that personnel are bringing contaminants outside of fire stations and exposing friends and family members. A prime example is the volunteer firefighter who, because of limited agency resources, takes gear home to be cleaned, cross contaminating their personal vehicles and home washing machines.



Initiative 1: Champion research on the health impacts specific to the fire and emergency services to evaluate the health risk of consecutive hours worked, sleep disruption, and the impacts on employee health.

Strategies:

1. Conduct research on the impacts of current work cycles on the health of the workforce and the impacts of sleep deprivation and sleep hygiene on the long-term health of the individual and their cognitive abilities while on duty.
2. Utilize the results of that research to make any needed operating policy changes, incorporate research results into appropriate standards, and pursue potential legislative changes to protect the health of the workforce.

Initiative 2: Proactively address the increased mental health challenge(s) facing the fire and emergency services.

Strategies:

1. Engage outside professional assistance to allow employees a confidential process to seek assistance for themselves or family members who may be struggling with mental health concerns.
2. Embrace an organizational atmosphere that removes the stigma and barriers for those seeking mental health assistance while safeguarding employee confidentiality.
3. Develop organizational processes that protect the confidentiality of what an employee is being treated for, while alerting the agency to any recommended restrictions to the employee's essential job functions and assignments.
4. Develop a comprehensive plan to address the need for employee assistance in those situations that warrant immediate intervention.
5. Develop on-going mental health assessments for emergency responders to promote early recognition of developing mental health issues aligned with a mental health assistance process if issues are detected.
6. Develop pre-employment hiring processes that provide for professional mental health pre-screening of candidates to avoid exposure for those that are highly susceptible to post-traumatic stress.

Initiative 3: Adopt and support fitness and wellness best practices throughout the whole organization and incorporate this philosophy in every aspect of operations.

Strategies:

1. Institutionalize employee wellness and fitness into the culture, practices, operational procedures, and training practices of the organization.
2. Provide structured support to maintain a healthy workforce.
3. Evaluate the level of fitness of each employee, and for those found to be unfit, assist employees in attaining a proper fitness level. If unsuccessful, address the issue with the employee.

Initiative 4: Ensure ongoing physical fitness and wellness requirements are standardized, adopted, and used within every department.

Strategies:

1. Adopt physical performance and annual fitness testing requirements for fire and emergency services employees to ensure the responder can safely do the job without injury or risk to their health.
2. Once these policies are developed, engage the workforce to adopt and implement strategies that will be employed by the agency.

Initiative 5: Continue research toward the development of comprehensive decontamination procedures for the fire and emergency services.

Strategies:

1. Address the traditional culture of the profession that promotes the wearing of soiled gear and transform it to one that sees it as contamination.
2. Conduct continued research to develop a comprehensive approach to reducing exposures, the best method(s) for decontamination, and periodic testing to help ensure a safer environment for the workforce.
3. Use research to develop best practices, comprehensive standards, and potentially, new legislation to protect the workforce.

Initiative 6: Urge personal protective equipment (PPE) manufacturers to develop new PPE and bio-metric sensors to ensure effectiveness, reduce equipment weight, and provide for the enhanced ability to monitor the physiologic health and stress markers for personnel during response to an incident.

Strategies:

1. Urge the PPE manufactures to develop a more effective ensemble that offers the protection needed and reduces the weight.
2. Champion the research and development of technologies to monitor the physiological health indicators of personnel during incident response and to determine when those indicators indicate personnel are at risk.
3. Urge PPE manufactures to design a more comprehensive ensemble for wildland firefighting that provides for better protection of personnel.
4. Provide recognition awards to manufacturers and vendors that make meaningful improvements to PPE.
5. Challenge the existing practice of allowing the PPE manufacturing industry to vote on standards that affect their business while recognizing their input is critical to the design of the PPE.

Case Study: Broward Sheriff Fire Rescue and Emergency Services Department (Broward)

Location: Fort Lauderdale, FL

Coverage Area: 1.95 million residents over 1,323 square miles

No. of Employees: 775

Annual Calls for Service: 50,000

Broward formalized its health and wellness initiatives under a division chief of health and safety. A departmental joint occupational safety and health committee meets bi-monthly to discuss safety issues and concerns. Broward conducts mandatory biannual Life Scan physicals for all personnel. Numerous exposure reduction steps, such as use of particulate filtration/blocking structural firefighting protective hoods and synthetic radio straps, issuance of post exposure reduction decontamination kits, and deployment of "healthy cab" initiatives, have been implemented by Broward. All front-line personnel have been issued ballistic protection. Working with the local University of Miami Sylvester Cancer Center, Broward has participated in a research project for the education and reduction of cancer exposures.

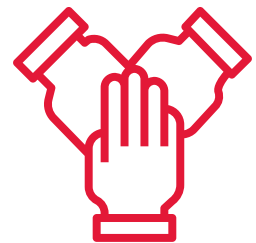


CRITICAL ISSUE E:

PARTNERSHIPS



A partnership is often thought to be a form of business, where two or more people come together to share ownership, responsibility, and profits from a given business venture. In every community across our nation, a partnership exists between the fire and emergency services and the general public that is built upon a shared commitment to the health and safety of its residents. The fire and emergency services are in an enviable position in communities, as they are well positioned to be the hub of service provision for many supporting services already found within their community, and that align with organization's core mission. The importance of this has been clearly proven during homeland security threats, through the interagency cooperation, intelligence sharing, and joint response to those events by law enforcement and the fire and emergency services. There are significant opportunities to create partnerships with allied health care, mental and behavioral health providers, and various social service agencies to leverage the talents of each agency with a focus on improving service to the community. Too often agencies respond multiple times to the same individual who calls 911 as their only known access for assistance, when the need is truly not an emergency, but could be met by another service provider in the community. Over the next 30 years, the fire and emergency services will need to partner with related service providers to create a local response network that can provide a host of services under the umbrella of a multifaceted organization, if it hopes to meet the needs of the community served.



Initiative 1: Acknowledge the need to work with a wide range of partners to serve the community and develop local strategies to create new approaches to providing services more effectively.

Strategies:

1. Inventory and leverage the allied services (law enforcement, health, social services, non-governmental organizations) in the community to provide more effective and efficient services.
2. Partner with insurers and health providers to innovate existing response strategies, improve patient outcomes, and reduce system costs.

Initiative 2: Promote a symbiotic relationship with other internal departments and outside agencies that are routinely allied responders to an incident.

Strategies:

1. Routinely meet, train, develop standardized operational response plans, and share real-time intelligence of what is happening in communities with allied responders to increase response capability and coordination during a homeland security event.
2. Develop goals and outcomes with a wide array of agency stakeholders, both internally and externally, to meet the objective of providing for a safe and healthy community.
3. Promote regular communication between all stakeholders on strategic issues, while continuing to handle operational issues through the established chain of command.
4. Develop opportunities for stakeholders to appreciate the roles and responsibilities of all other stakeholders toward better alignment of service delivery.

Initiative 3: Continue to expand community emergency response capabilities.

Strategies:

1. Promote individual and neighborhood self-sufficiency through existing programs (e.g. community emergency response teams, the radio amateur civil emergency service, volunteers in patrol, and senior Medicare patrol volunteers) to create greater resiliency in the community.
2. Focus on creating personal accountability in preparation for community-wide emergencies.
3. Identify and support community functions that are critical for recovering from and adapting to community-wide disasters.

Case Study: Rockford Fire Department (RFD)

Location: Rockford, IL

Coverage area: 147,000 residents over 65 square miles

No. of Employees: 318

Annual Calls for Service: 29,000

Identifying the increase in EMS calls and understanding that collaboration would benefit the department and community, RFD partnered with Swedish American Health System to develop a mobile integrated health (MIH) program. Twelve patients with chronic illnesses were selected for the 2015 pilot. As a result, ER visits were reduced by 54 percent, hospital admissions by 28 percent, and ambulance transports by 38 percent for this group. Enrollment in the program has grown with visits, admissions, readmissions, and transports continuing to be reduced. The MIH program scope expanded through a partnership with Winnebago County Health Department to train community members to recognize opioid overdoses and treat with them naloxone kits. In a one-year period, 1,500 people were trained, and more than 1,200 naloxone kits were distributed.



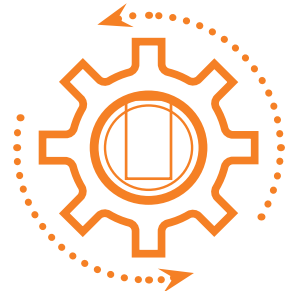
CRITICAL ISSUE F:

SUSTAINABILITY

Sustainability is often defined as meeting the needs of the present without compromising the ability of future generations to meet their needs. The concept of sustainability has three pillars: economic, environmental, and social. If we look through the lens of local government today, there are reasons to be concerned that local government may not be sustainable in the future. Many agencies across the United States are struggling with the cost to provide services at the levels needed to meet a growing population, an aging population, and a population with changing service demands. Those cost pressures are exacerbated by unfunded pension costs along with and the cost to maintain and replace aging infrastructure and response vehicles. Shifting responsibilities from federal and state governments to the local level have forced many local governments to provide new services. These factors have placed tremendous strain on local government to balance ever growing service demands with funding available within their jurisdiction. This will be an on-going issue and will necessitate doing business differently in the future, not only in the fire and emergency services but throughout all services provided by local government as well.

The volunteer fire service has struggled in the last decade in many parts of the United States to recruit and retain enough volunteers to provide adequate services. With the mission of providing services to more than 70 percent of U.S. jurisdictions, volunteer recruitment and retention is becoming a national problem.

Today business, government, and society are learning from the science of change that they must recreate themselves even when they would like to believe the old way of business will go on forever. As Peter Drucker put it, “the best way to predict the future is to create it.” The future of the fire and emergency services will rest upon those who are in it. If the fire and emergency services hope to sustain itself in the future, it must be willing to redesign itself and address the issues that are having a negative impact on the service today. Failure to address these issues will lead to what author Max Bazerman calls “predictable surprises.” Predictable surprises are those events or outcomes that catch us by surprise, yet both were predictable and preventable. If this occurs, the fire and emergency services will be placed at risk to continue to be the community’s safety net. Ultimately, local government will be faced with making difficult choices about how to provide the services needed and the level of services to be provided. That is why the issue of sustainability is so important and must be addressed now, rather than being left to the next generation of leaders to resolve.



Initiative 1: Address aging fire and emergency services vehicles and building structures.

Strategies:

1. Establish a comprehensive building renewal and replacement plan and provide the needed funding to address the short- and long-term community needs.
2. Urge the architectural profession and equipment manufacturing industry to anticipate and plan for the future designs needed by the fire and emergency services to address changes in response and deployment methods, building constructions, building densities, road infrastructure, and SMART cities and SMART building design.

Initiative 2: Reconsider and revamp current deployment methods.

Strategies:

1. Ensure response protocols and opportunities for consolidation are explored to ensure effectiveness of service delivery is balanced with cost efficiency.
2. Adopt staffing models based on statistically known call demand factors, such as time of day, special events, and seasonal changes while maintaining an adequate baseline deployment required to meet the health and safety needs of the community and employees.
3. Evaluate consolidation of seldom used specialty and single-purpose pieces of equipment to maintain effective cost management and capacity of those services for the threat environment that exists within the jurisdiction.
4. Develop a better understanding of community needs and their changing demands for services so as to modify the service delivery model(s) to meet them.

Initiative 3: Develop sustainable pension model.

Strategy:

1. Promote collaboration between labor groups, local government, and state government to ensure existing pension financial commitments are met while ensuring adequate service levels within the communities being served.

Initiative 4: Adopt and implement a community risk reduction strategy

Strategies:

1. Embrace a comprehensive strategy to minimize incidents and, if an incident does occur, to minimize the impact on the people, the community, and the emergency responder.
2. Adopt the concepts outlined in "Vision 20/20 – National Strategies for Fire Loss Prevention," and incorporate these recommendations into the daily agency operation to minimize the impacts to the community and emergency responders.
3. Develop strategies locally and nationally that reduce risk through proper vegetation management, designing new fixed fire protection systems that can be used in wildland urban interface, and zoning changes that prohibit building in the wildland urban interface.
4. Embrace the use of fire sprinkler technology in all buildings through the rapid adoption of codes and ordinances at the federal, state, and local government levels to dramatically reduce the incidence of deadly and costly fires.
5. Urge the sprinkler industry to develop a more cost-effective means to retrofit existing buildings with sprinklers or other fire suppressant technology.
6. Develop standards and a tiered code methodology that would support a phased in retrofit plan for existing buildings.

Initiative 5: Improve resource allocation by focusing on the outcomes trying to be achieved.

Strategy:

1. Evaluate resource allocation using department response data.
2. Alter deployment methods to assure better outcomes and desired services levels for communities including EMS, community paramedicine, or increased prevention efforts.

Initiative 6: Examine fixed costs associated with current delivery models and associated contracts.

Strategy:

1. Negotiate labor contracts with the flexibility to promote innovation in service delivery and servicing models, while still providing a fair and equitable wage, benefit, and pension package for the workforce that is economically sustainable.

Initiative 7: Explore public/private partnership opportunities.

Strategies:

1. Solicit success stories and best practices of effective public/private partnerships related to capital investments and operating costs.
2. Create, maintain, and regularly update a national repository of best practices available to all agencies at no cost.

Initiative 8: Research strategies to assist communities in sustaining their volunteer fire and emergency services or, if needed, how to transition to a new model.

Strategy:

1. Champion the establishment of a federal commission to develop a national plan of action to ensure volunteer fire and emergency services agencies remain viable in the future.

Initiative 9: Dramatically revamp the fire and emergency services education and training model to provide the needed skill sets, knowledge, and abilities required for the anticipated changes in the future and to remain current with the application of emerging technologies.

Strategy:

1. Urge academic institutions to develop the means to speed up their course development model and to be able to quickly adapt and develop new courses that will be required to sustain the needed workforce skill sets.
2. Encourage academia to use of state-of-the-art technology to meet the educational learning styles of future generations.

Case Study: South Metro Fire Rescue (SMFR)

Location: Centennial, CO

Coverage area: 540,000 residents over 287 square miles

No. of Employees: 716

Annual Calls for Service: 45,000



Serving 12 municipalities and unincorporated areas of three counties, SMFR has addressed the critical issue of sustainability. A 2016 merger with Parker Fire Protection District lowered the mil levy saving taxpayers \$11.2 million over 3 years. An upcoming merger with Cunningham Fire Protection District will result in additional savings of \$4.7 million. Consolidating dispatch centers and adopting more efficient coverage models has delivered better service to the community with SMFR rated as an ISO Class 1. Funding is now available for staffing community risk reduction efforts that in turn lead to a reduction in demand for service. Enhanced community connectivity and less susceptibility to changing politics has permitted SMFR to adopt long-term strategic initiatives furthering its sustainability.

CRITICAL ISSUE G:

TECHNOLOGY

Futurist Ray Kurzweil's predictions about trends in technological advance, which have been correct 86 percent of the time, are widely used by governments and large companies to prepare for the future. He has predicted that every 12 to 18 months computers will double their capabilities along with the information technologies that use them. Among his predictions are that in five years, we will experience 32 times more technological advancement, and in 10 years, a thousand times more. It is hard to imagine what that will translate to for the 21st century fire and emergency services, but it will undoubtedly change the way the local response agencies are doing business today.



Initiative 1: Adapt to and leverage rapidly evolving technology to improve service delivery.

Strategies:

1. Anticipate that artificial intelligence, smart technology, and robotics will shape future service delivery dramatically in the next 30 years and will change response methods requiring a new skill set and strategic processes for fire and emergency services agencies.
2. Leverage technology developed for other applications, professions, and purposes for use by emergency responders (e.g., robotics for the military, training simulation tools for the gaming industry, aviation flight simulation) to provide for better response and training.
3. Develop data sharing between departments/agencies that could benefit from shared applications and hardware, thus reducing the silos of data information in order to improve services.

Initiative 2: Develop a change mindset to help anticipate and support appropriate use of emerging technology and encourage the development of new technologies.

Strategies:

1. Champion the United States Fire Administration, in concert with other national organizations, to develop a fire advanced research challenge to promote application of technology developments for use in the emergency services through proof of concept and competitive challenges, similar to the Defense Advanced Research Projects Agency (DARPA) challenge utilized by the Department of Defense.
2. Coordinate national organizations to recognize and celebrate successful applications of emerging technology and help to spur future innovation at a more rapid pace for the fire and emergency services.

Case Study: City of Lenexa Fire Department (LFD)

Location: Lenexa, KS

Coverage Area: 50,000 residents over 34 square miles

No. of Employees: 96

Annual Calls for Service: 6,300



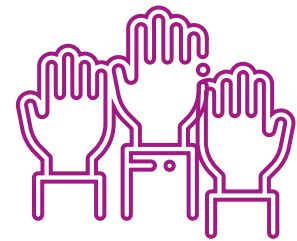
On the cutting edge of technology adoption, LFD received a FAA Certificate of Waiver or Authorization (COA) for Unmanned Aircraft Systems (UAS) in 2014. The COA permits LFD to use several UAS for aerial viewing and videography of both apparatus and personnel. LFD has utilized UAS for such varied activities as wildland hot-spot recognition, fire investigation, incident mission, and recruit training review. LFD requires interconnected smoke detectors in all new home-based day cares and permits Bluetooth detectors in older properties. Both configurations result in faster alerting of LFD to fire incidents in these high-risk properties. To protect its personnel, LFD has experimented with a waterproof arm band transmitter for its recruits monitoring their biometrics and pushing notifications during adverse situations.

CRITICAL ISSUE H:

INCLUSIVENESS



Communities served have continued to become more diverse in their culture, languages spoken, and norms. The workforce of many fire and emergency services agencies no longer reflect the people they serve. A workforce demographic that mirrors the community make-up helps to build trust with the community and promotes a better understanding by the agency. While firefighting is now a relatively small part of what agencies do, it is the most technically and physically demanding. Many fire departments are working with underrepresented groups to prepare them for the rigorous testing processes of joining the fire and emergency services. If the fire and emergency services hope to attract the right workforce to deliver the services conducted, then changes in culture and current perceptions are necessary to achieve more representative service.



Initiative 1: Make it an organizational priority to recruit, select, and promote members who reflect the demographic makeup of the community they serve.

Strategies:

1. Remove economic barriers to candidates desiring to participate in the fire and emergency services.
2. Remove social barriers to candidates desiring to participate in the fire and emergency services.
3. Remove non-validated physical ability barriers for candidates desiring to participate in the fire and emergency services.
4. Create pathways to attract, prepare, and hire underrepresented personnel into the fire and emergency services.
5. Establish an agency goal for the optimal demographic make-up of the agency.
6. Develop a plan to achieve that optimal goal for the agency within a specified time period.

Initiative 2: Understand the community characteristics, culture, and diversity that exist and determine the most appropriate way to serve and interact with all community members.

Strategies:

1. Provide opportunities for employees to engage with various community groups.
2. Promote cultural understanding and humility within the workforce to increase the quality of interactions and the services provided to the community.
3. Engage the community in helping to develop cultural humility within the agency.
4. Involve the community in agency decisions that affect them.

Case Study: Hartford Fire Department (HFD)

Location: Hartford, CT

Coverage Area: 124,000 residents over 17 square miles

No. of Employees: 361

Annual Calls for Service: 30,000



A majority-minority community, Hartford's residents are 44 percent Hispanic, 35 percent African American, 15 percent White, and 3 percent Asian. Striving to be a more inclusive fire department to better serve their diverse community, HFD has adopted strategies focused on enhanced two-way communication, team building, and fostering a department identity while permitting individuality. Meetings with all affinity groups allowed the chief to discuss challenge and concerns. These groups included the Emerald Society (Irish), Latin Society of Firefighters (Latino/Hispanic), Phoenix Society (African American), St. Florian Society (Italian), and Women in Fire & Emergency Services. Wide department representation on health and safety, strategic planning, and apparatus committees along with involvement of members in the development of HFD's first professional development program led to a greater sense of inclusion. Custom-designed company logos are permitted on apparatus while intra-mural activities bring together the entire department.



What the Future May Hold

The responder of the future and how agencies deploy available resources will likely differ significantly from today's fire and emergency services system of response. While the system will have to rely on a strong core response team to adequately respond to emergency situations, the responder of the future will likely come from a variety of disciplines, with varying education, certifications, and training to provide the array of needed services to their community.

Calling 911 may result in dispatching units to an emergency response or deploying an advanced medical provider, a social worker, a behavioral health specialist, community risk reduction officer, or other specialist who can provide the most appropriate set of skills needed by the caller. The fire and emergency services must be prepared to play a much larger role in the health and welfare of the community and anticipate that there will be a variety of specialists that make up the response team, creating a larger network of professionals that are deemed first responders.

Technologies and robust data analytics will have dramatic impacts on society, the workplace, and the fire and emergency services and will create a time of substantial organizational transformation. As smart cities develop during the next 30 years, the amount of data readily available to local government, the response agency, and the citizen will be substantial. Data will drive decisions as local governments focus to deliver better services, promote economic growth, and provide for a safe and healthy community. But to do so will require a new way of thinking for most local governments and the agencies that work with in them. The quickly advancing fields of automation and artificial intelligence will most certainly revolutionize every aspect of human life and are already making an impact on everything from military strategy to medical procedures. As robots take over increasingly complex tasks, new forms of human-machine interaction will emerge, and the structure of both industry and

society will evolve to accommodate this emerging and symbiotic relationship.

For this first time in history, we have five generations in the workforce. Two new generations are just entering: Gen Z and Gen Alpha. Gen Z is the first that is a true digital generation. This generation has been exposed to the internet, mobile systems, and social media from a very young age. They are hypercognitive, comfortable multitasking, and often have multiple devices in operation at the same time. Generation Alpha, also known as the iGeneration, are the first entirely born in the 21st century. This generation is set to be the most transformative generation yet. Alphas haven't just grown up with technology, they've been completely immersed in it since birth.

During the next 30 to 50 years, a nearly equal distribution of population bands will emerge. This will be a shift in global demographics and will undoubtedly have dramatic impacts on the workplace and the workforce.

Whether it's a more diverse workforce, a more demanding community, a more complex response system, or a shift caused by societal changes, as we look to 2050, the fire and emergency services will look vastly different that it does today.



Next Steps

If you have been working in local government during the last decade, you have experienced some of the most dramatic shifts in how it operates. Whether it's the political dynamic, the elevated threshold for transparency, the lack of civility, or the demands placed on local government to provide more services, it has been a time of real change. As we look to the future, those dynamics may continue, but other forces of change will emerge, making the leading and managing of tomorrow's governmental system very exciting, very challenging, and very fast.

The more than 1,200 people that shared their vision for the 21st Century Fire and Emergency Services all agreed that the fire and emergency services is an integral local government function. However, they felt that changes will be needed in how these vital services will be provided. The subject matter experts and the CPSE and ICMA boards indicate that a collaborative effort will be needed to address the rapid societal changes coming and should include city/county managers, elected officials, community members, fire and emergency response leadership, and the representative workforce. The changes foreseen and the rate at which change may occur will undoubtedly accelerate the transformation of the fire and emergency services. Thus, it is critical that we address the issues outlined in this white paper. We must begin today to position our agencies to be able to create an organizational DNA that can adapt quickly, embrace new technologies, and be open to unforeseen changes. These will need to be critical organizational characteristics if local government

hopes to sustain the fire and emergency services so it can continue to serve as the health and safety net for our communities.

We invite local governments and institutions to begin addressing the initiatives and research efforts outlined in this white paper. It is our hope that national organizations, such as CPSE, ICMA, and others, will address the topics outlined in the critical issues and prepare their members to meet these challenges going forward.



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