

**Transforming 911: Assessing the Landscape and Identifying New Areas of Action
and Inquiry**

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Preface

Throughout the United States, at least 240 million calls are made to 911 each year.¹ Many of these result in life-saving responses to medical emergencies and serious crimes in progress. This everyday excellence—24 hours a day, 365 days per year—is a remarkable, often undervalued accomplishment. At the same time, our nation’s 911 system presents many opportunities for improvement and could benefit from better documentation and dissemination of best practices to address mounting challenges.²

Data indicate that most 911 calls are not related to a crime in progress,³ yet elicit a police response. As a result, police spend much of their time responding to low-level or non-criminal incidents that do not amount to public safety or health emergencies.⁴ Police officers have become first responders to all manner of societal ills, including family and mental health crises, conflicts in schools, and “quality-of-life” offenses such as public intoxication and panhandling. This “police-first” emergency response model burdens law enforcement with the responsibility to address challenges which are often better-addressed by other responders. This model may also exacerbate harm and perpetuate distrust in the justice system among many communities—especially those of color.⁵

These challenges have prompted some localities to reduce the police footprint in first response and to improve medical and social-service responses to a diverse array of needs that are currently often addressed through the 911 system.⁶ For these efforts to yield their intended benefits and minimize undesired consequences, they need to be informed by data and research, practitioner expertise, and the perspectives of the various stakeholders who interact with 911 and alternative systems. To assist this process, the University of Chicago Health Lab launched Transform911 in July 2020 in an effort to cull the best available evidence to explore how the nation’s 911 system can better prioritize health and safety, to ensure the right responder is dispatched at the right time, and to identify and disseminate best-practices to improve first-response. Transform911 has engaged a diverse collection of 911 scholars, practitioners, and stakeholders in a community of practice to identify evidence-based practices, spark innovation, and—we hope—inspire transformative change.

911 is a system with universal impact and thus should be equally accessible to everyone. Accordingly, Transform911 participants represent a vast array of multidisciplinary stakeholders from across the United States. They serve as 911 professionals and other first responders; community service providers, advocates, activists; academics and other researchers; policymakers; and public health providers and

¹ National Emergency Number Association, “9-1-1 Statistics,” accessed November 22, 2021, <https://www.nena.org/page/911Statistics>.

² S. Rebecca Neusteter et al., “Understanding Police Enforcement: A Multicity 911 Analysis,” Vera Institute of Justice, September 2020, <https://www.vera.org/publications/understanding-police-enforcement-911-analysis>.

³ Cynthia Lum et al., “Can We Really Defund the Police? A Nine-Agency Study of Police Response to Calls for Service,” *Police Quarterly* (2021), <https://doi.org/10.1177/10986111211035002>; Neusteter, et al., “Understanding Police Enforcement;” S. Rebecca Neusteter et al., “The 911 call processing system: A review of the literature as it relates to policing,” Vera Institute of Justice, July 2019, <https://www.vera.org/publications/911-call-processing-system-review-of-policing-literature>.

⁴ Neusteter et al., “Understanding Police Enforcement.”

⁵ Council on Criminal Justice Task Force on Policing, “Shifting Police Functions,” May 2021, <https://counciloncj.foleon.com/policing/assessing-the-evidence/xvi-shifting-police-functions>.

⁶ Chanelle N. Jones, “#LivingWhileBlack: Racially Motivated 911 Calls as a Form of Private Racial Profiling,” *Temple Law Review Online* 92 (2020): 55-93.

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experts. They are divided into workgroups that correspond to six themes that collectively represent critical areas of knowledge, action, and inquiry pertaining to 911 and emergency crisis response. Their charge was to develop and inform content and recommendations that will be presented in public convenings to seek input and provide transparency. The workgroup co-chairs were selected to reflect geographic and field diversity, as well as to possess the professional stature necessary to solicit input from all workgroup members inclusively, facilitate discussions, and lead to consensus on recommendations (see the [Appendix A](#) for a list of workgroup chairs and members).

The below themes and their related descriptions orient the Transform911 workgroups, which have both contributed to and been informed by the content of this publication.

911 Professional Career and Supports: What are successful and promising efforts to improve investments in, and supports for, the 911 profession? What are the necessary skill-sets, recruitment and retention strategies, training and certification standards, occupational supports, opportunities for advancement, pay and benefit equity, mental health and wellness needs, and occupational reclassification/title changes (e.g., change classification from the Bureau of Labor statistics clerical/secretarial administrative category to the public safety one) to support these professionals?

Alternative First Responders: What are successful and promising practices that provide people with appropriate medical, social service, and community resources to complement or supplant traditional police, EMS, and fire first-response? How can calls to 911 for mental and behavioral health challenges, animal control, domestic violence/intimate partner violence, traffic, noise, burglary alarms and other issues be safely offloaded to other non-police responders?

911 Hotline Alternatives: What are the strengths and limitations of alternative crisis lines or “hotlines,” including 211, 311, 988, and text lines, along with runaway, domestic violence, and suicide prevention hotlines? How can they be supported to increase their use as safe alternatives to 911 for addressing health, social service, and other community needs?

Emergency Communications Center (ECC) Operations: What are current and best practices in 911 call-handling operations, including call-taking, triaging, and dispatching protocols? What are the pros and cons of various ECC operational structures, accountability mechanisms, quality assurance measures, and stakeholder engagement strategies? How can ECC policies, procedures, and protocols best promote accessible, appropriate, safe, and equitable responses to requests for emergency services?

911 Governance: What are the various entities, structures, and processes that govern 911 operations and emergency services? What statutes, administrative rules, budget considerations, resource constraints, agency operational orders, organizational and decision-making structures, and reporting protocols influence proper quality control, oversight, implementation, and operation of standardized 911 and alternative procedures?

911 Technology and Infrastructure: How can technology enhance ECC capacity and practical effectiveness in identifying callers’ needs and addressing them with the right response, at the right time, by the right responder? What are the specific areas in which improved technology

infrastructure and resources require upgrades or enhancements in service of improving public safety and health outcomes?

This report is structured in accordance with these six domains. Following the executive summary and glossary of terms, each chapter is structured to provide an overview of the topic, discuss the related state of practice, cull the research evidence and information provided in professional association reports and other grey literature, and provide specific, actionable questions to improve 911 and emergency response. The concluding chapter summarizes key themes and next steps in the journey to transform 911.

In developing this publication, we aspired to make it accessible and informative to industry experts and stakeholders, as well as to all others impacted by and interested in the subject matter. Toward that end, we employ language that may differ from standard vernacular used in the field. Namely, at the request of the Transform911 co-chairs and members, we use the term *911 professionals* rather than telecommunicators. The workgroup members believe this term better reflects both the role and credibility of these key personnel, especially in light of the complexity of their jobs and the distinct and invaluable role they play in society. Wherever possible, we similarly refer to 911 call centers as *Emergency Communications Centers* (ECCs) a term favored by 911 professionals⁷ in lieu of the more traditional term, Public Safety Answering Points (PSAPs).

Like all efforts associated with the Health Lab, Transform911 strives to improve public health, its impacts, and how it is discussed. If any aspect of this work appears to miss a critical perspective or employs language that needs improvement, please contact us at transform911@uchicago.edu. We welcome any and all feedback on the content of this publication as well as the ways in which we characterize issues and opportunities pertaining to 911 operations.



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⁷ A diverse array of entities, including 911.gov, the National Institutes of Health, APCO International, the IJIS Institute, and many local emergency centers use ECC in lieu of PSAP.

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Executive Summary

America's 911 system consists of an interconnected collection of professionals, operations, governance structures, and technologies, along with a wide array of stakeholders and interests. This ecosystem faces challenges and opportunities that must be considered in the context of several issues that intersect at 911: the inputs (calls for service and how they are processed) and the outputs (the options and resources available for informational response, first responder dispatch, or diversion). Successful transformation of 911 requires championing 911 professionals and operations while supporting equitable and efficient service delivery that conserves police resources, reduces biases, and ensures that calls for emergency services generate the appropriate response.

This publication describes the complex 911 system in the US, focusing on the areas of 911 professional career and supports, alternative first responders, 911 operations, 911 alternative hotlines, emergency communications center operations, 911 governance, and 911 technology and infrastructure. The corresponding chapters were developed principally to inform the Transform911 workgroups and to establish a baseline of understandings for the workgroups and the field writ large. The content of this executive summary is described and cited in detail in the chapters that follow, examining the state of practice, research evidence, and questions for inquiry and action in each of the six intersecting domains.

911 Professional Career and Supports

911 professionals are employees serving as 911 operators, call-takers, call-handlers, and dispatchers. While the job of 911 professional is occupationally categorized as administrative, this designation misrepresents the true nature of their work. 911 professionals hold complex, challenging, and stressful jobs. They require strong communication skills, technical literacy, and the ability to comply with standard operating procedures while making nuanced judgement calls in the moment.

The way in which 911 professionals interpret and triage incoming calls has implications for whether a responder is sent to the scene and what the responder expects to encounter upon arrival. Indeed, 911 professionals hold a crucial role in decisions to dispatch police, fire, or emergency medical services in truly exigent cases versus resolving calls without dispatch or sending alternative, unarmed responders. These decisions have important implications for the safe and equitable delivery of emergency and social services through 911 and alternative hotlines.

Despite the importance of 911 professionals, the sector endures considerable challenges, including:

- a perceived lack of respect, long shifts, low pay, and high burnout and attrition rates;
- scant mental wellness programs to help 911 professionals navigate stress and cope with vicarious trauma;
- a dearth of training to help 911 professionals identify people in need of mental and behavioral health supports; and
- insufficient access to information with which to refer callers to community-based resources.

Researchers have thoroughly documented these challenges, but have not definitively identified which changes and innovations will most benefit the 911 profession. The research is also silent on which types of 911 professional trainings, policies, and resources are most promising to reduce reliance on law

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enforcement and support safer, more equitable, and effective responses to community requests for emergency services. Priority areas for inquiry and action include:

- What are the impacts of improvements to 911 professionals' supervision, wellness supports and resources, and compensation levels on their job satisfaction, job performance, and tenure?
- What strategies work best to support the recruitment and retention of 911 professionals, and what do successful efforts to attract candidates who reflect the demographics of the communities they serve look like?
- What are the relative merits and impacts of various call-taking protocols, training and certification processes, and quality assurance and performance measurement standards on 911 response efficiencies and outcomes for responders and individuals who are the subject of the calls?
- How and to what extent would greater availability and increased awareness of behavioral health resources and supports relieve the burden on 911 professionals and safely divert more calls from police response?

Alternative First Responders

Tremendous and growing 911 call volumes strain both 911 professionals and the Emergency Communications Centers (ECCs) in which they work. And while many calls to 911 are neither exigent nor criminal in nature, police are typically the default response to calls that do not relate to fires or medical emergencies. This approach strains police resources, introduce police to situations other responders are better equipped to address, and may create unnecessary risk of harmful encounters between police and community members.

An array of alternative or specialized response models to 911 calls have been implemented around the country, including Crisis Intervention Teams (CIT), co-responder models, and civilian response programs. Strategies to divert 911 calls from police response have also been implemented for a variety of specific situations, including animal control issues, burglar alarms, and traffic problems. However, most jurisdictions lack alternative response models. Many programs that do exist are primarily new and under-researched. 911 professionals are not routinely trained to identify people with mental or behavioral health needs, and are not always aware of behavioral health resources that are available in the community to which callers could be referred. These challenges can be intensified by poor communications between ECCs and social and health service providers.

While alternative-response models hold promise for diverting some share of 911 calls from police to other responders who are specifically trained to address issues that are neither life-threatening nor violent, data on the number and types of calls that might fit this category are rarely examined and may reflect inaccurate call classification. Evaluations of alternative-response models are rare and pertain primarily to CIT training. These evaluations find an increase in officers' knowledge and attitudes about people with mental and behavioral health needs and how to interact with them safely, but limited evidence of improvement in outcomes for subjects of CIT-involved calls. Diversion-from-police rates

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for mobile crisis units are in the single digits, and the degree to which alternative response models impact racially disparate outcomes is unknown. However, co-responder programs have been found effective in reducing transports to emergency departments, increasing access to services, and yielding savings in both public health and criminal justice system costs.

Given the proliferation of pilot programs on alternative response throughout the country, several questions for inquiry and action require exploration through both quantitative and qualitative research. Key questions include:

- What trainings work best to ensure culturally sensitive, trauma-informed responses to public calls for emergency services?
- What opportunities exist to implement alternative response models and how can they be informed by reliable data on the volume and types of calls that are best suited for diversion from traditional 911 response?
- What is the impact of alternative models on the safe, equitable, and effective resolution and response to public calls for service?
- What are the unintended consequences of alternative response models and how can they be mitigated?
- To what degree do alternative response models yield better outcomes—what kinds of outcomes, for whom, and under what circumstances—including enhanced access, efficiency, justice, and safety?

911 Alternative Hotlines

Given high 911 call volumes that pertain to non-emergency and non-criminal matters, the use of alternative hotlines is an important component of efforts to transform 911. Alternative hotlines include three-digit dialing resources for non-emergency issues and municipal services (311), community-based health and human services referrals (211), and the newly established National Suicide Prevention Lifeline (988). Alternative resources to 911 for crisis issues also include helplines for domestic violence support, runaway youth, and human trafficking.

The 311 non-emergency hotline was introduced to relieve the burden on 911 professionals and traditional first responders. It seeks to redirect people requesting information and municipal services to other agencies and professionals who are arguably better suited to assist them. However, in jurisdictions that have implemented 311 systems, the public continues to call 911 for non-emergency issues and a meaningful share of calls to 311 result in police dispatch. Little documentation exists on how 311 calls are handled and by whom. In some jurisdictions, nonemergency hotlines are answered by the same professionals who field 911 calls. As such, implementing a 311 line may not reduce overall ECC call volume or response by police and other traditional first responders. Research on 311 implementation is extremely outdated and does not track impacts over long periods of time, thus hindering our ability to discern whether public use of this alternative-to-911 resource increases as the 311 system matures.

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211 is a social service line that provides referrals to community resources for needs ranging from food, clothing, and public healthcare to assistance with tax preparation, transportation, and eviction prevention. 211 is often a valuable resource to meet callers' needs. Yet 211 is also limited by social service capacity constraints, particularly in rural areas.

Crisis lines span an array of needs, with most evidence-based examples being helplines affiliated with the National Suicide Prevention Lifeline and the National Domestic Violence Hotline, both of which have been documented as providing crucial support to callers. However, the roll-out of 988, effective July 2022, will require sufficient supply of trained crisis line workers and community resources.

Alternative hotlines can only serve the public to the extent that people actually use them. Strategies to improve public awareness and engagement include popular media campaigns that deploy catchy slogans and celebrity spokespersons. In addition, effective, respectful, and efficient service delivery may encourage people to dial alternative hotlines in the future rather than resorting to 911. However, no literature exists on successful strategies to refer 911 callers to alternative lines, either directly or through the use of 311 or 211.

Several important questions exist about the best ways to develop, resource, and advertise alternative hotlines. These include the following:

- What are the impacts of various forms of non-emergency hotlines on 911 call centers, police dispatch practices, and the safe, effective, and equitable resolution of both crime-related and non-emergency events?
- How can alternative hotlines be informed by the people most likely to use or benefit from them?
- Are the resources associated with alternative hotlines equitably distributed in communities based on socio-economic, demographic, and geographic characteristics?
- What are the differential impacts of 911 versus alternative hotlines on people of color and those from under-resourced communities? To what degree do alternative hotlines reduce or increase racially disparate outcomes?
- What are the relative costs, benefits, and potential savings of alternative hotlines?

Emergency Communications Center Operations

Emergency Communications Centers (ECCs), also known as Public Safety Answering Points (PSAPs) are the entities charged with delivering emergency services in response to calls to 911. Central to an ECC's role is developing and overseeing the processes of receiving, routing, answering, dispatching, and resolving calls. A complex array of technologies, organizational structures and processes, and human decision-making is required to support these apparently straightforward call processes. ECCs, despite being restricted by the type of agency in which they are housed and their existing governance structures and mandates, have tremendous potential to influence the degree to which callers' needs are resolved efficiently, equitably, safely, and with minimal justice system involvement.

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The guidelines and protocols that dictate how 911 professionals interpret, classify, and triage calls, along with training and organizational supports, are essential in efforts to transform 911. ECC operating procedures, together with the discretion afforded 911 call-takers and dispatchers, guide which calls are resolved without the need for a field response, whether police officers are sent to the scene and what they anticipate they will encounter upon arrival, and which calls should be diverted to alternative responders, such as mental health professionals. While standardized call-taking and triaging protocols exist to ensure that calls to 911 are neither over-triaged (sending a responder when one is not necessary) or under-triaged (underestimating the exigency and risk of the event), they are not used universally by all ECCs. This patchwork of protocols leads to uneven experiences among community members seeking emergency services and renders ECCs without such tools (and the training to accompany them) vulnerable to litigation.

Best practices in ECC operations, as defined by emergency communications membership associations and expert practitioners, recommend local and regional partnerships with other ECCs, along with the sharing of standard operating procedures, training resources, technologies, and even staff and facilities. However, no research exists on the best model for ECC structure and operations, likely because the specific model for a particular ECC likely depends upon the organization's specific capacities and authorities, reporting agency, and local context. This includes the composition and interests of the community, recognizing that "community" is not a monolith. People residing in Black and brown communities, and those whose identities, mental and behavioral health issues, and/or life circumstances have made them the source of stigma and bias may be distrustful of the government and reluctant to call 911. As the very first of first responders, 911 call-takers could reduce the odds of stigma and bias with sufficient training and exposure to people of different races, ethnicities, and socio-demographic groups, but the research is insufficient to assert that hypothesis with confidence.

The research on ECC processes provides guidance on efficiency of service delivery and strategies to improve quality assurance measures but falls short of identifying effective practices from a rigorous empirical perspective. Among the many unanswered questions that could guide improvements in the accessible, efficient, equitable, and safe delivery of emergency services are:

- How can ECC operations be informed by members of the community they serve, including underrepresented communities, and what are the benefits of that type of engagement?
- What are the relative benefits of various call-taking and triaging protocols and standards? To what degree do they improve accurate classification and coding? To what degree do they result in over- or under-triaging?
- What changes to the structure and operation of ECCs and the training of ECC staff would promote interoperability and more accessible, equitable, and effective delivery of emergency services?
- What works best in increasing access to 911 and alternative services to people with disabilities, non-English speakers, and those with hearing and speech impairments?
- What operational changes are successful in reducing over- and under-triaging and supporting the offloading of appropriate calls to alternative resources/responders?

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- To what degree do efforts to create more behavioral health resources (e.g., the inclusion of mental health professionals in ECCs, the increase in availability of behavior health services in the community) improve service delivery and reduce the use of police responders?
- What methods can improve the accurate classification of calls and thus the quality of data needed to improve the efficiency and effectiveness of ECC service delivery?

911 Governance

In the context of emergency communications, the term “governance” refers to the coordination, oversight, funding, and standardization of both 911 and alternative hotlines and emergency services. 911 governance exists at the federal, state, regional, and local (county and city) levels, requiring planning, collaboration, and coordination given overlapping roles based on geography and type of emergency service or issue. Effective governance is essential in ensuring that funds are sufficient to support 911 operations, migration to Next Generation 911 (NG911), and the services needed to meet increased demand for suicide prevention and crisis counseling associated with the introduction of the new three-digit 988 hotline.

911 governance has evolved over time with increases in population, demand for emergency services, and advances in technology. These changes have introduced new capabilities and new challenges, with the migration to NG911 being a tremendous driver of efforts to revisit and revise 911 governance to ensure interoperability, and to provide reliable access to emergency services for people using alternatives to land lines (e.g., cellular devices, Voice over Internet Protocols, mobile texts). Coordination among multiple levels of existing 911, 311, and 211 governance structures, along with new governance structures for 988 and for other alternative hotlines, can also make certain that efforts to divert mental health and non-emergency calls from law enforcement response are implemented consistently and equitably.

Reports developed by governmental entities and emergency communications associations, in partnership with practitioners, have proposed ways in which 911 governance can establish better standards of practice, promote coordination and interoperability, enforce data collection and reporting requirements, ensure compliance with quality control and performance measurement practices, support decision-making processes, and develop efficient and economical operational structures. However, a common theme is the recognition that each ECC is unique. No one size fits all, particularly because many of the processes associated with emergency communications are governed by the agency in which the ECC is housed, as well as by jurisdictional and statewide governance factors that vary considerably and often geographically.

The scant empirical research on 911 governance prompts several areas of research inquiry and evaluation that should be prioritized to inform improvements in 911 governance. Key questions include:

- What types of governance standards and structures best promote interoperability and coordination among public safety and nonprofit or other governmental crisis hotlines and responders? How can these streamline coordination, ensure cost-containment, and enhance efficiency and appropriateness of service delivery?

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- Which governance structures and processes include strong public oversight? What are the advantages and disadvantages of such community-oriented accountability mechanisms? How can these approaches ensure that members from high 911-use communities are included?
- What opportunities exist for greater coordination and resource sharing among ECCs? What are the likely impacts of such collaboration on the efficiency and effectiveness of service delivery?
- What are the advantages and disadvantages of different 911 funding models? Which funding models best support efforts to promote migration to NG911?
- Which models improve accessibility of emergency and crisis services, including to those living with disabilities?
- Which models ensure sufficient services to meet 988 demand; and support alternative responses to calls to 911?
- What is the nature of existing demand for and current responses to calls for emergency and crisis services, and how does that inform various governance structures and consolidation measures?
- How can governance support communications strategies to encourage the public to use alternative hotlines, such as 988, and what is required to enable 911 professionals to reroute callers to 988? How can 988 be governed to ensure that emergency services are delivered quickly in life-threatening circumstances while protecting the privacy and anonymity of callers?

911 Technology and Infrastructure

911 systems in the United States are dependent upon and influenced by the current and evolving state of information and telecommunications technology. Unfortunately, the degree of technological sophistication varies across ECCs, and even neighboring systems may not have seamless communications or interoperability capabilities. Nevertheless, a variety of innovations technology are currently being implemented, from Federal Communications Commission (FCC) rules on wireless Enhanced 911 (E911) services to third-party smartphone apps that provide enhanced 911 dialing capabilities.

Next Generation 911 (NG911) may be the most publicly visible 911 technological advancement. This nationwide initiative seeks to upgrade 911 from analog phone systems to Internet Protocol (IP)-based systems that are capable of handling text and multimedia messages, as well as to promote standardization and interoperability across ECCs. NG911 represents both an opportunity and a challenge. Migration to the new system by all ECCs nationwide should improve interoperability, reliability, security, and service delivery. Yet, the process of adopting NG911 is difficult and expensive for many ECCs owing to antiquated infrastructures.

Computer-aided dispatch (CAD) systems are an essential aspect of existing and future 911 technology, as they help 911 professionals prioritize and record incident calls, coordinate incoming data from

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multiple streams, and manage or automate dispatch and monitoring of field responders. Together with records management systems (RMSs), which keep detailed records of incidents and reports (primarily from law enforcement agencies), the two technologies can aid in real-time decision-making, support the analysis of volume and type of calls for 911 services, and inform the need for alternative responses. These technologies, however, must be linked and coordinated across agencies. Vendors must also provide access to needed data. It is especially important to recognize that ECCs do not make decisions independently regarding technology acquisition, upgrades, and usage.

911 technologies must ensure reliable communications and efficient responses to the public's requests for emergency services. As important as these tasks are, 911 technologies must also assist ECCs to reroute 911 calls to alternative hotlines (and vice-versa). These technologies must address the challenge of endowing alternative hotlines with location-finding capabilities without violating caller privacy or inhibiting hotline usage. They must serve the needs of nonverbal people, people with hearing impairments, and non-English speakers to communicate needs for emergency services.

The limited research on 911 technology is focused primarily on the need for technological advances and upgrades and the challenges in meeting them, and issues related to service interoperability, data sharing, and data handling capabilities. Priority areas for inquiry and action include rigorous research to answer the following questions:

- What can we learn from tracking ECC migration to NG911 about technological barriers and what factors support successful migration? Are some ECCs better equipped to make the transition to NG911 based on the entity in which they are housed (e.g., police, fire/EMS) or the governance structure under which they operate?
- How can technology improve the speed, quality, and effectiveness of 911 services and responses? How can it provide better 911 and alternative hotline access for users who are nonverbal, hearing impaired, or who do not speak English fluently? How well does text-to-911 serve their needs?
- To what degree do call-taking and triaging facilitation and automation technologies yield more consistent and equitable responses and more effective service delivery? Are technologies when developed in partnership with ECC professionals more or less effective than developed without these partnerships?
- How is CAD best structured to support optimal and equitable outcomes for call-taking, triaging, assessment, dispatch, response, and follow-up? How might different CAD user interfaces or dashboards influence call-taker assessments and triaging decisions?
- What measures work best in promoting improvements in data quality, analysis, transparency, and secure data storage and retrieval? What measures can ensure that data generated by 911 and alternative systems and hotlines are used ethically, and that personal information is safeguarded and individual privacies are protected?

Conclusion

911 is a complex system – one that is evolving in real time owing to advances in technology and improvements in policies, practices, operations, and governance mechanisms. It serves a vital role in protecting the American public through responses to fire, medical, and serious criminal events. In addition to deserving tremendous respect, the professionals who staff our nation’s ECCs should be provided with the training and supports needed to navigate complex decision-making processes associated with fielding, triaging, and dispatching calls to 911. These priorities have significant implications for the efficient, effective, and equitable delivery of public calls for emergency services and all manner of requests for assistance.

The public’s use of 911 as the default resource for a wide array of non-emergency services results in the unnecessary deployment of police response. However, the existence and emergence of hotlines and alternatives to traditional responses to 911 calls create opportunities for new, safer, and more equitable ways of meeting the public’s needs for assistance, conserving police resources, and potentially relieving the burden on 911 call centers. Both the opportunities and challenges in this space underscore the need for greater research and more rigorous knowledge development to inform the field as it advances its efforts to transform 911.

Glossary of Terms

211

A toll-free number for information about health and human services to meet basic needs such as housing, food, transportation, and health care. 211, a service coordinated by the United Way, is available in every state, although not every community may have access to it.

311

A toll-free non-emergency municipal services number used in jurisdictions throughout the U.S., although some cities have other seven-digit numbers that provide similar services. 311 is intended for non-emergency services provided by city or public safety authorities, such as animal control, building violations, environmental concerns, street maintenance, and filing a non-emergency police report.

511

A toll-free number used in several states to provide travelers with real-time weather and traffic information.

911

The universal toll-free emergency services number for the United States and most of North America. 911 was first implemented in 1968 in Haleyville, Alabama, and is now available to most US residents, although some rural areas lack access.

911 Hotline Alternatives

911 is the national emergency number for the U.S., but there are other numbers to call (and text) for different kinds of help. These “hotlines” include medical, social service, civic, and community alternatives to calling 911 for assistance, including 311, 211, and a variety of mental health and crisis hotlines.

911 Professionals

The people who serve as operators, call takers, call-handlers, dispatchers, and other roles in emergency communications centers, which are the first point of access to response in an emergency.

988

The national number associated with mental-health, veterans, and suicide helplines. 988, operational effective July 16, 2022, connects callers to the National Suicide Prevention Lifeline and enables veterans seeking service to dial “1” for access to the national Veterans Crisis Line.

Alternative Responders

Generally, anyone other than police, firefighters, or Emergency Medical Service (EMS) personnel who responds to a 911 or alternative hotline call. Alternative responders may be trained mental health and substance use treatment providers, social workers, peers, community

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health workers, or other workers. Mental health and substance use calls are perhaps most often mentioned in this area, but other situations that may benefit from alternative response include animal control, domestic violence, traffic violations, and noise complaints.

Association of Public Safety Communicators (APCO)

Founded in 1935, APCO International represents the interests of public safety communications professionals.

Basic 911

The original 911 system for which the emergency and its location are communicated to a 911 professional by voice or teletype, using the public switched telephone network (PSTN).

Behavioral Health

Refers to the connection between mental health and behaviors that affect both mental and physical health, such as substance use disorder.

Computer-Aided Dispatch (CAD)

A computer-based system that aids 911 professionals by automating selected dispatching and record keeping activities. CAD helps 911 professionals prioritize and record incident calls, coordinate incoming data from multiple streams, manage or automate dispatch and monitoring of field responders, and facilitate quality assurance and performance measurement activities.

Calls for Service

Calls to 911 from community members.

Call Taker, or Call Handler

The professional who answers calls to 911 or an alternative hotline and determines what type of response is needed.

Call-taker Protocols

Scripts, decision trees, guide cards, and other tools and policies that guide how 911 professionals answer and triage calls.

Call Type

The reason for the 911 call for service, which can range from minor issues like traffic or auto accidents to more serious crimes like burglaries or assault. Call type is influenced by how the call taker interprets and classifies the call, as well as the array of classification options available to them.

Call Volume

The number of calls placed to an emergency communications center.

Crisis Intervention Team (CIT)

A group of police officers who have received specialized training to interact with people experiencing mental or behavioral health crises to avoid use of force and to connect people with services or treatment, rather than involvement with the criminal legal system. CIT-trained

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officers often receive collaborative support from mental health professionals and community members. CIT is sometimes used to refer only to the crisis intervention training that police officers receive.

Civilian Response Team

A team comprised of non-law enforcement professionals with expertise in any of the following: mental health, behavioral health, substance use disorders, social work, mobile crisis intervention, community resources for conflict resolution and crisis response, peer-support, public health, and any others who can deflect or divert people from police enforcement and correctional confinement.

Co-Responders or Co-Response

Co-response is a model of emergency response in which mental health and substance use professionals or other social services personnel (co-responders) respond to 911 calls for service along with police officers or soon after police arrive at the scene.

Dispatcher

The ECC professional who receives information from a 911 call taker (or in smaller ECCs may also serve as call taker) and then dispatches emergency responders, which are usually firefighters, EMS personnel, and/or police.

Emergency Communications Center (ECC)

The preferred term (in lieu of Public Safety Answering Point) of many 911 professionals for the entity that is designated to receive and respond to requests for emergency assistance.

Emergency Medical Technician/Emergency Medical Services (EMT/EMS)

Medical personnel who respond to medical emergency 911 calls. The term EMS is often used to refer to personnel that respond in ambulances.

Enhanced 911

A 911 system with location-tracking capabilities that enables the visual display a caller's phone number and address to the call taker.

Federal Communications Commission (FCC)

The U.S. government agency that serves as the lead authority for communications law, regulation, and technological innovation. The FCC regulates interstate and international communications, including 911, in all 50 states, the District of Columbia and U.S. territories.

FIRSTNET

A nationwide public safety cellular network to promote communications among first responders and those who support them.

Governance

In the context of 911, governance pertains to the authorities—including federal, state, county, and municipal governments, police jurisdictions, and for-profit companies—contracted by a municipality, that put forth statutes, policies, protocols, and accountability mechanisms to

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promote effective and efficient emergency communications and response, including service reliability, interoperability, and cyber security.

Hispanic American Police Command Officers Association (HAPCOA)

A national association representing Hispanic-American command officers from law enforcement and criminal justice agencies at the municipal, county, state, and federal levels.

Industry Council for Emergency Response Technologies (iCERT)

An association representing vendors of public safety and emergency response technologies.

Internet of Things (IoT)

The interconnection via the internet of physical objects—“things”—that are embedded with sensors, software, and other capabilities, enabling them to send and receive data and potentially communicate with each other.

Interoperability

The capability for disparate systems to communicate with one another.

Key Performance Indicators (KPIs)

Quantifiable metrics that are (or could be) used to define and measure success and failure within emergency response.

Landline

A colloquial term for the Public Switched Telephone Network access via an actual copper or fiber optic transmission line that travels underground or on telephone poles. Used to differentiate traditional telephonic communication from the "wireless" connectivity of a cellular or Internet-based device.

Land Mobile Radio System (LMRS)

A wireless communications system that uses portable and mobile devices to allow for two-way digital radio communications.

Long-Term Evolution (LTE)

The emergent technological network that allows for increased capacity and for large volumes of data to be exchanged over wireless networks.

National Suicide Prevention Lifeline (LIFELINE)

A national network of local crisis centers that provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. Effective July 16, 2022, LIFELINE will be accessible nationwide by dialing 988.

Low-Level Crimes

Generally considered to be minor offenses that do not involve the physical harm of another person, including misdemeanors, petty crimes, and crimes of survival.

National Association of State 911 Administrators (NASNA)

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An association of state 911 program administrators whose focus is to facilitate the success of 911 programming at the state, territory, and district level.

National Emergency Number Association (NENA)

An association established to improve 911 through research, standards development, training, education, outreach, and advocacy.

Next Generation 911 (NG911)

A digital or Internet Protocol (IP)-based 911 system that is currently being implemented across the U.S. to promote interoperability among emergency systems; enable 911 to be more reliable and responsive to widespread emergencies, natural disasters, and call overload; and to provide an avenue for the receipt of videos, photos, and text messages shared by 911 users.

National Highway Traffic Safety Administration (NHTSA)

A federal agency within the Department of Transportation whose mission is to promote transportation safety in the United States.

National Organization of Black Law Enforcement Executives (NOBLE)

An international association representing represent Black chief executive officers and command-level law enforcement officials from federal, state, county, municipal law enforcement agencies, and criminal justice practitioners.

On-Scene Response

Policies, practices, and analyses related to 911 and alternative hotline response tactics by police, EMS, fire, and alternative responders who are dispatched to the scene.

Public Safety Answering Point (PSAP)

The technical name for a 911 call center, also known as an Emergency Communications Center (ECC). Each PSAP represents a district or geographic area, such as a county, city, region, or independently bounded area. The preferred term is Emergency Communications Center.

Public Safety Telecommunicator (PST)

A term referring to 911 call takers, who answer 911 calls, and 911 dispatchers, who receive information from call takers and then deploy responders to the scene of an event. The preferred term is 911 Professional.

Smart911

A for-profit platform that enables voluntary users to enter information about themselves and other members of their household, including pets, into the platform to be stored for retrieval by ECCs.

Teletypewriter Devices for the Deaf (TTY)

The technology designed to enable non-hearing individuals to communicate by text via a telephone landline.

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Voice over Internet Protocol (VoIP)

Internet Protocol (IP)-based systems that rely on broadband internet rather than the public switched telephone network (PSTN) and have the ability to transmit multimedia messages in addition to voice calls. This is the major component of NG911.

Use of Force

Police officer use of physical means to compel compliance, including officer-involved shooting, taser use, and use of restraints.

Chapter One: 911 Professional Career and Supports

Introduction

911 professionals¹—the operators, call takers, call handlers, and dispatchers in Emergency Communications Centers (ECCs)² throughout the United States—collectively respond to an enormous call load, estimated at 240 million calls annually.³ This workload has increased considerably in recent years, with over half of all ECCs surveyed in 2017 reporting an uptick in the number of dispatched calls.⁴ Staffing has not kept pace with increased demand for emergency services,⁵ which has further spiked during the COVID-19 pandemic.⁶ Much is asked of these 911 professionals, who are tasked with supporting people who are seeking information and guidance, navigating problems and conflicts, and experiencing crises and victimizations, often collecting information from a frightened or confused caller in a short conversation. With each incoming call, 911 professionals must be prepared to pivot to meet the needs of the caller. This may involve patiently assisting a senior experiencing problems with medication, calming a distressed mother whose tween has yet to return home from school, or responding empathetically to a traumatized victim of violence. Each call requires a different set of strategies. Regardless of the nature of the call, each one can be stressful from the perspective of the 911 professional and can be life-changing from the perspective of the caller and others.

In essence, 911 professionals are America’s true first responders, serving as gatekeepers to law enforcement, fire, and emergency medical services (EMS) responses to community calls for service, and applying their best judgment to discern the appropriate response. 911 professionals are required to understand and comply with a wide array of policies for how to handle specific call types. They also have a critical role in preparing responders—particularly police officers—to arrive on the scene in a manner that protects their safety without predisposing them to approach difficult events in a way that reflects implicit or explicit biases or aggravates the risk that responders will use excessive force. 911 professionals may also be able to reduce reliance on law enforcement, dispatching responses from social workers or mental health clinicians instead of police officers when appropriate.

¹ Bureau of Labor Statistics, “Occupational Outlook Handbook: Public Safety Telecommunicators,” accessed October 28, 2021, <https://www.bls.gov/ooh/office-and-administrative-support/police-fire-and-ambulance-dispatchers.htm>

² These entities are referred to by some as Public Safety Answering Points (PSAPs).

³ National Emergency Number Association, “9-1-1 Statistics,” accessed November 22, 2021, <https://www.nena.org/page/911Statistics>.

⁴ APCO International, “Project RETAINS: Staffing and Retention in Public Safety Answering Points (PSAPs): A Supplemental Study,” 2017, <https://www.apcointl.org/services/staffing-retention/>; C. Scott, “911 Has Its Own Emergency: Not Enough Call Takers and Dispatchers,” KDVR, May 24, 2021, <https://kdvr.com/news/local/not-enough-911-call-takers-and-dispatchers/>.

⁵ APCO International, “Project RETAINS.”

⁶ Rachel Cardin, “911 Calls Surge With COVID-19 Cases, Thinly Staffed Firefighters Struggle To Keep Up,” CBS Baltimore, November 21, 2021, <https://baltimore.cbslocal.com/2021/12/27/911-calls-surge-with-covid-19-cases-as-firefighters-struggle-to-keep-up/>; Gwynne Hogan, “NYC EMS Faces Record Staffing Shortage As 911 Calls For COVID-Like Symptoms Surge,” Gothamist, December 29, 2021, <https://gothamist.com/news/nyc-ems-faces-record-staffing-shortage-911-calls-covid-symptoms-surge>; Amanda Hari, “San Francisco Overwhelmed by 911 COVID-19 calls,” KRON4, January 8, 2022, <https://www.kron4.com/news/bay-area/san-francisco-overwhelmed-by-911-covid-19-calls/>.

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This chapter describes the various roles 911 professionals play, with a focus primarily on those whose work includes interacting with police dispatchers and responders. After describing the current landscape of 911 professional recruitment, training, and retention, the research evidence on these topics as well as the job satisfaction and degree of stress experienced by 911 professionals is presented. The research questions at the end of this chapter put forth several important areas of inquiry that can inform strategies to improve the experiences and effectiveness of 911 professionals.

Types of 911 Professionals

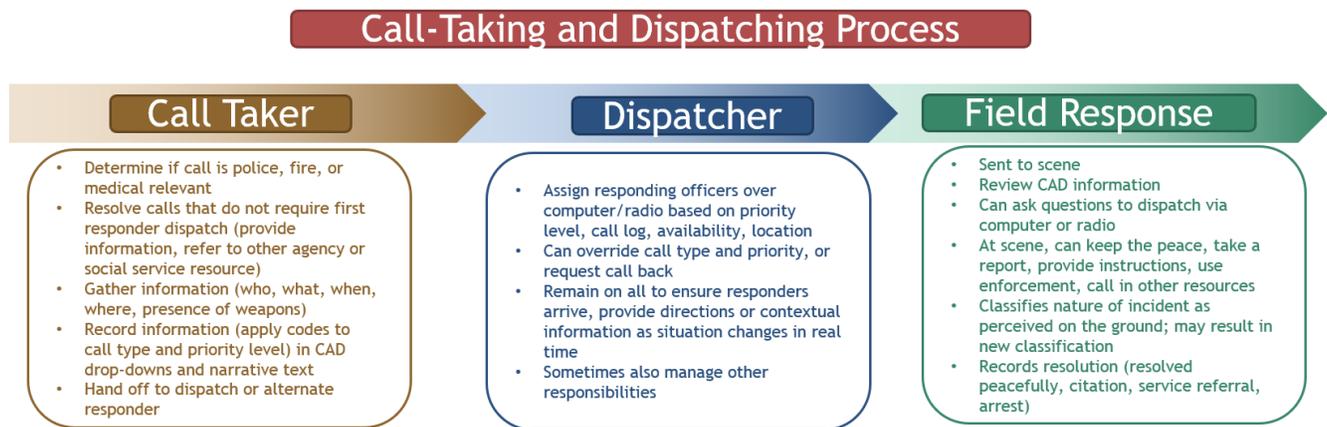


Figure 1.1: Call-Taking and Dispatching Process

Call takers, also known as call handlers, telecommunicators, or operators in some locations, receive public requests for assistance via phone call, text message, or alarm system alert. Call takers assess the reason for and exigent nature of each call. They may resolve the call on their own by providing information or guidance to the caller, or they may refer it to a dispatcher or to another information or resource line. Recent research on the largest ECCs in the country found that call takers resolved half of all calls without having to refer to dispatch, by engaging in informal counseling and problem solving.⁷ They also resolved one third of calls pertaining to property crimes and disorders that were not vice-related, and 22 percent of traffic-related calls.⁸ As such, call takers play a critical role in diverting calls from police response.⁹

Dispatchers direct field responders to crime scenes and other incident sites, and provide crucial information about the context of the event and any changing dynamics that unfold until responders arrive and the issue is resolved. Dispatchers communicate with and monitor the progress of emergency unit responders and provide instructions, such as first aid advice and how to remain safe, to the caller until the response unit arrives.¹⁰ In larger call centers, the roles of call taker and dispatcher are distinct

⁷ Lum et al., "Constrained Gatekeepers."

⁸ Lum et al., "Constrained Gatekeepers."

⁹ Melissa Reuland, "A Guide to Implementing Police-based Diversion Programs for People with Mental Illness," Rockville, MD: U.S. Department of Health and Human Services Substance Abuse and Mental Health Service Administration GAINS Center – Technical Assistance and Policy Analysis Center for Jail Diversion, 2004, <https://perma.cc/LGM2-9S6G>.

¹⁰ Bureau of Labor Statistics, "Occupational Outlook Handbook," September 15, 2021. <https://www.bls.gov/ooh/>.

and represent a career progression, whereas in smaller call centers one individual may serve in both roles owing to limited staff resources.¹¹

While the job of 911 professional is occupationally categorized as administrative,¹² this designation misrepresents the true nature of this work. Studies have documented the complex and challenging nature of 911 jobs, which require strong communication skills, nuanced judgments, the technical literacy to interact with computer-aided dispatch systems, and the ability to faithfully comply with a dizzying array of policies.¹³ 911 professionals are tasked with navigating critical situations that, particularly in smaller call center service areas, may involve their own colleagues, friends, and family members as both callers in need and field responders.¹⁴ Importantly, the way in which 911 professionals interpret and resolve calls has implications for how field responders perceive the level of risk and nature of the incident. These communications could predispose responders to behave in certain ways that, in the best-case scenario, support the safe and efficient resolution for all parties, or—in the worst case—inadvertently prompt unnecessary force or aggravate racial or other biases.¹⁵ Indeed, studies examining the nature of exchanges between callers and 911 professionals suggest that these interactions may compromise decision-making on the part of both 911 professionals and officers.^{16,17,18}

State of Practice

Prior to the 1968 establishment of 911, call takers and dispatchers handling emergency calls for service had little to no training.¹⁹ The field was already populated primarily by women (referred to as the “feminization of dispatch”²⁰) who were relegated as “complaint clerks” and lacked the authority to designate which calls warranted police response.²¹ The rapid proliferation of 911²² prompted the field to become more formalized in terms of training and professionalization, particularly in the area of emergency medical dispatch, as the recognition of the life-saving aspects of both effective triage and verbal guidance (also known as “pre-arrival instructions”) by 911 professionals grew.²³

¹¹ S. Rebecca Neusteter et al., “Understanding Police Enforcement: A Multicity 911 Analysis,” Vera Institute of Justice, September 2020, <https://www.vera.org/publications/understanding-police-enforcement-911-analysis>.

¹² Bureau of Labor Statistics, “Occupational Outlook Handbook.”

¹³ Heidi Kevoe-Feldman and Anita Pomerantz, “Critical timing of actions for transferring 911 calls in a wireless call center,” *Discourse Studies* 20, no. 4 (2018): 488-505; Balakrishnan S. Manoj and Alexandra Hubenko Baker, “Communication challenges in emergency response,” *Communications of the ACM* 50, no. 3 (2007): 51-53, <https://doi.org/10.1145/1226736.1226765>.

¹⁴ Roberta Mary Troxell, “Indirect exposure to the trauma of others: The experiences of 9-1-1 telecommunicators,” (PhD diss., University of Illinois at Chicago, 2008), <https://uic.figshare.com/account/projects/71123/articles/10898648>.

¹⁵ Roge Karma, “Want to fix policing? Start with a better 911 system,” *Vox*, August 10, 2020, <https://www.vox.com/2020/8/10/21340912/police-violence-911-emergency-call-tamir-rice-cahoots>.

¹⁶ Don H. Zimmerman, “Talk and its Occasion: The Case of Calling the Police,” in *Meaning, Form and Use in Context: Linguistic Applications*, ed. D. Schiffrin (Washington, D.C.: Georgetown University Press, 1984): 210-228.

¹⁷ Don H. Zimmerman, “The Interactional Organization of Calls for Emergency Assistance,” in *Talk at Work: Social Interaction in Institutional Settings*, ed. P. Drew & J. Heritage (Cambridge, UK: Cambridge University Press, 1992), 418.

¹⁸ Angela Cora Garcia and Penelope Ann Parmer, “Misplaced mistrust: The collaborative construction of doubt in 911 emergency calls,” *Symbolic Interaction* 22, no. 4 (1999): 297-324.

¹⁹ Isabel Gardett et al., “Past, Present, and Future of Emergency Dispatch Research: A Systematic Literature Review,” *Annals of Emergency Dispatch & Response* 29 (2016): 29-42, <https://perma.cc/SQ3N-DEQW>; S. Rebecca Neusteter et al., “Understanding Police Enforcement.”

²⁰ Jessica W. Gillooly, “How 911 callers and call-takers impact police encounters with the public: The case of the Henry Louis Gates Jr. arrest,” *Criminology & Public Policy* 19, no. 3 (2020): 787-804, <https://doi.org/10.1111/1745-9133.12508>.

²¹ Jessica W. Gillooly, “Police Encounters.”

²² Industry Council for Emergency Response Technologies (iCERT), *History of 911 and What It Means for the Future of Emergency Communications* (Washington, DC: iCERT, 2015), 3, <https://perma.cc/YL97-9J9C>.

²³ Gardett et al., “Past, Present, and Future.”

As technological advances in 911 have evolved, so too has the sophistication of the 911 profession. The establishment of Enhanced 911 (E911) in the mid-1970s brought with it selective routing and the ability to discern the location and phone number of the caller, with selective transfer and alternate routing soon following.²⁴ These features enabled ECCs to automate aspects of their triage and dispatching processes, and required 911 professionals to possess the skills needed to navigate the new software systems and complex decision trees that accompanied them.

The field has continued to evolve, aided in part by the development of call-taking standards. The National Emergency Number Association (NENA) developed customizable Law Enforcement Dispatch Guide cards²⁵ and the Association of Public Safety Communications Officials (APCO) offers triage protocols that draw from the 911 professionals' experience and judgment.²⁶ Relatedly, the Advanced Medical Protocol Dispatch System developed by the International Academies of Emergency Dispatch is widely used by emergency medical service 911 professionals.²⁷

Training certification and state training requirements have also enhanced the expertise of 911 professionals, who may be certified as emergency medical, fire, or police dispatchers, with some 911 professionals certified for two or all three of these roles.²⁸ Managers and supervisors can also obtain certification as emergency number professionals or certified public-safety executives.²⁹ Training requirements vary considerably by state and municipality, as does compensation. While APCO International provides minimum training standards for 911 professionals, along with training and technical assistance, compliance with these standards is optional. It is unclear what share of ECCs adopt these standards.

In a survey conducted in 2019, about three in four of the 48 reporting states and territories indicated statewide minimum training requirements for 911 professionals overall, an increase from two-thirds in 2018.³⁰ Just 44 percent indicated statewide minimum training standards specifically for police dispatch.³¹ Even among states that have minimum training requirements, standards vary considerably. North Carolina, for example, mandates a minimum of 47 hours of training,³² whereas California requires 120 hours of classroom setting before simulation and sit-along training can commence.³³

911 professionals also report insufficient training and lack of available resources with which to divert calls related to mental health concerns. A recent survey of ECCs across 27 states found that few 911

²⁴ iCERT, "History of 911."

²⁵ National Emergency Number Association PSAP Operations Committee 9-1-1 Call Processing Working Group, "NENA Standard for 9-1-1 Call Processing," April 16, 2020,

https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/nena-sta-020.1-2020_911_call.pdf.

²⁶ APCO International, "Guidecards," accessed December 3, 2021, <https://www.apcointl.org/services/guidecards/>.

²⁷ Jeff. J. Clawson, "The DNA of Dispatch: The Reasons for a Unified Medical Dispatch Protocol," *Journal of Emergency Medical Services*, 1997, <https://perma.cc/5X87-4QQ9>; Neusteter et al., "Understanding Police Enforcement."

²⁸ 911.gov, "Telecommunicators & Training," accessed December 3, 2021,

https://www.911.gov/issue_telecommunicatorsandtraining.html.

²⁹ 911.gov, "Telecommunicators & Training."

³⁰ 911.gov, "National 911 Annual Report 2019," 2020, https://www.911.gov/pdf/National_911_Annual_Report_2019_Data.pdf.

³¹ 911.gov, "National 911 Annual Report 2019."

³² North Carolina Department of Justice, "Minimum Training Standards: Telecommunicators," NC DOJ, September 5, 2019,

<https://ncdoj.gov/law-enforcement-training/sheriffs/training-requirements/minimum-training-standards-telecommunicators/>.

³³ North Carolina Department of Justice, "Minimum Training Standards: Telecommunicators."

professionals were trained in how to handle behavioral crisis calls – about one in five lacked specialized resources, such as behavioral health clinicians, crisis-trained 911 professionals or field responder staff, or mobile crisis units.³⁴

Uneven certification requirements may explain the wide range of compensation for various 911 professional roles. According to the U.S. Bureau of Labor Statistics (BLS), the median annual salary for public safety communicator was \$43,290 in 2020.³⁵ However, the website ZipRecruiter illustrates the range of pay by geography, placing the average annual salary for a 911 dispatcher (a higher-level subcategory of 911 professionals) at \$48,232, with a high of \$53,650 in New York to a low of \$35,408 in North Carolina.³⁶

Issues of insufficient compensation collide with increases in calls for 911 and challenges in recruiting and retaining 911 professionals. BLS projects that the number of 911 professional jobs will grow by eight percent between 2020 and 2030.³⁷ Similarly, a 2017 study found that over half of all ECCs have experienced an increase in the number of dispatched calls, with all experiencing staffing challenges.³⁸ The report also noted the mounting issue of staff attrition, with an average 911 professional retention rate of only 71 percent. Study authors conjectured that recruitment is becoming more difficult given that millennials desire more flexible work hours and are less likely to trust governmental institutions.³⁹

Efforts to reclassify 911 professionals from administrative staff to emergency responders could go a long way to further professionalize the field, increase pay equity, and attract new 911 professionals while retaining seasoned staff. However, efforts to lobby the Office of Management and Budget have been unsuccessful.⁴⁰ Related legislation passed the House of Representatives in 2019 but died in the Senate.⁴¹ This reclassification bill was reintroduced in April 2021.⁴²

Research Evidence

Attending to 911 professionals' training, support, and needs is essential to promote public safety while minimizing unintended, harmful, and inequitable outcomes. The research evidence on this topic, while largely descriptive, pinpoints issues and challenges along with potential remedies.

³⁴ Pew Charitable Trusts, "911 Call Centers Lack Resources to Respond to Behavioral Health Crises," 2021, <https://www.pewtrusts.org/-/media/assets/2021/11/911-call-centers-lack-resources-to-handle-behavioral-health-crises.pdf>.

³⁵ Bureau of Labor Statistics, "Outlook: Public Safety Telecommunicators."

³⁶ ZipRecruiter, "Q: What Is the Average 911 Dispatcher Salary by State in 2021?," accessed December 3, 2021, <https://www.ziprecruiter.com/Salaries/What-Is-the-Average-911-Dispatcher-Salary-by-State>.

³⁷ Bureau of Labor Statistics, "Outlook: Public Safety Telecommunicators."

³⁸ APCO International, "Project RETAINS."

³⁹ APCO International, "Project RETAINS."

⁴⁰ RadioResource International, "Public Safety Groups Disappointed with OMB Decision not to Reclassify Telecommunicators," November 29, 2017, <https://www.rmediagroup.com/News/NewsDetails/NewsID/16275/>.

⁴¹ Andrea Fox, "House Passes 911 Dispatcher Reclassification," Gov1, July 18, 2019, <https://www.gov1.com/public-safety/articles/house-passes-911-dispatcher-reclassification-ZfQcPEwENt43G6m2/>.

⁴² Laura French, "Legislators Reintroduce Bill to Change Job Classification of 911 Dispatchers Nationwide," EMS1, April 1, 2021, <https://www.ems1.com/communications-dispatch/articles/legislators-reintroduce-bill-to-change-job-classification-of-911-dispatchers-nationwide-ujPF8hi3WCbVIJcR/>.

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Recruitment, Retention, and Training

Given increased demands for 911 services and continued staffing difficulties experienced by ECCs, research on recruitment, retention, and training is particularly important.

Recruitment and Retention

Academic studies of effective recruitment strategies for 911 professionals are virtually nonexistent. A 2017 APCO International survey of ECCs identified workplace flexibility, supervisor and coworker support, employee recognition, opportunities for promotion, and sufficient compensation as key factors in both recruitment and retention.⁴³

Training

Apart from how to handle calls pertaining to cardiac arrest, the topic of 911 professional training has garnered scant research attention. A systematic review of 149 studies pertaining to emergency dispatch research unearthed just two studies of training program efficacy, one in Sweden⁴⁴ and the other in Belgium.⁴⁵ Both studies found that quality assurance processes improved dispatch outcomes; however, one focused solely on cardiac arrest calls, and both are decades old.⁴⁶

Training is important to ensure that 911 professionals comply with triaging and dispatching protocols. There is, however, a tradeoff between fidelity and competence in such protocols. Overly rigid policies can inhibit the ability of 911 professionals to apply experience-informed judgment regarding appropriate response. A recent study found that while 911 professionals resolve a large share of calls without need for officer dispatch, their decision-making is constrained by policies that require them to forward certain calls to dispatch based on event code, and sometimes these policies are even automated within the CAD system.⁴⁷ On the other hand, a lack of training may lead some 911 professionals to interpret calls in an inappropriately alarmist manner that can signal to police responders that the incident is a higher public safety threat than it actually is.⁴⁸

The types of calls that often require dispatch in accordance with ECC policies include domestic incidents, mental health concerns, and suspicious persons – many of the same call types that are associated with charges of excessive force and biased policing.⁴⁹ In some cases, a caller may demand and receive police response, even if that response conflicts with agency policy based on the nature of the event.⁵⁰ This is not to suggest that 911 professionals should be afforded full reign in deciding which calls to forward to dispatch. Even with the benefit of professional judgment, 911 professionals may interpret and communicate with callers and field responders in ways that negatively influence decisions

⁴³ APCO International, “Project RETAINS.”

⁴⁴ Bo Brismar et al., “Training of Emergency Dispatch-Center Personnel in Sweden,” *Critical Care Medicine* 12, no. 8 (1984): 679-680, <https://doi.org/10.1097/00003246-198408000-00017>.

⁴⁵ Paul A. Calle et al., “Do Victims of an Out-of-Hospital Cardiac Arrest Benefit from a Training Program for Emergency Medical Dispatchers?,” *Resuscitation* 35, no. 3 (1997): 213-218.

⁴⁶ Gardett et al., “Past, Present, and Future.”

⁴⁷ Lum et al., “Constrained Gatekeepers.”

⁴⁸ Jessica W. Gillooly, “‘Lights and Sirens’: Variation in 911 Call-Taker Risk Appraisal and its Effects on Police Officer Perceptions at the Scene,” *Journal of Policy Analysis and Management* (December 2021), <https://doi.org/10.1002/pam.22369>

⁴⁹ Gillooly, “Lights and Sirens.”

⁵⁰ Gillooly, “Lights and Sirens.”

surrounding whether an officer is dispatched and how the officer perceives the event.^{51,52,53} This can produce misinterpretations of the level of risk and yield biased outcomes.^{54,55,56} Training that employs concepts consistent with the tenets of procedural justice may effectively reduce these unintended outcomes,⁵⁷ but has not been subject to evaluation.

Job Satisfaction, Stress, and Resilience Factors

Surveys indicate that most 911 professionals take great pride in their work, reporting relatively high job satisfaction and “compassion satisfaction,” the positive feelings one derives from helping others.⁵⁸ That said, 911 professionals face significant job stresses owing to the nature of the role, with one survey finding that respondents were exposed to roughly three in four types of traumatic events during the course of their careers.^{59,60} 911 professionals are exposed to trauma on a daily basis,⁶¹ and such exposure has been associated with compassion fatigue,⁶² burnout, and secondary traumatic stress.⁶³ Other studies have found that stress levels and rates of post-traumatic stress disorders (PTSD) are higher among 911 professionals than among police officers or the general population,⁶⁴ with dispatchers who report low job satisfaction more likely to experience burnout.⁶⁵ Indeed, another study of 911 professionals found that they had greater rates of occupational burnout than members of the general public.⁶⁶

⁵¹ Zimmerman, “Talk and its Occasion.”

⁵² Zimmerman, “Interactional Organization.”

⁵³ Gillooly, “Lights and Sirens.”

⁵⁴ Gillooly. “Police Encounters.”

⁵⁵ M.R. Whalen & D.H. Zimmerman, “Describing Trouble: Practical Epistemology in Citizen Calls to the Police,” *Language in Society* 19, no. 4, 465–492. doi:10.1017/S0047404500014779.

⁵⁶ Garcia and Parmer, “Misplaced Mistrust.”

⁵⁷ Michaela Flippin et al., “The Effect of Procedural Injustice During Emergency 911 Calls: A Factorial Vignette-based Study,” *Journal of Experimental Criminology* 15, no. 4 (2019): 651–660 <https://doi.org/10.1007/s11292-019-09369-y>; Megan Quattlebaum, et al., “Principles of Procedurally Just Policing,” The Justice Collaboratory at Yale Law School, January, 2018, https://law.yale.edu/sites/default/files/area/center/justice/principles_of_procedurally_just_policing_report.pdf.

⁵⁸ Erik C. Cerbulis, “Job Attitudes of 911 Professionals: A Case Study of Turnover Intentions and Concerns Among Local Governments Throughout Central Florida,” Masters thesis, University of Central Florida (2001): 225. <https://stars.library.ucf.edu/honorstheses1990-2015/225>.

⁵⁹ Michelle M. Lilly and Heather Pierce, “PTSD and Depressive Symptoms in 911 Telecommunicators: The Role of Peritraumatic Distress and World Assumptions in Redicting Risk,” *Psychological Trauma: Theory, Research, Practice, and Policy* 5, no. 2 (2013): 135-141, <https://doi.org/10.1037/a0026850>.

⁶⁰ Heather Pierce and Michelle M. Lilly, “Duty-related Trauma Exposure in 911 Telecommunicators: Considering the Risk for Posttraumatic Stress,” *Journal of Traumatic Stress* 25, no. 2 (2012): 211-215. <https://doi.org/10.1002/jts.21687>; Michelle M. Lilly and Christy E. Allen, “Psychological Inflexibility and Psychopathology in 9-1-1 Telecommunicators,” *Journal of Traumatic Stress* 28, no. 3 (2015): 262-266.

⁶¹ Dana Marie Dillard, “The Transactional Theory of Stress and Coping: Predicting Posttraumatic Distress in Telecommunicators,” PhD diss., Walden University (2019), <https://scholarworks.waldenu.edu/dissertations/6719/>.

⁶² Elizabeth Belmonte et al., “The Impact of 911 Telecommunications on Family and Social Interactions,” Gov1, February 5, 2020, <https://www.gov1.com/emergency-management/articles/the-impact-of-911-telecommunications-on-family-and-social-interactions-t4fHEXWZMJCLfPdz/>.

⁶³ Troxell, “Indirect Exposure to Trauma.”

⁶⁴ Lilly and Allen, “Psychological Inflexibility;” Sandra L Ramey et al., “Evaluation of Stress Experienced By Emergency Telecommunications Personnel Employed in a Large Metropolitan Police Department,” *Workplace Health & Safety* 65, no. 7 (2017): 287-294; Cheryl Regehr et al., “Predictors of Physiological Stress and Psychological Distress in Police Communicators,” *Police Practice and Research* 14, no. 6 (2013): 451-463.

⁶⁵ Tod. W. Burke, “Dispatcher Stress and Job Satisfaction,” in *Protect Your Life: A Health Handbook for Law Enforcement Professionals*, ed. Davidson C. Umeh (Rockville: Looseleaf Law Publications, 1999), 79-86, <https://www.ncjrs.gov/pdffiles1/Photocopy/143957NCJRS.pdf>.

⁶⁶ Benjamin Trachik et al., “Is Dispatching to a Traffic Accident as Stressful as Being in One? Acute Stress Disorder, Secondary Traumatic Stress, and Occupational Burnout in 911 Emergency Dispatchers,” *Annals of Emergency Dispatch & Response* 3, No. 3 (2015): 27-38, <https://www.aedrjournal.org/is-dispatching-to-a-traffic-accident-as-stressful-as-being-in-one-acute-stress-disorder-secondary-traumatic-stress-and-occupational-burnout-in-911-emergency-dispatchers>.

Some stresses experienced by 911 professionals are likely born of the nature of shift work, which has been associated with a large array of mental and physical health risks including obesity, sleep disorders, diabetes, anxiety, depression, and cardiovascular disease.⁶⁷ The high vacancy rates in many ECCs can result in forced overtime, which may exacerbate these outcomes, creating disruptions in work routines and further compounding stress, compromising occupational wellness, and reducing retention. One study identified a rate of obesity among a sample of 911 professionals that was 50 percent higher than that of the general population, and identified a strong relationship between poor physical health and compromised mental health among 911 professionals.⁶⁸ Other research indicates that 911 professionals who felt over-extended had high levels of stress, and those who had greater abilities to recognize and process their stressful experiences and emotions had lower stress levels.⁶⁹

911 professional positions are primarily held by women, who disproportionately operate as their households' primary caregivers, and may find both shift work and the nature of the job particularly stressful.⁷⁰ A survey of a convenience sample of 911 professionals nationwide, resulting in 103 respondents, found that work-family conflict—described as the degree to which demands at work conflict with demands at home—was a significant predictor of PTSD symptoms, and emphasized that employee-focused policies and supports are essential to preserving a healthy work-life balance.⁷¹

Questions for Inquiry and Action

The research on 911 professionals is extremely limited. It is focused primarily on emergency medical responders rather than police dispatchers, and is typically conducted in a single jurisdiction or ECC. Even the more rigorous dispatch studies are largely retrospective, given the difficulties in conducting randomized controlled trials in emergency-driven settings.⁷² Research specific to 911 professionals is largely descriptive, suffers from small sample sizes, or is entirely qualitative.

There are similar evidence gaps regarding the relative merits and impacts of various call-taking protocols, training and certification processes, and quality assurance and performance measurement standards. These evidence gaps call for increased partnerships between researchers and ECC administrators and operations personnel to build a more robust knowledge base.⁷³

Research questions that, if answered rigorously, would fill critical knowledge gaps include the following:

⁶⁷ Malcolm J. Harrington, "Health Effects of Shift Work and Extended Hours of Work." *Occupational and Environmental Medicine* 58, no. 1 (2001): 68-72; Kate Sparks et al., "The Effects of Hours of Work on Health: a Meta-Analytic Review," *Journal of Occupational and Organizational Psychology* 70, no. 4 (1997): 391-408, <https://doi.org/10.1111/j.2044-8325.1997.tb00656.x>.

⁶⁸ Michelle M. Lilly et al., "Predictors of Obesity and Physical Health Complaints Among 911 Telecommunicators," *Safety and Health at Work* 7, no. 1 (2016): 55-62, <https://doi.org/10.1016/j.shaw.2015.09.003>.

⁶⁹ Hendrika Meischke et al., "An Exploration of Sources, Symptoms and Buffers of Occupational Stress in 9-1-1 Emergency Call Centers," *Annals of Emergency Dispatch and Response* 3, no. 2 (2015): 28-35, <https://www.aedrjournal.org/an-exploration-of-sources-symptoms-and-buffers-of-occupational-stress-in-9-1-1-emergency-call-centers>.

⁷⁰ Lilly et al., "Predictors of obesity;" Lilly and Pierce, "PTSD in 911 telecommunicators;" Pierce and Lilly, "Trauma Exposure in Telecommunicators."

⁷¹ Dillard, "Predicting Posttraumatic Distress in Telecommunicators."

⁷² Gardett et al., "Past, Present, and Future."

⁷³ Gardett et al., "Past, Present, and Future."

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- To what extent do existing training opportunities meet the needs of both 911 professionals and the demands of the job? Why do some 911 professionals pursue in-service training opportunities while others do not? What is the impact of certification and training requirements on 911 professionals' capabilities and job performance, particularly with regard to resolving calls on their own and adherence to triage and dispatching policies and protocols?
- What are the most effective recruitment and retention strategies for 911 professionals? How does the effectiveness of these strategies vary by age, sex, geography, and other factors?
- To what degree does reclassification of 911 professionals from administrative to first responder facilitate recruitment and retention, increased job satisfaction, pay equity, and improve retention rates?
- To what degree does reclassification of 911 professionals from administrative to first responder facilitate better outcomes for field responders and for people who are the subject of calls?
- What would be the budgetary impact—both for independent multi-jurisdiction ECCs and for public safety agencies that manage emergency calling services—of creating career and compensation parity for 911 professionals on par with those for field responders and public safety officers?
- What are the impacts of improvements to 911 professionals' supervision, wellness supports and resources, and compensation levels on their job satisfaction, job performance, and tenure?
- To what degree does co-location of nurses, mental health clinicians, or social workers at ECCs facilitate safer and more effective safety and health outcomes for people in need?
- To what extent would increased community awareness of and access to behavioral health resources and supports allow 911 professionals to divert more calls from police response?
- What internal (e.g., personality, coping) and external (e.g., work conditions, shift) factors increase the likelihood of resilience among 911 professionals?
- What is the impact of training 911 professionals in implicit bias and procedurally-just interactions with members of the public as measured by rate of 911 professional call resolution, share of calls resulting in police dispatch, nature of police response, and public safety and wellness outcomes?
- What are the advantages and disadvantages of giving 911 professionals more agency to divert calls from police dispatch? What is the impact of such diversion on public safety outcomes, use of excessive force, racial disparate policing, and community trust in the police?

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Chapter 2: Alternative First Responders

Introduction

The public dials 911 for a wide array of issues, not all of which are serious or urgent in nature. Many are requests for information that are handled by call takers or referred to other agencies or local nonprofits,¹ while others result in a responder being dispatched to the scene. Yet in most jurisdictions, call takers have just three options when choosing a responder: police, fire, or emergency medical services.

Even in jurisdictions that have alternatives to these three types of responders, such as mental health clinicians or mobile crisis units, call taker awareness of those resources may be limited owing to a lack of training or poor coordination between emergency communications centers (ECCs) and social and health services entities.² As a result, police dispatch is the default response to many calls for service, despite the fact that officers are not trained as social workers or behavioral health professionals. This “police first” response model places a strain on police resources, increases the odds that problems will be met with an enforcement-oriented response, and potentially exacerbates racial disparities in those responses.³

When it comes to calls for police service specifically, estimates from a five-site study suggest that the most frequent incident type is noncriminal in nature, with four in five calls pertaining to a complaint or request for an officer to perform a welfare check.⁴ A more recent nine-site study found that the vast majority of calls for service are for non-violent and non-life-threatening events.⁵ Similar findings have been replicated in studies of individual jurisdictions: in Philadelphia, about four percent of calls for service involve violent crime⁶ and approximately 65 percent of calls do not need an armed response;⁷ in San Antonio, 39 percent of calls are of the lowest priority level, with the vast majority pertaining to traffic incidents;⁸ and in Seattle, 80

¹ Cynthia Lum et al., “Constrained Gatekeepers of the Criminal Justice Footprint: A Systematic Social Observation Study of 9-1-1 Calltakers and Dispatchers.” *Justice Quarterly*, 37:7, 1176-1198, DOI: 10.1080/07418825.2020.1834604.

² Pew Charitable Trusts. “New Research Suggests 911 Call Centers Lack the Resources to Handle Behavioral Health Crises,” October, 2021. https://www.pewtrusts.org/-/media/assets/2021/10/mjh911callcenter_final.pdf.

³ S. Rebecca Neusteter et al., “Understanding Police Enforcement: A Multicity 911 Analysis,” Vera Institute of Justice, September 2020, <https://www.vera.org/publications/understanding-police-enforcement-911-analysis>.

⁴ Neusteter et al., “Understanding Police Enforcement.”

⁵ Cynthia Lum et al., “Can We Really Defund the Police? A Nine-Agency Study of Police Response to Calls for Service,” *Police Quarterly* (2021), <https://doi.org/10.1177/10986111211035002>.

⁶ Jeff Asher and Ben Horwitz, “How Do the Police Actually Spend Their Time?” *The New York Times*, June 19, 2020, <https://www.nytimes.com/2020/06/19/upshot/unrest-police-time-violent-crime.html>.

⁷ Jerry H. Ratcliffe. “Policing and Public Health Calls for Service in Philadelphia,” *Crime Science* 10, no. 1 (accessed December 1, 2021): 1-6, <https://doi.org/10.1186/S40163-021-00141-0/FIGURES/4>; Cynthia Lum et al., “Constrained Gatekeepers of the Criminal Justice Footprint: A Systematic Social Observation Study of 9-1-1 Calltakers and Dispatchers,” *Justice Quarterly* 37, no. 7 (2020): 1176-1198, <https://doi.org/10.1080/07418825.2020.1834604>.

⁸ Rob Tillyer and Michael R. Smith, “Public Requests for Assistance from the San Antonio Police Department (SAPD): An Assessment of Calls for Service Received between Jan 2018-Oct 2020,” University of Texas-San Antonio Department of Criminology & Criminal Justice, 2021, <https://www.sanantonio.gov/Portals/47/Files/UTSA-Report-20201-04.pdf?ver=2021-05-06-121643-027>.

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percent of calls pertain to non-criminal events.⁹ These findings underscore the importance of developing a greater array of alternative first responses and complementary community-based resources that focus on wellness and prevention¹⁰ while also developing more effective policing practices in response to the current climate of rising violent crime.¹¹ The question of who can respond instead of—or in ways that complement—police has become more pressing in the current policy moment, particularly given national efforts to assess and address racial biases in all aspects of the criminal legal system.¹²

Traditional responses to calls to 911 are not necessarily meeting the needs of the public, who often call 911 for non-emergency matters. As a result, many promising practices have been introduced to provide people with augmented access to appropriate medical, social service, and community resources in lieu of or in addition to police/EMS/fire response.¹³ These alternative responses can be in-person or remote, with the COVID-19 pandemic rapidly expanding the use of telemedicine for emergency services.¹⁴ Alternative responders include non-law enforcement government actors, professionals who accompany traditional responders, contracted community-based organizations, and community collectives. Potential alternative or co-responder approaches may address not only mental health and substance use, but also false alarms, animal control, domestic altercations, traffic, and calls involving low-level crimes. They may also reduce the racially disparate impacts associated with police response to calls pertaining to Black and brown people, although more research is needed to test that hypothesis, particularly given the documented racial disparities in delivery of health services.¹⁵

This review describes program examples of alternative first responder and co-responder models; highlights local jurisdictional efforts to redirect calls from an emergency government response; identifies ways these new responses can both provide a better service to communities and reduce harms to the public; summarizes the research on their implementation and impact; and puts forth research questions that can inform efforts to ensure that alternative responses meet their intended goals. The primary focus is on alternatives or complements to police responses because 911 calls for service are overwhelmingly routed to police for response. This is not because the 911 calls are clearly defined or identifiable as police calls. Rather, dispatching police is often the default for the numerous calls that are not clearly defined, such as “disturbance” and other codes that serve as a catchall for the various reasons people call 911. Indeed, even a fair share of calls to

⁹ City of Seattle, “Report on Reimagining Policing and Community Safety in Seattle,” July 2021,

<https://s3.documentcloud.org/documents/21018129/idt-report-on-reimagining-policing-and-community-safety-in-seattle.pdf>.

¹⁰ Henry Goldman, “As Murders Rise, New York City Turns to a Police Alternative,” *Bloomberg CityLab*, July 30, 2020, <https://www.bloomberg.com/news/articles/2020-07-30/new-york-tries-police-alternatives-to-stop-crime>.

¹¹ David A. Graham, “America Is Having a Violence Wave, Not a Crime Wave,” *The Atlantic*, September 29, 2021, <https://www.theatlantic.com/ideas/archive/2021/09/america-having-violence-wave-not-crime-wave/620234/>.

¹² Chanelle N. Jones, “#LivingWhileBlack: Racially Motivated 911 Calls as a Form of Private Racial Profiling,” *Temple Law Review* 92 (2020): 55-93.

¹³ Matt Delaus, “Alternatives to Police as First Responders: Crisis Response Programs,” Albany Law School Government Law Center, November 16, 2020, <https://www.albanylaw.edu/government-law-center/alternatives-police-first-responders-crisis-response-programs>.

¹⁴ National Highway Traffic Safety Administration, “FICEMS Releases Telemedicine Framework for EMS and 911,” Federal Interagency Committee on Emergency Services (May 2021), https://www.911.gov/pdf/Telemedicine_Framework%20May_2021.pdf.

¹⁵ Ziad Obermeyer et al., “Dissecting Racial Bias in an Algorithm Used to Manage the Health of Populations.” *Science* 366, no. 6464 (2019): 447-453.

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311 leads to police dispatch.¹⁶ As such, some alternative responder models featured in this chapter operate through 311 systems.

Programs that are officer-led and designed to divert people from the criminal justice system (e.g., Law Enforcement Assisted Diversion)¹⁷ as well as those for which responding officers have determined there is a need for referral to social services (e.g., services for survivors of intimate partner violence¹⁸ and supports for survivors of opioid overdoses)¹⁹ are outside of the scope of this review. While these practices may be worthwhile undertakings,^{20,21} they do not typically represent an alternative to 911 or the use of police first responders.²² For a description of other programs that are complementary to but beyond the scope of this chapter, see the Community-Driven Responses textbox.

Figure 2.1: Community-Driven Responses

Numerous other programs and toolkits have been developed in the United States and across the world with the goal of generating options for community-driven responses and alternatives to 911 calls for service. Examples of such programs include the following:

- response units trained and equipped to provide assistance in cases of drug overdose;
- conflict resolution efforts to address situations that are unlikely to result in serious injury or harm (e.g., disputes with neighbors over parked cars or blocked driveways);
- suicide ambulances and ambulatory care akin to the psychiatric nurse response deployed through specialized clinical ambulances in Stockholm, Sweden;²³
- social services that can reasonably respond to community requests for needs, such as requests for food, when callers have no other alternatives to attend to these basic needs; and
- other alternative responses to crime and violence, such as organizations like Rose City Copwatch in Portland, Oregon through their *Alternatives to Police Toolkit*; the *Creative Interventions Toolkit: A Practical Guide to Stop Interpersonal Violence*; the *Safe OUTside the System (SOS) Collective* of the Audre Lorde Project's *Safer Party Toolkit*; and Charleston, SC's *Don't Call The Police*, community-based alternatives to the police.²⁴

¹⁶ Cynthia Lum et al., "Constrained Gatekeepers of the Criminal Justice Footprint: A Systematic Social Observation Study of 9-1-1 Calltakers and Dispatchers," *Justice Quarterly* 37, no. 7 (2020): 1176-1198, <https://doi.org/10.1080/07418825.2020.1834604>; Lorraine Mazerolle et al., "Managing Citizen Calls to the Police: the Impact of Baltimore's 3-1-1 Call System." *Criminology & Public Policy* 2, no. 1 (2002): 97-124.

¹⁷ Dina Perrone et al., "Harm Reduction Policing: An Evaluation of Law Enforcement Assisted Diversion (LEAD) in San Francisco," *Police Quarterly*, November 2021, <https://doi.org/10.1177/10986111211037585>.

¹⁸ Craig D. Uchida et al., "Evaluating a Multi-Disciplinary Response to Domestic Violence in Colorado Springs, 1996-1999," accessed December 21, 2021, <https://www.icpsr.umich.edu/web/NACJD/studies/3282>.

¹⁹ Sarah M. Bagley et al., "A Scoping Review of Post Opioid-Overdose Interventions," *Preventive Medicine* 128 (November 1, 2019), <https://doi.org/10.1016/j.ypmed.2019.105813>.

²⁰ Susan E. Collins et al., "Seattle's Law Enforcement Assisted Diversion (LEAD): Program Effects on Recidivism Outcomes," *Evaluation and Program Planning* 64 (October 1, 2017): 49-56, <https://doi.org/10.1016/j.evalprogplan.2017.05.008>.

²¹ Stan J. Orchowsky, "Evaluation of a Coordinated Community Response to Domestic Violence: The Alexandria Domestic Violence Intervention Project – Final Report," Washington, DC: National Institute of Justice, 1999, <https://www.endvawnow.org/uploads/browser/files/Evaluation%20of%20a%20Coordinated%20Community%20Response.pdf>.

²² One exception is the Fulton County LEAD program for which social service professionals are dispatched via 311. "311 PAD Community Referral Services Flow Chart," Policing Alternatives and Diversion Initiative, accessed Oct. 15, 2021, <https://www.atlantapad.org/s/PAD-311-Community-Referrals-Flow-Chart.pdf>.

²³ The World staff and Carla Hills, "Stockholm's Mental Health Ambulance Could Help the US Rethink Policing," *The World*, September 10, 2020, <https://theworld.org/stories/2020-09-10/stockholms-mental-health-ambulance-could-help-rethink-policing-us>.

²⁴ Neusteter et al., "Understanding Police Enforcement."

These resources offer guidance around alternatives to calling 911 or seeking a police response. Given this intention, they are not a focus of the current review. However, the growing availability and importance of such options in the current landscape renders their growing development and availability noteworthy.

State of Practice: Behavioral Health Crises

Vulnerable populations, including people experiencing homelessness and those living with disabilities or mental and behavioral health disorders, are often subjects of calls to 911, and are at risk of injury or death during police encounters.²⁵ People living with mental health and addiction disorders are overrepresented in arrests that lead to confinement in jails and prisons.²⁶ In the aftermath of the murder of George Floyd in May 2020, the national conversation has focused attention on reducing the police footprint in 911 calls for service regarding low-level crimes, addiction, mental illness, and disability. Also prominent is the call to build and strengthen community-based resources to support individuals in crisis as alternatives to police response.²⁷

Estimates of the number of calls that relate to people experiencing a behavioral health crisis, and how these crises are defined and identified, vary by location and method of assessment. Recent research found that calls pertaining to mental health concerns made up approximately 1.3 percent of the calls where police were dispatched.²⁸ Other analyses have found that 6.5 percent of dispatched calls include a person in mental health crisis.²⁹ These differences may stem from regional variations in coding and notation practices, as well as lack of clarity and missing details about these calls when they come into the 911 ECC.³⁰ Socio-economic or other jurisdictional characteristics, such as availability of resources, may also influence call frequency. Regardless, these low estimates suggest that eliminating the police response to calls that are currently identified as behavioral or mental health-related, and which do not exhibit an emergent violent crime, may not result in a significant reduction in the overall share of calls that lead to police dispatch.³¹

The number of calls, though a meaningful issue for the ECC and responding agencies alike, is not the only metric of interest. For example, agencies report that these calls are time consuming³² and complex, and they can be dangerous. An estimated one in four cases in which people are

²⁵ Fatal Force: Police Shootings Database," *The Washington Post*, accessed Oct 15, 2021, <https://www.washingtonpost.com/graphics/investigations/police-shootings-database/>.

²⁶ Falconer, "Mental Illness and the Criminal Justice System: Issues and Considerations," in *Handbook on Crime and Deviance*, Marvin D. Krohn, Nicole Hendrix, Gina Penly Hall, and Alan J. Lizotte, eds. (New York: Springer Publications, 2019), 419–436.

²⁷ "How these Cities are Breaking Up the Work of Police Departments," accessed Oct 15, 2021, <https://theappeal.org/how-cities-are-defunding-replacing-the-work-of-police-departments/>.

²⁸ Lum et al., "Can We Really Defund the Police? A Nine-Agency Study of Police Response to Calls for Service" *Police Quarterly*, July 22, 2021, <https://journals.sagepub.com/doi/full/10.1177/1098611211035002>.

²⁹ Jennifer L.S. Teller et al., "Crisis Intervention Team Training for Police Officers Responding to Mental Disturbance Calls," *Psychiatric Services* 57, no. 2 (2006): 232–37, <https://doi.org/10.1176/appi.ps.57.2.232>.

³⁰ Neusteter et al., "Understanding Police Enforcement."

³¹ Cynthia Lum et al., "Constrained Gatekeepers of the Criminal Justice Footprint: A Systematic Social Observation Study of 9-1-1 Calltakers and Dispatchers," *Justice Quarterly* 37, no. 7 (2020): 1176-1198, <https://doi.org/10.1080/07418825.2020.1834604>.

³²Thomas J. Wieczorek et al., "Police Data Analysis Report: Oakland, CA," Center for Public Safety Management, n.d., <https://cao-94612.s3.amazonaws.com/documents/CPSM-Oakland-CFS-Report-Dec-2020.pdf>.

killed by police involve someone experiencing a mental health crisis.³³ Greater specificity is needed on the front end to better determine caller needs and to deploy the best response.

To improve safety during these calls and connect people to appropriate services, policymakers must address key considerations that often hinge on procedures in ECCs, which serve as hubs for public requests for assistance, and on the availability of relevant services for vulnerable populations.³⁴ This review highlights cross-system collaboration to reduce police involvement and increase access to appropriate services and supports. These programs are proliferating quickly with the aid of new, practical stakeholder tools.^{35,36} A map depicting initiatives around the nation can be found at [Transform911](#).

Police-Based Responses to Behavioral Health Crises

Police departments and communities across the country have collaborated to implement alternative responses that aim to reduce fatal police encounters and increase access to crisis services for vulnerable populations. The two most employed approaches are Crisis Intervention Teams (CIT) and co-responder models. These models are not focused on reducing police presence. Instead, they seek to improve interactions between officers and community members. CIT programs involve substantial officer training and extensive collaboration with community partners to emphasize on-scene crisis de-escalation and connection to appropriate services instead of jail.³⁷ Co-responder models typically involve a collaboration between a police officer and mental health professional who respond together to crisis calls concerning behavioral health or other disturbances that can be linked to underlying mental health, substance use, or homelessness concerns.³⁸ (See below for further research evidence on the effectiveness of CIT intervention.)

Civilian-Based Response Programs and ECCs' Role

While mobile crisis teams (MCTs) are present in many communities, this review covers those that are dispatched by 911 or 311 call takers.³⁹ These MCTs are civilian responses that address crisis calls categorized as non-violent “nuisance” or “quality of life” crime, typically concerning mental health, substance use disorder, and homelessness.⁴⁰ The types of responders in these models vary, and can include mental health professionals, paramedics, peers with lived

³³ Amam Z. Saleh et al., “Deaths of People with Mental Illness during Interactions with Law Enforcement,” *International Journal of Law and Psychiatry* 58 (2018), <https://doi.org/10.1016/j.ijlp.2018.03.003>.

³⁴ DeLaus, “Alternatives to first responders.”

³⁵ Council of State Governments Justice Center, “The Toolkit,” accessed December 16, 2021, <https://csgjusticecenter.org/publications/expanding-first-response/the-toolkit/>.

³⁶ DeLaus, “Alternatives to first responders.”

³⁷ Alan B. McGuire and Gary R. Bond, “Critical Elements of the Crisis Intervention Team Model of Jail Diversion: An Expert Survey,” *Behavioral Sciences and the Law* 29, no. 1 (January 2011): 81–94, <https://doi.org/10.1002/BSL.941>.

³⁸ International Association of Chiefs of Police, “Assessing the Impact of Co-Responder Team Programs: A Review of Research Academic Training to Inform Police Responses Best Practice Guide,” n.d. <https://www.theiacp.org/sites/default/files/IDD/Review%20of%20Co-Responder%20Team%20Evaluations.pdf>.

³⁹ Amy C. Watson et al., “Crisis Response Services for People with Mental Illnesses or Intellectual and Developmental Disabilities: A Review of the Literature on Police-Based and Other First Response Models,” Vera Institute of Justice, October 2019, <https://www.vera.org/downloads/publications/crisis-response-services-for-people-with-mental-illnesses-or-intellectual-and-developmental-disabilities.pdf>.

⁴⁰ SAMHSA, “Executive Order Safe Policing for Safe Communities: Addressing Mental Health, Homelessness, and Addiction Report,” accessed October 18, 2021, <https://www.samhsa.gov/sites/default/files/safe-policing-safe-communities-report.pdf>.

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experience, or trained crisis responders.⁴¹ A key element of the programs dispatched by 911 professionals is the practice of allowing non-police department personnel to carry police radios so they can either monitor radio traffic to identify calls they might respond to and/or receive dispatches directly from 911 professionals.⁴²

One example of this approach is Crisis Assistance Helping Out On The Streets (CAHOOTS), which started in Eugene, OR in 1989.⁴³ In this pioneering model, White Bird Clinic staff carry police radios and respond to crisis calls concerning mental health, substance use disorder, and homelessness.⁴⁴ These staff are trained for their role and are often not traditional mental health practitioners.⁴⁵ In a similar program in Atlanta, GA, team members of the Policing Alternatives and Diversion (PAD) Initiative respond to 311 callers expressing a need for resources related to behavioral health or poverty.⁴⁶

Iterations of the CAHOOTS model have emerged in Olympia, WA, Denver, CO, Austin, TX, Chicago, IL, Portland, OR, New York City, NY, Oakland, CA, and continue to propagate.⁴⁷ Specifically, Denver has replicated the CAHOOTS model through a collaboration between the police department and the Mental Health Center of Denver known as STAR.⁴⁸

Another emerging practice involves creating a new entity to respond to these calls. For example, in Albuquerque, New Mexico, instead of police or fire, 911 dispatchers can deploy a third branch of public safety – The Albuquerque Community Safety (ACS) Department.⁴⁹ The agency recruits social workers, counselors, and people with experience in the field of peer-support to be dispatched in teams of two to non-violent and non-medical crises. Unlike traditional emergency responders, they are trained to assess situations involving mental health emergencies with a goal of reducing arrests.⁵⁰

Alternative responses to calls involving someone in crisis do not always require dispatching a specialized team. In Phoenix, AZ, 911 professionals transfer calls to a mental health expert who triages the situation and either addresses the person's needs by phone or sends a mobile crisis

⁴¹ Jennifer Carroll et al., "The Workforce for Non-Police Behavioral Health Crisis Response Doesn't Exist—We Need to Create it," *Health Affairs*, September 8, 2021, <https://www.healthaffairs.org/doi/10.1377/hblog20210903.856934/full/>.

⁴² Jackson Beck, Melissa Reuland, and Leah Pope, "Behavioral Health Crisis Alternatives: Shifting from Police to Community Responses," Vera Institute of Justice, 2020, <https://www.vera.org/behavioral-health-crisis-alternatives>.

⁴³ Ben Adam Climer and Brenton Glicker, "CAHOOTS: A Model for Prehospital Mental Health Crisis Intervention," *Psychiatric Times* 38, no. 1 (January, 2021), 15-15.

⁴⁴ Beck et al., "Crisis Alternatives."

⁴⁵ White Bird Clinic, "What is CAHOOTS?" October 29, 2020, <https://whitebirdclinic.org/what-is-cahoots/>.

⁴⁶ Policing Alternatives and Diversion Initiative, "PAD 311 Community Referral Services," accessed November 22, 2021, <https://www.atlantapad.org/311-community-referrals#FAQ>.

⁴⁷ Rob Waters, "Enlisting Mental Health Workers, Not Cops, in Mobile Crisis Response," *Health Affairs* 40, no. 6 (June 1, 2021), 864-869. doi:10.1377/hlthaff.2021.00678. <https://www.healthaffairs.org/doi/10.1377/hlthaff.2021.00678>.

⁴⁸ Esteban L. Hernandez, "Denver's STAR Program, Sending Mental Health Pros on Certain Calls Instead of Police Officers, Is about to Get Bigger," *Denverite*, accessed November 22, 2021, <https://denverite.com/2021/08/30/denver-star-mental-health-police-program/>.

⁴⁹ Harry Gass, "Police Reform: Why Albuquerque Sends Social Workers on Patrol," *Christian Science Monitor*, accessed November 22, 2021, <https://www.csmonitor.com/USA/Justice/2021/1112/Why-Albuquerque-s-latest-experiment-in-policing-doesn-t-involve-officers>.

⁵⁰ Gass, "Police Reform."

team.⁵¹ In several other jurisdictions, including Dallas, TX,⁵² Houston, TX,⁵³ and Detroit, MI,⁵⁴ a mental health expert is present in the communications center and 911 professionals transfer the call to them for triage and appropriate response. In all cases, the call can be transferred back to the 911 professional if needed.⁵⁵

Civilian- and Community-Based Response Programs and Needed Resources

Alternative response programs face serious workforce shortages,⁵⁶ especially in rural areas,⁵⁷ with some recommending the development of multiple pathways of entry into this workforce that focus on the skills needed rather than educational attainment alone.⁵⁸ For example, CAHOOTS crisis workers must have experience or education in their field, and the White Bird Clinic conducts extensive training,⁵⁹ while in Oakland, CA, the response program focuses on hiring people with lived experience.⁶⁰ Indeed, one of the earliest first response alternative programs in the country was established in the 1960s when Black community members in Pittsburgh felt “indignity and fear when forced to rely on police officers for transportation to the hospital.”⁶¹ In response, residents developed a community-based alternative program called Pittsburgh’s Freedom House Enterprise Ambulance Service staffed with Black community members who were trained to provide emergency medical services.⁶² A study of the program found that Freedom House paramedics provided improper treatment in 11% of cases, compared with 62% of cases improperly handled by the police.⁶³ Some posit that these findings demonstrate the potential both for alternative responses and their capacity to reduce racial disparities.⁶⁴ While Freedom House was deprioritized in favor of a citywide ambulance program and ultimately closed in 1975,⁶⁵ such creative innovations, especially as a reaction to racial inequity, continue

⁵¹ Beck et al., “Crisis Alternatives.”

⁵² “RIGHT Care Team Responds to Mental Health Crisis Calls,” Parkland Hospital, February 18, 2019, accessed October 15, 2021, <https://www.parklandhospital.com/news-and-updates/right-care-team-responds-to-mental-health-crisis-c-1488>.

⁵³ “Crisis Call Diversion Program,” Houston Police Department, accessed Oct 15, 2021, <https://www.houstoncit.org/ccd/>.

⁵⁴ Veronica Meadows and David Komer, “Detroit Police Expand Mental Health Crisis Response Program,” Fox2 Detroit, accessed October 15, 2021, <https://www.fox2detroit.com/news/detroit-police-expand-mental-health-crisis-response-program>.

⁵⁵ Beck et al., “Crisis Alternatives.”

⁵⁶ Beck et al., “Crisis Alternatives.”

⁵⁷ Shinobu Watanabe-Galloway et al., “Recruitment and Retention of Mental Health Care Providers in Rural Nebraska: Perceptions of Providers and Administrators,” *Rural and Remote Health* 15, no. 4 (2015), 3392. <https://www.ncbi.nlm.nih.gov/pubmed/26567807>.

⁵⁸ Beck et al., “Crisis Alternatives.”

⁵⁹ White Bird Clinic, “What is CAHOOTS?”

⁶⁰ Eric Westervelt, “Oakland Becomes Latest City Looking to Take Police Out of Nonviolent 911 Calls,” NPR, accessed Oct 16, 2021, <https://www.kuow.org/stories/oakland-becomes-latest-city-looking-to-take-police-out-of-nonviolent-911-calls>.

⁶¹ Matthew L. Edwards, “Race, Policing, and History - Remembering the Freedom House Ambulance Service,” *New England Journal of Medicine* 384, no. 15 (April 15, 2021), 1386-1389. doi:10.1056/NEJMp2035467. <https://www.nejm.org/doi/full/10.1056/NEJMp2035467>.

⁶² Edwards, “Race, Policing, and History.”

⁶³ Jared N. Day and Joe William Trotter, eds. *Race and Renaissance: African Americans in Pittsburgh Since World War II*. Pittsburgh: University of Pittsburgh Press, 2010.

⁶⁴ Eric Rafla-Yuan, Divya K. Chhabra, and Michael O. Mensah. “Decoupling Crisis Response from Policing – A Step Toward Equitable Psychiatric Emergency Services,” *New England Journal of Medicine* 384, no. 18 (May 6, 2021). DOI: 10.1056/NEJMms2035710. <https://www.nejm.org/doi/full/10.1056/NEJMms2035710>.

⁶⁵ Edwards, “Race, Policing, and History.”

today. For example, Chicago-based Ujimaa Medics provides training to enable community members to provide essential first aid to gun violence victims.⁶⁶

State of Practice: Domestic Violence/Intimate Partner Violence

The standard pathway for domestic violence (DV) incidents in most jurisdictions is a call to 911, from either the survivor or a third party, that results in police dispatch to the scene. DV survivors often share households with their abusers, however, making it difficult for them to call 911. Calling or threatening to call 911 during such crises may lead to increased abuse or violence from the abuser.⁶⁷ Many survivors are also unwilling to call 911 because of the consequences of involving the police, which may include loss of child custody,⁶⁸ loss of housing,⁶⁹ loss of economic and social support from the partner,⁷⁰ fears of harm to the victim and abuser as the result of arrest or police use-of-force,⁷¹ and the threat of increased abuse.⁷² In some states, mandatory arrest rules in cases of domestic abuse can lead to the arrest of the survivor, in addition to or instead of the abuser.⁷³ Mandatory arrest laws have not been associated with reductions in subsequent abuse by arrestees.⁷⁴ While one study found that mandatory arrests laws may actually increase intimate partner homicides,⁷⁵ a more recent found no such evidence.⁷⁶

Some alternative first responses to DV incidents come in the form of a co-response model where two or more agencies coordinate responses. These collaborations aim to use each partner's strengths to best serve survivors and provide coordinated response and case management, including follow-up care. Involved sectors may include criminal justice, health care, social work, and nonprofit partners.

Co-responders either respond immediately to the scene or arrive once officers have responded and assessed the need for them to come. These co-responders typically provide immediate services to survivors and their families, including assessing and enhancing survivor safety, providing information about social services, and developing a plan to access these services.

⁶⁶ Alexandria Davis and Caverl, Martine, "Leave No Homie Behind: A Peer Education Approach to Urban Health Justice," American Public Health Association 2017 Annual Meeting and Expo, November 4 – 8, 2017,

https://apha.confex.com/apha/2017/meetingapi.cgi/Paper/381656?filename=2017_Abstract381656.html&template=Word

⁶⁷ Rona Kaufman Kitchen, "Constrained Choice: Mothers, The State, and Domestic Violence," *Temple Political & Civil Rights Law Review* 24, no. 4 (June 2015): 375-99.

⁶⁸ Kitchen, "Constrained choice."

⁶⁹ Anna Kastner, "The Other War at Home: Chronic Nuisance Laws and the Revictimization of Survivors of Domestic Violence," *California Law Review* 103, no. 4 (August 2015): 1047: 1048–80.

⁷⁰ Kastner, "The Other War."

⁷¹ Kastner, "The Other War."

⁷² World Health Organization, "Violence Against Women," March 9, 2021, <https://www.who.int/news-room/fact-sheets/detail/violence-against-women>.

⁷³ World Health Organization, "Violence Against Women."

⁷⁴ J. David Hirschel, et al., "The Failure of Arrest to Deter Spouse Abuse," *Journal of Research in Crime and Delinquency* 29, no. 1 (February 1992): 7–33.

⁷⁵ Hirschel et al., "Failure of Arrest."

⁷⁶ You-Mi Chin and Scott Cunningham, "Revisiting the effect of warrantless domestic violence arrest laws on intimate partner homicides." *Journal of Public Economics* 179 (2019): 104072.

Examples of these true co-responder models include programs in Los Angeles, CA,⁷⁷ Richmond, VA,⁷⁸ Rochester, NY,⁷⁹ and St. Joseph County, IN.⁸⁰

While there are likely many types of domestic altercations that are appropriate to divert to alternative or co-response models, the field lacks research on how to identify which calls appropriately fall in this category. Moreover, little is known about the impact of these alternative models and the degree to which they may inadvertently pose risks to survivors. The high social costs of both over- and under-policing these extremely sensitive situations underscores the pressing need for rigorous program evaluation in this particular area.

State of Practice: Alternative Responses to “Low-Level” Incidents, including Traffic Accidents, Burglaries, and False Alarms

This category of response is variously defined and the subject of much discussion as communities reflect on ways to reduce police response to certain types of incidents, thereby reducing use of force and racial disparities and freeing up officer time to respond to and investigate serious crimes. Calls in this category are not exigent and arguably do not require an armed response. This category can contain low-level crimes, such as a completed burglary when the perpetrator is not on scene,⁸¹ responses to traffic accidents with no injuries,⁸² and thefts for which the perpetrator is gone.⁸³ These calls are common.⁸⁴ For example, in a recent analysis of open data on calls for service in three jurisdictions, researchers found that between 13 and 19 percent of calls involved traffic complaints.⁸⁵ Burglar alarms take up an outsized amount of law enforcement response⁸⁶ and are predominantly false alarms.^{87,88}

Some police agencies, facing serious staffing shortages in the face of the COVID-19 pandemic,⁸⁹ have reduced on-scene response to these low-level crimes and violations, which are instead

⁷⁷ City of Los Angeles, Office of Mayor Antonio Villaraigosa, “Evaluation Report City of Los Angeles Domestic Abuse Response Team,” March 2009, <http://www.safela.org/downloads/Harder-Evaluation.pdf>.

⁷⁸ Erin Lane et al., “Second Responders Program: A Coordinated Police and Social Service Response to Domestic Violence,” U.S. Department of Justice Office of Justice Programs (2004). <https://www.ojp.gov/pdffiles1/nij/199717.pdf>.

City of Rochester, “City Announces Creation of New Crisis Intervention Services Unit to Better Serve the Needs of the Community,” accessed December 15, 2021, <https://www.cityofrochester.gov/article.aspx?id=21474845356>.

⁸⁰ Brie Isom, “St. Joseph County Police Department Announces Domestic Violence Response Team,” WSBT News, October 21, 2020, <https://wsbt.com/news/local/st-joseph-county-police-department-announces-domestic-violence-response-team>.

⁸¹ Bethany Blankley, “Austin Police No Longer Responding to ‘non-Life Threatening’ 911 Calls,” The Center Square | Texas, accessed November 22, 2021, https://www.thecentersquare.com/texas/austin-police-no-longer-responding-to-non-life-threatening-911-calls/article_fdb7f92c-22c3-11ec-a7b6-9f5ad0b58c93.html.

⁸² Blankley, “Austin Police.”

⁸³ Chris Magnus, “Tucson Police Department Meeting the Challenges of a Growing Call Load,” *Tucson.com*, June 11, 2018, <https://perma.cc/LV7W-NA4D>.

⁸⁴ Cynthia Lum et al., “Constrained Gatekeepers.”

⁸⁵ Asher and Horwitz, “How Do Police Spend Their Time?”

⁸⁶ Neusteter et al., “Understanding Police Enforcement.”

⁸⁷ Erwin A. Blackstone et al., “Evaluation of Alternative Policies to Combat False Emergency Calls,” *Evaluation and Program Planning* 28, no. 2 (May 1, 2005): 233–42, <https://doi.org/10.1016/J.EVALPROGPLAN.2004.09.004>.

⁸⁸ Erwin A. Blackstone et al., “Not Calling the Police (First).” *Regulation* 25, no. 1 (Spring 2002): 16.

<https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip.shib&db=bsu&AN=6582839&site=ehost-live&scope=site>.

⁸⁹ David Aaro, “Austin, Texas, Police to Stop Responding to Nonemergencies Beginning Today,” Fox News, October 1, 2021, <https://www.foxnews.com/us/austin-texas-police-non-emergencies>.

routed to 311 where a report can be taken, or callers are asked to report their complaint online.⁹⁰ Efforts to reduce automated calls from burglar alarms to police have ranged from fines to educating the public on preventing and identifying false alarms to private-public partnerships that create a marketplace for alternative on-site response that can verify the alarm.⁹¹

An emerging practice is the creation of a civilian response unit, also called a community responder model, where non-armed personnel respond on scene or by phone to address complaints and manage disputes.⁹² In Tucson, for example, Community Service Officers are deployed to address minor complaints.⁹³

State of Practice: Animal Control

Complaints about animals, ranging in severity from noise complaints to dog fights to reports of animal cruelty, come into 911 call centers frequently, although it is difficult to assess how frequently given that these complaints are often coded more generally as “complaints.”⁹⁴

As with calls about low-level crimes and disturbances, calls about animals can lead to officer dispatch, resulting in an inefficient use of police resources that could yield undesired outcomes owing to the presence of an armed responder. One study of small-town policing examined calls to a single ECC over two years and found the most common call to police involved animals (14 percent).⁹⁵ Alternatives to police response to such calls include animal safety hotlines (e.g., Animal Poison Control, Pet Poison Helpline, Animal Behavioral Hotline, and Animal Help Now for assistance with wildlife emergencies) and animal cruelty organizations (such as the American Society for the Prevention of Cruelty to Animals and Humane Society), which can link callers to an animal control officer. Communities also work to redirect nuisance issues, such as barking dogs and stray animals, to relevant county/city agencies or to 311.

Research Evidence

The research evidence on the effectiveness of alternative police responses is thin, and studies are largely descriptive. Much of the research that exists on behavioral health alternative responses is on CIT programs. These programs have been the subject of descriptive survey data and pretest-posttest knowledge assessments, wherein individuals are assessed at the beginning and end of the study in both control and experimental groups, for decades,⁹⁶ but the programs have yet to be subject to randomized controlled trials, which are the gold standard for valid assessment of

⁹⁰ “Gilroy Police Ask Residents To Report Non-Emergencies Online Gilroy, CA Patch, accessed November 22, 2021, <https://patch.com/california/gilroy/gilroy-police-ask-residents-report-non-emergencies-online>.

⁹¹ Blackstone and Hakim, “False Calls.”

⁹² Amos Irwin and Betsy Pearl, “The Community Responder Model: How Cities Can Send the Right Responder to Every 911 Call,” Center for American Progress, October 15, 2020, <https://www.americanprogress.org/article/beyond-policing-investing-offices-neighborhood-safety/>.

⁹³ Chris Magnus, “Meeting the Challenges.”

⁹⁴ Neusteter et al., “Understanding Police Enforcement.”

⁹⁵ Brian K. Payne et al., “Policing in Small Town America: Dogs, Drunks, Disorder, and Dysfunction,” *Journal of Criminal Justice* 33, no. 1 (January 1, 2005): 31–41, <https://doi.org/10.1016/J.JCRIMJUS.2004.10.006>.

⁹⁶ Watson et al., “Crisis Response for People with Disabilities.”

program effectiveness.⁹⁷ In brief, literature on pretest-posttest evaluations of the CIT training component reveal that this training can successfully change officer attitudes. Observational studies of 911 call disposition reveal that when compared to their non-CIT-trained colleagues, CIT officers refer and transport people in crisis more often to mental health resources.^{98,99} A comprehensive study summarizing the literature on all facets of CIT implementation and outcomes noted improvements in officer attitudes and self-efficacy, as well as potentially safer immediate encounters related to the 911 call itself, but found limited evidence of improved long-term outcomes for the subjects of CIT-involved calls.¹⁰⁰ Although research is scant on co-responder programs, they do appear to be effective in reducing transports to emergency departments,^{101,102} increasing access to services, and saving health and criminal justice system time and money.¹⁰³

Descriptive research has focused on how many police calls for service are diverted to CAHOOTS and STAR. Analysis by the Eugene Police Department of the calls CAHOOTS has responded to indicates that the team has diverted approximately five to eight percent of calls for service from police response.¹⁰⁴ A six-month pilot evaluation of STAR showed that the team composed of a mental health professional and a medic addressed approximately three percent of the police department's calls for service.¹⁰⁵ Other research on mobile crisis teams has focused on those units that are called either by the person in crisis or an associate, or by law enforcement officers from the field,¹⁰⁶ and thus are not relevant to the focus of this review.

Two descriptive studies have examined DV co-responder programs. In the first, surveys of clients who received services from the Los Angeles, CA, Domestic Abuse Response Team (DART) program revealed that a large majority of clients felt they were treated with respect, listened to, and were able to obtain a safety plan and learn about different resources from the

⁹⁷ Eduardo Hariton and Joseph J. Locascio, "Randomised Controlled Trials—the Gold Standard for Effectiveness Research," *BJOG: An International Journal of Obstetrics and Gynaecology* 125, no. 13 (December 1, 2018): 1716, <https://doi.org/10.1111/1471-0528.15199>.

⁹⁸ Erin B. Comartin et al., "Mental Health Crisis Location and Police Transportation Decisions: The Impact of Crisis Intervention Team Training on Crisis Center Utilization," *Journal of Contemporary Criminal Justice* 35, no. 2 (May 1, 2019): 241–60, <https://doi.org/10.1177/1043986219836595>.

⁹⁹ Amy C. Watson et al., "The Crisis Intervention Team (CIT) Model: An Evidence-Based Policing Practice?" *Behavioral Sciences & the Law* 35, no. 5-6 (Sep, 2017), 431-441. doi:10.1002/bsl.2304. <https://onlinelibrary.wiley.com/doi/abs/10.1002/bsl.2304>.

¹⁰⁰ Amy C. Watson and Michael T. Compton, "What Research on Crisis Intervention Teams Tells Us and What We Need to Ask," *Journal of the American Academy of Psychiatry and the Law* 47, no. 4 (2019):422-426, <https://citinternational.org/resources/Documents/Press%20Releases/What%20Research%20on%20Crisis%20Intervention%20Teams%20Tells%20Us%20and%20What%20We%20Need%20To%20Ask.pdf>.

¹⁰¹ Stephen Puntis et al., "A Systematic Review of Co-Responder Models of Police Mental Health 'Street' Triage," *BMC Psychiatry* 18, no. 256 (2018). <https://bmcp psychiatry.biomedcentral.com/articles/10.1186/s12888-018-1836-2>.

¹⁰² Melissa S. Morabito and Jenna Savage, "Examining Proactive and Responsive Outcomes of a Dedicated Co-Responder Team," *Policing: A Journal of Policy and Practice* 15, no. 3 (September 1, 2021), 1802-1817. doi:10.1093/policing/paab029. <https://doi.org/10.1093/policing/paab029>.

¹⁰³ International Association of Chiefs of Police, "Assessing co-responder programs."

¹⁰⁴ Eugene Police Department, "CAHOOTS Program Analysis," accessed November 21, 2021, <https://www.eugene-or.gov/DocumentCenter/View/56717/CAHOOTS-Program-Analysis>.

¹⁰⁵ Grace Hauck, "Denver Successfully Sent Mental Health Professionals, Not Police, to Hundreds of Calls," *USA Today*, Feb. 6, 2021, <https://www.usatoday.com/story/news/nation/2021/02/06/denver-sent-mental-health-help-not-police-hundreds-calls/4421364001/>.

¹⁰⁶ Watson et al., "Crisis Response for People with Disabilities."

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advocates. The authors commented that “nearly all respondents left their abusers.” The DART program benefitted LAPD officers as well by improving officer knowledge of domestic abuse, reducing workloads, and improving efficiency.¹⁰⁷

In the second study, researchers interviewed subjects who received services from the co-responder program in Richmond, VA, called Second Responders, and compared them to subjects in a comparable geographic area who did not receive these services. These individuals who received the co-responder intervention were pleased with their experiences with the program, and were significantly more likely to have made steps toward separating from the abuser and accessing services.¹⁰⁸

A single research project looked at the impact of a program called “verified response,” which activates a private security on-scene response to burglar alarms instead of police.¹⁰⁹ The security officers then call police only if a crime is confirmed. Researchers found that a single case study site saw an 87 percent reduction in police responses to burglar alarms.¹¹⁰ Apart from descriptive studies noting the frequencies of calls, there are no research studies or program evaluations of the impacts of diverting calls away from 911 that are related to low-level crimes (e.g., burglary, theft), incidents not involving a crime, traffic accidents, or animal control.

Questions for Inquiry and Action

The research on alternative responders has not kept pace with the proliferation of such programs, rendering the outcomes and tradeoffs of their implementation largely unknown. Rigorous evaluation is needed to explore the impact of alternative responders on the safe, equitable, and effective resolution of and response to public calls for service, along with assessments of their cost-effectiveness and any unintended outcomes. In order to test these models, basic research questions must also be answered around the frequency and types of calls for police service, the accuracy of the data collected, and the nature and effectiveness of protocols designed to ensure that call takers make appropriate use of alternative responders.

- What share and types of calls to 911 and 311 result in police dispatch? What share and types of those calls result in a co-response of fire, paramedics, or mental health specialists being dispatched alongside police? To what degree does that vary by ECC, region, or state? How accurate is the coding and classification of data on call type and priority level?
- What share and types of calls to 911 and 311 are appropriate for diversion to alternative responders or co-response units? To what degree do existing alternative responder resources and co-response units meet the needs of various communities, call types, and

¹⁰⁷ City of Los Angeles, “Evaluation report.”

¹⁰⁸ Erin Lane et al., “The Second Responders Program: A Coordinated Police and Social Service Response to Domestic Violence,” Department of Justice, 2004, <https://www.ojp.gov/ncjrs/virtual-library/abstracts/second-responders-program-coordinated-police-and-social-service>.

¹⁰⁹ Blackstone et al., “False calls.”

¹¹⁰ Blackstone et al., “False calls.”

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populations? What gaps exist and by what type of calls/needs and areas of alternative responder expertise?

- Does the introduction of alternative response options dispatched through 911 change the quantity or demographic distribution of who calls 911 or the composition of calls received?
- How effective are alternative first responder programs at resolving problems and reducing police dispatch, use of force, and disparate outcomes, especially for those who reside in marginalized communities, communities of color, and areas with historically high 911 call volume?
- Are community members more or less satisfied with services they receive via alternative responders versus police officers? To what degree do services received through alternative responders affect community members' perceptions of trust in municipal services, public safety services, and the government overall? To what degree do they affect community members' future willingness to call 911 for police services? To what degree do they affect community members' future willingness to call alternative hotlines? Do these outcomes vary by type of alternative responder or type of problem or issue to which they respond?
- What is the degree to which alternative first responses increase or decrease call center professionals' abilities to answer calls efficiently and classify and triage calls accurately? To what degree does the introduction of new alternative responder options slow down or speed up the triaging and call resolution processes?
- What policies and call-taking protocols work best in identifying which calls to divert to alternative resolution or responder? To what degree do call takers comply with those guidelines? What are the differential outcomes in call resolution based on variation in call-taker compliance? What strategies work best in ensuring call-taker compliance? To what degree does call-taker engagement or training influence the accuracy of alternative responder protocols and degree of implementation fidelity?
- Recognizing that the measurement of bias in service delivery of any type is vital to an equitable and well-functioning government, to what degree do alternative first responses mitigate or exacerbate biased outcomes? How might these outcomes vary by the degree to which they are connected to/or involve the police?
- What impact do alternative response models have on measures of police and community safety? Do these impacts differ by type of community (urban, rural, affluent, marginalized) and demographic of caller and subject(s) of call?
- What share of non-police alternative responses ultimately result in police dispatch? Does this proportion vary by call type or characteristics of the community, caller, or call subject(s)? What factors are associated with calls for police dispatch that occur before

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arrival of the alternative response versus during or after alternative responses are attempted?

- To what degree does the addition of alternative response models affect the volume of 911 calls for police service and calls to 311 or other alternative hotlines?
- What data are needed to support triage and dispatch protocols for communities with alternative response options?
- What are community preferences for the composition of alternative response teams, avenues to access them, and the types of calls for service they should address?

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Chapter 3: 911 Hotline Alternatives

Introduction

911 is the most used hotline in the United States,¹ with members of the public making an average of 600,000 calls to 911 each day.² The public relies on 911 for a wide array of issues, ranging from requests for information to assistance in acute emergencies. For a small but important share of 911 calls, the resulting dispatch yields life-saving responses to medical emergencies and serious crimes-in-progress. But many calls to 911 are from people seeking information or lodging minor complaints, from questions about how to get a driver's license renewed to complaints about a neighbor's car is blocking one's driveway. A recent analysis of 911 calls to the largest public communications center in the country found that the most common calls pertained to minor traffic concerns, followed by non-crime administrative or information requests and accidental calls or hang-ups.³

The tremendous volume and diversity of 911 calls has placed a considerable burden on emergency communications centers (ECCs), which, coupled with staffing shortages, may severely diminish capacity to respond to calls for service. In response, alternative hotlines have been established to divert some share of those calls to nonemergency telecommunicators, trained counselors, or other public resources. These alternative hotlines serve a variety of purposes, providing assistance with non-emergency issues and municipal services (311),⁴ community-based health and human services referrals (211),⁵ suicide prevention counseling (988),⁶ support for information on safe digging in relation to gas lines (811),⁷ and even transportation information for travelers (511).⁸ Crisis hotlines, while not associated with three commonly used digits, are prevalent, including those for domestic violence support, runaway youth, mental health services for veterans, and human trafficking.

Understanding and examining the effectiveness of these resources could generate important insights into public safety, public trust in the police and government service provision overall, and efforts to reduce biases and harms caused by traditional police responses to calls for service. Alternative hotlines hold promise in providing faster and more tailored responses to inquiries from members of the public, which in turn could increase public satisfaction with local services. These hotlines have the potential to engage in proactive problem-solving in partnership with community members while freeing officer time to address serious crimes. They may also divert calls from law enforcement response, thereby reducing

¹ "911 Stats & Data," 911.gov, accessed on October 5, 2021, https://www.911.gov/issue_911statsanddata.html.

² "9-1-1 Statistics," National Emergency Number Association (NENA), accessed on October 5, 2021, <https://www.nena.org/911Statistics>.

³ Cynthia Lum et al., "Constrained Gatekeepers of the Criminal Justice Footprint: A Systematic Social Observation Study of 9-1-1 Calltakers and Dispatchers," *Justice Quarterly* 37, no. 7 (2020): 1176-1198, <https://doi.org/10.1080/07418825.2020.1834604>.

⁴ Colin Wood, "What Is 311?" GovTech. GovTech, April 23, 2021. <https://www.govtech.com/dc/articles/what-is-311.html>.

⁵ Federal Communications Commission, "Dial 211 for Essential Community Services," December 31, 2019, <https://www.fcc.gov/consumers/guides/dial-211-essential-community-services>.

⁶ Federal Communications Commission, "Fcc Designates '988' as 3-Digit Number for National Suicide Prevention Hotline," FCC News, July 16, 2020, <https://docs.fcc.gov/public/attachments/DOC-365563A1.pdf>.

⁷ "Call811: Know What's below. Call before You Dig." Call 811. Accessed October 19, 2021, <https://call811.com/>.

⁸ Christine M. Johnson and Elwyn Tinklenberg, "511: America's Traveler Information Number," *ITI Journal*, August, 2001, <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.376.2103&rep=rep1&type=pdf>

response times for serious calls, reliance on armed first responders, and the risk of harms and biases associated with excessive force. This chapter explores these intended outcomes, drawing from the relatively limited research evidence and more extensive literature developed by associations and government entities on the topic. It describes the state of practice and summarizes what is known about the effectiveness of alternative hotlines in meeting the needs of people in search of nonemergency supports, service referrals, mental health and suicide prevention counseling, domestic violence counseling and resources, and other issues that may be best resolved through these alternative routes. Questions for inquiry and actions stem from this summary and the gaps in knowledge encountered along the way.

State of Practice

In 1968, just a few short months after President Johnson’s Administration recommended a single telephone number to contact the police, AT&T officially designated 911 as an emergency number and mass implementation ensued.⁹ Adoption of 911 proliferated at lightning pace, resulting in 96 percent of the country being covered by 911 service by the late 1990s.¹⁰ Indeed, the 911 system has evolved into a one-stop shop for all manner of public inquiries, leading municipalities to quickly begin to lament the problem of “call saturation” – the unmanageable volume of calls to 911 for city services and information.¹¹

Introduction of 311, the Non-Emergency Call Number

By the mid-1990s, the Department of Justice estimated that between 50 and 90 percent of calls pertained to non-emergencies.¹² In response, the Clinton White House and the US Department of Justice’s Office of Community Oriented Policing Services requested that the Federal Communications Commission (FCC) reserve 311 for non-emergency calls for municipal services, and the FCC complied in 1997.¹³ In addition to the goal of relieving the burden on 911 call centers, the creation of 311 was prompted by the desire among government officials to have a more systematic means of identifying and responding to needs of the general public and tracking data on public requests and their resolution.¹⁴ The federal government provided grants to 13 jurisdictions to pilot the introduction of 311 and assess the degree to which it effectively offloaded non-emergency calls from 911.¹⁵ Baltimore, MD, was one of the first cities to implement a 311 system in 1996, and countless others soon followed.¹⁶ More recently, 311 has

⁹ Industry Council for Emergency Response Technologies (iCERT), *History of 911 and What It Means for the Future of Emergency Communications* (Washington, DC: iCERT, 2015), 3, <https://perma.cc/YL97-9J9C>.

¹⁰ “9-1-1 Origin & History,” National Emergency Number Association (NENA), <https://perma.cc/X3NB-SL8R>.

¹¹ Lorraine Mazerolle et al., “Managing Citizen Calls to the Police: The Impact of Baltimore’s 3-1-1 Call System,” *Criminology & Public Policy* 2, no. 1 (2002): 97-124.

¹² Office of Community Oriented Policing Services, “COPS Factsheet: 311 for Non-Emergencies, Helping Communities One Call at a Time,” 2003, <https://icma.org/documents/cops-fact-sheet-311-non-emergencies-helping-communities-one-call-time>

¹³ Office of Community Oriented Policing Services, “COPS Factsheet.”

¹⁴ Wood, “What Is 311?,” Richard W. Schwesler et al., “An Examination of the Municipal 311 System,” *International Journal of Organization Theory & Behavior* 12, no. 2 (March 2009): 218-236; Pew Charitable Trusts, “A Work in Progress: Philadelphia’s 311 System After One Year,” Philadelphia Research Initiative (March 2, 2010), <https://www.pewtrusts.org/-/media/assets/2010/03/02/final-311-report-030210.pdf>.

¹⁵ Shelley E. Solomon and Craig D. Uchida, “Building a 3-1-1 System for Non-Emergency Calls: A Process and Impact Evaluation,” U.S. Department of Justice, Office of Justice Programs, September 2003, <https://www.ncjrs.gov/pdffiles1/Archive/205987NCJRS.pdf>.

¹⁶ Wood, “What Is 311?”

been employed to support alternatives to police response, such as through the Fulton County, GA, Police Alternatives and Diversion Program.¹⁷

211 for Social Service Referrals

In 1997, the first 211 system was introduced in Atlanta, GA. Whereas 311 was designed to connect members of the public with municipal services, 211 was established to afford callers quick access to community-based health and human services resources, such as homeless shelters, employment placement centers, substance use disorder programs, and veterans' services.¹⁸ In 2000, the FCC designated 211 for nationwide use as a service request number, with the nonprofit network United Way spurring adoption through its local affiliates, and other nonprofit social service providers quickly following suit.¹⁹ As noted by some experts, 211 has provided considerable societal benefits, particularly during natural disasters such as Hurricane Katrina.²⁰ In addition, some experts conjecture that 211 reduces reliance on 911 because its service referral functions help address social problems, preventing them from manifesting into more serious events that generate calls to 911.²¹

Crisis Hotlines

As 911 was evolving and 311 and 211 were coming into use, the field experienced a proliferation of tailored helplines serving a variety of people in crisis and need, from runaway youth to survivors of domestic violence and people experiencing suicidal ideation. While most of these lines do not benefit from an easy-to-recall three-digit number, they may have prompted the diversion of some share of calls from 911, arguably to other professionals and organizations better-equipped to field them.

One notable addition to the ranks of crisis hotlines came with the recent passage of National Suicide Hotline Designation Act in 2020, which designates 988 as the official phone number for mental health crises and suicide prevention.²² The legislation requires all telecommunications carriers and Voice over Internet Protocol (VoIP) providers to ensure that users can dial 988 to reach the National Suicide Prevention Lifeline (NSPL), a national network of approximately 170 local- and state-funded crisis centers, as of July 16, 2022.²³ The Act also requires the Department of Health and Human Services, which operates the NSPL, and the Department of Veterans Affairs, which operates the Veterans Crisis Line, to research and report on strategies to make use of 988 operational and effective nationwide, including the provision of specialized services for high-risk populations such as lesbian, gay, bisexual, transgender, and queer (LGBTQ) youth; people of color, and people residing in rural communities.²⁴

¹⁷ Policing Alternatives and Diversion Initiative, "PAD 311 Community Referral Services," accessed November 22, 2021, <https://www.atlantapad.org/311-community-referrals#FAQ>.

¹⁸ Saxton et al., "2-1-1 Information Services: Outcomes Assessment, Benefit–Cost Analysis, and Policy Issues." *Government Information Quarterly* 24, no. 1 (2007): 186-215.

¹⁹ Saxton et al., "2-1-1 Information Services."

²⁰ Saxton et al., "2-1-1 Information Services."

²¹ S. Rebecca Neusteter et al., "The 911 Call Processing System: A Review of the Literature as it Relates to Policing," Vera Institute of Justice, July 2019, <https://www.vera.org/publications/911-call-processing-system-review-of-policing-literature>.

²² "S. 2661 — 116th Congress: National Suicide Hotline Designation Act of 2020," www.GovTrack.us, accessed November 30, 2021, <https://www.govtrack.us/congress/bills/116/s2661>.

²³ The current NSPL is 10-digits long, as is the Veterans Crisis Line. The FCC designation of 988 facilitates access to mental health crisis services and consolidates both lines such that veterans who dial 988 are invited to press "1" to be routed to the Veterans Crisis Line while all other callers can obtain services through the NSPL.

²⁴ "S. 2661 — 116th Congress: National Suicide Hotline Designation Act of 2020."

One issue pertaining to 988 that remains unresolved is whether the helpline should have the ability to trace the location and identity of the caller. As discussed in the [911 Governance chapter](#) of this volume, the advantages of granting 988 geolocating capabilities in facilitating quick responses to life-threatening events may be overshadowed by the disadvantages associated with violating the privacy and anonymity of callers and prompting interventions that cause trauma and lead to unnecessary police response or hospitalization.²⁵

Research Evidence

For this research brief, the most germane literature on hotlines that serve as viable alternatives to 911 pertains to the degree to which they successfully offloaded calls from 911, reduced reliance on police response to nonemergency events, improved the efficiency, quality and equity of police services, and increased effectiveness of service delivery based on the caller's specific needs. A crucial inquiry underlying all the above-referenced questions is the degree to which the public is aware of and makes use of alternative hotlines. It is also essential to examine the types of calls that are made to 911 and alternative call centers, and to understand how those calls are triaged and could be diverted. With studies examining 311 comprising the bulk of the 911 alternative hotline research, we look to the findings from these evaluations as a means of informing the challenges, opportunities, and viability of all manner of alternative hotlines.

In jurisdictions with 311, what types of calls are placed to 911 and how are they triaged?

Literature on this topic is thin and outdated, likely because of the difficulty researchers experience in accessing and processing computer-aided dispatch (CAD) data, which is typically where information on incoming calls and their resolution are housed.²⁶ A nine-site analysis of 911 calls found that the most common calls pertained to minor traffic concerns, followed by requests for information and accidental calls or hang-ups.²⁷ Just 16 percent of calls were for more serious safety concerns such as property and violent crimes, domestic violence, and missing persons.²⁸ Similarly, an analysis of calls for service in San Antonio found that 39 percent of calls were of the lowest priority level, with the vast majority pertaining to traffic incidents.²⁹ A study of Seattle calls for service concluded that 80 percent of calls pertained to non-criminal events.³⁰ Moreover, research has found that 911 professionals resolve half of all calls to 911 without the need to dispatch an officer.³¹

²⁵ Wireline Competition Bureau, "988 Geolocation Report — National Suicide Hotline Designation Act of 2020," Federal Communications Commission, April 15, 2021.

²⁶ Cynthia Lum et al., "Can We Really Defund the Police? A Nine-Agency Study of Police Response to Calls for Service," *Police Quarterly* (2021), <https://doi.org/10.1177/10986111211035002>; S. Rebecca Neusteter et al., "Understanding Police Enforcement: A Multicity 911 Analysis," Vera Institute of Justice, September 2020, <https://www.vera.org/publications/understanding-police-enforcement-911-analysis>; Neusteter et al., "911 Call Processing System."

²⁷ Lum et al., "Can We Really Defund the Police?"

²⁸ Analysis of data in Table 2 of Cynthia Lum et al., "Constrained Gatekeepers."

²⁹ Rob Tillyer and Michael R. Smith, "Public Requests for Assistance from the San Antonio Police Department (SAPD): An Assessment of Calls for Service Received between Jan 2018-Oct 2020," University of Texas-San Antonio Department of Criminology & Criminal Justice, April 2021, <https://www.sanantonio.gov/Portals/47/Files/UTSA-Report-20201-04.pdf?ver=2021-05-06-121643-027>.

³⁰ City of Seattle, Mayor Jenny A. Durkan, "Report on Reimagining Policing and Community Safety in Seattle," n.d., <https://s3.documentcloud.org/documents/21018129/idt-report-on-reimagining-policing-and-community-safety-in-seattle.pdf>.

³¹ Lum et al., "Can We Really Defund the Police?"; Neusteter et al., "Understanding Police Enforcement"; George Antunes and Eric J. Scott, "Calling the Cops: Police Telephone Operators and Citizen Calls for Service," *Journal of Criminal Justice* 9, no. 2 (1981): 165-180.

In jurisdictions that have introduced 311, what types of calls are placed to 311 and what share represent actual diversions from 911?

Information varies on the nature of calls to 311. While in most jurisdictions the vast majority are indeed nonemergency requests for information, one study found that 42 percent of calls to the 311 nonemergency line resulted in police dispatch.³² Another found that 57 percent of calls to 311 were dispatched to police.³³ Similarly, a recent study found that 62 percent of calls for service pertaining to suicide, welfare checks, individuals experiencing mental health crises, felonious assault, simple assault, and disorderly behavior came from non-emergency lines versus 38 percent from 911 lines. Of high priority calls, about 43 percent came in on 911 lines and 57 percent on non-emergency lines.³⁴

What are the various models of receiving and fielding emergency and nonemergency calls?

In some municipalities, 911, 311, and 211 are handled by the same staff of call center professionals, with the distinction being that 211 and 311 calls are treated as secondary priorities. In New York City, NY, for example, callers to 211 are routed through 311, which call center professionals then triage to the appropriate city service or nonprofit resource, taking what is known as a “blended approach.”³⁵ Officials in New York posit that such consolidation increased efficiencies and yielded cost saving through shared software and personnel.³⁶ In Baltimore, however, calls to 311 are routed to a different physical center and group of professionals. While it may seem logical to combine 211 and 311 into the same consolidated systems, as New York City has done, experts have observed that fielding 211 and 311 calls may require distinct and separate skill sets, training, protocols, and performance metrics.³⁷ Indeed, using the same ECC to handle all manner of calls may be problematic, given that a recent survey of 37 ECCs in 27 states found that most centers do not use standardized tools, such as scripts or questionnaires, to identify calls pertaining to behavioral health crisis, and most call takers are not specially trained to handle such calls.³⁸

Does the introduction of 311 reduce the overall volume of calls?

The research on the impact of 311 systems on the volume of calls placed to 911 and 311 is decidedly mixed. In Baltimore, evaluators found that the adoption of 311 was associated with a 25 percent decline in calls to 911, but those calls were offset by ones placed to 311, resulting in no net change in the total (911 plus 311) number of calls.³⁹ Similarly, an evaluation of 311 implementation in Austin, TX, reported a 20 percent reduction in calls to 911 during the first year of 311 operation, but the total volume of calls to 911 and 311 increased substantially during that same period.⁴⁰ And in Philadelphia, PA, researchers concluded that while the system provided easier access to nonemergency information and services, 311 resulted in just a 1.4 percent reduction in call volume during its first year of operation.⁴¹

³² Lum et al., “Constrained Gatekeepers.”

³³ Mazerolle et al., “Baltimore’s 3-1-1 System.”

³⁴ Jessica W. Gillooly, “‘Lights and Sirens’: Variation in 911 Call-Taker Risk Appraisal and its Effects on Police Officer Perceptions at the Scene,” *Journal of Policy Analysis and Management* (December 2021), <https://doi.org/10.1002/pam.22369>.

³⁵ Elizabeth Charis Idicheria et al., “A Review of 311 in New York City,” *Interdisciplinary Studies on Politics, Law, Administration and Technology*, Hamburg, 2012, https://negz.org/wpcontent/uploads/2017/03/ISPRAT_Projekt_Report_311_115_finales_Dokument.pdf.

³⁶ Idicheria et al., “Review of 311.”

³⁷ David Eichenenthal, “211/311: Is there a Case for Consolidation or Collaboration?” *PM Magazine, International City Managers Association* 92, no. 7 (August 2010).

³⁸ Pew Charitable Trusts, “New Research Suggests 911 Call Centers Lack the Resources to Handle Behavioral Health Crises,” October 2021, https://www.pewtrusts.org/-/media/assets/2021/10/mjh911callcenter_final.pdf.

³⁹ Pew Charitable Trusts, “New Research.”

⁴⁰ Solomon and Uchida, “Building a 3-1-1 System.”

⁴¹ Pew Charitable Trusts, “A Work in Progress.”

These inconsistent impacts suggest that much of the success of alternative hotlines rests in getting the public to use the right number for the right service.

Does the introduction of 311 reduce the share of calls that result in police dispatch?

Jurisdictions that divert calls from 911 without reducing the overall volume of calls for service should not necessarily be viewed as unsuccessful. One key potential outcome of 311 and other alternative hotlines is that nonemergency numbers reduce the share of calls that result in police dispatch. In Baltimore, researchers found that 3,700 fewer calls to both 311 and 911 resulted in police dispatch during the first two years following 311 implementation compared to the two years prior.⁴² Moreover, one in three Baltimore officers who were surveyed about their perceptions of the impact of 311 believed that the number of dispatches for nonemergency events had declined significantly.⁴³ However, a study of almost four million calls to both 911 and 311 in San Francisco cautioned that callers could contribute to the criminalization of visible poverty through what the author terms as “complaint-driven policing.”⁴⁴

What do we know about 211 effectiveness, and how does it relate to efforts to divert calls from 911?

Published information on 211 effectiveness is relatively scarce; that which does exist is confined to studies pertaining to 211 business operations and cost effectiveness.⁴⁵ However, one longitudinal study of Missouri 211 users found that while most callers were referred to services, relatively few (36%) actually received services from their referrals. Those who made use of referred services were more likely than non-users to report that the issue for which they called 211 had been resolved, and callers with multiple needs were less likely to report such resolution.⁴⁶

Similarly, a recent study examining social service system capacity in Alabama, Connecticut, Iowa, Minnesota, Missouri, Nebraska, and Nevada through surveys with 211 call takers found that 211 was able meet caller needs for such items as food access and tax preparation services but was less likely to be helpful in rent and car payment assistance.⁴⁷ The same study mapped social service capacity by zip code in Missouri and found considerable variation by location, with fewer services in rural areas.⁴⁸ These findings have implications for diverting calls from 911, suggesting that to be successful, the supply of non-emergency services needs to be able to meet the demand.

Other research of 211 has focused on the lack of incentives among 211 and other social service referral entities to collect, maintain, and share data on social service requests by type, referrals, and resolutions. This presents a missed opportunity to understand community needs and to assess the performance of 211 systems designed to meet them.⁴⁹ Those agencies that do routinely collect these data don’t necessarily

⁴² Mazerolle et al., "Baltimore's 3-1-1 System."

⁴³ Mazerolle et al., "Baltimore's 3-1-1 System."

⁴⁴ Chris Herring, "Complaint-Oriented Policing: Regulating Homelessness in Public Space." *American Sociological Review* 84, no. 5 (2019): 769-800. <https://journals.sagepub.com/doi/10.1177/0003122419872671>.

⁴⁵ Sonia Boyum et al., "Getting Help from 2-1-1: A Statewide Study of Referral Outcomes," *Journal of Social Service Research* 42, no. 3 (2016): 402-411. DOI: [10.1080/01488376.2015.1109576](https://doi.org/10.1080/01488376.2015.1109576).

⁴⁶ Boyum et al., "Getting Help from 2-1-1."

⁴⁷ Matthew Kreuter et al., "Assessing the Capacity of Local Social Services Agencies to Respond to Referrals from Health Care Providers," *Health Affairs* 39, no. 4 (2020):679-688. doi: 10.1377/hlthaff.2019.01256.

⁴⁸ Kreuter et al., "Assessing Capacity."

⁴⁹ Greg Bloom, "Averting Tragedy of the Resource Directory Anti-Commons: A Practical Approach to Open Data Infrastructure for Health, Human, and Social Services" in *The Cambridge Handbook of Commons Research Innovations*, eds. Sheila R Foster and Chrystie F. Swiney (Cambridge: Cambridge University Press, 2021).

share them with other agencies, creating a knowledge “anti-commons”⁵⁰ by which data that are technically shared resources are held by multiple agencies in a manner that leads to their systematic underutilization.⁵¹

How effective are efforts to get people to use alternative hotlines?

For alternative hotlines to work effectively, the public needs to know about them, use them, and have sufficient satisfaction with the quality of the response received that they use them again. Chicago, IL, has raised public awareness of 311 through communications campaigns, one of which broadcasted former Mayor Rahm Emanuel quipping the slogan “Burning building? Call 911. Burning question? Call 311.” throughout the city.⁵² This may explain why Chicago boasts one of the higher annual rates of calls to 311, at 151 per 1,000 population.⁵³

Some evidence demonstrates that hotline awareness and usage increases via popular media, such as the Grey’s Anatomy show whose storyline featured a sexual assault and for which the Rape, Abuse, and Incest National Network rape crisis hotline National Rape Hotline Number was shared prior to the show’s credits,⁵⁴ or when singer Demi Lovato was hospitalized for a heroin overdose and an addiction treatment hotline was mentioned in the coverage.⁵⁵ Recent research suggests that Logic’s song *1-800-273-8255* produced a significant increase in calls to suicide prevention resources.⁵⁶ Other research, however, finds that concerted efforts to increase use of hotlines yield mixed results. A multi-pronged effort in Hawaii to share information about an invasive species of snake was effective in raising general awareness of the threat, but not in raising awareness or usage of the pest hotline.⁵⁷

One way to encourage people to use alternative hotlines is to ensure that their issue or request is resolved expediently. In terms of timeliness, analysis of 311 data from 15 jurisdictions found that average wait time can range from 5 to 231 seconds, with the share of calls resulting in hang-ups prior to an agent answering ranging from 1.4 percent to 45 percent.⁵⁸ Satisfaction with services rendered is also crucial in encouraging 311 usage. For example, an evaluation of Philadelphia, PA’s introduction of 311 found that the system was perceived by users as providing easier access to nonemergency information and services, and that the vast majority (68 percent) of Philadelphians who made use of the line reported satisfaction with it, even though one in four service requests went unresolved within a year’s time.⁵⁹

⁵⁰See Michael A. Heller, "The Tragedy of The Anticommons: Property in the Transition from Marx to Markets," *Harv. L. Rev.* 111, no. 3 (1998): 621-88.

⁵¹ Bloom, “Averting Tragedy.”

⁵² Mazerolle et al., "Baltimore's 3-1-1 System."

⁵³ Pew Charitable Trusts, “A Work in Progress.”

⁵⁴ Trevor Torgerson et al., “Public Awareness for a Sexual Assault Hotline Following a Grey's Anatomy Episode,” *JAMA Internal Medicine* 180, no. 3 (2020): 456-458, <https://doi.org/10.1001/jamainternmed.2019.5280>.

⁵⁵ John W. Ayers et al., "Media Trends for the Substance Abuse and Mental Health Services Administration 800-662-HELP Addiction Treatment Referral Services After a Celebrity Overdose," *JAMA Internal Medicine* 179, no. 3 (2019): 441-442.

⁵⁶ Thomas Niederkrotenthaler et al., "Association of Logic’s Hip Hop Song ‘1-800-273-8255’ with Lifeline Calls and Suicides in the United States: Interrupted Time Series Analysis," *BMJ* 375 (December 2021), <https://doi.org/10.1136/bmj-2021-067726>.

⁵⁷ Christy Martin, "Promoting Awareness, Knowledge, and Good Intentions," *Managing Vertebrate Invasive Species* 28 (2007), <https://digitalcommons.unl.edu/nwrcinvasive/28>.

⁵⁸ Pew Charitable Trusts, “A Work in Progress.”

⁵⁹ Pew Charitable Trusts, “A Work in Progress.”

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What does research tell us about best practice in the implementation and operation of nonemergency hotlines?

No rigorous research exists that links specific features of alternative hotlines with concrete measures of hotline effectiveness. However, a qualitative study of 311 implementation in New York and Chicago (both cities having been identified by the author as exceptionally positive case studies) yields some prescriptive insights.⁶⁰ The author notes that New York's successful implementation of 311 was a result of:

- strong executive leadership (311 implementation was a priority for then-Mayor Michael Bloomberg);
- the use of existing yet scalable software;
- establishment of a centralized 311 governance structure;
- the ability to hold agencies accountable for the adequate resolution of service requests through a web-based portal of performance metrics; and
- a customer service orientation on the part of telecommunicators.

Another study notes the fact that New York's system allows residents to track the progress of their requests, which serves as an accountability mechanism.⁶¹

Ingredients for success in Chicago included coordination with local aldermen, who are closer to constituents and can submit service requests and track service resolution for them; investment in continual technological enhancements; and the 311 system's flexibility in allowing members of the public the option of engaging via phone, email, or mobile app.⁶² Others have observed the value and promise of 311 access via an array of means, with New York now offering both a Twitter and online reporting service, and Philadelphia employing a 311 smartphone app with which users can text requests and upload photos.⁶³ Given that the National Emergency Number Association reports that more than 80 percent of calls to 911 are placed via wireless devices, the development of smartphone apps for both 311 and 211 is a promising approach.⁶⁴

Evaluators of Baltimore's 311 system made several recommendations that could improve operations and effectiveness. These include ensuring that the system is sufficiently funded and adequately staffed, that the goals of the system are effectively communicated to practitioner stakeholders and community members, and that dispatch priorities and governing policies be modified in accordance with responses to nonemergency calls.⁶⁵ Importantly, the evaluators recommended that the 311 system be integrated into community policing activities, such that officers use the free time associated with reductions in dispatched calls to engage in problem solving with community members.⁶⁶ A related recommendation was to pilot a "split force" approach to handling nonemergency calls, wherein 311 calls are diverted to designated patrol units who would use a problem solving approach to their responses.⁶⁷

⁶⁰ Wiseman, "311 Call Centers."

⁶¹ Marc Holzer et al., "State-level 311 Systems: Leveraging Service Enhancement and Performance Measurement at the State Level," *The Book of the States* 38 (2006): 409-413.

⁶² Wiseman, "311 Call Centers."

⁶³ Thornton, "Beyond 311."

⁶⁴ National Emergency Number Association, "9-1-1 Statistics," accessed July 15, 2021, <https://www.nena.org/page/911Statistics>.

⁶⁵ Mazerolle et al., "Baltimore's 3-1-1 System."

⁶⁶ Mazerolle et al., "Baltimore's 3-1-1 System."

⁶⁷ Mazerolle et al., "Baltimore's 3-1-1 System."

Finally, a 2006 review of 311 systems in Baltimore, MD, New York, NY, Chicago, IL, Houston, TX and Dallas, TX concluded that it is important to invest in integrating 311 with a web system that can be used to both submit requests and track performance, combine 311 with 211 and 511, and develop systems that span multiple jurisdictions or even an entire state.⁶⁸

What do we know about the effectiveness of crisis hotlines?

Evaluations of tailored hotlines are limited primarily to suicide and domestic violence hotlines. However, one study of eight generic crisis lines serving non-suicidal callers found them to be successful in reducing callers' crisis states and levels of hopelessness during the call and in the weeks following. That same study found that most callers were referred to mental health services in their communities, and about one in three callers made use of those services.⁶⁹ Similarly, a study of 1,085 suicidal callers found that levels of suicidality decreased significantly both during the call and in the weeks following it.⁷⁰ Descriptive studies of suicide lines that employ a chat function found that users engaging via chat or text as opposed to phone have higher levels of suicidal ideation, suggesting that crisis lines should increase their capacity to use texting or chatting functions to promote accessibility for this high-need population.⁷¹

These studies are quite promising, but it should be noted that not all helplines are of equal quality. In fact, the quality of service provided by suicide hotlines varies considerably, even within the same state. A study of ten suicide prevention hotlines in California found that, while the demographics and risks of callers were similar across hotlines, callers to lines that were part of the National Suicide Prevention Lifeline were more likely to experience reduced distress compared with callers to other suicide and crisis prevention lines. This suggests that standardization of processes and continual monitoring through measures such as those in the recent 988 suicide hotline legislation passed by Congress hold promise for improving service delivery across all suicide hotlines.⁷²

Another sobering finding related the National Suicide Prevention Lifeline is the rate at which counselors send emergency services. Researchers found that for 20 percent of calls categorized as posing imminent risk, counselors sent emergency services (police, sheriff, emergency medical services) with the collaboration of the callers, and in 25 percent of such cases counselors sent emergency services without the caller's collaboration.⁷³ The authors concluded that there remains room for improvement in that mobile crisis teams and stabilization facilities are not universally available resources.

Research in domestic violence or intimate partner violence hotlines is limited to studies that survey hotline callers, rather than experimental designs that can isolate hotline impact, or rigorous

⁶⁸ Holzer et al., "State-level 311 Systems."

⁶⁹ John Kalafat et al., "An Evaluation of Crisis Hotline Outcomes. Part 1: Nonsuicidal Crisis Callers," *Suicide and Life-threatening Behavior* 37, no. 3 (2007), 322-337.

⁷⁰ Madelyn S. Gould et al., "An Evaluation of Crisis Hotline Outcomes. Part 2: Suicidal Callers," *Suicide and Life-threatening Behavior* 37, no. 3 (2007), 338-352.

⁷¹ Madelyn S. Gould et al., "National Suicide Prevention Lifeline Crisis Chat Interventions: Evaluation of Chatters' Perceptions of Effectiveness," *Suicide and Life-Threatening Behavior* 51, no. 6 (2021): 1126-1137. <https://doi.org/10.1111/sltb.12795>.

⁷² Rajeev Ramchand et al., "Characteristics and Proximal Outcomes of Calls Made to Suicide Crisis Hotlines in California," *Crisis* 38, no. 1 (2016): 26-35.

⁷³ Madelyn S. Gould et al., "Helping Callers to the National Suicide Prevention Lifeline who are at Imminent Risk of Suicide: Evaluation of Caller Risk Profiles and Interventions Implemented," *Suicide and Life-Threatening Behavior* 46, no. 2 (2016): 172-190, <https://onlinelibrary.wiley.com/doi/pdf/10.1111/sltb.12182>.

implementation-science analyses of hotline structures and processes. In addition, a stakeholder-informed assessment framework has been developed but not yet implemented.⁷⁴ These descriptive, survey-based studies of the National Domestic Violence Hotline reported overall caller satisfaction with online chats and telephonic services, which were perceived as providing helpful emotional support.⁷⁵ However, a follow-up study found that while improvements in knowledge, outlook, and self-confidence were self-reported at two weeks following hotline contact, actual changes in behavior did not comport with callers' intentions (for example, only one in four who expressed an intention to move into a shelter had done so).⁷⁶ Another important finding was that domestic violence callers reported higher rates of emotional support and greater access to all forms of services than chatline users, with the exception of healthy relationship education.⁷⁷ Importantly, callers were more likely than chatline users to report emotional, verbal, and physical abuse.⁷⁸ A companion study noted that use of the online chat function was increasing over time, and that potential users (identified as website visitors) rated online chat as their preferred method of communication.⁷⁹

Questions for Inquiry and Action

As referenced above, research is sparse regarding alternative hotlines and the degree to which they reduce reliance on 911 ECCs, police dispatch, and the effect of such hotlines on reducing poor or disparate outcomes on those in need. Existing research is largely descriptive or correlational. In part, these gaps in knowledge reflect the challenges facing researchers seeking to access calls-for-service data. These data were not designed for research use, thus are difficult to document, clean, and recode for evaluation purposes. The few rigorous studies that do explore the impact of 311 introduction suffer from methodological challenges, such as how to disentangle changes in 311 and 911 usage with concurrent increases or decreases in crime that may occur during the evaluation period.

Studies of municipalities' transitions to 311 typically examine impact only in the first year of implementation. Moreover, existing research on this topic is already years, if not decades, old, rendering the relevance of the findings in the present-day context questionable, particularly given advances in information and communications technologies in recent years. Across this broad swath of literature, no studies were identified that examine the impact of alternative hotlines on people of color or under-resourced communities.

More studies are needed across a range of relevant topics:

⁷⁴ Jessica G. Burke et al., "A Theoretical and Stakeholder-Informed Assessment Framework for the National Domestic Violence Hotline," Family and Youth Services Bureau and the Office of Planning, Research, and Evaluation, Administration for Children & Families, U.S. Department of Health and Human Services, 2019, https://www.acf.hhs.gov/sites/default/files/documents/opre/tf_brief_20190329_final_508a_2019.pdf.

⁷⁵ Karen A. McDonnell et al., "Short-Term Outcomes for Users of the National Domestic Violence Hotline and loveisrespect," OPRE Report # 2020-55, Washington, D.C.: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, April 2020; Karen A. McDonnell et al., "An Evaluation of the National Domestic Violence Hotline and loveisrespect: A report from the Accomplishments of the Domestic Violence Hotline, Online Connections, and Text Project," Administration for Children & Families, U.S. Department of Health and Human Services, December 2018, <https://www.acf.hhs.gov/opre/report/evaluation-national-domestic-violence-hotline-and-loveisrespect>.

⁷⁶ McDonnell et al., "Short-Term Outcomes."

⁷⁷ McDonnell et al., "Short-Term Outcomes."

⁷⁸ McDonnell et al., "Short-Term Outcomes."

⁷⁹ McDonnell et al., "Evaluation of NDVH."

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- To what degree does the introduction or expansion of alternative hotlines divert calls away from 911, reduce the dispatch of police officers, or increase the dispatch of non-sworn social workers or mental health clinicians? Are some hotlines more successful in meeting callers' non-emergency needs than others?
- What is the difference in the quality of response to calls made to alternative hotlines versus those made through 911?
 - Are alternative hotline responses faster or slower (including call hold time)?
 - What share of alternative hotline calls are resolved without having to dispatch someone? What share result in the dispatch of an officer versus a social worker, mental health clinician, or other non-sworn responder?
 - What is the difference in caller satisfaction with services rendered among 911, 311, and 211 for the same call type?
 - What is the difference in the provision of appropriate follow-up services between 911, 311, and 211 for the same call type?
 - What are the privacy concerns and protections needed for people accessing service via 911, 311, 211, and 988?
 - What are the most effective approaches to educate communities about accessing 911, 311, 211, and 988?
- What are the relative costs (including time spent on scene) and potential savings of alternative hotlines, and where are any savings reinvested (e.g., to support the operation of the hotline or back into the community)?
- To what degree does the introduction of various forms of alternative hotlines reduce or increase racially disparate outcomes?
 - Do alternative hotlines lead to reductions in police dispatches by race and community demographics?
 - Do they reduce disparate outcomes associated with those calls that still result in police dispatch?
- What impact will the introduction on 988 have on the share of people who seek helpline versus 911 services? What are the issues and challenges associated with re-routing calls from 911 to 988 and vice versa? Are people who seek suicide and mental health services through 988 less likely to experience a police response or hospitalization compared with those who call 911 for the same services? To what degree does the inability of 988 to geolocate the call source compromise the ability to provide life-saving services?

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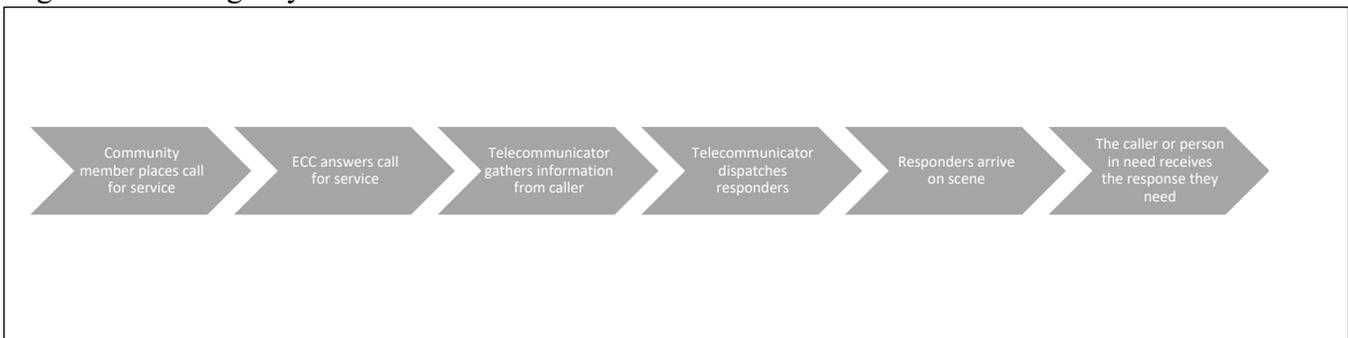
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Chapter 4: Emergency Communications Center Operations

Introduction

When a member of the public places a call to 911, a series of processes are initiated that have significant consequences for the caller, for the subject of the call, and for first responders. The steps taken are determined by policies and procedures governing whether and to whom the call is routed, and by how the 911 professional who answers the call captures information about the situation, assesses the level of urgency and risk, and resolves the call on their own or transfers it to another service provider or dispatcher. The role of 911 professionals thus goes beyond answering and routing calls. They must employ active listening skills to assess the nature and exigency of the call; provide information and referrals to calls for information; apply (often-complex) rules or guidelines associated with which calls should result in police dispatch; impart contextual information to ensure the safety of assigned responders; communicate with the caller to provide critical guidance until the arrival of responders; and record any updates to the nature of the call and its resolution into the computer-aided dispatch (CAD) system. These processes may appear straightforward on the surface, but they are influenced by the complex interplay of technologies, organizational structures and processes, and human decision-making. Emergency Communications Centers (ECCs), also known as Public Safety Answering Points (PSAPs) are essential in ensuring that these processes are delivered in a manner that resolves callers' needs efficiently and effectively.

Figure 4.1: Emergency Communications Center Process



While many of the processes associated with emergency communications are governed by the agency in which the ECC is housed,¹ faithful execution of these measures is squarely in the domain of the ECC. Their activities influence when police officers are sent to the scene and what those officers anticipate they will encounter upon arrival. Together with sound governance and standard operating procedures, optimal ECC processes can guide what share of calls are resolved without the need for field response, which ones should be diverted to alternative first responders, such as a mental health professional, and

¹ Depending on the state or locality, ECCs may be housed in fire departments, law enforcement agencies, other public agencies, or occasionally in private entities. For more details, see the [911 Governance chapter](#) in this volume.

which might be addressed through specialized responses such as Crisis Intervention Team or co-responder models.

This brief examines 911 call-handling processes, including the use of triaging guidelines, call-taking scripts, and dispatching protocols. It also addresses ECC policies, procedures, and protocols that enable the valid and reliable collection of information about calls for service, support call classification and triage reliability, and promote the efficient and effective dissemination of that information to traditional first and alternative first responders. Given that other briefs in this volume address issues pertaining to the recruitment and training of 911 professionals, technology issues and advances in 911, and 911 governance issues, this brief is focused primarily on call-taking and dispatching processes and technologies, ECC operational structures, accountability mechanisms, and stakeholder engagement and accountability.

State of Practice

ECC functions vary based on the local agencies they serve, as well as the geographic characteristics and reach of their purview. Regardless, all ECCs are required to answer and coordinate responses to calls for service (CFS), which involves the use of standard operating procedures governing a wide array of technologies, information services, protocols, and personnel. These procedures are influenced by the overall structure of the ECC, its jurisdictional reach, and the agency in which it is housed.

Call Taking, Triaging, and Dispatching

When a call is placed to an ECC, it must be routed to the nearest answering point, answered by a trained professional and assessed for the nature of the caller's need and degree of urgency (triage). Ultimately, the call must be resolved by the call taker (which may involve providing information or service referral, such as to a government agency, 311, 211, or crisis line), referred to a specialized professional (e.g., a mental health clinician or person trained behavioral health issues), or referred to police, fire or emergency medical service (EMS) dispatch. 911 professionals also may remain engaged with the caller until field responders arrive on the scene, providing treatment or safety guidance.² Dispatchers are responsible for helping to direct field responders to locations in need of service while ensuring that responders have accurate information on the nature of the incident in order to take measures to protect both their safety and that of the public.

911 professionals have both considerable decision-making authority and substantial constraints on their influence of call outcomes, both of which can promote beneficial or harmful outcomes, depending on the context.³ One study found that call takers resolved half of all calls, without having to refer them to dispatch, by responding to requests for information or referring callers to other governmental or community services.⁴ This degree of agency is helpful in preventing unnecessary police response and inefficient allocation of resources, but absent sufficient guidelines, it may also enable excessive subjective decision-making. The way in which 911 professionals interpret and resolve calls affects how

² S. Rebecca Neusteter et al., "The 911 Call Processing System: A Review of the Literature as it Relates to Policing," Vera Institute of Justice, July 2019, <https://www.vera.org/publications/911-call-processing-system-review-of-policing-literature>.

³ Cynthia Lum et al., "Constrained Gatekeepers of the Criminal Justice Footprint: A Systematic Social Observation Study of 9-1-1 Calltakers and Dispatchers," *Justice Quarterly* 37, no. 7 (2020): 1176-1198, <https://doi.org/10.1080/07418825.2020.1834604>.

⁴ Lum et al., "Constrained Gatekeepers."

field responders perceive the level of risk and nature of the incident. Communications from 911 professionals could prime responders to use force or be influenced by a racially—or otherwise—biased perception of the circumstances.⁵ Indeed, studies examining the nature of exchanges between callers and 911 professionals suggest that such communications may compromise objective decision-making on the part of both 911 professional and officer.⁶ In addition, an ethnographic study of 911 professionals documents the difficulties they experience in exercising their functional authority, citing the challenges and emotional toil they experience when officers question or resist their directives.⁷

Scripts and questionnaires are designed to help 911 professionals assess the nature of each call and whether it should lead to police or emergency service dispatch.⁸ This guidance is important to ensure that calls are neither over-triaged (sending a responder when one is not necessary) or under-triaged (underestimating the exigency and risk of the event). Standardized call-taking and triaging protocols exist to provide this guidance, such as the National Emergency Number Association’s (NENA) Standard for 911 Call Processing,⁹ the Law Enforcement Dispatch Guidecards and triage protocols developed by the Association of Public Safety Communications Professionals (APCO),¹⁰ the Advanced Medical Protocol Dispatch System developed by the International Academies of Emergency Dispatch, and the proprietary Medical Priority Dispatch system, although the latter two were developed for use by EMS 911 professionals.¹¹ The Criteria Based Dispatch program, which was originally developed for emergency medical services responders, is being adapted for police dispatch in select jurisdictions across the country. In addition, many ECCs develop and use their own tools internally.¹² These protocols differ in their original purposes, and the degree of flexibility and discretion they afford call takers.¹³

⁵ Jessica W. Gillooly, "How 911 Callers and Call-takers Impact Police Encounters with the Public: The Case of the Henry Louis Gates Jr. Arrest." *Criminology & Public Policy* 19, no. 3 (2020): 787-804; Roge Karma, "Want to Fix Policing? Start with a Better 911 System," Vox, August 10, 2020. <https://www.vox.com/2020/8/10/21340912/police-violence-911-emergency-call-tamir-rice-cahoots>;

Paul L. Taylor, "Dispatch Priming and the Police Decision to Use Deadly Force," *Police Quarterly* 23, no. 3 (2020): 311-332.

⁶ Jessica W. Gillooly, "'Lights and Sirens,' Variation in 911 Call-Taker Risk Appraisal and its Effects on Police Officer Perceptions at the Scene," *Journal of Policy Analysis and Management* (December 2021), <https://doi.org/10.1002/pam.22369>; D.H. Zimmerman, D. "Talk and Its Occasion: The Case of Calling the Police," in *Meaning, Form and Use in Context: Linguistic Applications*, ed. D. Schiffrin (Washington, D.C.: Georgetown University Press, 1984), 210–228; D.H. Zimmerman, "The Interactional Organization of Calls for Emergency Assistance," in *Talk at Work: Social Interaction in Institutional Settings*, ed. P. Drew & J. Heritage (Cambridge: Cambridge University Press, 1992), 418–469; A.C. Garcia & P.A. Parmer, "Misplaced Mistrust: The Collaborative Construction of Doubt in 911 Emergency Calls," *Symbolic Interaction* 22, no. 4 (December 2011): 297–324. doi:10.1525/si.1999.22.4.297; M.R. Whalen & D.H. Zimmerman, "Describing Trouble: Practical Epistemology in Citizen Calls to the Police," *Language in Society* 19, no. 4 (December 2008): 465–492. doi:10.1017/S0047404500014779.

⁷ Arvind Karunakaran, "Status–Authority Asymmetry between Professions: The Case of 911 Dispatchers and Police Officers," *Administrative Science Quarterly* (November 2021) doi:10.1177/00018392211059505.

⁸ Karunakaran, "Status–Authority Asymmetry."

⁹ PSAP Operations Committee, and 9-1-1 Call Processing Working Group, "NENA Standard for 9-1-1 Call Processing," Alexandria: National Emergency Number Association (NENA), April 16, 2020.

¹⁰ APCO International, "Guidecards," accessed December 3, 2021, <https://www.apcointl.org/services/guidecards/>.

¹¹ Jeff. J. Clawson, "The DNA of Dispatch: The Reasons for a Unified Medical Dispatch Protocol," *Journal of Emergency Medical Services* 22, no. 5 (May 1997): 55-57; S. Rebecca Neusteter et al., "Understanding Police Enforcement: A Multicity 911 Analysis," Vera Institute of Justice, September 2020, <https://www.vera.org/publications/understanding-police-enforcement-911-analysis>.

¹² Neusteter et al., "Understanding Police Enforcement."

¹³ Neusteter et al., "Understanding Police Enforcement."

¹³ Brian S. Zachariah and Paul E. Pepe, "The Development of Emergency Medical Dispatch in the USA: A Historical Perspective," *Official Journal of the European Society for Emergency Medicine* 2, no. 3 (1995): 109-112.

Call-taking protocols around behavioral health¹⁴ and intimate partner violence¹⁵ crises are also in use in some ECCs. APCO has developed a set of standards that 911 professionals who respond to behavioral health-related calls should meet. These standards recommend that 911 professionals possess awareness of the different ways that behavioral health crises present themselves, knowledge of available behavioral health resources in the community, and the skills needed to adopt a compassionate and empathetic approach to call-taking that includes listening actively and responding calmly.¹⁶

Call-taking scripts or questionnaires are not used universally by ECCs, thus there is a patchwork of protocols guiding 911 professionals, and uneven experiences among community members seeking emergency services. A recent survey of 37 ECCs across 27 states found that many had no tool to aid in the identification of behavioral health-related calls. Similarly, 911 professionals experience insufficient training and a lack of available resources to divert calls related to mental health concerns. Relatively few 911 professionals are trained in how to handle behavioral crisis calls; in fact, about one in five lack specialized resources, such as behavioral health clinicians, crisis-trained 911 professional or field responder staff, or mobile crisis units.¹⁷ Furthermore, the survey found that 11 of 17 responding ECCs serving predominantly white communities indicated they have 911 professionals on staff who had been trained in behavioral health crisis identification, versus just 1 in 9 of ECCs serving majority nonwhite communities, providing yet another example of the inequitable provision of services to communities of color.¹⁸

Research on lawsuits filed against ECCs found that the incidents that are most vulnerable to litigation involve dispatch errors, many of which could be prevented through better call handling and customer service practices.¹⁹ One theme that ran throughout these cases was that most of the ECCs under litigation lacked a standardized protocol to guide dispatching. Even for cases in which a tool was available, oftentimes that tool was either not routinely used, 911 professionals were not trained to use it, or it was not integrated as part of a comprehensive system. The key takeaway is that to prevent adverse events that result in litigation, ECCs should both have a dispatch tool and ensure that 911 professionals are trained and held accountable for using it routinely and with fidelity.

As discussed in detail in the *911 Professionals* research brief in this volume, 911 professionals must be trained²⁰ and should be accredited and classified as emergency responders rather than administrative staff. APCO has put forth minimum training standards for 911 professionals, along with training and technical assistance.²¹ However, compliance with these standards is entirely optional, and it is unclear what share of ECCs adopt them. Importantly, a recent survey found that just one third of ECCs had staff

¹⁴ APCO International, “Crisis Intervention Techniques and Call Handling Procedures for Public Safety Telecommunicators,” accessed August 10, 2021, <https://www.apcointl.org/~documents/standard/11201-2021-cit-and-call-handling?layout=default>.

¹⁵ North Carolina Governor's Crime Commission, “911: Dispatcher Protocol: Violence Against Women,” accessed August 10, 2021, <https://static1.squarespace.com/static/530103c6e4b0aca487ca285f/t/55f19befe4b063e7526b58af/1441897455862/911+Dispatch+Protocol.pdf>.

¹⁶ APCO International, “Crisis Intervention Techniques.”

¹⁷ Pew Charitable Trusts. “911 Call Centers Lack Resources to Respond to Behavioral Health Crises,” October 2021, <https://www.pewtrusts.org/-/media/assets/2021/11/911-call-centers-lack-resources-to-handle-behavioral-health-crises.pdf>.

¹⁸ Pew Charitable Trusts, “911 Call Centers Lack Resources.”

¹⁹ Jeff Clawson et al., “Litigation and Adverse Incidents in Emergency Dispatching,” *Annals of Emergency Dispatch & Response* 6 (2018): 1-12.

²⁰ 911.gov, “Telecommunicators & Training,” accessed August 10, 2021, https://www.911.gov/issue_telecommunicatorsandtraining.html.

²¹ APCO International, “About APCO,” July 9, 2019, <https://perma.cc/V9JW-ZFQB>; APCO International, “Minimum Training Standards for Public Safety Telecommunicators,” 2015, <https://perma.cc/752L-2HFJ>.

who had received specialized training in mental health and substance use disorders.²² Moreover, training may over-emphasize a customer service orientation that leads to the unnecessary dispatch of police,²³ particularly in cases where the caller requests a police response.²⁴

Call Classification

An important component of call-taking protocols and ECC processes is the degree to which they ensure that calls are classified accurately and reliably. Many ECCs have a large number of codes to use to classify calls by type and priority level.²⁵ This can be problematic when 911 professionals are tasked with coding calls very quickly, particularly when callers are in distress.²⁶ Despite this array of options (or perhaps because of it), different 911 professionals will code the same type of call at a higher or lower priority level,²⁷ and many calls of an uncertain nature end up being classified in nebulous or “other” categories.²⁸ This is particularly true for codes such as “suspicious circumstance” and “unknown trouble” which typically result in a police response.²⁹ Relatedly, while recent research has indicated that the share of calls pertaining to mental health issues is less than four percent, categories such as “disorder” and “welfare check” likely mask the true extent of behavioral health related calls.³⁰ Furthermore, a 2021 statewide survey of Michigan 911 dispatchers found that only about half have specific call categories for mental health needs; just 30 percent reported referring mental health calls to behavioral health crisis lines, with the remainder sharing concerns about liability from doing so.³¹

Both call takers and dispatchers also have a crucial role in interpreting and manufacturing CAD and CFS data. They are tasked with generating a record of each incident and potentially updating details associated with the incident to ensure accurate classification and document resolution.³² Their decisions and actions can influence both the accuracy of the data produced³³ and an ECC’s ability to analyze it to identify trends that can guide staffing and service delivery decisions.³⁴ A 2021 survey of 37 ECCs nationwide found that just 15 had a policy for updating 911 classification codes to reflect the outcome of the call or to reclassify the nature of the incident.³⁵ Those who lacked such a policy cited system inadequacies, staffing shortages, and a lack of updated information from field responders as the primary reasons.³⁶ A recent analysis of over 500,000 calls classified by 911 professionals and responding officers found that while most calls were classified correctly, the call type with the highest degree of misclassification was “unknown trouble.”³⁷ In addition, the authors observed that the most ambiguous

²² Pew Charitable Trusts, “911 Call Centers Lack Resources.”

²³ Gillooly, “Police Encounters with the Public.”

²⁴ Lum et al., “Constrained Gatekeepers.”

²⁵ Neusteter et al., “911 Call Processing System.”

²⁶ Rylan Simpson, “Calling the Police: Dispatchers as Important Interpreters and Manufacturers of Calls for Service Data,” *Policing: A Journal of Policy and Practice* 15, no. 2 (June 2021): 1537–1545, <https://doi.org/10.1093/police/paaa040>.

²⁷ Gillooly, “Lights and Sirens.”

²⁸ Neusteter et al., “911 Call Processing System.”

²⁹ Neusteter et al., “911 Call Processing System.”

³⁰ Cynthia Lum et al., “Can We Really Defund the Police? A Nine-Agency Study of Police Response to Calls for Service,” *Police Quarterly*, July 2021, <https://doi.org/10.1177/10986111211035002>.

³¹ Wayne State University School of Social Work Center for Behavioral Health and Justice, “Michigan Statewide Emergency Dispatch Survey,” December 2021, https://behaviorhealthjustice.wayne.edu/crisis-response/cbhj_michigan-dispatch-survey_dec2021.pdf.

³² Simpson, “Calling the Police.”

³³ Simpson and Orosco, “Re-Assessing Measurement Error.”

³⁴ Simpson and Orosco, “Re-Assessing Measurement Error.”

³⁵ Pew Charitable Trusts, “Call Centers Lack Resources.”

³⁶ Pew Charitable Trusts, “Call Centers Lack Resources.”

³⁷ Simpson and Orosco, “Re-Assessing Measurement Error.”

call categories, such as “suspicious circumstance,” were not typically recategorized with more precise labels after closure.³⁸

APCO³⁹ has put forth common standards for incident codes, but it is unclear which ECCs have adopted them and with what degree of uniformity. The lack of a national standard for 911 call classification has implications not just for individual ECCs but also for their ability to communicate clearly and efficiently with other ECCs. This issue has prompted the development of a “plain language guide” for emergency communications that involve multiple jurisdictions, encouraging agencies to use common terminology rather than codes that are often unique to their ECC.⁴⁰ In addition, a partnership between APCO and NENA produced a National Information Exchange Model conformant standard to enable the sharing of emergency incident information among entities.⁴¹

Quality Assurance and Performance Measures

Compliance with call-taking and classification protocols can be reinforced by using quality assurance and performance measures, which provide operational checks and balances and aid in the ability to assess and improve upon desired outcomes, such as call efficiency and accurate triaging. As with other ECC standards of operation, quality assurance protocols vary by ECC. The most commonly employed metrics pertain to average speed of answer (the time it takes to answer an incoming call), call duration (the time it takes to resolve the call), dispatch time (the time it takes for responders to arrive on the scene), the share of abandoned calls (hang-ups), speed of resolution, and community complaints.⁴² However, these metrics may not represent effective response; both APCO, in partnership with NENA,⁴³ and other experts⁴⁴ recommend the use of more robust performance indicators to inform quality assurance processes, including;

- the number and share of calls that are transferred;
- the number and type of wired, wireless, text, and telecommunications device for the deaf calls by type; and
- ECC operational performance metrics such as forecasted versus actual call load, scheduled versus actual staff, staff adherence to schedule, average cost per call, and frequency of call review.⁴⁵

For further quality assurance, APCO and NENA recommend that at least two percent of all CFSs be randomly selected and assessed for accurate classification, dispatching, and record-keeping on event resolution.⁴⁶ Assessment of calls should be guided by a scoring template that covers protocols such as

³⁸ Simpson and Orosco, “Re-Assessing Measurement Error.”

³⁹ APCO International, “Public Safety Common Incident Types for Data Exchange (2012),” accessed August 10, 2021, https://cdn.ymaws.com/www.ijis.org/resource/collection/FA7CC2D0-8ABE-4946-BD92-5B81E09DEE85/Common_Incident_Type_Codes_Standard_FINAL_2012.pdf.

⁴⁰ SAFECOM, “Plain Language Guide: Making the Transition from Ten Codes to Plain Language,” US Cybersecurity & Infrastructure Security Agency, accessed January 24, 2022, <https://www.cisa.gov/sites/default/files/publications/PlainLanguageGuide.pdf>.

⁴¹ NENA/APCO, “NENA/APCO Emergency Incident Data Document (EIDD) Information Document (2013),” https://cdn.ymaws.com/www.nena.org/resource/resmgr/Standards/EIDD_INF-005_FINAL_20140221.pdf.

⁴² Brad Cleveland and Debbie Harne, “Call Center Metrics: Key Performance Indicators (KPIs),” ICMI Tutorials, Incoming Calls Management Institute, 2003, <https://www.icmi.com/files/StudentResourcePage/CCF/CCMetricsKPIs.pdf>.

⁴³ APCO/NENA, “Standard for the Establishment of a Quality Assurance and Quality Improvement Program for Public Safety Answering Points,” 2015, https://cdn.ymaws.com/www.nena.org/resource/resmgr/Standards/APCO-NENA_ANS_1.107.1.2015_Q.pdf.

⁴⁴ Cleveland and Harne, “Call Center Metrics.”

⁴⁵ Cleveland and Harne, “Call Center Metrics.”

⁴⁶ APCO/NENA, “Quality Assurance.”

adherence to standardized call-taking questions (location, nature, and urgency of event or incident); accuracy in use of and data entry into the CAD system, and telephone and communications protocols and communications skills.⁴⁷ Dispatching processes should be assessed in a similar manner, attending to issues such as accurate adherence to dispatch protocol by call type and severity, and whether the appropriate number of units were dispatched based on the nature of incident.⁴⁸

In addition, the call should be assessed based on the data in the CAD system with regard to accuracy, location of incident, and adherence to protocols requiring the sharing of crucial contextual information to field responders (presence of weapons, number of people involved, etc.).⁴⁹ ECCs should also examine CAD data entry error rates, the time it takes to locate a specific CFS event in the CAD system, and uniformity in call type coding among 911 professionals.⁵⁰ This review of data could include an assessment of what share of calls are reclassified following event resolution and what share of call types are coded as “other” and why.⁵¹ Improving the quality of call classification and documentation is particularly important in light of the fact that several states have introduced or passed anti-bias legislation creating or enhancing punitive measures the placing of false calls to 911, specifically including calls made to harass or intimidate a person or group based on race, ethnicity, or identity.⁵²

The performance of ECCs can also be assessed by soliciting community feedback; doing so is essential in building trust between community members and public institutions.⁵³ This can be accomplished through surveys of the entire community or surveys of people who have called 911 seeking emergency services. These may be conducted in person, by phone, via internet, or via text message. No industry standard exists for measuring customer satisfaction with ECC services.⁵⁴ Moreover, these surveys have the same limitations as those conducted to assess community satisfaction with the police, which tend to yield inflated measures of positive feedback owing to biased samples that over-represent people in affluent, low-crime communities.⁵⁵ Intentionally over-sampling people from high call-volume communities,⁵⁶ conducting focus groups with people who reside there,⁵⁷ or soliciting feedback through text-based surveys⁵⁸ may produce more accurate and representative views of ECC service delivery. It is also important to repeat the administration of surveys and focus groups over time to assess changes and identify areas that have improved or are in need of improvement.⁵⁹

⁴⁷ APCO/NENA, “Quality Assurance.”

⁴⁸ APCO/NENA, “Quality Assurance.”

⁴⁹ APCO/NENA, “Quality Assurance.”

⁵⁰ APCO/NENA, “Quality Assurance.”

⁵¹ Simpson and Orosco, “Re-Assessing Measurement Error.”

⁵² Mia Geoly, “Some States Crack Down on False 911 Reports,” State Legislative News. National Conference of State Legislatures, September 3, 2021. <https://www.ncsl.org/research/telecommunications-and-information-technology/some-states-crack-down-on-discriminatory-false-911-reports-magazine2021.aspx>.

⁵³ Thomas C. O'Brien and Tom R. Tyler, “Rebuilding Trust Between Police & Communities Through Procedural Justice & Reconciliation,” Behavioral Science & Policy 5, no. 1 (2019): 34-50.

⁵⁴ Cleveland and Harne, “Call Center Metrics.”

⁵⁵ Nancy La Vigne et al., “How do People in High Crime, Low Income Communities View the Police?,” Urban Institute, February 2017, https://www.urban.org/sites/default/files/publication/88476/how_do_people_in_high-crime_view_the_police.pdf.

⁵⁶ Jocelyn Fontaine et al., “Views of the Police and Neighborhood Conditions: Evidence of Change in Six Cities Participating in the National Initiative for Building Community Trust and Justice,” Urban Institute, November 11, 2019.

⁵⁷ Carla Barrett and Megan Welsh, “Petty Crimes and Harassment: How Community Residents Understand Low-Level Enforcement in Three High-Crime Neighborhoods in New York City.” *Qualitative Sociology* 41, no. 2 (2018): 173-197.

⁵⁸ Tammy Chang et al., “Text messaging as a community-based survey tool: a pilot study.” *BMC Public Health* 14, no. 1 (2014): 1-8.

⁵⁹ Fontaine et al., “Views of Police.”

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Operations and Structure

ECC operations have historically been unique to each center and driven by the needs of the jurisdictions and agencies they serve and where they are housed (e.g., police or sheriff's department, fire department, or other public or private entity). Indeed, ECC operations are primarily a local function⁶⁰ based on their geographic purview; according to the FCC's registry, of primary and secondary PSAPs, there were over 8,900 PSAPs as of October 15, 2021.⁶¹ Perhaps not surprisingly, the current state of ECC operational practice reveals a patchwork of structures and approaches, with scant clarity and little uniformity in call coding, answering, dispatching, and quality assurance processes. In recent decades, ECC operations have been challenged with increased demand for 911 services,⁶² which has compromised their ability to respond to emergency calls, particularly owing to rising intra- and inter-agency communications delays⁶³ and perennial funding issues, given that 911 service fees routinely fall short of covering the costs of operations.⁶⁴ Technology is a particular challenge for ECCs, given the wide array of vendors and proprietary CAD systems, many of which are antiquated or inhibit interoperability, thus restricting the ability of centers to take a data-driven approach to provision of services as well as to engage in quality assurance measures.

The advance of NG911 will promote greater coordination, collaboration, and interoperability among ECCs. This will require more complex operational procedures, greater cooperation and partnership across multiple agencies, and the modification of existing policies and practices to support the NG911 environment.⁶⁵ Indeed, improving ECC operations demands attending both to global issues, such as enhancing uniformity in service delivery across ECCs, as well as to local issues, such as ensuring representative input on operational priorities that embodies all perspectives, including those of residents from high call-volume communities.

NG911 may also lead to the consolidation of ECCs, a trend that is already under way, as the number of PSAPs nationwide has declined considerably over time.⁶⁶ While consolidation has its advantages in terms of increased efficiencies and economies of scale, it requires significant infrastructural investments to launch. Merging ECCs must agree upon standardization of call-taking and dispatching protocols, classification systems, certification, and training standards; and must ensure technologies are compatible (or migrate to a shared CAD system), among other considerations. Importantly, given the documented staffing shortages within ECCs,⁶⁷ consolidation should not be pursued as a means of laying off existing staff. Instead, the primary goal of such a move would be improving service delivery.

⁶⁰ Industry Council for Emergency Response Technologies (iCERT), *History of 911 and What It Means for the Future of Emergency Communications*, 2015, 3, <https://perma.cc/YL97-9J9C>.

⁶¹ iCERT, "History of 911."

⁶² More than half of all ECCs have experienced an increase in the number of dispatched calls. APCO International, "Project RETAINS: Staffing and Retention in Public Safety Answering Points (PSAPs): A Supplemental Study, 2017, <https://www.apcointl.org/services/staffing-retention/>.

⁶³ APCO International, "Project RETAINS."

⁶⁴ APCO International, "Project RETAINS."

⁶⁵ Task Force on Optimal PSAP Architecture (TFOPA), "Task Force on Optimal PSAP Architecture Final Report," Federal Communications Commission, January 29, 2016, https://transition.fcc.gov/pshs/911/TFOPA/TFOPA_FINALReport_012916.pdf.

⁶⁶ TFOPA, "Final Report."

⁶⁷ C. Scott, "911 Has Its Own Emergency: Not Enough Call Takers and Dispatchers," KDVR, May 24, 2021, <https://kdvr.com/news/local/not-enough-911-call-takers-and-dispatchers/>.

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Even among neighboring ECCs that have not consolidated, the differences in call-taking and dispatching protocols create an uneven experience for people seeking emergency services across geographic locations based on differences in how localities prioritize and triage calls. Different communities may desire different types of emergency services, with some communities expecting police response for events that appear “suspicious” and others preferring a non-law enforcement response to certain types of incidents.⁶⁸

To be clear, considerable operational challenges present themselves in the context of transitioning to NG911. Standard operating procedures will be needed to address broadband data and to account for a likely increase in call times, to validate the legitimacy of the data, to enable real-time texting and video chatting with the public and with first-responders, and to employ new technological options, such as captioning, for communications with non-English speakers and hearing and visually impaired callers.⁶⁹ These capabilities, which should be guided by functional and interface standards,⁷⁰ are essential in ensuring equitable access to emergency service delivery, facilitating communications with all communities and populations, and preventing miscommunications that could have dire consequences for people in need. Importantly, the migration to NG911 will enable people experiencing intimate partner violence to surreptitiously text their location and details of their event. However, the improved location identification functions increase the risks of violating the confidentiality of the caller, who may wish to remain anonymous.

ECC operations are determined by policies and procedures developed by leaders in each agency.⁷¹ Resources for standardizing or optimizing these operations exist, but are not always used or followed. For example, 911.gov provides wide-ranging resources, including assistance with NG911 implementation, telecommunicator job classifications, and resources for COVID-19.⁷² Two additional policy resources include NENA and APCO, which are membership associations supporting 911 professionals. Policies establish criteria for the tasks described above, as well as mechanisms for maintaining quality of the information captured. Protocols enable valid and reliable information collection about emergencies, support inter-rater reliability, and support the efficient and effective dissemination of that information to first responders and, where necessary, to others.

Research Evidence

As referenced above, the research evidence on ECC operations is relatively sparse regarding the best structures and operational models for ECCs but is increasingly robust regarding the call-taking and dispatching processes. ECCs operations can be informed by recent qualitative research that describes the call-taking, triaging, and dispatching processes; by quantitative studies that examine the degree to which calls are coded as high priority and classified accurately; and by reasons for variations in decision-

⁶⁸ Chris Magnus, “Tucson Police Department Meeting the Challenges of a Growing Call Load,” *Tucson.com*, June 11, 2018, <https://perma.cc/LV7W-NA4D>.

⁶⁹ APCO International, *Broadband Implications for the PSAP: Analyzing the Future of Emergency Communications*, 2017, <https://www.apcointl.org/~documents/report/p43-report-broadband-implications-for-the-psap?layout=default>.

⁷⁰ National Emergency Number Association (NENA), “i3 Standard for Next Generation 9-1-1 Version 1.0 (i3),” NENA Core Services Committee, i3 Architecture Working Group, October 7, 2021, https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/nena-sta-010.3a-2021_i3_stan.pdf.

⁷¹ The vast and complex governance structures are described more fully in Chapter 5: Governance.

⁷² 911.gov, <https://www.911.gov/>.

making among 911 professionals. Research outside of the emergency services domain, such as implicit biases and behavioral economics studies, may also help inform ECC efforts to improve equitable and safe service delivery.

What is the best or most optimal ECC structure?

Each ECC is a part of a complex, multi-level governmental ecosystem and its place within it in large part dictates its structure, as does the ECC's geography and population.⁷³ As such, the conventional wisdom on "best" ECC structure is that one size does not fit all. However, guidance on optimal ECC structures and operations, developed specifically to facilitate migration towards NG911, underscores the necessity of increased coordination and potential consolidation.⁷⁴ Best practice ECC operations, especially in the NG911 context, may involve local and regional partnerships, shared standard operating procedures and quality assurance mechanisms, shared staff among neighboring ECCs and/or across police, fire, and emergency medical services, and strategies to share technology and promote interoperability.⁷⁵ Such coordination holds promise for greater flexibility during high call-volume periods, improved communications in the case of widespread disasters, and potential costs savings in shared resources.⁷⁶ Examples of shared 911 communications center models span the continuum from facility sharing with separate staff, to sharing of staff housed in separate facilities, to sharing of staff in a shared facility, such as centralized call-taking centers, which bridge multiple agencies.⁷⁷ Again, no research exists on which model is best, likely because "best" means something different to each ECC based on its authority, reporting agency, and local context.

What is the best operational model to support the routing of non-emergency calls to other hotlines, telecommunications specialists, and alternative responders?

One descriptive research study hypothesizes that the use of such tailored protocols has made dispatchers more comfortable in routing calls to alternative responders.⁷⁸ The same study recommends that 911 professionals be involved in the planning and development of new call-taking and dispatch protocols designed to make better use of alternative responders. These should be data-driven, easy to read, and accompanied by training. This engagement in protocol design holds promise in encouraging 911 professionals to dispatch to alternative first responders.⁷⁹

One potential model in the context of shifting certain types of 911 calls from law enforcement to other actors is to retain the local ECC structure but divert certain types of calls to a secondary ECC that has dedicated personnel to respond to them. However, this model requires a higher degree of specialization for call center staff.⁸⁰

Another operational consideration is whether 911 and alternative hotlines such as 311, 211, and 988 employ the same call center professionals in a central hub or are handled separately. The literature is

⁷³ TFOPA, "Final Report."

⁷⁴ TFOPA, "Final Report."

⁷⁵ TFOPA, "Final Report."

⁷⁶ TFOPA, "Final Report."

⁷⁷ TFOPA, "Final Report."

⁷⁸ Ethan Aaronson, "Preparing 911 Dispatch Personnel for New First Responder Teams," Council of State Governments Justice Center, Field Notes: Behavioral Health, December 2021, https://csgjusticecenter.org/wp-content/uploads/2021/12/Field-Notes_Preparing-911-Dispatch-Personnel_508.pdf.

⁷⁹ Aaronson, "Preparing 911 Dispatch Personnel."

⁸⁰ Aaronson, "Preparing 911 Dispatch Personnel."

silent on the best operational structure. On the one hand, it is less expensive and more feasible to deliver training on behavioral health issues and available alternative resources to a subset of specialized call takers, such as those answering 311 or dedicated crisis lines. On the other hand, research indicates that the public uses 911 for non-emergency calls regardless of the existence of alternative hotlines,⁸¹ suggesting that training all 911 professionals on alternative responses would increase the likelihood that most calls that are appropriate for alternative response are diverted.

How can call-taking processes be improved to ensure that incidents are not subjected to over- or under-prioritization and response?

One of the greatest tensions in emergency dispatch is the need to ensure that calls are neither over- nor under-triaged. No empirical research exists on the relative merits of different triaging models in the context of police dispatch, but some literature explores the impact of Criteria Based Dispatch (CBD) and Medical Priority Dispatch (MPD) in the context of emergency services. CBD is a framework developed by grouping similar call types together and guiding telecommunicators to ask corresponding questions for each grouping, the answers of which are associated with recommended guidelines for priority level and type of response while affording the call taker with some level of discretion.⁸² MPD also standardizes call-taking but employs a more rigid question-and-answer protocol which automatically generates a dispatch priority level.⁸³

King County, WA, Washington, DC, and Tucson, AZ are among the few jurisdictions that have implemented CBD in the context of police dispatch,⁸⁴ and no system has been rigorously evaluated. However, an analysis of 911 call and response decision-making processes in Boston, MA, concluded that the use of a digitized call-taking checklist (derived from the Emergency Medical Dispatch Guidecards) holds promise for improving response times by enabling the 911 professional to collect critical information from the caller more efficiently.⁸⁵

In addition, research comparing CBD, MPD, and non-standardized triaging processes in the emergency medical response context finds that standardized protocols perform better than non-standardized processes in correctly diagnosing the nature of EMS calls,⁸⁶ and that while research comparing MPD and CBD yielded mixed findings, CBD's more flexible protocol may yield better results.⁸⁷

Related research examines how 911 professionals assess the risk level in police dispatch. A recent study examined the variation in 911 professionals' classifications of calls as high priority and meriting police dispatch, finding that some professionals are consistently more likely than their peers to classify incidents as high priority.⁸⁸ These "alarmist" staff pass along their perceptions to officers, who in turn perceive the incident as more severe and code it as such. Mental health calls classified by those alarmist

⁸¹ Gillooly, "Lights and Sirens;" Lum et al., "Constrained Gatekeepers."

⁸² Frankie Wunschel and Daniel Bodah, "A New Way of 911 Call Taking: Criteria Based Dispatching," Vera Institute of Justice, December 2020, <https://www.vera.org/publications/a-new-way-of-911-call-taking#:~:text=Instead%20of%20the%20call%2Dtaker,the%20urgency%20of%20the%20need.>

⁸³ Wunschel and Bodah, "A New Way of 911."

⁸⁴ Wunschel and Bodah, "A New Way of 911."

⁸⁵ Molloy et al., "Factors Leading to Delays."

⁸⁶ Michal Plodr, et al., "Effect of Introduction of a Standardized Protocol in Dispatcher-Assisted Cardiopulmonary Resuscitation," *Resuscitation* 106 (2016): 18-23.

⁸⁷ Wunschel and Bodah, "A New Way of 911."

⁸⁸ Gillooly, "Lights and Sirens."

staff were six times more likely to be coded as high priority by police, and public assault calls classified by alarmist staff were two times more likely to be coded as high priority by police. Interestingly, the study did not detect variations in staff alarmism pertaining to intimate partner violence calls.⁸⁹

The author recommends that alarmist staff could be informed of their tendency to code calls as higher priority than their peers to encourage them to conform with the norm, which could be enhanced by inviting call takers, dispatchers, police, and other responders to debrief and share expertise with each other in the interests of organizational learning. In addition, ECCs could create more specific definitions and associated scripts for call types that are particularly vulnerable to misclassification, such as suicidal subjects and people experiencing mental health crisis. For example, the Philadelphia Police Department has developed a questionnaire to aid in classifying behavioral health calls more objectively, a measure that will be reinforced through the presence of mental health clinicians at the call center.⁹⁰

What strategies can minimize subjective perceptions and implicit biases associated with call-taking, dispatching, and field responses?

Implicit biases are the unconscious stereotypes that are embedded in humans' coding, storing, and retrieving of data.⁹¹ Simply put, all people have implicit biases, primarily pertaining to race and gender, that can influence how they perceive people and their motivations, as illustrated through the well-known Implicit Bias Association Test (IAT).⁹² It stands to reason that 911 professionals are not immune to such biases – even call takers and dispatchers who are engaging with callers solely by phone may be able to discern (or presume) the racial or ethnic background of a caller by the caller's manner of speaking. Indeed, research on sociolinguistics has established that a person's way of speaking can also lead to stereotyping and biases associated with both Black people⁹³ and speakers with American South dialects.⁹⁴ Such biases are directly correlated with explicit measures of bias⁹⁵ and discriminatory behaviors.⁹⁶

⁸⁹ Gillooly, "Lights and Sirens."

⁹⁰ Nina Feldman, "Philly Police to Start Flagging 911 Calls That Involve a Behavioral Health Crisis," *WHYY NPR*, October 9, 2020, <https://whyy.org/articles/philly-police-to-start-flagging-911-calls-that-involve-a-behavioral-health-crisis/>.

⁹¹ James H. Neely, "Semantic Priming and Retrieval from Lexical Memory: Roles of Inhibitionless Spreading Activation and Limited-capacity Attention," *Journal of Experimental Psychology* 106, no. 3 (1977): 226-254; Anthony G. Greenwald and Mahzarin R. Banaji, "Implicit Social Cognition: Attitudes, Self-esteem, and Stereotypes," *Psychological Review* 102, no. 1 (1995): 4-27.

⁹² Greenwald and Banaji. "Implicit Social Cognition"; Anthony G. Greenwald et al., "Measuring Individual Differences in Implicit Cognition: The Implicit Association Test," *Journal of Personality and Social Psychology* 74, no. 6 (1998): 1464-1480.

⁹³ Courtney A. Kurinec and Charles A. Weaver, "'Sounding Black': Speech Stereotypicality Activates Racial Stereotypes and Expectations About Appearance," *Frontiers in Psychology* 24, no. 12 (2021).

⁹⁴ Brandon C. Loudermilk, "Implicit attitudes and the perception of sociolinguistic variation." *Responses to language varieties: Variability, processes and outcomes* (2015): 137-156.

⁹⁵ Brian A. Nosek, "Moderators of the Relationship Between Implicit and Explicit Evaluation," *Journal of Experimental Psychology* 134, no. 4 (2005): 565-584.

⁹⁶ John T. Jost et al., "The Existence of Implicit Bias is Beyond Reasonable Doubt: A Refutation of Ideological and Methodological Objections and Executive Summary of Ten Studies That No Manager Should Ignore," *Research in Organizational Behavior* 29 (2009): 39-69, <https://www.sciencedirect.com/science/article/abs/pii/S0191308509000239>; Benedek Kurdi et al., "Relationship Between the Implicit Association Test and Intergroup Behavior: A Meta-analysis," *American Psychologist* 74, no. 5 (2019): 569-586; Frederick L. Oswald et al., "Predicting Ethnic and Racial Discrimination: A Meta-analysis of IAT Criterion Studies," *Journal of Personality and Social Psychology* 105, no. 2 (2013): 171-192.

Training to reduce implicit biases, while increasingly common within police departments,⁹⁷ has not been subject to much rigorous evaluation.⁹⁸ Those studies that do exist suggest that such training is impactful in changing officers' knowledge, perceptions, and attitudes.⁹⁹ However, no studies to date have documented changes in behavioral outcomes in the field specific to police¹⁰⁰ although one study found that gender bias awareness training promoted more gender equity-promoting practices in candidate review practices among trained faculty.¹⁰¹ This positive finding, however, is derived from a study of gender bias in an academic institution, a very different context from that of the stressful, rapid-paced, and high-stakes emergency call-taking and dispatch setting. In fact, some scholars have posited that it would be more effective to change behavioral norms than to reduce implicit biases.¹⁰²

Lessons from behavioral economics, the application of psychology to guide economic decision-making, may have implications for reducing biases in emergency communications practices. In this case “economic decision-making” pertains to the weighing of costs and benefits of certain actions, such as the risk of over- versus under-triaging a call for which the call taker has insufficient information on level of risk. However, applying behavioral economics principles to call-taking and dispatching protocols may backfire, as scholars examining the interplay between behavioral economics and implicit racial stereotypes concluded that racial stereotypes are so powerful that they alter economic irrationalities and could end up exacerbating racial biases.¹⁰³

Alternatively, a meta-analysis of 515 studies of “intergroup contact theory”—the notion that exposure of one racial, ethnic, or socio-demographic group to another—found that such contact reduces prejudice.¹⁰⁴ For example, an experimental study in which transgender activists canvassed voters on issues pertaining to transgender rights found a 10 percentage point increase in voters' positive attitudes towards transgender people compared with voters who were canvassed on recycling issues.¹⁰⁵ Thus, efforts to bring together 911 professionals with members of high call-volume communities could reduce prejudices that lead call takers and dispatchers to misinterpret and over-triage calls and convey to field responders a level of risk that may be disproportionate owing to biases. This may also aid 911 professionals in identifying when biases may be at play for 911 callers.

⁹⁷ According to a 2019 survey of 150 large police departments, 69% offered some form of implicit bias training. CBS News, “We Asked 155 Police Departments About Their Racial Bias Training. Here’s What They Told Us,” August 7, 2019, <https://www.cbsnews.com/news/racial-bias-training-de-escalation-training-policing-in-america/>.

⁹⁸ Robert J. Smith, “Reducing Racially Disparate Policing Outcomes: Is Implicit Bias Training the Answer?,” *University of Hawaii Law Review* 37 (2015): 295.

⁹⁹ Robert E. Worden et al., “The Impacts of Implicit Bias Awareness Training in the NYPD,” The John F. Finn Institute for Public Safety, Inc., July 2020, <https://finninstitute.com/the-impacts-of-implicit-bias-awareness-training-in-the-nypd/>; Jesse Jannetta et al., “Learning to Build Police Community Trust,” The Urban Institute, August 2019, <https://www.urban.org/research/publication/learning-build-police-community-trust/view/full-report>.

¹⁰⁰ Worden et al., “Implicit Bias Awareness Training in the NYPD;” Jannetta et al., “Learning to Build Police Community Trust.”

¹⁰¹ Worden et al., “Implicit Bias Awareness Training in the NYPD;” Jannetta et al., “Learning to Build Police Community Trust.”

¹⁰² Jillian Swencionis et al., “Why Behavioral Reforms are More Likely Than Implicit Bias Training to Reduce Racial Conflicts in U.S. Policing,” Scholars Strategy Network, March 8, 2018, <https://scholars.org/brief/why-behavioral-reforms-are-more-likely-implicit-bias-training-reduce-racial-conflicts-us>.

¹⁰³ Justin D. Levinson, “SuperBias: The Collision of Behavioral Economics and Implicit Social Cognition,” *Akron Law Review* 45, no. 591 (2011-12).

¹⁰⁴ Thomas F. Pettigrew, and Linda R. Tropp, “A Meta-Analytic Test of Intergroup Contact Theory.” *Journal of Personality and Social Psychology* 90, no. 5 (2006): 751.

¹⁰⁵ David Broockman and Joshua Kalla, “Durably reducing transphobia: A Field Experiment on Door-To-Door Canvassing,” *Science* 352, no. 6282 (2016): 220-224.

What strategies can increase community trust in ECCs, particularly among people who are often stigmatized?

The manner in which 911 call takers interact with members of the public can influence whether callers seek 911 services in the future,¹⁰⁶ suggesting that training call takers to interact with callers respectfully and helpfully could increase community trust. However, this strategy would only work with people who call 911 in the first place. Research has documented many cases in which people who are subject to biases and stigma choose not to call 911. In-depth interviews with women in Baltimore, MD, who had experienced sexual or intimate partner violence revealed a general reluctance to call 911 because of lack of trust in police and the criminal justice system. Black women were even less inclined to call 911 based on fear of an overzealous, racially biased police response.¹⁰⁷

Given the well-documented differential response of police to LGBTQ victims of intimate partner violence, who are often stigmatized and may experience additional abuse by police responders,¹⁰⁸ it is likely that this subpopulation is also reticent to call 911, but more research is needed on this topic. In addition, a recent study concluded that residents of Latinx and immigrant communities became less likely to call 911 for domestic violence issues as awareness of police immigration enforcement increased.¹⁰⁹ Similarly, a study consisting of focus groups with people who use drugs revealed that they were reluctant to call 911 because they perceived that doing so was essentially calling the police. This disinclination to call 911 inhibits them from seeking medical assistance for overdoses and victimizations. Focus group participants desired a means of requesting emergency medical services that would not trigger a police response. The authors recommended that the people who use drugs be solicited for their input in the development and implementation new interventions that rely on the 911 system.¹¹⁰ This inclusive strategy could be used with other people who are subject to bias and stigma, and would be an important subject for rigorous evaluation.

Questions for Inquiry and Action

The existing literature on ECC processes provides important insights into the social and operational mechanisms that can promote or hinder accessible, efficient, equitable, and safe emergency services outcomes. However, no evaluative literature exists that enables ECCs and their partners to learn from and adopt best practices. The following research questions, if answered, would build a wealth of knowledge to inform efforts to transform 911.

- How can existing national standards and protocols be catalogued and assessed to highlight best practices, as well as existing opportunities, gaps, overlap, difference, and conformance?

¹⁰⁶ Michaela Flippin, et al., "The Effect of Procedural Injustice During Emergency 911 Calls: A Factorial Vignette-Based Study." *Journal of Experimental Criminology* 15, no. 4 (2019): 651-660.

¹⁰⁷ Decker et al., "'You Do Not Think of Me as a Human Being': Race and Gender Inequities Intersect to Discourage Police Reporting of Violence Against Women." *Journal of Urban Health* 96, no. 5 (2019): 772-783.

¹⁰⁸ For a comprehensive review of the literature on this topic see Rollè et al., "When Intimate Partner Violence Meets Same Sex Couples: A Review of Same Sex Intimate Partner Violence," *Frontiers in Psychology* 9 (2018): 1506.

¹⁰⁹ Ashley N. Muchow and Catalina Amuedo-Dorantes, "Immigration Enforcement Awareness and Community Engagement with Police: Evidence from Domestic Violence Calls in Los Angeles." *Journal of Urban Economics* 117 (2020): 103253.

¹¹⁰ Karla D. Wagner et al., "Post-Overdose Interventions Triggered by Calling 911: Centering the Perspectives of People Who Use Drugs (PWUDs)," *Plos One*, October 17, 2019, <https://doi.org/10.1371/journal.pone.0223823>.

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- What changes to the structure of ECCs would promote more accessible, equitable, and effective delivery of emergency services (e.g., increase access to people with disabilities, reduce over- and under-triaging, support the offloading of appropriate calls to alternative resources/responders)?
- To what degree do efforts to create more behavioral health resources (e.g., the inclusion of mental health professionals in ECCs, the increase in availability of behavior health services in the community) improve service delivery and reduce the use of police responders?
- Do variations in behavioral health resources by community demographics lead to disparate outcomes for community members? To what degree does increasing access to behavioral health resources in communities of color reduce police dispatch, arrests, and use of force in response to such calls?
- What are the relative benefits of various call-taking and triaging protocols and standards? To what degree do they improve accurate classification and coding? To what degree do they result in over- or under-triaging?
- What methods can improve the accurate classification of calls and thus the quality of data needed to improve the quality and efficiency of ECC service delivery?
- How does the introduction of texting, video calls, and inclusion of photos by 911 callers affect 911 communications operations in terms of facilitating better communications with the hearing and visually impaired and people with language barriers?
- To what degree does the introduction of texting, video calls, and inclusion of photos by 911 callers affect 911 communications operations in terms call takers' abilities to manage information efficiently? How do these new communication mechanisms and data sources affect the stress level of 911 professionals and their degree of compassion fatigue and burnout? How can those outcomes be anticipated and prevented or mitigated?
- To what degree does call taker alarmism vary by call taker demographics and tenure? How does the level of call taker alarmism impact decisions to route to a first responder versus an alternative responder? How does it affect first responder decisions to arrest or use force? What measures are effective in reducing call taker alarmism?
- How might principles of behavioral economics be employed to incentivize 911 professionals from over-triaging? How might they be applied in the design of CAD user interfaces to streamline call-taking and encourage the use of alternative responders? What is the degree of their effectiveness?
- What measures are effective in breaking down silos and encouraging greater understanding and cooperation among 911 professionals and field responders?
- What measures are effective in reducing the stigma that 911 professionals and field responders may have towards people who use drugs?

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- What are the effects of anti-bias 911 laws on the number and types of calls of service and the ability of 911 professionals and ECC operations to document those calls accurately?

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Wunschel, Frankie, and Daniel Bodah. “A New Way of 911 Call Taking: Criteria Based Dispatching.” Vera Institute of Justice (December 2020).

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Chapter 5: Governance

Introduction

Emergency management governance is essential to ensuring that 911 systems are sufficiently funded, that the public has access to reliable emergency services, and that emergency communications are coordinated, particularly in the context of regional and national disasters. Such governance has evolved over time with increases in population, demand for emergency services, and advances in technology. These changes have introduced new capabilities as well as new challenges, with the migration to Next Generation 911 (NG911) being a tremendous driver of efforts to revisit and revise 911 governance. The transition to a three-digit national suicide hotline (i.e., 988), together with increased calls for alternatives to traditional police response to many calls to 911, underscore the need for a closer examination of the various governance structures and their funding mechanisms. These issues are particularly germane in the context of ensuring that alternative hotlines and responders are appropriately utilized, and that their associated services are adequately funded and regulated.

Improving 911 governance to enhance interoperability and provide reliable access to emergency services for people using alternatives to land lines (cellular devices, Voice over Internet Protocols, mobile texts) is crucial to ensuring equitable access to emergency services for all. Coordination among multiple levels of existing 911 and 311 governance structures, along with new 988 governance structures and those of other alternative hotlines, are critical to ensuring that efforts to divert mental health and non-emergency calls from law enforcement response are implemented consistently and equitably.

This chapter covers emergency communications governance issues, focusing on the coordination, oversight, funding, and standardization of 911 and alternative hotlines and emergency services. Its focus differs somewhat from other chapters in this volume because the existing literature on 911 governance is mostly descriptive and advisory in nature, leading to higher-level, thematic content. In addition to the state of practice and the limited research that was unearthed, this chapter contains reports developed by both expert taskforces and emergency communications associations in partnership with practitioners. These partnerships produced reports exploring how governance influences standards of practice, coordination and interoperability, data collection and reporting, compliance with quality control and performance measurement practices, and efficient and economical operational structures. The scant empirical research on this topic prompts several areas of research inquiry and evaluation that should be prioritized to inform improvements in 911 governance.

State of Practice

Understanding 911 governance requires a delineation of the various levels of government involved in 911 service delivery, operations, management, and coordination. Emergency services governance takes place at all levels of government – federal, state, county, and city – and these roles sometimes overlap based on geography and type of emergency service or issue. Indeed, a single agency cannot address the complex and interconnected ecosystem of emergency communication actors on its own; partnerships

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across all levels of government and discipline are required,¹ as is a high degree of planning and sufficient dedication of resources.²

Federal Governance

At the federal level, 911 governance is shared among the following entities:

- the Federal Communications Commission’s (FCC) Public Safety and Homeland Security Bureau (PSHSB),³ which governs interoperability and accessibility issues surrounding 911;
- the National Telecommunications and Information Administration (NTIA),⁴ an executive-branch entity primarily focused on expanding broadband internet availability and access;
- the Department of Homeland Security’s Cybersecurity and Infrastructure Security Agency,⁵ which promotes 911 interoperability and cybersecurity and facilitates coordinated emergency communications in the event of threats, attacks, and natural emergencies; and
- the Department of Justice,⁶ which promotes equal access to 911 for people with disabilities through enforcement of the Americans with Disabilities Act (ADA).

In addition, the National 911 program⁷ was established to provide federal leadership to coordinate among these federal agencies along with state and local 911 services. And in 2004, passage of the ENHANCE 911 Act prescribed the establishment of a national 911 Implementation Coordination Office (ICO). The ICO is charged with coordinating between the NTIA in the U.S. Department of Commerce and the U.S. Department of Transportation’s National Highway Traffic Safety Administration (NHTSA) on 911 issues.⁸

State Governance

State governance structures vary widely, both in terms of the state agency in which emergency services are housed and the agency’s degree of authority. Some states have dedicated state-based 911 boards, while others have public safety communications centers that report to the department of emergency management, public safety, homeland security, or information technology. While most states have some type of centralized 911 program, these vary in geography and scope, and in some states strong locally governed 911 programs have restricted statewide governance efforts.⁹ Importantly, no single state governance model exists, as the ideal composition and authority is unique to state and local contexts.¹⁰ Presenting and evaluating each state’s model is beyond the scope of this current research brief and is

¹ SAFECOM and National Council of Statewide Interoperability Coordinators (NCSWIC), “Emergency Communications Governance Guide for State, Local, Tribal, and Territorial Officials,” Department of Homeland Security, Cybersecurity and Infrastructure Security Agency. December 2018.

https://www.dhs.gov/sites/default/files/publications/2018_ECD_SLTT_Governance_Guide_02132019_FINAL_508C.pdf.

² Department of Homeland Security, 2018 Governance Guide for State, Local, Tribal, and Territorial Emergency Communications Officials. https://www.dhs.gov/sites/default/files/publications/2018_ECD_SLTT_Governance_Guide_02132019_FINAL_508C.pdf.

³ Federal Communications Commission. “Public Safety and Homeland Security.” Accessed December 9, 2021. <https://www.fcc.gov/public-safety-and-homeland-security>.

⁴ National Telecommunications and Information Administration, “National Telecommunications and Information Administration,” accessed December 9, 2021, <https://www.ntia.doc.gov/>.

⁵ Cybersecurity & Infrastructure Security Agency, “CISA: Homepage,” accessed December 9, 2021, <https://www.cisa.gov/>.

⁶ Department of Justice, “Disability Rights Section,” accessed December 9, 2021, <https://www.justice.gov/crt/disability-rights-section>.

⁷ 911.gov, “National 911 Coordination,” accessed December 9, 2021, <https://www.911.gov/national911coordination.html>.

⁸ National Association of State 911 Administrators, “Model State 911 Plan,” U.S. Department of Transportation, National Highway Traffic Safety Administration, February, 2013, https://drive.google.com/file/d/1FPaBrHCVyJbyAhjlr1_p9iYhnB5emMCX/view.

⁹ National Association of State 911 Administrators, “Model State 911 Plan.”

¹⁰ National Association of State 911 Administrators, “Model State 911 Plan.”

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somewhat limited in utility, given that Emergency Communications Center (ECC) operations are hyper-local, with over 6,000 primary ECCs operating nationwide.¹¹ Information regarding the detail of each state's ECC governance structure can be found in 911.gov's Guidelines for Developing a State NG911 Plan.¹²

State governance is supported by other entities. For example, State Emergency Response Commissions (SERCs) and Tribal Emergency Response Commissions (TERCs) were established by federal statute to help states implement requirements associated with the Emergency Planning and Community Right-to-Know Act of 1986.¹³ The same statute required SERCs and TERCs to create Emergency Planning Districts and name a Local Emergency Planning Committee (LEPC) for each district (described in more detail below).¹⁴ In addition, most states have a State Emergency Operations Center (SEOC) to aid in developing a common communications and response strategy in the event of a disaster, and a Telecommunicator Emergency Response Task Force (TERT) to coordinate communications and aid among ECCs and emergency management agencies from different municipalities, states and regions.¹⁵

Local (County and City) and Regional Governance

Despite the robust and complex federal and state emergency management governance structures, 911 governance is primarily a local function,¹⁶ based on the geographic purview of ECCs (traditionally known as PSAPs, the term still used by the FCC, which governs their communications activities;¹⁷ according to the FCC, "primary PSAPs" receive 911 calls directly from a 911 control office and "secondary PSAPs" receive calls routed from primary PSAPs.)¹⁸

As with state-level emergency management governance, local governance through ECCs varies widely, with most operating at the county level but some at the regional or city-level. While all ECCs operate independently, some may cover regions that span multiple jurisdictions and others, particularly in tribal settings, may have no dedicated emergency service, instead relying on local jurisdictional support.¹⁹ In fact, based on the organic way in which ECCs have proliferated over time, ECC boundaries do not necessarily align with jurisdictional boundaries, overlapping across both cities and counties.²⁰

¹¹ Federal Communications Commission, "911 Master PSAP Registry," November 30, 2021. <https://www.fcc.gov/general/9-1-1-master-psap-registry>.

¹² 911.gov, "Guidelines for Developing a State NG911 Plan: Model Plan and Tips to Facilitate NG911 Planning for States and Jurisdictions," 2018, https://efaidnbmnnnibpcajpcgclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.911.gov%2Fpdf%2FGuidelines_for_Developing_a_State_NG911_Plan.pdf&cLen=1939203&chunk=true

¹³ Environmental Protection Agency, "What is EPCRA?" accessed December 9, 2021, <https://www.epa.gov/epcra/what-epcra>.

¹⁴ Environmental Protection Agency, "What is EPCRA?"

¹⁵ National Association of State 911 Administrators, "911 and Emergency Management: Best Practices for Coordination and Collaboration," July 31, 2015, https://www.911.gov/pdf/NASNA_911_Emergency_Management_Best_Practices_Coordination_Collaboration_2015.pdf.

¹⁶ Industry Council for Emergency Response Technologies (iCERT), History of 911 and What It Means for the Future of Emergency Communications (Washington, DC: 2015), 3, <https://perma.cc/YL97-9J9C>.

¹⁷ The 911 industry is shifting towards the term Emergency Communications Center (ECC), which is the preferred language for the Transform911 initiative. Because most local, state, and national governing bodies and practices still employ the Public Safety Answering Point (PSAP) terminology, the current review similarly uses the PSAP terminology.

¹⁸ iCERT, "History of 911."

¹⁹ Industry Council for Emergency Response Technologies (iCERT), History of 911 and What It Means for the Future of Emergency Communications (Washington, DC: 2015), 3, <https://perma.cc/YL97-9J9C>.

²⁰ See this national map of PSAP areas by way of example: <https://www.transform911.org/resource-hub/#resource>.

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Even within the same state, local ECC structures differ. For example, in Washington State, close to half of all ECCs are housed under an intergovernmental entity, whereas the remainder reside within a variety of other governance structures, including county emergency management agencies, sheriff's offices, mayor's offices, and county commissioners.²¹ Given the varying roles, authorities, and geographies associated with ECCs, their managerial, operational, and fiscal functions depend on the nature of the local agencies that they serve.²²

Unlike ECCs, LEPCs are nonprofit community organizations consisting of local emergency management officials and representatives from public health, transportation, environmental agencies, community groups, and the media. LEPCs must assist in the development of emergency response plans, conduct annual reviews, and provide public information about hazards in the community.²³ In addition, many counties have Emergency Operations Centers (EOCs) that are activated in the event of large-scale disasters and emergencies, some of which house a 911 center.²⁴

The array of federal, state, and local entities governing emergency communications, management, and operations is a function of the organic growth of emergency services needs in accordance with growing populations. Tracking the history of 911 can provide insights into opportunities for improvements in governance structures.

Recent History

Since its inception in 1968, 911 has evolved tremendously. This growth has been spurred by increased demand for emergency services along with a proliferation of new information and communication technologies that have created both opportunities and challenges for efficient emergency services delivery. The creation of ECCs was prompted by national policy encouraging widespread adoption of 911, most of which occurred at the city and county level.²⁵ The need to automate routing of 911 calls coupled with the need for data on the location of the caller prompted the establishment of Enhanced 911 (E911) services, leading the FCC to issue rules requiring the establishment of enhanced wireless 911 services in 1996.²⁶

Further technological advances, such as wireless cellular technology and internet-based Voice over Internet Protocols (VoIP) have prompted additional regulations and governmental oversight to ensure reliable and interconnected emergency services.²⁷ These advances have coincided with the establishment of new state and regional governance structures, along with efforts to consolidate emergency service delivery, resulting in a considerable decline in the number of ECCs over time.²⁸ However, 911 service

²¹ State of Washington Military Department, "911 Cost Study Report to the Legislature," December 2020, <https://mil.wa.gov/asset/6012f4af4611d>.

²² Task Force on Optimal PSAP Architecture (TFOPA), "Task Force on Optimal PSAP Architecture Final Report," Federal Communications Commission, January 29, 2016, https://transition.fcc.gov/pshs/911/TFOPA/TFOPA_FINALReport_012916.pdf.

²³ National Association of State 911 Administrators, "Coordination and Collaboration."

²⁴ National Association of State 911 Administrators, "Coordination and Collaboration."

²⁵ iCERT, "History of 911."

²⁶ iCERT, "History of 911."

²⁷ iCERT, "History of 911."

²⁸ TFOPA, "Final Report."

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delivery today remains a largely local endeavor, enabling emergency communication and response to be tailored to the needs of the community.²⁹

NG911 is the latest initiative in the emergency services landscape, which is having a profound impact on 911 governance at all levels. Established originally through the US Department of Transportation, NG911 was developed in recognition of the need for ECCs to upgrade from analog to Internet Protocol (IP)-based 911 systems.³⁰ NG911 was established to develop a secure, open-standards, IP-based system that can process a variety of voice, text, data, and multimedia 911 call types and efficiently route calls to the appropriate ECC, enabling seamless coordination and emergency response among multiple centers and responders.³¹ NG911 architects envision that it will yield a more efficient infrastructure to handle 911 calls through interoperability among call centers, improved call routing, and the ability for the public to communicate through text (rather than solely through Teletypewriter/Telecommunications Device for the Deaf), share photos, and place video calls.³²

The transition to NG911 has spurred guidance to improve governance structures at both the state and local levels. Importantly, transitioning to NG911 is about more than just adopting new hardware or software—it requires coordination across a wide array of emergency communications and governing entities.³³ While local 911 operations used to have the ability to operate in silos, the advent of NG911 has added urgency to the call for coordination among ECCs.³⁴ The decentralized ECC environment is prone to fragmentation and duplication, underscoring the need for better state and local planning, coordination, and governance.³⁵

Most recently, passage of National Suicide Hotline Designation Act in 2020 designated 988 as the official phone number for mental health crises and suicide prevention.³⁶ The legislation requires all telecommunications carriers and VoIP providers to ensure that callers can dial 988 to reach the National Suicide Prevention Lifeline (NSPL), a national network of approximately 170 local- and state-funded crisis centers, as of July 16, 2022. The current NSPL is 10 digits long, as is the Veterans Crisis Line. The FCC designation of 988 facilitates access to mental health crisis services and consolidates both lines such that veterans who dial 988 are invited to press “1” to be routed to the Veterans Crisis Line while all other callers can obtain services through the NSPL.

The Act also allows states to collect fees to cover the costs associated with 988 services, which must be held in a dedicated account and only spent on 988 services, with reporting to FCC on 988 fee collections and expenditures required annually. Given that an estimated seven percent of 911 fee collections are diverted by states for non-911/E911 expenditures,³⁷ it will be important to hold states accountable for

²⁹ iCERT, “History of 911.”

³⁰ 911.gov, “Next Generation 911.”

³¹ 911.gov, “Next Generation 911.”

³² TFOPA, “Final Report.”

³³ 911.gov, “Next Generation 911.”

³⁴ U.S. Department of Transportation, “Next Generation 9-1-1 (NG9-1-1) System Initiative: Concept of Operations,” Intelligent Transportation Systems Joint Program Office, April 2007, 12, <https://rosap.ntl.bts.gov/view/dot/4013>.

³⁵ James E. Holloway et al, “State, Agency and Local Next Generation (NG) 911 Planning and Coordination to Implement State NG911 and Internet Protocol (IP) Enabled Network Policies,” *University of Pittsburgh Journal of Technology, Law & Policy* 11 (2010): 3-80.

³⁶ Federal Communications Commission (FCC), “Eleventh Annual Report to Congress on State Collection and Distribution of 911 and Enhanced 911 Fees and Charges,” December 19, 2019, <https://www.fcc.gov/files/11thannual911feereport2019pdf>.

³⁷ FCC, “911 Fees and Charges.”

complying with the federal statute on 988 expenditures. In addition, and as referenced in the [911 Hotline Alternatives](#) chapter, the Act requires the Department of Health and Human Services (HHS), which operates the NSPL, and the Department of Veterans Affairs, which operates the Veterans Crisis Line, to research and report on strategies to make 988 operational and effective nationwide, including the provision of specialized services for high-risk populations such as lesbian, gay, bisexual, transgender, and queer (LGBTQ) youth; people of color; and people residing in rural communities.

One wrinkle in the transition to 988 is the fact that telephone customers throughout the country have phone numbers for which the first three of seven digits (the “exchange”) is 988. An estimated 82 area codes in 36 states include phone numbers with a 988 exchange.³⁸ This requires a transition to dialing all 10 digits of any such numbers to reach the intended recipient, even if the caller is in the same area code. Effective October 24, 2021, customers who dial the seven digits will receive an error message and be advised to hang up and redial using the area code.

By July 16, 2022, customers who dial 988 will be routed to the NSPL. The degree to which dialers intending to reach other recipients with 7-digit numbers that begin with 988 will clog up and overburden the NSPL during this transition period is unclear. Presumably such callers will hang up upon realizing that they misdialed. Or it could be that routing systems are intelligent enough to identify a quick succession of seven digits rather than automatically routing to NSPL.

Another important consideration as the nation transitions to 988 is the ability of hotlines to identify the precise location of the caller. 911 has the capability to geolocate the source of calls in the interests of providing emergency services promptly. Other helplines can only determine the location of the caller by contacting the nearest ECC. Some argue that 988 helplines should have the same call tracing abilities as 911 in order to facilitate more accurate routing in the case that emergency services are necessary in life-threatening situations as well as to support referrals to local service providers.³⁹ The arguments against such tracing capabilities are that they violate the privacy and anonymity of callers who may not want to be identified and may also inhibit people in crisis from making use of the helpline.⁴⁰ Moreover, location tracing without the consent of the caller could lead to unwelcome intervention, including unnecessary police response or hospitalization, and cause trauma.⁴¹ These issues are currently under consideration by the FCC, which submitted a report Congress in April of 2021 recommending the establishment of a multi-stakeholder advisory committee to examine the privacy, policy, technology, and cost issues associated with enabling 988 to have location tracking capabilities.⁴² The report lists a wide array of stakeholders who should be included on the committee, but people with lived experience in making use of suicide and mental health crisis helplines did not make the list, and as of January 2022 the working group had yet to be established.⁴³

³⁸ North American Numbering Plan Administrator. “Transition to 10-digit dialing for 988,” accessed December 9, 2021. https://www.nationalnanpa.com/transition_to_10_digit_dialing_for_988/index.html.

³⁹ Wireline Competition Bureau, “988 Geolocation Report — National Suicide Hotline Designation Act of 2020,” Federal Communications Commission, April 15, 2021, <https://www.fcc.gov/document/988-geolocation-report-national-suicide-hotline-designation-act>.

⁴⁰ Wireline Competition Bureau, “988 Geolocation Report.”

⁴¹ Rob Wipond, “Roll-Out of 988 Threatens Anonymity of Crisis Hotlines,” Mad in America, January 29, 2022, <https://www.madinamerica.com/2022/01/roll-988-threatens-anonymity-crisis-hotlines/>.

⁴² Wireline Competition Bureau, “988 Geolocation Report.”

⁴³ Wireline Competition Bureau, “988 Geolocation Report.”

The transition to 988 as a national crisis line has prompted a flurry of state legislation to ensure adequate funding and program support for mental health crisis services. Seventeen states introduced 26 bills in the 2021 legislative session (through October 21, 2021), and 14 states enacted legislation, including measures to establish 988 implementation plans, assess 988 surcharges on wireless accounts, and provide funding to increase lifeline call center capacity and crisis care coordination.⁴⁴

These states, however, will encounter challenges in anticipating the degree to which the transition to 988 will generate what could be a substantial increase in call volume associated with the ease of dialing and increased public awareness of the hotline. Conceivably, some share of these calls will not be new cases but rather calls that would have previously been placed to 911. Anticipating the degree to which 988 will reduce first responder time (i.e., emergency medical services, fire, and police) and the associated expenditures, and place additional burdens on helplines and alternative crisis response mechanisms, is an inexact science at best. Data on reasons for 911 calls are imprecise due to coding inconsistencies and classification decisions and errors,^{45,46} including those stemming from subjective perceptions and implicit biases.⁴⁷ Estimates of the share of 911 calls that are mental health-related range from 1.6 percent⁴⁸ to 10 percent⁴⁹ or perhaps even closer to 18 percent.⁵⁰ According to some experts, mining data from NEMSIS, the National Emergency Management System (EMS) Information System, may be more fruitful in predicting demand for mental health services given that the system tracks data in more specificity based on calls that lead to an ambulance response.⁵¹

Governance Challenges

The complexity of 911 governance structures, coupled with efforts to transition both to NG911 and 988, as well as to divert 911 calls to other alternative hotlines, present many challenges to state and local governments. These include antiquated legacy systems that rely on voice-based telephone technology, inhibiting interoperability with new systems;⁵² the decentralized ECC environment, which results in inconsistent standard operating procedures and inhibits coordination and resource-sharing;⁵³

⁴⁴ Charlie Severance-Medaris, "Legislatures Prepare for New National Suicide Prevention Lifeline," National Conference of State Legislatures, October 12, 2021, <https://www.ncsl.org/research/health/legislatures-prepare-for-new-national-suicide-prevention-lifeline-magazine2021.aspx>.

⁴⁵ S. Rebecca Neusteter et al., "Gatekeepers: The Role of Police in Ending Mass Incarceration," Vera Institute of Justice, August 2019, <https://www.safetvandjusticechallenge.org/wp-content/uploads/2019/08/Gatekeepers-The-Role-of-Police-in-Ending-Mass-Incarceration.pdf>.

⁴⁶ S. Rebecca Neusteter et al., "Understanding Police Enforcement: A Multicity 911 Analysis," Vera Institute of Justice, September 2020, <https://www.vera.org/publications/understanding-police-enforcement-911-analysis>.

⁴⁷ Stephanie Hepburn, "The Troubling History of 911 and How 988 Can Avoid the Same Missteps," CrisisTalk, May 25, 2021, <https://talk.crisisnow.com/the-troubling-history-of-911-and-how-988-can-avoid-the-same-missteps/>.

⁴⁸ Cynthia Lum et al., "Can We Really Defund the Police? A Nine-Agency Study of Police Response to Calls for Service," *Police Quarterly* (2021), <https://doi.org/10.1177/10986111211035002>.

⁴⁹ A survey representing 355 law enforcement agencies throughout the country found that 10 percent of agency budgets in 2017 was spent responding to and transporting persons with mental illness. Treatment Advocacy Center, "Road Runners: The Role and Impact of Law Enforcement in Transporting Individuals with Severe Mental Illness, A National Survey," May 2019, <https://www.treatmentadvocacycenter.org/storage/documents/Road-Runners.pdf>.

⁵⁰ Stephanie Hepburn, "How an Atlanta 911 Study Resulted in a 311 Referral Line for Quality of Life Calls," #CrisisTalk, April 27, 2021, <https://talk.crisisnow.com/how-an-atlanta-911-study-resulted-in-a-311-referral-line-for-quality-of-life-calls/>.

⁵¹ Stephanie Hepburn, "The Reporting System 988 Estimates Haven't Included," #CrisisTalk, November 30, 2021, <https://talk.crisisnow.com/the-reporting-system-988-estimates-havent-included/>.

⁵² SAFECOM, "Emergency Communications Governance Guide."

⁵³ TFOPA, "Final Report."

communication and cybersecurity issues that can disrupt emergency communications;⁵⁴ and staffing,⁵⁵ training,⁵⁶ and cultural barriers⁵⁷ to efficient 911 operations. In addition, challenges surrounding sufficient funding of local ECC operations are perennial and troublesome.⁵⁸ In most states, 911 systems are funded by surcharges to consumers on landlines, and more recently on wireless and VoIP lines, but those funds often fall short of the needs of emergency response functions.⁵⁹ These funding issues are particularly problematic in states that divert some share of those fee-generated resources to non-emergency expenditures, which the FCC estimated amounted to \$1.275 billion between 2012 and 2018.⁶⁰

Research Evidence

Empirical research on the most effective approaches to 911 governance is virtually non-existent. In fairness, outcome evaluation would be extremely difficult in this arena, given the wide array and tremendous complexity of governance models. Considerable variation in state and local contexts hinder efforts to isolate the effect of specific strategies on outcomes of interest. Even if such outcome evaluations were possible to execute, the findings would have limited generalizability to other jurisdictions without rigorous accounting of organizational processes, contextual barriers, and facilitating factors. Hybrid implementation trials to isolate impacts on outcomes of interest and process evaluations that discern the degree of implementation fidelity may be the most helpful paths to producing generalizable knowledge in this context.⁶¹

The literature that does exist on 911 governance is confined to case studies of specific states or localities, surveys of various governance structures, and recommendations stemming from study groups consisting of expert practitioners. Much of this literature is dedicated to advising on how to develop a suitable governance structure along with varying models of collaboration and consolidation, rather than prescribing any one specific governance strategy.

“Best” Governance Models

The literature on 911 governance is primarily from non-academic government and association sources and is typically specific to either state or local governance, although both categories of publications address the need for local governance structures to be coordinated with regional and state ones. However, four recommendations emerge consistently among documents on 911 governance despite their focus on one level of government or another. The first is the conclusion that there is no one “best”

⁵⁴ Department of Homeland Security, “2018 SAFECOM Nationwide Survey Results National-Level Summary,” August, 2018. https://www.dhs.gov/sites/default/files/publications/FINAL_SNS_National-Level%20Random%20Sample%20Results_08092018.pdf.

⁵⁵ TFOPA, “Final Report.”

⁵⁶ TFOPA, “Final Report.”

⁵⁷ SAFECOM, “Emergency Communications Governance Guide.”

⁵⁸ James E. Holloway et al., “Federalism in the Financing of 911 Emergency Call Services: The Nature of the Federal-State Funding Arrangement to Finance Next Generation (NG) 911 Services,” *Journal of Law, Technology, & the Internet*, Vol. 5. 2014, <https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=1067&context=jolti>.

⁵⁹ Linda K. Moore, “Emergency Communications: The Future of 911,” Congressional Research Service, April 27, 2010. <https://books.google.com/books?hl=en&lr=&id=CKAvX11HK2wC&oi=fnd&pg=PA1&dq=911+emergency+call+center+infrastructure&ots=5-4GEaqLFn&sig=sEsBqDbEb-B795k9dWnWkD3utGU#v=onepage&q&f=false>.

⁶⁰ Federal Communications Commission, “FCC Seeks to Combat 911 Fee Diversion,” November 4, 2020, <https://www.fcc.gov/document/fcc-seeks-combat-911-fee-diversion>.

⁶¹ Sara J. Landes et al., “An Introduction to Effectiveness-Implementation Hybrid Designs,” *Psychiatry Research* 283, (January 2020): 112630, <https://doi.org/10.1016/j.psychres.2019.112630>.

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overall model for governance because different jurisdictions are characterized by different operational structures and political contexts that relate to current and potential levels of coordination.⁶² Instead of recommending a specific model, experts advise on the best approach to governance model *development*, which involves prioritizing intergovernmental coordination and technology integration and interoperability; considering a wide range of legal, fiscal, and technology challenges; and designing a structure that enables the measurement of problems, the identification of solutions, and the documentation of outcomes.⁶³

The second consistent theme is that the range of independent management and leadership powers across levels of government demands a level-specific management framework, for which each level must address and integrate the policies of the others, including federal regulations, state policies, and local public interests.⁶⁴ Similarly, one report observes that ECCs are a part of a complex, multi-level governmental ecosystem requiring routine and sustained engagement among authorities at all levels, particularly to navigate conflicting operations, architectures, and priorities.⁶⁵ Thus, new governance strategies that promote inter- and intra-state collaboration along with public/private partnerships will enable jurisdictions to reap the full benefits of NG911.⁶⁶

A third governance issue that transcends state and local bifurcation is the need for a national uniform 911 system that promotes the routine collection and sharing of standardized 911 data. Fulfilling the vision of a national 911 data system requires governance and coordination among multiple units and levels of government and codified standards to ensure data uniformity, consistency in data handling, ease of information sharing, robust support mechanisms, and the engagement of data-savvy 911 professionals.⁶⁷ Once developed, such a system can generate information to guide 911 and community leaders in prioritizing the type of emergency management and crisis services are needed and identify opportunities for operational improvements.⁶⁸ However, even absent national standardization of 911 data experts recommend that states take a greater leadership in promoting, incentivizing, or mandating uniformity in coding and data standards such as developing common definitions and reporting 911 data through a common, centralized system.⁶⁹

The fourth theme that applies to both state and local 911 governance is the importance of stakeholder outreach and engagement. Governance guides consistently recommend that governing bodies include community partners that are representative of the entire population, suggesting that when 911 entities engage with a broad spectrum of community members, it becomes easier to tailor programs to partner needs and, therefore, make the best use of public safety funds.^{70,71} This guidance is echoed by 911 leaders themselves, who named stakeholder engagement as a key ingredient in improving the quality of

⁶² SAFECOM, “Emergency Communications Governance Guide.”

⁶³ APCO International, “Project 43: Broadband Implications for the PSAP,” 2017, <https://www.apcointl.org/~documents/report/p43-report-governance?layout=default>.

⁶⁴ Holloway et al., “State NG911.”

⁶⁵ TFOPA, “Final Report.”

⁶⁶ APCO International, “Project 43.”

⁶⁷ 911.gov, “911 DataPath Strategic Plan,” 2019, https://www.911.gov/project_strategicplanningfor911data.html.

⁶⁸ 911.gov, “911 DataPath.”

⁶⁹ APCO International, “Next Generation 911 Cost Estimate.”

⁷⁰ APCO International, “Next Generation 911 Cost Estimate.”

⁷¹ SAFECOM, “Emergency Communications Governance Guide.”

organizational management and service delivery.⁷² Stakeholder outreach also ensures that NG911 efforts prioritize access to emergency services for people with hearing impairments and speech disabilities. However, the literature is silent on the topic of ECC community advisory boards or specific efforts to solicit input from and forge partnerships with community members from high 911-use communities. Opportunities for improvements in stakeholder engagement are evident from results of a 2018 SAFECOM (described below) survey of emergency management agencies, which found that very few had decision-making groups that proactively sought new participants other than first responders.

State Models

In addition to the overarching governance themes described above, the literature specific to state 911 governance tends to emphasize the importance of having centralized state-level authority and forging intergovernmental and interagency collaboration. By way of example, SAFECOM, a collaborative managed by the Cybersecurity and Infrastructure Security Agency, has developed a continuum of 911 governance features ranging from the weakest to the strongest models.⁷³ Weak governance models are characterized by individual agencies operating independently, with their own standard operating procedures and training curricula and limited technology with which to share communications and data.⁷⁴ By contrast, the most robust governance models are regional and coordinated statewide, have uniform standard operating procedures, have two-way communications and data sharing capabilities and complete interoperability, and regional or statewide training standards and delivery.⁷⁵

In a separate report, SAFECOM also put forth two models for state emergency management governance specific to interoperability. One model is entirely centralized and integrates all emergency functions into one governing and decision-making body, informed by multiple committees, which is useful in ensuring that all tactical, operational, and communications needs are addressed.⁷⁶ The second model is more decentralized and assumes that a central state governing entity is already in place and therefore recommends the establishment of a 911 or broadband authority that works in equal partnership with the states' ECCs, with successful models having overlapping membership and operating in close coordination.⁷⁷

Regardless of which of the two models is employed, SAFECOM recommends that statewide 911 governance bodies have a single point of contact and direct access to the governor, be formally established by the legislative or executive branch, and have documented authority and balanced representation.⁷⁸ In addition, the entity should be (1) subject to accountability mechanisms; (2) transparent in its activities, priorities, and decision-making; (3) flexible enough to allow for changes as new issues and technological advances develop over time; and (4) sufficiently funded to ensure

⁷² Steven C. Sharpe, "9-1-1 Leadership: Perceptions of Evidence-Based Quality Improvement," (PhD diss., St. John Fischer College, 2018), https://fisherpub.sjfc.edu/cgi/viewcontent.cgi?article=1356&context=education_etd.

⁷³ SAFECOM, "Emergency Communications Guide."

⁷⁴ SAFECOM, "Emergency Communications Guide."

⁷⁵ SAFECOM, "Emergency Communications Guide."

⁷⁶ SAFECOM, "Emergency Communications Guide."

⁷⁷ SAFECOM, "Emergency Communications Guide."

⁷⁸ SAFECOM, "Emergency Communications Guide."

sustainability.⁷⁹ Ohio and Delaware are two state systems identified as embodying these features.⁸⁰ It is also recommended that any state governance structure be closely synchronized with local ECCs.⁸¹

Local and Regional Models

For local 911 governance, descriptive literature exists on building or renovating a ECC,⁸² ECC funding mechanisms,⁸³ and ECC resource sharing strategies.⁸⁴ Much of this literature focuses primarily on coordination and collaboration with neighboring and overlapping 911 systems and the consolidation and sharing of activities and resources among them. An important starting point in developing a new or revised local 911 governance model, particularly in the context of NG911, is to establish local and regional partnerships to forge agreement on shared goals and desired outcomes on issues such as standard operating procedures, staffing and personnel issues, methods of operation, quality assurance measures, and strategies to share technology and promote interoperability.⁸⁵ One means of coordination is to promote more sharing of equipment, services, resources, technology infrastructures and standard operating procedures.⁸⁶ This can be accomplished under joint management or while retaining the independence of collaborating ECCs.⁸⁷

Perhaps the most recent and arguably most comprehensive guidance on local 911 governance is the final report of the Task Force on Optimal PSAP Architecture (TFOPA), a group charged with exploring the best approaches to successful ECC transition to NG911. The TFOPA noted that, while governance issues associated with the NG911 transition by ECC exist, jurisdictions have ample opportunities to restructure or consolidate local 911 functions. The report recommends at least some degree of integration and consolidation of ECCs to reduce the resources required to cover large geographic areas.⁸⁸ Consolidating governance structures also reduces duplication of efforts and enhances cost efficiencies. For example, models that allow for the sharing of staff provide greater flexibility during call surge periods and yielding potential savings in janitorial costs, office supplies, and support infrastructure, along with technology.⁸⁹ Sharing staff requires governance to agree upon standardized job descriptions and pay scales, minimum training standards, coordinate training delivery, and standard operating procedures.

Governance models that promote and support consolidation can be developed to enable ECCs to continue functioning independently or to integrate operations. Regardless, the arrangement should be documented in an intergovernmental agreement of all involved parties and include details on the management of the agreed upon activities and the establishment of performance standards for what is considered successful program performance.⁹⁰ Examples of shared 911 communications center models

⁷⁹ SAFECOM, "Emergency Communications Guide."

⁸⁰ SAFECOM, "Emergency Communications Guide."

⁸¹ Holloway et al., "State NG911."

⁸² National Emergency Number Association, "NENA Public Safety Answering Point Site Selection Criteria Information Document," 2018, https://cdn.vmax.com/www.nena.org/resource/resmgr/standards/nena-inf-039.2-2018_orig_56.pdf.

⁸³ FCC, "Fees and Charges."

⁸⁴ TFOPA, "Final Report."

⁸⁵ TFOPA, "Final Report."

⁸⁶ TFOPA, "Final Report."

⁸⁷ TFOPA, "Final Report."

⁸⁸ NHTSA, "NG911 Cost Estimate."

⁸⁹ NHTSA, "NG911 Cost Estimate."

⁹⁰ NHTSA, "NG911 Cost Estimate."

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include facility sharing with no sharing of staff, sharing of staff housed in separate facilities, and sharing of staff in a shared facility, such as centralized communications centers, which bridge multiple agencies.⁹¹ One promising model in the context of shifting certain types of 911 calls from law enforcement to other actors is to retain the local ECC structure but divert certain types of calls to a secondary ECC that has dedicated to personnel to respond to them. However, this model requires a higher degree of specialization for telecommunicator staff.⁹²

Funding

911 services are primarily funded through landline fees, which are decreasing significantly as more consumers opt for cellular or VoIP technology. However, funding models have not evolved as quickly, leaving challenges in continuing to fund traditional 911 systems, not to mention funding technology upgrades to the digital environment of NG911 systems. Indeed, a 2018 report to Congress estimated the cost of full NG911 implementation nationwide as amounting to billions of dollars.⁹³ While every state in the country has some type of established funding mechanism to support their 911 systems,⁹⁴ this doesn't mean that local ECCs are receiving funding sufficient to support the true costs of 911 service delivery.

For example, a recent comprehensive cost study of Washington State's 911 services found that state taxes cover just one third of emergency communications expenditures.⁹⁵ The report observed that costs vary by ECC based on the population size of their jurisdictional purview, with some ECCs so small that they only receive a handful of calls per day.⁹⁶ This results in a range of cost per call from \$361 in the smallest Washington county to \$1.25 in the largest one.⁹⁷ Similar studies from other states either have not been conducted or were not publicly disseminated.

The TFOPA final report recommends that states continue to rely upon the current funding model, but that they complement those resources by assessing a new fee on broadband carriers and providers as well as a new network connection fee on users with broadband services.⁹⁸ This model could be coupled with efforts to ensure that prepaid wireless plans include assessment of 911 fees at retail point of sale, as is already happening in 37 states as of 2018.⁹⁹ Other funding models, such as using state universal service fee assessments, increasing sales taxes and dedicating a portion of them to 911 services, or funding 911 through state insurance fees were determined by TFOPA to have practical and political barriers to implementation.¹⁰⁰ However, most of these funding decisions are made at the state level.

At the ECC level, the offloading of some emergency response functions to other entities may yield valuable savings. For example, researchers estimate that finding alternative responses to false alarms and eliminating some other police responses could free up around one third of homeland security

⁹¹ NHTSA, "NG911 Cost Estimate."

⁹² NHTSA, "NG911 Cost Estimate."

⁹³ NHTSA, "NG911 Cost Estimate."

⁹⁴ NHTSA, "NG911 Cost Estimate."

⁹⁵ State of Washington Military Department, "911 Cost Study."

⁹⁶ State of Washington Military Department, "911 Cost Study."

⁹⁷ State of Washington Military Department, "911 Cost Study."

⁹⁸ TFOPA, "Final Report."

⁹⁹ TFOPA, "Final Report."

¹⁰⁰ TFOPA, "Final Report."

spending.¹⁰¹ While those costs would simply be shifted to crisis centers and other public health or nonprofit entities, they could be recouped through government grants and philanthropic donations.

Some scholars argue that Congress should allow states to collect more 911 funds and receive more federal 911 grant funds, something that could be accomplished by establishing an enforceable minimum floor of state NG911 services and imposing minimum technical and performance standards that must be funded.¹⁰² Others recommend that local governments close the 911 funding gap through grants and the assessment of local fees.¹⁰³ For example, Monroe County, IL, levied a local Public Safety Income Tax to subsidize 911 costs, which funded the establishment of a new ECC.¹⁰⁴ In addition, some argue that there should be greater restrictions and accountability mechanisms in place to ensure that fees collected for 911 are used for that purpose.¹⁰⁵

Questions for Inquiry and Action

The literature on best practices on 911 governance is helpful, although it cannot be used as a playbook given the variations and complexities of governance structures spanning multiple levels of governments. Moreover, research is virtually silent on the question of governance models and innovations as they pertain to efforts to offload some share of emergency responses to other actors and entities. This underscores the value of rigorously exploring the long list of questions that, if answered through rigorous implementation science, could aid in transforming 911.

- What types of governance structures work best in the interest of promoting interoperability and coordination between public safety and nonprofit or other governmental crisis hotlines and responders?
- What types of governance structures are most effective and efficient in terms of costs and harm reduction?
- Which structures and processes have strong public oversight and what are the advantages and disadvantages of such community-oriented accountability mechanisms?
- What efforts have been made to engage community members from high 911-use communities in ECC governance and what have been the outcomes of those efforts?
- What is the nature of existing demand for and current responses to calls for emergency and crisis services and how does that inform various governance structures and consolidation measures?
- What are the advantages and disadvantages of different 911 funding models, and which ones best support efforts to divert calls for emergency services to alternative responders?

¹⁰¹ Erwin A. Blackstone et al., "The Economics of Emergency Response," *Policy Sciences* 40, no. 4 (2007): 313-334. <https://www.jstor.org/stable/25474342>.

¹⁰² Holloway et al., "Federalism in Financing 911."

¹⁰³ Randy Ross, "Closing the 911 Funding Gap: Increasing Revenues for 911 Emergency Dispatch Centers," *Certified Public Manager Applied Research* 1, no. 1 (2020), <https://scholarworks.sfasu.edu/cpmar/vol1/iss1/4>.

¹⁰⁴ SAFECOM, "Emergency Communications Governance Guide."

¹⁰⁵ Neusteter et al., "Understanding Police Enforcement."

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- How can governance promote NG911 transition to improve accessibility of emergency and crisis services, particularly to those with disabilities?
- How can governance support communications strategies to encourage the public to use alternative hotlines, such as 988, and what is required to enable 911 professionals to reroute callers to 988?
- To what degree should 988 governance mirror or differ from 911 governance models?
- How can 988 be governed to ensure that emergency services are delivered quickly in life-threatening circumstances while protecting the privacy and anonymity of callers?
- What are the intersections among 911, 311, and 988 governance models? How can they inform efforts at streamlining coordination, cost-containment, and efficiency of service delivery?
- Is it possible to isolate whether some types of governance structures lead to more efficient, cost-effective, and equitable outcomes in public safety and crisis intervention service delivery compared with others?
- What role does governance play in communicating to various communities and demographics the existence and value of alternatives to 911 and the cases in which 911 should be used?
- To what degree do more inclusive governance models lead to more equitable delivery of public safety and crisis intervention services?
- What framework would support the national collection of 911 data to understand the volume, type, resolution, and costs of calls and their associated responses? How might such a data collection inform 911 governance models in the context of increasing equitable access to emergency services and reducing harms and disparate outcomes?
- What are the actual costs of 911? How do those costs vary by state, jurisdiction, and locality? How are those systems funded? What funding gaps exist and what models work well for filling those gaps?

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Chapter 6: 911 Technology and Infrastructure

Introduction

The U.S. 911 system was created in 1968 and its expansion was facilitated by the Wireless Communications and Public Safety Act of 1999, designed to ensure immediate response to public requests for fire, police, and emergency medical services.¹ Nationwide, the 911 system currently fields an estimated 240 million calls every year,² yet the degree of technological sophistication associated with routing, responding, and documenting this tremendous volume of calls varies greatly from one jurisdiction to another. Technological advances create opportunities to upgrade and modernize these 911 systems by generating more accurate information in support of efficient and equitable responses to calls for service and facilitating data sharing and interoperability between different dispatcher systems and responders. Technology could streamline call taker decision making to enable a more accurate assessment of priority and risk, and reduce unnecessary police response and biased outcomes. It could also ensure the quick re-routing of calls from 911 to alternative hotlines. In addition, technology could be employed to improve the wellbeing of 911 professionals and first responders through reducing strain and burden on this critical frontline workforce. However, the effectiveness of technology in fulfilling these goals has not been examined empirically.

The proliferation of cell phones and internet-based communications to interact with a 911 system designed for land line use poses certain challenges. Some public safety answering points (PSAPs), also known as Emergency Communications Centers (ECCs), are not able to automatically detect a caller's location if they dial from a mobile phone,³ and most are ill equipped to receive and securely store photographs and videos shared by the public. In addition, some technologies designed to automate 911 processes may be racing ahead of data-driven and inclusive development of the processes to be automated.⁴ Indeed, the fast pace of technology advancement makes it difficult for ECC leaders to assess which new technologies are necessary or superfluous, instead relying on the guidance of vendors who have a vested interest in their adoption.⁵

In response to these opportunities, challenges, and limitations, a variety of technology-related initiatives are currently under way in the 911 space, from Federal Communications Commission (FCC) rules on wireless Enhanced 911 (E911) services to third-party smartphone apps that provide enhanced 911 dialing capabilities. The most publicly visible 911 upgrade effort is Next Generation 911 (NG911), a nationwide initiative to upgrade 911 from analog phone systems to Internet Protocol (IP)-based systems that are capable of handling text and multimedia messages. In addition, independent companies have developed applications to streamline call-taking and triaging processes and enable members of the

¹ FCC, "911 and E911 Services," accessed December 21, 2021, <https://www.fcc.gov/general/9-1-1-and-e9-1-1-services>.

² National Emergency Number Association (NENA), "9-1-1 Statistics," accessed October 26, 2021, <https://www.nena.org/page/911Statistics>.

³ NENA, "9-1-1 Statistics."

⁴ Transform911 Technology Workgroup discussions.

⁵ Transform911 Technology Workgroup discussions.

public to share critical information about themselves and their household members, particularly those with medical conditions, special needs, and disabilities, in advance of emergencies.

This research brief highlights the technological challenges specific to 911, including the limitations introduced above, as well as the system’s limited capacity during natural disasters or widespread emergencies and challenges related to accessibility for people with disabilities and the aging population. This review describes the NG911 initiative, the challenges ECCs are encountering in transitioning to NG911, and other measures to deploy technology in the service of improving 911 service delivery. The research on this topic is particularly sparse and mostly confined to methods and algorithms designed to expedite or automate certain 911 call-taking and emergency response functions. As such, this brief closes with several questions in need of additional research evidence.

The State of Practice: Existing 911 Call Technology

At its most basic, a 911 call is simply audio communication between a caller and a call taker, with no supporting information. An estimated 93 percent of US counties with 911 coverage have technology at least one step above basic: “enhanced” 911, which automatically makes the caller’s phone number and address available to the call taker, provided the caller is using a landline.⁶ Wireless phone service providers are able to provide additional information to ECCs when a call comes from a mobile phone, including the cell tower location, caller’s GPS coordinates (in some cases), and mobile phone number⁷ (useful for calling back in case the call drops or the caller hangs up). The table below describes five technological stages of 911, spanning three types of communications networks (landline, wireless, and internet).

Table 6.1 *Descriptions from National Emergency Number Association.*⁸

Stage	Description
Basic 911	Emergency and its location are communicated by voice or teletype, using the public switched telephone network (PSTN).
Enhanced 911	ECC has database information that display caller’s phone number and address to call-taker.
Wireless Phase I	Call-taker automatically receives wireless (mobile) phone number and location of cell tower handling the call.
Wireless Phase II	Call-taker automatically receives wireless phone number and caller’s location information.
Voice over Internet Protocol (VoIP)	Internet Protocol (IP)-based systems rely on broadband internet rather than the public switched telephone network (PSTN) and have the capability to transmit multimedia messages in addition to voice calls. This is the major component of NG911.

⁶ NENA, “9-1-1 Statistics.”

⁷ NENA, “9-1-1 Statistics.”

⁸ NENA, “9-1-1 Statistics.”

The decentralized nature of 911 implementation and regulation, coupled with limited data-sharing, makes it difficult to confidently summarize the state of 911 practice from a technology infrastructure perspective. For example, as of this writing, the National Emergency Number Association's (NENA) map of state NG911 (VoIP) transition progress was last updated in 2018,⁹ and 911.gov's NG911 progress snapshot was last updated in 2017,¹⁰ though the webpage states that the National 911 Program collaborates with 911 associations annually to collect this information. The mapping and routine tracking of ECC migration to NG911 nationwide would be a useful undertaking to identify leaders to learn from and stragglers in need of additional assistance.

Computer-aided dispatch (CAD) systems have become indispensable to 911 emergency response over the past 40 years.¹¹ CAD systems can help 911 professionals prioritize and record incident calls, coordinate incoming data from multiple streams, and manage or automate dispatch and monitoring of field responders.¹² CAD systems can also incorporate information from records management systems (RMSs), which keep detailed records of incidents and reports from partner agencies – for example, law enforcement RMSs contain arrest and crime reports. CAD systems and RMSs may come packaged together with a mobile data terminal and mobile report entry system as a software suite from a particular technology vendor, which then provides support to an entire department.¹³ Often times, however, CAD systems and RMSs are owned and operated by different agencies and are not linked. This underscores the importance of examining ECC technology issues and needs within the context of where the ECC is housed (e.g., police department, public safety office, fire department) and what standard operating procedures and procurement policies govern its operations and technological capabilities, capacities, and needs. Indeed, it is important to recognize that ECCs do not operate independently with regard to technology acquisition, upgrades, and usage.

Despite the ubiquity of CAD systems, little research has been done on their use or best practices. Recent reports in this area include a variety of internal studies of departmental practices or impact assessments brought to the public in a particular jurisdiction. A 2019 report by the Seattle Police Department described the extent and use of CAD surveillance data and included a variety of comments from public meetings about this technology.¹⁴ What recent scholarship on CAD systems that does exist is largely from surveillance studies or a sociological perspective rather than a technical perspective.¹⁵

⁹ National Emergency Number Association (NENA), "Status of NG9-1-1 State Activity," last updated February 2, 2018, https://www.nena.org/page/NG911_StateActivity.

¹⁰ 911.gov, "Next Generation 911," accessed November 16, 2021, https://www.911.gov/issue_nextgeneration911.html.

¹¹ Kent W. Colton, "Police and Computer Technology: The Case of the San Diego Computer-Aided Dispatch System," *Public Productivity Review* (1980): 21-42, <https://www.jstor.org/stable/3380055>.

¹² U.S. Department of Homeland Security, "Tech Note: Computer Aided Dispatch Systems," September 2011, https://www.dhs.gov/sites/default/files/publications/CAD_TN_0911-508.pdf.

¹³ Brad Brewer, "Versadex PoliceCAD," *Law and Order: The Magazine for Police Management* 56, no. 7 (2008): 38-43, <https://www.ojp.gov/ncjrs/virtual-library/abstracts/versadex-policecad>.

¹⁴ Seattle Police Department, 2019 Surveillance Impact Report: Computer-Aided Dispatch (CAD), April 24, 2019, <https://www.seattle.gov/Documents/Departments/Tech/Privacy/SPD%20Computer%20Aided%20Dispatch%20Final%20SIR.pdf>.

¹⁵ James N. Gilmore and McKinley DuRant, "Emergency Infrastructure and Locational Extraction: Problematizing Computer Assisted Dispatch Systems as Public Good," *Surveillance & Society* 19, no. 2 (2021): 187-198, <https://ojs.library.queensu.ca/index.php/surveillance-and-society/article/view/14116/9776>.

Challenges and Opportunities

The current and evolving 911 system in the United States experiences both challenges and opportunities in the context of technology. The challenges result from the fact that technology has advanced more rapidly than existing 911 infrastructures, creating barriers to communication particularly during widespread disasters. The opportunities come from innovations that afford new ways of communication and automate 911 processes. NG911 represents both an opportunity and a challenge: migration to the new system by all ECCs nationwide should result in improved interoperability, reliability, security, and service delivery, but the process of adopting NG911 is difficult for many ECCs owing to antiquated infrastructures and limited resources.

Challenges with Existing 911 Technologies

Technology has introduced new forms of communication, such as text messaging, cell phone video calling, and telecommunications spectrums like the 5th Generation (5G) network. These features enable the conveyance of more comprehensive information to call takers, and make 911 more accessible to people who are deaf or hard of hearing, or who speak a language other than English.¹⁶ However, 911 still runs largely on analog call systems that are unable to support email, text, or any other form of multimedia communications.¹⁷ Moreover, while analog systems support Teletypewriter Devices for the Deaf (TTY), most non-hearing individuals no longer use the decades-old device, instead opting for cell phones or VoIP, in part because TTY is unreliable on digital networks.¹⁸ As such, people who are deaf, deafblind, hard of hearing, or have a speech disability lack a reliable means of communicating with 911.¹⁹

Existing system use of analog and narrow broadband communications networks, which are unable to incorporate wider broadband data connection and communication, can cause network congestion, low data rates, and interoperability problems.²⁰ Furthermore, in situations like severe storms or natural disasters, cell service may face outages, resulting in 911 being unable to support people in need of help.²¹ Public safety systems also face challenges such as lack of cooperation between different agencies and rupture of base stations during disaster situations.²² Risk maps are required to guide safe travel during disasters, but dissemination of such maps requires cellular service that is often lacking. Cyberattacks on 911 call centers are also a source of vulnerability that can take an entire jurisdiction's call infrastructure offline. Such attacks have become concerningly common during the transition to

¹⁶ 911.gov, "Text-to-911," accessed October 26, 2021, https://www.911.gov/issue_textto911.html.

¹⁷ Patrick Purdy, "An Inquiry Regarding the Development of an Effectual Architecture Framework Supporting Next Generation 9-1-1," (Masters Thesis, Regis University, 2011), 631, <https://epublications.regis.edu/theses/631>.

¹⁸ Richard Lorenzo Ray, "Americans with Disabilities Act (ADA) and Twenty-First Century Communications and Video Accessibility Act (CVAA)," report prepared at the request of United States Senator Edward Markey (May 2021).

¹⁹ Ray, "ADA and CVAA."

²⁰ Abhaykumar Kumbhar et al., "A Survey on Legacy and Emerging Technologies for Public Safety Communications," *IEEE Communications Surveys & Tutorials* 19, no. 1 (2016): 97-124, <https://arxiv.org/pdf/1509.08316.pdf>.

²¹ Ramon Ferrus et al., "LTE: The Technology Driver for Future Public Safety Communications," *IEEE Communications Magazine* 51, no. 10 (2013): 154-161, <https://ieeexplore.ieee.org/document/6619579>.

²² Ferrus et al., "LTE."

NG911,²³ but with proper mitigation strategies²⁴ the NG911 system overhaul could improve security once it is fully in place.²⁵

Technology challenges are also evident in the ability of ECCs to access data housed in CAD systems and data dashboards operated by third-party vendors. ECCs do not always have real-time access to such data and language in vendor contracts can be unclear on issues of data ownership and access.²⁶ These challenges can be overcome by specifying data ownership and access requirements in requests for proposals, and by ensuring contractual language aligns with those requirements.²⁷ This includes requiring cloud-based vendors to offer ECCs the option of local mirroring of data and ensuring that data are fully exportable to avoid potential vendor lock-in practices.²⁸

A related issue that merges data and technology pertains to ethics in securing the privacy and confidentiality of personal information in emergency service decision-making.²⁹ The 911 profession currently lacks uniform data ethics guidelines to ensure that data are used to improve service delivery while safeguarding the privacy rights and protections afforded to all people. Technological advances in data anonymization techniques, such as generating and sharing synthetic data from aggregated sources, could be applied to 911 operations.³⁰

Innovations in 911 Dialing

NENA estimates that 80 percent of calls to 911 are placed from mobile phones.³¹ The near-ubiquity of smartphones can present challenges to 911 operations – mainly, the need to ask for a caller’s location verbally in ECCs with basic or enhanced 911,³² and calls being routed to the wrong ECC based on cell tower location.³³ However, many smartphones make dialing 911 easier through shortcut or quick-dial 911 features,³⁴ and a variety of apps offer 911 dialing with enhanced information-sharing (e.g. the Uber app “emergency button” shares car description, location, and license plate number³⁵). Both dialing shortcuts and app safety features can cut down the time needed to call and communicate with 911 in an emergency, though shortcuts may exacerbate the prevalence of resources wasted on accidental 911 calls

²³ Jon Schuppe, “Hackers Have Taken Down Dozens of 911 Centers. Why Is It So Hard to Stop Them?” NBC News, April 3, 2018, <https://www.nbcnews.com/news/us-news/hackers-have-taken-down-dozens-911-centers-why-it-so-n862206>.

²⁴ U.S. Cybersecurity & Infrastructure Security Agency, “Cyber Risks to Next Generation 9-1-1,” November 2019, <https://www.cisa.gov/sites/default/files/publications/NG911%20Cybersecurity%20Primer.pdf>.

²⁵ Colin Wood, “Will a Cyberattack Take Down Next-Generation 911?” StateScoop, October 19, 2021, <https://statescoop.com/will-a-cyberattack-take-down-next-generation-911/>.

²⁶ Transform911 Technology Workgroup discussions held from October 6, 2021 to February 8, 2022.

²⁷ Transform911 Technology Workgroup discussions.

²⁸ Transform911 Technology Workgroup discussions.

²⁹ Transform911 Technology Workgroup discussions.

³⁰ Transform911 Technology Workgroup discussions.

³¹ NENA, “911 Statistics.”

³² William B. Millard, “Dialing Down the Delta: Wireless Telephones at Odds With 911 Systems,” *Annals of Emergency Medicine* 68, no. 6 (2016): A18-A24, [https://www.annemergmed.com/article/S0196-0644\(16\)31216-1/fulltext](https://www.annemergmed.com/article/S0196-0644(16)31216-1/fulltext).

³³ S. Rebecca Neusteter et al., “The 911 Call Processing System: A Review of the Literature as it Relates to Policing,” Vera Institute of Justice, July 2019, 6-9; 34-36, <https://www.vera.org/downloads/publications/911-call-processing-system-review-of-policing-literature.pdf>.

³⁴ See Apple’s Emergency SOS for iPhone, <https://support.apple.com/en-us/HT208076>.

³⁵ Uber, “Uber’s Emergency Button,” March 14, 2019, <https://www.uber.com/newsroom/emergencybutton/>.

and hang-ups.³⁶ Smart devices like Apple Watch even claim to share location data with 911 automatically,³⁷ though whether this happens depends on the ECC's ability to receive said data.

Many elderly individuals currently use Personal Emergency Response Systems (PERS) pendant devices, which allow individuals to connect with family members and the 911 system by the push of a button.³⁸ However, using PERS is not foolproof, as individuals need to manually activate the button to call for help.³⁹ In cases of unconsciousness, or in cases where an individual is not wearing the pendant device, a PERS device loses its utility.⁴⁰ In response to such challenges, many companies are introducing sensors to detect if a user has fallen and to automatically send out an emergency response,⁴¹ as well as static buttons installed in high-risk locations like showers.⁴²

For car emergencies, In-Vehicle Systems (IVS) can automatically connect individuals involved in car accidents to the emergency help system. IVS utilizes cellular data to connect with the appropriate ECC. The IVS system requires standardization across ECCs through the development and implementation of the NG-eCall system.⁴³

The Next Generation 911 (NG911) Initiative

To update the 911 system on par with overall technological innovations, and to match consumer behavior around communication systems, the US government has been working towards upgrading the system by shifting to a Voice over Internet Protocol (VoIP) based network, an initiative commonly known as NG911. VoIP utilizes internet connection instead of the public switched telephone network (PSTN), thus utilizing an already established digital network. As the internet has allowed personal communication to move beyond voice calls, and to incorporate multimedia forms of communication, the NG911 system utilizing VoIP will be able to provide services which are not restricted to voice calls. VoIP can also allow callers to choose the area code from where the complaint is being made, allowing for a direct routing to the right ECC.⁴⁴

³⁶ CBS Minnesota, "Apple Upgrade Blamed For Thousands Of Wasteful 911 Hang-Ups," July 31, 2019, <https://minnesota.cbslocal.com/2019/07/31/apple-upgrade-blamed-thousands-wasteful-911-hang-ups/>; Jonathan Fortier, "Smart Devices Causing More 911 Hang-ups," WEAU News, January 14, 2020, <https://www.weau.com/content/news/Smart-devices-causing-more-911-hang-ups-566985441.html>. See also Neusteter et al., "Understanding Police Enforcement: A Multicity 911 Analysis," Vera Institute of Justice, September 2020, <https://www.vera.org/downloads/publications/understanding-police-enforcement-911-analysis.pdf>.

³⁷ Apple, "Use Emergency SOS on your Apple Watch," April 27, 2021, <https://support.apple.com/en-us/HT206983>.

³⁸ William C. Mann et al., "Use of Personal Emergency Response Systems by Older Individuals with Disabilities," *Assistive Technology* 17, no. 1 (2005): 82-88, <https://escholarship.mcgill.ca/downloads/8910jz98x>.

³⁹ Mann et al., "Personal Emergency Response Systems."

⁴⁰ Mann et al., "Personal Emergency Response Systems."

⁴¹ Tine Smits and Andrea Ryter, "Personal Emergency Response System (PERS) with Optimized Automatic Fall Detection Shows Greater Effectiveness than PERS Alone," *Philips Lifeline*, 2015, https://www.lifeline.philips.com/content/dam/PLL/PLL-Common/PDFs/WhitePaper-AA_Analytics-j.pdf.

⁴² E.g., LifeAlert shower button, <http://www.lifealert.com/HELPEButton.aspx>.

⁴³ Risto Oorni and Ana Goulart, "In-Vehicle Emergency Call Services: eCall and Beyond," *IEEE Communications Magazine* 55, no. 1 (2017): 159-165.

⁴⁴ Andre Pierre Guerlain and Nicholas James Algieri, "IP-Enabled WAN EMS System," Worcester Polytechnic Institute Interactive Qualifying Projects (2013), <https://core.ac.uk/download/pdf/212990288.pdf>.

The NG911 system is being developed to handle higher call volume, have more reliable network connections, and provide richer information to first responders.⁴⁵ The NG911 system can also help address the challenges of data integration for the use of the first responders.⁴⁶ NG911 will utilize an upgraded form of network called the Emergency Services Internet Protocol Networks (ESINets). ESINets will allow for transmission of large amounts of data to first responders, and are able to function in emergency and disaster situations where faults may occur at end points or some circuits might break.⁴⁷ NG911 will also allow for the detection of incident location and thereby allow interoperability between neighboring ECCs.⁴⁸

These capabilities hold great promise, but migrating all ECCs to NG911 nationwide is a monumental task, and one that requires technical assistance and resources. To facilitate this transition, the National Telecommunication Industry Administration and the National Highway Traffic Safety Administration have initiated a NG911 grant program. NG911 funding has also been proposed as part of the LIFT America Act in March 2021⁴⁹ and the Build Back Better (BBB) Act in September 2021,⁵⁰ though the \$10 billion in NG911 funding proposed in the BBB Act was cut by over 95 percent while the bill was in the House of Representatives.⁵¹ In addition to grant funding to promote NG911 migration, 911.gov has developed the 911 DataPath Strategic Plan, a model for a nationally uniform 911 data system to standardize data collection in support of secure data sharing and collaboration among jurisdictions.⁵²

Smart911

Another technological advancement related to 911 is Smart911, a for-profit platform that enables voluntary users to enter information about themselves and other members of their household, including pets, into the platform to be stored for retrieval by ECCs. The system is designed to equip call-takers, dispatchers, and responders with quick access to vital information in the event of an emergency.⁵³ Smart911's Vulnerable Needs Registry allows users to submit information about their medical conditions, medications, allergies, disabilities, and language preferences.⁵⁴ When an enrolled household dials 911, this information is displayed on call-taker screens, provided that the ECC participates in the Smart911 program. Smart911 also shares alerts and notifications and real-time information about weather, traffic, and other emergencies with Smart911 subscribers.⁵⁵ ECCs in Atlanta, GA, Chicago, IL, Nashville, TN, Seattle, WA, and Washington, DC, as well as in the states of Arkansas, Delaware, and Michigan currently participate in Smart911. While Smart911 claims that its platform reduces response

⁴⁵ Andrew Jackson Coley, "NG9-1-1, Cybersecurity, and Contributions to the Model Framework for a Secure National Infrastructure," *Cath. UJL & Tech* 27, no. 1 (2018): 127, <https://scholarship.law.edu/cgi/viewcontent.cgi?article=1062&context=jlt>.

⁴⁶ Coley, "NG9-1-1 and Cybersecurity."

⁴⁷ Coley, "NG9-1-1 and Cybersecurity."

⁴⁸ Coley, "NG9-1-1 and Cybersecurity."

⁴⁹ U.S. Congress, House, "LIFT America Act," H.R. 1848, introduced in House March 12, 2021, <https://www.congress.gov/bill/117th-congress/house-bill/1848>.

⁵⁰ U.S. Congress, House, "Build Back Better Act," H.R. 5376, introduced in House September 27, 2021, <https://www.congress.gov/bill/117th-congress/house-bill/5376/>.

⁵¹ Margaret Harding McGill, "Congress Decimates 911's Digital Upgrade," *Axios*, November 25, 2021, <https://www.axios.com/congress-decimates-911s-digital-upgrade-845c5730-d1b2-4478-b32d-9d980793570d.html>.

⁵² 911.gov, "Introducing the 911 DataPath Initiative," accessed February 12, 2022, https://www.911.gov/pdf/911_Data_Information_Sharing_Strategic_Plan_Final.pdf

⁵³ Smart911, "Smart911," accessed January 2, 2022, <https://www.smart911.com/>.

⁵⁴ Smart911, "Smart911."

⁵⁵ Smart911, "Smart911."

times and saves lives, no studies have been conducted on the effectiveness of Smart911 in streamlining the provision of emergency services.

Research Evidence

What measurable impacts do analog 911 systems have on emergency response?

Even in ECCs that have wireless enhanced 911 capabilities, some types of calls present real challenges. One study found that nearly all alarm system alerts to 911 are made via phone calls over PSTN, limiting information-sharing to verbal communication between alarm monitoring operators and 911 call takers, and leading to long processing times as well as wasted call-taker time due to numerous false alarms. The study estimated the annual cost to the emergency response system (and therefore to taxpayers) of the approximately 62 million yearly false alarms at around \$3.1 billion.^{56,57} If alarm systems were able to use NG911 to send video or audio footage directly to a call taker, unnecessary police dispatch to false alarms could be greatly reduced, as could potentially harmful interactions between officers and reportedly “suspicious persons.”

Does current 911 technology impact medical emergency response?

The current system of first response in hospitals relies on the estimations of “pre-hospital providers” (i.e., Emergency Medical Services or EMS) about response time and arrival time at the hospital, which are often incorrect. For example, one study in Oregon found that pre-hospital providers’ *estimated* duration of transport time was accurate within five minutes of the *actual* transport time in fewer than 16 percent of instances studied,⁵⁸ which can result in unnecessary downtime or delays at the emergency department. Moreover, the reliance on pre-hospital providers also led to a delay in the hospital receiving medical reports and making suitable response arrangements for the incoming patient.⁵⁹ EMS are now trying to incorporate Geographical Information Systems (GIS) technology to identify location and choice of transport (air or ground) for faster response. GIS is also being used for other purposes, such as trauma triage and ambulance deployment.⁶⁰ Similarly, the use of Global Positioning Systems (GPS) can allow for live mapping systems and help in better predicting transport times, which can then help in making dispatching and response team decisions.⁶¹ In addition, platforms such as Smart911 may streamline the provision of emergency services and result in more effective emergency response because responders will have information about medical conditions and special needs of residents. These developments may offer promise for 911 call taking, dispatching, and response – particularly for those instances in which response may involve transporting the subject of a call to an emergency department or other medical facility.

⁵⁶ Cirrus Foroughi, "Understanding the Data Gap in Emergency Response: Evidence from US 911 Agencies," working paper, available at SSRN (2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3633580.

⁵⁷ Neusteter et al., “Understanding Police Enforcement.”

⁵⁸ Ross J. Fleischman et al., "Predicting Ambulance Time of Arrival to the Emergency Department Using Global Positioning System and Google Maps," *Prehospital Emergency Care* 17, no. 4 (2013): 458-465, <https://doi.org/10.3109/10903127.2013.811562>.

⁵⁹ Fleischman et al., “Predicting Ambulance Time.”

⁶⁰ Fleischman et al., “Predicting Ambulance Time.”

⁶¹ Fleischman et al., “Predicting Ambulance Time.”

What challenges are expected from the transition to NG911?

While the NG911 system will be a transformative improvement in technological capability and sophistication from the existing 911 system, it will bring new challenges that will need to be addressed by governing bodies. For example, given that ECCs in most states operate independently, the advantages of NG911 will be limited until all ECCs, particularly those serving neighboring jurisdictions, have adopted NG911 and thus have full interoperability, the capability to receive VoIP calls, and the ability to receive and manage text and video media.⁶² Many ECCs currently rely on antiquated legacy CAD systems and outdated technology comparable to that used by systems 30 years ago,⁶³ which will need to be upgraded to comport with NG911 requirements and capabilities.⁶⁴ Measures to upgrade these networks occur at the ECC level, resulting in different technologies and ways of coding calls that make data sharing and interoperability challenging.⁶⁵ Governance at all levels is therefore needed to fund and coordinate the transition to NG911 to enable service interoperability and mitigate cybersecurity risks.⁶⁶

Given the large volume of data which will be part of the NG911 system, privacy breaches and cybersecurity risks will pose challenges.⁶⁷ Furthermore, since NG911 aims to amass data and promote connectivity, security breaches or blockages to the system can be especially disruptive to the network's public safety and communication services. The significant increase in volume of data associated with NG911's ability to transmit photos and videos will also present significant data storage challenges.

The large volume of complaints that will come in the form of multimedia calls, texts, videos, and pictures are also expected to impact the mental health and stress levels of 911 professionals.⁶⁸ In particular, 911 professionals are concerned about having to view violent or disturbing images that may increase their risk of traumatic stress.⁶⁹ 911 professionals already face psychological and traumatic stress due to the kind of emergency calls and complaints that they have to answer.⁷⁰ With NG911, 911 professionals will now be exposed to triggering multimedia photos and videos of crisis and criminal situations, increasing the level of stress that they are likely to face. This has the potential to be both personally harmful and professionally detrimental in terms of job performance and productivity.⁷¹ 911 professionals will also need to undergo training to comprehend time-sensitive data from media forms other than voice calls and convey that information to first responders.⁷² Furthermore, transitioning to the NG911 system will likely require organizational challenges that have the potential to cause staff resistance.⁷³

⁶² Neusteter et al., "911 Call Processing System."

⁶³ Coley, "NG9-1-1 and Cybersecurity."

⁶⁴ Abobakr Y. Shahrah et al., "Developing and Implementing Next-Generation Computer-Aided Dispatch: Challenges and Opportunities." *Journal of Homeland Security and Emergency Management* 14, no. 4 (2017).

⁶⁵ Rob Grace and Jess Kropczynski, "Communicating Next-Generation 911 with Local 911 Professionals: Preliminary Recommendations," in *2020 IEEE International Professional Communication Conference* (2020): 110-114, <https://par.nsf.gov/servlets/purl/10281186>.

⁶⁶ Coley, "NG9-1-1 and Cybersecurity."

⁶⁷ Grace and Kropczynski, "Communicating NG911."

⁶⁸ Grace and Kropczynski, "Communicating NG911."

⁶⁹ 911.gov, "NG911 Guide for Telecommunicators," accessed November 16, 2021, https://www.911.gov/project_ng911publicsafety/telecommunicators/index.html

⁷⁰ Janet Baseman et al., "Impact of New Technologies on Stress, Attrition and Well-Being in Emergency Call Centers: The NextGeneration 9-1-1 Study Protocol," *BMC Public Health* 18, no. 1 (2018): 1-9, <https://link.springer.com/content/pdf/10.1186/s12889-018-5510-x.pdf>.

⁷¹ Baseman et al., "Impact of New Technologies."

⁷² Oorni and Goulart, "eCall and Beyond."

⁷³ Baseman et al., "Impact of New Technologies."

Although the NG911 system is capable of data sharing and connecting different ECCs and enables callers to use VoIP devices to contact emergency services from any internet access point, those calls are routed to the ECC associated with the subscriber's home; if the caller is contacting 911 from a different location, then the call must be rerouted.⁷⁴ Rerouting which wastes precious time and allows for human error in identifying the correct ECC.⁷⁵

How can we build in resilience and prevent NG911 systems from being overloaded?

NG911's main drawback is that it will collapse under a faulty internet connection, the odds for which increase during the heavy traffic disaster situations when the system is most critical. In response, researchers have proposed developing a single protocol level which can integrate remote media control system with the VoIP-based NG911 system. This combined system can then switch between multimedia messages and voice only systems (during high emergency and traffic situations). This integration can happen with the help of a smartphone option of enabling and disabling remote media control (RMC).⁷⁶

Reverse 911 systems are another mechanism through which 911 automated calls are sent out to people in areas affected by emergency situations. This process preempts community members placing a high volume of 911 calls by proactively providing warnings and information through recorded or automated messages.⁷⁷ Reverse 911 usefully curates messages and warnings for specific populations, and is effective in communicating instructions, such as directing the evacuation of a disaster area.⁷⁸

When setting up a landline, users are prompted to provide a valid address within their country of purchase.⁷⁹ In the United States, this address and number is accessible to local 911 services and can be used to notify individuals of crisis situations with reverse 911.⁸⁰ More recently, the VoIP-based NG911 system has brought reverse 911 to cell phones, making it an even more powerful tool. Authorities are no longer confined to alerting individuals solely at their home addresses. They are now able to share more precise warnings and instructions no matter where people are. This is especially useful for those who are unhoused and do not have regular access to a landline. However, since cell phones are wireless, can be carried anywhere, and are not tied to specific addresses, residents are responsible for registering their cell phone numbers with their county in order to receive alerts.⁸¹ This additional step of registration may act as an unintended barrier for certain populations, specifically the elderly and disabled, who may not have the capacity to register for such services, and people living under unstable conditions who may not have continuity in phone service.

⁷⁴ Guerlain and Algieri, "IP-Enabled WAN EMS System."

⁷⁵ Anthony Daniel Salerni, "IP-Enabled WAN EMS System," Worcester Polytechnic Institute Interactive Qualifying Projects (2013), https://digital.wpi.edu/concern/student_works/7p88ch066.

⁷⁶ Vikram Chandrasekaran et al., "Socio-Technical Aspects of Remote Media Control for a NG9-1-1 System," *Multimedia Tools and Applications* 62, no. 3 (2013): 733-759, <https://doi.org/10.1007/s11042-011-0875-1>.

⁷⁷ Lesley Strawderman et al., "Reverse 911 as a Complementary Evacuation Warning System," *Natural Hazards Review* 13, no. 1 (2012): 65-73, [https://ascelibrary.org/doi/abs/10.1061/\(ASCE\)NH.1527-6996.0000059](https://ascelibrary.org/doi/abs/10.1061/(ASCE)NH.1527-6996.0000059).

⁷⁸ Strawderman et al., "Reverse 911."

⁷⁹ Ooma, "Calling 911 From Landline Phones, VOIP Phones, and Cell Phones," Ooma FAQ, <https://www.ooma.com/home-phone-service/faqs/calling-911-from-a-landline-phones-voip-phones-and-cell-phones/>.

⁸⁰ Maricopa County, "Community Emergency Notification System (CENS)," <https://www.maricopa.gov/1755/CENS>.

⁸¹ Douglas County, NV Sheriff, "Reverse 911," https://sheriff.douglascountynv.gov/services/reverse_911.

How can advanced 911 technology improve accessibility and equity within the emergency response system?

Most attention around accessibility and equity in 911 call technology focuses on deaf and hard of hearing users, and text-to-911 is the 911 technological innovation perhaps most frequently touted as a tool to improve access for these users.⁸² A simulation pilot study in King County, WA, found that 911 call-takers were able to provide CPR instructions via text to ten deaf and hard of hearing participants, all of whom then successfully completed CPR on a practice mannequin.⁸³ Recently, researchers have suggested integrating NG911, voice-to-text captioning, and third-party video calls directly into mobile dialer systems, rather than requiring separate apps or workarounds for these services, to provide deaf and hard of hearing users with an experience akin to that of auditory phone users.⁸⁴

As of this writing, there is little public awareness or clarity around new services like text-to-911. One content analysis of text-to-911 public education information across Texas found that local government entities and ECCs provided minimal and inconsistent information about the availability and use of text-to-911.⁸⁵ Information about text-to-911 availability is itself sometimes inaccessible for deaf and hard of hearing populations, as well as being vague or minimally descriptive. A Houston-Galveston Area Council video announcing new text-to-911 availability, for example, has inaccurate automatic closed captioning and no subtitles or in-video text, and advises that if you don't get a text back from 911 (no specific timeframe was given), you should call.⁸⁶ This "call if texting doesn't work" approach has been documented by other scholars, who are concerned about the effective rollout of text-to-911 for individuals with disabilities.⁸⁷

Rural and tribal communities may encounter challenges to 911 access due to lack of phone network coverage,⁸⁸ among other factors like distance to emergency services and hospitals or outright lack of a local ECC. Scholars have identified cellular coverage and other dispatch issues within American Indian reservations and other tribal communities as an area needing further research.⁸⁹

Users who do not speak English fluently may also have difficulty using 911, though little research exists in this area. NG911's potential to send photos and video footage could help overcome language barriers, but further research should be conducted into technology to support language interpreting services or automated translation. While no evaluations have been published on Smart911 to date, this technological

⁸² e.g., [911.gov](https://www.911.gov), "Ensuring Access." This page on 911.gov states in a paragraph about deaf and hard of hearing callers that text-to-911 "is a great benefit for this community and others."

⁸³ Priyanka Gautam, "Text-to-9-1-1: Testing CPR Instructions for the Deaf and Hard of Hearing Population in King County, WA." (Master's thesis, University of Washington, 2019, <https://digital.lib.washington.edu/researchworks/handle/1773/44314>).

⁸⁴ Gary Behm et al., "Equivalent Telecommunications Access on Mobile Devices," in *the 23rd International ACM SIGACCESS Conference on Computers and Accessibility*, pp. 1-3. 2021, <https://doi.org/10.1145/3441852.3476535>.

⁸⁵ Rob Grace and Sierra Sinor, "How to text 911: A content analysis of text-to-911 public education information," in *the 39th ACM International Conference on Design of Communication* (2021): 135-14, <https://dl.acm.org/doi/abs/10.1145/3472714.3473633>.

⁸⁶ Houston-Galveston Area Council, "Text To 9-1-1," accessed November 22, 2021, <https://www.h-gac.com/gcrecd/text-to-9-1-1>.

⁸⁷ Elizabeth Ellcessor, "Call If You Can, Text If You Can't: A Dismediation of US Emergency Communication Infrastructure," *International Journal of Communication* 13 (2019).

⁸⁸ 911.gov, "Ensuring Access."

⁸⁹ Kathryn Quick et al., "Emergency Medical Services in American Indian Reservations and Communities: Results of a National Survey," Center for Transportation Studies, University of Minnesota (2019), <https://conservancy.umn.edu/handle/11299/203396>.

tool is designed to assist users with language and verbal differences to access and communicate with 911 and associated first responders.

911 technology is particularly relevant in the move to expand the use of alternative three-digit (988, 311, 211) hotlines and helplines, as research finds that many calls for services that are suitable for alternatives to police response are nonetheless placed to 911.⁹⁰ Advances in 911 technology should include the exploration of the most efficient re-routing of such calls and of considerations surrounding location-finding capabilities for alternative hotlines to ensure that they are fully employed when appropriate and generate the information needed to direct emergency medical services if necessary.

What other innovations have been proposed by researchers?

Many public safety communication systems use the land mobile radio system (LMRS), which is a wireless communication system that uses portable and mobile devices to allow for two-way digital radio communications.⁹¹ LMRS, however, is unable to support high data rate applications, thus is lacking during situations with high broadband requirements.⁹² To overcome the challenges of LMRS, long-term evolution (LTE) is the emergent technological network which will allow for increased capacity and for large volumes of data to be exchanged over wireless networks. Currently, the FirstNet network is in development under a public-private partnership between the US government and AT&T as an LTE-based broadband network for supporting public safety communications.⁹³ FirstNet will help in enabling group calls, talker identification, emergency alerting, and improving audio quality.⁹⁴ Unmanned aerial vehicles (UAVs) are the other LTE-based wireless communication systems which can be used during emergency situations. They have the advantages of easier deployment than traditional towers and the ability to send out quicker communications during crisis situations.⁹⁵

Researchers have also proposed improvements to the CAD system. A team in Australia has suggested an “agent-based” CAD system for automatic deployment of resources, using interconnected visual interfaces to facilitate communication between dispatch, responders (e.g., police departments, fire stations), and mobile units.⁹⁶ On the consumer side of technology, researchers are exploring social media’s dedicated SOS features (e.g., Facebook’s Safety Check⁹⁷), and organic use of social media for emergency outreach (e.g., frequent use of social media to ask for help during natural disasters that have caused network outages⁹⁸), as well as potential ways to harness these networks for formal emergency

⁹⁰ Jessica W. Gillooly, ““Lights and Sirens”: Variation in 911 Call-Taker Risk Appraisal and its Effects on Police Officer Perceptions at the Scene,” *Journal of Policy Analysis and Management* (2021), <https://doi.org/10.1002/pam.22369>; Cynthia Lum et al., “Constrained Gatekeepers of the Criminal Justice Footprint: A Systematic Social Observation Study of 9-1-1 Calltakers and Dispatchers,” *Justice Quarterly* 37, no. 7 (2020): 1176-1198, <https://doi.org/10.1080/07418825.2020.1834604>; Lorraine Mazerolle et al., “Managing Citizen Calls to the Police: The Impact of Baltimore’s 3-1-1 Call System,” *Criminology & Public Policy* 2, no. 1 (2002): 97-124.

⁹¹ Kumbhar et al., “A Survey on Public Safety Technologies.”

⁹² Kumbhar et al., “A Survey on Public Safety Technologies.”

⁹³ Kumbhar et al., “A Survey on Public Safety Technologies.”

⁹⁴ Kumbhar et al., “A Survey on Public Safety Technologies.”

⁹⁵ Arvind Merwaday, et al., ‘Improved Throughput Coverage in Natural Disasters,’ IEEE, 2016.

⁹⁶ Jihang Zhang et al., “Enable Automated Emergency Responses Through an Agent-Based Computer-Aided Dispatch System,” in *Proceedings of the 17th International Conference on Autonomous Agents and MultiAgent Systems* (2018): 1844-1846.

⁹⁷ Kate Sangwon Lee, “Explicit Disaster Response Features In Social Media: Safety Check And Community Help Usage On Facebook During Typhoon Mangkhut,” in *Proceedings of the 21st International Conference on Human-Computer Interaction with Mobile Devices and Services* (2019): 1-12, <https://doi.org/10.1145/3338286.3340140>.

⁹⁸ Chaudhry and Yuksel, “Social Media for Public Safety.”

response. With the proliferation of social media in emergency communication, researchers have proposed frameworks for detecting SOS messages/posts/tweets and actionable information on social media^{99,100} and using a “public safety bot” to triage and escalate requests for help.¹⁰¹

Researchers have proposed that the effectiveness of fire emergency response systems could be improved by adopting an Internet of Things (IoT)-based system which can automatically determine the source of fire in a building and share that information with the responding fire department. This can be useful in reducing response time and managing the evacuations.¹⁰²

Finally, there has been some preliminary exploration of computer algorithms and artificial intelligence/machine learning to assist in triage of 911 calls,¹⁰³ particularly for identifying medical emergencies. One recent study of machine learning triage for out-of-hospital cardiac arrest found that machine learning alerts alone had a significantly higher sensitivity than dispatchers without machine learning. Given this pattern, the machine learning triage had a lower rate of false negatives but a higher rate of false positives than a dispatcher.¹⁰⁴ Similarly, an algorithm employed in New York City, NY, to divert COVID-19-related 911 calls to hospital-based hotlines staffed by physician assistants and/or nurses reduced the proportion of calls resulting in ambulance response and increased the more appropriate allocations of EMS resources.¹⁰⁵

Questions for Inquiry and Action

As described above, the lack of centralized, publicly available data makes it difficult to get a full picture of what technology is currently in use – and much more difficult to study the capabilities of these technologies to promote more equitable access to 911 services and streamline the diversion of calls to alternative hotlines and responders. Questions for researchers to explore in the future include:

- How can technology provide better 911 and alternative hotline access for users who are nonverbal, hearing impaired, or who do not speak English fluently? How well does text-to-911 serve their needs?
- To what degree does Smart911 improve the speed and effectiveness of 911 services and responses? Does Smart911 result in improved communications and better-quality services,

⁹⁹ Jess Kropczynski et al., "Identifying Actionable Information on Social Media For Emergency Dispatch," *Proceedings of the ISCRAM Asia Pacific* (2018).

¹⁰⁰ Chaudhry and Yuksel, "Social Media for Public Safety."

¹⁰¹ Chaudhry and Yuksel, "Social Media for Public Safety."

¹⁰² Chang-Su Ryu, "IoT-based Intelligent for Fire Emergency Response Systems," *International Journal of Smart Home* 9, no. 3 (2015): 161-168, <http://dx.doi.org/10.14257/ijsh.2015.9.3.15>.

¹⁰³ Marcos Orellana et al., "A Methodology to Predict Emergency Call High-Priority: Case Study ECU-911," in *2020 Seventh International Conference on eDemocracy & eGovernment (ICEDEG)* (2020): 243-247.

¹⁰⁴ Stig Nikolaj Blomberg et al., "Effect of Machine Learning on Dispatcher Recognition of Out-Of-Hospital Cardiac Arrest During Calls to Emergency Medical Services: A Randomized Clinical Trial," *JAMA Network Open* 4, no. 1 (2021): e2032320-e2032320.

¹⁰⁵ W. Haussner et al., "49 911 Call Diversion to Telemedicine During the COVID-19 Pandemic in New York City: Call Characteristics, Outcomes and 48-Hour Follow-Up at a Single Academic Center," *Annals of Emergency Medicine*, August 1, 2021, <https://doi.org/10.1016/j.annemergmed.2021.07.050>.

particularly to those who are nonverbal, hearing impaired, have cognitive or developmental disabilities, or do not speak English fluently?

- How can existing and NG911 technologies be improved to promote more seamless and efficient rerouting from 911 to alternative hotlines and helplines?
- To what degree do call-taking and triaging facilitation and automation technologies yield more consistent and equitable responses and more effective service delivery? Are technologies development in partnership with ECC professionals more or less effective than those developed without practitioner input?
- How can technology needs be assessed objectively in a manner that informs the actual needs of the 911 profession and community rather than guided by the introduction of new applications promoted vendors?
- What can we learn from tracking ECC migration to NG911 to better understand technological barriers and what factors support successful migration? Are some ECCs better equipped to make the transition to NG911 based on the entity in which they are housed (e.g., police, fire/EMS) or the governance structure under which they operate?
- What has the impact of the NG911 grant program been in facilitating migration to 911? What are the remaining gaps in technical assistance and resource needs among ECCs nationwide?
- How do different communication types (call, text, multimedia) affect performance indicators like call outcome and response time? Do they have any impact in promoting more or less equitable and less harmful responses to request for emergency services?
- How does lack of cellular network coverage affect 911 accessibility in rural and tribal areas?
- To what degree does the underlying 911 technological infrastructure reduce or exacerbate the under- or over-triaging of calls to 911? Can changes to 911 technology reduce the over-triaging of calls pertaining to people of color?
- How is CAD best structured to support optimal outcomes for call-taking, triaging, assessment, dispatch, response, and follow-up? How might different CAD user interfaces or dashboards influence triaging decisions?
- How can emergency communications systems be fortified against outages, network overload, and cyberattacks?
- What are the most efficient ways to detect and handle false alarms and accidental calls?
- How can lags and lapses in service during the transition to NG911 be prevented or mitigated?

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- How could 911 technology infrastructure better support standardized data collection around volume and type of 911 calls, responses, and associated outcomes?
- How can machine learning assist 911 professionals to provide appropriate responses to medical and other emergencies?

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Chapter 7: Conclusion

This report documents the complex and interconnected nature of 911 and alternatives to emergency response systems in this country. The wide array of stakeholders and interests—from 911 professionals to advocates seeking to reduce the police footprint—exist within intersecting operations and governance structures that span jurisdictional boundaries and lack standardized training, policies, and practices. One sobering reality of these complexities is that not all interests are currently coordinated in efforts to improve 911 service delivery, despite their shared alignment with the goal of delivering safe, high quality, and equitable responses to public requests for both emergency and non-emergency services. Without greater coordination and collaboration, the various stakeholders in this space run the risk of operating at cross purposes.

Successful transformation requires that all people engaged with and affected by the 911 system approach efforts to improve it with open minds and open hearts. Indeed, given the diversity of the 911 ecosystem, stakeholders of all stripes need to come together to recognize and collectively solve problems and create solutions. This includes the 911 professionals who hold vital but all too often under-appreciated roles in public safety and community health; the public officials and jurisdictional leaders who are well positioned to advocate for sufficient funding and prioritization of 911 and alternative hotlines and responses; and members of the community—ranging from those who are reluctant to dial 911 to those who are heavy users of the system. Engagement of the people most affected by the 911 system is crucial in promoting shared understanding and engendering buy in for the implementation of new strategies.

Migration to Next Generation 911 (NG911) requires a tremendous investment in people, systems, and technologies, as do all manner of efforts to re-envision emergency communications and service delivery in this moment. This need is urgent and demands the attention of policymakers at all levels of government. Importantly, it is essential that investment in NG911 and alternative response systems not be viewed as a zero-sum game. Increasing resources and supports for 911 should not come at the expense of investments in traditional first responders. Rather, the two are complementary and inextricably linked, and therefore should be supported in equal measure.

Research and data are foundational to diagnosing the underlying source of problems in meeting the public's demand for services and developing solutions that hold the greatest promise of yielding intended results. This report documents the scant research across all six domains, raising crucial gaps in knowledge and data that must be filled, particularly in the interests of evaluation. Rigorous process and impact evaluations of 911 professional training programs, the implementation of new call-taking and triaging protocols, the piloting of alternative response programs, and the deployment of new technologies are all required. The absence of a significant research investment in this space risks replacing current inefficiencies and inequities with new ones.

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In closing, it is important to note that in many respects, our nation's 911 system represents the state writ large; its effective and equitable operation is integral to a democratic society. The public calls 911 for a wide array of requests for information and services, a considerable share of which are non-emergency in nature. As such, the ability of 911 to meet the needs of the public is foundational to the public's trust in government and their confidence in the reliability of public institutions. It is hoped that this report, as a foundation to the Transform911 initiative, helps build that public trust, providing a strong foundation from which to promote the equitable and reliable delivery of the right response by the right person at the right time.

Appendix: Workgroup Co-Chairs and Members

911 Professional Career and Supports

Co-Chairs

George Rice, *Managing Partner, SkyHawk Global*

George Rice is a Managing Partner at Skyhawk Global Associates. He has a diverse background covering 35 years in public service and global engagement. He is a former American enforcement and intelligence agent and has headed a series of programs and organizations directed at public sector and emergency services efforts, with a focus on the technologies that enhance these vital interests. He is the former Executive Director of the Association of Public-Safety Communications Officials (APCO) International and the Industry Council for Emergency Response Technologies (iCERT), leading both organizations into significant growth periods.

Lora Ueland, *Executive Director, Valley Communications Center 911*

Lora Ueland is the Executive Director of Valley Communications Center 911 in Washington State. She began her career as a dispatcher at Valley Com and has held multiple roles, culminating in her current position as Executive Director since 2011. Lora is the immediate past-

president of the Washington APCO/NENA Chapter, Board Chair of the Puget Sound Emergency Radio Network, and Board member of the Community Connectivity Consortium, a fiber-optic network serving cities, schools, hospitals and 911 Centers in the greater Puget Sound region. With nearly 40 years' experience in the 911 field, Lora has earned APCO certifications as a Registered Public-Safety Leader and Certified Public-Safety Executive. Continual improvement, growth mind-set and being of service are part of Lora's core values.

Members

Jill Baldassano, *Senior Manager, SkyHawk Global*

Jill is Senior Manager at SkyHawk Global where she develops strategic and integrated content to help clients advance overall business objectives. In her diverse background, she has helped companies from small startups to multi-billion-dollar global organizations develop their own brand and increase share of voice in their own unique way. Jill has expertise in helping transform companies through customer service content, digital strategies, user engagement campaigns and overall marketing communications. She has spent her career collaborating with subject matter experts, thought leaders, stakeholders and ultimately, the audience, to engage in meaningful content. Jill holds a bachelor's degree in English Literature from Brigham Young University.

Mary Boyd, ENP, *Vice President, Regulatory Policy, Government Affairs, Intrado Life & Safety*

In addition to her role as VP at Intrado, Mary Boyd is involved in many 911 related associations and standards organizations. She has also served as one of the earliest presidents of the

National Emergency Number Association and has over 30 years of Public Safety experience. Her career has ranged from PSAP Operations to Statewide 911 Authority, and in the late 90's she moved into the Private Sector. While serving in a state leadership role she was involved with 9-1-1 system design, implementation, funding, and regulatory issues associated with deployment of the service at both the State and Federal Government levels.

Jeremy Hill, *911 Center Co-Manager, Amarillo, TX*

Captain Jeremy Hill currently serves as Co-Manager of the consolidated 911 center in Amarillo, TX. He has served in a First Responder capacity since 1999, where he performed duties in the communications center as a Dispatcher and Call Taker. Captain Hill also leads the Critical Incident Stress Management team at his 911 center and at the regional level. He cites employee health and wellness as core values to be championed.

Yolanda L. Lewis, *Executive Vice President, Justice and Health, Meadows Mental Health Policy Institute*

Yolanda Lewis is the Executive Vice President of Justice and Health for the Meadows Institute, focused on improving outcomes for individuals with behavioral health conditions in the criminal justice system. Before joining Meadows, she served as the Senior Director for Safety and Justice at The Pew Charitable Trusts, overseeing work to improve justice-related efficiencies at the state and local levels of government. Formerly the District Court Administrator for the Atlanta Judicial Circuit, Lewis designed initiatives in judicial administration, court and jail management, mental health, and justice reinvestment. A certified court manager, Lewis is an appointee to the Racial Equity Advisory Board for the District Court of Columbia, and a board member of the Institute for the Advancement of the American Legal System. She has served as faculty for Michigan State University's Judicial Administration program, vice president of the National Association for Court Management, a founding member of the Fulton County Smart Justice Advisory Council, and president of the Georgia Council of Court Administrators. Lewis holds a bachelor's degree in criminal justice, and a master's in public administration from the University of South Alabama and is a graduate of the executive leadership program at Yale University.

Monica Million, *9-1-1 Business Development Manager, Amazon Web Services*

Monica Million began working in 2001 as a telecommunicator at the Grand Junction Regional Communication Center in Colorado. Well respected within the industry, she advanced to serve as the president of NENA, the National Emergency Number Association. With 20 years of service, Monica currently works in the role of 9-1-1 Business Development Manager for Amazon Web Services.

Keris Myrick, *Director at JED Foundation/Co-Director S2i (The Mental Health Strategic Impact Initiative)*

Keris Jän Myrick is a Co-Director of The Mental Health Strategic Impact Initiative (S2i) which aims to advance the transformation of mental health by catalyzing cross-sectional reforms, strengthening collaborations, and bridging gaps, she serves on the Board of the National Association of Peer Specialists (N.A.P.S.) is a Certified Personal Medicine Coach and Therapeutic Game Master. Keris previously held positions as the Chief, Peer and Allied Health

Professions for the Los Angeles County Department of Mental Health, the Director of the Office of Consumer Affairs for the Center for Mental Health Services (CMHS) of the United States Health and Human Services' Substance Abuse and Mental Health Services Administration (SAMHSA), President and CEO of Project Return Peer Support Network, a Los Angeles-based, peer-run nonprofit and the Board President of the National Alliance on Mental Illness (NAMI). Keris is a leading mental health advocate and executive, known for her innovative and inclusive approach to mental health reform and the public disclosure of her personal story. Ms. Myrick has over 15 years of experience in mental health services innovations, transformation, and peer workforce development. In June 2021, Keris was the recipient of Mental Health America's highest honor the Clifford W. Beers Award. Ms. Myrick has a Master of Science degree in organizational psychology from the California School of Professional Psychology of Alliant International University. Her Master of Business Administration degree is from Case Western University's Weatherhead School of Management.

Bob Patterson, *Executive Director, Mercy EMS Springfield Communities*

Tiffany Russell, *Project Director, Mental Health and Justice Partnerships, The Pew Charitable Trusts*

Tiffany Russell directs Pew's mental health and justice work with a focus on improving justice-related efficiencies in state and local governments. This includes developing national standards for reforms that reduce the use of law enforcement and jails when responding to individuals with a mental health issue. Before joining Pew, Russell served as the director of planning and development for the Superior Court of Fulton County, Georgia, where she was responsible for building the court's capacity by developing policies, programs, and processes to enhance the administration of justice and increase access to justice for all. Russell also held several positions in grant management, research, strategic planning, public relations, and communications in nonprofit, government, and education organizations. Russell holds a bachelor's degree in organizational leadership and a Master of Business Administration in innovation from Mercer University.

Brian Scott, *Principal, BDS Planning & Urban Design*

Brian Scott and has more than 40 years of professional experience and founded BDS Planning in 2009 to solve strategic puzzles toward more vibrant, just, and sustainable communities. His professional practice focuses on inclusive processes, consensus facilitation, organizational development, and place management. Strategic planning and racial equity in 9-1-1 communications are particularly relevant specialties. Brian a Ph.D. in Urban Studies from Portland State University.

Jeff Streeter, *Executive Director, Jefferson County Communications Center Authority*

Jeff Streeter currently serves as the Executive Director of the Jefferson County Communications Center Authority. He is a retired Chief of Police for the Lone Tree Police Department in Colorado, with more than 30 years of experience in the field. Streeter holds a bachelor's degree in Criminal Justice/Police Science and Sociology from the Metropolitan State College in Denver, Colorado. He also completed the Senior Management, Leadership at the FBI National Class #241.

Adam Timm, *Consultant and Founder, The Healthy Dispatcher*

Adam Timm began his 17-year career in public safety as a 9-1-1 dispatcher for the Los Angeles Police Department, where he spent over a decade under the headset. He left the LAPD after founding his training and consulting company to provide classes, conference sessions and culture change consulting services to dispatchers across the country. Adam's energetic presentations and uplifting message have made him one of the most highly regarded speakers in the 9-1-1 industry.

Ashley Tjaden, *Business Services/Equity & Diversity Coordinator, Bureau of Emergency Communications (9-1-1)*

Ashley Tjaden currently serves as the Equity Coordinator at the Portland (OR) Bureau of Emergency Communications (9-1-1). She has a background in Code Enforcement and has worked in several public utilities departments including Water, Sewer & Stormwater, and Garbage. She specializes in community engagement with diverse communities. Tjaden holds a bachelor's degree in Community Development with an emphasis on Community Organization and Change from Portland State University.

Vikki Wachino, *Principal, Viaduct Consulting*

Vikki Wachino has worked for more than 25 years to advance stronger health care systems for low-income people in the U.S. She is the former deputy administrator of the Centers for Medicare and Medicaid Services, for which she oversaw all policy and operations for Medicaid and the Children's Health Insurance Program and led historic efforts to expand Medicaid coverage, reduce the nation's uninsured rate, and strengthen state health care delivery systems. Ms. Wachino is the author of many publications on Medicaid coverage and financing and speaks frequently on these topics, including in testimony before Congress. She is a graduate of Harvard's Kennedy School of Government and Mount Holyoke College.

Kim Westcott, *Senior Program Officer, Criminal Justice Grantmaking, Charles and Lynn Schusterman Family Philanthropies*

Kim Westcott is a Senior Program Officer in Criminal Justice Grantmaking with Charles and Lynn Schusterman Family Philanthropies, supporting the new portfolio focusing on ending mass incarceration, increasing opportunities for those impacted by the criminal legal system and promoting the health and safety of all communities. Throughout her career, Kim has been committed to addressing root problems and promoting systemic change that builds the power of communities of color. Before joining Schusterman Family Philanthropies, Kim served as Associate Counsel in the Community Service Society of New York's Legal Department, where she developed human rights centered strategies and programming to remove barriers to employment for the formerly incarcerated and expand opportunities to fully participate in the life of the community.

Wes Wright, *Executive Director, Next Generation 911 Institute*

Wesley (Wes) Wright serves as the Executive Director of the Next Generation 911 Institute and is a recognized expert on federal and state rules relating to 911 services, including 911 reliability, interconnection, and outage reporting requirements. Wright holds a bachelor's degree from the College of Wooster and a J.D. from the University of Akron, School of Law. As a Partner at Keller and Heckman, he also represents trade associations and corporate clients on policy matters

before the FCC and assists clients with all aspects of FCC enforcement investigations. Prior to rejoining Keller and Heckman, Wes worked as an in-house attorney for a telecommunications company where he advised the company's subsidiaries on federal and state regulations governing the 911 industry, VoIP requirements, and other telecommunications compliance matters of interest.

Research Delegates

April Feng, *Senior Analyst, Center for Radical Innovation for Social Change at the University of Chicago*

April Feng is a Senior Analyst at the Center for Radical Innovation for Social Change (RISC) at the University of Chicago. Feng worked previously as the Deputy Director of Economic Empowerment for the City of South Bend under Mayor Pete Buttigieg, and as a Legislative Aide in the UK House of Commons. Feng received a bachelor's degree in Economics and Political Science from the University of Notre Dame, as well as a master's in philosophy and Public Policy with Distinction from the London School of Economics and Political Science.

Lois James, *Assistant Dean of Research, Washington State University College of Nursing*

Lois James is an associate professor in the Washington State University (WSU) College of Nursing, where she focuses on bias, stress, sleep, and performance in "high stress" populations such as police officers, military personnel, nurses, and top tier athletes. She is one of a handful of research advisors for the International Association of Chiefs of Police, has received multiple honors and awards for her work, and is internationally recognized as a leading expert in her field. Dr. James's simulation-based research on the impact of bias on police decision making has significantly advanced what is known about how suspect race and ethnicity (as well as other factors) influences police officers during critical encounters with the public. She is the founding director of Counter Bias Training Simulation (CBTsim), a novel and innovative simulation-based implicit bias training program that has been featured in National Geographic and the recent feature-length documentary "bias." Dr. James's work has been published extensively in academic journals, practitioner magazines, and mainstream media such as the New York Times and the Washington Post. During her time at WSU, James has brought in approximately \$6,000,000 of extramural funding, making her an important contributor to WSU's "Drive to 25" goal of being recognized as one of the nation's top 25 public research universities, preeminent in research and discovery, teaching, and engagement by 2030.

Michelle Lilly, *Professor of Clinical Psychology, Northern Illinois University*

Dr. Michelle Lilly is a licensed clinical psychologist, who received her doctorate in clinical psychology from the University of Michigan where she completed a post-doctoral fellowship before becoming a faculty member at Northern Illinois University. She has previously worked as a Co-Investigator on a federally funded grant examining the impact of NG9-1-1 on telecommunicators. In 2019, Dr. Lilly developed Illinois funded "Saving Blue Lives," a two-day training for law enforcement on PTSD, suicide, peer support, and resilience.

Jim Marshall, Co-Founder, 911 Training Institute

Jim Marshall is a Co-Founder of the 911 Training Institute with his sister, Deborah Achtenberg, and his wife, Linda Marshall. He currently serves as the CEO and Lead Instructor for 911TI, strategically leading the organization in development of curriculum and resources to benefit the 9-1-1 industry. Jim is a leading voice in the 9-1-1 industry for mental health and dispatcher wellness. He is a mental health professional and educates telecommunicators in personal stress resilience and mastery of calls involving suicide and mental illness. Jim is co-editor of *The Resilient 9-1-1 Professional: A Comprehensive Guide to Surviving & Thriving Together in the 9-1-1 Center*. Jim has served on the Editorial Board of the *Journal of Emergency Dispatch* and as Co-chair of the NENA Working Group that produced the NENA Standard on Acute/Traumatic and Chronic Stress. He also served as the Chair/CEO of the 911 Wellness Foundation, a former non-profit organization that was devoted to fostering the well-being of 9-1-1 professionals through research, education, policy, and intervention.

Alternative First Responders

Co-Chairs

Sean Goode, *Executive Director, Choose 180*

Sean Goode is a speaker, facilitator, writer, podcast host, executive coach, and nonprofit leader who is driven by his mantra, “possibilities over problems,” which was born out of his lived experience growing up in what was overwhelmingly challenging circumstances. Through his stewardship of the now nationally recognized nonprofit, CHOOSE 180, he has worked to decriminalize youthful behavior and transform the very systems that have historically caused harmed to marginalized communities. Prior to leading this 2021 City of Seattle Human Rights award-winning organization he served as a chaplain in juvenile detention, championed gang and group intervention efforts, and worked to provide education and employment opportunities for youth in at-risk communities.

Sean Goode is considered a national expert on justice reform and has been appointed by the Washington State Governor to the Partnership Council on Juvenile Justice where he serves as the vice chair working to address statewide issues surrounding the criminalization of adolescent behavior. As a thought leader, Sean is regularly sharing his own personal journey, the transformative power of grace and the impact of elevating possibilities over problems with a diversity of audiences in both the private and public sector.

Gabriel Rodriguez, *Chief of Police, Camden, New Jersey*

Chief Gabriel Rodriguez assumed command of the Camden County Police Department on December 31, 2020. An East Camden native Chief Rodriguez has served the City of Camden as a police officer for more than seventeen years. Chief Rodriguez graduated from the prestigious Senior Management Institute for Policing in 2019, earned his bachelor’s degree from Fairleigh Dickinson University, and is currently completing a master’s degree in public administration. Chief Rodriguez is recognized as a plank-holding member of the department, playing a key role in the creation and successful stand-up of the department in 2013. Throughout his career Chief Rodriguez has served in many capacities including uniformed operations, investigations, community leadership, and executive commands.

Members

Rebecca Brown, *Owner and President, Further The Work*

As founder and President of Further The Work, Rebecca seizes opportunities to build better justice wherever she can. Fiercely committed to both equity and excellence and noted for her uncommon ability to forge effective partnerships among highly diverse stakeholders, Rebecca has proven capacity to design progressive, effective, transformative, and fundable initiatives that significantly shift collective premises, policies, and practices. Among her other work, Rebecca has designed a nationally recognized Misdemeanor Early Representation program to advance procedural justice and reduce failures to appear and related warrants; designed a public/private collective impact reentry center that has served as a replicable model for other jurisdictions; and designed and is managing a national project to advance effective implementation of LEAD

initiatives across the country. Rebecca holds a bachelor's degree from the University of California at Berkeley and a master's degree from Stanford University, where she is also completing her PhD.

Joseph Cortez, *Associate Professor, University of Southern California*

Joseph retired as the Executive Officer in the Office of the Chief of Police at the Santa Monica Police Department and currently employed as a faculty member at the University of Southern California, where he teaches undergraduate and graduate level courses in public policy and organizational leadership. Joseph is also a decorated NSW combat veteran and member of several veteran associations. Joseph represents the Los Angeles County Police Chiefs for the Los Angeles Urban Areas Security Initiative (UASI) program for Unmanned Aviation related matters, Chairs the Unmanned Aviation Working Group for the LA/LB UASI program, and is the Co-Chair for the Research and Policy Committee for the International Association of Chiefs of Police.

Katie Camp, *Senior Program Manager at The Policing Project, New York University School of Law*

Brendan Cox, *Director of Policing Strategies, LEAD Support Bureau*

Brendan Cox is the Director of Policing Strategies for the LEAD Support Bureau. He was born and raised in Albany, NY and maintains his Bureau office there. Prior to coming to the Bureau, Brendan worked for the Albany Police department for 23 years and retired as the Chief. Albany was the third City to adopt and implement LEAD. Brendan enjoys the hands-on work at the Bureau and helping communities across the country work to reform how systems look at problematic substance use, mental health, and poverty.

Dolores (D.C.) Ernst, *Program Administrator for Community Assistance Program, City of Phoenix*

Dolores Ernst is the Program Administrator for the City of Phoenix Community Assistance Program. Ms. Ernst has been the Administrator since June 2021. She has been an employee with Community Assistance Program since 2006. For 3 years, Dolores served as Adjunct Faculty with Maricopa Community Colleges and taught a variety of social work courses. Dolores received a Master of Social Work from Arizona State University.

Naji Fenwick, *Program Manager, Vital Strategies*

Naji Mujahid Fenwick, Esq. is the Program Manager of Police Assisted Diversion (PAD) at Vital Strategies' Overdose Prevention Program, a seconded position to the City of Philadelphia Managing Director's Office of Criminal Justice. Among other duties, he supports the Assistant Director of Diversion and Deflection in their efforts to develop and implement improvements to the PAD program model and advance harm reduction approaches in law enforcement, including strategies to reduce overdose by diverting people away from arrest to supports and services.

David Heppard, *Executive Director, Freedom Project Seattle*

David knows first-hand the impacts of mass incarceration after being incarcerated at 16 years old with a de facto life sentence. Due to his juvenile status when he was convicted, and the passage

of the 5064 bill, he was released after 24 years of confinement. He now works toward developing partnerships with other community providers whose mission is in alignment with making advancements in criminal justice and prison reform. He is also a Credible Messenger, which is a national initiative of adult men and women from similar backgrounds who equip young people with the tools to heal their lives and provide them with a living example of hope and transformation.

Daniel Kornfield, *Executive Director, Dignity Best Practices*

Dan Kornfield has led best-practices research, benchmarking, and consulting teams at Corporate Executive Board and Frontier Strategy Group, serving executives within large enterprises. In 2016 he pivoted to work with city governments, to help them pioneer their practices in public safety. He has served in Washington DC as a Senior Budget Analyst in the Office of the City Administrator, as a sworn reserve Police Officer and as Supervisor of the Research and Analytical Services Branch within the Metropolitan Police Department.

Lionel King, *Program Specialist, Law Enforcement Action Partnership*

Lionel King is a Program Specialist for Law Enforcement Action Partnership in addition to a ethnographer, author, and researcher. He holds a PhD in Intercultural Relations. His research centers on the use of religious/cultural practices in mental health treatment. Lionel is a New Orleans native and a proud husband and father.

India Hayes Larrier, *State Advocacy Manager, Community Catalyst*

India Hayes Larrier, MPH, is a state advocacy manager for Community Catalyst, a leading non-profit national health advocacy organization dedicated to advancing a movement for health equity and justice. Through technical assistance, coaching, and coalition building, Mrs. Larrier builds and maintains relationships with national, state, and local partners. She especially works with those organizations seeking transformative approaches to addiction.

Before joining Community Catalyst, India worked as associate state director for advocacy at AARP NJ, where she organized community partnerships and coalitions. She also coached volunteer advocates and members of the 50+ community to inform peers and state and federal legislators on issues of concern and advocate for amendments and passage of legislation beneficial to New Jersey. Before AARP, as a health care organizer for the state-wide advocacy and social justice organization, New Jersey Citizen Action, she organized and spoke out at events in defense of the Affordable Care Act, expansion of substance use disorder treatment, and prevention services for youth and young adults. She served two terms in elected office as Township Committeewoman in Maplewood, NJ.

Janelle Marcellis, *Police Commander, University of Chicago*

Janelle is an experienced Police Commander at the University of Chicago who has demonstrated history of working in all levels of law enforcement including public, private, state, federal and the higher education industry. Janelle has served in law enforcement for more than twenty years and is skilled in Patrol Operations, Investigations, Community Relations, Emergency Management, and Crisis Intervention. Janelle graduated from Northwestern University School of Police Staff and Command and earned two bachelor's degree in law enforcement justice

administration and psychology from Western Illinois University and a master's degree in public safety administration from Lewis University.

Matthew Moody, *Director, Contact Center Operations at Crisis Response Network*

Matthew Moody serves as the Director of Contact Center Operations at Solari Crisis Response Network. In this role, he oversees 100 employees in a crisis contact center that fields over 25,000 calls per month. He also provides oversight to 2-1-1 Arizona, which offers information and referral services to the state of Arizona. He has over ten years of experience in the behavioral health field, specializing in case management, crisis, and counseling services. Matthew is passionate about veteran support, increasing public knowledge of mental health issues, and reducing mental health stigma. With a strong desire to prevent suicide, Matthew leads innovative change to improve the lives of those with mental illness. Matthew earned a Bachelor of Psychology degree and a Master of Science degree in Counseling from Arizona State University. Matthew also serves on the Board of Directors for Mental Health America of Arizona.

Brianna O'Steen, PhD, *Senior Public Policy Associate, Mark43*

Brianna O'Steen is an interdisciplinary researcher whose expertise sits at the intersections of public policy, health, and safety. Brianna is particularly passionate about human-centered policy design and evaluation to promote equitable public policy and social programs. She is a mixed methods practitioner employing econometric, traditional qualitative, and content analysis aided by machine learning and natural language processing methodologies in her work. Currently, Brianna holds the position of Senior Public Policy Associate at Mark43 where she and colleagues leverage public policy and cloud-native software to connect communities and increase public safety. Prior to this position, Brianna O'Steen was a Doctoral Candidate at Oregon State University studying the social and economic costs and benefits of labor migration policies in the Philippines. Brianna also holds advanced degrees in Public Health and Applied Anthropology from the University of South Florida.

Emily Perish, *Co-Founder, Comprehensive Care Institute*

Emily joined the CCP team while pursuing her Master of Public Policy at the University of Chicago where she focused on health policy, inequities, and economics. After graduating, she was selected to participate in the Administrative Fellowship at University of Chicago Medicine, continuing to work with the CCP program around development and expansion. Before graduate school, Emily managed district operations and strategic development within the Illinois House of Representatives and performed independent research about the use of mobile health interventions to improve maternal health outcomes. Emily is passionate about increasing access to high quality, holistic health care for all people.

Matt Perkins, *Program Director, Local Initiatives Support Corporation*

Matt Perkins is an expert in community-based crime reductions efforts and advocate for resident-based crime prevention efforts. Matt joined LISC in 2013, his work has included supporting community-based approaches to reducing crime and increasing safety. The goals of this work are to help residents improve their neighborhoods' safety and health through community action and capacity building in equal partnership with local law enforcement agencies. He has been a lead technical assistance provider on multiple U.S. Department of Justice (DOJ) programs,

trainer for local LISC partners and collaborator with criminal justice policy and research organizations. Prior to working with LISC, Matt was a technical assistance provider for the federal Weed and Seed crime prevention program, provided crime reduction support to HUD and public housing agencies nationwide, and worked at DOJ's Office of Community Oriented Policing Services.

Research Delegates

Amir Chapel, *Policy Analyst, National Institute for Criminal Justice Reform*

Amir Chapel is a Policy Analyst at NICJR. Amir coordinates projects and initiatives, often with local government agencies or other stakeholders. Amir conducts research on policies, programs, strategies, and organizations in the fields of criminal and juvenile justice, youth development, violence reduction, organizational development, and other relevant areas through the collection and analysis of data. Amir also coordinates legislative and policy advocacy initiatives. Amir has been directly impacted by the criminal justice system as a formerly incarcerated person who is dedicated to improving the outcomes of those that cannot advocate for themselves.

Aili Malm, *Professor of Criminology and Criminal Justice, California State University, Long Beach*

Dr. Aili Malm is a Professor in the School of Criminology, Criminal Justice and Emergency Management at California State University, Long Beach. She is interested in the assessment and evaluation of policing strategies and intelligence. She has worked as a PI or Co-PI for over \$6 million in grants. She has published over 40 research articles and two books including *Disrupting Criminal Networks* with Gisela Bichler, and *Cops, Cameras and Crisis* with Mike White. She has also worked with several police departments across the globe, including the Royal Canadian Mounted Police, British Home Office, Danish National Police, and numerous local departments across the United States.

Amy Watson, *Professor, Helen Bader School of Social Welfare, University of Wisconsin-Milwaukee*

Dr. Watson is a professor at Helen Bader School of Social Welfare at University of Wisconsin-Milwaukee. Professor Watson has worked extensively on issues involving the relationship between the criminal justice system and mental health systems in Chicago and around the country. Her research has focused on police encounters with persons with mental illnesses, the Crisis Intervention Team (CIT) model, and opportunities to reduce police involvement. Dr. Watson has published extensively on this work and presented findings to local, national, and international audiences.

911 Hotline Alternatives

Co-Chairs

Jasmine Desiderio, *Deputy Director of Albuquerque Community Safety Department, City of Albuquerque, New Mexico*

Jasmine Desiderio previously served as the Project Director of a Native American Youth Suicide Prevention program, where her roles included strategic action planning, policymaking, program development and evaluation, community outreach and engagement, data surveillance, grant administration and training facilitation. Desiderio brings eight years of experience in coordinating multidisciplinary, interservice and interagency teams to strategically design and implement injury prevention services ranging from crisis intervention, suicide prevention and postvention programs in northwestern New Mexico. She is currently in the Organization, Information and Learning Sciences Ph.D. program at the University of New Mexico. Her research interest focuses on applying innovative methods of human performance technology, organizational development, and evaluation research to address adversities amongst marginalized populations. Desiderio holds a Master of Arts in Professional Counseling and Guidance from New Mexico Highlands University, and a Bachelor of Arts in both Psychology and Criminology from the University of New Mexico.

Moki Macias, *Executive Director, Policing Alternatives & Diversion*

Moki Macias is the executive director at the Policing Alternatives and Diversion Initiative (PAD), which started as a pre-arrest diversion program in Atlanta for people detained for violations related to substance use, mental health, or extreme poverty. She says developing a non-police public safety response requires determining what drives police involvement in the first place. Prior to this position, Moki served as an Instructor for the Region IV Public Health Training Center. Moki Macias earned a bachelor's degree in International Relations from Mt. Holyoke College and a Master of City Planning in Land & Community Development from Georgia Institute of Technology.

Mary Naoum, *Crisis Response Design Consultant, Policing Alternatives & Diversion Initiative*

Mary Naoum serves Policing Alternatives & Diversion Initiative (PAD) through her role as Crisis Response Design Consultant. Mary has spent many years in relationship with communities directly impacted by over-policing and incarceration, particularly towards efforts to reimagine community safety and wellness using artistic expression and grassroots advocacy. Most recently, she supported the development of a Detroit-based social justice fund, helping steward a community-defined grantmaking strategy focused on moving significant resources to community organizing led by Black, Indigenous and people of color. Mary received her master's degrees in Public Policy and Social Work from the University of Michigan, and is most passionate about moving forward tangible, community-driven solutions that are boldly designed to transform local systems.

Mariela Ruiz-Angel, *Director of Albuquerque Community Safety Department, City of Albuquerque, New Mexico*

Mariela Ruiz-Angel is a proud Chicana, born and raised in the border city of El Paso, Texas. She understands the needs of diverse communities and works to empower, educate, and advocate for all Burqueños. Prior to her appointment as Director of ACS, Ruiz-Angel was the City Coordinator for the Office of Immigrant and Refugee Affairs (OIRA). In her new role leading the third branch of public safety, Ruiz-Angel is working to ensure that the department follows through with its mission of advocating and promoting a citywide culture that values the voices of all residents. She brings to the City of Albuquerque an extensive background in education, business development, and corporate customer relations. Ruiz-Angel holds a Master of Business Administration in Human Resources and a Master of Social Work in Leadership and Administration.

Members

Victor Armstrong, *Chief Health Equity Officer, North Carolina DHHS*

Victor Armstrong serves as North Carolina DHHS Chief Health Equity Officer, with responsibility for leading the overarching strategy and operational goals to promote health equity, diversity, and inclusion across all the agency's health and human services. Victor joined NC DHHS as Director of the NC Division of Mental Health, Developmental Disabilities, Substance Abuse Services in March of 2020. Prior to accepting this role, Victor spent six years as Vice President of Behavioral Health with Atrium Health. Based in Charlotte, NC Victor had responsibility for operations of Atrium's largest behavioral health hospital, Behavioral Health Charlotte. Victor currently serves on the board of directors for the American Foundation for Suicide Prevention (AFSP) of NC. He is also former board chair of NAMI NC, and a member of National Association of Social Workers (NASW). Victor is a former member of the board of directors of National Council for Behavioral Health, i2i Center for Integrative Health, and RI International.

Phil Ashlock, *Director of Data & Analytics, GSA Technology Transformation Services*

Phil Ashlock creates digital civic infrastructure to support open government and civic engagement. He's spearheaded community-driven civic technology initiatives with global reach like the Open311 standard for interacting with government through an open feedback channel. Currently he leads the Data & Analytics portfolio in the GSA Technology Transformation Services Division and serves as the Chief Architect for Data.gov where he oversees an open development process and a federated architecture supporting open data and APIs across government. Previously, he served as a Presidential Innovation Fellow working with the GSA and the White House Office of Digital Strategy. Before joining government, Phil was at OpenPlans, a civic tech non-profit where he served as the Open Government Program Manager and established the Open311 initiative. Open311 is a standard for publicly reporting and tracking civic issues and is now implemented by dozens of cities around the world. Through a partnership between OpenPlans and Code for America he then co-founded Civic Commons, a pilot initiative to help governments share technology and their experience using it.

Martin Bennett, *Executive Director, Cook County Sheriff's Police 911 Center*

Martin Bennett is Executive Director of Emergency Communications/911 Center at the Cook County's Sheriff's Department. Martin's experience includes redesign of two PSAPs, upgrade of

Computer Aided Dispatch (CAD), cybersecurity, procurement, and implementation of NG911 services, hiring/recruitment, network infrastructure and Standard Operating Procedures (SOP) development. Martin earned a Bachelor of Science in Criminal Justice and Political Science from MacMurray College and master's degree in Emergency Management from Jacksonville State University.

Tim Black, *Director of Consulting, White Bird Clinic*

Tim Black is director of consulting for White Bird Clinic in Eugene, Oregon. His primary focus is on development and support of behavioral health first-response programming in North America, based on the CAHOOTS (Crisis Assistance Helping Out On the Streets) model run by the clinic. He is an experienced professional with extensive background in direct service, harm reduction and mobile crisis intervention. Black began working with White Bird Clinic in 2010 as a crisis intervention worker. He served as CAHOOTS operations coordinator from 2014 to 2020, overseeing the day-to-day operations of CAHOOTS, as well as relationships with local and national media, consultation, program development and expansion, fundraising, and communication and coordination with local and state government agencies. Prior to his work with CAHOOTS, Black worked with Looking Glass Community Services; with SageWalk, The Wilderness School; with the Northwest Youth Corps; as an Americorps volunteer; and with a youth environmental conservation program.

Greg Bloom, *Founder, Open Referral Initiative*

Greg Bloom is the founder of Open Referral, which is promoting open access to information about the health, human, and social services available to people in need. He is a strategic advisor on community resources and engagement for the Gravity Project. He is also a visiting scholar at Indiana University's Ostrom Workshop on the Commons. Previously, Greg managed communications for Bread for the City in DC. He has been a fellow with Provisions Library and Civic Hall Labs, and has published writing in In These Times, Civic Quarterly, Personal Democracy Forum, and Code for America's Beyond Transparency.

David Covington, *CEO & President, RI International*

David Covington serves as CEO and president of RI International, is an owner of Behavioral Health Link, and leads the international initiatives Crisis Now and Zero Suicide. He is a two-time national winner of the Council of State Governments Innovations Award, in 2008 with the Georgia Crisis & Access Line and again in 2012 with Magellan Health. For five consecutive years, he competed as a national finalist in innovations award competitions, including Harvard University's Innovations in American Government in 2009. Mr. Covington has served as a member of the National Action Alliance for Suicide Prevention since it was created in 2010, co-chairing task forces on clinical care and crisis services. He has served as vice chair of the National Suicide Prevention Lifeline SAMHSA steering committee since it was created in 2005 and as the clinical division chair of the American Association of Suicidology since 2014. He served on the National Council for Behavioral Health board of directors from 2011 to 2014 and the Relias Learning Behavioral Health Advisory Board from 2014 to 2016.

Vinny Eng, *Director of Policy and Advocacy, Safer Together SF Bay Area*

Susan Frankel, *Chief Executive Officer, National Runaway Safeline*

Susan Frankel is an experienced Chief Executive Officer with a demonstrated history of working in the non-profit organization management industry. Susan is skilled in Nonprofit Organizations, Customer Insight, Business Planning, Event Planning, and Sales, and withholds strong business development professional with a Master of Social Services Administration focused on Social Services & Public Policy from University of Chicago. Prior to their Chief Executive Officer position, Susan served as President & CEO of a nonprofit named Crayons to Computers.

Kevin Hall, *Assistant Chief, Tucson Police Department, Arizona*

Assistant Chief Kevin Hall is a thirty-year member of the Tucson Police Department, joining the department in 1992. He has held the position of patrol officer, detective, patrol sergeant, SWAT sergeant, investigative sergeant, patrol lieutenant, Field Services Bureau Executive Officer, patrol captain, and now assistant chief. He has worked in various assignments within the department to include Operations Divisions South, Midtown, East, the Gang Unit, Physical Child Abuse Unit, Internal Affairs, Homicide, and the Home Invasion/Kidnapping Unit. Assistant Chief Hall developed and implemented a comprehensive pre-arrest deflection program in 2018 in Tucson for both misdemeanor and felony non-violent charges associated with substance misuse.

Richard LaPratt, *Member, 211 Database and Technology Director, United Way of Southwestern Pennsylvania*

Jason Renaud, *Program Coordinator, Law & Mental Health Conference*

Jason Renaud is a Program Coordinator for the Law & Mental Health Conference and Board Officer for the Mental Health Association of Portland. Prior to this position, Jason devoted their efforts in research and development for an organization named Compassion & Choices. Jason Renaud earned a Bachelor of Arts in Philosophy from The Evergreen State College, and a master's degree in Public Administration from Portland State University.

Raymond Schwartz, *Co-President, NAMI New York City Metro*

Raymond Schwartz is a highly skilled nonprofit executive and manager with a deep knowledge of health care policy and over 35 years of experience in the mental health field. For over 20 years, first as associate executive director and then as executive director, Raymond guided Venture House, an accredited and respected New York City Clubhouse, to successfully support people with a serious mental illness to live in their community at the same time meeting the challenges of a changing health care financing environment. He has served on the Board of Directors of the Coalition of Behavioral Health Care Agencies and the NY State Association of Psychiatric Rehabilitation Services (NYAPRS). Raymond is a member of the faculty for Clubhouse International. He holds a certificate in Non-Profit Management from Columbia University School of Business and a master's degree in Cultural Anthropology from New York University.

Jaime D. Young, *Consultant, Mission Critical Partners, LLC*

Jaime's career has spanned 40 years in the San Francisco Bay Area, where she gained expertise in public safety communications management, including, administration, operations, technical systems, and personnel management in municipal and county government. She served on the

California State 911 Advisory Board, the Executive Board of the California Chapter of NENA and is the current representative from the Public Safety Dispatch Advisory Council to the California Commission on Peace Officer's Standards and Training. She is currently a consultant with Mission Critical Partners LLC, working with 911 and public safety clients to address a variety of challenges that impact their ability to optimize desired performance and outcomes.

Research Delegates

Amir Chapel, *Policy Analyst, National Institute for Criminal Justice Reform*

Amir Chapel is a Policy Analyst at NICJR. Amir coordinates projects and initiatives, often with local government agencies or other stakeholders. Amir conducts research on policies, programs, strategies, and organizations in the fields of criminal and juvenile justice, youth development, violence reduction, organizational development, and other relevant areas through the collection and analysis of data. Amir also coordinates legislative and policy advocacy initiatives. Amir has been directly impacted by the criminal justice system as a formerly incarcerated person who is dedicated to improving the outcomes of those that cannot advocate for themselves.

Soledad McGrath, *Executive Director, Northwestern Neighborhood & Network Initiative (N3)*

Soledad A. McGrath is a Research Professor at Northwestern University's Institute for Policy Research and the Executive Director of the Northwestern Neighborhood & Network Initiative (N3). Prior to joining Northwestern, she was a Senior Program Officer in the Gun Violence Prevention & Justice Reform Program at the Joyce Foundation where she developed and led the foundation's justice reform strategy, which included a focus on policing, criminal justice reform, and violence prevention. Prior to joining the Joyce Foundation, McGrath was a Program Officer with the John D. and Catherine T. MacArthur Foundation's Justice Reform program and was a member of a multidisciplinary team that designed and implemented its criminal justice reform strategy – a more than \$200 million initiative focusing on a network of jurisdictions throughout the country targeting excessive and unjust incarceration at the local level. She led the foundation's efforts to reduce racial and ethnic disparities in the justice system.

Amy Watson, *Professor, Helen Bader School of Social Welfare, University of Wisconsin-Milwaukee*

Dr. Watson is a professor at Helen Bader School of Social Welfare at University of Wisconsin-Milwaukee. Professor Watson has worked extensively on issues involving the relationship between the criminal justice system and mental health systems in Chicago and around the country. Her research has focused on police encounters with persons with mental illnesses, the Crisis Intervention Team (CIT) model, and opportunities to reduce police involvement. Dr. Watson has published extensively on this work and presented findings to local, national, and international audiences.

Emergency Communications Center Operations

Co-Chairs

Edwin F. Huellstrouk, RN, BSN, NREMT-Paramedic, ECRN, TNCC, CEN, *Emergency Room Nurse for Edward-Elmhurst Hospital in Naperville, IL*

Edwin F. Huellstrouk is currently an Emergency Room Nurse for Edward-Elmhurst Hospital in Naperville, IL. Edwin started his career in 1994 as a volunteer on the Montgomery Countryside Fire Protection District in Montgomery, IL. He became a paramedic and later achieved the rank of Captain. While on the department, he was a key part in advancing effective communications between the 911 dispatch center and the department. Edwin went on to become the EMS System Coordinator for the Southern Fox Valley EMS System of Northwestern Medicine – Delnor Hospital, Geneva, IL., as well as being firefighter and paramedic. As coordinator, Edwin was in charge of the five 911 dispatch centers and twenty Fire/EMS Departments. As coordinator he was responsible for the education and EMS regulations of both departments.

Chad Kasmar, *Chief of Police, Tucson, Arizona, Education*

Chief Kasmar oversees the Department's four bureaus: Patrol Services, Investigative Services, Administrative Services, and Special Services and Innovation. Prior to being appointed Chief in 2021, he served as Interim Director of the City's Public Safety Communications Department, where he led efforts to stabilize the department, reducing attrition and increasing staffing while moving from a co-located but separate police and fire 911 call center to a consolidated 911 call center. As a captain in the Tucson Police Department Chief Kasmar served as Deputy Chief, as Chief of Staff, and as the Eastside Patrol Division Commander. As a lieutenant, he served as an Office of Internal Affairs (now Office of Professional Standards) Commander, and as a Westside Patrol Division Commander. As a sergeant and officer, he served in the Street Crime Interdiction Unit, Operations Division South Community Response Team, Operations Division Downtown, Operations Division Midtown, Bicycle Patrol, Operations Division South Solo Motor, and Hostage Crisis Team.

Tyrell Morris, *Executive Director, Orleans Parish Communication District*

Executive Director Morris came to Orleans Parish Communication District (OPCD) with more than 15 years of success leading operations within high profile diverse public, private and non-profit organizations. During that time, he experienced repeated success driving and leading large-scale operations to ensure standards of excellence and business prosperity. Mr. Morris is a consummate communicator with expertise in cross-functional collaboration and the ability to ensure buy-in and engagement from all stakeholders. After becoming Executive Director of OPCD, Mr. Morris recognized an opportunity to challenge his staff to consistently seek ways to be their best selves during each and every shift, and so developed the acronym, SHOWUP (S-Sincere, H-Honest, O-Optimistic, W-Well-informed, U-Upbeat, and P-Procedurally compliant). The development of SHOWUP and the buy-in from OPCD staff has been a key factor in enabling OPCD to provide the citizens of New Orleans with top-notch emergency and non-emergency services when they need them most.

Members

Alicia Atkinson, *Quality Assurance and Training Coordinator, Regional Emergency Dispatch Center, Northbrook, IL*

With over 15 years of experience in the 911 industry in both the public and private sector, Alicia Atkinson is currently the QA/Training Manager for Regional Emergency Dispatch (RED) Center in Northbrook, IL. RED Center serves as the dispatch center for fourteen fire departments in the near Chicago suburbs and Illinois MABAS Statewide and Special Teams responses.

Martin Bennett, *Executive Director, Cook County Sheriff's Police 911 Center*

Martin Bennett is Executive Director of Emergency Communications/911 Center at the Cook County's Sheriff's Department. Martin's experience includes redesign of two PSAPs, upgrade of Computer Aided Dispatch (CAD), cybersecurity, procurement, and implementation of NG911 services, hiring/recruitment, network infrastructure and Standard Operating Procedures (SOP) development. Martin earned a Bachelor of Science in Criminal Justice and Political Science from MacMurray College and master's degree in Emergency Management from Jacksonville State University.

Ron Bruno, *Executive Director, CIT International*

Ron Bruno serves as the Executive Director of CIT International. Ron is a founding board member of the corporation and previously served as the corporation's Second Vice President. Ron has been involved in CIT programming for over twenty years, serving the majority of his twenty-five-year law enforcement career as a CIT Officer, CIT Investigator, CIT Agency Coordinator, CIT Regional Coordinator, and as the State of Utah's CIT Program Director. Ron has spoken nationally and internationally on crisis response system reform. Ron is an appointed member of the Interdepartmental Serious Mental Illness Coordinating Committee (ISMICC). This committee, that was established by the 21st Century Cures Act, reports to the United States Congress to make recommendations for actions that federal departments can take to better coordinate the administration of mental health services for adults with serious mental illnesses and children with serious emotional disturbances.

Bill Duggan, *Director, FreCom Dispatch Center, Florence, Colorado*

Bill Duggan was appointed as director of FreCom dispatch center in Florence, Colorado in early 2020. He has been in public safety for over 30 years. He has been a volunteer firefighter Lieutenant/Safety Officer, an Emergency Medical Technician, and graduated first in his class from the 1991 Kansas Law Enforcement Training Center while being a patrol officer for the City of Andover, Kansas. Duggan became the 911 Director and the first Information technology director, serving with Andover for over 25 years. He then took on a new challenge of a newly consolidated center in Lyon County, Kansas, and again a newly consolidated center in Cochise County, Arizona.

Donna L. Carrell, *Training Manager, Northeast Oklahoma Enhanced 911 Trust Authority*

Donna is the Training Manager for the Northeast Oklahoma Enhanced 911 Trust Authority. She began in Emergency Communications in 2011 as a frontline telecommunicator. She became a training officer and shift supervisor and accepted her current position as training manager in

2018. Donna holds a bachelor's degree in Criminal Justice from Missouri Southern State University and a master's degree in Public Administration from Grand Canyon University. Her passion is leadership, and she is most proud of her APCO certification as a Certified Public-Safety Executive (CPE). Her goal is to use her leadership skills to transform 911 into a partner that is deservedly recognized for the indispensable value it brings to the field of emergency services.

Don Champley, *Deputy Director, Regional Emergency Dispatch (RED) Center*

Don Champley started his career with the Regional Emergency Dispatch (RED) Center in Northbrook, Illinois in 1999. He was promoted to Deputy Director in 2020. He has a total of 35 years of experience in public safety with most of that time spent in the fire service where he has held every rank from Firefighter to Assistant Chief.

Margaret Fine, *Chair, Mental Health Commission for the City of Berkeley, California*

Margaret Fine serves as Chair of the Mental Health Commission and as a Mental Health Commissioner for the City of Berkeley. She is appointed to the Reimagining Public Safety Task Force for the City of Berkeley. Previously she served as a Deputy City Attorney in the Child Welfare Unit for the City of Philadelphia Law Department. Margaret Fine received her JD from the George Washington University Law School, MSc in Human Rights & Criminal Justice from Queen's University Belfast, and PhD in Sociology from the University of Liverpool.

Audace Garnett, *Technology Safety Project Manager, Safety Net at The National Network to End Domestic Violence*

Audace Garnett has over a decade of experience working in New York City with victims of domestic violence. She began her career in 2004 as a disability advocate at a non-profit organization named Barrier Free Living. Audace has also worked at the Brooklyn District Attorney's Office where she served as the Teen Services Coordinator in the Victim Services Unit. She was the liaison between survivors 24 and under the police department, courts, schools, and community organizations. After six years at the district attorney's office, she then went on to prevention and intervention work at a Teen Dating Violence prevention and intervention program named Day One where she trained adult professionals around the intersection of teen dating violence and domestic sex trafficking. She is currently a Technology Safety Specialist with Safety Net at NNEDV, where she focuses specifically on the intersection between domestic violence, sexual assault, stalking, and technology.

Kelle Hall, *Communications Manager for the town of Highland Park, Texas*

Kelle Hall is a Communications Manager for the town of Highland Park, Texas where they manage and direct the Highland park Department of Public Safety's Emergency Communications Center. Prior to this position, Kelle worked as lieutenant for the Randall County Sheriff's Office for 24 years. As lieutenant, Kelle oversaw the emergency communications center, warrants division, and records division and served as a Personnel and Training officer.

Kim Lettrick, *Communications Manager, Southeast Communications Center*

Kim Lettrick is the Communications Manager for Southeast Communications Center providing 911 and emergency dispatch service to Benton and Franklin Counties in Eastern Washington. Kim has 34 years of experience as a 911 professional holding numerous positions within the field Dispatcher, Supervisor, Training Coordinator, Certified Training Officer, Criteria Based Dispatch Instructor, APCO Certified Training Officer instructor.

Erica Olsen, *Safety Net Project Director, National Network to End Domestic Violence*

Since joining NNEDV in 2007, Erica has advocated on behalf of survivors of gender-based violence by educating and advocating victim service providers, policymakers, and technology companies on issues of technology abuse, privacy, and victim safety. She has provided trainings to technologists, attorneys, law enforcement officials, victim advocates, and other practitioners in the United States and internationally. Through the Safety Net Project, Erica works with private industry, state, and federal agencies and international groups to improve safety and privacy for victims in this digital age. She regularly provides consultation to leading technology companies on the potential impact of technology design and reporting procedures on survivors of abuse. She also provides technical assistance on technology safety to professionals working with survivors. Erica's prior work at the New York State Coalition Against Domestic Violence included writing curriculum and training statewide on a project focusing on the intersection of domestic violence and disabilities. Erica has a MSW from SUNY Albany and a Certificate in Non-Profit Management from the Center for Women in Civil Society.

Carlena Orosco, *Research and Planning Supervisor, Tempe Police Department, Arizona*

Carlena Orosco, M.A. is a Doctoral Candidate in the School of Criminology and Criminal Justice at Arizona State University. She is also employed full-time as the Research and Planning Supervisor in the Strategic Planning, Analysis & Research Center (SPARC) at Tempe Police Department. Prior to joining Tempe PD, she worked as a Senior Research Analyst for the Arizona Criminal Justice Commission, Statistical Analysis Center. Carlena has worked on research projects spanning numerous content areas, including de-escalation in policing, police dispatchers, community crime patterns, and law enforcement decision-making. Additionally, she worked for nine years as a dispatcher for the Los Angeles County Sheriff's Department, where she also served as an Acting Supervisor and Systems Monitor. Carlena's subject-matter expertise in policing and crime analysis also led to her selection as a trainer for the UN-led effort to provide crime analysis instruction to new Crime Analysts in the Caribbean. She has also served as an Instructor for the Nature of Crime, Gangs, Crime Control Policies, Police Accountability, and Urban Crime Patterns courses. Currently, she is a research assistant on the ASU/Tempe PD SPI project under the guidance of Dr. Mike White. Carlena holds both a B.A. and M.A. in Criminal Justice from California State University, San Bernardino, and her work can be found in *Policing: An International Journal*, *Policing: A Journal of Policy and Practice*, and the *Journal of Criminal Justice*.

Rick Pegues, *Public Safety Communications Coordinator, Tucson, Arizona*

A native of Peoria, IL, and graduate of Eastern Illinois University, Rick served in the United States Air Force (USAF) as Fire Protection Specialist, before transitioning to being an agent with the Office of Special Investigations. After tours in Saudi Arabia, Afghanistan, and Somalia,

he retired from the USAF in 2013 and moved to Tucson, AZ, beginning a second career with the City of Tucson, Public Safety Communications Department. Initially a Fire Dispatcher, he was promoted to Supervisor in 2017 and subsequently to Coordinator in 2019. In that capacity, he began as training coordinator, and as a Certified Training Officer (CTO) before moving to Operations in 2021. His passion is serving the community at the frontline level by being active with his church, the Urban League, and the E.L.I.T.E youth outreach program.

Richard Ray, *Co-Chair, National Emergency Number Association Accessibility Committee; Member, FCC Disability Committee*

Richard Ray retired from the City of Los Angeles after serving over 35 years as an Americans with Disabilities Act Technology Access Coordinator to continue working in the field of Telecommunication Technologies, Emergency Services and advocating for civil rights of individuals who are deaf, deafblind, and hard of hearing in all levels of government. He is actively involved as a co-chair of the National Emergency Number Association (NENA) Accessibility Committee and the Federal Communications Commission (FCC) Disability Advisory Committee. He has served on the FCC various committees such as Text to 9-1-1, Real-Time Text to 9-1-1, Next Generation 9-1-1, Emergency Notification Systems, and other issues concerning communication access in support of federal, state, and local governments. He was named as one of the top 25 Doers, Dreamers and Drivers and while featured in Government Technology Magazine in 2018. In 2019, he was inducted into NENA's Hall of Fame.

Tony Ruffin, *Co-Founder, Pillars and Bridges*

Joe Smarro, *Chief Executive Officer, SolutionPoint +, LLC*

Joe Smarro is a decorated combat veteran from the United States Marine Corps. He honorably served two tours to Afghanistan and Iraq with the 1st Battalion 4th Marines. In 2005 he joined the San Antonio Police Department (SAPD), where he became one of the original members of SAPD's Mental Health Unit, which Smarro helped to grow into a nationally recognized best practices policing unit. In addition to being one of the main subjects in the HBO documentary, ERNIE & JOE: CRISIS COPS, Smarro has been featured in multiple media outlets including the TEDx talk "I See You." He is the founder and CEO of SolutionPoint+, a national training and consulting firm that focuses on cultivating mental wellness to maximize human capital and promote safety within organizations.

Kate Vander Wiede, *Crisis Response and Prevention Project Manager, Allegheny County Department of Human Services*

Kate Vander Wiede is a Crisis Response and Prevention Project Manager for Allegheny County Department of Human Services, working on projects in which traditional first responders interact with individuals with behavioral health and human service needs. Kate has a bachelor's degree in Mechanical Engineering from the University of Colorado Boulder and a master's in Public Policy and Management from Carnegie Mellon University.

Research Delegates

Brian Aagaard, *Research Analyst, RTI International*

Brian Aagaard, a member of our Policing Research Program, has extensive experience as a crime and intelligence analyst. Mr. Aagaard worked with law enforcement at the local, county, state, and federal levels for more than a decade. His areas of expertise include the collection, management, and analysis of law enforcement data. Mr. Aagaard's current work focuses on the intersection of policing, technology, and analysis. He is particularly interested in the dynamics of law enforcement-community interactions, specifically during routine encounters such as traffic stops. Prior to joining RTI, Mr. Aagaard worked as an analyst at the Onondaga Crime Analysis Center in New York State, the North Carolina State Bureau of Investigation Intelligence Unit, and the City of Durham (North Carolina) Police Department. He is a member of the International Association of Crime Analysts and became an IACA certified law enforcement analyst in 2013.

Jessica W. Gillooly, *Assistant Professor of Sociology & Criminal Justice, Suffolk University*

Jessica Gillooly joined the Sociology & Criminal Justice Department at Suffolk University in the Fall of 2021. Before transitioning to Suffolk, she was a postdoctoral research fellow at the Policing Project at NYU School of Law. Dr. Gillooly's research portfolio focuses on 911 dispatch, policing, organizations, and race. Central to this work is a large multi-method project about dispatch centers and the role the 911 system plays in the criminal justice system. Using a mix of quantitative, qualitative, and conversation analytic methods, she examines the process through which caller requests become police responses. One thread of her research examines the function of the 911 call-taker in mediating caller requests, and their impact on policing in the field. Another thread explores the public's reliance on 911 and identifies potential organizational policy reforms aimed at rethinking the current dispatch-and-response system.

Jeremiah Johnson, *Researcher; LEAD Scholar; Sergeant, Darien Police Department*

Jeremiah Johnson is a policing researcher and practitioner, currently serving in a sworn capacity with the Darien Police Department in Connecticut. During his policing career Jeremiah has worked as a patrol officer, field training officer, accreditation manager, patrol sergeant, detective sergeant, and acting lieutenant. A former National Institute of Justice LEADS Scholar (Class of 2016), Jeremiah is an advocate for evidence-based policing and practitioner-led research. He is an appointed member of the Connecticut Sentencing Commission and is affiliated with the National Police Foundation in Washington DC where he proudly serves as a Policing Fellow. Jeremiah holds a BA in Sociology from Geneva College, an MS in Justice Administration from Western Connecticut State University, an MA in Criminal Justice from John Jay College, and a PhD in Criminal Justice from the City University of New York Graduate Center.

Rylan Simpson, *Assistant Professor of Criminology, Simon Fraser University*

Rylan Simpson is an Assistant Professor in the School of Criminology at Simon Fraser University. He received his Ph.D. in Criminology, Law and Society from the University of California, Irvine (UCI). Prior to receiving his Ph.D., he received his B.A. in Sociology and Psychology from the University of British Columbia and his M.A. in Social Ecology from UCI. He is the recipient of numerous awards for his policing scholarship and engagement with policing officials. He is also an executive counselor for the American Society of Criminology's

TRANSFORM 911

Division of Experimental Criminology, a member of the Canadian Association of Chiefs of Police's Research Advisory Committee, and a mentor for the Canadian Society of Evidence-Based Policing's Virtual Scholar Program.

911 Governance

Co-Chairs

Jerry Clayton, *Sheriff, Washtenaw County, Michigan*

Jerry L. Clayton is a 30+ year Public Safety Services professional, currently serving his fourth term as the Sheriff of Washtenaw County. Sheriff Clayton leads an organization of approximately 420 staff, serving a population of over 358,000, covering a 720-square mile geographical area. During his career with the Sheriff's Office, Jerry served as a front-line Corrections Officer, Deputy Sheriff, and command officer. He was also appointed to the following executive positions; Corrections Commander, Police Services Commander and SWAT Team Commander). Sheriff Clayton serves on the boards of numerous local organizations. These include the Washtenaw Area Council for Children, the local Chapter of NAMI (National Alliance on Mental Illness), the Washtenaw County Mental Health Treatment Court Advisory Board, Washtenaw County Continuum of Care Board (ending homelessness) and the SafeHouse Center.

Stephanie Olson, *Strategic Planning & Performance Manager, Raleigh, North Carolina*

Stephanie Olson is the Strategic Planning & Performance Manager for the City of Raleigh. In this position, she is responsible for overseeing the implementation of the City's 5-year Strategic Plan, departmental business planning, and organization-wide performance management efforts. Stephanie enjoys helping the City make strides in strategic and data-informed decision making. Over the past year, Stephanie has been leading the City of Raleigh's efforts to review 911 calls for service and pilot and implement alternative responses.

Jeanne Milstein, *Director for Human Services, City of New London, CT*

Jeanne is currently the Director for Human Services in the City of New London. Prior to this position, Jeanne was Director of Special Projects and Staff Researcher at the Tow Youth Justice Institute, University of New Haven. She served as Connecticut's Child Advocate from 2000 until 2012, an independent state agency responsible for overseeing the care and protection of children. Jeanne has led efforts to reform the foster care, juvenile justice and mental health systems for children and youth. In addition, Jeanne served as the Deputy Commissioner of Strategic Planning and Policy Development for the Office of Children and Family Services in New York State. Jeanne has also served as the Director of Government and Community Relations at the Department of Children and Families; Legislative Director at the Connecticut Commission on Children; Director of Government Relations at the Permanent Commission on the Status of Women; and Director of the Women's Center of Southeastern Connecticut.

Members

Kurt August, *Interim Director for the City of Philadelphia's Office of Criminal Justice*

Kurt August, MSW, works in close collaboration with criminal justice partners and other City agencies to develop and implement policies designed to meaningfully address the racial, ethnic, and economic disparities in the criminal justice system. For the past 5 years, Kurt has worked at the intersection of the law enforcement and behavioral health communities by piloting a pre-

booking diversion program, an Outreach focused Co-Responder pilot which embeds behavioral health professionals with law enforcement to collaboratively address quality of life issues in the Kensington/Harrowgate section of the City, and a 911 Triage Desk/Co-Responder model that embeds behavioral health professionals in the 911 Call Center to triage 911 calls and also pairs behavioral health professionals with CIT-trained police Officers in unmarked police vehicles in the field to address behavioral health calls that come in to the 911 Call Center in real time.

Peter Beckwith, *General Counsel, South Sound 911*

Peter Beckwith serves as General Counsel for South Sound 911, a regional consolidated PSAP/ECC in Washington State (Tacoma). He received his law degree from Seattle University School of Law and his undergraduate degree from Washington State University. Within the 911 profession he is a graduate of the Association of Public-Safety Communications Officials (APCO) Certified Public-Safety Executive (CPE) program and is an elected board member of the NG911 Institute.

Timothy Bergel, *Director of Support Services, Cook County Sheriff's Police*

Timothy Bergel currently serves as the Director of Support Services for the Cook County Sheriff's Office Emergency Communications Center. In his current role, Timothy oversees the Information Technology and GIS divisions within the ECC/9-1-1 and has served previously as a training instructor and communications supervisor. Timothy has nineteen years of public safety experience in emergency communications (2006-present) and emergency medical services (2003-2006). Timothy earned a Bachelor of Arts Degree in Criminal Justice from Benedictine University and a Master of Science Degree in Threat & Response Management from the University of Chicago – where he was named an Emerging Leader in Emergency Preparedness.

Daryl Branson, *State 911 Program Manager, Colorado Department of Regulatory Agencies*

Daryl Branson currently serves as the State 911 Program Manager for the Colorado Department of Regulatory Agencies and is working with the staff of the Public Utilities Commission. He has worked as a public safety dispatcher, a shift supervisor, and Public Safety Answering Point (PSAP) director in Missouri, Wisconsin, and New Mexico, and most recently served as the executive director of the Colorado 9-1-1 Resource Center. Daryl earned his MPA in Public Administration from Missouri State University, and is certified as an Emergency Number Professional by the National Emergency Number Association and a Registered Public Safety Communications Leader by the Association of Public Safety Communications Officials, Intl.

Richard Collins, *Director of Emergency Services, Sarasota County Government*

Richard Collins currently serves as Director of Emergency Services for Services, Sarasota County Government where they provide strategic direction, leadership and mentoring to Sarasota County emergency services departments including Fire Rescue, Emergency Management, Public Safety Communications, and Lifeguard Operations. Leads a high-performing team of public safety professionals and leaders in the delivery of emergency services to the residents and visitors of Sarasota County. Prior to this position, Richard held titles of Emergency Management Director and Fire Chief in Osceola County Government, Florida, for 9 years. Richard Collins earned a master's degree in Organizational Leadership from Palm Beach Atlantic University. In totality, Richard has over 32 years of public safety experience in both Illinois and Florida.

Chris Fisher, *Senior Advisor, Office of the United States Attorney General*

Christopher Fisher is the Senior Advisor, Office of the United States Attorney General. Previously he served as the Chief Strategy Officer for the Seattle Police Department and was Senior Policy Advisor at the Council of State Governments Justice Center with a focus on law enforcement issues. Prior to the Justice Center, Chris worked throughout the New York City justice system. As Director of Analysis and Integrated Solutions in the New York City Mayor's Office of Criminal Justice, he coordinated interagency efforts to solve criminal justice challenges. Chris has served in similar capacities for other New York City criminal justice agencies, including the New York City Police Department, the Department of Probation, the Administration for Children's Services, and the former Department of Juvenile Justice. Chris holds a doctorate in criminal justice from the Graduate Center of the City University of New York, a master's degree in criminal justice from John Jay College of Criminal Justice, and a Bachelor of Arts degree in psychology from the University of Virginia.

Kris Henderson, *Executive Director of Amistad Law Project*

Kris Henderson is the Executive Director of Amistad Law Project. They grew up in East Orange, New Jersey-- a majority Black, working class community. Their educational career began in East Orange's underfunded schools, continued at a private Christian School, and led to boarding school in New England for high school. Their diverse educational experiences and the realization that a quality education is possible but often incredibly expensive, led them to work towards making sure we all have what we need. They are a movement lawyer, a co-founder of Amistad and a co-founding member of the Coalition to Abolish Death By Incarceration. They are on the steering committee of Free The Ballot! Incarcerated Voter Family Network and on the board of directors of Black Youth Project 100. They are a 2018 Law for Black Lives and Movement Law Lab Legal Innovators Fellow and a 2019 Soros Justice Fellow.

Jason Hernandez, *Executive Director of Intergovernmental Relations, Cook County Sheriff's Department*

Jason Hernandez currently serves as Executive Director of Intergovernmental Relations for Cook County Sheriff's Department as of September 2021. Prior to this position, Jason was Director of Government Affairs for Reyes Kurson, Ltd and Chief of Staff to Alderman Deborah Mell for the City of Chicago. Jason Hernandez has earned a Bachelor of Arts in Political Science and Government and Communication and Media Studies from Loyola University Chicago.

Sally Lawrence, *E911 Coordinator, Sarasota County Public Safety Communications*

Sally Lawrence, E911 Coordinator with Sarasota County, has been working Public Safety since joining the Military Police Corps in 1984. She made the jump to 911 in 1992 becoming operator with the Lakeland Police Department and working her way through the ranks to include trainer, supervisor, County 911 Training Coordinator, 911 Addressing Coordinator and 911 Systems Manager with Polk County. As the Systems Manager, Sally oversaw a robust Public Safety Information Technology and GIS system. During her 14 years as a Coordinator, she has also served as the Chair of the State of Florida's Coordinator's group and Legislative Liaison for Florida NENA and has instructed at 911 Coordinator Bootcamp. Sally moved to Sarasota County in 2017 to explore technology and to continue her career closer to the beach.

Tad McGalliard, *Director for Research, Development, and Technical Assistance, IBM Center for the Business of Government*

Tad McGalliard serves as ICMA's director for research, development, and technical assistance with the International City/County Management Association. For the past 18 years, Tad has led programs, projects, and research on creating more sustainable and resilient communities. Prior to ICMA he worked with Cornell University's Center for the Environment.

Paul Noel, *Deputy Superintendent, Investigation & Support Bureau, New Orleans Police Department*

Paul currently serves as Deputy Superintendent in the Investigation & Support Bureau of the New Orleans Police Department. Prior to this position, Paul served as Deputy Superintendent in the Field Operations Bureau for the New Orleans Police Department. Paul Noel earned a bachelor's degree in Criminal Justice/Safety Studies and Master of Arts in Criminal Justice/Law Enforcement Administration from Loyola University New Orleans.

Shannon Scully, *Senior Advisor, Justice & Crisis Response Policy, National Alliance on Mental Illness*

Shannon Scully is the Senior Advisor for Justice and Crisis Response Policy at NAMI, where she serves as a subject matter expert, providing strategic guidance across the organization regarding NAMI's criminal justice, diversion and crisis response policy. She works closely with key federal agencies and Congress to advance NAMI's priorities and supports leaders across the NAMI Alliance to increase their impact on local and state policies. Prior to joining NAMI, Ms. Scully worked for several other national non-profit organizations on various justice related issues. She began her criminal justice career supporting victims of crime in the county courts in Cook County, IL. Ms. Scully holds a bachelor's degree from the College of St. Benedict, and a Master of Public Policy from American University.

Susan Shah, *Managing Director, Trinity Church Wall Street*

Susan Shah serves as the Managing Director for the Racial Justice Initiative with Trinity Church Wall Street Philanthropies. In this role, she oversees the philanthropic strategy, execution, and partnerships for the initiative. Susan is an experienced lawyer, public health professional, and policymaker in the areas of criminal justice, immigrant rights, and immigrant health. She was previously at the Vera Institute of Justice for over a decade and served in a number of roles, her final being the Director of Programs and Strategy. In this role, she led the national organization with 200+ staff in partnering with local, state, and federal government officials to ensure that justice systems protect human dignity and strengthen communities. Prior to joining Vera, Susan ran immigrant health programs in NYC and practiced immigration law. Susan earned her BA in journalism from Drake University, an MPH from Tufts University, and a JD from Northeastern University School of Law.

Cornelia Sigworth, *Supervisory Program Manager (Associate Deputy Director), Bureau of Justice Assistance*

Cornelia Sigworth currently serves as the Associate Deputy Director with the US Department of Justice's Bureau of Justice Assistance, a post she has held since July 2014. In this capacity, Ms. Sigworth directs the BJA's law enforcement team including its partnerships with local, state, and

national policymakers and their efforts to combat crime and reform the criminal justice system. Ms. Sigworth previously served in a variety of capacities within BJA including most recently as the Senior Advisor to the Deputy Director for Policy and Director of the Violence Reduction Network. Ms. Sigworth began her career with The Department at the National Institute of Justice, where she managed national research, evaluation, and program development. Ms. Sigworth holds a bachelor's degree from Northern Arizona University and a M.S. in Justice, Law, and Society from American University. She is a graduate of the Department of Justice's Leadership Excellence and Achievement Program and is a recipient of the Assistant Attorney General's Dedicated Service Award.

Evonne Silva, *Senior Director, Criminal Justice, Code for America*

Evonne is the Senior Program Director of Criminal Justice, where she leads a team that works alongside communities and government to transform the way services are delivered to those impacted by the criminal legal system. Most recently, Evonne held leadership positions with the ACLU of Northern California, as a legal advisor, building and leading teams, driving process improvement and systems changes, and managing complex, collaborative projects. She has successfully designed and led policy advocacy campaigns across a range of issues with cross-sector stakeholders at several nonprofit advocacy and legal organizations. Evonne is a licensed attorney who holds a Juris Doctorate from UCLA School of Law and a bachelor's degree in politics and economics from Saint Mary's College of California. She also serves as board member of CORO of Northern California and taught legal ethics at U.C. Berkeley School of Law.

Anise Vance, *Assistant Director, Community Safety, Durham, North Carolina*

Anise Vance serves as the Open Data Program Manager for the City and County of Durham. Previously, he was the Senior Manager of Research in Race and Equity at the Boston Foundation. He holds an M.Phil. in Geography from Queen's University Belfast, an MFA in Creative Writing from Rutgers University, and a B.A. from Dartmouth College.

Ken Zimmerman, *Founder and Co-Director, Mental Health Strategic Impact Initiative (S2i)*

Ken Zimmerman is founder and co-director of the Mental Health Strategic Impact Initiative (S2i). He is also a Distinguished Fellow at NYU's Furman Center and a Distinguished Fellow at the Jed Foundation. Previously, he served as director of U.S. programs for the Open Society Foundations and in the Obama and Clinton administrations. Previously, he served as a member of the Obama Administration's HUD transition team as Senior Advisor to HUD Secretary Shaun Donovan. In addition, he was a litigation partner for the pro bono practice group at Lowenstein Sandler, Chief Counsel to New Jersey Governor Jon Corzine, and founding Executive Director of the New Jersey Institute of Social Justice. A graduate of Yale and Harvard Law School, Ken also serves as a Distinguished Fellow at the NYU Furman Center and teaches at NYU's Wagner Graduate School of Public Service.

Research Delegates

Roseanna Ander, *Executive Director, University of Chicago Crime Lab and Education Lab*
Roseanna Ander serves as the founding Executive Director of the University of Chicago Crime Lab (since 2008) and the University of Chicago Education Lab (since 2011) with offices in Chicago and New York, which work to design, test, and scale data-driven programs and practices that improve the public sector's approach to public safety and education. Since their inception, Ander has led the Crime Lab and Education Lab's efforts on violence prevention, criminal justice reform, and improved educational outcomes in Chicago, New York, and around the nation. Ander also helped launch the University of Chicago Urban Labs network, with the creation of three new, independently run labs focused on poverty, health, and the environment. Ander was also key to navigating police training and reform efforts within the Chicago Police Department (CPD), including the Crime Lab's study of CPD's Officer Support System: a first-of-its-kind, data-driven early intervention system that flags officer at risk for adverse events and provides training and support to help avert tragic incidents between police and residents before they occur.

Ayesha Delany-Brumsey, *Director, Behavioral Health, The Council of State Governments*
Dr. Ayesha Delany-Brumsey oversees the Behavioral Health Division and its various portfolios, which focus on how parts of the criminal justice system intersect with the mental health, substance addiction, and homelessness systems, among others. Before joining the organization, Ayesha was most recently the director of Behavioral Health Research and Programming at the Mayor's Office of Criminal Justice in New York City. Prior to that, she was the director of the Substance Use and Mental Health program at the Vera Institute. She received her PhD in clinical psychology from the University of California, Los Angeles.

Jesse Jannetta, *Senior Policy Fellow, Justice Policy Center, Urban Institute*
Jesse Jannetta is a senior policy fellow in the Justice Policy Center at the Urban Institute, where he leads projects on prison and jail reentry, community antigang and antiviolence initiatives, police-community relations, parole and probation supervision, and risk prediction. He is the project director for the Safety and Justice Challenge Innovation Fund, the principal investigator for the Evaluation of Procedural Justice in Probation project, and a member of the leadership team for the Prison Research and Innovation Initiative. He was previously project director for the Transition from Jail to Community initiative, the process and fidelity assessment lead for the evaluation of the National Initiative for Building Community Trust and Justice, and coprincipal investigator for evaluations of the Los Angeles Gang Reduction and Youth Development strategy and the Chicago Violence Reduction Strategy. He applies mixed methods approaches to process and impact evaluations and provides direct technical assistance to jurisdictions improving justice system functioning.

David Muhammed, *Director, The National Institute for Criminal Justice Reform (NICJR)*
David Muhammad is a leader in the fields of criminal justice, violence prevention, and youth development. David is the Executive Director of the National Institute for Criminal Justice Reform (NICJR). David has worked to implement positive youth development into youth justice systems around the country and was the primary author of NICJR's seminal report, A Positive

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Youth Justice System. For three years, David was extensively involved in developing a detailed reform plan for the Los Angeles County Probation Department, the largest probation department in the country. He also served as the technical assistance provider for the Sierra Health Foundation's Positive Youth Justice Initiative, providing training and consulting to several California probation departments. NICJR is currently serving as a technical assistance provider to the City and County of San Francisco, working to reform its juvenile justice system and close its juvenile detention center.

911 Technology and Infrastructure

Co-Chairs

Michael Cowden, *Director of Solutions Engineering, Code for America*

Michael Cowden is the Director of Solutions Engineering at Code for America. He currently works with government stakeholders, and their existing state infrastructure, to find achievable technology and policy solutions for implementing Clean Slate legislation. Prior to joining Code for America, Michael successfully led and developed large software projects across start-ups, Fortune 500 companies and the Federal Government. He holds a degree in Psychology and Computer Science from Towson University and currently resides in Washington, D.C.

Meredith Horowski, *Senior Director, Network, Code for America*

Meredith Horowski is the Senior Director for the Code for America Network. Meredith is an experienced campaigner with particular expertise in grassroots organizing and in creating powerful, diverse movements on pressing social issues. Prior to joining Code for America, she was the Campaign Manager for a 2018 gubernatorial campaign in Rhode Island. As an independent consultant, she led US strategy for the civic tech firm New/Mode and provided strategic support to NetChange Consulting. Meredith founded Beyond the Bomb—a grassroots organization to end systems of nuclear violence. She also served for four years as the Global Campaign Director at Global Zero, where she spearheaded GZ’s international advocacy strategy, creative campaigns, and public mobilization. She’s written for outlets including Teen Vogue, The Nation, and Huffington Post.

Members

Jim Bueermann, *Retired President, National Police Foundation*

Chief Jim Bueermann (Ret.) has spent more than 40 years in policing. From 1978 to 2011 he was a member of the Redlands (CA) Police Department, where he served in every unit within the department. In his last 13 years with the department, he was the Chief of Police and Director of Housing, Recreation and Senior Services. He directed the implementation and strategic development of community policing in Redlands which included directing the consolidation of Housing, Recreation and Senior Services into the police department as a risk and preventative factor strategy for reducing crime and adolescent problem behavior. In 2000, this effort was recognized by the Innovations in American Government Award program (Harvard’s Kennedy School) as one of the 25 most innovative governmental programs in America. After his retirement in 2011 he worked for a year for the USDOJ, National Institute of Justice as an Executive Fellow.

Brian Dunkle, *Regional Sales Manager, Deccan International*

Accomplished executive with a sales and management background in multiple governmental and commercial industries. A recognized ability to enhance and revitalize a division, company, or organization through the identification of new market opportunities utilizing existing products or organizational skill sets. A verifiable track record of building territories, increasing sales, and implementing operational improvements to increase productivity and reduce operating costs.

Christine Gardiner, *Professor of Criminal Justice, California State University, Fullerton*

Christie Gardiner is a Professor of Criminal Justice at California State University, Fullerton, and a Senior Research Fellow for the Police Foundation, as well as a member of CSUF-PD Chief's Advisory Board. She is a certified Crime and Intelligence Analyst with prior work experience as a sheriff's department crime analyst, a police dispatcher, a police explorer, and an intern probation officer. Her fields of expertise include policing and crime policy. She has conducted two major studies on the role of higher education in policing – one on California, the other National – as well as studies on public opinions of police and crime policies and a variety of research projects for local agencies. She has edited multiple books and authored numerous articles, book chapters, and an introduction to policing textbook (*Policing for the 21st Century: Realizing the Vision of Police in a Free Society*).

Ben Horwitz, *Co-Founder, AH Datalytics*

Ben is a nationally recognized expert in data-driven policy management and criminal justice data systems. Ben's work has been instrumental in analyzing organizational problems, evaluating possible solutions, and building data-driven organizations. Before launching AH Datalytics, Ben worked as the Director of Analytics for the New Orleans Police Department, where he instituted a crime analyst unit and implemented the nationally recognized Management Analytics for Excellence (MAX). This platform assists in optimizing police management in the areas of crime, community policing, consent decree compliance, and much more. Ben's influential collaborations have been with the U.S. Department of Justice, National Police Foundation, Ferguson Missouri Police Department, Puerto Rico Police Bureau, the Baltimore Police Department, and others. Ben has a master's degree in Public Policy and Management from Carnegie Mellon University that specializes in the intersection of data, information systems, and public policy. Ben holds a Bachelor of Arts from American University.

Jerry Hall, *Founder, Civic Mapping*

Jerry Hall is a serial entrepreneur currently focused on improving meaningful informed-stakeholder engagement at the intersections of the criminal-legal and behavioral health systems. Jerry served on the San Diego County Behavioral Health Advisory Board for five years and blogs about improving behavioral health stakeholder engagement. Jerry advocates for open and transparent government, especially in the areas of public records and data access. He has served in multiple capacities in community elected and other civic boards, commissions, and workgroups. Jerry is also a CalVoices ACCESS Ambassador advocating from a lived-experience trauma-informed perspective for those released from incarceration while also experiencing mental health and substance use disorder issues.

Billy Lim, *Senior Organizer, Code for America*

Billy is a Senior Organizer at Code for America. From a career in civic organizing, political campaigns, and leadership development, he holds deep conviction in the potential of government to support the flourishing of everyday people and the role of grassroots, people-powered movements to effect and reflect the world of our dreams. An advocate for equity in public service for Asian Americans and ally communities, Billy serves as Chair Emeritus of the Board of Directors for the Conference on Asian Pacific American Leadership (CAPAL). He is a proud son of Cambodian refugees and was born and raised in Milwaukee, Wisconsin. He holds a

Bachelor of Arts degree in American Studies from Yale University, where he was a recipient of the Mellon Mays & President's Public Service fellowships.

Kevin Miller, *Director of Strategic Partnerships, Microsoft Justice Reform Initiative*

Kevin Miller is the Director of Strategic Partnerships for Microsoft's Justice Reform Initiative. In this capacity, Kevin leads grantmaking strategy and manages Microsoft's engagement with justice reform organizations and justice system stakeholders across the US, working toward improved racial equity in the criminal legal system. Before joining the Justice Reform Initiative, Kevin leads national and local partnerships at Microsoft designed to bring technology and data to bear on social issues facing US cities. Prior to Microsoft, he held various roles across the public and nonprofit sector at the intersection of technology and social impact. Kevin holds a BA in political science from UC Berkeley and Master of Public Policy degree from American University.

Micah Mutrux, *911 National Action Team Program Manager, Code for America*

Micah currently serves as 911 National Action Team Program Manager for Code for America where they assist in establishing and leading Code for America's first National Action Team, focused on reimagining 911 emergency response. In the past, Micah was a fellow for Aspen Tech Policy Hub and Volunteer Team Lead for U.S. Digital Response. Micah earned a bachelor's degree in Computer Science from Marlboro College and completed a certificate of Project Leadership and Management and Business Management from Cornell University.

Jesse Niwa, *Deployment Engineer, SPIDR*

Jesse spent seven years as the lead systems analyst for Tucson public safety, handling the technical implementation of CAD and RMS upgrades, and everything in between. Jesse was heavily involved with data analysis for Tucson Police Department's research and analysis unit. For the past year, he has worked as a deployment engineer at SPIDRtech to help law enforcement agencies better connect to their community through automated text messaging from their CAD and RMS systems.

George Rice, *Managing Partner, SkyHawk Global*

George Rice is a Managing Partner at Skyhawk Global Associates. He has a diverse background covering 35 years in public service and global engagement. He is a former American enforcement and intelligence agent and has headed a series of programs and organizations directed at public sector and emergency services efforts, with a focus on the technologies that enhance these vital interests. He is the former Executive Director of the Association of Public-Safety Communications Officials (APCO) International and the Industry Council for Emergency Response Technologies (iCERT), leading both organizations into significant growth periods.

Dave Sehnert, *Director of Strategy and Partnerships, NG911, RapidSOS*

Dave Sehnert serves as Director of Strategy and Partnerships for RapidSOS in conjunction with Commissioner at the NG911 Interoperability Oversight Commission. Prior to these positions, Dave worked as Director of the Innovation and Integration sector of Mission Critical Partners. Dave Sehnert earned a Bachelor of Arts in Economics and Management from Albion College and a Master of Science in Information and Communications Sciences from Ball State

University. Since April of 2014, Dave is certified by NENA as an Emergency Number Professional.

Scott Sobotka, *Primary Consultant, Pragmatica, LLC*

Scott currently serves as Primary Consultant for Pragmatica where they develop software with a specialization in law enforcement, criminal justice, and corrections at all levels of government. Prior to this position, Scott was Senior Software Engineer for NetPro Computing where they developed system monitoring and administration tools for Netware and Active Directory. In the past, Scott has worked for Hypercom Network Systems as a Software Developer and developed network administration applications for Hypercom's line of network devices.

Sema Taheri, *Director of Research Operations, Measures for Justice*

Sema Taheri is the Director of Research & Strategic Initiatives at Measures for Justice. In her role, Sema collaborates with the Engagement team to develop MFJ's data collection protocol, co-manages the development and implementation of a rigorous methodology for data management, and directs the general operations of the Research team. She also collaborates closely with MFJ's leadership to advance the organization's research agenda. Sema has worked closely with practitioners across the system on projects related to data standards, performance measure development, and evaluation. Sema holds a Ph.D. in Criminology & Justice Policy from Northeastern University and a M.A. in Criminology & Criminal Justice from Loyola University Chicago. Her research interests include understanding the research and practice gap and the development of partnerships to guide data-led policy, institutional and community corrections, offender reentry, CJ organizations, and program evaluation.

Research Delegates

Loren Atherley, *Director of Performance Analytics & Research, Seattle Police Department*

Loren currently serves as Director of Performance Analytics & Research for the Seattle Police Department. As a Director for the Seattle Police Department, Loren manages three complimentary programs (Research, Data Warehousing and Data Governance) to discover new insights, develop new methods and operationalize those findings to improve the delivery of police services. Prior to this position, Loren was an adjunct Professor of Criminal Justice at Seattle University. Loren earned a Bachelor of Arts in Political Science and Master of Arts in Criminal Justice from Seattle University. Loren is currently pursuing a PhD in Criminology at the University of Cambridge.

Jake Cramer, *Senior Researcher, Policing Analytics and Strategy, RTI International*

Dr. Jake Cramer is a Senior Policing Researcher with RTI International, where he supports multiple privately and federally funded projects focused on improving police responses to 911 calls for service, use of force data collection and reporting, and improving the national use of NIBRS data. Prior to joining RTI, Dr. Cramer served as the Analysis Administrator the Tucson Police Department, where he was responsible for creating and leading the Analysis Division. As administrator, he was recognized for his work with multiple state and national awards, including an Arizona Innovator Award, the 40 Under 40 Award by IACP, and was the first civilian to be selected by NIJ to be a LEADS fellow. Dr. Cramer has more than 10 years of experience, and

received his Ph.D., and M.A., from the University of Arizona, and received his B.A., from Syracuse University.

Robin Engel, *Professor of Criminal Justice, University of Cincinnati*

Dr. Robin S. Engel is a Professor of Criminal Justice at the University of Cincinnati. She also serves as the Director of the International Association of Chiefs of Police (IACP)/UC Center for Police Research and Policy. Dr. Engel engages in research and evaluation in the field of criminal justice and works directly with practitioners to implement evidence-based strategies and best practices. Dr. Engel's work includes establishing academic-practitioner partnerships in policing, with expertise in empirical assessments of police behavior, police use of force, police-minority relations, police supervision and management, criminal justice policies, criminal gangs, and crime reduction strategies. She has served as the Principal Investigator for over 80 contracts and grants, and has provided statistical and policy consulting for international, state, and municipal law enforcement agencies. She teaches in the areas of policing and criminal justice.

Dave McClure, *Senior Principal, Police Executive Research Forum*

Dave McClure is a Senior Principal at the Police Executive Research Forum (PERF) in Washington, D.C. For more than 15 years. Dave has been working in different research, policy, and practice settings to improve the effectiveness and efficiency of justice systems through empirical research, science, data, and technology. Prior to joining PERF in 2019, Dave was a Research Associate in the Urban Institute's Justice Policy Center, where he worked on different aspects of police body-worn cameras, DNA and other forensic sciences, open data from police and other government agencies, the opioid crisis, evidence-based smartphone applications, and many other topics involving science, data, and technology in the justice system. Dave earned his undergraduate degrees from the University of Georgia and his M.A. and Ph.D. from George Mason University. Dave has served as a member of Integrated Justice Information System Institute's Information Technology and Architecture Committee since 2015.